

## Minutes for AMiBA Engineering Telecon

Meeting Date: 17-Jan-2003

Participants:

Australia: not present

USA: B. Martin, F. Patt, D. Kubo, C.J. Ma, J. Peterson, P. Ho, H.M. Jiang, C.J. Ma, K.Y. Lin

Taiwan: T. Huang, C.T. Li, W. Ho, C.C Han, M.T. Chen,

Minutes Recorder: D. Kubo

[comments from this week](#), [previous weeks comments](#)

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### I. New Action Items:

AI-17Jan03-1: **Assigned to all** - Philippe sent out an e-mail on 15-Jan-03, subject: "re drawing". It had 2 attachments, a platform drawing with box locations and a table describing box sizes, quantities, and weights. Philippe highlighted areas in red which require immediate attention.

AI-17Jan03-2: **Assigned to all** - Ted sent out an e-mail on 15-Jan-03, subject: "Document of cable route". It had 1 attachment which described Ted's proposed approach for routing the various cable assemblies. At the end of the document, Ted asked a number of questions to be answered by others.

AI-17Jan03-3: Assigned to **Ming-Tang** - Bob asked that a mechanical review package of the final receiver design be generated and distributed by January 31. This package is to be reviewed by pertinent individuals with a discussion following on the Feb 13<sup>th</sup> engineering meeting.

AI-17Jan03-4: Assigned to **Derek Kubo** - C.T. asked Derek to provide the new IF output pin spacing info so that he can modify the current mechanical interface to fit the new 4-lag module.

AI-17Jan03-5: Assigned to **Derek Kubo** - Provide PN of Jonathon slide candidate to Ted (for Correlator frame slide).

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### II. Previous Action Items (still open):

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

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### IV. Miscellaneous Discussions:

MMIC: none

Huei - Received e-mail from TRW (now Northrup Grumman) saying they retested the InP wafer with lower input power and found increased gain. Also talked with Todd G. 2 days ago and believed that collaboration with NRAO could be helpful in resolving the licensing issue.

Receiver: [see AI at top](#)

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LO/IF: none

Correlator: Derek - Rapadas is currently having 3 4-lag modules assembled at an outfit called 2Pi Microwave. He is intending on having this place also perform the production build of 55 modules. Jeff expects the modules to be completed by this weekend with tests to begin thereafter.

Derek asked Ted what the purpose of the gas spings were. Ted said they are tension springs which are intended to counter the weight of the correlator frame. Similar to what is used to hold up SUV tailgates except tension instead of compression.

Derek: Went over "Remaining Scope of Work, Correlator System" document line by line. Key discussions:

- 2)d.- Ferdinand: Separate back planes will allow for flexibility. Bob: Yes but I would like to see this made into a single backplane PCB. Derek: Doesn't matter to me.
- 2)f. - Bob: The DC-DC converter is a hot issue that we need to resolve soon. Many designs rely on the results of this solution. Derek: Homin plans to purchase one set of Vicor DC-DC modules and install it in place of the linear supplies on the prototype at ML.
- 3)b. - Ferdinand: Does the addition of the DC-DC converter assembly add to the mechanical dimensions of the final correlator frame? Derek: Yes it will... I need to forward this info to Ted and Philippe.
- 5)a. - Derek: Rapadas is making 3 4-lag modules and will be sending 1 to Peterson, 1 to CT, and keeping one. Ship date should be sometime next week. Also, I forwarded the new quote to Paul S., unit price for 55 modules is now \$1365, was previously \$1035 each for 100. Paul S.: Should we wait unit CT runs his tests before we purchase the 55 modules? Derek: Definitely yes. Paul H: The mixer delivered last month had a problem with low responsivity. Was this ever resolved? Derek: Yes, the mixer diodes were replace and this solved the responsivity problem, but Rapadas never found out what the exact cause was. The mixer design as it stands right now appears to be sound.
- 7)b. - Ferdinand: Does the data acquisition 3U card cage need to have an additional 1U panel to accommodate I/O (like the rest of the chassis used elsewhere)? This added 1U space could make the difference between fitting into a nook within the platform or not. Derek: I would prefer to see this chassis and enclosure to be exactly the same as the others. We can use this 1U for the large number of 40-conductor ribbons and 48VDC input power.
- 7)h. - Derek: Homin proposed via e-mail last week to use 110VAC, 60 Hz to power the correlator PC (no DC-DC converters). We agreed that this would be OK. Bob pointed out that this is the only item on the platform receiving 110VAC. CT: Correlator PC height is tentatively 5U, Warwick is currently looking for one which is both EMI and environmentally sealed. Jeff P: If the PC is on the platform, won't the processor generate potential EMI radiation within our 2-18 GHz IF band?

DC power distribution: Ferdinand reviewed Ted's proposed cable routing. He suggested to use a "Y" configuration instead of a "ring" to distribute DC power on the platform.

Dishes: none

Paul S: Received pictures of the 60cm dishes from Dr. Ong and will distribute. Delivery of 2 dishes is scheduled for end of January. Jeff P.: What do we do

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next after we receive the dishes? Bob: Do an independent measurement (mechanical) there in Taiwan to verify accuracy, then install onto prototype on ML.

Platform/Mount: none

Bob: How soon can Ted provide final design details to CMA? Answer: Don't know and will resolve this offline.

Site Issues/Network: none

Hilo Facilities: none

Schedule: Bob asked how the delay of the 4-lag module delivery is impacting the planned upgrade for the prototype on ML. After some discussion, we decided that the 2 new correlators will be installed during the last week of February. This is predicated on us receiving working modules from Rapadas.

This would also be a good time for Ming-Tang to install the 2 noise injection couplers into the receivers. Also, Ted may consider to install the clock drive motor at this time although this should be the lowest priority. Motor has been received but there is still some work which is necessary before installation.

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### V. Other Inputs:

At 09:25 AM 1/16/2003 +0100, Philippe Raffin wrote:  
Dear Bob,

There is still quite some work to do on the platform:

1. Loads on the platform: update FE model with mass of (and locate):

- cable twist
- cables
- cryo lines
- boxes

2. Platform design: Modify FE model

- Interface with hexapod: finalize access to bolts from top of platform.
- The platform has been analyzed for gravity loads at 2 elevations (30 and 90 degrees) and wind loads at 2 positions. Further analyses to be done for more positions and load configurations.
- The stress level should also be checked in lap joints. (Other FEA model)
- The center of gravity of the platform will not be located on the z-axis, due to the non-uniform load distribution on the platform. Check the displacement of the cg with respect to the 6 upper u-joints and calculate in-plane deformations of the platform for all loadcases.
- VA will need to know the bending and axial stiffness of the platform to eventually input the stiffness parameters in the pointing model. To do asap to see if more analysis needs to be done.
- See whether the platform could be supported at other locations than the jackscrew locations for assembly or emergency purposes in case of a jackscrew failure for instance.

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3. When design and model finalized, run miscellaneous configurations (Az,El,Pol) with different receiver configurations (7, 13, 19) to cover as many cases as possible.

4. Interface platform/instrumentation, espacially correlator boxes. Need to design supporting brackets.

5. At the CDR, there was a concern raised about the possible misalignment of the holes in matching parts during assembly in Tucson and at the MLO because of ambient temperature change. To be checked by analysis.

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On Thursday, January 16, 2003, at 03:23 AM, Robert Martin wrote:  
Philippe,

Sounds fine to me. I hope that we can be well along with the platform design before then. I worry that we are holding up CMA at this point. Can you and Ted roughly summarize what still needs to be done? Maybe Ted can comment at the weekly meeting tomorrow.

Bob

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At 10:28 AM 1/14/2003 +0100, Philippe Raffin wrote:  
Hi Bob,

I was thinking of going to Taipei just after Chinese New Year, to finalize the platform design with Ted and visit Along to work with them on the alignment and measurements of the dish.

What do you think?

Regards,  
Philippe