MROD-X Test Log
Production series
(Modules 37-264)

MROD-X 37
Type: 6 Channel

Assembled Jun, 2007

Power Short Check:

Fuse 16A pad (Board 3V3) to Lemo Chassis (Gnd)	measure	5,3Ω
Fuse 5A pad (Board 5V) to Lemo Chassis (Gnd)	measure	several 100K

MROD_In4_Present = FALSE:

R523 = 1M	measure	5,4Ω
R524 = 0Ω	measure	0Ω

SharcB_Present=FALSE:

R525 = 1M	measure	5,4Ω
R526 = 0Ω	measure	0Ω
R541 = 4K7	measure	4K7
R542 = 4K7	measure	4K7

Power Supplies:

2V5 (VCCAUX XC2VP20; IC582)	direct feedback		
1V9 (VDDINT Sharc-A en B; IC583)	R770 = 34K7	measure	20K62
	R771 = 48K7	measure	20K84
1V5 (VCCINT XC2VP20; IC584)	R775 = 17K8	measure	13K00
	R776 = 48K7	measure	13K01
2V5 (MROD-In 1 & 2 VCCAUX; IC578)	direct feedback		
2V5 (MROD-In 3 & 4 VCCAUX; IC579)	direct feedback		
1V9 (VDDINT Sharc-C en D; IC580)	R757 = 34K7	measure	20K51
	R758 = 48K7	measure	20K64
1V9 (VDDINT Sharc-E en F; IC581)	R762 = 34K7	measure	20K66
	R763 = 48K7	measure	20K88
1V5 (VCCINT MROD-In 1; IC107)	R144 = 17K8	measure	13K06
	R145 = 48K7	measure	13K09
1V5 (VCCINT MROD-In 2; IC207)	R244 = 17K8	measure	13K04
	R245 = 48K7	measure	13K07
1V5 (VCCINT MROD-In 3; IC307)	R344 = 17K8	measure	13K03
	R345 = 48K7	measure	13K05
1V5 (VCCINT MROD-In 4; IC407)	R444 = 17K8	measure	17K80
	R445 = 48K7	measure	48K6
3V3 (S-Link power; IC540)	direct feedback		

DIP Switches (Sw1A, Sw1B, Sw2A, Sw2B, Sw3A, Sw3B, Sw9) in Slave SelectMap mode M2, M1, M0 = “110”

R605, R608, R609, R610, R719, R720, R721, R1006, R2006, R3006, R4006, R5006, R6006, R7006, R8006 checked okay! (although handsoldered)

R710, R712, R714, R716 not placed -> okay
R711, R713, R715, R717 0603 (51 ohm) -> okay

Install EMC Gasket
Check Optical Transceiver clips

Solder connectors onto the Fuses to be able to apply 5V and 3V3 from tabletop power supplies.

Apply 5V and 3V3!

5V Current	measure	0,7 A
3V3 Current	measure	3,2 A

Note: All LEDs are on except for ASP Connected (Green)

Power Supplies:

2V5 (IC582/L538/C963)	measure	2,52 V
1V9 (IC583/L539/C970)	measure	1,89 V
1V5 (IC584/L540/C977)	measure	1,50 V
2V5 (IC578/L534/C935)	measure	2,52 V
2V5 (IC579/L535/C942)	measure	2,52 V
1V9 (IC580/L536/C949)	measure	1,89 V
1V9 (IC581/L537/C956)	measure	1,89 V
1V5 (IC107/L101/C183)	measure	1,50 V
1V5 (IC207/L201/C283)	measure	1,50 V
1V5 (IC307/L301/C383)	measure	1,50 V
3V3 (IC540L533/C794)	measure	3,32 V

Put board into the crate.

Cd /project/et/Atlas/Atlas_MROD/MROD_X/usbcmd
programmrod.sh in <slotnumber>
    Check project/et/Atlas/Atlas_MROD/MROD_X/usbcmd/_impactbatch.log
    '3': Programming completed successfully.
programmrod.sh out <slotnumber>
    Check project/et/Atlas/Atlas_MROD/MROD_X/usbcmd/_impactbatch.log
    '1': Programming completed successfully.

VME interface is not up yet -> power cycle the module
Connect S-Link fiber
Connect LoopBack Fibers (1A<>3B; 1B<>2A; 2B<>3A)

MRODTest Okay!
    But temperature warning: output FPGA reads 68 degrees…

MROD-X 38
Type: 6 Channel

Assembled Jun, 2007

Place Serial Number stickers on front panel and PCB.
Archive the PCB Technologies “MROD S/N”

Power Short Check:

Fuse 16A pad (Board 3V3) to Lemo Chassis (Gnd)	measure	5,3Ω
Fuse 5A pad (Board 5V) to Lemo Chassis (Gnd)	measure	several 100K

DIP Switches (Sw1A, Sw1B, Sw2A, Sw2B, Sw3A, Sw3B, Sw9) in Slave SelectMap mode M2, M1, M0 = “110”

R605, R608, R609, R610 => “01A”

Install EMC Gasket
Check Optical Transceiver clips

Put board into the crate.
Check: All LEDs are on except for ASP Connected (Green)

cd /project/et/Atlas/Atlas_MROD/MROD_X/usbcmd
./program_in_and_out.sh <slotnumber>
slot 6 in
'3': Programming completed successfully.
slot 6 out
'1': Programming completed successfully.

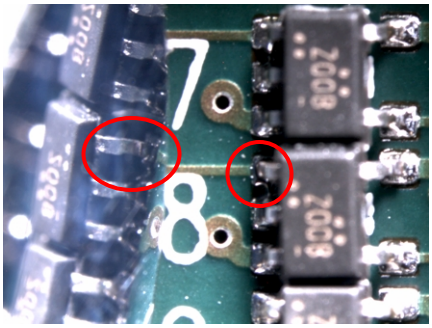
Connect S-Link fiber
Connect LoopBack Fibers (1A<>3B; 1B<>2A; 2B<>3A)

cd MRODTest
mrodtest <slotnumber> <serialnumber>

cd MROD-<serialnumber>
GREP ### *

MROD-X 41
Type: 6 Channel

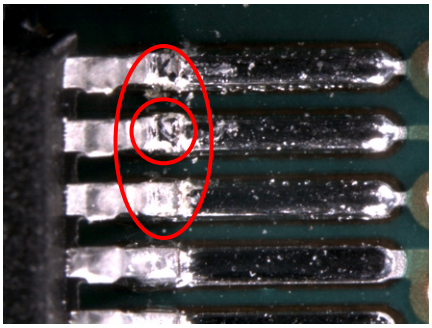
Assembled Jun, 2007



IC588 pin 1 open; repaired (9-jul-2007)

MROD-X 42
Type: 6 Channel

Assembled Jun, 2007



IC2006 pin 79 (ZBT memory Data15) open; repaired (9-jul-2007)

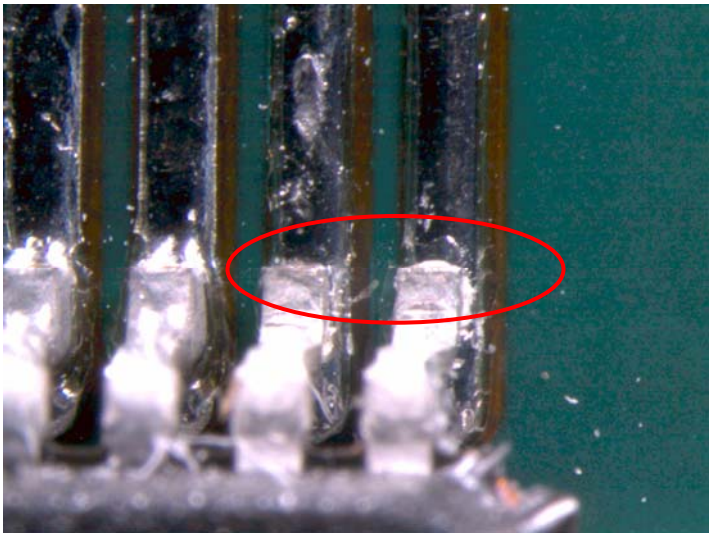
During duration test channel TLP word changed from 0x3FFFF to 0x00000 for CSM#1

11-12-2007:
Module needs version upgrade to
In: 07083100
Out: 07101000
Program PROMS (slot 11) via RCAT okay.

```
Channel B:
----------
-> address overlay
   (walking-1/walking-0/pattern in address, number of data patterns: 6):
 -> All memory locations set to 0xFFFFFFFF
Walking-1 memory indices
..==> ERRORS...
### addr #00000101:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000001:  written  #AAAAAAAA
### addr #00000201:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000001:  written  #AAAAAAAA
### addr #00000301:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000001:  written  #AAAAAAAA
### addr #00000102:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000002:  written  #AAAAAAAA
### addr #00000202:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000002:  written  #AAAAAAAA
### addr #00000302:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000002:  written  #AAAAAAAA
### addr #00000104:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000004:  written  #AAAAAAAA
### addr #00000204:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000004:  written  #AAAAAAAA

### ERRORS found in file MROD-42/mem-C.log
### UNEXPECTED number of lines in file MROD-42/mem-D.log
### check if test completed properly!
### UNEXPECTED number of lines in file MROD-42/mem-E.log
### check if test completed properly!
### There were errors, type any to continue..
```

Check address lines A8 and A9 of IC2006 (pins 81 and 82)

81 and 82 were loose!



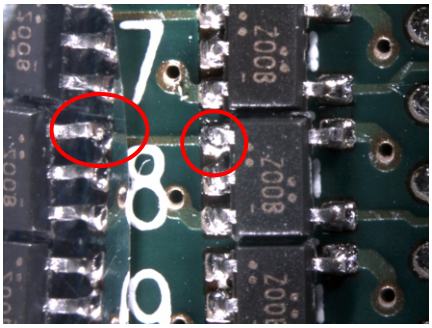
Reflowed pins 75 to 86

Mrodtest okay!

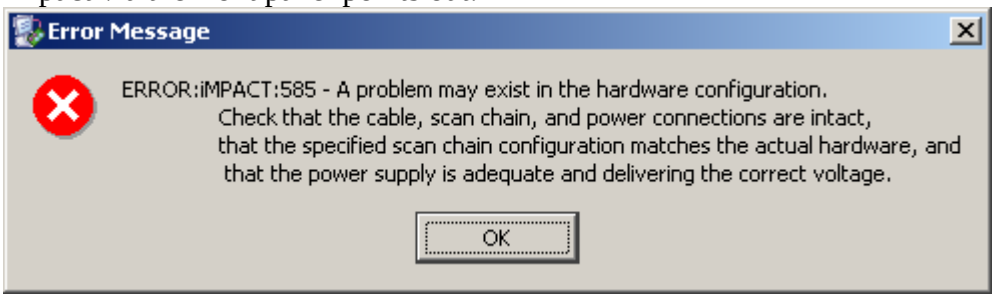
15-Aug-2008:
Firmware updated, mounted slink 0416
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 10 42 okay!

MROD-X 43
Type: 6 Channel

Assembled Jun, 2007


IC588 pin 1 open; repaired (9-jul-2007)

After 24 hours duration test, the module does not want to configure anymore…
Impact via the front panel points out:



13-Aug-2007:
Measure R662 (DONE) and R673 (MRI_DONE). At both sides of the resistor 1,39 V.
This should have been 2,5V from IC582 powered by 5V. Fuse F1 5A is defect.
Repaired.
Mrodtest okay

MROD-X 45
Type: 6 Channel

Assembled Jun, 2007

Something wrong with ECR?

[daqmuon@calore MROD-45] [43] grep ### *
intr-A.log:tst 1: ###Timeout IRQ2 (ECR) interrupt
intr-A.log:tst 1: ###Timeout IRQ1 Spy EvtLen FIFO interrupt
intr-A.log:tst 1: ###Timeout IRQ1 Spy Evt FIFO interrupt
slink_evts.log:### Something wrong found in here (MROD-45/slink_evts.log) by slinktest.sh

9-Aug-2007:
`mrodtest 11 45 ointr` simply works!?

Mrodtest okay (twice!)

MROD-X 47
Type: 6 Channel

Assembled Jun, 2007

Power Short Check:

Fuse 16A pad (Board 3V3) to Lemo Chassis (Gnd)	measure	**2,3Ω << Low!**
Fuse 5A pad (Board 5V) to Lemo Chassis (Gnd)	measure	several 100K

Used Tabletop Powersupply to measure the 3V3 current -> 3,3 A which is normal.
Again measured Fuse 16A pad (Board 3V3) to Lemo Chassis (Gnd); now 5,3Ω
Probably some small short circuit that is now burnt away…
repaired (9-jul-2007)

MROD-X 48
Type: 6 Channel

Assembled Jun, 2007

12-Jul-2007:
Module 48 again through mrodtest since this one comes from slot 5 of the duration test crate. It is being investigated if a hang-up of the duration test is due to this module…
Mrodtest okay!
Duration test now runs flawless without module 48! So 48 indeed is suspect.

13-12-2007:
Firmware updated:
In: 07083100
Out: 07101000

mrodtest 9 48 -> okay!

04-02-2008:
Duration test fails after several hours. Than the module has BUSY set and the run is stalled. The "Slot#.log" files and "mrodchk datafile" look fine, no clues found here.
See "test-01-02-1653" and "test-04-02-0932".

12-03-2008:
Firmware updated:
In: 07083100
Out: 08030301
Meenemen in de duration test op zoek naar RocketIO Down fouten…

Na een tijdje… MRODtest 7 aap:

```
###ERRORS found in file MROD-aap/crcsr.log
### There were errors, type any to continue..error: 0x911      => major: Error  17 in
package   9 => FILAR library: A link did not come up again after a reset
```

Maar weer uit het crate halen…

6-May-2008:
For reflow sent to CERN-DEM (DEM removed Triple-LEDs before reflow and replced them afterwards)

29-May-2008:
Remount the front panel
Mount S-Link Card (SN1608)
Firmware updated:
In: 08041800
Out: 08051400
Mrodtest 14 48 fail:

```
###ERRORS found in file MROD-48/crcsr.log
### There were errors, type any to continue..

VME-slot 14, BAR = 70h
CRCSR string = "MROD-X, Muon Drift Tube Readout Driver, NIKHEF"
MRODOUT reset...done
###MRODOUT SHARC-A WAIT-reg: 41CE739C, but expected 01CE739C
###MRODOUT SHARC-A WAIT-reg: 4AAAAAAA, but expected AAAAAAAA
MRODOUT reset...done
###MRODOUT SHARC-A WAIT-reg: 41CE739C, but expected 01CE739C
```

VME databit 30 stuck at ‘1’ ?
Check IC569 an IC568 (data bits 31-28 =IC569 pin 37/20; 36/21; 34/23; 33/24)
All VME Buffers visually okay. Reflowed IC569 (just in case)

Mrodtest 14 48 okay! (although number of lines in linktest.log is not as expected)

MROD-X 50
Type: 6 Channel

Assembled Jun, 2007

06-06-2016:
Module returned from CERN by Henk.
Suspected SHARC boot problems.
Needs to be re-tested in Amsterdam

MROD-X 52
Type: 6 Channel

Assembled Jun, 2007

IMPACT via front panel connector -> Valid JTAG chain!
ASP does *not* connect in slot 6, nor in 10!

9-Aug-2007:
Connect.sh 6 fail
Reflow connections around ICs 585, 586, 587, 588 and 589
Connect.sh 6 fail
Measured all relevant connections (including power supplies and LED connection) around ICs 585, 586, 587, 588, 589, and 552 -> okay!

IC552 (74LVT8996) broken?

10-Aug-2007:
Replaced IC552 (74LVT8996)
Connecttest.sh fail
Measured pull-ups R627/R628 -> 4k3~4k0~4k7 -> reflowed R267/R628
Connecttest.sh fail

13-12-2007:
Slot 15 connect fail.
Checked Tiny Logic (on the table) IC552 address pins (toggle when P1-10d,11d,13d,15d and 17d are taken to gnd). okay
Checked (ohmic) V_TCK, V_TRST_n, V_TMS, V_TDI, V_TDO connections to P1. okay.
Checked Other address pins (IC552 pin 24 to 20) okay.
Checked connection to ASP LED. Okay.

Impact via front panel; PROMs programmed:
In: 07083100
Out: 07101000
Board does not come out of config cycle… PROMs verify okay.
Both DONE lines stay low. Checked Sysreset (pin 4 IC556) and PROG signals -> okay!
Checked 20MHz config clock on R672/675 okay.
During sysreset only activity on one MRI_D line (on termination resistors R676/677)
Check PROM solderings -> okay
Check power supplies
During sysreset only activity on one MRI_D0 line (on pin 28 IC554) and on D0 (on pin 28 IC553). Checked DIP switches -> okay. Are the PROMs programmed for serial configuration?
Impact via front panel; Erased PROMs and re-programmed (Checked “Parallel Mode”)
In: 07083100

Out: 07101000
Sysreset -> board out of configuration!

Connect/Disconnect in Slot 6 and 9 okay!
Reprogram via RCAT fails although module does connect in slot 9!

```
Identifying chain contents ....done.
ERROR:iMPACT:585 - A problem may exist in the hardware configuration.
        Check that the cable, scan chain, and power connections are intact,
        that the specified scan chain configuration matches the actual hardware, and
        that the power supply is adequate and delivering the correct voltage.
```

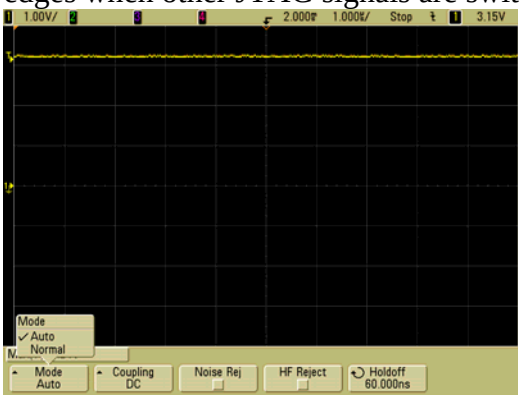
Checked Tiny logic IC 548,549,550,551. During programming via RCAT saw pulses on ASP pin 16,15,14,and 17 but connect seems flackery…

Mrodtest 6 52 -> okay!

Brute force reflow all ASP pins (IC552) and all tiny logic pins IC 548,549,550,551, 542,543,544 and 545…
Connect slot 6, 7 fail. Conect/Disconnect 12 okay.
program_in_and_out.sh 12 fail!

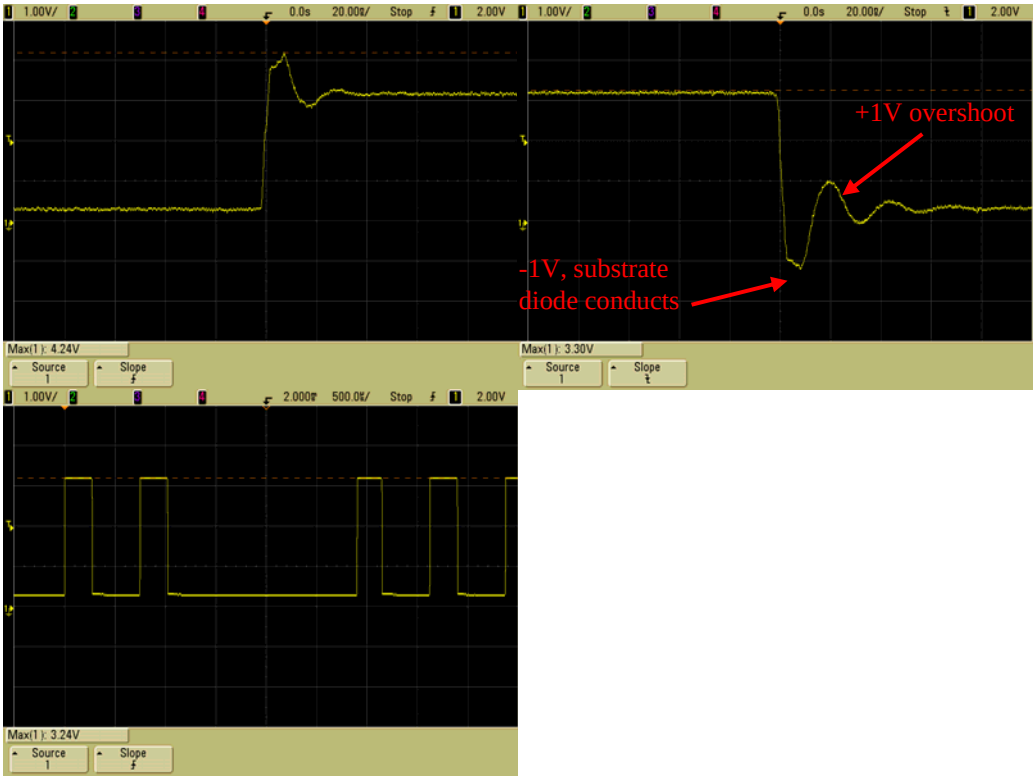
05-02-2008:
Slot 5 connect/disconnect fail!
Measurements: use 1.5 GHz probe (Agilent 1156A) using “2g” to connect ground to IC552 pins 24-23-22 and “2s” to connect probe tip:

pin 12 (V_TRST_n). Prove that this pin is always ‘1’ and that there are no negative going edges when other JTAG signals are switched.



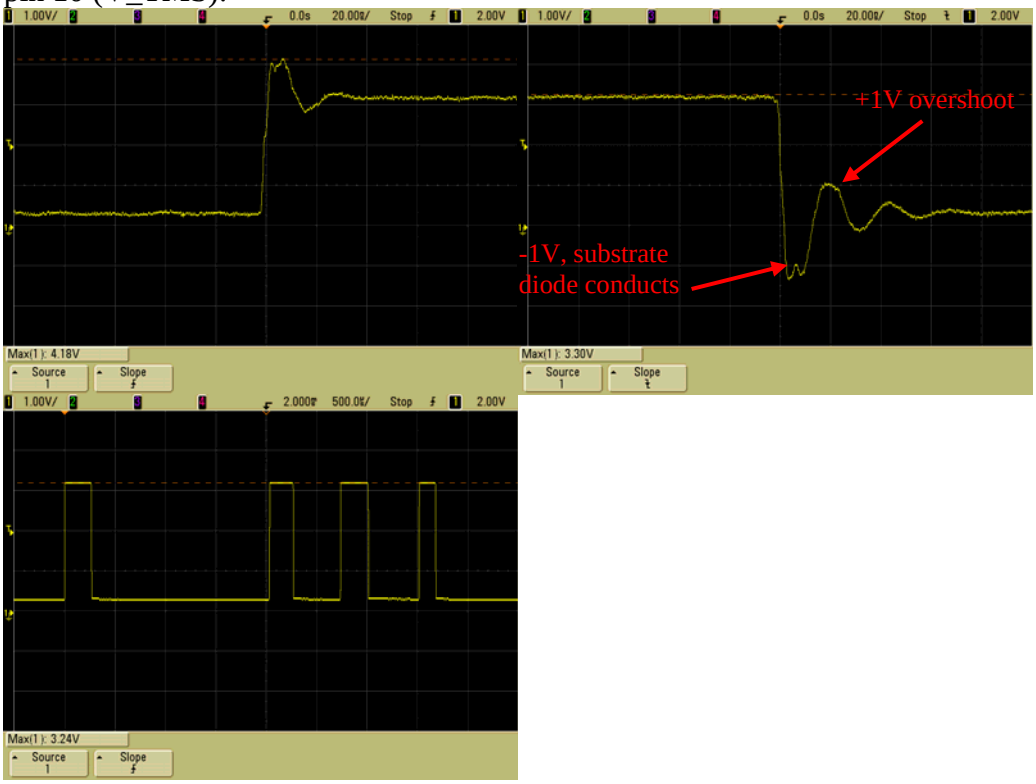
No edges found!

pin 11 (V_TDI):



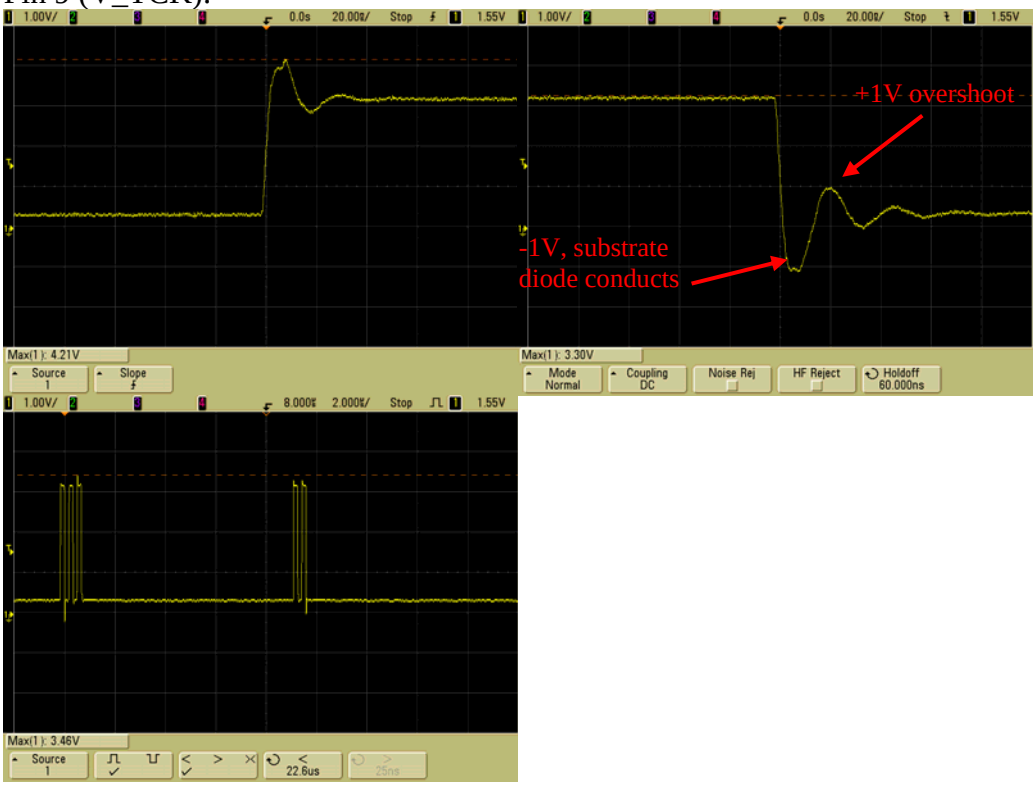
Note: now slot 5 does connect, but does ***disconnect fails***

pin 10 (V_TMS):



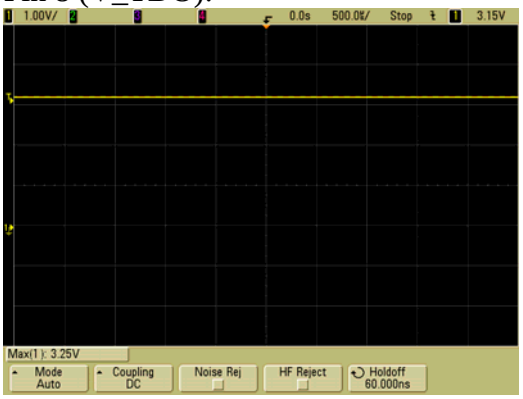
Slot 5 connect/disconnect fail!

Pin 9 (V_TCK):



Note: Slot 5 connect/disconnect okay!

Pin 8 (V_TDO):



No edges found! Signal is ‘1’ always!
Slot 5-8 connect/disconnect okay!
Slot 9 connect once /disconnect ***fail***!
Slot 10 connect/disconnect okay!
Slot 11 connect/disconnect ***fail***!
Slot 12-19 connect/disconnect okay!
Slot 9 connect/disconnect okay!
Slot 5 connect/disconnect okay!
Now suddenly all slots seem to work fine!?

06-02-2008:
Modified the RCAT module (SN18) series resistors R12, R16 and R24. Instead of 0 ohm, placed a 1uH inductor (BLM18AG102SN1D).
Module does connect and disconnect in all slots! (5-20)

Mrodtest 7 52 okay!

MROD-X 55
Type: 6 Channel

Assembled Jun, 2007

Errors in Slink.log

10-Aug-2007:
Mrodtest runs fine. Was there a problem in the test setup at the time module 55 was tested earlier?

Mrodtest okay

MROD-X 56
Type: 6 Channel

Assembled Jun, 2007

While starting up duration test SHARC-C didn't want to boot anymore…

10-Aug-2007:
Repeatedly (at least 20 times) tried "mrodtest 6 56a led" -> okay

Mrodtest okay

14-Aug-2007:
While starting up duration test SHARC-C didn't want to boot (again!)

13-12-2007:
Reprogram (slot 6) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 6 56

Hang on linktest:

```
==> Starting SHARC Link test

+ LDRDIR=ldr
+ SLOT=6
+ SERNO=56
+ OPTION=
+ LOGDIR=MROD-56
+ TMPFILE=MROD-56/linksend.log
+ '[' 2 -ne 2 ']'
+ '[' '!' -d MROD-56 ']'
+ '[' -e MROD-56/linksend.log ']'
+ echo
+ echo 'MROD-X SHARC-Link test, slot' 6
++ date
+ echo Thu Dec 13 15:29:23 MET 2007
+ echo ------------------------------
+ echo 'MROD-X SHARC-Link tests Sender Log, slot' 6
++ date
+ echo Thu Dec 13 15:29:23 MET 2007
+ echo ----------------------------------------
+ CLKDIV=2
+ echo
+ echo '==> LINK A0-->C1'
+ mrodsrv -c 6A ldr/oSndrc.ldr -l0 -8 -c2
+ mrodsrv 6C ldr/iRecv.ldr -l1 -8 -c2
```

Loose BGA ball on SHARC-C? Push hard onto SHARC-C
mrodtest 8 56 -> okay! Conclusion ***SHARC-C Loose BGA ball!***
Note: Module has an "X-Ray pass" sticker

13-Feb-2008:
For repair sent to CERN-DEM:
Serial Number **56**: Reflow IC101 = ADSP-21160NKB-100

14-Apr-2008:
Try to remount the front panel but the plastic of the Triple Leds D1A, D1B, D2A, D2B, D3A, D3B is a bit deformed so these need to be replaced.
Try to test without the front-panel.
Mount S-Link Card (SN0402; replaced TLK1501->2501 by Peter)

Mrodtest 8 56

Fail on Slink Test -> Replace S-Link Card by SN406 (replaced TLK1501->2501 by Wim Gotink)
Mrodtest 8 56 slink
Fail:

```
Errors counted per subtower (CSM)
 MROD#       CSM 0:  CSM 1:  CSM 2:  CSM 3:  CSM 4:  CSM 5:  CSM 6:  CSM 7:
 x000=0000:      28       0       0       0       0       0       0       0
 x0da=0218:       0       0       0     342       0       0       0     262
```

Replace S-Link Card by SN1602 (replaced TLK1501->2501 by Wim Goting)

Mrodtest 8 56 -> okay!

13-Jun-2008:
Mounted new Triple LEDs
Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
=> duration test

16-Nov-2011:
Henk Boterbrood brought this module back from CERN

27-Nov-2009 SHARC-C booting problems reported in USA-15
Module put into USA-15 test crate (problem probably seen by Henk, but he can't recall for sure)
Module brought to CERN office

18-Nov-2011:
Module put into test crate in Amsterdam SHARC-C boots!

MROD-X 57
Type: 6 Channel

Assembled Jun, 2007

12-Jul-2007:
ASP connect problem. IMPACT via Front panel JTAG chain okay.
Tiny Logic IC's (IC585, IC586, IC587, IC588, IC589) resoldered although they looked fine.
Problem is still there…

10-Aug-2007:
Measured all relevant connections (including power supplies and LED connection) around ICs 585, 586, 587, 588, 589, and 552 -> okay!
Connect.sh 7 fail

IC552 (74LVT8996) broken?
Replaced IC552 (74LVT8996)
Connecttest.sh okay!

```
[daqmuon@calore usbcmd] [23] program_in_and_out.sh 6
Execute Xilinx Impact commands in _xprogram.cmd ...
slot  6 in
'3': Programming completed successfully.
Execute Xilinx Impact commands in _xprogram.cmd ...
slot  6 out
'1': Programming completed successfully.
```

Board does not come out of FPGA configuration…

DONE = '1' and MRI_DONE = '0' => MROD-Out FPGA is configured, but MROD-In FPGAs are not.
Measured MRI-CCLK at R672 -> okay (18.25 MHz)
Measured MRI-D(7:0) at R676(a-h) -> okay

Programmed MROD-In PROM via front panel JTAG -> Board configures!

```
[daqmuon@calore usbcmd] [24] program_in_and_out.sh 7
Execute Xilinx Impact commands in _xprogram.cmd ...
slot  7 in
'3': Programming completed successfully.
Execute Xilinx Impact commands in _xprogram.cmd ...
slot  7 out
'1': Programming completed successfully.
```

Mrodtest okay

MROD-X 58
Type: 6 Channel

27-11-2007
Returned from CERN while module originally was tested okay…
***Diagnose:* "VME-access fails"**

Checked tiny logic and ASP: IC585, IC586, IC587, IC588, IC589 and IC552 -> okay
Checked VME: IC568, IC571, IC572, IC576, IC573, IC577 and IC570 -> okay
Firmware updated:
In: 07083100
Out: 07101000

mrodtest 7 58 -> okay!

6-May-2008:
For reflow sent to CERN-DEM (DEM removed Triple-LEDs before reflow and replaced them afterwards)

29-May-2008:
Remount the front panel.
Visual: Triple LED D2B loose contacts; resoldered
Mount S-Link Card (SN1610)
Firmware updated:
In: 08041800
Out: 08051400
Mrodtest 17 58 fail:

```
### ERRORS found in file MROD-58/intr-A.log
### There were errors, type any to continue..
MROD-58/intr-A.log:tst 1: ###Timeout IRQ1 Spy EvtLen FIFO interrupt
MROD-58/intr-A.log:tst 1: ###Timeout IRQ1 Spy Evt FIFO interrupt
```

Measured LHC_CLK on termination restistors R706/R707 -> okay
`mrodtest 12 58 ointr`
Measured TTC(1) = ECR pulse on termination resistors R728/R729 -> okay
Measured TTC(1) = ECR pulse on via near output FPGA pin AJ22 -> okay
Measured TTC(4) = Serial EVID on termination resistors R734/R735 -> okay
Measured TTC(5) = Serial TType on termination resistors R736/R737 -> okay

Replace S-Link Card Serial Number 1610. Now new card is Serial number 1612.
Problem persists…
Mrodtest 12 58 led:

```
MROD-X LED test, slot 12
-------------------------
==> LEDs on A
==> LEDs on C
```

Seems that Sharc-C hangs…

30-May-2008:
Mrodtest 9 58 led now okay…
Mrodtest 9 58 okay!

10-Jun-2008:
While starting up duration test, the module fails in slot 6. mrodtest 6 effe returns:

```
###ERRORS found in file MROD-effe/crcsr.log
### There were errors, type any to continue..Setting up DAQ SW Release "tdaq-01-
08-04"

###Failed to read VME CS/CSR BAR
error: 0x205      => major: Error   5 in package   2 => VMEbus driver/library
for the RCC: VMEbus bus error received
```

replace module…

Further investigation Necessary

MROD-X 60
Type: 6 Channel

27-11-2007
Returned from CERN while module originally was tested okay…
***Diagnose:* "SHARC C access problem"**

Checked tiny logic and ASP: IC585, IC586, IC587, IC588, IC589 and IC552 -> Just to be sure… Reflowed IC588
Firmware updated:
In: 07083100
Out: 07101000

mrodtest 7 60 -> okay!

6-May-2008:
For reflow sent to CERN-DEM (DEM removed Triple-LEDs before reflow and replaced them afterwards)

29-May-2008:
Remount the front panel.
Mount S-Link Card (SN1612)

30-May-2008:
Firmware updated => fail:
Module does not connect…
Mvmereset 16 => bus error…
Busy and Config LEDs burn very faint. Is there 3V3?
Measure 1V6 after fuse -> Fuse blown (Probably due to thermal shock in the SMD-oven)
Replaced 16A fuse.

Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 9 60 okay

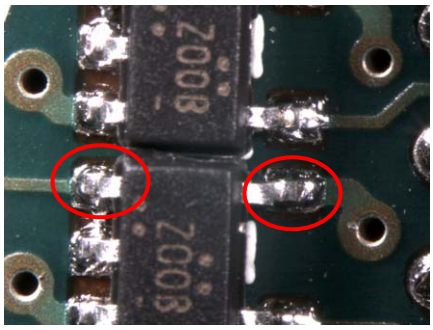
16-Nov-2011:
Henk Boterbrood brought this module back from CERN
28-Apr-2010 SHARC-C booting problems reported in USA-15
Module put into USA-15 test crate problem persisted
Module brought to CERN office

18-Nov-2011:
Module put into test crate in Amsterdam SHARC-C boots!

MROD-X 61
Type: 6 Channel

Assembled Jun, 2007

12-Jul-2007:
ASP does connect but JTAG chain is not present. IMPACT via Front panel JTAG chain okay.



IC588 pin 1 and 5 open; repaired (12-jul-2007)

MROD-X 62
Type: 6 Channel

Assembled Jun, 2007

12-Jul-2007:
MRODTest:

Although temperature of output FPGA reads 72 degrees…
Checked output FPGA power supplies: 3,23V/2,52V/1,49V
Checked voltage across C799 (Temperature sensor input) ~ 590 mV
On other modules this is ~ 630 mV. With -2 mV/C this gives a difference of 20 C. Is this due to the characteristic of this FPGAs particular diode? FPGA is from the same batch as on other modules…?

Errors in Slink.log

10-Aug-2007:
Fan speed now higher (2700 rpm) -> MROD-Out Temperature = 67 degrees
Mrodtest runs fine. Was there a problem in the test setup at the time module 62 was tested earlier?

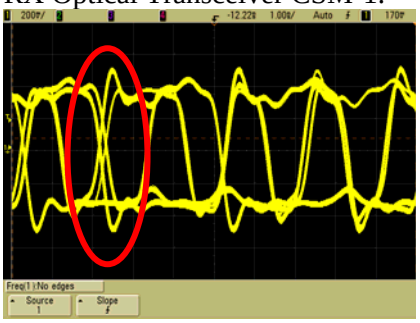
Mrodtest okay

16-Aug-2007:
Duration test performed okay while the module was operated without loopback fibers. When the loopback fibers are used a lot of errors are encountered (see directory test-16-08-1249).
Exchanged S-Link card without success…

13-12-2007:
Reprogram (slot 7) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 7 62 okay
RX Optical Transceiver CSM-0:

RX Optical Transceiver CSM-1:



Bad behavior! Sourced from TX CSM-2

RX Optical Transceiver CSM-2:

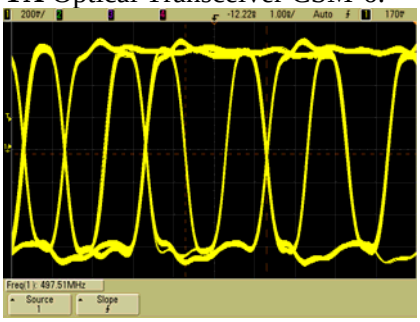
RX Optical Transceiver CSM-3:

Bad behavior! Sourced from TX CSM-5

RX Optical Transceiver CSM-4:

RX Optical Transceiver CSM-5:

TX Optical Transceiver CSM-6:



Exclude source problems on RX Optical Transceiver CSM-1:

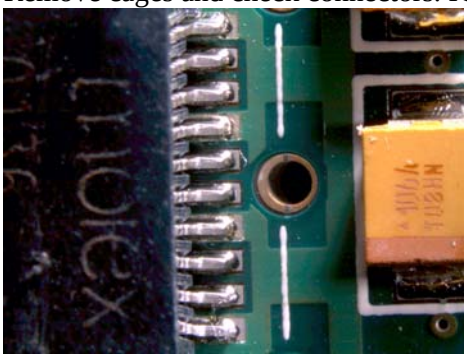
Bad behavior! ***Now sourced from TX CSM-5***

Exclude source problems on RX Optical Transceiver CSM-3:

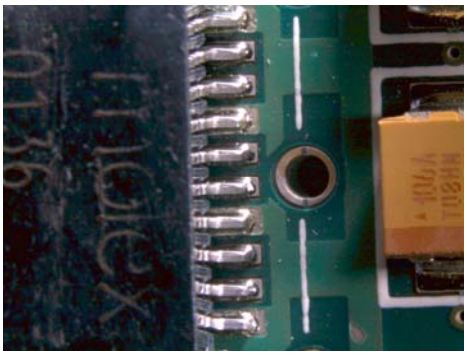
Bad behavior! ***Now sourced from TX CSM-5***

Conclusions: Check connections on CSM-1 and CSM-3 optical transceivers.

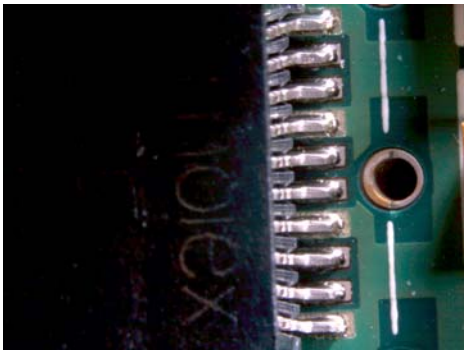
Remove cages and check connectors. IC2001 and IC4001 look fine.



IC2001 Connector



IC3001 Connector



IC4001 Connector

Anyhow reflow the TX/RX pins.

14-12-2007:
No significant change for CSM-1 RX and CSM-3 RX. Exchange Optical Transceivers:
CSM-0 <-> CSM-1
CSM-2 <-> CSM-3
Again, no significant change…
Check Module 186 as a reference module. CSM-1 and CSM-3 look equally jittery!
So this may not be the cause of the errors after all…

Again do a full mrodchk 11 62 -> okay
Try again in duration test…

15-Aug-2008:
Firmware updated, mounted slink 0422
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 5 62 okay!

MROD-X 63
Type: 6 Channel

Assembled Jun, 2007

12-Jul-2007:
ASP does connect but JTAG chain is not present. IMPACT via Front panel JTAG chain okay.
Tiny Logic IC's (IC585, IC586, IC587, IC588, IC589) resoldered although they looked fine.
JTAG Connections from P1 to LS8996 seem to be present. Voltages on address pins and BYP pin checked okay.
Problem is still there…

20-Aug-2007:
Replaced IC552 (74LVT8996)
Connecttest.sh fail

```
8      01000  <- fail
9      01001  <- fail
10     01010  <- fail
12     01100  <- fail;
16     10000  <- Connect!
```

Connect.sh fail (in slot 10)
19-11-2007:
Tiny Logic IC's (IC585, IC586, IC587, IC588, IC589) replaced by new ones…
Connect.sh

```
8      01000  <- fail
9      01001  <- connect
10     01010  <- fail
12     01100  <- fail
16     10000  <- fail

Retested after resoldering, in slot 16 and 12... Both fail.
```

14-12-2007:
ASP connect fail in slot 11
Impact via front pannel -> Programmed PROMs okay -> front panel sysreset
mrodchk 11 63 okay!

Checked Tiny Logic (on the table) IC552 address pins (toggle when P1-10d,11d,13d,15d and 17d are taken to gnd). okay
Checked (ohmic) V_TCK, V_TRST_n, V_TMS, V_TDI, V_TDO connections to P1. okay.
Checked Other address pins (IC552 pin 24 to 20) okay.
Checked connection to ASP LED. Okay.

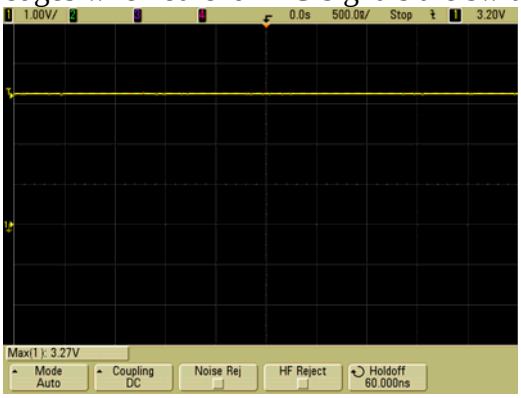
05-02-2008:
Slot 5-7 Connect/Disconnect ***fail***
Slot 8 Connect/Disconnect okay

Slot 9 Connect/Disconnect ***fail***
Slot 10-14 Connect/Disconnect okay
Slot 5 Connect ***okay*** / Disconnect ***fail***

06-02-2008:
Slot 5-7 Connect/Disconnect ***fail***
Slot 8-11 Connect/Disconnect okay
Slot 12-15 Connect/Disconnect ***fail***

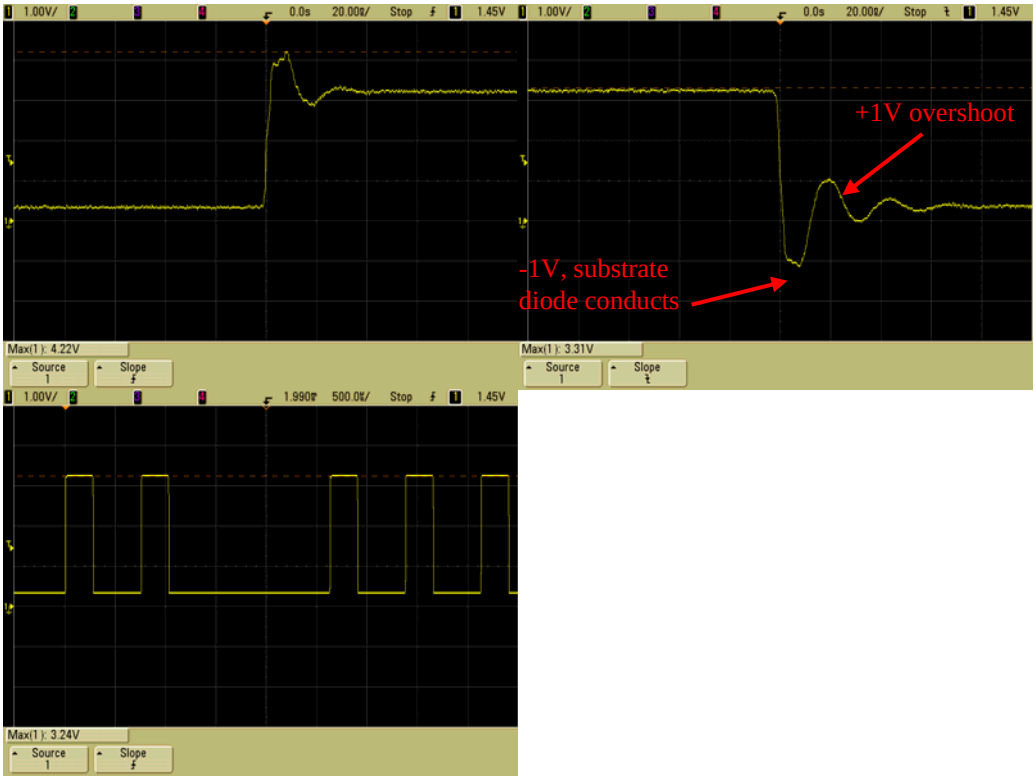
Measurements: use 1.5 GHz probe (Agilent 1156A) using “2g” to connect ground to IC552 pins 24-23-22 and “2s” to connect probe tip:

pin 12 (V_TRST_n). Prove that this pin is always ‘1’ and that there are no negative going edges when other JTAG signals are switched.



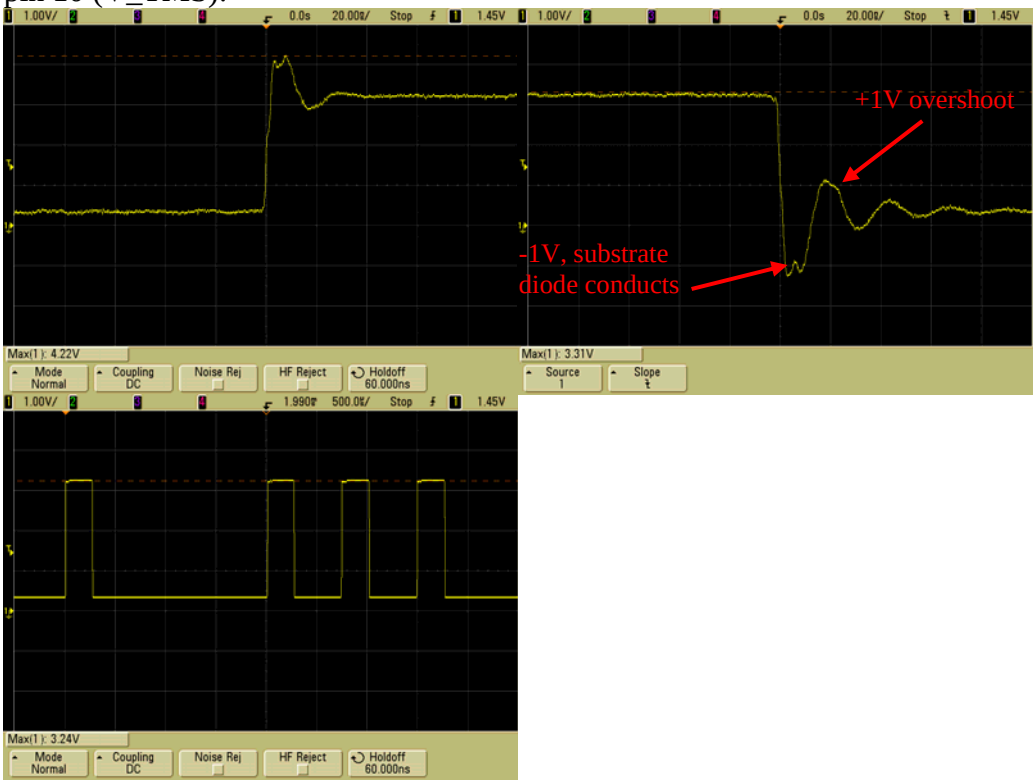
No edges found!

pin 11 (V_TDI):



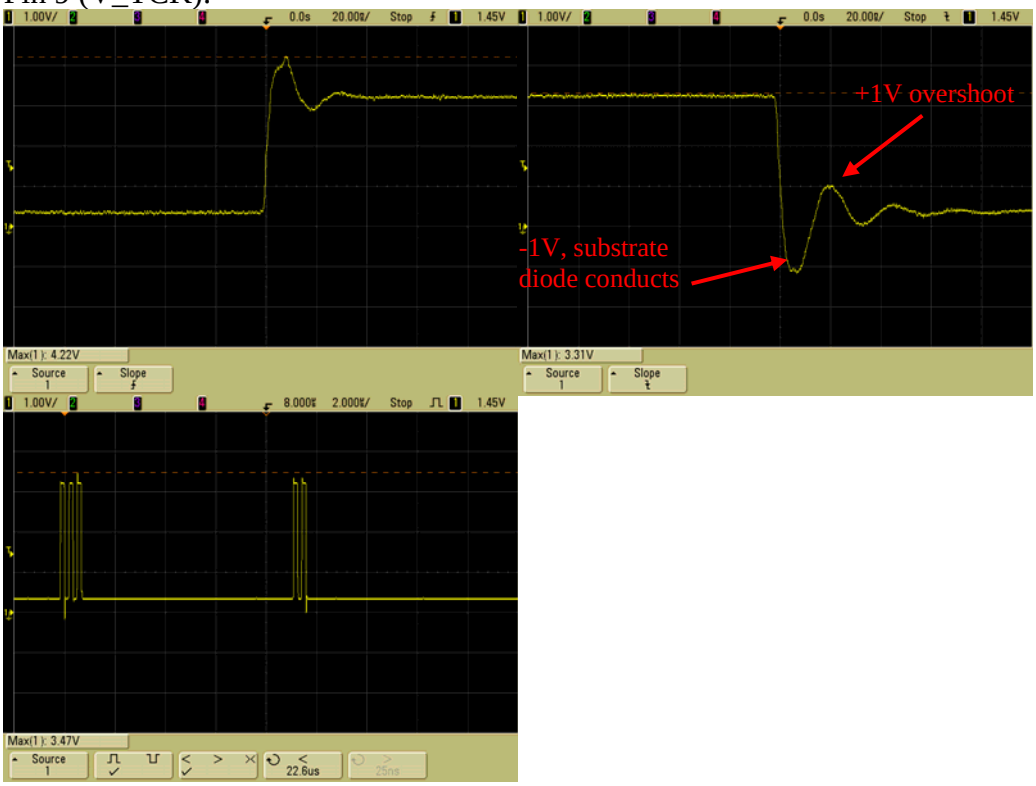
Note: now slot 5 does connect, but does ***disconnect fails***

pin 10 (V_TMS):



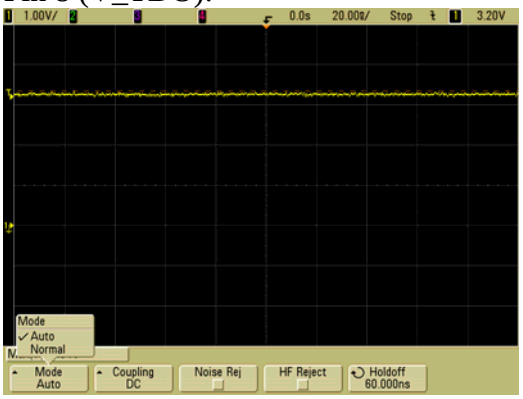
Slot 5 connect/disconnect fail!

Pin 9 (V_TCK):



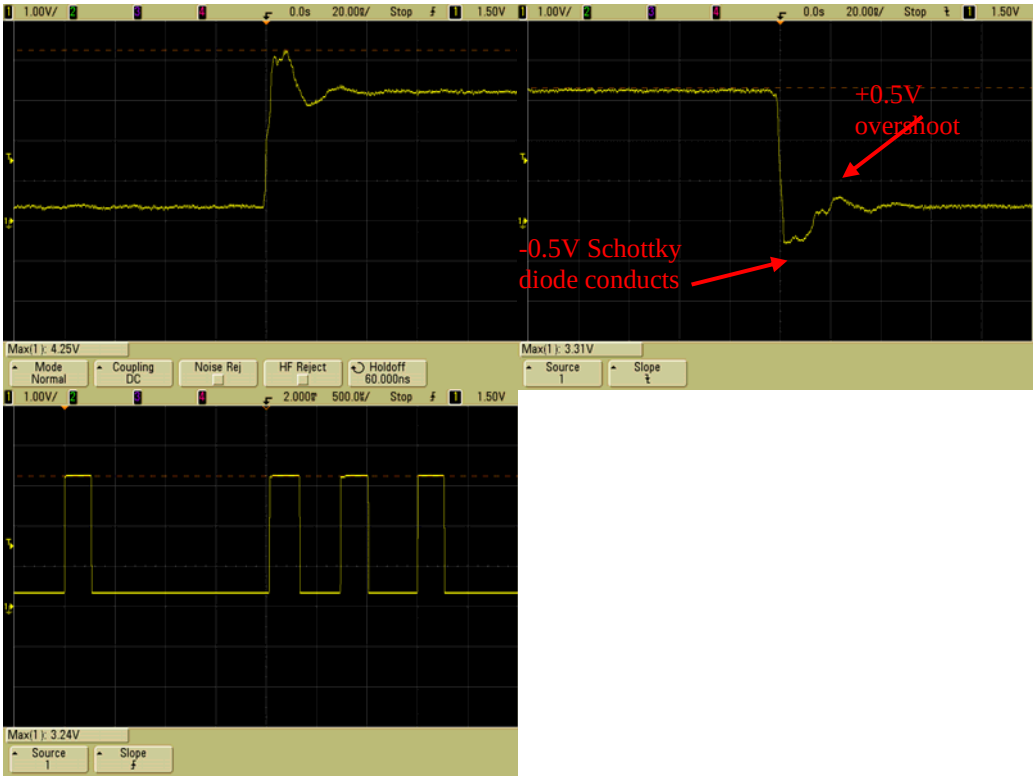
Note: Slot 5 connect/disconnect okay!

Pin 8 (V_TDO):



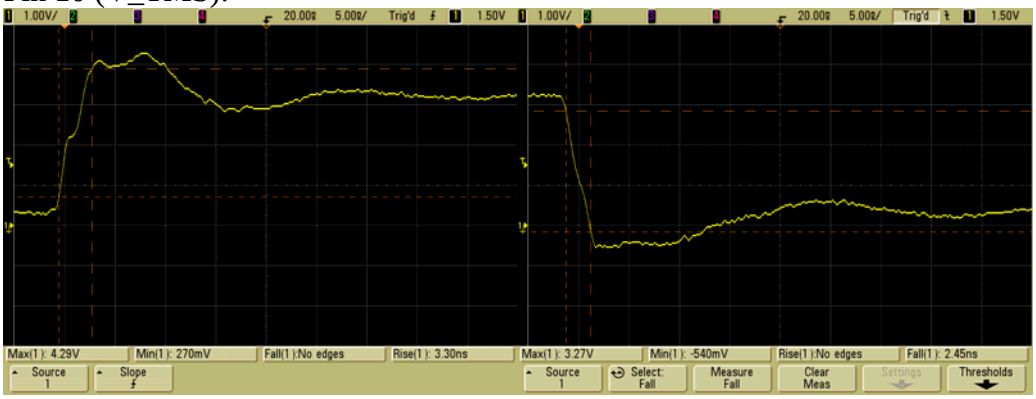
No edges found! Signal is ‘1’ always!
Note: now slot 5 does connect, but does ***disconnect fails***

Place Shottky diodes from Ground to pins 9 (V_TCK), 10 (V_TMS), and 11 (V_TDI) to reduce undershoot.
pin 10 (V_TMS):



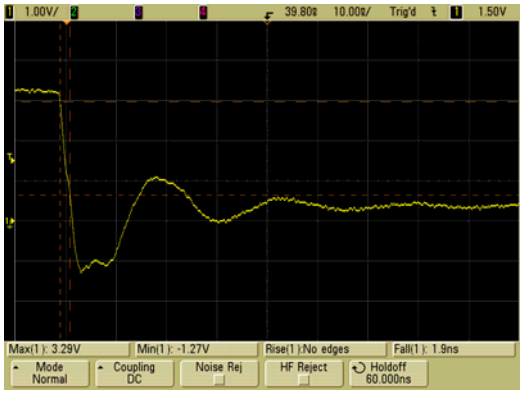
Still: ***Slot 5 connect/disconnect fail!***

Added 3 * 100 pf on the signals V_TCK, V_TMS, V_TDI to tamper the superfast (2.5 ns) rising and falling edges. Edges now 3.2 ns. Module does connect in slot 5!
Pin 10 (V_TMS):



Module connects and disconnects in ***all*** slots (5-19) ***okay***!
Module now and then needs an extra push in order to make contact to the P1 connector…
Remove shottky diodes. Now slot 5 does ***not*** want to connect!

pin 10 (V_TMS):

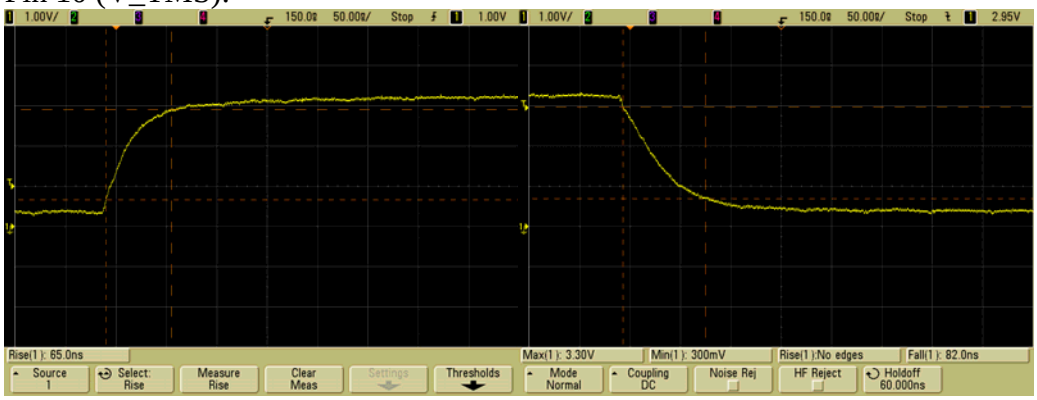


Conclusion so far:

1. Module does not always make a perfect contact on the P1 “Z” row.
2. A combination of the undershoot with fast edges gets the ASP crazy.

Remove the 3 * 100 pf on the signals V_TCK, V_TMS, V_TDI

Modified the RCAT module (SN18) series resistors R12, R16 and R24. Instead of 0 ohm, placed a 1uH inductor (BLM18AG102SN1D).
Pin 10 (V_TMS):



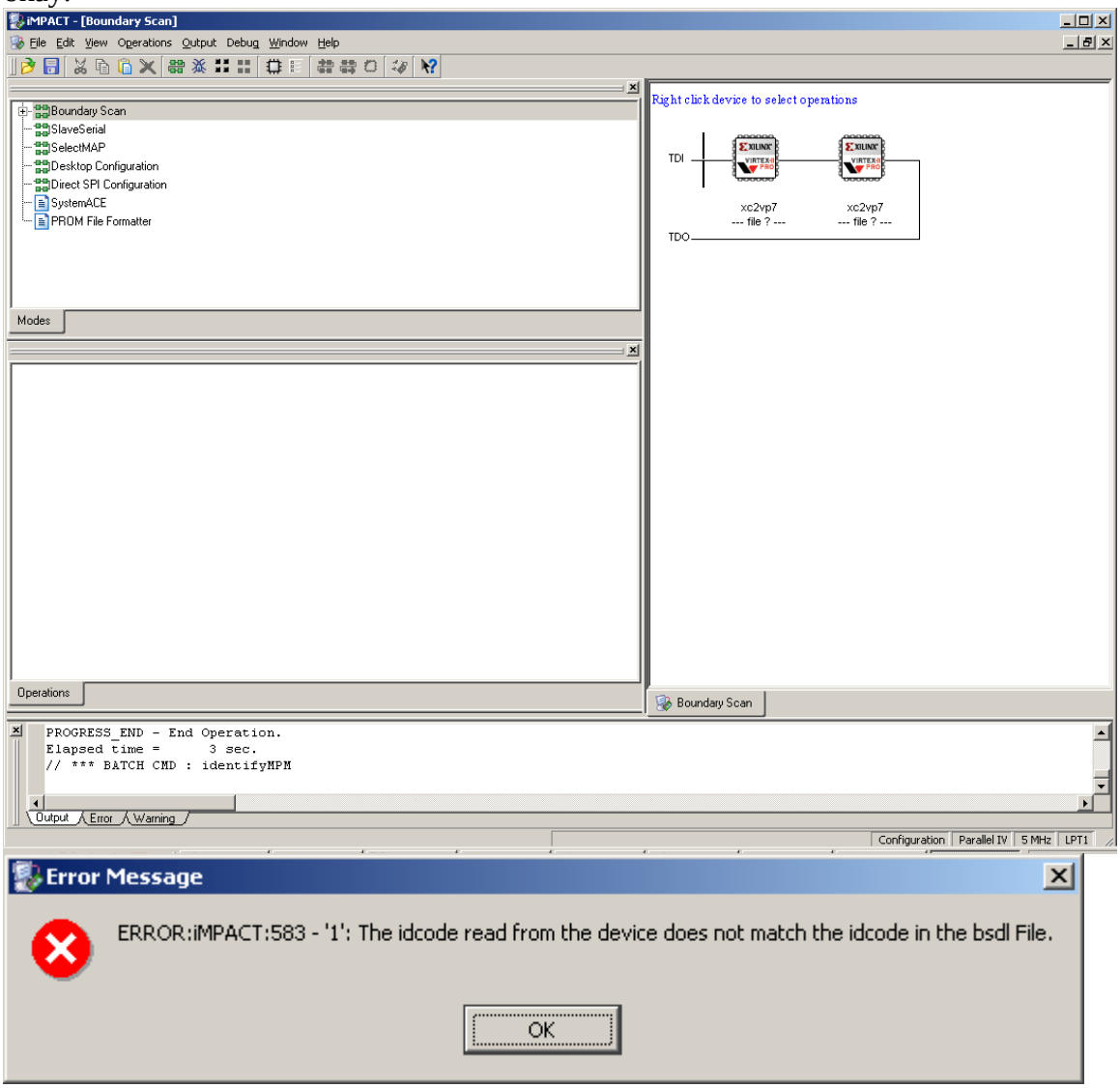
Module does connect and disconnect in all slots! (5-20)

Mrodtest 7 63 okay!

MROD-X 65
Type: 6 Channel

Assembled Jun, 2007

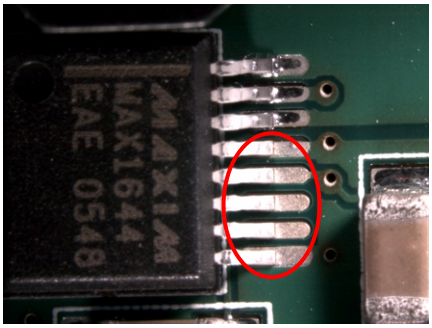
17-Jul-2007:
ASP does connect but JTAG chain (partly) fails. IMPACT via Front panel JTAG chain okay.



13-Aug-2007:

```
iMPACT:2130 - Boundary-scan chain test failed . Please check tdi->tdo connection between
device:'7' ( 'xc2vp7') and device:'8' ( 'xc2vp7').
        A problem may exist in the hardware configuration.
        Check that the cable, scan chain, and power connections are intact,
        that the specified scan chain configuration matches the actual hardware, and
        that the power supply is adequate and delivering the correct voltage.
```

Divece ‘7’ = IC4006, Device ‘8’ = IC5006
1V5 power supply for IC4006 = IC207 = 0,31V



IC207 pin 9, 10, 11, 12 and 13 open: repaired
Mrodtest okay

15-08-2007 (Gerard Kieft):
Duration test. Module in slot 15: Source “dol” -> Green leds GOL link 2A and 2B are not burning (note internal loopback; no fibers attached).
Duration test busy is active all the time.

14-12-2007:
Connect/Disconnect in slot 11 okay
Morodtest 11 65 Linktest fail:
LINK A5-->D1 errors

```
###expected 4B9AED68 got 04D75719 (block     0,   1), prev 409DFE47
###expected 16047702 got 04D75719 (block     0,   3), prev 04D75719
###expected 409DFE47 got 04D75719 (block     0,   4), prev 04D75719
###expected 409DFE47 got 16047702 (block     0,  16), prev 16047702
###expected 409DFE47 got 16047702 (block     0,  24), prev 16047702
```

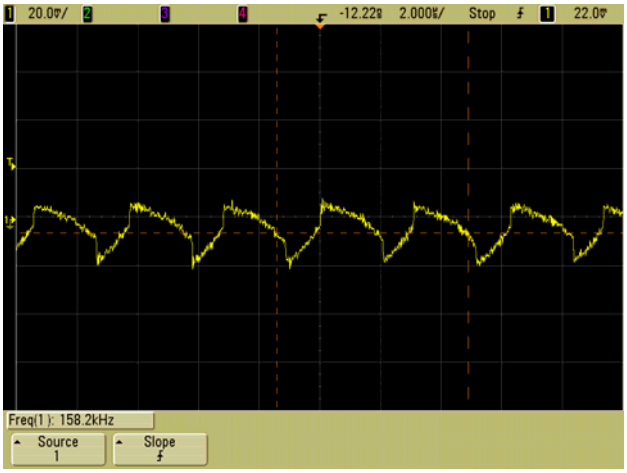
LINK C0-->D5 errors

```
###expected 4B9AED68 got 04D75757 (block     0,   1), prev 409DFE47
###expected 4B9AED68 got 409DFE47 (block     0,  17), prev 409DFE47
###expected 4B9AED68 got 409DFE47 (block     0,  25), prev 409DFE47
###expected 4B9AED68 got 409DFE47 (block     0,  33), prev 409DFE47
###expected 409DFE47 got 16047702 (block     0,  56), prev 16047702
###expected 4B9AED68 got 409DFE47 (block     0, 109), prev 409DFE47
```

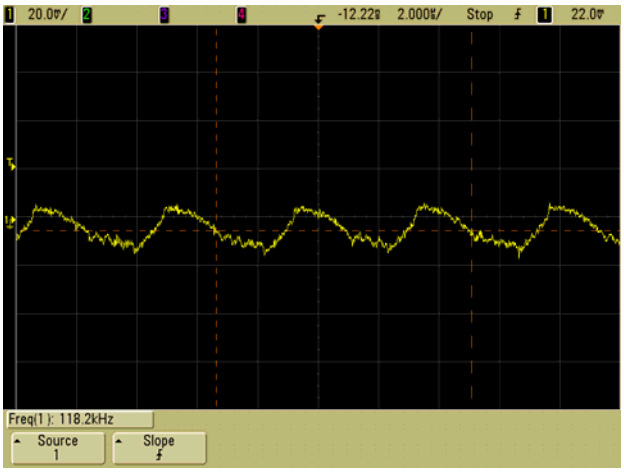
LINK D0-->E5 errors

```
###expected 4B9AED68 got 04D75719 (block     0,   1), prev 409DFE47
###expected 16047702 got 04D75719 (block     0,   3), prev 04D75719
###expected 409DFE47 got 04D75719 (block     0,   4), prev 04D75719
###expected 04D75719 got 4B9AED68 (block     0,  18), prev 4B9AED68
###expected 04D75719 got 4B9AED68 (block     0,  26), prev 4B9AED68
###expected 4B9AED68 got 409DFE47 (block     0,  49), prev 409DFE47
```

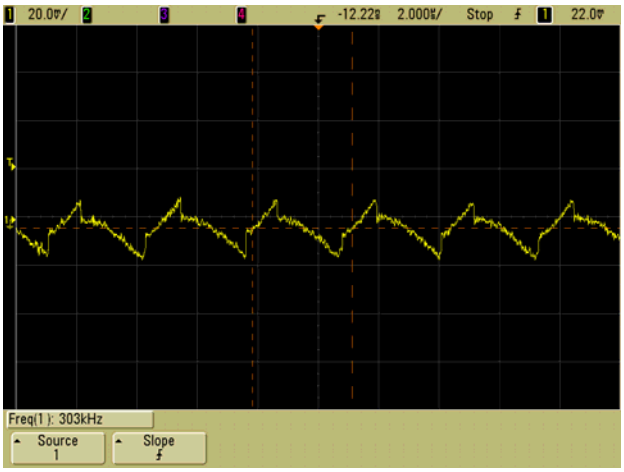
LINK D4-->A2 timeout
Seem to be all SHARC-D links…
Check 1V5 supplies:



Measure over C183 (1V5 SHARC-C)



Measure over C283 (1V5 SHARC-D)



Measure over C383 (1V5 SHARC-E)

Again check soldering joints around IC207…
mrodtest 11 65 linktest fail…
mrodtest 11 65 led -> Leds of SHARC-D only blink half the frequency…

Output of IC205 (50 MHz SHARC-D clock) is dead.
Replaced IC205
mrodtest 11 65 regtest errors -> version not up to date…
Reprogram (slot 11) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!
mrodtest 11 65 okay!

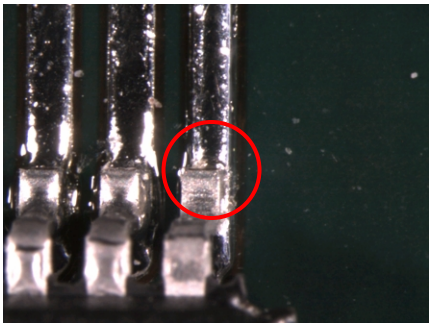
15-Aug-2008:
Firmware updated, mounted slink 0416
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 11 65 okay!

MROD-X 67
Type: 6 Channel

Assembled Jun, 2007

17-Jul-2007:
Channel C-B seems to have address line error on ZBT:

```
Channel B:
-> pattern write/read (number of patterns: 6):
==> ERRORS...
### addr #00000000,  expected #AAAAAAAA,  read #A5A5A5A5
### addr #00000001,  expected #55555555,  read #5A5A5A5A
### addr #00000002,  expected #A5A5A5A5,  read #FFFFFFFF
### addr #00000003,  expected #5A5A5A5A,  read #00000000
### addr #00000004,  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000005,  expected #00000000,  read #55555555
### addr #00000006,  expected #AAAAAAAA,  read #A5A5A5A5
### addr #00000007,  expected #55555555,  read #5A5A5A5A
### addr #00000008,  expected #A5A5A5A5,  read #FFFFFFFF
### addr #00000009,  expected #5A5A5A5A,  read #00000000
### addr #0000000A,  expected #FFFFFFFF,  read #AAAAAAAA
### addr #0000000B,  expected #00000000,  read #55555555
### addr #0000000C,  expected #AAAAAAAA,  read #A5A5A5A5
### addr #0000000D,  expected #55555555,  read #5A5A5A5A
### addr #0000000E,  expected #A5A5A5A5,  read #FFFFFFFF
### addr #0000000F,  expected #5A5A5A5A,  read #00000000
```



IC2006 pin 81 (ZBT memory A9) open; repaired (17-jul-2007)

MROD-X 68
Type: 6 Channel

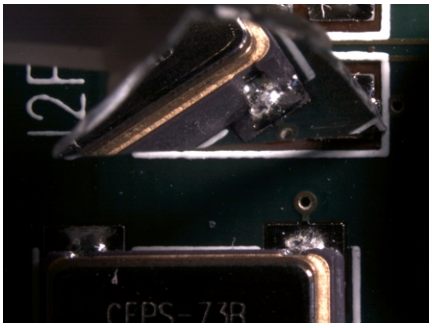
Assembled Jun, 2007

18-Jul-2007:
Duration Test… After some 20 minutes flawless running the error LEDs for channel 2A and 2B started to burn.

13-Aug-2007:

```
==> Getting MRODIN FPGA Version

Srv: MROD-6-SHARC-D opened (*Sharc=B6461000)
Srv: MRODIN 1 reset
Srv: MRODIN 1 reset
Srv: booting (binary)...
Srv: size=43314 (bytes), instructions=7219
Srv: MROD-6-SHARC-D (MRODIN 1) booted with ldr/iidreadx.ldr
Srv: establishing communication with MRODIN SHARC (via MRODOUT A Link 2)
```

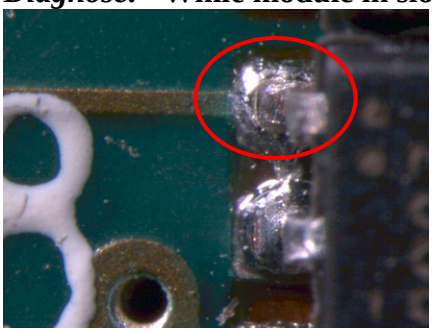
Try mrodtest 6 68 led -> LEDs start to blink but MROD-In D LEDs blink 4 times slower than MROD-In C and E. Check crystal oscillator -> unstable clock on pin 3 of IC205.



There was a crack in the solder joint of IC205 pin 3.
This was not a remedy… no clock on pin 3.
Replaced IC205 by new crystal.
Mrodtest okay

MROD-X 70
Type: 6 Channel

27-11-2007
Returned from CERN while module originally was tested okay…
***Diagnose:* "While module in slot 17 the ASP LED does not turn on"**



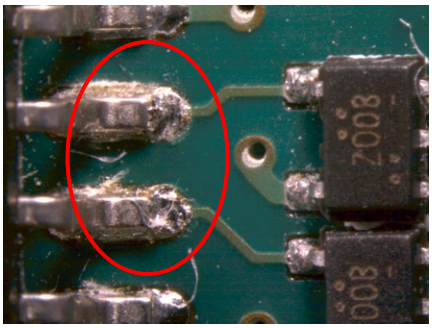
Found IC588 Pin 1 loose.

Versions already up to date. In: 07083100, Out: 07101000
mrodtest 17 70 -> okay!

MROD-X 71
Type: 6 Channel

27-11-2007
Returned from CERN while module originally was tested okay…
***Diagnose:* "While module in slot 9 the ASP LED does turn on, but the module fails to programm"**

ASP sometimes fails; programming is possible; mrodtest okay
29-11-2007: Reflowed IC585, IC586, IC587, IC588, IC589 (tiny logic) and IC522 pins 4 and 5.



Problem persists; ASP does not connect (in slot 9)
07-12-2007:
Tested Slot 5-12 and 13-20; all Connect and Disconnect okay. Problem solved itself…

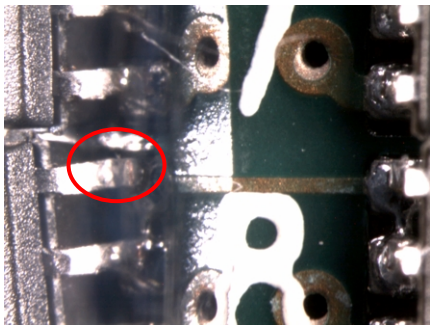
25-01-2008:
Tested Slot 5-12 and 13-20; all Connect and Disconnect okay.

program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

MROD-X 73
Type: 6 Channel

Assembled Jun, 2007

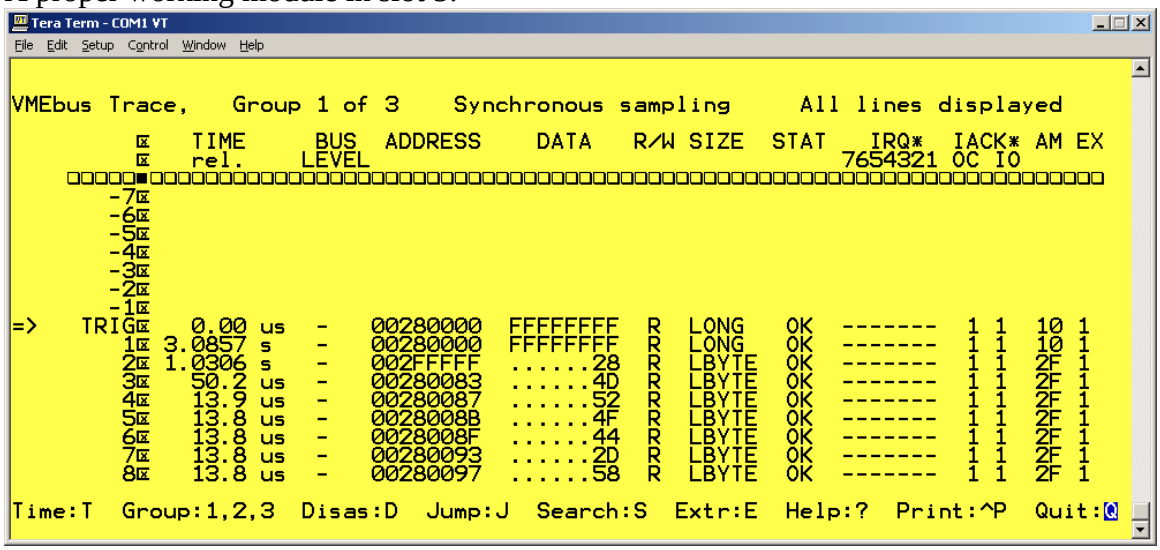
17-Jul-2007:
ASP does **not** connect. IMPACT via Front panel JTAG chain okay.



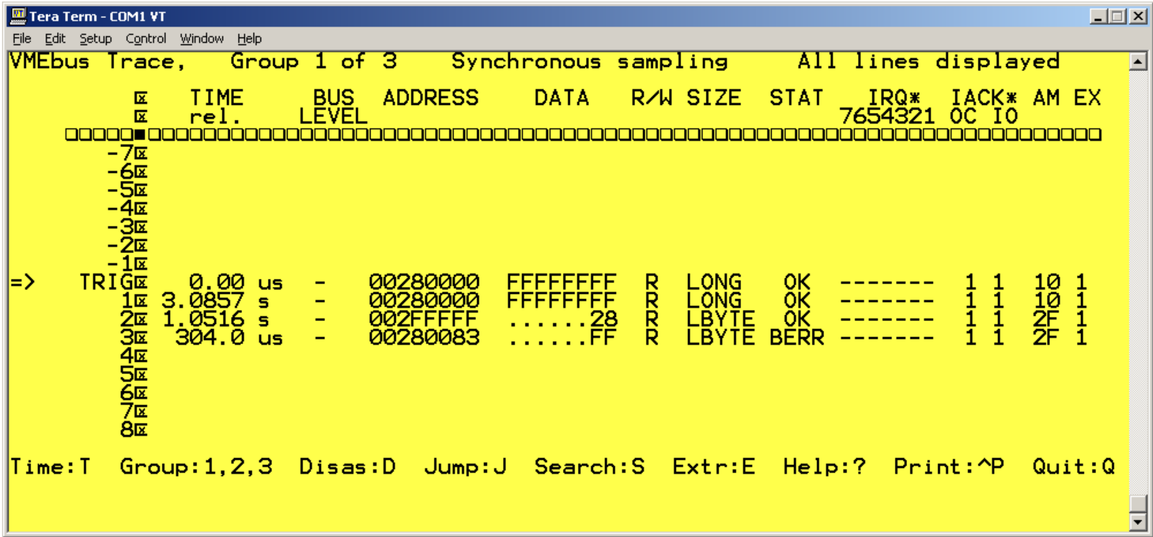
IC588 pin 1 and 5 open; repaired (17-jul-2007)

VME-slot 6, BAR = 30h
###Failed to read VME CS/CSR ROM space (string)
error: 0x205 => major: Error 5 in package 2 => VMEbus driver/library for the RCC: VMEbus bus error received

13-Aug-2007:
Mvmereset works fine. DTACK line?
A proper working module in slot 5:

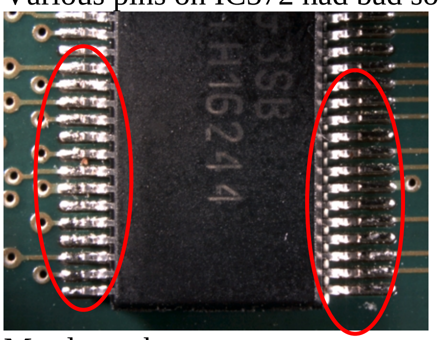


Module 73 in slot 5:




```
VMEbus Trace,    Group 1 of 3    Synchronous sampling     All lines displayed

              TIME      BUS  ADDRESS     DATA    R/W SIZE  STAT    IRQ*   IACK* AM EX
              rel.     LEVEL                                     7654321 OC IO
          -7
          -6
          -5
          -4
          -3
          -2
          -1
=>     TRIG   0.00 us   -   00280000  FFFFFFFF  R  LONG   OK   -------  1 1  10 1
          1 3.0857 s    -   00280000  FFFFFFFF  R  LONG   OK   -------  1 1  10 1
          2 1.0516 s    -   002FFFFF  ......28  R  LBYTE  OK   -------  1 1  2F 1
          3  304.0 us   -   00280083  ......FF  R  LBYTE BERR  -------  1 1  2F 1
          4
          5
          6
          7
          8

Time:T  Group:1,2,3  Disas:D  Jump:J  Search:S  Extr:E  Help:?  Print:^P  Quit:Q
```

14-Aug-2007:
Various pins on IC572 had bad solder joints:

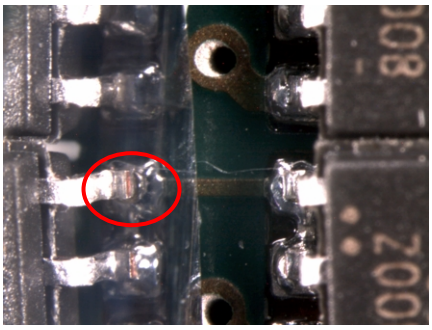


Mrodtest okay

MROD-X 74
Type: 6 Channel

Assembled Jun, 2007

17-Jul-2007:
ASP does **not** connect. IMPACT via Front panel JTAG chain okay.



IC588 pin 1 and 5 open; repaired (17-jul-2007)

ASP now does connect but scan chain is fails...
Reflowed IC548, IC549, IC550, IC551 (buffers that give the ASP access to the JTAG chain).
19-jul-2007:
Reflowed IC585, IC586, IC587, IC588, IC589 and IC 552 (this was a remedy for module 82) Problem still there…

20-Aug-2007:
Replaced IC552 (74LVT8996)
Connecttest.sh okay (in slot 10)
Connect.sh fail (in slot 6)

```
6      00110  <- fail!
8      01000  <- connect!
9      01001  <- connect!
10     01010  <- connect!
12     01100  <- connect!
16     10000  <- Connect!
```

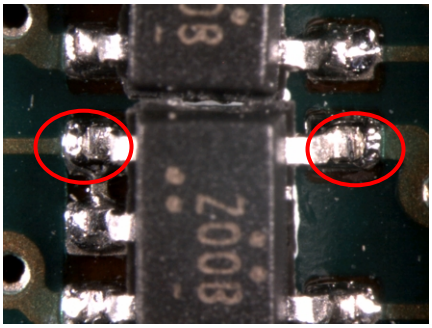
Calore crate slot 6 needs a push on row ‘d’ in order to connect. So this seems a mechanical Calore-Crate feature…
Mrodtest okay

Further investigation necessary!

MROD-X 77
Type: 6 Channel

Assembled Jun, 2007

17-Jul-2007:
ASP does **not** connect. IMPACT via Front panel JTAG chain okay.



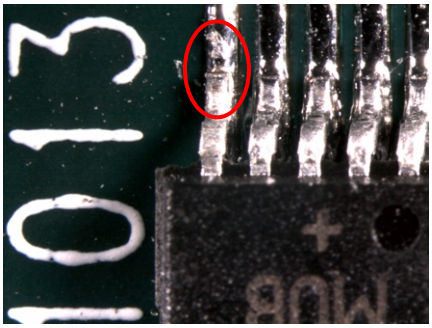
IC588 pin 1 and 5 open; repaired (18-jul-2007)

27-11-2007
Returned from CERN while module originally was tested okay…
Diagnose: “While module in slot 20 ASP/programming problem… Functions/Fails”
Resoldered ic588.
ASP connect in slot 20 okay; mrodtest okay

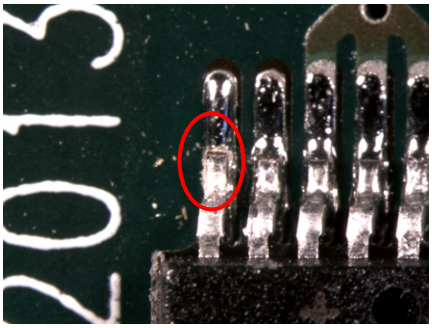
MROD-X 78
Type: 6 Channel

Assembled Jun, 2007
18-Jul-2007:
reg-C.log:

```
MROD-78/reg-C.log:###reg 49 (MRI_FPGA_TEMPERATURE     ):
default #00000008, read #00000000
MROD-78/reg-C.log:###reg 49 (MRI_FPGA_TEMPERATURE     ):
default #00000008, read #00000000
MROD-78/reg-C.log:  ###Temperature Out-Of-Limits (30<=T<=60)
MROD-78/reg-C.log:  ###Temperature Out-Of-Limits (30<=T<=60)
MROD-78/reg-C.log:  ###Temperature Out-Of-Limits (30<=T<=60)
MROD-78/reg-C.log:  ###Temperature Out-Of-Limits (30<=T<=60)
MROD-78/reg-C.log:  ###Temperature Out-Of-Limits (30<=T<=60)
MROD-78/reg-C.log:  ###Temperature Out-Of-Limits (30<=T<=60)
```



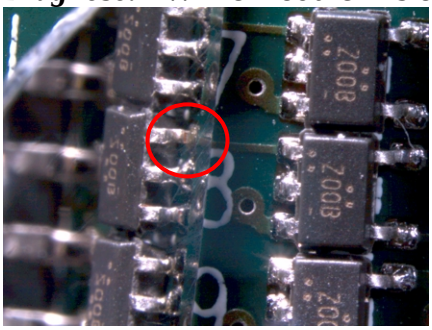
IC1013 pin 5 open



IC2013 pin 5 open

Repaired (18-jul-2007)

27-11-2007
Returned from CERN while module originally was tested okay…
***Diagnose:* "While module in slot 18 the ASP LED does not turn on"**

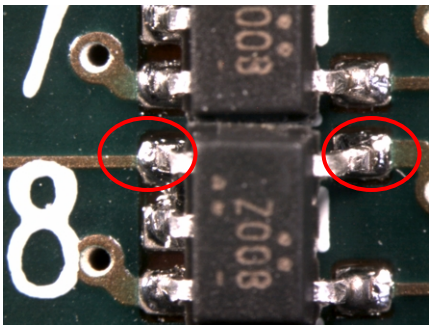


28-11-07: Found IC588 Pin 1 loose.
Resoldered, ASP not working in slot 18. Mrodtest okay.
Replaced IC588 (just to make sure it was not damaged) and reflow IC585, IC586, IC587 and IC589 -> Now module ***does*** connect in slot 18!
Mrodtest okay.

MROD-X 80
Type: 6 Channel

Assembled Jun, 2007

18-Jul-2007:
ASP does **not** connect.



IC588 pin 1 and 5 open; repaired (18-jul-2007)

MROD-X 81
Type: 6 Channel

02-Oct-2012:
Brought back from CERN by Henk B&B after:

```
En ik heb MROD #81 die gisteren eerst een paar keer
na een reset (met die speciale VME-cycle) bleef hangen in
z'n 'configuratie'(?) (het FPGA Config LEDje bleef aan),
waar ik 'm alleen uit kreeg door het crate uit en aan te zetten.
Nu lukt 't me niet meer om die situatie te krijgen....
```

See mail d.d.21-Sep-2012

MROD-X 82
Type: 6 Channel

Assembled Jun, 2007

18-Jul-2007:
ASP **does** connect but JTAG chain fails. IMPACT via Front panel JTAG chain okay.

19-Jul-2007:
Slot 11 -> Connect.sh 11 ASP does **not** connect
Slot 10 -> Connect.sh 10 ASP does **not** connect

```
      IIIII
      CCCCC
      55555
      88888
      98765

5     00101
6     00110
7     00111  <- connect!
8     01000  <- connect!
9     01001  <- connect!
10    01010  <- no connect
11    01011  <- no connect
12    01100
```

Again in slot 11 -> **connect!?**
Scoop LS8996 pin 9 (PTCK) -> pulses
Scoop LS8996 pin 12 (PTRST_n) -> always '1'
Scoop LS8996 pin 10 (PTMS) -> pulses
Scoop LS8996 pin 11 (PTDI) -> pulses
Scoop LS8996 pin 8 (PTDO) -> pulses

program_in_and_out.sh 11
Scoop LS8996 pin 16 (STCK) -> pulses
Now the module is indeed programming!? Time to reflow the LS8996!
Reflowed IC585, IC586, IC587, IC588, IC589 and IC 552

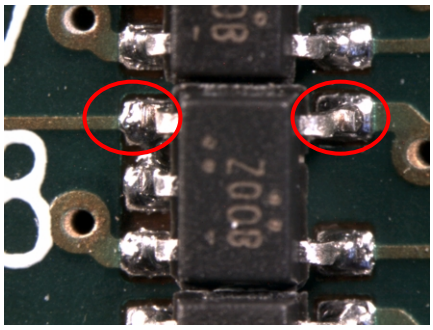
Mrodtest okay!

27-11-2007
Returned from CERN while module originally was tested okay…
Resoldered pins on ic588 and neighbours…
Tested ASP in slot 16 okay; mrodtest okay.

MROD-X 85
Type: 6 Channel

Assembled Jun, 2007

18-Jul-2007:
ASP does **not** connect.



IC588 pin 1 and 5 open; repaired (18-jul-2007)

MROD-X 86
Type: 6 Channel

Assembled Jun, 2007
Module initially passed all tests without problems and was shipped to CERN July 20, 2007.
The module was send back to Amsterdam in August 2008 with the complain that SHARC-C sometimes does not want to boot…

12-Sep-2008:
Mrodtest 0kay

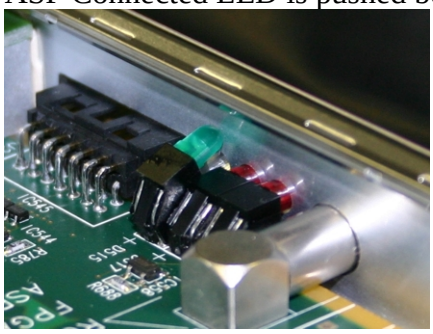
MROD-X 87
Type: 6 Channel

27-11-2007
Returned from CERN while module originally was tested okay…
***Diagnose:* "While module in slot 17 the ASP LED does not turn on"**
Resodered IC588 and neighbours. Tested ASP slot17: okay.
Mrodtest okay.

MROD-X 88
Type: 6 Channel

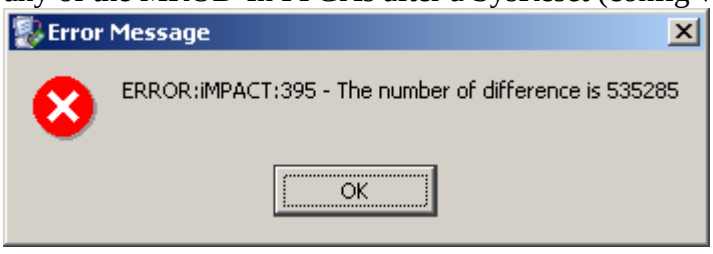
Assembled Jun, 2007

18-Jul-2007:
ASP Connected LED is pushed behind the front panel.



Repaired (18-jul-2007)

program_in_and_out.sh 6 -> okay
mrodtest 6 88 -> MROD-In FPGAs do not come out of configuration…
program_in_and_out.sh 6 -> '3': Programming completed successfully.
'1': Programming completed successfully.
Board does not come out of configuration…
19-jul-2007: MRI_DONE is **not** going '1'. All other config signals look okay (Checked MRI_PROG_B = rising edge, MRI_INIT_B = rising edge, MRI_CCLK (18 MHz) terminated and MRI_D(7:0) non-terminated).
Tried to configure the MROD-In FPGAs via IMPACT and JTAG. As soon as the last FPGA is programmed than MROD_DONE goes '1'. (X = uninitialized, P = Programmed, U = Up) sequence:
XXXXXX, PXXXXX, PPXXXX, PPPXXX, PPPPXX, PPPPPX, PPPPPU, UPPPPU, UUPPPU, UUUPPU, UUUUPU, UUUUUU
Thus all FPGAs can be put into a configured state via JTAG and IMPACT. Verify for any of the MROD-In FPGAs after a SysReset (config via PROM) yields:



Checked resistor values, dip switches, presses MROD-In FPGAs (bad BGA solderings).
Resoldered IC554 (configuration PROM MROD-In).

14-12-2007:
MROD-Out FPGA DONE is '1' (R662); MRI_DONE = '0' (R673).
Measure 20 MHz on termination resistors R672/R675 -> okay.

Only bit D0 shows activity during sysreset. -> Probably forgot the “Parallel Mode” checkbox while programming via Impact.

Reprogram (slot 11) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!
mrodtest 11 88 okay!

15-1-2008:
Wanted to start the duration test (once again). Now the ***board does not come out of Config***. (MRI_Done stays low).

PROM XCF08P IC554. Already resoldered once. Therefore IC554 Suspect -> Replace

Programmrod.sh in 11 -> okay!

mrodtest 11 88 okay!

16-1-2008:
Duration tests (test-16-01-0944 and test-16-01-1610) passed okay. But while starting a new duration test (after power-up) the ***board does not come out of Config***…

22-1-2008:
MRI_Done stays low.
Try to determine which of the FPGAs does not want to configure… Try to program (IMPACT via the front panel) each FPGA, each directly after a SysReset (thus initiating a config cycle).
Sysreset -> program 1A -> no cure
Sysreset -> program 1B -> no cure
Sysreset -> program ***2A*** -> board comes out of config cycle!
Sysreset -> program 2B -> no cure
Sysreset -> program 3A -> no cure
Sysreset -> program 3B -> no cure
Check SW2A. Soldering okay, but switch M2 is bad! -> Place new DIP switch.

Mrodtest 8 88 okay!

MROD-X 93
Type: 6 Channel

Assembled Jun, 2007

~23-Jul-2007:
cd MRODTest
mrodtest <slotnumber><serialnumber>
-> VME Bus Error

6-Aug-2007:
Investigated "MROD-93-1e-poging" and "MROD-93-2e-poging" => "vmeintr-A.log":
`###Time-out waiting for interrupts`

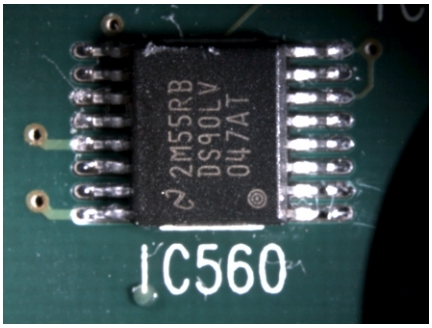
This can be due to an un-programmed module that was in the crate at between this module and the crate controller. The IACK daisy chain is then not forwarded.

Plug module into slot 6 (no other modules present in the crate)
cd MRODTest
mrodtest <slotnumber><serialnumber>
`###reg 13 (MRO_CHANNEL_ENABLE ): default #000063FF, read #010063FF`
`= Bit [24]: Busy status of the TTC interface.`

golttc-Ca.log (but also Cb, Da, Db, Ea and Eb) and Slink.log => Missed TTC ECR interrupts.
intr-A.log:tst 1: ###Timeout IRQ2 (ECR) interrupt
intr-A.log:tst 1: ###Timeout IRQ2 (TTC FIFOs Full) interrupt
intr-A.log:tst 1: ###Timeout IRQ1 Spy EvtLen FIFO interrupt
intr-A.log:tst 1: ###Timeout IRQ1 Spy Evt FIFO interrupt
Conclusion TTC interface is not working properly…

7-Aug-2007:
`mrodtest 11 93 ointr` complaines about "`###Timeout IRQ2 (ECR) interrupt`"
Measured TTC(1) = ECR pulse on termination resistors R728/R729 -> okay
Measured TTC(1) = ECR pulse on via near output FPGA pin AJ22 -> okay
Measured TTC(4) = Serial EVID on via near output FPGA pin AF23 -> okay
Measured TTC(5) = Serial TType on via near output FPGA pin AF22 -> okay
Could BGA ball AJ22 be not connected? There is **no "X-RAY PASS"** sticker

Measured LHC_CLK on termination restistors R706/R707 -> **No Clk!**
IC566 pin 20 no clk!



IC560 should have been a DS90LV048 (LVDS receiver) and **not a "047"** which is a transmitter; repaired (07-aug-2007)

Mrodtest okay

Has been in duration test for 6 hours. Than it went "Busy". Is this a single upset? Once again into duration test (see test results "test-09-08-2320").

```
Note! The log files were last updated August 8, 2007, 23:20h and MROD #93
(slot5) had a continuous "Busy" (thus holding the trigger)
checkit found no errors in the slot#.log files
mrodchk found no errors in the by TDAQ daq_ROS-#.data file
```

Gerard Kieft; 15-08-2007:
Duration test started 14-aug-2007 15:14h
Stopped 14-aug-2007 20_18h because of continuous "Busy" of module #93.

```
The test has stopped at August 14, 2007, 20:18h because MROD #93 in slot 06
had Busy active all the time!
The TDAQ Event Rate is 0 Hz
checkit found no errors in the slot#.log files
mrodchk found no errors in the by TDAQ daq_ROS-#.data file
```

19-12-2007:
Reprogram (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!
mrodtest 8 93 okay!

12-03-2008:
Firmware updated:
In: 07083100
Out: 08030301
Meenemen in de duration test op zoek naar RocketIO Down fouten…

6-May-2008:
For reflow sent to CERN-DEM (DEM removed Triple-LEDs before reflow and replaced them afterwards)

29-May-2008:
Remount the front panel.
Mount S-Link Card (SN1614)

30-May-2008:
Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 9 93 okay

13-Jun-2008:
Duration test repeatedly ended with “Busy” on module 93 (in slot 8) while all CSM links were down. See duration test: “test-11-06-0756” / “test-12-06-0851” / “test-12-06-1521” / “test-13-06-0828”
Not sure whether this is an MROD failure, might be a mrodchk / TDAQ software or TIM failure…

MROD-X 95
Type: 6 Channel

Assembled Jun, 2007

~23-Jul-2007:
cd MRODTest
mrodtest <slotnumber><serialnumber>
-> VME Bus Error

6-Aug-2007:
Investigated “MROD-95-1e-poging” and “MROD-95-2e-poging” => “crcsr.log”:

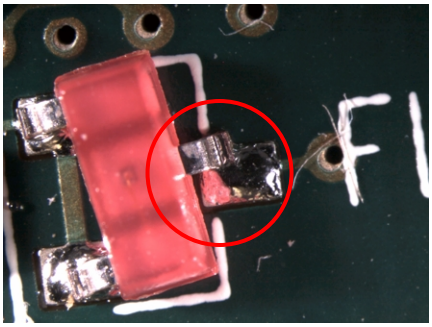
```
###Failed to read VME CS/CSR BAR
error: 0x205      => major: Error   5 in package   2 => VMEbus driver/library
for the RCC: VMEbus bus error received
```

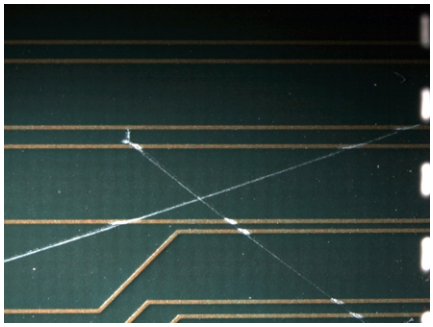
tried mvmerest 6 => also gives VME Bus error
Reprogram MROD-Out FPGA PROM:
program_in_and_out.sh 6

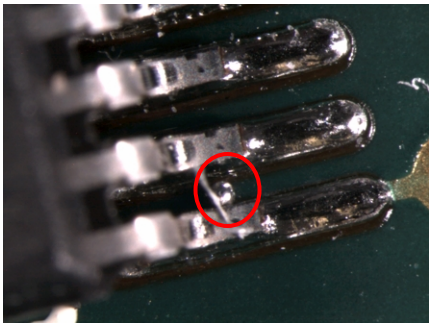
```
Execute Xilinx Impact commands in _xprogram.cmd ...
slot  6 in
'3': Programming completed successfully.
Execute Xilinx Impact commands in _xprogram.cmd ...
slot  6 out
'1': Programming completed successfully.
```

Still mvmerest 6 => also gives VME Bus error

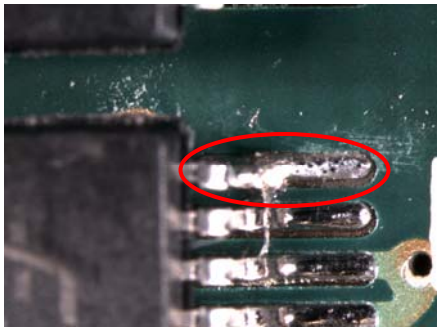
Check soldering


LED FLAG0B was not soldered properly
(Repaired 6-Aug-07)

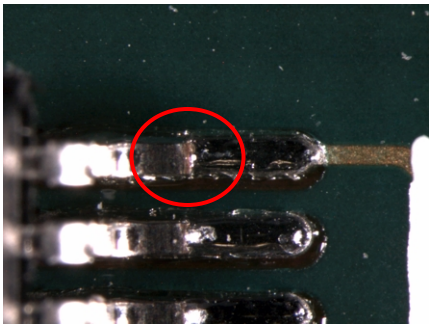

Scratch near IC571 and IC572



Solder Ball between pin25 and 26 of IC569 (Repaired 6-Aug-07)

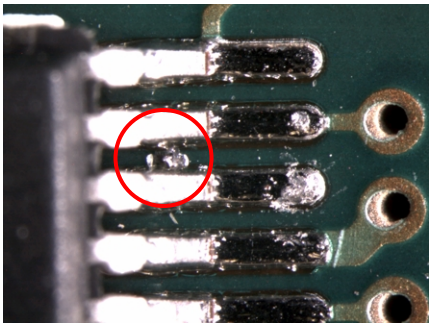


poor rework (PCB Technologies) on IC577 pin48



Several poor solderings were found on IC568, IC569, IC570, IC571, IC572, IC573, IC574, IC576 and IC577. The picture above is an example of IC576 pin48

Note: FPGA Config LED is always on!
Measured -> MROD-Out FPGA does not come out of configuration.



Solder Bridge Between IC553 (MROD-Out FPGA Config PROM) pin46 (Gnd) and 47 (D6); repaired (07-aug-2007)

Mrodtest okay

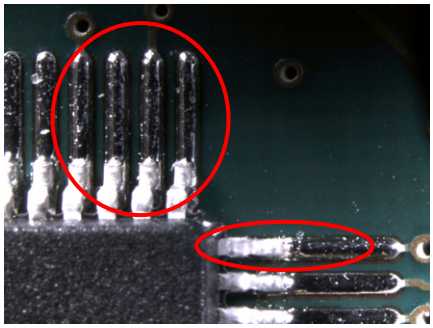
MROD-X 96
Type: 6 Channel

Assembled Jun, 2007

~23-Jul-2007:
cd MRODTest
mrodtest <slotnumber><serialnumber>
-> Mem-C Error

7-Aug-2007:
ZBT memory C-B has address errors:

```
### addr #00000101:  expected #FFFFFFFF,  read #AAAAAAAA    << Adr(8)
### addr #00000001:  written  #AAAAAAAA
### addr #00000201:  expected #FFFFFFFF,  read #AAAAAAAA    << Adr(9)
### addr #00000001:  written  #AAAAAAAA
### addr #00000301:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000001:  written  #AAAAAAAA
### addr #00020001:  expected #FFFFFFFF,  read #AAAAAAAA    << Adr(17)
### addr #00000001:  written  #AAAAAAAA
### addr #00020101:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000001:  written  #AAAAAAAA
### addr #00020201:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000001:  written  #AAAAAAAA
### addr #00020301:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000001:  written  #AAAAAAAA
### addr #00000102:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000002:  written  #AAAAAAAA
```



IC2006 Pin 80 (D34 = Not used), Pin 81 (A9), Pin82(A8), Pin83(A17), Pin84(A18 = not used) are open; repaired (07-aug-2007)

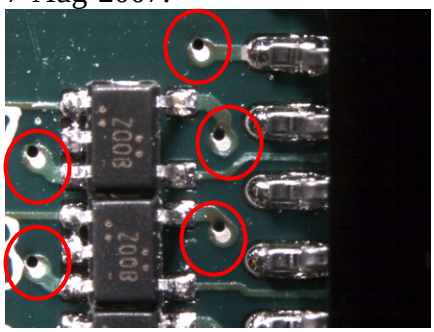
Mrodtest okay

MROD-X 100
Type: 6 Channel

Assembled Jun, 2007

~23-Jul-2007:
JTAG chain fail when Impact via backplane. Impact via front panel okay.

Bad alignment between the component and solder side op the board. Via holes at the components side are out of the center of via:
7-Aug-2007:



Section nearby the JTAG Addressable Scan Port. This might well explain that the module is not Addressable via the backplane.
Try program via the front connector and test to see if there are more problems in the board…
PROMs programmed okay; mrodtest okay.
Measured all relevant connections between P1, ICs 585, 586, 587, 588, 589 and IC 522 including power supplies.
Try connect.sh:

```
5      00101  <- connect!
6      00110  <- connect!
7      00111  <- connect!
8      01000  <- connect!
9      01001  <- connect!
10     01010  <- connect!
11     01011  <- connect!
12     01100  <- connect!
13     01101
14     01110
15     01111
16     10000  <- No Connect
```

8-Aug-2007:
Reflow connections around ICs 585, 586, 587, 588 and 589

```
8      01000  <- connect!
9      01001  <- connect!
10     01010  <- connect!
12     01100  <- connect!
16     10000  <- Connect!
```

Mrodtest okay

MROD-X 105
Type: 6 Channel

Assembled Jun, 2007

~23-Jul-2007:

IC588 pin 5 open; repaired (~23-jul-2007)

MROD-X 107
Type: 6 Channel

Assembled Jun, 2007

~23-Jul-2007:
JTAG chain fail when Impact via backplane. Impact via front panel okay.

8-Aug-2007:

```
8      01000  <- connect!   IC588
9      01001  <- connect!   IC585
10     01010  <- connect!   IC586
12     01100  <- connect!   IC587
16     10000  <- Connect!   IC589
```

Problem seems to have solved itself!?
Reflow connections around ICs 585, 586, 587, 588 and 589

```
8      01000  <- connect!   IC588
9      01001  <- connect!   IC585
10     01010  <- connect!   IC586
12     01100  <- connect!   IC587
16     10000  <- Connect!   IC589
```

Mrodtest okay

MROD-X 110
Type: 6 Channel

Assembled Jun, 2007

~23-Jul-2007:
Green ASP connected LED does not lit.

8-Aug-2007:
```
8     01000 <- connect!  IC588
9     01001 <- no connect!     IC585
10    01010 <- connect!  IC586
12    01100 <- connect!  IC587
16    10000 <- Connect!  IC589
```

Reflow connections around ICs 585, 586, 587, 588 and 589
```
8     01000 <- no connect!     IC588
9     01001 <- connect!  IC585
10    01010 <- connect!  IC586
12    01100 <- connect!  IC587
16    10000 <- Connect!  IC589
```

9-Aug-2007:
Reflow R628 (GAP_n and GA_n[4])
```
8     01000 <- connect!  IC588
9     01001 <- connect!  IC585
10    01010 <- connect!  IC586
12    01100 <- connect!  IC587
16    10000 <- Connect!  IC589
```

Mrodtest okay

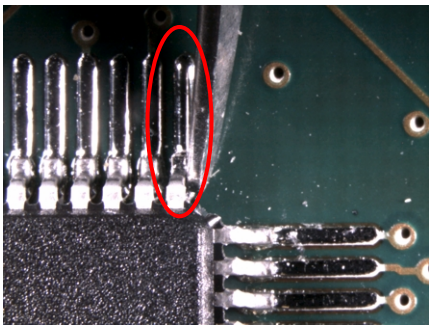
MROD-X 113
Type: 6 Channel

Assembled Jun, 2007

~23-Jul-2007:
cd MRODTest
mrodtest <slotnumber><serialnumber>
-> Mem-C Error

9-Aug-2007:
ZBT memory C-B has address errors:

```
### addr #00000201:  expected #FFFFFFFF,  read #AAAAAAAA    << Adr(9)
### addr #00000001:  written  #AAAAAAAA
### addr #00000202:  expected #FFFFFFFF,  read #AAAAAAAA    << Adr(9)
### addr #00000002:  written  #AAAAAAAA
### addr #00000204:  expected #FFFFFFFF,  read #AAAAAAAA    << Adr(9)
### addr #00000004:  written  #AAAAAAAA
### addr #00000208:  expected #FFFFFFFF,  read #AAAAAAAA    << Adr(9)
### addr #00000008:  written  #AAAAAAAA
### addr #00000210:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000010:  written  #AAAAAAAA
### addr #00000220:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000020:  written  #AAAAAAAA
### addr #00000240:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000040:  written  #AAAAAAAA
### addr #00000280:  expected #FFFFFFFF,  read #AAAAAAAA
### addr #00000080:  written  #AAAAAAAA
```



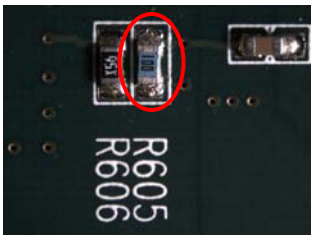
IC2006 Pin 81 (A9) is open (note the tweezers); repaired (09-aug-2007)

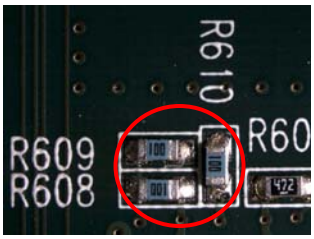
Mrodtest okay

MROD-X 114
Type: 6 Channel

Assembled Jun, 2007

~23-Jul-2007:



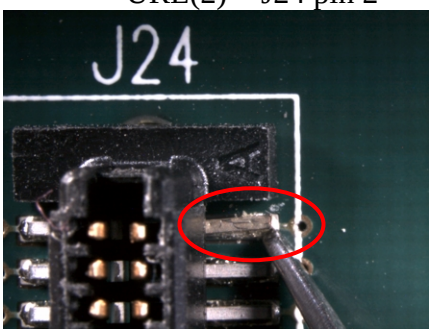


R605, R608, R609, R610, R719, R720, R721, R1006, R2006, R3006, R4006, R5006, R6006, R7006, R8006 **are 10 Ω!**
repaired (08-aug-2007)

mrodtest <slotnumber><serialnumber>

```
###reg  5 (MRO_SLINK_STAT_INTR      ): default #00003800, read #00003804
```

= URL(2) = J24 pin 2



Pin 2 is not connected… (note the tweezers); repaired (08-aug-2007)

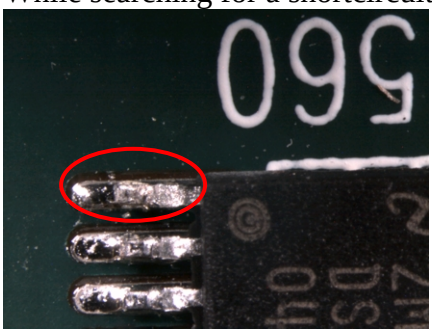
Mrodtest okay

MROD-X 115
Type: 6 Channel

Assembled Jun, 2007

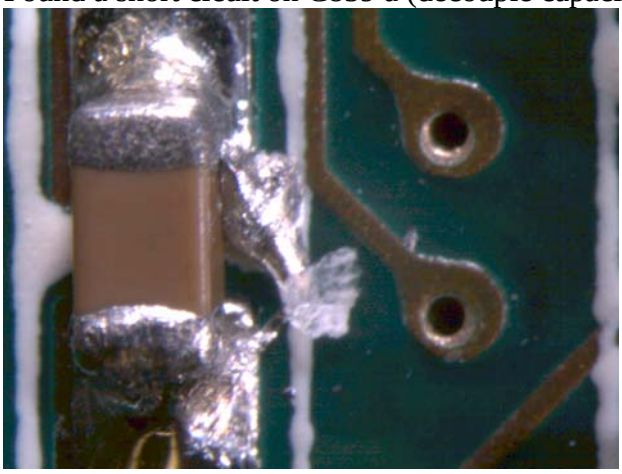
14-08-2007:
Resistance 16A fuse to gnd measured 0.3Ohm

While searching for a shortcircuit, found pin 1 IC560 open:



Mrodtest not performed

19-12-2007:
Found a short cicuit on C859 a (decouple capacitor near the output FPGA; IC529)



Short removed, now measure 5,2 ohm between 3V3 and GND.

program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!
mrodtest 8 115 okay!

15-Aug-2008:
Firmware updated, mounted slink 0418
(Note: su root => chmod 777 /dev/windrv6)

In: 08041800
Out: 08051400
Mrodtest 16 115 okay!

MROD-X 116
Type: 6 Channel

Assembled Jun, 2007

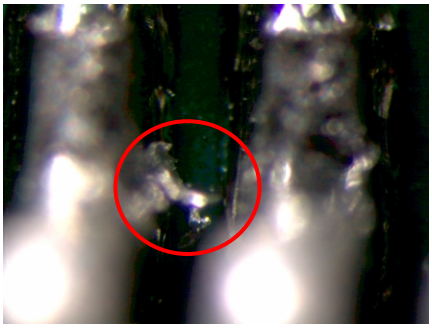
14-08-2007:
Board did not connect to backplain easily, although it is not curved. VME Connector?
Test failed after programming: Reset crate and reprogrammed FPGAs. Reprogramming failed, LEDs stay on.

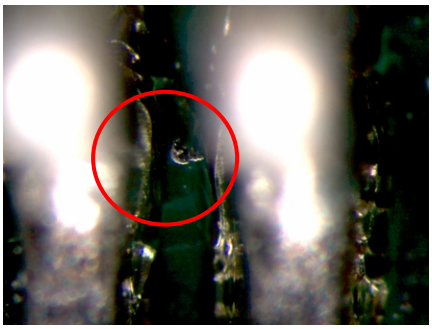
21-01-2008:
Returned from Nijmegen (repaired by Thei).

22-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay, ***But module does not want to come out of the configuration cycle…***
MRI_Done stays low.
Checked MRI_D(7:0) and MRI_CCLK (20 MHz!) at the termination resistors -> okay…
Dip switches in correct position.
Try to determine which of the FPGAs does not want to configure… Try to program (IMPACT via the front panel) each FPGA, each directly after a SysReset (thus initiating a config cycle).
Sysreset -> program 1A -> no cure
Sysreset -> program ***1B*** -> board comes out of config cycle!
Sysreset -> program 2A -> no cure
Sysreset -> program 2B -> no cure
Sysreset -> program 3A -> no cure
Sysreset -> program 3B -> no cure
Power supplies 3V3, 1V5 and 2V5 okay
Check SW1B. Soldering okay, but switch M2 is bad! -> Place new DIP switch.

```
###ERRORS found in file MROD-116/reg-E.log
Checking T-sensor Chan A:
  found at addr 30
  Thi = 127, Tlo = -55
  Write 13 to Tlow... OKAY: Tlo =  13
  Write 27 to Tlow... OKAY: Tlo =  27
  Temp=  29 C
  ###Temperature Out-Of-Limits (30<=T<=60)
  Temp=  29 C
  ###Temperature Out-Of-Limits (30<=T<=60)
  Temp=  29 C
  ###Temperature Out-Of-Limits (30<=T<=60)
```

Check IC5013


Short/dirt between pin 4 and 5


Short/dirt between pin 9 and 10

Mrodtest 8 116 okay!

25-03-2003
To investigate the RocketIO-LDown Problem, Added J13 and attached tiny wire onto Adr(21) near IC6004 in order to connect the Logic Analyzer.

04-04-2008
Adr(21) wire removed.

17-04-2008:
program (slot 11) PROMs via RCAT:
In: 08041600
Out: 08030301
(Is MROD-In version with LVCMOS_S_8 on Sharc-Databus)
While testing with “mrodtest” encountered errors in reg-E. Data(0) seems to be stuck. I’ve seen this on the oscilloscope as well. Is there a bad via due to measurements made earlier?
Measured (ohm meter) the connection between the various via’s (from Sharc-D(0) via to IC5004 D(0) via) -> Okay.
Could it be that the connected (but not turned on) logic analyzer on J13 is to blame? -> Disconnect Logic Analyzer:

Mrodtest 15 116 okay!

MROD-X 121
Type: 6 Channel

Assembled Jun, 2007

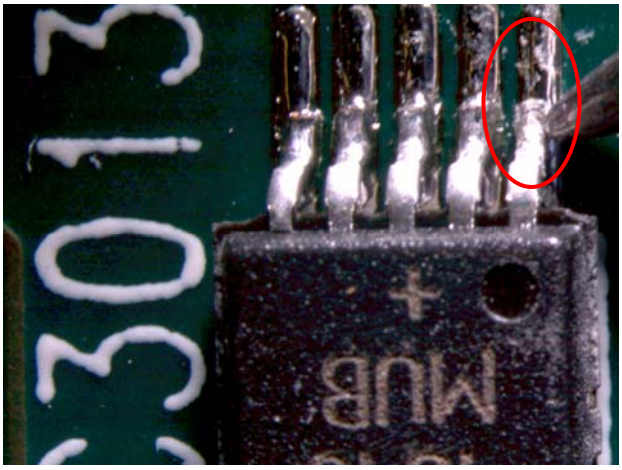
14-08-2007:

Programming of FPGA failed. ASP connect light did not turn on.

19-12-2007:
Connect/Disconnect in all slots okay except for slot 10
Connect slot 10 fail.
Second pass Connect in slot 10 okay!?
Reflow IC 585, 586, 587, 588, 589 and IC552
Connect/Disconnect in slot 10 okay.
program (slot 10) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!
mrodtest 10 121 fail:

```
###ERRORS found in file MROD-121/reg-D.log
Checking T-sensor Chan A:
###ERROR: T-sensor not found (at expected addr 0)
###T-sensor found at addr index 3 (addr=52h)
```

Check IC3013



IC3013 pin 1 loose

mrodtest 10 121 okay

15-Aug-2008:
Firmware updated, mounted slink 0416
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800

Out: 08051400
Mrodtest 11 121 okay!

MROD-X 122
Type: 6 Channel

Assembled Jun, 2007

06-06-2016:
Module returned from CERN by Henk.
Reset problems reported. Should be inspected and possibly repaired.

MROD-X 123
Type: 6 Channel

Assembled Jun, 2007

14-08-2007:
C971 blew up as the power was turned on.

5-10-2007:
C971 replaced

Apply 5V and 3V3 from tabletop power supplies.
Measure Power Supplie:

1V5 (IC584/L540/C977)	measure	1,51 V

Board into Crate -> program_in_and_out.sh 19
10-10-2007:
Tested oaky!

MROD-X 125
Type: 6 Channel

Assembled Jun, 2007

15-08-2007:
Programming of FPGAs failed: ASP Connect light did not turn on.
19-11-07: Slot 19 ASP did connect. Module okay…
But test in other slots:

```
8      01000  <- connect
9      01001  <- connect
10     01010  <- connect
12     01100  <- connect
19     10011  <- connect
```

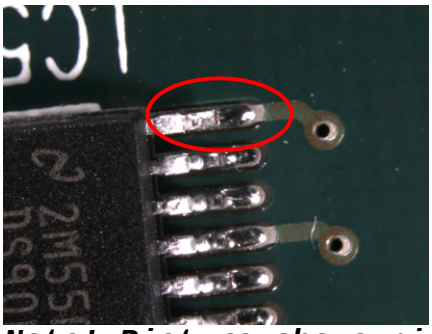
MROD-X 126
Type: 6 Channel

Assembled Jun, 2007

15-08-2007:
mrodtest of this module failed:

```
MROD-126/intr-A.log:tst 1: ###Timeout IRQ2 (ECR) interrupt
MROD-126/intr-A.log:tst 1: ###Timeout IRQ2 (TTC FIFOs Full) interrupt
MROD-126/intr-A.log:tst 1: ###Timeout IRQ1 Spy EvtLen FIFO interrupt
MROD-126/intr-A.log:tst 1: ###Timeout IRQ1 Spy Evt FIFO interrupt
MROD-126/reg-A.log:###reg 13 (MRO_CHANNEL_ENABLE       ): default #000063FF,
read #010063FF
MROD-126/slink_evts.log:### Something wrong found in here (MROD-
126/slink_evts.log) by slinktest.sh
```

Pin 9 on IC560 not connected:



Note! Picture shows pin 16?

17-08-2007:
Errors in Slink.log:

```
====== INTERRUPTS ======
Interrupt counters:
 IRQ0: 0, IRQ1: 0, IRQ2: 1 ( IRQ2 occurred)
 SLINK LRL, LDOWN, FIFO HalfFull    :     0,     0,     0
 TTC   ECR                          :     1
 TTC   IdFFSharc,  TrigTypeFFSharc  :     0,     0
 TTC   IdFFRcktIO, TrigTypeFFRcktIO :     0,     0
 SpyEvtLenFifoFull, SpyEvtFifoFull  :     0,     0
 RocketIO LDOWN: 0 0 0 0 0 0 0 0
=======================
###EvtId 1, BOT: got D5A747BC, expected A0001BCC (BOL=1800A5A1)
###EvtId 2, BOT: got D5A747BC, expected A0002BCC (BOL=1800A5A1)
###EvtId 3, EvtLenFIFO Length: got 000001D9, expected 000001D7
###EvtId 5, BOT: got D5A747BC, expected A0005BCC (BOL=1800A5A1)
###EvtId B, EvtLenFIFO Length: got 0000018F, expected 000001D7
###EvtId C, EvtLenFIFO Length: got 00000206, expected 000001D7
###EvtId D, BOT: got D5A747BC, expected A000DBCC (BOL=1800A5A1)
###EvtId F, EvtLenFIFO Length: got 000001D9, expected 000001D7
###EvtId 10, BOT: got D5A747BC, expected A0010BCC (BOL=1800A5A1)
###EvtId 18, EvtLenFIFO Length: got 000001D8, expected 000001D7
```

Exchanged Slink card -> still errors

```
====== INTERRUPTS ======
Interrupt counters:
 IRQ0: 0, IRQ1: 0, IRQ2: 1 ( IRQ2 occurred)
 SLINK LRL, LDOWN, FIFO HalfFull    :     0,     0,     0
 TTC   ECR                          :     1
```

```
 TTC   IdFFSharc,  TrigTypeFFSharc  :     0,     0
 TTC   IdFFRcktIO, TrigTypeFFRcktIO :     0,     0
 SpyEvtLenFifoFull, SpyEvtFifoFull  :     0,     0
 RocketIO LDOWN: 0 0 0 0 0 0 0 0
========================
###EvtId 3, TDC-data: got 32500000, expected 320A0000 (BOL=1800A5A1)
###EvtId 23, BOT: got DA023B8C, expected A2023BCC (BOL=1800A5A1)
```

Reflowed J24 (Slink connector)
Strange! “mrodtest 6 126 slink” succeeds but a complete “mrodtest 6 126” fails. Are things not cleared well after the last test in golttc?
Mrodchk on slink_evts.dat:

```
Error3:  Unexpected change in TLP (tdc-links present).     (event 0000000e)
          (Previous TLP: 0003ffff, current TLP: 0003ff7f CSM 1 MROD a5a    )
 +=----:  Error(s) in  MROD a5a    in   Dump.event 0000000e (event 0000000e)

 Error3:  Unexpected change in TLP (tdc-links present).     (event 0000000f)
          (Previous TLP: 0003ff7f, current TLP: 0003ffff CSM 1 MROD a5a    )
 Error7:  Event count in TDC header differs from BOBEcnt    (event 0000000f)
          (BOBEcnt= 00f, Ecnt=00e  in TDC 07 CSM 1 MROD a5a)
 Error6:  dc00e0af  GOL par.err.   in TDC?07 CSM 1 MROD a5a (event 0000000f)
 ErrorE:  Found BOT but previous word must be EOT.          (event 0000000f)
 +=----:  Error(s) in  MROD a5a    in   Dump.event 0000000f (event 0000000f)

 Error6:  da015b8c  GOL par.err.   in TDC?07 CSM 1 MROD a5a (event 00000015)
 +=----:  Error(s) in  MROD a5a    in   Dump.event 00000015 (event 00000015)

 Error3:  Unexpected change in TLP (tdc-links present).     (event 00000027)
          (Previous TLP: 0003ffff, current TLP: 0003ffbf CSM 1 MROD a5a    )
 +=----:  Error(s) in  MROD a5a    in   Dump.event 00000027 (event 00000027)

 Error3:  Unexpected change in TLP (tdc-links present).     (event 00000028)
          (Previous TLP: 0003ffbf, current TLP: 0003ffff CSM 1 MROD a5a    )
 Error7:  Event count in TDC header differs from BOBEcnt    (event 00000028)
          (BOBEcnt= 028, Ecnt=027  in TDC 06 CSM 1 MROD a5a)
 Error6:  dc027404  GOL par.err.   in TDC?06 CSM 1 MROD a5a (event 00000028)
 ErrorE:  Found BOT but previous word must be EOT.          (event 00000028)
 +=----:  Error(s) in  MROD a5a    in   Dump.event 00000028 (event 00000028)

Errors counted per subtower (CSM)
 MROD#       CSM 0:  CSM 1:  CSM 2:  CSM 3:  CSM 4:  CSM 5:  CSM 6:  CSM 7:
 x05a=0090:       0      11       0       0       0       0       0       0
```

Exchange optical module CSM0 (1A) and CSM1 (1B)

```
MROD#       CSM 0:  CSM 1:  CSM 2:  CSM 3:  CSM 4:  CSM 5:  CSM 6:  CSM 7:
 x05a=0090:       0     160       0       0       0       0       0       0
```

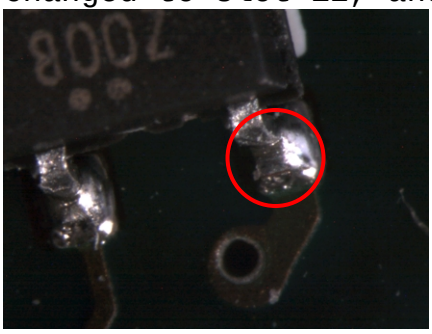
Power supply 2V5 for Ch-1B okay. Checked decouple C and L for Rocket-IO and GOL. Differentially measured GOL_RXP and GOL_RXN (13, 12), GOL_TXP, GOLTXN (18,19) on an oscilloscope -> looks fine.
mrodtest 12 126 okay -> slot 12 passed!
mrodtest 6 126 okay -> slot 6 passed!
Module repaired itself?

Mrodtest okay

MROD-X 129
Type: 6 Channel

Assembled Jun, 2007

15-08-2007:
Programming of FPGAs did not work in Slot 6 of test crate.
Changed to slot 12, and FPGAs could be programmed.



IC586 pin 5

On first test, got this error:
MROD-129/slink_evts.log:### Something wrong found in here (MROD-129/slink_evts.log) by slinktest.sh

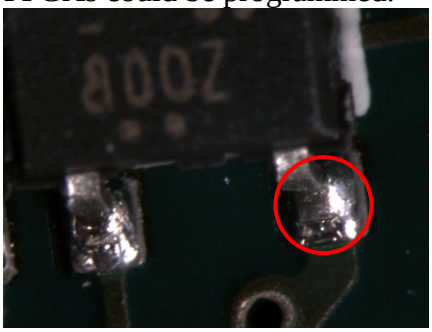
The second test was ok

17-08-2007:
Connecttest.sh okay
Mrodtest okay

MROD-X 130
Type: 6 Channel

Assembled Jun, 2007

15-08-2007:
Programming of FPGAs did not work in Slot 6 of test crate. Changed to slot 8, and FPGAs could be programmed.



IC586 pin 5

17-08-2007:
Still… No Connect in slot 10!

19-12-2007:
Connect slot 10 fail.
Reflow IC 585, 586, 587, 588, 589 and IC552
Checked Tiny Logic (on the table) IC552 address pins (toggle when P1-10d,11d,13d,15d and 17d are taken to gnd). okay
Checked (ohmic) V_TCK, V_TRST_n, V_TMS, V_TDI, V_TDO connections to P1. okay.
Checked Other address pins (IC552 pin 24 to 20) okay.
Checked connection to ASP LED. Okay.

Connect/Disconnect all slots 10 okay except
Connect slot 5 fail
Second pass slot 5 Connect/Disconnect okay!

program (slot 5) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!
mrodtest 5 130 okay!

15-Aug-2008:
Firmware updated, mounted slink 0402:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800

Out: 08051400
Mrodtest 10 130

MROD-X 131
Type: 6 Channel

Assembled Jun, 2007

15-08-2007:
Could not program FPGAs. ASP connect light stayed off.

17-08-2007:
Reflowed some pins on ICs 585, 586, 587, 588 and 589
Connecttest.sh okay
Mrodtest okay

23-08-2007:
Duration test: Fail to connect in slot 10 (Brenta)!
21-11-2007.
Tested again… The first time there is a connect in slot 9, but the modeule does not disconnect when you do conncect.sh 10!
Moved into slot 8. and now connect 8 works, connect 9 deselects the module.
Programmed the latest firmware … succesfull.
Added SLINK module. Tried connect: failed in slot 8 !
Do mrodtest … -> okay! BUT: ASP connect problem persists…
26-11-2007:
We tried several things like termination Vcc-330/470-gnd on TCK line (in slot 4), RC filtering (47 ohm + 470 pF) to gnd on TCK (in slot 4) still Connect-FAIL !!!
Replaced ASP chip (74lvt8996 old:44dhyvt, new: 44dhyvt)
Problem persists…
07-12-2007:
Slot8 Connect and disconnect okay
Slot7 Connect and disconnect okay
Slot6 Connect and disconnect okay
Slot5 Connect fail!

19-12-2007:
Connect slot 5 fail.
Checked Tiny Logic (on the table) IC552 address pins (toggle when P1-10d,11d,13d,15d and 17d are taken to gnd). okay
Checked (ohmic) V_TCK, V_TRST_n, V_TMS, V_TDI, V_TDO connections to P1. okay.
Checked Other pins (IC552 pin 24 to 20) okay.
Checked connection to ASP LED. Okay.
program (slot 9) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

mrodtest 9 131 okay!

Connect slot 5 fail.

06-02-2008:
Modified the RCAT module (SN18) series resistors R12, R16 and R24. Instead of 0 ohm, placed a 1uH inductor (BLM18AG102SN1D).
Module does connect and disconnect in all slots! (5-20)

Mrodtest 7 131 okay!

MROD-X 132
Type: 6 Channel

Assembled Jun, 2007

15-08-2007:
Could not program FPGAs. ASP connect light stayed off. No faulty connections found under microscope.
03-12-2007: Reflowed ic553 and ic554. (XCF08P proms)
Slot 7: Module doesn't want to connect. Try IMPACT via Parallel IV cable @ 2.5 MHz.
Replaced IC588, reflowed other ASP related chips. Connect slot 10 okay.
Programming okay !

Mrodtest:

```
###ERRORS found in file MROD-132/crcsr.log
### There were errors, type any to continue..
```

crcsr.log:

```
VME-slot 10, BAR = 50h
CRCSR string = "MROD-X, Muon Drift Tube Readout Driver, NIKHEF"
MRODOUT reset...done
MRODOUT SHARC-A WAIT-reg: 01CE739C
###MRODOUT SHARC-A WAIT-reg: 0AAAA2A8, but expected AAAAAAAA
MRODOUT reset...done
MRODOUT SHARC-A WAIT-reg: 01CE739C
```

19-12-2007:
Connect slot 7 fail.
Reflow IC 585, 586, 587, 588, 589 and IC552
Connect slot 5, 6, 7 fail.

Checked Tiny Logic (on the table) IC552 address pins (toggle when P1-10d,11d,13d,15d and 17d are taken to gnd). okay
Checked (ohmic) V_TCK, V_TRST_n, V_TMS, V_TDI, V_TDO connections to P1. okay.
Checked Other pins (IC552 pin 24 to 20) okay.
Checked connection to ASP LED. Okay.
P1-10d,11d,13d,15d and 17d have 4K7 to 3V3: okay

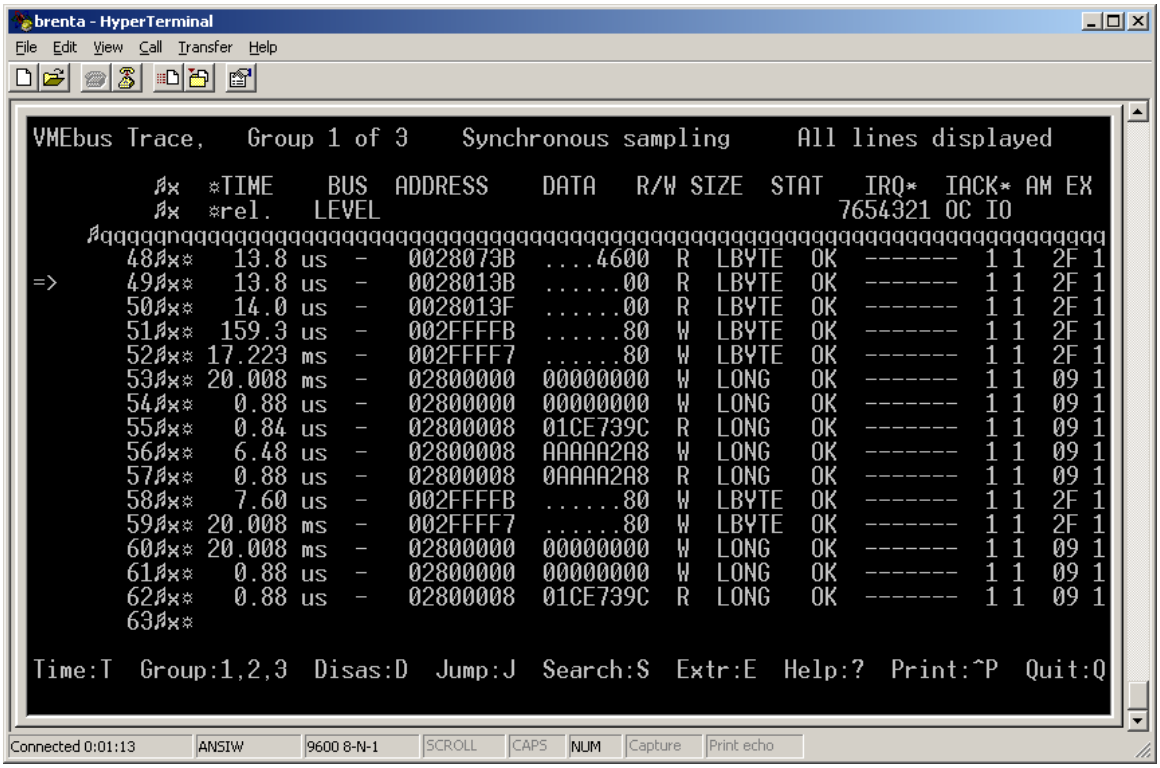
Connect/Disconnect slot 5, 6, 8, 9, 10, 12, 14-20 okay.
Connect slot 7, 11 Fail

program (slot 5) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

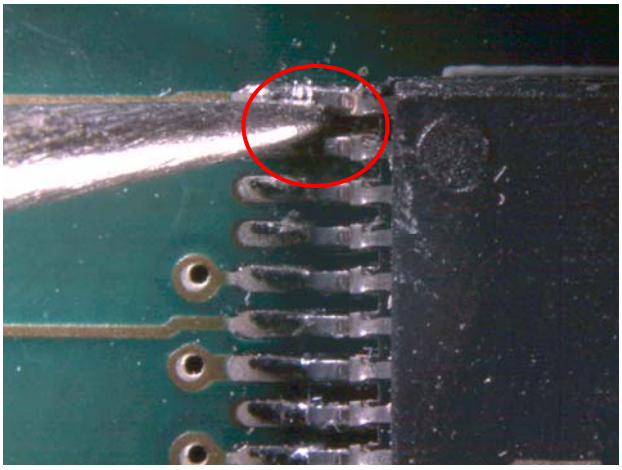
mrodtest 5 132 fail

crcsr.log:

```
VME-slot 10, BAR = 50h
CRCSR string = "MROD-X, Muon Drift Tube Readout Driver, NIKHEF"
MRODOUT reset...done
MRODOUT SHARC-A WAIT-reg: 01CE739C
###MRODOUT SHARC-A WAIT-reg: 0AAAA2A8, but expected AAAAAAAA
MRODOUT reset...done
MRODOUT SHARC-A WAIT-reg: 01CE739C
```



Written onto the VME bus is 0AAAA2A8. Check if data bits 31-28 (IC569 pin 37/20; 36/21; 34/23; 33/24) and bit 11 (IC568 pin 43/14) and bit 1(IC568 pin 49/8) are stuck to GND.



Pin 1 (OEAB) and 2 (LEAB) of IC568 are loose

mrodtest 5 132 okay

For some reason? Now Connect/Disconnect slots 5-12 are okay

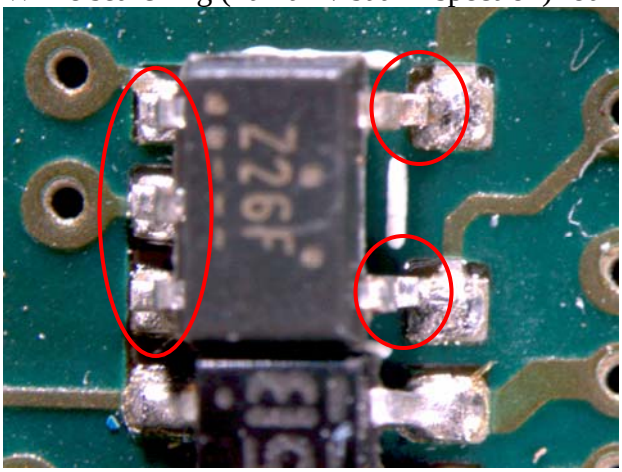
14-Aug-2008:
Firmware updated, mounted slink 0402:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 18 132 okay!

MROD-X 134
Type: 6 Channel

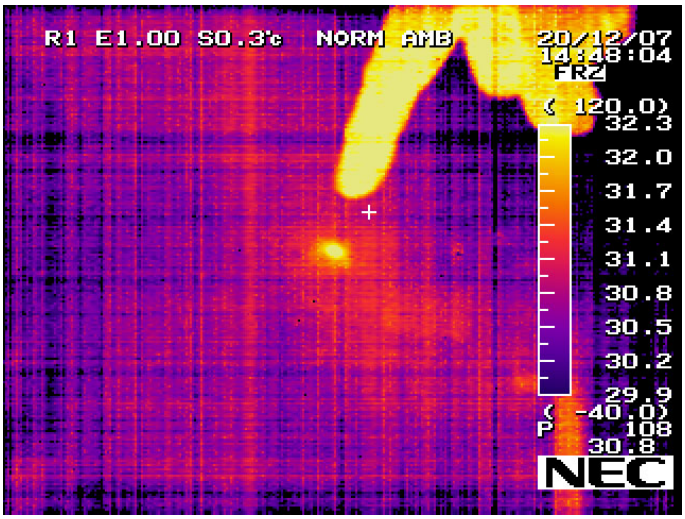
Assembled Jun, 2007

15-08-2007:
Short circuit between 16A fuse and ground.
Removed Slink board and all Optical receivers.

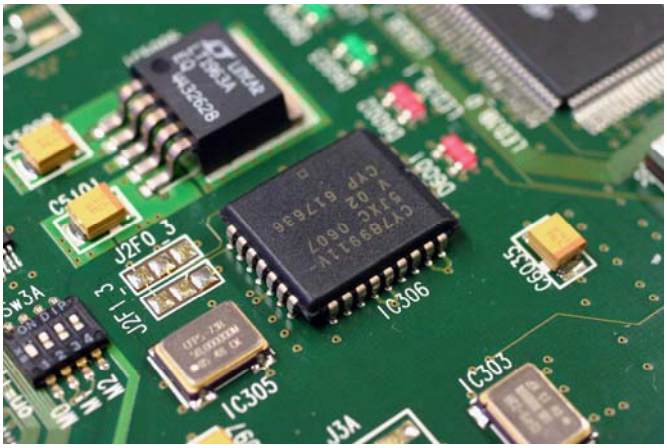
20-12-2007:
While searching (human visual inspection) found *no short circuit* but IC544 misaligned:



Try to put current (1A) through the board and find the short circuit with the thermal camera…



Hotspot points to IC306. This IC was placed in the wrong orientation.



Repaired; now measure 5,6 ohm between 3V3 and GND.

Plugin Optical Tranceivers.

program (slot 9) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

mrodtest 9 134 fail

```
### ERRORS found in file MROD-134/intr-A.log:
MROD-134/intr-A.log:tst 1: ###Timeout IRQ2 (ECR) interrupt
MROD-134/intr-A.log:tst 1: ###Unexp SHARC ID FIFO Full interrupt cnt 0 (expected 1)
MROD-134/intr-A.log:tst 1: ###Unexp SHARC TT FIFO Full interrupt cnt 0 (expected 1)
MROD-134/intr-A.log:tst 1: ###Unexp Rckt ID FIFO Full interrupt cnt 0 (expected 1)
MROD-134/intr-A.log:tst 1: ###Unexp Rckt TT FIFO Full interrupt cnt 0 (expected 1)
MROD-134/intr-A.log:tst 1: ###Timeout IRQ0 (SLINK FIFO Half Full) interrupt
MROD-134/intr-A.log:tst 1: ###MRO_SLINK_HALFFULL bit not set
MROD-134/intr-A.log:tst 1: ###Timeout IRQ1 Spy EvtLen FIFO interrupt
MROD-134/intr-A.log:tst 1: ###Timeout IRQ1 Spy Evt FIFO interrupt
```

Inspection of the TTC interface needed.
LHC_Clk1/4 and LHC_Clk are present.
TTC signals (L1A, ECR, Serial_EVID, SerialTType) present on termination resistors (R726-741)

03-01-2008:
FB pin 17 of IC567 has wrong frequency (60 MHz) -> IC562 is 100 MHz instead of 50 MHz.

Repaired: This solves a lot of IRQ problems, but not all…

```
MROD-134/intr-A.log:tst 1: ###Timeout IRQ1 Spy EvtLen FIFO interrupt
MROD-134/intr-A.log:tst 1: ###Timeout IRQ1 Spy Evt FIFO interrupt
```

Exchanged S-Link card with one that proved to be okay (from module SN130). Now `mrodtest 5 134 ointr` is okay

Cross-check. Placed failing S-Link card on module SN130 -> No problem found...?
Exchange S-Link cards back to their original boards (SN134 and SN130) -> Now both modules are okay. Probaly a failing S-Link connection or a badly paced loopback fibre…

mrodtest okay!

Note: Removed Slink card (SN 02104 to be used on other modules)

14-Aug-2008:
Firmware updated, mounted slink 0410:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 11 134 okay!

MROD-X 136
Type: 6 Channel

Assembled Jun, 2007

15-08-2007:
Unable to program FPGAs, no ASP connect light. Tried slots 16,17 and 7
21-11-2007:
Reflowed pins on ICs 585, 586, 587, 588 and 589
Problem persists…

03-01-2008:
Connect slot 5 fail.
Checked Tiny Logic (on the table) IC552 address pins (toggle when P1-10d,11d,13d,15d and 17d are taken to gnd). okay
Checked (ohmic) V_TCK, V_TRST_n, V_TMS, V_TDI, V_TDO connections to P1. okay.
Checked Other pins (IC552 pin 24 to 20) okay.
Checked connection to ASP LED. Okay.

Replace IC552
Connect slot 5,6,7,8,9 fail.
Connect/Disconnect Slot 10,11 okay!
Connect slot 12 fail.
Connect/Disconnect Slot 14 okay!
Connect slot 15,16,17 fail.
Connect/Disconnect Slot 18,19 okay!
Connect slot 20 fail.

Against better knowledge… Replace: ICs 585, 586, 587, 588 and 589
Connect/Disconnect Slot 5 okay
Connect slot 6 fail.
Connect/Disconnect Slot 7,8,9 okay
Connect slot 10 fail.
Connect/Disconnect Slot 11,12 okay
Connect slot 14 fail.
Connect/Disconnect Slot 15,16,17,18,19 okay
Connect slot 20 fail.

program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 8 136 okay!

06-02-2008:
Modified the RCAT module (SN18) series resistors R12, R16 and R24. Instead of 0 ohm, placed a 1uH inductor (BLM18AG102SN1D).
Module does connect and disconnect in all slots! (5-20)
Note: Module often makes a bad contact on P1 row “Z”.

Mrodtest 7 136 okay!

MROD-X 137
Type: 6 Channel

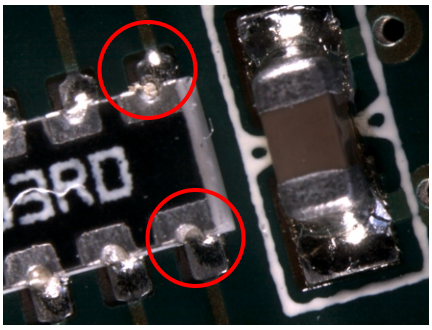
Assembled Jun, 2007

16-08-2007:
IC 588 is out of line under the microscope. Resoldered pins 1 ,2, 4 and 5.
FPGA Programming ok.

MROD-X 139
Type: 6 Channel

Assembled Jun, 2007

17-08-2007:
SHARC- Link test C0 <-> D5 and D5 <-> C0 failed:



Link bit 6 through R101 open; repaired
Mrodtest okay

MROD-X 142
Type: 6 Channel

Assembled Jun, 2007

16-08-2007:
C950 Blew up.

5-10-2007:
C950 replaced

Apply 5V and 3V3 from tabletop power supplies.
Measure Power Supplie:
1V9 (IC581/L537/C956) measure 1,89 V

Board into Crate -> program_in_and_out.sh 7
10-10-2007:
ASP does connect but JTAG chain fails … Did two things at the same time:

- Today new impact (Xilins ISE 92i installed) Chmod 666 /dev/windrvr6
- Reflowed connections around ICs 585, 586, 587, 588 and 589 although all solder joints looked okay…

Now ASP does connect (don't know which of the above points did cure the fault)
Programmed okay
Mrodtest:

```
###reg  5 (MRO_SLINK_STAT_INTR      ): default #00003800, read #0000B000
```

S-Link not Up. Reconnect S-Link to Osiris. Try again:

```
Mrodtest 19 142 reg
```

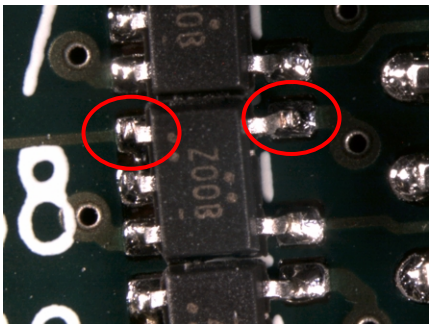
Tested okay!

MROD-X 143
Type: 6 Channel
Assembled Jun, 2007

15-08-2007:
IC 588 is out of line under the microscope. Expecting problems programming FPGAs.
16-08-2007:
Resoldered pins 1, 2 and 5, FPGAs programmed without problem.
Mrodtest okay

MROD-X 146
Type: 6 Channel
Assembled Jun, 2007

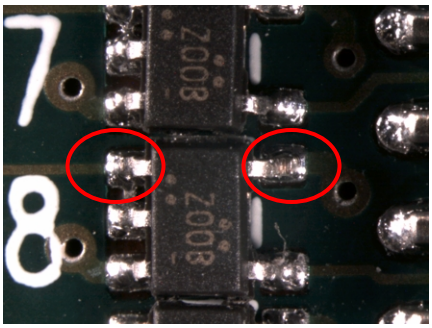
20-08-2007:
ASP fails to connect.



IC588 pin 1 and 5 open; repaired 20-Aug-2007
Mrodtest okay

MROD-X 147
Type: 6 Channel
Assembled Jun, 2007

20-08-2007:
ASP fails to connect.



IC588 pin 1 and 5 open; repaired 20-Aug-2007
ASP still fails to connect
Reflowed IC585, IC586, IC587, IC588, IC589 and IC 552
ASP still fails to connect
20-Aug-2007:
Replaced IC552 (74LVT8996)
Problem still there…
30-11-2007: replaced IC588 (might have been damaged due to open pins)
03-12-2007. Reflowed … asp connect in slot 17 okay.
Programming okay but "config" stays on. "manual programming (via Impact) okay BUT still "config" stays ON. (Impact individual programming done twice may clear Config LED.) Reflowed ic553 and ic554. (XCF08P proms)
Mrodtest OKAY !

Note: S-Link Output Optical Transceiver is functioning properly but differs from all others.

MROD-X 148
Type: 6 Channel
Assembled Jun, 2007

22-08-2007:
Duration test had a hang-up after 3 hours running.
The log file (test-21-08-1917/slot12.log) points out that there is a problem on Channel 1A.

```
>>>> slot12.log
###EvtId 39A950, BOT: got A09EBBCC, expected A0950BCC (Input=1A, BOL=180000C0)
###EvtId 39A950, EOT: got C09EB002, expected C0950002 (Input=1A, BOL=180000C0)
###EvtId 39A9B5, BOT: got A0A50BCC, expected A09B5BCC (Input=1A, BOL=180000C0)
###EvtId 39A9B5, EOT: got C0A50002, expected C09B5002 (Input=1A, BOL=180000C0)
###EvtId 39AA1A, BOT: got A0AB5BCC, expected A0A1ABCC (Input=1A, BOL=180000C0)
###EvtId 39AA1A, EOT: got C0AB5002, expected C0A1A002 (Input=1A, BOL=180000C0)
###EvtId 39AA7F, BOT: got A0B1ABCC, expected A0A7FBCC (Input=1A, BOL=180000C0)
###EvtId 39AA7F, EOT: got C0B1A002, expected C0A7F002 (Input=1A, BOL=180000C0)
###EvtId 39AAE4, BOT: got A0B7FBCC, expected A0AE4BCC (Input=1A, BOL=180000C0)
###EvtId 39AAE4, EOT: got C0B7F002, expected C0AE4002 (Input=1A, BOL=180000C0)
###EvtId 39AB49, BOT: got A0BE4BCC, expected A0B49BCC (Input=1A, BOL=180000C0)
Ect…
```

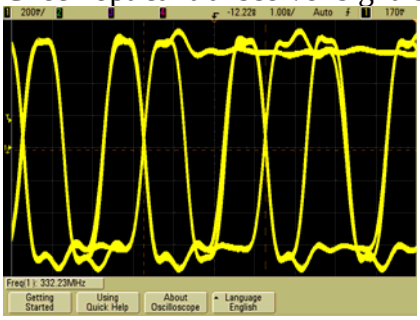
Exchanging the optical fibers did not solve the problem. A new startup of a duration test immediately hangs again…

04-01-2008:
program (slot 7) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 7 148 okay! Twice!?

Bits D21, D20, D18, D16, D15, D14, D13, D12 are effected

Check optical transceiver signals for Channel 1A:



Fine…

Check ZBT memory IC1006 -> okay!

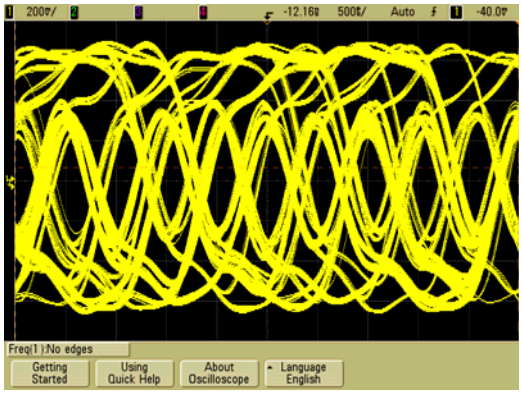
Once again: Mrodtest 7 148 okay!
Was the failing duration test a bad shot? Try duration test again…

08-01-2008:
Duration test had a hang-up after 3 hours running.
The log file (test-08-01-1625/slot15.log) points out that there is a problem on Channel 1A.

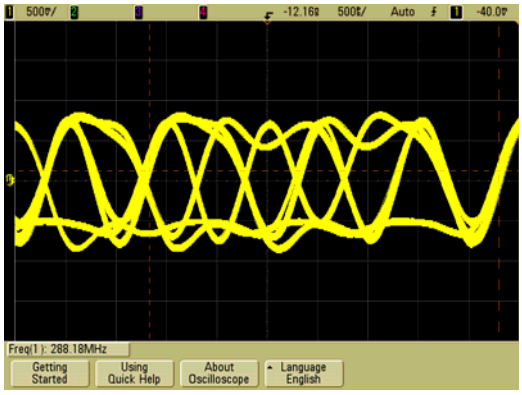
```
###EvtId 9ADDE4, BOT: got A0E6EBCC, expected A0DE4BCC (Input=1A, BOL=180000F0)
###EvtId 9ADDE4, EOT: got C0E6E003, expected C0DE4003 (Input=1A, BOL=180000F0)
###EvtId 9ADE49, BOT: got A0ED3BCC, expected A0E49BCC (Input=1A, BOL=180000F0)
###EvtId 9ADE49, EOT: got C0ED3003, expected C0E49003 (Input=1A, BOL=180000F0)
###EvtId 9ADEAE, BOT: got A0F38BCC, expected A0EAEBCC (Input=1A, BOL=180000F0)
###EvtId 9ADEAE, EOT: got C0F38003, expected C0EAE003 (Input=1A, BOL=180000F0)
###EvtId 9ADF13, BOT: got A0F9DBCC, expected A0F13BCC (Input=1A, BOL=180000F0)
###EvtId 9ADF13, EOT: got C0F9D003, expected C0F13003 (Input=1A, BOL=180000F0)
###EvtId 9ADF78, BOT: got A0002BCC, expected A0F78BCC (Input=1A, BOL=180000F0)
###EvtId 9ADF78, EOT: got C0002003, expected C0F78003 (Input=1A, BOL=180000F0)
```

Note that the module did not use loopback fibers in this configuration!

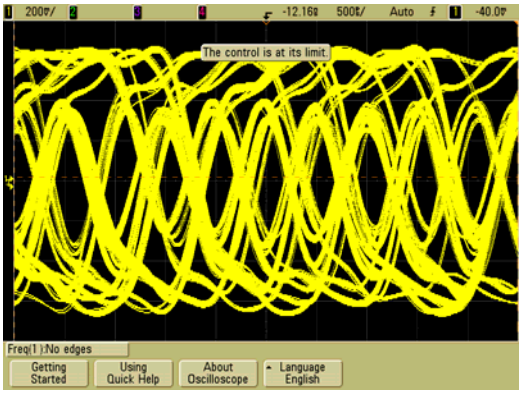
28-01-2008:
Check the RocketIO link between IC1004 (Ch_1A MROD_In FPGA) and IC529 (MROD-Out FPGA).



Channel-1A RX



TX



Channel-2A RX TX

Channel 1A looks okay (and compares to Channel 2A)

Measured 2V5 and ripple on pin 4 of IC1005; looks reasonable.
Precaution: replace IC1005 (Ripple? Cha_1A MGT 2V5), IC103 (Jitter? Cha_1A_1B X-tal GOL), IC104 (Jitter? Cha_1A_1B X-tal RocketIO)

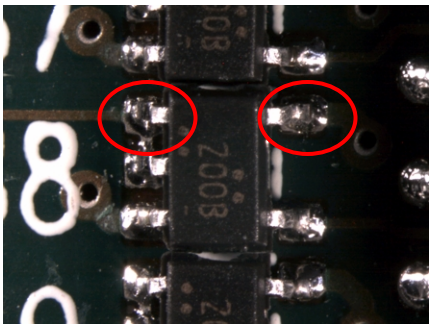
Mrodtest 7 160 okay!

MROD-X 149
Type: 6 Channel
Assembled Jun, 2007

PCB Curved

MROD-X 150
Type: 6 Channel
Assembled Jun, 2007

20-08-2007:
ASP fails to connect.



IC588 pin 1 and 5 open; repaired 20-Aug-2007
Mrodtest okay

21-08-2007:
Duration test: Fail to connect in slot 15 (Brenta)!

```
7      00111  <- fail
8      01000  <- fail
15     01111  <- fail
```

Relowed IC585, IC586

```
15     01111  <- fail
```

30-11-2007: replaced IC588 (might have been damaged due to open pins)
03-12-2007: ASP still doesn't connect (in slot 18)

04-01-2008:
Connect slot 18 fail.
Connect/Disconnect Slot 14 okay!
Brute force: replace: ICs 585, 586, 587, 588 and 589 and ASP IC552

Connect slot 18,11 fail.
Connect Slot 14 okay! / ***Disconnect slot 14 fail***
Connect/Disconnect Slot 5 okay!

program (slot 5) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 5 150 okay!

06-02-2008:

Modified the RCAT module (SN18) series resistors R12, R16 and R24. Instead of 0 ohm, placed a 1uH inductor (BLM18AG102SN1D).
Module does not want to connect in slot 5, 7…
Module does connect in slot 6, 8…
Check IC585 -> Replaced IC585
Module does not want to connect in slot 5, 7…
Pin Z10 on P1 seems to make bad contact. With the help of a test-tip, the module works fine in slot 19 whilst otherwise slot 19 does not connect…
Scratched the surface of pin Z10 a bit and slightly lifted the pin.
Module does connect and disconnect in all slots! (5-20)

Mrodtest 7 150 okay!

MROD-X 154
Type: 6 Channel

Assembled Jun, 2007

23-06-2009:
Mail from Henk from Cern:

```
Het zijn er intussen 2...
Allebei zitten ze in slot 20.
In de ene is SHARC C niet meer te booten,
in de andere SHARC E.

Henk
```

This MROD has been put into the TestCrate in USA-15 to further diagnose…

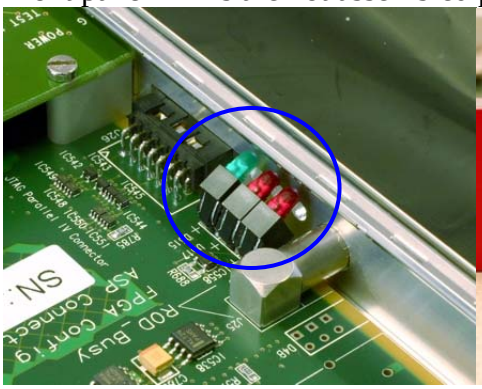
Comment from Henk after he delivered the modules in Amsterdam (13-10-2009)

```
  - MROD #154: SHARC E cannot be booted
    (in crate EA1 slot 20)
```

26-Jan-2012:
MROD 154 in slot 6
mrodsrv 6c ldr/ihello.ldr ==> MRODIN-C says HELLO !
mrodsrv 6d ldr/ihello.ldr ==> MRODIN-D says HELLO !
mrodsrv 6e ldr/ihello.ldr ==> MRODIN-E says HELLO !

MROD-X 155
Type: 6 Channel
Assembled Jun, 2007

20-08-2007:
Front panel LEDs are not assembled properly.




Reparired 21-Aug07

During mrodtest SHARC-C booted a few times and refused to boot when starting the slink test…

04-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

`Mrodtest 8 155` -> SHARC-C doesn't want to boot!
`Mrodtest 8 155 led` -> SHARC-C doesn't want to boot!

Even when pushing SHARC-C hard… No boot. Maybe not be a loose Ball…
Check power supplies of Sharc-C -> All power supplies okay (checked on table top)
Check Sharc-C Clock… On pin 1 IC106, no reference clock found… X-Tal IC105 fails.
Replaced IC105

Mrodtest 7 155 okay!

14-Aug-2008:
Firmware updated, mounted slink 0408:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 11 155

```
###reg  5 (MRO_SLINK_STAT_INTR      ): default #00003800, read #00003808
```

Bit 3 stuck at '1'; "S-LINK LRL(3:0)"

Check pin 1 of the S-Link connector and reflow pin 1 (S-Link LRL(3)) on S-Link card 0408 (note: neighboring pin 3 is 3v3).

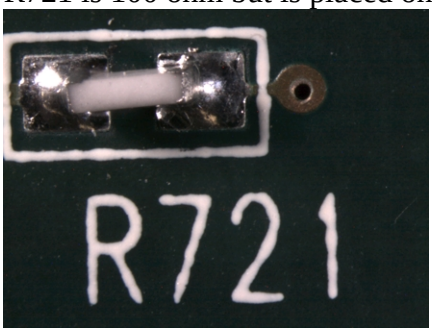
Mrodtest 11 155

```
###reg  5 (MRO_SLINK_STAT_INTR      ): default #00003800, read #00003801
```

Bit 0 stuck at ‘1’; “S-LINK LRL(3:0)”
Check pin 6 of the S-Link connector and reflow pin 1 (S-Link LRL(3)) on S-Link card 0408 (note: neighboring pin 3 is 3v3).
Relflow once again S-Link connector on Slink 0408
Mrodtest 11 155 okay!

MROD-X 156
Type: 6 Channel
Assembled Jun, 2007

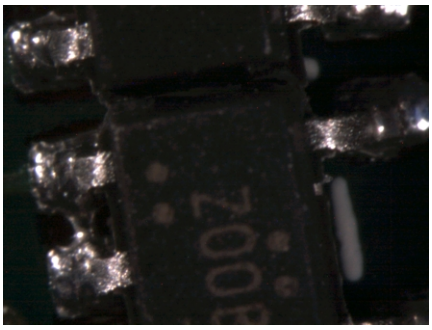
20-08-2007:
R721 is 100 ohm but is placed on its side…



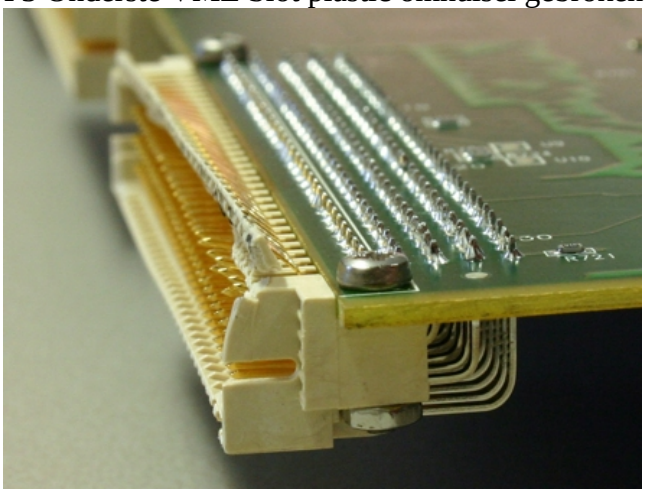
Repaired 20-Aug-2007

MROD-X 157
Type: 6 Channel
Assembled Jun, 2007

22-08-2007:
IC 588: resoldered Pins 1 and 5
IC 587: resoldered Pin 1



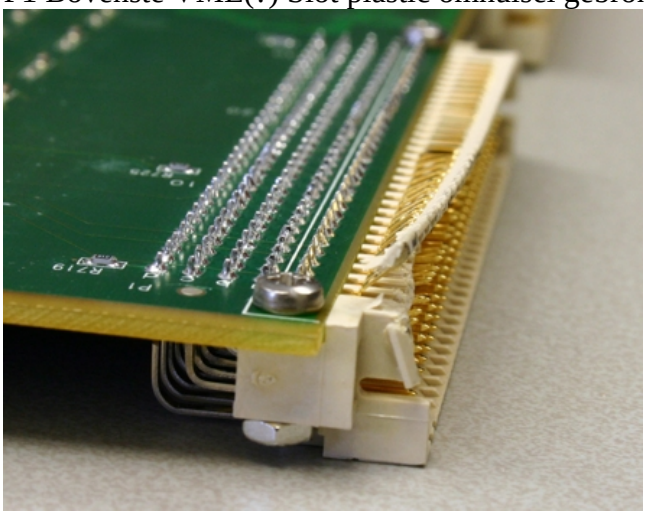
P3 Onderste VME Slot plastic omhulsel gebroken.



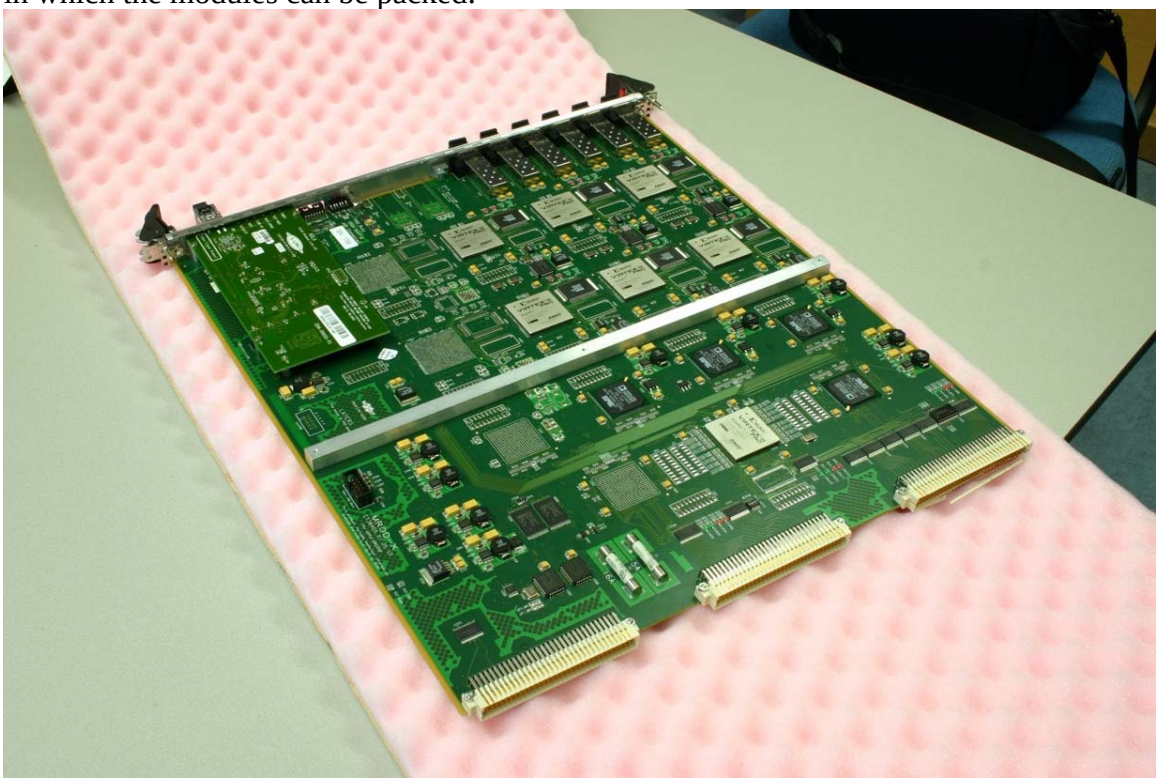
26-10-2007:
Returned from repair in Nijmegen by Han van der Vliet.
Programmed FPGA PROMs
MRODtest okay!

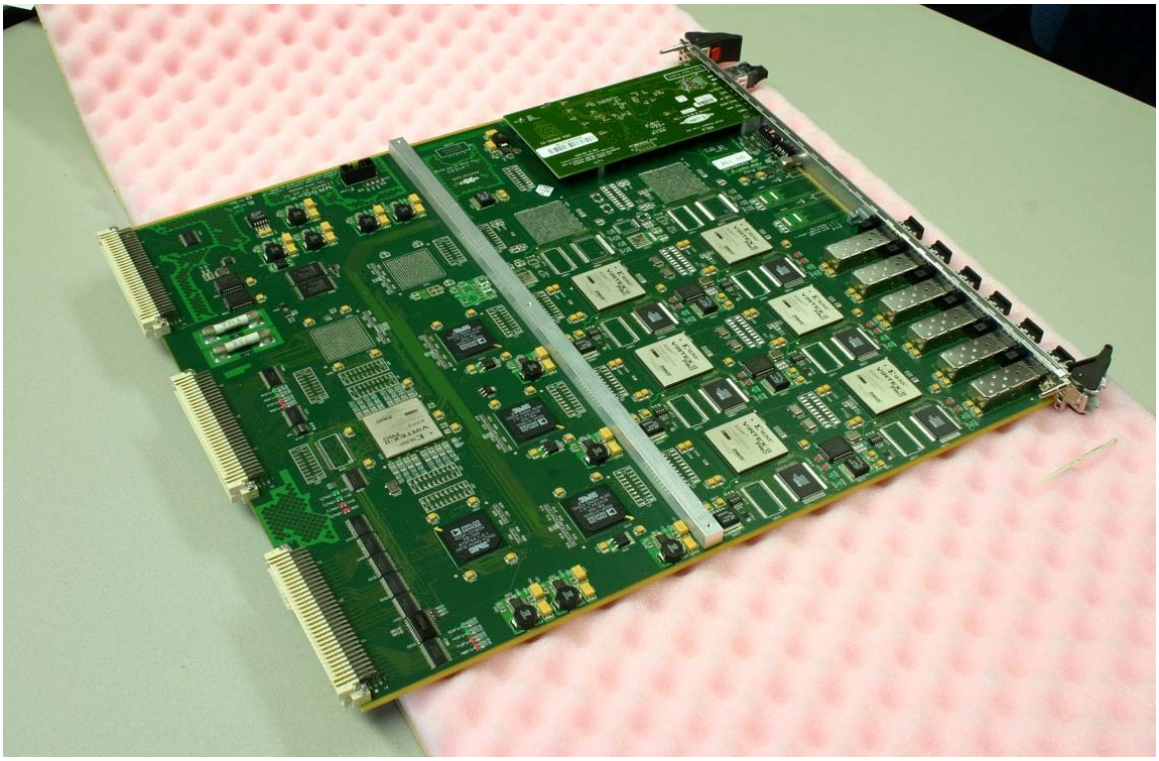
MROD-X 158
Type: 6 Channel
Assembled Jun, 2007

22-08-2007:
P1 Bovenste VME(?) Slot plastic omhulsel gebroken.



This damage cannot be due to shipment in the special boxes. There is just one orientation in which the modules can be packed:

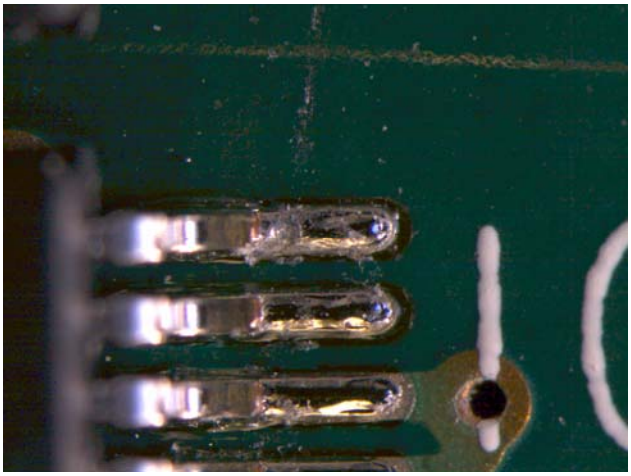


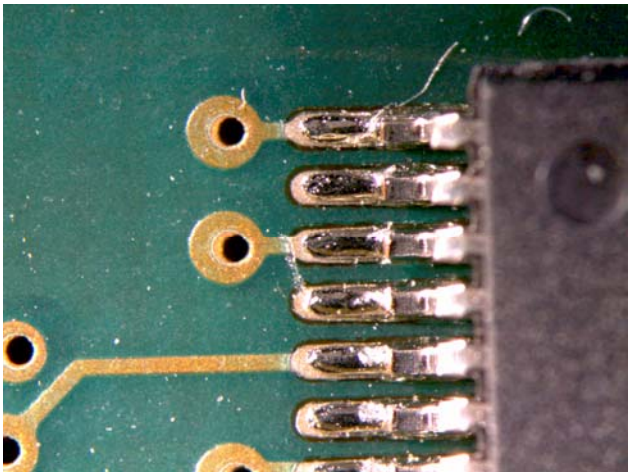


Wrong orientation… The module is too wide for the special box.

26-10-2007:
Returned from repair in Nijmegen by Han van der Vliet.
Programmed FPGA PROMs

###ERRORS found in file MROD-158/crcsr.log
There were errors, type any to continue..
VME-slot 18, BAR = 90h
###Failed to read VME CS/CSR ROM space (string)
error: 0x205 => major: Error 5 in package 2 => VMEbus driver/library for the RCC: VMEbus bus error received
07-12-2007:
Mvmereset works fine.
“Mrodtest 9 158 reg” fail -> buss error.
Several pins are suspected on IC570, IC573, IC577


IC577 pin 48


IC570 pins 1 to 6

Reflowed pins on IC570, IC573, IC577
Things got worst:

```
[daqmuon@calore ~/MRODtest] [25] mvmereset
  Mrod Slot: 16. offset: 800000 size: 8. (bytes)
-> BusError <-[daqmuon@calore ~/MRODtest] [26] mvmereset 9
  Mrod Slot: 9. offset: 480000 size: 8. (bytes)
-> BusError <-[daqmuon@calore ~/MRODtest] [27]
```

10-12-2007.
Reflowed pins on IC570, IC573, IC577, IC576, 571, 572,568.
Mvmereset does not respond -> Buss Error!

Impact showed verify fail on MROD-Out FPGA PROM. Reprogrammed (via front connector). Now also MROD-In FPGA PROM fails…
Both proms reprogrammed -> okay.
Module doesn't come out of config cycle.
11-12-2007:
ASP connect fail in slot 11

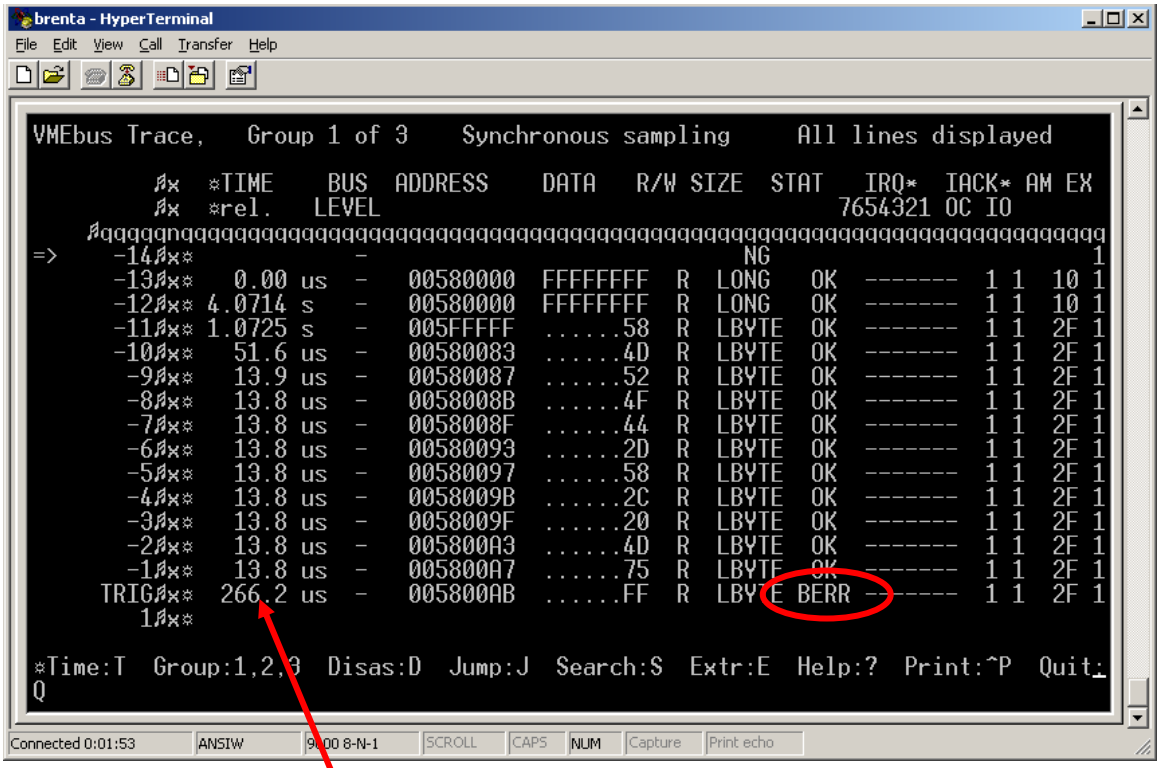
Reflowed IC585, IC586, IC587, IC588, IC589.
Impact via front pannel -> Programmed PROMs okay -> but board does not come out of configuration!
Checked Tiny Logic (on the table) IC552 address pins (toggle when P1-10d,11d,13d,15d and 17d are taken to gnd). okay
Checked (ohmic) V_TCK, V_TRST_n, V_TMS, V_TDI, V_TDO connections to P1. okay.
Checked Other address pins (IC552 pin 24 to 20) okay.
Checked connection to ASP LED. Okay.

04-02-2008:
Both MRI_Done and MRO_Done stay low…
Reprogrammed PROMS via front panel -> no Configuration!
Forgot to check the "Parallel Mode" option… Reprogram again -> board out of config!

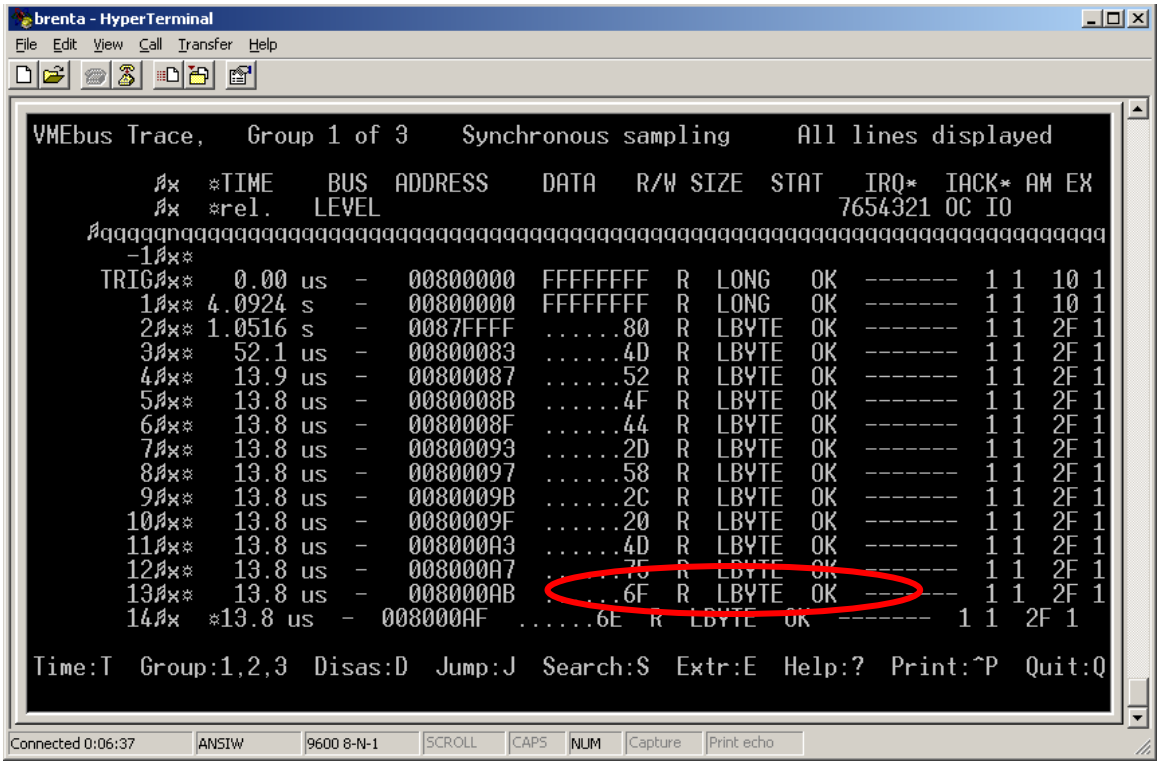
Mrodtest 11 158:

```
###ERRORS found in file MROD-158/crcsr.log
VME-slot 11, BAR = 58h
###Failed to read VME CS/CSR ROM space (string)
error: 0x205      => major: Error   5 in package   2 => VMEbus driver/library for the RCC:
VMEbus bus error received
```

Mvmereset 11 works fine.



Buss Timeout?



A Comparing module (SN186 in slot 16)…

Is this the same problem as found on module 159?
Put pressure onto the output FPGA.
Yep! That works! Conclusion ***Loose BGA ball***!
Note: Module has an “X-Ray pass” sticker

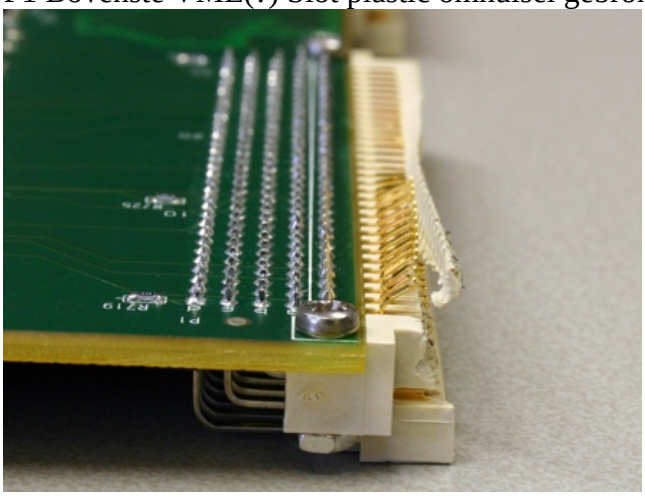
13-Feb-2008:
For repair sent to CERN-DEM:
Serial Number **158**: Replace IC529 = XC2VP20FF896

14-Apr-2008:
During removal of IC529 pads were lost under the BGA.

Board is wasted!

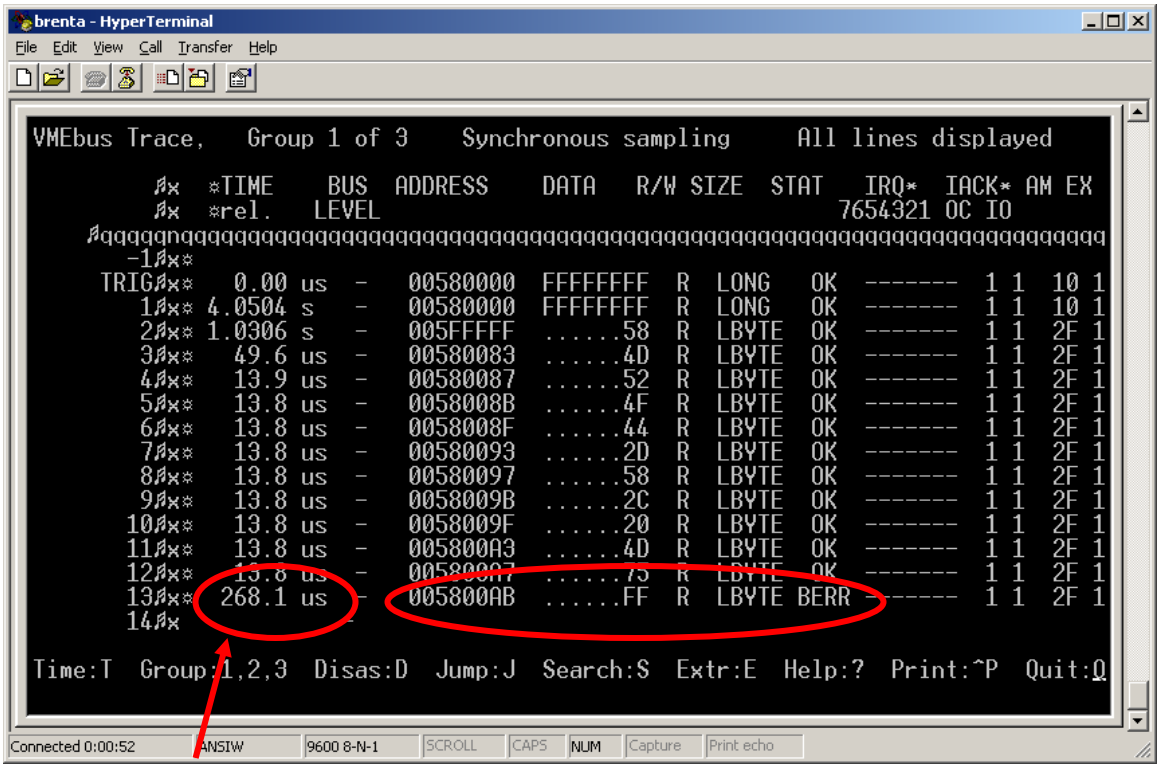
MROD-X 159
Type: 6 Channel
Assembled Jun, 2007

22-08-2007:
P1 Bovenste VME(?) Slot plastic omhulsel gebroken.



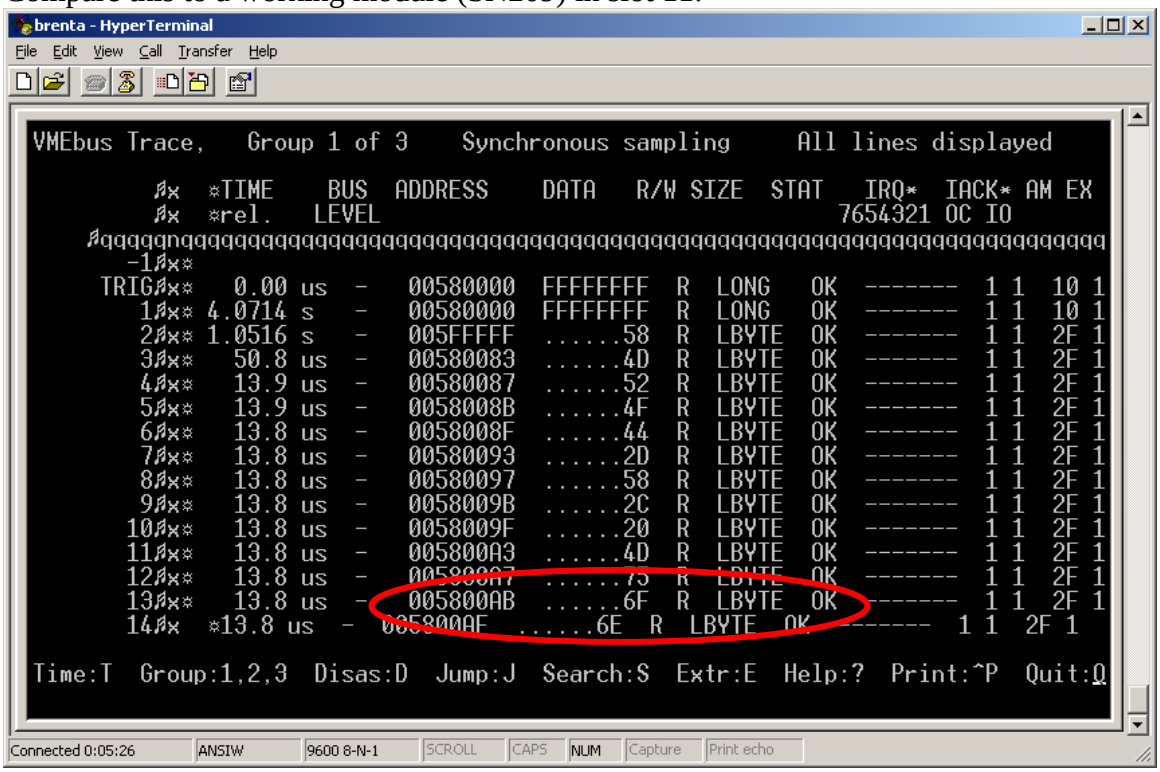
26-10-2007:
Returned from repair in Nijmegen by Han van der Vliet.
Programmed FPGA PROMs

##ERRORS found in file MROD-159/crcsr.log
There were errors, type any to continue..###VME-slot 18, BAR = 92h, expected BAR = 90h
###Failed to read VME CS/CSR ROM space (string)
error: 0x205 => major: Error 5 in package 2 => VMEbus driver/library for the RCC: VMEbus bus error received
10-12-2007
Still the same error…
11-12-2007:
Connect/Disconnect in slot 11 okay. Reprogramm PROMs (via RCAT) okay.
Mvmereset 11 okay.
Mrodtest 11 159 fail:



Probably a Bus Time Out

Compare this to a working module (SN209) in slot 11:



Logic thinking:

First 13 cylces are okay thus, DTACK, DS0, DS1, AM[5:0] must be okay.
Lowest Nibble address ‘3’,’7’,’B’,’F’ where okay.
Next nibble address ‘0’, ‘F’, ‘8’, ‘9’, ‘A’ where okay.
Combination ‘AB’ -> fail.
Check IC573 for shorts… Some pins reflowed
Pin rows 20-30 P1 reflowed.
Problem persists.
Again view all VME address buffers (IC572, IC573 and IC574) Nothing strange…
Again, now in slot 8. Put force onto the output FPGA (are there loose Balls?).
Yep! That works! Conclusion ***Loose BGA ball***!
Note: Module has an “X-Ray pass” sticker

13-Feb-2008:
For repair sent to CERN-DEM:
Serial Number **159**: Replace IC529 = XC2VP20FF896

14-Apr-2008:
During removal of IC529 pads were lost under the BGA.

Board is wasted!

MROD-X 160
Type: 6 Channel
Assembled Jun, 2007

24-08-2007:
Green and Yellow Triple LED of Channel 1B are exchanged…
10-10-2007:
Triple led channel 1B replaced
10-10-2007: In use as test Module on Argos

03-12-2007: retested in Calore: OKAY.

MROD-X 164
Type: 6 Channel
Assembled Jun, 2007

22-08-2007:
IC 588: resoldered Pins 1 and 5
IC 585: resoldered Pins 1 and 5

Error during testing:
In MROD-164/crcsr.log:
###MRODOUT SHARC-A WAIT-reg: FFFFFFFF, but expected 01CE739C
###MRODOUT SHARC-A WAIT-reg: FFFFFFFF, but expected AAAAAAAA
###MRODOUT SHARC-A WAIT-reg: FFFFFFFF, but expected 01CE739C

Op het scherm:
Vme_rcc(cct_berrInt): bus error on coupled VMEbus cycle

07-01-2008:
program (slot 9) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 9 164 okay!?
Earlier fail may be caused by another failing module that masked the proper function of this module…
Try once again:
Mrodtest 9 164 okay!

11-01-08:
Duration test failed twice (test-10-01-1655 and test-11-01-1154) when the module was operated with loopback fibers (but this might be coincidence when something broke down over time since 164 was in the set that had the loopback fibers connected last).
Errors:

```
###EvtId 80CA54, BOT: got A3A541CC, expected A3A54BCC (Input=1B, BOL=18000111)
###EvtId 4D8C45, EvtLenFIFO Length: got 0000018F, expected 0000016B
###EvtId A28678, EvtLenFIFO Length: got 0000018F, expected 0000016B
###EvtId A71143, EvtLenFIFO Length: got 0000013B, expected 0000016B
###EvtId 3836A4, BOT: got AB6A41CC, expected AB6A4BCC (Input=1B, BOL=18000111)
###EvtId 5B2AA4, EvtLenFIFO Length: got 00000135, expected 0000016B
###EvtId 56B137, BOT: got D4000000, expected A0137BCC (Input=1B, BOL=18000111)
###EvtId B2A43D, EvtLenFIFO Length: got 00000135, expected 0000016B
###EvtId 452C44, BOT: got A3C441CC, expected A3C44BCC (Input=1B, BOL=18000111)
###EvtId B0DCD5, EvtLenFIFO Length: got 00000198, expected 0000016B
###EvtId 3BE465, EvtLenFIFO Length: got 00000135, expected 0000016B
###EvtId 1A6760, BOT: got A2640BCC, expected A2760BCC (Input=1B, BOL=18000111)
###EvtId BD3151, EvtLenFIFO Length: got 00000159, expected 0000016B
###EvtId 5F0A7C, BOT: got 52A7CBCC, expected A0A7CBCC (Input=1B, BOL=18000111)
###EvtId 4F0584, BOT: got AE5841CC, expected AE584BCC (Input=1B, BOL=18000111)
###EvtId DB0B, EvtLenFIFO Length: got 00000159, expected 0000016B
###EvtId 5987BC, BOT: got A07BBBCC, expected A07BCBCC (Input=1B, BOL=18000111)
```

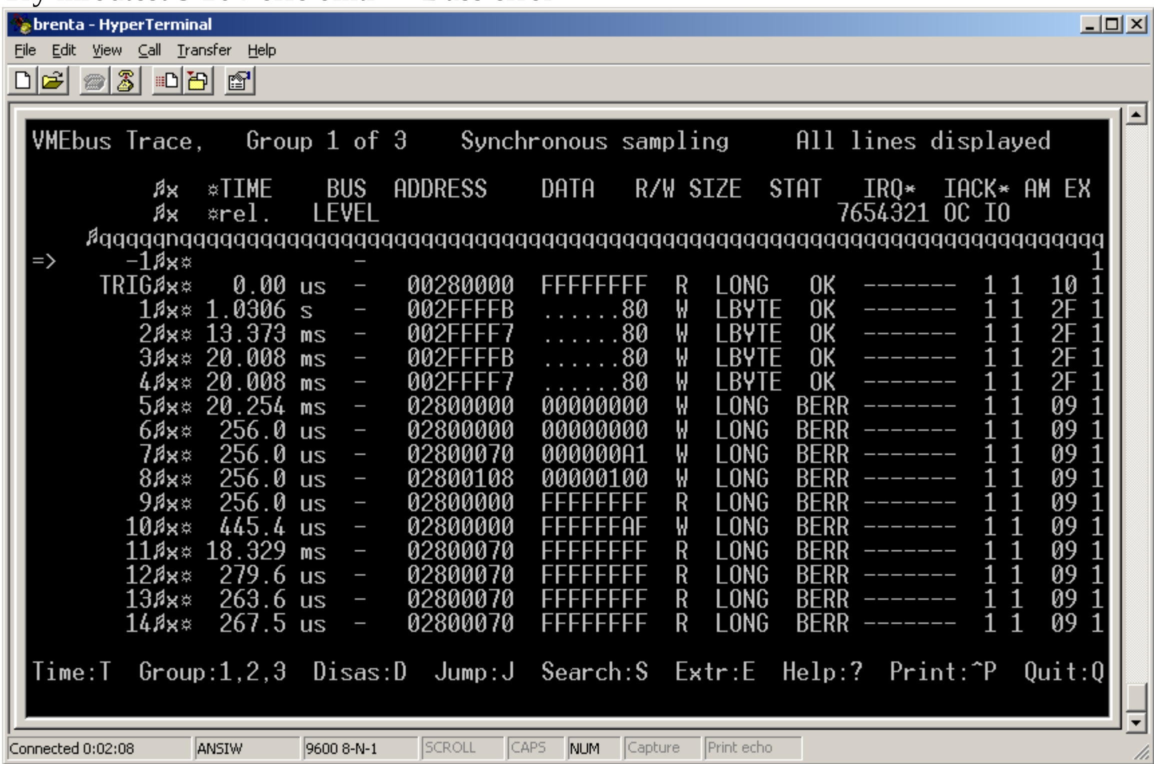
```
###EvtId 8C6FB8, EvtLenFIFO Length: got 00000135, expected 0000016B
###EvtId 1B7B1D, BOT: got A3BEDBCC, expected A3B1DBCC (Input=1B, BOL=18000111)
###EvtId 23B21C, BOT: got DA218BCC, expected A221CBCC (Input=1B, BOL=18000111)
###EvtId A70DD0, BOT: got A0DD40CC, expected A0DD0BCC (Input=1B, BOL=18000111)
###EvtId 6785D6, BOT: got DA5C6BCC, expected AD5D6BCC (Input=1B, BOL=18000111)
###EvtId 48CA84, BOT: got A1A841CC, expected A1A84BCC (Input=1B, BOL=18000111)
###EvtId 23CE95, BOT: got D5CC41BC, expected A0E95BCC (Input=1B, BOL=18000111)

###EvtId AA8DFC, TDC-data: got 3153AA00, expected 316CAA00 (Input=1B, BOL=18000111)
###EvtId 501A90, BOT: got A8A90BD7, expected A8A90BCC (Input=1B, BOL=18000111)
###EvtId 50752C, BOT: got AF52CBD7, expected AF52CBCC (Input=1B, BOL=18000111)
###EvtId BD6C81, BOT: got AEC81BD7, expected AEC81BCC (Input=1B, BOL=18000111)
###EvtId 96FE48, TDC-data: got 3328AA00, expected 333CAA00 (Input=1B, BOL=18000111)
###EvtId 664A5C, BOT: got A8A5CBD7, expected A8A5CBCC (Input=1B, BOL=18000111)
###EvtId A2C9D, BOT: got A4C9DBD7, expected A4C9DBCC (Input=1B, BOL=18000111)
###EvtId 4F8B79, TDC-data: got D335AA00, expected 3254AA00 (Input=1B, BOL=18000111)
###EvtId 66D124, TDC-data: got 3328AA00, expected 333CAA00 (Input=1B, BOL=18000111)
###EvtId 419A83, TDC-data: got D354AA00, expected 310CAA00 (Input=1B, BOL=18000111)
###EvtId 58A363, TDC-data: got 3152AA00, expected 318CAA00 (Input=1B, BOL=18000111)
###EvtId 4B1417, TDC-data: got 3157AA00, expected 314CAA00 (Input=1B, BOL=18000111)
###EvtId 533D64, TDC-data: got 3152AA00, expected 318CAA00 (Input=1B, BOL=18000111)
###EvtId 233B52, BOT: got ACB52BD7, expected ACB52BCC (Input=1B, BOL=18000111)
###EvtId 8CE4EF, TDC-data: got 3117AA00, expected 310CAA00 (Input=1B, BOL=18000111)
###EvtId 4DE773, TDC-data: got 3364AA00, expected 331CAA00 (Input=1B, BOL=18000111)
###EvtId B4D428, BOT: got A2428BD7, expected A2428BCC (Input=1B, BOL=18000111)
###EvtId 191E5A, BOT: got A9E5ABD7, expected A9E5ABCC (Input=1B, BOL=18000111)
###EvtId 2FEBC4, BOT: got A4BC4BD7, expected A4BC4BCC (Input=1B, BOL=18000111)
###EvtId B88FB2, BOT: got ABFB2BD7, expected ABFB2BCC (Input=1B, BOL=18000111)
###EvtId 302F6B, BOT: got A2F6BBD7, expected A2F6BBCC (Input=1B, BOL=18000111)
###EvtId 47A898, TDC-data: got D335AA00, expected 3254AA00 (Input=1B, BOL=18000111)
###EvtId 750659, BOT: got A6659BD7, expected A6659BCC (Input=1B, BOL=18000111)
###EvtId 668B0C, BOT: got AAB0CBD7, expected AAB0CBCC (Input=1B, BOL=18000111)
###EvtId 1C646A, TDC-data: got 3153AA00, expected 316CAA00 (Input=1B, BOL=18000111)
###EvtId 135F7B, BOT: got A4F7BBD7, expected A4F7BBCC (Input=1B, BOL=18000111)
###EvtId AD967, BOT: got A2967BD7, expected A2967BCC (Input=1B, BOL=18000111)
###EvtId 355A7, TDC-data: got D335AA00, expected 3254AA00 (Input=1B, BOL=18000111)
###EvtId 45FC57, TDC-data: got 3137AA00, expected 312CAA00 (Input=1B, BOL=18000111)
###EvtId 8AFA1E, BOT: got AFA1EBD7, expected AFA1EBCC (Input=1B, BOL=18000111)
###EvtId 8C2589, TDC-data: got D339AA00, expected 3234AA00 (Input=1B, BOL=18000111)
###EvtId 61099F, TDC-data: got 3348AA00, expected 335CAA00 (Input=1B, BOL=18000111)
###EvtId 905A06, EvtLenFIFO Length: got 0000017D, expected 0000016B
###EvtId 2E3D6D, BOT: got A3D6DBD7, expected A3D6DBCC (Input=1B, BOL=18000111)
###EvtId AE9CB2, EvtLenFIFO Length: got 0000016E, expected 0000016B
###EvtId 8633B, BOT: got A133BBD7, expected A133BBCC (Input=1B, BOL=18000111)
###EvtId 3B95F4, BOT: got AE5F4BD7, expected AE5F4BCC (Input=1B, BOL=18000111)
###EvtId 3DBC46, TDC-data: got D354AA00, expected 310CAA00 (Input=1B, BOL=18000111)
###EvtId 165354, TDC-data: got 3214B700, expected 3214AA00 (Input=1B, BOL=18000111)
###EvtId 1B158E, TDC-data: got D325AA00, expected 3044AA00 (Input=1B, BOL=18000111)
###EvtId 745694, TDC-data: got 2074AA00, expected 3274AA00 (Input=1B, BOL=18000111)
###EvtId 7545D9, TDC-data: got 302CAA00, expected 3064AA00 (Input=1B, BOL=18000111)
###EvtId 429722, TDC-data: got D335AA00, expected 3254AA00 (Input=1B, BOL=18000111)
###EvtId 2102ED, BOT: got B02EDBD7, expected B02EDBCC (Input=1B, BOL=18000111)
###EvtId 5B4E53, TDC-data: got D354AA00, expected 310CAA00 (Input=1B, BOL=18000111)
###EvtId 264D8B, TDC-data: got D329AA00, expected 3024AA00 (Input=1B, BOL=18000111)
###EvtId 35250D, EvtLenFIFO Length: got 0000016A, expected 0000016B
###EvtId 5A0883, TDC-data: got 3328AA00, expected 333CAA00 (Input=1B, BOL=18000111)
###EvtId 94530A, BOT: got AC30ABD7, expected AC30ABCC (Input=1B, BOL=18000111)
###EvtId 2D6D3A, BOT: got D0D3ABCC, expected A5D3ABCC (Input=1B, BOL=18000111)
###EvtId 9DE794, BOT: got A6794BD7, expected A6794BCC (Input=1B, BOL=18000111)
###EvtId 9D6F63, BOT: got ABF63BD7, expected ABF63BCC (Input=1B, BOL=18000111)
```

Hunch: Check for loose contacts on IC2006 (ZBT memory)…
IC2006 -> okay.

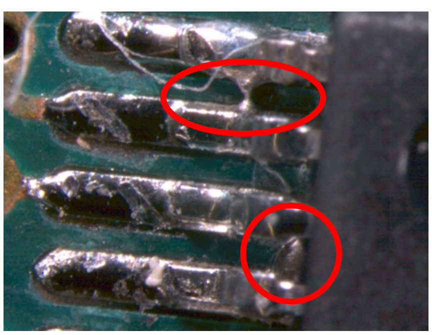
Put module into slot 5 to check 1B optical channels.
Mrodtest 5 164-effe slink -> **Sharc-C doesn't want to boot!**
Mrodtest 5 164-effe led -> **Sharc-C doesn't want to boot!**

Moved module to slot 8 to be able to put pressure on Sharc-C; now Sharc-C does boot. Back to Slot 5 again.

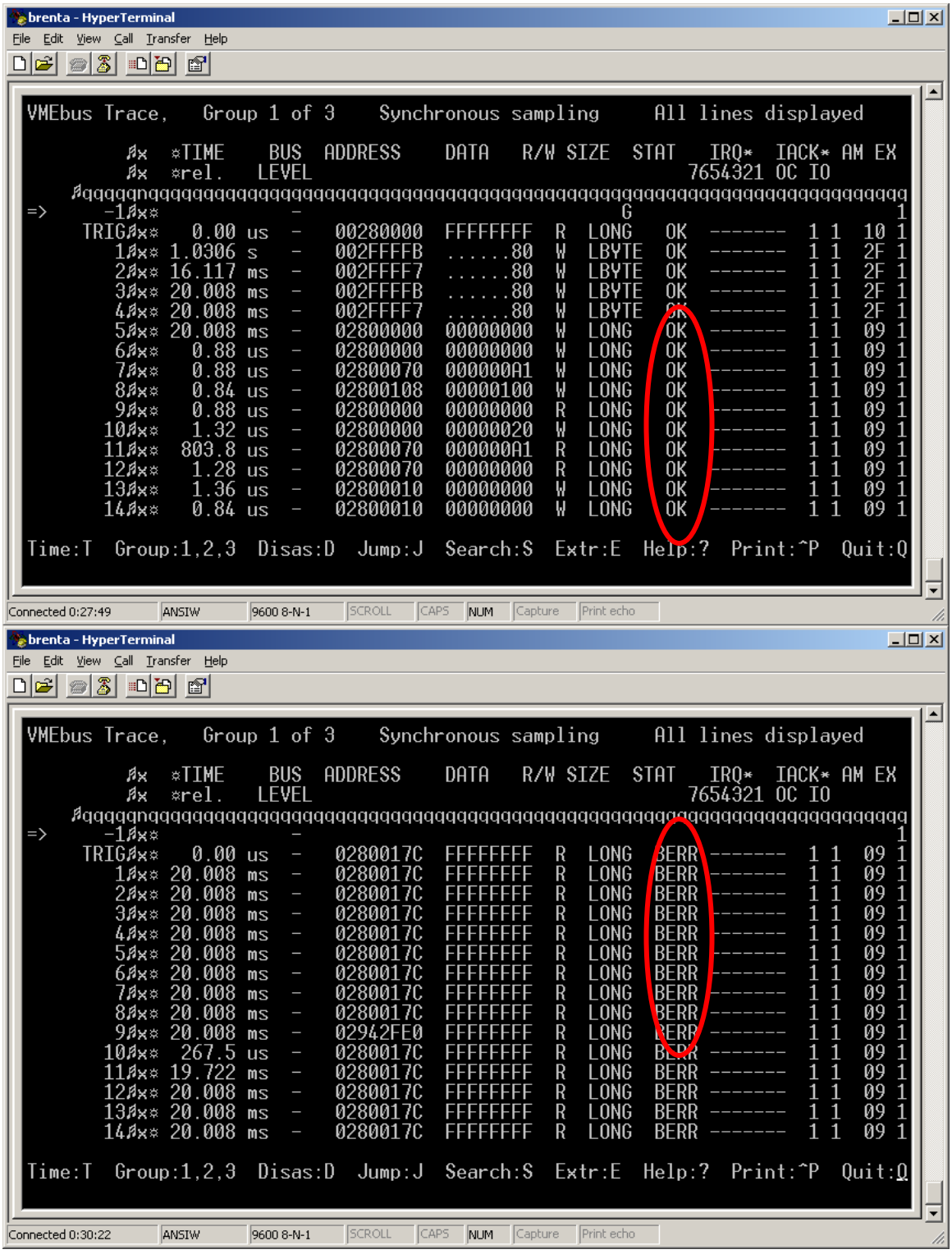
In slot 5 fails again.
Try mrodtest 5 164-effe ointr -> Buss error



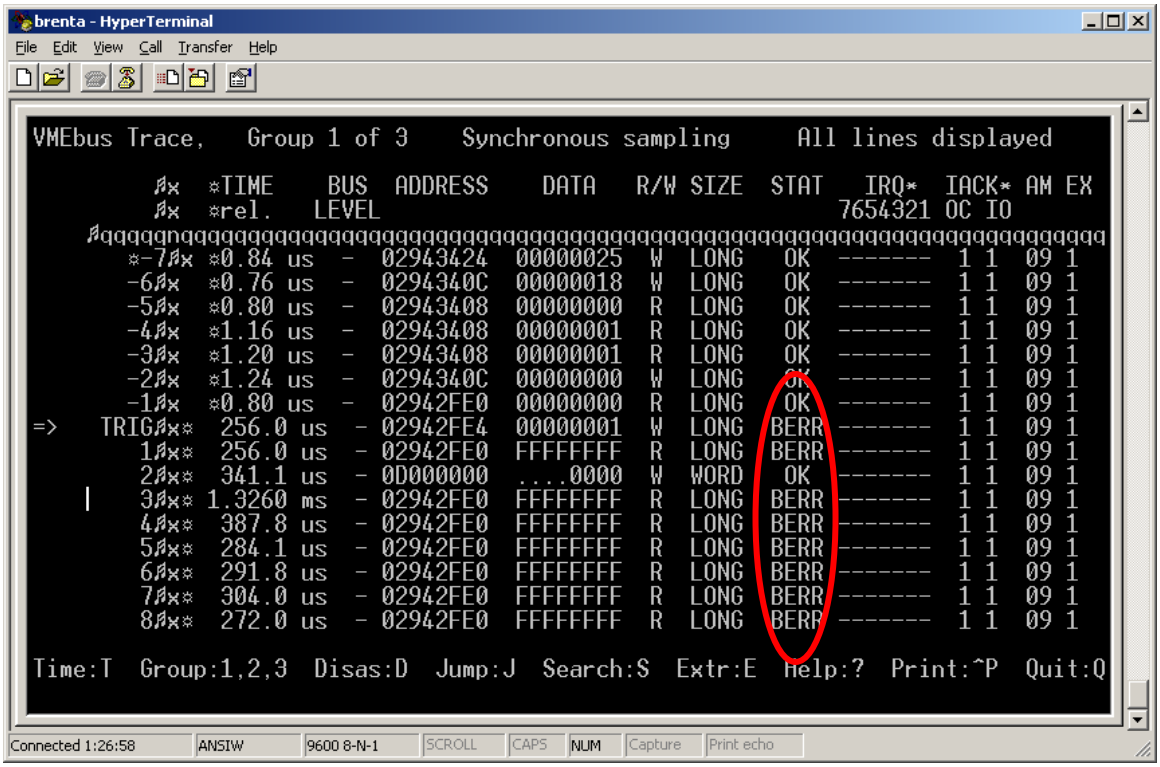
As if the VME_ (23:18) are not properly connected -> check!


Short between pins 1 and 2 (GND <-> VME_A(24)) and pins 3 and 4 (VME_A(25) <-> GND) of IC574.

Try mrodtest 5 164-effe ointr -> Still Buss error although intial cycles that went wrong the first time are now okay!



Could the shorted pins have been damaged?
Replace IC574



At least… The Buss errors have changed…

15-1-2008:
Brute force: Reflow other VME ICs 568, 569, 570, 571, 572, 573, 576 en 577
-> No More Bus Errors!

In order to fix the duration test errors (see above test-10-01-1655 and test-11-01-1154).
Brute force: Reflow IC2006.

Mrodtest 5 164 okay!

14-Aug-2008:
Firmware updated, mounted slink 0402:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 7 164

```
MROD-164/reg-A.log:###reg  5 (MRO_SLINK_STAT_INTR    ): default #00003800, read #0000B800
```

Bit 15 stuck at '1'; "S-Link FIFO Half Full asserted" ???
Relflow once again S-Link connector on Slink 0402
Problem persists.
Check pins near Altera device… Reflow the pins that connect to the Slink connector.

```
MROD-164/reg-A.log:###reg  5 (MRO_SLINK_STAT_INTR    ): default #00003800, read #0000B003
```

15-Aug-2008:
Now bit 11 stuck at '0' and bit 0 and 1 are stuck at '1'
Checked connections of J24 on MROD-164

Put Slink 0414 on

```
MROD-164/reg-A.log:###reg  5 (MRO_SLINK_STAT_INTR    ): default #00003800, read #0000B000
```

Reflow J24

Mrodtest 8 164 slink => slink_evts.dat stays empty…

MROD-X 165
Type: 6 Channel
Assembled Jun, 2007

24-08-2007:
Duration test: SHARC-C (slot 10 Brenta) does not Boot (“source dom” hangs).

07-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Try quick boot for Sharc-C: Mrodtest 8 165 led -> okay.

Tested twice!
Mrodtest 8 165 okay!

16-01-2008:
Duration test: SHARC-C (slot 15 Calore) does not Boot (“source dol” hangs).
Remarkable since this module passed several duration tests:
test-09-01-1137
test-10-01-1002
test-10-01-1655
test-11-01-1154
test-16-01-0944
test-16-01-1610

25-01-2008:
Mrodtest 7 165 led -> okay
Mrodtest 7 165 -> Hang on SHARC linktest A0-->C1'
Mrodtest 7 165 led -> Hang on SHARC-C
Sharc-C: Clock okay (instability on the amplitude?), Power supplies okay.
Brute force push on SHARC-C -> does not solve the problem.
Check Sharc-Link series termination resistors -> all look fine…
After Crate power-up Mrodtest 7 165 led -> okay
As a precaution, reflow SHARC-C and SHARC-A termination resistors and replace IC105 (50 MHz x-tal).
Mrodtest 8 165 okay!
Mrodtest 8 165 okay!
Mrodtest 8 165 okay!
Mrodtest 8 165 okay!

30-08-2007:
Duration test: SHARC-C (slot 9 Calore) does not Boot (“source dom” hangs).

6-May-2008:
For reflow sent to CERN-DEM (DEM removed Triple-LEDs before reflow and replaced them afterwards)

29-May-2008:
Remount the front panel.
Mount S-Link Card (SN1616)

30-May-2008:
Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 16 165 okay

07-Aug-2008:
Programcrate.sh in:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Module does not come out of config cycle…

```
ERROR:iMPACT:585 - A problem may exist in the hardware configuration.
       Check that the cable, scan chain, and power connections are intact,
       that the specified scan chain configuration matches the actual hardware, and
        that the power supply is adequate and delivering the correct voltage.
```

13-Aug-2008:
DONE (R662) and MRI_DONE (R673) signals 1V5 in stead of 2V5 (VCCAUX) =>
Check power supplies -> all 1 Volt!
Fuse 5A (for 5 volt) is broken (probably weak after CERN-DEM oven)… Replaced.

Firmware re-updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 7 165 okay

MROD-X 170
Type: 6 Channel

Assembled Jun, 2007

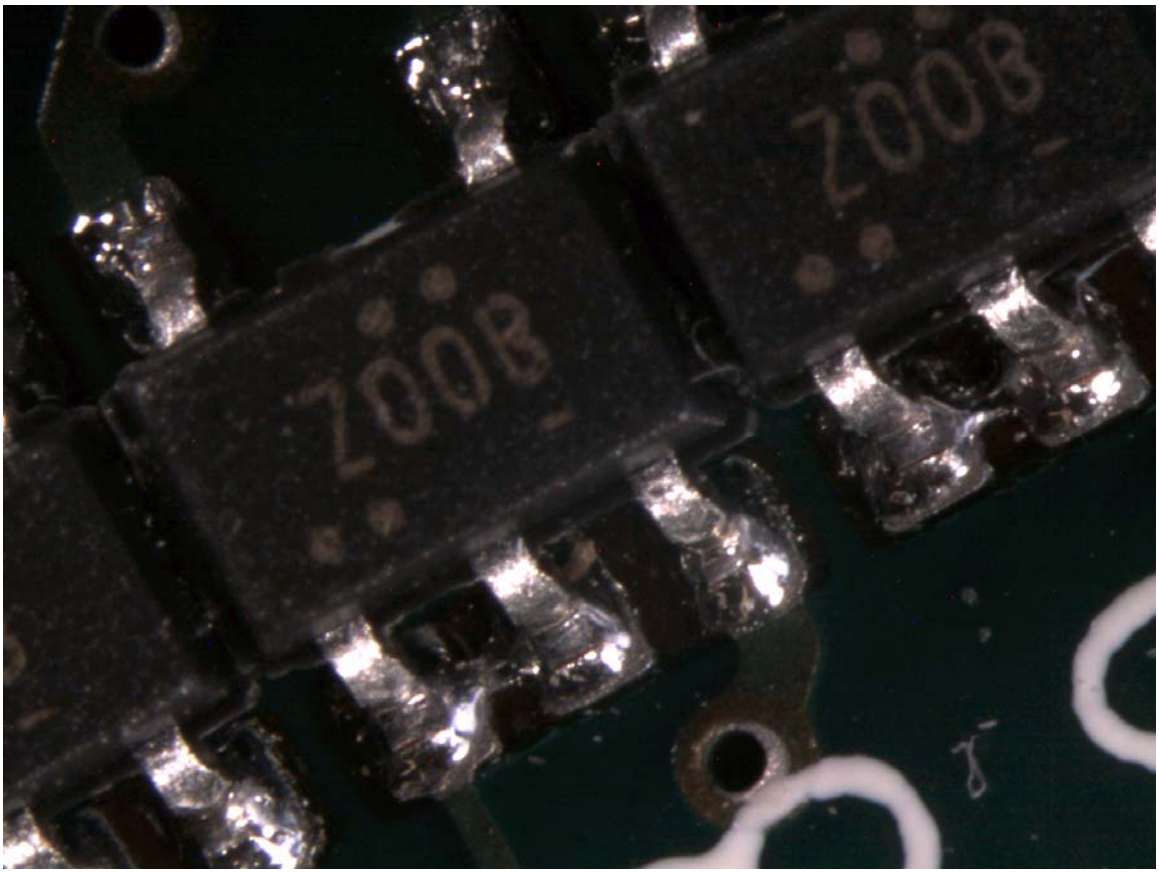
23-08-2007:
IC 588 is out of line under the microscope. Resoldered pins 1 ,2, 4 and 5.

Tested: okay

MROD-X 171
Type: 6 Channel

Assembled Jun, 2007

23-08-2007:
IC 588 and IC 589 don't look properly connected (puns 1 and 2) resoldered under microscope.



Tested: okay

MROD-X 172
Type: 6 Channel

Assembled Jun, 2007

23-08-2007:
IC 588 is out of line under the microscope. Resoldered pins 1 ,2, 4 and 5.

Tested: okay

MROD-X 173
Type: 6 Channel

Assembled Jun, 2007

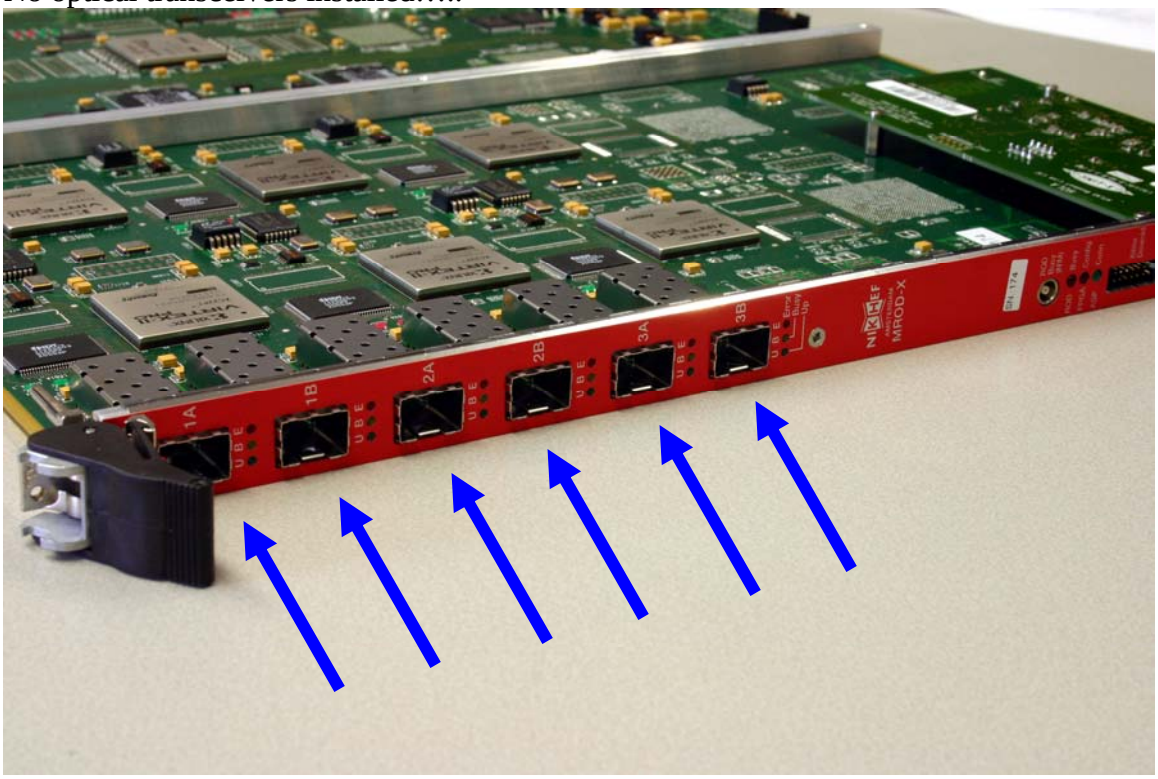
23-08-2007:
IC 588 is out of line under microscope. Resoldered.

Tested: okay.

MROD-X 174
Type: 6 Channel

Assembled Jun, 2007

23-08-2007:
No optical transceivers installed…..



NOT TESTED.

MROD-X 178
Type: 6 Channel

Assembled Jun, 2007

26-08-2007: PCB curved
Tested: Okay

MROD-X 179
Type: 6 Channel

Assembled Jun, 2007

26-08-2007:
Tested: okay

MROD-X 180
Type: 6 Channel

Assembled Jun, 2007

26-08-2007:
Tested:
[daqmuon@calore ~/MRODtest] [28] grep ### MROD-180/*
MROD-180/reg-A.log: ###Temperature out-of-limits (40<=T<=70)
MROD-180/reg-A.log: ###Temperature out-of-limits (40<=T<=70)
MROD-180/reg-A.log: ###Temperature out-of-limits (40<=T<=70)

Okay !

MROD-X 181
Type: 6 Channel

Assembled Jun, 2007

26-08-2007:
Tested: okay

MROD-X 182
Type: 6 Channel

Assembled Jun, 2007

26-08-2007:
Tested:
MROD-182/reg-A.log:
###reg 5 (MRO_SLINK_STAT_INTR): default #00003800, read #0000B000

Refitted Slink fiber;
Test again…. okay

MROD-X 183
Type: 6 Channel

Assembled Jun, 2007

26-08-2007:
Tested: okay

02-Oct-2012:
Brought back from CERN by Henk B&B after:

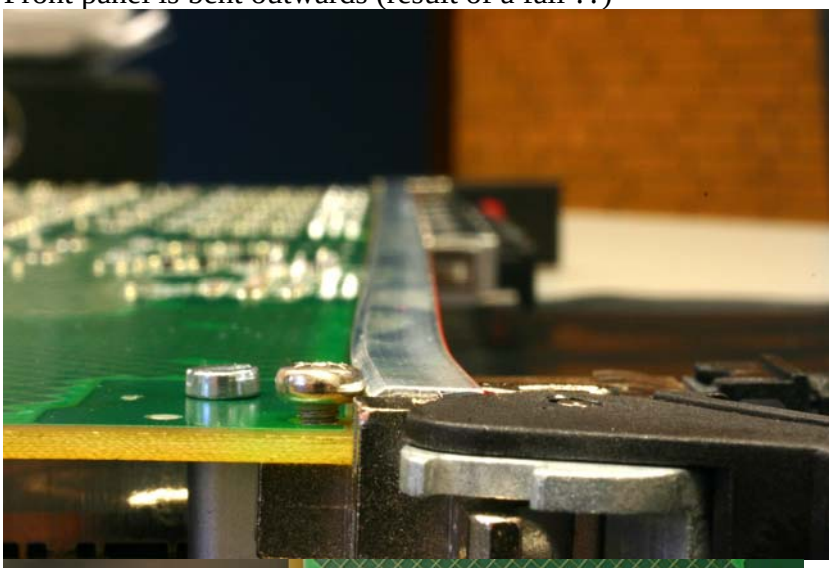
```
Ik heb MROD #183 met een ZBT issue, op -gek genoeg- maar 2 adressen:
Patroon test:
 mem-C.log:### addr #00034749,  expected #30F7D7CC,  read #70F7D7CC
 mem-C.log:### addr #00034741,  expected #066EECA4,  read #466EECA4
 mem-C.log:### addr #00034749,  expected #0C47D7CC,  read #4C47D7CC
 mem-C.log:### addr #00034741,  expected #A5A5A5A5,  read #E5A5A5A5
 mem-C.log:### addr #00034749,  expected #00000000,  read #40000000
 mem-C.log:### addr #00034749,  expected #AAAAAAAA,  read #EAAAAAAA
 mem-C.log:### addr #00034741,  expected #00000000,  read #40000000
Memory-overlay test:
 mem-C.log:### addr #00000001:  written  #AAAAAAAA
 mem-C.log:### addr #00034749:  expected #00000000,  read #40000000
 mem-C.log:### addr #00000001:  written  #AAAAAAAA
 mem-C.log:### addr #00034741:  expected #00000000,  read #40000000
en bijv.:
 mem-C.log:### addr #00000004:  written  #AAAAAAAA
 mem-C.log:### addr #00034749:  expected #00000000,  read #40000000
 mem-C.log:### addr #00000004:  written  #AAAAAAAA
 mem-C.log:### addr #00034741:  expected #00000000,  read #40000000
(ik weet niet wat het symptoom was toen deze MROD
 werd vervangen; ).
```

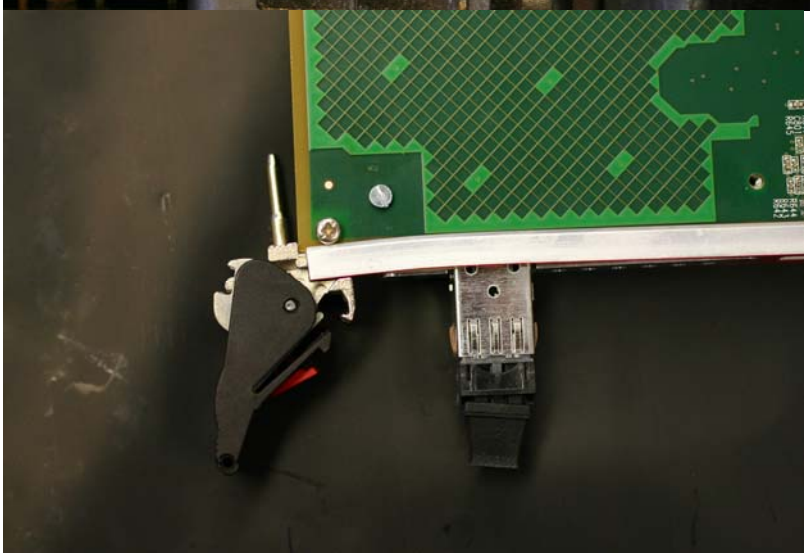
See mail d.d.21-Sep-2012

MROD-X 184
Type: 6 Channel

Assembled Jun, 2007

26-08-2007:
Front panel is bent outwards (result of a fall ??)





Tested …. Okay

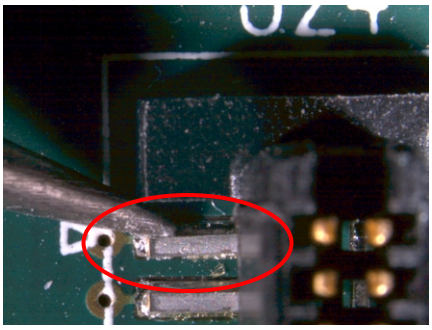
MROD-X 186
Type: 6 Channel

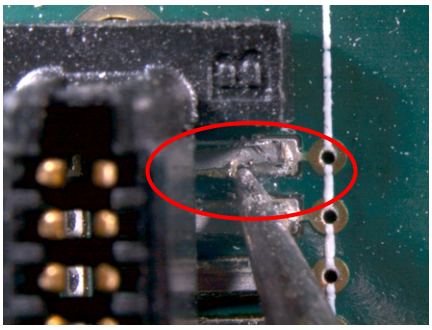
Assembled Jun, 2007

27-8-2007:
ASP does not connect.
21-11-2007:
Measured (with table top power supply) that IC585, IC586, IC587, IC588, IC589 and IC552 function properly. Address lines all okay. Connections to P1 JTAG signals verified okay. LVT8996 broken? -> Replaced.
While removing the chip some pads on the PCB were damaged (especially pin 11). Repaired
Tested… Once there was a connect light. BUT it could not be repeated!
Still no ASP connection.
28-11-2007: resoldered pins on IC588, tested ASP: okay. Mounted SLink.

Mrodtest: `###reg 5 (MRO_SLINK_STAT_INTR ): default #00003800, read #0000380C`
'C' -> S-Link return lines. Check J24 pin 1 and 2 and R637

29-11-2007:

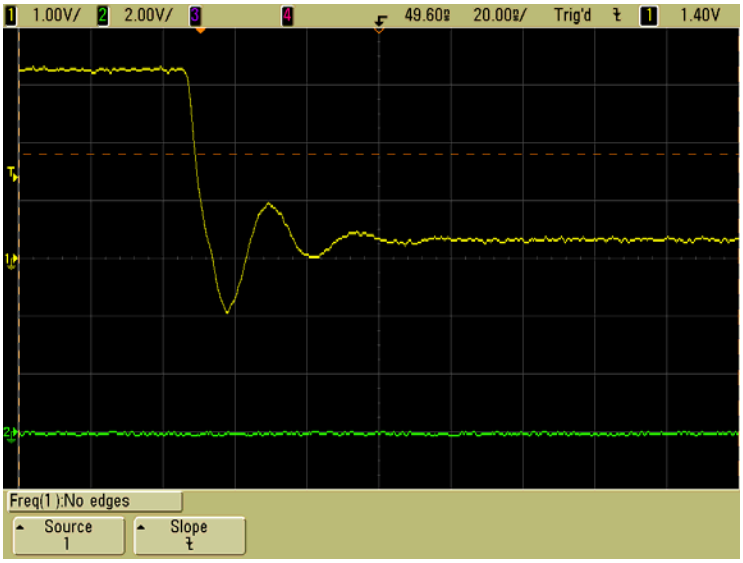




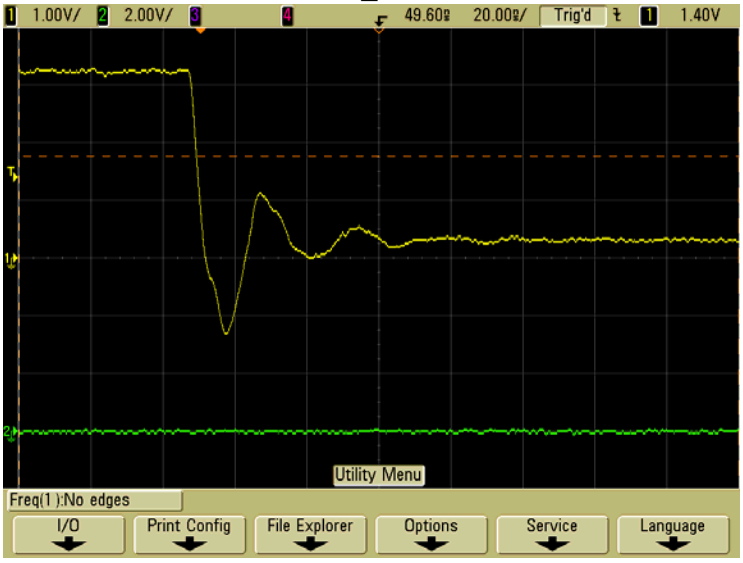
Found pin 1 and 2 of J24 loose.

Mrodtest okay!

ASP does connect (in slot 10) but doesn't want to disconnect anymore!
07-12-2007:
Slot10: Connect okay, disconnect fail.
Slot11: Connect okay, disconnect fail.
Slot12: Connect okay, disconnect fail.
Slot14: Connect fail.
Lifted pin 9 of IC552 (TCK) and added a 100 ohm 0603 DMS resistor in series.
Now slot14 does connect, but disconnect fails. V_TCK:



Lifted pin 9 of IC552 (TCK) and added a 1K1 0603 SMD resistor in series.
Now slot14 connect fails. V_TCK:



Lifted pin 9 of IC552 (TCK) and added a 100 ohm 0603 DMS resistor in series.
Lifted pin 10 of IC552 (TMS) and added a 100 ohm 0603 DMS resistor in series.
Lifted pin 11 of IC552 (TDI) and added a 100 ohm 0603 DMS resistor in series.
Slot14-20: Connect and Disconnect okay!
Slot5: No Connect! -> Measure TCK on pin 9… Connector P1-Z3 seems sloppy… Force a test pin between Backplane and mating connector op pin Z3 and module 5 connects!
Disconnect fail…
Slot 6,7,8 Connect and Disconnect okay.
Slot 9 fails to connect…

05-02-2008:
Slot 16 connect/disconnect okay
Slot 9 connect/disconnect okay

Slot 5 connect ***fail***

Measurements: use 1.5 GHz probe (Agilent 1156A) using “2g” to connect ground to IC552 pins 24-23-22 and “2s” to connect probe tip:

pin 12 (V_TRST_n). Prove that this pin is always ‘1’ and that there are no negative going edges when other JTAG signals are switched.

No edges found! Note; slot 5 conncect/disconnect okay!
Remove probe (leave lead soldered onto oin 12); remove TIM and test:
Slot 5 to 19 Connect/Disconnect okay!? (slot 20 impossible due to signal lead from probe tip).

Module doesn’t show any fault right now…

06-02-2008:
Modified the RCAT module (SN18) series resistors R12, R16 and R24. Instead of 0 ohm, placed a 1uH inductor (BLM18AG102SN1D).
Removed IC552 and the series resistors that where placed in the signal paths of V_TCK (9), V_TMS (10) and V_TDI (11).
The ***pads of IC552 pin 9 and 11 are broken***. These pins are connected via e tiny wire-wrap lead to the nearby via.

Module does connect and disconnect in all slots! (5-20)

Mrodtest 7 186 okay!

MROD-X 187
Type: 6 Channel

Assembled Jun, 2007

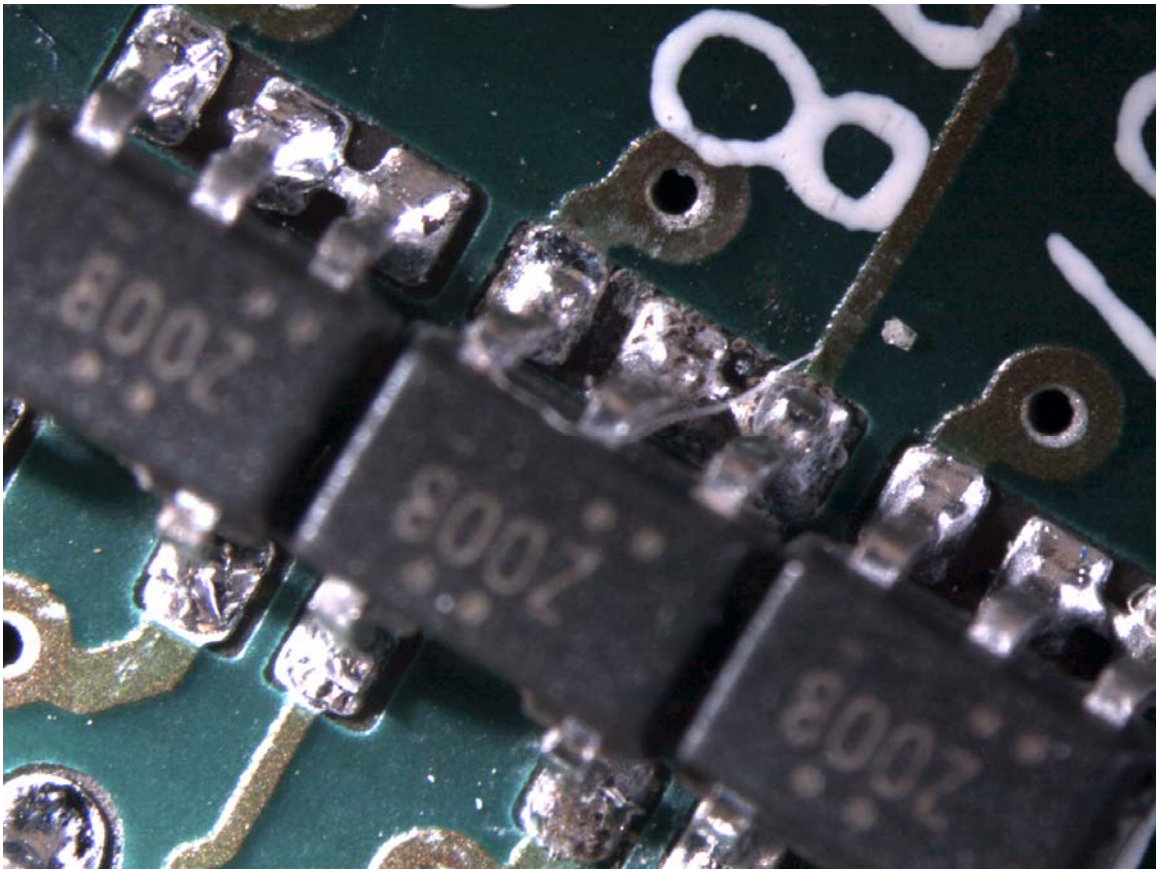
27-8-2007:
ASP does not connect.
03-12-2007:
IC589 suspected loose (Tiny Logic) replaced
IC552 pin loose (ASP) replaced.
ASP Does connect!
Mrodtest okay!

06-06-2016:
Module returned from CERN by Henk. Reported “Weird Benahiour”?
Needs to be re-tested in Amsterdam

MROD-X 190
Type: 6 Channel

Assembled Jun, 2007

28-8-2007:
IC 588: Pins look ugly:



Resoldered all pins… FPGA programming failed. Rechecked and resoldered pins, FPGA programming ok.

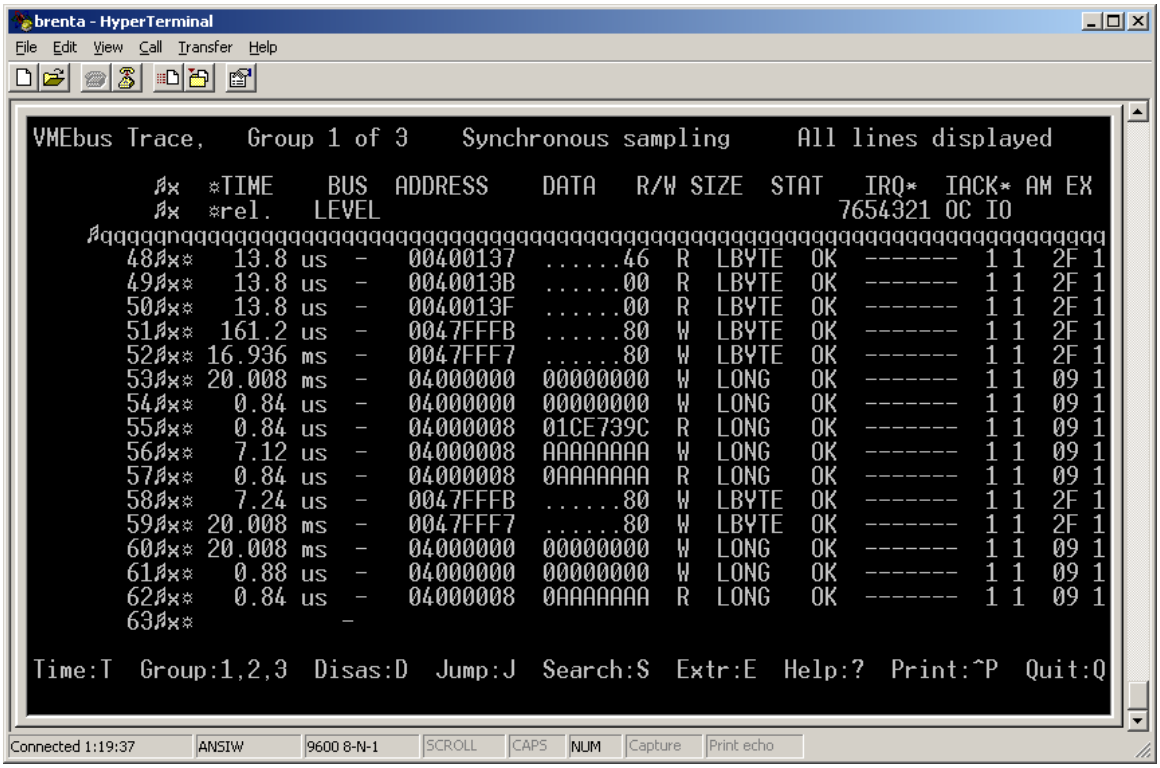
Error during mrodtest:
###VME-slot 17, BAR = 0h, expected BAR = 88h
###Unexpected CR/CSR string found:
###MRODOUT SHARC-A WAIT-reg: 0AAAAAAA, but expected 01CE739C

07-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

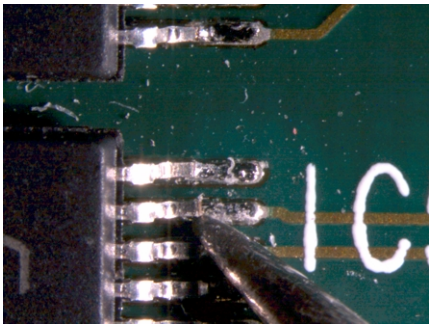
Mrodtest 8 190:

```
###ERRORS found in file MROD-190/crcsr.log
### There were errors, type any to continue..

###VME-slot 8, BAR = 0h, expected BAR = 40h
###Unexpected CR/CSR string found:
got     : "p"
expected: "MROD-X, Muon Drift Tube Readout Driver, NIKHEF"
MRODOUT reset...done
MRODOUT SHARC-A WAIT-reg: 01CE739C
MRODOUT SHARC-A WAIT-reg: 0AAAAAAA
MRODOUT reset...done
###MRODOUT SHARC-A WAIT-reg: 0AAAAAAA, but expected 01CE739C
```

VMETRO:



Similar fault occurred with SN 132:
Written onto the VME bus is 0AAAAAAA. After CSR reset expected 01CE739C again.
Check VME Buffers:



Found loose pin 47 on IC573(VME Address bit 7)

Mrodtest 8 190 okay!

MROD-X 195
Type: 6 Channel

Assembled Jun, 2007

28-8-2007:
IC 588: Pins not connected properly. Resoldered. FPGA programming failed
03-12-2007. Resoldered pins on ASP circuitry. ASP connect slot 16 okay.
Programming … okay; mrodtest okay.

16-Nov-2011:
Henk Boterenbrood brought this module back from CERN (because of SHARC booting problems?)

```
#########################################################################
#

Jan 5 2011, 18:51
-------------------
A new ATLOG entry has been submitted:
Author              : Zimmermann Stephanie
Message Type        : Default Message Type
Status              : closed
System Affected     : MDT | DAQ
Logbook URL         : https://pc-atlas-
www.cern.ch/elog/ATLAS/ATLAS/129495
Reply from P1       : https://pc-atlas-
www.cern.ch/elog/ATLAS/ATLAS/129495?cmd=Reply
Reply from GPN      :
https://atlasop.cern.ch/elog/ATLAS/ATLAS/129495?cmd=Reply
================================
MROD 195, BC-04 slot 9, replaced by module 142, MROD 227, BC-04 slot 11
replaced by module 219 due
to persistent failures during configure phase of the standalone
partition with VME errors reported.
Removed modules have been placed in the test crate for further
investigations, problem appears
similar to one we had last year which was suspected a connectivity issue
between MRODs and VME back
plane.

From an email:
"> > > It's again one of these mysterious faults, which I can't explain.
 > > > So you say, you have been unplugging/replugging these modules,
in-situ
 > > > so to say (out of their VME socket, and immediately back in) ?
 > >
 > > yes, we had pulled out all modules in that crate and pushed
 > > them back in immediately.
 >
 > All ?
 > It wasn't clear which slots in particular had problems..?
```

```
 > (should be indicated in the boot fail MRS messages, if booting was
the problem)

 yes, all, since in the numerous tries we gave it first with run control
it
 was not always the same module reported failed ...
"
#########################################################################
#
```

18-Nov-2011:
Module put into test crate in Amsterdam seems to work fine!

26-Jan-2012:
MROD 195 in slot 9
mrodsrv 9c ldr/ihello.ldr ==> MRODIN-C says HELLO !
mrodsrv 9d ldr/ihello.ldr ==> MRODIN-D says HELLO !
mrodsrv 9e ldr/ihello.ldr ==> MRODIN-E says HELLO !

MROD-X 198 (?)
Type: 6 Channel

Assembled Jun, 2007

28-8-2007:
MROD-198/intr-Ea.log:tst 1: ###Timeout IRQ1 LDOWN interrupt
MROD-198/intr-Ea.log:tst 2: ###Timeout IRQ1 LDOWN interrupt

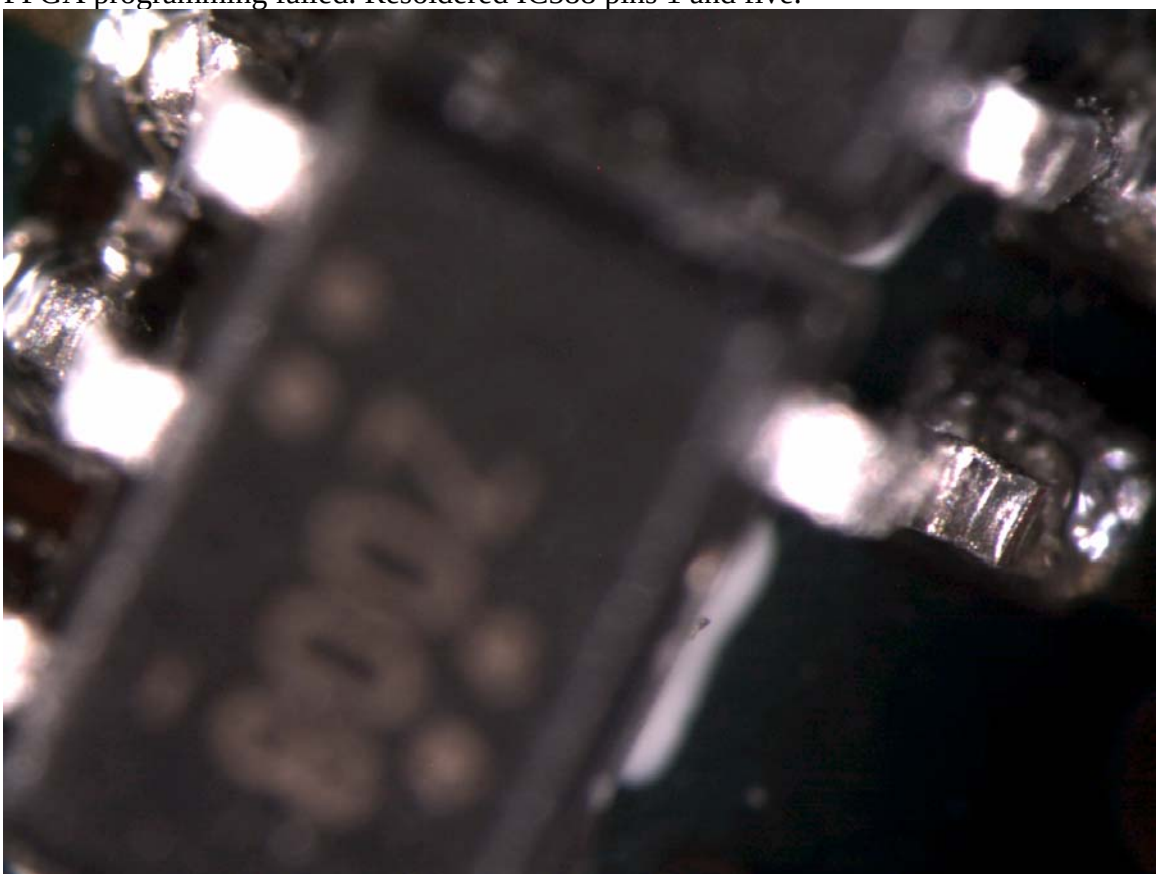
22-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 8 198 okay!

MROD-X 199
Type: 6 Channel

Assembled Jun, 2007

17-9-2007:
FPGA programming failed. Resoldered IC588 pins 1 and five.



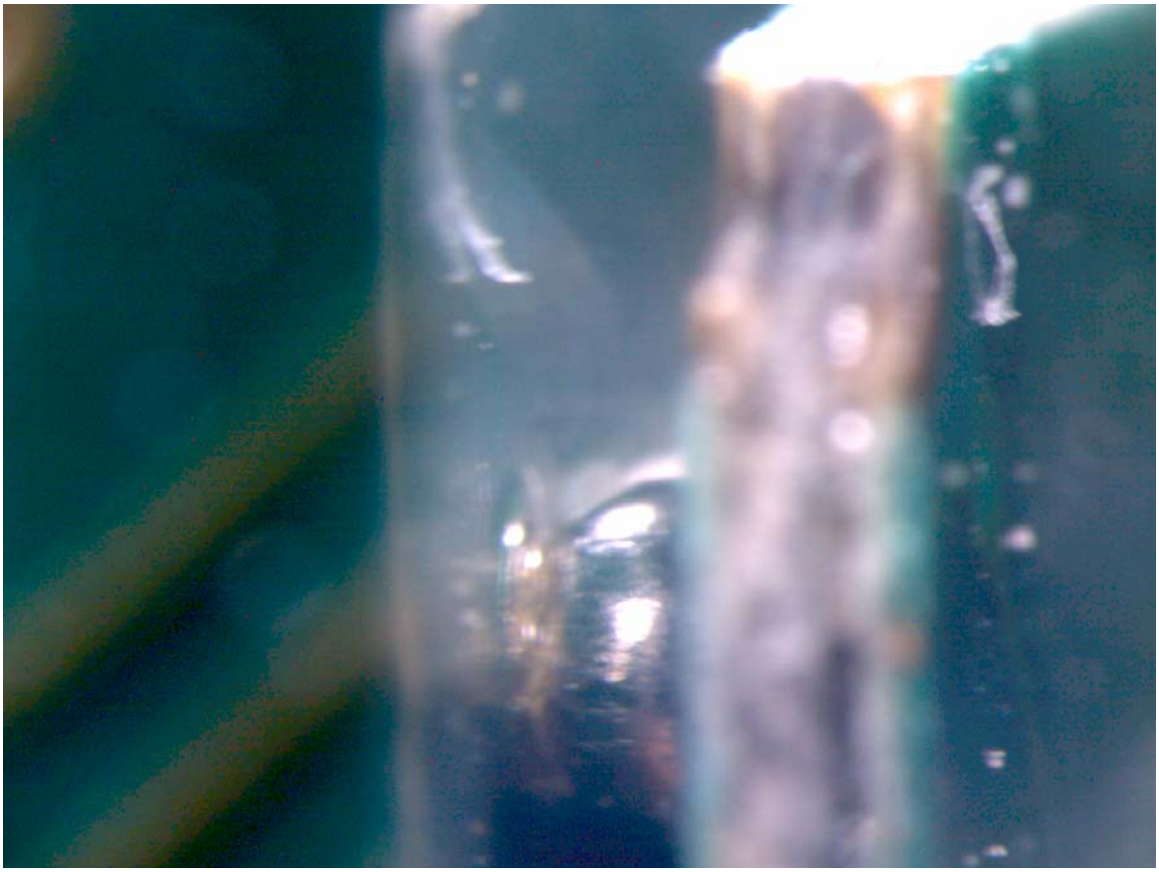
Okay?

MROD-X 200
Type: 6 Channel

Assembled Jun, 2007

17-9-2007:
Linktest failed:
MROD-200/linktest.log:###expected 4B9AED68 got 4B8AED68 (block 0, 253), prev 408DEE47
MROD-200/linktest.log:###expected 04D75719 got 04C74709 (block 0, 254), prev 4B8AED68
MROD-200/linktest.log:###expected 16047702 got 06046702 (block 0, 255), prev 04C74709
Repeated many times…..
12-12-2007: Checked Slink connector: seems okay.
Programmed latest firmware.

==> LINK C0-->D5
Srv: MROD-10-SHARC-D opened (*Sharc=B6460000)
Srv: MRODIN 1 reset
Srv: MRODIN 1 reset
Srv: booting (binary)...
Srv: size=52332 (bytes), instructions=8722
Srv: MROD-10-SHARC-D (MRODIN 1) booted with ldr/iRecv.ldr
Srv: establishing communication with MRODIN SHARC (via MRODOUT A Link 2)
Errors as whole words (up to 256 max):
###expected 409DFE47 got 408DEE47 (block 0, 0), prev 00000000
###expected 4B9AED68 got 4B8AED68 (block 0, 1), prev 408DEE47
###expected 04D75719 got 04C74709 (block 0, 2), prev 4B8AED68
###expected 16047702 got 06046702 (block 0, 3), prev 04C74709
###expected 409DFE47 got 408DEE47 (block 0, 4), prev 06046702
###expected 4B9AED68 got 4B8AED68 (block 0, 5), prev 408DEE47
….
Bit 28, 24, 12, 4 have problems.
C0->D5 bit 4 traces back to R102 pin 1-8 and R214 pin 1-8. Check!
13-12-2007:
Nothing special can be seen… Even measured 66 ohm between resistor pack pads…
Anyway -> reflow resistor packs R102 and R214
Linktest fails…
Loose balls? Put pressure on Sharc-C -> linktest fail
Loose balls? Put pressure on Sharc-D -> linktest fail



Ball A20 IC101 suspect

Note: Module has an “X-Ray pass” sticker

13-Feb-2008:
For repair sent to CERN-DEM:
Serial Number **200**: Reflow IC101 = ADSP-21160NKB-100

14-Apr-2008:
Try to remount the front panel but the plastic of the Triple Leds D1A, D1B, D2A, D2B, D3A, D3B is a bit deformed so these need to be replaced.
Try to test without the front-panel.
Mount S-Link Card (SN1604; replaced TLK1501->2501 by Wim Gotink)

Mrodtest 8 200 Okay!

13-Jun-2008:
Mounted new Triple LEDs
Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
=> duration test

MROD-X 204
Type: 6 Channel

Assembled Jun, 2007

17-9-2007:
MROD-204/rocket-Ea.log:###EvtId 1F, LWC: got 810B004C, expected 810F004C
MROD-204/rocket-Ea.log:###EvtId 1F, BOT: got A001BBCC, expected A001FBCC (BOL=1800A5A4)
MROD-204/rocket-Ea.log:###EvtId 1F, EOT: got C001B004, expected C001F004 (BOL=1800A5A4)
Repeated many lines

22-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 8 204 rocket -> no problems!?

Mrodtest 8 204 okay!

06-06-2016:
Module returned from CERN by Henk. Reported Rocket IO problem between MROD-In and MROD-Out.
Seems persistent returning error. Repair seems difficult, probably lose FPGA ball? Put on the failing list.

MROD-X 206
Type: 6 Channel

Assembled Jun, 2007

27-9-2007:
Failed to startup the duration test. Some loopback fiber links (Ch1A, Ch1B?) showed "error".
Taken out of the test…

28-9-2007:
Mrodtest on Calore…
Errors on Sharc Link C1<-> A0 and C0 <-> D5, C5 <-> E0, C4 <-> A1

22-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

SHARC-C seems to have problems? Test ***mrodtest 8 206 led*** to see if the clock frequency is correct. Leds blink on half the frequency… Outut of IC105 (50 MHz x-tal) is dead -> Replace.

Mrodtest 8 206 okay!

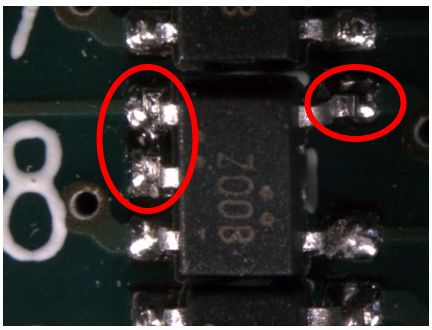
MROD-X 207
Type: 6 Channel

Assembled Jun, 2007

25-9-2007:
Duration test -> Connecttest.sh failed!
Module was located in Brenta slot-6 and did not ASP-connect. However, the module ASP connected while slot-14 was accessed.

```
6  = 000110
14 = 001110
```

Bit 3 stuck at '1'…



IC588 pin 1, 2 and 5 open; repaired (26-sep-2007)

MROD-X 209
Type: 6 Channel

Assembled Jun, 2007

17-9-2007:
FPGA programming failed. Resoldered infamous pins 1 and 5 of equally infamous chip 588. After programming, which seemed successful, all optical transceiver LEDs stayed on. No further tests performed.

10-12-2007:
Reflowed ASP related chips; Programmed via local USB and impact.
connect slot 10 okay
mrodtest okay…. But reprogramming via RCAT okay but module did not get out on "config".
Reflowed PROMs IC553, IC554… reprogramming via RCAT okay but module did not get out on "config".
11-12-2007:
Stupid! The DIP switches were not yet put into the correct setting!
Once again: Reprogramming via RCAT okay (slot 11)
Mrodtest okay!

MROD-X 210
Type: 6 Channel

Assembled Jun, 2007

17-9-2007:
ASP connect light lit up, but FPGA programming failed. Chip 588, pins 1, 2 and 5 resoldered. Programming ok.

MROD-X 217
Type: 6 Channel

Assembled Jun, 2007

4-5-2009:
Module successfully operated for a year at Cern but is now returned:

```
Date 7-4-2009 11:37
Hoi,
Alberto heeft mij gevraagd om een MROD te vervangen ivm deze error:

0 16:20:47 FATAL MDT-BC3-RCD MDT-message MROD-BC3-18-T37: MRODINs boot
failed, file=/det/muon/MDT/mrodtools/ldrx/mrodinx.ldr

Wat moet ik met de oude MROD doen? Moet die terug naar Amsterdam?

Folkert

Date 8-4-2009 9:57
Hoi Folkert,

  > Alberto heeft mij gevraagd om een MROD te vervangen ivm deze error:
  > 0 16:20:47 FATAL MDT-BC3-RCD MDT-message MROD-BC3-18-T37: MRODINs
boot
  > failed, file=/det/muon/MDT/mrodtools/ldrx/mrodinx.ldr

hmm, mogelijk weer een SHARC die af en toe niet geboot kan worden;
of is dit een permanent probleem ?

  > Wat moet ik met de oude MROD doen? Moet die terug naar Amsterdam?

Ja, ik zou zeggen dat-ie uiteindelijk toch maar hier naartoe moet komen.
Heb je er al zo'n mooie doos voor ? Die staan in BB5... Gerjan weet
waar.

Je mag 'm ook voorlopig in het testcrate in USA15 zetten, wat mij
betreft,
mits goed gelabeld als zijnde 'faulty'; op die manier kan ik er ook wel
even naar kijken.
Ik kom overigens waarschijnlijk vanaf juni weer voor langere tijd naar
CERN
(part-time voor ATLAS..).

Henk
```

MROD-X 219
Type: 6 Channel

Assembled Jun, 2007

25-9-2007:
Error:
MROD-219/reg-D.log:###ERROR: T-sensor not found (at expected addr 0)
MROD-219/reg-E.log:###ERROR: T-sensor not found (at expected addr 0)

12-12-2007: check temperature sensor and pin 1 of IC4013 and IC6013 appeared to be open. Resoldered ! Connect ASP in slot 11 okay. Reprogrammed FPGAs.
mrodtest OKAY!

21-01-2008
Duration test errors:

```
###EvtId B338BE, EvtLenFIFO Length: got 00000168, expected 0000016B
###EvtId B338BE, LWC: got 810E0037, expected 810E003A (Input=1A)
###EvtId B338BE, TLP: got 8901FFFF, expected 8903FFFF (Input=1A, BOL=18000070)
###EvtId B6D90F, EvtLenFIFO Length: got 0000018C, expected 0000016B
###EvtId B6D90F, LWC: got 810F005B, expected 810F003A (Input=1A)
###EvtId B6D90F, BOT: got 3004AA01, expected A090FBCC (Input=1A, BOL=18000070)
###EvtId B6D90F, TDC-data: got C090F000, expected 3004AA00 (Input=1A, BOL=18000070)
###EvtId B6D90F, EOT: got A190EBCC, expected C090F003 (Input=1A, BOL=18000070)
###EvtId 6C38DF, EvtLenFIFO Length: got 00000173, expected 0000016B
###EvtId 6C38DF, LWC: got 810F0042, expected 810F003A (Input=1A)
###EvtId 6C38DF, BOT: got C08DE003, expected A08DFBCC (Input=1A, BOL=18000070)
###EvtId 6C38DF, TDC-data: got A08DFB00, expected 3004AA00 (Input=1A, BOL=18000070)
###EvtId 6C38DF, EOT: got 3004AA01, expected C08DF003 (Input=1A, BOL=18000070)
:
###EvtId 24EBF5, EvtLenFIFO Length: got 0000016E, expected 0000016B
###EvtId 24EBF5, LWC: got 8105003D, expected 8105003A (Input=1A)
###EvtId 24EBF5, BOT: got 3004AA01, expected A0BF5BCC (Input=1A, BOL=18000070)
###EvtId 24EBF5, TDC-data: got C0BF5000, expected 3004AA00 (Input=1A, BOL=18000070)
###EvtId 24EBF5, EOT: got 310CAA01, expected C0BF5003 (Input=1A, BOL=18000070)
###EvtId 4FB22C, EvtLenFIFO Length: got 00000168, expected 0000016B
###EvtId 4FB22C, LWC: got 810C0037, expected 810C003A (Input=1A)
###EvtId 4FB22C, TLP: got 8903DFFF, expected 8903FFFF (Input=1A, BOL=18000070)
```

Something wrong with Channel 1A?
Re-attach loopback fiber for Channel 1A <-> 3B to assure proper connection and resume duration test…
Again errors (TLP=8903DFFF instead of 8903FFFF). Is TDC memory partition 13 wrong? -> Reflow IC1006
Still errors…
Loopback fibers moved to other pair of 4 modules -> errors! Clean the loopback fibers!
The duration test runs flawless with cleaned fibers on other set of 4 modules (thus this module SN219 does not have loopback fibers now, and is performing okay!
Place (cleaned) loopback fibers back in place (so SN219 now has a loopback fiber as before where the duration tests went wrong).

13-Aug-2008:
Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800

Out: 08051400
Board does not come out of config cycle => MRI_DONE (R673) is low
Check dipswitches Sw1A, Sw1B, Sw2A, Sw2B, Sw3A, Sw3B =>
Replaced Sw2B, Sw3A
Problem persists.
Verify PROMs via IMPACT and front panel:
MROD_Out Okay
MROD_In Fail! => Reprogram via front panel => okay and board comes out of config!
Try again “programmrod.sh in 9” via crate controller => okay!

Mrodtest 9 219 okay!

MROD-X 220
Type: 6 Channel

Assembled Jun, 2007

25-9-2007:
Errors:
MROD-220/intr-Cb.log:==> Chan B ###FIFO readout: 3325 words, 518 events, expected 49210 and 518
MROD-220/intr-Cb.log:tst 2: ###Timeout IRQ0 (I2OFIFO Full) interrupt
MROD-220/intr-Eb.log:tst 1: ###Timeout IRQ1 LDOWN interrupt
MROD-220/mem-C.log:### addr #00000000, expected #AAAAAAAA, read #FFFFFFFF
MROD-220/mem-C.log:### addr #00000001, expected #55555555, read #00000000
MROD-220/mem-C.log:### addr #00000002, expected #A5A5A5A5, read #AAAAAAAA
MROD-220/mem-C.log:### addr #00000003, expected #5A5A5A5A, read #55555555
MROD-220/mem-C.log:### addr #00000004, expected #FFFFFFFF, read #A5A5A5A5
MROD-220/mem-C.log:### addr #00000005, expected #00000000, read #5A5A5A5A

10-12-2007
Dangling pin on IC 2005 (zbt memory). Resoldered pins.
Fpga programming ok. (connect 10 okay)
mrodtest OKAY!

13-Aug-2008:
Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 17 220 okay

MROD-X 221
Type: 6 Channel

Assembled Jun, 2007

25-9-2007:
Error:
MROD-221/reg-A.log:###reg 5 (MRO_SLINK_STAT_INTR): default #00003800, read #00003804

01-10-2007:
Duration test errors: Many S-Link LRL Interrupts in slot5.log file:

```
Parameters:
-----------
  Channel Mask    : 0x3F
  Prescale        : 100
  TTC             : 1
  SLINK Flush     : 0
  MRI header      : 0x89000000
  MRI trailer     : 0x8A000000
  Display level   : 2
  Run number      : 0
FPGA Temperature:  59

====== INTERRUPTS ======
Interrupt counters:
 IRQ0: 2, IRQ1: 0, IRQ2: 0 (IRQ0 occurred)
 SLINK LRL, LDOWN, FIFO HalfFull    :     2,     0,     0
 TTC   ECR                          :     0
 TTC   IdFFSharc,  TrigTypeFFSharc  :     0,     0
 TTC   IdFFRcktIO, TrigTypeFFRcktIO :     0,     0
 SpyEvtLenFifoFull, SpyEvtFifoFull  :     0,     0
 RocketIO LDOWN: 0 0 0 0 0 0 0 0
========================

====== INTERRUPTS ======
Interrupt counters:
 IRQ0: 6, IRQ1: 0, IRQ2: 0 (IRQ0 occurred)
 SLINK LRL, LDOWN, FIFO HalfFull    :     6,     0,     0
 TTC   ECR                          :     0
 TTC   IdFFSharc,  TrigTypeFFSharc  :     0,     0
 TTC   IdFFRcktIO, TrigTypeFFRcktIO :     0,     0
 SpyEvtLenFifoFull, SpyEvtFifoFull  :     0,     0
 RocketIO LDOWN: 0 0 0 0 0 0 0 0
```

```
Time 1191223115 Temp 61 C Checked 197330001 SN 0
Time 1191223121 Temp 61 C Checked 197335001 SN 0
Time 1191223127 Temp 61 C Checked 197340001 SN 0
Time 1191223133 Temp 61 C Checked 197345001 SN 0

====== INTERRUPTS ======
Interrupt counters:
 IRQ0: 199128, IRQ1: 0, IRQ2: 1893 ( IRQ2 occurred)
 SLINK LRL, LDOWN, FIFO HalfFull    :199128,     0,     0
 TTC   ECR                          :  1893
 TTC   IdFFSharc,  TrigTypeFFSharc  :     0,     0
 TTC   IdFFRcktIO, TrigTypeFFRcktIO :     0,     0
 SpyEvtLenFifoFull, SpyEvtFifoFull  :     0,     0
 RocketIO LDOWN: 0 0 0 0 0 0 0 0
```

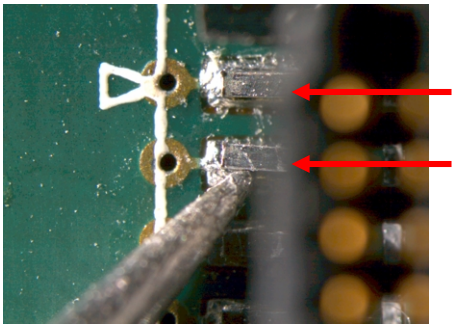
23-01-2008:
program (slot 8) PROMs via RCAT:

In: 07083100
Out: 07101000
Okay!

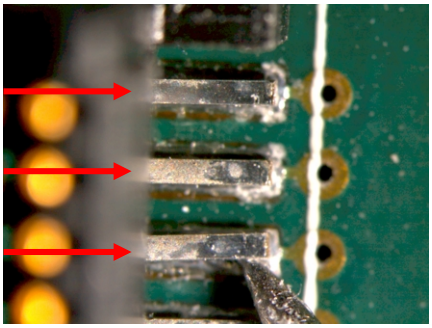
Mrodtest 8 221:

```
### ERRORS found in file MROD-221/reg-A.log
###reg  5 (MRO_SLINK_STAT_INTR      ): default #00003800, read #0000380C
```

S-Link LRL bits 3 and 2. Check J24 pins 1 and 2 (and 4 and 6) and R637.



Found J24 Pins 1 and 3 loose



Found J24 Pins 2, 4 and 6 loose

Mrodtest 8 221 okay!

MROD-X 222
Type: 6 Channel

Assembled Jun, 2007

25-9-2007:
Dip switch Sw3A is Installed the wrong way around. Should be resoldered.

5-10-2007
Sw3A replaced in proper orientation.

MROD-X 223
Type: 6 Channel

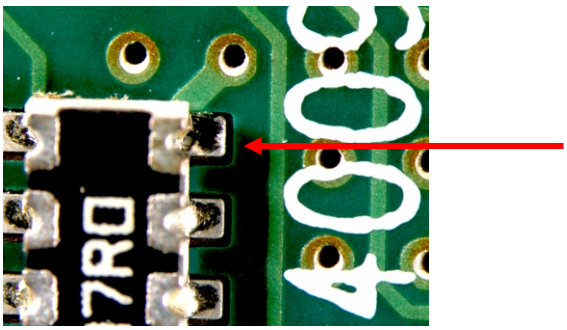
Assembled Jun, 2007

25-9-2007:
Could not make ASP connection. Resoldered IC 587-589. However, this did not do the trick.

23-01-2008:
Connect slot 8,16 fail.
Checked Tiny Logic (on the table) IC552 address pins (toggle when P1-10d,11d,13d,15d and 17d are taken to gnd). okay
Checked (ohmic) V_TCK, V_TRST_n, V_TMS, V_TDI, V_TDO connections to P1. okay.
Checked Other pins (IC552 pin 24 to 20) okay.
Checked connection to ASP LED. Okay.
Connect slot 5,7 fail.
Connect/disconnect slot 6, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, ***5*** okay
Now all of a sudden slot 5 does connect!

program (slot 11) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

mrodtest 9 223:
```
###ERRORS found in file MROD-223/reg-D.log
```
All registers seem to be ***not*** present…
T-sensor DB is ***not*** present…
Check IC4004 (MROD in FPGA channel DB). Power supplies 3V3, 1V5 and 2V5 okay.
Check IC206 Clocks -> okay.
Pressure on the BGA does not help…



R4009 one pin loose. Note R4009 serves the VRN/VRP-4 IO bank (series termination Sharc Databus).

Mrodtest 11 223 okay!

Connect slot 9 fail.

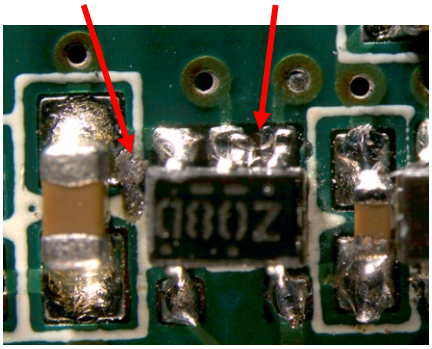
06-02-2008:
Modified the RCAT module (SN18) series resistors R12, R16 and R24. Instead of 0 ohm, placed a 1uH inductor (BLM18AG102SN1D).
Module does connect and disconnect in all slots! (5-20)

Mrodtest 7 223 okay!

MROD-X 226
Type: 6 Channel

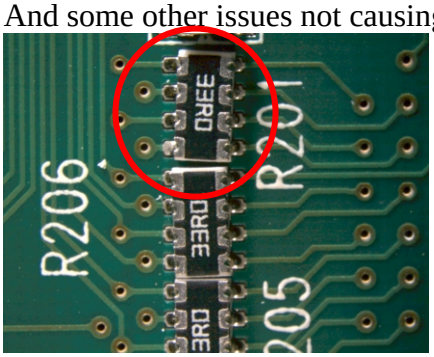
Assembled Jun, 2007

25-9-2007:
Short circuit between 16A fuse and Ground.

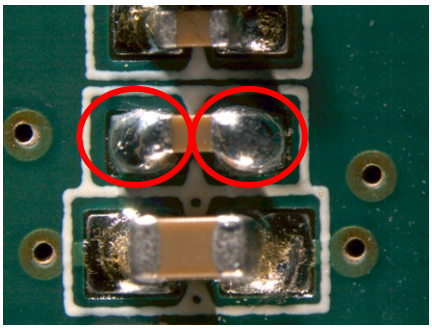


Found short (?) around IC402
Reworked but this didn't solve the short problem…

And some other issues not causing the short…



Mis Alignement of R201



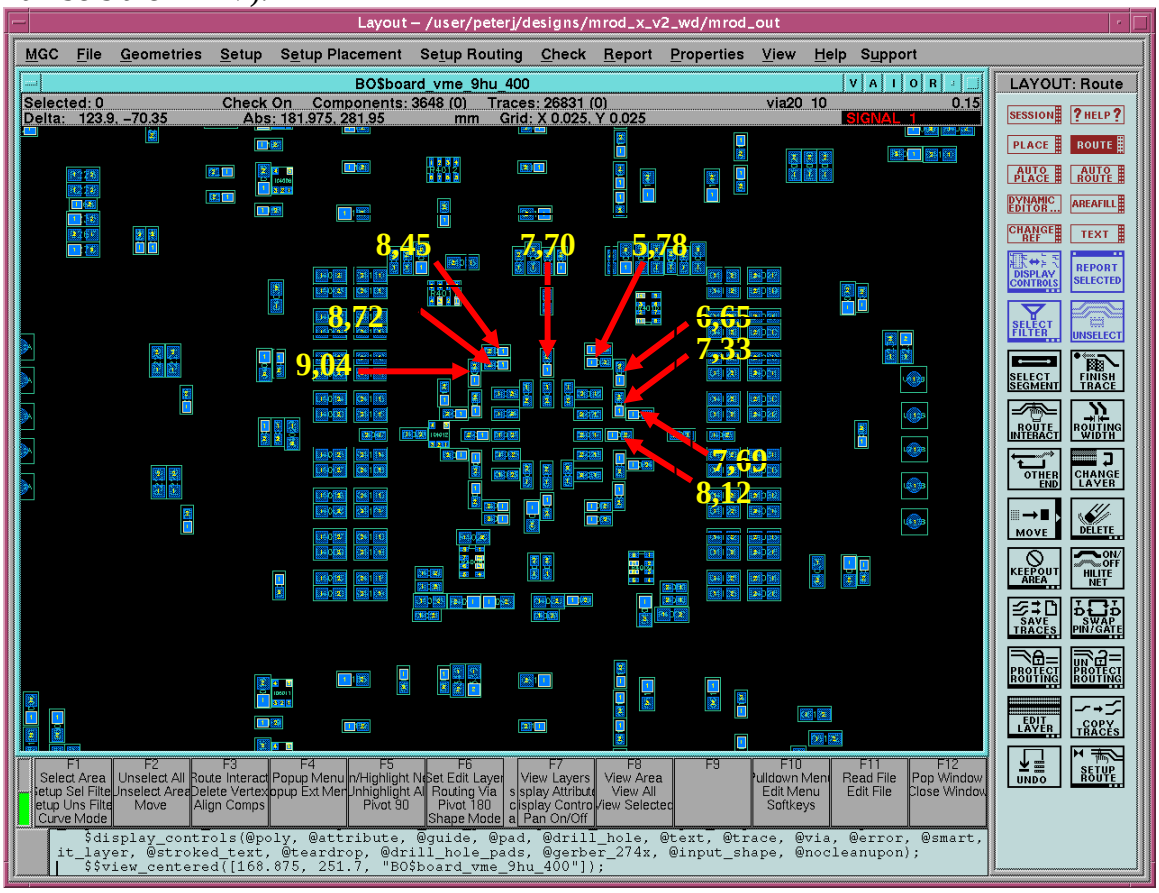
Too much solder on a Capacitor

Try to put current (1A) through the board and find the short circuit with the thermal camera…

30-01-2008:

Thermal Camera image does not yield any result! Even when the board is fed with 10 Amp! Somewhere there should be a massive (and/or distributed) short which has such a low resistance that no power is dissipated. With 10 Amps the voltage across the planes is ~ 200 mV.

Feed 3V3 with 10 Amps and probe with an accurate mV meter (Used the HP 3456A Digital Voltmeter) and probe 3V3 <-> GND decouple capacitors across the board. The lowest reading is closest to the short which looks to be under IC4004 (yellow numbers are in mV).



Note that the module does not have an “X-Ray passed” sticker.

13-Feb-2008:
For repair sent to CERN-DEM:
Serial Number **226**: Replace IC4004 = XC2VP7FF896

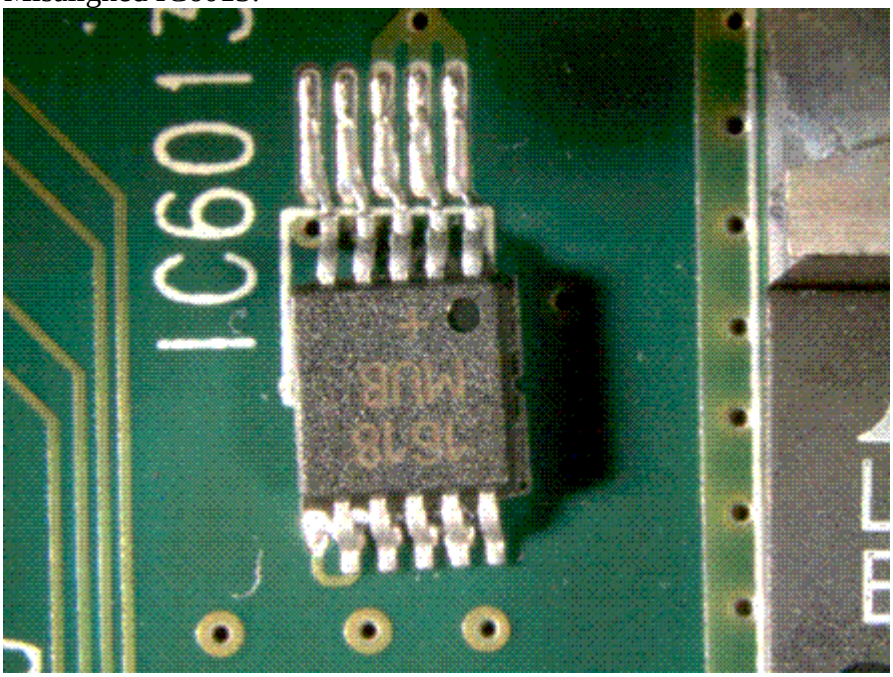
14-Apr-2008:
Try to remount the front panel but the plastic of the Triple Leds D1A, D1B, D2A, D2B, D3A, D3B is a bit deformed so these need to be replaced.
Try to test without the front-panel.
Mount S-Link Card (SN0404; replaced TLK1501->2501 by Wim Gotink)

Program (slot 16) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 16 226

```
###ERRORS found in file MROD-226/reg-E.log:
reg 49 (MRI_FPGA_TEMPERATURE     ), #bits= 2: bitmask=       3 ###ERRORS...
  addr #49,  expected #00000001,  read #0000000B, #0000000B
Checking T-sensor Chan B:
###ERROR: T-sensor not found (at expected addr 0)
```

Misaligned IC6013:



Repaired!

Mrodtest 16 226

Slink Test Fails:

```
### Less events than expected in eventfile
### There were errors, type any to continue..
```

Replace Slink board SN404 by SN1606

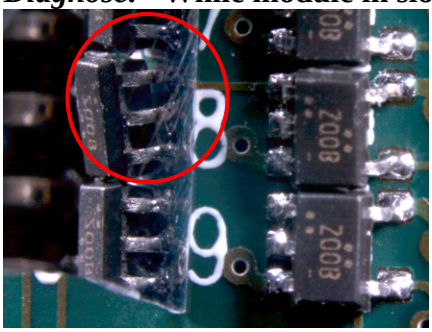
Mrodtest 16 226

13-Jun-2008:
Mounted new Triple LEDs
Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)

In: 08041800
Out: 08051400
=> duration test

MROD-X 227
Type: 6 Channel

27-11-2007
Returned from CERN while module originally was tested okay…
***Diagnose:* "While module in slot 16 the ASP fails"**



28-11-2007: IC588 was found loose.
Replaced IC588 by a new tiny logic chip (to avoid problems with an old broken chip)
ASP slot 16 okay.
mrodtest okay

16-Nov-2011:
Henk Boterbrood brought this module back from CERN (because of SHARC booting problems?)

```
################################################################################
#

Jan 5 2011, 18:51
-------------------
A new ATLOG entry has been submitted:
Author              : Zimmermann Stephanie
Message Type        : Default Message Type
Status              : closed
System Affected     : MDT | DAQ
Logbook URL         : https://pc-atlas-
www.cern.ch/elog/ATLAS/ATLAS/129495
Reply from P1       : https://pc-atlas-
www.cern.ch/elog/ATLAS/ATLAS/129495?cmd=Reply
Reply from GPN      :
https://atlasop.cern.ch/elog/ATLAS/ATLAS/129495?cmd=Reply
================================
MROD 195, BC-04 slot 9, replaced by module 142, MROD 227, BC-04 slot 11
replaced by module 219 due
to persistent failures during configure phase of the standalone
partition with VME errors reported.
Removed modules have been placed in the test crate for further
investigations, problem appears
similar to one we had last year which was suspected a connectivity issue
between MRODs and VME back
plane.
```

```
From an email:
"> > > It's again one of these mysterious faults, which I can't explain.
 > > > So you say, you have been unplugging/replugging these modules,
in-situ
 > > > so to say (out of their VME socket, and immediately back in) ?
 > >
 > > yes, we had pulled out all modules in that crate and pushed
 > > them back in immediately.
 >
 > All ?
 > It wasn't clear which slots in particular had problems..?
 > (should be indicated in the boot fail MRS messages, if booting was
the problem)

 yes, all, since in the numerous tries we gave it first with run control
it
 was not always the same module reported failed ...
"
##############################################################################
#
```

18-Nov-2011:
Module put into test crate in Amsterdam seems to work fine!

26-Jan-2012:
MROD 227 in slot 8
mrodsrv 8c ldr/ihello.ldr ==> MRODIN-C says HELLO !
mrodsrv 8d ldr/ihello.ldr ==> MRODIN-D says HELLO !
mrodsrv 8e ldr/ihello.ldr ==> MRODIN-E says HELLO !

MROD-X 230
Type: 6 Channel

Assembled Jun, 2007

25-9-2007:
Errors during test:
Errors in linktest, RocketIO test, regtest, ttc test. Teveel om op te noemen, zie MRODtest/MROD-230/ Looks like a problem with the slink. Replaced S-link board, no effect.

23-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 8 230:

```
###ERRORS found in file MROD-230/reg-D.log
Channel A (Chan-ID = 2A)
###reg 37 (MRI_TEST_CTRL            ): default #80560880, read #80560800
Channel B (Chan-ID = 2B)
###reg 37 (MRI_TEST_CTRL            ): default #80760880, read #80760800
```

In both cases bit 7 = '0' -> "status of the LDOWN_n line of the RocketIO Link (Note that '0' read back means link is down)" -> Check MROD-In-D RocketIO Xtal ***IC204 -> 50 MHz in stead of 100 MHz!***

Wrong Frequency

Mrodtest 8 230 okay!

MROD-X 231
Type: 6 Channel

27-11-2007
Returned from CERN while module originally was tested okay…
***Diagnose:* "While module in slot 18 or 19 the ASP fails"**
28-11-2007: resoldered IC588,587,589. ASP slot 18 okay.
Mrodtest okay.

ASP does not connect (in slot 17)

13-Aug-2008
Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 17 231 okay

MROD-X 233
Type: 6 Channel

Assembled Jun, 2007

28-9-2007:
ASP connect failed. Resoldered pin 1 IC588. ASP connect succeeded.

Leds optical transceiver 3B Missing!!!!

5-10-2007:
Led placed on the board
Error:
MROD-233/intr-A.log:tst 1: ###Timeout IRQ1 Spy EvtLen FIFO interrupt
MROD-233/intr-A.log:tst 1: ###Timeout IRQ1 Spy Evt FIFO interrupt
MROD-233/intr-Eb.log:tst 1: ###Timeout IRQ1 LDOWN interrupt
Second test ointr and iintr only:
Ok, but XOF light is on.
Third test (complete):

MROD-X 234
Type: 6 Channel

27-11-2007
Returned from CERN while module originally was tested okay…
***Diagnose:* "While module in slot 16 the ASP fails"**
Replaced IC588 (appeared a bit loose when touched).
ASP connect in slot 16: okay. Mrodtest okay.

MROD-X 239
Type: 6 Channel

Assembled Jun, 2007

02-10-2007:
MROD-239/reg-A.log:###reg 5 (MRO_SLINK_STAT_INTR): default #00003800, read #0000B000
MROD-239/slink_evts.log:### Something wrong found in here (MROD-239/slink_evts.log) by slinktest.sh

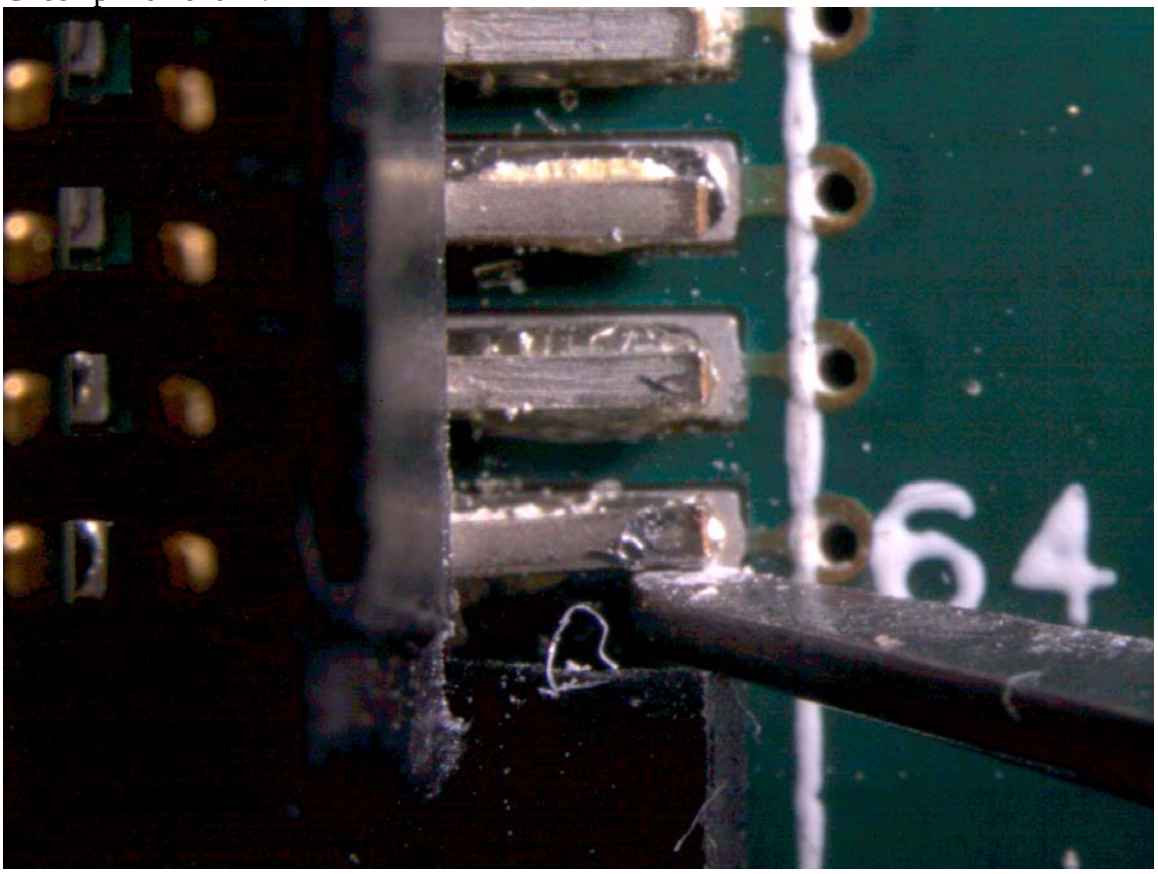
24-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 8 239 okay!

MROD-X 242
Type: 6 Channel

Assembled Jun, 2007

02-10-2007:
MROD-242/reg-A.log: ###Temperature out-of-limits (40<=T<=70)
MROD-242/reg-A.log: ###Temperature out-of-limits (40<=T<=70)
MROD-242/reg-A.log: ###Temperature out-of-limits (40<=T<=70)
MROD-242/reg-E.log:###reg 45 (MRI_SEPARATOR_FLAGS): default #00000000, read #04000000
MROD-242/slink_evts.log:### Something wrong found in here (MROD-242/slink_evts.log) by slinktest.sh
21-11-2007:
Erros in slink_evts.log -> S-Link bit 0 seems to be stuck at '1'.
Check pin 64 of J24.



Pin 56, 60, 61, 63 and 64 not soldered.
Mrodtest okay.

MROD-X 244
Type: 6 Channel

Assembled Jun, 2007

02-10-2007:
Top VME Connector broken.

21-01-2008:
Returned from Nijmegen (repaired by Thei).
R720 (0603, 100 ohm) and C906 (0402, 22 nF) were removed by accident -> Replaced

22-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 8 244 okay!

MROD-X 247
Type: 6 Channel

Assembled Jun, 2007
Errors:
MROD-247/reg-A.log: ###Temperature out-of-limits (40<=T<=70)
MROD-247/reg-A.log: ###Temperature out-of-limits (40<=T<=70)
MROD-247/reg-A.log: ###Temperature out-of-limits (40<=T<=70)
19-11-2007
IC1013 en IC2013 resoldered.
Reprogrammed (update to newest firmware)
Mrodtest okay!

MROD-X 255
Type: 6 Channel

Assembled Jun, 2007

5-10-2007:
ASP connect failed, resoldered IC 588, ASP connect ok. However, programming of FPGAs fails, all leds on the front stay on. Tried resoldering what looked like a loose pin on IC572, no effect.
Slot 11, ASP does connect. PROMs programmed Versions In: 07083100, Out: 07101000.
"Config" LED keeps illuminated…
Pin2_IC557 (MRI_DONE) always low.

24-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!
Board does not come out of Config Cycle. MRI_DONE stays low.
Try to determine which of the FPGAs does not want to configure… Try to program (IMPACT via the front panel) each FPGA, each directly after a SysReset (thus initiating a config cycle).
Sysreset -> program 1A -> no cure
Sysreset -> program ***1B*** -> board comes out of config cycle!
Sysreset -> program 2A -> no cure
Sysreset -> program 2B -> no cure
Sysreset -> program 3A -> no cure
Sysreset -> program 3B -> no cure
Check SW1B. Soldering okay, but switch M2 is bad! -> Place new DIP switch.

Mrodtest 8 255 okay!

13-Aug-2008:
Firmware updated:
(Note: su root => chmod 777 /dev/windrv6)
In: 08041800
Out: 08051400
Mrodtest 14 255 okay

20-Aug-2008:
Duration test startup fails on booting SHARC-C. Also LED test fails:

```
[daqmuon@argos ~/MRODtest] [35] mrodtest 9 effe led

MROD-X test, slot 9
Wed Aug 20 09:42:25 MET DST 2008
------------------------------


MROD-X LED test, slot 9
```

```
-------------------------
==> LEDs on A
==> LEDs on C


[daqmuon@argos ~/MRODtest] [37] mrodtest 9 effe
###Failed to read VME CS/CSR BAR
error: 0x205      => major: Error   5 in package   2 => VMEbus driver/library for the RCC:
VMEbus bus error received
```

21-Aug-2008:
Mrodtest 8 255 okay

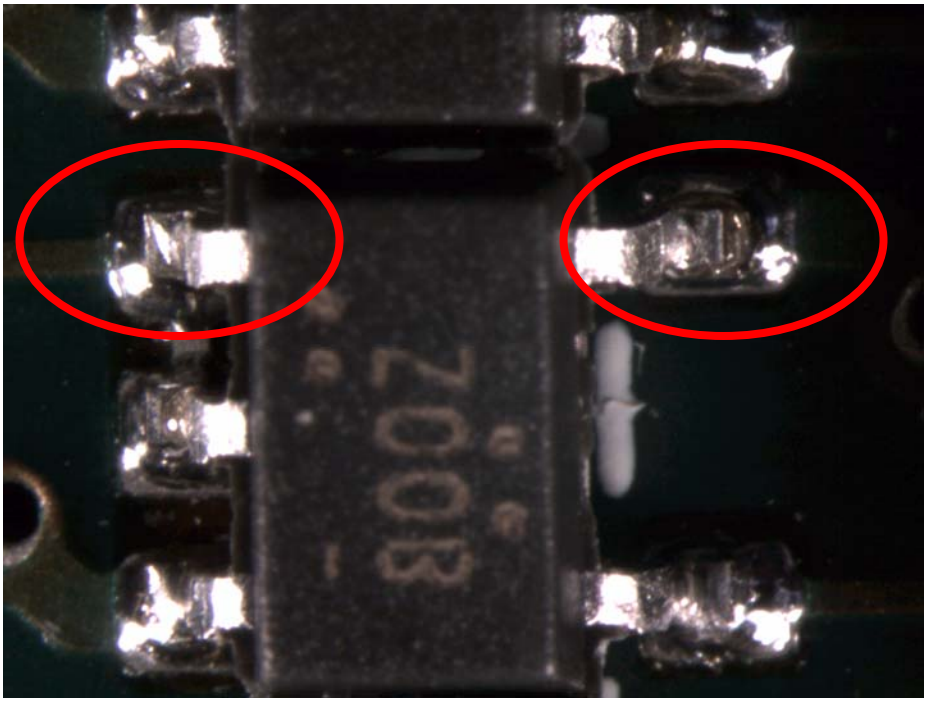
MROD-X 257
Type: 6 Channel

Assembled Jun, 2007

5-10-2007:
In Brenta Connecttest.sh. This module does not connect in slot 5 but when slot 13 is addressed then a connection is made.
Connecttest.sh fail

```
5      00101  <- fail
13     01101  <- connect;
```

Look for IC588!



IC588 pin 1 and 5
Reflowed IC585, IC586, IC587, IC588, IC589.

Repaired !

MROD-X 260
Type: 6 Channel

Assembled Jun, 2007

4-12-2007:
Module failed while in the duration test (test-04-12-2007). Module was in slot 12 and had Busy “on” all the time and kept the run hanging…

24-01-2008:
program (slot 8) PROMs via RCAT:
In: 07083100
Out: 07101000
Okay!

Mrodtest 8 260 Hangs on:
```
+ echo '==> LINK A0-->C1'
+ mrodsrv -c 8A ldr/oSndrc.ldr -l0 -8 -c2
+ mrodsrv 8C ldr/iRecv.ldr -l1 -8 -c2
```

Check mrodtest 8 260 led okay!
again mrodtest 8 260 Hangs on:
```
###UNEXPECTED number of lines in file MROD-260/reg-C.log
###check if test completed properly!
```
File ended while testing channel B register 4D:
```
Channel B (Chan-ID = 1B)
:
reg 4D (MRI_CHABUSY_MASK         ), #bits=19: bitmask=   7FFFF   OKAY
```
SHARC-C hangs?
Check mrodtest 8 260 led repeatedly okay!

Check (boot) link resistors for Sharc-C

25-01-2008:
Replaced R111 (Link C4_A1). Not sure if this resistor was damaged (a crack in the package).
```
Mrodtest 8 260 reg:
###ERRORS found in file MROD-260/reg-C.log
       ###Srv: SHARC Link Port timeout (LCOM=FFFFFFFF)
###ERRORS found in file MROD-260/reg-D.log
       ###Srv: SHARC Link Port timeout (LCOM=FFFFFFFF)
###ERRORS found in file MROD-260/reg-E.log
       ###Srv: SHARC Link Port timeout (LCOM=FFFFFFFF)
```

Check power supplies on the table -> okay
Check Clocks -> IC105 (Clock source for SHARC-C) is dead… -> Replace

Mrodtest 8 260 reg:
```
### ERRORS found in file MROD-260/reg-A.log
###reg  5 (MRO_SLINK_STAT_INTR      ): default #00003800, read #0000B000
```
S-Link card (SN 1608) is not up. Broken? Replace S-Link card.
S-Link card (SN 1610) is not up.

Broken? Replace S-Link card. During Crate power-up Link goes up for a short time and than goes down. Replace S-Link card.
Try a “Series Prodiction” S-Link card…

Mrodtest 8 260 okay!

Try a S-Link card SN1612… ->fail
Try a S-Link card SN1614… ->fail
Try a S-Link card SN1616… ->fail
Try a S-Link card SN1620… ->fail
Try a “Series Prodiction” S-Link card… -> okay!

Mrodtest 8 260 okay!

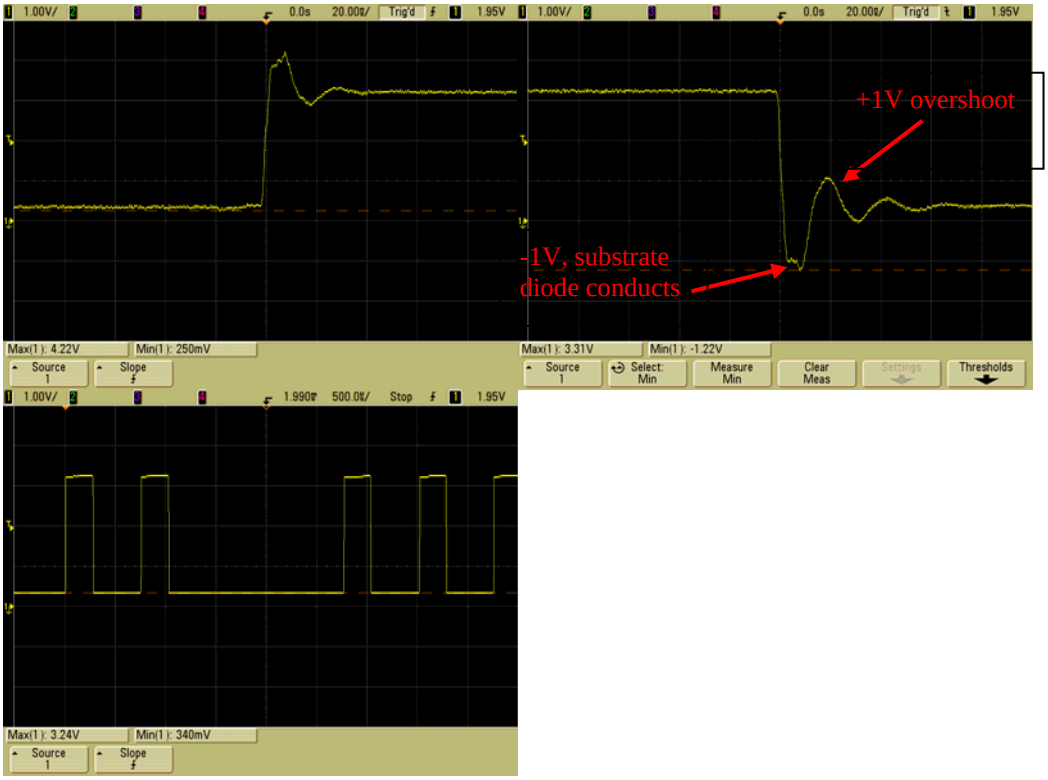
05-02-2008:
ASP Connect fails for slot 20!
Slot 5 fail.

Measurements: use 1.5 GHz probe (Agilent 1156A) using “2g” to connect ground to IC552 pins 24-23-22 and “2s” to connect probe tip:

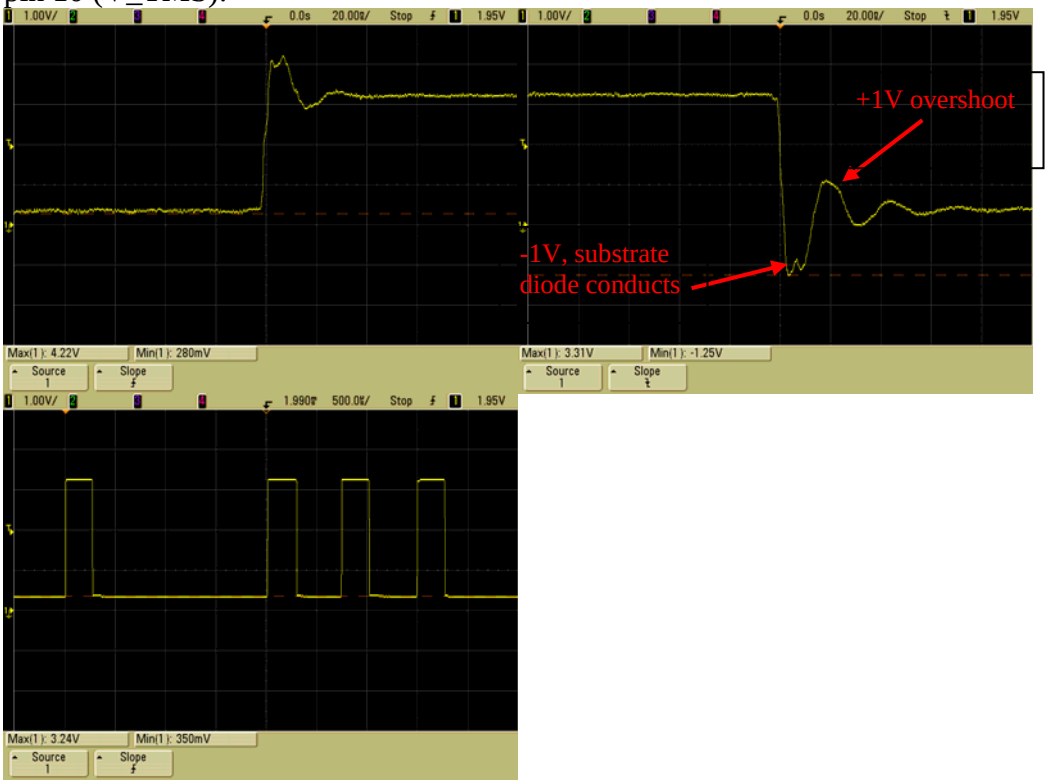
pin 12 (V_TRST_n). Prove that this pin is always ‘1’ and that there are no negative going edges when other JTAG signals are switched.

No edges found!

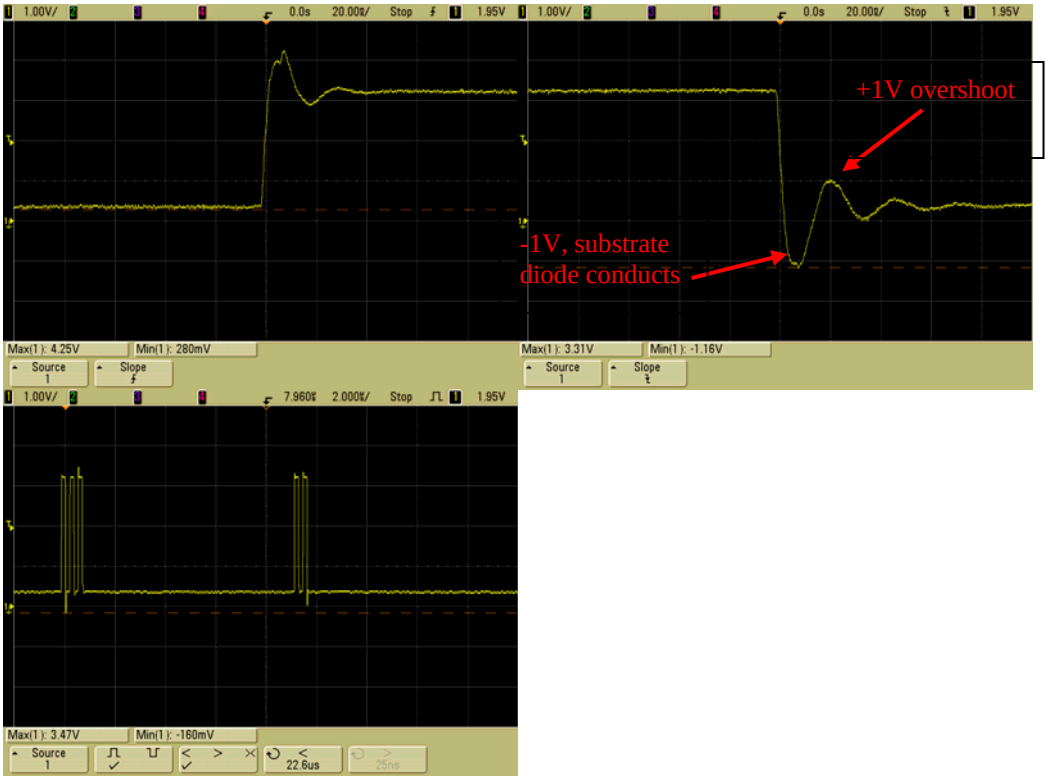
pin 11 (V_TDI):



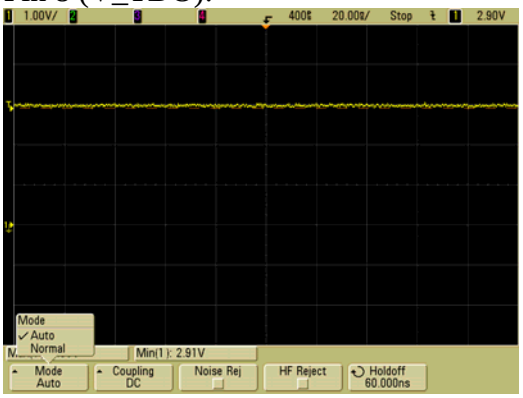
pin 10 (V_TMS):



Pin 9 (V_TCK):

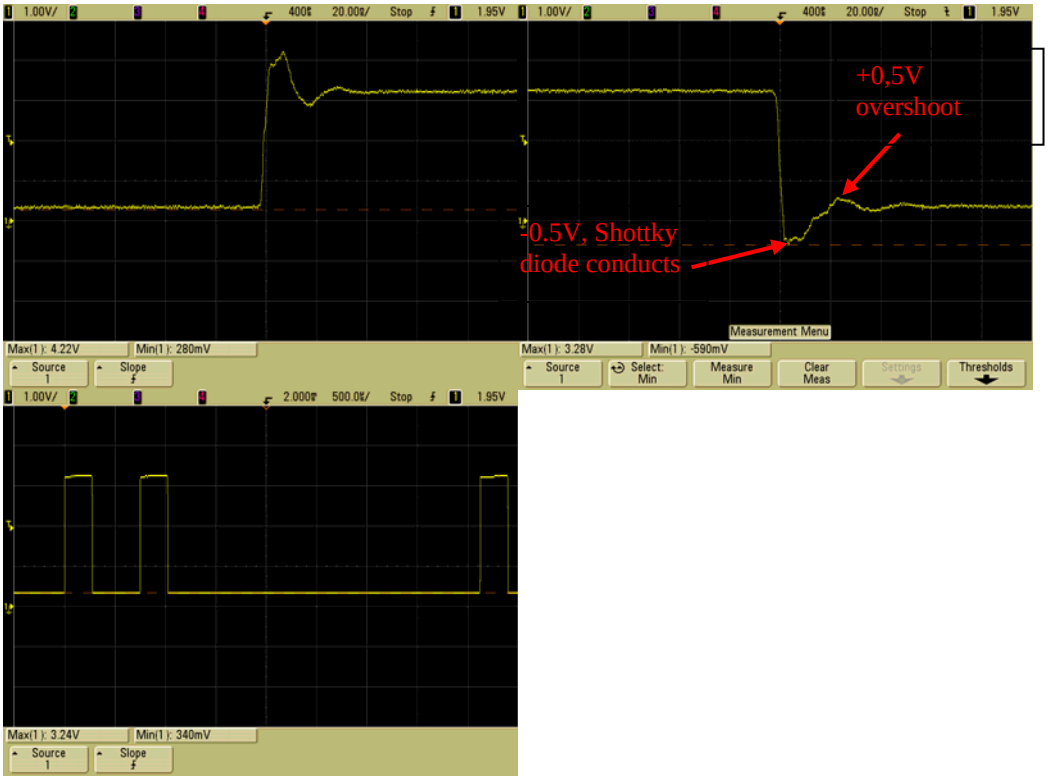


Pin 8 (V_TDO):



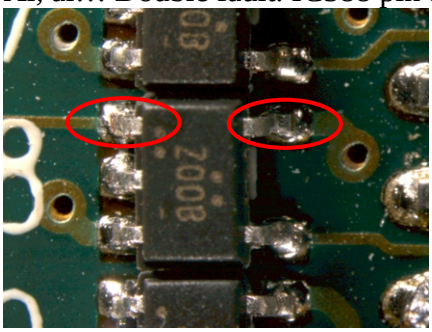
No edges found! Signal is ‘1’ always!

Added Shottky diodes from Ground to pins 9, 10, and 11.
Measure pin 11 (V_TDI):



Note! Still connect in slot5 **fails**!

Ai, ai… Double fault. IC588 pin 1 and 5 were loose:



Removed Shottky diodes; Slot 5 now connect and disconnect okay!
-> Duration test! 06-02-2008:

Modified the RCAT module (SN18) series resistors R12, R16 and R24. Instead of 0 ohm, placed a 1uH inductor (BLM18AG102SN1D).
Module does connect and disconnect in all slots! (5-20)

MROD-X 262
Type: 6 Channel

Assembled Jun, 2007

23-06-2009:
Mail from Henk from Cern:

```
Het zijn er intussen 2...
Allebei zitten ze in slot 20.
In de ene is SHARC C niet meer te booten,
in de andere SHARC E.

Henk
```

This MROD has been put into the TestCrate in USA-15 to further diagnose…

Comment from Henk after he delivered the modules in Amsterdam (13-10-2009)

```
  - MROD #262: SHARC C cannot be booted
    (in crate BC4 slot 20)
```

MROD-X 263
Type: 6 Channel

Assembled Jun, 2007

5-10-2007:
In Brenta Connecttest.sh. This module does not connect in slot 16.
Connecttest.sh fail

```
16     10000 <- fail
```

Soldering joints do not show any particularities but anyway reflowed IC585, IC586, IC587, IC588, IC589.

Repaired!

Serial number cross reference:

MROD sn.	PCB Technologies sn.	Remark	ASP Connecttest
037			
038			
039			
040			
041			
042			Okay
043			Okay
044			
045			Okay
046			
047			
048			
049			
050			
051			
052			
053			
054			
055			Okay
056			Okay
057			Okay
058			
059			
060			
061			
062			Okay
063			
064			
065			Okay
066			
067			
068		PCB Curved	Okay
069			
070			Okay
071			Okay
072			
073			Okay
074			Okay
075			
076			

077			Okay
078			Okay
079			
080			
081			
082			Okay
083			
084			
085			
086			
087			Okay
088			Okay
089	103		Okay
090	183		
091	209		
092			
093	181		Okay
094	120		
095	124	PCB Curved	Okay
096	153		Okay
097	051		
098	068		
099	094		
100	071	PCB Curved	Okay
101	055		
102	066		
103	075		
104	057		
105	076		Okay
106	147		Okay
107	060		Okay
108	131		Okay
109	028		Okay
110	074	PCB Curved	Okay
111	077		Okay
112	039		Okay
113	095	PCB Curved	Okay
114	096	PCB Curved	Okay
115	072		Okay
116	020		Okay
117	058		
118	079		
119	080		
120	092		Okay

121	046		Okay
122	045	PCB Curved	
123	047		Okay
124	042		Okay
125	030		Okay
126	015		Okay
127	017	PCB Curved	Okay
128	014	PCB Curved	Okay
129	065	PCB Curved	Okay
130	062		Okay
131	026		
132	038		Okay
133	036		Okay
134	016	PCB Curved	Okay
135	032		Okay
136	035		
137	196	PCB Curved	Okay
138	161		Okay
139	108	PCB Curved	Okay
140	178		Okay
141	104	PCB Curved	Okay
142	137		Okay
143	093		Okay
144	112		Okay
145	146		Okay
146	084		Okay
147	207		Okay
148	091	PCB Curved	Okay
149	236	PCB Curved	Okay
150	098		
151	169	PCB Curved	Okay
152	048	PCB Curved	Okay
153	129		Okay
154	224		Okay
155	222		Okay
156	223		Okay
157	206		Okay
158	193		
159	195		
160	101	PCB Curved	Okay
161	085		Okay
162	145	PCB Curved	Okay
163	203		Okay
164	189		Okay

165	238		Okay
166	237		Okay
167	240		Okay
168	234		Okay
169	117		Okay
170	232		Okay
171	219	PCB Curved	Okay
172	187		Okay
173	139		Okay
174	235	PCB Curved	Okay
175	198		Okay
176	115		Okay
177	159		Okay
178	121	PCB Curved	Okay
179	089		Okay
180	082		Okay
181	184		Okay
182	220		Okay
183	127		Okay
184	229		Okay
185	086		Okay
186	143	PCB curved	Connect okay, disconnect fails
187	239		Okay
188	231		Okay
189	138		Okay
190	136		Okay
191	116		Okay
192	144		Okay
193	100	PCB curved	Okay
194	118	PCB curved	Okay
195	122		Okay
196	083		Okay
197	180		Okay
198	140		Okay
199	099	PCB curved	Okay
200	190		
201	201		Okay
202	111	PCB curved	Okay
203	194		Okay
204	192		Okay
205	226	PCB curved	Okay
206	188		Okay
207	113	PCB curved	Okay
208	056		Okay

209	191	PCB curved	Okay
210	142		Okay
211	097	PCB curved	Okay
212	114		Okay
213	205		Okay
214	199	PCB curved	Okay
215	174		Okay
216	175	PCB curved	Okay
217	128		Okay
218	157		Okay
219	110		Okay
220	227		Okay
221	197	PCB curved	Okay
222	215	PCB curved	Okay
223	107		
224	141		Okay
225	210		Okay
226	173		
227	228		Okay
228	233		Okay
229	172		Okay
230	177		Okay
231	105		Okay
232	216		Okay
233	186		Okay
234	171		Okay
235	064		Okay
236	087		Okay
237	182		Okay
238	185		Okay
239	176		Okay
240	125		Okay
241	163		Okay
242	119	PCB curved	Okay
243	204	PCB curved	Okay
244	164	PCB curved	Okay
245	109		Okay
246	158		Okay
247	162		Okay
248	150		Okay
249	012		Okay
250	255		Okay
251	221		Okay
252	212		Okay

253	148	PCB curved	Okay
254	167		Okay
255	218		Okay
256	090		Okay
257	088		Okay
258	165		Okay
259	211		Okay
260	156	PCB curved	
261	230		Okay
262	179		Okay
263	214		Okay
264	102		Okay

Returned from CERN (27-11-2007):

58: VME-access faalt
geen bijzonderheden, mrodtest okay
Even opzij leggen

60: SHARC C access probleem
geen bijzonderheden, mrodtest okay
Even opzij leggen

70: ASP LED wordt niet groen (slot 17)
pin 1 van IC588 inderdaad los.

71: ASP groen, maar wil niet programmeren (slot 9)
ASP blijft weigerachtig; wel te programmeren; mrodtest okay

77: ASP/programmeer probleem (werkt wel/werkt niet, slot 20)
Resoldered pins on IC588… tested in slot 20 ok. Mrodtest okay

78: ASP LED wordt niet groen (slot 18)
IC588 pin 1 was los. Na vastzetten werkt ASP niet in 18, wel in slot 17.
Programmeren en mrodtest okay.
IC588 vervangen en andere tiny logic gereflowed, nu ASP okay in slot 18

82: ASP groen, maar wil niet programmeren (slot 16)
Resoldered pins IC588, tested ASP slot 16 okay. Mrodtest okay

87: ASP LED wordt niet groen (slot 17)
Resodered IC588 and neighbours. Tested ASP slot17: okay.
Mrodtest okay.

227: ASP (slot 16)
IC588 was found loose. Replaced IC588 by a new tiny logic chip (to avoid problems with an old broken chip) ASP slot 16 okay. mrodtest okay

231: ASP (slot 18+19)
resoldered IC588,587,589. ASP slot 18 okay. Mrodtest okay.
ASP does not connect (in slot 17) duration test "connecttest.sh"
Even opzij leggen

234: ASP (slot 16)
Replaced IC588 (appeared a bit loose when touched). ASP connect in slot 16: okay. Mrodtest okay.

Tough guys: "Suspect", "Harde Noot"

MROD sn.	Error:	Remark
048	Tests fine. **But already failed twice during duration test… Log files do not show any clue**	**CERN-DEM**
058	Tests fine. failed infrequently (at CERN: **VME-access fails**)	**CERN-DEM**
060	Tests fine. failed infrequently (at CERN: **SHARC C access problem**)	**CERN-DEM**
093	Tests fine. **But already failed twice during duration test…**	**CERN-DEM**
165	Tests okay. Nothing really found… **Failed during duration test… SHARC-C does not want to boot** Reflowed SHARC-C link resistors and replaced IC105 (X-tal 50 MHz) **Failed during duration test… SHARC-C does not want to boot**	**CERN-DEM**

Tough guys: "**BGA problems**"

MROD sn.	Error:	Remark
056	**SHARC-C** Loose BGA ball! Note: Module has an "X-Ray pass" sticker	**CERN-DEM**
158	**Wasted**	**CERN-DEM**
159	**Wasted**	**CERN-DEM**
200	Loose Ball IC101-A20 (**SHARC**-Link-C0 bit 4). Note: Module has an "X-Ray pass" sticker	**CERN-DEM**
226	Presume a (very) hard short between 3V3 and GND under **IC4004**	**CERN-DEM**

Note: Spares: 0 SHARC; 4 Output FPGAs; 20 input FPGAs

Duration test

MROD sn.	Error:	Remark
052	2109	
063	2108	
131	2110	
136	2107	
150	1404	
186	1402	
223	2101	
260	20DQCERLSC1489	

Modules (duration) tested okay -> ***Spares in Amsterdam (without S-Link LSC card)***:
42, 62, 65, 115, 121, 130, 132, 134, 155, 164,
190, 209, 219, 220

Modules (duration) tested okay -> ***Spares in Amsterdam (with S-Link LSC card)***:

MROD SN	S-Link SN	Remark
71	20DQCERLSC1709	

88	1405	
148	1401	
198	20DQCERLSC1700	
204	20DQCERLSC1723	
206	20DQCERLSC1724	
221	20DQCERLSC1750	
230	1407	
239	2103	
244	20DQCERLSC1220	
255	20DQCERLSC1718	

Modules in A'dam:

MROD Sn	MROD-Out Version	MROD-In Version	S-Link Sn	Remark	Duration test
42	08051400	08041800	0424	=> CERN Spare (3-10-2008)	test-18-08-0812
48	08051400	08041800	1608	=> CERN Spare (3-10-2008)	test-07-08-0931
52	08051400	08041800	2109	=> CERN Spare (3-10-2008)	test-08-08-0803
56	08051400	08041800	1602	16-Nov-11 Returned to A'dam	test-07-08-0931
58	08051400	08041800		After CERN-DEM still VME-access fails => Nijmegen (Demo)	
60	08051400	08041800	1610	16-Nov-11 Returned to A'dam	test-07-08-0931
62	08051400	08041800	0422	=> CERN Spare (8-10-2008, woodencrate)	test-18-08-0812
63	08051400	08041800	2108	=> CERN Spare (8-10-2008, woodencrate)	test-06-08-0903
65	08051400	08041800	0420	=> CERN Spare (8-10-2008, woodencrate)	test-18-08-0812
71	08051400	08041800	20DQCERLSC1709	=> CERN Spare (8-10-2008, box)	test-05-08-0850
81				02-Oct-2012 Returned to A'dam with FPGA Configuration problem	
88	08051400	08041800	1405	=> CERN Spare (8-10-2008, box)	test-05-08-0850
93	08051400	08041800		After CERN-DEM still Duration test repeatedly ended with "Busy" => Nijmegen (Demo)	
115	08051400	08041800	0418	=> CERN Spare (8-10-2008, box)	test-18-08-0812
116	08051400	08041800	2104	=> CERN Spare (8-10-2008, box)	test-06-08-0903
121	08051400	08041800	0416		test-19-08-0825
130	08051400	08041800	0402		test-19-08-0825
131	08051400	08041800	2110		test-06-08-0903
132	08051400	08041800	0412		test-19-08-0825
134	08051400	08041800	0410		test-19-08-0825
136	08051400	08041800	2107		test-06-08-0903
148	08051400	08041800	1401		test-07-08-0931
150	08051400	08041800	1618		test-08-08-0803
154				13-10-2009: Module successfully operated for a year at Cern but is now returned.	
155	08051400	08041800	0408		test-20-08-0828
158				@ CERN-DEM; Wasted	
159				@ CERN-DEM; Wasted	
164	08051400	08041800	0414		test-20-08-0828
165	08051400	08041800	1616		test-20-08-0828
183				02-Oct-2012 Returned to A'dam with ZBT bit errors	
186	08051400	08041800	1620		test-08-08-0803
190	08051400	08041800	0406	=> CERN Spare (15-11-2011 H B&B)	test-20-08-0828
198	08051400	08041800	20DQCERLSC1700	=> CERN Spare (15-11-2011 H B&B)	test-11-08-0811
200	08051400	08041800	1604	=> CERN Spare (15-11-2011 H B&B)	test-05-08-0850
204	08051400	08041800	20DQCERLSC1723	=> CERN Spare (15-11-2011 H B&B)	test-11-08-0811
206	08051400	08041800	20DQCERLSC1724	=> CERN Spare (15-11-2011 H B&B)	test-12-08-0811
209	08051400	08041800	0404	=> CERN Spare (12-04-2012 H B&B)	test-21-08-0813
217				4-5-2009: Module successfully operated for a year at Cern but is now returned.	
220	08051400	08041800	1614	=> CERN Spare (02-10-2012 H B&B)	test-21-08-0813
221	08051400	08041800	20DQCERLSC1750	=> CERN Spare (02-10-2012 H B&B)	test-12-08-0811
223	08051400	08041800	2101	=> CERN Spare (13-06-2014 Harry v.d. Graaf)	test-11-08-0811
226	08051400	08041800	1606	=> CERN Spare (13-06-2014 Harry v.d. Graaf)	test-05-08-0850
230	08051400	08041800	1407	=> CERN Spare (13-06-2014 Harry v.d. Graaf)	test-12-08-0811
231	08051400	08041800	20DQCERLSC1499	=> CERN Spare (13-06-2014 Harry v.d. Graaf)	test-21-08-0813
239	08051400	08041800	2103		test-12-08-0811
244	08051400	08041800	20DQCERLSC1220		test-08-08-0803
255	08051400	08041800		Fail startup with duration test, mrodtest okay!? => CERN (demo "VIP-ROD") Removed S-Link 20DQCERLSC1718	Pass (old firmw)
260	08051400	08041800	20DQCERLSC1489		test-11-08-0811
262				13-10-2009: Module successfully operated for a year at Cern but is now returned.	

Modules later transferred to CERN:

MROD Sn	MROD-Out Version	MROD-In Version	S-Link Sn	Remark	Duration test
219	**08051400**	**08041800**	**1612**	**13-10-2009 Henk B&B ships one spare to Cern**	**test-21-08-0813**

Henk B&B 5 oktober 2011:
bij ATLAS zijn de volgende MRODs al eens vervangen (wegens SHARC boot-problemen):
 56 door 115
 60 door 123
 11 door 63 (MROD #11 heeft een stuck-data-bit op een van de MRODINs)
195 door 142
227 door 219

Comments during MROD meeting:
56, 60, 11, 195, 227 probably in USA-15 Test Crate (currently no access to verify this)
15-Nov-2011: 56, 60, 11, 195, 227 brought by Henk to A'dam
16-Nov-2011: 190, 198, 200, 204, 206 given to Henk to bring as new spares to CERN

MRODs with Sharc boot problems:
56 Sharc boot problem C (Reflowed one at CERN-DEM)
(27-mar-2012 seems okay? Already on in slot 6 for 24 hours)
60 Sharc boot problem C (Reflowed one at CERN-DEM)
(27-mar-2012 seems okay? Already on in slot 7 for 24 hours)
154 Sharc boot problem E (26-jan-2012 seems okay?)
195 Boot problem (which Sharc unknown)
217 Boot problem? (which Sharc unknown)
227 Boot problem (which Sharc unknown) (26-jan-2012 seems okay?)
262 Sharc boot problem C (26-jan-2012 seems okay?)

Henk B&B 2 oktober 2012 brought back (81 and 183):
Exchanged with 220 and 221
81 FPGA configuration problems
183 ZBT bit errors

28-6-2013:
11 "wasted" as showmodel for Andrea Borga (note S-link LSC card (20DQCERLSC1890)is still operational and on the module (in the showcase)

Tables below last updated 06-06-2016:

{(p) playground; (s) stock; (h) returned by henk 2016}:

Modules in Amsterdam:

Okay	Okay (2nd choice; boot problem once)
121 (p)	060 (p)
130 (p)	086 (s)
131 (s)	154 (s)
132 (s)	195 (p)
134 (p)	227 (p)
136 (p)	
148 (s)	
150 (p)	
155 (p)	
164 (p)	
165 (p)	
188 (p)	
239 (s)	
244 (s)	
260 (s)	

Modules to repair?:

Fail	
050 (h)	Boot problem (need re-test)
081 (s)	FPGA config
122 (h)	Reset problem
183 (s)	ZBT errors
187 (h)	“weird behaviour”
217 (s)	Boot problem (need re-test)
262 (s)	Boot problem (need re-test)

Modules failing:

Fail	
056 (s)	Boot problem lose ball
204 (h)	RocketIO problem