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Binoculars, Prismatic, Hand-Held (for Aeronautical Use)
(7 x 50 and 6 x 42 (Wide Field))

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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NOTICE

This document has been taken directly from U.S. Military Specification MIL-B-8568B and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards. The initial release of this document is intended to replace MIL-B-8568B. Any part numbers established by the original specification remain unchanged.

The original Military Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, and (b) the use of the existing government specification or standard format.

Under Department of Defense policies and procedures, any qualification requirements and associated qualified products lists are mandatory for DOD contracts. Any requirement relating to qualified products lists (QPL's) has not been adopted by SAE and is not part of this SAE technical document.

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1. SCOPE:

1.1 Scope:

This specification covers hand-held prismatic stereoscopic binoculars for aeronautical use in search, rescue, and patrol operations. (See 6.1.)

1.2 Classification:

The binoculars shall be of the prismatic stereoscopic type, wherein the image in each of the two telescopic systems is erected by a prism system designed to enhance stereoscopy, and shall be of the following types:

Type I - 7-power, 50 millimeter (mm) aperture (7 x 50)

Type II - 6-power, 42 millimeter (mm) aperture (6 x 42)

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

Federal

KK-B-650	Brief Case (Leather)
KK-L-154	Leather; Cattlehide, Bag and Case
QQ-P-416	Plating, Cadmium (Electrodeposited)
UU-P-553	Paper, Wrapping, Tissue
PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-636	Box, Fiberboard

Military

MIL-P-116	Preservation, Methods of
MIL-G-174	Glass, Optical
MIL-C-675	Coating of Glass, Optical Elements (Anti-Reflection)
MIL-D-1000	Drawing, Engineering and Associated List
MIL-M-3171	Magnesium Alloy, Processes for Pretreatment and Prevention of Corrosion on
MIL-E-5272	Environmental Testing, Aeronautical and Associated Equipment, General Specification for
MIL-C-5541	Chemicals, Films, and Chemical Film Materials for Aluminum and Aluminum Alloys
MIL-E-5557	Enamel, Heat-Resisting, Glyceryl-Phthalate, Black

2.1 (Continued):

MIL-E-5558	Enamel, Wrinkle-Finish for Aircraft Use
MIL-R-6855	Synthetic Rubber Sheets, Strips, Molded or Extruded Shapes
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-F-22191	Films, Transparent, Flexible, Heat Sealable, For Packaging Applications

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-143	Specifications and Standards, Order of Precedence for the Selection of
MIL-STD-1186	Cushioning, Anchoring, Bracing, Blocking, and Waterproofing with Appropriate Test Methods
MS33586	Metals, Definition of Dissimilar

DRAWINGS

Air Force - Navy Aeronautical

AN227	Fasteners - Snap and Curtain
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(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.)

2.2 Other publications:

The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issues in effect on the date of invitation for bids or request for proposal shall apply.

Consolidated Classification Committee

Uniform Freight Classification Rules

(Applications for copies should be addressed to the Consolidated Classification Committee, 202 Chicago Union Station, Chicago, Illinois 60606.)

2.2 (Continued):

National Bureau of Standards Publication

Handbook H28 Screw-Thread Standards for Federal Services

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.)

3. REQUIREMENTS:

3.1 Preproduction:

The binoculars furnished under this specification shall be a product, which has been tested and meets the Quality Assurance Provisions specified herein.

3.2 Selection of Government documents:

Except as provided in 3.2.1 and 3.2.2, specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143.

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

3.2.2 Commercial parts: Commercial parts having suitable properties shall be used, when on the date of invitations for bids, there are no suitable standard parts. In any case, commercial parts, such as 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 practicable, on the contractor's drawings.

3.3 Materials:

Materials shall conform to applicable specifications and shall be as specified herein. Materials for which there are no applicable specifications, or which are not specifically described herein, shall be of the best quality, of the lightest practicable weight, and suitable for the purpose intended.

3.3.1 Critical materials: Noncritical materials shall be used where practicable. Where the use of a critical material is essential to meet specification requirements, the material used shall be the least critical of those which are adequate for the purpose.

3.3.2 Nonmagnetic materials: Nonmagnetic materials shall be used for all parts of the binoculars except where magnetic materials are essential.

- 3.3.3 Metals: Metals shall be of the corrosion resistant type, or shall be suitably protected as specified herein to resist corrosion due to fuels, salt spray, or atmospheric conditions to which the binoculars may be subjected when in storage or during normal service life.
- 3.3.3.1 Dissimilar metals: Dissimilar metals as defined in MS33586 shall not be used in intimate contact with each other, unless protection against electrolytic corrosion is provided.
- 3.3.3.2 Magnesium alloy parts: Magnesium alloy parts shall be treated in accordance with MIL-M-3171. When abrasion resistance is a factor, an anodic treatment approved by the procuring activity shall be used.
- 3.3.3.3 Aluminum alloy parts: Unless otherwise specified, aluminum alloy parts shall be covered with an anodic film conforming to MIL-A-8625. Small holes need not be anodized. Aluminum alloys which do not anodize satisfactorily shall be coated with a chemical film in accordance with MIL-C-5541.
- 3.3.3.4 Steel parts: Steel parts shall be cadmium plated, where practicable, in accordance with QQ-P-416, Type II or III as applicable, and of a class that is adequate to achieve the degree of protection required.
- 3.3.4 Protective treatment: When materials are used in the construction of the binoculars that are subject to atmospheric or environmental conditions likely to cause corrosion in normal service life, they shall be protected against corrosion in a manner that will in no way prevent compliance with the performance requirements of this specification. Finishes and protective coatings which will crack, chip, or scale during normal service life or are affected by extremes of atmospheric or environmental conditions, shall not be used.
- 3.3.5 Fungus-proof materials: Materials which are nutrients for fungi shall not be used where it is practicable to avoid them. Where used, they shall be treated with a fungicidal agent acceptable to the procuring activity.
- 3.3.6 Lubricating and sealing materials: All greases, waxes, sealing materials, and lubricants used on the metal parts shall be such as not to cause corrosive action on the mechanical parts, cause filming of the optical elements, or support fungus or mite growth.

- 3.3.7 Moisture and water resistance: The binoculars shall be watertight under normal conditions of service; accordingly, all fixed fittings which close the openings in the main body tubes shall be tightly secured and sealed. Wax of the composition conforming to Table I may be used as a seal.

TABLE I
COMPOSITION OF WAX

INGREDIENT	GRAMS	PERCENTAGE OF INGREDIENT
Burgundy pitch	189.0	41.2
Unvulcanized rubber	10.4	2.3
Carnauba wax	46.4	10.1
Beeswax	191.0	41.7
Lampblack (dry)	21.5	4.7

The above composition shall be made up by disintegrating the rubber and dissolving the rubber particles gradually in a hot solution of Burgundy pitch. When the rubber is thoroughly dissolved, the other constituents shall be dissolved in the order given above. When necessary, the sealing compound may be softened by the addition of 45 ml of tricresyl phosphate. Methods and materials other than that mentioned above shall be considered acceptable, provided that all requirements and tests covered by this specification have been complied with and satisfied. Gutta-percha shall not be used in these binoculars.

3.3.8 Glass:

- 3.3.8.1 Optical elements shall be in accordance with MIL-G-174 and shall be stable, nonhydroscopic, free from strain, striae, bubbles, seeds, or stones visible in the field of view or which would impair optical performance. Minor material defects in any optical elements will not be considered sufficient cause for rejection unless they are obvious to the unaided eye when looking directly into the binocular eyepiece against a background having the brightness of the sky in average daylight.
- 3.3.8.2 Polished surfaces shall be free from objectionable scratches, pits, stain, and other defects visible in the field of view or that would impair optical performance. Minor surface defects or occasional dust specks on surfaces will not be considered sufficient cause for rejection unless they are obvious to the unaided eye when looking directly into the binocular eyepiece against a background having the brightness of the sky in average daylight.

- 3.3.8.3 The optical parts and the entire interior of the binoculars shall be clean and free from oil, dust, dirt, or other foreign matter, and free from any lubricant which might, in time, collect on any of the optical parts. Occasional dust specks on surfaces will not be considered sufficient cause for rejection unless they are obvious to the unaided eye when looking directly into the binocular eyepiece against a background having the brightness of the sky in average daylight.

3.4 Design and construction:

Each type binocular shall include the following items:

- (a) 1 each binocular.
- (b) 1 each sling strap.
- (c) 1 each carrying case with strap.

- 3.4.1 Optical requirements: All lenses and prisms shall be of optical glass in accordance with MIL-G-174 as specified for binoculars and shall be well corrected for color and spherical aberration.
- 3.4.2 Light transmission: Optical surfaces, except reflecting and cemented surfaces, shall be coated in accordance with MIL-C-675.
- 3.4.3 Focal lengths: The equivalent focal lengths of the 2 objectives and of the 2 eyepieces shall not differ by more than 1.5 percent. Objectives, mounted eyepieces, and eyepiece elements furnished as repair or maintenance parts shall not vary more than ± 1 percent from their nominal focal lengths.
- 3.4.4 Definition: The image shall be sensibly free from defects resulting from spherical aberration, distortion, coma, and chromatic aberration within 1.5 degree of true field about the center of the field, and shall be reasonably free from these defects over the rest of the field. Aberrations which cannot be eliminated and which affect either the definition or the stereoscopic accuracy of the instrument, shall be substantially identical in both fields of view. The optical systems shall be sensibly free from distortion, and any residual distortion shall be compatible with the best correction of other aberration.
- 3.4.5 Collimation: The images of a distant vertical straight line formed by the 2 optical systems shall be parallel to each other within 1 degree, and neither image shall vary from the vertical by more than 1 degree. When 2 parallel pencils or bundles of rays are projected into the 2 objectives, the conjugate rays emerging from the 2 eyepieces shall be parallel within the following limits at the infinite focus of the eyepiece and for any setting of the interocular distance scale as follows:

3.4.5 (Continued):

(a) Type I (7 x 50)

- (1) 14 Minutes of arc (apparent field) in a direction perpendicular to the plane determined by the 2 entrant pencils.
- (2) They shall not diverge more than 28 minutes of arc (apparent field), nor converge more than 14 minutes of arc (apparent field), in the direction parallel to the plane of the 2 entrant pencils.

(b) Type II (6 x 42 WIDE FIELD)

- (1) 12 Minutes of arc (apparent field) in the direction perpendicular to the plane determined by the 2 entrant pencils.
- (2) They shall not diverge more than 24 minutes of arc (apparent field) nor converge more than 12 minutes of arc (apparent field) in the direction parallel to the plane of the 2 entrant pencils.

3.4.6 Extraneous images: When sighting in normal manner, binoculars exhibiting ghost images, or images of targets outside the field of view formed by extraneous reflections within the binocular, are not acceptable.

3.4.7 Mechanical requirements:

3.4.7.1 Eye guard: Unless another type of eye cap or eye guard is specified, each ocular shall be provided with a molded soft-rubber rotatable eye guard of such shape as may be approved by the contracting officer. The size and shape of the caps shall be such as to allow the observer to see the entire field of view when the eyes are placed in the most comfortable position with respect to the two caps, and exclude from both eyes the major portion of all light except that transmitted by the ocular. The eye-guard assembly shall be readily removable to facilitate cleaning the exit surfaces of the eye lenses.

3.4.7.1.1 The eye-guard material shall be in accordance with MIL-R-6855, Class II, Grade 40.

3.4.7.1.2 The eye guards shall be smooth, resilient, tough, durable, and nonirritating to the skin. They shall not cause corrosion or pitting of the metal parts with which they are assembled.

3.4.7.1.3 The color of the eye guards shall be black, nonblooming.

3.4.7.1.4 The eye guards shall be finished as molded, clean, free from fins, pits, and other surface defects.

3.4.7.1.5 The rubber eye guards shall be permanently attached to the eye-guard assembly which shall, in turn, be screwed to the eyepiece.

- 3.4.7.2 Hinges: The hinges of the binoculars shall be so designed as to permit the adjustment of the interocular distance from 56 to 74 mm, with a scale graduated at 2-mm intervals. The interpupillary distance indicated by the scale shall be corrected within 1 mm. The hinge shall be fitted and adjusted with sufficient tightness, and the hinge lubricant shall be of such consistency that the interpupillary distance shall be maintained when the binoculars are tested as specified in 4.6.5. The hinge lugs shall be integral with their respective body tubes.
- 3.4.7.2.1 The hinges shall be of substantial construction with an adequate length between bearings. The clearance between the hinge lugs shall be adequate. The axle shall be capable of being adjusted to compensate for any wear. The hinges and lugs shall be of sufficient size and strength to prevent any breakage of these parts.
- 3.4.7.3 Shockproofness: The entire binocular shall be of such construction as to withstand the shocks and jars to which it will be subjected in service, with derangement of any of the parts or impairment of its adjustments beyond specified limits. The binoculars shall withstand the Shock test specified in 4.6.6 without damage or without disturbing the collimation beyond specified limits.
- 3.4.7.4 The main bodies shall be die castings, centrifugal castings, or extrusions of an aluminum-base alloy. The wall thickness shall be approximately 1/16 inch, except where greater thickness is required for attachments, strength, or manufacturing requirements.
- 3.4.7.5 There shall be a staple or loop, of suitable strength, integral with each main body tube, near the ocular end, for attaching the sling strap, and so positioned as to facilitate wearing the binoculars on a strap around the neck, in order that they will be placed and balanced properly for ready use.
- 3.4.7.6 Cover plates: Where cover plates are used, those at the ends of the main body tubes shall overlap the tubes slightly. A gasket of suitable material shall be placed between the two parts if required to insure watertightness. The cover plates shall be secured by a sufficient number of screws, suitably located to insure that they will be held securely in place.
- 3.4.8 Type I (7 x 50):
- 3.4.8.1 Magnification: The magnification of each of the 2 telescopic systems of the binocular shall be 7 diameters ± 2 percent. The magnification of the 2 telescopes of any binocular shall not differ by more than 1 percent.
- 3.4.8.2 Entrance pupil: The free aperture of the objective shall be not less than 50.0 mm, nor more than 52.5 mm.
- 3.4.8.3 Exit pupil: The central exit pupil shall have a diameter not less than 50 mm divided by the measured magnification, except that it will be satisfactory for the pupil to be bounded at 1 point only by a chord of said pupil, provided the reduction in area of the exit pupil does not exceed 2 percent. At the edge of the field of view, the minimum dimension of the exit pupil shall be not less than 45 percent of the diameter of the central exit pupil.

- 3.4.8.4 True field of view: The true field of view of each of the two telescopic systems shall be not less than 7 degrees, 10 minutes.
- 3.4.8.5 Eye distance: The eye distance shall be not less than 14.0 mm from the exterior surface of the eyelens.
- 3.4.8.6 Curvature: The curvature of field, defined as the algebraic mean of the diopter scale readings when the eyepiece is focused successively on tangential and radial lines, shall not exceed 2 diopters at any point in the field of view. At 3 degrees of true field from the center of the field, the astigmatic difference shall not exceed 4 diopters and, at all angles, this difference shall be so adjusted as to give the best obtainable definition throughout the field, without sacrificing the best image quality and definition at the center.
- 3.4.8.7 Resolution: The limit of resolution within 1 degree of true field from the center of the field shall not exceed 4.0 seconds of arc (true field) for either vertical or horizontal lines at same eyepiece focus.
- 3.4.8.8 Eyepiece: The eyepiece shall be of the rotating focusing type. Each eyepiece shall be capable of being focused independently from +2 to -4 diopters. There shall be a knurled strip around the circumference of each eyepiece, with a graduation for the zero position and one for each diopter, each second diopter graduation to be numbered. The index shall be fixed, and the scale shall be on the rotating part. The zero mark of the diopter scale shall be correctly located within 1/4 diopter, and the interval between adjacent lines shall be correct to 1/4 diopter. Less than one rotation of the eyepiece shall be required to change the focus through the entire range of 6 diopters. There shall be index lines on the underside of the binocular and on the fixed portion of the eyepiece tubes for use in setting the diopter scales.
- 3.4.8.9 Weight: The weight of the Type I binoculars without strap or case shall not exceed 51 ounces.
- 3.4.9 Type II (6 x 42 WIDE FIELD):
- 3.4.9.1 Magnification: The magnification of each of the 2 telescopic systems shall be 6 diameters ± 2 percent. The magnification of the 2 telescopes of a single binocular shall not differ by more than 2 percent.
- 3.4.9.2 Entrance pupil: The effective aperture of the objective shall be not less than 42.0 mm or more than 44.0 mm.
- 3.4.9.3 Exit pupil: The central exit pupil shall have a diameter not less than 42 mm divided by the measured magnification ± 3 percent, except that it will be acceptable for the pupil to be bounded at 1 point only by a chord of said pupil, provided the reduction in area of the exit pupil does not exceed 2 percent. For a light source subtending an angle of not more than 2 minutes at the objective lens of the glass, the light flux transmitted at 5.75 degrees of real field from the center of the field shall be not less than 40 percent of the light flux transmitted at the center of the field.
- 3.4.9.4 True field of view: The true field of view of each of the 2 telescopic systems shall be not less than 11 degrees, 45 minutes.

- 3.4.9.5 Eye distance: The eye distance shall be not less than 19.0 mm from the exterior surface of the eyelens.
- 3.4.9.6 Curvature: The curvature of field, defined as the algebraic mean of the diopter scale readings when the eyepiece is focused successively on tangential and radial lines, shall not exceed 1.0 diopter within 5.5 degree of true field about the center of the field view. At 4 degrees of true field from the center of the field, the astigmatic difference shall not exceed 2.2 diopters, and at all angles this difference shall be so adjusted as to give the best obtainable definition throughout the field, without sacrificing the best image quality and definition at the center.
- 3.4.9.7 Resolution: The limit of resolution within 1 degree of true field from the center of the field shall not exceed 5.0 seconds of arc (true field) for either vertical or horizontal lines at the same eyepiece focus.
- 3.4.9.8 Eyepiece: The eyepiece shall be identical to that described above for the Type I binocular, except the entire focusing range shall encompass at least 5 diopters, and shall be from +2 to at least -3 diopters.
- 3.4.9.9 Weight: The weight of the Type II binoculars without strap or case shall not exceed 72 ounces.
- 3.4.10 Prism mounting: The prism mounting of the two optical systems shall facilitate accurate alignment of the prisms. The prisms shall be fixed to their respective mountings in such manner that misalignment shall not occur during normal service use or as a result of the tests specified in Section 4.
- 3.4.11 Objectives: The objectives shall be secured in double eccentric mounts to permit adjustment in any direction in a plane perpendicular to the line of sight. A cover shall be provided to prevent tampering with the adjustment.
- 3.4.12 Accessories:
- 3.4.12.1 Sling strap: A strap of a single thickness of 4/64-inch boarded cowhide of a length sufficient to allow the binocular to rest upon the chest when the strap is placed around the neck shall be attached to each binocular.

3.4.12.2 Carrying case: Each binocular, unless otherwise specified in the contract or order, shall be provided with a black carrying case of 6/64-inch boarded cowhide, case leather, in accordance with the requirements for Type II of KK-L-154. Defects which affect serviceability or appearance shall not be permitted. The case shall be properly stiffened and lined with twilled linen or other suitable material, and the case shall be closed with a strap reaching from the lid to the side of the case. The strap shall contain a socket in accordance with AN227-1 or -15, and the case shall contain a suitable matching post stud. The case and thread shall be protected against mildew. The general requirements of KK-B-650 shall be considered to apply to the carrying case. The case shall be provided with a strap of single thickness 5/64-inch boarded cowhide, not less than 6 feet in length, fitted with a brass buckle and 1 fixed and 1 movable keeper. The strap shall be attached to the case through 2 leather loops in each side and 1 on the bottom. The straps shall pass through the leather loops and entirely across the bottom of the case, and shall not be attached to the case by having the ends of the straps sewed or fastened thereto. There shall be attached to the top of the case a leather becket for convenience in carrying in the hand, and to the back of the case one large loop through which a belt of 3-inch width may be easily passed. The carrying case shall meet the test, workmanship, and performance requirements of KK-B-650. An equivalent substitute material may be used if approved by the procuring activity.

3.4.12.2.1 Stowage provisions only shall be provided in the case to carry separate eye-guard assemblies incorporating single-thickness filters. These stowage provisions shall not increase the height of the carrying case.

3.5 Screws:

Screws shall be made of corrosion-resistant metal which shall possess the characteristics necessary to insure an adequate fastener that will sustain normal usage beyond the life expectancy of the binoculars.

3.5.1 Screw threads: Unless otherwise specified, the threads of all machine screws, 0.060 inch, or larger in diameter, shall conform to Handbook H28.

3.6 Finish:

3.6.1 The main bodies and all aluminum parts shall be anodized and dyed black before subsequent finishing. The main body tubes and external metal surfaces shall be covered with black wrinkle-finish baked enamel in accordance with MIL-E-5558, Type I. Vinyl or other suitable plastic may be used as a covering material in lieu of an enamel cover if approved by the procuring activity. External metal surfaces containing diopter data shall be covered with a durable black baked-on enamel in accordance with MIL-E-5557, Type IV.

3.6.2 The prisms shall not be silvered.

3.6.3 Finishes of the metal parts shall be such as to prevent corrosive action of the optical or mechanical parts.

- 3.6.4 Polished surfaces shall be free from objectionable scratches, pits, stains, and other defects visible in the field of view or that would impair optical performance.
- 3.6.5 No bright reflections shall be visible when the exit pupil is viewed from a point at some distance along the ocular axis extended. All places at which troublesome reflections might occur shall be blackened by a suitable process. Any material or process employed for this purpose shall be such that it will not cause dusting or flaking.

3.7 Performance:

The binocular and carrying case shall meet the performance requirements specified in Section 4 when subjected to the applicable tests.

3.8 Markings:

All scale graduations, numerals, and index marks shall be permanently and legibly marked. Engraved or etched markings shall be filled with enamel of a color that will permit distinct reading. All identification and markings shall be engraved or etched.

3.9 Identification of product:

Equipment, assemblies, parts, and carrying case shall be marked for identification in accordance with MIL-STD-130 except that the FSN shall be omitted.

- 3.9.1 Binocular nameplate: The right body cover shall contain the nameplate data which shall include a serial number and special characteristics data as follows:

For the Type I binocular -
7 x 50

For the Type II binocular -
6 x 42
(WIDE FIELD)

- 3.9.2 Carrying case nameplate: The required information shall be placed beneath the fasteners and shall include the following data:

Case, (7 x 50 (or 6 x 42 - WIDE FIELD as applicable))
Binocular
Contractor's Part No. (for Case)

A serial number is not required on the case.

3.10 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.

3.11 Workmanship:

The binoculars, including all parts and accessories, shall be constructed in accordance with high-grade optical standards and finished in a thoroughly workmanlike manner. Particular attention shall be given to neatness and thoroughness of welding, marking of parts and assemblies, and freedom of parts from burrs and sharp edges.

- 3.11.1 Dimensions: Dimensions and tolerances not specified shall be as close as is consistent with the best shop practices. Where dimensions and tolerances may affect the interchangeability, operation, or performance of the binoculars, they shall be held or limited accordingly.
- 3.11.2 Screw assemblies: Assembly screws and bolts shall be so tightened that the screw or bolt cannot be appreciably tightened further, without damage or injury to the screw, bolt, or threads.
- 3.11.3 Gears: Gear assemblies shall be properly alined and meshed, and shall be operable without interference, tight spots, loose spots, or other irregularities. Where required for accurate adjustments, gear assemblies shall be free from backlash.
- 3.11.4 Cleaning: The binoculars shall be thoroughly cleaned of loose, spattered, or excess weld material, metal chips, and other foreign material, after final assembly. Burrs and sharp edges, as well as resin flash that may crumble, shall be removed.

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 that supplies and services conform to prescribed requirements.

4.2 Classification of inspection:

Inspection of the binoculars shall be classified as follows:

- (a) Preproduction inspection - Preproduction inspection consists of examination and tests performed after award of contract on sample binoculars to determine that the binoculars meet the requirements of this specification. The sample shall be representative in design, performance, and configuration of the binoculars which will be produced on the manufacturer's production line.
- (b) Quality conformance inspection - Quality conformance inspection consists of examination and tests performed on the binoculars manufactured and submitted for acceptance under contract.

4.3 Preproduction inspection:

The preproduction inspection of the binoculars shall consist of all of the examinations and tests of this specification performed in the order specified under the paragraph headed Inspection methods and unless otherwise specified in the contract shall include the Sampling Phases.

- 4.3.1 Preproduction inspection sample: Preproduction inspection samples shall consist of two binoculars manufactured in accordance with this specification. The samples shall be forwarded, at the manufacturer's expense for preproduction inspection and shall have been previously subjected only to the Individual inspection. The samples shall be forwarded to the laboratory designated by the procuring activity.

- 4.3.1.1 Preproduction inspection sample identification: The preproduction inspection samples shall be plainly identified by durable tags, securely attached, and marked with the following information:

Sample for Preproduction Inspection
(Name of equipment)
Submitted by (Manufacturer's name, date) for
Preproduction Inspection in accordance with
Specification MIL-B-8568 under contract
or order number.
Type number
Manufacturer's Part Number

4.4. Quality conformance inspection:

The Quality conformance inspection shall consist of the Individual inspection, and the Sampling plans, of this specification. The contractor shall furnish all samples and shall be responsible for accomplishing all the inspections. Sampling plan B inspections shall be conducted at a Government laboratory designated by the procuring activity. Quality conformance inspection, except for Sampling plan B, shall be under the supervision of the Government quality control representative. The contractor shall furnish test reports showing quantitative results for all tests required by this specification, signed by an authorized representative of the contractor or laboratory as applicable. Acceptance or approval of material during the course of manufacture shall in no case be construed as a guarantee of the acceptance of the finished product.

- 4.4.1 Individual inspection: Each binocular submitted for acceptance shall be subjected to the Individual inspection. This inspection shall determine compliance with the requirements of material, workmanship, operational adequacy, and reliability. As a minimum, each binocular accepted shall have passed the following inspections:

Altitude
Low temperature
Humidity
High temperature
Vibration, Procedure V

- 4.4.2 Sampling plans: The Sampling plans shall consist of Sampling plan A and Sampling plan B inspections. The inspection samples selected for sampling tests shall first have passed the Individual inspections. The inspection samples which have been subjected to Sampling plan A inspection shall not be delivered on contract until they have been refurbished and resubmitted and passed all the Individual inspections. Inspection samples which have been subjected to the Sampling plan B inspection shall not be delivered on contract.

- 4.4.2.1 Lot: All binoculars of the same type presented at one time shall be considered a lot for purposes of Acceptance tests.
- 4.4.2.2 The binocular case shall be inspected in accordance with KK-B-650.
- 4.4.2.3 Sampling plan A: A random sample of binoculars shall be selected from each inspection lot and shall be subjected to each of the following tests, with lot acceptance based on the sampling requirements of MIL-STD-105, using an AQL equal to 1.5 percent. Each of the sample binoculars selected shall be subjected to each of the following tests described under "Inspection methods," and the results of each test shall be compared with this specification.