Minutes for AMiBA Engineering Telecon

Meeting Date: 19-June-2003

<u>Participants:</u> <u>Australia:</u> W. Wilson, M. Kesteven <u>USA:</u> D. Kubo, B. Martin, P. Ho <u>Taiwan:</u> H. Jiang, J. Han, W. Ho, T. Huang, P. Shaw, C.J. Ma, K. Lin, H. Wang, C.T. Li

Minutes Recorder: D. Kubo comments from this week, previous weeks comments

I.<u>New Action Items:</u>

AI-19June01-: Ming-Tang - Check schedule for IF/LO hardware from Prof. Chu.

II.Previous Action Items (still open):

<u>AI-12Jun03-4:</u> Derek - Send Ted an interconnect drawing for semi-rigid cable routing between 2nd section outputs and 3rd section inputs.

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

AI-12Jun03-1: Bob - Follow up on MMIC items while Huei is gone (asked by Paul Ho).

Huei - Clintworth (at NGC) has not received all of our e-mails sent to him. Bob has called to check which were missed and made sure he got them. Paul H. suggested we do something like send a copy of the e-mail via fax to make sure it is received. Huei to call Clintworth to make sure he has everything he needs.

AI-12Jun03-2: Derek - Perform noise tests of both Marki and Meridian correlator modules in prototype hardware (asked by Warwick).

Derek - Ran series of tests and summarized results via Excel table. No signal into correlator modules: Marki = 29, Meridian = 39 counts (same readout chip/same channel). -7 dBm into both modules: Marki = 401, Meridian = 59 counts. Warwick suggested that the tests be repeated with -2 dBm into the Meridian because of the 6 dB internal pads. See also discussions under "2 Element Prototype Issues" later in this document.

<u>AI-12Jun03-3:</u> Ted - Send cable wrap design drawings to Philippe. He will look for fabricators in Europe.

Ted - Distributed design and received comments from Bob and Philippe. Have not received any feedback (quotes) from European fabrication houses yet.

IV. Miscellaneous Discussions:

MMIC: Bob - Huei is not present but there have been a lot of e-mails exchanged to NGC. See AI above assigned to Bob.

<u>Receiver:</u> Ming-Tang on Rx status- Preparing to perform MMIC amp tests in Hilo; expect to received 2 cold heads 1st week of July, rest in August; waveguides to be delivered by the end of June; 2 compressors 6 weeks ARO, translates to early August in Hilo.

Chao-Te - Cold phase shifter tests about 2-3 weeks away. Waiting for fab of waveguides. Chao-Te has not yet made plans for his visit to ATNF as of yet.

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Chao-Te - Next test for phase shifter will be to perform a cold test in a dewer. Might have to order some custom waveguides to perform this test. Bob was a little concerned as to how long it would take to acquire these waveguides. Warwick commented that e_r increases at -60C which should result in an even larger phase shift (presently 110-120 degrees, want 90 degrees).

Paul S. - Cold head and compressor orders are now under way.

LO/IF: see AI above

<u>Correlator:</u> Derek - Marki received PO last week (for 55 modules). Housings and boards all ordered. ECD for 1st 10 is July 11. SN003 prototype revision involved milling a rectangular cover or "hat" out of solid absorber for each mixer. Reserved 1500 diode quads for AMIBA. As an aside experiment, Marki has asked Metalics to make a custom diode quad out of detector diodes. To his surprise, this mixer seems to work very well but only between ~3-10 GHz.

Derek asked Chao-Te to characterized 003 ASAP. CT said he has not received it yet. Derek will provide tracking number to CT. We would like to know if there are any problems introduced to the module with Marki's latest "absorber hat" addition.

Derek asked Ted and CT why the rear power divider dimension was increased? Ted said he will send the reason/dwg via e-mail. Also, Derek said he received the DC-DC converter board from Taipei. CT asked that Derek use this to power up his electronics as a test. Peter is sending a blank 1st Section plate with face plate, DIN connectors, brackets, etc., plus mechanical drawings. We would like for CT to use the same parts for his XY and TP Readout modules.

Derek - Distributed an e-mail describing the history, technical issues, and test results of both the Meridian and Marki correlator modules. This combined with comments from Mike should provide the necessary justification to proceed with the order to Marki.

Tested 003 Marki module and distributed results via e-mail. Had some phase noise problem with available synthesizers so phase linearity data should be considered suspect. Results look similar to 002 but the undesired suckout at ~3.5 GHz appears to be gone. This 003 module is now on its way to CT in Taiwan. Sent 1st Section backplane info to CT last week.

CT is working on the XY module design and is attempting to resolve the old problem of how to de-emphasize the effect of the slope equalizer. Can't use coax with present power profile because the overall loss will be too great (unless can get more power from receivers). CT is sending more 1st and 2nd Section parts to Hilo for Peter to complete the 7-element hardware.

<u>Platform/Mount:</u> Bob - Weekly meeting with CMA on the platform. Latest issue was with the cable wrap. Received quote for shipping platform from Tucson to Germany - paperwork is in process. Philippe is researching lifting devices for the platform. Vertex - Ring was shipped from Poland and is due to be shipped to Hilo. Testing of actuators is proceeding in Dresdin. Philippe to go there on Monday. Considering to made a video of the assembly procedure.

Bob - Ted is working on the cable wrap hardware design. Still working out the details of how many pieces it will consist of. Will it be welded or bolted together. Should consider having the design manufactured in Europe since it will have to go to Vertex for fitting with the CMA platform.

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Bob - Had a meeting with CMA last weekend and 2 days ago. Schedule appears to be on track. Had a meeting with Vertex last night. No schedule change. Latest milestone of shipping anchors was due last Monday and it did happen. Vertex had some kind of a concern about potential viruses in the computer supplied by Mike.

Paul S. - Have not received shipment quote from Philippe (of platform from CMA to Vertex?).

DC Power Distribution: none

<u>Site Issues/Network:</u> Drawings (for foundation?) are in Bob's office. Ready to go to bid next week. RCUH recommends that the bid packages stay out for 30 days.

Putting (contractor?) purchasing packages together through RCUH. Paul Ho was a little concerned that Ferdinand will be away until the middle of July. Bob said he will be in contact with Ferdinand and will be taking over his tasks while he is gone.

<u>2-Element Prototype Issues:</u> Discussed methods to characterize SNR while in Hilo and came to the realization that since the DC amplifiers are now AC coupled (via 1uF cap/1MOhm load) we must phase switch the IF signal. Conclusion - wait to characterize final SNR at ML using actual receivers.

Mike brought forth a concern about processing the 4-lag data outputs from the correlators and obtaining the complex visibilities. It seems that the limitation of having only 4-lags combined with the non-ideal amplitude/phase variations could present a problem. The first question is "given ideal amplitude and phase conditions, do we have an algorithm to process the 4-lag data to obtain the desired visibilities? Does it work?" The second question is "with the addition of complex amplitude and phase variations, is there an algorithm to remove or reduce these effects". (Mike, did I quote you correctly?)

Bob - Asked if the 3 layers of demodulation is a practical way to solve the current offset problem. Answer was a weak yes. What do we need to do next? Warwick said he will work on the software change to flip the phase of the phase switch. Derek will start adding one item at a time to the correlator box and characterize offset, with nodemod and demod in TKCOR.

<u>Schedule:</u> none

Enclosures: none