INCH - POUND

MIL-W-46374E
31 May 1989
SUPERSEDING
MIL-W-46374D
10 OCTOBER 1986

MILITARY SPECIFICATION

WATCH, WRIST: GENERAL PURPOSE

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

1. SCOPE.

1.1 Scope. This specification covers mechanical and mechanical/quartz wrist watches intended for general use.

1.2 Classification. Watches shall be of the following types and colors, as specified (see 6.1 and 6.2).

Types

1 - Mechanical analog, fifteen jewel, maintainable
2 - Mechanical analog
3 - Quartz analog with battery installed
4 - Quartz analog; battery out of watch but packed with watch
5 - Quartz analog; battery not included with watch

Colors

M - Silvery metallic
B - Black
O - Olive drab

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document, should be addressed to: Commander U.S. Army ARDEC, ATTN: SMCAR-BAC-S, Picatinny Arsenal, New Jersey 07806-5000 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FSC 6645

2. APPLICABLE DOCUMENTS.

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

Federal

L-P-392	Plastic Molding Material, Acetal, Injection and Extrusion
PPP-T-360	Time Measuring Instruments, Packaging Of
PPP-B-566	Boxes, Folding, Paperboard
PPP-B-636	Box, Fiberboard
PPP-B-676	Boxes, Set-up Paperboard

Military

MIL-I-45607	Inspection Equipment, Supply and Maintenance Of
MIL-S-46383	Strap, Wrist: Instrument

STANDARDS

Federal

FED-STD-313	Material Safety Data Sheets, Preparation and Submission Of
FED-STD-595	Colors

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-109	Quality Assurance Terms and Definitions
MIL-STD-129	Marking for Shipment and Storage

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

2.1.2 Other Government documents and publications.

CODE OF FEDERAL REGULATIONS
Nuclear Regulatory Commission, Rules and Regulations
Title 10 - Chapter I, Parts 30 and 32

(Applications for copies should be addressed to Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS.

3.1 Qualification. The watches furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable Qualified Products List at the time set for opening of bids (see 4.3 and 6.7).

3.2 Design and construction. Watches shall have a plastic or corrosion resistant steel case and a strap. A stem set movement shall drive luminous concentrically mounted hour and minute hands around a 12 hour dial having luminous vials. The watch design shall be such that parts will not loosen in service. Figures forming a part of this specification are intended for guidance in physical and dimensional detail. Alternative designs and dimensional deviations are permissible but subject to prior Government approval (see 6.7).

3.2.1 Materials. All materials shall be of a uniform quality and free from any defects which might impair the function, accuracy, wear resistance or safety. Material which is not specified by a definite material specification shall be of a composition and quality that will enable the watch to meet all applicable requirements of this specification.

3.2.1.1 Self-luminous features. Self-luminous features shall be luminous vials consisting of glass encapsulated phosphor with the hydrogen isotope tritium, in gaseous form, as an exciter: Vials shall contain not more than one percent of tritium oxide and not more than six percent total impurities. Any watch shall contain no more than 25 millicuries of tritium.

3.2.1.2 Nuclear Regulatory Commission license. At the time of contract award, contractor must possess a valid U.S. Nuclear Regulatory Commission (NRC) or Agreement State Byproduct Material License which authorizes possession of sufficient elemental tritium to fulfill contract requirements and which authorizes manufacture of radioactive instruments and articles (i.e., watches). The contractor must also possess an NRC license issued pursuant to 10 CFR 32 which authorizes manufacture and distribution to the general public of the contracted watches as license exempt items. A copy of these licenses, with license application package, will be provided to the contracting officer.

3.2.1.3 Toxicity. The finished product covered by this specification shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the contracting activity to the appropriate departmental medical service who will act as an advisor to the contracting agency.

3.2.2 Protective finish. All metal parts, which are susceptible to corrosion and not protected by a lubricant, shall be protected by a protective finish or preservation except those parts whose proper functioning would be detrimentally affected.

3.2.3 Movements.

3.2.3.1 Movement and manufacturer identification. Preferably at the time of "application for qualification testing" but no later than the date of initiation of such testing, the watch manufacturing or distributing source of supply shall submit to the Government activity identified in 6.7 the name and plant address of the manufacturer of the actual movement employed in the finished watch and the caliber and similarly descriptive movement identification. Any change in movement manufacturer or plant address of the manufacturer or choice of movement employed in the watch design without first alerting the qualifying activity identified in 6.7 accordingly, shall be cause for immediate removal from the Qualified Products List.

3.2.3.2 Type 1 and 2 mechanical watches.

3.2.3.2.1 Mechanical watch movement. The movement shall be stem wound and stem set, with the stem located at the 3 o'clock position of the dial. The maximum diametric measurement of the movement of type 1 mechanical jeweled watch shall be not less than 0.933 inch or greater than 1.025 inches.

3.2.3.2.2 Mainspring. When fully wound, the mainspring shall drive the complete movement a minimum of 36 hours without rewinding. The material for the mainspring shall be a corrosion resistant "nonbreakable" or cobalt base alloy.

3.2.3.2.3 Hairspring and balance wheel assembly. The movement shall have a temperature compensated hairspring and a solid monometallic non-magnetic balance wheel. The hairspring and balance wheel shall be material that in combination will not be affected functionally in the presence of the magnetic field specified in 3.3.8.

3.2.3.2.4 Movement design approval. At the initiation of qualification testing and at the time of each contract award, movement design of Types I and II watches shall be reviewed by and subject to the approval of the Government. Manufacturer drawings, specifications and supporting data, as applicable, shall be submitted for Government approval in accordance with 4.9. Data submitted shall be of sufficient detail to allow complete review of movement design, including all dimensions, jewel bearing locations and functional components.

3.2.3.3 Type 1, mechanical jeweled watch.

3.2.3.3.1 Second hand stop mechanism. Pulling the stem to the setting position shall result in stopping of the movement. Rotation of the stem shall permit the minute and hour hand to be advanced without any movement of the second hand. The depressing of the stem shall result in complete operation of the movement and hands.

3.2.3.3.2 Escapement. The pallet and escape wheel shall be steel. The pallet shall contain jewels.

3.2.3.3.3 Jewel bearings. The movement shall have a minimum of fifteen functional jewel bearings located at bearing points most essential to reduce friction and wear of the train and escapement parts. Jewels shall be solidly secured in the plate or bridge by friction fit. The jewel bearing material shall be of synthetic sapphire or equal.

3.2.3.3.4 Regulator. The movement shall be provided with a regulator. The regulator shall be at the midpoint of adjustment (within ±20% of its total range of adjustment), when the watch is subjected to the accuracy tests specified in 4.7.19.

3.2.3.3.5 Female stem. The female stem shall be fabricated of corrosion resistant steel and when joined with the male stem, shall result in the complete stem functioning as an assembly. It shall be dimensioned so that the face of the female section will be outside of the case sleeve when the stem is in the winding position, and locked within the male stem inside of the case sleeve (for the full length of motion from winding to setting), when in the setting position. The female stem shall be so dimensioned as to locate the joint between the male and female stems inside of the sleeve when the stem is in the setting position. It shall also enable the movement to drop out of the watchcase when the female stem is in the winding position.

3.2.3.4 Type 3 thru 5, quartz watch.

3.2.3.4.1 Quartz watch movement. The movement shall be battery powered quartz.

3.2.3.4.2 Power. The watch shall be powered by a self contained power cell which is commercially available from a minimum of two manufacturers. The watch shall be designed to operate a minimum of 2-1/2 years. The power cell shall contain orientation marks which identify the positive (+) side.

3.2.3.4.3 Internal. The spring used for power cell contacts shall be phosphor bronze or equivalent. The negative contact for the power cell shall be plated 0.1 micron thickness of bright gold. The positive power cell contact shall be either nickel plated stainless steel or plated bright gold 0.1 micron in thickness.

3.2.4 Watch crown. The crown shall have a straight knurl, and conform to the dimensions of Figure 3.

3.2.5 Design of dials and hands.

3.2.5.1 Dimensions, dial and hands. Figures 1 and 2 indicate dimensions preferred for dial and hands. Alternative designs shall be permissible but subject to the approval of the Qualifying Activity.

3.2.5.2 Application of self-luminous sources. Areas designated in Figures 1 and 2 as "luminiscent green" indicate required position of glass vial encapsulated tritium.

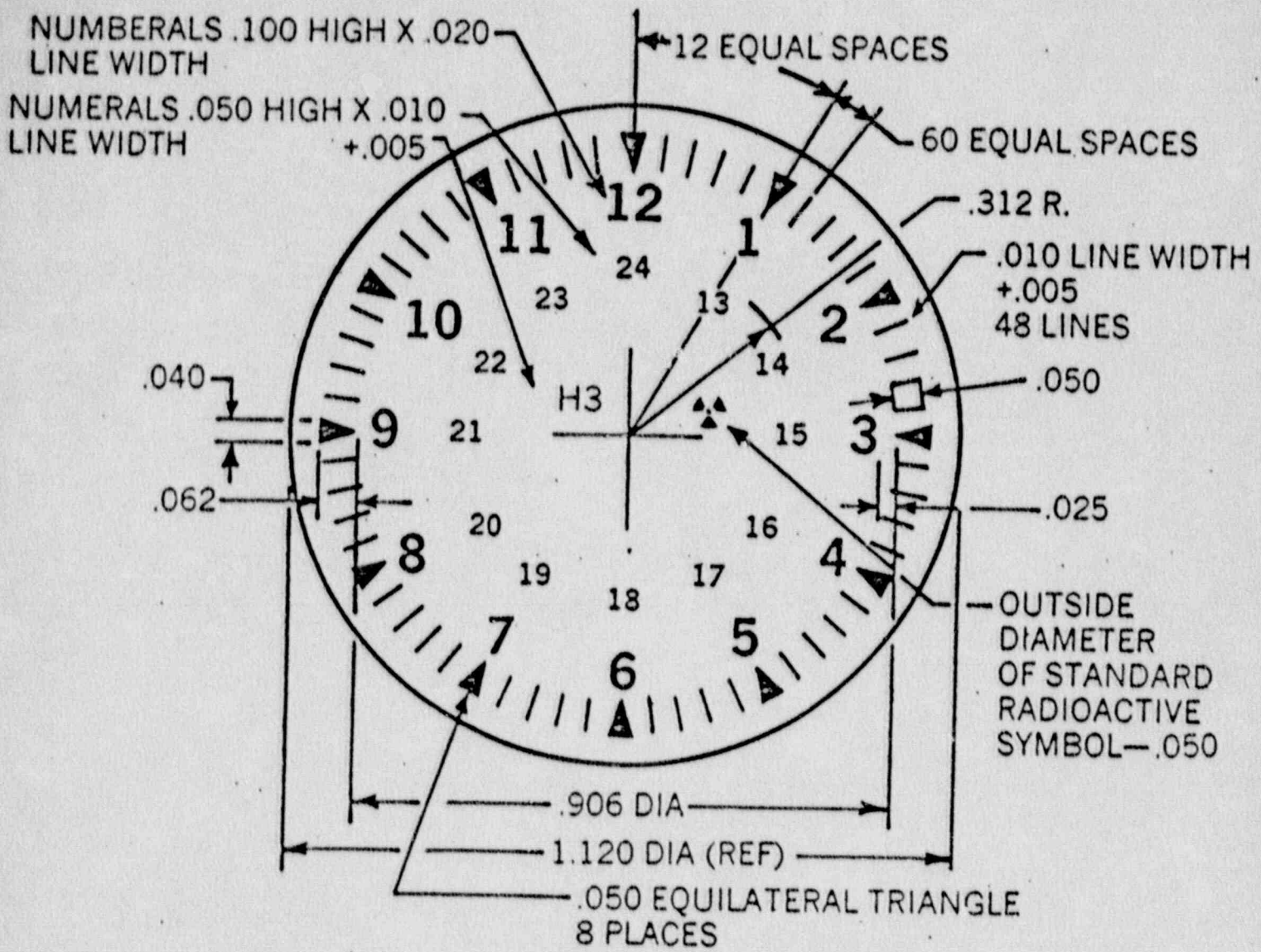
3.2.5.3 Dial markings. Markings on dials shall be in accordance with Figure 1. Manufacturer symbols or identification shall not appear on the dial.

3.2.6 Case assembly and design.

3.2.6.1 Case dimensions. Figure 3 indicates preferred case dimensions. Alternate designs shall be permissible but will be subject to the approval of the Qualifying Activity.

3.2.6.1.1 Case, type 2. Case design shall prevent access to the movement.

3.2.6.1.2 Case, types 3 thru 5. Case design shall allow access for battery servicing.



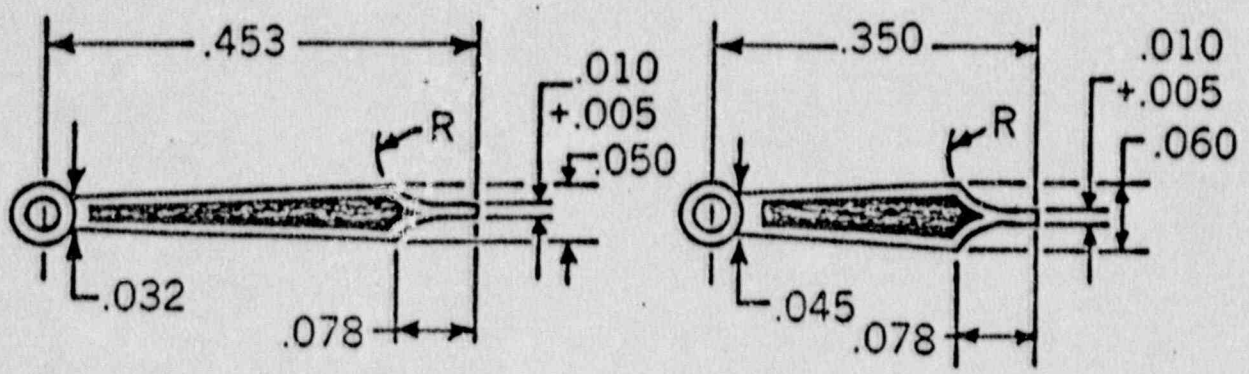
NOTES:

1. Dial face background in accordance with FED-STD-595 Color Black No. 37038.
2. Numbers and graduations in accordance with FED-STD-595 Color White No. 37875.
3. All triangles indicate positions for luminous vials.
4. H3 and ☢ shall be centrally located and clearly visible.

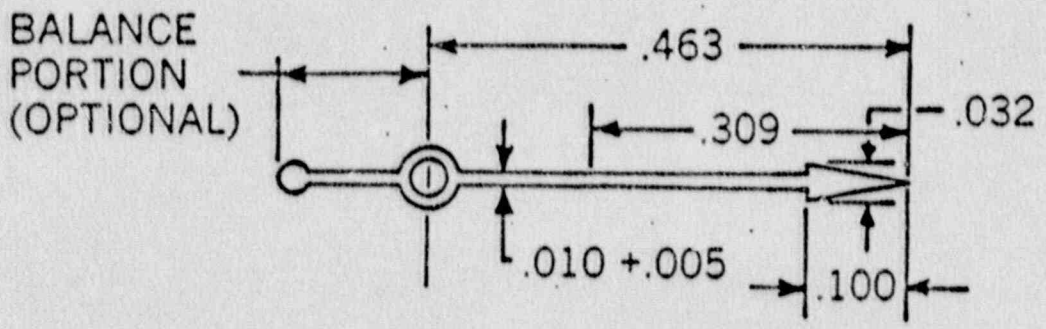
Dimensions in inches
unless otherwise
specified
Tolerances
Decimals ± .010

INCHES	MM
.005	.127
.010	.254
.020	.508
.025	.635
.040	1.016
.050	1.270
.062	1.575
.100	2.540
.312	7.9248
.906	23.012
1.120	28.575

FIGURE 1



MINUTE HAND HOUR HAND



SWEEP SECOND HAND

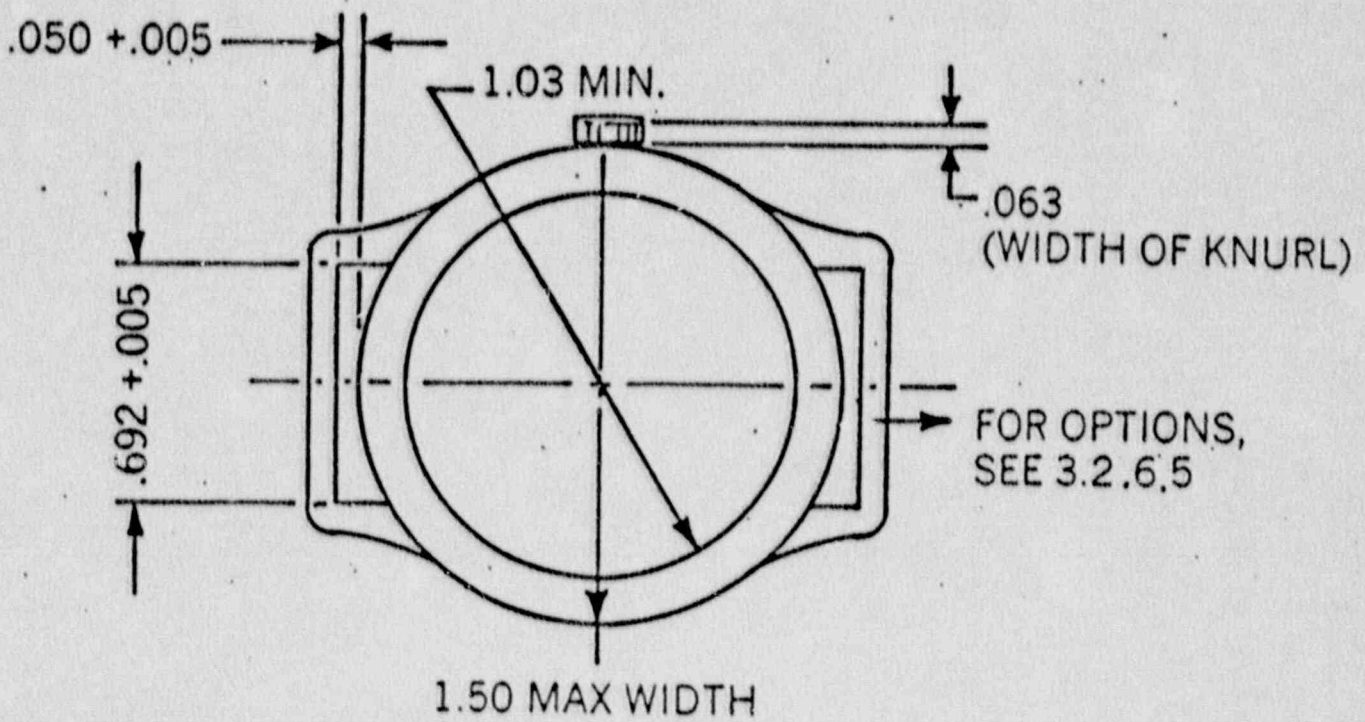
NOTES:

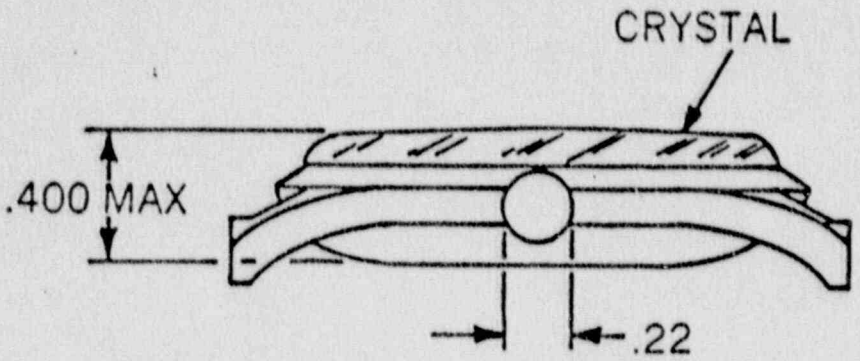
1. Shaded areas of hands to be luminescent green.
2. Hour and minute hand skeletons to be in accordance with FED-STD-595, Color White No. 37875.
3. Thickness of skeletons .008
4. Unshaded areas to be in accordance with FED-STD-595, Color White No. 37875
5. Variations will be considered. See 3.2.6

Dimensions in inches
unless otherwise
specified
Tolerances
Decimals ± .010

INCHES	MM
.005	.127
.008	.2032
.010	.254
.032	.813
.045	1.143
.050	1.270
.078	1.981
.100	2.540
.309	7.849
.350	8.800
.453	11.506
.463	11.760

FIGURE 2



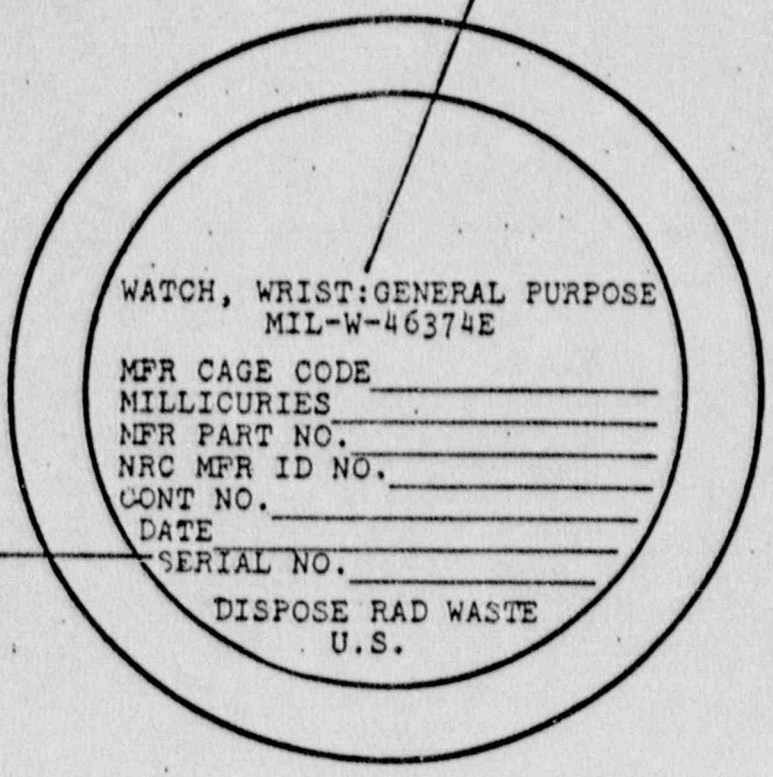


INCHES	MM
.005	.127
.010	.254
.050	1.27
.063	1.600
.22	5.588
.40	10.16
.692	17.577
1.03	26.162
1.50	38.100

DIMENSIONS IN INCHES
TOLERANCES ± .010 (UNLESS OTHERWISE SPECIFIED)

FIGURE 3

LETTERS AND NUMERALS TO BE .05 (1.270MM) HIGH X .010 (.254MM) DEEP CENTRALLY LOCATED OR MAY BE POSITIONED AROUND THE BEVELED PORTION.
THE MFR NAME, NATL STOCK NO., CONT NO., AND DATE MAY BE APPLIED WITHOUT THE DESCRIPTIVE TITLES.



INCLUDE ON TYPE 1 ONLY

BACK OF CASE

DIMENSIONS IN INCHES
TOLERANCES ± .01

FIGURE 4

3.2.6.2 Case markings. The back of each case shall be marked with the data required by Figure 4. The marking of the month shall be the first three letters of the month and the marking of the year shall be the year in full, e.g., December 1986 would be "DEC 1986". Preferred dimensions of markings are indicated. Variations shall be permissible but subject to the approval of the Qualifying Activity.

3.2.6.2.1 Type 1. The date (month and year) to be included in the identification shall be the date of acceptance of the watch by the Government. The serial numbers will be assigned by the contracting officer (see 6.2.). Serial numbers of rejected watches shall not be repeated. The manufacturer's name and model or grade number shall be marked on the movement (barrel bridge, train bridge or both).

3.2.6.2.2 Type 2 thru 5. The date (month and year) to be included in the identification shall be the date of manufacture.

3.2.6.3 Case material. The case shall be fabricated of Type I, Class 3 acetal plastic material in accordance with L-P-392, or of corrosion resistant steel.

3.2.6.4 Case finish and color. All visible exterior metal or plastic surfaces of the case assembly, excluding control switches and spring type case bars shall have a dull nonspecular/nonreflective finish. The color shall be silvery metallic, black (color number 37038) or olive drab (color number 24087) of FED-STD-595 as specified in the ordering data (6.2).

3.2.6.5 Case bars. Watch cases shall include either integral bars or stainless steel removable spring bars for the watch strap. The case/spring bars shall be designed to accommodate a MIL-S-46383 strap and shall be capable of withstanding a static pull on the strap of up to 15±1/2 pounds on each bar without damage as specified in 4.7.6.5.

3.2.7 Crystal. The crystal shall be made of tempered glass, mineral crystal or nonhygroscopic, thermosetting plastic. The crystal shall be transparent, uncolored, and free from bubbles, striae, scratches, chips, or other imperfections which may interfere with reading the watch. The crystal shall be fabricated in such a manner as to be similar in design to Figure 3 and shall properly fit the case.

3.2.7.1 Crystal strength. The crystal, when assembled to the case, shall show no evidence of cracking or chipping when tested as specified in 4.7.7.1.

3.2.8 Strap. The strap shall be in accordance with MIL-S-46383, Type II. The color number shall be 34087 of FED-STD-595 or as specified (see 6.2).

3.3 Performance.

3.3.1 Vibration. While running, the watch shall not be damaged and shall pass the radiological requirements after 60 minutes of composite vibrations at amplitudes of (0.3 - 0.7 - 0.3 mm). The frequencies shall be varied uniformly between 30 Hz to 60 Hz and 30 Hz for 20 minutes each of the directions stated in 4.7.22.

3.3.2 Shock. The watch shall show no evidence of damage affecting serviceability and shall pass the radiological requirements after the shock test specified in 4.7.23.

3.3.3 Storage. The watch shall show no evidence of damage affecting serviceability and shall pass the radiological requirements after being subjected to storage temperature test specified in 4.7.24. This criteria pertains to mechanical and radiological performance; therefore the battery should be removed from the quartz watch during the test. Batteries used for powering a quartz watch degrade considerably if stored at the temperature extremes.

3.3.4 Water resistance. The watch shall show no evidence of leakage after being subjected to the test specified in 4.7.25.

3.3.5 Synchronization. The hands shall be synchronized to eliminate the possibility of error in reading correct time. The hour hand shall indicate the correct time within ±1 dial graduation when the minute hand is at 12.

3.3.6 Setting. The crown shall be capable, while being moved from the running to set position, of withstanding a pull of 5 pounds ±0.25 lb (see 4.7.13).

3.3.6.1 Mechanical watch. The minute hand shall not rotate (jump), at its tip, more than one tip width when the crown is moved from the setting position to the winding position after setting the hands.

3.3.6.2 Quartz watch. When the crown is pulled in the setting position the mechanism is mechanically stopped. When the stem is pushed in the watch shall start immediately.

3.3.7 Winding torque, type 1 and 2. When fully wound, the mechanical watch shall not be damaged when a torque of 6±0.5 inch-ounces is applied to the crown (see 4.7.12).

3.3.8 Magnetism. While running, the watch shall not be adversely affected when subjected to a 14.5 to 15.5 gauss magnetic field, as specified in 4.7.21, and shall subsequently meet the requirements of 3.3.11.

3.3.9 Dark viewing. The luminous features shall be of sufficient brightness so as to be readable in darkness while holding the watch no closer to 12 nches from the eyes of a dark-adapted observer having normal or corrected 20/20 vision. Luminosity shall be uniform for visible dials. There shall be no indication of dead or dim vials.

3.3.10 Isochronism. Watches shall pass the test for isochronism specified in 4.7.20, in a dial-up position at 75 degrees ±3 degrees fahrenheit (23.9 degrees ±1 degrees celsius).

3.3.10.1 Type 1. The variation in rate (see 6.5.4), shall be recorded every 6 hours for a period of 24 hours and shall not exceed 5 seconds from the rate recorded in the previous 6 hour period. The watches shall be fully wound prior to testing and shall not be wound during the test.

3.3.10.2 Type 2. In the dial up position, at 75 degrees ±3degrees fahrenheit (23.9 degrees ±1 degrees celsius) the variation in rate shall not exceed ten seconds in a 24 hour period, between the first four hours and the last four hours.

3.3.11 Accuracy. After meeting the requirements of 3.3.1 to 3.3.10 inclusive (as applicable to the type watch), the mean daily rates (see 6.5.6) of the watch in each of the two positions of (1) dial-up and (2) crown-down shall not exceed the following values at the temperatures specified.

Temperature (In Degrees)		Mean Daily Rate (Seconds Per Day)		
Fahrenheit	Celsius	Type 1	Type 2	Type 3
40±2	(4.4±1.1)	±60	±120	±3
75±2	(23.9±1.1)	±30	±60	±0.7
125±2	(51.7±1.1)	±60	±120	±3

3.3.12 Radiological.

3.3.12.1 Contamination. Complete watches, after having been subjected to 3.3.1, 3.3.2 and 3.3.3, wiped as specified in 4.7.2.3.1, shall indicate disintegrations per minute (dpm) of not more than 100.

3.3.12.2 Contamination, long term. Qualification and surveillance testing, see 4.8). Complete watches, when packaged in accordance with 5.1.2 for a period of not less than ninety days and wiped in accordance with 4.7.2.3.1, shall indicate not more than 100 dpm.

3.3.12.3 Diffusion. Completed watches, with all luminous vials installed, shall be submerged in a measured volume of distilled or deionized water, equal to approximately 10 times the volume of the watch, for 24 hours at 73±3 degrees fahrenheit (23±1 degrees celsius). The diffusion of contamination into the water shall not exceed 50 nanocuries per day, when tested as specified in 4.7.2.3.2.

3.3.13 Long term accuracy, (qualification only). Accuracy will be determined during a 90 day period as specified in 4.7.26. During the 90 day period of operation, watches shall be subjected to shock and vibration after 30 days and 60 days of operation in accordance with 3.3.1. and 3.3.2., except that duration of vibration shall be for only five (5) minutes in each direction. Watches shall meet the following criteria:

	Average Mean Daily Rate (Seconds Per Day)	Mean Daily Rate (Seconds Per Day)
Type 1	36	60
Type 2	72	120
Type 3 thru 5	2.4	4

3.4 Workmanship. All parts shall be finished so the case and the crown shall have no sharp edges or corners which could cause skin cuts or abrasions. All lugs from tip of lug to body of bezel shall have sharp edges and corners rounded to avoid skin abrasion. Rounded edges and corners shall be reasonably uniform in appearance.

3.4.1 Assembled vials. All luminous vials, after final assembly of the watch, shall be free from extraneous paint, adhesive or other foreign materials which could reduce luminosity.

3.5 Interchangeability, type 1. All like parts shall be interchangeable in all watches of one model furnished by one manufacturer, and shall not adversely affect timekeeping exclusive of minor adjustments. The hairspring and balance wheel assembly shall be interchangeable as a unit.

3.6 Operating instructions. An operating instruction shall be furnished with each watch. This instruction shall describe all the functions of the watch, the durability (i.e., shock and water resistance features) life expectancy, and accuracy that can be expected from the watch, type battery, and any precautions that should be observed during the life of the watch. (See 5.3).

3.7 Safety data sheet. Since this specification describes a product which contains a hazardous (radioactive) material, material safety data sheets shall be prepared in accordance with FED-STD-313 (see 6.2.1).

4. QUALITY ASSURANCE PROVISIONS.

4.1 Responsibility for inpsection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Covernment. The Covernment 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.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection as part of manufacturing operations is an acceptable practice to ascertain performance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification Inspection

b. Quality Conformance Inspection

4.3 Qualification inspection. Qualification inspection consist of testing, and material certifications as applicable, for all the requirements specified in Sections 3 and 5.

4.3.1 Qualification sample. A quantity of 20 watches shall be submitted for qualification testing as directed by the activity identifyed in 6.7. Testing shall be performed at a laboratory facility acceptable to the Government. Sample watches submitted for testing shall be derived from normal production and be indicative of normal production equipment and procedures. Ten of the watches shall be packaged in accordance with 5.1.2. The twenty watch sample shall be identifyed by an attached tag containing the following information:

a. Sample for Qualification Tests.

b. Submitted by (name) (date) for qualification tests in accordance with requirements of MIL-W-46374 under authorization (reference letter authorizing test).

c. Manufacturer's model, grade number or part number.

d. Name of manufacturer.

4.3.2 Retention of qualification. To retain qualification, the contractor shall forward a report at 6-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of:

a. A summary of the results of the tests performed for inspection of product for delivery (Table IV), indicating as a minimum the number of lots that have passed, the number that have failed, and the group which they failed. The results of tests of all reworked lots shall be identified and accounted for.

b. A summary of the results of tests performed for periodic inspection (Table II), including the number and mode of failures. The summary shall include results of all periodic inspection tests performed and completed during the 6-month period. If the summary of the test results indicates nonconformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list.

Failure to submit the report within 30 days after the end of each 6-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 6-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit his qualified products to testing in accordance with the qualification inspection requirements and the reason for no production.

4.4 Quality conformance inspection. Inspections shall be performed in accordance with inspection provisions set forth herein. The characteristics shown in Tables I, II, III and IV, and requirements for packaging and marking set forth in 4.5.3.7 shall constitute minimum inspections to be performed by supplier prior to Government acceptance or rejection by item or lot.

4.5 Inspection provisions.

4.5.1 General provisions. The quality assurance provisions of this specification and of other documents referenced herein form the basis for inspection to be performed by the supplier. Quality assurance terms and definitions shall apply as defined in MIL-STD-109.

4.5.2 Submission of product. Unless otherwise specified herein or by the contracting officer, inspection lot size, lot formation, and presentation of lots shall be in accordance with "Submission of Product" provisions of MIL-STD-105.

4.5.3 Examination and tests. Examination and tests related to section 3 herein, shall be performed on an individual characteristics basis in accordance with MIL-STD-105, and the inspection level and sampling plans specified in each table. Acceptance or rejection of a lot shall be based on cumulative defects on characteristics of each table. Examination and tests for packaging, packing and marking shall be in accordance with PPP-T-360. The Government reserves the right to inspect for any applicable requirement and to reject individual nonconforming items.

4.5.3.1 Certifications. Certifications for characteristics specified in Table I below shall include test data and results specified. Certification shall be provided prior to performing inspections in accordance with Tables and shall suffice for Government acceptance throughout contract, providing the materials, finishes, manufacturing processes, and techniques used to produce the items for which certification was issued have not been changed or revised. Any and all changes will require a new certification from the contractor. Certification does not relieve contractor of the responsibility for inspection of characteristics, and recording data and results therefrom. Recorded data results shall be made available to the Government upon request. When defects or inferior quality is detected, and the Government deems a material or finish analysis necessary, the contractor will be required to submit data, samples, or specimens to the contracting officer for analysis and approval.

TABLE I. Conformance Inspection, Certifications.

CHARACTERISTIC	REQUIREMENT
Materials	3.2.1
Glass vials	3.2.1.1
Protect've finishes, (metal parts)	3.2.2
Case (Material)	3.2.6.3
Crystal	3.2.7
Strap	3.2.8

4.5.3.2 Quality conformance inspection, radiological shall be in accordance with Table II.

TABLE II. Conformance Inspection, Radiological.

USE LEVEL S-4 OF TABLE I WITH SAMPLING PLAN TABLE II-A, MIL-STD-105

Watch Lot sizes for inspection of installed gaseous tritium filled glass vials of completed watches, hour hands, minute hands, or second hands shall be not less than 500. The acceptance number for glass vials shall be "0", regardless of lot size.

CHARACTERISTICS	REQUIREMENT	TEST
MAJOR: AQL (see 6.3)		
101. Contamination	3.3.12.1	4.7.2.3.1
102. Diffusion	3.3.12.3	4.7.2.3.2

4.5.3.3 Quality conformance inspection, materials and design. Quality conformance inspection, materials and design shall be in accordance with Table III.

TABLE III. Conformance Inspection, Materials and Design.

USE LEVEL II OF TABLE I WITH SAMPLING PLAN TABLE II-A, MIL-STD-105

CHARACTERISTICS	REQUIREMENT	TEST
MAJOR: AQL (see 6.3)	Type 1-5	Type 1-5
107. Case	3.2.6	4.7.6
108. Crystal	3.2.7	4.7.7
109. Dark viewing	3.3.9	4.7.10
110. Movement design	3.2.3.2.4	4.9
MINOR: AQL (see 6.3)		
201. Dial	3.2.5	4.7.4
202. Hands	3.2.5	4.7.5
203. Case bars	3.2.6.5	4.7.6.5
204. Case finish	3.2.6.4	4.7.6.2
205. Crown	3.2.4	4.7.8
206. Identification marking	3.2.6.2	4.7.17
207. Workmanship	3.4	4.7.18
208. Operating Instructions	3.6	5.3

4.5.3.4 Qualification conformance inspection, performance. Quality conformance inspection, performance testing shall be in accordance with Table IV.

TABLE IV. Conformance Inspection, Performance.

CHARACTERISTIC	REQUIREMENTS		TEST	
MAJOR: AQL (see 6.3)	Type 1-2	Type 3-5	Type 1-2	Type 3-5
GROUP A				
110. Mainspring	3.2.3.2.2		4.7.15	
111. Winding torque	3.3.7		4.7.12	
112. Magnetism	3.3.8		4.7.21	
113. Hairspring Magnetism	3.2.3.2.3		4.7.16	
114. Setting	3.3.6.1	3.3.6.2	4.7.13	4.7.13
115. Synchronization	3.3.5	3.3.5	4.7.14	4.7.14
116. Isochronism	3.3.10		4.7.20	
GROUP B				
117. Vibration	3.3.1		4.7.22	
118. Shock	3.3.2		4.7.23	
119. Storage	3.3.3		4.7.24	
120. Water resistance	3.3.4		4.7.25	
121. Accuracy	3.3.11		4.7.19	
122. Power	3.2.3.4.2		4.7.3.3	

USE Level II of Table I with sampling plan Table IIA, MIL-STD-105.

Examinations 110 through 115 inclusive shall be completed prior to conducting 117 through 122. Examination 117 through 120 shall be performed prior to 121.

4.5.3.5 Qualification testing. Qualification testing shall be in accordance with Table V.

TABLE V. Qualification.

CHARACTERISTIC	REQUIREMENTS	TEST
123. Long term accuracy	3.3.13	4.7.26
124. Contamination, long term	3.3.12.?	4.7.27
125. Movement design	3.2.3.2.4	4.9

4.5.3.6 Noncompliance. If a sample fails to pass Table II inspection, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, and on all units of product which can be corrected and which are considered subject to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity has been taken. After the corrective action has been taken, Table II inspection shall be repeated on additional sample units (all tests and examinations, or the test which the original sample failed, at the option of the qualifying activity). Table IV, Groups A and B inspections may be reinstituted; however, final acceptance and shipment shall be withheld until the Table II inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure shall be furnished to the cognizant inspection activity and the qualifying activity.

4.5.3.7 Packaging and marking inspection. Examination and tests for packaging, packing, and marking shall be in accordance with Section 5 and PPP-T-360.

4.5.3.8 Disposition of nonconforming product. Rejected lots shall be screened for all defective characteristics. Removal or correction of defective units and resubmittance of rejected lots shall be in accordance with "Acceptance and Rejection" as specified in MIL-STD-105.

4.6 Inspection equipment and facilities. The contractor shall insure that test and inspection facilities of sufficient accuracy, quality and quantity are established and maintained in accordance with MIL-I-45607 to permit performance of required inspections. The Government reserves the right to use the test equipment for its own independent inspections to the extent that such use will not unduly interfere with the contractor's delivery schedule.

4.6.1 Accuracy. Accuracy of the watch shall be determined by a mechanical, electric, or electronic time measuring instrument having an accuracy of ± 2 seconds per day for testing the mechanical watch and $\pm .025$ seconds per day for testing the quartz watch as determined by a primary time standard.

4.6.2 Contractor provided inspection equipment. The contractor shall provide inspection equipment compatible with the "Test Methods and Procedures" specified in 4.7 of this specification.

4.6.3 Diffusion test - accuracy and procedures. The manufacturer analysis of tritium content in the diffusion test shall be made with a liquid scintillation counter. The system calibration shall be established using quenched standards. Total system plus standards errors in the standardization shall not be in excess of ±5 percent. Efficiencies of the unknown samples shall be established by the channels-ratio method, the external channels-ration method, or the "H" number method of quench compensation. Counting time shall be established as such that at the test limits, the error (1 standard deviation) shall not be greater than 15 percent. The scintillation solution shall be an acceptable water soluble liquid scintillation cocktail. The counting bottles shall be a low potassium liquid scintillation borosilicate glass bottle or polyethylene liquid scintillation vial. When polyethylene scintillation vials are used, a set of quench standards traceable to the NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY shall be made up in the polyethylene vials to determine efficiency. If the quench standards are in glass bottles, a correction factor shall be determined so that the correct results will be obtained from samples in polyethylene scintillation vials.

4.7 Test methods and procedures. Unless otherwise specified herein, the tests shall be performed at 60 F (15.6 C) to 90 F (32.2 C), at barometric pressure of 28 to 31 inches of mercury and maximum relative humidity of 80 percent.

4.7.1 Materials and protective finishes. Compliance of materials and protective finishes to the requirements of 3.2.6, 3.2.7 and 3.2.8 shall be certified as set forth in 4.5.3.1. In addition, a visual inspection of component parts and assemblies shall be made to determine compliance with 3.2. Where defects or inferior quality is evident and the Government deems a material analysis necessary, the contractor will be requested to submit samples or specimens to the contracting officer for analysis and approval.

4.7.2 Luminous components.

4.7.2.1 Certification. Glass vials shall be certified to meet the requirements of 3.2.1.1.

4.7.2.2 Visual. Assembled vials shall be inspected for compliance with 3.4.1.

4.7.2.3 Radiological.

4.7.2.3.1 Contamination. A piece of Whatman-50 filter paper, or equivalent, moistened with deionized or distilled water shall be used to wipe the watches. All exterior surfaces of the completed watch shall be thoroughly wiped with the filter paper. The amount of tritium contamination on the filter paper shall be determined by using a liquid scintillation counting technique. The paper shall be placed in the liquid scintillation solution within one minute after wiping the watch. The liquid scintillation counting system shall have sufficient sensitivity to detect a lower limit of detection of 10 picocuries or less of tritium with a 95 percent confidence limit. This test shall be performed by the contractor. The contractor shall furnish filter paper, solution, and bottles. The scintillation solution shall be as specified in 4.6.3. The bottles shall be as specified in 4.6.3. The test solution in the bottle with the used filter paper inside shall be identified with the sample watch it represents by the use of a waterproof marking system on the bottle. The five watches (see 4.8), and their corresponding contamination wipes shall be forwarded to the Government (see 6.7), for liquid scintillation counting. Disintegration rate of more than 250 dpm per watch shall constitute failure of this test.

4.7.2.3.2 Diffusion and water leakage. Completed watches with all the luminous sources installed shall be submerged in, a measured volume of distilled or deionized water, equal to approximately 10 times the volume of the watch, for 24 hours at 73±3 degrees fahrenheit (23±5 degrees celsius). Watches shall be removed from the water. This is the test procedure for tritium diffusion, and if the radioactive content of the water exceeds 50 nanocuries/day, it shall constitute failure of the test. The watches also shall be examined for water leakage, and if there is water in the crystal bowl at the completion of the test, it shall constitute failure of the water resistance test. Failure of watches of either of these tests shall be cause for refusal by the Government to continue acceptance of the production watches until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiencies. Diffusion testing shall not be conducted until at least 30 days after vial manufacture.

4.7.3 Design and construction - movement. Movement identity and design and construction, (stem mound and stem set) shall be determined prior to qualification testing for compliance with 3.2.3.

4.7.3.1 Type 1 Jewel bearings. One percent of the watches under contract, but not less than three watches, shall be examined to insure the watch contains the appropriate number of jewels placed at the most critical friction points, and are in compliance with 3.2.3.3.3.

4.7.3.2 Type 1 and 2 Regulator. The regulator setting shall be checked after meeting the accuracy requirement of 3.3.11, to determine compliance with 3.2.3.3.4.

4.7.3.3 Type 3 thru 5 Module power drain tests. The module shall be tested to insure that the current drain allows an operating life as specified in 3.2.3.4.2. The module shall be measured with a current meter to determine the timekeeping current drain. To allow sufficient latitude in available power, the capacity of the power cell as measured in milliamp-hours (ma hours), shall be derated by 20 percent to obtain the net power capacity of the power cell. The comparison of power drain from the module to the power capacity of the derated power cell shall be made to insure that a minimum life of 30 months can be obtained from the power cell.

4.7.4 Dial. The dial shall be visually and dimensionally inspected for size of markings, legibility and finish in accordance with the respective requirements of 3.2.5 and Figure I.

4.7.5 Hands. The hour, minute and second hands shall be inspected for style, length, shape and finish in compliance with 3.2.5 and Figure 2.

4.7.6 Case.

4.7.6.1 Case material. The material (plastic or corrosion resistant steel) shall be certified as specified in 4.5.3.1 to determine compliance with 3.2.6.3.

4.7.6.2 Case finish. The plastic case shall be visually color matched to determine compliance with the color chip number per FED-STD-595 as specified in 3.2.6.4. Stainless steel cases shall be visually examined for a dull nonreflecting finish as specified in 3.2.6.4.

4.7.6.3 Type 2 Case. The case shall be inspected visually and dimensionally to determine conformance to Figure 3 or acceptability to the Qualifying Activity. A physical test shall be applied where case parts are not capable of being removed to determine conformance to 3.2.6.1.1. The physical test shall consist of applying a force, or prying under normal pressure (equivalent of 8 to 10 pounds direct force) in such a manner that no marking or scarring of the case and case finish shall result.

4.7.6.4 Type 3 thru 5 Case. The case shall be inspected visually and dimensionally to determine conformance to 3.2.6.1.2 and 3.2.6.4. The plastic case shall be visually color matched to determine compliance with the color chip number and Federal Standard specified in 3.2.6.4. Stainless steel cases shall be visually examined for a dull nonreflecting finish as specified in 3.2.6.4.

4.7.6.5 Case bar test. With the watch in a secured position and the strap held in a position that will not exert pressure on the buckle or the keeper of the strap, a pulling force of 15±1/2 pounds shall be applied to each case/spring bar via the strap without the case/spring bar permanently bending, loosening or causing damage to the case/spring bar or case assembly.

4.7.7 Crystal. Crystals shall be examined before and after assembly to the case and after the storage temperature test of 4.7.24, to determine compliance with 3.2.7. Certification of the material shall be in conformance with 4.5.3.1.

4.7.7.1 Mineral glass crystal strength test. After assembly to the case, the case assembly including crystal shall be placed flat, crystal up, on a rubber sheet (0.5 mm or 0.02 inch thickness) placed on a horizontal, rigid nonresilient, metal surface. A solid steel sphere weighing 0.56 + 0.05 ounces (15.7±1.4 grams) approximately 5/8 inch or 1.59 cm diameter) shall then be freely dropped so as to fall 12 inches (30.48 cm) before striking the crystal. Any visible damage to the crystal shall be cause for rejection.

4.7.8. Crown. The crown shall be visibly examined and dimensionally checked for conformance with Figure 3 or acceptability by the Qualifying activity.

4.7.9. Strap. The strap shall be accepted by certification (see 4.5.3.1) to insure compliance with 3.2.8.

4.7.10 Dark viewing. A dark room shall be utilized to represent total darkness when conducting the visual examination under the conditions and distance specified in 3.3.9 to determine compliance therewith. Watches shall be in the dark room for at least eight hours prior to conducting examinations. Individual(s) performing test shall be acclimated to the dark room a minimum of 20 minutes prior to conduct of test. This test shall be performed no sooner than sixty days after vial installation.

4.7.11 Winding test, Type 1 and 2. The winding operation shall be smooth without excessive torque. Continuous winding shall not adversely affect the timekeeping qualities of the watch.

4.7.12. Winding torque, Type 1 and 2. The winding torque will be applied and measured with a torque gauge. When the watch is fully wound, the maximum torque specified in 3.3.7 shall be applied without any damaging effect to the watch.

4.7.13. Setting. A standard type pull gauge with appropriate adapter shall be utilized to apply the direct force (pull) specified in 3.3.6. The crown shall not be damaged or separated from the movement when the direct force (pull) is applied.

4.7.13.1 Hour-minute setting. Six settings shall be made in 2-hour increments to insure compliance with 3.3.6.1 and 3.3.6.2.

4.7.13.2 Second hand stop mechanism. The second setting mechanism shall be activated for at least five different settings, to insure that a precise stop and start action can be obtained without adverse effect on the hands or movement, in accordance with 3.2.3.3.

4.7.14 Hand synchronization. The watch shall be examined to determine conformance with 3.3.5. The setting mechanism shall be activated and readings taken when the minute hand is at "12" and the hour hand is at the 3, 6, 9 and 12 hour respectively, to determine compliance with 3.3.5.

4.7.15 Mainspring, Type 1 and 2. With the watch fully wound, it shall be examined for continuous running, without rewinding, for the minimum time specified in 3.2.3.2.2.

4.7.16 Hairspring and balance wheel assembly, Type 1 and 2. The hairspring and balance wheel unit shall be considered acceptable for compliance with 3.2.3.2.3 if the watch is capable of meeting the requirements of 3.3.11.

4.7.17 Identification marking. All numbers and lettering shall be visually inspected for correctness, legibility, and application in accordance with 3.2.6.2. Inspection for permanent marking shall insure that acceptable processes have been applied such as: castings, moldings, steel stamp, acid, etching, or engraving.

4.7.18 Workmanship. Quality of workmanship in conjunction with best industry practices shall be inspected by visual and tactile means at the discretion of the Government during in-process and on the complete watch to insure that watches are continually produced in accordance with 3.4.

4.7.19 Accuracy. During the conditioning period, the running watches shall be subjected to the test temperature for at least 4 hours prior to the test. Daily rates (see 6.5.5), shall be recorded for a period of three days in each position and the mean daily rate (see 6.5.6), determined therefrom. The watches shall be rejected if the mean daily rate (see 6.5.6), exceeds the requirements of 3.3.11. The Type 1 and 2 watches shall be wound at the beginning of each test and each 24 hours thereafter for the duration of the tests. The mean daily rate shall be determined by means of a master time source as specified in 4.6.1.

4.7.20. Isochronism. This test shall be conducted concurrently with 4.7.19.

4.7.20.1 Type 1. This test shall vary from that in 4.7.19 in that the error shall be determined at 6-hour intervals. The difference of error recorded between each 6-hour period shall not exceed 5 seconds.

4.7.20.2 Type 2. In the position and at the temperature specified in 3.3.10, the watch shall be fully wound and operated for four hours. The watch shall again be fully wound and the rate recorded while fully wound and after four hours of operation. The rates shall again be recorded at the 20 and 24th hour. The difference in uniformity of rate between the four-hour periods shall not exceed 10 seconds.

4.7.21 Magnetism. A magnetic field shall be generated electrically utilizing standard test equipment capable of developing the magnetic intensity (in Gauss) within the limits specified in 3.3.8. With the watch running, it shall be placed into the energized field with the stem parallel to the direction of the field. The field shall be on for three seconds and off for three seconds. This cycle shall be repeated ten times. Upon completion and removal from the field, the watch shall be rated by a precision type rate recorder having an accuracy as specified in 4.6.1 to determine compliance with 3.3.8.

4.7.22 Vibration. The watch shall be vibrated in accordance with 3.3.1 as follows:

20 minutes with vibration perpendicular to dial.
20 minutes with vibration in plane of dial and in direction from 12 to 6.
20 minutes with vibration in plane of dial and in direction from 9 to 3.

4.7.23 Shock. While running, the watch shall be dropped from the height of 50 centimeters (19.7 inches), uncontrolled, onto vinyl tile (3 mm or 1/8 inch thickness) affixed to a concrete block. At the conclusion of this test the watch shall be running and be subjected to a visual and tactile examination in compliance with 3.3.2 for any crystal damage or other loose, missing, and damaged parts. After passing this examination the watch shall then be subjected to the test in 4.7.24.

4.7.24 Storage. In compliance with 3.3.3, subject the watches to ambient temperatures and time in the following order:

Store at -50 degrees ±2 degrees F (-45 degrees + 1.1 degrees C) for 24 hours.
Store at room temperature (60 degrees to 90 degrees F (15.5 to 32.2 degrees C) for 24 hours.
Store at 140 degrees ±2(60 degrees ±1.1 degree C) with at least 50 percent relative humidity for 24 hours.
Store at room temperature for 24 hours.

After exposure to each extreme temperature, the watch shall be examined for physical defects or damage. There shall be no evidence of physical defects, damage of watch, or imperfections of crystal. After passing this test the watch shall be subjected to and shall meet the requirements of 3.3.11.

NOTE: Type 1 and 2 watches shall not be run during storage tests. Temperature changes in the watch may be gradual to avoid thermal shock. Type 3 to 5 watches shall have the battery in the watch.

4.7.25 Water resistance. In compliance with 3.3.4 the watch shall be tested for waterproofness by immersing it completely for at least five minutes in distilled water containing a wetting agent of approximately 1% by weight at room temperature and atmospheric pressure of 15 pounds per square inch (1 atmosphere) for five minutes. For an additional five minutes the watch shall be immersed under a pressure of 44 pounds per square inch (3 atmospheres).

The watch interior shall then be inspected for moisture by placing on a heating element at 105 F (40.6 C) for five minutes, then placing several drops of 70 F (21 C) water on the center of the crystal. Any visible condensated water (fogging) on the inside of the crystal constitutes failure of this test.

4.7.26 Long term accuracy (qualification only). The test shall only be conducted on watches submitted in conformance with 4.3 to determine compliance with 3.3.13. Each watch shall have met all other qualification requirements and tests herein prior to being subjected to the long term accuracy test. The test shall be conducted at 75 degrees F $\pm$3 degrees F (23.9 degrees C + 1.7 degrees C) for a total running time of 90 days, half of which time shall have been in a dial-up and half in a crown-down position, alternated at seven (7)day intervals. In consideration of the normal work week of testing personnel, testing need not be continuous. The watches shall be wound daily an shall be alternated and tested as specified in 3.3.13 to obtain approximately half the operating time (45 days) in each position. Compliance with long term accuracy specified in 3.3.13 shall be determined by using a master time source accurate to within $\pm$.025 seconds a day, to record the average mean daily rate (see 6.5.6) for compliance with 3.3.13. The mean daily rate (see 6.5.6) for any "individual" watch tested shall meet the accuracy specified in 3.3.13 for mean daily rate.

4.7.27 Contamination, long term (qualification only). Ten watches, packaged in accordance with 5.1.2 and held in storage for a period of not less than 90 days, shall be subjected to the test in 4.7.2.3.1, shall pass the requirement stated in 3.3.12.2.

4.8 Surveillance testing. Five watches randomly selected from production lot quantities not to exceed 1000 units, shall be forwarded to the Qualifying activity (see 6.7) for testing in accordance with 4.7.2.3.1 and 4.7.2.3.2. These five watches shall not have been previously selected from any sample nor shall they be washed or cleaned. Failure of any of the five watches shall be cause for refusal of the Government to continue acceptance of production watches until evidence has been provided by the manufacturer that corrective action has been taken to eliminate the deficiences. Failure to notify the Government of corrective action within 30 days of having been notified of failure of a surveillance sample shall be cause for removal from the Qualified Products List. Watches submitted for surveillance testing shall not be returned to the manufacturer, but shall be retained by the Qualifying activity (6.7) for historical audit and record keeping purposes.

4.9 Movement design inspection. Manufacturer data on movement design shall be forwarded to the Government activity identified in 6.8.

5. PACKAGING.

5.1 Packaging. Packaging shall be level A or C, as specified (6.2).

5.1.1 Level A.

5.1.1.1 Unit packaging. Each wrist watch shall be wrapped in neutral tissue paper. The wrist strap shall be wrapped around the watch and cushioned to prevent damage to the instrument. Type 3 watch shall have the stem maintained in the setting position (battery disconnected) by a removable spacer or shim while in the package. Each watch, wrapped and cushioned shall be packaged in a paperboard box conforming to PPP-B-676 or PPP-B-566. The box shall be closed as specified in the appendix to the applicable box specification.

5.1.1.2 Intermediate packaging. Ten unit packages of wrist watches shall be intermediately packaged in a fiberboard box conforming to PPP-B-636, class domestic.

5.1.2 Level C. Wrist watches shall be packaged to afford adequate protection against damage during shipment from the supply source to the first receiving activity.

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

5.2.1 Level A. The packing shall be in accordance with group 1, Level A of PPP-T-360.

5.2.2 Level B. Six intermediate packages (60 watches) shall be packed in a close fitting fiberboard box conforming to PPP-B-636, class weather-resistant. Closure of the fiberboard box shall be in accordance with the appendix of PPP-B-636.

5.2.3 Level C. Wrist watches in quantities as specified (6.2), packaged as specified in 5.1.2, shall be packed in containers to assure carrier acceptance and safe arrival at destination in compliance with Uniform Freight Classification Rules or National Motor Freight Classification Rules.

5.3 Operating Instructions. Operating instructions shall be included in each unit package as specified in 3.6.

5.3.1 Disposal instructions Type 2 thru 5. Disposal instructions shall be included in each unit package, printed on 20 pound white sulphite paper, four inches by 1-1/2 inches. This may be included as part of the operating instructions. The instruction shall be as follows:

DO NOT ATTEMPT TO REPAIR UNSERVICEABLE WATCHES

5.4 Marking. In addition to the marking requirements specified in PPP-T-360, the unit package, intermediate package, and shipping container shall be marked with the date of acceptance by the Government.

5.4.1 Radioactive marking. Radioactive marking and labeling shall be as specified in MIL-STD-129, except as follows:

a. Marking for unit and intermediate packages shall include the lot number.

b. The unit and intermediate packages shall be marked with radioactive symbol, the isotope, and activity present in millicuries. Abbreviations may be used for the isotope, H^3, and millicuries, mCi.

6. NOTES.

(THIS SECTION CONTAINS INFORMATION OF A GENERAL OR EXPLANATORY NATURE THAT MAY BE HELPFUL BUT IS NOT MANDATORY.)

6.1 Intended use. The intended use, available maintenance and storage of the watch will determine which type watch is required. The following criteria is a guide for watch type selection to match user requirements:

Type 1: Long life (5-10 years), maintainable, nonmagnetic, synchronizable, water resistant, accuracy $\pm$90 seconds per month (18 minutes per year).

Type 2. Short life (2 years), nonmaintainable, anti-magnetic, water resistant, accuracy $\pm$90 seconds per month (18 minutes per year).

Type 3-5: Short life (2 years), nonmaintainable, battery powered, anti-magnetic, water resistant, accuracy $\pm$21 seconds per month (4 minutes per year).

6.2 Ordering data. Procurement documents should specify the following:

a. Title, number, and date of this specification

b. Selection of applicable levels of packaging and packing

c. Applicable Part Identifying Number

d. List of serial numbers to be assigned, Type 1 only (see 3.5).

e. Quantities required in level C packing (5.2.3).

f. Warranty: Notwithstanding inspection and acceptance by the Government of supplies furnished under this contract, or any condition of this contract concerning the conclusiveness thereof, the contractor warrants that for two years all watches furnished under this contract will be free of defects in design material or workmanship and will conform with all requirements of this contract (in conformance with FAR clause 52.246-17).

g. Applicable AQLs (see 6.3).

6.2.1 Material safety data sheet. Since the specification describes a product which contains a hazardous (radioactive) material, a Material Safety Data Sheet shall be prepared in accordance with FED-STD-313. One copy shall be submitted to the contracting officer, address as specified (6.2). In addition, a copy shall be provided to the Military Service or Federal department/agency address in 20.5 of FED-STD-313, of each service or agency that purchased the item.

6.2.2 Disposal of radioactive waste. Contractor generated radioactive waste must be disposed of in accordance with federal and state regulations. The provisions of AR 700-64 apply.

6.3 Acceptable quality level (AQL). The AQL applicable to Tables II through IV is 1.0 (percent defective).

6.4 Acquisition strategy, recommended for quartz analog watches. Establish a multiyear contract with delivery of small quantities of 100 units or less within 30 days and large quantities of 100 to 1,000 units within 45 to 60 days. This will reduce high temperature storage time and stocking cost for a noncritical item.

NOTE: A typical 30 month battery used in a quartz analog watch stored at 120 degrees Fahrenheit would affect a loss of approximately 10% of its capacity in 30 days reducing the battery runable life to six months.

6.5 Definitions of terms used.

6.5.1 Accuracy error notation. Where algebraic signs are used to denote the direction of timekeeping accuracy error, the plus (+) sign represents "fast" and the minus (-) sign "slow."

6.5.2 Error. Algebraic time difference in seconds between the watch being tested and the master timepiece.

6.5.3 Starting error. Error at start of test period.

6.5.4 Rate. Difference between the starting error and error at the end of a given time interval.

6.5.5 Daily rate. Rate in a 24 hour period. The term "daily rate" is used synonymously with the term "daily error" and "daily accuracy."

6.5.6 Mean daily rate. Mean daily rate is the arithmetic average of individual daily rates (daily errors) with proper regard to algebraic signs in the summation. Unless otherwise specified, the mean daily rate shall be for three consecutive days operation.

6.5.7 Average mean daily rate. This term is used to denote the average of the mean daily rates of two or more timepieces with each individual rate being considered as algebraically positive (+) in the computation.

6.6 Part or Identifying Number (PIN). The military part number shall consist of the designator "M", the basic specification number, the dash number assigned to the type of number of the watch (see 1.2), case color symbol (see 1.2 and 3.2.6.4) and strap color symbol (see 1.2 and 3.2.8).

M	46374	1	M	B
Military Designator	General Specification Number	Type Number (See 1.2)	Case Color (See 1.2 and 3.2.6.4)	Strap Color (See 1.2 and 3.2.8)

6.7 Qualification. With respect to products requiring qualifications, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion on the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and are urged to arrange to have the products that they propose to offer to the Federal Government, tested for qualification, in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the qualified products list is the U.S. Army Armament, Research, Development and Engineering Center, ATTN: SMCAR-BAC-S, Picatinny Arsenal, New Jersey 07806-5000. Information pertaining to qualification of products may be obtained from that activity.

6.8 Movement design review. Drawings, specifications and associated data, in conformance to 3.2.3.2.4, must be forwarded to the following:

William Langer Plant
Rolla, North Dakota 58367

6.8.1 Jewel bearings. Jewel bearings for Type I and II watches are subject to the provisions of FAR Clauses 52.208-1 and 52.208-2.

6.9 Subject term (key word) listing.

Analog Watch
Aviation Watch, Wrist
Chronograph, Wrist
Chronometer, Wrist
Electronic Watch, Wrist
Jewel Bearings
Luminous Vials
Quartz Movement
Scintillation counter
Tritium

Custodian:
Army - AR
Navy - SH
Air Force -99

Preparing activity:
Army - AR

Project No. 6645-0397

Review activities:
Air Force - 82
DLA - GS

User activity:
Navy - MC

Civil Agencies Coordinating Activities:
GSA - FSS

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-W-46374E	WATCH, WRIST: GENERAL PURPOSE

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
	☐ USER
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ MANUFACTURER
	☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 82 MAR 1426 PREVIOUS EDITION IS OBSOLETE.

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

(Fold along this line)

(Fold along this line)

DEPARTMENT OF THE ARMY

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 12062 WASHINGTON D. C.
POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE ARMY

Commander
US Army ARDEC
ATTN: SMCAR-BAC-S
Picatinny Arsenal, NJ 07806-5000

Stocker & Yale, Inc.

P.O. BOX 494
ROUTE 128 AND BRIMBAL AVENUE
BEVERLY, MASSACHUSETTS 01915-0344
TEL: 508-927-3940 FAX: 508-927-8756

January 5, 1989

Mr. Steve Baggett//Mr. Tom Rich
Nuclear Regulatory Commission
7735 Old Georgetown Road
Bethesda, MD 20555

Reference: Omitted Letter of Notification dated 12/22/89 re:
Solicitation No. FSCG N3-126-9-13-89
GSA Notice of Award to Marathon Watch Company

Gentlemen:

Please find enclosed Letter of Notification regarding Solicitation No. FSCG N3-126-9-13-89, GSA Notice of Award to Marathon Watch Company which was inadvertently omitted from the data which was mailed to your office.

Thank you for your time in this matter.

Sincerely,

STOCKER & YALE, INC.

James Bickman

James Bickman
President

JB/khs

Enclosure

General Services Administration
Federal Supply Service
Washington, DC 20406

DEC 22 1989

Certified Mail - Return Receipt Requested

Mr. James Bickman
Stocker & Yale, Inc.
133 Brimbal Ave.
Beverly, MA 01915

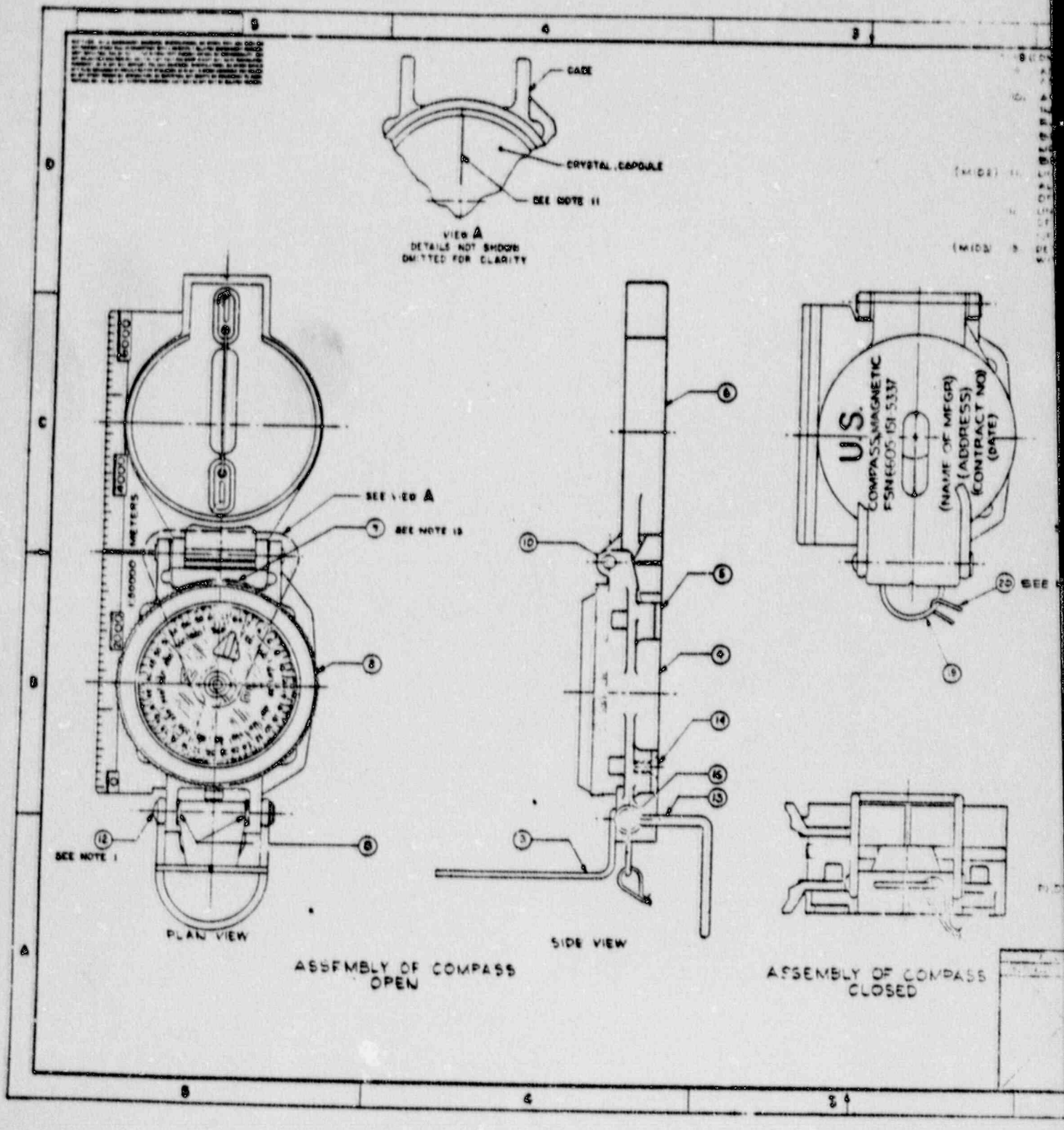
Dear Mr. Bickman:

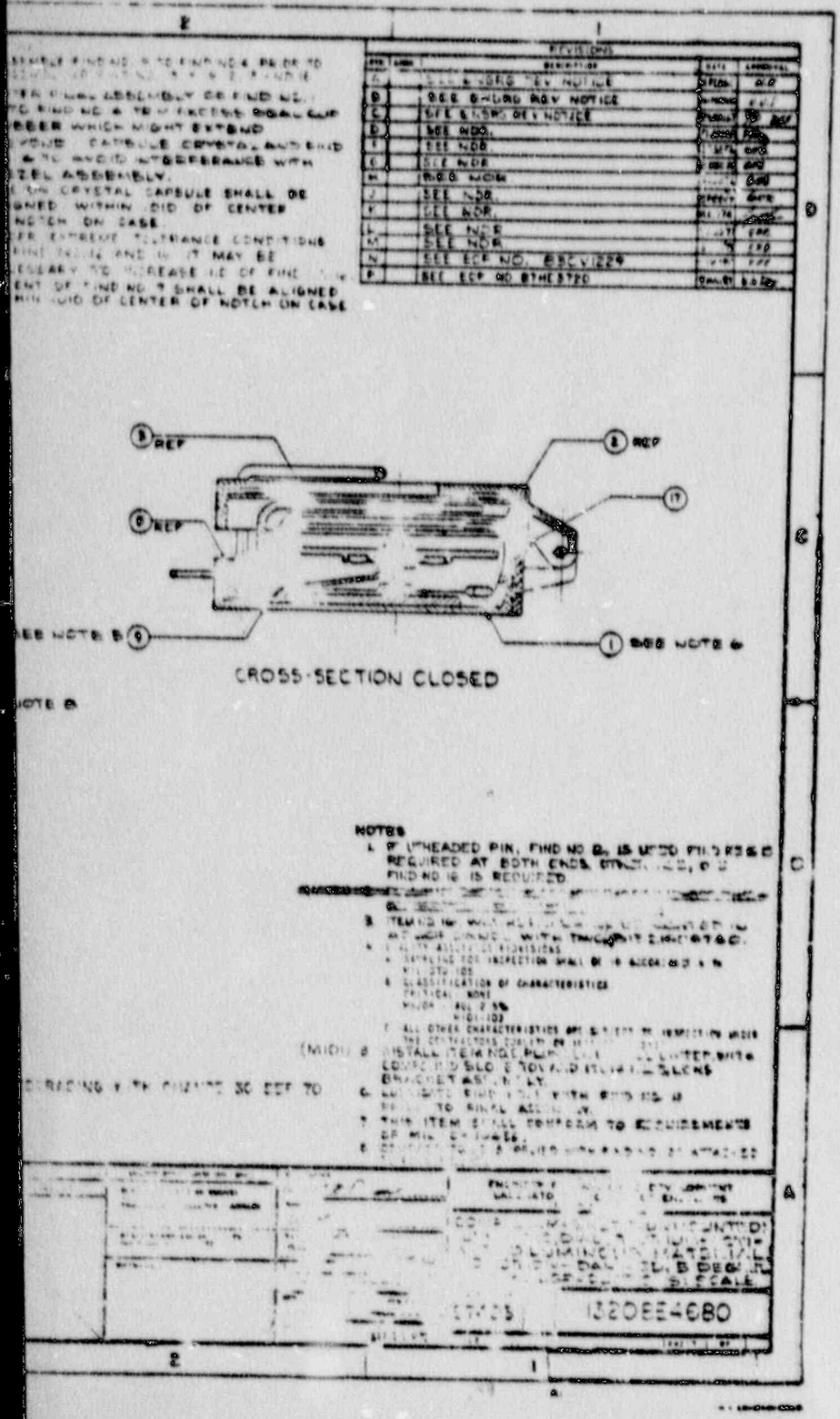
This is to notify you that the award for Wrist Watch under Solicitation Number FCGA-N3-N-126-9-13-89 was made to the lowest responsive responsible offeror. Marathon Watch Co., Ltd., 67A Steelcase Road W., Markham, Ontario L3R 2M4, Canada. The award price is $32.23.

We appreciate your interest in this procurement.

Sincerely,

Marianne Cole
MARIANNE COLE (CPPO)
Contracting Officer
Special Programs Division (FCGA)

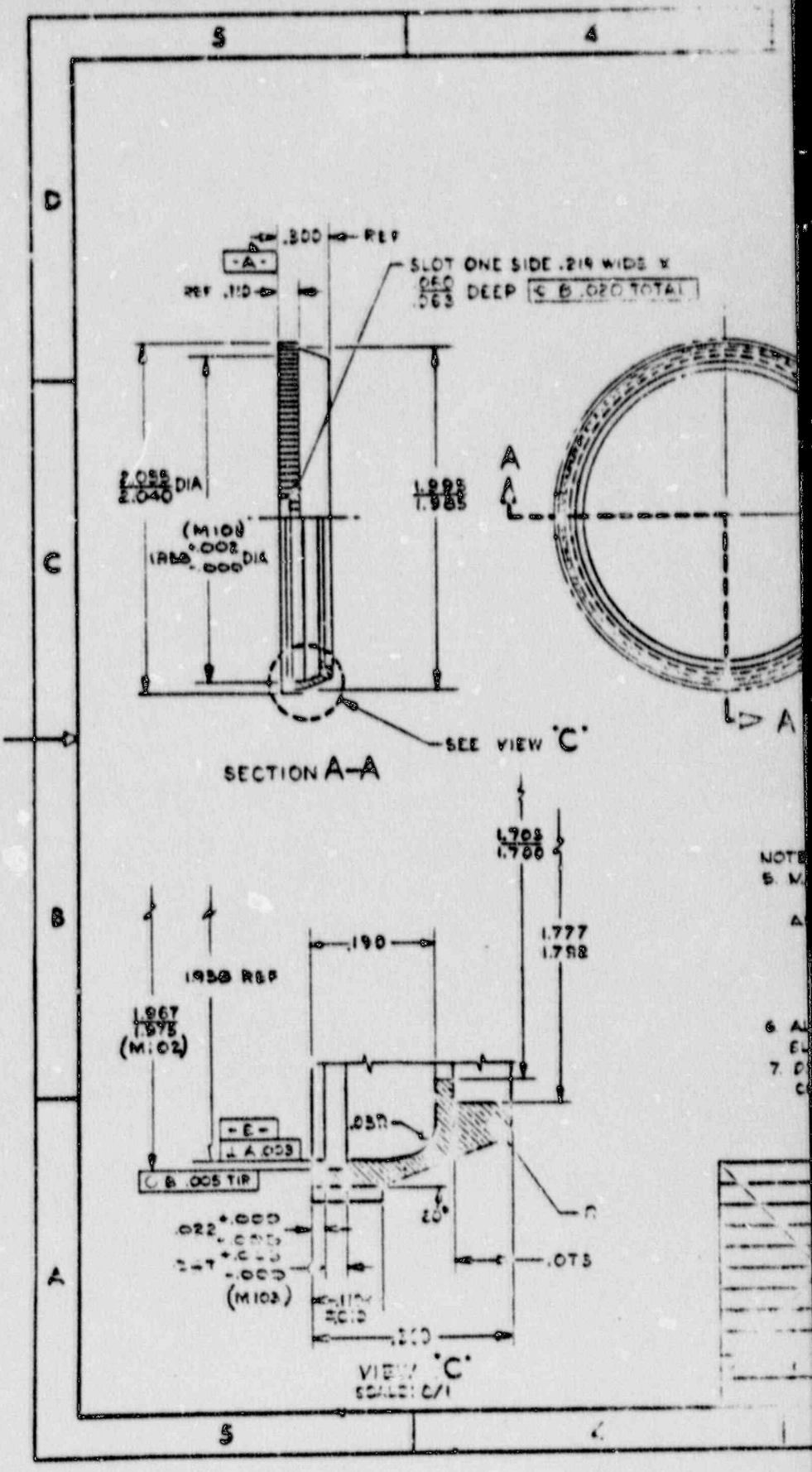

CASE
CRYSTAL CAPSULE
SEE NOTE 11
VIEW A
DETAILS NOT SHOWN
OMITTED FOR CLARITY
SEE VIEW A
SEE NOTE 13
SEE NOTE 1
PLAN VIEW
SIDE VIEW
U.S.
COMPASS, MAGNETIC
FSN 6605-151-5337
(NAME OF MFGR)
(ADDRESS)
(CONTRACT NO)
(DATE)
ASSEMBLY OF COMPASS
OPEN
ASSEMBLY OF COMPASS
CLOSED



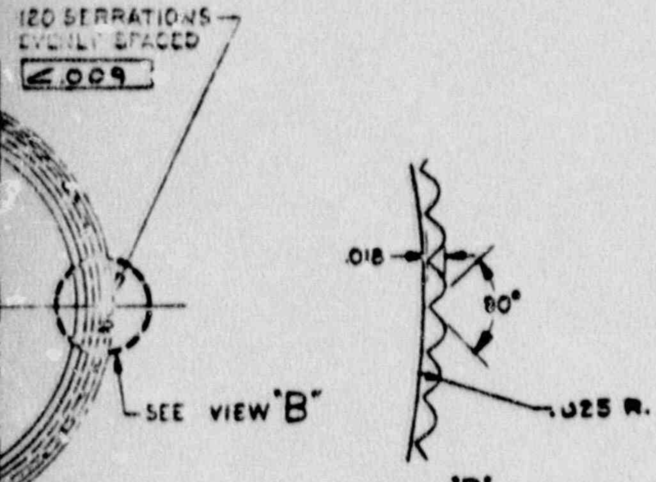
SI
APERTURE
CARD

Also Available On
Aperture Card

9002150284-01


5
4
D
C
B
A
.300 REF
-A-
REF .110
SLOT ONE SIDE .214 WIDE X .063 DEEP ⌖ B .020 TOTAL
2.058 / 2.040 DIA
1.993 / 1.985
(M10)
REF .008 / .000 DIA
SEE VIEW "C"
SECTION A-A
1.703 / 1.700
1.777 / 1.798
.190
1.950 REF
1.967 / 1.575 (M102)
-E-
⊥ A .003
⌖ B .005 TIP
.057
20°
.022 +.000 -.000
.075
(M103)
.110 REF
.200
VIEW "C"
SCALE: 6/1

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	H	SEE NOR	14 AUG 72	GOB
	J	SEE NOR.	8 FEB 74	AFB
	K	SEE NOR	1 MAR 76	[illegible]
	L	SEE NOR	21 JAN 76	EFB
	M	SEE ECP NO. 83HE0652	28 JUL 83	[illegible]
	N	SEE ECP NO 87HE3720	5 AUG 87	[illegible]



VIEW "B"
SCALE: 8/1

SI
APERTURE
CARD

Also Available On
Aperture Card

NOTES:
1. REMOVE ALL SHARP EDGES.
2. BRASS SHALL BE FINISHED PER DWG 8182198E9740.
3. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5 %
      101-103
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.

...S CONT:
...TERIAL:
BRASS ASTM B176 ALY NO. 879
...LT MATERIAL:
BRASS ASTM B16 HALF HARD
ALUMINUM ASTM B209,
AL ALY 6061-T6
AL ALY 6262-T6
...TERNATE ALUMINUM TO BE HARD
...ACK ANODIZED PER MIL-A-8625.
...MENSIONAL LIMITS APPLY AFTER
...ATINGS.

4. FOR INTERPRETATION OF DIMENSIONS AND TOLERANCING SEE ANS-Y14.5

PHOTOTRACING WITH CHANGE

SEE NOTE 5

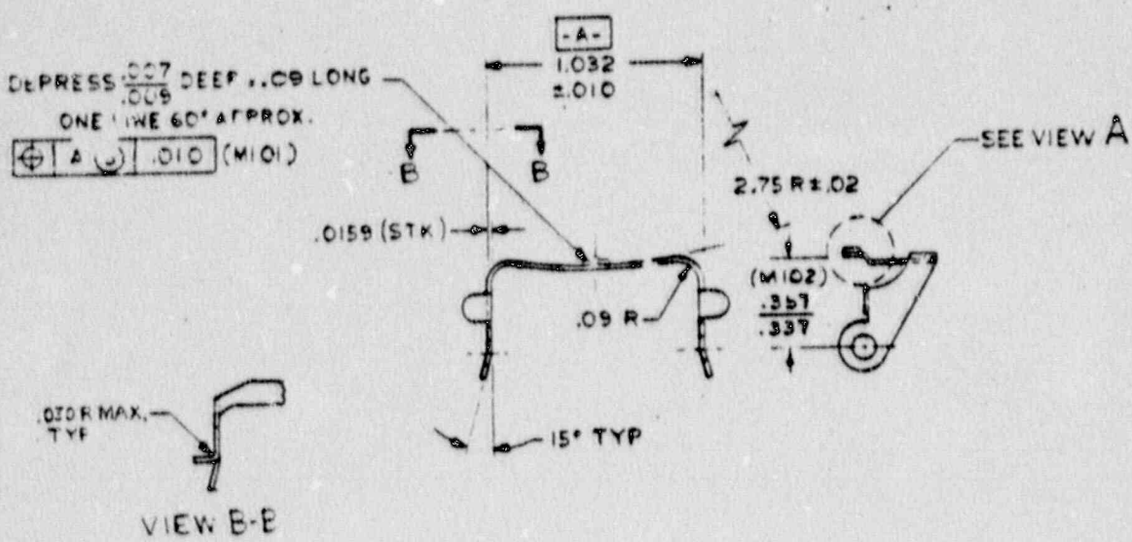
U.S. ARMY ... COMMAND
MOBILITY EQUIPMENT ... CENTER
FORT BELVOIR ...

BEZEL

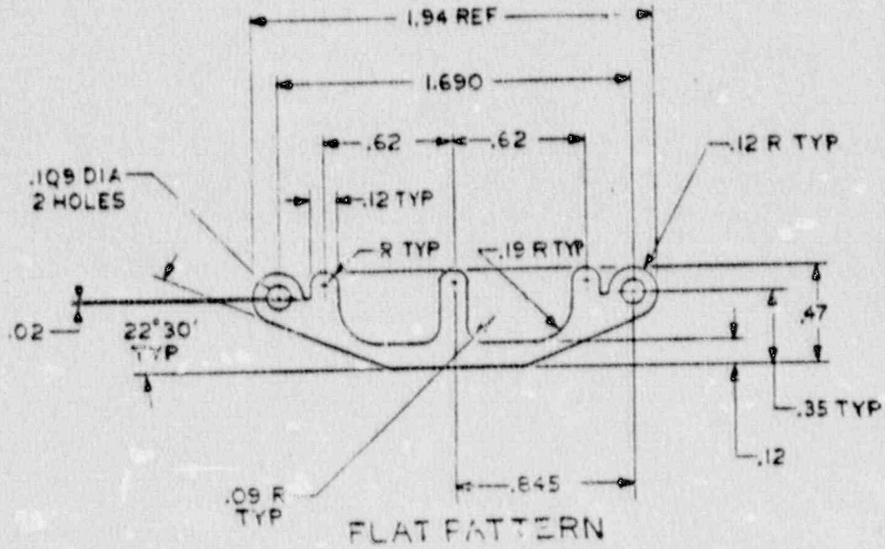
SIZE	CODE IDENT NO.	
C	97403	13208E4695

9002150284-02

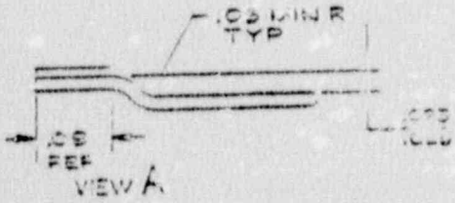
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	K	SEE ECP NO. 67-E3720	[illegible]	[illegible]



VIEW B-B



FLAT PATTERN



VIEW A

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS
DECIMALS
ANGLES ±1°

1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE ENGRG REV NOTICE	[illegible]	[illegible]
	B	ADDED VIEW A	[illegible]	[illegible]
	C	SEE ENGRG REV NOTICE	[illegible]	[illegible]
	D	SEE ENGRG REV NOTICE	[illegible]	[illegible]
	E	SEE NOR.	17JAN69	[illegible]
	F	SEE NOR	[illegible]	[illegible]
	G	SEE NOR.	[illegible]	[illegible]
	H	SEE NOR.	[illegible]	[illegible]
	J	SEE ECP NO. E3HE0652	[illegible]	[illegible]

D

NOTES:

1. COPPER-BERYLLIUM MATERIAL SHALL BE PRECIPITATION HEAT TREATED AFTER FORMING.
2. ALTERNATE MATERIAL TO BE USED ONLY UPON SPECIFIC APPROVAL OF CONTRACTING OFFICER.
3. DEVELOPMENT FROM BOTTOM FIGURE IS OPTIONAL.
4. FINISH IN ACCORDANCE WITH DWG B13219E9740.
5. UNLESS OTHERWISE SPECIFIED:
   BREAK SHARP EDGES .002 TO .005.
   ALL FILLETS .000 TO .005.
6. FOR INTERPRETATION OF:
   DIMENSIONING AND TOLERANCING, SEE ANS-Y14.5.
7. ~~[illegible]~~
8. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5%
      MIDI-102
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.

C

B

A

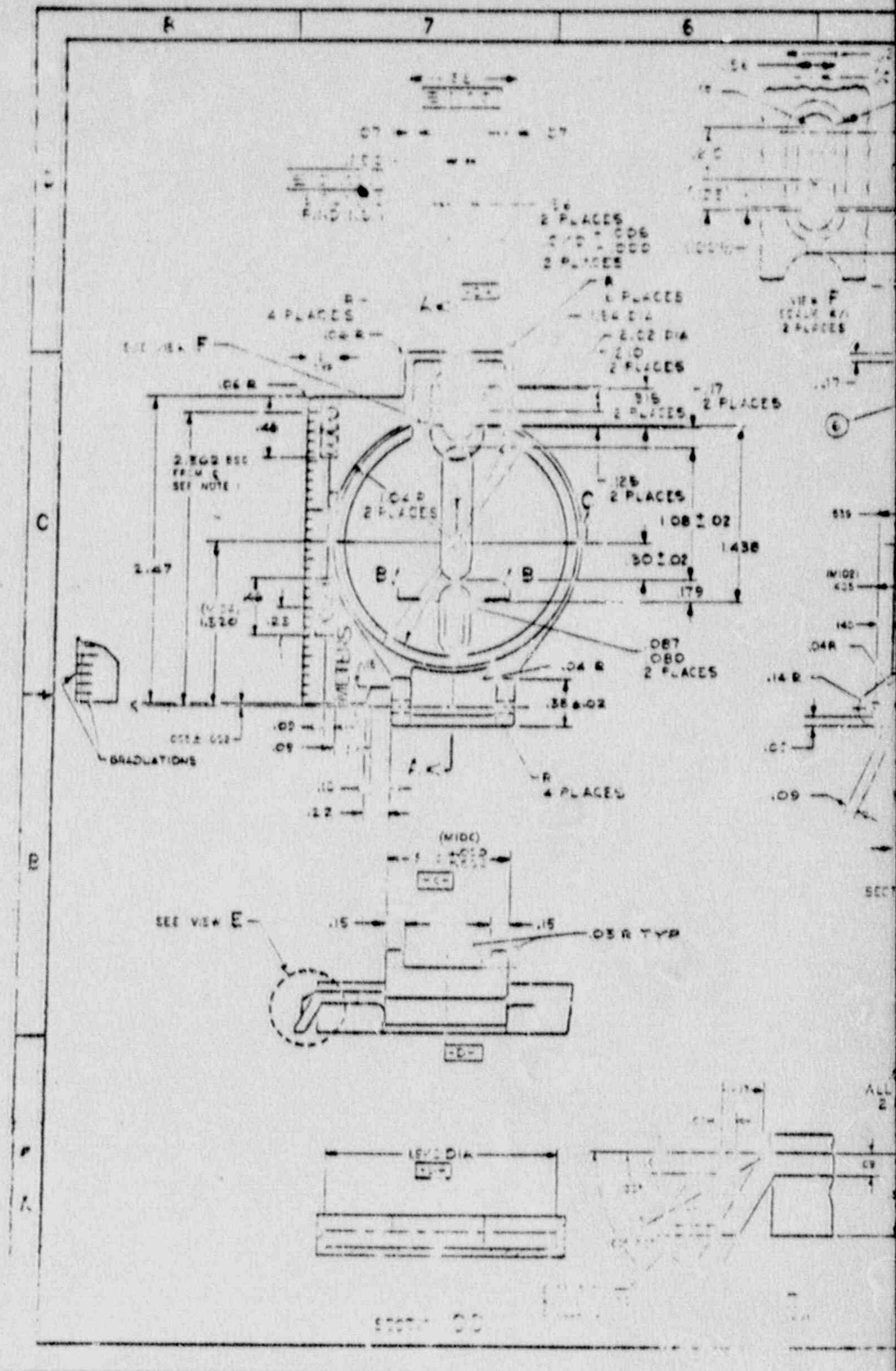
S[illegible] DETENT

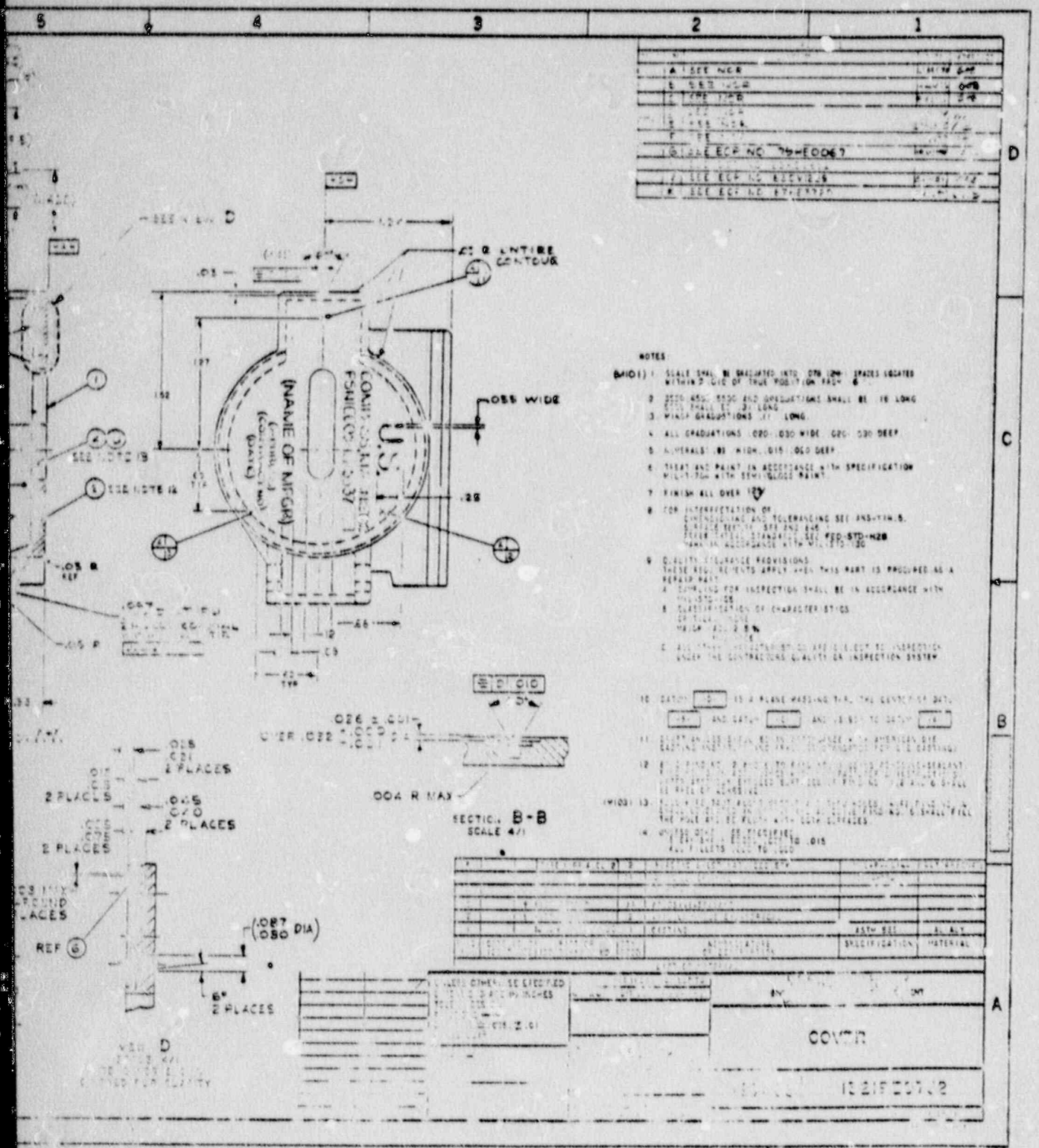
0 | [illegible]7403 | [illegible]

SI
APERTURE
CARD

Also Available On
Aperture Card

9002150284-03

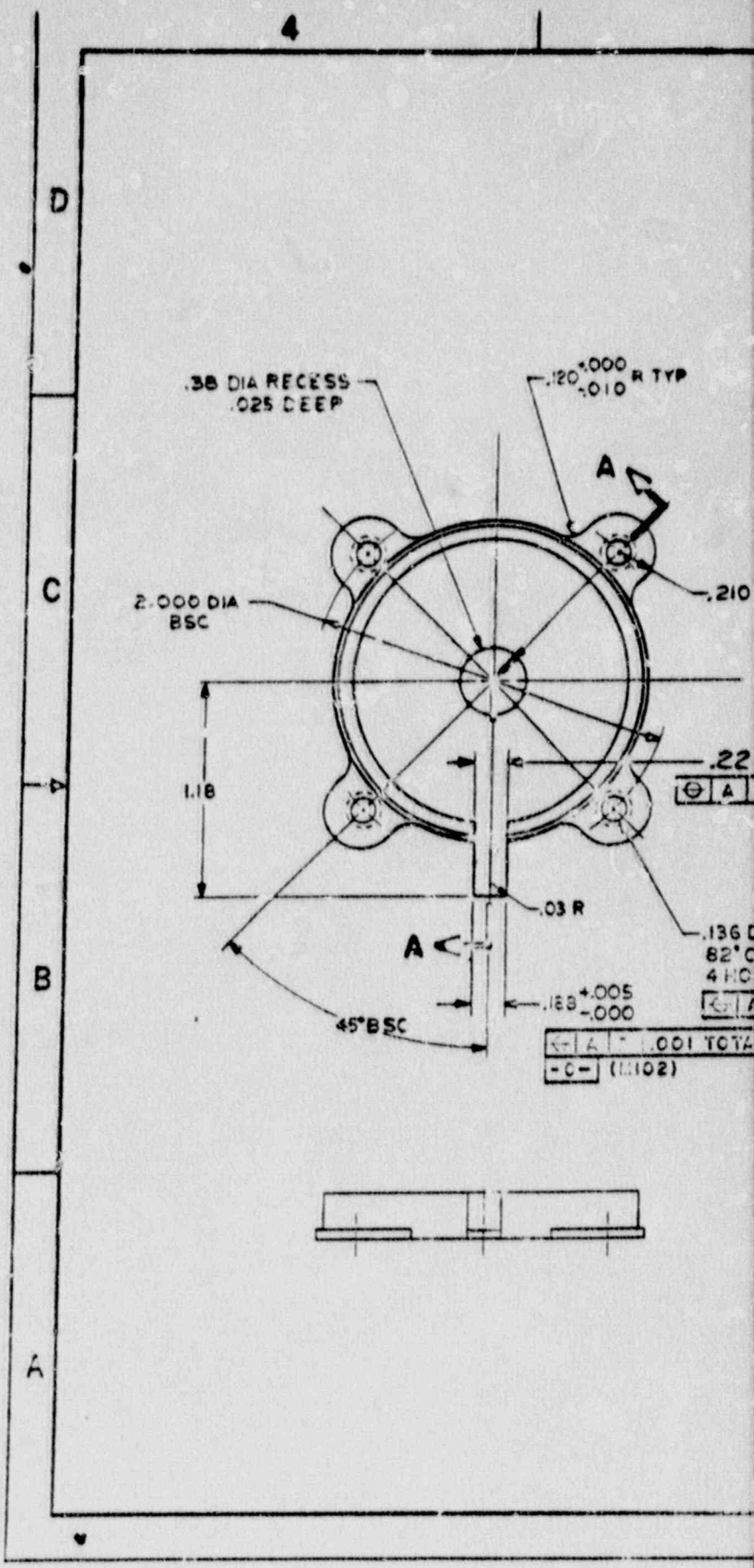

8
7
6
C
B
2 PLACES
4 PLACES
.06 R
2.47
.44
1.08 ± .02
1.438
.30 ± .02
.179
.125
2 PLACES
.04 R
2 PLACES
.087
.080
2 PLACES
.04 R
.38 ± .02
.03
.09
.10
.22
R
4 PLACES
GRADUATIONS
.23
.17
2 PLACES
(WIDE)
SEE VIEW E
.15
.15
.03 R TYP
.09
.14 R
.04R



SI
APERTURE
CARD

Also Available On
Aperture Card

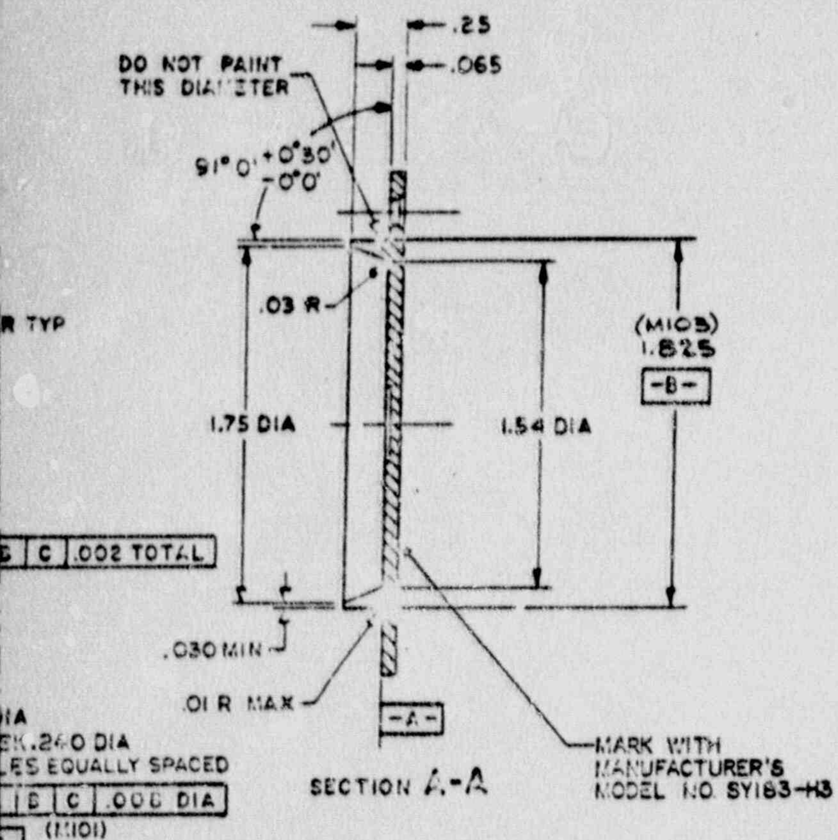
9002150284-04


4
D
C
B
A
.38 DIA RECESS
.025 DEEP
.120 +.000 -.010 R TYP
A
.210
2.000 DIA
BSC
1.18
.22
A
.03 R
.136
82°
4 HO
A
.188 +.005 -.000
45° BSC
.001 TOTA
(1.102)

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE NOR	[illegible]	[illegible]
	B	SEE NOR.	[illegible]	[illegible]
	C	SEE NOR.	[illegible]	[illegible]
	D	SEE NOR.	[illegible]	[illegible]
	E	SEE ECP NO. 83HE0652	[illegible]	[illegible]
	F	SEE ECP NO. E3CV1229	[illegible]	[illegible]
	G	SEE ECP NO. C7HE2720	[illegible]	[illegible]

SI
APERTURE
CARD

Also Available On
Aperture Card



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   ALL SURFACE TO HAVE 125
   BREAK SHARP EDGES .005 TO .015.
   ALL FILLETS TO .020 TO .030.
2. TREAT AND PAINT IN ACCORDANCE WITH MIL-T-704, WITH SEMI-GLOSS PAINT.
3. FOR INTERPRETATION OF:
   DIMENSIONING AND TOLERANCING, SEE ANSI-Y14.5.
   SURFACE TEXTURE, SEE ANS B46.1.
4. ~~[illegible]~~
5. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
   CRITICAL: NONE
   MAJOR - AQL 2.5%
   M101-103
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.
6. DRAFT ANGLES SHALL BE IN ACCORDANCE WITH AMERICAN DIE CASTING INSTITUTE, INC. (PRODUCT STANDARDS FOR DIE CASTIN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ±— DECIMALS ±.005 ±.01 ANGLES ± 0° 15'

MATERIAL: ALUMINUM ALLOY ASTM B85 ALLOY A413.0 ALT. ASTM B85 ALLOY A380.0

DRAWN: (ALB) 30 SEP 70

CHECKED: RSS 30 SEP 70

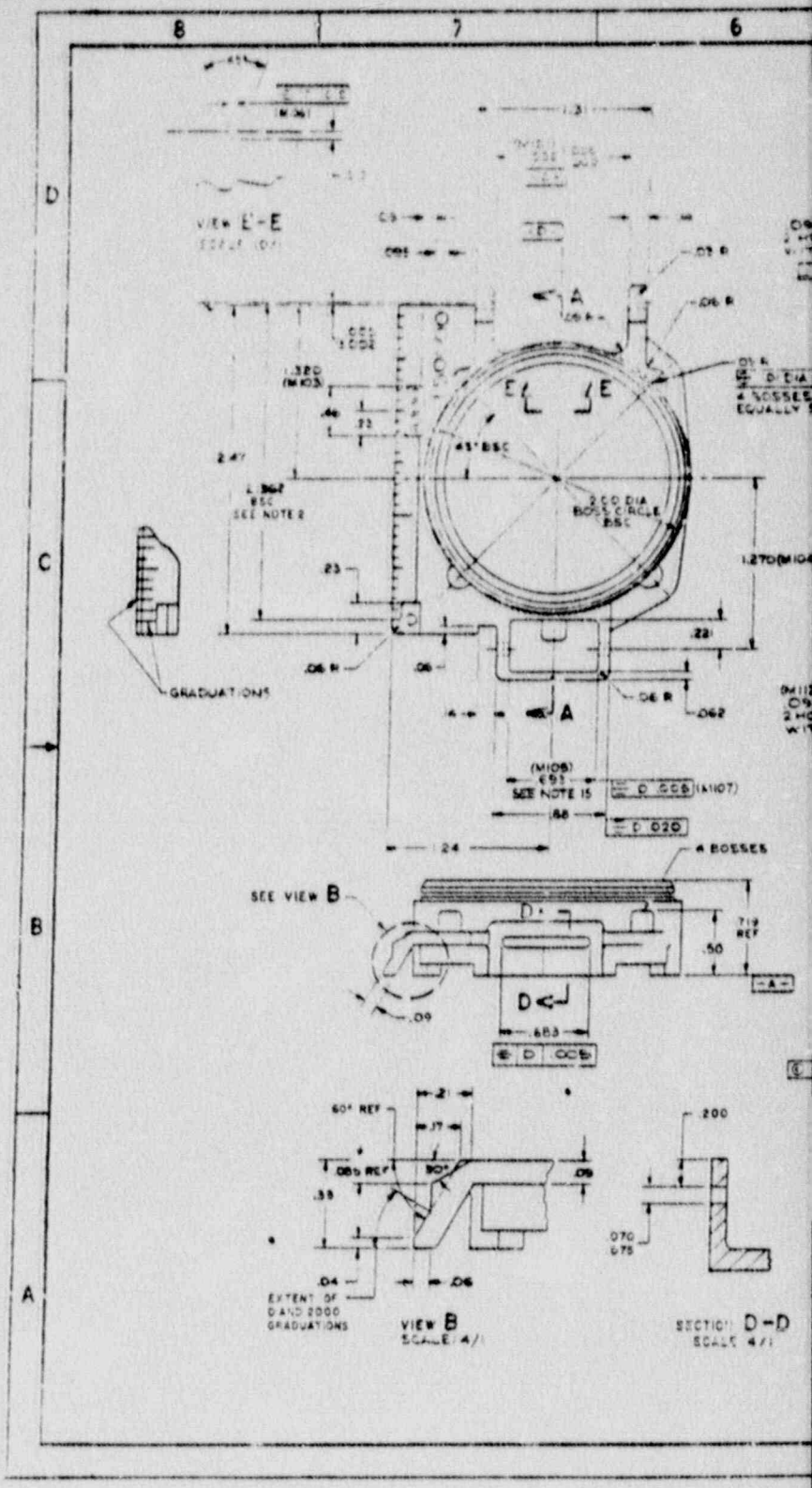
U.S. ARMY ... ENGINEERING ... DEVELOPMENT

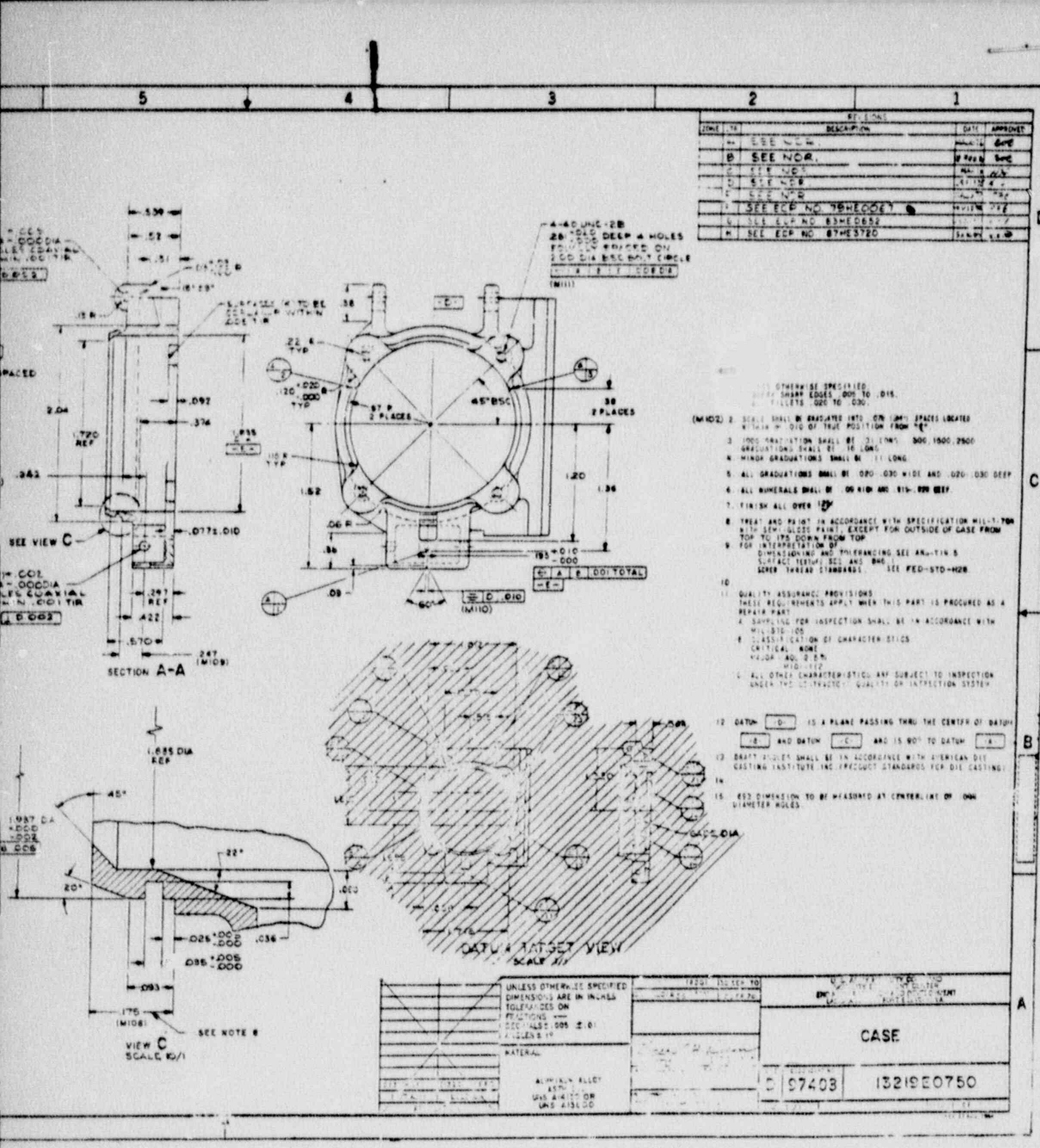
BOTTOM, CASE

SIZE C | CODE IDENT NO. 97403 | 13219E0751

SCALE 2/1 | SHEET 1 OF 1

150284-05

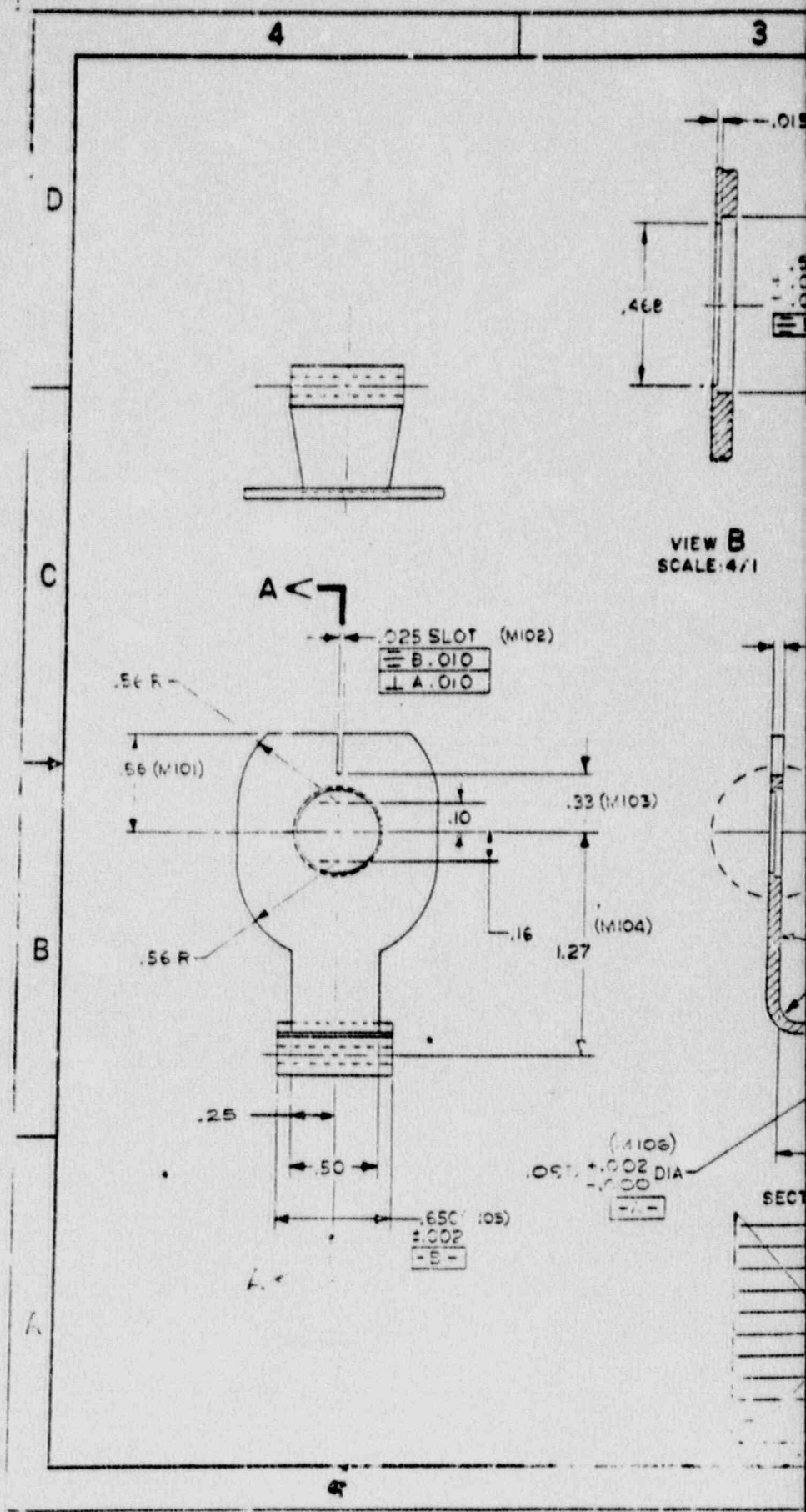

8
7
6
D
C
B
A
VIEW E-E
SCALE (2/1)
GRADUATIONS
SEE NOTE 15
4 BOSSES
SEE VIEW B
EXTENT OF
0 AND 2000
GRADUATIONS
VIEW B
SCALE 4/1
SECTION D-D
SCALE 4/1



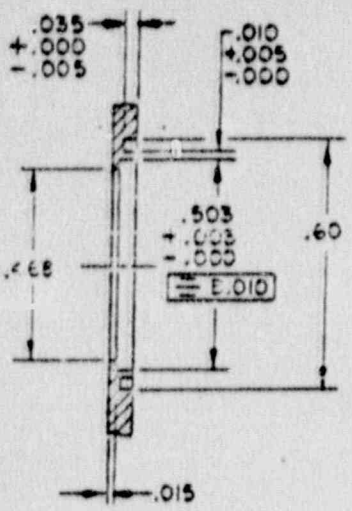
SI
APERTURE
CARD

9002150284-06

Also Available On
Aperture Card


4
3
D
C
B
A
.468
VIEW B
SCALE: 4/1
A
.025 SLOT (M102)
⌯ B .010
⊥ A .010
.56 R
.56 (M101)
.33 (M103)
.10
.16
(M104)
1.27
.56 R
.25
.50
.650 (M105)
±.002
-B-
(M106)
±.002
DIA
-A-
SECT

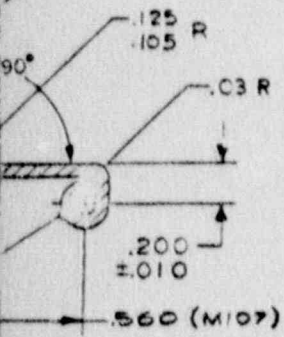
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	B	SEE ENGRG REV NOTICE	4FEB66	
	C	SEE ELGRG REV NOTICE	20JUL66	
	D	SEE ENGRG REV NOTICE	23JAN67	
	E	SEE NOR.	17JAN69	
	F	SEE NOR	4NOV72	
	G	SEE NOR	15JUN73	
	H	SEE NOR.	18FEB75	
	J	SEE NOR	11AUG77	
	K	SEE NOR.	10JAN79	
	L	SEE ECP NO 81HE0652	27JUL83	
	M	SEE ECP NO 87HE3720	9AUG87	



VIEW B
ALTERNATE
SCALE: 4/1

.063 (STK)

SEE VIEW B



SECTION A-A

NOTES:

1. BREAK SHARP EDGES .005 TO .015.
2. ANODIZE IN ACCORDANCE WITH SPECIFICATION MIL-A-8625 TYPE II AND DYE BLACK.
3. FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ANS-Y14.5.
4. [illegible] SEE QUALITY ASSURANCE PROVISIONS
5. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5%
      MIDI-105
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION.
6. DIMENSIONAL LIMITS APPLY AFTER COATING.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± .03
DECIMALS .XX ± .05
ANGLES ± 1°30'

MATERIAL
ALUMINUM ALLOY
ASTM-B209
ALLOY 3003-H14

DRAWN: J. K. 21 JUN65
CHECKED:
ENG APPR:

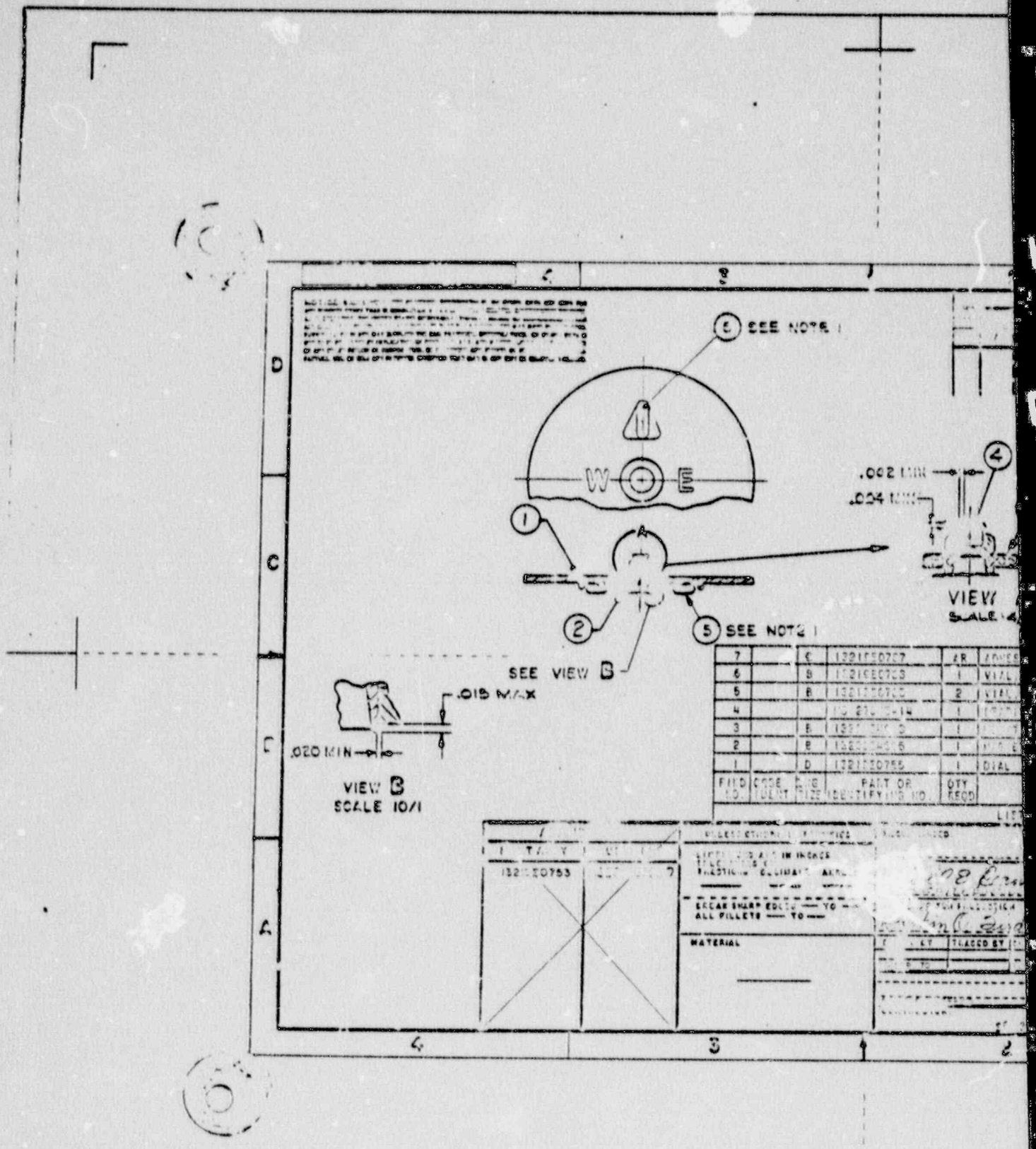
U.S. [illegible]

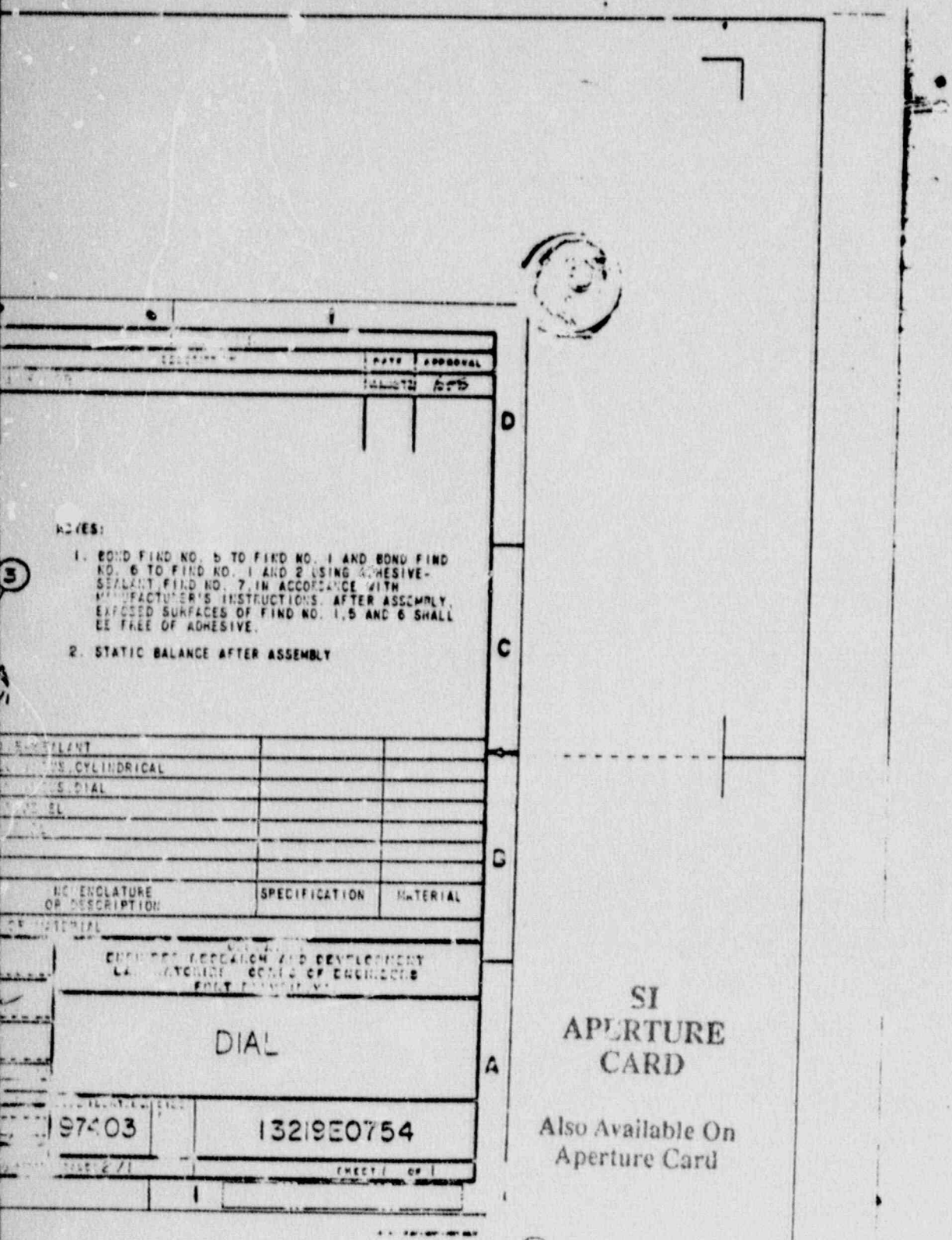
BRACKET, LENS

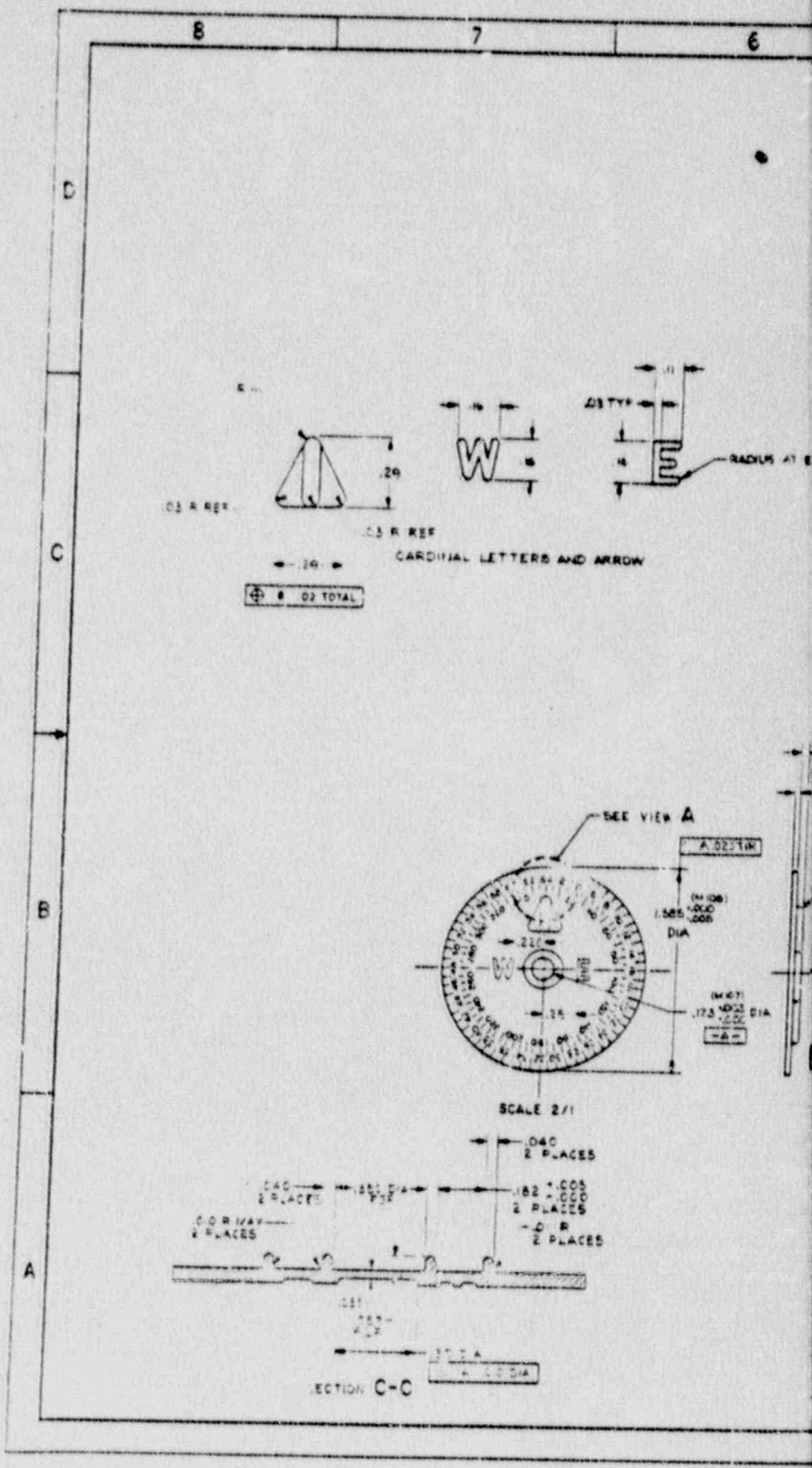
SIZE C | DWG NO. 97403 | 1820E4700

SCALE 2/1 | SHEET 1 OF 1

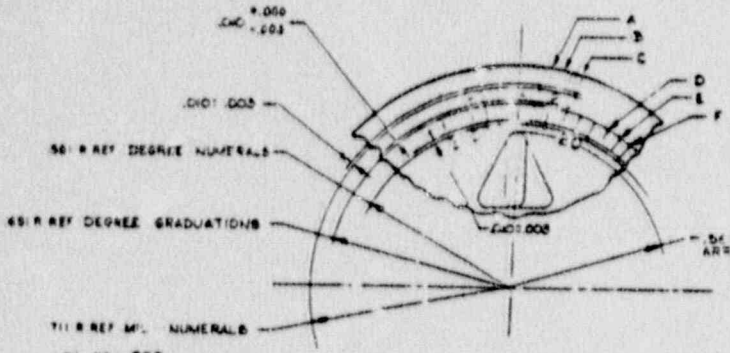
9002150284-07


6 SEE NOTE 1
.002 MIN
.024 MAX
4
1
2
5 SEE NOTE 1
VIEW
SCALE
SEE VIEW B
.015 MAX
.020 MIN
VIEW B
SCALE 10/1
7 C 1321E50707 AR ASSEM
6 B 1321E50705 1 VIAL
5 B 1321E50706 2 VIAL
4 NO. 8-14 1
3 B 1321E50704 1
2 B 1321E50703 1
1 D 1321E50755 1 DIAL
FIND NO. CODE IDENT SIZE PART OR IDENTIFYING NO. QTY REQD
LIST
1321E50753
BREAK SHARP EDGES — TO —
ALL FILLETS — TO —
MATERIAL
TRACED BY
D
C
B
A
4
3
2

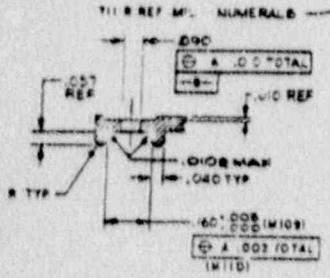



B
7
6
D
C
B
A
.03 TYP
.03 R REF
.03 R REF
.20
CARDINAL LETTERS AND ARROW
.20
.02 TOTAL
SEE VIEW A
1.585 DIA
SCALE 2/1
.040
2 PLACES
.182
2 PLACES
2 PLACES
SECTION C-C

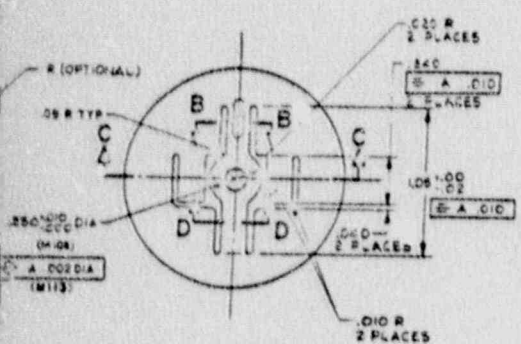
REVISIONS				
ZONE	NO	DESCRIPTION	DATE	APPROVED
	A	SEE ECR		
	B	SEE NOR		
	C	SEE NOR		
	D	SEE ECP B3HF0652		
	E	SEE ECP NO 87HE3720		

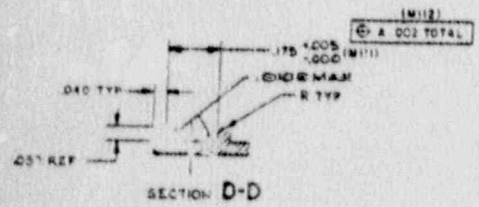


VIEW A



SECTION B-B





SECTION D-D

NOTES

(M101) 1. OUTER SCALE-MILS .028 WIDE X .009 DEEP.
A SHORT GRADUATIONS: .045 LONG
B MEDIUM GRADUATIONS: .070 LONG
C LONG GRADUATIONS: .095 LONG
FILL GRADUATIONS AND NUMERALS WITH BLACK SEMI-GLOSS LACQUER [illegible] CLASS 1, COLOR 27038

(M102) 2. INNER SCALE-DEGREES .018 WIDE X .009 DEEP.
D SHORT GRADUATIONS: .045 LONG
E MEDIUM GRADUATIONS: .060 LONG
F LONG GRADUATIONS: .085 LONG
FILL GRADUATIONS AND NUMERALS WITH RED SEMI-GLOSS LACQUER [illegible] CLASS 1, COLOR 21136

(M103) 3. CARDINAL LETTERS ARE ARROW TO BE .010 DEEP AND FILLED WITH BLACK SEMI-GLOSS LACQUER [illegible] IN ACCORDANCE WITH [illegible] CLASS 1, COLOR 27038

(M104) 4. DIGITS TO BE .060 +.005 -.000 HIGH X .040 ± .002 WIDE X .004 TO .006 DEEP WITH LINE WIDTH .007 ± .001. MULTIPLE DIGITS IN A NUMBER SHALL BE SPACED .005 ± .002.

(M105) 5. ALL GRADUATIONS TO BE IN THEIR TRUE POSITION WITHIN .020 OF ARC.

6. FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING SEE ANSI Y14.5

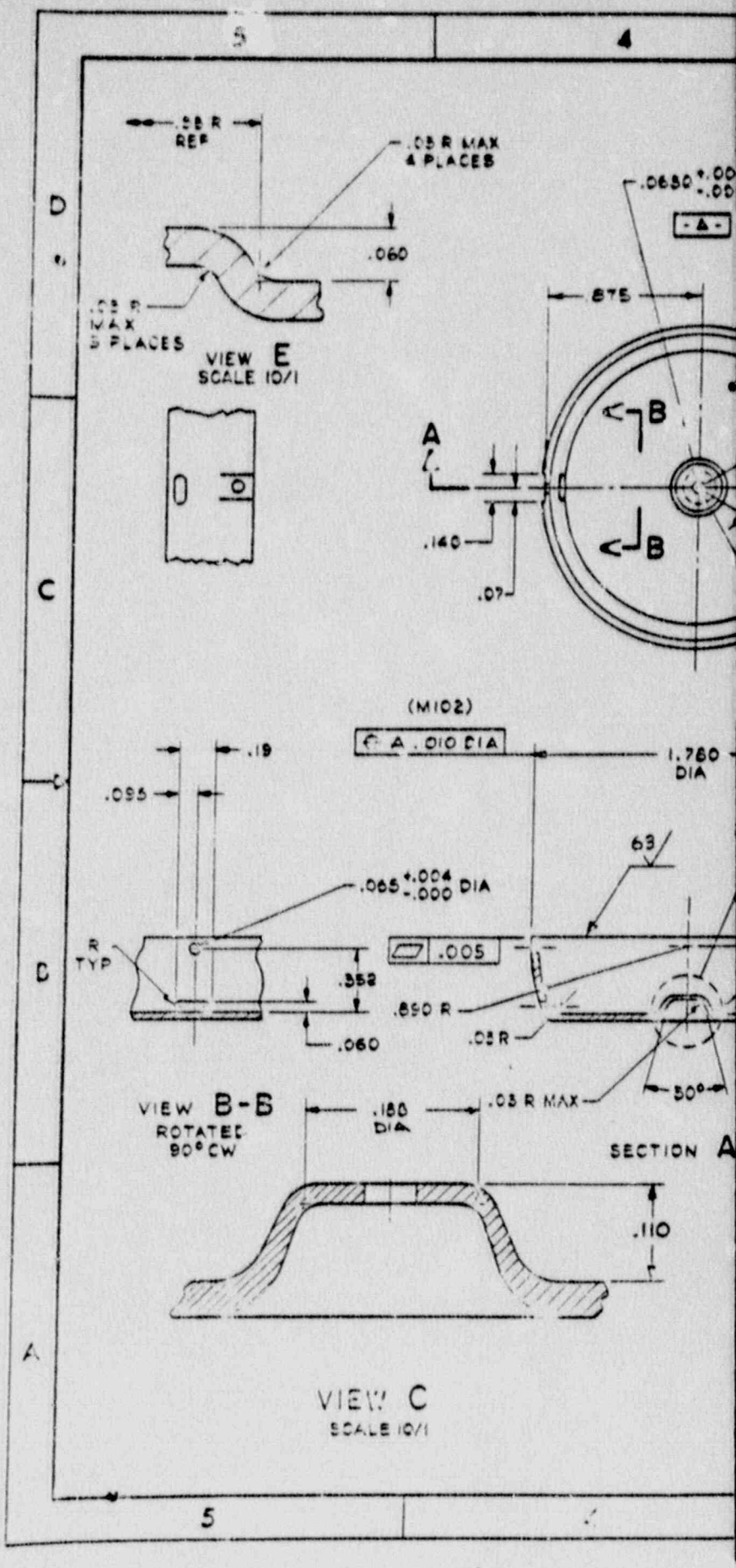
7. QUALITY ASSURANCE PROVISIONS.
THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
A SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105
B CLASSIFICATION OF CHARACTERISTICS:
CRITICAL: NONE
MAJOR: AQL 2.5%
MIC: 113
C ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTOR'S QUALITY OR INSPECTION SYSTEM

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

MATERIAL: PLASTIC MOLDING COMPOUND

DIAL

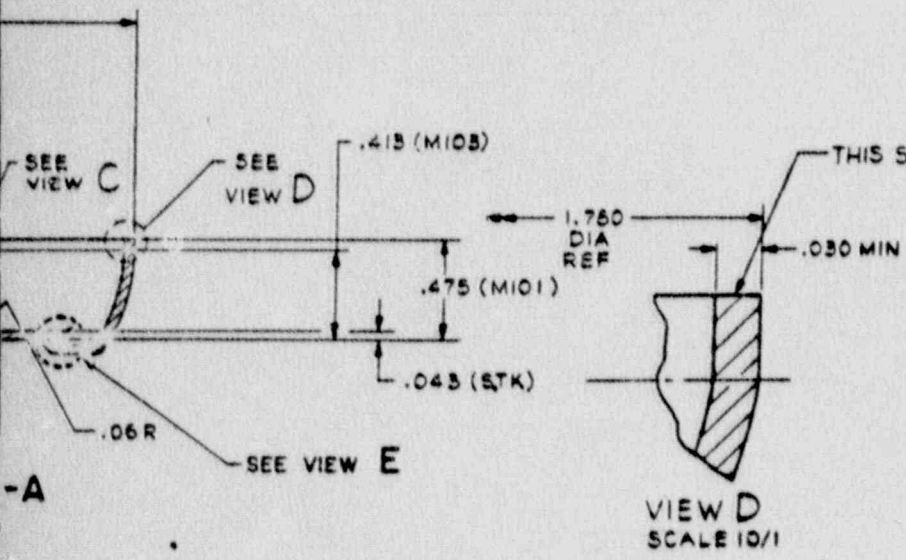
D | 97403 | 1321SE0755


.08 R REF
.03 R MAX 4 PLACES
.060
.03 R MAX 3 PLACES
VIEW E
SCALE 10/1
.875
.0630 +.000 -.001
-A-
B
A
.140
.07
(M102)
A .010 DIA
1.780 DIA
.19
.095
63
.065 +.004 -.000 DIA
.005
R TYP
.352
.060
.850 R
.03 R
.03 R MAX
30°
VIEW B-B
ROTATED 90° CW
.188 DIA
SECTION A
.110
VIEW C
SCALE 10/1

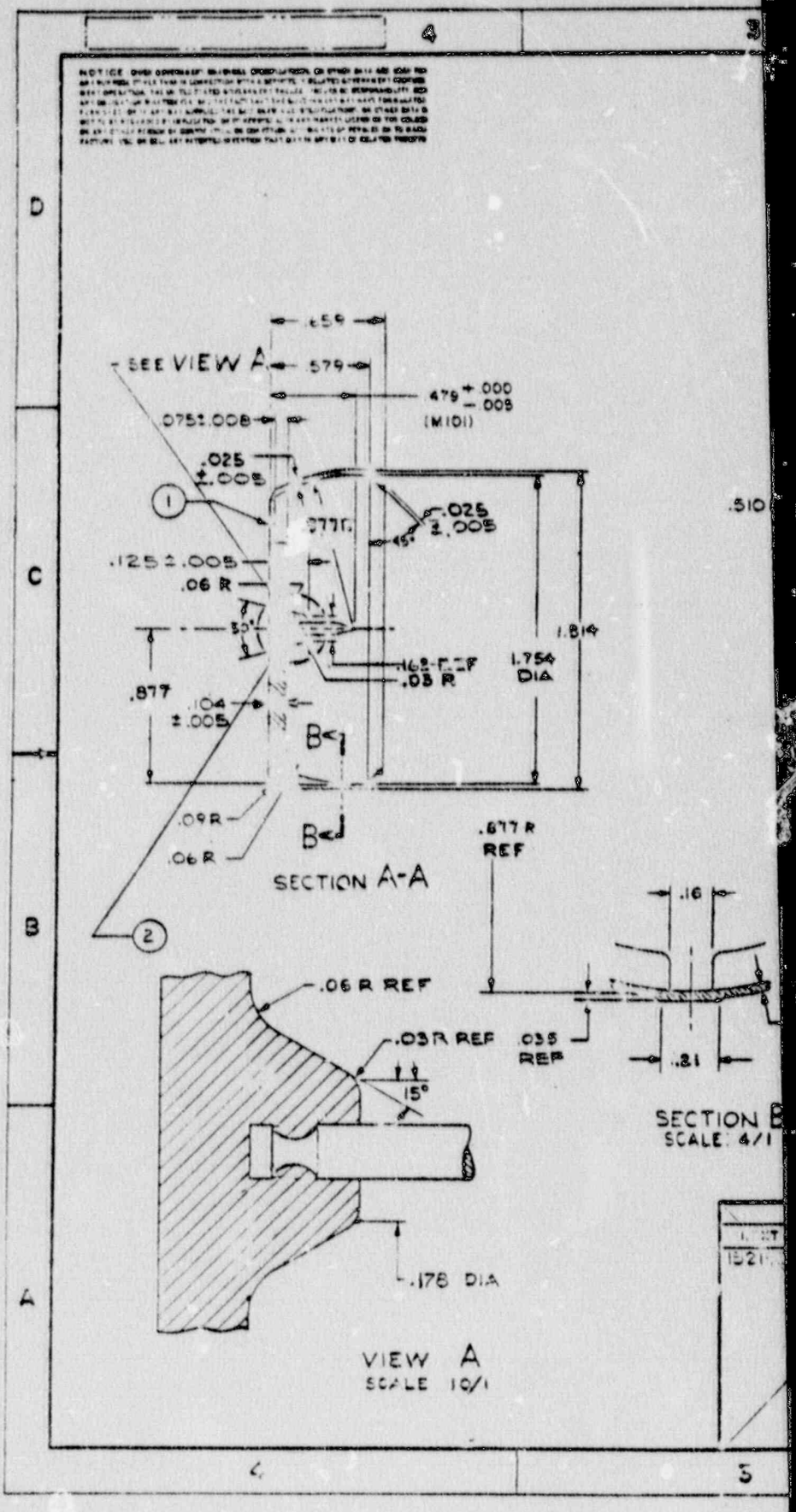
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE NOR	16 JUN 72	BOB
	B	SEE NOR.	[illegible]	[illegible]
	C	SEE NOR.	[illegible]	[illegible]
	D	SEE NOR.	16 JAN 79	[illegible]
	E	SEE ECP NO. 83HE0652	28 JUN 83	[illegible]
	F	SEE ECP NO. 87HE3720	[illegible]	[illegible]

NOTES:

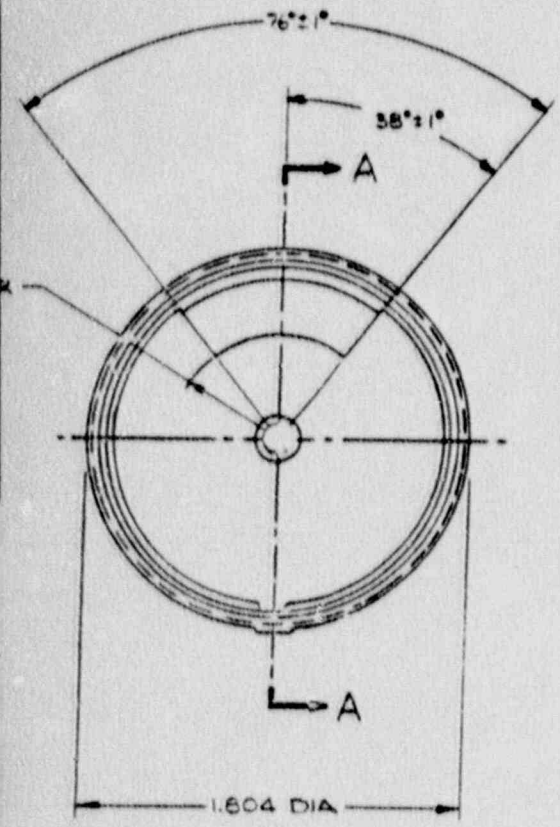
1. TREAT AND PAINT INSIDE SURFACES IN ACCORDANCE WITH MIL-T-704. ENAMEL SHALL CONFORM TO TT-E-529, CLASS A COMPOSITION G, COLOR 27875 PER FED STD 595.
2. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5%
      M101-103
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.
3. FOR INTERPRETATION OF:
   SURFACE TEXTURE, SEE ANS B46.1.



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES: ANGLES ±2°, 3 PLACE DECIMALS ±.005, 2 PLACE DECIMALS ±.01. DO NOT SCALE THIS DRAWING. SHARP EDGES .002 TO .005. FILLET RAD .025 TO .015. MATERIAL: ELECTROLYTIC COPPER, ASTM B152, NO 110	DRAWN (PDO) 30 SEP 70	U.S. ARMY MOBILITY EQUIPMENT COMMAND ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES, FORT BELVOIR, VA.	
	CHECKED [illegible] 30SEP70		
	QUALITY APPROVAL [illegible] QUALITY ENGINEER	SHELL, DAMPING	
	APPROVED FOR PRODUCTION [illegible] PRODUCTION ENGINEERING		
	RELEASED FOR PROCUREMENT CHIEF ENGINEERING DEPT	SIZE C / CODE IDENT NO 97403 / 13219E0757	
	DATE SEP 30 [illegible]	SCALE 2/1	SHEET 1 OF 1


4
3
D
C
B
A
SEE VIEW A
.559
.579
.479 +.000 -.003
(M101)
.075±.008
.025 ±.005
.025 ±.005
45°
.277
.510
.125±.005
.06 R
30°
1.814
1.754 DIA
.877
.104 ±.005
.09R
.06 R
B<1
B<1
SECTION A-A
.677 R REF
.16
.06 R REF
.03R REF
.035 REF
.81
15°
SECTION B
SCALE 4/1
.178 DIA
VIEW A
SCALE 10/1
2
4
3

REVISIONS				
STA	ZONE	DESCRIPTION	DATE	APPROVAL
	A	SEE NOR	[illegible]	[illegible]
	B	SEE NOR.	[illegible]	[illegible]
	C	SEE NOR	[illegible]	[illegible]
	D	SEE ECP NO. E2HE0652	[illegible]	[illegible]
	E	SEE ECP NO. E7HE3720	[illegible]	[illegible]



.025 REF

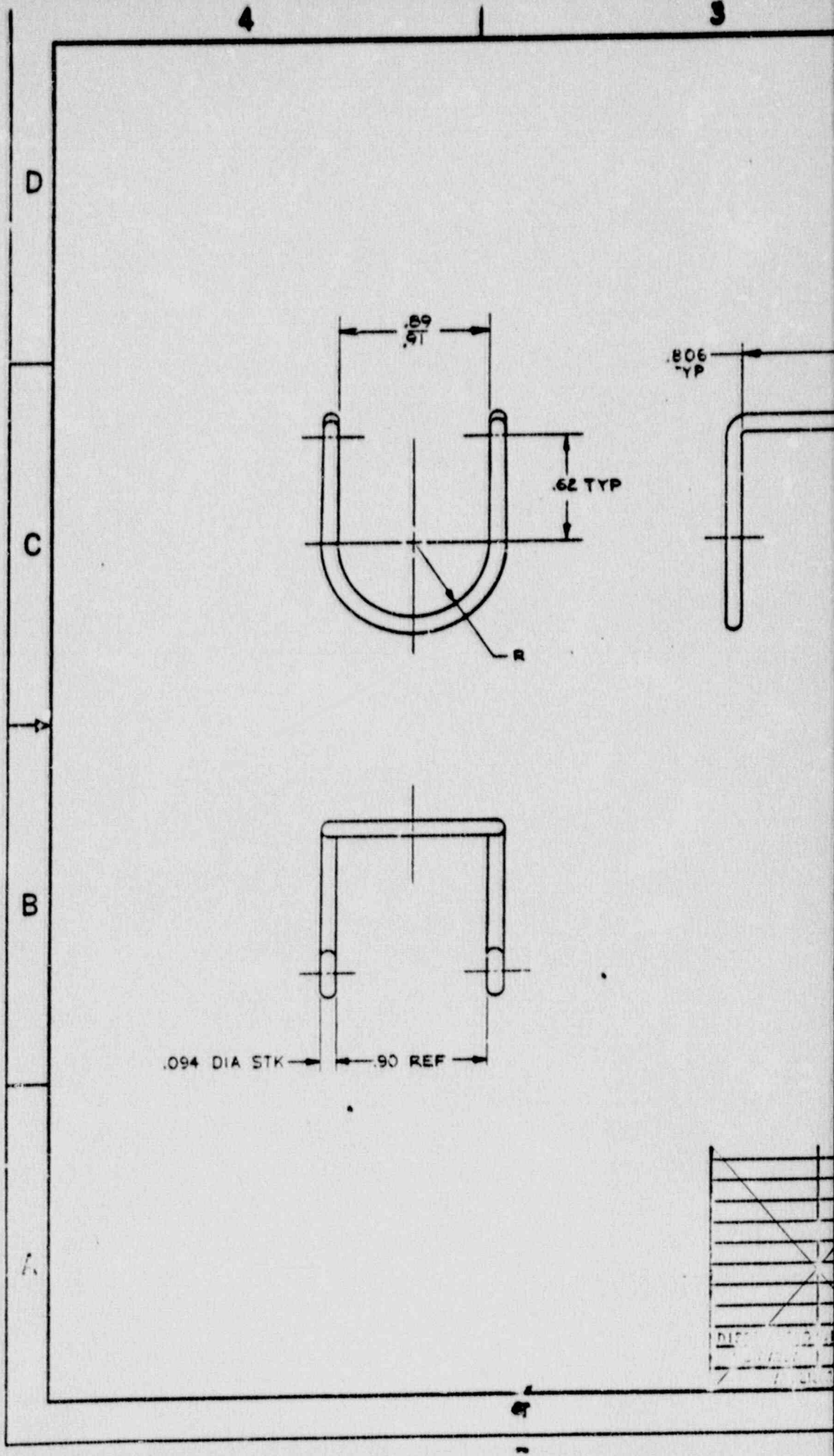
NOTES:

1. FOR INTERPRETATION OF:
   A. DIMENSIONING AND TOLERANCING, SEE ANS - Y14.5
   B. GOVERNMENT INSPECTION EQUIPMENT SHALL BE USED TO CHECK DIMENSIONS IDENTIFIED BY THE SYMBOL (T). SEE QUALITY ASSURANCE PAMPHLET AISD-FE-R7154.
3. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5%
      MINOR
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.
4. PIVOT, FIND NO. 2, MUST BE able TO WITHSTAND 50 GRAM MIN AXIAL PULL.

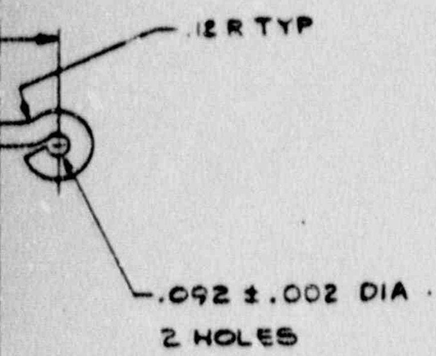
FIND NO.	CODE IDENT	PART NO.	QTY REQD	DESCRIPTION	SPECIFICATION	MATERIAL
2		8152008465D	1	PIVOT		
1			1	CUP, SEAL	MIL-R-7328	SUBSTITUTE GG TO DRAWING

LIST OF MATERIAL

APPLICATION	UNLESS OTHERWISE SPECIFIED	RECOMMENDED	ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES, CORPS OF ENGINEERS, FORT BELVOIR, VA.
	DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS .XX ±.02, .XXX ±.010; ANGLES ±0°30'. ENDS OF SHARP EDGES — TO —. ALL FILLETS — TO —. MATERIAL —		SEAL CUP ASSEMBLY
		SEP 30 1970	97403 — 13219E0756


4
3
D
C
B
A
.89
.61
.62 TYP
R
.806
TYP
.094 DIA STK
.90 REF

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE NOR.	[illegible]	[illegible]
	B	SEE NOR.	[illegible]	[illegible]
	C	SEE NOR.	1AUG77	FAB
	D	SEE ECP NO. 83HE0652	28JL83	P.P.B



NOTES:

1. FINISH IN ACCORDANCE WITH DWG B1B219E974D.
2. FOR INTERPRETATION OF: DIMENSIONING AND TOLERANCING, SEE ANS-Y14.5.

SI
APERTURE
CARD

Also Available On
Aperture Card

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS
DECIMALS ±.015 ±.04
ANGLES

MATERIAL:
BRASS WIRE
ASTM B134, ALLOY 260,
HALF HARD

DRAWN
CHECKED

APPROVED FOR QUANTITY PRODUCTION

CHIEF ENGINEER 19

LOOP, THUMB

SIZE C | CODE IDENT NO. 97403 | 13219E0701

SCALE 2/1

9002150284-12

[illegible] RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

TECHNICAL DATA PACKAGE LIST TL-MIL-C-10488 TOP ASSEMB
COMPASS MAGNETIC UNMOUNTED LENSATIC DIAL TRITIUM ACTVT
FEDERAL STOCK NUMBER 6605-151-9987

	FSCM	DOCUMENT IDENT NUMBER	EI REV	CUR REV	DOC DATE	NO SH	DOCUMENT NAME
	81346	ASTM-B103					PHOSPHOR BRONZE
	81346	ASTM-B134					BRASS WIRE
	81346	ASTM-B139					PHOSPHOR BRONZE
	81346	ASTM-B152					COPPER
	81346	ASTM-B159					PHOSPHOR BRZ WI
	81346	ASTM-B170					COP ALY DTE CA
	81346	ASTM-B196					COP-BERYLLIUM A
	81346	ASTM-B209					AL-ALT SHEET/PL
	81346	ASTM-B211					ALUMINUM-ALLOY
	81346	ASTM-D4066					NYL INJ/EXTRN
		• MAGNETIC MATERIALS PRODUCERS ASSOCIATION					
		MMPA-0100					MAGNET MATERIA
		• OTHER STANDARDS AND SPECIFICATIONS					
		CAMBRIDGE PRESS					CIE PROCEEDINGS
	06542	FED-STD-H28			- 31MAR78		SCREW-THREAD ST
		SUPPLEMENT 1			- 31MAR78		SCREW-THREAD ST
		CHNG NOTICE 1			- 28MAY86		SCREW-THREAD ST
		MAP-I-913					MAG HORIZ INTEN
		MAP-I-914					MAG VERT INTENS
		MAP-I-1283					MAG DECLINATION
		MAP-I-1379					MAG TOTAL INTEN

TOTALS FOR THIS LISTING
DWG & ASSOC LIST = 0041
GOVT SPEC & STD = 0038
IND SPEC & STD = 0018
OTHER SPEC & STD = 0006
OUTSTANDING CHG = 0000

SYMBOLS IN COLUMN DOC SY
A=ALTERED ITEM DWG L=S
C=SPEC CONTROL DWG M=M
E=INSP EQPT DWG S=S
F=INTFC CONT DWG W=W
I=GAGE DATA ON DWG O=S
P=C

INDICATES DATA NOT AVAILABLE
• INDICATES DOCUMENTS NOT SUPPLIED WITH TECHNICAL DATA PACKAGE

CMPTR REQUEST NO 7ME3605
PCN D39MEF00446

V DRAWING TA13208E4680

TL REV AE CHG NO 0000
CMPTR RUN DATE 18 AUG 87
PAGE 4

DOC R S OUTSTANDING CHANGES
SYM C ECP NUMBER REV CHG DATE DESCR OF CHG DISPN

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M SYMBOLS IN COLUMN R (RIGHTS)
EL ITEM DWG L=LIMITED RIGHTS U=UNLIMITED RIGHTS
ULTI-USE DWG SYMBOLS IN COLUMN SC (SECURITY CLASSIFICATION)
OURCE CONT DWG C=CONFIDENTIAL S=SECRET
OD WORK ORDER U=UNCLASSIFIED T=TOP SECRET
GAP DATA ON DWG
AMOUFLAGE PATTERN PAINT
AND MAY BE OBTAINED THRU THE AGENCY INDICATED BY THE FSCM

BELVOIR RESEARCH, DEVELOPMENT AND ENGINEERING CEN

PARTS LIST FOR PL13208E4680 REV L DOC DAT 29 AUG

COMPASS MAGNETIC UNMOUNTED LENSATIC DIAL TRITIUM

FIND NO	FSCM	PART OR IDENTIFYING NO OR SPECIFICATION NO	GFP OPT
	97403	D13208E4680	
1	97403	B13219E0753	
2	97403	B13208E4694	
3	97403	B13208E4701	
4	97403	D13219E0750	
5	97403	C13219E0751	
6	97403	D13219E0752	
7	97403	C13208E4698	
8	97403	B13208E4699	
9	97403	B13219E0780	
10	81349	MIL-P-10971	
12	97403	B13208E4705	
13	97403	C13219E0781	
14	96906	MS35198-12	
14	96906	MS21959-138	OPT
16	96906	MS15795-902	
17	97403	B13208E4697	
18	81349	MIL-S-8660	
19	97403	B13219E0786	
20	81349	MIL-C-43307	

SYMBOLS IN COLUMN DOC SYM

A=ALTERED ITEM DWG
C=SPEC CONTROL DWG
E=INSP EQPT DWG
F=INTFC CONT DWG
I=GAGE DATA ON DWG
L=SEL ITEM DWG
M=MULTI-USE DWG
Q=SQAP DATA ON DWG
S=SOURCE
W=ADD WO

\# INDICATES DATA NOT AVAILABLE

* INDICATES THE REQUIRED DATA APPEARS ON THE NEXT LIN

CMPTR REQUEST NO 0CE0639
PCN 038KEF00846

DOC SYM R SC FSCM
U U 97403

CMPTR RUN DATE 11/03/88
PAGE 001 OF 001

QTY	NAME/ DESCRIPTION OR NOTE	DOC SYM	R	S C
REF	COMPASS MAGNETIC		U	U
001	CAPSULE ASSEMBLY		U	U
001	BEZEL ASSEMBLY		U	U
001	LENS-BRACKET ASSY		U	U
001	CASE		U	U
001	BOTTOM CASE		U	U
001	COVER		U	U
001	SPRING-BEZEL DETENT		U	U
002	WASHER SPRING		U	U
001	PLUNGER NEEDLE LFT		U	U
001	PIN SLOTTED BERYLLIUM-COPPER ALY .094 NOM SZ X 1.355 TO 1.395 L			
001	PIN HINGE LENS BRKT		U	U
001	LOOP THUMB		U	U
004	SCREW MACHINE-FLAT COUNTERSUNK HEAD, 82 DEG, CROSS-RECESSED, BRASS, BLACK CHEMICAL FINISH, UNC-2A .112-40 X .250 L			
004	SCREW MACHINE-FLAT COUNTERSUNK HEAD, 82 DEGREE, CROSS-RECESSED, CORROSION RESISTING STEEL, UNC-2A .112-40 X 1/4 L BLK OXD CTD			
AR	WASHER FLAT-METAL, ROUND GENERAL PURPOSE .094 ID .250 OD X .020 THKNS BRS BLK OXD			
01	SPRING BEZEL RTNG		U	U
AR	SILICONE COMPOUND			
01	LOOP LANYARD		U	U
01	CORD OLIVE DRAB 3/32 DIA X 60 PLUS OR MINUS 2 L			

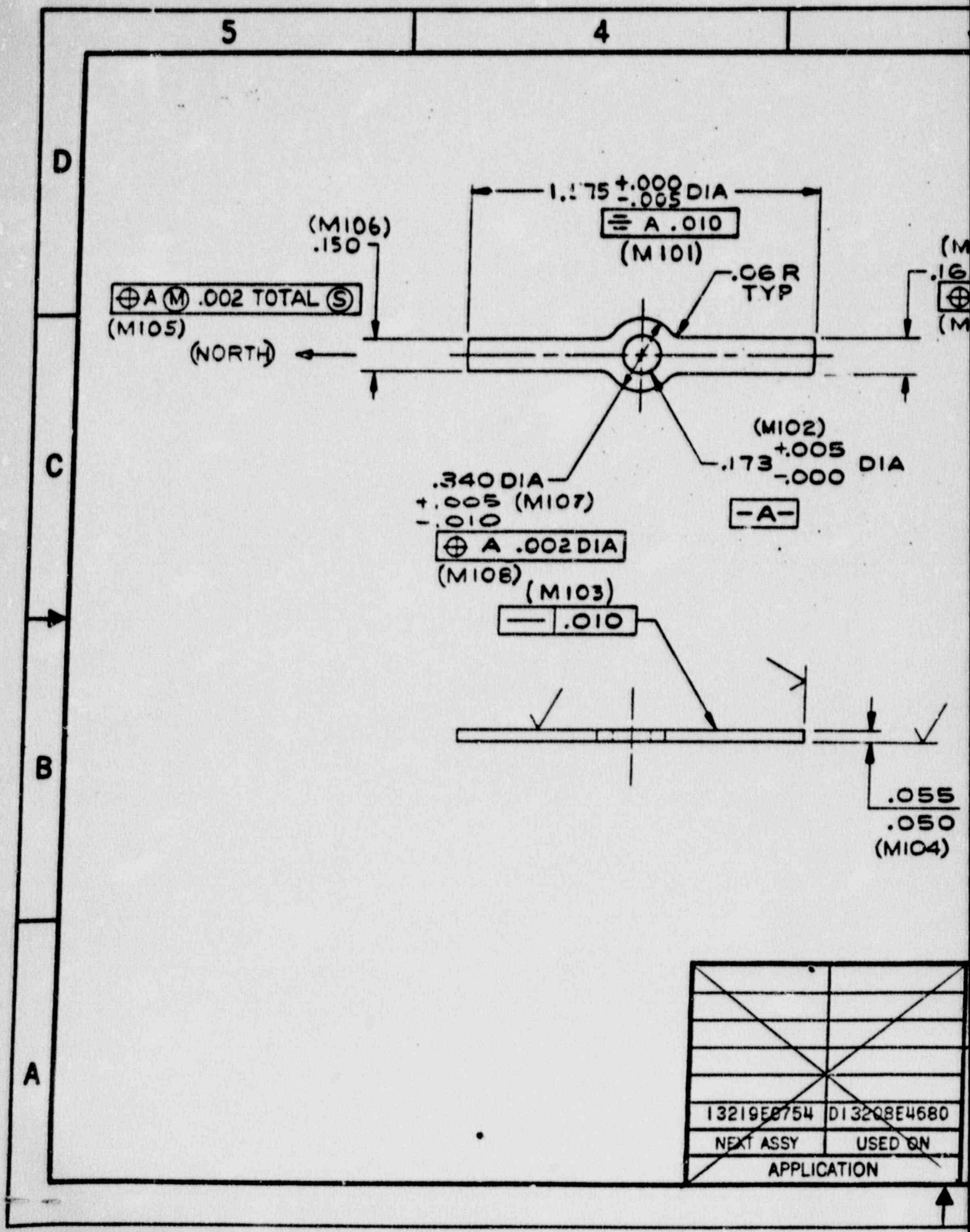
SI
APERTURE
CARD

Also Available On
Aperture Card

SYMBOLS IN COLUMN R (RIGHTS)
L=LIMITED RIGHTS U=UNLIMITED RIGHTS
SYMBOLS IN COLUMN SC (SECURITY CLASSIFICATION)
C=CONFIDENTIAL S=SECRET
U=UNCLASSIFIED T=TOP SECRET

CONT DWG
RK ORDER

THAT BEGINS WITH THE SYMBOL 8


5
4
D
C
B
A
1.175 +.000 -.005 DIA
A .010
(M101)
(M106)
.150
A M .002 TOTAL S
(M105)
(NORTH)
.06 R
TYP
(M102)
.173 +.005 -.000 DIA
-A-
.340 DIA
+.005 (M107)
-.010
A .002 DIA
(M108)
(M103)
.010
.055
.050
(M104)
13219E8754
D13208E4680
NEXT ASSY
USED ON
APPLICATION

3	2	1

109)

5

A (M) .002 TOTAL (S)

110)

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	B	SEE ENGRG REV NOTICE	4FEB66	H R
	C	SEE ENGRG REV NOTICE	21 MAR 66	J J D
	D	SEE ENGRG REV NOTICE	23JUN67	9th 269
	E	SEE NOR	27 MAR 68	BOB
	F	SEE NOR.	30SEP70	BOB
	G	SEE NOR	14AUG72	BOB
	H	SEE NOR	15JUN73	BOB
	J	SEE NOR.	8FEB74	BOB
	K	SEE ECP NO. 83HE0652	28JUL83	R R B
	L	SEE ECP NO. 87HE3720	5AUG87	M. H. B.

NOTES:

1. BREAK SHARP EDGES .005 TO .010.
2. FOR INTERPRETATION OF:
   DIMENSIONING AND TOLERANCING, SEE ANS-Y14.5
   SURFACE TEXTURE, SEE ANS B46.1.
3. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5%
      MIOI-110
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.
4. SURFACES MARKED √ TO HAVE 125 √ FINISH.
5. MATERIAL: MAGNET, PERMANENT, CAST SINTERED, ALNICO 5 (MIPA STD NO.0100)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS:— DECIMALS: ±.005, ±.01 ANGLES: —	DRAWN LRS	19 JUN 65	U.S. ARMY MOBILITY COMMAND MOBILITY EQUIPMENT CENTER ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES, FORT BELVOIR, VA.
	CHECKED		
MATERIAL: SEE NOTE.5	Harold E. Ream COMMODITY ENGINEER		MAGNET
	APPROVED FOR QUALITY		
	25 AUG 1965	SCALE 2/1	SIZE D — CODE IDENT NO. 97403 — 13208E4686 — SHEET 1 OF 1

9002150284-15

REV. 17 AUG. 1964

4 3

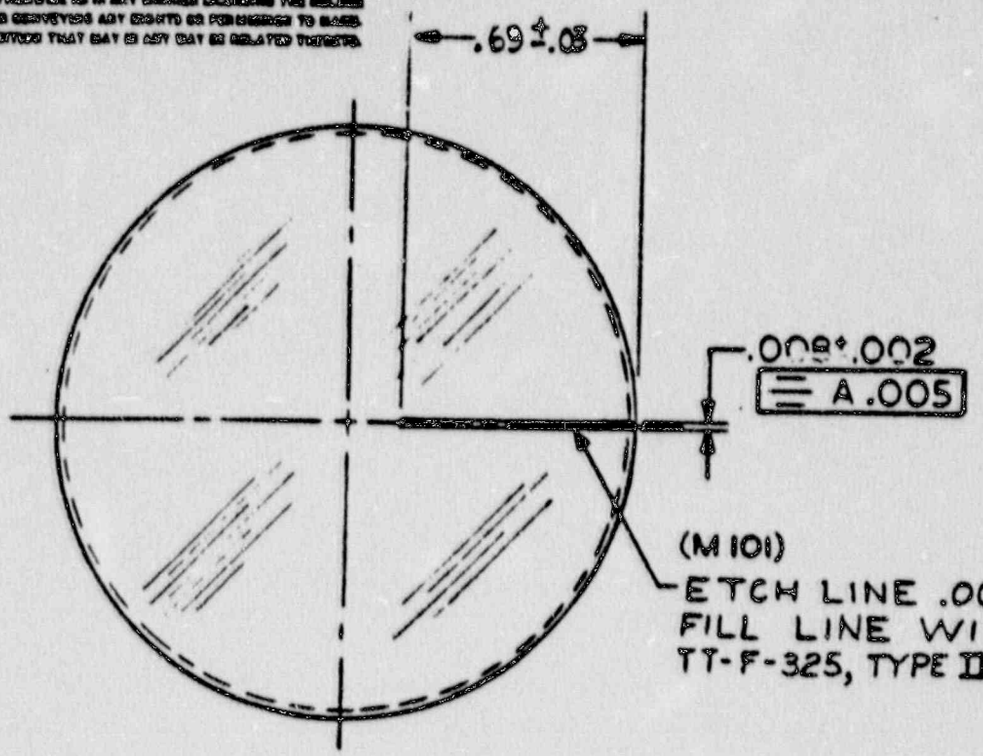
NOTICE: WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY, NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

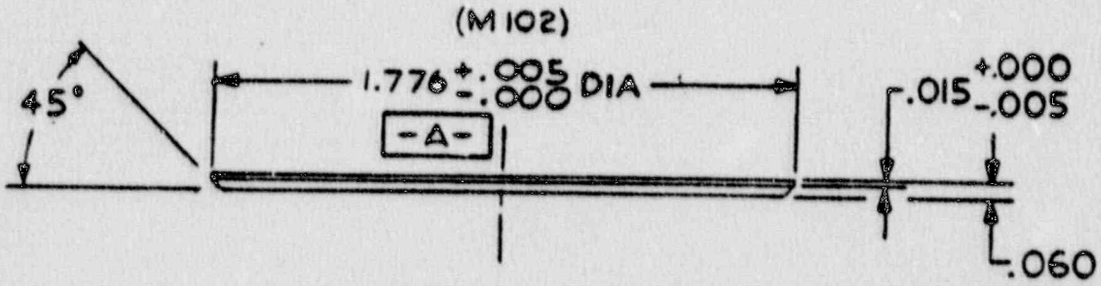
D

C

B

A





APPLICATION	
NEXT ASSY	USED ON
13219E0753	D1320EE4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS — DECIMALS ±.005 ANGLES ±0°30'

BREAK SHARP EDGES TO
ALL FILLETS TO

MATERIAL

GLASS
DD-G-451
TYPE I, CLASS I
QUALITY q1

REC
SUB
REV
DRAW
6-
APPR
CONT

4 3

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A		SEE ENGRG REV NOTICE	4FEB68	H.R.
B		SEE ENGRG REV NOTICE	23JUN67	[illegible]
C		SEE NOR.	17JAN69	[illegible]
D		SEE NOR.	30SEPTO	BOB
E		SEE NOR	14AUG72	BOB
F		SEE NOR.	8FEB74	BOB
G		SEE NOR.	11AUG77	EJH
H		SEE ECP NO. 87HE3720	5AUG87	[illegible]

NOTES:

1. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5%
      MIOI-102
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.

IO DEEP
LER PER
OLOR BLK

OMMENDED:
[illegible]

ITTED:
[illegible]

EWED FOR PRODUCTION
[illegible]

N BY	TRACED BY	CHECKED BY
		W.H.C.
-62		11-8-62

VED [illegible]

RACTOR

U.S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

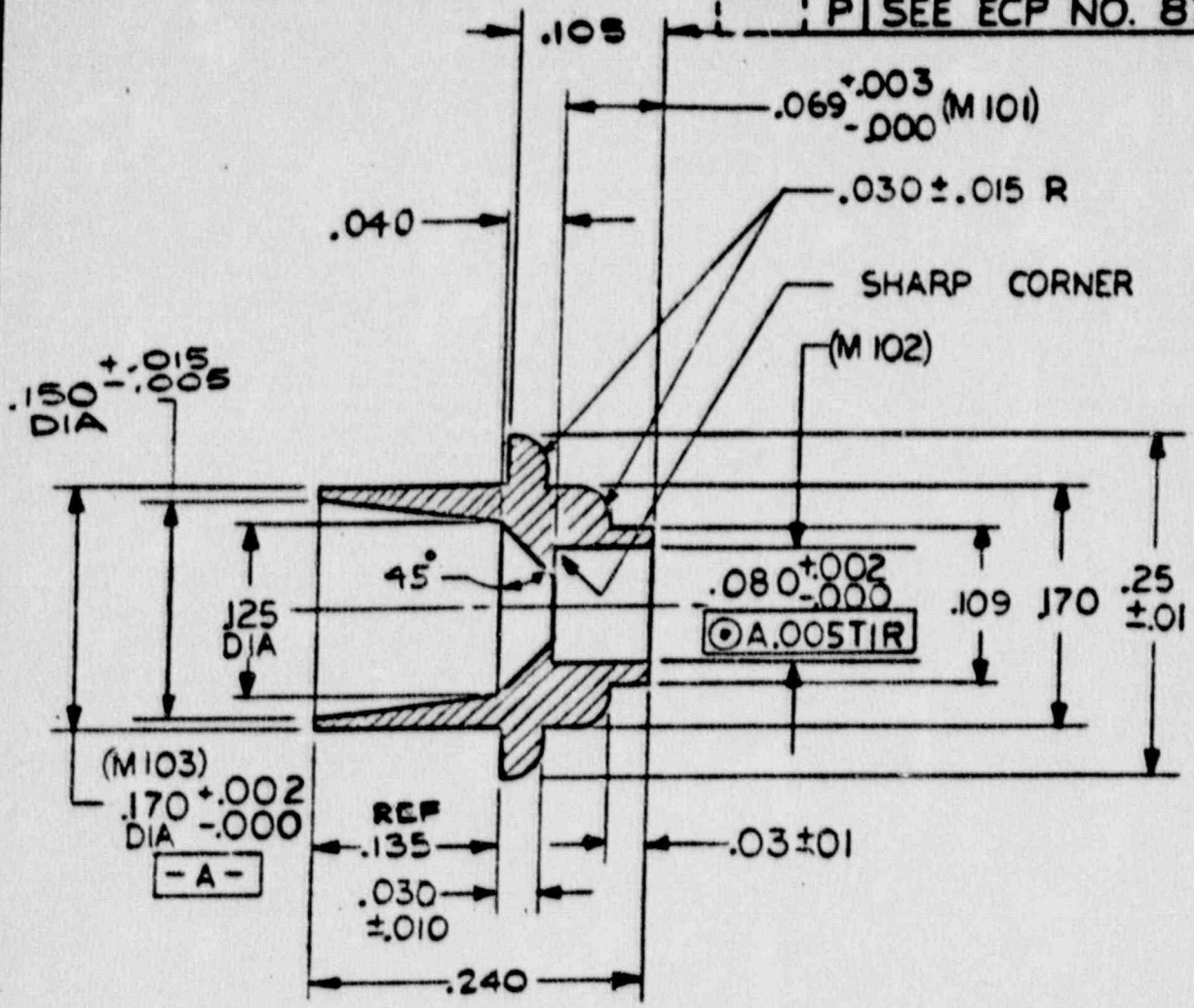
CRYSTAL, CAPSULE

CODE IDENT. NO.	SIZE	
97403	E	13208E4687

SCALE: 2/1

SHEET 1 OF 1

REVISIONS		
ZONE	LTR	DESCRIPTION
	P	SEE ECP NO. 87HE3720



13219E0754	D1320BE4680
NEXT ASSY	USED ON
APPLICATION	

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	2	1

DATE	APPROVED
5AUG67	W.B.L.

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	C	SEE ENGRG REV NOTICE	4 FEB66	N.R.
	D	SEE ENGRG REV NOTICE	31MAR66	J.J.D.
	E	SEE ENGRG REV NOTICE	30JUN66	[illegible]
	F	SEE ENGRG REV NOTICE	23JUN67	[illegible]
	G	SEE NOR	27 MAR 68	BOB
	H	SEE NOR.	30SEP70	BOB
	J	SEE NOR	4 AUG 72	BOB
	K	SEE NOR.	8 FEB 74	BOB
	L	SEE NOR.	11AUG77	EFB
	M	SEE NOR.	16 JAN 79	EFB.
	N	SEE ECP NO. 83HE0652	28 JUL 83	RPB

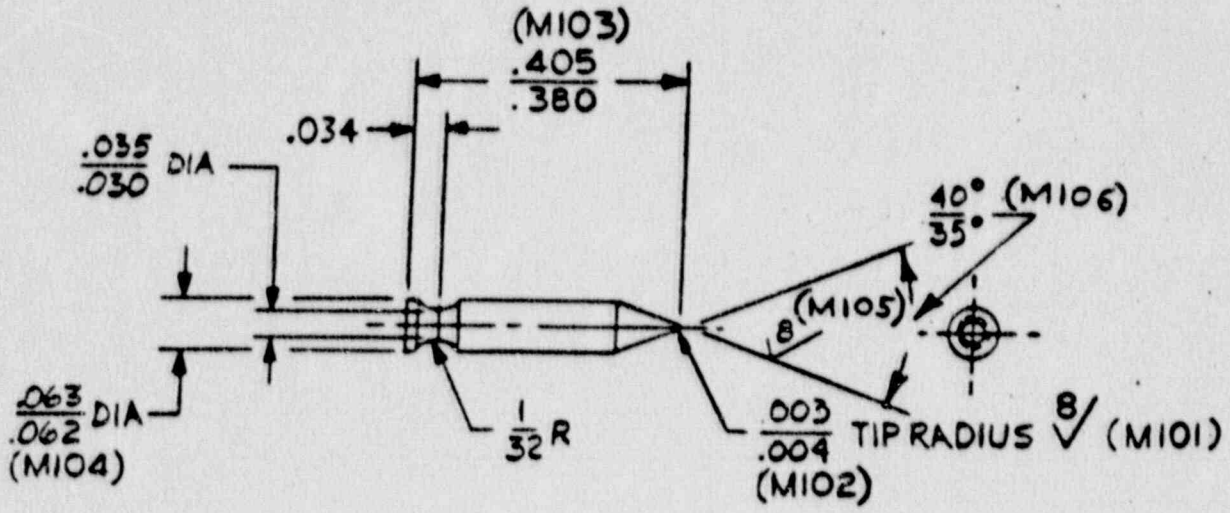
NOTES:

1. FINISH 63 ALL OVER.
2. BREAK SHARP EDGES .005 TO .010.
3. FOR INTERPRETATION OF:
   DIMENSIONING AND TOLERANCING, SEE ANS-Y14.5.
   SURFACE TEXTURE, SEE ANS B46.1.
4. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5%
      MIOI-103
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTOR'S QUALITY OR INSPECTION SYSTEM.
5. UNLESS OTHERWISE SPECIFIED, ALL FILLET RADII TO BE .005 TO .010R.

9002150284-7

ESS OTHERWISE SPECIFIED ENSIONS ARE IN INCHES ERANCES ON TIONS: — MALS: ±.005, LES: ±0°30'	DRAWN 23JUN65	U. S. ARMY MOBILITY COMMAND MOBILITY EQUIPMENT CENTER ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES, FORT BELVOIR, VA.
	CHECKED	
ERIAL: AL ALY ASTM B211 2011-T[illegible] ALTERNATE MATL ASTM B85 ALLOY A 4130	Harold E. Ramer COMMODITY ENGINEER 23 Jun 65 APPROVED FOR QUANTITY PRODUCTION CHIEF, ENGINEERING DEPT. 19	MOUNT, JEWEL
	25 AUG 1965	SIZE D · CODE IDENT NO. 97403 · 13208E4688
		SCALE 8/1 · SHEET 1 OF 1

REV. 17 AUG. 1964



NOTES: (CONTINUED)

4. FOR INTERPRETATION OF:
SURFACE TEXTURE, SEE ANS B46.1.

APPLICATION	
NEXT ASSY	USED ON
13219E0756	D13208E4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES —

BREAK SHARP EDGES TO
ALL FILLETS TO

MATERIAL

PHOSPHOR BRONZE
ASTM B139
COP. ALY NO. 510, TEM-SPRING

REC
SUB
REV
DRA
APPR
CHK
CON

	2	1	

REVISIONS

SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A	C-2	ADDED QUALITY ASSURANCE DATA		
	C-4	DIM .405/.300 WAS .415/.411	4FEB66	J. . D.
B		SEE ENGRG REV NOTICE	31MAR66	J J D
C		SEE NOR.	17JAN69	JJD
D		SEE NOR.	30SEP70	BOB
E		SEE NOR.	8FEB74	BOB
F		SEE ECP NO. 87HE3720	5AUG87	L.L.G.

SI APERTURE CARD

Also Available On Aperture Card

NOTES:

~~1. GOVERNMENT INSPECTION EQUIPMENT SHALL BE USED TO CHECK DIMENSIONS IDENTIFIED BY THE SYMBOL (G) SEE QUALITY ASSURANCE PAMPHLET AMSMO-FD-7715X26~~

2. QUALITY ASSURANCE PROVISIONS:
THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
   CRITICAL: NONE
   MAJOR - AQL 2.5%
   M101-106
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.

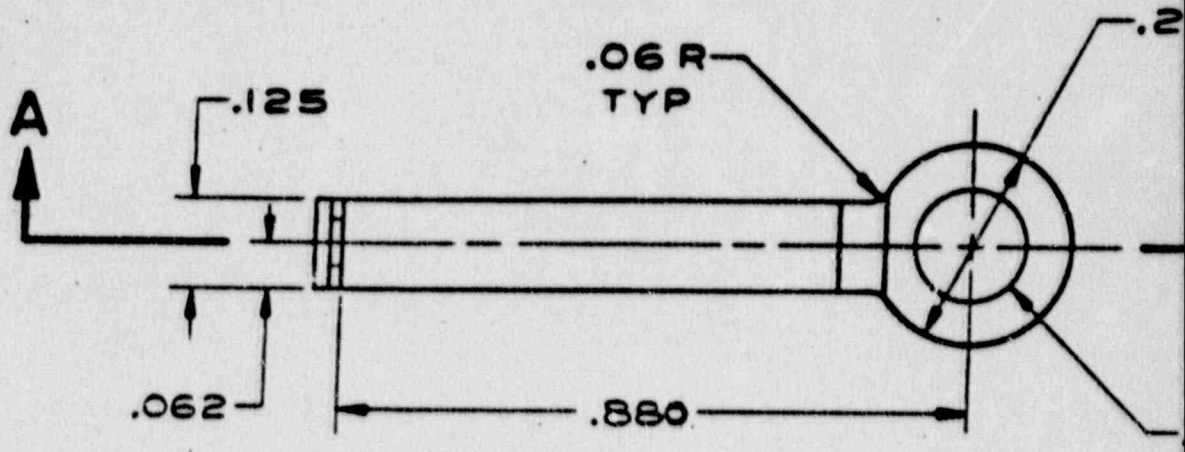
3. OPTIONAL MATERIAL: CRES, ASTM A478, TYPE 302, CD.

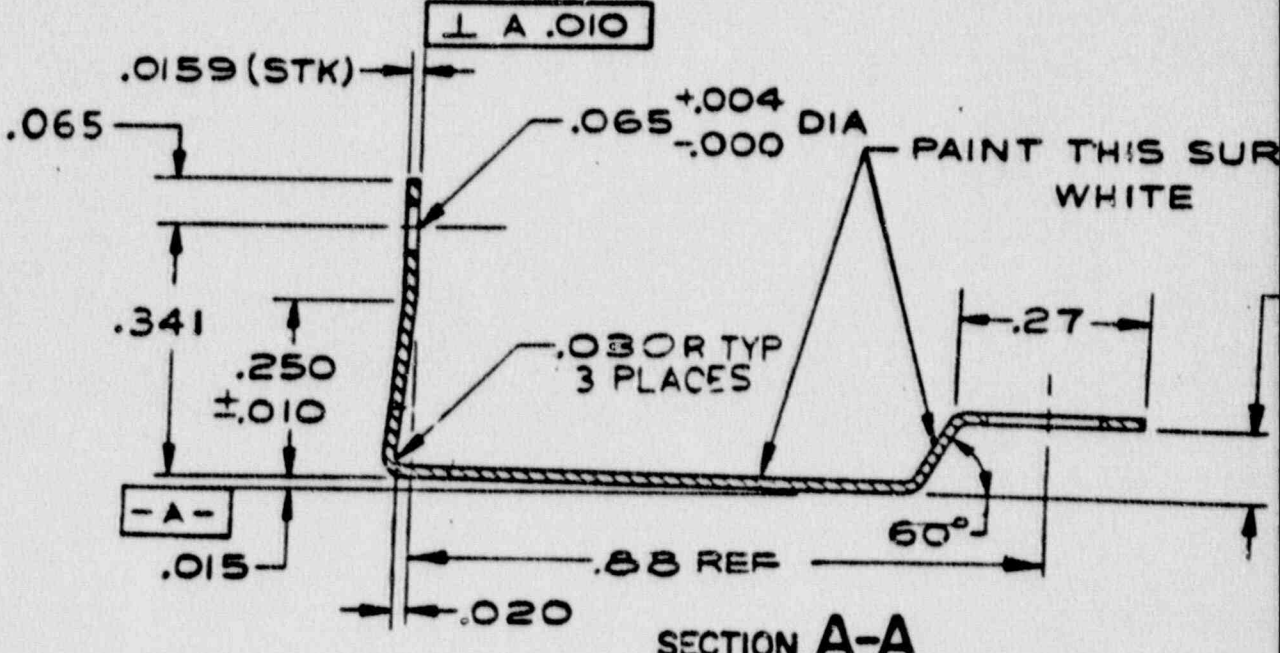
D C B A

RECOMMENDED: Harold E. Ream	U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES CORPS OF ENGINEERS FORT BELVOIR, VA.
SUBMITTED: R. W. Davis	
REVIEWED FOR PRODUCTION H. Gi...	PIVOT
DRAWN BY / TRACED BY / CHECKED BY W.H.C.	9002150284-18
10-31-62 / 11-5-62	
APPROVED: 29 Nov 62	CODE IDENT. NO. 97403 / SIZE B / 13208E4690
CONTRACTOR:	SCALE: 4/1 / SHEET 1 OF 1

2	1

REVISIONS		
ZONE	LTR	DESCRIPTION
	L	SEE ECP NO. 87HE372





SECTION A-A

13219E8782	D13288E468
NEXT ASSY	USED ON
APPLICATION	

3	2	1

	DATE	APPROVED
O	9AUG67	E.W.B.

8 DIA

A

156 DIA

FACE

.10 +.01 -.00

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE ENGRG REV NOTICE	4FEB66	W.K.
B-5 C-4	B	ADDED DATUM B. ⊥ B WAS ⊥ A	31MAR 66	J.J.D.
	C	SEE ENGRG REV NOTICE	30JUN 66	
	D	SEE NOR.	17JAN 69	
	E	SEE NOR.	30SEP70	BOB
	F	SEE NOR	14AUG72	BOB
	G	SEE NOR	15JUN73	BOB
	H	SEE NOR.	8FEB74	BOB
	J	SEE NOR.	16JAN79	E.F.C.
	K	SEE ECP NO. 83HE0652	28JUL83	R.C.B.

2. ALTERNATE MATERIAL SHALL BE USED ONLY UPON SPECIFIC APPROVAL OF THE CONTRACTING OFFICER.

3. LIFTER SHALL BE VAPOR DEGREASED, SHALL BE TREATED WITH A PHOSPHORIC ACID CONDITIONER, AND SHALL BE PAINTED AS INDICATED USING ENAMEL CONFORMING TO TT-E-529, CLASS A COMPOSITION G, COLOR NO. 27875.

4. MATERIAL: COPPER-BERYLLIUM, ASTM B194, CONDITION 1/2 H. ALLOY 170 OR 172. ALTERNATE MATERIAL: PHOSPHOR BRONZE, ASTM B103, ALLOY NO. 510, SPRING TEMPER,

5. BREAK SHARP EDGES .002 TO .004.

6. FOR INTERPRETATION OF:
DIMENSIONING AND TOLERANCING, SEE ANS Y-14.5.

~~7. GOVERNMENT INSPECTION EQUIPMENT SHALL BE USED TO CHECK DIMENSIONS INDICATED BY THE SYMBOL (I). SEE QUALITY ASSURANCE PAMPHLET, [illegible] FSC PSIT-126.~~

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS:
DECIMALS: ±.005, ±.01
ANGLES: ±2°

MATERIAL:

SEE NOTE 4

DRAWN: LRS 19JUN65
CHECKED:

Harold E. Rian
COMMODITY ENGINEER 25 Aug 19[illegible]
APPROVED FOR QUANTITY PRODUCTION
CHIEF, ENGINEERING DEPT. 19
25 AUG 1965

U. S. ARMY MOBILITY COMMAND
MOBILITY EQUIPMENT CENTER
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES, FORT BELVOIR, VA.

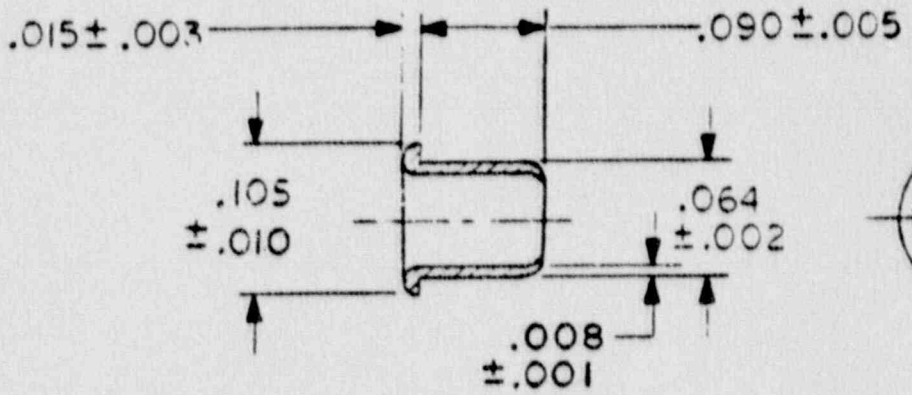
LIFTER, NEEDLE

SIZE	CODE IDENT NO.	
B	97403	13208E4691

SCALE 4/1 SHEET 1 OF 1

REV. 17 AUG. 1964

SUGGESTED SOURCES OF SUPPLY	
VENDOR PART NO.	VENDOR
A-261	STIMPSON, EDWIN B., CO. INC. 900 SYLVAN AVE. BAYPORT, N.Y. 11705 CODE IDENT 57771



APPLICATION	
NEXT ASSY	USED ON
13219E0782	D13208E4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
— — —

BREAK SHARP EDGES — TO —
ALL FILLETS — TO —

MATERIAL

COPPER SHEET
ASTM B152
ALLOY NO. 110

2	1

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A		SEE ENGRG RFV NOTICE	25 Aug 69	N. R.
B		SEE NOR.	30SEP70	BOB
C		SEE NOR.	8FEB74	BOB
D		SEE NOR.	11AUG77	EZE.

SPECIFICATION CONTROL DRAWING

RECOMMENDED Harold E. Ream

SUBMITTED: W W Davis

REVIEWED FOR PRODUCTION H. H. Grimmyer

DRAWN BY	TRACED BY	CHECKED BY
WI 5-31-62		

APPROVED: 5 NOV 1962

CHIEF - ENGR DIV - DEPT

CONTRACTOR:

U. S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

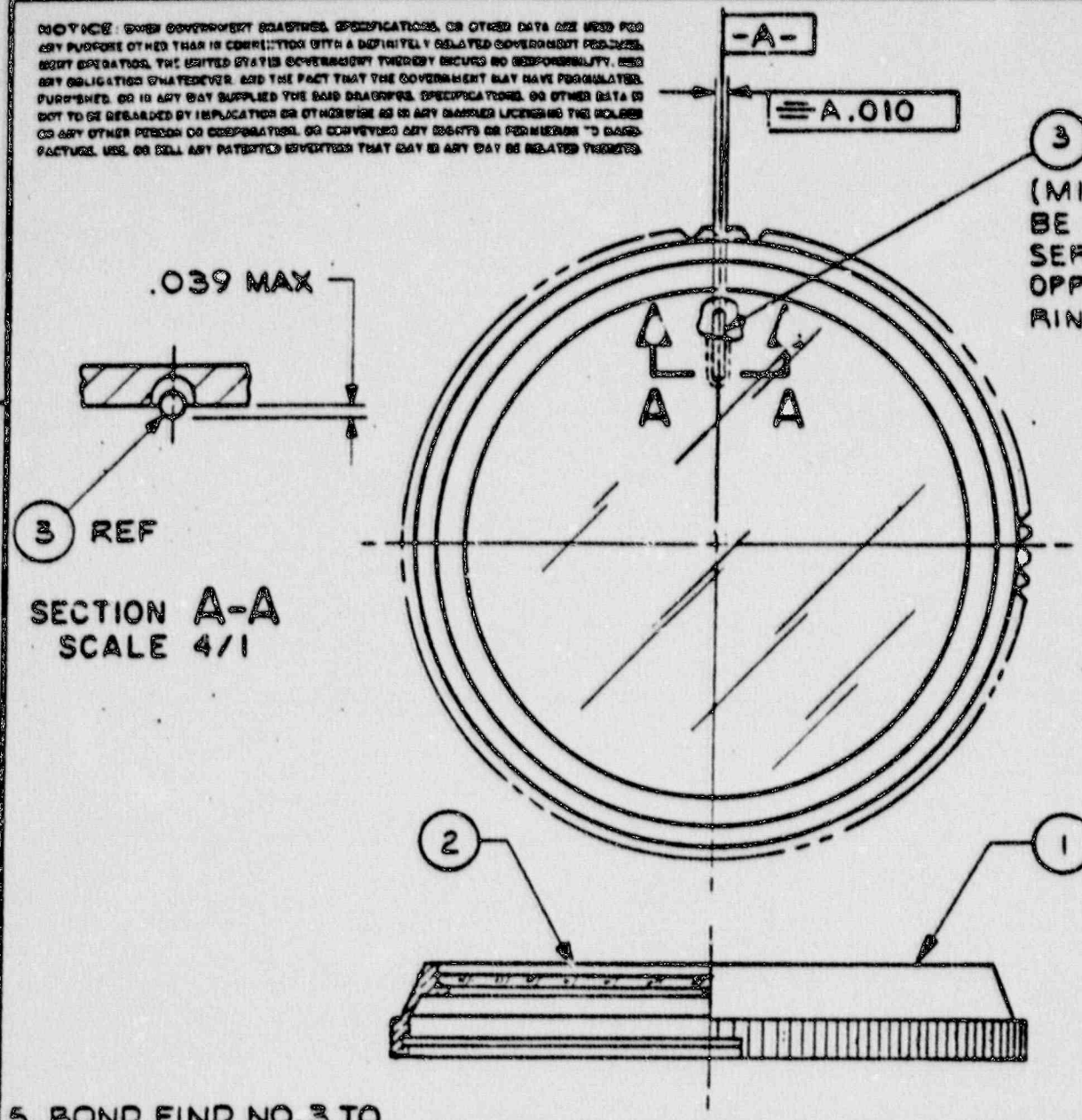
EYELET, FLANGED

9002150284-20

CODE IDENT NO	SIZE	
97403	B	13208E4693

SCALE: 10/1 SHEET 1 OF 1

2	1	



SECTION A-A
SCALE 4/1

5. BOND FIND NO. 3 TO FIND NO. 2 USING ADHESIVE-SEALANT, FIND NO. 4, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. AFTER ASSEMBLY, EXPOSED SURFACES OF FIND NO. 2 AND 3 SHALL BE FREE OF ADHESIVE.

APPLICATION	
NEXT ASSY	USED ON
D1320BE4680	D1320BE4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES

BREAK SHARP EDGES TO
ALL FILLETS TO

MATERIAL

2	1

REVISIONS

SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A	C-2	ADDED NOTE 1	12 NOV 66	H.R.
B	B-4 C-2	ADDED QUALITY ASSURANCE DATA, ITEM 3 DELETED	4 FEB 66	J.J.D.
C		SEE ENGRG REV NOTICE	31 MAR 66	J.J.D.
D		SEE ENGRG REV NOTICE	23 JUNE 67	JJD JJD
E		SEE NOR.	17 JAN 68	JJD
F		SEE NOR.	30 SEP 70	BOB
G		SEE NOR	14 AUG 72	BOB
H		SEE NOR.	8 FEB 74	BOB
J		SEE ECP NO. 83HE0652	28 JUL 83	R.R.B.
K		SEE ECP NO. 87HE3720	5 AUG 87	[illegible]

3 TO
H
BEZEL
NING
SHOWN.

NOTES:

1. BOND ITEM 1 TO ITEM 2 USING ADHESIVE PER MIL-S-11031.
2. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR-AQL 2.5%
      MIOI
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.
3. FOR INTERPRETATION OF:
   DIMENSIONING AND TOLERANCING SEE ANS-Y14.5.
4. IMMEDIATELY PRIOR TO FINAL ASSEMBLY, THE INTERNAL DIAMETER OF THE BEZEL RING (METAL ONLY) SHALL BE COATED WITH SILICONE COMPOUND PER MIL-S-8660, APPLIED WITH A COTTON SWAB. CARE SHALL BE TAKEN TO SEE THAT GREASE IS NOT SQUEEZED OUT ONTO THE BEZEL CRYSTAL.

E

On
d

COMMENDED:
Harold E. Ream

PROVED:
Walter W. Davis

VIEWED FOR PRODUCTION
[illegible]

DRAWN BY	TRACED BY	CHECKED BY
		W.M.C.
1-62		11-5-62

REQ'D: 14 Nov 1962
[illegible]
CONTRACTOR

U.S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

BEZEL ASSEMBLY

9002150284 21

CODE IDENT. NO.	SIZE	
97403	B	13208E4694

SCALE: 2/1 | SHEET 1 OF 1

2	1	

UNITED STATES ARMY
MOBILITY EQUIPMENT COMMAND

PARTS LIST FOR:	REV	DOC DATE	DOC SYM	FSCM	NEXT HIGHER ASSY NO	END ITEM DOC	COMPT RUN DATE
PL13208E4694	6	22AUG72		97403	13208E4680	DL13208E4680	REQUEST NO
BEZEL ASSEMBLY							PAGE 001 OF 0

FIND NO	FSCM	PART OR IDENTIFYING NO OR SPECIFICATION NO	GFA OPT	QTY	NAME/ DESCRIPTION OR NOTE	DOC SYM
	97403	UB13208E4694			BEZEL ASSEMBLY	B
	81349	MIL-S-11031		AR	SEALING COMPOUND	
1	97403	UC13208E4695		1	BEZEL	B
2	97403	UB13208E4696		1	CRYSTAL BEZEL	B
3	97403	UB13219E0788		1	VIAL LUMINOUS CYL	
4	97403	UB13219E0787		AR	ADHESIVE SEALANT	S

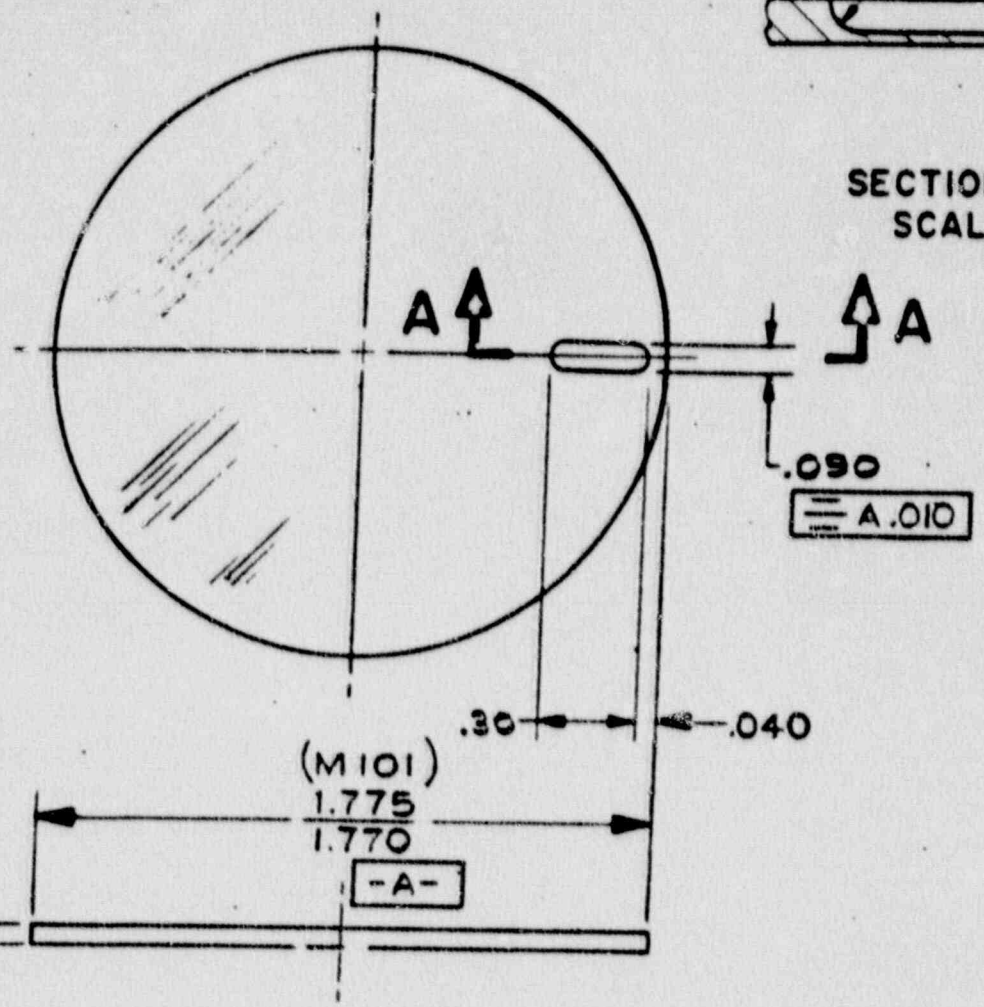
@ INDICATES DATA NOT AVAILABLE
# INDICATES THE REQUIRED DATA APPEARS ON THE NEXT LINE THAT BEGINS WITH THE SYMBOL #
DEF INDICATES INSUFFICIENT INFORMATION WITHIN COMPUTER FILE TO COMPLETE REQUIRED DATA

DOC SYM LEGEND
A-MULTI USE
S-SOURCE CONTROL DWG
C-SPEC CONTROL DWG
B-SOAP DATA ON DWG
I-GAGE DATA ON DWG
M-MODIFICATION WORK ORDER
E-INSPECTION EQUIPMENT DWG
A-ALTERED ITEM DWG
L-SELECTED ITEM DWG
F-INTERFACE CONTROL DWG

SI
APERTURE
CARD

Also Available On
Aperture Card

9002150284 -22



APPLICATION	
NEXT ASSY	USED ON
B1320E4694	D1320E4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGL
— XX ± .02 —
XXX ± .005

BREAK SHARP EDGES TO .0
ALL FILLETS TO

MATERIAL

GLASS
DD-G-451
TYPE I, CLASS 1,
QUALITY q1

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A	C-4	ADDED QUALITY ASSURANCE DATA, FRACTIONS DELETED	4 FEB 66	J. J. D.
B		SEE ENGRG REV NOTICE	3 MAR 66	J. J. D.
C		SEE ENGRG REV NOTICE	23 JUN 67	GJD 269
D		SEE NOR.	17 JAN 69	GJD
E		SEE NOR.	30 SEP 70	BOB
F		SEE NOR	14 AUG 72	BOB
G		SEE NOR.	8 FEB 74	BOB
H		SEE ECP NO. 87HE3720 SI	9 AUG 87	L. L. [illegible].

NOTES:

3. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5%
      MIOI
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.

9002150284-23

RECOMMENDED: Harold E. Ream

SUBMITTED: W. W. Davis

REVIEWED FOR PRODUCTION: [illegible]

DRAWN BY	TRACED BY	CHECKED BY
W J		W. H. C
8-1-62		11-5-62

APPROVED: 14 Sept 1962
[illegible]
CHIEF, ENGINEERING DIVISION

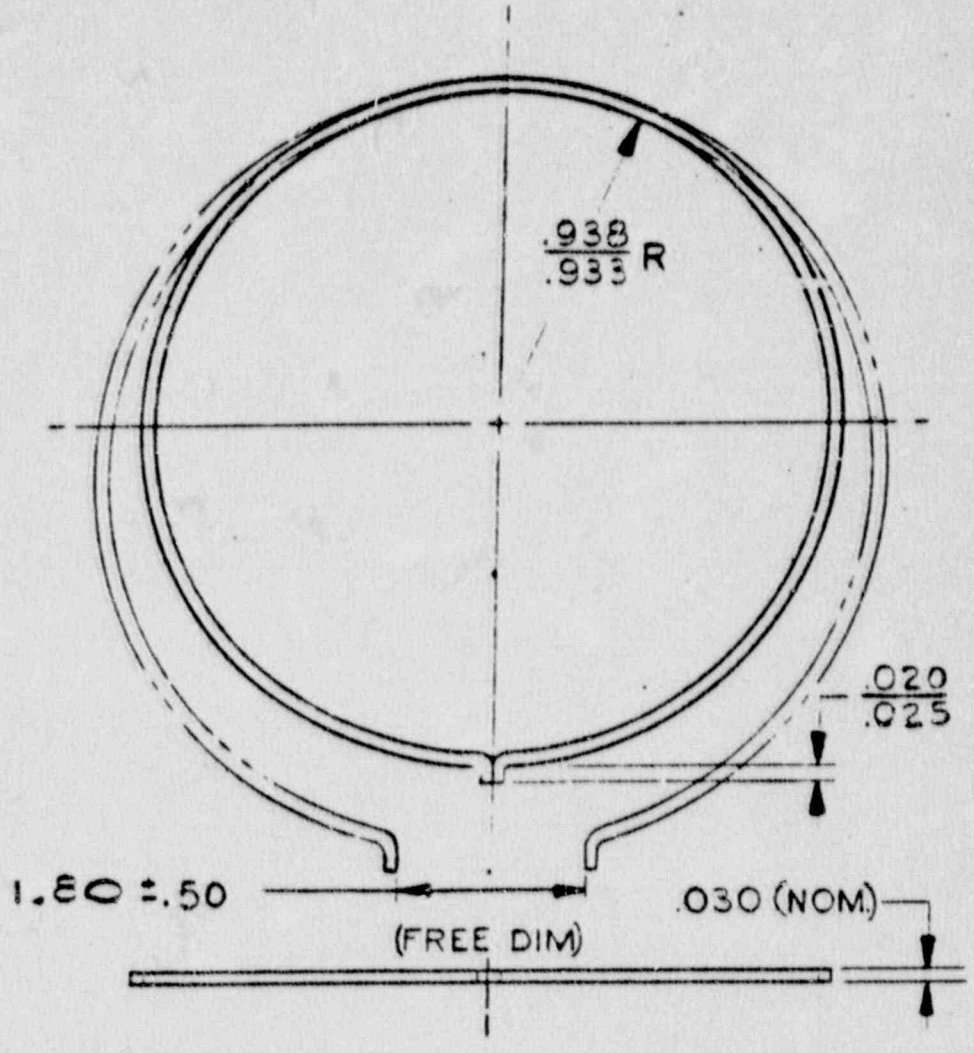
CONTRACTOR:

U. S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

CRYSTAL, BEZEL

CODE IDENT. NO.	SIZE	
97403	E	13208E4696

SCALE: 2/1 SHEET 1 OF 1



APPLICATION	
NEXT ASSY	USED ON
D1320E4680	D1320E4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
— — —

BREAK SHARP EDGES .002 TO .005
ALL FILLETS — TO —

MATERIAL
PHOS. BRONZE, SQUARE WIRE ASTM B159, ALY NO. 510, HARD

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A	1	SEE ENGRG REV NOTICE	[illegible]	H.R
B	1	SEE ENGRG REV NOTICE	9 MAR 72	J.J.T.
C	1	SEE NOR.	14 AUG 72	BOB
D	1	SEE NOR.	8 FEB 74	BOB
E	1	SEE NOR	31 AUG 77	E.F.G.

NOTES:

1.

2. FINISH IN ACCORDANCE WITH DWG 3132219E9740
3. REMOVE SHARP EDGES FROM EARS

9002150284-24

RECOMMENDED: Harold E. Braun

SUBMITTED: W.W. Davis

REVIEWED FOR PRODUCTION: [illegible]

DRAWN BY	TRACED BY	CHECKED BY
W.I.		
6-1-6[illegible]		

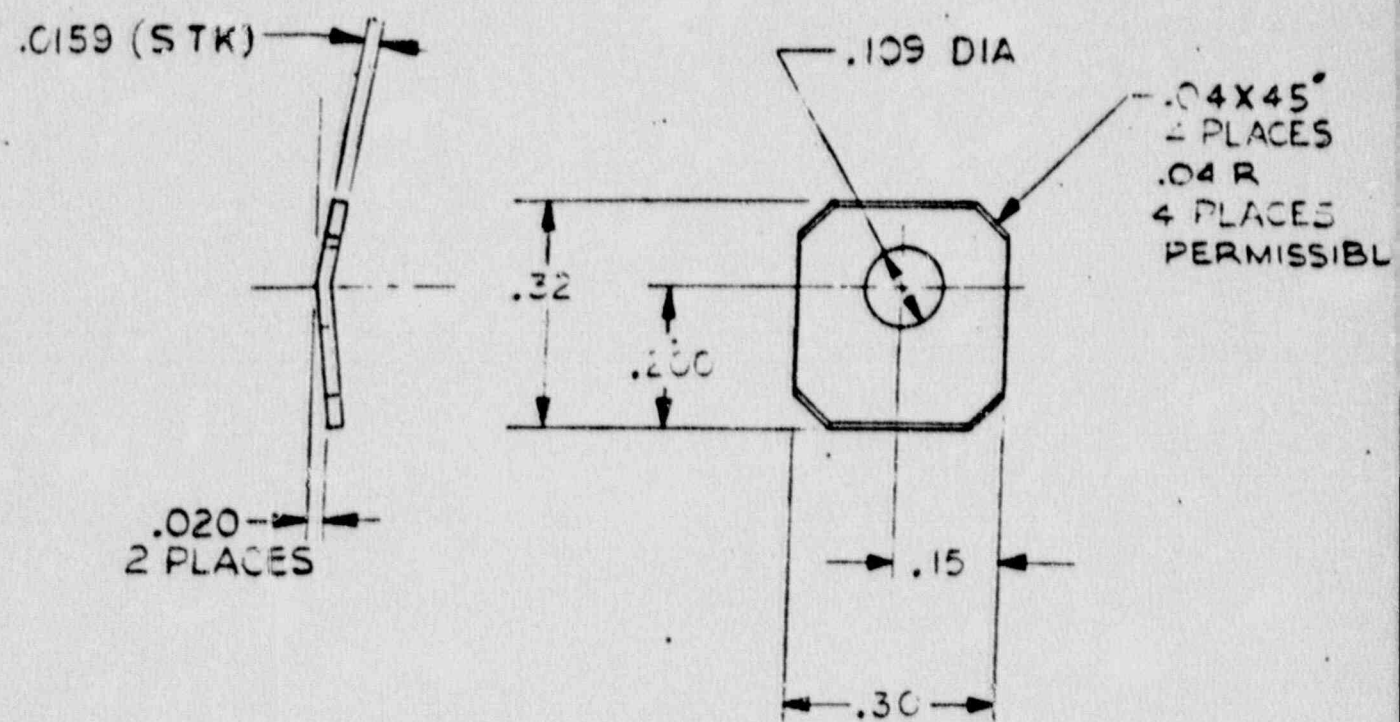
APPROVED: [illegible]
CHIEF - ENGINEERING DIV
CONTRACTOR:

U.S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA

SPRING, BEZEL RETAINING

CODE IDENT NO	SIZE	
97403	E	13208E4697

SCALE 2/1 SHEET 1 OF 1



APPLICATION	
NEXT ASSY	USED ON
D1320BE4680	D1320BE4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
— ±.005 ±2°
±.01

BREAK SHARP EDGES .001 TO .005
ALL FILLETS — TO —

MATERIAL
COPPER-BERYLLIUM, ASTM B194,
ALY NO. 170 OR 172 1/2 H
ALTERNATE MATERIAL:
PHOSPHOR BRONZE
ASTM B103, ALY NO. 511,
EXTRA HARD

RECOMMENDED
Harold E
SUBMITTED:
WWD
REVIEWED FOR
DRAWN BY
W I
6-1-62
APPROVED
CHIEF
CONTRACTOR:

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A		SEE ENGRG REV NOTICE	4 FEB 64	H. R
B	4-B	.020 WAS .010	31 MAR 66	
C		SEE ENGRG REV NOTICE	30 JUN 66	
D		SEE ENGRG REV NOTICE	23 JUN 67	
E		SEE NOR	14 AUG 72	BOB
F		SEE NOR.	8 FEB 74	BOB
G		SEE NOR.	11 AUG 77	E.J.G.

NOTES:

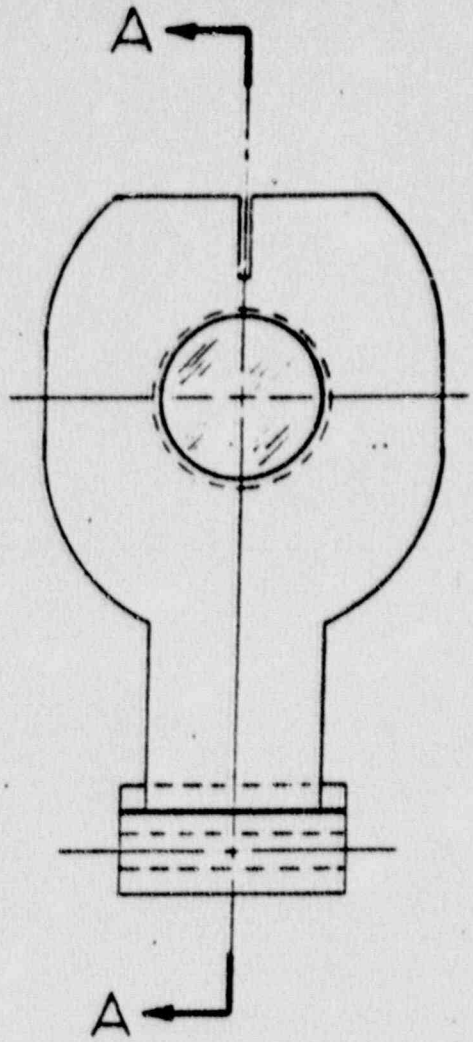
1. COPPER-BERYLLIUM MATERIAL SHALL BE PRECIPITATION HEAT TREATED AFTER FORMING.
2. ALTERNATE MATERIAL TO BE USED ONLY UPON SPECIFIC APPROVAL OF THE CONTRACTING OFFICER.
3. FINISH IN ACCORDANCE WITH DWG 13219E9740.

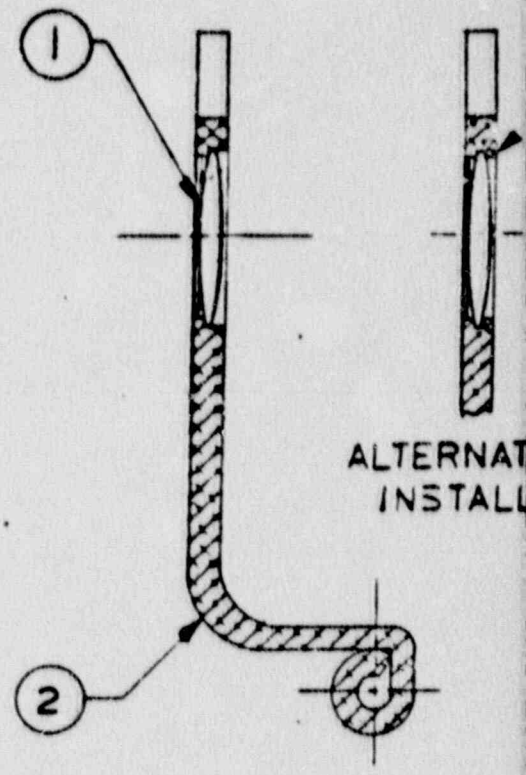
U.S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

WASHER, SPRING

CODE IDENT NO	SIZE	
97403	E	13208E4699

SCALE: 4/1 SHEET 1 OF 1





SECTION A-A

APPLICATION	
NEXT ASSY	USED ON
D1320EE4680	D1320EE4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES

BREAK SHARP EDGES TO
ALL FILLETS TO

MATERIAL

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A	C-2	ADDED NOTE 1	12 NOV 1964	H R
B		SEE ENGRG REV NOTICE	6 FEB 66	H. R
C		SEE ENGRG REV NOTICE	23 JUN 67	[illegible]
D		SEE NOR	15 JUN 73	BOB
E		SEE NOR.	5 FEB 74	BOB

-SPIN

NOTES:

1. SPIN OR BOND ITEM 1 IN PLACE, USING ADHESIVE PER MIL-S-11031.

E LENS
LATION

9002150284-26

RECOMMENDED: Harold E. Rear

SUBMITTED: W W Davis

REVIEWED FOR PRODUCTION: H J Grimmer

DRAWN BY	TRACED BY	CHECKED BY
W I		H. H.
5-21-62		[illegible]

APPROVED: [illegible]
CHIEF ENGINEER

CONTRACTOR:

U.S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

LENS-BRACKET ASSEMBLY

CODE IDENT. NO.	SIZE	
97403	B	13208E4701

SCALE 2/1 SHEET 1 OF 1

UNITED STATES ARMY
MOBILITY EQUIPMENT COMMAND

PARTS LIST FOR:	REV	DOC DATE	DOC SYM	FSCM	NEXT HIGHER ASSY N
PL13208E4701	E	22AUG72		97403	13208E4680
LENS BRACKET ASSY					

FIND NO	FSCM	PART OR IDENTIFYING NO OR SPECIFICATION NO	GFR OPT	QTY	NAME/ DESCRIPTION OR NOTE
	97403	UE13208E4701			LENS BRACKET ASSY
	81349	MIL-S-11031		AR	SEALING COMPOUND
1	97403	UE13208E4707		1	LENS
2	97403	UC13208E4706		1	BRACKET LENS

@ INDICATES DATA NOT AVAILABLE
& INDICATES THE REQUIRED DATA APPEARS ON THE NEXT LINE THAT BEGINS WITH THE &
DEF INDICATES INSUFFICIENT INFORMATION WITHIN COMPUTER FILE TO COMPLETE REQUIRE

DOC SYM LEGEND

M-MULTI USE	I-GAGE DATA ON DWG	L-SELECTED ITEM DWG
S-SOURCE CONTROL DWG	M-MODIFICATION WORK ORDER	P-INTERFACE CONTROL
C-SPEC CONTROL DWG	E-INSPECTION EQUIPMENT DWG	
G-SOAP DATA ON DWG	A-ALTERED ITEM DWG	

[illegible] 19 AUG 1972

END ITEM DOC
DL132D8E4680

COMPT RUN DATE 25 AUG 72
REQUEST NO
PAGE 001 OF 001

DOC SYM

0

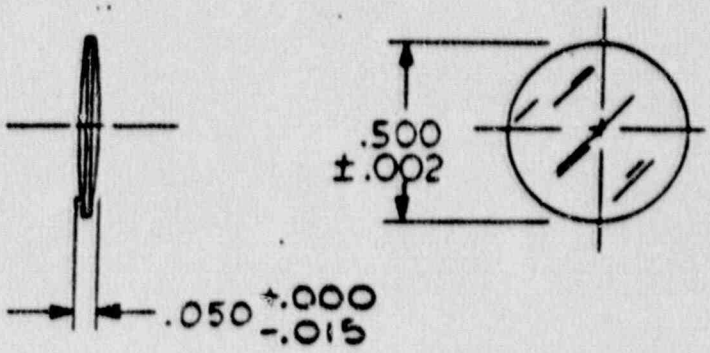
0
0

PROL &
DATA

DMS

PAGE 001 OF 001

9002150284-27



APPLICATION	
NEXT ASSY	USED ON
B13208E4701	D13208E4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ____ DECIMALS ____ ANGLES ____

BREAK SHARP EDGES ___ TO ___
ALL FILLETS ___ TO ___

MATERIAL PLASTIC
L-P-380, TYPE I, CL 3
OPTIONAL:
OPTICAL GLASS,
MIL-G-174,
CLASS 1, GRADE A

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A		SEE ENGRG REV NOTICE	4 FEB 66	H.R
B		SEE ENGRG REV NOTICE	23 JUN 67	[illegible]
C		SEE NOR.	8 FEB 72	[illegible]
D		SEE ECP NO. 87HE3720	5 AUG 87	[illegible]

NOTES:

(M101) 1. BI-CONVEX MAGNIFYING LENS
FOCAL LENGTH-2 5/8.
MUST BE FREE OF BUBBLES & DEFECTS.

2. QUALITY ASSURANCE PROVISIONS:
THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
B. CLASSIFICATION OF CHARACTERISTICS:
CRITICAL: NONE
MAJOR - AQL 2.5%
M101
C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTOR'S QUALITY OR INSPECTION SYSTEM.

RECOMMENDED: Harold E. Rees

SUBMITTED: W W Davis

REVIEWED FOR PRODUCTION: H. N. Grinnan

DRAWN BY	TRACED BY	CHECKED BY
W I		[illegible]
5-31-62		11-5-62

APPRO: [illegible]
CHIEF [illegible]
CONTRACTOR:

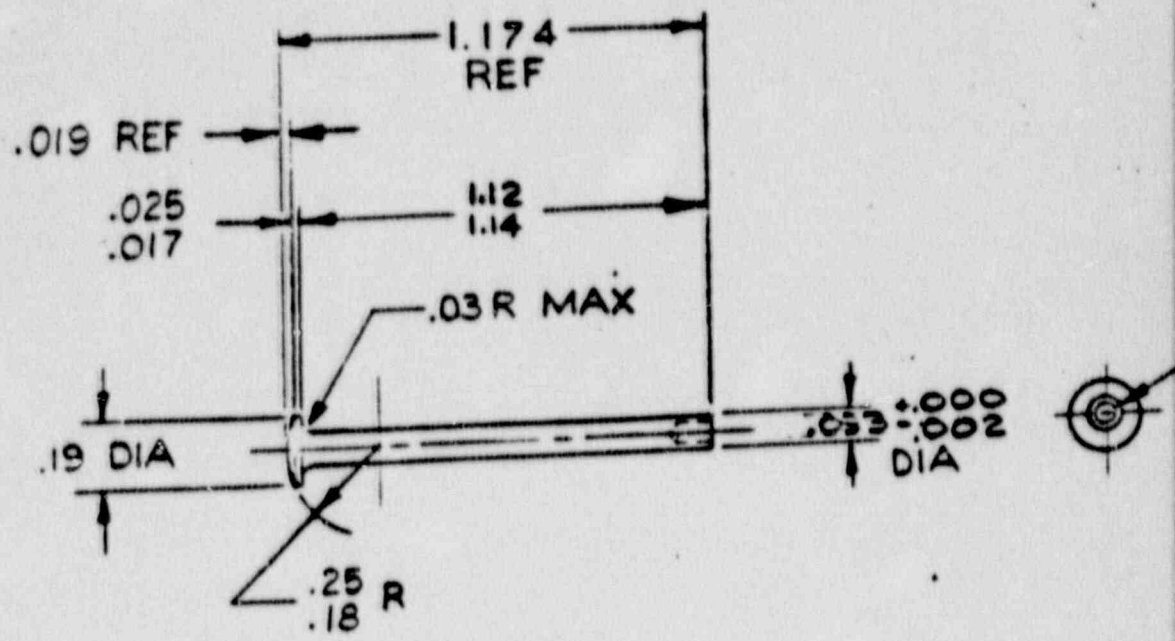
U.S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

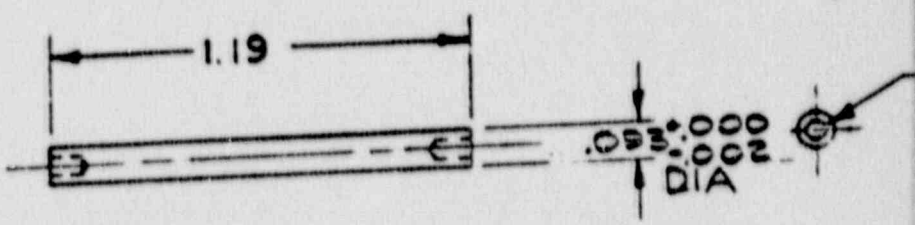
LENS

9002150284-28

CODE IDENT. NO.	SIZE	
97403	B	13208E4702

SCALE: 2/1 SHEET 1 OF 1





ALTERNATE METHOD

D13208E4680	D13208E46
NEXT ASSY	USED ON
APPLICATION	

3	2	1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	B	SEE ENGRG REV NOTICE	FEB 66	N.R.
	C	SEE ENGRG REV NOTICE	JUN 67	HB 269
	D	SEE NOR	672	BCB
	E	SEE NOR.	FEB 72	BCB
	F	SEE NOR.	JAN 74	EFB
	G	SEE NOR	1977	EFB
	H	SEE NOR.	JAN 79	EFB.
	J	SEE ECP NO. 83HE0652	FEB 83	PRB
	K	SEE ECP NO. 87HE3720	5-JUL-87	L.W.C.

.043 DIA.
+.010
-.001
X .12 DEEP

NOTES:

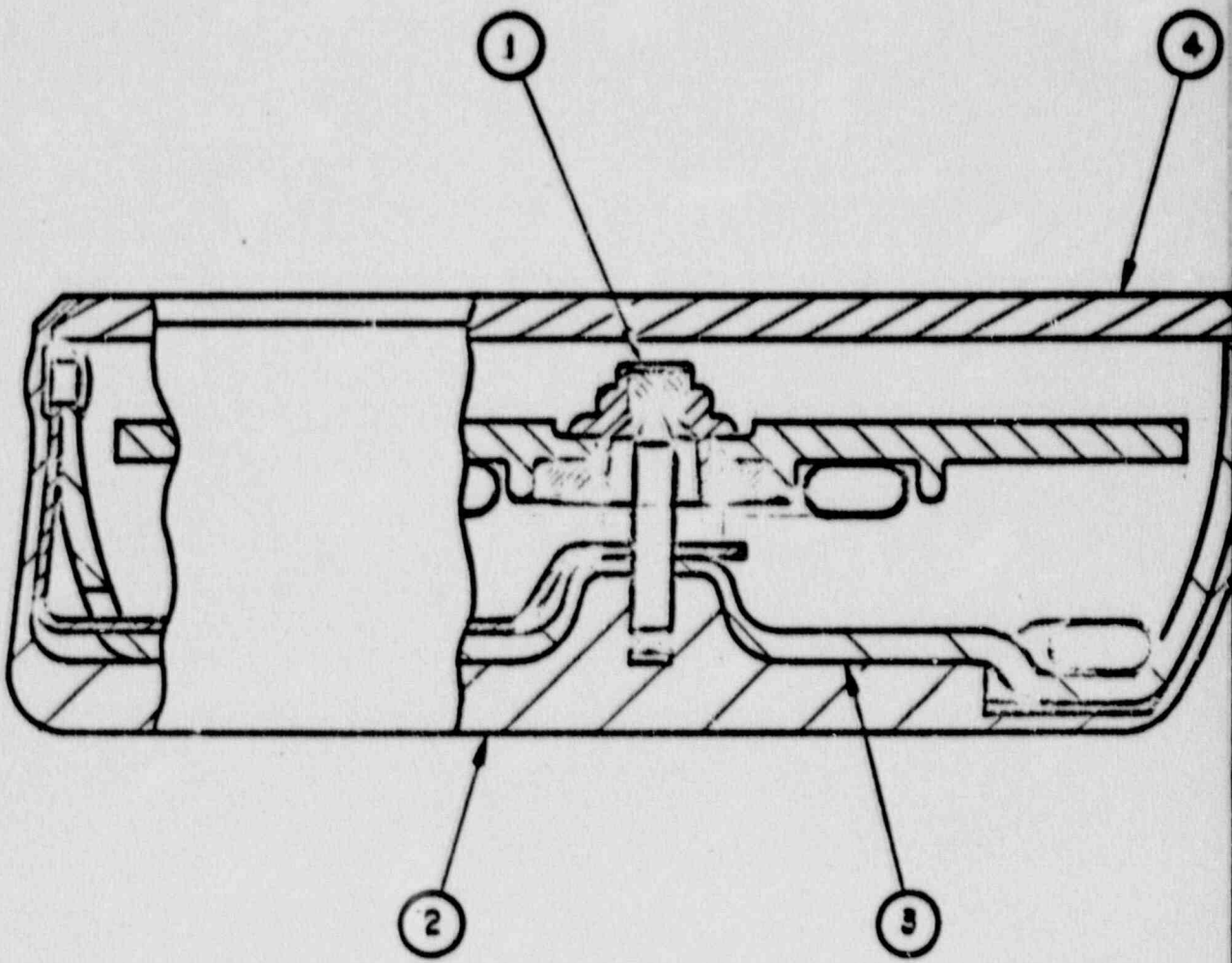
1. BREAK SHARP EDGES .002 TO .005.
2. FINISH IN ACCORDANCE WITH DWG B13219E9740.
3. FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ANS-Y14.5.

.043 +.010 -.001 DIA
X .09 DEEP
2-HOLES

9002150284-29

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS: DECIMALS: ±.005, ±.01 ANGLES:	DRAWN P.K. 21-JUL-65	U.S. ARMY MOBILITY COMMAND MOBILITY EQUIPMENT CENTER ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES, FORT BELVOIR, VA.	
	CHECKED	PIN, HINGE, LENS BRACKET	
MATERIAL: BRASS WIRE ASTM B134 ALY NO.270 1/4 HARD	COMMODITY ENGINEER		
	APPROVED FOR QUALITY CHIEF ENGINEERING DIV.	SIZE D	CODE IDENT NO. 97403
	25 AUG 1965	SCALE 2/1	SHEET 1 OF 1

REF: 17 AUG. 1964



1320EE4680	1320EE4680	
NEXT ASSY	USED ON	
APPLICATION		
FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING. SEE ANS Y14.5		

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE ECP NO. 83HE0652	28 JUL 83	R.P.B.

SI
APERTURE
CARD

Also Available On
Aperture Card

9002150284-3D

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES ± —
PLACE DECIMALS ± —
PLACE DECIMALS ± —

DO NOT SCALE THIS DRAWING

FILLET RADII — TO —
SHARP EDGES — TO —

MATERIAL:

DRAWN VECO (CJS) DATE 30 SEP 70

CHECKED & M.-QC R.S.C. 30 SEP 70

DESIGN APPROVED
COMMODITY ENGINEER

APPROVED FOR PRODUCTION
PRODUCTION ENGINEER

RELEASED FOR PROCUREMENT
CHIEF, ENGINEERING DEPT.

U.S. ARMY MOBILITY EQUIPMENT COMMAND
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES, FORT BELVOIR, VA.

CAPSULE ASSEMBLY

SIZE	CODE IDENT NO.	
B	97403	13219E0753

DATE SEP 30 | SCALE 4/1 | SHEET 1 OF 1

UNITED STATES ARMY
MOBILITY EQUIPMENT COMMAND

PARTS LIST FOR:	REV	DOC DATE	DOC SYM	FSCM	NEXT HIGHER ASSY NO	END I
PL13219E0753	0	22AUG72		97403	13219E0500	BEGIN
CAPSULE ASSEMBLY						

FIND NO	FSCM	PART OR IDENTIFYING NO OR SPECIFICATION NO	OFR OPT	QTY	NAME/ DESCRIPTION OR NOTE	DOC
					CAPSULE ASSEMBLY	
	97403	UB13219E0795		1	DIAL	
1	97403	UP13219E0794		1	SEAL CUP ASSEMBLY	0
2	97403	UC13219E0796		1	DAMPING SHELL ASSY	0
3	97403	UB13219E0762		1	CRYSTAL CAPSULE	0
0	97403	UB1320PE0087				

0 INDICATES DATA NOT AVAILABLE
8 INDICATES THE REQUIRED DATA APPEARS ON THE NEXT LINE THAT BEGINS WITH THE SYMBOL 8
DEF INDICATES INSUFFICIENT INFORMATION WITHIN COMPUTER FILE TO COMPLETE REQUIRED DATA

DOC SYM LEGEND
M-MULTI USE
S-SOURCE CONTROL DWG
C-SPEC CONTROL DWG
G-SOAP DATA ON DWG
I-GAGE DATA ON DWG
M-MODIFICATION WORK ORDER
N-INSPECTION EQUIPMENT DWG
A-ALTERED ITEM DWG
L-SELECTED ITEM DWG
P-INTERFACE CONTROL DWG

29 AUG 72

MICROFILMED

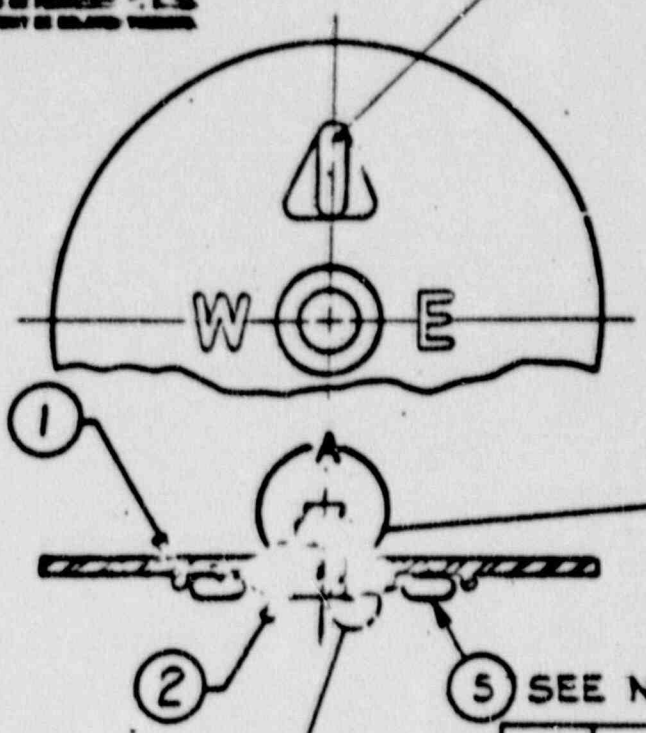
ACCEPT AUTH DATE 25 AUG 72
REQUEST RID
PAGE RID 0F 001

PAGE 001 OF 001

SI
APERTURE
CARD

Also Available On
Aperture Card

9002150284 31



VIEW B
SCALE 10/1

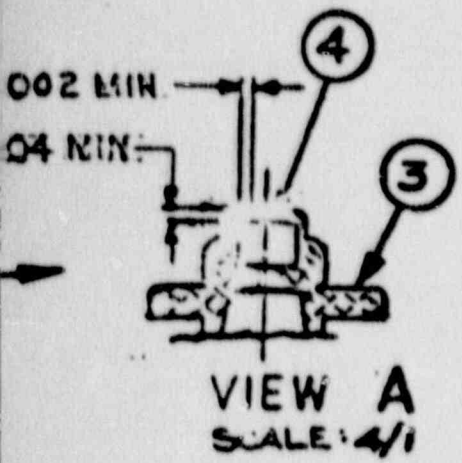
FIND NO.	CODE IDENT	DWG SIZE	IDENT
7		B	1321
6		B	1321
5		B	1321
4			MS 2
3		B	1320
2		B	1320
1		D	1321

APPLICABLE	
NEXT ASSY	USED ON
13219E0753	DISCONTINUED

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
BREAK SHARP EDGES — TO —
ALL FILLETS — TO —

MATERIAL

REVISIONS			
	DESCRIPTION	DATE	APPROVAL
A	SEE SHEET 2 OR	[illegible]	[illegible]



VIEW A
SCALE: 4/1

NOTES:

1. BOND FIND NO. 5 TO FIND NO. 1 AND BOND FIND NO. 6 TO FIND NO. 1 AND 2 USING ADHESIVE-SEALANT, FIND NO. 7, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. AFTER ASSEMBLY, EXPOSED SURFACES OF FIND NO. 1, 5 AND 6 SHALL BE FREE OF ADHESIVE.
2. STATIC BALANCE AFTER ASSEMBLY

ART OR FYING NO.	QTY REQD	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	MATERIAL
9E0787	AR	ADHESIVE-SEALANT		
9E0783	1	VIAL, LUMINOUS, CYLINDRICAL		
9E0785	2	VIAL, LUMINOUS, DIAL		
7045-14	1	BEARING, JEWEL		
9E4688	1	MOUNT, JEWEL		
9E4686	1	MAGNET		
9E0755	1	DIAL		

LIST OF MATERIAL

RECOMMENDED:

SUBMITTED: Harold E. Farm
ENGINEERING ENGINEER

REVIEWED FOR PRODUCTION Roykin O. Bird

DRAWN BY	TRACED BY	CHECKED BY
[illegible]		
30 SEP 70		

PRODUCTION ENGINEERING CONTRACTOR

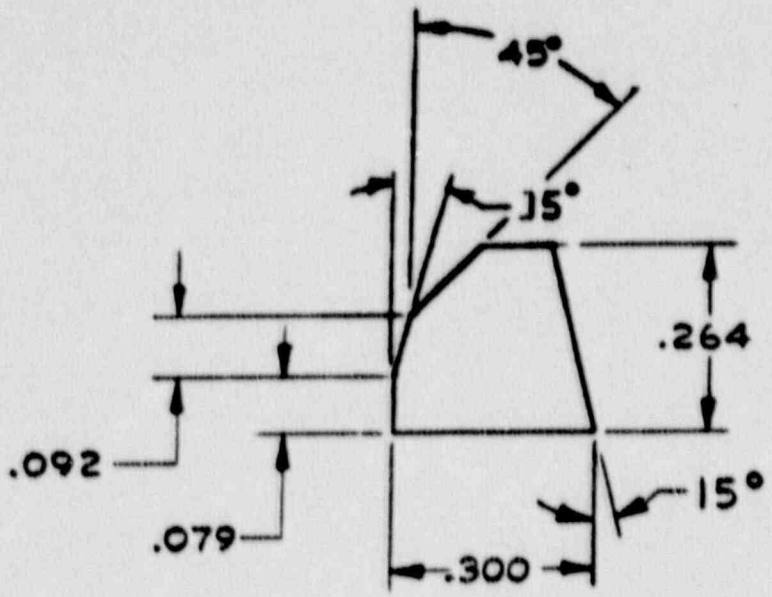
U. S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

DIAL

9002150284-32

CODE IDENT. NO.	SIZE	
97403	B	13219E0754

SCALE: 2/1 SHEET 1 OF 1



APPLICATION	
NEXT ASSY	USED ON
D1320E4600	D1320E4000

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
— ±.005 ±1°

BREAK SHARP EDGES .005 TO .015
ALL FILLETS — TO —

MATERIAL

SEE NOTE 2

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL
	A	SEE NOR.	[illegible]	BOA
	B	SEE NOR	11AUG77	EJB
	C	SEE NOR.	16 JAN 79	EJB.
	D	SEE ECP NO. 83HE0652	28JUL83	R R B.

NOTES:

1.

2. MOLDING PLASTIC, NYLON, ASTM D4066 PA 111.

RECOMMENDED:

SUBMITTED:
Harold E Pearn
COMMODITY ENGINEER

REVIEWED FOR PRODUCTION:
Boykin A. Byrd

DRAWN BY	TRACED	CHECKED
[illegible]		RSG/[illegible]
[illegible] 80		6SEP 83

APPROVED:
CHIEF ENGINEERING DEPT

CONTRACTOR

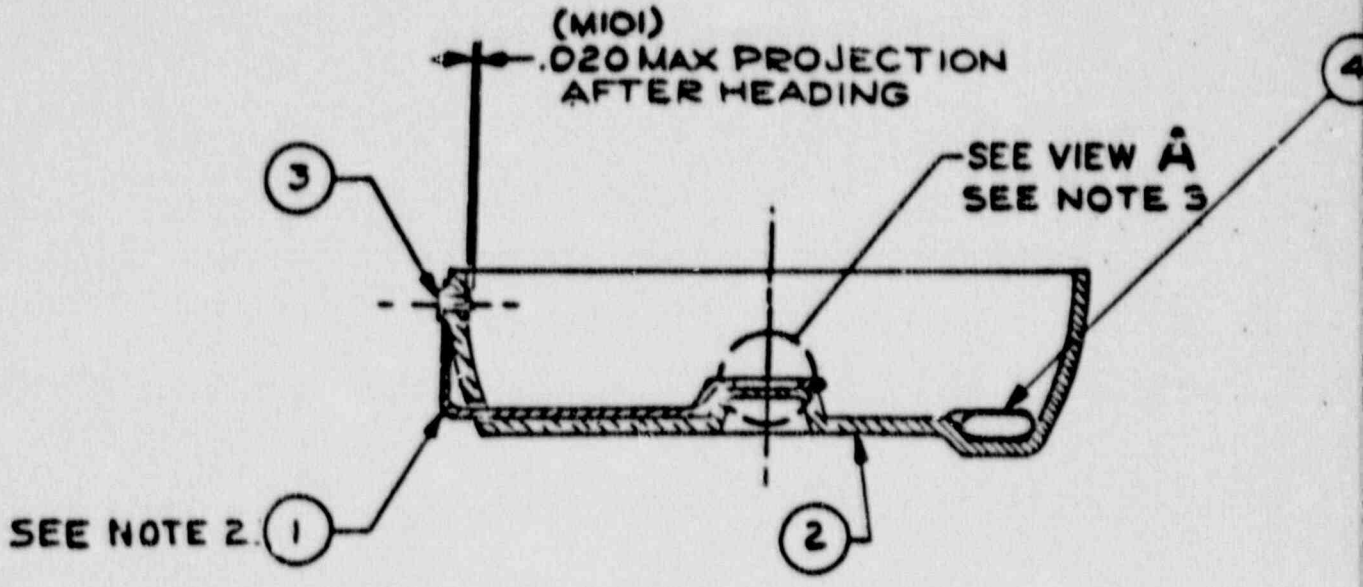
U.S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

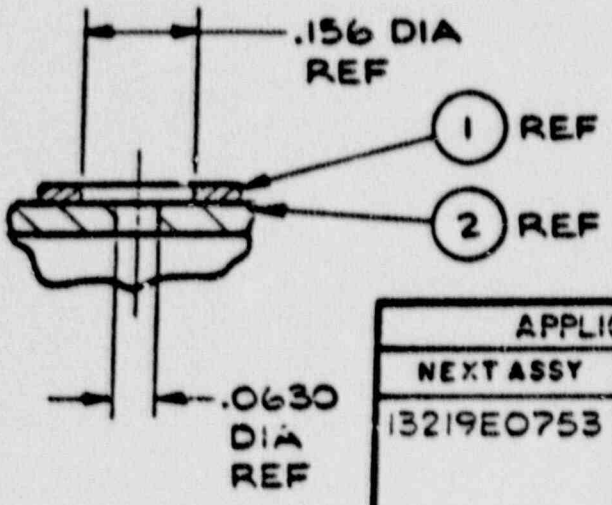
PLUNGER, NEEDLE LIFTER

9002150284 33

CODE IDENT. NO.	SIZE	
97403	E	13219E0780

SCALE: 4/1 SHEET 1 OF 1





VIEW A
SCALE 4/1

APPLICATION	
NEXT ASSY	USED ON
13219E0753	D13208E4680

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES

BREAK SHARP EDGES — TO —
ALL FILLETS — TO —

MATERIAL

2	1

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVAL
A		SEE NOR.	16 JAN 79	E.Z.B.
B		SEE ECP NO. 87HE3720	5 AUG 87	L.L.S.

D

SI
APERTURE
CARD

Also Available On
Aperture Card

NOTES:

1. QUALITY ASSURANCE PROVISIONS:
   THESE REQUIREMENTS APPLY WHEN THIS PART IS PROCURED AS A REPAIR PART.
   A. SAMPLING FOR INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105.
   B. CLASSIFICATION OF CHARACTERISTICS:
      CRITICAL: NONE
      MAJOR - AQL 2.5%
      MIOI
   C. ALL OTHER CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTORS QUALITY OR INSPECTION SYSTEM.
2. WHEN PRESSED AGAINST OUTER WALL OF SHELL, FIND NO. 1 SHALL HAVE FREE MOVEMENT AND SHALL RETURN TO ITS ORIGINAL POSITION UPON RELIEF OF PRESSURE.
3. HOLE IN FIND NO. 2, AS SHOWN IN VIEW A, TO BE LOCATED WITHIN .156 DIA HOLE IN FIND NO. 1
4. BOND FIND NO. 4 TO FIND NO. 2 USING ADHESIVE-SEALANT, FIND NO. 5, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. AFTER ASSEMBLY EXPOSED SURFACES OF FIND NO. 2 AND 4 SHALL BE FREE OF ADHESIVE.

C

B

RECOMMENDED:

SUBMITTED: Harold E. Rosen
COMMODITY ENGINEER

REVIEWED FOR PRODUCTION
Boyskin C. Bird

DRAWN BY	TRACED BY	CHECKED BY
[illegible]		[illegible]
[illegible] P 70		30 SEP 70

APPROVED:

DEPT. OF THE ARMY
CONTRACTOR:

SEP 30 1970

U.S. ARMY
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES CORPS OF ENGINEERS
FORT BELVOIR, VA.

DAMPING SHELL ASSEMBLY

9002150284 34

CODE IDENT. NO.	SIZE	
97403	B	13219E0782

SCALE: 2/1 SHEET 1 OF 1

A

2	1	

UNITED STATES ARMY
MOBILITY EQUIPMENT COMMAND

PARTS LIST FOR:	REV	DOC DATE	DOC SYM	FSCM	NEXT HIGHER ASSY NO	END ITEM DOC
PL13219E0782	B	22AUG72		97403	13219E0753	DL13208E4680
DAMPING SHELL ASSY						

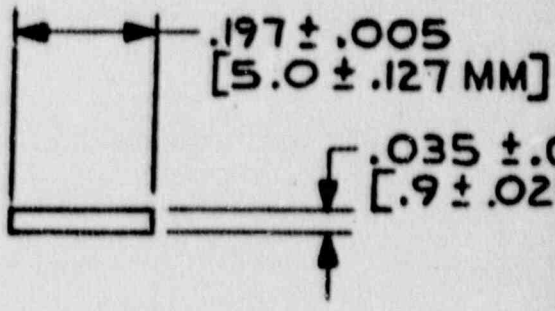
FIND NO	FSCM	PART OR IDENTIFYING NO OR SPECIFICATION NO	OFR OPT	QTY	NAME/ DESCRIPTION OR NOTE	DOC SYM
	97403	UB13219E0782			DAMPING SHELL ASSY	B
1	97403	UB13208E4691		1	LIFTER NEEDLE	B
2	97403	UC13219E0757		1	SHELL DAMPING	B
3	97403	UB13208E4693		1	EYELET FLANGED	C
4	97403	UB13219E0784		1	VIAL LUMINOUS CPSL	
5	97403	UB13219E0787		AR	ADHESIVE SEALANT	S

* INDICATES DATA NOT AVAILABLE
@ INDICATES THE REQUIRED DATA APPEARS ON THE NEXT LINE THAT BEGINS WITH THE SYMBOL @
DEF INDICATES INSUFFICIENT INFORMATION WITHIN COMPUTER FILE TO COMPLETE REQUIRED DATA

DOC SYM LEGEND
M-MULTI USE
S-SOURCE CONTROL DWG
C-SPEC CONTROL DWG
Q-SQAP DATA ON DWG
I-GAGE DATA ON DWG
W-MODIFICATION WORK ORDER
E-INSPECTION EQUIPMENT DWG
A-ALTERED ITEM DWG
L-SELECTED ITEM DWG
F-INTERFACE CONTROL DWG

T RUN DATE 25 AUG 72
EST NO
001 OF 001

001 OF 001



		UNLES DIMEN TOLER 3 PLA 2 PLA
13219E0754	13208E4680	
13219E0752	13208E4680	DO NO
13208E4694	13208E4680	FILLET SHARP
NEXT ASSY	USED ON	MATLR
APPLICATION		
FOR INTERPRETATION OF DRAWING, SEE 000-STD-100		

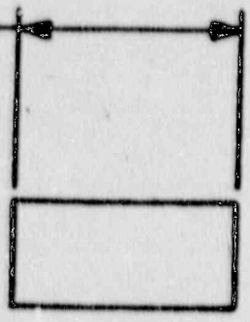
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE NOR	14 AUG 72	BOB
	B	SEE NOR	25 SEP 72	BOB
	C	SEE NOR.	5 FEB 74	BOB
	D	SEE ECP NO. E2CE1121	24 JAN 83	R.A.B.
	E	SEE ECP NO. 87HE3720 AND 87HE3605	5 AUG 87	L.L.D.
	F	SEE ECP NO. E8CE0116	14 MAR 88	L.L.G.

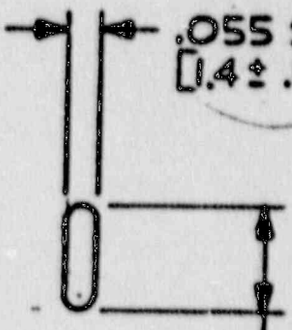
NOTES:

1. MATERIAL:
   A. VIAL SHALL BE BOROSILICATE GLASS IN ACCORDANCE WITH DD-G-541, TYPE I, CLASS A.
   B. INTERIOR SURFACE OF VIAL SHALL BE COATED WITH ZINC SULFIDE, COPPER ACTIVATED, PHOSPHOR.
   C. VIAL SHALL BE FILLED WITH TRITIUM GAS WITH A MAXIMUM ACTIVITY OF 5.0 MILLICURIES AND CONTAINING LESS THAN ONE PERCENT WATER.
2. PEAK SPECTRAL OUTPUT: 530 ± 30 NANOMETERS.
3. EMITTED BRIGHTNESS: 100 μL MINIMUM AFTER AGING 30 DAYS.
4. VIAL SHALL BE HERMETICALLY SEALED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES ± — FRACTIONAL DECIMALS ± —	DRAWN VECO (GCT)	DATE 14 SEP 70	U.S. ARMY MOBILITY EQUIPMENT COMMAND ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES, FORT BELVOIR, VA.
	CHECKED R.S.G.	30 SEP 70	
SCALE THIS DRAWING	DESIGN APPROVAL COMMODITY ENGINEER		VIAL, LUMINOUS, CYLINDRICAL
RADII — TO — EDGES — TO —	APPROVED FOR PRODUCTION PRODUCTION ENGINEER		
SEE NOTE.	RELEASED FOR PROCUREMENT CHIEF, ENGINEERING DEPT.		SIZE B · CODE IDENT NO. 97403 · 13219E0783
			DATE SEP 30 1970 · SCALE NONE · SHEET 1 OF 1

.327 ± .012
[8.3 ± .30 MM]





.055 ± .004
[1.4 ± .102 MM]

.157 ± .005
[4.0 ± .127

13219E0782	13288E4680
NEXT ASSY	USED ON
APPLICATION	
FOR INTERPRETATION OF DRAWING, SEE DOD-STD-100	

UNLESS OTHERWI
DIMENSIONS ARE
TOLERANCES AR
3 PLACE DECIMA
2 PLACE DECIMA

DO NOT SCALE T

FILLET RADII —
SHARP EDGES —

MATERIAL

SEE NOT

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE NOR	25 SEP 72	BOB
	B	SEE NOR.	8 FEB 73	BOB
	C	SEE ECP NO. 82CE1121	24 JUNE 83	R.P.B.
	D	SEE ECP NO. 87HE3720 AND 87HE3605	5 AUG 87	W.W.B.
	E	SEE ECP NO. 88CE0116	4 MARCH	W.W.B.

NOTES:

1. MATERIAL:
   A. VIAL SHALL BE BOROSILICATE GLASS IN ACCORDANCE WITH DD-G-541, TYPE I, CLASS A.
   B. INTERIOR SURFACE OF VIAL SHALL BE COATED WITH ZINC SULFIDE, COPPER ACTIVATED, PHOSPHOR.
   C. VIAL SHALL BE FILLED WITH TRITIUM GAS WITH A MAXIMUM ACTIVITY OF 50 MILLICURIES AND CONTAINING LESS THAN ONE PERCENT WATER.
2. PEAK SPECTRAL OUTPUT: 530 ± 30 NANOMETERS.
3. EMITTED BRIGHTNESS: 470 μL MINIMUM AFTER AGING 30 DAYS.
4. VIAL SHALL BE HERMETICALLY SEALED.

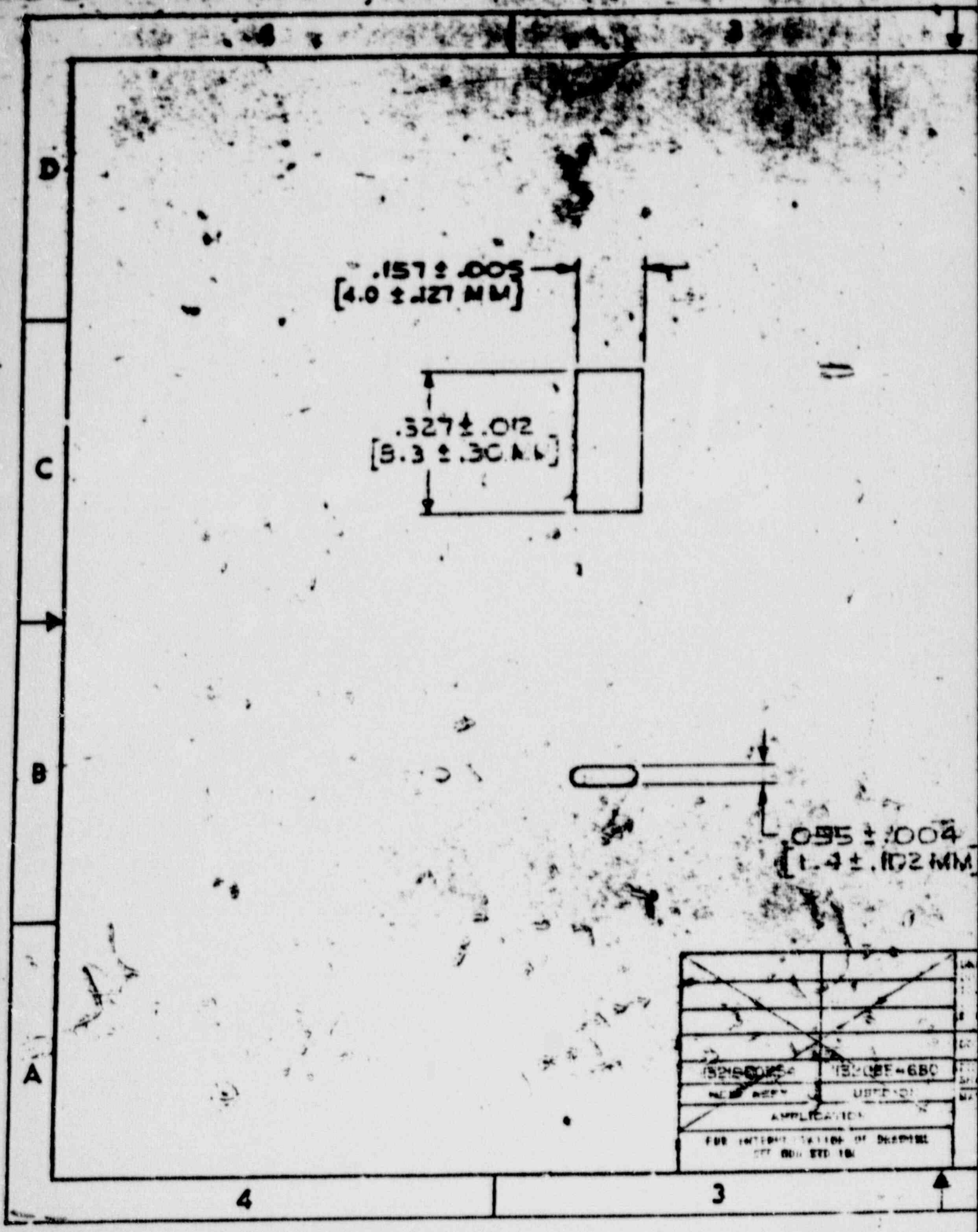
DRAWN	VECO (GCT)	DATE	14 SEP 70
CHECKED	RSG		30 SEP 70
DESIGN APPROVAL	COMMODITY ENGINEER		
APPROVED FOR PRODUCTION	CHIEF, PRODUCTION ENGINEER		
RELEASED FOR PROCUREMENT	CHIEF, ENGINEERING DEPT.		

U.S. ARMY MOBILITY EQUIPMENT COMMAND
ENGINEER RESEARCH AND DEVELOPMENT
LABORATORIES, FORT BELVOIR, VA.

VIAL, LUMINOUS, CAPSULE

SIZE	CODE IDENT NO.	
B	97403	13219E0784

DATE SEP 30 1970 | SCALE 8/1 | SHEET 1 OF 1


.157 ± .005
[4.0 ± .127 MM]
.327 ± .012
[8.3 ± .30 MM]
.055 ± .004
[1.4 ± .102 MM]
D
C
B
A
4
3

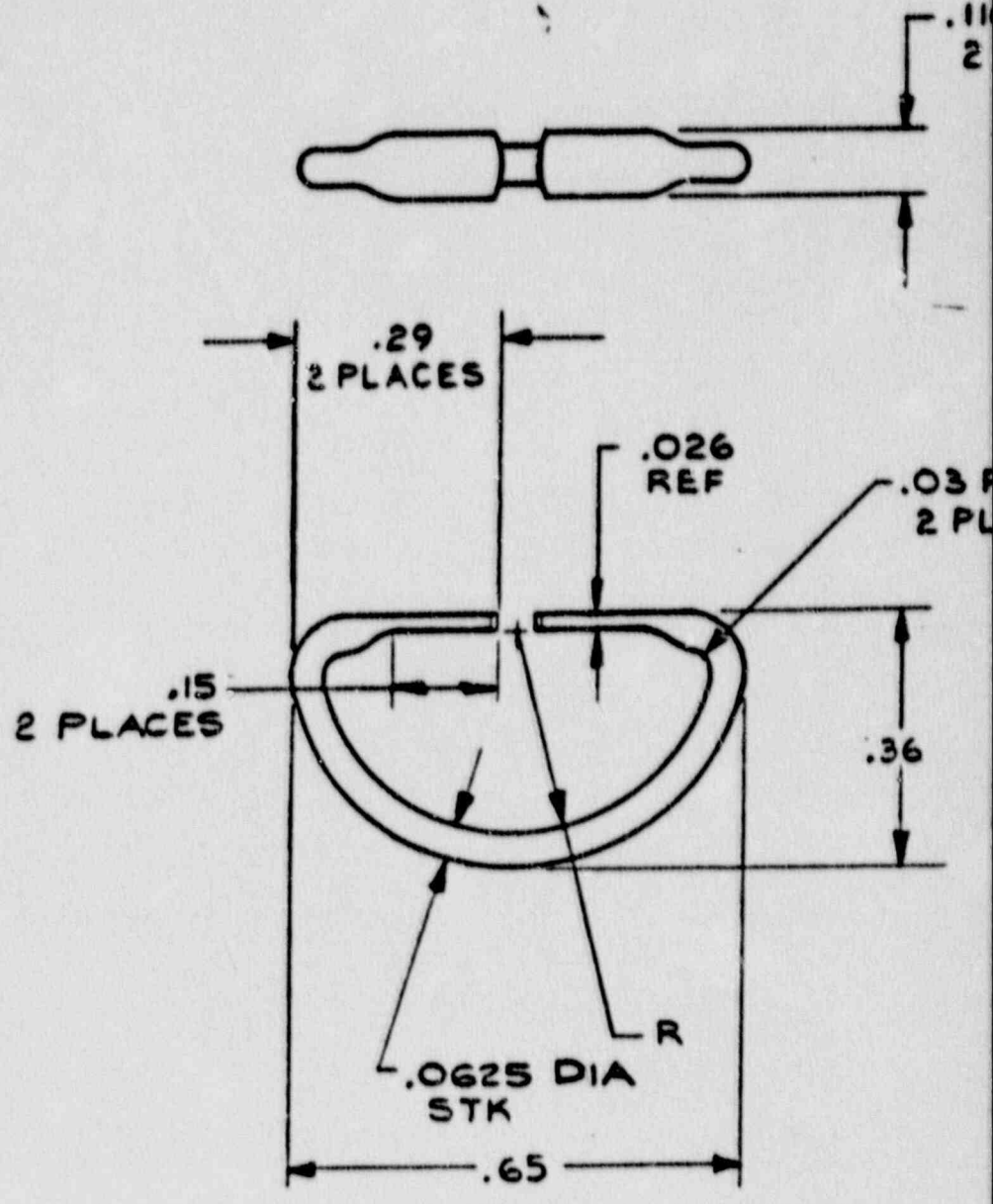
LTR	DESCRIPTION	DATE	APPROVED
A	SEE NDR.		
B	SEE NDR.		
C	SEE ECP NO. E7[illegible]	[illegible]	[illegible]
D	SEE ECP NO. E[illegible] AND E[illegible]	[illegible]	[illegible]
E	SEE ECP NO. E[illegible]	[illegible]	[illegible]

NOTE

1. MATERIAL:
   A. [illegible] SHALL BE RADIOACTIVE GAS IN ACCORDANCE
   B. [illegible] ASSOCIATED WITH
   C. [illegible] GAS WITH A [illegible] IMPURITIES AND CONTAINING
2. [illegible] 400 NANOMETERS.
3. EMITTED BRIGHTNESS: 100 μL MINIMUM AFTER AGING
4. [illegible] SHALL BE HERMETICALLY SEALED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES SURFACE FINISH ANGULAR LINEAR DECIMALS PLACE DECIMALS	MATERIAL SEE NOTE 1	U.S. ARMY MOBILITY EQUIPMENT COMMAND ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES, FORT BELVOIR, VA.
		VIAL, LUMINOUS, DIAL
	SIZE B	CODE IDENT NO. 97403
		13219E0785
	DATE SEP 30 1970	SCALE 4/1
		SHEET 1 OF 1

POOR COPY



13208E4680	13208E4
NEXT ASSY	USED
APPLICATION	

FOR INTERPRETATION OF DIMENSI
AND TOLERANCING. SEE ANS Y

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE NOR.	4AUG72	BOB
	B	SEE NOR.	8FEB74	BOB

D PLACES

R ACES

NOTES:

1. MATERIAL: BRASS, IN ACCORDANCE WITH ASTM B134, ALLOY 260, HALF HARD.
2. FINISH IN ACCORDANCE WITH DWG B1321SE9740.

9002150284 39

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES ±— 3 PLACE DECIMALS ±.005 2 PLACE DECIMALS ±.02 DO NOT SCALE THIS DRAWING FILLET RADII —— TO —— SHARP EDGES —— TO —— MATERIAL: SEE NOTE 1	DRAWN VECO(MEF) DATE 1 SEP 70 CHECKED RSG Mgr-QC 30SEP70 DESIGN APPROVAL COMMODITY ENGINEER APPROVED FOR PRODUCTION PRODUCTION ENGINEER RELEASED FOR PROCUREMENT CHIEF, ENGINEERING DEPT.	U.S. ARMY MOBILITY EQUIPMENT COMMAND ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES, FORT BELVOIR, VA.	
		LOOP, LANYARD	
		SIZE B / CODE IDENT NO. 97403	13219E0786
		DATE SEP 30 1974 / SCALE 4/1	SHEET 1 OF 1

APPROVED SOURCES OF SUPPLY	
VENDOR PART NO.	VENDOR
RTV-732 WITH A-4094 PRIMER	DOW-CORNING CORP S SAGINAW RD MIDLAND, MICHIGAN 48641 CODE IDENT 71984

ONLY THE ITEM DESCRIBED ON THIS
PROCURED FROM THE VENDOR(S) LIS
APPROVED BY USAMERDC FOR USE IN
MAGNETIC, UNMOUNTED, LENSATIC, DIA
ACTIVATED LUMINOUS MATERIAL, IND
5 DEGREES AND 20-MIL GRADUATION
SUPSTITUTE ITEM SHALL NOT BE US
TESTING AND APPROVAL BY USAMERD

13219E0782	13208E4680
13219E0754	13208E4680
13219E0752	13208E4680
13208E4694	13208E4680
NEXT ASSY	USED ON
APPLICATION	
FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING. SEE ANS Y14.5	

DRAWING WHEN
TED HEREON IS
THE COMPASS,
L, TRITIUM
UCTION DAMPED,
S; SCALE. A
ED WITHOUT PRIOR
C.

ZONE	LTR	[redacted]	DATE	APPROVED
	A	SEE SOR	8 FEB 74	[illegible]

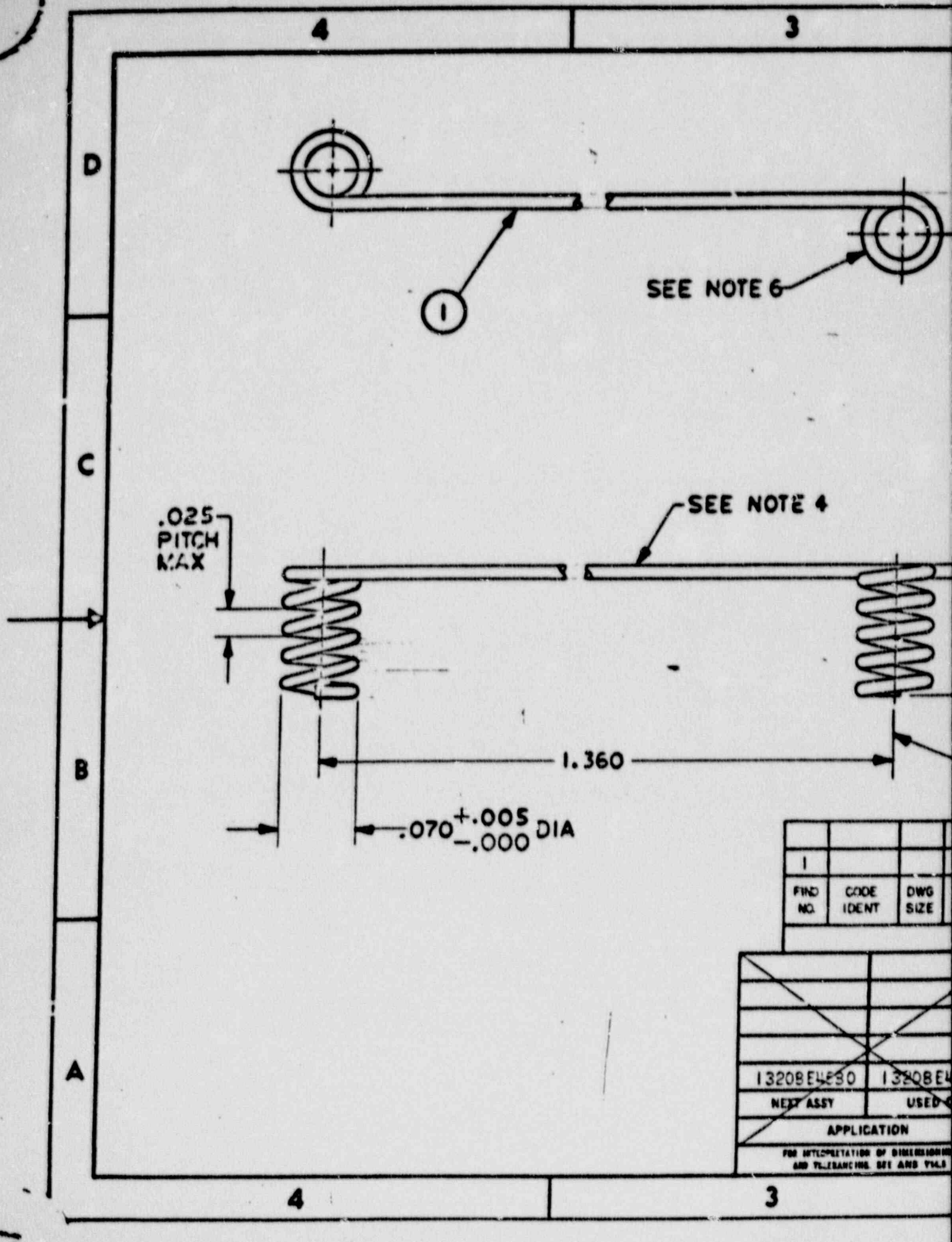
NOTES:

1. ADHESIVE-SEALANT [redacted] IN ACCORDANCE WITH MIL-A-[redacted] WITH PRIMER EXCEPT:
   TENSILE [redacted]
   ELONGATION [redacted]
   PEEL [redacted]
   WHEN APPLIED [redacted] MANUFACTURER'S INSTRUCTIONS [redacted] IN ACCORDANCE WITH MIL-A-[redacted].

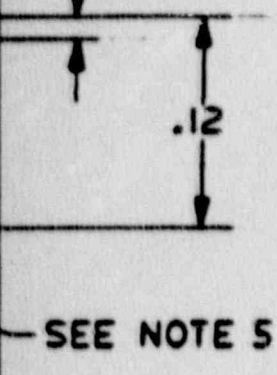
SOURCE CONTROL DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ANGLES ± — 3 PLACE DECIMALS ± — 2 PLACE DECIMALS ± —	DRAWN VECO (LRJ)	DATE 12 SEP 73	[redacted] EQUIPMENT COMMAND AND DEVELOPMENT [redacted] FORT BELVOIR, VA.
	CHECKED RSG	30 SEP 73	
DO NOT SCALE THIS DRAWING	DESIGN APPROVAL [redacted] COMMODITY ENGINEER		ADHESIVE-SEALANT
FILLET RADII — TO — SHARP EDGES — TO —	APPROVED FOR PRODUCTION [redacted] PRODUCTION ENGINEER		
MATERIAL: SEE NOTE 1	RELEASED FOR PROCUREMENT [redacted] CHIEF, ENGINEERING DEPT		[redacted] 13219E0787
			[redacted] SHEET 1 OF 1

2 1


4
3
D
C
B
A
1
SEE NOTE 6
SEE NOTE 4
.025
PITCH
MAX
1.360
.070 +.005 -.000 DIA
1
FIND NO.
CODE IDENT
DWG SIZE
1320BE4E30
NEXT ASSY
APPLICATION

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE NOR	14 AUG 72	BOB
	B	SEE NOR.	6 FEB 74	BOB



NOTES:

1. FINISH AFTER FORMING IN ACCORDANCE WITH B13219E9740.
2.
3.
4. WIRE SHALL BE STRAIGHT WITHIN .005 BETWEEN COILS.
5. COILS SHALL BE PARALLEL TO EACH OTHER AND PERPENDICULAR TO STRAIGHT PORTION WITHIN .010 OVER LENGTH OF COIL.
6. CUT OFF TAIL SHALL NOT PROTRUDE OUTSIDE OF COIL O.D. (BOTH COILS).

9002150284-41.

PART OR IDENTIFYING NO.	QTY REQD	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	MATERIAL
AL 510	AR	WIRE, .0126 DIA (28 GA) SPG. TEMP	ASTM B159	PH BRZ

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES ±
3 PLC. DECIMALS ± .005
2 PLACE DECIMALS ± .02
DO NOT SCALE THIS DRAWING
REMOVE BURRS AND BREAK SHARP EDGES
SHARP EDGES — °, —
FILLET RADII — TO —
MATERIAL

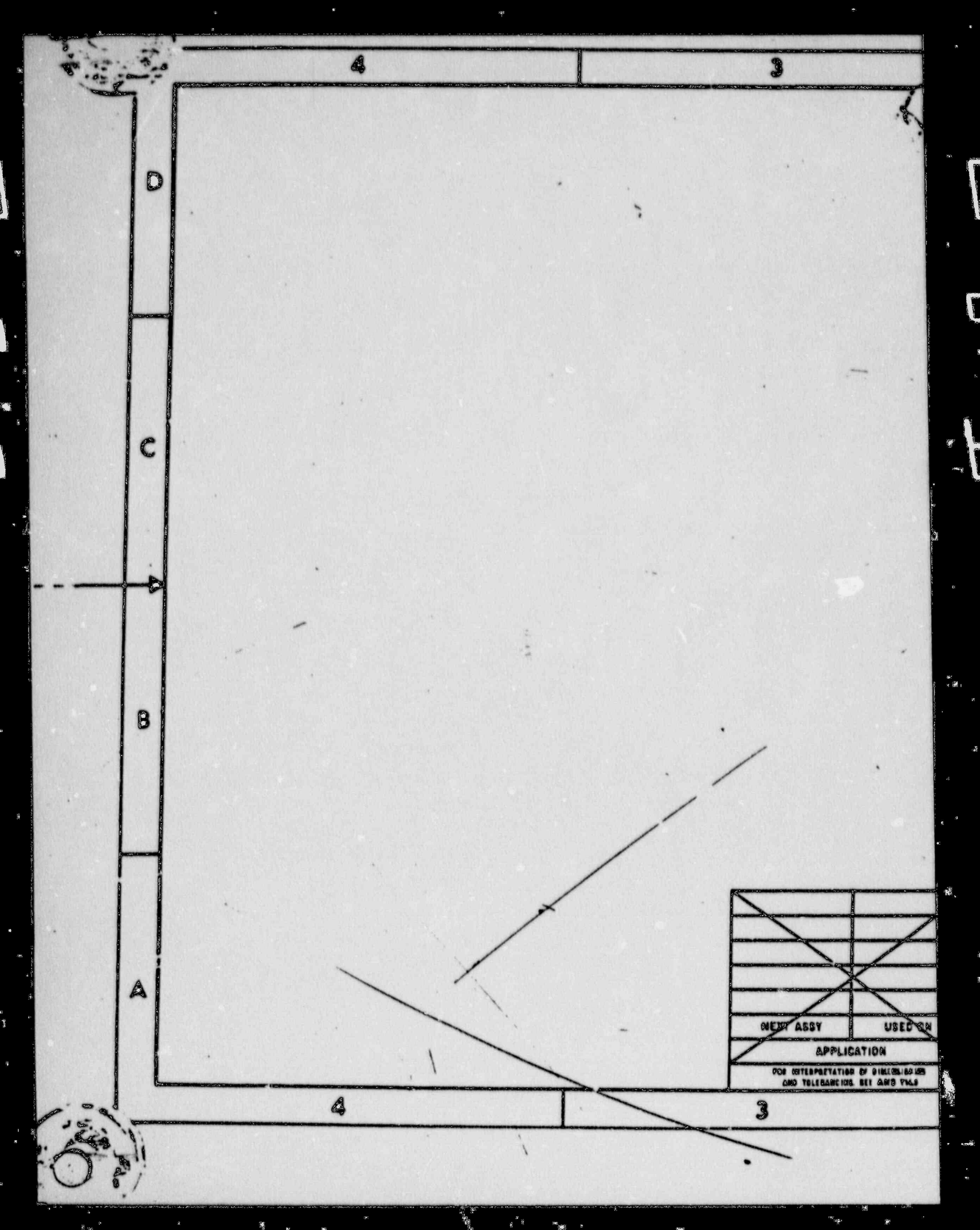
DRAWN ADC (TWA) DATE 1 FEB 72
CHECKED ADC RKD 1 FEB 72
DESIGN APPROVAL Kenneth D. Traveller PRINCIPAL ENGINEER
APPROVED FOR PRODUCTION Loyalton A. Bird PRODUCTION ENGINEER

U.S. ARMY MOBILITY COMMAND
MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT CENTER
FORT BELVOIR, VIRGINIA 22060

SIGHT WIRE

SIZE	CODE IDENT NO.	
B	97403	13219E3959

SCALE 10/1 SHEET 1 OF 1


4
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NEXT ASSY
USED ON
APPLICATION
FOR INTERPRETATION OF DIMENSIONS
AND TOLERANCES SEE ANSI Y14.5
4
3

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

NOTES:

1. PROCEDURE:
   - A. DEGREASE IN TRICHLORDETHYLENE AND DRY.
   - B. PLACE IN ONE TO ONE HYDROCHLORIC ACID AT AMBIENT TEMPERATURE FOR 5 TO 10 MINUTES.
   - C. RINSE THOROUGHLY IN RUNNING WATER.
   - D. PLACE FOR APPROXIMATELY 10 MINUTES IN A 200 DEGREE FAHRENHEIT BATH FORMULATED WITH 15 PERCENT SODIUM HYDROXIDE, 5 PERCENT SODIUM CHLORITE AND 80 PERCENT WATER.
   - E. RINSE THOROUGHLY IN RUNNING WATER AND DRY.
2. FINISHED PARTS SHALL MEET THE REQUIREMENTS OF MIL-F-495.

9002150284-42

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES: ANGLES ± ——
3 PLACE DECIMALS ± ——
2 PLACE DECIMALS ± ——

DO NOT SCALE THIS DRAWING

REMOVE BURRS AND BREAK SHARP EDGES
SHARP EDGES —— TO ——
FILLET RAD!! —— TO ——

MATERIAL ——

DRAWN (LJS) DATE 1 AUG 72
CHECKED (JAA) 1 AUG 72
MILITARY APPROVAL Kenneth D. Lowell COORDINATING ENGINEER
APPROVED FOR PRODUCTION Stephen A. Bird QUALITY PRODUCTION ENGINEER
RELEASED FOR PROCUREMENT
CHIEF, ENGINEERING LAB.

U.S. ARMY MOBILITY COMMAND
MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT CENTER
FORT BELVOIR, VIRGINIA 22060

BLACKENING PROCESS, COPPER BASE ALLOYS

SIZE	CODE IDENT NO.	
B	97403	13219E9740

1 AUG 1972 | SCALE NONE | SHEET 1 OF 1

MIL-C-10436L
15 May 1987
SUPERSEDING
MIL-C-0010436K(ME)
14 March 1986 and
USED IN LIEU OF
MIL-C-10436J
12 February 1974

MILITARY SPECIFICATION

COMPASS, MAGNETIC, UNMOUNTED: LENSATIC, LUMINOUS, 5 DEGREE AND 20 MIL GRADUATIONS

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

1. SCOPE

1.1 Scope. This specification covers an induction-damped, tritium excited, luminous dial, lensatic, unmounted magnetic compass, 5 degree and 20 mil graduations. It is designed for individual issue and for intended use as described in section 6 of this specification.

1.2 Purpose. The purpose of the specification is to standardize the preparation of the compass and associated documentation.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA Belvoir Research, Development, and Engineering Center, ATTN: STRBE-TSE, Fort Belvoir, VA 22060-5606 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

AMSC N/A

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FSC 6605

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

L-P-387 • Plastic Sheet, Laminated, Thermosetting (For Designation Plates).
PPP-B-601 • Boxes, Wood, Cleated-Plywood.
PPP-B-636 • Boxes, Shipping, Fiberboard.

MILITARY

MIL-T-704 • Treatment and Painting of Materiel.
MIL-C-43745 • Case, Field, First Aid Dressing-Unmounted, Magnetic Compass, LC-1.

STANDARDS

FEDERAL

FED-STD-313 • Material Safety Data Sheets, Preparation and the Submission of.

MILITARY

MIL-STD-105 • Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129 • Marking for Shipment and Storage.
MIL-STD-889 • Dissimilar Metals.
MIL-STD-1186 • Cushioning, Anchoring, Bracing, Blocking and Waterproofing with appropriate Test Methods.

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DEPARTMENT OF INTERIOR, U.S. GEOLOGICAL SURVEY

ISOGONIC CHARTS

Epoch 1980 Map No. 11283 Magnetic Declination of the U.S.
Epoch 1980 Map No. 11370 Magnetic Total Intensity of the U.S.
Epoch 1975 Map No. 1914 Magnetic Vertical Intensity of the U.S.

Epoch 1975 Map No. 1913 Magnetic Horizontal Intensity of the U.S.

(Application for copies should be addressed to the Map Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225.)

NATIONAL BUREAU OF STANDARDS (NBS)

NBS Handbook 116 American National Standard N540 - Classification of Radioactive Self-Luminous Light Sources.

(For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Order by SD Catalog No. C13.11:116).

CODE OF FEDERAL REGULATIONS

Title 10 (Nuclear Regulatory Commission)

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

DRAWINGS

ME

TA13208E4680	Compass, Magnetic, Unmounted: Lensatic, Luminous Dial, Tritium Excited, Induction-Damped, 5 Degree and 20 Mil Graduations, with Carrying Case.

(Copies of specifications, standards, drawings, publications, and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting 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 specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the non-Government documents which is current on the date of the solicitation.

CAMBRIDGE UNIVERSITY PRESS

CIE Proceedings - 1931

(Application for copies should be addressed to the Cambridge University Press, 32 East 57th Street, New York, NY 10022.)

(Non-Government standards and other publications are normally available from

the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The compass shall be as shown on top assembly TA13208E4680, and shall be as specified herein.

3.1.1 Drawings. The drawings forming a part of this specification are magnetic compass and vial drawings. No deviation from dimensions, tolerances, materials, or processes coded as quality assurance provisions (QAPs), no deviation from specified materials, and no deviation from drawings defining vials to contain radioactive material are permissible without prior approval of the contracting officer. Any data (e.g. shop drawings, layouts, flow sheets, processing procedures, etc.) prepared by the contractor or obtained from a vendor to support fabrication and manufacture of the production item shall be made available, upon request, for inspection by the contracting officer or his designated representative.

3.2 First article. Unless otherwise specified (see 6.2), the first article shall be subjected to inspection (see 4.4 and 6.3). Any changes or deviations of compasses from the approved first article during production will be subject to the approval of the contracting officer. Approval of the first article shall not relieve the contractor of his obligation to furnish compasses conforming to this specification.

3.2.1 Pilot model. The approved first article shall be a pilot model. Any changes or deviations from the pilot model during production shall be subject to the approval of the contracting officer. Approval of the first article as a pilot model will not relieve the contractor of his obligation to furnish compasses that conform to all requirements of this specification.

3.2.2 Nuclear Regulatory Commission license. The contractor shall obtain a specific license from the Nuclear Regulatory Commission to manufacture and distribute tritium excited luminous sources in the form prescribed on the drawings and Title 10 (Nuclear Regulatory Commission) of the Code of Federal Regulations. The first article shall not be submitted for test until the contractor possesses this license. The license shall be made available for review by the contracting officer or the contracting officer's representative.

3.3 Material. Material shall be as specified herein and as shown on the applicable drawings. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.3.1 Material deterioration prevention and control. The item(s) shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration that may be encountered in any of the applicable operation and storage environments to which the item may be exposed.

3.3.2 Dissimilar metals. Dissimilar metals shall not be used in intimate contact with each other unless protected against galvanic corrosion. Dissimilar metals and methods of protection are defined and detailed in MIL-STD-889.

3.3.3 Identification of materials and finishes. The contractor shall identify the specific material, material finish or treatment for use with component and subcomponent, and shall make information available upon request to the contracting officer or designated representative.

3.3.4 Luminous material. Luminous material shall consist of a phosphor and a phosphor exciter encapsulated in vials. The isotope hydrogen-3 (tritium) in the gaseous form shall be the phosphor exciter. The tritium gas shall be obtained from the Oak Ridge National Laboratory, Oak Ridge, Tennessee. The vials shall contain not more than one percent of tritium oxide and not more than six percent total impurities. (see 6.2).

3.3.4.1 Verification of luminous materials. When specified (see 6.2), the contractor shall provide 2 sets (see 6.6) of 7 vials for destructive evaluation of the vial and vial contents (see 6.7).

3.4 Neck lanyard. The contractor shall furnish a nylon endless circular neck lanyard with each compass. The lanyard shall be 60 inches ±2 inches in circumference and made of 3/32 inch diameter nylon cord. The lanyard shall be pigmented to approximate the color "green 383" cited in MIL-T-704.

3.5 Carrying case. A carrying case conforming to MIL-C-43745 shall be furnished with each compass. Markings on inside of flap may be omitted.

3.5.1 Instruction card. An instruction card with white lettering on a dark green field shall be moisture-sealed by laminating in clear plastic, 2-1/2 inches x 4 inches nominal size, in accordance with L-P-387, type GCP-F. An instruction card shall be inserted into each compass carrying case for user application. Additional instruction cards shall be provided as specified (see 6.2). Data printed legibly on cards shall be as follows:

INSTRUCTIONS:

(1) Rotate bezel ring until luminous line is lined up with luminous lines on cover.

(2) Turn ring counterclockwise to number of clicks required. Determine clicks by dividing azimuth desired by 3. Example: 51 degrees = 17 clicks counterclockwise.

(3) Turn compass until north arrow is directly under luminous line.

(4) Proceed forward in direction of front cover luminous sight lines.

3.6 Magnetic performance. The compass shall operate in a magnetic field with a horizontal component equal to the local standard ±0.01 oersted and vertical component of the local standard ±0.03 oersted (Continental United States). The local standards shall be established by U.S. Geological Survey (Department of the Interior) Epoch 1980 Map No. 11283, Magnetic Declination of the U.S.; Epoch 1980 Map No. 11370, Magnetic Total Intensity of the U.S.; Epoch 1975 Map No. 1914, Magnetic Vertical Intensity of the U.S.; and Epoch 1975 Map No. 1913, Magnetic Horizontal Intensity of the U.S., and shall be used during dial assembly balancing (see 3.7.6).

3.7 Mechanical performance. These tests shall be performed with the compass in the operational position, and away from all magnetically attracting metals external to the compass.

3.7.1 Shock. The compass, shall not be damaged when dropped twice, once face up and once on its side from a height of 3 feet onto a sand-covered solid surface (see 4.6.3.3.1).

3.7.2 Damping. The magnetic assembly shall come to rest within 6 seconds of time after being deflected 540 mils ±20 mils from the equilibrium position (see 4.6.3.3.2).

3.7.3 Freedom of rotation when tilted. The dial and magnet assembly shall remain free when the compass is tilted 8 degrees ±0.1 degree from the horizontal and rotated 360 degrees in a plane normal to the longitudinal axis of the pivot, when tested as specified in 4.6.3.3.3.

3.7.4 Compass error and magnetic performance. The error in magnetic azimuth, including that caused by pivot friction, shall be not more than 40 mils (see 4.6.3.3.4).

3.7.5 Friction error. The error caused by friction between the pivot and jewel shall be not more than 20 mils (see 4.6.3.3.5).

3.7.6 Dial assembly balance. The dial assembly shall be balanced after the needle is magnetized, and self-luminous sources installed (see 4.6.3.3.3).

3.7.7 Low and high temperatures. Complete compasses shall show no evidence of damage, and when the compass is opened at the low and high temperatures, the dial shall seek north and rotate smoothly and freely (see 4.6.3.3.6).

3.7.8 Water leakage. The complete compass shall be capable of being submerged into water without any evidence of leakage into the bowl assembly (see

3.7.9 Impact. When tested as specified in 4.6.3.3.9, the vials shall show no evidence of leakage, breaking, checking, shattering or spalling.

3.8 Luminosity working standards.

3.8.1 Photometer standards. When specified (see 6.2), the contractor shall furnish to the Government, 16 luminous source standards for photometer standardization. The standards shall be manufactured by the vial tube manufacturer. The standards shall be flat glass tubes, 0.6 to 1.0 inch square by a maximum of 0.2 inch thick. One of the square surfaces of each tube shall be painted white, and upon drying, the white paint shall be covered with black paint. The outer surface of the other side of each tube shall be a natural clear surface. The tube shall contain the same self-luminous material as required on applicable drawings and as specified in 3.3.4. The tubes shall emit a dominant wave length of 530 nanometers (nm) ±30 nm. The luminosity of each tube shall not vary by more than 5 percent across the clear flat surface and the luminosity intensities shall be as follows:

a. Eight tubes - 80 microlamberts ±12 microlamberts
b. Eight tubes - 120 microlamberts ±18 microlamberts

These standards shall be used for photometer standardization and shall be recertified at intervals not to exceed six months. The total activity of the radioactive inventory shall be furnished to the Commander, U.S. Army Belvoir Research, Development and Engineering Center, ATTN: STRBE-VR, Fort Belvoir, VA 22060-5606.

3.8.2 Compass standards. When specified (see 6.2), the contractor shall furnish Belvoir RD&E Center, two completely assembled compasses of known luminosity and activity, at the beginning of a contract and each six months thereafter. (If the interval between the last time the assembled compasses were submitted and the end of the contract is less than four months, the compasses may not be furnished.) Each assembled compass shall contain seven vials; four according to drawing 13219E0783, two according to drawing 13219E0785, and one according to drawing 13219E0784. Each vial shall age 30 days prior to being assembled into the compass. The luminosity of each of the compass vials will be measured at Belvoir RD&E Center, and returned to the contractor with the associated readings. These two compasses shall be used as standards during testing in 4.6.3.3.7. In the event there is a discrepancy in values, the Belvoir RD&E Center values shall be used.

3.9 Luminous vials.

3.9.1 Thermal shock. The luminous vials shall show no signs of degradation when tested in accordance with 4.6.3.1.1.

3.9.2 Brightness.

3.9.2.1 Vials. The brightness of the various luminous vials shall be as specified on the applicable drawings.

3.9.2.2 Assembled compasses. The brightness of the various luminous vials installed in the completed compasses shall meet the following minimum requirements when tested as specified in 4.6.3.1.2: front and rear sights, 75 microlamberts; north arrow, 75 microlamberts; east and west, 50 microlamberts; bezel, 75 microlamberts; bowl, 100 microlamberts. See 4.6.3.3.10.

3.10 Diffusion.

3.10.1 Vials, supplier. When a vial is submerged in a measured amount of distilled or deionized water for 24 hours at 23 ±5 °C, the tritium allowed to diffuse into water shall not exceed 0.025 microcuries /day, when tested as specified in 4.6.3.1.4.

3.10.2 Vials, installer. When a vial is submerged in a measured amount of distilled or deionized water for 24 hours at 23 ±5 °C, the tritium allowed to diffuse into the water shall not exceed 0.014 microcuries/day, when tested as specified in 4.6.3.2.2.

3.11 Compass radiological.

3.11.1 Contamination. When the completed compass is wiped as specified in 4.6.3.3.8.1, the disintegration rate per minute (dpm) shall be less than 900 dpm for the compass at the time of production.

3.11.2 Diffusion. The completed compass with all the luminous vials installed shall be submerged in 300 ml of distilled or deionized water for 24 hours at 23 ±5 °C. The tritium allowed to diffuse into the water shall not exceed 0.05 microcuries/day, when tested as specified in 4.6.3.3.8.2.

3.12 Markings.

3.12.1 Lot identification. Lot identification shall be rubber stamped with permanent type ink inside the cover of the compasses. The marking shall include year, month of manufacture and lot number, e.g. 86-2-002.

3.12.2 Radiation marking.

3.12.2.1 Specific license marking. The bottom of the compass shall be molded or metal stamped as required by applicable Nuclear Regulatory Commission Byproduct Materials License. It shall include the radiation caution symbol (not in color), quantity of isotope, the byproduct-materials license number, and appropriate control instructions of the using service (see 6.4). A warning against disassembly of the compass shall also be included.

3.12.2.2 Marking of a license exempt item. The bottom of the compass shall be molded or metal-stamped to include the Nuclear Regulatory Commission manufacturer's identification number, XXXmCi 3H (where XXX shall be replaced by the actual nominal activity), and "CONTROLLED DISPOSAL REQUIRED" (see 6.5). The cover of the compass shall be molded or metal-stamped to include the designated NSN (605-01-196-6971) for a license exempt item.

3.13 Government-loaned property. When specified (see 6.2), the Government will loan the contractor 8 of 80 microlambert and 8 of 120 microlambert source standards as specified in 3.8.1a and 3.8.1b (total of 16 tubes) for periods not to exceed six months. Also when specified (see 6.2), the Government will loan the contractor two compass standards as specified in 3.8.2 for periods not to exceed six months.

3.14 Workmanship. All parts, components, and assemblies of the compass including castings, molded parts, stampings, bearings, and machined surfaces shall be clean and free from dirt, oil, fins, pits, sprues, scale, flux, and other harmful extraneous material. All edges shall be rounded and beveled.

3.14.1 Threaded connections. All holes shall be drilled, or drilled and tapped, and all burrs and chips shall be removed. Screws shall be tight to properly seat components.

3.14.2 Bends. Bending of any metal parts as a result of manufacturing processes shall not result in fracturing or fissuring of the material.

3.14.3 Assembled vials. All luminous vials, after final assembly of the compass shall be free from extraneous paint, adhesive, or other foreign materials which reduce the luminosity.

3.15 Safety data sheet. Material safety data sheets shall be prepared in accordance with FED-STD-313 (see 6.2.1)

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance (4.5) does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Classification of inspections. Inspections shall be classified as follows:

a. In-process vial inspection (see 4.3).
b. First article inspection (see 4.4).
c. Quality conformance inspection (see 4.5).
d. Inspection of packaging (see 4.8).

4.3 In-process vial inspection.

4.3.1 Vial supplier's inspection.

4.3.1.1 Examination. All luminous vials shall be examined and tested as specified in 4.6.1.1. Any vial failing to pass examination shall be considered defective.

4.3.1.2 Tests.

4.3.1.2.1 Individual. All completed luminous vials shall be subjected to the tests specified in 4.6.3.1.1 and 4.6.3.1.3. These tests shall be conducted prior to performing examination 4.6.1.1.

4.3.1.2.2 Sample tests. A sample of luminous vials selected in accordance with 4.5.1, shall be tested as specified in 4.6.3.1.4. The sample shall consist of 125 standard samples as defined in 6.6.

4.3.2 Vial installer's inspection.

4.3.2.1 Examination. All luminous vials shall be examined as specified in 4.6.1.2. Any vial failing to pass any examination shall be considered defective.

4.3.2.2 Tests.

4.3.2.2.1 Vials. All luminous vials shall be tested as specified in 4.6.3.2. Nonconformance to these tests shall constitute failure of that vial only.

4.4 First article inspection. (First article compasses shall consist of 10 completely assembled units as described in 6.3.)

4.4.1 Compass brightness. After the compasses have been dark adapted for 1 hour, the brightness of each vial in each completely assembled first article compass shall be determined as specified in 4.6.3.3.7. Failure to meet the brightness limits as specified in 3.9.2 shall constitute failure of this test and shall be cause for rejection of the first article compasses.

4.4.2 Examination. The first article compasses shall be examined as specified in 4.6.1.3. Presence of one or more defects shall be cause for rejection of the first article compasses.

4.4.3 Tests. The first article compasses shall be tested as specified in table I, groups A and B. Failure of any test shall be cause for performing the inspection specified in 4.4.4.

TABLE I. Test schedule.

	Test Paragraph	Requirement Paragraph
GROUP A		
Shock.	4.6.3.3.1	3.7.1
High and low temperature.	4.6.3.3.6	3.7.7
Damping.	4.6.3.3.2	3.7.2
Freedom of rotation when tilted /Dial assembly balance.	4.6.3.3.3	3.7.3, 3.7.6
Compass error and magnetic performance.	4.6.3.3.4	3.7.4
Friction error.	4.6.3.3.5	3.7.5
Impact.*	4.6.3.3.9	3.7.9
GROUP B		
Luminosity.	4.6.3.3.7	3.9.2.2
Contamination.**	4.6.3.3.8.1	3.11.1
Diffusion and water leakage.	4.6.3.3.8.2	3.7.8, 3.11.2
Final luminosity	4.6.3.3.10	3.9.2.2

* To be performed during first article testing only.
** To be performed prior to group A testing for both first article and production compasses.
NOTE: No reduced inspection allowed on contamination, or diffusion and water leakage tests.

4.4.4 Disassembly inspection. Failure of any test by the first article models shall be cause for disassembly, in the presence of a Government representative, of the first article models to the extent necessary to determine the cause of the failure. Each disassembled part shall be examined in detail for compliance with this specification and referenced drawings in regard to materials, dimensions, tolerances, and workmanship. Parts not complying with such requirements shall be cause for rejection of all the first article compasses.

4.5 Quality conformance inspection.

4.5.1 Sampling. Sampling for examination and tests shall be in accordance with MIL-STD-105, general inspection level II, lot size 3200, code letter K (sample size 125), AQL 2.5% defective, single sampling plan. Selection of the 125 samples shall be made using a random number generator/source.

4.5.2 Examination.

4.5.2.1 Individual examination. Each production compass product shall be

compared to an approved first article model by examination in a darkroom for uniformity of light, proper source alinement, and adhesive bonding, after the compasses have been dark adapted for a period of not less than 1 hour. The absence of light uniformity as compared to an approved first article model, or improper source alinement or bonding shall constitute failure of that compass only. In cases of question, the luminosity of the vial shall be determined as specified in 4.6.3.3.7. Failure of one or more vials to meet the brightness limits as specified in 3.9.2.2 shall constitute failure of that compass only.

4.5.2.2 Samples. Samples selected in accordance with 4.5.1 shall be examined as specified in 4.6.1.3.

4.5.3 Tests.

4.5.3.1 Samples. Samples selected in accordance with 4.5.1 shall be tested as specified in table I, groups A and B (4.4.3). Any sample failing to pass any test shall be considered defective. At the option of the contracting officer, group B tests may be conducted by the Government at a Government installation (see 6.2).

4.6 Inspection procedure.

4.6.1 Examination.

4.6.1.1 Vial supplier's examination. All vials shall be examined at the place of manufacture after the thermal shock and brightness tests have been performed, for the following defects:

101. Luminous vial material not as specified.
102. Complete interior surface of vial not coated as specified.
103. Luminous vial dimensions not as specified.
104. Nuclear Regulatory Commission license missing.

4.6.1.2 Vial installer's examination. After installation of luminous vials to component parts, the vials shall be examined by the installer, for the following defects:

105. Adhesive for bonding luminous vials not as specified.

106. Installed luminous vials not located or bonded properly on the component part.

4.6.1.3 Compass examination. The completed compass shall be examined after performing the tests in 4.6.2 for the following defects:

107. Index line on the capsule cover not fixed; and when compass is sighted on a known magnetic azimuth, the compass does not read within 40 mils of known azimuth. This may be accomplished during compass error test, 4.6.3.3.4.
108. The bezel crystal does not remain in a fixed position relative to the

bezel ring.

109. Compass cover, thumb loop, and lens bracket do not remain in desired position, or lens bracket does not move independently with thumb loop held.
110. Detent spring does not permit distinct individual detent action, or bezel is not secure against accidental rotation.
111. Retaining ring does not permit required rotation or does not secure bezel assembly to the case.
112. Lifting mechanism does not operate uniformly, contacts pivot, or does not hold dial assembly against capsule cover when compass is closed, or does not release dial assembly when lens bracket is opened 35 degrees or more from the bezel crystal.
113. Materials not as specified.
114. Identification or special markings incorrect, illegible, or missing.
115. Treatment and painting not as specified.
116. Dimensions not as specified, or assembly incorrect.
117. Dial assembly not balanced.
118. Workmanship not as specified.
119. Tritium excited sources not installed in true position and bonded correctly.
120. Sightwire not tight, in place, or more than 0.005 inches above surface of the cover.
121. Light sources not uniform in intensity when visually examined.
122. When compass is fully open, gap between case and cover on scale side is not between 0.004 and 0.015 inches wide.
123. Bottom surfaces of the case and cover not within 0.015 inches of the same plane.
124. The edge of the scale on the case and cover not within 0.030 inches of the same plane.
125. Instruction card not as specified.
126. Materials are not resistant to corrosion or deterioration, or treated to be made resistant to corrosion or deterioration for the applicable storage and operating environment as specified.
127. Dissimilar metals of MIL-STD-889 are not effectively insulated from each other as specified.
128. Contractor does not have documentation available for identification of material, material finishes, or treatments.
129. Material Safety Data Sheet not prepared in accordance with FED-STD-313.

4.6.2 Test [illegible]. The [illegible] as specified herein, to the [illegible] groups A and B (4.4.3) shall be performed on the sequences specified, unless otherwise specified.

4.6.3 Test procedure.

4.6.3.1 In-process test procedure of vial supplier.

4.6.3.1.1 Thermal shock. All luminous vials shall be subjected to [illegible] continuous cycles of thermal shock. Begin the cycle by immediately placing the

vials in a temperature of -52 ±2 °C for 15 minutes. Immediately remove the vials from the cold environment to a temperature of 68 ±3 °C for another 15 minutes. This completes one cycle. After the final cycle the vials shall be returned to room temperature. The vials shall be tested as specified in 4.6.3.1.3.

4.6.3.1.2 Brightness. All brightness tests shall be determined by the photoelectric photometry method which is corrected for phototopic vision (1931 CIE color matching function). The contractor's photometer shall be standardized using the luminous working standards (see 3.8) that were standardized within the previous six months.

4.6.3.1.3 Brightness vials. After each luminous vial has been dark adapted for not less than 1 hour, it shall be examined for brightness. Each vial shall be visually compared with acceptable standard vials of known luminosity (see 3.8.1) for proper brightness. Vials with questionable luminosity shall be discarded. Failure to meet the brightness limits as specified in 3.9.2.1 shall constitute failure of the vial only.

4.6.3.1.4 Vial supplier's diffusion test. The vial supplier shall perform a diffusion test on all sample units. The lot sample of vials shall be submerged in a covered container in a measured amount of distilled or deionized water for 24 hours at 23 ±5 °C. The water shall be analyzed for its radioactive content according to 4.6.3.1.5. A lot sample having a radioactive content exceeding 0.025 microcuries/day shall be cause to divide the lot sample into groups of 10 and retested. Any group that exceeds 0.025 microcuries/day shall be divided into single vials and retested. Any single vial exceeding 0.025 microcuries/day shall be rejected and require a test of another complete sample.

4.6.3.1.5 Diffusion test - accuracy and procedures. The analysis of tritium content in the diffusion test shall be made with a scintillation counter. The system calibration shall be established using quenched standards. Total system plus standards errors in the standardization shall not be in excess of 10 percent. Efficiencies of the unknown samples shall be established by the channels-ratio method, the external channels-ratio method, or the "H" number method of quench compensation. Counting time shall be established as such that at the test limits, the error (1 standard deviation) shall not be greater than 15 percent. The scintillation solution shall consist of a liquid scintillation grade of toluene with 8 grams/liter toluene of butyl PBD, 0.5 percent grams/liter PBBO, and 10 percent Beckman biosolve solubilizer BBS3 or any commercial acceptable liquid scintillation cocktail. The counting bottles shall be a low potassium liquid scintillation borosilicate glass bottle or polyethylene liquid scintillation vial. When polyethylene scintillation vials are used, a set of quench standards traceable to the National Bureau of Standards shall be made up in the polyethylene vials to determine efficiency. If the quench standards are in glass bottles, a correction factor shall be determined so that the correct results will be obtained from samples in polyethylene scintillation vials.

4.6.3.2 In-process test procedures at vial installer.

4.6.3.2.1 Vials, darkroom. After the luminous vials have been dark adapted for

not less than 1 hour, they shall be inspected for dead or dim vials which are to be discarded. In cases of question, the luminosity of the vial shall be determined as specified in 4.6.3.1.2. A nonconforming vial shall constitute failure of that vial only.

4.6.3.2.2 Vial installer's diffusion test. The vial installer shall perform a diffusion test prior to installing vials into the component parts of the compass. This test shall be performed on 100 percent of the vials. A group of 100 vials shall be submerged in a covered container in a measured amount of distilled or deionized water for 24 hours at 23 ±5 °C. The water shall be analyzed for its radioactive content according to 4.6.3.1.5. A group of 100 vials having a radioactive content exceeding 0.04 microcuries/day shall require the group to be divided into smaller groups of 10 and retested. Any group of 10 that exceeds 0.04 microcuries/day shall be divided into single vials and retested. Any single vial exceeding 0.04 microcuries/day shall be rejected.

4.6.3.3 Test procedure for completed compass. (see 4.5.3.1).

4.6.3.3.1 Shock. The compass in the open position shall be dropped twice from a height of 3 feet onto a solid surface, covered with 4 inches of 40 grit sun-dried sand. The sand may be covered with a sheet of plastic not greater than 2 mils thick. The compass shall hit the sand or plastic face up on one drop and edgewise on the second. Any evidence of damage to the compass or failure to operate as specified herein shall constitute failure of this test.

4.6.3.3.2 Damping. The compass magnet shall be deflected 540 mils ±20 mils from the equilibrium position and released. Time required to come to rest in excess of 6 seconds shall constitute failure of this test.

4.6.3.3.3 Freedom of rotation when tilted. The compass shall be tilted 8 degrees ±0.1 degree from the horizontal and uniformly rotated 360 degrees at approximately 10 seconds of time per revolution in a plane normal to the longitudinal axis of the pivot. The compass shall be rotated 1 complete revolution in the clockwise direction and 1 revolution in the counterclockwise direction. The lens bracket end of the compass shall be in the using position during this test. Inability of the dial or magnetic assembly to remain free while being rotated shall constitute failure of this test.

4.6.3.3.4 Compass error and magnetic performance. The compass shall be placed in a horizontal position on a fixed point, and by means of the sighting slot and wire, the compass shall be sighted on three targets of known magnetic azimuths approximately 120 degrees apart. Without tapping the compass, the dial shall be read under the index line on the capsule crystal, using the magnifier. The difference between the known azimuths and readings taken is the compass error. An error in excess of 40 mils or failure of the compass to function correctly shall constitute failure of this test.

4.6.3.3.5 Friction error. The compass dial assembly shall be magnetically deflected 40 mils ±5 mils by an external force acting in the horizontal plane of the compass card. The needle shall be permitted to come to rest. The external

force shall then be removed in a radial direction in the same horizontal plane. The compass dial shall then be read. The procedure shall be repeated by deflecting the magnet 40 mils ±5 mils in the opposite direction. One-half difference between the two readings is the friction error. An error in excess of 20 mils shall constitute failure of this test.

4.6.3.3.6 Low and high temperature. The completed compass shall be subjected to one complete cycle each of both low and high temperature operation. The compass in its closed position shall be subjected to a temperature of -44 ±2 °C for a period of 30 minutes without the benefit of solar radiation. After this period and at this temperature the compass shall be opened and examined. The compass shall then be closed, and after stabilizing at room temperature, shall be subjected to a temperature of 68 ±3 °C for a period of 30 minutes. After this period and at this temperature the compass shall be opened and examined. After examination at both low and high temperature tests, any evidence of damage or failure of the compass dial to seek north and rotate smoothly and freely, shall constitute failure of this test.

4.6.3.3.7 Luminosity. After the compass has been dark adapted for not less than 1 hour, it shall be examined visually for dead or dim vials. The compass shall be visually compared to an acceptable standard compass of known luminosity (see 3.8.2). If the compass has any dead or dim vials it shall be considered a failure. In cases of question, the luminosity of the vials shall be determined as specified in 4.6.3.1.2. A compass containing any vials not conforming to 3.9.2.2 shall constitute failure of this test.

4.6.3.3.8 Radiological.

4.6.3.3.8.1 Contamination. A piece of Whatman-50 filter paper, or equivalent, moistened with deionized or distilled water shall be used to wipe the compass. All exterior surfaces of the opened completed compass (unit's usable position) shall be thoroughly wiped with the filter paper. The amount of tritium contamination on the filter paper shall be determined by using a liquid scintillation counting technique. The paper shall be placed in the liquid scintillation solution within one minute after wiping the compass. The liquid scintillation counting system shall have sufficient sensitivity to measure 100 picocuries or less of tritium. This test shall be performed by the contractor prior to the performance of the table I, group A tests. The contractor shall furnish filter paper, solution, and bottles. The scintillation solution shall be as specified in 4.6.3.1.5. The bottles shall be as specified in 4.6.3.1.5. The test solution in the bottle with the used filter paper inside shall be identified with the sample compass it represents by the use of a waterproof marking system on the bottle. The five compasses and their corresponding contamination wipes shall be forwarded to Belvoir RD&E Center, ATTN: STRBE-VR, for liquid scintillation counting. Disintegration rate of more than 900 dpm per compass shall constitute failure of this test.

4.6.3.3.8.2 Diffusion and water leakage. The completed compass with all the luminous sources installed shall be submerged in 300ml of distilled or deionized water for 24 hours at 23 ±5 °C. The compass shall be removed from the water.

The water shall be analyzed in accordance with 4.6.3.1.8. This is the test procedure for tritium diffusion, and if the radioactive content of the water exceeds 0.1 microcuries/day, it shall constitute failure of the test. The compass also shall be examined for water leakage, and if there is water in the compass bowl at the completion of the test, it shall constitute failure of the water leakage test. Failure of the compass of either of these tests shall be cause for refusal by the Government to continue acceptance of the production compasses until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiencies.

4.6.3.3.9 Impact. Unless otherwise specified (see 6.2), the first article compasses only shall be subjected to the performance testing procedures of Chapter 7 of National Bureau of Standards Handbook 116, Test Level 2. Nonconformance to 3.7.9 shall constitute failure of this test. Damage to the compass, other than the vial, does not constitute failure of this test.

4.6.3.3.10 Final luminosity. At the completion of the Government verification testing of the five compasses from each lot (4.6.3.3.11), a luminosity measurement of all the compass self-luminous sources shall be performed at the Belvoir RD&E Center in accordance with 4.6.3.1.2. A compass containing any vials not conforming to 3.9.2.2 shall constitute failure of this test. The results of these measurements shall be identified by compass and become the property of Belvoir RD&E Center.

4.6.3.3.11 Government verification testing. The contracting officer shall require the contractor to furnish completed compasses to Belvoir RD&E Center for Government verification testing as follows:

a. Twenty compasses shall be randomly selected using a random number generator/source, from the first 200 production compasses of a lot. These 20 compasses will be tested by the Government in accordance with this specification. Failure [illegible] of the 20 shall be cause for rejecting the 200 production compasses and refusal by the Government to continue acceptance of production compasses until evidence has been provided by the [illegible] corrective action has been taken to eliminate the deficiencies. [illegible] ter testing has been completed, 10 of the [illegible] to the contractor along with re[illegible] ment for comparative [illegible]

b. Five co[illegible] selected using a random n[illegible] generator/[illegible] n lot of 3,20[illegible] contamina[illegible] and luminosity [illegible] Government in accordance wit[illegible] specificatio[illegible]). These 5 comp[illegible] shall not have be[illegible]ously selected in any sample, but shall be ch[illegible] from the rem[illegible] compasses of the lot. There shall be no substituting. The contractor shall perform a contamination wipe test on the 5 compasses. [illegible] compasses shall not be [illegible] or cleaned in any way following the test. [illegible] ne comp[illegible] and wipes shall be forwarded to Belvoir RD&E Cente[illegible]. Upon com[illegible] the stated

tests, the Government will notify the contractor of the results within 7 working days. Failure of any of the 5 compasses shall be cause for refusal by the Government to continue acceptance of the production compasses until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiencies.

4.7 Inspection comparison. The government may select compasses at any time during the contract production period and subject these compasses to the examination specified in 4.6.1.3 and the test specified in table I, groups A and B (4.4.3), to determine conformance to the requirements of this specification. The inspection will be performed by the Government, at a site selected by the Government, on units selected at random from those which have been accepted by the Government and will not include the previously inspected first article model compasses. In addition to any test specified as part of the inspection comparison, the Government reserves the right to conduct any and all other tests contained in this specification as part of the inspection comparison, and failure of such additional tests shall have the same effect as failure of these tests specified as inspection comparison.

4.8 Inspection of packaging

4.8.1 First article pack inspection. The first article pack shall be examined for the defects specified in 4.8.2.3. Presence of one or more defects shall be cause for rejection of the first article pack. Any deficiencies shall be corrected and the pack re-examined for conformance to this specification.

4.8.2 Quality conformance inspection of packaging.

4.8.2.1 Unit of product. For the purpose of inspection, a completed pack prepared for shipment shall be considered a unit of product.

4.8.2.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105.

4.8.2.3 Examination. Samples selected in accordance with 4.8.2.2 shall be examined for the following defects. AQL shall be 1.0 percent defective.

130.	Preservation not as specified (see 5.2).
131.	Assembled compasses not intermediate packed as specified (see 5.3).
132.	Assembled compasses not packed as specified for level A, B and C. (see 5.4.2, 5.4.3, and 5.4.4).
133.	Marking not as specified (see 5.5).
134.	Special marking not as specified (see 5.5).

5. PACKAGING

5.1 First article pack. The contractor shall furnish a first article pack for examination within the time frame specified (see 6.2), to prove prior to starting production packaging, that the applied packing and marking comply with requirements of this specification. Examination shall be as specified in Section 4 and shall be subject to surveillance and approval by the Government (see 6.4). The first article pack may be accomplished by utilizing either a first article compass or production compass. When the first article compass is utilized, and the Government requests a comparison between the first article compass and the production compass, any packing shall be removed by the contractor at no expense to the Government.

5.2 Preservation. Each assembled compass, complete with neck lanyard and instruction card, shall be enclosed inside the carrying case, and the carrying case flap closed and snapped.

5.3 Intermediate packing. Each assembled compass, preserved as specified in 5.2, shall be intermediate packed in quantities of 20 in a fiberboard box conforming to PPP-B-636, type CF, class weather resistant, variety SW, style optional, grade W5C. The box shall be closed and waterproofed.

5.4 Packing. The packing for the assembled compass shall be level A, B, or C as specified (see 6.2). Packing of vials only shall be as specified in 5.4.1.

5.4.1 Vials. Vials to be shipped for testing only to the Belvoir RD&E Center, shall be packed in the quantity specified (see 6.2) in accordance with applicable Nuclear Regulatory Commission Regulations.

5.4.2 Level A. Five intermediate packs (see 5.3) (quantity of 100 compasses) shall be packed in close fitting boxes conforming to PPP-B-601, overseas type, style optional. Strapping in accordance with the box specification shall be class 1, finish B. Any cushioning, anchoring or blocking and bracing shall be in accordance with MIL-STD-1186.

5.4.3 Level B. Five intermediate packs (see 5.3) (quantity of 100 compasses) shall be packed in close fitting boxes conforming to PPP-B-636, type CF, class weather resistant, variety SW, style optional, grade V3C. Strapping shall be in accordance with box specification except that round wire strapping shall not be used. Any cushioning, anchoring or blocking and bracing shall be in accordance with MIL-STD-1186.

5.4.4 Level C. Five intermediate packs (see 5.3) (quantity of 100 compasses) shall be packed in snug fitting boxes conforming to PPP-B-636, type CF, class domestic, variety SW, style optional, grade 275. Enclosure of boxes shall be in accordance with box specification. The items shall be cushioned or blocked so that there is no movement inside the box.

5.5 Marking. Intermediate packs and shipping boxes shall be marked in accordance with MIL-STD-129. All intermediate packs shall have appropriate radioactive labels on them. In addition to the marking requirements of MIL-STD-129, the following special marking shall be included on each intermediate

pack and shipping box:

"Storage of compasses in any one location, such as one warehouse section, shall be limited to 20,000 compasses."

6. NOTES

6.1 Intended use. The compasses, with radioactive vials to facilitate use during periods of darkness, are for obtaining magnetic azimuths for ground navigation, reconnaissance, and fire control purposes.

6.2 Ordering data. Procurement documents should specify the following:

a. Title, number, and date of this specification.
b. When first article tests are not required (see 3.2.1).
c. When 2 sets of 7 compass vials of luminous material are required, see 3.3.4.1 and 6.7).
d. When 16 photometer standards are required (see 3.8.1 and 6.7).
e. When 2 compasses are required as standards (see 3.8.2).
f. Government loaned property (see 3.13 and 6.7).
g. When the Government will conduct any or all of the first article model examinations and tests. When the Government will conduct some but not all of the first article examination and test, the contracting officer should specify which examination and tests will be conducted by the Government and which examination and tests shall be conducted by the contractor (see 3.2).
h. When the Government will conduct group II testing (see 4.5.3.1).
i. When contamination test counting will be performed at Fort Belvoir, (see 4.6.3.3.8.1).
j. Number of additional instruction cards required (see 3.5.1).
k. Whether marking of compasses are to be for specific licenses or for general licenses (see 3.12.2.1 and 3.12.2.2).
l. When the impact test is not required (see 4.6.3.3.9).
m. Addresses for submittal of Material Safety Data Sheets (see 6.2.1).
n. Time frame for submission of first article pack (see 5.1).
o. Level of packing required (see 5.4).
p. Quantity of vials required (see 5.4.1).
q. When chemical agent resistant coating (CARC) is specified.

6.2.1 Material safety data sheet. Since the specification describes a product which contains a hazardous (radioactive) material, a Material Safety Data Sheet shall be prepared in accordance with FED-STD-313. One copy shall be submitted to the Contracting Officer, address as specified (6.2). In addition, a copy shall be provided to the Military Service or Federal department/agency address in 20.5 of FED-STD-313, of the same service or agency that purchased the item.

6.2.2 Disposal of radioactive waste. Dispose of radioactive waste material in accordance with AR700-64, Radioactive Commodities in the DoD Supply System.

6.3 First article. When a first article inspection (4.4) is required, the items shall be preproduction models. The first article shall consist of 10 units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, tests, and approval of the first article test results and disposition of the first article.

6.4 First article pack. Any changes or deviations of production packaging from the approved first article packaging will be subject to the approval of the contracting officer. Approval of the first article pack will not relieve the contractor of his obligation to pack and mark the compasses in accordance with his specification (see 3.12.2.1).

6.5 Marking of a license exempt item. The contracting officer should take the necessary action to assure proper marking when the contractor is furnishing a license exempt item (see 3.12.2.2).

6.6 Standard sample. A standard sample set consisting of 7 vials is defined as follows:

a. Four vials conforming to drawing 13219E0783.
b. Two vials conforming to drawing 13219E0785.
c. One vial conforming to drawing 13219E0784.

6.7 Set of vials, photometer standards, and Government loaned property. The contracting officer shall require that the sets of vials specified in 3.3.4.1 and photometer standards specified in 3.8.1 be delivered to Commander, U.S. Army Belvoir Research, Development, and Engineering Center, ATTN: STRBE-VR, Fort Belvoir, VA 22060-5606. In addition, the contracting officer shall make provisions for the Belvoir RD&E Center to calibrate the photometer standards provided in accordance with 3.8.1 and loan the photometer standards to the contractor for six month periods (see 3.13).

6.8 Subject term (key word) listing.

Compass, lensatic
Graduations, 5 degree and 20 mil
Induction damped
Magnetic, unmounted
Military specification
Self-luminous dial, tritium excited

Custodian:
Army - ME
Air Force - 99

Preparing activity:
Army - ME

Project 6605-0350

Review activity:
Navy - SH

User activity:
Navy - MC

19 MAY 1987

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 8, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 8 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

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Fort Belvoir, VA 22060-5606

9002150284-53

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE Compass, Magnetic, Unmounted, Lensatic, Prismatic, 5 Degree and 20 Mil Graduations
3a. NAME OF SUBMITTING ORGANIZATION Ca. ry1eg Case	4. TYPE OF ORGANIZATION (Mark one) ☐ VENDOR ☐ USER ☐ MANUFACTURER ☐ OTHER (Specify): _____
3b. ADDRESS (Street, City, State, ZIP Code)	

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional	b. WORK TELEPHONE NUMBER (Include Area Code) - Optional
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional	8. DATE OF SUBMISSION (YYMMDD)

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FSCM	DOCUMENT IDENT NUMBER	EI REV	CUR REV	DOC DATE	NO SH	DOCUMENT NAME
	PRODUCT SPECIFICATIONS					
81349	MIL-C-10436	L	L	19MAY81		COMPASS
	GENERATION BREAKDOWN LISTS					
97403	*BL13208E4680	AE	AE	17AUG87		COMPASS MAGNETIC
	PARTS LISTS					
97403	PL13208E4680	K	K	11AUG77		COMPASS MAGNETIC
97403	PL13208E4694	G	G	22AUG72		BEZEL ASSEMBLY
97403	PL13208E4701	E	E	22AUG72		LENS BRACKET ASSY
97403	PL13219E0753	B	B	22AUG72		CAPSULE ASSEMBLY
97403	PL13219E0782	B	B	22AUG72		DAMPING SHELL ASSY
	DRAWINGS					
97403	D13208E4680	P	P	05AUG87	1	COMPASS MAGNETIC
97403	B13208E4686	L	L	05AUG87	1	MAGNET
97403	B13208E4687	H	H	05AUG87	1	CRYSTAL CAPSULE
97403	B13208E4688	P	P	05AUG87	1	MOUNT JEWEL
97403	B13208E4690	F	F	05AUG87	1	PIVOT
97403	B13208E4691	L	L	05AUG87	1	LIFTER NEEDLE
97403	B13208E4693	D	D	11AUG77	1	EYELET FLANGED C
97403	B13208E4694	K	K	05AUG87	1	BEZEL ASSEMBLY
97403	C13208E4695	N	N	05AUG87	1	BEZEL
97403	B13208E4696	H	H	05AUG87	1	CRYSTAL BEZEL
97403	B13208E4697	E	E	11AUG77	1	SPRING BEZEL RTNG
97403	C13208E4698	K	K	05AUG87	1	SPRING-BEZEL DETENT
97403	B13208E4699	G	G	11AUG77	1	WASHER SPRING
97403	B13208E4701	E	E	08FEB74	1	LENS-BRACKET ASSY
97403	B13208E4702	D	D	05AUG87	1	LENS
97403	B13208E4705	K	K	05AUG87	1	PIN HINGE LENS BRKT
97403	C13208E4706	M	M	05AUG87	1	BRACKET LENS
97403	D13219E0750	H	H	05AUG87	1	CASE
97403	C13219E0751	G	G	05AUG87	1	BOTTOM CASE
97403	D13219E0752	K	K	05AUG87	1	COVER
97403	B13219E0753	A	A	28JUL83	1	CAPSULE ASSEMBLY
97403	B13219E0754	A	A	14AUG72	1	DIAL
97403	D13219E0755	E	E	05AUG87	1	DIAL
97403	C13219E0756	E	E	05AUG87	1	SEAL CUP ASSEMBLY
97403	C13219E0757	F	F	05AUG87	1	SHELL DAMPING
97403	B13219E0780	D	D	28JUL83	1	PLUNGER NEEDLE LFT
97403	C13219E0781	D	D	28JUL83	1	LOOP THUMB
97403	B13219E0782	B	B	05AUG87	1	DAMPING SHELL ASSY
97403	B13219E0783	E	E	05AUG87	1	VIAL LUMINOUS CYL
97403	B13219E0784	D	D	05AUG87	1	VIAL LUMINOUS CPSL
97403	B13219E0785	D	D	05AUG87	1	VIAL LUMINOUS DIAL
97403	B13219E0786	B	B	08FEB74	1	LOOP LANYARD

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BELVOIR RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

TECHNICAL DATA PACKAGE LIST TL-MIL-C-10936 TOP ASSEM
COMPASS MAGNETIC UNMOUNTED LENSATIC DIAL TRITIUM ACTVT
FEDERAL STOCK NUMBER 6605-191-9937

FSCM	DOCUMENT IDENT NUMBER	ET REV	CUR REV	DOC DATE	NO SH	DOCUMENT NAME
97403	8132190E0787	A	A	08FEB74	1	ADHESIVE SEALA
97403	8132190E0959	B	B	08FEB74	1	SIGHT WIRE
97403	8132190E0960	-	-	14AUG72	1	BLACKENING PRO

GOVERNMENT STANDARDS AND SPECIFICATIONS

* MILITARY STANDARDS (BOOK FORM)

96906	DOD-STD-100	D	03APR87	ENGRG DWG PRAC
96906	MIL-STD-105	D	29APR63	SAMPLING PROCE
	NOTICE 1	D	01NOV63	SAMPLING PROCE
	CHNG NOTICE 2	D	20MAR64	SAMPLING PROCE
96906	MIL-STD-129	J	25SEP84	MARKING
	NOTICE 1	J	05NOV86	MARKING
96906	MIL-STD-130	F	21MAY82	IDENT MARKING
	NOTICE 1	F	02JUL84	IDENT MARKING
	NOTICE 2	F	01MAY86	IDENT MARKING
96906	MIL-STD-889	B	07JUL76	DISSIMILAR MET
	NOTICE 1	B	21NOV79	DISSIMILAR MET
96906	MIL-STD-1186	A	12MAR81	CUSHIONING

* MILITARY STANDARDS (DRAWING FORM)

96906	MS15795	G	10JUL86	WASHER
96906	MS27045	B	20MAY70	BEARING
96906	MS35198	C	14JUN76	SCREW

* MILITARY SPECIFICATIONS

81349	MIL-G-174	B	05DEC86	GLASS
81349	MIL-F-495	D	26AUG75	FINISH
81349	MIL-T-704	J	28MAY85	TRTMT AND PAINT
81349	MIL-A-8625	D	30JUN83	ANODIC COATING
81349	MIL-S-8660	C	22SEP83	SILICONE COMPOU
81349	MIL-P-10972	E	23MAY69	PIN
	AMENDMENT 2	E	30AUG85	PIN
81349	MIL-S-11031	B	05JUN63	SEALING COMPOUN
81349	MIL-R-14328	B	12DEC75	RUBBER SHEET
81349	MIL-L-19538	C	11MAY70	LACQUER
81349	MIL-C-43307	B	28JAN72	CORD
81349	MIL-C-43743	B	09MAR81	CASE
81349	MIL-A-46106	A	18SEP70	ADHESIVE-SEALAN
	AMENDMENT 2	A	11FEB74	ADHESIVE-SEALAN
81349	MIL-P-46144	C	03JUN86	PLASTIC SHEET

* FEDERAL STANDARDS

06542	FED-STD-313	B	14APR83	MATL SAFETY DAT
06542	FED-STD-595	A	02JAN68	COLORS
	CHNG NOTICE 1	A	02JAN68	COLORS

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FEDERAL STOCK NUMBER 6605-151-9337

FSCM	DOCUMENT IDENT NUMBER	EI REV	SUR REV	DOC DATE	ND SH	DOCUMENT NAME
	CHNG NOTICE 2		A	17APR72		COLORS
	CHNG NOTICE 3		A	28APR72		COLORS
	CHNG NOTICE 4		A	01AUG73		COLORS
	CHNG NOTICE 5		A	01MAR79		COLORS
	CHNG NOTICE 7		A	JAN84		COLORS
	CHNG NOTICE 8		A	30AUG84		COLORS
	CHNG NOTICE 9		A	29MAY85		COLORS
	• FEDERAL SPECIFICATIONS					
81348	L-P-380		C	24AUG73		PLASTIC MLDG
81348	L-P-387		A	29OCT63		PLASTIC SHEET
	INT AMEND 2		A	09JUL71		PLASTIC SHEET
81348	DD-G-451		D	25APR77		GLASS
81348	DD-G-541		B	12JAN66		GLASS
	INT AMEND 1		B	23SEP74		GLASS
81348	TT-E-529		F	24JAN84		ENAMEL
81348	TT-F-325		A	16SEP65		FILLER
	AMENDMENT 2		A	05JUN73		FILLER
81348	MMM-A-134		-	17AUG70		ADHESIVE
81348	PPP-B-601		G	21OCT81		BOX
	AMENDMENT 2		G	29MAR85		BOX
81348	PPP-B-636		J	22JUN81		BOX
	AMENDMENT 1		J	20JAN82		BOX
	• NATIONAL BUREAU OF STANDARDS					
24054	NBS-HDBK-118					CLASS-RAACT LT
	• CODE OF FEDERAL REGULATIONS					
	CFR-TITLE-10					ENERGY
	INDUSTRY STANDARDS AND SPECIFICATIONS					
	• AMERICAN DIE CASTING INSTITUTE					
	ADCI					PROD STD-DFT AN
	• AMERICAN NATIONAL STANDARDS INSTITUTE					
80204	ANS-B46.1					SURFACE TEXTURE
80204	ANS-N540					CLASS-RAAC? LT
80204	ANS-Y14.5					DIM AND TOL
	• AMERICAN SOCIETY FOR TESTING AND MATERIALS					
81346	ASTM-A478					STEEL WEAVING W
81346	ASTM-B16					FREE-CUTTING BR
81346	ASTM-B85					AL-ALY DIE CAST

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PCN D39REFD0446

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