

# Module Test Status & New Test Procedures

# Procedures for Module Testing

- Task force work: the “Procedures for Module Testing Using ARC Systems” are on web since Oct 13th in:  
[hep.fi.infn.it/CMS/moduletest/tkwoct03/test\\_procedures.pdf](http://hep.fi.infn.it/CMS/moduletest/tkwoct03/test_procedures.pdf)

A screenshot of ModTest webpage

## Module Test Working Group

Last Upd.

LINK to:

[Task Force: New Test Procedures with ARC \(.ps\) \(.pdf\) \(Oct. 2003\)](#)

[Updated Macros and config. files \(from Firenze website\),](#)

[K-MUX "how to" info page from P. Gartung,](#)

[Macros and Results \(July 2003, Torino\);](#)

[Cross Calibration Pages](#)

[Test Results Pages](#) of Laboratories involved in Module Test

Link on Electrometer to be added soon

# Procedures for Module Testing

- From module test web page you find also:
  - Official cuts corresponding to new procedures
  - Settings files for ARC to be used with TIB modules (TOB and TEC are default in ARCS)
  - Configuration files to be used with 'task force macros'

The screenshot displays a webpage with several links and text elements. A red box highlights the entire content area, and a blue box highlights a specific section. A red arrow points to the 'ARCS 6.2.1 OFFICIAL' link. Two red ovals highlight the 'Official cuts for modules' link and the list of module types.

Modules bonded in Firenze

Official cuts for modules

**ARCS 6.2.1 OFFICIAL** Configuration file for TIB modules

Download Tony's macros for ARCS 6.1 and later  
Download configuration file for Tony's macros:

- TIB modules
- TOB and TEC modules

Channel Fault Key

Created by Antanix

A screenshot of Firenze production webpage

# What Users Should Do

- **Absolutely needed:** feedback from users to spot possible problems (again!!). Developers (both ARC and LT) need **you** fully use sw and study in detail all features to make fast progress.
- Good collaboration between some users and ARC sw team on many aspects:
  - ARC results fully equivalent to macro's output
  - IV data treatment (text files, xml files etc.)
  - Temperature readout
  - Pinhole test, HV current limit
  - LED test flagging
- LT team is doing the same, but with maybe a slightly minor feedback from users

# Operations Sequence 1-3

Extracted from New Procedures (ARC)

## A.0.1 First step: module arrival

First of all, perform optical inspection; then, with hybrid + PA cuts, perform:

- a complete FAST TEST;
- a subset of ALL TEST: pedestal, noise, pulse shape, pipeline.

Save data!

## A.0.2 Second step: HV bonding

Bond all needed HV connections, then perform, again with hybrid + PA cuts:

- an IV curve;
- a complete FAST TEST;
- a subset of ALL TEST: pedestal, noise, pulse shape, pipeline.

Save data!

## A.0.3 Third step: strip to PA bonding

Bond sensor to PA then, using full module (1 or 2 sensors) cuts:

- perform an IV curve;
- set bias at 400 V;
- perform a complete FAST TEST;
- perform a subset of ALL TEST: pedestal, noise, pulse shape, pipeline, led, pinhole (for this test set HV current limit to 400  $\mu$ A).

Save data!

# Operations Sequence 4-5

## A.0.4 Fourth step: passive cooling

The module must be cooled down to  $-20\text{ }^{\circ}\text{C}$  (with no readout) and then back to room temperature. Then, using full module (1 or 2 sensors) cuts:

- perform an IV curve;
- set bias at 400 V;
- perform a complete FAST TEST;
- perform a subset of ALL TEST: pedestal, noise, pulse shape, pipeline, led, pinhole (for this test set HV current limit to  $400\text{ }\mu\text{A}$ ).

Save data!

## A.0.5 Fifth step: database

Data taken after passive cooling must be written into the database. The xml is produced using the xml parser included in ARCS, taking the appropriate record from the ROOT file. All the data must be kept also in local files for future reference, and made accessible from the web.

See local files storage example in Firenze in <http://hep.fi.infn.it/CMS/marchett/production/production.html>

# A Simple Directory Structure

## Modules bonded in Firenze

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30200020000024  
30200020000025  
30200020000026  
30200020000027  
30200020000028  
30200020000030  
30200020000031  
30200020000032

Created by AntaniX

# The Summary Page of a Module

**Module number 30200020000030 (on Sep 09, 2003)**

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Optical inspection: No defects found.

Before bonding:

IV Curve [Txt](#) [Excel](#)

ARCS results [Root file](#)

After bonding:

ARCS results [Root file](#) [Xml file](#) [Plots](#)

Bad strip list (following [official cuts](#)):

Chan#	Peak Off	Peak On	Dec Off	Dec On
256	NOIS	NOIS		NOIS

[Channel Fault Key](#)

[Back to module list](#)

Edited by marchett

Created by Urzahil

Module Test 21/10/2003

Marco Meschini, INFN Firenze

# On Module Grading

Quoting from Procedures:

Module grading as of now is fairly simple.

- A module is Grade A if the module has less than 1% bad channels (a channel with any testing failing in any mode).
- A module is Grade B if the module has 1–2% bad channels.

In both cases the module's IV test has to pass selection.

Otherwise it will be marked as suspicious (grade C).

- Any module with more the 2% bad channels is grade F.

**Do not discard modules at this stage!**  
Put them aside and store carefully: they can be recovered in the future (or even needed...)

# A Time Estimate

First estimation of time needed to test a module at bonding centres, based on September production in Florence

- Using 1 ARC system, CPU Intel Celeron [1GHz]
- HV system not integrated with ARC (Keithley 2410 + Labview on RS232); ARC-DEPP boards in production for all TIB bonding labs

# First Step: module arrival

- Optical Inspection 15'
- complete FAST TEST 1'
- subset of ALL TEST 4'
  - Ped, Noise, Common Mode (1')
  - Pulse Shape (2'30")
  - Pipeline (30")
- Total 20'

## Second Step: after HV bonding

- I V curve 10'
- complete FAST TEST 1'
- subset of ALL TEST 4'
  - Ped, Noise, Common Mode (1')
  - Pulse Shape (2'30")
  - Pipeline (30")
- Total 15'

# Third Step: after strip-PA bonding

- I V curve 10'
  - set bias at 400 V 1'
  - complete FAST TEST 1'
  - subset of ALL TEST 5'
    - Ped, Noise, Common Mode (1')
    - Pulse Shape (2'30")
    - Pipeline (30")
    - LED Test (10")
    - Pinhole Test (30")
  - Total 17'
- The same applies to step 4, after passive cooling

## Fifth Step: database

- xml parser + write to database

1'

The (Preliminary) Final Number

Total time for all needed tests 70'

## A.O.B.

- CAEN module A1303 CAEN NET HS controller (PCI replacement of I SA A303 Caenet Controller which is out of production)
- If ordered before end of 2003:  
846 SF up to 3 boards  
764 SF above 4 boards
- Please react fast, contact Wim or Patrice for a common order