NOTICE OF CHANGE

METRIC

MIL-STD-981B
NOTICE 4
13 June 2000

DEPARTMENT OF DEFENSE

DESIGN CRITERIA STANDARD
DESIGN, MANUFACTURING AND QUALITY STANDARDS FOR CUSTOM ELECTROMAGNETIC DEVICES FOR SPACE APPLICATIONS

TO ALL HOLDERS OF MIL-STD-981B:

1. THE FOLLOWING PAGES OF MIL-STD-981B HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
1B	13 June 2000	1B	REPRINTED WITHOUT CHANGE
2	13 June 2000	2	31 January 1992
7	13 June 2000	7	31 January 1992
8	13 June 2000	8	REPRINTED WITHOUT CHANGE

2. RETAIN THIS NOTICE PAGE AND INSERT BEFORE THE TABLE OF CONTENTS.

3. Holders of MIL-STD-981B will verify that the changes indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the standard is completely revised or cancelled.

4. The margins of this notice are marked with asterisks to indicate where changes were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
NASA – NA
Air Force – 19

Preparing activity:
DLA - CC

(Project 5950-1058)

AMSC N/A

FSC 5950

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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.

SPECIFICATIONS

FEDERAL

J-W-1177	-	Wire, Magnetic, Electrical
QQ-S-571	-	Solder, Tin Alloy: Tin-Lead Alloy and Lead Alloy

MILITARY

MIL-T-27	-	Transformers and Inductors (Audio, Power, and High-Power Pulse), General Specification For.
MIL-F-14256	-	Flux, Soldering, Liquid (Rosin Bath).
MIL-C-15305	-	Coils, Fixed and Variable, Radio Frequency, General Specification For.
MIL-T-21038	-	Transformers, Pulse, Low Power, General Specification For.
MIL-S-22473	-	Sealing, Locking and Retaining Compounds, Single Component.
MIL-W-22759	-	Wire, Electric Fluorocarbon Insulated, Copper or Cooper Alloy.
MIL-T-55631	-	Transformers, Intermediate Frequency, Radio Frequency and Discriminator, General Specification For.
MIL-C-83446	-	Coils, Radio Frequency, Chip, Fixed or Variable, General Specification For.

STANDARDS

MILITARY

MIL-STD-105	-	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-202	-	Test Methods for Electronic and Electrical Component Parts.
MIL-STD-1285	-	Marking of Electrical and Electronic Parts.
MIL-STD-45662	-	Calibration System Requirements.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Defense Automation and Production Service, Building 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

5.1.6 Screws, nuts, and washers. All mounting and terminal screws, nuts, and washers shall be protected against corrosion. Cadmium or Zinc plating shall not be used on any surface exposed to space environment. Tin plating shall be fused if such plating is used externally. All materials shall be compatible and not support galvanic corrosion.

5.2 Internal elements. Packaged or unpackaged parts (other than the wound magnetic elements) used within these devices shall be of the same class as the device in which they are used. Use of any other part shall require approval of the procuring activity. The request for approval must justify the need for the part and provide sufficient data to substantiate the suitability of the part in the application. Procurement documentation for the part shall be submitted to the procuring activity for approval.

TABLE II. **Wire limitations for magnet wire (see 5.1.4.1)**.

Family	Minimum Wire Size (AWG) (1)	
	Class S	Class B
03, 04, 36, 37, 40, and 41	38	44
11, 12, 13, 14, 20, 21, 31, 50, and 51	44	50

(1) Procuring activity approval shall be required when other sizes of magnet wire are used.

TABLE III. **Termination limitations (see 5.1.4.3)**.

Type of Termination	Minimum Terminal/Self Lead Wire Size (AWG)	
	Class S	Class B
Interconnected lead	29	32
External terminal/self lead (1)	26	28

(1) Spliced internal lead diameter ratios shall not exceed 5 to 1 for magnet wire sizes larger than # 44.

5.3 Radiographic inspection (when applicable). Devices shall be inspected in accordance with appendix C.

5.4 Marking. Devices shall be marked as specified in the procurement document on the part in accordance with Method I of MIL-STD-1285. The marking as a minimum shall include the procurement document number, manufacturer's part number and CAGE, trademark or symbol, terminal identification, lot date code, and the word "C981". The "C981" shall designate the device as being fully compliant to MIL-STD-981.

5.5 **Manufacturing practices.** The contractor shall provide to the procuring activity for review and approval a copy of the contractor's written procedures covering manufacturing practices. Proprietary documents shall be reviewed, approved, and maintained at the manufacturer's facility. These procedures shall, as a minimum, conform to the requirements specified herein. Any change from the approved procedures shall require approval of the procuring activity in writing. The contractor may, at his option, provide separate sets of procedures for classes S and B.

5.5.1 **Clean handling.** Operators shall have clean hands (free from handcream, etc.) while handling these devices. The use of clean, lint-free gloves or finger cot is recommended whenever practical. Magnet wire spools shall be handled by the rims of the spools only. Material and piece parts stored, or being transferred to or between work stations shall be kept in covered containers to maintain a dust-free seal.

***5.5.1.1** **Solvents.** Crazing of magnet wire may occur as a result of uncontrolled exposure to solvents such as water or alcohol. The use of alcohol or alcohol based cleaning agents for the cleaning of magnet wire or assemblies shall be controlled and properly documented.

5.5.2 **Work areas.** Work and inspection areas must be cleared of all foreign materials before parts or materials for these devices are placed thereon. While working on these devices, the work areas shall not be used to store any parts, materials, or devices used on any other devices.

5.5.3 **Foreign material.** Care must be exercised to prevent introduction of foreign materials into the component. At each in-process inspection, the operator shall examine the device under 3X to 10X magnification to assure that no foreign materials are present. Special attention should be give to loose wire-ends, solder splashes, wire scrapings, or residues.

5.5.4 **Tools.** Except for cutting pliers, the tools used shall not be capable of cutting, nicking, or damaging the wire insulation in any manner. All tools used in the handling of magnet wire shall be free of sharp or rough surfaces or edges. This may be accomplished by the application of an epoxy or by filing any of the sharp surfaces or edges.

5.5.5 **Carriers.** Wound cores, coils, or bobbins shall not be carried or stored on pegboards with nails or other sharp pegs that may cause damage to wire or insulation. All sharp or abrasive pegs shall be sufficiently covered to insure against damaging wire. The carriers shall be covered with a material that will prevent contamination by foreign materials during transport and storage.

5.5.6 **Damaged material.** Material that exhibits evidence of damage shall not be used in the fabrication of the devices.

5.5.7 **Travelers.** A lot traveler specifying each operation in the proper sequence shall be provided with each lot. Initialing or stamping of the individual traveler by the operator or inspector prior to moving to the next work station shall be required for each operation in the manufacturing process.

5.5.8 **In-process inspection.** All critical in-process operations used in the manufacturing of these devices shall be inspected by an adequately trained inspector. If circumstances preclude inspections after the process is complete, the inspection shall occur during the process. These inspection stations shall be as defined in the manufacturing process.