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	Quality Assurance Procedure to Verify Group Resistances		
	ATLAS project document no. ATL-IT-QP-0036	Date last modified. 24 May, 2001	Approval status Full Production

1 Scope

1.1 Scope

This procedure establishes requirements for inspection of the module-assembly straw-group cathode resistance prior to module assembly straw sealing glue application and wire stringing.

1.2 Applicability

1.2.1 Applicability

This procedure applies to all modules assembled by the Indiana and Duke Production Facilities.

1.2.2 Relation to Other ATLAS Project Requirements

The inspection procedure described by this specification is in addition to other tests and inspections required for module assembly. Module-assembly straw-sealing glue application and wire stringing may begin only after acceptable results from this inspection.

2 Applicable Documents

2.1 Document List

The following documents of the issue in effect on the effective date of this specification form a part of this specification to the extent specified herein.

2.1.1 ATL-IT-EY-0004, ATLAS U.S. Environmental, Health, and Safety Plan

2.2 Amendments and Revisions

Whenever this procedure is amended or revised subsequent to its effective date, the Revised Version will be placed in the Engineering Data Management System, the

Production Database displays, and released to the technicians. The QA Engineer and the affected Production Engineers will coordinate release to the technicians.


3 Requirements

3.1 Background

Proper performance of detector straw groups depends on satisfactory electrical parallel connectivity between all of the straws in each straw group and the high voltage plate pads at each end of the module. Conductive epoxy provides this connectivity between each straw and the high voltage plate. This test determines the acceptability of conductive glue joints in each straw group.

After gluing all straws with conductive epoxy but before applying the sealing glue, Indiana will check the resistance between conjugate pads on the high voltage plates. The resistance should be equal between all pairs of pads to a level of 10%. The resistance is expected to be about 6.4 ohms for a group of eight straws. The 10% variation produces an acceptable resistance range from 5.8 to 7.0 ohms. For a group of seven straws the resistance is expected to be about 7.3 ohms. The acceptable resistance range is 6.6 to 8.0 ohms.

If this test measures a resistance significantly different from those stated above (such as measuring 12.5 ohms on an eight-tube group) there is a connectivity defect. One of the straws is not making contact with the high voltage plate through the conductive epoxy on one end or the other on either the inner or outer surface. The identity of the disconnected straw must be determined and more conductive glue applied so that contact is made.

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3.2 Software Interface

(Indiana University)

Straw Resistance Program

Uses a Wavetek 235 Digital Multimeter (DMM) to sequentially measure the resistance of the straws from one end to the other of a module. The program asks the user to push a button when the meter is set up to measure the next straw. When the operator presses the button, the straw number, the straw location, the module serial number, the date/time, and the resistance are recorded in an output file. The Program then waits for the user to move the probe of the resistance meter to the pin socket on the next pad. The contents of the output file can be read at a later time to reinspect just the straws that have been designated as bad by simply copying the file to a new name and deleting the entries for straws that are designated as good using any text editor. The user can also specify which straw ends to measure by entering a list of the standard straw numbers.

Appendix A provides a checklist to be used by Technicians performing this procedure.

4 Preparation for Delivery

4.1.1 Storage, Packing , and Shipping Requirements

There are no storage, packing, and shipping requirements applicable to this procedure.


5 Environment, Health, and Safety (EH&S)

5.1.1 EH&S Invoked

No special EH&S hazards are associated with the conduct of this test.

6 References

- 6.1 ATLITB1_0001, Type 1 Isometric Assembly Diagram (Exploded)
- 6.2 ATLITB2_0001, Type 2 Isometric Assembly Diagram (Exploded)
- 6.3 ATLITB3_0002, Type 3 Isometric Assembly Diagram (Exploded)

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Appendix A

8 Enter "Save" to exit and save the data. Otherwise, enter "Cancel" to exit without saving.

Table Name:

tblChecklistVerifyGrpResistances

Step Check List Steps

1 Scan the "Quality Assurance Procedure for Verifying Group Resistances" Product ID Barcode.

2 Ground the pads on the front end by attaching the grounding plate or grounding pins. Enter "Done".

3 Move the computer with the multimeter to the back end of the module. Position the multimeter with the RS232 connection near the module, be careful of the data cable where it attaches to the meter. Enter "Done".

4 Start the resistance program on the computer. Enter "Done"

5 Measure the resistances of each pad as prompted by the computer. Enter "Done".

6 Remove the grounding plate. Print a list of the resistances; identify those measuring over 10 ohms. Remeasure these pads with a probe on the front as well as the back. Enter "Done"

7 Call supervisor or expert to examine the results. Enter "Accept" if no pad has a high resistance. Otherwise enter "Reject" and rework the module.

Procedure Quality Assurance Procedure to Verify Group Resistances Product ID Barcode



Procedure Part Number



Approvals

Name	Signature	Revision	Date
J.Callahan		B	
D.Rust		B	
C. Wang		B	