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Minimum Performance Standards – Airborne Ground Proximity Warning Equipment

RTCA DO-161A
Revised May 27, 1976

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SC-128

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F O R E W O R D

This Document was prepared by Special Committee 128 of the Radio Technical Commission for Aeronautics (RTCA). It was approved by RTCA on May 27, 1976.

RTCA is an association of aeronautical organizations of the United States from both government and industry. Dedicated to the advancement of aeronautics, RTCA seeks sound technical solutions to problems involving the application of electronics and telecommunications to aeronautical operations. Its objective is the resolution of such problems by mutual agreement of its member organizations.

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I N T R O D U C T I O N

This Document sets forth Minimum Performance Standards for Airborne Ground Proximity Warning Equipment.

This revision of DO-161 includes Changes 1 and 2 to that Document, and also includes further changes that were suggested by operational experience. The Environmental Tests in this Document have been modified to reflect the requirements of RTCA Document DO-160, "Environmental Conditions and Test Procedures for Airborne Electronic/ Electrical Equipment and Instruments".

Compliance with these standards by manufacturers and users is recommended as a means of assuring that the equipment will satisfactorily perform its intended function under all conditions normally encountered in routine aeronautical operations.

In any application of these minimum performance standards, due allowance should be made, where necessary, for equipments in current use which meet the intent of the standards contained herein.

It is recognized that any regulatory application of these standards is the responsibility of governmental agencies.

Inasmuch as the measured values of equipment performance characteristics may be a function of the method of measurement, standard test conditions and methods of test are also recommended in this Document.

The word "equipment" as used herein includes all of the components or units necessary (as determined by the equipment manufacturer) for the equipment to properly perform its intended function. For example, an Airborne Ground Proximity Warning "equipment" may include cockpit controls, an indicator, a computer unit, aural warning generator, a barometric rate computer, a shock mount, etc. In the case of this example, all of the foregoing components or units comprise the "equipment". It should not be inferred from this example, however, that every "equipment" will necessarily include all of the foregoing components. This will depend on the design used by the "equipment" manufacturer. The "equipment" need not include other sensor systems for which separate standards are applicable, e.g. Radio Altimeter.

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1.0 GENERAL STANDARDS

1.1 Purpose of Equipment

Ground Proximity Warning Equipment is an aid to aircrew for determining the imminent occurrence of inadvertent contact with the ground. It is intended to supplement flight instrument data from which this situation may be determined, annunciating the onset of the condition caused by excessive rate of descent, excessive closure rate to terrain, negative climb rate or altitude loss after take-off, flight into terrain when not in landing configuration and excessive downward deviation from an ILS glide slope.

1.2 Operation of Controls

The operation of controls intended for use during flight, in all possible combinations and sequences, shall not result in a condition whose presence or continuation would be detrimental to the continued performance of the equipment.

1.3 Accessibility of Controls

Controls which are not normally adjusted in flight shall not be readily accessible to flight personnel.

1.4 Effects of Tests

Unless otherwise provided, the application of the specified tests shall produce no subsequently discernible condition which would be detrimental to the continued performance of the equipment.

1.5 Modes of Operation

Ground Proximity Warning equipment shall provide indications of imminent inadvertent contact with the ground in the following modes of aircraft operation as further defined by this Minimum Performance Standard:

1. Excessive Rates of Descent
2. Excessive Closure Rate to Terrain
3. Negative Climb Rate or Altitude Loss After Take-Off
4. Flight Into Terrain When Not in Landing Configuration
5. Excessive Downward Deviation From an ILS Glide Slope