

EVLA Correlator Face-to-face Meeting, Socorro NM V3

Decisions for 2006October31

1. Testing of board prototypes – Penticton.
 - a. CBE output will be stored in ASCII files.
 - b. Station board output stored in XML files.
2. UVFits is okay for OTS testing re: “Round-trip comparison check” of UVFits as routed through CASA and AIPS.
3. FORM is part of antenna control, not correlator responsibility.
4. Delay Models come from antenna; no CALC in correlator.

Action Items for 2006October31

1. Testing of board prototypes – Penticton.
 - a. **Sonja** to define directory structure and file names to be used for prototype testing.
 - b. **Sonja** to update document “S/W Requirements for the Testing of Board Prototypes”.
 - c. **Kevin** to develop “Station Board Output Data Reader” S/W.
2. Delay Models
 - c. **Sonja** to update OTS testing diagram to show that models are coming from antenna S/W.
 - d. **Sonja** to define format for delay models (XML Schema).
 - e. **Barry, Bruce, Sonja** to achieve mutual agreement regarding the format of the delay models.
 - f. For OTS testing MCCC and Station Board CMIB should be able to handle delay models received from the antenna S/W (**see action 4**).
3. DCAF – add to Backend or Server? (SKIP if irrelevant).
4. **Bryan, Bill and Sonja** to define S/W needed for OTS (RFS document). VCI functionality (MCCC + Configuration Mapper) needed for the OTS will be defined in this document.
5. **Bruce, Sonja, Bill** to define in detail, functionality of Baseline Board and Station Board at the next level “up” from the MAH. **Bruce** to update CMIB Real Time S/W RFS.
 - g. Several other things raised in Sonja’s slides 9-11.
6. Sub-band delay tracking implementation on antenna servers – handling delta delays – will they be sent to MCCC? Ans: No work required now for this task. (**see action 2**).
7. Number of cable spares that NRAO may wish to procure – **NRAO**.
8. Output both lags and spectra simultaneously in ASCII data Output? Answer – Not needed for ASCII format. Open question for binary format.
9. List of CBE software items needed and priorities established – **Sonja**.
10. Installation Plan for WIDAR boards as they arrive – proposal from DRAO is “one sub-band correlator at a time” – **NRAO** to comment on this, but seem to agree.
 - h. Impacts the number of Terminator Boards required.
 - i. Alternative is wide band with smaller number of antennas (this is not a feasible option because too many terminator boards would be required).
11. **Question:** Do we need more FORM boards in Penticton?
 - j. Three more needed in Penticton to assure everything works okay?
 - k. NRAO to order another batch soon – **Mike Revnell**.
12. Ten “astronomer-determined tests” have been left open in the OTS plan.
 - l. **NRAO (Rupen, Clark...)** to review proposed test suite before it is finalized.
 - m. Barry – long tracking run on a source will be required to look for phase jumps.

13. Setting IP addresses on the FORMS, which are connected to Station Boards. Serial lines do not exist for these modules, and it is unclear how to set the IP addresses – **Revnell & other NRAO staff**.
14. MCCC protocol for communication with CBE/FF – **Martin, Sonja**.
15. Van Vleck correction algorithm → **Fred Schwab** to transfer his previous work on this subject to EVLA situation.
16. Items from Bryan Butler's slide 11.
 - n. Adequacy of UVFits (carried over from long ago) – **M. Rupen and B. Carlson**.
 - o. Phasing Board (PB) data. Station Board data (non SDM data) – How to handle? **Rupen, Sonja, Bryan, Bruce, etc.**
 - p. WIDAR Monitor data: investigate data rate, format in database, etc – **Bryan, Sonja**.
 - q. CMIB communication with Monitor DB.
 - r. CMIB communication with DCAF (through MCCC?).
 - s. WIDAR – CPCC, PB, CBE/FF connection to DCAF? How many data paths are actually required?
 - t. How much of DCAF code can be borrowed from ALMA?
17. EVLA Science Data Model (ESDM) → DCAF – Is this routed through MCCC? (**Rupen** by February 2007).
 - u. What data is passed back through M&C? (Wideband A/C, Correlator set up, times and durations)?
18. **Martin and Michael Rupen** to produce formal written specification for Binary Data Format (BDF). Does the binary format drive the RTDD? (Provisional answer = yes).
19. "Round-trip comparison check" of UVFits as routed through CASA and AIPS.
 - a. Michael to send test data to Brent.
20. Actions from **Michael Rupen's** slide 28/29.
21. Establish Correlator Output Team to investigate transfer of data to archive → visibility data only.

Decisions for 2006 November 01

1. Only one output at a time will be provided – lags or spectra but not both simultaneously. (**See Action 8, October 31**)
2. 15KW and space for 3 racks to be provided for CBE and FF. Expansion capacity will be possible. (**NRAO**).
3. Time in XML messages and on GUI screens is to be in the ISO 9600 or Julian date (MJD) formats. Do not use local time (UT only).
4. Clamp for Ethernet cable or strapping plan – leave extra 2 feet of CAT5 e/6 cable leader coming out of racks so the RJ-45 coupler rests in the cable tray.
5. Mount 1 RPMIB inside one Control Rack for HVAC M&C. All levels are TTL/CMOS (+5v) compatible.
6. For each CPCC, provide a separate dedicated fibre to EVLA M&C that does not go through the Control Rack Switch.
7. CBE Racks: 3, 19" (2' x 2') racks, 5kW each, 110VAC and 208 VAC plugs.
8. Two Control Racks: 19" (2' x 2'), 1kW, 110/208V each.
9. One Phasing/VLBI 19" (2' x 2') rack, 1kW, 110/208V each.
10. Each Control Rack has 3 CPUs for CMIB boot servers.
11. The CPCC and MCCC are not the same computer. The MCCC and the CMIB boot servers may be the same.
12. Will have 1 TTL monitor line going to Control Rack RPMIB to indicate 60 secs until fire suppression discharge.

13. Extra 2 ground-wafer outputs (unused) from Fanout Boards may be terminated on the boards, rather than using wafer terminators.

Action Items for 2006November01

1. M&C to periodically check configuration queue for “dangling configurations”.
2. Need to trigger Correlator Model discovery by command over VCI.
 - b. TBD at a later date – **Sonja**.
3. GUI or visualization tool will be required to analyze the correlator model file.
4. Need a new query (request) command for correlator to find out if there are sufficient resources to carry out an additional observation. Such a command would have to include a trigger time – **Sonja**.
5. Create t_{map} = time at which a new configuration is to be processed. Add this parameter to the activation trigger command – **Sonja**.
6. Testing of MCCC interface - **Sonja** to send the format required for models - **Barry** to generate messages from prototype executor to **Sonja** in Penticton. **Sonja** to carry out tests. Go to step one? (see **Action 2, Day 1**).
7. Status and alerts document to be completed – **Bryan**.
8. Document that combines NRC-EVLA Memo 27, the correlator system network, the CBE and CPU processing – **Brent** (September 2007).
9. Document the plans to implement EVLA Prototype Archive – **John Benson**
10. Account for SCSI cables in cable tray system in correlator room – **NRAO**.
11. **NRAO** to address question of what action to take when generators become overloaded.
12. Put MIB into generator system – **NRAO**.
13. **NRAO** to provide fault indication to correlator system for HVAC system.
14. Add power-up of HVAC blowers to **Brent's** start-up sequence.
15. Provide a “secure display” of CPCC status to EVLA operators via direct Ethernet fiber to control room.
16. Location of archive equipment (in or out of correlator room)? – **NRAO**.
17. CMIB server needed – Compact PCI crate in each control rack with room for at least 3 CPUs each will be sufficient – **NRAO**.
18. Modify fiber-input boxes for Station racks to accept input from sides, not from the top – **NRAO**.
19. Fundamental timing signals for correlator – use signals from redundant timing sources instead of splitting one signal.
20. **NRAO** to pay for overhead cable trays.
21. Installation of fibres – ensure that these are actually included in installation plan. Is it all right to place them in same cable trays as the Ethernet cable (consider physical damage potential)? – **NRAO**.
22. Provide a 60 sec warning to RPMIB from fire discharge system before discharging. Consider implications and action to take on correlator shut-down, etc. – **Brent**.
23. **NRAO** staff to use EVLA correlator website more frequently. Also contribute documents when appropriate. Get document numbers from donna.morgan@nrc.ca.
24. **NRAO** to provide “external timecode” generator board for prototype tests. – **Jim Jackson**.
25. **NRAO** to consider sending people to DRAO or to participate remotely in prototype testing.
26. “Wire-up” (placement) of Phasing Boards.
27. Is testing of 10Gbit Ethernet a requirement for DRAO? Cost is \$5000 – **Brent**.
28. DRAO to keep NRAO informed on likelihood of using sockets for correlator chips on production boards. Bell Labs reliability report from Bell Labs to be circulated – **Brent**. The issues are:

- c. NRAO might be willing to take the risk of replacing the interface material (Paricon pads) if necessary, rather than pay up front for more spare baseline boards.
 - d. DRAO is concerned about additional cost: Socketing would be cost neutral if the cost of the interface pads and the socket hardware is less than the handling cost that BreconRidge charges for soldering the correlator chips on the baseline boards.
29. Consider the suggestion of an “early test” (before OTS) of Station and Baseline Boards on VLA antennas. This could entail risk to the first prototype boards and would only be carried out after DRAO has completed all the lab testing – **Brent**.
 30. Is it necessary to purchase a large number of Terminator Boards or can resistors be mounted on the Fanout Boards instead? They could be removed if necessary. The cost of a contract to build all the terminator boards is \$US 40k. If the correlator configuration will not be changed, then the resistor solution is adequate. **NRAO** to raise objections if this solution is not adequate.
 31. Brent to keep Bill Sahr/NRAO regularly updated on Prototype Correlator delivery dates; at least after every Monthly Issues meeting.

Actions and Comments as noted by B. Carlson as a result of the Site Visit 02November2006

1. Try to minimize power consumption by putting parts of the correlator not being used into sleep mode.
2. **Action** – Send spec sheet for 3M rubber for strain relief to Bob B. for feedback.
3. RPMIB monitor lines from HVAC okay.
4. Tiles are 2’ x 2’ – 19” COTS rack should fit on them. Yes.
5. COTS racks don’t require cool air from the floor; front to back and integrated cooling only.
6. Run ground wires between rack frames and then 1 row/end 13 ground to room ground cable.
 - a. **Action** – Update Correlator Room Spec.
7. HM cables can be installed without removing tiles, so stepping on cables should not be a problem.
8. **Action** – Send Bob Broilo specs on 3M rubber that DRAO is going to use.