

## Minutes for AMiBA Engineering Telecon

Meeting Date: 13-Feb-2003

Participants:

Australia: W. Wilson, M. Kesteven

USA: D. Kubo, R. Martin, J. Rapadas, J. Peterson

Taiwan: M.T. Chen, W. Ho, T. Hwang, P. Shaw, H. Jiang, K.Y. Lin, P. Raffin

Minutes Recorder: D. Kubo

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

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### I. New Action Items:

[AI-13Feb03-1:](#) **Ferdinand Patt** - Gather/determine hole patterns for all boxes on the platform. Will serve as focus on this issue and will have to work with others to gather info.

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

[AI-6Feb03-2:](#) **Ming-Tang** - Test the different LO/IF slope equalizers for variations in group delay. Variations of delay (delay =  $d\phi/df$ ) verses frequency from one equalizer to another is undesirable.

[AI-6Feb03-3:](#) **Michael** - What is our spec for group delay variations from one IF path to another? I.e., how well should they be matched? Is non-flat group delay is OK as long as they are all the same?

[AI-23Jan03-2:](#) Assigned to **Ted(?)** - 60 cm dishes will block the view of the optical telescope. Need to find an alternate location and method of installation.

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

[AI-6Feb03-1:](#) **Jackie** or **Paul S.** - Please arrange for dial-in phone numbers for Receiver mechanical design review telecon meeting scheduled for Wed Feb 12, 8:30am Taipei time.

[Complete.](#)

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

[Derek sent e-mail on 13-Feb to Ted and others with recommended slide PN and data sheet. Derek will purchase 2.](#)

[AI-23Jan03-1:](#) Assigned to **Homin Jiang** - Was asked by Ming-Tang to briefly summarize (for the record) the reason why AMiBA went to 48VDC primary DC power on the platform.

[Homin sent an e-mail on 13-Feb to distribution with text summary and spreadsheet.](#)

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### IV. Miscellaneous Discussions:

MMIC: none

Receiver: Bob - Receiver mechanical design review was presented by Ming-Tang yesterday. Very productive and well done. Minutes from this meeting have already been distributed. Ming-Tang said Ferdinand provided some feedback since then so he (Ming-Tang) will distribute this additional info.

Discussed preparations for the Receiver mechanical design review (see AI-1 above).

LO/IF: none

Ferdinand asked whether the slope equalizers located within LO/IF box will compensate for the receiver response itself. Ming-Tang said each equalizer will be custom designed for each channel with the goal of producing a flat noise output (14 potentially unique equalizers for 7 elements). Bob asked whether these unique equalizers will have the same delay verse frequency (group delay). The answer is probably not. See AI-2 above. Jeff Peterson suggested that the active components will probably have more unit to unit variation than the passive components.

Correlator: Jeff Rapadas - SN001 - channels 3 and 4 were dead but he has isolated this to a hairline open at both the power divider (common to ch 3 & 4) and one of the delay lines. This was repaired using a bonder and now all 4 channels are active! Jeff still sees a lack of responsivity at the low 2 GHz end which is similar in shape to the return loss measurement of one of the two RF ports. He will be replacing the glass bead on this BMA connector. Goal is to ship 001 to Chao-Te before the end of this week (absolute deadline is Feb 17<sup>th</sup>). He will begin testing of SN002 shortly.

Philippe ask Derek where the CG is for the correlator frame. Derek - approximately 10% higher than the geometric center.

Jeff Rapadas joined us for the first 10 minutes of this meeting. SN001 has 3 working IF outputs with one marginal one. SN002 has 2 working lags and 2 bad ones. SN003 is rough model and is not working at all. He mentioned that the quality of this housing is not as good as for the 16-lag and that this is causing him some difficulties. He's had to make some significant changes to the Duroid substrates in order to keep them flat to the housing. Estimated ship date is sometime next week. Jeff will contact Derek to determine shipping destination (Hilo or Taipei). Jeff has sent Derek an O-scope plot of one of the working lag outputs. Derek will distribute this to the correlator team.

Derek - Sent Ted feedback on Correlator frame interface to the platform. Ted will look at this e-mail and get back with Derek. Peter is fabricating and assembling 1<sup>st</sup> Section IF Distribution module. Hardware looks good.

DC power distribution: See completed AI-23Jan03-1 above.

Derek sent Homin JW Miller inductor samples for passive filtering. Homin said he tested the Vicor Micro-pack 5VDC module using a 48VDC input. Ferdinand

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mentioned that he found some Accopian linear rack mount 48VDC power supplies and will send the info to Homin via e-mail. Derek asked about the Correlator PC (-)48V requirement. Warwick mentioned that the telephone industry uses the (-)48V as a standard to avoid some sort of electrolysis problem. Ferdinand suggested that we just route a separate (-)48V pair of wires up to the platform just for the Correlator PC.

Dishes: Philippe - They (Ong?) are removing the ring. This ring is thicker than the thickness of the dish. The outside of the dish does not appear so smooth but the inside looks very smooth. In the circulated drawings, the white part is the re-machined epoxy. This particular dish may not be useable (due to extensive rework) and they will probably have to make a new one.

Ted - Do we need to measure the dish after the coating is done? Bob - Recommend to do one measurement after coating, assembly, and alignment are completed.

Bob to review measurement results from Ted. Bob suggested that Ted and colleagues look over the 60cm dishes on their next visit to Dr. Ong.

Platform/Mount: Philippe - Currently performing FEA stress analysis on the platform for all elevations/polarizations with added weights. May have to add some minor support structures but this shouldn't stop CMA.

Bob - When will the platform drawings be put together? Ted - approximately 2 weeks (from today). Still awaiting hole patterns (from AMiBA designers). Philippe - Also waiting for Bob Romeo to send him details on how he is planning to make the holes in the stringers.

Mike - Control system work (for mount?) is done on his side. Remaining work is on their (Vertex) side. Bob - Need to work closely with them to make sure both side mesh together properly.

Bob mentioned that CMA (platform) progress is coming along fine. Bob Romeo is waiting for box attachment point locations and hole templates from us. Ted is in the process of gathering this information. Ferdinand asked whether we will still have standard hole patterns on the platform. Bob said that this won't be necessary for the boxes (because we will give them hole templates) but we will probably have standard hole patterns for the cabling. Bob, Ted, and Philippe will have another general platform review meeting with CMA at the end of next week.

Paul Ho reiterated that he did not want to a spare jackscrew. We need to tell Vertex this decision by Feb 12. Delivery for a spare is ~6 months.

Bob mentioned that Vertex is not responsible for the assembly of the mount on ML. Cost of this option was very high, approximately \$4M NTD. We opted to hire Vertex to supervise our crew to assemble the mount. To learn how this is assembly process is done, Bob & Ferdinand (and ?) will visit Vertex during the initial assembly at the factory. Vertex's schedule is moving along fast with assembly in May and test in June.

Site Issues/Network: Bob - Mauna Loa of Boulder has contacted A&E(?) firm to start drawings. No progress on agreements (of ??). Paul S. asked when the foundation will be completed. Bob will send out an answer via e-mail but estimated around the end of August.

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Shelter - Bob is working on a quote for this.

Mauna Loa - They are currently very short of stored water (due to lack of rain) and asked all visitors to be very limited with water usage. "Yellow be mellow, brown flush it down".

Bob - Working on ML site work. Need to hire a company to drill to conduct a geological survey. Also need to contract out the design (~\$15k) of the foundation so that we can go out for bid. Schedule could be 1 month for design, 1 month for bid, 1 month for review which could take us into the summer. Bob will send out a summary.

Paul H. - was concerned about this schedule. It looks possible that we receive the mount and platform but not have the foundation complete?

Hilo Facilities: none

Derek - New offices (x3) in Casey building across the street from the SMA offices has 3 phones and internet connection working.

Schedule: none

Enclosures: none

Ferdinand - Found a weather/EMC tight enclosure which also serves as a card cage. This is an easier solution than using a separate card cage and enclosure. The box accepts 3U cards and has a 1U space below for I/O. Cost for a single unit is approximately \$280 - \$300 USD. This box has removable feet which might be usable to secure mounting bars to mount the box to the platform. Ferdinand has to check on the strength of these 4 holes before attempting this. He is planning to order 2, one for Hilo and the other to send to Taipei. Info on this box has been routed via e-mail.

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V. Other Inputs: none