Minutes for AMiBA Engineering Telecon

Meeting Date: 19-Feb-2004

Participants:
Australia: Michael, Warwick
USA: Paul Ho, T.H. C.J. Ma, Chiueh, Derek, Jeff
Taiwan: Paul Shaw, Kyle, C.T. Li, West, Homin, Steven Teng

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-12Feb04-1: Ming-Tang – To discuss whether we will do end-to-end test in Taipei, and whether that would require current amplifiers to be inserted to imitate the final amplifiers?
T.H. Chiueh – Is there a pseudo-setup to test LO, sub-harmonic mixers and subsequent IF in Taipei? Is there any plan to test the entire system before Rx #2 is shipped to Hilo with fake RF coming in?

II. Previous Action Items (still open):

AI-12Feb04-1: Ted/Philippe – Generate a load test plan for platform after the 2nd modification.
Michael – The expectation is that the movement of receivers along the baseline should be much less than 1mm (within 30 um). We ought to be able to validate platform's model for various things. One way of testing the platform is photo-geometry?.
Paul Ho – We need to have Ted and Philippe generate this plan that people can discuss it thoroughly since they're going to perform the test soon in Vertex.

AI-12Feb04-2: Ming-Tang – Ask Michael to generate a plan for software interface and mount/platform pointing test.
Michael – Sent a note to Ming-Tang about the plan. Plan to go to Vertex in the end of April, early May after talking to Vertex people about their schedule for testing of mount. Right now we have the software to talk to Vertex's computer, and the software that imitates their machine. Then I can use the high-level program – the observation program = to drive the platform. In parallel, Vertex will perform their tests – first of all, the commission test – they will get their machine and codes to drive the platform; after that they have a week of calibration test that they attempt to establish the pointing model.
For the alignment, with 60-cm dishes, we probably have enough signal to noise that we can use radio objects. It would be better if we could start with a very good approximation to where we want to be. We could have some jigs sitting in receiver holes and if there's a static-scan? technique To make sure they relate to each other properly. Then you can just drop the receivers in and that should be pretty close to what you want.

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

IV. Miscellaneous Discussions:

MMIC:

Paul Shaw – They (Paul Clenworld) are ready to ship the chips by end of this week.

Huei – We haven't received those chips from Paul Clenworld yet. Paul Shaw has ordered some desiccators to store them. Milton will be the person responsible for proper handling of those chips in lab.

C.T. – We have modified the DC amplifier circuits, will try again to measure output noise of multiplier chips.

Receiver:

Homin – We're testing the vacuum receivers #3 and #4. Joshua is assembling electronic box for Rx #3. There is not much test to do here because we don't have the amplifiers. The amplifiers will be installed in Hilo. We plan to ship Rx #2 in April.

Ming-Tang – We received 5 OMTs so far, waiting for another 7 units, and we have most of RF and mechanical parts for 7-element.

LO/IF:

Steven – Will test the temperature vs. power variation next week in the temperature chamber with #2 IF/LO. Prof. Chu agreed to deliver IF/LO #3 and #4 in April. However we are still missing some components. Will check with him whether all components can be delivered in time. Also asked Prof. Chu's student to deliver the DRO as soon as possible that we can test it in the temperature chamber in the near future.
Derek – We placed the order of cavity filters for LO.

Steven – Will test the 2nd IF/LO unit in temperature chamber probably on next Tuesday, need to borrow a 21-GHz synthesizer from Prof. Chu. Will start testing all of components next week.

Correlator:

C.T. – Have been testing the control circuits and software. I will ship those SiGe multipliers to Warwick that AT can double-check our results. For the total length tolerance of IF cables, 5ps corresponds to 1mm in cable length. I suggest we tighten the tolerance to be +/- 0.5mm.

West – The final length for each IF cable is 1 meter. They will use cables from Hover-Hill and connectors from Amphenol to manufacture the cables if we don't provide the material. Right now they will trim our 60" cables.

C.T. – Successfully programmed the phase switch circuit, it now can generate the phase switch signals.

West – The 60"-long semi-rigid cables are too long to fit in Ted's frame design. We have asked a local cable company (Raison) whether they can either trim and bend those cables in lab or manufacture some new ones. Will ask them for a formal quote including the specifications of connectors and cables.

Platform/Mount:

Paul Ho – Platform people should be in Germany today. People from Along will be there as well. We will hire Along to do the FEA analysis of the platform.

Ted – Philippe and Bob Romeo are checking the component list for the 2nd platform modification. We plan to do the modification and load testing from Feb. 18th to March 3rd.

Calibration System:

T.H. Chiueh – The trip last week to test the calibration system wasn't successful since the lack of amplifier? Ferdinand will go up, perhaps tomorrow to do the test again. It's still the CW test. We are waiting for a component (connector) to test the photonic noise source.

Ferdinand – We're going up tomorrow to test the CW noise source again, still waiting for one component for photonic noise source.

Dish:

Kyle – Patrick and I tested the 60-cm dish. We fixed the receiver, and moved the transmitter. But this method somehow increase the noise. We have a good angular resolution, however, the amplitude is too noisy. We have a pretty good idea about the far-side lobe, but the 1st side lobe and main lobe is too noisy to say. The frequency of the source is drifting. We need to find out how to stabilize the source. We will repeat the test.

Michael – You should have a beam width about 20 arc-min between the 3dB points. I wonder whether you have missed the actual beam center, skirting along the 1st side lobe? We should expect 20 to 25 arc-min between the 3dB points, and the 1st side lobe were to be 17dB below the main beam. I wonder if you missed the broad side since I really can't see the central beam, which should be dominant. I would suggest exploring the tri-pod more that you can swivel the antenna to find the peak. One of my concern is whether the antenna is pointing in the right direction.

Kyle – Plan to do the beam pattern measurement soon since the weather is getting better these days.

Site:

Paul Ho – Still waiting to execute the contract. We need to make a decision soon. We can't wait much longer. I aksed Ming-Tang to contract the executor by the end of month. The construction should take 2 to 3 months that we should get started.
Paul Shaw – We have a short fall if we want to finish the 7 elements now. However, we still have money in our hands to execute the site work.

Ming-Tang – Haven't received the formal quote from Ishii yet, also need to discuss with several inspectors as our construction consultant. Will discuss further with Paul Shaw.

2-Element Prototype Testing:

T.H. Chiueh – We went up to the mountain to check the LO power difference directly, not just the IF power difference between phase switching. New finding is that the power difference of 42 GHz LO will change with LO input power. We probably need to know what kind of input power regime that we want.

C.J. – We changed the 21 GHz LO power about 1 dB, and the 42 GHz power difference changed from 1.1dB to 0.5 dB.