ECSV Discussion
4 December 2012, 10am in room 317

Attendees:

Barry Clark, Mark Claussen, Claire Chandler, Vivek Dhawan, Feng Gao, Miller Goss, Eric Greisen, Dave Harland, Minnie Mao, Josh Marvil, Steve Myers, Robert Mutel, Susan Neff, Juergen Ott, Frazer Owen, Dave Roberts, Michael Rupen, Deb Shepherd, Lorant Sjouwerman, Ken Sowinski, Gustaaf Van Moorsel, Stephan Witz, Joan Wrobel

Minutes:

News:

- Steve Ellingson will be visiting Socorro next year to work on the 4-band system with Frazer and Ravi:
    - Jan 14 to Feb 1, 2013 (3 weeks)
    - Mar 11 – Apr 5 (4 weeks)
    - Jun 24 – Aug 9 (7 weeks)
- Feng Gao will extend his visit for 2 additional weeks (until 22dec12) so he can get a good test dataset with the phased VLA and the VLBA, including the GBT. He is working on a Megamaser Cosmology Project (see his lunch talk tomorrow).
- Bob Mutel's last day will be 15dec. He will give a short summary of the work he has been doing next week, on 11dec.
- Susan Neff's last day will be 19dec. She will give a report of her work on 18dec.
- David Roberts last day will be 20dec. Report date is TBD (either 11 or 18dec).

Correlator and general system health (Michael, Vivek, Ken)

- 3-bit status (still in GOOD shape!):
    - 3-bit SBs are now going through the normal OPT and OST and it is working well.
    - We have only 4 wonky samplers now – making good progress.
    - 3-bit science status:
        - Claire has had 12x3hr 3-bit observations now (Q band, continuum). The data look good mostly.
        - As long as she applies the requantizer gain correction, the rest of the data can be reduced in a standard fashion and, indeed, she is doing the reduction in the Pipeline and it is working well.
        - Four antennas are behaving strangely: 2, 18 & 20 and 11.
        - The RMS noise in the continuum images is a factor of 2 higher than what the exposure calculator predicts. Compared with similar 8-bit observations the noise is about the same when it should be a factor of 2 better. Something is impacting the

overall sensitivity. Possibilities include decreased sensitivity at the higher frequency sub-bands, poor pointing and an overly optimistic exposure calculator.
        - Note: If you weight the data by the noise using the CASA task statwt then you are down-weighting the higher frequency data, effectively decreasing the impact of the higher frequency sub-bands. The exposure calculator includes the SEFDs in the OSS but this is probably optimistic and will certainly cause some issues.
        - Poor pointing would also affect the high end of the band since pointing errors will be worse than at the lower end of the band given that the primary beam size is smaller.
        - 4 of Claire's 12 datasets suffered from missing BDFs, but the data was actually there, just attached to the previous scan. This appears to be a timing issue with the CBE. The CBE is occasionally (30% of the time with the 3-bit system, seemingly less often with 8-bit data) putting calibrator scans at the end of source scans. What happens is that the calibrator visibility data is given the coordinates of the source field and this produces what appears to be a source at the phase center. Michael and Martin have been informed and will be tracking down the problem at high priority. Note: All missing single BDFs are probably attached to the previous scan. We can identify when this happened and we will develop a strategy to warn users until we can get this fixed.
    - We now need to do a few more things to wrap up the 3-bit preparations for D array (observing starting 25 January 2013):
        - Quantify how strong the calibrators need to be to work at Q band. Lorant and Minnie will do a test to evaluate how bright a calibrator needs to be to work well.
            - The test SB is in the queue.
        - We need a big push to get the Documentation in a good state for our users. The focus will be on K, Ka, Q band continuum observation (this is all that was offered for general observing in January; lower frequency continuum and spectral line observations with the 3-bit system will be shared risk or resident shared risk).
        - We need to take a careful look at how the noise integrates down with frequency. This should be scheduled in the next week or so.
- Phased Array
    - VLBA DDC (digital down-convertor) issues are still the largest blockers. These are being aggressively troubleshooted and fixed by the VLBA team (science & electronics) and expect to be solved very soon.

    - Vex2OPT still needs some work done by Matthias Bark. Note: Vex2OPT is the software that will take a VLBA schedule file called a VEX file (generated with SCHED) and convert the phased VLA information into a schedule block (SB) that can be read by the VLA on-line system (normally SBs are created by the OPT, Observing Preparation Tool, hence the name of Vex2OPT).
    - We are now focusing on the end-to-end data path (making sure Vex2OPT works well, making sure we understand how to do the relative flux calibration between the phased VLA and the VLBA, documenting everything for our users, etc). Amy and Vivek will continue to push on this.
    - Amy did a phasing test to make sure the new CM works well and found it was possible to phase up the array with sources down to 10's of milliJanskys.
- Sub-arrays
    - Sub-arrays continue to be broken in this latest version of the configuration mapper (CM) in the correlator but Michael/Ken/Vivek have demonstrated the breakages to Sonja who is now working on the problem at high priority.
- Configuration Mapper (CM)
    - A lot of work is going on with the CM, checking this to the extreme detail.
- Correlator Back End (CBE)
    - There have been no instances of the CBE going into a catatonic state (this happened frequently when observing Claire's 3-bit projects). This appears to be fixed now.
    - Martin has done the 2nd and last of his major CBE upgrades that changes the underlying multi-process functionality. If testing goes well today, we may run with this over night tonight. The hope is that this buys us robustness and the ability to use the new CBE nodes.
    - New CBE nodes were shipped back to Canada a couple of weeks ago and they should be back in mid-Jan for testing and incorporation into the CBE.
- The CBE "Swiss cheese problem"
    - We had a problem where large fractions of some of the scans contain 'integer zeros' (and hence are removed by BDF2AIPS). In column listings, some baselines were fully present, but about half the baselines had only ~25% of the data. The data that remained was OK.
    - There was strong evidence that this was caused by a timing error in the dumptrig generation in the CBE that occurs only rarely. Bruce repaired this and we have rebooted all the station boards, so the problem should no longer be seen. Please look at your data taken since last Wed – if you see lots of zeros, contact Michael and Ken.

Testing coordination and best LST ranges for tests (Joan):

- We have made good progress to get the night time high frequency observations in A array done. This has opened up the amount of time we can use to test: The optimal test window is now 4-7 LST, regardless of weather.
- Weekday tests continue to be difficult to do given that we still have high pressure from WIDAR, 3-bit, phased array, and sub-array testing.
    - Try not to set up your tests in the weekday but it is possible if necessary.
- Weekend daytimes are still needed for science. We will be having a science Friday this week to try to 'discharge' some of the daytime science SBs.
    - It will be very difficult to get test time during the weekend daytime. Its not impossible but do everything you can to avoid this time. If you absolutely cannot run your test any other way except during a weekend day, contact: Deb, Michael, Vivek, Joan.

Software status (David Harland):

- Dave Harland went through the status of the SSS software under development. His summary is given at https://builder.aoc.nrao.edu/meetings/sssMtgNotes20121204.html, additional notes from the conversation we had are below:
    - GOST.
        - We need to check that the default times for D-array in GOST are appropriate.
    - Exposure Calculator requirements update was summarized by Mark:
        - P-band confusion can be handled as at other frequencies. We mostly just need to get the normalization value right.
        - P-band sky background changes depending on whether you are looking toward or away from the galactic plane. So we will have to ask the user for information that will allow us to make a rough estimate of the sky background (e.g., provide 3 estimates of the sky background based on the galactic latitude of the source). This implementation depends on the NRL folks to provide us with numbers we need to estimate the system temperature increase expected as the source gets closer to the galactic plane. Future improvements will likely be more accurate and complicated to implement but this is good enough for this call.
        - We might have to change the 3-bit sensitivity based on Claire's finding that the sensitivity is a factor of 2 larger than the current version of the exposure calculator predicts. Mark should make sure this is included in the requirements given to Dave.
    - VLBA phased array:
        - This is generally in good shape.

        - The output generated by the VEX2OPT code (to convert SCHED output to something the OPT can read for the phased VLA) will be tested in the OPT to make sure it works.
        - Vivek said that he & Amy will have a few additional small things needed in the OPT and they will talk to Dave outside of this meeting.
    - RCT Spectral line UI
        - We have had excellent interactions between the developers and our sub-system scientists: Lorant & Emmanuel.
        - A new webtest update will be released this week, hopefully today.
        - Next Tuesday, hopefully we will have a demo of this by Lorant and Emmanuel.
        - Juergen and Michael will be testing this during day time testing as soon as the software is released to make sure that the sub-bands are placed correctly on the astronomical lines.
    - There will be a new VCI (Virtual Correlator Interface) Jar file because Sonja is working on the correlator.
        - Note: VCI xml files are generated from the submitted scheduling blocks with the model2script software and they specify the correlator setup controls.
    - OPT/OST releases:
        - Spectral line OPT/OST updates will be pushed to production after 1 Jan… This will make the final testing difficult and we will have to have an intermediate release between 21dec12 and 1jan13. Claire and Michael strongly voted in favor of the intermediate release item 2:
            - Eager users who want to set up their SBs early should do so with dummy resources in their scans and then add the resources when the UI is available.
        - ***The OPT slowdown issue is still a big problem and must be addressed with high priority.***
    - A problem was found yesterday:
        - If a new project is created, you will see it without problem. But if you just play with it and log out, you will not see it – it becomes 'hidden.'
        - Daniel can make a database change to make this 'seen' again and this is the work around we will use now. Folks who answer the helpdesk tickets should be aware of this issue.
    - Final release with the new spectral line UI (8 Jan) will need adequate testing.
        - Deb and Claire will discuss who will test and when.

CASA (Steve, Juergen):

- CASA 4.0 release is still not released yet; there are still problems with the creation of the distributions.
- The 4.1 CASA test build is out. Items that need to be tested are:
    - Cal table data can be plotted in plotms at a basic level
    - Urvashi's current patch for clean using nterms=2 – speeds clean up an order of magnitude, better than multi-threading speedup.
        - And Frazer are Susan Neff is testing Urvashi's Clean version and it seems to be working well.
    - Requantizer gains for the EVLA
    - Syspower now in Jy scale
    - Linear pol calib document will be ready for review.
        - This is a general description that should be applicable for both ALMA and VLA P-band but it is not written specifically for one or the other. The casa-guide for VLA P-band is still planned but not worked yet.
    - Ability to run flagdata/flagcmd on Cal Tables
    - Feathering GUI – stand-alone tool
    - Development of a Value-mapper tool (needed for the pipeline)
    - Makemask update by Tak (may make it in)
- New gain curves are now in the repository.
- From last time: Frazer gave Steve a Linear polarization P-band dataset so Steve will be able to calibrate the data in CASA and see if this works and then start to create a regression script and then a 'casa-guide' for our users on how to do this.

Reminder: CfP documentation update:

- Status is below.
- REMINDER - CfP documentation is due SOON.
- We would like to have all documentation drafts done by Friday, 14 December (a week earlier than we thought last week - apologies!)
- Status of where we stand is below. ***If you are planning to travel before 14 Dec - get your documentation updates in before you leave.***
- Note: Gustaaf asked for additional documentation updates in a Guide to VLA observing – these are due on 21 December. The link to that content is: https://science.nrao.edu/facilities/vla/docs/manuals/obsguide/modes. Gustaaf has asked that the following pages are updated by those indicated below:
    - Continuum - NEW: leave for now
    - Spectral Line – Jurgen
    - High Frequency Observing – Mark
    - Low Frequency Observing – Emmanuel
    - Very Low Frequency Observing - NEW: leave for now
    - Polarimetery – Steve
    - Mosaicking – Steve
    - RFI - Emmanuel (content still being ported, leave for now)

- Moving Objects - Bryan (NEW - would be nice to have some content)
- VLBI at the VLA – Amy

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CfP documentation status

Update for the Jan 2013 CfP (Semester 13B)

Documentation preparation for the call for proposals (Everyone)

- Call must go to CV on 21 December (Friday before Christmas). Documentation content due date will **be 14 December**. The documentation must be reviewed and made consistent before 4 January (when the call goes out).

The proposal overview will be located at:

- https://science.nrao.edu/facilities/vla/proposing/vlapst2013b
  - Deb & Claire will be mostly responsible for this

The OSS for 13B is available at:

- https://science.nrao.edu/facilities/vla/docs/manuals/oss2013b/
  - Everyone will be responsible according to the proposed assignments identified below.
  - **P-band** will be added to the OSS in two ways: as an intro section giving the status of the system for 13B and added through out the OSS. Frazer will be providing the content for the sections – please see him if P-band info must be added (as indicated below). If you think P-band info (or even just a sentence or footnote) might need to be included and it is not indicated below, please talk to Frazer to see how to approach it.
  - **P-band** will also need to be added to the Exposure calculator and associated documentation.

- Various sections of the OSS:
  - Rick
    - 4.1 Resolution (+ P-band)
    - 4.2 Sensitivity (+ P-band)
    - 4.3 EVLA Frequency Bands and Tunability (+ P-band)
    - 4.6 RFI (+ P-band)
    - 4.9 Imaging (with Urvashi checking this)
    - 4.10 Cal and Flux Density Scale
    - 4.11 Complex Gain Calibration
    - 4.15 Snapshots
    - 4.16 Shadowing and Cross Talk
  - Urvashi
    - 4.9 Imaging – check what Rick has done

- Emmanuel
  - 4.2 Sensitivity (+ P-band)
- Steve
  - 4.4 FoV
  - 4.12 Polarization (Note: ***no*** P-band polarization will be offered for shared risk)
    - Rick add his table of the polarization fraction and angle on the standard sources, equivalent to what is in the old VLA guide at: http://www.vla.nrao.edu/astro/calib/manual/polcal.html
      This is most relevant for actual observing.
  - 4.17 Combining configurations and mosaicing
    - Link to the evlaguides page on mosaicing to 4.5.2 & 4.18 (http://evlaguides.nrao.edu/index.php?title=Mosaic_Observing)
- Claire
  - 5.8 Data processing
    - Provide link to Juergen's updated CASA documentation.
  - 5.9 Travel Support
  - 5.10 Student Observing Support Program
  - Add a section on pipeline products. (Maybe just link to an evlaguides page)
- Vivek
  - 4.8 Positional accuracy
- Frazer
  - 1.3.1 New Capability for 2013B: Low-Band Status (about 20 receivers, continuum and single field only)
  - Provide P-band content for all sections identified above, answer all P-band questions.
  - Link to P-band evlaguide page
    - Susan Neff will provide content for data processing while Huib/Minnie will convert this to plone and update as needed (evlaguide content is not due for the CfP but we should start on this before Susan leaves)
- George
  - 4.11 Complex Gain Calibration
- Michael
  - 4.5 Time Resolution & data rates
  - 4.7 Sub-arrays
  - 4.13 Correlator Configs
  - 4.18 Pulsar observing
- Jon/Amy
  - 4.14 VLBI
- Joan ***- Done***

        - 5.1 Obtaining Observing Time on the EVLA ***- Done***
        - 5.2 Director's Discretionary Time ***- Done***
        - 5.5 Fixed date and dynamic scheduling ***- Done***
    - Gustaaf
        - 5.3 Helpdesk
        - 5.6 Observations and remote observing
        - 5.13 Reservations for the EVLA site and/or DSOC
        - 5.14 Staying in Socorro
        - 5.15 Help for Visitors to the EVLA and DSOC
    - Lorant
        - 5.4 Observing Preparation
        - 5.7 Data Access
    - James/Bryan
        - 5.12 Computing at the DSOC
    - Deb
        - 1 Introduction
            - 1.1 Purpose of Document
            - 1.2 The Expanded Very Large Array Project History
            - 1.3 VLA Science Opportunities
                - 1.3.1 New Capability for 2013B: Low-Band Status (Ensure this is set up for Frazer)
        - 2 Overview of the VLA
        - 5.16 On-line information about the NRAO and the VLA
        - 6 Publication guidelines
            - 6.1 Acknowledgement to NRAO
            - 6.2 Dissertations
            - 6.3 Preprints
            - 6.4 Reprints
            - 6.5 Page Charge Support
        - 7 Documentation
        - 8 Key Personnel (refer to people to the helpdesk)
        - 9 Acknowledgements

- Other documentation (outside of the OSS)
    - Claire
        - Draft Call for Proposals
        - Pipeline
    - Joan
        - Config plans web page
        - Including LST availability plots
    - Michael, Emmanuel, Juergen
        - General Observing Setup-Tool (GOST) – Includes in-line help (button taking people to the separate help file)
    - Deb
        - TUNE tool, includes in-line help

- Lorant, Emmanuel
  - Stand-alone RCT (SRCT) for shared risk - includes in-line help (button taking people to the separate help file)
- Deb/Claire
  - Shared risk observing web page
  - RSRO web page update, include low-band
  - ECSO web page
  - Main Proposal Preparation and Submission page: overview about how to submit a proposal (like a quick-start guide), directing people to different tools and links depending on what type of proposal they will be writing and what to do in each tool if asking for shared risk, RSRO or ECSO.
  - Update the CfP with any last minute changes.
- Gustaaf
  - FAQ update, add FUnaskedQs discussed at tech review meeting
- Jon, Amy
  - Phased VLA for VLBI
- Juergen
  - Spectral line observing guide
  - CASA documentation
- Mark
  - PST documentation update - https://my.nrao.edu/nrao-2.0/secure/Help
  - Exposure Sensitivity calculator (+ P-band)