

## Minutes for AMiBA Engineering Telecom 20060518

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Meeting Time: UTC 1:00, 20060518, (Taipei 9:00am, 20060518) (HST: 3:00pm, 20060517)

Regular Meeting Time: UTC 1:00 Every Thursday

Participants:

Australia:

Hilo: CT, Peter, Chia-Hao, Hiroaki, Patrick, Johnson, Ted, Ken, Fabi, MTC (minutes)

Taiwan: Homin, Joshua, Eugene, Umetsu, Johnny, Locutus, Kyle, Su-Wei, Paul Shaw

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- **Upcoming Milestone**
  - **First Image of AMiBA, for system check.**
  - **Target: Sun, without dishes, at least 5 receivers.**
  - **Target date: June 2, 2006**
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- AMiBA current status:
  - Path length alignment.
    - (0517) Kyle reported that he was still working on the report to have a consistent delay length for self-correlation in each receiver.
    - (0511) Analyzed from the noise source/translation stage measurement among the first 6 receivers, Kyle reported that the 15 baselines differed in length from few mm to almost 9 cm. Kyle would pursue to acquire a set of cables to narrow down differences to within  $\pm 2$  cm. For the fine-tuning, he planned to rely on the variable delay lines built in the system. The final goal is to reach a max. difference of  $\pm 2.5$  mm.
  - Grxmon did not function properly. Could not monitor multiple receivers under the correlator PC, nor the monitor PC.
    - (0517) Homin & Chia-Hao reported that after disabling two specific ports on F83 (Rxe-2), the system had been running over 24 hours with crash. Good progress. The two disabled ports were for monitoring temperature and one of Vg for LNA.
    - (0510) Discussion on relocating Grxmon to different computer. Another monitoring PC close to platform?
    - (0509) Homin reported that the problem seemed to stem from on F83 in Rxe-2, communication firmware. Rxe-7 might be OK, contrary to the perception from last few weeks testing. Request help from Michael and ATNF personnel.
  - Hexapod operation:
    - (0516) CT reported further problem in driving hexapod below 60 degrees in elevation. Michael advised on proper way of operation. CT confirmed that operation was initiated from ACU. Would try TCS. Patrick would check out this issue with CT on site.
    - (0508) Hexapod did not seem to like the position: az 275.1, el 47.0, hex-pol 0, on ACU. It showed "The Hexapod backward transformation has returned invalid results !!! Move telescope into NEUTRAL position from the Drive cabinet". Not a recurrent event so far. Categorized in the Intermittent Problem.
  - (0507) DRO & receiver overnight stability. Got measurement. DRO over night seemed OK in both phase and amplitude. MT urged everyone to look into what were the realistic numbers we were after. Would come back to this issue again.
  - (0511) Homin & Chia-Hao reported the problem related with "lost synchronization" problem was resolved with the removal of the RAID case in TCS computer. Timing was now accurate down to milli-second, with GPS.
  - (0515) Patrick reported 1.2M dish data analysis result.
    - Geometrical shape and focal distance (413.67mm) were ok,
    - Large surface rms (0.098mm). A factor of about 2 compared to the specs.
    - Similar outcome as the first prototype, although the number of supporting points during machining was increased (from 8 to 18, according to Prot'y's recommendation.)
    - Source of the large rms value came was unknown.

- Some information: Three layers fabrication: carbon – epoxy – aluminium coating: Cotech claimed (without data) the aluminium coating would not change the surface shape. The carbon layer (resin) is CNC machined, whereas the very hard epoxy layer is polished by hand.
    - A separate measurement of the carbon layer only could tell where exactly the large rms value comes from.
    - Paul Shaw reported that Dr. Ong would remove the coating and measure the carbon layer.
    - surface check: bubbles are smaller – but still there.
    - MTC to contact Ong for follow-up plan, solution, and schedule.
  - (0516) CT had reported several measurements on sun total power scan:
    - Total power detector saturation? Maybe the TP was toasted. Would investigate.
    - Output power variation, both correlated and uncorrelated were present. Further investigation, and guesstimation for impact and cure.
  - (0517) Large temperature variation in correlator. Major problem. Resolution to be investigated.
- Intermittent Problems:
  - (20060517) Too much activity and work load in correlator computer? Resolved with extra computer in the cone area? Monitoring computer under the hexapod, permanent or not?
  - (20060508) Hexapod backward transformation invalid? Cause unknown.
  - Compressor occasional trips. Cause unknown.
  - (20060504) ACU occasional crashes. Cause unknown. Reboot the machine would resolve the situation.
- Testing:
  - (0517) MT reported a second-hand CCD (ST-237A) had arrived. New OT bracket was on its way to Hilo. Missing the parallel -> Ethernet adaptor (Homin), a second OT e-box (Joshua). Second OT on platform. Target date: End of May.
  - (0504) Testing Schedule (Kyle)
    - Determine delay difference and order IF compensation cable. (Kyle) – *Early May, three weeks.*
    - Test, assemble and install Ant7 (Rx7). (Johnson) – *Mid May, two weeks.*
    - Install compensation cable and measure Ant7 delay with translation stage. (Johnson?) – *Late May or early June, one week.*
    - After compensation, measure fringe of each baseline as reference. (Johnson, Patrick, Hiroaki) – *June, two weeks.*
    - IF, LO monitoring. And phsw power difference, DC offset, noise property investigation. (CT) – *May, three weeks?*
    - 2<sup>nd</sup> OT installation and verification. (Patrick, Ken) – *Late May? Two weeks?*
    - Remove 1<sup>st</sup> OT and install 60cm dishes. Dish/Rx alignment with TP from sun. (??) – *Late June or early July? Two weeks.*
    - Planets! (??) – *July.*
- Hexapod testing:
  - (0517) Michael advise on checking the scanning option in a-boss?
  - (0427) Star pointing OK. (0427) Tracking OK. (0504) Polarization test, OK, data analysis was coming, together with interpolation table (Patrick).
- Site:
  - (0510) Pierre reported scheduled site electrical work on power distribution, additional grounding for shelter, fence, cone etc. Replace shelter electrical box, high power flooding light on site. Compressor electrical enclosure relocation, finished shelter electronic/electrical, power generator, etc.
    - (0517) COMPRESSORS OUTSIDE ENCLOSURE
      - location directly above conduit (after shelter rise). Add the control cables for the remote compressors circuit.
      - Add 5x 12 points connectors for remote control of cold heads (buy those connectors)
      - Pull the control cables
    - SHELTER NEMA 4 ENCLOSURE

- rewire for three phases motors. (when they'll arrive)
  - Wiring of a SECOND LOAD CENTER there (hook on previously crane circuit – wire size AWG 10/4, 25Amps CB).
  - Change wire size to AWG 8/4 or 8/5 for the load center
  - Wiring of flood lights, switches, receptacles w/ metallic conduit
- LIVING CONTAINER:
  - Check wiring + Circuit breaker (size).
- CHANGE 50 A CIRCUIT BREAKERS FOR THE COMPRESSORS.
  - Wire size AWG 8/4, locked rotor 22A → 25Amps CB need 6.
- GROUNDING”
  - Grounding of the cone:
  - Grounding of the platform (hook to copper plate)
  - Grounding of the shelter
  - Grounding of the fence
- TRANSFORMER FILTER, Hook & check
- New ethernet switch installed
- Tiltmeter installed
- (0504) No update on firewall (John & Homin)
- (0504) No update on emergency power generator (Pierre & Ted)
- Few more tasks or issues need to be discussed or taken care of:
  - Automate the weather station
  - A Site PA system (Over internet?)
  - Light inside the shelter (For day time worker)?
  - Control container, water leakage need to be fixed?
  - Lighting protection?
  - Sleeping container, need to install a door stopper to prevent further door damage
  - Need discussion regarding move out the transformer? Pierre's comment.
  - A shelter operation procedure.
  - Fabric replacement (Long term, but important.)
  - Ground shield, feasibility study, may contract to Bill and ARL
  - Supporting cone insulation?
  - Platform covers for drop-thru holes (CFRP, strong structure)?
  - A stair way up to the platform – might have to order an off-the-shelf model and modify it?
  - Crane?
- Calibration:
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- RX/IF/LO:
  - (0517) Johnson planned for Rx-7 installation by next week.
- Correlator:
- Software update:
- Dish:
  - (0511) Philippe proposed 2 ways of reducing the weight:
    - Reduce the thickness of the main dish, but this will be a big problem for the fabrication as the mold is already made. In any case the gain in weight would be marginal.
    - change the structure of the baffle: replace the plain carbon fiber by a composite sandwich, similar to the dish. I already discussed this with Dr.Ong and he said it would be feasible. This would be a substantial gain in weight.
    - Regarding the supporting of the 1,2-m dish on extra points of the platform, this is not straightforward at all, as every location will induce a different behavior to the dish, due to the deformation pattern of the platform. I still need to quantify a few positions to see how they compare.

- Need more details about the supports UNDER the dish from Ong, but I am still waiting for these details. It may be that we could add an extra structure from the brackets supporting the receiver, depending on the clearance there is.
  - (0511) MT reported a phone conversation with Dr. Ong. The dish should be coated on 5/10, and the surface measurement on 5/11. Paul\_S and Patrick would be on-site for the measurement.
    - Proposed Schedule (Ong, 4/20/2006)
      1. Dish RMS calculation (Patrick?) May 10
      2. Assembly and measurement May 12
      3. Delivery: May 15
  - (0504) 1.2 M dish structural support. MTC expresses concern on 1.2M dish mounting mechanism. MTC to ask Philippe to look into this issue.
  - (0504) No update on dish cover.
- Some lingering ideas (Need further sharpened...)
  - (0511) Kyle proposed another run of photogrammetry.
  - (0511) Protty addressed data storage on site.
- Upcoming events:
  - AMiBA Technical Review: June 2?, 2006, ASIAA (Taipei)

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#### Traveling Schedule to Hilo

Chia-Hao Chang	May 2 - June 16 (Hilo)
Ted Huang	May 11 - June 12 (June 13 – 24 to NRAO VLA)
Johnson Han	May 11 - June 13
Su-Wei Chang	March 2 - May 9
Ken Chen	May 16 -
Chao-Te Li	April 27 - May 26
Patrick Koch	May 17 - June 12 (June 13 – 24 to NRAO VLA)
Hiroaki Nishioka	May 17 - June 12
Pierre Martin-Cocher	May 11 – 27, (May 28 – June 2 to Orlando)
Homin Jiang	June 1 – 8 (May 28 – 31 to Orlando)
Mark Birkinshaw:	June 4-11
Katy Lancaster:	June 5-11
Keiichi Umesu	June 9 - ?
Locutus Huang	June 9 - ?

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