

# Minutes for AMiBA Engineering Telecon

Meeting Date: 27-Oct-2005

Participants:

Australia:

USA: M.T., Hiroaki

Taiwan: Homin, C.T., Kyle, Edwin, Ted, Chia-Hao, Patrick, Johnson, Paul S., Eugene, Joshua, Paul H., Faby

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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 Site)

(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):**

(13/Oct/05)

Philippe/Ted - Photogrammetry analysis. (See Platform)

**IV. Miscellaneous Discussions:**

Platform:

**MT** - I got a report from Philippe and will forward it to people. A fast statement I draw from the report is that in "compact config" the deflection should be within 100um.

**Ted** - The setup was 6 dummy weights on the outskirts of the platform, which should give the worst scenario.

(29/Sep/05)

**C.T.** - Can we modify the receiver hole covers to be able to hook the harness?

**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.

(22/Sep/05)

**Ted** - The cables will be mounted under the platform. I have some weight information and Joshua can order standard cable trays directly.

(11/Aug/05)

**Paul** - Kyle, organize a separate meeting in Taipei with some engineers to sort out the issues with laser measurement system.

Shelter:

(27/Oct/05)

**MT** - Pierre is on leave. He is having some trouble with buying the load sensors. Jackie and I will help him on this.

(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.

**M.T.** - A contract with ARL is being worked out now. We'll try to get them to come to Hilo in early Nov. They will stay for quite a some time.

**Pierre** - I have sent a mail to ASFI for calculations and detailed drawings.

(06/Oct/05)

**Pierre** - About hiring a civil engineer to inspect our shelter, we lack the drawings and documents. Will ask ASFI for them. The cost for the engineer to come and check is around 10k.

(29/Sep/05)

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**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.

### Mount:

**Homin** - The optical telescope mount should be made in Hilo.

**MT** - Ted is coming to Hilo soon. Please discuss with Dayton directly after you get here.

**Hiroaki** - We did some more tests on program track and I need to analyze the result. Another thing is to compare the trajectory the hexapod follows with the input. I will release soon. We received a new PTC software but it still does not read our pointing table. I will check our format. About the automatic pointing pipeline, Michael informed me it should be ready. I plan to do some tests later today.

**MT** - Please ask Stephan's comment on your pointing table.

**Patrick** - I suggest we test circular trajectory with different step size. We may check when does the real trajectory starts to deviate from the input.

(13/Oct/05)

**MT** - Michael has some communication with VA about network between ACU and TCS. I will forward the email to people who are interested in.

**Hiroaki** - I will also do some analysis on the current pointing data.

(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** - I am designing a fixture to run cables through center of the platform.

**MT** - We are going to place another container in the site and make it into two sleeping quarters.

(27/Oct/05)

**Ted** - I wrote an email to people in NASA who also uses hexapod for flight simulator. They run cables through the center of the hexapod. Since we are on a much larger scale than theirs, we need some fixtures and clamps to support cables.

**Ted** - On the top we plan to use the central hole and probably a few neighboring holes. On the bottom, we will need some kind of funnel shape structure to catch cables when platform is lowered.

**MT** - I am looking for a 2nd container on site. Whether it should be for sleeping or for office, we should make a decision soon.

**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.

(06/Oct/05)

**M.T.** - We need more engineering mind to help solve the cabling problem.

(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** - Chia-Hao packaged Rx5 and Rx6 for shipping next week. We tested the stability of DRO for 5hr. Although the case temperature of the oscillator increased from 26 to 31 degC, the power only dropped by 0.3dB. I think we can ship it out now.

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**CT** - There are some homemade cables in the module. Remember to order some new ones to replace.

**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.

**Chia-Hao** - I will order helium lines from Austin. It should be cheaper than ordering through Taiwan.

(06/Oct/05)

**Pierre** - 1-to-4 cold head power distribution box is finished in the lab. Need to more receivers to be connected and tested if it really works to cool down four Rx. If it work, then we can ship it up to ML.

(15/Sep/05)

**Eugene** - The Tsys were measured with noise coupler installed and seems to be higher than the earliest measurements done on Rx1 without a noise coupler. We need to repeat the test on Rx1 with noise coupler to see whether it increased the temperature or not.

(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:

(08/Sep/05)

**Eugene** - Johnson reported the modules in Hilo need two hours after switch on to reach stable performance. I think it indicated thermal isolation and the device need time to heat up and establish equilibrium. I think the thermal link should be improved to protect the devices.

### Correlator:

**CT** - I found some broken link in the software of data acquisition. I will ask Warwick about it.

**MT** - The correlator bracket has arrived Hilo.

**CT** - Po-I is leaving today for Hilo. He will work on the bracket.

**CT** - I investigated the polarization leakage based on the spec we gave NRAO for the polarizer (0.1dB power difference, 5deg phase error). I found 6% leakage between L and R. It seems to me phase error is more important than amplitude balance.

**Kyle** - We are only going to measure total intensity I. Leakage between L and R is not important. However, amplitude imbalance will result in I leak into Q and U and that's what we don't want.

(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.

**C.T.** - I will increase the phase switch speed to 2kHz or 4kHz to beat the 1/f noise in our system.

(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

**Homin** - Software to control VGA is ready. Once we have the total power detector reading, we can close the loop.

**M.T.** - Our problem is that VGA has different gain and phase response under different control voltage. Can we really use it to do AGC?

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

### Calibration System:

(13/Oct/05)

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**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.  
(18/Aug/05)

**Kyle** - Pierre found a quote for the motion controller and the PC/104.

**M.T.** - We should discuss it offline. There should be another person to work on this part since Pierre will be working on the shelter part. There may be some changes to the design and so we should hold on the ordering.

### 1.2m dish:

**Ted** - I got contact with Gortex about cover for the dishes. I will send them a drawing and see if they can make the shape we like and make a test.

**MT** - Is the cover incorporated into the dish design?

**Ted** - I have contacted Cotech about it and they will make some modification but it is not in the contract. They just started making the mold for primary. The cover will involve change in baffle. They have not started that part yet.

**Ted** - Philippe will visit Cotech (Along) in mid Nov when they are laying the primary on the mold. If not done properly, the thickness and structure will be affected.

**Patrick** - I have consulted Po-I about changing the interface between the dish and the equatorial mount (tripod) for beam pattern measurement.

**MT** - Since Po-I does not have time, and the design is not that difficult, I suggest we let people in charge of beam pattern to come up with the design. That means probably Locutus. Po-I can help if he has a problem.  
(29/Sep/05)

**Philippe** - Paul S. Said he will organize a telecon with Along this week or next week.

**Ted** - We probably want to add some cover on the dish, so we need to ask Along to leave this possibility of the baffle.

**Philippe** - We can discuss it with Along in the telecon, but we need to specify more clearly what we need.

### Misc: