

# Minutes for AMiBA Engineering Telecon

Meeting Date: 05-Jan-2006

Participants:

Australia: Michael

USA: Ted, Bill, MT, Paul H.

Taiwan: Homin, Kyle, Edwin, Eugene, CT, Paul S., Chia-Hao, Joshua, Johnny, Paul S., Keiichi

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Outside USA Dial-in = 1 847 330 4361

Minutes Recorder: Kyle

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## I. New Action Items:

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

(29/Dec/05)

**Bill/Ted/Pierre** - Modification of shelter.

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

## IV. Miscellaneous Discussions:

### Platform:

(22/Dec/05)

**Ted** - Philippe is preparing the final report on photogrammetry. He will send it out before new year. As for the data, I have sent out to some people including Prof. Chiueh and Proty.

(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:

**Ted** - We have put the plan for elevating the shelter on RxBlog. Please take a look. The current schedule is to do the modification in mid Feb, taking one day to a few days. We'll try to minimize the interruption on mount operation. As for manufacturing the parts, we'll first ask local shops in Hilo. If they can not do it, we may also consider shops in Honolulu or Taipei. ARL may also provide some help.

(29/Dec/05)

**Ted** - We heard some strange noise from the motor. I did some calculation and found that it can roughly support the shelter. Taking into account the imbalance problem and wind factor, the motors were probably overloaded. The noise might mean some damage to the reduction gear. We will study whether we need to replace both motors and the lifting cable.

(08/Dec/05)

**Pierre** - I rewired the motor control and it is working. Now I am working on software. Also 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** - I am going to Hilo next week and my first task is to check the new Vertex software.

**Ted** - Do you plan to install the new optel bracket? Since the last time Hiroaki did pointing, we have added about 130kg weight on the platform and the repeatability may be invalid.

**Homin** - Let's wait for Patrick to make decision. He will be back in this week.

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Michael - I think it would be better if the optel axis can be aligned with the platform. That would make the analysis easier. To achieve it, for example, we can point the platform to zenith and use the tilt meter to measure both optel and platform to be horizontal.

(22/Dec/05)

**Homin** - We tried to find the problem of network timeout to ACU issue, but Michael does not have enough information. We need to start logging a fault report whenever tests are done and errors encountered. I have added a category in the blog.

**MT** - You should see what SMA test log looks like. No matter how boring it is, you note it down.

(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:

**Ted** - We have cooled down Rx3 and are pumping Rx4. DRO has been installed and Johnson is connecting it up with the Rx. To pump the Rx, we need to put the vacuum pump on the cone and use the long pipe. For future installation, Johnson suggests to pump Rx to high enough vacuum ( $<1e-6$  torr) on ground and then move to install it on the platform.

**Ted** - We've also assembled the scaffolding from McMaster-Carr. The width is narrower than the ones we rent locally but should be ok. We will need some foot step to adjust height working under the platform. I will order 4 of them.

(29/Dec/05)

**Bill** - We are doing some design for the large holes on the supporting cone. We'll discuss with Kevin when he comes back from vacation.

**Johnson** - Receiver installation on the platform encountered some mechanical interference. At some locations, the 42GHz variable attenuator sticks out of the receiver cylinder and interfere with structures under the platform. I think by modifying the LO module bracket, and shift the LO module by 3cm, the problem can be solved. Other ideas are welcome.

**Ted** - I am asking for quotation for the container from one of the companies.

(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?

(27/Oct/05)

**MT** - As for a new car, we seem to have reach a consensus. We also need emergency generator and lightning protection.

(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?

### Receiver:

**Chia-Hao** - We will ship out Rx5 and Rx6 tomorrow.

(29/Dec/05)

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**Johnson** - The LNA in Hilo can be used to assemble another two receivers.  
(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:

**CT** - I will ask Johnson to monitor the (DRO) frequency drift on platform with temperature variation.

**Eugene** - The 42GHz LO amplifier case temperature is 30deg higher than ambient temperature for the old heat sink. We will do a comparison when we finish the new heat sink. We'll also check the power drop due to temperature.

Eugene - IF/LO #5 and #6 will be sent out before Chinese New Year to replace the ones in Hilo.  
(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:

**CT** - We tested another main board from a different company. The time drift was found to be 16sec/day, compared to the current one with 200sec/day. It's about an order of magnitude better. We've also tried to use the stable external oscillator on this MB. The drift is about 0.1sec in 2hr, which is also about 10 times better than the current one. I will do some long term monitoring to isolate some error with network time protocol. With this new performance, we should resolve the synchronization problem because the ATDC will update system time every 15min.

**CT** - I need some time to transfer and update the software to the new PC. In the near future, we will still use the current corr PC to test and replace it later.  
(29/Dec/05)

**CT** - Next time when I go to Hilo I will try the 300N gas spring on the correlator bracket. Other problems may show up and we will solve them together.  
(22/Dec/05)

**Po-I** - I have made some modification to the translation stage mount design. The detail can also be discussed after meeting.  
(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

### Calibration System:

**Pierre** - The choice of motion control and PC/104 is dependent upon which OS (DOS or Linux) to use. Since the system only accepts command via ethernet from

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outside, it does not really matter which OS is used. The choice probably depends on the taste of the programmer.

**CT** - If it does not matter which OS to use, we should make a decision soon and find the appropriate people to work on it.

(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:

(22/Dec/05)

**Ted** - The mechanical structure to hold dish cover will come back in mid-Jan. However, the order of fabric to GORE is delayed in processing. We will test the structure using some other fabric.

**Paul S.** - Dr. Ong said the primary will be finished within one month and sent to ITRI for surface measurement. A piece of coating sample will also be given to us.

**MT** - Does anyone have some idea about how to measure the coating?

(10/Nov/05)

**Patrick** - Locutus is designing the interface with beam pattern measurement setup.

### Misc:

(22/Dec/05)

**Kyle** - Are we going to schedule a time to discuss the testing plan?

**MT** - Let's wait when Patrick is back, maybe early Jan.

(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.