# Minutes for AMiBA Engineering Telecon

Meeting Date: 26-Jan-2006

Participants:
Australia:
USA: Bill, Keiichi, MT
Taiwan: Homin, Edwin, Eugene, CT, Paul S., Chia-Hao, Joshua, Johnny, Paul H., Hiroaki, Ted, Kyle, Pierre, Patrick
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Minutes Recorder: Kyle

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**I. New Action Items:**

**II. Previous Action Items (still open):**
**Philippe –** Summary report of photogrammetry measurement.
**Ted/Bill** – Replace the damaged motor for shelter.
**Keiichi/Patrick** – Mount testing.
**Bill/Ted/Pierre** – Modification of shelter.

**III. Closed Action Items (as of this meeting):**
**Keiichi** – Summarize dish configuration issue.

**IV. Miscellaneous Discussions:**
Platform:

(19/Jan/06)
**MT –** I talked to Philippe about the photogrammetry report. He's having some difficulty in finding out a fitting function for all the data we've taken. Nevertheless he will circulate the report in this week. I am hoping someone in Taipei can help him on the fitting. Last time Ted sent the data to Prof. Chiueh and some people. We haven't heard anything yet.
(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:
**Bill –** Ted sent me some external drawing of the motor, but I would need some more detailed interior drawings to open and check it.
**Ted** – That's what the vendor could provide. They also claimed that the motor can hold 15,000 lb before breaking. If our max load when unbalanced is 8,000 lb, the motor should be ok. It is hard to figure out what causes the weird sound without looking inside.
**Pierre** – If we are going to buy new motors to replace them, I suggest we buy ones with 3 phase electrical power because it would provide better balance than 2 phase motors and we have more electrical power on 3 phase. On the other hand, if only the gear box was damaged, we can just replace the gear box.
**MT** – Pierre please talk to Ted to see what choice of 3 phase motors do we have before you leave Taipei. And when you come to Hilo, you can check the motor with Bill.
**Ted** – We prefer to make the I-beam to elevate the shelter in Hawaii, either Aloha machine shop or Mu's machinery. If we ask ARL to do it, plus shipping time, and it will be much longer than in Hawaii.
**MT** – Ted please send the information to Bill so we can continue this work during the Chinese New Year.
**Ted** – About the installation procedure, I will circulate it after consulting Bill.
(08/Dec/05)

**Pierre –** I rewire the motor control and it is working. Now I am working on software. Also I'm waiting for some parts for hand panel and other things.
(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.

Mount:
**Keiichi –** The problem about reading log file was solved last week. All data were being analyzed, and Patrick, Michael and Hiroaki gave me some comments. The software pre-hard limit still has some problem. The velocity dependent accuracy in program track mode is about 7 to 10 arcsec while we expect 1 to 2 arcsec. The connection timeout issue requires Vertex's response. And I will do some more tests about the center of rotation tomorrow.
**MT** – The new optical telescope bracket is hard to installed. Bill has some ideas about how to do it and we will do some tests before real installation. For the pointing tests, Keiichi will still use the original bracket.
(19/Jan/06)
**MT** – I will discuss with Patrick and setup a meeting with Vertex to solve the timeout problem.
(16/Dec/05)
**Michael** – Repeatability needs to be checked. I think we can observe the same star several nights in a row. If they agree with each other, then it's probably good enough. For longer period, like a month, change in pointing model, we have to live with it. We will change the interpolation table regularly. On the other hand, there aren't many factors to change the pointing.
(25/Aug/05)
**Patrick** – Some temperature sensors have loose wires that need to be soldered. Someone onsite or in Hilo can do it.

Site:
**Keiichi –** About the dish config, we can start with 60cm dish on 1.4m baseline for CMB power spectrum and then replace with 1.2m dish and continue on SZ observation.
**MT** – Keiichi could you start thinking about the observing plan for the year based on some information and assumption of hardware availability and put it in writing to show people?
**Ted** – There were some discussion about the insulation rating and circuit breaker location of the sleeping container. Since the vendor has not received our order yet, we still can modify the design.
(19/Jan/06)
**MT** – I asked Philipe to start design an insulating wrap around the cone and hope to reduce thermal deformation. That's a long term plan.
(08/Dec/05)
**Pierre** – I got a quote for the 2ndhand generator. It's about 10k including shipping to site. I'll also look for some comparison.
(24/Nov/05)
**Pierre** – Is there a coax cable for 10MHz clock from GPS time server to correlator on the platform?

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

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Receiver:

**Edwin –** IF/LO #5 and #6 were just shipped out this morning.
**Johnson** – Rx1 and Rx2 can go to site at end of Feb.
**MT** – We can discuss about the schedule offline.
**Homin** – For expansion to 13 element, Michael said it should be ok for them to make some cards for receiver.

(19/Jan/06)
**Homin** – We tried to reinstall the monitor PC with the standard OS for other AMiBA PC (RedHat 9.0) but glish (to be used by Grxmon) failed to be installed. I have gathered some error messages.
**Michael** – glish is a powerful scripting language but we almost only used for its GUI. I will talk to Homin to see if there's something I can help.

(08/Dec/05)
**Pierre –** I found that the LNA bias comes from a 7805 regulator which is sensitive to temperature change. I ordered a 8588 chip which is programmable and more stable. I plan to use hair dryer to test it.

(10/Nov/05)
**Kyle** – The first two Rx on the platform can accept one polarization of calibration when the cal source is ready.

(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:

(19/Jan/06)
**Eugene –** We almost finished testing of IF/LO 6. We have found some space possible to put more heat sinks to reduce the heat dissipation problem. And we are aiming to ship out #5 and #6 next week.

Correlator:

**CT –** I received the new PC last Friday. I installed the software but it requires some tuning due to some new hardware. The clock is ok, no timing problem.
**Kyle** – Could we setup a correlator system in Hilo? For example, we may use the prototype system. It is not the same as the production system, but we will be able to do some tests in the lab.
**CT** – AT was planning to supply as two sets of new correlator system, but we received only one complete set and part of the other. I would like to test the prototype cards compatibility. If they are compatible, then we can assemble a second correlator system in Hilo as spare and for testing.
**CT** – As for parts for expansion, I haven't heard from Warwick because he just got back from vacation. I will contact him again.
**Chia-Hao** – The translation stage was shipped out this morning as well.

(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.

Calibration System:

(12/Jan/06)
**Kyle –** Before Pierre went on vacation last week, we contacted a few vendors about the Linux version and driver for the motion control compatibility. One of the vendors had

good response but the other did not answer yet. I will keep pushing them to find an answer.
(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.

Dish:
**Paul S. –** Cotech found some problem in the coating and will redo the coating.
**Patrick –** For future 1.2m dish beam pattern measurement, the far field requirement will be 0.5 to 1 km. Our current setup is about 100 m separation, which is a little short for 60cm beam pattern. We should think about it. We had discussed about sending the dish to AT for measurement. How about it now?
**MT** – It also costs some money. Let's discuss with the students to be doing the beam pattern measurement to see if they can solve it.
(12/Jan/06)
**Paul S.** – The small telescope holder is in the design but the fabric holder is probably not. I will ask them to clarify.
**Ted** – About the 60cm dish cover, Dayton said he can only finish the structure early next week. By that time, I will be gone. The fabric from GORE will come in early Feb.
**MT** – Bill, can you help on this issue? Just check how it looked like and maybe if you have some other idea.

Testing:
**Johnson –** We had some discussions this week. I think we need about two more weeks for monitoring the system and the schedule may overlap with pointing. So I think we can secure the instrument under the platform and use a 8m GPIB cable to record data on the cone.
**Pierre** – Transmission may become unstable at long distance. You should be careful. Another way may be to convert the GPIB to CAN bus or ethernet, and then the distance is not a problem.

Misc:
**Keiichi –** Mark Birkinshaw and Katy Lancaster are planning to come to Hilo. When will we be doing fringe?
**MT** – We will have first light with dish, and it will happen after the shelter elevation is done. And by the time we have a successful fringe, we may want to have a dedication, also for the NSC review.
**Paul H.** – For the review, I think it is better held in Hawaii where they can see the actual thing and a successful fringe. We'll try to arrange a good time for it.
(12/Jan/06)
**MT –** I think we really need to solve the Vertex problem and close the contract. RF test will begin in Feb. Now we are lacking manpower for the test. Johnson has done some testing regarding freq drifting and noise temperature. Let’s wait for his report.
(16/Dec/05)
**Patrick –** MT mentioned that we should have a place to collect all the important information and factors of the system, different from the everyday communication of problems.
**CT** – I think for what Patrick said, people can request such information in the weekly meeting and the responsible person will come up with the information and be collected somewhere. The important information does not change very often.