FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SCIENCE AND TECHNOLOGY
Washington, D.C. 20554

Measurement Procedure MP-8
(December 1984)

Measurement Procedures for Radiotelegraph Auto Alarms

1. INTRODUCTION

1.1 Cargo ships subject to the radiotelegraph provisions of Title III, Part II of the Communications Act of 1934, as amended, which carry only one radio officer, are required by the Act to be fitted with radiotelegraph auto alarm receivers. This document contains the recommended measurement procedures for the auto alarm receivers. Reference to this document may be made in connection with application to the Federal Communications Commission (FCC) for equipment authorization of auto alarm receivers. This document is not intended to be a complete engineering standard.

2. TESTS PROCEDURES

2.1 Tests will be conducted using signals with A1B, A2B, and H2B emissions, with modulation percentages and modulation frequencies as described in the following paragraphs, and with the auto alarm connected to an artificial antenna consisting of a 20 microhenry inductance, a 500 picofarad capacitor, and a 5 ohm resistor connected in series. The signal levels specified refer to the RMS value of signal applied to the series combination of the specified artificial antenna and the auto alarm receiver.

3. SENSITIVITY TESTS

3.1 For these tests, the alarm signal utilized shall consist of a series or 4-second dashes separated by 1-second spaces.

3.2 Measure the minimum radio frequency signal input to the auto alarm at 500 kHz, keyed with an alarm signal (30 percent modulated with a 300 Hz tone) required to activate the alarm.

3.3 Test for proper operation of the alarm using a 100 microvolt radio frequency input at 500 kHz, keyed with an alarm signal (30 percent modulated with a 300 Hz tone).

3.4 Test for proper operation using a 1 volt radio frequency input at 500 kHz, keyed with an alarm signal (30 percent modulated with a 300 Hz tone).

3.5 Repeat the tests in paragraphs 3.2, 3.3, and 3.4 using a test signal that is 30 percent modulated with a 1350 Hz tone.

3.6 Repeat the tests in paragraphs 3.2, 3.3, and 3.4 using a test signal that is 100 percent modulated with a 300 Hz tone.

3.7 Repeat the test in paragraph 3.6 using a 1350 Hz tone.

3.8 Test for proper operation of the alarm with a 100 microvolt alarm signal (30 percent modulated with a 300 Hz tone) transmitted on any radio frequency from 496 to 504 kHz, inclusive.

4. OPERATIONAL TESTS

4.1 Test the auto alarm for proper operation with the simultaneous input of a 100 microvolt auto alarm signal (30 percent modulated with an 800 Hz tone) on 492 kHz, and a 200,000 microvolt unkeyed signal (30 percent modulated with an 800 Hz tone) on the frequency 350 kHz.

4.2 Repeat the test in 4.1 with the same alarm signal and a 25,000 microvolt unkeyed signal (30 percent modulated with an 800 Hz tone) on the frequency 460 kHz.

4.3 Test the auto alarm for proper operation with the simultaneous input of a 100 microvolt auto alarm signal (30 percent modulated with an 800 Hz tone) on 508 kHz, and a 25,000 microvolt unkeyed signal (30 percent modulated with an 800 Hz tone) on the frequency 540 kHz.

4.4 Repeat the test in 4.3 with the same alarm signal and a 200,000 microvolt unkeyed signal (30 percent modulated with an 800 Hz tone) on the frequency 650 kHz.

5. SELECTOR RESPONSE

5.1 Test the auto alarm for the rejection of dashes and spaces as provided in Section 83.555(a) of the FCC Rules. The tests will be made on the radio frequency 500 kHz with any input from 100 microvolts to 1 volt RMS with A1B, A2B, and H2B emissions at any modulation frequency from 300 to 1350 Hz.

5.2 The alarm signal selector circuitry must be capable of ignoring any interfering signal which occurs during any alarm signal space interval, as long as that signal is separated from a preceding or succeeding dash by the minimum permissible space.

5.3 The AGC charge and discharge time constants of the auto alarm receiver shall be such that the alarm signal selector does not experience signal drop-out due to AGC reduction of receiver sensitivity when testing for the maximum permissible length dash in conjunction with the minimum permissible space.

6. POWER FAILURE

6.1 Test to see that the warning device is activated when the main power supply to the auto alarm fails.

7. TEST CIRCUIT

7.1 Test the built-in test circuit as specified in the operator's manual to determine that the circuit will operate the auto alarm.

8. RELIABILITY

8.1 The auto alarm must perform properly after being placed in operation for a period of one hour while subjected to each of the following conditions of temperature and relative humidity.

8.1.1 50 degrees centigrade and 50 percent relative humidity.

8.1.2 30 degrees centigrade and 95 percent relative humidity.

8.1.3 Zero centigrade and 50 percent relative humidity.

8.2 The auto alarm must perform properly after being placed in operation for one hour under the following conditions:

8.2.1 While the device is being rocked in such a manner as to simulate a roll and pitch of 45 degrees from the vertical.

8.2.2 When subjected to vibrations having a period between 20 and 30 hertz and an amplitude of at least 0.03 inch total excursion (plus or minus 0.015 inches from position of rest) in a direction at an angle of 30 to 45 degrees with the base of the device.

8.3 A test must be conducted 24 hours a day for a period of not less than 30 consecutive days to ascertain the reliability of the auto alarm and its freedom from false alarms under practical interference conditions. For this test, the auto alarm must be connected to an antenna typical of the average main antenna on shipboard and its operation must be observed continuously during this period.

8.3.1 During this test period, a minimum of 500 test alarm signals must be applied to the auto alarm while it remains connected to the specified field test antenna. During the official test period, no adjustment of the auto alarm may be made more often than once in each 12 consecutive hours.

9. GENERAL CONSTRUCTION

9.1 All units of the auto alarm system must be designed and constructed in accordance with generally accepted principles and practices of modern marine electronics engineering.