

Minutes for AMiBA Engineering Telecon

Meeting Date: 06-Nov-2003

Participants:

Australia: Warwick Wilson, Mike Kesteven

USA: M.T. Chen, F. Patt, T.H. Chiueh

Taiwan: Paul Ho, C.T. Li, H. Jiang, West Ho, Ted Huang, C.J. Ma, Kyle Lin

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Minutes Recorder: C.T. Li

[previous weeks comments](#)

I. New Action Items:

AI-06Nov03-1: Paul Ho - Find out the optimal date for Mike to do the software testing in Vertex.

AI-06Nov03-2: C.T./Homin - To check out all schedules (for components assembled in Taipei) to see whether we're late or not, to look at the man power as we project forward how many people we need.

AI-06Nov03-3: Ted - Talk to Phillipe and Ming-Tang about the necessary man power for platform re-assembling

AI-06Nov03-4: T.H. Chiueh - Circulate a report about the burnt dish and how to avoid it in the future

II. Previous Action Items (still open):

AI-30Oct03-1: Bob - Give RCUH a call, and ask Richard about the long term for CSO. Ferdinand will follow up on Nancy on the current space. Discuss with Ming-Tang and others about the idea to establish a permanent lab on the site.

Paul Ho - SAO continued to maintain the position that the building is only for SMA work. Ideally we would like not to be in separate places because it makes so hard for staffs to work on things and run back and forth. The backup is that we will rent some space. Another solution is to have a trailer on top of mountains. Don't think that is very attractive either. First of all, living on top is not that easy to get approval. It is actually tiring to be on top. There are real good reasons for being downtown to do work.

AI-30Oct03-2: Bob/Huei - Contact Paul Clenworld about some MMIC questions - 1) Whether the MMIC has to go back to the states for approval? 2) Whether the test period in Taiwan can be two years, instead of one? 3) What exactly is the checking business in Taiwan?

Paul Ho - Got a note from Clenworld on the Technology Control Plan. It turns out that the stuff does have to go back to the state department for approval. They're still concerned to have only one year as the period of testing in Taipei. One of thing we can do is only when you need the stuff, you ship it. Then you have a period of one year after shipping to test. Wasn't clear how to check things in Taipei.

AI-30Oct03-3: Phillipe/Bob - Summarize the meeting minutes, get more evaluation on platform and make a decision on what to do next

Paul Ho - There was some summary from Phillipe. That has been cycled through Bob Romeo in Tucson. They're more or less in agreement to proceed to fix, except that Romeo doesn't want to be responsible for the design of that fix (the end fixture).

Ted - At the moment, Phillipe and I will take care of the design. But we still need the help from CMA. We have a rough idea about how to fix it. Just sent some of 3-D model to Phillipe yesterday. He will put it into his analysis model.

Paul Ho - The action item is still on going exactly how to fix the platform. We have to get some report from Vertex as to what they're doing. They're going to do some

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wiring. They're waiting this particular fix. This particular fix will require us to loosen the platform, and re-bolt.

AI-30Oct03-4: Bob/Ferdinand - Come up with a scenario whether it is feasible or not to work on the site excavation by ourselves.

Paul Ho - There was a note from Ferdinand on the site situation. Taisei has a bid about 664K. Ludwig will come in about 526K. Ferdinand's budget total is about 418K for the site work. These bids are a little higher than what we're imagining. The next drawback is to do the rental, do the work by ourselves. Ferdinand reported that he has two workers who are ready to go. He can rent the necessary equipment. The problem is the supervisor. Based on the numbers on the table, surely looks like Ludwig is the better way to go than Taisei. The next question to ask is whether we wanna go with Ludwig or we can try to save some money by doing some of the stuff ourselves. The danger of doing things ourselves is mainly because we don't have enough people. We need to know how much money we actually save by doing that.

Ferdinand - What I need from Taisei is detailed numbers - how much his projection on the excavation. That is only thing we can save, maybe also the electrical, because I got one electrical quote from Mo-Key. The big advantage is that we could go with general contractor. They have reasonable numbers right now. Decent and reasonable firms come in with consistent number. My proposal is I will talk to Taisei and Ludwig more detail about their quotes. Then we can see how they come out with that number.

Paul Ho - I'd like to drive this into a conclusion in turn of making a decision, specifically against doing ourselves, we like to make sure that if we go ahead just contract out, we're all happy to do that. You can back me up with some information as to your analysis on potential trap of trying to do it ourselves.

AI-23Oct03-2: T.H. Chiueh and Bob - Sort out what to do next, and summarize what has been done so far (for prototype testing).

T.H. Chiueh, Bob - Will get together on Friday morning to discuss it.

AI-25Sept03-2: Ming-Tang - Volunteered to review all the specs as much as we can, and collect them into one place so that we can look them up.

Ming-Tang - Don't have time to work on it right now, besides finding all the data collected in AMiBA web site. Found several areas with some testing specs, e.g. Ferdinand's calibration system has some tolerance specs.

T.H. Chiueh - Volunteer to work with Ming-Tang. Bob - Let's talk about more on Friday.

AI-18Sept03-1: Bob - Re-visit the testing of phase shifter in a month.

Ming-Tang - Finally got the cryogenic cold test dewar together and running. All the necessary components are in place. We have some test data (dummy and phase shifter at 90 degree, at 15K and room temperature). However, the dielectric slab in phase shifter fell off during the cool down.

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

IV. Miscellaneous Discussions:

MMIC:

Bob - Tried to call Paul Clenword, but didn't get through. He is working on the plan for export.

Huei - Don't feel comfortable because he said that prior to delivery of MMIC, we will most likely need the US state department to approve it (the plan). Like to clarify that with him. Hope that the plan to inspect all the MMICs will not make everyone of us panic. Can not conclude until see the plan. Will not be available next week. Suggest that Bob could talk to Paul first. Bob - Are you concerned about the amount of time to evaluate? Huei - Paul said he'd like to keep it within one year, but I think in the beginning we're talking about two years. The only concern I have is because those testing may be time consuming if we need to wait for equipment or something. Right now we tried to prepare everything, but still there is something we may miss. Bob - Possible solution to plan ahead that you test one kind of circuits, and wait to ship the other type that they are not all there at once? Huei - In his(Paul) email, he said MMIC

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control is achievable within one year. Don't see what the difference is between one year and two years. If he really insists, I am OK with one year. But if this is not really critical or we need to write down the time frame, I would prefer to have two years.

Paul Ho - Summary of the questions - 1) Whether the MMIC has to go back to the states for approval? 2) Whether the test period in Taiwan can be two years, instead of one? 3) What exactly is the checking business in Taiwan?

Bob - Maybe I should ask him time frame to start?

Receiver:

Ming-Tang - We are making the mechanical components for the next 5 receivers. The contract has been signed few days ago. Do need to talk to Prof. Chu. Haven't heard from him for a while. There are several issues that need to resolve with him. Will ship the 1st receiver when the lab space issue is settled. Todd Gaier is working on all the MMIC amplifiers right now. Tried to correct the error that they made.

LO/IF:

Correlator:

C.T. - Wisewave just finished the packaging of Triquint MMIC amplifiers, and will ship it soon. Maybe we can start assembling the custom power divider module in the last week of November. Integration and Testing probably starts in early Feb. next year.

Derek - Received the covers for DC amplifier modules and installed them. Will ship 16 of them first, including 8 of them for XY modules (Have Marki change the sex of connectors already). Have the 1st IF module installed in the prototype, and finished running several fringes. It is working quite fine. Will keep it up there for a while.

C.T. - Johnson and I were working on the bias circuit for the Triquint amplifiers because we just realized that we need to turn on the gate voltage first before turning on the drain voltage. West and Mark finished the front panels for all 4 PCBs. Sent out a schedule for multiplier correlator module to Paul Shaw to see if we can proceed with it? Derek - For those SiGe mixers, is their 1/f noise low enough for AMiBA application? C.T. - For the 1st version, the corner frequency of 1/f noise is around 800 Hz, below 1 KHz. The chips I have is the 2nd version. They modified the design a little. Haven't have the 1/f noise checked out yet. Derek - Is there a possibility that we can use this design for 13 element expansion? C.T. - The current dimensions are much larger that it won't fit in the current frame. I plan to make one or two modules for now just to see if we can use this approach. Bob - If I understand right, this is the development for the next phase for 13 elements? C.T. - Actually this is proposed in e-AMiBA. I'd like to ask Paul Shaw whether we can proceed right now or we have to wait until the proposal gets approved? Bob - Really what you're asking is the first step of development, because you really don't even have the right size yet. But you want to get electronic and those characteristics right and then work on shrinking it in size. I imagine it is very much a financial question. Wouldn't it also be a priority question, giving all the other stuffs to do, to construct? Does this take away from those efforts, or somebody else working on it? C.T. - I think for each person, it will probably take one or two weeks to work on it. I think it should be OK. Bob - We got to complete the other stuffs right now. That is the concern. Man power and financial, we are in the crunching of both in the whole project.

Derek - How is generally the correlator frame design? Ted - We got the quad pack correlator frame two weeks ago. We got few problems with correlator modules into the frame because the dimensions from Dasiy-Joson? are a little bit bigger than the drawing. We solved the problem. West is working on putting power divider together with the BMA connectors. Then we can try to put them together to see how the connectors align. After that, I'll send you the details about what we got, also the drawing. After we discuss this, we can proceed the production type.

Platform/Mount:

Bob - Had a long telecon on Monday on platform. Asked Phillipe to summarize where we stand on things are still out-standing, needed to be done for work on the platform. Phillipe is going to prepare a list on that. Talked to Bob Romeo about that. He is certainly available and ready to refund? When we have more firm plans what we want to do. First we should get Phillipe to summarize the minutes.

Calibration System:

Ferdinand - Plan to go up with T.H. Chiueh and the new student on Friday morning to do the first test on the calibration system.

Ferdinand - Ordered the V-type to WR10 transition. That should be delivered soon. That should improve the roll-off a little bit at the higher end. Everything is more compact, less expensive because I only need one component. We plan to do a test up on the summit with the 60-cm dish. Talked with Prof. Chiueh about the calibration. We got some ideas together, and how we could do an amplitude calibration, and a phase calibration, and how we could combine those together. Have no time to summarize that all up and

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communicate with John Payne. Will do hopefully early next week. John Payne's RAL photonic detector at 3mm waveguide band would be a good comparison to the coaxial device that we have. So it seems that coaxial device may work well. That would be a big money saver. Apart from that we just have to keep going on the test. We talked about the specs very briefly. Would like to do a few more tests before, and have something together that the test team can use there on the test mount to play with. That takes few weeks to finish it. May need Peter's or someone else help to put that all together. Hope by next week we have the first result on ML. For the V-type to WR10 transition, that does not exist on the market before. Wisewave technology developed something with Edward Tom. This improves very much the loss from the V-type to WR10. If you go from V to WR12 or WR15, and you have an E-probe in the waveguide, your back-short position is optimized for that wavelength, but it's not optimized for 3mm wavelength. The V-type connector is almost good up to 120 GHz. Edward designed one of those transitions with Wisewave, and moved the waveguide back-short in the right position. If you look at specs sheets, there is only 1dB insertion loss. I guess we have about 20dB insertion loss with the wrong transition. It all works but you have the roll-off, power loss, and reflection. RAL device is a waveguide photonic detector. The output of RAL photonic detector is the WR10 waveguide. But it's much more expensive.

DC Power/ Distribution:

Homin - Done!

Enclosures:

Site:

Dishes:

Ted - Will take a look at the burnt 60-cm dish and contact Along for repair or replacement.

2-Element Prototype Testing:

Kyle - Took out the dishes and measured the sun fringe. Increased (emphasized) the high frequency power by inserting extra equalizers. When we connected correlators to the same power dividers, i.e. have the same IF, RF, two fringes did not coincide. We didn't see that much difference when we connected them to different IF pathes, i.e. one is connected to IF1 of 2 receivers, the other one to IF2.

Mike - We ran experiment with noise source on carriage before. That gives very predictable fringes. It seems to me that would be the best way of diagnosing these problems. Now we do have very clean, strong signal, and there is no other confusing factors, like source size or beam size. With long travel, you could get many fringes, and you now can get your bandpass and delay quite accurately.

Kyle - The fringe of sun with dishes could be regarded as a template for other sun fringes with dishes. We did try to measure the fringe envelop with dishes. We put two phase shifters into IF pathes to shift the relative phase between two receivers. We can sample the envelop at discrete position. The result looks quite consistent with no-dish fringe.

Schedule: