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MILITARY SPECIFICATION
MAGNETIC DISK, DATA STORAGE; MANUFACTURING PROCESSES AND INSPECTION OF

1. SCOPE

1.1 This specification covers the manufacturing and inspection of the Magnetic Disk, Data Storage: 10526600 (Memory) a part of the Gun Direction Computer: M18. This computer is used for field artillery applications.

2. APPLICABLE DOCUMENTS

2.1 The following specifications, standards, drawings, and publications of the issue in effect on date of invitation for bids or request for proposals, form a part of this specification to the extent specified herein.

SPECIFICATIONS

Federal

O-T-236	Tetrachloroethylene, Perchloroethylene, Technical Grade

Military

MIL-C-4003	Cement, General Purpose, Synthetic Base
MIL-B-5087	Bonding (Electrical), for Aircraft, ASG
MIL-T-7003	Trichlorethylene; Stabilized Degreasing
MIL-A-8623	Adhesive, Epoxy Resin, Metal to Metal Structural Bonding
MIL-A-9067	Adhesive, Bonding, Process and Inspection Requirements For
MIL-F-13926	Fire Control Material, General Specification Governing The Manufacturing and Inspection Of
MIL-I-16923	Insulating Compound, Electrical, Embedding
MIL-C-26074	Coating, Nickel, Phosphorous, Electroless Nickel, Requirements For
MIL-I-45607	Inspection Equipment, Supply and Maintenance for Ordnance
MIL-C-46357	Computer, Gun Direction: M18, Manufacturing Processes and Inspection of
MIL-M-60183	Magnetic Disk, Data Storage: 1052660C

STANDARDS

Federal

FED-STD-151	Metals, Test Methods
FED-STD-175	Adhesives, Methods of Testing

STANDARDS

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-109	Quality Assurance Terms and Definitions
MIL-STD-194	Painting and Finishing Systems for Fire Control Instruments
MIL-STD-414	Sampling Procedures and Tables for Inspection by Variables for Percent Defective
MIL-STD-1242	Machining Standards for Fire Control Materiel

DRAWING

U.S. Army Munitions Command

F10526600	Magnetic Disk, Data Storage

3. REQUIREMENTS

3.1 Order of precedence.- Order of precedence shall be as established in the detail specification with the exception that any conflict occuring between the detail specification and this specification, the detail specification shall take precedence.

3.2 Materials and equipment.- Materials and equipment used in the fabrication and assembly of the memory shall be of high quality, suitable for the purpose, and shall conform to such specifications as are specifically applicable under the contract.

3.3 Soldering.- The solder and soldering of connections shall be in accordance with the soldering requirements of MIL-C-46357. Consideration shall be given to the use of high temperature solder or other means where connections are made in high temperature areas.

3.4 Bonding.- Bonding shall be accomplished as necessary to insure the performance of the memory, computer and its components, and to provide for safety during maintenance. Bonding shall be accomplished in accordance with the applicable sections of MIL-B-5087.

3.5 Solvent vapor degreasing.

3.5.1 Cleaning.- Oily and greasy parts shall be cleaned in a solvent vapor degreaser when it is necessary or desirable that they be clean for easier handling, for easier working or for application of protective films during fabrication.

3.5.2 Holding devices.- All holding fixtures such as racks and baskets and their associated parts such as chains, hooks, etc., shall be of metal. Baskets shall be constructed of expanded or perforated metal, or mesh.

3.5.3 Precautions.- Work shall be introduced and withdrawn slowly to and from the degreaser to minimize degreasing solvent vapor drag out. The introduction of moisture into the degreaser shall be avoided. Water-set work shall never be introduced.

3.5.4 Degreasing materials.

3.5.4.1 Perchloroethylene.- Degreasing materials such as Perchloroethylene as defined in O-T-236 is intended specifically for use in the vapor type degreasers only.

3.5.4.2 Trichloroethylene.- Degreasing materials, Trichloroethylene, as defined in MIL-T-7003 may be used in all applications.

3.5.5 Degreasing.- The work shall be allowed to stand for at least five minutes after withdrawal from the degreaser and then visually examined for completeness of cleaning. If not completely clean, repeat the particular complete degreasing cycle or hang the work in the vapor phase only, for an additional period.

3.5.6 Maintenance provisions.

3.5.6.1 Control of pH.- The degreaser solvent shall be maintained at a pH of not lower than 7.0, or as specified. Solvent shall be maintained at a temperature sufficient to maintain a vapor phase, depending upon the degreasing solution used.

3.6 Precision bonding with resinous compounds.

3.6.1 Usage.- This bonding procedure shall be used to eliminate creep properties in the micro-inch range. Precise measurement of ingredients, application, and curing procedures shall be adhered to. Glass, metal, and plastics may be cemented to the same material or other materials using Epon VI or equal and the method outlined herein.

3.6.2 Cleaning.- Surfaces to be bonded shall be cleaned with clean acetone. The wet surfaces shall be immediately dried. If acetone is allowed to dry on the surface, the area will still be contaminated. The cleaned surfaces shall not be touched with the fingers or allowed to become contaminated in any manner. Unless otherwise specified, cleaning shall be done in accordance with MIL-A-9067.

3.6.3 Mixing materials.- All equipment used in preparing and mixing resinous compounds shall be cleaned with acetone or equivalent before each usage. The container and stirring rod used for mixing shall be made of glass, polyethylene, or other suitable non-porous material.

3.6.4 Preparation of resinous compounds.

3.6.4.1 Curing agents.- Curing agents shall be kept in a clean, dark-colored glass container fitted with a self-sealing silicone rubber cover or a glass stopper. If a rubber cover is used on the container, the curing agent shall be withdrawn with a clean hypodermic syringe. If a glass stopper is used as a closure, it shall be replaced immediately after the required amount of curing agent is withdrawn.

3.6.4.2 Resinous compounds.- Resinous compounds shall be processed such that the end results will produce physical and electrical properties in accordance with MIL-A-8623 or MIL-I-16923 or MIL-C-4003 whichever is applicable or as specified on the applicable drawing.

3.6.5 De-airing resinous compounds.- When required by applicable drawing, the activated resinous compound shall be de-aired by placing it in a suitable evacuation chamber and stirring for 2 to 5 minutes while maintaining a vacuum of 29 or more inches of mercury.

3.6.6 Application of resinous compounds.- Resinous compounds shall be applied in an even, continuous film over the entire area of both surfaces to be bonded conducive to the best available properties.

3.6.7 Joining of parts.- Parts shall be assembled immediately after application of resinous compound. The mating surfaces shall be brought together and light pressure applied by suitable means to maintain proper contact and alignment during the curing cycle. Spring clamps will be satisfactory for most joints. Excess resinous compound squeezed from the joint shall be removed immediately after the clamps are applied. Parts requiring rework shall be thoroughly cleaned of all cured material prior to reapplication of resinous compound.

3.6.8 Curing of resinous compounds.- The curing time and temperature shall be such that the required bonding adhesion, tensile strength, and other properties are produced with no detrimental results to parts or components.

3.7 Plating, electrodeposited iron.

3.7.1 Prohibited materials.- Cadmium, lead, bismuth, antimony, zinc, and tin, when present as plating, solders, or portions of the assembly or of parts to be processed shall be removed or effectively masked with vinyl maskant or equivalent before plating.

3.7.2 Materials, fixtures, tooling.- Fixtures or tooling used to hold or agitate parts during plating process shall not consist of or contain any of the materials listed under prohibited materials. Materials that melt or soften at or below 210°F shall be removed completely from parts before processing.

3.7.3 Processing.

3.7.3.1 Positioning.- The position of a surface will affect the plating deposited on it. Parts shall be positioned in the plating bath so that the critical surfaces will receive the best obtainable plating.

3.7.3.2 Controls.- The plating operation shall not be interrupted by the removal for inspection or other reasons. Test panels shall be simultaneously processed with the work and used as a means of control to check the thickness of the deposited plate or any other specified tests. Immediately after rinsing, the work should exhibit no water break. If a water break is present, repeat the cleaning process. This step shall be used as a prerequisite for the zincate dip (see 6.2).

3.7.4 Plating.

3.7.4.1 Appearance.- The iron plate shall be smooth, fine grained, adherent, and free from blisters, pits, modules, porosity, and excessive edge build up.

3.7.4.2 Tensile strength.- The tensile strength of the joint shall be tested by Method 211.1, FED-STD-151.

3.8 Processing of aluminum alloys for dimensional stability.

3.8.1 Preparation for heat treating.

3.8.1.1 Cleaning.- Paint, dye, grease, oil, and other foreign matter shall be removed from parts prior to solution heat treatment, precipitation hardening, and stress relieving.

3.8.1.2 Straightening and forming.- Straightening and forming shall be done only prior to solution heat treatment and shall not be done at any other time during processing. Straightening or forming parts after solution heat treatment will be cause for rejection.

3.8.2 Solution heat treat.- When specified, solution heat treating shall be done in accordance with the applicable drawing call out.

3.8.3 Thermal shock cycle.- When specified, thermal shock cycling shall be done in accordance with the applicable drawing call out.

3.8.4 Precipitation hardening.- When specified, precipitation hardening shall be done in accordance with the applicable drawing call out.

3.8.5 Stress relief heat treating.- When specified, stress relief heat treating shall be done in accordance with the applicable drawing call out.

3.9 Spray coating of magnetic memory recording disk.

3.9.1 Preparation of disk.

3.9.1.1 Masking.- Mask all surfaces to be void of dispersion coating.

3.9.1.2 Cleaning.- Areas on face of disk to be coated shall be cleaned with acetone. No visible residue from the acetone should remain on this disk. Areas on face of disk to be coated shall be free of any contaminate and corrosion.

3.9.1.3 Drying.- Dry the disk and return to room temperature of 70 $\pm$ 2°F by blowing clean dry nitrogen over the disk. The disk shall then be coated immediately.

3.9.2 Preparation of magnetic dispersion.- After shaking the container of magnetic dispersion coating on a paint shaker for 45 minutes, remove approximately 75 cc and place in a clean mixing container. Add predetermined amount of thinner to the 75 cc and shake for 10 minutes.

3.9.3 Application of coating to disk.- After an additional five minutes shaking of the mixture, place it in a properly cleaned and prepared applicator. Apply the coating to the disk in such a manner that a uniform coating, free of all pin holes, checks and cracks, results on the entire face of the disk. The coating and coating surface must be free from contaminates, obvious orange peel, globs or lumps in excess of 0.010 inches. The applied coating should have a thickness 0.002 to 0.003 inches.

3.9.4 Coating cure.- The coating shall be oven cured at temperatures and times conducive to the properties required for the magnetic memory disk per MIL-M-60183.

3.10 Precision cleaning and assembling of magnetic memory parts.

3.10.1 Cleaning.- All operations shall be performed in a dust-free temperature and humidity controlled environment as specified in MIL-C-46357, unless otherwise specified within this specification. To obtain proper results from the cleaning as specified herein it is mandatory that all parts receive proper preliminary cleaning and final deburring in accordance with MIL-STD-1242. It is a requirement that the cleanliness of containers or handling devices be maintained, to the same degree as that of the parts being handled or packaged.

3.10.2 Handling.- Parts must be transported and handled with great care as specified in MIL-C-46357. It is a requirement that the parts be handled by means of special fixtures or tools, whenever possible, in preference to handling by hand. All parts in transit or storage shall be adequately protected from any environment or condition which may tend to damage, contaminate, or otherwise degrade the parts to a level or in a manner not normally corrected by subsequent scheduled cleaning procedures.

3.10.3 Cleaning solutions.- All solvents and cleaning agents must be filtered through a filter, 0.30 micron maximum size, or distilled immediately prior to use. In no case will the solvents be used more than once before redistillation, or filtration, except the solvents used in vapor degreasing.

3.10.4 Cleaning methods.

3.10.4.1 Method A.- Method A cleaning shall be performed as outlined herein:

a. Fill beaker with Freon TF, in a sufficient amount, to insure coverage of the part.

b. Place part in beaker and place beaker in the ultrasonic cleaner, for a period of 3 to 10 minutes. The ultrsonic cleaner may use either ethyl alcohol, distilled water, or Freon TF, as a coupling fluid.

c. Turn part several times during cleaning operation to insure complete cleaning of all surfaces.

d. Blow dry with nitrogen.

3.10.4.2 Method B.- Method B cleaning shall be performed as outlined herein:

a. Fill beaker with Freon TF in a sufficient amount to insure coverage of the part.

b. Place part in beaker and place beaker in the ultrasonic cleaner, for a period of 3 to 10 minutes. The ultrasonic cleaner may use either ethyl alcohol, distilled water, or Freon TF as a coupling fluid.

c. Turn part several times during cleaning operation to insure complete cleaning of all surfaces.

d. Blow dry with nitrogen.

e. Place part in clean oven, and vacuum bake at 130 $\pm$ 15°F for 30 minutes minimum.

3.10.4.3 Method C. - Method C cleaning shall be performed as outlined herein:

a. Vapor degrease in accordance with the applicable section of this specification except use Freon TF as the degreasing solvent.

b. Vapor degreasing shall be done within an atmosphere controlled drybox. The environment shall be as specified under assembly area of this specification except temperature control.

c. Blow dry with nitrogen.

3.10.5 Assembly procedure.

3.10.5.1 Assembly area.- Final assembly shall be done within an atmosphere controlled dry box or equivalent with an environment as specified in MIL-C-46357 except that the dust particle size shall not be greater than 0.5 micron nor shall there be more than 200 particles within the range of 0.3 to 1.5 microns per cubic foot. Between the cleaning and assembly atmosphere controlled dry boxes there shall be an intermediate atmosphere controlled dry box with locking doors in the connecting passages. At no time shall both doors be opened simultaneously. The atmospheric pressure within the atmosphere controlled dry box shall be as follows:

a. 1st atmosphere controlled dry box (assembly) positive

b. 2nd atmosphere controlled dry box (intermediate assembly) positive

c. 3rd atmosphere controlled dry box (final cleaning) least positive, but a minimum of 0.15 inch of water above ambient.

3.10.5.1.1 Cleaning precautions.- All items entering atmosphere controlled dry boxes 1 and 2 must have had vapor degrease (Method C) or hand clean with heated Freon TF. Final cleaning and assembly shall be done by operators using handling equipment of a design to insure no human contact and non violation of the environment specified in 3.10.5.1. Should the completed memory assembly be opened other than in the specified environment, the entire cleaning procedure shall be rerun.

3.10.6 Headplate assembly.- Clean in accordance with methods B and C in sequence, except the method B cleaning shall be a minimum of 8 minutes with a minimum of 4 minutes in the inverted (air bearing up) position. After method C cleaning, a waiting period of 2 hours minimum or evacuation of the part to a pressure of 1 millimeter of (Hg) Mercury maximum for 10 minutes minimum, shall be in effect before final assembly.

3.10.7 Housing assembly.- Clean in accordance with methods B and C in sequence. After method C cleaning, a waiting period of 2 hours minimum or evacuation of the part to a pressure of 1 millimeter of Hg maximum, for 10 minutes minimum, shall be in effect before final assembly.

3.10.8 Rotor assembly.- Clean all details except the bearings in accordance with methods A and C in sequence and assemble.

WARNING: At no time shall cleaning solvent of any nature be allowed to contact the bearing surfaces, or the bearing be allowed to reside in the Number 3 atmosphere controlled dry box, as solvent vapor may have a detrimental effect on the lubricant.

3.10.8.1 Curing of cement.- After assembly, the component may be transported into the environment specified in MIL-C-46357 for cement cure. Upon completion of the cure the component shall be returned to the atmosphere controlled dry box Number 3 for hand cleaning with dust free absorbent paper, and Freon TF, before going to final assembly.

3.10.9 Seals and O-rings.-Clean in accordance with methods A and C in sequence. Method A cleaning shall be limited to a maximum of 5 minutes.

3.11 Heat treating magnetic materials.

3.11.1 Cleaning.- Annealing shall be performed after all machining, stamping, deburring, or other similar operations have been completed. Annealing boxes, holding fixtures and parts to be annealed shall be cleaned of oil, scale, and other foreign material immediately prior to processing. Unless otherwise specified, cleaning shall be by vapor degreasing.

3.11.2 Type I and Type III steels.

3.11.2.1 Types.- Type I steels are nickel-iron alloys and Type III steels are grain oriented silicon steels.

3.11.2.2 Preannealing operations.- Loading: Laminations shall be stacked in the annealing box; toroidal cores and C cores shall be laid on their sides. Parts shall be stacked in such a manner as to prohibit warping and distortion. Holding fixtures shall be used where required to prevent shifting of parts; however, parts shall be held loosely, without clamping, bolting, or undue pressure. Each part shall be completely surrounded by a thin, even layer of dry calcined alumina, to prevent physical contact with the annealing box, holding fixture, or other parts. After the alumina has been applied, care shall be taken in handling and transporting the annealing boxes to prevent dislodging of the alumina. The annealing boxes shall have a gas tight seal, and shall have means for maintaining positive pressure inside the box. Any leaks shall be eliminated prior to the annealing operation. The annealing box shall be placed in the furnace and the necessary connections made to permit flow of the gas for atmospheric control.

3.11.3 Annealing.

3.11.3.1 Type I steels.- Type I steels shall be annealed by a pre-anneal using forming gas, then switching to a hydrogen atmosphere at annealing temperatures, then cooling using a controlled hydrogen atmosphere and temperature, and finally switching to a second atmosphere of forming gas.

3.11.3.2 Type III steels.- Type III steels shall be annealed under controlled temperatures and atmosphere with a final controlled cooling.

3.11.4 Unloading.

3.11.4.1 Opening atmosphere and temperature.- Atmospheric control gas lines shall be disconnected, and the ends capped as soon as the flow of gas is stopped. Annealing boxes shall not be opened until the temperature has reached 300°F or less. Welded annealing boxes shall be opened by means of a cold cutting device.

3.11.5 Quality.- The specified materials, when annealed, shall be capable of meeting the performance specified in MIL-M-60183.

3.12 Workmanship.

3.12.1 Assemblies.- The equipment, including all parts and accessories, shall be constructed and finished in a thoroughly workmanlike manner. Particular attention shall be paid to neatness and thoroughness of soldering, wiring, impregnation of coils, marking of parts and assemblies, plating, machine-screw assemblage, and freedom of parts from burrs and sharp edges.

3.12.2 Dimensions.- Dimensions and tolerances not specified shall be as close as is consistent with best shop practices. When dimensions and tolerances affect the interchangeability, operation, or performance of the equipment, they shall be held or limited accordingly.

3.12.3 Fabrication.- Machining, drilling, and forming shall be done with the use of accurate templates, jigs, or gages.

3.12.4 Cleanup.- Units shall be thoroughly cleaned of loose, spattered, or excess solder, metal chips, and other foreign material after final assembly. Burrs and sharp edges as well as rosin flash which might crumble shall be removed.

3.12.5 Wire Stripping.- Wire stripping shall be done without nicking or otherwise damaging the wire.

4. QUALITY ASSURANCE PROVISIONS

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

4.1.1 Ganeral provisions.-The component inspection requirements of MIL-F-13926 form a part of the Quality Assurance Provisions of this specification. Definitions of inspection terms shall be as listed in MIL-STD-109.

4.2 Inspection provisions.

4.2.1 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" as specified in MIL-STD-105.

4.2.2 Examination and Tests.- Inspection to determine compliance with Section 3 herein shall be performed on a defect (individual characteristic) basis in accordance with MIL-STD-105, and the inspection level and sampling plans specified in Tables I to VIII inclusive. The tabulated classification of defects shall constitute the minimum inspection to be performed by the supplier prior to Government acceptance or rejection by lot. The Government reserves the right to inspect for any applicable requirement, and to reject individual non-conforming items.

4.2.3 Acceptance and rejection.- 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.

TABLE I - DEGREASING

Use Inspection Level II of Table I
with Sampling Plan Table II-A of MIL-STD-105

Characteristic	Requirement	Method of Inspection
Critical: None		
Major: AQL 1.0% defective		
101. Cleaning	3.5.1	Vis, SME
102. Precautions	3.5.3	Vis
103. Degreasing	3.5.5	Vis
Minor: None		

TABLE II - BONDING

Use Special Inspection Level S-4
of Table I with Sampling Plan Table II-A of MIL-STD-105

Characteristic	Requirement	Method of Inspection
Critical: None		
Major: AQL 1.0% defective		
104. Bonding	3.4	MIL-B-5087, 4.4.1.1
105. Useage	3.6.1	Vis., SME
106. Cleaning	3.6.2	Vis
107. Mixing materials	3.6.3	Vis
108. Curing agents	3.6.4.1	Vis
109. De-airing resinous compounds	3.6.5	Vis, SME
110. Application of resinous compounds	3.6.6	Vis
111. Joining of parts	3.6.7	Vis
112. Curing of resinous compounds	3.6.8	Vis
Minor: None		

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TABLE III - PLATING

Use Special Inspection Level S-4 of Table I
with Sampling Plan Table II-A of MIL-STD-105

Characteristics	Requirement	Method of Inspection
CRITICAL: NONE		
MAJOR: AQL 1.0% defective		
113. Prohibited materials	3.7.1	Visual
114. Materials, fixtures, tooling	3.7.2	Visual
115. Positioning	3.7.3.1	Visual
116. Controls	3.7.3.2	4.4.1.2, 4.4.1.4
117. Appearance	3.7.4.1	Visual
118. Tensile strength	3.7.4.2	4.4.1.3
MINOR: NONE		

TABLE IV - PROCESSING OF ALUMINUM ALLOYS

Use Special Inspection Level S-4 of Table I
with Sampling Plan Table II-A of MIL-STD-105

Characteristics	Requirement	Method of Inspection
CRITICAL: NONE		
MAJOR: AQL 1.0% defective		
119. Cleaning	3.8.1.1	Visual
120. Straightening and forming	3.8.1.2	SME
121. Solution heat treat	3.8.2	Visual, SME
122. Thermal shock cycle	3.8.3	Visual, SME
123. Precipitation hardening	3.8.4	Visual, SME
124. Stress relief heat treating	3.8.5	Visual, SME
MINOR: NONE		

TABLE V - MAGNETIC DISC

Use Special Inspection Level S-4 of Table I
with Sampling Plan Table II-A of MIL-STD-105

Characteristics	Requirement	Method of Inspection
CRITICAL: NONE		
MAJOR: AQL 1.0% defective		
125. Masking	3.9.1.1	Visual
126. Cleaning	3.9.1.2	Visual
127. Drying	3.9.1.3	Visual
128. Preparation of magnetic dispersion	3.9.2	4.4.1.5
129. Application of coating to disk	3.9.3	4.4.1.6, SME
130. Coating cure	3.9.4	MIL-M-60183

MINOR: NONE

TABLE VI - ASSEMBLY CLEANING

Use Special Inspection Level S-4 of Table I
with Sampling Plan Table II-A of MIL-STD-105

Characteristics		Requirement	Method of Inspection
CRITICAL: NONE			
MAJOR: AQL 1.0% defective			
131.	Cleaning	3.10.1	MIL-C-46357, Vis.
132.	Handling	3.10.2	MIL-C-46357, Vis.
133.	Cleaning methods	3.10.4	Vis.
134.	Assembly area	3.10.5.1	MIL-C-46357, Vis.
135.	Cleaning precautions	3.10.5.1.1	Vis, SME
136.	Head plate assembly	3.10.6	Vis, SME
137.	Housing assembly	3.10.7	Vis, SME
138.	Rotor assembly	3.10.8	Vis.
139.	Curing of cement	3.10.8.1	MIL-C-46357, Vis.
140.	Seals and O-rings	3.10.9	Vis.
MINOR: NONE			

TABLE VII - HEAT TREATMENT OF STEELS

Use Inspection Level II of Table I
with Sampling Plan Table II-A of MIL-STD-105

Characteristics		Requirement	Method of Inspection
CRITICAL: NONE			
MAJOR: AQL 1.0% defective			
141.	Cleaning	3.11.1	Visual
142.	Preannealing	3.11.2.2	Visual
143.	Type I steels	3.11.3.1	Visual
144.	Type II steels	3.11.3.2	Visual
145.	Opening atmosphere and temperature	3.11.4.1	Visual
146.	Quality	3.11.5	MIL-M-60183

MINOR: NONE

TABLE VIII - WORKMANSHIP

Use Special Inspection Level S-4 of Table I
with Sampling Plan Table II-A of MIL-STD-105

Characteristics	Requirement	Method of Inspection
CRITICAL: NONE		
MAJOR: AQL 1.0% defective		
147. Soldering	3.3	MIL-C-46357, Vis.
148. Assembling	3.12.1	Vis, Tactile
149. Dimensions	3.12.2	SME
150. Fabrication	3.12.3	SME
151. Cleanup	3.12.4	Vis, Tactile
152. Wire stripping	3.12.5	Vis, Tactile
MINOR: NONE		

4.2.4 Certification.- Certification will be accepted for the requirements in Table IX and shall include test data and results for all characteristics specified. Certification will be required prior to performing final acceptance inspection and shall suffice for the remainder of the production quantities, provided the 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.

TABLE IX - CERTIFICATION

Characteristics	Requirement
Materials	3.2
Degreasing materials	3.5.4
Resinous compounds	3.6.4.2
Cleaning solutions	3.10.3
Type I and Type II steels	3.11.2.1
Quality	3.11.5

4.3 Inspection equipment.- Except as otherwise provided for by the contract, the contractor shall supply equipment in accordance with the applicable requirements of MIL-I-45607. The Government reserves the right to use the test equipment for its own independent inspections to the extent that such use will unduly interfere with the contractor's delivery schedule.

4.3.1 Contractor design.- The contractor shall provide inspection equipment compatible with 4.3.1.1 and the following tolerance criterion for all standard measuring equipment specified in Tables I to VIII inclusive and "Test Methods and Procedures" specified in 4.5. Since tolerance of test equipment is normally considered to be within 10% of the product tolerance for which it is intended, this inherent error in the test equipment design must be considered as part of the prescribed product tolerance limit. Thus, concept, construction, materials, dimensions and tolerances used in the design of test equipment shall be so selected and

controlled as to insure that the test equipment will reliably indicate acceptability of a product which does not exceed 90% of the prescribed tolerance limit, and permit positive rejection when non-conforming. Construction shall be such as to facilitate routine calibration of test equipment.

4.5.1.1 Test equipment.- In conjunction with 4.3.1, the following test equipment shall be utilized in the performance of the applicable tests.

ITEM NUMBER	DESCRIPTION
1 Folding devices (see 3.5.3)	To be constructed of metal.
2 Control of pH	7.0 min.
3 Materials, Fixtures tooling (see 3.7.2)	Prohibited materials (see 3.7.1)
4 Cleaning requirement (see 3.6.2)	Lint free cloth and acetone
5 Temperature controls (see 3.9.1.3)	± 5%
6 Max humidity controlled area	± 2%
7 Assembly area (see 3.10.5.1)	Atmospheric control shall be within the limits specified for the assembly area
8 Annealing boxes (see 3.11.2.2)	Shall have a tight gas seal and a means for maintaining positive pressure inside the box.
9 Materials, Fixtures tooling (see 3.7.2)	Fixtures or tooling shall not contain prohibited material as specified in 3.7.1

4.4 Test methods and procedures.- The requirements of Section 3 shall be inspected in accordance with the inspection method specified in the respective Tables of I to VIII inclusive, and the following tests. Where "SME" is specified in the Tables under "Method of Inspection" it shall be by means of Standard Measuring Equipment (SME). All other testing specified in the tables shall be in accordance with their related test methods and procedures outlined in Section 4 of the specified specifications, or the tests outlined in other documents specified therein. Certification shall be in accordance with 4.2.4 and Table IX.

4.4.1 Test panels.- When specified on applicable documents, test panels shall be prepared using processes herein and shall be prepared in accordance with the appropriate test methods or specifications with the sampling being done in accordance with MIL-STD-105. All finishes, unless otherwise specified, shall be in accordance with Military Standard No. 194.

4.4.1.1 Adhesive bonding.- Sampling of adhesive bonding, when specified, shall be in accordance with Federal Standard No. 175 to determine compliance with 3.4.

4.4.1.2 Adhesion of plating.- Plating adhesion tests shall be performed as specified to determine compliance with 3.7.3.2.

4.4.1.3 Tensile strength of deposited iron.- To determine compliance with 3.7.4.2 the tensile strength of electroless deposited iron shall be performed in accordance with Federal Test Method Standard No. 151, Method 211.1. The plate shall be considered to have passed the adhesion test if the tensile strength is 7000 psi or greater. If the tensile strength is less than 7000 psi and the joint fails at the adhesive bond rather than at the base metal-nickel junction, the test shall be repeated after using care ti improve the adhesive bond.

4.4.1.4 Water break test.- To determine compliance with 3.7.3.2, a mist of purified water shall be atomized on the surface under test. If the water gathers into droplets within 25 seconds the surface has failed. If the water forms a continuous film by flashing out suddenly over a large area, this indicates free alkali, residual detergent, etc., and the surface has failed the test. If the water droplets coalesce into a continuous film of water without sudden flash-out and forms a lens, then the surface shall be considered as having satisfactorily passed the water break test.

4.4.1.5 Magnetic dispersion coating viscosity.- To determine compliance with 3.9.2 the viscosity of the coating shall be such that 150 cc of the mixture will flow through the viscosity meter in one minute thirty seconds $\pm$ one percent when applying.

4.4.1.6 Visual examination.- To determine compliance with 3.9.3, the coating after cure must be free of all pin holes, checks, inclusions, and cracks that can be observed with 10X magnification.

5. PREPARATION FOR DELIVERY

5.1 Preparation for delivery shall be as specified in the individual detailed specification.

6. NOTES

6.1 Intended use.- This specification is intended for use in connection with the manufacturing and inspection of the Magnetic Disk, Data Storage (Memory) a part of the Gun Direction Computer: M18.

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

(a) Title, number and date of this specification
(b) Quantity of test panels (see 3.7.3.2)

Custodian:

Army - MU

Preparing activity:

Army - MU

Project No. 1220-A212Y

Electrical Schematic Drawing 11D231716 to determine compliance with 3.4.

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SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004

INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity.

SPECIFICATION

ORGANIZATION	CITY AND STATE

CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT
		$

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐ YES ☐ NO IF "YES", IN WHAT WAY?

4. REMARKS *(Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)*

SUBMITTED BY *(Printed or typed name and activity)*	DATE

DD FORM 1 OCT 64 1426

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