Minutes for AMiBA Engineering Telecon

<u>Meeting Date</u>: 24-Nov-2005

<u>Participants:</u>
<u>Australia:</u>
<u>USA:</u> Hiroaki MT, Pierre, Faby
<u>Taiwan:</u> Homin, Kyle, Edwin, Patrick, Eugene, Keiichi, Paul S.
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Minutes Recorder: Kyle

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I. New Action Items:

II. Previous Action Items (still open):
(29/Sep/05)
Ted – Routing cable from ground up to platform. (See <u>Site</u>)
(08/Sep/05)
Po-I/Ted – Design a sturdy optical telescope mount (including fixure of the CCD). (See <u>Mount</u>)
(07/Jul/05)
Pierre – Top priority to improve the shelter. (See <u>Shelter</u>)

III. Closed Action Items (as of this meeting):

IV. Miscellaneous Discussions:
<u>Platform:</u>
MT – Philippe is away now. We need him to finish the analysis on the photogrammetry asap.
(17/Nov/05)
Philippe – I used FEM to simulate the platform deformation. I can not reproduce the saddle pattern seen by photogrammetry. The FEM shows comparable deformation in magnitude but the pattern is like bending from one end, not a saddle shape. Taking Patrick's and Kyle's suggestion, I applied a 'thermal load' to the upper u-joint so that it adds about 100um to the original upper u-joints plane. The pattern changes but still not quite the same as real data. I will keep trying on this direction.
(29/Sep/05)
Philippe – I will spend some time to look into the safety issues of operation.
C.T. - I would like to ask the science team to finalize the configuration of 7-element receiver locations.

<u>Shelter:</u>
MT – Pierre is working on it.
(03/Nov/05)
Pierre – The load sensor is still not acquired yet.
(13/Oct/05)
Pierre – One year ago we asked Manfred to add a few relays and software in PLC to indicate mount is in parking position. We need to test its function whether the relay is closed when the mount is parked when next time I am in Hilo.
Pierre – I am working on improving the shelter. I plan to go to Hilo in November.
Pierre – I have sent a mail to ASFI for calculations and detailed drawings.
(29/Sep/05)
Pierre – Fabric is becoming more and more a problem.
Ted – New lift cable is not installed yet because the pulley and tower need to be modified. It will take 1 to 2 weeks.

<u>Mount:</u>
MT – Optical telescope bracket, no word yet. It should be in progress.
MT – We had a discussion on pointing yesterday with Michael, Patrick and Hriaki.
Hiroaki – One problem is the hexpol rotation. We observed 40deg arc when we commanded only 20deg rotation. Michael suspected the optel tilt correction being wrong. We did three more tests: optel tilt correction off, different Hx and Hy, and rotation during startracking. I have some data is the result is under discussion.
Patrick – There are three major problems left with Vertex:

(1) az=0 obspol=0 crossing, clearly software problem
(2) timing offset leading to velocity dependent error in program track
(3) skypol rotation problem Hiroaki reported earlier
We should also get some answers regarding our last report to Vertex by the end of this week.
Hiroaki – We found a new oscillation problem related to interpolation table. If we turn off the table, the mount can not move back to az=0. I will send a report to Vertex.
(17/Nov/05)
Hiroaki – I am now working on the automatic pointing. It does not work now. So we checked more basic functions in a_boss. Startrack works, but image taking has some problem. It reported images were saved, but we could not find any image. Homin is solving this problem now.
Hiroaki – I also took 48 stars pointing data with interpolation table correction. The data need to be analyzed, but looks consistent with Patrick's analysis of previous data. I will also take the same data without the interpolation table correction.
(10/Nov/05)
Ted – The optical telescope bracket design is sent to Dayton-Jackson. However, because of material and machining problem, it will take them about 1 month to finish.
(25/Aug/05)
Patrick – Some temperature sensors have loose wires that need to be soldered. Someone onsite or in Hilo can do it.

Site:
MT – Cable routing from cone to platform is done and some tests are needed.
Pierre – Is there a coax cable for 10MHz clock from GPS time server to correlator on the platform?
MT – Eventually it will be done.
(03/Nov/05)
Ted – Last week I was informed by Proty and Kyle that the central hole is still needed to install a receiver. I am now redesigning the fixture. It will block some holes next to the central hole. If any of the six holes next to the central one is needed, please let me know soon.
(27/Oct/05)
MT – We are going to place another container in the site and make it into two sleeping quarters.
(27/Oct/05)
MT – As for a new car, we seem to have reach a consensus. We also need emergency generator and lightning protection.
Pierre – I will talk to a electrician in Hilo about emergency generator when I am in Hilo.

(11/Aug/05)
M.T. - Open issues in general on site:
(1) spare parts for the mount. Philippe will be in charge of it.
(2) helium lines and cables routing to the platform
(3) lightning protection
(4) emergency generator
(5) how do people access the platform. Cherry-picker, ladder?
(6) accomodation on site -> 2nd container for sleeping? Or visitor building for sleeping and 2nd container for office?
(7) a new car

Receiver:

(17/Nov/05)
Johnson – One receiver is being monitored for temperature variation. The other three are ok. I think Rx3 and Rx4 are ready to go up to the site. As for compressor, we have tested one. The other one needs some helium line. I will test the 2nd compressor next week. I think I will test all the receiver again.
(10/Nov/05)
Johnson – I will warm up one rx later to test the difference in Tsys with and without the noise coupler.

Minutes for AMiBA Engineering Telecon

Kyle – The first two Rx on the platform can accept one polarization of calibration when the cal source is ready.
(03/Nov/05)
Kyle – Have we bought some temperature sensors for the correlator and IF system?
CT – This part is on-going.
(09/Jun/2005)
Pierre – Two quick fixes to the LNA power supply card.
> 1. Reverse the protection diode instead of removing it should provide a protection at 3V.
> 2. The polarized capacitor at output is reversed and I suspect it is dead. They should be replaced.

LO/IF:

Eugene – Shu-Wei (Edwin) sent out a test result of DRO to some people. We have successfully suppressed the 60Hz spurs. The spurs are now below 50dBc while the noise floor is 60-70dBc. The phase noise is about 0.5deg. Frequency drifting is only 1-2 Hz. Next is to machine the heat sink for the new 100MHz reference clock and then we can mount them back to the module and ship to Hilo.
Eugene – Basically we add some voltage regulator to suppress the spurs from power supply.
Homin – I think Eugene has made this DRO more stable than the one in Hilo. I think we should modify the Hilo one to the same spec.
Eugene – The DRO in Hilo can not cut the internal reference, so it can not lock to a more stable external reference. I suggest we build a new one and use the old one in Hilo as a spare. Currently the DRO in Hilo has spurs of about 240Hz.
(17/Nov/05)
Eugene – We are working on the frequency drifting problem. Production DRO uses an external oscillator to lock the frequency and is different from the DRO in prototype. We will compare the performance. If the production one is not good, we will use the prototype one to replace it and send the bad one back to vendor for repair.
(27/Oct/05)
Johnson – We also tested the phase switch in IF/LO5. The result is different from Steven's. I used 2.4mm cable but Steven used 3.5mm cable. 2.4mm should give the correct result. I will use 3.5mm to double check the consistency.

Correlator:

(17/Nov/05)
CT – I am doing final inspection for the installation. Also working on some software problems in the data acquisition here.
MT – We should find another time to discuss about the test plan. What to test first and what's second.
(10/Nov/05)
CT – I am looking into the backup plane of readout system. Simulation shows the FPGA should work. I will continue this after I get back from Hilo. I will depart next week.
(06/Oct/05)
C.T. - I want to test one baseline with eletronically-tuned attenuator for LO to balance the power between phase states. One concern is if the control has some delay (like we found in prototype testing with a PIN attenuator in 21GHz LO), then the scheme would not work.
(29/Sep/05)
C.T. **-** We got three comments from the workshop:
> 1. automatic gain control (AGC) of IF power
> 2. LO power balance in phase switch
> 3. thermal stablize the correlator and IF

C.T. - Derek suggested to put some temperature sensors in the correlator box. We will discuss about it in more detail.

Calibration System:

(10/Nov/05)
Kyle – Pierre is going to order the computer and motion control components.
(13/Oct/05)
Kyle – I will put together a schedule when the calibration should be online and when we should really push to finish the system.
(29/Sep/05)

Minutes for AMiBA Engineering Telecon

Kyle – I will circulate the test results presented in the workshop for more comments. And we also need to discuss the next step of the calibration system.

<u>1.2m dish:</u>

(17/Nov/05)
Philippe – I am going to Taichung today to check on Cotech's progress of the 1.2m dish. The mold is finished. They will lay up the main mirror.
(10/Nov/05)
Patrick – Locutus is designing the interface with beam pattern measurement setup.
Ted – Philippe will visit Cotech. He will probably show up in Taipei next week.
(03/Nov/05)
Ted – I have sent drawing to Goretex and ask them make one cover for 60cm dish. I will probably get a reply tomorrow.

<u>Misc:</u>

Kyle – We had a discussion here in Taipei before Philippe left. We discussed his FEM analysis and photogrammetry results. We further exchanged some ideas about the phase error induced by platform deformation and the correction in visibility. However, we should come up with a spec on the phase error and hence the platform error.
(17/Nov/05)
Kyle – I sent out an email asking for a meeting to discuss about the laser measurement system for platform deformation. Since next week is not a good time in Hilo, please send me a time that is good, and then I will make the announcement.