

Minutes for AMiBA Engineering Telecon

Meeting Date: 6-Feb-2003

Participants:

Australia: W. Wilson, M. Kesteven

USA: D. Kubo, J. Peterson, F. Patt, R. Martin, P. Ho, J. Rapadas

Taiwan: M.T. Chen, W. Ho, T. Hwang, P. Shaw, H. Jiang

Minutes Recorder: D. Kubo

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

I. New Action Items:

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.

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?

II. Previous Action Items (still open):

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

Still in process.

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.

Still in process.

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.

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

AI-30Jan03-1: Assigned to **Derek Kubo** - Schedule a telecon this week with Jeff Rapadas of Meridian Microwave to communicate our schedule concerns. Is there anything we can help him with?

Conducted telecon with Jeff last Thursday. Telecon attendees included: Bob, Ferdinand, Jeff P, and Derek. Described our technical and schedule needs to Jeff. Jeff gave us his present status and described what he thinks he needs to do to get us our 2 modules.

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AI-30Jan03-2: Assigned to **Ming-Tang** - Send mechanical review package by this Friday for review. Bob asked for an agenda as well. Telecon review will take place @ 8:30AM, Wed Feb 12 Taipei time.

Ming-Tang distributed a substantial package via e-mail last Friday. The 2 enclosures will be the subject of discussion for next weeks Receiver review telecon.

IV. Miscellaneous Discussions:

MMIC: none

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

Ming-Tang - File size he is planning to send for the receiver mechanical design review will be ~10MB. Package will not include any calibration source discussions. 2 OMTs from ? have been delayed so he cannot test the noise coupler. Can't tell AT to make a 2nd noise coupler(?) until he is done testing the 1st.

LO/IF: 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.

Ming-Tang - for Prof. Chu - DC-to-DC converter is a change of spec. LO/IF has no room for DC converters so will have to put these within the Receiver Electronics.

Homin - Receiver/Correlator chassis has enough room for only 4 DC-DC converter circuits on the PC board (located behind back plane). These 4 supplies will probably have to be shared among the Receiver, IF/LO, and Correlator. Could be a problem with noise corruption. Individual modules should attempt to filter heavily with LC circuits.

Correlator: 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 1st Section IF Distribution module. Hardware looks good.

Jeff P. sent a mixer to CT in Taipei around 2 weeks ago. Should be there by now. Derek or Ming-Tang to ask Jackie if she has seen this.

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Derek - Talked to Jeff R. yesterday about the status. 001/002 modules were tested briefly and were found to have good responsivity at low frequency (2 - 4 GHz) and poor responsivity down to ~500 at 18 GHz. Jeff is having the modules reworked at 2Pi. Replacing delay lines and mixers due to some kind of improper assembly work.

Paul Ho expressed concern over the technical problems with the correlator and it's schedule delay. He asked that we schedule a telecon with him this week (see AI) and have him join us in the regular telecons.

Jeff P. - Mixer which CT was testing in Taipei was damaged or defective. Mixer was sent back to Rapadas who simply replaced the mixer diodes. Jeff P. did some quick tests and found the mixer to be quite good. He will send the files to Derek.

DC power distribution: 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 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.

Ming-Tang/Homin - Ran a quick test with the Vicor DC-DC converters. Accopian linear (24V?) >> DC-to-DC converter (5VDC) >> ripple attenuator module >> load resistor (2A). Measured ~17 mV periodic spike, period of ~3usec at output of RAM. Spec for raw DC-to-DC converter output is ~100mV ripple.

Dishes: 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: 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 assembly 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.

Platform - Ted - Still trying to tie down hole patterns. Need enclosure size info from Ferdinand.

Mount - Bob - Telecon next Monday with Vertex. Should we purchase a spare jack-screw for \$62k? Answer = no. Bob to ask for the recommended spares list Vertex mentioned during the CDR. Mike had a software question for Klaus in regard to the polarization(?).

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Site Issues/Network: 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?

Proty - He and C.J. Ma are working on the automated backup for the prototype machines on ML. Current scheme is to backup the correlator PC contents onto the monitor PC, and the monitor PC contents to Taiwan. This will happen every day. In order to free up space on the monitor PC, data which is older than 2 weeks will be deleted.

Proty - Discussion forum for ASIAA is now open (courtesy of Benson Lin). He suggested that observers could cut & paste the end-of-night report into the discussion forum for discussion. Proty will write up a summary on this.

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: discussed under individual areas (above)

Proty - Asked about moving over one of the 30 cm dishes (& receiver packages) to where the optical telescope is currently residing. This smaller baseline will increase the sensitivity to a level which should permit us to detect the CMB. Ming-Tang mentioned that an alternative to this is to wait until the 60 cm dishes are available (scheduled to be received in Taiwan end of Jan). The larger 60 cm dishes will provide better sensitivity without having to move a receiver packages to where the optel is. It was decided that we would wait for the 60 cm dishes rather than modify the existing 30 cm positions.

Ming-Tang - Will the 60 cm dishes block the path of the optel? Answer is yes. We will have to find another location and scheme to mount the optel (see new AI).

Enclosures: 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.

V.Other Inputs: none