Minutes for AMiBA Engineering Telecon

Meeting Date: 01-Apr-2004

<u>Participants:</u> <u>Australia:</u> Michael <u>USA:</u> Derek, Johnson, Jeff, Ferdinand, Paul Ho, T.H. Chiueh <u>Taiwan:</u> C.J. Ma, Huei, Philippe, Paul Shaw, Kyle, C.T. Li, West, Homin, Steven

USA Dial-in = 1-800-653-5390, 6668081# Outside USA Dial-in = 1 773 843 6301 Minutes Recorder: C.T. Li previous weeks comments

I.New Action Items:

AI-01Apr04-1: Ming-Tang - To compile a list of modifications we need to do on platform, e.g. loose walnuts, delamination at the ends, stiffness.

II.Previous Action Items (still open):

AI-25Mar04-1: Philippe - To find out what Vertex plans to do during the in-plant calibration test and how they plan to implement the pointing model. Ming-Tang - We need to extract the exact time line from Vertex, also to see if we can push Vertex to stick to the original schedule so that Michael can do some tests in early May.

AI-11Mar04-4: Ted - To check the progress of dish cover design. Ted - I got the reply from Gortex's Taiwan branch. The minimum order of the material is 500 meter square. The price is about 1 Million NT dollars. We will need 10 meter square for 7-element. Ferdinand - The previous quote I got from Gortex is about couple of thousand US dollars for the amount that we need. I will look it up.

Ted - Still waiting for the reply from Gortex.

Jeff - We used expanded Teflon material for windows at 30 um on sub-mm sky monitor at South Pole. It is quite transparent at 30 um, should be more transparent at milli-meter. But it's not particularly tough. You could put a piece of sample in front of receiver feed to see how much the system temperature increases, probably in 45-degree angle to avoid reflecting any noise radiated by the receiver back down to the feed horn.

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

IV.Miscellaneous Discussions:

MMIC:

Huei - We're waiting for the tax exemption document, which is different than usual since we will export those chips one year later.

Huei - Chips are in Taiwan's custom right now. We should get them in a couple of days. Milton will open the package and take photos.

Receiver:

Ming-Tang - Johnson tried to set up the Hilo lab for testing, to see if he can finish the test on Rx#1 before he leaves in mid April. Homin - For the control electronics, we have two sets ready. The DC-to-DC converters are all ready now, but not yet tested. Tashun is still working on Rx #3 and #4 - assembling, testing of vacuum and cold head.

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Ming-Tang - We got all of our LNAs from JPL after Todd finished the modifications. Johnson has put LNAs in the 1^{st} receiver in Hilo yesterday. He will proceed to do the room temperature test on the receiver chain.

LO/IF:

Steven - We have received all the components for 7 elements this week. We started to assemble #3 and #4 IF/LO modules. I used our network analyzer to test IF/LO cables at 20 GHz. I have asked Andrew a quote for 10 of 11-meter cable for LO distribution, 20 of 4-meter ones from receivers to correlators, and 50 of 10-meter from 1^{st} to 2^{nd} sections of correlator system. We will have #3 module by end of April. We can ship the 2^{nd} receiver by end of this month.

Correlator:

C.T. - continued testing the data circuit up to readout. We're asking a quote for the semi-rigid cables from company in states. Derek - The current design drive level at the correlator module inputs is -10 dBm. We have about 6 dB spare power for some un-expected loss. We probably will use up some of the spare power in the revised slope equalizers or longer IF cables.

C.T. - We got the data acquisition electronic box back-planes back that we can connect further upstream to the readout. Correlator frames will come in around 10th of May. We're still trying to get another quote for the semi-rigid IF cables from correlator 2^{nd} to 3^{rd} sections because the return loss of samples from local cable vendors isn't very good. We start to ask the company in states to provide a quote. For the flexible cables used from receivers to correlators, correlator 1^{st} section to 2^{nd} sections. Ted has figured out the required lengths. We should be able to get a quote from Andrew. We still need Johnson to finish the rest of 3^{rd} section custom power dividers. Johnson has put together 7 front and 5 rear ones, enough for the system test with 2 receivers. For 7-element, we will need total of 20 front and 16 rear ones with some spare.

Ferdinand - We have ordered a network analyzer with an \bar{E} -cal kit to be used in Hilo, also a dual-channel power meter and sensors for it.

Derek - We also need to order the cables for LO distribution.

Michael - For the auto-correlation, the fringe pattern should be symmetric regardless of the shape of passband. For cross-correlation, since the signals are coming from two receivers with different band shapes, the fringes with plus and minus delays would be different. We could increase the effective bandwidth by processing the data from 4-lag correlators.

Platform/Mount:

Ted – Along will delay for one week for the platform analysis. They will give us the analysis result, model, and their suggestion for the final or 3^{rd} modification.

Ming-Tang - Vertex likes to try the cable wrap cone. However, Philippe is concerned that they might run into the loose walnut problem at the lap joints.

Ming-Tang - Vertex has put the platform onto the hexapod. They're doing the low-level testing right now. There is an issue about changing of contract or work order.
Philippe - Konrade proposed to send two engineers, one mechanical engineer for 2-3 weeks to do the assembly of the cone, hexapod, and platform, and then another engineer for 2-3 weeks when the telescope is wired again. In exchange of this manpower, they would not go to the site for the calibration. Then the issue is how we're going to accept the telescope? Because in the proposition of Vertex, once the telescope is commissioned, we pay them the rest of money. Then there's another 6 months for calibration and testing. There will be no pressure on them anymore because everything is fully paid. Our idea was to change the contract, to make an amendment, to keep some money, and pay the whole at the end when we're sure the telescope are within specs. We will extend the 6 months to maybe 1 year. We would pay the remaining 55% of contract upon shipping from Germany.
Michael - We need to figure out how Vertex plans to implement the pointing model. We ourselves need to worry about how the mean platform deforms, and how we embed that into the pointing model. Since we have Along to do the FEA of platform, are we going to translate their result into the effect on pointing?

Calibration System:

Ferdinand - Plan to go up the week to do some test on the CW noise source. Got several quotes to upgrade the current system with polarization maintain fiber, just a preparation for later. Not date is confirmed about John Payne's visit to

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ML. We might get away from the polarization scrambler if the polarization maintain fiber works.

Ferdinand - The (photonic calibration) unit is ready. End of April is still the time for us (with John Payne) to go up to MLO to test the new photonic detectors to see if we got more power out. Before I got 60K of noise that we could inject into the system to check the receiver gain variation. The idea is to inject the noise behind the sub-reflector. We could use the translation stage to move the horn one or two wavelengths to change the relative phase between signals. We should be able to generate fringes.

Dish:

Site:

Ming-Tang /Ferdinand - We're hoping to have the ground breaking in this month. Ferdinand is wrapping up all the drawings with the architect. Hope to have the PO out for the site inspector, and the architect for updated blue prints. Hope to have the electrical drawing back by next week.

Ming-Tang - After yesterday's meeting, we're proceeding in 3 parallel directions. Paul Shaw has presented the initial contract to the contractor. They had only some minor comment. We hope to finish amending the wording the contract today. There are also some minor issues about the drawing. Hopefully we can get everything finished up in this week.

2-Element Prototype Testing:

T.H. Chiueh - People were doing analysis on translation stage data. The effective bandwidth of IF is about 16 GHz.

Administration:

Paul Shaw – We need to feed back the budget plan according to the approved budget by $6^{\rm th}$ of this month.

Paul Shaw - We got partial approval of NSC funding for the operation and expansion of AMiBA for the following 4 years. However, we only got 35% percent, around 3 Million US dollars.