

# Minutes for AMiBA Engineering Telecon

Meeting Date: 01-Dec-2005

Participants:

Australia:

USA: Hiroaki MT, Pierre, John, CT, Ted

Taiwan: Homin, Kyle, Patrick, Eugene, Keiichi

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Minutes Recorder: Kyle

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## I. New Action Items:

Joshua - Attachments on platform for cable routing (See Site)

## II. Previous Action Items (still open):

(08/Sep/05)

**Po-I/Ted** - Design a sturdy optical telescope mount (including fixture of the CCD). (See Mount)

(07/Jul/05)

**Pierre** - Top priority to improve the shelter. (See Shelter)

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

(29/Sep/05)

**Ted** - Routing cable from ground up to platform. (See Site)

## IV. Miscellaneous Discussions:

### Platform:

(24/Nov/05)

**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.

### Shelter:

**Pierre** - I ordered some stuff but waiting for the load sensor. Will proceed to install other things. Jackie helped place the order. It will take about two months.

**MT** - ARL people have some problem with their visa. Once it is settled, they will come and stay in Hilo from Dec to Apr.

(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 have sent a mail to ASFI for calculations and detailed drawings.

(29/Sep/05)

**Pierre** - Fabric is becoming more and more a problem.

### Mount:

**MT** - Optical telescope bracket under final surface treatment in LA. We expect it to come back in a few weeks. Patrick will decide when it is best to change the bracket.

Hiroaki - Homin fixed the ccd image taking problem. Automatic pointing pipeline was tested but found some problem. It seems the image was taken right after the startracking command is given while the mount is moving. It should have waited

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for the on-source flag. Homin and Michael will fix this problem. Another thing is the images taken are dark.

**Homin** - I will look into these issues. Hiroaki needs to wait till the problems are solved.

**Homin** - Another issue is that on TCS, some library disappeared. They were put under /usr/local/..., and amibausr has write privilege. That means everyone could have accidentally erased them. We should start to manage TCS, like creating an account for everyone.

**Patrick** - I have analyzed four sets of 48 stars pointing data. Sep/28 has one set without interpolation correction, and Nov/18 has another set with the same setting. Nov/16 and Nov/18 each has a set with interpolation correction based on the data of Sep/28. The two sets without correction, separated by two months, have as large as 5' systematic difference. The repeatability is so bad that any further analysis can not be trusted. However, the two sets with correction, taken only two days apart, show about 1' difference and is pretty good. Either there's something different after Sep/28 or the long term repeatability is really bad. We need more data to confirm.

(24/Nov/05)

**MT** - We had a discussion on pointing yesterday with Michael, Patrick and Hiroaki.

**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 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.

(25/Aug/05)

**Patrick** - Some temperature sensors have loose wires that need to be soldered. Someone onsite or in Hilo can do it.

### Site:

**Ted** - Major part for cabling from ground to platform is done, including cable wrap and fixtures. The rest of work is pending till we have manpower and resource to finish.

**Ted** - Last week we also installed two correlator box on the platform. And two lifting cable for the shelter were replaced. About safety net, I am contacting the vendor. Should we also put some net extended from the platform edge?

**Homin** - I suggest people who install anything on the platform to post it on the rxblog so other people know what has changed. They may affect things like pointing results.

**Joshua** - When I install some cable on the platform, I found we have no more spare holes to tie down the cable. Now the cable is temporarily put inside the platform(?)

**Ted** - If we want to drill holes on the platform, we need very special drills and probably need a specialist to do the job.

**MT** - Probably we can use special glue to put attachments. Some preparation should be done. Joshua will look into this issue.

**Homin** - We can consult Bill Liu or ARL people. They are expert on carbon fiber structures.

**Chia-Hao** - We found the He line on site can be shorten by 15' (~5m). We can order the 2nd set shorter.

**Ted** - The compressor to be sent to ML needs to be purged. Waiting for He to come.

**John** - We are changing IP address on site. Almost done now. I will send a report when it is done.

**Pierre** - I got a quote for a 2nd hand generator. I will get some comparison prices.

(24/Nov/05)

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**Pierre** - Is there a coax cable for 10MHz clock from GPS time server to correlator on the platform?  
(03/Nov/05)

**Ted** - Last week I was informed by Protty 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:

**Johnson** - I measured the Trx for four receivers in Hilo. 7 out 8 channels show Trx below 70K and one channel around 85K. This result is much better than the result we got before. I think new result is more accurate, taking into account proper measurement power level, and better 42GHz LO optimum power.  
(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)

**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:

**Johnson** - I did integration test on the IF/LO in Hilo. Module #1 has a damaged semi-rigid cable and is replaced. Module #2 has one IF amplifier that shows oscillation problem and we replaced it.

**Eugene** - We are closing the case of DRO modification. Now revising the heat sink. Next will ask Edwin reassemble IF/LO 5-8 with revised electronic boards. It will take about 2-3 weeks.  
(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:

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(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 electronically-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 stabilize 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)

**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.

### 1.2m dish:

**Ted** - About the dish cover, I have placed an order to GORE to buy 45" of GORETEX. Now designing structure to hold it and try on one dish (60cm).

(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.

### Misc:

(24/Nov/05)

**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.