

REVISIONS

Letter	ECO No.	Description	Checked	Approved	Date
		Taken from LSE Specification QAP-I 201			
A	64-47	INITIAL RELEASE	WFM		5/5/91

		MASSACHUSETTS INSTITUTE OF TECHNOLOGY CENTER FOR SPACE RESEARCH			
Drawn: Brian Klatt	12/18/90	INSPECTION AND DOCUMENTATION			
Checked: W. Mayer	5/3/91				
Approved:					
Released:					
		Size	Code Identification No.	Drawing No.	Rev.
		T	80230	99-02001	A
		Scale: NONE		Sheet: 1 of 15	

Inspection and Documentation

1.0 SCOPE

This specification describes the procedure used to inspect hardware as required by the Performance Assurance Implementation Plan. This applies to Sponsored Research Projects at the Massachusetts Institute of Technology (MIT), Center for Space Research.

1.1 Incoming Inspection

1.1.1 Data and Certifications

Each incoming shipment is examined to ensure that test reports, test data, certifications, and other required paperwork are included.

1.1.2 Visual

All incoming parts, materials, subassemblies, and assemblies are inspected for count and damage to insure that the shipment is complete and was not harmed during transport. A visual examination is then performed utilizing both the microscope and unaided eye. All items are inspected in accordance with the criteria established by the applicable drawing or specification. Additional visual examination or mechanical measurements may be performed to determine compliance with particular aspects of the specification or drawing.

See Figure 1-1, Receiving Inspection at MIT, for details.

1.1.3 Electrical

An electrical performance test is conducted on selected electrical parts (capacitors, diodes, transistors, and resistors) to verify functional operation.

1.1.4 Documentation

The results of all inspections, tests, acceptance, or rejection, along with pertinent remarks, are recorded on the Incoming Inspection Report form, Figure 2-1. The completed Incoming Inspection Report is retained in the Incoming/Receiving files.

RECEIVING INSPECTION AT MIT

ITEM	TEST	NDE	DATA REVIEW	100% VISUAL INSPECT	MEASURE DIMEN- SIONS	CHEMICAL ANALYSIS
EEE DISCRETES	100%	N/A	YES	YES	NO	N/A
MICROCIRCUITS	<u>7/</u>	N/A	YES	YES	NO	N/A
MECHANICAL PARTS FABRICATED	NO	YES <u>1/</u>	YES	YES	YES <u>8/</u>	YES <u>1/</u>
MECHANICAL PARTS FABRICATED	NO	YES <u>1/</u>	YES	YES	SAMPLE <u>2/</u>	NO <u>3/</u>
ASSEMBLIES	NO	NO	YES	YES	NO	NO
FASTENERS (<140,000 psi) <u>4/</u>	NO	YES <u>1/</u>	YES	YES	NO	NO
METALLIC RAW MATERIALS	NO	N/A	YES	YES	NO	YES <u>1/ 5/ 9/</u>
NONMETALLIC RAW MATERIALS	NO	N/A	YES	YES	NO	NO <u>1/ 9/</u>
ADHESIVES	<u>6/</u>	N/A	YES	N/A	N/A	NO <u>1/ 9/</u>

1/ Testing is performed on fracture critical items only

2/ All dimensions are measured and recorded by the Vendor

3/ Material is supplied by MIT from bonded stock

4/ Fasteners >140,000 psi are not used

5/ Done by MIT or an Independent testing laboratory

6/ Each adhesive lot (100%), is sample tested for proper cure characteristics

7/ PPL and Military devices have 100% GSI. Nonstandards receive 100% MIT S.I.

8/ where applicable

9/ This is an exception to the PAR

Figure 1-1

1.1.5 Inspection Status Tag

An Inspection Status Tag, Figure 3-1, is attached to the parts container (or to the material where practical). Information contained on the tag indicates the inspections or test to which that particular group of parts or material has been subjected. The Inspection Status Tag also indicates acceptance of the particular group of parts or material when marked "ACCEPTED" in the appropriate information block, by the inspector. The Inspection Status Tag remains attached to the container in which the items are stored until all parts or materials have been expended.

1.1.6 Reject Tag

Parts, materials, subassemblies, and assemblies submitted for inspection, which fail to meet the inspection criteria, in any way, are rejected. A Reject Tag (Figure 4-1) is prepared and affixed to the rejected material. The rejected material is stored separately from all other material to await further action.

1.1.7 Incoming Electrical Performance Test Data

Electrical tests performed per paragraph 1.1.3 above are recorded on appropriate data sheets. Completed Data sheets are maintained in the Incoming/Receiving files.

1.1.8 Parts Screening Data

Data supplied as part of the purchase requisition for parts and materials, as well as evidence of compliance with screening specifications, are reviewed by the inspector and are kept on file in the Incoming/Receiving files. Critical test data will be reviewed by the appropriate design engineer.

1.1.9 limited Life items

Age sensitive products which have a limited self life shall be recorded on the shelf life tag. The shelf life tag shall be attached to the limited life item. The date of manufacture and the expiration date are also recorded on the product unit package. See Figure 5-1.

1.1.9 limited Life items (continued)

Data which is recorded on the shelf life tag is as follows:

- product name
- purchase order number
- manufacturer
- manufacturer's part number
- manufacturer's lot code or number
- date of manufacture
- shelf life and storage conditions
- expiration date

1.2 Kit Inspection

Parts and materials which have successfully passed incoming inspection are stored in flight bonded stock awaiting use. When needed for assembly, they are drawn from bonded stock and placed in kits by Quality Assurance. The kits are assembled and inspected before issuance for fabrication, utilizing the latest released parts list. Kit tags are attached to the containers.

The kit tags provide next assembly identification as well as the necessary information for the configuration traceability list.

1.3 In-process Inspection

1.3.1 Visual

A visual examination, using both microscope and unaided eye is performed on all fabricated components, assemblies, subassemblies, cable harnesses, and sensors. Criteria for accepting the articles submitted for inspection is established by the "Workmanship Requirements: Inspection Criteria for Electronic Equipment" and the appropriate assembly drawings. The steps in the manufacturing process, at which inspections shall be performed, are shown on the applicable approved Assembly Work Order. These inspections are performed to ensure that unacceptable workmanship, not easily detectable at a later stage of manufacture, is clearly identified so that action to correct the deficiency may be taken in a timely manner.

1.3.2 Electrical

Electrical performance tests are conducted at various stages in the manufacturing process to verify performance of subassemblies or assemblies. These tests shall be performed in accordance with applicable released test procedures.

1.3.3 Documentation

At the subassembly and assembly level, the results of all in-process inspections, tests, acceptance, or rejection, along with amplifying remarks, are recorded in the AWO. Discrepancies are recorded in the fault log. The completed Fault Log is attached to the applicable assembly work order. Inspection sign off on the Assembly Work Order is made only after acceptance. Those measurements required by the applicable test procedure are recorded on appropriate data sheets. Completed data sheets are maintained in the equipment documentation file.

1.3.4 Component Inprocess Inspection and Tests

As the functionally grouped major subassemblies begin to take on the form of a complete experiment, a Flight Assembly/History Log is started. The log book shall contain a record, in chronologic form, of all inspections, tests, operating time, problems, failures, repairs, serial numbers, weights and any other information useful in compiling a history on the particular experiment. The Flight Assembly/History Log shall be maintained by the Individual responsible for the hardware, and will remain with the experiment. The Log shall be reviewed from time to time by the Quality Assurance Group to verify that entries are complete, and up to date.

INCOMING INSPECTION REPORT

- 2.0 INSTRUCTIONS FOR COMPLETING THE INCOMING INSPECTION REPORT (FIGURE 2-1)**
- 2.1 Project** Abbreviated form of the project name; i.e. XTE, Astro-D, AXAF etc.
- 2.2 Part Name** Noun name of part; i.e. Diode, transistor, I.C., bracket, housing, connector, power supply, detector, etc..
- 2.3 Part No.** Part number which is assigned by MIT/CSR
- 2.4 Distr / Mfr** Distributor and Manufacturer from whom the item is procured.
- 2.5 Lot Code** The lot code/lot date code shall be as it appears on the manufacturers documentation (if applicable).
- 2.6 P.O.Number** The purchase order number by which the parts were procured.
- 2.7 Date Rec** The date on which MIT/CSR receives the part or shipment.
- 2.8 Quantity** The total of parts in a particular shipment, except where more than one lot code/lot date code is received. A separate inspection report will be initiated for each lot.
- 2.9 Test Procedure No.** The number assigned to the written electrical test procedure by which the part is to be tested (if applicable).
- 2.10 Manufacturer's P/N** Part number which is assigned by the part manufacturer.
- 2.11 Documentation** Screening data, test data, or other data required by the purchase order will be reviewed by the inspector. If complete and satisfactory, the inspector shall stamp or initial the space provided.

- 2.12 **Serial Number** The serial number marked on the part, material, subassembly, or assembly, which clearly denotes its individual identity when compared with parts of the same type, lot, and part number.
- 2.13 **Visual** Mark "accepted" or "rejected" as determined by the requirements.
- 2.14 **Electrical** Mark "accepted" or "rejected" as determined by the requirements.
- 2.15 **Comments** Self explanatory.

THE INCOMING INSPECTION STATUS TAG

3.0 INSTRUCTIONS FOR COMPLETING THE INCOMING INSPECTION STATUS TAG (FIGURE 3-1)

- 3.1 **Project** Abbreviated form of the project, i.e. XTE, AXAF, Astro-D, etc.
- 3.2 **Manufacturer**. Manufacturer from whom the item is procured.
- 3.3 **MIT No.** A part or drawing number which is assigned by MIT/CSR.
- 3.4 **Mfg No.** The part, item, or assembly number assigned by the manufacturer.
- 3.5 **Lot.** The lot code shall be as it appears on the manufacturer's documentation (if applicable).
- 3.6 **P.O. Number.** The purchase order number by which the item was procured.
- 3.7 **Date Received.** The date on which MIT/CSR receives the part, or shipment of parts.
- 3.8 **Quantity.** The total number of parts in a particular shipment, except where more than one lot code is received. A separate inspection report will be initiated for each lot code when practical.
- 3.9 **Part Name** Noun name of part; i.e. Diode, transistor, I.C., bracket, housing, connector, power supply, detector, etc..
- 3.10 **Date.** Enter the date the visual inspection was performed.
- 3.11 **By .** Inspector's stamp or signature.
- 3.12 **Date.** Enter the date the electrical testing was performed.

3.13 **By.** The inspector's stamp or signature.

3.14 **Date.** Enter the date the screening was completed.

3.15 **By.** Inspector's stamp or signature.

3.16 **Remarks.** Special instructions; i.e. Electrostatic sensitive, refrigerate, store flat, radioactive, do not freeze, use before date, etc.

Incoming Inspection Status Tag MASSACHUSETTS INSTITUTE OF TECHNOLOGY CENTER FOR SPACE RESEARCH	
Project	MFG.
MIT No.	MFG No.
Lot	P.O. No.
Date Rec'd.	QTY.
Part Name	
Visual Inspection	
Date	By
Electrical Test	
Date	By
Screening Completed	
Date	By
Remarks:	

Figure 3-1

REJECT TAG

4.0 INSTRUCTIONS FOR COMPLETING THE REJECT TAG (FIGURE 4-1)

- 4.1 **Project** Abbreviated name of the project, i.e. XTE, AXAF, Astro-D, etc.
- 4.2 **Date**. Date material was rejected.
- 4.3 **Part Name**. Diode, resistor, transistor, etc..
- 4.4 **Part No.** The part or drawing number assigned by MIT/CSR.
- 4.5 **Inspection Report Date**. The "date received" as recorded on the inspection report on which the material was rejected.
- 4.6 **Reason for Rejection**. Brief summary; broken lead, improper marking, void in seal, etc.
- 4.7 **Disposition**. Awaiting engineering review, MRB action, Return to Vendor (RTV), scrap, etc.
- 4.8 **Inspector**. The inspector's stamp or signature rejecting the material.

REJECT TAG

CENTER FOR SPACE RESEARCH
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PROJECT _____ DATE _____

PART NAME _____ PART NO. _____

INSPECTION REPORT DATE _____

REASON FOR REJECTION _____

DISPOSITION _____

SIGNATURE _____

Figure 4-1

SHELF LIFE TAG

CENTER FOR SPACE RESEARCH
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PRODUCT NAME _____

PURCHASE ORDER NO. _____

MANUFACTURER _____

MFGR'S P/N _____

MFGR'S LOT CODE _____

DATE OF MANUFACTURE _____

SHELF LIFE _____

STORAGE CONDITIONS _____

EXPIRATION DATE _____

SIGNATURE _____

DATE RCV'D @ MIT _____

Figure 5-1