

Minutes for AMiBA Engineering Telecon

Meeting Date: 27-May-2004

Participants:

Australia: Michael

USA: Derek, T.H. Chiueh, Ming-Tang, Jeff

Taiwan: Ted, Johnson, Kyle, Paul Shaw, C.T., Homin, Steven, West

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Minutes Recorder: C.T. Li

[previous weeks comments](#)

I. New Action Items:

AI-May20-1: Ming-Tang - To discuss whether 1.2m dishes are sufficient for operation next March, and whether we should re-enforce the platform more for even larger dishes (> 2m)?

II. Previous Action Items (still open):

AI-May13-1: Steven - To gather all the open issues about the IF/LO module.

Steven - We found that two outputs of LO will affect each other. I will measure it again with a power meter to verify the magnitude, before I used a spectrum analyzer. I will try to see if modifying PIN diode switch bias can solve this problem.

Steven - We have found more open issues. I'll summarize and circulate them later. Right now we found two LO paths will affect each other. We still need to find out the reason before putting #3 module together.

AI-Apr22-1: Philippe/Ted - To form a solution about how to deal with Bob Romeo, and decide whether he is responding to the components that we need.

Ted - We are still waiting for photogrammetry result. Vertex is doing it this week. Then we will proceed with platform modification with Bob Romeo.

Ted - We will wait for the result of photogrammetry, which will start on next Monday. Then we will decide how to modify the platform and discuss with Bob Romeo.

Ming-Tang - Talked to Philippe that we won't give Bob Romeo the last payment until he fixes all the bugs about the platform. We agree to ship the platform back to CMA for repair. We can't ship the platform until the testing of mount is finished.

AI-Apr22-2: Philippe/Ted - To check on Along's analysis and come up with a conclusion on how to repair the platform.

Ted - They sent us their final conclusion about platform analysis. But they need one more week to finish their model.

Ted - Philippe and I sent them some items that they haven't finished. At the moment we're waiting for their model.

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

IV. Miscellaneous Discussions:

MMIC:

Derek - I took a look at how MMICs are stored in Taipei. I think everything is fine as far as the handling of MMICs is concerned.

Huei - We're still working on the final report. Students will start measuring InP MMICs for the first run before June. We will need to put in more resources if we want to develop some modules. Another alternative is to have the company, like Wisewave, to package them.

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Receiver:

Homin - Finally we shipped out the Rx #2 two days ago. Next shipment would be the control electronics and lots of cables.

T.H. Chiueh - We measured Rx noise temperature around 40K with a power meter. The difference in output power between hot and cold load is 4.6dB. Ming-Tang tried to look into the hot/cold load spectra with a spectrum analyzer. The power difference between hot/cold load is larger at low frequencies (below 2 GHz); at higher frequencies (from 2 up to 20 GHz), it's between 3.5 and 4dB. For the spectrum, there are two humps located at 10 and 15 GHz with difference less than 0.5 dB.

Derek - The output power is low (-18 dBm with the hot load), while we're expecting -8 dBm. I talked to Ming-Tang about adding another amplifier somewhere. My preference is to put the amplifier back in Rx end to amplify the power before long cables.

Homin - We will ship Rx #2 to Hilo probably tomorrow. Tashun keeps working on #3.

LO/IF:

Calibration System:

T.H. Chiueh - We found the calibration source might be narrow-band, and time variant. The correlated signals from 4 lags are quite similar, which imply the IF seems to be narrow-band and low-frequency. We tried to check whether it's due to de-correlation by adjusting the IF paths to be equal. Another thing we like to check whether the calibration source is strong enough that we can put it on the translation stage to create some fringes. With fringes, we will be able to investigate the spectrum of the calibration source. Right now we found the S/N ratio is only about 20 (Jupiter is 2 times stronger). The strength of the calibration source is comparable to thermal emission from the holder. Another approach is to beating two laser lights with the same device.

Correlator:

Derek - Right now we have 13dB slope equalizers to make up for the cables within correlator IF, as well as the front-end cables - cables between Rx's and correlators, and all the losses thru all the components, except for the 3rd section power dividers (6dB slope). We need to use equalizers with larger slopes to flat out the total band.

C.T. - I corrected the timing for the phase switching. The large offset is gone. Right now the back-end offset is about 2 counts, rms around 15 counts. The integration time for each data point is 0.226 second.

C.T. - We have phase switched CW signals, have them go thru 3 stages of IF chain, and have them correlated in the correlator. The entire correlator system is working from end to end. There are still some minor issues. The large offset we have seen so far might be due to some timing problem. I'll keep work on them.

Platform/Mount:

Ted - I got an email from Philippe and Ferdinand that Vertex will re-furbish two gear boxes. Vertex is proceeding the laser tracking measurement by moving the hexapod with half speed and monitoring gear box temperature. The acceptance test will wait until June 21. We will have another telecon with Vertex next week to decide the schedule for acceptance test.

Ming-Tang - For the mount, few days ago we had a meeting with Vertex, discussing the problem about the gear box. Vertex found the two gear boxes they took off have bearing problem. They're going to replace all the gear boxes. They put in the wrong lubricant, not suitable for high-temperature operation. The laser tracking company will come to Vertex to do the calibration next week.

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Dish:

T.H. Chiueh - We checked the symmetry of the shoulder by rotating the 60-cm dish by 60 degrees. One side of shoulder disappeared. My suspicion is whether the interface between the dish and the mount has been manufactured properly? Another issue is to go for larger dishes (1.2m) to meet the deadline by early next year.

T.H. Chiueh - We have detected shoulders (side lobes) for one 60-cm dish. The dish belonging to the first pair has better performance.

Ted - For two dishes on the prototype, one has better surface roughness. But both meet our specs.

Mike - The illumination pattern should be Gaussian. The side lobe should be smaller than with uniform illumination.

Jeff - It might be difficult to understand the result using a source twice as big as the beam. The convolution confuses the issue. You lost information on the fine structure of the beam.

Site:

Ted - Ludwig finished the concrete work last Thursday before I left Hilo. The site is almost done last week. The electrical work will start in June.

Ted - Last Saturday they poured concrete on the telescope pad. This week they started to put steel bars outside of telescope pad for container and parking. Ludwig will provide us with a revised contract for excessive concrete used and other issues. Electrical work will start from June. We decided to order one container. We will get the container in mid June.

Ming-Tang - Finally we got the enclosure P.O. thru to RCUH.

2-Element Prototype Testing:

Administration:

Paul Shaw - For the overall report for the Cospa review on June 14, I got some inputs, still waiting for input for LO/IF, Rx, dish, mount/platform, site, calibration source, control/software...

Paul Shaw - We haven't received the response from MoE yet. But we have requested Taida to pre-pay some money. I will talk to Ludwig about the compensation.