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To: Mark 5 Development Group

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Subject: Testing the Mark 5B Sampler Module

Test equipment required:

Field System (FS) Computer with fs-9.10.0 or higher
chkvsi4.prc file
Mark 3 Rack with 14 Video Converters
Mark 4 Decoder
26-way ribbon cable
IF noise source
IF signal splitter
Mark 5B DIM
VSI cable
Mark5B control program dated 25 July 2007 (2007y206d) or later

The installation instructions for building a new Mark5B/B+ operating system disk can be found on the download page on the Haystack web site:

<http://www.haystack.mit.edu/tech/vlbi/mark5/downloads.html>

Test setup:

(Some obvious changes to the setup are required if you have a VLBA4 rack.)

Install the Sampler in the rack

Use the Splitter to connect the noise source to both IF1 and IF2.

Connect one Sampler Module VSI output to the DIM input.

Connect the Sampler to the Decoder with the 26-way cable.

Connect the FS to the front panel connector on the Sampler Module

Switch the Sampler Module front panel switch to LOCAL.

Press Ctrl+Alt+F1 on the Mark 5B DIM computer console.

Login

Enter dimino (or Mark5B) on the Mark 5B DIM computer console.

Edit /usr2/control/equip.ct1 according to the instructions in
/usr2/fs/misc/mk5_ops.txt

Start the FS.

Test Procedure:

1. Enter `log=<Serial No. of VSI4 board>`
2. Enter `vsi4`
See `/vsi4/geo,m,n,0x10`
where `m` and `n` can be any numbers less than 17, usually 1,2
3. Move the FS cable to the MAT input on the rack,
move the switch to MAT,
enter `vsi4`, and
see the same response as before.
4. Enter `proc=chkvsi4`
5. Enter `chksamp`
See something like
`/decode4/samples usbx 3236634 4803390 4734541 3225179`
`/decode4/samples lsbx 3590547 4424443 4400732 3584022`
`/decode4/samples usby 3314399 4694313 4645301 3345731`
`/decode4/samples lsby 3415546 4614214 4534756 3435228`
repeated 7 times
6. Enter `vsi4`
See `/vsi4/geo,13,14,0x10`
7. Enter `vsi4=tvgr`
8. Enter `vsi4`
See `/vsi4/tvgr,13,14,0x10`
9. Enter `tvron`
See `!tvr? 0 : 0xffffffff : 0 : 1 ;`
and the TVR LED on the Mark 5B DIM turn green.
10. Move the VSI cable to the other VSI output of the Mark 5B Sampler Module.
11. Enter `tvron`
See `!tvr? 0 : 0xffffffff : 0 : 1 ;`
and the TVR LED on the Mark 5B DIM turn green.

12. Enter `mk5=dot?` and wait a few seconds.
13. Enter `mk5=dot?` again, and see the last number, `<DOT-OS difference>`, change by no more than a few milliseconds. If `<DOT-OS difference>` is drifting, then verify that `SAMPLE CLOCK` is locked to the rack 5 MHz, and that the Mark 5B system clock is synchronized to network time.
14. Enter `vsi4=geo`
15. Enter `mk5=dot_set=:force`
16. Enter `mk5=dot?` yet again.
17. See, among other things, `syncerr_eq_0`
If not, then check the `HOUSE 1PPS`

Contents of the `chkvsi4.prc` file:

```
define tvron          000000000000x
"tvron
" check vsi cable connections
" using the test vector generator in the sampler module
" and the test vector receiver in the mark 5b dim.
" dan smythe - mit haystack observatory - 2 july 2007
mk5=tvr=0
vsi4=tvgr
!+.1s
vsi4
mk5=dot_set=:force
mk5=dot?
mk5=tvr=0xffffffff
!+1s
mk5=tvr?
endif
```

```

define chksamp      00000000000
"chksamp - dls - 2 july 2007
"checks sampler statistics - mark 5b sampler
"from raw sampler outputs.
"requires 26-conductor ribbon cable from formatter j13 to decoder j7.
vsi4=,1,2
vsi4
samplesxy
vsi4=,3,4
vsi4
samplesxy
vsi4=,5,6
vsi4
samplesxy
vsi4=,7,8
vsi4
samplesxy
vsi4=,9,10
vsi4
samplesxy
vsi4=,11,12
vsi4
samplesxy
vsi4=,13,14
vsi4
samplesxy
endif
define samplesxy    00000000000x
"samplesxy - 2007 june 29 - dls
decode4=samples usbx
!+1.5s
decode4=samples
!+.1s
decode4=samples lsbx
!+1.5s
decode4=samples
!+.1s
decode4=samples usby
!+1.5s
decode4=samples
!+.1s
decode4=samples lsby
!+1.5s
decode4=samples
endif

```