

# Minutes for AMiBA Engineering Telecon

Meeting Date: 08-Dec-2005

Participants:

Australia:

USA: Pierre, CT, Ted, Joshua, Johnson

Taiwan: Homin, Kyle, Patrick, Edwin

USA Dial-in = 1-800-653-5390, 6668081#

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Minutes Recorder: Kyle

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## I. New Action Items:

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

(01/Dec/05)

**Joshua** - Attachments on platform for cable routing (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):

## 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 rewire the motor control and it is working. Now I am working on software. Also waiting for some parts for hand panel and other things.

(01/Dec/05)

**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:

**Patrick** - Keiichi may plan to go to Hilo after the ALMA workshop in mid-Dec, but testing would depend on Vertex's software update. If there's no update, it can be a good time to do a consistent pointing check from the beginning.

**Ted** - We just received the optel bracket this morning. Should we install it?

**Patrick** - Basically ok, but let me think about it and let you know.

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**Patrick** - Hiroaki reported that he had done an automatic pointing run with 100 stars. It was stopped with timeout problem. He wanted to check log file whether all information is correctly logged.

**Patrick** - We sent a report back to Vertex regarding the new software, but all the major problems remain. The only problem solved is the oscillation when interpolation table was turned on.

**Patrick** - About the pointing repeatability problem I reported last week, now I got some more feedback. However, not a possible cause can fully explain what we saw. The extra tilt is in the same direction of the original tilt. That is too systematic and there has to be an explanation. More tests will follow.

(01/Dec/05)

**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 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.

(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 added more receiver hole covers to the platform. Now total weight added is 20kg. We now wait for DRO module to arrive. We schedule to install two receivers and correlator modules next (correlator bracket and frame are already installed).

**Ted** - We are testing the 45ft 3"/4 helium line and the 15m 1"/2 helium line with hard line. So far it looks ok, but we need to check the temperature log. Chia-Hao purged the 2ndhand compressor and it is now ready to ship to ML.

**Ted** - For schedule, we expect the DRO to ship out from Taipei at end of Dec. And then we'll use it to test IF/LO after it arrives Hilo. However, by that time, many people are leaving Hilo. So I'm not sure about the schedule after mid-Jan.

**Pierre** - I got a quote for the 2ndhand generator. It's about 10k including shipping to site. I'll also look for some comparison.

**Joshua** - Chia-Hao suggested me to order some cable gut from McMaster-Carr. Normally it should arrive next week and then I'll take it to test on the platform.

(01/Dec/05)

**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.

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

(24/Nov/05)

**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.

(11/Aug/05)

**M.T.** - Open issues in general on site:

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- (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:

**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.

**Johnson** - Now I am testing how much DRO power variation (due to environment change) will cause how much receiver noise temperature change. We used to set 21GHz input level to IF/LO module to 7dBm, but I think the new DRO will have less power and the LO will be less saturated and we want to test how much variation will occur.

**Kyle** - You mentioned last time that you had improved the method for determination of the LO optimum power. How did you do it?

**Johnson** - I check the broad band Trx when I varied the LO power and determine the mixer optimum LO power to be the one with minimum Trx.

**Kyle** - I am concerned about the IF power difference due to phase switching. Please double check under this LO power, how much is the power difference and whether it exceeds 0.04dB.

(01/Dec/05)

**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:

**Edwin** - Manufacturer is making heat sink and PCBs for DRO. It will take 1~2 weeks. I need some components to modify the IF/LO PCB.

(01/Dec/05)

**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:

**CT** - I tested atdc with GPS time server on ML. They can lock together. The problem is correlator PC system clock can not lock well with atdc. Although

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system clock is fixed by atdc, there is still +/- 100ms drifting. I suspect it is causing the synchronization error in the data acquisition system.

(17/Nov/05)

**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

### 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:

(01/Dec/05)

**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).

(10/Nov/05)

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

### Misc:

**Paul S.** - Yuan Lee confirmed that he approved NT 20M for 13 element expansion, almost enough. Please proceed with purchasing and send me a schedule. Major items should be ordered before end of June. CT, please check with MT about the LNA and OMT because these items should go through him.

(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.