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#####  
# this file records what has been done during NAOMI #  
# commissioning at WHT (La Palma) #  
##### X.Gao 10~19/08/2000 #####
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CCD-SDSU controller  
10/08/2000

1). checked the video cable, found out that Slave cable in 50way connector end has one CCD output wire's plaster shell (cut) out by the fixing clamps. Ask electronics workshop fixed, put insulation tape around. Also tidy up others.

Software  
see READMEfirst.doc  
10/08/0000

1). tested iraf, can display image, imexam, works  
2). tested QI\_server, works with VMEdummy\_star(\_epics)

11/08/0000

3). tested gmake for \*.vws works, change startup\_cam from simulation mode to real mode ( can not re-write, so, named another startup\_cam\_epics\_xg.vws)  
4). tested gmake for \*.m4 works, add VME\*.m4, works  
5). copy scripts of xg\* from atc /sw4/naomi/naomiWfs/scripts/xg to acontrol1/naomi\_wht\_xg/scripts\_atc  
6). put /sw4/naomi/naomiWfs/dsp\_code/xg/DOWNLOAD\_MASTER\_DUMMY\_STAR.lod and /sw4/naomi/naomiWfs/dsp\_code/xg/finalversion/vmeapl4\_dwld.lod into /software/naomi/naomi-0.2/naomiCam/dspsrc/vme and into /software/naomi/naomi-0.2/naomiCam/bin/asm56000/timing/ /software/naomi/naomi-0.2/naomiCam/bin/asm56000/vme/

12/08/0000

7). asked Andy.V to change permission for M4, delete ABT in (close1.m4, close2.m4) to Timing as VME code already done it when it receives ABT. gmake  
8). asked Andy.V to change permission for vws, change startup\_cam (sdsuLib from simulation mode to real mode). gmake  
9). asked Andy V to copy cameraTop.db to /software/naomi/naomi-0.2/naomiCam/./data/ and tested startup\_cam, things are OK tested with VMEdummy\_star\_epics  
10). tested with SDSU controller on <readout\_cam1/2 works  
11). measured the noise with INGRID SDSU switched off, slaver seems good, master slight high

/naomi\_image/testimage/ master1.fits (SET=10, HIH), master5ms.fits (SET=200,HIH), slaver5ms (SET=200,HIH), the cooler set to 8 degree. but the iraf would not let me change paramter

13/08/0000

12). the INGRID is switched on with side lid on ( hot ). the INGRID GND was not connected yesterday, now it is.

13). fixed the problem with iraf, it is working fine. take noise measurement again (assume gain=0.6)

/naomi\_image/testimage/ master5msHihIngird.fits (5.57, 4.67, 5.27, 8.71)  
master5msSlwIngird.fits (4.81, 3.94, 3.99, 5.3 )  
slaver5msHihIngird.fits (4.69, 4.12, 4.6, 4.89 )  
slaver5msSlwIngird.fits ( 4.15, 3.43, 3.64, 3.79)

only one channel of the Master is bit higher 8.71, the rest is ok.

14/08/0000

14). tidy up the drawing for cable and GND, now it is called aocontrol1  
/home/xg/naomi\_wht\_xg/ naomicable.xls,  
also copy Naomicable.xls into  
cp Naomicable.xls /software/naomi/naomi -  
0.2/docs/software/naomiCam/dsp\_code/vme\_board/  
remove gnding1, gnding2 VSD file, remove naomicable2.xls in here too  
copy alba /act\_naomi/naomi-0.1/docs/camera/ naomi\_ICD\_parttwo.doc and  
naomi\_ICD\_partthree.doc to  
aocontrol1 /home/xg/naomi\_wht\_xg/, also to  
/software/naomi/naomi-0.2/docs/software/naomiCam/dsp\_code/vme\_board/

15). check the GND between CCD header and Controller, slaver==header =0.6 Ohms,  
Master==header =23 Ohms  
put an external Earth wire, the Ohm all ==0.3. the Ingrid controller now is  
put on top of Naomi  
and the side lip is open, with Ingrid switch on, Master quadrant 1 noise  
=18ADU, and =15ADU  
when Ingrid is switched off. the salver still OK. Wait for another time to  
test ( change cable ?)

15/08/0000

16). the Ingrid controller is off the Naomi controller, but Ingrid has add to  
the cooling circulation  
made a change to  
Master controller =====slave cable===== master header  
slave controller =====master cable===== slave header  
the noise test (HIH) results are master ( 6.4, 4.56, 6.72,9.48), slave  
(4.62 max) assume gain=0.6e/ADU

17). measure the dark current ( assume gain=0.6e/ADU)  
master: swpedcam12s.fits, swpedcam110s.fits, 15 e/pixel/second  
slave : swpedcam22s.fits, swpedcam210s.fits, 15.6 e/pixel/second

16/08/0000

18).take gain measure, and ask Derek for naomigain ( I could not run at here)

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////////////////////////////////////  
Check (5:35,5:35] in each set you send me and got the following results: -  
slave gain for that quadrant = 0.53 e/ADU  
master gain = 0.55 e/ADU
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////////////////////////////////////  
take noise measurement again
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a). change back with Ingrid controller working  
/home/xg/naomi\_image/testimage/

Mater controller===master cable=====master header, mastertry0.fits  
(HIH,SET=200)

Slave controller===slave cable=====slaver header, slavetry0.fits  
(HIH,SET=200)

noise is same as before

b). change back with Ingrid controller off, not see much difference

Mater controller===master cable=====master header, mastertry1.fits  
(HIH,SET=200)

Slave controller===slave cable=====slaver header, slavetry1.fits  
(HIH,SET=200)

switch on Ingrid controller again

c). swap clock cable for master and slave, the video cable kept unchanged, not make much difference

Mater controller===slver clk cable=====master header,  
 Slave controller===master clk cable=====slaver header,

d). swap controller, get much better noise

Mater controller===slave cable=====slaver header, msCtrlSlhdHih.fits  
 (HIH,SET=200),  
 msCtrlSlhdSlw.fits (SLW,SET=200)  
 Slave controller===master cable=====master header slCtrlMshdHih.fits  
 (HIH,SET=200),  
 slCtrlMshdSlw.fits (SLW,SET=200)

e). change Slaver controller Timing board setup into master setup ( Clk, EPROM, sync )

change Master controller Timing board setup into slave setup ( Clk, EPROM, sync )

test noise again, get similar to d). Now, the configuration (re-labeled)

Mater controller===master cable=====master header,  
 newmasterHih.fits (HIH,SET=200),

newmasterSlw.fits (SLW,SET=200)

Slave controller===slave cable=====slaver header newslaveHih.fits  
 (HIH,SET=200),

newslaveSlw.fits (SLW,SET=200)

The NOISE results ( take master/slave gain=0.55e/ADU)

imstat	[6:36,44:74]	[53:83,44:74]	[53:83,6:36]
[6:36,6:36]			
newmasterHih.fits	4.79	4.16	4.27
newmasterSlw.fits	4.08	3.07	3.23
newslaveHih.fits	4.77	4.15	5.04
newslaveSlw.fits	4.04	3.48	3.60
msCtrlSlhdHih.fits	4.53	3.99	4.76
msCtrlSlhdSlw.fits	3.84	3.15	3.67
slCtrlMshdHih.fits	4.48	3.75	4.06
slCtrlMshdSlw.fits	4.08	2.99	3.29
mastertry0.fits	4.91	4.25	4.71
slavetry0.fits	4.11	3.83	4.07

OK, the noise at high speed under new configuration is near as good as at ATC test. fine turning

needs much more access time of WFS camera, which is not possible at the commissioning stage. Maybe some test when mechanism control is running.

17/08/0000

19). write Camera operation/test proceducret, tidy-up the docs, get docs printed out for tomorrow. wait

for test when motor is going to move. Had a go with motor running. only very occasion see a sudden

noise on master, but later repeat test did not see. otherwise, the noise is not changed much. the slave

seems bit noisier while master become better than before, could be caused by someting be rearranged

on optic bench. need more time to paly with.

18/08/0000

20). handle over meeting, demonstration, modify READMEfirst.doc and Naomi\_wfs\_camera\_op\_testing.doc  
test startup\_cam, with close restart, it works well. tidy -up \*.m4 and back-up  
cp /software/naomi/naomi-0.2/naomiCam/dspsrc/scripts/\*.m4 into /home/xg/naomi\_wht\_xg/script\_wht  
21). noise calculation for last night.

	mastertmttest2.fits	4.16	3.92	4.16	
4.46	slavemttest2.fits	5.68	3.99	4.90	6.92

19/08/0000

22). the camera is used by others most of the time , only able to try mode2, 3 to see the image, did notice  
that in mode 2, the image updateing rate in SAOtng window is not as fast as in model, do n't know why,  
it could be the data is so fast that Vxwork could not couple, so ,drop some.

Issuers need attention

- 1). the Peltier cooler power supply fuse has been burnt the second time, this needs to be investigated.  
as fas as I kwon, this should not happen, it is either the fuse or the large current. the CCD  
can take maximum 4A. Need to check with either Derek or Brenda for the final circuit.
- 2). the loose Lemon socket on Master header for Peltier power needs to be fixed, if the loose nut inside the  
header touch the wire, it could be the cause of burnt of the fuse.
- 3). the scripts have to be checked for final release thought I had tidyed up, there needs a high level camera  
start script. readouts with epics have been tested with QI\_server, start then stop, start again or start  
another cam ,it works well. It should be no problem with C40, but has not been tested.

Suggestion

- 1). C40 system should check whether there is frame missing and log message at least. Chatted  
with Richard, he says, at present, C40 code is not checking, but he will add.

the c40 system should know if the data sent from CCD controller is not shifted at  
pixel level, this can be tested by deliverly shifting image in Timing code.

- 2). sdsu\_Rs422 converter card should have two 14bit ( DIP switch )
  - A. for bright star, using high 14 bits
  - B. for normal operation using low 14 bits

3). sdsu\_Rs422 converter card should have a DIP switch to connect RMT\_RST to FIFORD or  
dis-connect RMT\_RST to FIFORD, as by disconnecting RMT\_RST to FIFORD, the  
VME I/F DSP  
should be able to send data to C40 directly without any CCD and controller.  
It has been  
implemented in VME I/F DSP code, and tested with QI\_server. But not tested  
with  
C40. With this facility, C40 system can do a simulation test without  
running camera  
and can test its centroid algorithm, can check if it can detect shift at  
pixel level by  
setting the dummy\_star in such a way that the spot position is shifted  
deliverly.