Minutes for AMiBA Engineering Telecon

Meeting Date: 29-Jan-2004

Participants:
Australia:
USA: Paul Ho, Ferdinand, T.H. Chiueh, Jeff
Taiwan: Ming-Tang, Paul Shaw, Huei Wang, C.J. Ma, Kyle, C.T. Li, Johnson, West

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Minutes Recorder: C.T. Li
previous weeks comments

I. New Action Items:

II. Previous Action Items (still open):

AI-15Jan04-1: Johnson – Contact Prof. Chu to see whether there is any power balance mechanism in LO module, also look into the biasing of PIN diode switches, and the model number and manufacturer of PIN switches. If Prof. Chu has a plan to investigate this issue, he probably has to vary with temperature and power. Because supposedly he uses Mylar to do the compensation for another path, that might depend on temperature or power level. He might want to change the parameter regime a little bit.

Johnson - Circulated a test report by Prof. Chu and his student about the power level difference between 2 states.

AI-15Jan04-2: Ted/Philippe – Generate a report about the finite element analysis of the platform.

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

IV. Miscellaneous Discussions:

MMIC:

Huei – Will contact Clenworld about how MMIC will be handled in Taipei or Hilo. He will send the chips directly to Taipei shortly.

Derek – Will ask Paul Clenworld about the quantities of MMIC that he sent to Hilo, then generate a report for Gilbert.

Huei – The MMICs that will be shipped to Taiwan will be handled by NGST, not through RCUH (contract was signed by RCUH though). We should inform Todd or JPL about the contact person change because JPL and RCUH have separate contracts for the 28 LNA modules. The old contract expired in Dec. 2003. But he still has some development owed to RCUH. Therefore he would like to have the no-cost extension of the contract.

Receiver:

Ming-Tang – We will continue assembling more receivers in Taipei.

Ming-Tang – The receiver is here. We haven't got the time to open it yet. The lab is pretty much ready. But we need to recharge the compressor. We're looking for the recharging kit.

LO/IF:

Ming-Tang – We will have a new person come in to work on LO/IF with Prof. Chu's group.

Johnson – The 2nd IF/LO module has been fixed. We will get it in next week.

Ming-Tang /Derek – Tzihong would like to know the IF power difference in different phase switch states. Another question is how much the LO power or phase change when it is cold or warm. For the adjustable attenuation, it might be possible to adjust the bias for the PIN diode switch so that two paths have different loss?

Correlator:

C.T. – Mark has put together one phase switch circuit board, which will generate phase switch and demodulation signals. We will have to test it soon, probably in next week. Johnson is moving along with 3rd section power dividers.

C.T. – Johnson is putting together some power divider modules. Some of them are working, while some of them need debugging. He will assemble at least 4 of each kind before he leaves for Hilo. We also got the phase switch circuit boards (PHSW) back. Mark is putting together one that I can start to test it. The power divider is quite lossy due to substrate loss (the shunt resistive layer below the microstrip lines), the gain slope is about 6 dB from 2 to 18 GHz. Don't know how to get around this problem unless we don't use this kind of substrate. The return loss is all below 10 dB, it's just that the insertion loss and gain slope is quite large. Will investigate the conventional power dividers using surface mount resistors for the next iteration.

Platform/Mount:

Ming-Tang – For platform, after talking to Philippe and Ong, somehow Philippe still doesn't feel comfortable about the 2nd fix. Dr. Ong convinced me that we need to do the finite element analysis as soon as possible. He has the capability of assembling a team to do that. Not quite confident that after the current load testing, it would be no problem to put the platform on the mount and load it with all equipments. Ferdinand proposed another meeting soon to discuss and update the platform test plan. We can test the platform with 2 or 3 different loads to extrapolate how the platform behaves. There is a conflict between Bob and Philippe's inspection on platform after manufacturing. Haven't seen a complete blue print so far(either a machine shop or design blue print from CMA or ourselves). Right now we tried to assemble an FEA team in Taipei and set up the modeling, in the mean time, to go over the load testing plan with Philippe.

Ted – We got a quotation from CMA, the price is about 23,000 dollars. Philippe and I listed the items that should be done in Germany, and circulated to Bob Romeo. Hope to start the modification work on 2nd of Feb. Plan to stay there for two weeks. Then the testing of the mount will follow.

Ming-Tang – We need to make sure who will attend the mount testing in Germany(Philippe, Michael?)

Calibration System:

Ferdinand – Started testing the CW calibration system. There is some drifting, and some lines in receiver IF output. Plan to go up next week one day to have a look. The output power is large enough even to saturate everything. For the photonic calibration, most of the mechanical parts can be set up soon.

Dish:

Ted – The repaired dish will come in before the end of this month. Taiwan branch of Gor Co. tried to find out the part number of the sample I have. About the fixture to hold the Gortex material, I am still working on the design.

Ferdinand – The person from JCMT brought two articles they wrote 20 years ago about the radome material. The sample we had is 20 years old. In Gortex's web site, the material 79RA7906 is their current radome material. About the fixture, in Andrew cable/antenna's web site, you can find some simpler designs, like spring-loaded or rubber type material.

Ted – About the burnt-out 60-cm dish, Along are still working on rebuilding it. It will take one or two weeks, including the measurement, to make sure all the dimensions and alignment are correct.

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Site:

Paul Shaw – Got several quotes from possible contractors.

Ferdinand – Got two quotes from Ishii – one with the modified shelter. Also got an informal shelter proposal – a retractable one like a clam shell. Everything included is about 75K. Two together will cost the same as the current site w/o the shelter. Besides the company may over-design the shelter for wind restriction because the site would be on the side slope, not on top of the hill. The modified site design have a few advantages – first of all is to save money, the old design runs about 410K just for the site construction; the modified site design would 340K, with 75K for the retractable shelter. The saving would be the cost in the roll-off shelter, which is in the order of 40~50K. Another advantage of the retractable shelter is the impact on the site is much less. Also once the shelter is open, you can't see it, not like the roll-off shelter, which would still be somewhere down the hill. One disadvantage of the retractable shelter is that we would not be able to put on a crane, which could be installed on the roll-off shelter. Will generate a memo explaining the retractable shelter and modified site design, and comparing it with current design with the roll-off shelter. Paul Shaw expressed the concern about this change, because people have spent some much effort to review the current design and circulated it around contractors for bid. There may be some risk and time constraint if we decide to go with the alternative.

Ming-Tang – About the site, we've made some progress over the past week, and we are almost ready to throw in the money.

2-Element Prototype Testing:

Tzihong – In the past week, we've done the CW testing suggested by Ferdinand. It looks that there's correlated signals. The coupling is quite good. Today we tried to find out the IF power as the function of 42 GHz LO power at night time. Ming-Tang has already measured it during the day time. We want to find out whether this optimum power level is different during the night time. There's another concern about the correlator – there's a spike in responsivity at 3 GHz. Is there any improvement we can do?

Derek – One of the possible solution is that we will find out the overall gain or amplitude slope, then add another equalizers to correct that.