MIL-S-7852B
1 April 1968
SUPERSEDING
MIL-S-7852A
18 June 1958

MILITARY SPECIFICATION

SEAT, AIRCREW, ADJUSTABLE SWIVEL, TYPE E-1

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

1. SCOPE

1.1 This specification establishes the requirements for standard, adjustable, swivel seats for use by crew memebers other than pilot and copilot.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Federal

QQ-P-416	Plating, Cadmium (Electrodeposited)
QQ-Z-325	Zinc Coating, Electrodeposited Requirements For
PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-621	Boxes, Wood, Nailed And Lock-Corner
PPP-B-636	Box, Fiberboard

Military

MIL-P-116	Preservation, Methods Of
MIL-D-1000	Drawings, Engineering And Associated Lists
MIL-M-3171	Magnesium Alloy, Processes For Pretreatment And Prevention Of Corrosion On
MIL-R-5001	Rubber Cellular Sheet, Molded And Hand Built Shapes; Latex Foam
MIL-C-7219	Cloth, Duck, Nylon, Parachute Packs
MIL-E-7729	Enamel, Gloss For Aircraft Application
MIL-R-8236	Reels, Shoulder Harness, Inertia Lock
MIL-P-8585	Primer Coating, Zinc Chromate, Low-Moisture-Sensitivity
MIL-A-8625	Anodic Coatings, For Aluminun And Aluminum Alloys

STANDARDS

Federal

FED-STD-595	Colors

Military

MIL-STD-129	Marking For Shipment And Storage
MIL-STD-130	Identification Marking Of US Military Property
MIL-STD-143	Specifications And Standards, Order Of Precedence For The Selection Of
MIL-STD-831	Test Reports, Preparation Of
MIL-STD-1186	Cushioning, Anchoring, Bracing, Blocking, And Waterproofing; With Appropriate Test Methods
MS33586	Metals, Definition Of Dissimilar

DRAWINGS

Air Force

53D20961	Harness, Aircraft Safety, Shoulder, Adjustable, Type MB-2
54H19650	Belt, Aircraft Safety, Lap, Type MD-1
54H19651	Belt, Aircraft Safety, Lap, Type MD-2

(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 testing. This specification makes provision for preproduction testing.

* 3.2 Selection of specifications and standards. Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143 except as provided in 3.3.1 and 3.3.2.

3.2.1 Commercial parts. Commercial parts having suitable properties may be used where, on the date of invitation for bids, there are no suitable standard parts. In any case, commercial utility parts, like screws, bolts, nuts, cotter pins, having suitable properties may be used provided:

a. They can be replaced by the standard parts (MS or AN) without alteration.

b. The corresponding standard part numbers are referenced in the parts list and, if practical, on the contractor's drawings.

3.2.2 Standard parts. With the exception in 3.2.1, MS and AN standard parts shall be used where they suit the purpose. They shall be identified on the drawings by their part numbers.

3.3 Materials.

3.3.1 Fungus-proof materials. Materials that are nutrients for fungi shall not be used where it is practical 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 inclosure, fungicidal treatment will not be necessary.

3.3.2 Metals. Metals shall be of the corrosion-resistant type or suitably treated to resist corrosion due to fuels, salt spray, or atmospheric conditions likely to be met in storage or normal service.

3.3.2.1 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be used in intimate contact with each other. Dissimilar metals are defined in MS33586.

3.4 Design. The seat shall be designed for maximum comfort, ease of adjustment, and minimum weight.

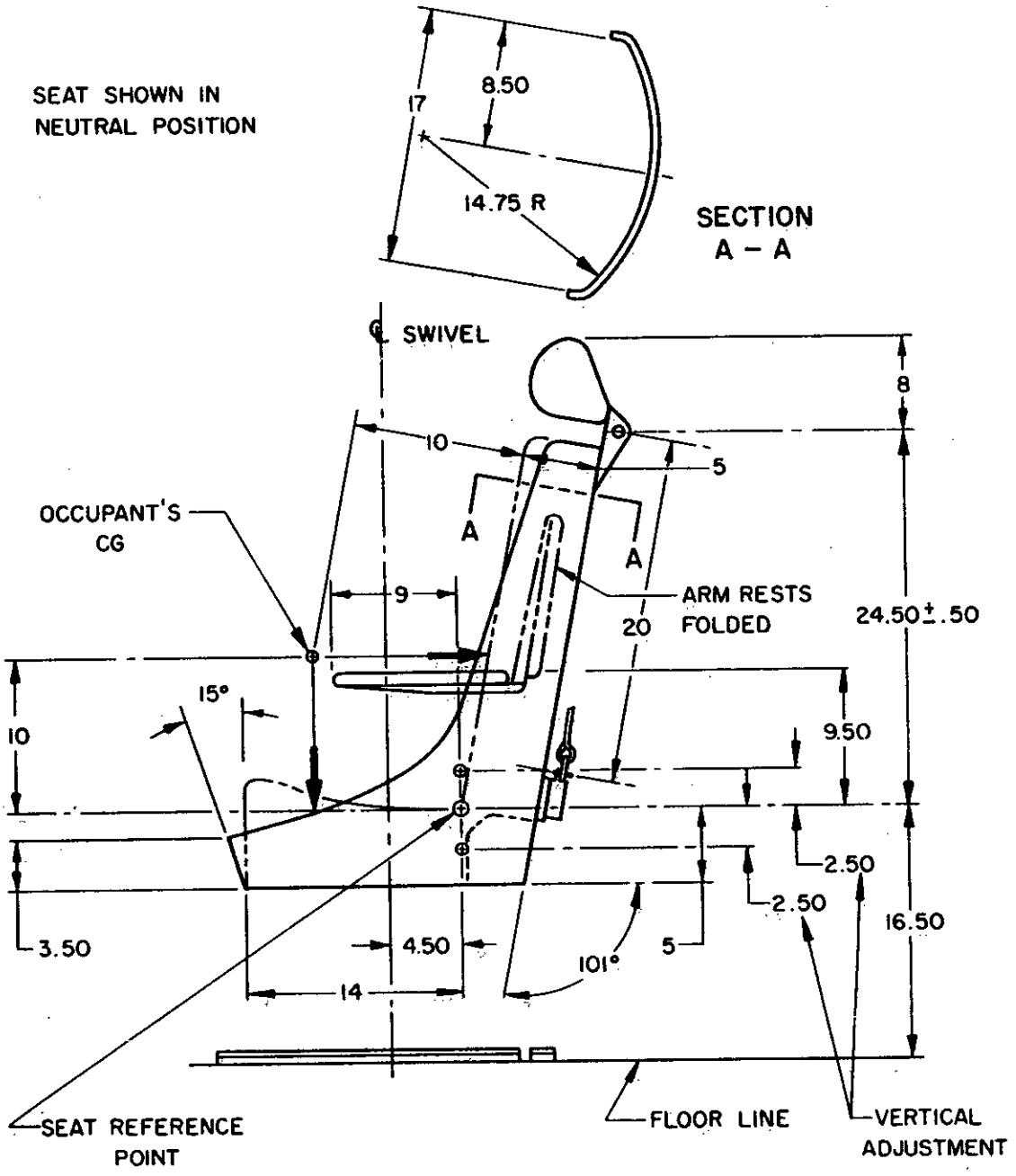
3.4.1 Dimensions. The critical dimensions of the seat shall be as specified in Figures 1 through 4. Unless otherwise specified, a tolerance of 1/16 inch will be allowed on the over-all dimensions.

3.4.2 Adjustments. The seat shall be adjustable as follows.

3.4.2.1 Vertical adjustments. The seat shall be provided with a 5-inch vertical adjustment as indicated in Figure 1. The seat shall be adjustable in increments of 1/2 inch within the 5-inch adjustment range. This adjustment shall incorporate a loaded mechanical device which shall raise the seat as the occupant's weight is removed. This load shall not exceed 150 pounds when the seat is in the lowest position nor be less than 30 pounds when the seat is in the highest position.

3.4.2.2 Swivel adjustment. The seat shall be capable of being rotated on its base through any number of complete revolutions in either the clockwise or counterclockwise directions. The swivel adjustment shall contain at least 8 locking positions equally speaced through 360 degrees and shall be capable of being swiveled freely, when unlocked, while carrying a load of 250 pounds on the seat bottom.

3.4.2.3 Horizontal adjustment. The seat shall be adjustable along the tracks for a distance of not less than 6 inches in increments of not more than 1 inch.



DIMENSIONS IN INCHES

FIGURE 1. SIDE VIEW OF SEAT

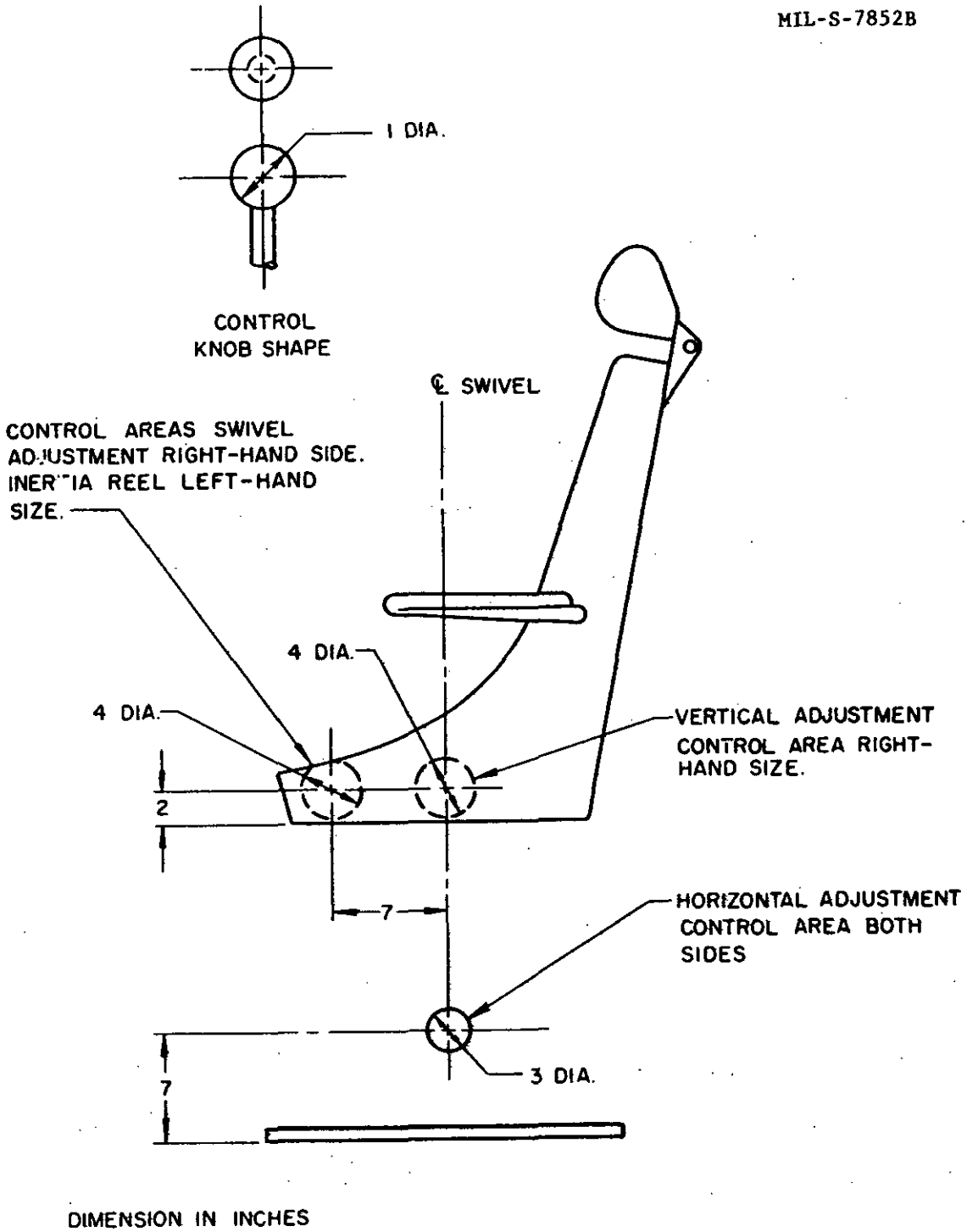
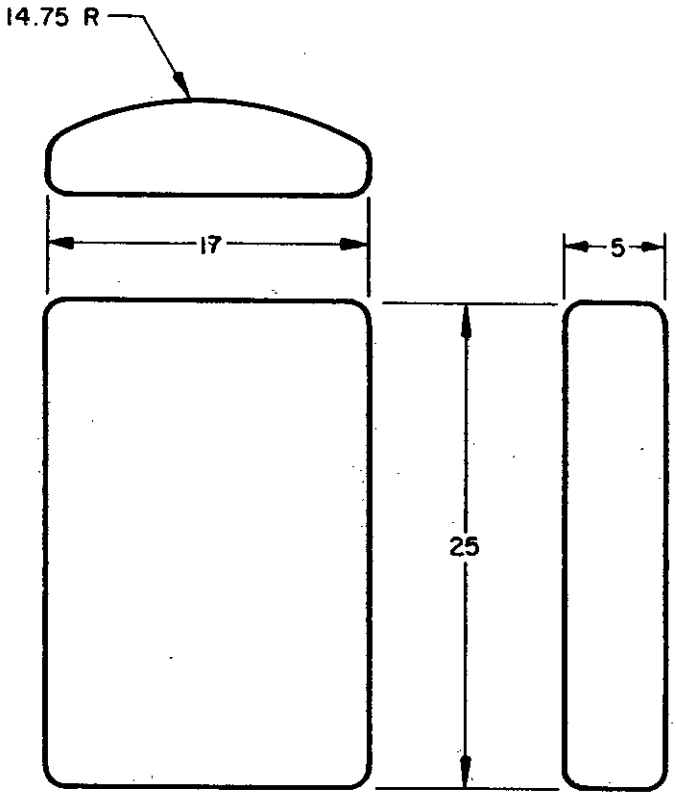
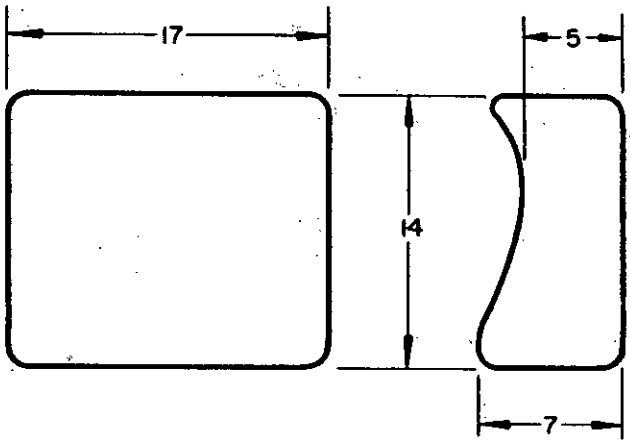


FIGURE 2. SIDE VIEW OF SEAT SHOWING LOCATION OF CONTROL AREAS FOR SEAT ADJUSTMENTS.



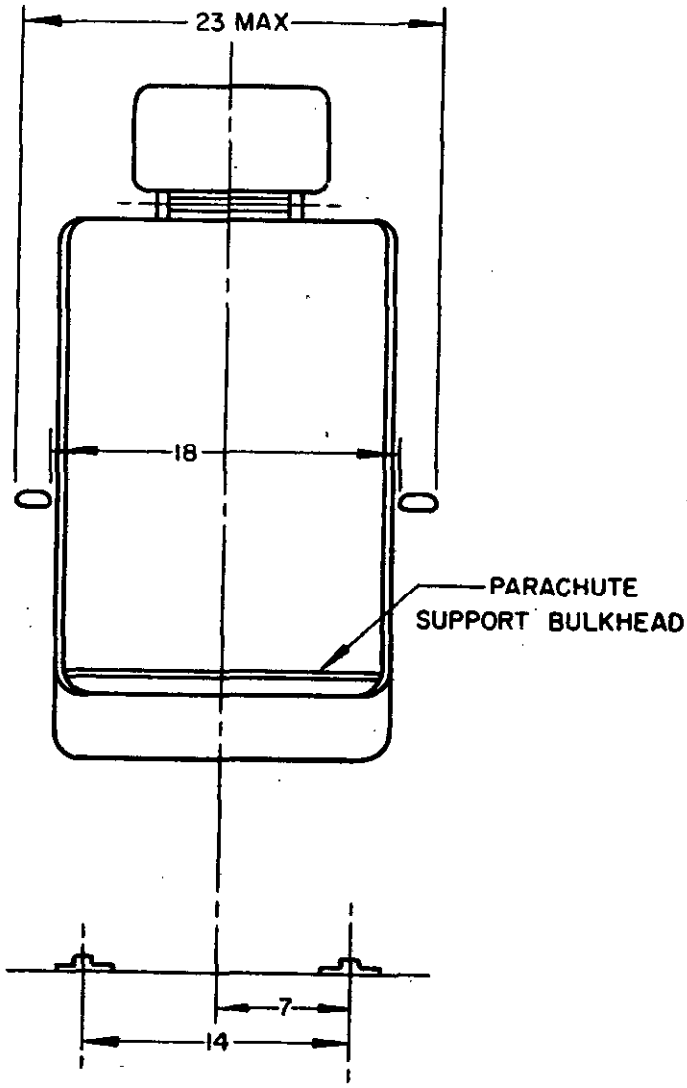
BACK PARACHUTE SPACE REQUIREMENTS



SURVIVAL KIT SPACE REQUIREMENTS

DIMENSIONS IN INCHES

FIGURE 3. BACK VIEW OF SEAT



DIMENSIONS IN INCHES

FIGURE 4. SPACE REQUIREMENTS

3.4.3 Locking mechanism. The control levers for operating the swivel and vertical adjustments shall be located on the right hand side of the seat within the circular areas indicated in Figure 2. The control lever for operating the shoulder harness inertia reel shall be located on the left hand side of the seat within the circular area indicated in Figure 2. The relative location with respect to the occupant of the control levers for the swivel and vertical adjustment and the inertia reel shall not change when the seat is adjusted horizontally or swiveled. Two control levers shall be provided for operating the horizontal adjustment along the tracks. One control lever shall be located on each side of the seat when the seat is faced parallel to the tracks. The control levers shall be located within the circular areas indicated in Figure 2. The seat adjustment control knobs shall be shaped as shown in Figure 2, and there shall be a minimum of 1 1/2 inches clearance between the seat adjustment control knobs and the seat structure. The locking mechanisms shall be released by an upward movement of the levers and the angular movement of the levers shall not exceed 50 degrees. Special attention shall be given to the locking mechanisms to insure that the mechanisms will automatically lock when the levers are released.

3.4.4 Arm rests. Arm rests shall be provided on each side of the seat at the approximate location indicated in Figure 1. The arm rests shall fold into a position where they will not interfere with the egress or ingress of the occupant.

3.4.5 Headrest. The seat shall incorporate a headrest at the approximate location indicated in Figures 1 and 3. The headrest shall be so designed and installed as to not interfere with the egress or ingress of the parachute pack.

3.4.6 Shoulder harness reel. The seat shall incorporate a shoulder harness take-up inertia lock reel, conforming to MIL-R-8236. The reel shall be located in such a manner that the centerline of the shoulder harness attachment bolt is 20 inches below the top of the seat back over which the shoulder harness will slide. It shall be so located that the cable pulls off the reel in a plane which includes the longitudinal (fore and aft) centerline of the seat.

3.4.7 Shoulder harness roller and guide. A shoulder harness roller and guide shall be provided on the seat back. The dimensions and location of the roller and guide shall be as shown on Figures 2 and 3. The roller shall have a minimum diameter of 1 inch.

3.4.8 Safety belt and shoulder harness. Provisions shall be made for the use of the Type MD-1 safety belt conforming to Drawing 54H19650 or the Type MD-2 safety belt conforming to Drawing 54H19651, the belt to be attached with 1/4 inch diameter aircraft bolts. The attachment fitting shall be of the fork type which will place the attachment bolt in double shear. The point of attachment to the seat shall be so located that when the belt is inclined upward and forward with the plane of the belt at an angle of 40 degrees to the plane of the floor, the centerline of the belt will pass through the reference point. Provisions shall also be made for the use of the Type MB-2 shoulder harness conforming to Drawing 53D20961, the belt to be attached to the take-up mechanism with a 10-32 aircraft bolt.

* 3.4.9 Headrest and arm rests upholstery. The covering material on the headrest and arm rests shall be 7 1/4 ounce nylon cloth conforming to MIL-C-7219, type III. It shall be vat dyed maroon (red) conforming to color number 21136 of FED-STD-595. The headrest cushioning material shall be resilient, curable, comfortable, and shall not pack due to use. The top surface of the arm rests shall be cushioned with a 3/4 inch thickness of foam rubber, conforming to MIL-R-5001, type II, class medium.

3.4.10 Parachute support bulkhead. The seat shall be provided with a metal bulkhead permanently fastened within the seat and located as shown in Figures 1 and 3.

3.4.11 Drain holes. Drain holes shall be provided to drain the seat with the bottom in any position into which it might be placed by the normal ground position of the airplane.

3.4.12 Tracks. The tracks which permit horizontal adjustment of the seat shall be provided with holes for attachment to the floor. These holes shall be drilled size "G" (0.261) for 1/4 inch bolts. The holes shall be arranged in two rows on each track. The two rows shall be symmetrical about the centerline of the track (not in staggered rows) and 2 1/2 inches apart. The longitudinal spacing of the holes in both rows shall be 5 1/2 inches between centers, starting with a set of holes directly below the reference point when the seat is adjusted to a position midway of the fore-and-aft travel. The tolerance on the distance between the centerline of any two holes on one track shall be ±1/64 inch.

3.5 Construction.

3.5.1 Basic structure. The basic structure of the seat shall be fabricated of metal. No wood or other materials which are subject to attack by mildew or fungus shall be used in the basic structure.

3.5.2 Methods. Riveting or welding may be used for assembly of component parts fabricated of metals which are suitable for this type of construction. Fittings and joints which will require disassembly for installation or removal of the seat from the airplane or for disassembly of the component parts of the seat shall be bolted.

3.5.3 Projections. The inside surfaces of the seat shall be free from projections which could catch or damage by abrasion the parachute pack or the clothing of the occupant. The exterior surfaces of the seat shall be free from sharp edges or any projections which might scratch the hands or clothing of the occupant as he moves his arms about the sides of the seat to handle equipment within his reach to the rear and to the sides.

3.5.4 Strength requirements. The seat shall have sufficient strength to carry the following loads.

3.5.4.1 Seat bottom. A down load of 4,000 pounds ultimate, 2,665 pounds proof, distributed over the seat bottom with the load center of gravity (cg) located as shown in Figure 1. The seat shall be mounted facing parallel to the tracks and adjusted to the maximum up position.

3.5.4.2 Seat back. An aft load of 4,000 pounds ultimate, 2,665 pounds proof, distributed over the seat back with the load cg located as shown in Figure 1. The seat shall be adjusted to the maximum up position. This aft load shall be applied under three separate conditions; directly aft, 20 degrees to the right, and 20 degrees to the left of aft.

3.5.4.3 Headrest. An aft load of 200 pounds ultimate, 135 pounds proof, uniformly distributed over the headrest.

3.5.4.4 Arm rests. A down load of 300 pounds ultimate, 200 pounds proof, applied at the center of each arm rest. A side load of 100 pounds ultimate, 67 pounds proof, applied outward or inward perpendicular to each arm rest in a horizontal plane. The load shall be applied at the center of the arm rest. It is not required that these loads be applied simultaneously.

* 3.5.4.5 Safety belts. A load of 2,880 pounds ultimate, 1,920 pounds proof, applied to the lap safety belt mountings (equally distributed between the two) on the side of the seat in a direction forward and inclined 40 degrees up from the floor line; and a load of 1,800 pounds ultimate 1,200 pounds proof, applied to the shoulder harness takeup mechanism in a forward direction parallel to the floor line as indicated in 4.6.2. These loads shall be applied simultaneously and under three separate conditions; directly forward, 20 degrees to the right, and 20 degrees to the left of forward.

* 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-1000.

3.7 Weight. The completed seat, including all parts, inertia reel, adequate finish coating, and tracks which permit a 6-inch fore and aft adjustment shall not exceed a total weight of 42 pounds.

* 3.8 Color. The color of the seat structure shall be medium gray conforming to color 36231 of FED-STD-595, unless otherwise specified by the procuring agency.

* 3.9 Finish. Aluminum-alloy parts shall be anodically treated in accordance with MIL-A-8625. Magnesium-alloy parts shall be treated in accordance with MIL-M-3171. Noncorrosion-resisting steel parts shall be cadmium-plated in accordance with QQ-P-416, or zinc-plated in accordance with QQ-Z-325. The paint finish shall consist of one thin coat of zinc-chromate primer, conforming to MIL-P-8585, followed by two coats of aircraft enamel conforming to MIL-E-7729.

3.10 Identification of product.

3.10.1 Nameplate. A nameplate, permanently and legibly filled in with the following information, shall be securely attached to the seat in an appropriate position for easy detection after installation. The information marked in the spaces provided on the nameplate shall be in accordance with MIL-STD-130.

SEAT, AIRCREW, ADJUSTALLE, SWIVEL, TYPE E-1.
Specification MIL-S-7852.
Stock Number.
Manufacturer's Part Number (or identification).
Contract or Order Number.
Manufacturer's Name or Trade-Mark.
U.S. Property.

3.11 Workmanship. The seat, including all parts and accessories shall be constructed and finished in a thoroughly workmanlike manner. Particular attention shall be given to neatness and thoroughness of welding, riveting, machine-screw assemblies, painting, and freedom of parts from burrs and sharp edges.

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 in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by 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 seats shall be as follows:

a. Preproduction tests see 4.4

b. Quality conformance inspection see 4.5

4.3 Test conditions. The test conditions are described under the individual tests to which they apply.

4.4 Preproduction testing.

* 4.4.1 Test sample. The preproduction test samples shall consist of models representative of the production crew seat. They shall be tested at a laboratory acceptable to the Government or, when so stated in the contract, at the contractor's plant under the supervision of the procuring activity.

* 4.4.1.1 Preproduction sample. Examination and testing of the preproduction sample shall be made on a completely fabricated item for all provisions of this specification applicable to end product examination and test before regular production is started.

* 4.4.1.2 When specified in the contract, one seat shall be submitted to the procuring activity at the time the preproduction sample test report is submitted for approval. The sample will be used by the procuring activity for performance of any of the tests specified herein which may be deemed necessary after a review of the contractor's test report.

* 4.4.2 Test report. In the event that the preproduction testing is performed at the contractor's plant, the contractor shall, after completion of the preproduction tests, prepare a preproduction test report according to MIL-STD-831. The contractor shall furnish this report to the procuring activity.

* 4.5 Quality conformance inspection. Quality conformance inspection shall consist of the following:

a. Individual test see 4.5.1

b. Sampling plans and tests see 4.5.2

* 4.5.1 Individual tests. Each seat shall be subjected to the following tests as described under 4.6.

* 4.5.2 Sampling plans and tests. Sample seats shall be selected at random from each lot on the same material order, in the quantities specified below for compliance with the tests in 4.6 test methods.

a. Two seats from each lot or fraction thereof.

b. Three seats from each lot of 500 or fraction thereof above 200.

c. One seat from each additional 500 or fraction thereof above 500.

* 4.5.3 Rejection and retest. Failure of any seat to pass the inspection tests shall be cause for rejection of the entire lot represented. If in the opinion of the inspector, such failure is attributable to faulty workmanship or other defects not likely to occur throughout the lot, the contractor may test three additional seats selected at random from the lot. Failure of any one of these additional seats shall be cause for the final rejection of the entire lot represented.

* 4.6 Test methods.

* 4.6.1 Examination of product. Each seat shall be carefully examined to determine conformance to this specification with respect to design, standard parts, finish, adjustments, dimensions, workmanship, material, weight, and marking.

* 4.6.2 Functional tests. The sample seat shall be mounted in a suitable jig or fixture by utilizing the normal track tie down provisions. The seat shall then be subjected to and be required to withstand without failure, the ultimate loads specified in 3.5.4.1 through 3.5.4.5 inclusive. These loads shall be applied to the seat without cushions. The attitude of the seat during the test may be changed to facilitate testing if the direction of the loads with respect to the seat remains the same. The loads may be applied by means of hydraulic or pneumatic press, jacks, shot bags, or any other suitable method. The lap belt and shoulder harness mountings shall be loaded simultaneously to the ultimate loads specified in 3.5.4.5. The lap belt attachments shall be subjected to tests in which the loads are applied to a block or a frame fitted within the seat and held in place by the lap belt attached to the mountings. The load shall be applied to the shoulder harness take-up reel by means of a shoulder harness or strap of equivalent dimensions to the shoulder harness attached to the take-up reel cable terminal. The strap or shoulder harness shall be carried up over the shoulder harness support, and the loads applied as indicated in 3.5.4.2 and 3.5.4.5.

* 4.7 Inspection of the preservation, packaging, packing and marking for shipment and storage. Sample items or packs and the inspection of the preservation, packaging, packing and marking for shipment and storage shall be in accordance with the requirements of Section 5, or the documents specified therein.

* 5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or C, as specified (see 6.2).

5.1.1 Level A. Each seat shall be preserved and packaged in accordance with MIL-P-116, Method III, in a weather resistant unit container conforming to PPP-B-636.

5.1.2 Level C. Level C preservation and packaging will afford adequate protection against corrosion, deterioration and physical damage during shipment from supply source to the first receiving activity for immediate use. This level may conform to the supplier's commercial practice, provided the latter meets the requirements of this level.

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

5.2.1 Level A. Seats preserved and packaged as specified in 5.1.1 shall be packed in overseas type shipping containers conforming to PPP-B-601 or PPP-B-621. As far as practicable, shipping containers shall be of uniform shape and size, of minimum cube and tare consistent with the protection required, and contain identical quantities. The gross weight of each shipping container shall not exceed the weight limitation of the specification. Containers shall be closed and strapped in accordance with the specification and appendix thereto.

5.2.2 Level B. Seats preserved and packaged as specified in 5.1.1 shall not be overboxed for domestic shipments. The unit container, closed and strapped in accordance with the applicable appendix of the container specification shall be the shipping container.

5.2.3 Level C. Level C packing will afford adequate protection at the lowest rate against damage during direct domestic shipment from the supply source to the first receiving activity for immediate use. This level shall conform to applicable carrier rules and regulations and may be the supplier's commercial practice, provided the latter meets the requirements of this level.

5.3 Physical protection. Cushioning, blocking and bracing, shall be in accordance with MIL-STD-1186, except that for domestic shipments, waterproofing requirements for cushioning materials and containers shall be waived. Drop tests of MIL-STD-1186 shall be waived when preservation, packaging and packing of the item is for immediate use or when drop tests of MIL-P-116 are applicable.

5.4 Marking. Interior and exterior containers shall be marked in accordance with MIL-STD-129. The nomenclature shall be as follows:

Seat, Aircrew, Adjustable, Swivel, Type E-1

6. NOTES

6.1 Intended use. The Type E-1 Crew Seat is intended for the use of aircraft crew members other than the pilot and copilot.

* 6.2 Ordering data. Procurement documents should specify the following:

a. Title, number, and date of this specification.

b. Selection of applicable levels of preservation, packaging and packing (see 5.1 and 5.2).

c. If one seat shall be submitted to the procuring activity (see 4.4.1.2).

* 6.3 Identification of changes. The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Air Force - 82
Army - AV
Navy - AS

Review Activities:
Air Force - 82
Army - AV
Navy - AS

Preparing Activity:
Air Force - 82

Project No. 1680-0052

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

OMB Approval
No. 22-R255

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DOCUMENT IDENTIFIER AND TITLE

NAME OF ORGANIZATION AND ADDRESS

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?
   A. GIVE PARAGRAPH NUMBER AND WORDING.

   B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

2. COMMENTS ON ANY DOCUMENT REQUIREMENT CONSIDERED TOO RIGID

3. IS THE DOCUMENT RESTRICTIVE?

   ☐ YES ☐ NO *(If "Yes", in what way?)*

4. REMARKS

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