



Barbados Civil Aviation  
Department

BCAD Document AAC-023

**AIRWORTHINESS**

**ADVISORY**

**CIRCULAR**

# AVIONICS TEST EQUIPMENT



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# AVIONICS TEST EQUIPMENT

## Section 1 Background

### 1. OBJECTIVE.

This circular provides guidance for:

- a). Inspecting test equipment used during the calibration, repair and overhaul of avionics equipment.
- b). The maintenance of avionics test equipment used to check avionics installations on aircraft.

### 2. GENERAL.

An AMO certified to maintain airborne avionics equipment must have test equipment suitable to perform that maintenance. Regardless of the type of equipment being used, the minimum test equipment necessary to perform the maintenance, as required by the manufacturer is acceptable.

#### *A. Test Equipment Equivalency*

Normally, test equipment which is equivalent to that recommended by the appliance or aircraft manufacturer will be accepted. It is the responsibility of the AMO with support from the manufacturer to demonstrate equivalency.

#### *B. Test Equipment Updating.*

(1) State-of-the-art advances often affect the modes and parameters of avionics equipment. Therefore, previously accepted test equipment may need to be modified to ensure compatibility with any new equipment used.

#### *C. Test Equipment Calibration.*

The regulations require that maintenance facilities calibrate the test equipment at regular intervals to ensure accuracy.

(1). Appliances requiring calibration are those items which are necessary to perform measurements or tests of an aircraft, system or component to defined limits as specified in the type certificate holders technical documentation.

(2). In all cases it is the responsibility of the AMO to ensure that an unbroken traceability chain is in place to a National or International accreditation standard, for example, the United States. The National Institute of Standards and Technology traceability can be verified by reviewing test equipment calibration records for references to National Institute of Standards and Technology test report numbers. These numbers certify traceability of the equipment used in calibration.

(3). If the AMO uses a standard for performing calibration, that standard cannot be used to perform maintenance. It must be clearly identified as a calibration standard and kept in a secure place.

(4). The calibration intervals for test equipment will vary with the type of equipment, environment, and use. The accepted industry practice for calibration intervals is usually one year. Where the AMO considers that a different interval is warranted, in a particular case, this must be supported by the manufacturer and will require a system of continuous analysis of calibration results to be established to support variations to manufacturers recommended intervals.

(5). A clear system of labeling calibrated appliances is necessary, setting out when the next inspection, service or calibration is due.

(6). The AMO must have procedures for maintaining a register of all test equipment together with calibration records, approved calibration sources and an effective call up system.

(7). Calibration certificates should as a minimum, contain the following information for each appliance calibrated:

- . • Identification of equipment
- . • Standard used
- . • Results obtained
- . • Uncertainty of measurement
- . • Assigned calibration interval
- . • Limits of permissible error
- . • The authority under which the release document was issued
- . • Any limitation of use of the equipment
- . • Date on which the calibration was conducted.

(8). Any appliance whose serviceability is in doubt, must be removed from service and labeled accordingly. Such equipment shall not be returned to service until the reasons for the unserviceability have been eliminated and its continued calibration is re-validated. Where the results of calibration prior to adjustment or repair indicate that a risk of significant errors may have existed in any previous measurements made, the necessary corrective action shall be taken.

## **Section 2 Procedures**

### *A. Perform the Inspection.*

(1) Determine what test equipment is required by reviewing the operator/manufacturer's maintenance manuals.

(2) Ensure that the AMO has full control of the test equipment, i.e. ownership, lease, etc., and that the test equipment is located on the premises.

(3) Ensure that the following is accomplished according to the operator's/AMO's approved

Maintenance Procedures Manual:

- Identification of equipment
- Recording of the date and person/organization calibrating each piece of test equipment.

(4) Ensure that inspection and calibration of the precision tools and test equipment is done in accordance with the operator/agency's manual procedures.

*B. Inspect Automatic Test Equipment (ATE)*

(1) Ensure that the ATE testing program provides an in-depth analysis that ensures the aircraft components and testing standards are functionally tested within the prescribed manufacturer's limits.

(2) Verify that management control is accomplished in accordance with the operator's/AMO's approved manual and includes procedures for the following:

- The setting of limits and standards
- The performance of evaluation checks and tests
- The updating of a listing that identifies each ATE test by number and a reference to the applicable section of the component manual
- Controlling and identifying the revision status of software programs

(3) Ensure that the operator/agency's purchasing maintenance service, including ATE programs, is accomplished in accordance with the operator/agency's approved maintenance program.