PREPARED BY:	***Multiband Imaging Photometer for SIRTF***	NUMBER M11I51	
C. DAVIDSON		TYPE INSPECTION	
APPROVALS			
ENGINEERING	University of Arizona Steward Observatory, IR Group	DATE 07/07/97	
QUALITY	**SPECIFICATION**	SUPERSEDES SPEC. DATED	
PI/DEPUTY PI		REV. NEW	PAGE 1 of 5

TITLE

INCOMING INSPECTION OF CONCENTRATOR (MIPSD–066), PROCEDURE FOR

1.0 SCOPE

This specification defines the equipment, materials and procedure for incoming inspection of the germanium concentrator, PIN MIPSD-066, which will be used in the build of the MIPS 32x32 Ge: Ga focal plane array.

2.0 PURPOSE

The incoming inspection is to verify that the requirements of the purchase order have been satisfied and that the concentrators meet the specifications of drawings MIPSD-066.

3.0 APPLICABLE DOCUMENTS

The following documents form a part of this inspection procedure to the extent specified herein. In the event of conflict between the requirements of this document and the requirements of the engineering drawings called out, the requirements of the drawings shall take precedence. Unless otherwise specified, the most recent revision of the documents identified herein shall apply.

Manual
University of Arizona Safety Manual

University of Arizona, Steward Observatory, IR Group
MIPSD-066 Concentrator

4.0 REQUIREMENTS

4.1 Equipment

Acceptable results are contingent upon the use of the recommended equipment listed below or equivalent equipment. Equivalent equipment may be substituted for the recommended equipment if and only if effectiveness and accuracy are not decreased by its use.

Item	Quantity	Description
1	1 each	Microscope, stereozoom, Bausch and Lomb
2	1 each	Microscope, measuring, x, y, and z-axes, Nikon
3	1 each	Measurement system, Nikon Digimicro System
4	1 each	Gun, blow

4.2 Materials

Item	Quantity	Description
1	as received	Concentrator, germanium PIN MIPSD-066
2	as required	Acetone, electronic grade
4	as required	Methanol, electronic grade
5	as required	Isopropanol, electronic grade
6	as required	Nitrogen, gaseous (dry) or air (dry)
7	as required	Wipes, cleanroom

5.0 PROCEDURAL REQUIREMENTS

Incoming inspection of the concentrators is to be performed and tracked on a lot basis. The lot number to be recorded on the lot inspection summary sheet, document no. M11I51-A, (see figure 1) is the lot number designated by the vendor on the shipper accompanying the parts or on other vendor supplied documentation. If the vendor does not provide a lot number, then the U of A purchase order number followed by the date the concentrators were received will be used as the lot number. Traceability of the concentrators as they are used in the build of upper level assemblies will be made to the lot number. Concentrators that fail to meet the acceptance requirements will be stored separately from those that do meet acceptance requirements.

6.0 PROCEDURE

Notes:

1. Handling, storage and disposal of chemicals are to be in accordance with the University of Arizona Safety Manual.
2. Cleanroom gloves or finger cots are to be worn when handling hardware and equipment.
3. Removal of outer wrappings and packaging material is to be done outside of the cleanroom.

6.1 Verify Receipt of Requested Paperwork and Quantity of Concentrators.

6.1.1 Inspect the outer packaging for signs of damage incurred during transport. Record the results on the inspection sheet, document no. M11I51-A.

6.1.2 Carefully remove the outer packaging and then remove the contents and paperwork. With a cleanroom wipe dampened with isopropanol, wipe the inner packaging that covers the container of concentrators. If the container is not within plastic bags or other packing material, wipe down the containers, taking care not to obscure label information. Place the paperwork in cleanroom bags. Transport the container of concentrators and the paperwork to the cleanroom.

6.1.3 Verify that the quantities of concentrators on the vendor shipper document and on the UA purchase order are in agreement with the quantity received. Report any deficiencies or overages in quantity to the lead engineer for resolution. Verify receipt of all paperwork (e.g., certificate of compliance) called out on the purchase order.

6.2 Examine the Concentrator for Contamination and Defects.

6.2.1 Place a concentrator onto a clean microscope stage. Under 30x magnification, inspect the concentrator for scratches, chips and contamination. Reject the concentrator if there are any visible chips or scratches on the output end surface. The output end surface is the surface of the concentrator which in 1x32 module form will be in near contact with the detector. Acceptable concentrators will have scratches or other flaws in the input end of the concentrator which individually or combined would extend across or through a region of no more than 1 detector element in 1x32 module form. Scratches or other flaws comprising a combined area between 1 and 3 detector elements will be conditionally acceptable. Concentrators with scratches or chips in the input end of the concentrator which individually or combined would extend across or through a region of more than 3 detector elements in 1x32 module form shall be rejected. The maximum inward extent of any chip is to be less than 0.5 mil.

If contamination is observed, flush the concentrator for a minimum of 20 seconds each with acetone, methanol then isopropanol. With low-level pressure from a blow gun, blow the concentrator dry with dry N_2 or air. Note: To prevent redistribution of contaminants or possible solvent residue from remaining on the concentrator, keep the concentrator wet with solvents until it is blown dry.

6.2.2 Inspect the concentrator to verify that the it is free of contamination. Repeat step 6.2.1, as necessary. If contamination remains, ultrasonically clean the concentrator in isopropanol for 15-20 minutes, flush with isopropanol and blow dry. If contamination is still present, reject the concentrator from process continuation.

6.3 Verify the Concentrator Dimensions.

Note: If a contact measuring system (i.e., a Nikon Digimicro System) is used to make any of the required measurements, take care not to scratch, chip or otherwise damage the concentrator.

Using a 3-axes measuring microscope and using drawing MIPSD-066 as a reference, make the measurements called out in the inspection sheet. Each parameter is to be measured at three different locations, and a minimum of three measurements is to be made at each location. For concentrator acceptance, the average of the measurements for a parameter must fall within the specification range identified on the drawing and on the inspection sheet.

Reminder: In the event of conflict between the drawing and this specification or the inspection sheet, the drawing is to take precedence.

6.4. Lot Acceptance Verification.

Visually examine and measure each concentrator per paragraphs 6.2.1 through 6.3.

6.6 Store the Concentrators.

Place acceptable concentrators in a clean storage container, which is compartmentalized or otherwise allows for physical separation of the concentrators one from another. Cover the container and label the cover: 'MIPS Concentrator, PIN MIPSD-066, Lot No. xxxx, Acceptable.' For lot number identification, reference paragraph 5.0. Store the container on an appropriate shelf of an N_2-purged desiccator.

In a similar manner, but in a separate location, label and store reject bars. On the label, record the word 'reject'.

6.7 Complete Incoming Inspection Sheet.

6.7.2 Summarize the results of inspection and measurement of the concentrators on the lot incoming inspection sheet, M11I51-A.

6.7.3 Advise the process lead engineer of the status of the lot of concentrators. Place all vendor-supplied paperwork and the inspection sheet in the process files.

MIPS Optical Concentrator (PIN MIPSD-066)
Lot Incoming Inspection Sheet
Document No. M11I51-A

Lot No: _____ Operator: _____ Date: _____

Vendor: _____ U A Purchase Order No: _____

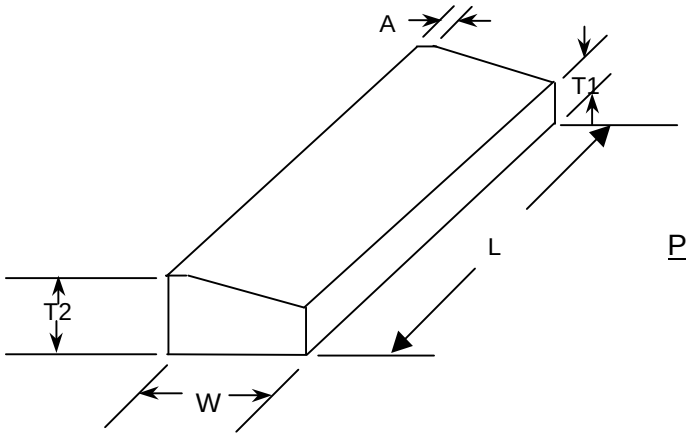
1. Outer Packaging: No damage noted ☐ Comments:
   Damage noted ☐

2. Quantity Concentrators Ordered: _____; Quantity Received: _____

3. Measurements

Instrument Used: _____

Calibration Date: _____



Parameter	Spec. Range (inch)
A	.010 - .005
T1	.018 - .015
T2	.030 - .029
L	1.020 - 1.005
W	.074 - .072

4. Lot Inspection/Measurement Summary:

Quantity Acceptable Concentrators: _____

Quantity Rejected Concentrators: _____

Primary cause for rejection:
- a. contamination ☐
- b. chips ☐
- c. scratches ☐
- d. out of spec dimension ☐
- e. other ☐

Figure 1. MIPS Concentrator (PIN MIPSD-049) Incoming Inspection Summary Sheet