

MIL-S-6904B  
 19 April 1965  
SUPERSEDING  
 (See Section 6)

## MILITARY SPECIFICATION

### SIGNALS, EMERGENCY WARNING, GENERAL SPECIFICATION FOR

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope - This specification covers the requirements for aircraft emergency crew warning signals for operation on 28VDC circuits aboard aircraft.

1.2 Classification - Emergency crew warning signals suitable for operation on 28VDC circuits shall be classified as specified on the applicable specification sheet.

#### 2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on the date of invitation for bids, or request for proposal, form a part of this specification to the extent specified herein.

#### SPECIFICATIONS

##### Military

MIL-E-5272	Environmental Testing, Aeronautical and Associated Equipment, General Specification for
MIL-S-6904/1	Signal, Emergency Warning (Bell)
MIL-S-6904/2	Signal, Emergency Warning (Horn)
MIL-S-6904/3	Signal, Emergency Warning (Horn with a Projector)
MIL-S-7742	Screw Threads, Standard, Optimum Selected Series, General Specification for
MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of

FSC 6340

MIL-S-6904B

Military (Continued)

MIL-D-70327 Drawings, Engineering and Associated Lists

## STANDARDS

Military

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-129 Marking for Shipment and Storage

MIL-STD-130 Identification Marking of U. S. Military Property

MIL-STD-704 Electric Power, Aircraft, Characteristics and Utilization of

MIL-STD-831 Test Reports; Preparation of

MS33586 Metals, Definition of Dissimilar

MS3102 Connectors, Electrical Receptacles, Box Mounting

(Copies of specifications, standards, drawings and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

## 3. REQUIREMENTS

3.1 Preproduction - The signals furnished under this specification shall be a product which has been tested and has passed the preproduction tests specified herein.

3.2 Precedence - When the requirements of this specification and the applicable specification sheet are in conflict, the requirements of the specification sheet shall govern.

3.3 Materials -

3.3.1 Protective treatment - When materials are used in the construction of the signal assembly that are subject to deterioration when exposed to climatic and environmental conditions likely to occur during service usage (see 3.5.10) they shall be protected against such deterioration in a manner that will in no way prevent compliance with the performance requirements of this specification. The use of any protective coating that will crack, chip, or scale with age or extremes of climatic and environmental conditions shall be avoided.

MIL-S-6904B

3.3.2 Metals - Wherever practicable, all metals used in the manufacture of the signal assembly shall be corrosion resistant unless plated or treated to resist corrosion. The use of dissimilar metals, especially brass, copper, or steel in intimate metal-to-metal contact with aluminum or aluminum alloy shall be avoided wherever practicable. Dissimilar metals are defined in MS33586.

3.3.3 Fungusproof materials - Materials that are nutrients for fungi shall not be used where it is practicable to avoid them. Where used and not hermetically sealed, they shall be treated with a fungicidal agent acceptable to the procuring activity. However, if they will be used in a hermetically sealed enclosure, fungicidal treatment will not be necessary.

3.3.4 Standard parts - Standard parts shall be used wherever they are suitable for the purpose, and shall be identified on the drawings by their part numbers. Commercial utility parts such as screws, bolts, nuts, cotter pins, etc., may be used, provided they possess suitable properties and are replaceable by the standard parts without alteration, and provided the corresponding standard part numbers are referenced in the parts list and, if practicable, on the contractor's drawings. In the event there is no suitable corresponding standard part in effect on date of invitation for bids, commercial parts may be used provided they conform to all requirements of this specification.

### 3.4 Design and construction -

3.4.1 Design - The design of all signals shall be of the lightest and most compact nature consistent with reliable, economical service operation. The design shall be reasonably simple to permit disassembly and reassembly for the purpose of repair, replacement of parts or adjustment without requiring special tools and fixtures. The signal assembly shall be of sufficiently rugged construction to withstand the mechanical shocks, vibrations, and stresses incident to its use on aircraft. The complete assembly shall be similar to the assembly shown on the applicable specification sheet. The specification sheet covers a representative sample, and assemblies of slightly different design will be considered as meeting the requirements providing the specified and limiting dimensions, mounting holes, connections, and all other requirements of the specification are met, and preproduction samples are approved.

3.4.2 Adjustment - The signals shall be so designed and constructed to provide a means for making any necessary adjustments as specified on the applicable specification sheet.

3.4.3 Terminations - The wiring for the signals shall terminate in an electrical connector or terminal posts as specified on the applicable specification sheet.

### 3.5 Performance -

3.5.1 Operation - When the signal assemblies are tested as specified in 4.6 the operating characteristics shall conform as specified herein and in accordance with the applicable specification sheet. (See 3.2.)

MIL-S-6904B

3.5.2 Temperature rise - The signal shall be capable of withstanding continuous operation for the period and maximum temperature rise specified on the applicable specification sheet.

3.5.3 Starting voltage-operation - The signal shall be designed to operate on 28 volt direct current. The signal shall be capable of meeting the power requirements established between aircraft electric systems and airborne utilization equipment in accordance with MIL-STD-704, unless otherwise specified on the applicable specification sheet.

3.5.4 Dielectric strength - The signal assembly shall be so insulated that it will withstand between terminals and other exposed metal parts the applied specified voltage as shown on the applicable specification sheet.

3.5.5 Current consumption - The current consumed by the signal when adjusted to produce the required sound intensity shall be as specified in 4.6 and in accordance with the applicable specification sheet.

3.5.6 Sound intensity - The signal shall provide a sound intensity of at least 100 decibels as indicated on a standard sound meter at a distance of 3 feet under conditions encountered in a soundproof room (see 4.6) and as specified on the applicable specification sheet. (See 3.5.7.)

3.5.7. Endurance - The signal shall satisfactorily withstand the life signal test as specified on the applicable specification sheet. (See 4.6.)

3.5.8 Sound frequency - The signal shall provide sound at the frequencies specified on the applicable specification sheet. (See 4.6.)

3.5.9 Cycling - The cycling of the signal shall be checked as specified on the applicable specification sheet. (See 4.6.)

3.5.10 Environmental - The signal shall be capable of operating under the following environmental conditions:

- (a) Temperatures - Ranging from  $-54^{\circ}$  to  $+71^{\circ}$  C.
- (b) High temperature - The high temperature test shall be as specified in 4.6 and on the applicable specification sheet.
- (c) Low temperature - The low temperature test shall be as specified in 4.6 and on the applicable specification sheet.
- (d) Altitude - At a pressure altitude from sea level to 55,000 feet. (See applicable specification sheet.)

## MIL-S-6904B

- (e) Relative humidity - Up to 100 percent, including conditions wherein condensation takes place in the form of both water and frost.
- (f) Sand and dust - Exposure to airborne sand and dust particles encountered in normal and desert operation.
- (g) Salt spray - Exposure to salt sea atmosphere.
- (h) Vibration - Incident to service use.
- (j) Explosionproofing - Operation in an explosive vapor within or surrounding the equipment. (As specified on the applicable specification sheet.)

3.6 Interchangeability - All parts having the same manufacturer's part number shall be directly and completely interchangeable with each other with respect to installation and performance. Changes in manufacturer's part numbers shall be governed by the drawing number requirements of MIL-D-70327.

3.7 Dimensions - The signal assembly shall conform to the dimensions as specified on the applicable specification sheet.

3.8 Weight - The weight of one signal shall not exceed the value specified on the applicable specification sheet.

3.9 Screw threads - Screw threads shall be in accordance with MIL-S-7742.

3.10 Identification of product - Each signal shall be marked in accordance with MIL-STD-130.

3.11 Soldering - No acid soldering flux shall be used in the construction of the assemblies.

3.12 Workmanship - The signal, including all parts and accessories, shall be fabricated and finished in a thoroughly workmanlike manner. Particular attention shall be given to freedom from blemishes, defects, burrs, and sharp edges; accuracy of dimensions, radii of fillets, thoroughness of soldering, welding, brazing, painting, wiring, and riveting; alignment of parts and tightness of assembly screws, bolts; etc.

3.12.1 Riveting - Riveting operations shall be carefully performed to insure that the rivets are tight and satisfactorily headed.

3.12.2 Cleaning - The signal shall be thoroughly cleaned, and loose, spattered, or excess solder, metal chips, and other foreign material shall be removed during and after final assembly.

MIL-S-6904B

## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection - Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of tests - The inspection and testing of the signals shall be classified as follows:

- (a) Preproduction tests (see 4.3.).
- (b) Acceptance tests (see 4.4.).

4.3 Preproduction tests -

4.3.1 Sampling instructions - Preproduction test samples shall consist of three signals of each manufacturer's part number for which preproduction is desired. Preproduction test samples shall be identified by the manufacturer's own part number and any additional identification required by the letter of authorization. Samples shall be forwarded to the activity responsible for preproduction, designated in the letter of authorization from that activity. (See 6.2.) If the product is later modified in any way, the modified form shall be subjected to and pass the same preproduction tests.

4.3.2 Preproduction tests - Preproduction tests shall consist of all of the tests described under 4.6, in accordance with the applicable specification sheet, and shall be performed in the order specified in Table I for each type of signal assembly. (See 3.2.)

TABLE I

SAMPLE NO. 1	SAMPLE NO. 2	SAMPLE NO. 3
Examination of product Operating test Temperature rise (see specification sheet) Low-voltage operation Dielectric strength Current consumption Sound intensity Endurance Sound frequency Cycling High temperature Low temperature Humidity Sand and dust Salt spray	Examination of product Operating test Vibration Explosionproofing (See applicable specification sheet)	Examination of product Operating test Altitude (see applicable specification sheet)

MIL-S-6904B

4.4 Acceptance tests - Acceptance tests shall be performed on signals which have been submitted under contract to determine conformance of the product with requirements set forth in the specification prior to acceptance. The acceptance tests shall consist of the following:

- (a) Individual tests.
- (b) Sampling plans and tests.

4.4.1 Individual tests - Each signal shall be subjected to the following tests:

- (a) Examination of product (see 4.6.1).
- (b) Operating test (see 4.6.2).

4.4.2 Sampling plans and tests -

4.4.2.1 Sampling plan A - A sample from each lot shall be selected in accordance with MIL-STD-105, Special Inspection Level S-2, acceptance number zero, and subjected to all the tests of 4.6, as applicable, with the exception of the altitude test of 4.6.

4.4.2.2 Sampling plan B - A sample of signals from each lot which has been accepted when tested as specified by 4.4.1 and 4.4.2.1 shall be selected in accordance with MIL-STD-105, Special Inspection Level S-1, acceptance number zero, subject to the altitude test in accordance with paragraph 4.6.11.3 and the applicable specification sheet (see 3.2).

4.5 Test conditions -

4.5.1 Standard atmospheric conditions - Unless otherwise specified tests shall be made at atmospheric pressure (approximately 29.92 inches Hg) and at room temperature approximately 25° C (77° F). When tests are made with atmospheric pressure or room temperature differing materially from the above values, proper allowance shall be made for the difference from the specified condition.

4.6 Test methods -

4.6.1 Examination of product - Signal assemblies shall be examined to verify that the materials, design, construction, physical dimensions, marking, and workmanship are in accordance with the applicable requirements (see 3.1, 3.3, 3.4, 3.7, 3.10, and 3.12).

4.6.2 Operating test - Signals shall be measured for operating characteristics in accordance with the applicable specification sheet (see 3.5.1).

4.6.3 Temperature rise - One signal selected for test in each lot shall be subjected to test continuously for the period and temperature rise as specified on the applicable specification sheet (3.2). This test shall be conducted with the signal suspended in still air by a nonheat-conducting material attached to the mounting base so that the signal is within a minimum of 1 foot from any heat-conducting surface.

## MIL-S-6904B

4.6.4 Low-voltage operation - The low-voltage operation for the signal shall be as specified on the applicable specification sheet (see 3.2).

4.6.5 Dielectric strength - The signal assembly shall be tested to the specified voltage in accordance with the applicable specification sheet (see 3.2).

4.6.6 Current consumption - The current consumed by the signal when adjusted to produce the required sound intensity (see 4.6.7) shall be as specified on the applicable specification sheet (see 3.2).

4.6.7 Sound intensity - The signals selected for test from each lot shall be mounted on a nonresonant stand and shall be operated as specified on the applicable specification sheet (see 3.2) to determine that a sound intensity of at least 100 decibels is produced at a 3-foot distance. The sound intensity shall be determined with a standard sound meter in a soundproof room.

4.6.8 Endurance - The signal selected for test shall be operated in accordance with and as specified on the applicable specification sheet (see 3.2).

4.6.9 Sound frequency - The frequency range and sound level of the signal shall be tested by an approved commercial method and shall conform to the requirements as specified on the applicable specification sheet (see 3.2).

4.6.10 Cycling - The cycling of the signal shall be checked by an approved commercial method during the test as specified in 4.6.9. It shall conform to the requirements as specified in the table of the applicable specification sheet (see 3.2).

4.6.11 Environmental - The signal shall be subjected to the following environmental tests in accordance with the specified procedure of MIL-E-5272.

4.6.11.1 High temperature - The high temperature test shall be in accordance with Procedure II. At the completion of this test the signals shall function normally. (See 3.2.)

4.6.11.2 Low temperature - The low temperature test shall be in accordance with Procedure II and the signal tested for proper operation.

4.6.11.3 Altitude - The signal shall be placed in an altitude chamber maintained at an altitude temperature of  $-65^{\circ}\text{C}$  ( $-85^{\circ}\text{F}$ ) and the pressure reduced to simulate an altitude condition of 55,000 feet (2.9 inches of mercury absolute pressure) for a period of 4 hours. After returning to room temperature, the signal shall be carefully examined for any evidence of damage (see 3.2).

4.6.11.4 Humidity - The signal assembly shall be subjected to the Humidity test Procedure I unless otherwise specified on the applicable

## MIL-S-6904B

specification sheet (see 3.2). The signal shall be checked for proper operation at the conclusion of the test.

4.6.11.5 Sand and dust - The signal assembly shall be mounted in the test chamber to simulate actual installation. The signal shall be subjected to the sand and dust test in accordance with Procedure I. The signal shall be operated during the test when so specified by the applicable specification sheet. The signal shall operate satisfactorily at the conclusion of the test.

4.6.11.6 Salt spray - The signal assembly shall be mounted in the test chamber to simulate actual installation. The signal shall be subjected to the salt spray test in accordance with Procedure I. Unless otherwise specified in the applicable specification sheet, the duration of the salt spray test shall be 50 hours. The signal shall not be operated during the test, unless otherwise specified in the applicable specification sheet. At the conclusion of the test, the signal shall operate satisfactorily, and there shall be no evidence of excessive corrosion or failure of any part to function properly.

4.6.11.7 Vibration - The signal assembly shall be subjected to a vibration test in accordance with Procedure XII. The vibration amplitude (total excursion) shall be 0.060 inch and the vibration frequency continually varying between 10 and 55 cps. The signal shall be operated at intervals during the test. Upon the completion of the test the signal shall operate satisfactorily. It shall not operate inadvertently.

4.6.11.8 Explosionproof test - The signal assembly shall be subjected to an explosion test in accordance with Procedure III, and as specified on the applicable specification sheet. The design of the signal shall be such that it will not cause an explosion when operated in an explosive atmosphere.

## 5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging - Preservation and packaging shall be level A or C as specified in the contract or order (see 6.2).

5.1.1 Level A or C - Signals (horn and bell) shall be packaged in accordance with the applicable packaging requirements of MIL-E-17555.

5.2 Packing - Packing shall be level A, B or C as specified (see 6.2).

5.2.1 Level A, B or C - Signals (horn or bell) packaged as specified in 5.1 shall be packed in accordance with the applicable packing requirements of MIL-E-17555.

5.3 Marking - In addition to any special marking required by the contract or order, marking for identification and shipment shall be in accordance with MIL-STD-129.

MIL-S-6904B

6. NOTES

6.1 Intended use - The signals covered by this specification are intended for use in aircraft to warn the crew of an emergency condition.

6.2 Ordering data - Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Military part number of signal desired (see 1.2).
- (c) Quantity required.
- (d) Where the preproduction test samples, and test reports should be sent (see 4.3.1).
- (e) Levels of preservation, packaging and packing required (see 5.1).

6.3 Supersession data - This specification supersedes the following specifications and standard.

MIL-S-6904A  
Dated 30 November 1951

MIL-S-8372 (USAF)  
Dated 25 August 1953

MIL-H-25747A (USAF)  
Dated 13 February 1958

MS25222 (ASG)  
Dated 21 August 1957

6.4 Provisions for preproduction testing - Manufacture of any additional signals on a particular contract should be suspended until the samples submitted for the preproduction tests are pronounced satisfactory by the procuring activity. When a contractor is in continuous production of these signals from contract to contract, submission of further preproduction samples on the subsequent contracts may be waived at the discretion of the procuring activity. Approval of preproduction samples or the waiving of preproduction tests does not reduce the requirements of acceptance testing.

6.4.1 It is understood that the signal supplied under contract or order will be identical with the corresponding preproduction sample in design, construction, quality, material, workmanship and method of manufacture. Evidence of unauthorized change may constitute cause for rejection.

MIL-S-6904B

Custodians:

Army - MO  
Navy - WP  
Air Force - 82

Preparing activity:

Navy - WP  
(Project No. 6340-0019)

Review activities:

Army - MO  
Navy - WP  
Air Force - 82

User activities:

Army  
Navy - CG  
Air Force

Review/user information is current as of this document. Future coordination of changes to this document, draft circulation should be based on the information in the current DODISS.

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
INSTRUCTIONS		
This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).		
SPECIFICATION		
MIL-S-6904B		SIGNALS, EMERGENCY WARNING, GENERAL SPECIFICATION FOR
ORGANIZATION (Of submitter)		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING.		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO      IF "YES", IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED (Printed or typed name and activity)		DATE

FOLD

DEPARTMENT OF THE NAVY  
Naval Air Engineering Center  
Philadelphia, Pennsylvania 19112

POSTAGE AND FEES PAID  
NAVY DEPARTMENT

OFFICIAL BUSINESS

BuWeps Engineering Standardization Office (Code X)  
Naval Air Engineering Center  
Philadelphia, Pennsylvania 19112

FOLD