RADIO TECHNICAL COMMISSION FOR AERONAUTICS
1717 H Street, N. W., Suite 655
Washington, D. C. 20006

# MINIMUM OPERATIONAL PERFORMANCE STANDARDS FOR GROUND BASED AUTOMATED WEATHER OBSERVATION EQUIPMENT

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Prepared by:
SC-143

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# F O R E W O R D

This document was prepared by Special Committee 143 of the Radio Technical Commission for Aeronautics (RTCA). It was approved by RTCA on January 23, 1981.

It should be noted here that certain elements of the ground based automated weather equipment are not defined in great detail (i.e. specific requirements/test procedures). Development of equipment to measure phenomena such as visibility, sky condition and thunderstorms is still in the embryonic stages and precise definition and quantification is beyond the current state of the art.

The RTCA Executive Committee elected to approve this report in the hope that it will serve as a benchmark for future development activities in automated weather sensing equipment.

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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# 1.0 PURPOSE AND SCOPE

## 1.1 Introduction

This document sets forth minimum operational performance standards for ground based automated weather observation equipment. Incorporated within these standards are system characteristics that will be meaningful to users of the system as well as designers, manufacturers and installers. These characteristics are intended to be in accord with the requirements of various users, including fixed-based operators, the National Weather Service, the Federal Aviation Administration, airplane and helicopter operators, etc.

Section 1.0 of this document provides information needed to understand the rationale for equipment characteristics and requirements stated in the remaining sections. It describes typical equipment applications and operational goals as envisioned by the members of Special Committee 143, and is the basis for the standards stated in Sections 2.0 through 4.0. Definitions and assumptions essential to proper understanding of this document are also provided in Section 1.0.

Section 2.0 contains the minimum performance standards for the equipment. These standards define the required performance under standard operating conditions and stressed physical environmental conditions. It also details the recommended bench test procedures necessary to demonstrate compliance.

Section 3.0 describes the performance required of the installed equipment. Tests for the installed equipment are included when performance cannot be adequately determined through bench testing.

Section 4.0 describes the operational characteristics for equipment installations and defines conditions that will ensure that the equipment will function safely and reliably in the expected operational environment.

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

Any regulatory application of this document, in whole or in part, is the sole responsibility of appropriate governmental agencies.

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

It is recognized that differences exist between international and local requirements, standards and practices with respect to meteorological information. These differences are primarily in terminology, units of measurement, averaging times and reporting accuracies. Users and manufacturers should be aware of these differences when designing equipment for installation at locations which use these other techniques.

This document considers an equipment configuration consisting of:

a. Minimum System Configuration

Includes:

(1) Barometric Pressure
(2) Wind Direction and Speed (light and variable, wind gusts and calm outputs in voice systems)
(3) Time (Greenwich)
(4) Automatic Data Processing Equipment for:
    (a) Processing
    (b) Storing
    (c) Averaging
(5) Observation output in voice and/or digital format.

b. Recommended Instrument Flight Rule Configuration

Includes the minimum system configuration plus sensors for:

(1) Sky Condition
(2) Visibility
(3) Dewpoint
(4) Temperature

c. Optional Features:

Additional functions and components that may refer to expanded system capabilities are identified as optional features. The additional functions which have been defined as desirable are:

(1) Thunderstorm location and intensity