Metsähovi station report Q1/2014
EVN TOG meeting – Wettzell

1) Receiver status

The new 86 GHz receiver has been suffering from instability issues and it will be repaired during 2014. The receiver should be functional at the last end of 2014 at the earliest. The 43 GHz receiver has been out of order for the last years. New LNA's have been ordered and received. They are being tested at the moment. The receiver should be functional hopefully before summer holidays. The 22 GHz receiver is working fine. However, in one of the EVN sessions in 2013 LCP's LO oscillated. The problem disappeared after the session before we had time to troubleshoot it. There have been some problems with the S-band of the geodetic S/X receiver since 2007. We changed the semi rigid coaxial cables of the receiver which were broken. S/X receiver should now work fine.

2) BBC/DBBC status

Our old analog BBCs have now been retired. We have switched to using DBBC + Mark5B+ combo in June 2013. We ordered a DBBC from Hat-Lab, and it arrived in September, 2012, with a standalone FILA10G. Fila10G works nicely. A Mark5B+ arrived in Spring of 2012. DBBC works mostly fine with firmware versions DDC v 104_2 and PFB v 14. We have had some issues with the DDC firmware. Sometimes when uploading the firmware something (perhaps related to timing) goes wrong, and the gain readings for BBC 05-08 remain too low when compared to other BBCs. The problem appears to be hardware related. We will take the boards with us to Wettzell for troubleshooting and fixing.

3) Disk recorder developments

We have developed a new DAQ system, the FlexBuff, using COTS components. Local UDP streaming performance tests : Wirespeed 10GE , Long (30min) tests show writing at max wire speed and 0 packet loss , Writing to 34 disks /wo net, architecture can handle 40Gbps; always >30Gbps. We participated successfully in the NEXPReS 4G demonstration using FlexBuff and Fila10G on September 18, 2013 → fringes!

4) Software versions

We have installed FS 9.11.4, SDK 9.2 and jive5ab 2.4.4. We are using DBBC firmware versions DDC v 104_2 and PFB v 14.

5) Other issues: phase cal, 1PPS and cont cal

Because the phase cal box is temperature dependent and because there has been a lot of drifting and phase jumps, the box will be temperature stabilised.

Phase coherence tests will be done prior to every session.

The 1PPS distributor destroyed the Metsähovi 1PPS going to the VLBI equipment. A new distributor has been purchased and the problem exists no more.

Continuous calibration is implemented but not yet tested.

6) Personnel

EVN VLBI Friend of Metsähovi starting from January 2014 is Minttu Uunila (minttu (at) kurp.hut.fi).

7) Mark 5A / Mark5B+ issues

We have fixed our Mark5A 1 Gbps recording problems by changing a resistor (R25 to a 27-ohm one) in the Mark5A I/O board. Mark5A is now only used for testing purposes. We have purchased a Mark5B+ system, which is in use but it had problems with its Bank A which did not work due to a broken StreamStor Amazon card. Mark5B+ is now used with jive5ab instead of DIMino.

Because the Bank A in Mh's Mark5B+ was broken, we used a special version of SSErase from Haystack to enable conditioning in Bank B. After conditioning with it, the modules were left in an unusable condition. Also several Mark5 related errors could be seen each time when using Mark5B+. After switching to jive5ab all the mentioned Mark5B related errors (listed below) disappeared and now we don't have to reboot Mark5B+ every time we change modules.
Mh used jive5ab for t2092 in October 2013, and not a single Mark5 related error appeared and we didn't have to reboot Mark5B+ at all during the session. We have used jive5ab ever since.

In October 2013 we loaned a Mark5C Amazon board from MPIfR and uploaded required firmware from Conduant to make it and Mark5B+'s daughter board compatible. Now conditioning and recording in both banks was possible. Mh Amazon board was shipped to Conduant for repair earlier. We got the Mh board back from Conduant at the end of 2012 and tests at Mh show that it appears to work fine now. The problems that occurred with our own Amazon board before switching to jive5ab are listed below.

7.1) Switching modules

Every time a module was changed Mark5B+ needed to be rebooted, otherwise Mark5 related errors in the FS appeared, for example, 'Device is not responding'.

7.2) SSErase error

During SSErase with the special version of SSErase the following error showed up:
SSErase ERROR: XLR error 148 Drive module is not ready

7.3) get_stats? Errors

Every time the inquiry was sent, the reply resulted in an error:
/mk5/!get_stats? 4 : 0 : Probably no such disk ;

7.4) Recording only zeros, September 2013

Below is a caption of one FS log filled with serious Mark5 related errors. The data recorded was only zeros.
2013.243.07:12:28.37/mk5/!status? 0 : 0x00040803 : 1008 : Disks misconfigured or
faulty ;
013.243.07:12:47.34?ERROR 5b -302 VSN does not contain + or - in first seven
characters
2013.243.11:19:03.07?ERROR m5 -900 Probably no such disk
2013.243.11:19:03.07?ERROR m5 -904 MARK5 return code 4: error encountered (during
attempt to execute)
2013.243.11:19:03.07/mk5/!get_stats? 4 : 0 : Probably no such disk ;
2013.243.11:39:33.25?ERROR m5 -900 Not bank mode
2013.243.11:39:33.25?ERROR m5 -906 MARK5 return code 6: inconsistent or
conflicting request

7.5) eur125 Mark5B problems, September 2013

The operator had written the following:
2013.245.12:05:50.33;"due some problems with Mk5 therecord of first scan strated with delay

But she didn't say what those problems were, and I couldn't find anything strange from the FS log.

Usually in this sort of situations there's no connection to Mark5B+. More Mark5B connection errors during eur125:

2013.245.13:24:54.00:disk_pos
2013.245.13:24:57.02?ERROR m5 -104 mk5cn: time-out, connection closed
2013.245.13:24:57.02:disk_record=on
2013.245.13:25:00.02?ERROR m5 -21 mk5cn: error connect(): mk5 device connection open timed-out
2013.245.13:25:00.02:disk_record
2013.245.13:25:03.03?ERROR m5 -21 mk5cn: error connect(): mk5 device connection open timed-out
...
2013.245.13:25:06.03?ERROR un 113 No route to host
2013.245.13:25:06.03?ERROR m5 -23 mk5cn: error opening, mark 5 probably not running, see above for error
2013.245.13:25:10.04?ERROR un 113 No route to host
2013.245.13:25:10.04?ERROR m5 -23 mk5cn: error opening, mark 5 probably not running, see above for error
2013.245.13:25:10.04:!2013.245.13:28:05
2013.245.13:25:13.04?ERROR un 113 No route to host
2013.245.13:25:13.04?ERROR m5 -23 mk5cn: error opening, mark 5 probably not running, see above for error
2013.245.13:25:16.05?ERROR un 113 No route to host
2013.245.13:25:16.05?ERROR m5 -23 mk5cn: error opening, mark 5 probably not running, see above for error
...
2013.245.13:25:19.05?ERROR m5 -21 mk5cn: error connect(): mk5 device connection open timed-out
2013.245.13:25:19.05?ERROR un 113 No route to host
2013.245.13:25:19.05?ERROR m5 -23 mk5cn: error opening, mark 5 probably not running, see above for error
...
2013.245.13:28:05.00:disk_record=off
2013.245.13:28:07.02?ERROR m5 -900 Already off
2013.245.13:28:07.02?ERROR m5 -906 MARK5 return code 6: inconsistent or conflicting request

7.6) t2090 Mark5B errors, June 2013

get_stats? Faults:

2013.176.20:03:22.64/mk5/!get_stats? 0 : 0 : 85188 : 9 : 8 : 55 : 11 : 3 : 0 : 45 : 0 : Fault ;
2013.176.22:09:32.69/mk5/!get_stats? 0 : 0 : 162895 : 17 : 8 : 90 : 15 : 3 : 0 : 54 : 0 : Fault ;

Many of these, too:

2013.176.20:40:48.50?ERROR sc -13 setcl: formatter to FS time difference 0.5 seconds or greater

One of these:

2013.176.21:19:04.27?ERROR m5 -104 mk5cn: time-out, connection closed
2013.176.23:21:30.20:checkmk5
2013.176.23:21:36.49?ERROR m5 -104 mk5cn: time-out, connection closed