

Minutes for AMiBA Engineering Telecon

Meeting Date: 26-Feb-2003

Participants:

Australia: W. Wilson, M. Kesteven

USA: D. Kubo, J. Peterson, M.T. Chen, B. Martin

Taiwan: W. Ho, T. Hwang, P. Shaw, H. Jiang, P. Ho, C.T. Li, E. Hwang, J. Han

Minutes Recorder: D. Kubo

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

I. New Action Items:

AI-26Feb03-1: **Derek, Bob** - Review mounting method of correlator frame to platform. We want to make sure correlator frame expansion/contraction does not deform the platform.

AI-26Feb03-2: **Bob** - describe planned location of dishes/receivers in relation to boxes on platform for 7, 13, and 19 elements.

II. Previous Action Items (still open):

AI-20Feb03-1: **Ted, Derek** - Need to provide hole pattern in platform for mounting the Correlator Frames. Forward this info to Ferdinand who is serving as the focus for the physical interfaces to the platform.

Ted has come up with a rudimentary design for a CFRP bracket which attaches the correlator frame slides to the platform. The hole patterns for this bracket to platform interface is not critical as long as the hole patterns fall within the body of the bracket.

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.

Awaiting info for correlator frame to platform interface. Will summarize this information and distribute before the end of the month.

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?

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

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

Ming-Tang distributed plots by e-mail. Suggestion was to use a single equalizer which represents the average correction necessary for each receiver. This should help with different phase vs. frequency consistency between equalizers.

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Johnson has measured the characteristics of the 4 custom slope equalizers. He probably needs to repeat the measurement for phase vs. frequency to unwrap the phase (so that we can see 10 deg/div detail). Ming-Tang will distribute this info by e-mail.

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.

Ted distributed a proposed solution via e-mail.

IV. Miscellaneous Discussions:

MMIC: none

Receiver: Ming-Tang - Completed CTI cold head test. Results are good, have made the decision to go with this for the final design. Receiver drawing updates are still in process. Also working on details of how to distribute and route the helium lines on the platform.

Paul S. asked whether only 5 new receivers will be built and 2 refurbished, or 7 new receivers. Ming-Tang = 7 new receivers will be built.

Bob - OMT - West G. was supposed to have the OMTs measured and sent to Taipei last week. This apparently didn't happen. There was a change made from hard to soft gold plating which should result in less loss. Ming-Tang was concerned about the state of West G's business climate and was worried whether we will get the entire run of OMTs for our 7-element system. Warwick mentioned that AT has developed a 3mm OMT and will forward the information to Ming-Tang.

Bob relayed a message from John Payne - has asked about doing trial tests of his noise generation scheme with the prototype in March. Bob - this will probably not be a good time as we will have many activities going on during March.

Currently cleaning up the receiver package design. No OMT yet, MTC will write an e-mail to West G. directly. MTC and Ferdinand went to visit the VLBI (on MK) to see their use of the CTI-22 cold head. They looked at their power supply distribution scheme for the cold head as well as their stainless steel and superfex cyro lines.

LO/IF: none

Ferdinand asked about the question of the phase switcher that CT asked about earlier via e-mail. Could the phase switcher phase be drifting with temperature? CT commented that Warwick believed that if the phase was near 180 degrees (at the final LO) then this shouldn't hurt us. Ferdinand then asked whether there are specs for the LO chain and Homin believed that there was not anything in regard to phase verse temperature.

Correlator: Derek - Assy of 1st Section IF Distribution module nearly complete with Peter Oshiro's help. Will send out photos. Need to make a total of 16. Peter is working on the layout of the large 2nd Section plate and will probably begin assembly in 3 weeks.

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Derek - The Meridian correlator appears to have a responsivity of around 800 to 900 V/W (peaks at 1000 at lower end). The original 16-lag had a responsivity closer to 2000 V/W (albeit with large variations vs frequency). One possible explanation for this is additional passive losses before the mixer. If this is the case then driving the unit harder would overcome this without running the mixer into compression.

Chao-Te - He is having difficulty interfacing with the 4-lag module (SN001) because the pins are recessed into the module. He will send an e-mail out with pictures of the interface to describe his problem. Warwick thought that he may have the necessary hardware if in fact the interface is the same as for the previous 16-lag.

Bob asked what the plans were for the prototype. Chao-Te will come here to 1) upgrade the Readout chip, 2) install the 4-lag correlator module (replace one of the 16-lag modules).

Jeff Rapadas - Shipped 001 to CT and it has arrived in Taiwan according to its tracking #. He shipped along an adapter (only 1) to attach to the IF output port. He believes that 002 will ship the 1st week in March. Derek asked what the responsivity was and Jeff said about 1000 V/W for lags 1, 3, 4, and a little less for lag 2. Jeff P. commented that driving at -7 dBm was probably putting the mixers into compression. Probably get a little more responsivity if you back off.

CT distributed the preliminary test results of Professor Wang and Ming Dar Tsai's SiGe Gilbert cell multiplier. They have 5 right now. So far the results look very good and CT will continue to run tests. Next major test is 1/f noise characterization. Jeff P. suggested to do this both without noise inputs and with uncorrelated noise inputs. Derek asked if the compression (output) can be characterized as well.

Ming-Tang asked CT to looking into fabricating enough of these multipliers for our AMiBA correlators (4 x 55 for 7-elements). Warwick was also highly interested in finding out more about this multiplier.

DC power distribution: none

Homin - Tested the DC-DC converters again with filters. Sees about 15mVpp of noise but some of this is from the O-scope. He needs to obtain a lower noise O-scope. He is encouraged by these results and thinks with more filtering and shielding he can get close to the low noise performance of linears.

Dishes: 60cm - Ted responded to some questions from Dr. Ong. Paul S. stated that the contract specifies that measurements be included as part of their service (I.e., we are paying for it). Bob would like this measurement to be conducted on the finalized assembly. Paul S. asked whether measurement of the dish can damage the mirror surface. Bob - probably not because the contact pressure is very low at 7-12gm force. Paul S. - current schedule has the delivery of the 2 dishes at the end of March.

Paul H. asked about the status of the 1.2m dishes. Bob - no progress. Paul S. asked Bob to summarize what needs to be done and the costs estimates.

Ted - Spoke to Dr. Ong, will be using carbon fiber ring instead of stainless steel. Will revise the drawings. Dr. Ong also commented on the post assembly measurements of the dish. Ted will send this information out via e-mail.

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Platform/Mount: Ted - waiting for hole patterns for small electrical boxes. Vertex - April/May - fitting of U-joints and jack screws; June - integration. Michael is involved with the programming (pointing?) interface. Next meetings: March 3 with CMA, March 21 with Vertex.

Ted - Philippe and Ted will finalize the platform design information before the end of February and will send this to Bob. CMA will begin to cut(?) in March. There is ~~another platform~~ **mount** meeting tomorrow (**with VERTEX**) and Bob will be part of this.

Site Issues/Network: Bob - was at Boulder CO last week. Discovered that there was previous soil test done on the area we are interested in. Don't have to do this anymore (saved \$10k USD). Solid lava approximately 10 feet down, will design foundation to tie to this. The electrical design aspect was looked at separately by the ML group. Plan to tap off 208VAC 3-phase power from one of their existing transformers. AMiBA will pay for the extension of the power line from the transformer to our facility (underground conduits). There will be 2 subcontractors involved, one for the excavation/concrete and the other for the electrical. Rough schedule: May - bid, June - construction, August - done. The mount will ship from Germany early August and will probably arrive in Hawaii early September.

Bob - Electrical usage at ML has increased by about \$800/month since we powered up the receivers. Also, Bob asked that we take fewer cars up to the summit to reduce road wear (I.e., more people per car). ML pays for the road maintenance and estimates the cost per 1 car*trip to be \$300.

Ferdinand - put a voltage event recorder at ML to monitor the 110VAC power. He plans to run this for about a month and then send out the results (outages, brown outs, over voltage, etc).

Paul H. asked about the camera at ML. Derek said that there is none right now. Paul suggested that we try to use NetMeeting instead of our current LiveVideo videocon software. Michael says he's successfully used Netmeeting in conference calls so it does work.

Bob is currently visiting NOAA in Colorado addressing the ML site issues. Ferdinand is investigating the geological testing issues of ML.

Hilo Facilities: none

Schedule: none

Enclosures: none

V. Other Inputs: none