

Minutes of Plan meet of 01 May 2013 (follow-up of some pending topics from different areas) :

1. Documentation related :

1.1 Follow-up on level 3 (NTR) -- pending for long : from 3 Apr & before (SSK/DO):
To check status of report on design of OF system.

==> SSK is trying for a IEEE photonics conf 4 page abstract as the motivation factor for this, which would be well worth it. To check after 2 weeks.

1.2 Documentation : central data base for storing information -- from 20 Mar (SJ/YG) :
to be taken up for a discussion?

==> generally may be useful, but not clear what is the best way to do this.

Maybe useful to talk to Dongare also? YG to check. To follow-up after one month.

2. FE & OF related :

2.1 Update on results from test range -- from 17 Apr & before (GSS/SSK) :

(i) phase centre tests for 250-500 CDF : to report on results with different VVM;
to report on expt with additional 10 to 20 mm height increase in 250-500 feed on
one antenna to see how much change in sensitivity is seen.

==> other (new) VVM requires controlled temp environment which is difficult now
at antenna test range. Antenna test is being planned within next few weeks.

(ii) update on calculation (based on reference paper) of the expected deflection
at 450 or 500 MHz and comparison with measurements to see if we are losing
significant sensitivity.

==> first round of calculations are giving unrealistic results -- needs a cross-
check of the methodology and the calculations.

(iii) status of phase centre checking for ver2 550-900 CDF and CSIRO feeds.

==> ver2 feed is not yet free from use at GMRT; CSIRO feed will be done
Meanwhile, test range is back in proper operations after some repairs; will use
some spare time for completion 1-3 GHz feed testing and then ver2 CDF.

Follow-up on all items after 2 weeks.

2.2 Update on RF dump tests for new feeds -- from 17 Apr & before (HRB/GSS/SSK)

(i) new data and results for 130-260, 250-500, 550-900 (HRB/SSK) : further
data for 130-260 & 250-500 to be provided by FE group to NK, and results from this.

==> no fresh data has been taken; HRB to be reminded about this.

(ii) scheme for (re)calculation of expected values across the broad bands to be
finalised (and added to measured curves) -- (SSK and team) : scheme to have been
initiated after detailed discussions with APK (including items from with 3 Apr
and 27 Feb discussion).

==> Gaurav Parikh has been discussing with APK for implementation for the scheme;
reminder to DVL and YG to see if they can provide the Tsky estimates.

To follow-up after 2 weeks.

2.3 Signal flow analysis related items -- from 17 Apr and before (GP/ANR/SSK)

(i) new version of L-band analysis to be released : if we are happy with this
work, then matter can be closed (ITR has been released).

==> SSK would like some additional details of measurements at antenna base to understand the effects of varying power levels across the band.

(ii) to try system with extra amplifier at receiver room to check 6 dB margin : status update if final mounting arrangement done and test carried out.

==> mounting plates received; 6 amplifiers available and hence 3 antennas have been done (W4, S4, E2); gain has been increased to 10 dB (20 dB ampl preceded by 10 dB attn) NOTE : E2, W1, W4, S2, S4 have broadband CB also installed (ampl with flatter response and higher dynamic range, but no increase in gain). SFA needs to incorporate these changes / effects !

(iii) plans for trying analysis of 250-500 system; also generating a first cut block diagram of the 250-500 MHz receiver : to check if (a) analysis has started (b) missing items (like temp monitor) added to blk diagram (c) list of parts, items to be ordered, jobs to be done for making new version FE box is ready (see above).

==> (a) and (b) still pending; (c) indents and processing for power det IC and dir coupler (for power detector) have been done, may also need to change the ampl in the power det circuit.

==> Additional item : slope across the band needs to be looked into more carefully -- how much is it; where does it come from (ampl, sub-band filters, cable loss with freq). signal flow analysis to be updated accordingly to take into consideration such effects (e.g. 10 dB extra ampl in 1390 band on some antennas etc). FE group to do initial investigation and provide a summary for discussion.

==> To follow-up all items after 2 weeks.

2.4 Tests of 130-260 system on C10 vs other antennas -- from 17 Apr (NK/HRB) : to follow-up on action items : (i) results by NK from RF dump data to be summarised.

(ii) to try for tests with 2 feeds fitted with modified 130-260 system, if C10 one channel not working has been fixed.

==> C10 unit has been repaired and will go up this week (W1 is working ok). Both will have new CB and better TV filter. To follow-up in next meeting.

2.5 New LNA for 130-260 system -- from 17 Apr & before (VBB/SSK) : FE team to report on tests of thermal characterisation to check if physical temperature near the LNA can be correlated to gain and Tnoise of LNA; also to update status of environmental chamber.

==> tests have been done; not clear if the results have been circulated; quick look at the plots shows about 10 K varn in Tsys and 2 dB or so in gain with 50 deg in PCB temperature.

environmental chamber : to verify if problem with the FE unit is due to temperature in the shed by testing in a cooler location and then decide on follow-up action.

Follow-up after 2 weeks.

2.6 Directional coupler for 250-500 FE system -- from 17 Apr and before (ANR/SSK) : follow-up on status of design on alternate PCB substrate (for reducing the loss);

also to compare with other option / design that was done using older system...

==> still waiting for the substrate boards ; meanwhile, to do the simulation for the new design so that the chassis can be decided; also to look at the old version and cutting out the directional coupler and making a chassis for the same.

Follow-up after 2 weeks.

2.7 Walsh switching arrangement in FE -- from 3 Apr (SSK) : FE group to come back with clear statement about (a) what is feasible and (b) how to go about doing the tests (vis-a-vis of action items minuted in meeting of 19 Dec 2012); does new system need new RFCM card?

==> no updates for now; to check after 3-4 weeks.

2.8 Filters at different stages of receiver chain -- from 3 Apr & before (SSK) :

(i) to follow-up on improvements to basic design of scheme for antenna base.

==> improvements have been done and a prototype is under construction ! FE group to send out a document showing this design.

(ii) to follow-up on refinements of the scheme for each FE box.

==> Draft document with the above to be circulated in time for a discussion.

To follow-up after 2 weeks.

2.9 Finalisation of design for temperature detectors for FE system -- from 17 Apr and before (SSK) : final design using TC1047 + amplification scheme : prototype to be ready.

==> big problem with this as compatibility of old vs new MCMs. Needs a separate detailed discussion. YG to check and coordinate. Follow-up after 2 weeks?

2.10 Characterisation of new OF systems -- from 10 Apr & before (PAR/SSK) : status of follow-up on action items :

(i) to check for HPF problem in other antennas

==> C4 had the only odd one out; replaced with a corrected one and matter can be closed.

(ii) follow-up on S2 to fix the RF/FE problem

==> S2 now has C6 box and C6 will get S2 box by this week; to make one round of measurements and release the system for regular monitoring.

(iii) 4-5 bad OF systems to be checked and updated set of measurements to be provided (compared to 13 Feb presentations).

==> optical power level to be adjusted; need optical attenuators which are under order; leaves about 4 dB antenna to antenna variation in RF gain of OF system.

(iv) finally, need a clearer statement about how many antennas with broadband links are giving reliable signal level performance.

==> FE group is doing integrated tests with RF signal levels; first list of antennas with poor FE problem has been circulated; some antennas are now thought to be working OK and some may have FE issues for Lband; need some systematic work for debugging.

10 dB gain has been added in 3 antennas -- BE group to test signal levels for these 3 antennas and confirm that things are acceptable.

Detailed discussion about power levels :

Basic requirement : -24 dBm over working bandwidth is needed by BE system.

At Lband, -24 dBm over 400 MHz into analog back-end is OK with FE/OF; note that this is with ~1-2 dB attn in OF system at antenna base, and ~8 dB for analog backband; however, this can be a problem when BW is reduced to 110 MHz at L-band as the attn in BB will come to the edge; hence, FE/OF team is adding an extra 10 dB gain at antenna base, by using a combination of 20 dB ampl + 10 dB fixed attenuation (effect of this on SFA needs to be established clearly, see above) -- this should be enough to take care of this variation; furthermore, 110 MHz selection at different parts of Lband is expected to contribute about 4 to 9 dB extra variation. For other wave-bands, e.g. 250-500, 130-260, we expect the total power from FE to increase (this remains to be verified); hence extra attenuation will be used in OF system to give back -24 dBm over the working bandwidth. It was agreed that signal level variations due to sub-band filtering within a wave band will be compensated in BE system, whereas signal level variations between the different wave bands will be compensated in OF system.

==> detailed follow-up after 2 weeks on this topic.

2.11 Scheme for M&C for new FE systems with new Rabbit etc needs to be discussed and finalised -- new item (SSK/SN).

==> It was pointed out that this matter needs to be taken up for a discussion in a forthcoming meeting, as early as possible. To aim for a discussion 2 weeks later.

3. RFI related matters :

3.1 Effect of military satellite RFI in 243 band -- from 3 Apr & before (PAR/SSK) : follow-up action on testing for saturation effects, decision about appropriate location of switchable filter, possibility about control room (ops group) being able to come up with predictions for user's observations.

==> Not discussed due to shortage of time.

3.2 Radiation from CAT5 cable -- from 3 Apr & earlier, but matter dragging from 25 Jul onwards ! (SSK/PAR): Follow-up on action from 3 Apr discussions : to install shielded CAT6 cable in conference room as trial and finalise the scheme for all other public places in the building.

==> Not discussed due to shortage of time.

3.3 Mobile phone RFI -- from 17 Apr and earlier (SSK/PAR) : to check (i) progress on multiple SIM cards (ii) if more units of the particular phone can be / have been purchased (iii) progress on identifying the operators at and around E06, and in Nagar, Junnar directions (follow-up with BSNL etc).

==> Not discussed due to shortage of time.

3.4 Discussion relating to Industrial RFI survey -- from 3 Apr, but pending for a long time (PAR/SSK) : revised docs (from 2009 and 2012 discussions) were to have been circulated by RFI group for discussion in today's meeting, for identifying a way forward.

==> Not discussed due to shortage of time.

4. Operations :

4.1 Rabbit card related activities -- from 10 Apr and before (CPK/SN) :

(i) release of SoP for testing procedure (to be shared with other groups) -- 1st version was to be released (by Satish).

==> email update : work ongoing, will be ready in 2 weeks time.

(ii) software changes for analog back-end system & MCMPRN type version : work in progress at 10 Apr meeting -- to check present status.

==> email update : work ongoing, waiting for NS to return from leave.

To check status of both tasks after 2 weeks.

4.2 Development of M&C software -- from 10 & 17 Apr (JPK/RU/SN/NGK/YW) :

(i) update on in-house development efforts (RU/SN)

==> email updates : following jobs done / ongoing :

(1) handshake between Online-dispatcher-MCM program on Ethernet done (2) prototype program which automatically updates the database done (3) QML based GUI which displays graphs, plots and other monitoring information (4) 1st level of QT based

GUI for User Interface (5) studied DAS chain and working on interfacing DAS chain with Online program. To check status after 1 month.

(ii) update on HRS & SRS work with TCS (JPK/SN)

==> work ongoing, can review more in detail 2 weeks from now.

(iii) plans to organise larger discussions regarding major decision items (all)

==> To be taken up in next 2-3 weeks.

4.3 Monitoring of 3-phase power at each antenna -- from 17 Apr (SN/RVS) : Ops group to report on tests done at antenna base.

==> not done yet; SN to discuss with RVS about details. To check after 2 weeks.

4.4 Using new MCM card on ethernet of PC for upgraded analog backend -- from last week (JPK/NS/CPK/BAK) : (i) completion of s'ware (by NMS) for all commands & tests in receiver room -- to check compatibility with web-based version

(ii) schedule for implementing in 8 antenna system -- can this be closed now?

==> confirmed that online control version installed on 8 antenna systems and tested and released; SOP to be released to control room; option to go back to web-based version is now gone; NMS is working on integrating it back along with online version; till then, agreed to work with online version.

To follow-up after 2 weeks.

5. Back-ends :

5.1 Analog back-end for 8 antennas -- from 17 Apr (BAK) : to confirm that 8 antenna system has been restored and what is the current status of availability.

==> system is released with 400 MHz baseband filter, with online version for control. A formal SOP needs to be released within the next week or so.

To check 2 weeks later.

5.2 Analog back-end beyond 8 antennas -- from 17 Apr and before (BAK) :

(i) plans for component ordering etc to be checked and see if this can be closed.

==> this appears to be on track and can be closed.

(ii) status of implementation of new layout to be checked.

==> during MTAC old baseband system (for GSB) has been shifted and occupies only 4 racks (instead 8); work for installing new systems requires mechanical works for routing of cables, installation of connectors, power supply distribution; Hande has made a first level drawing which is being fine tuned and will be circulated soon within 1-2 week; actual wiring of 8 racks will start after that. low loss cable from OF to BB has been done for 16 antennas, 16 more to be done.

Follow-up after 2 weeks.

(iii) filter bank choices in the system : discussion to be held.

==> baseband filters : 400, 200, 100 are the default choices, and one more option will be possible (as it is a 4 way switch); status : one prototype of each is ready; and PCBs given for mass production; all components are in hand.

RF filters on input side : this needs some discussion with FE group also.

Check after 2 weeks.

5.3 GPU corr status -- from 25, 17 Apr, 20 Mar & before (SHR/GSJ/BAK/DVL) : updates on following items :

(i) release of 4 node, 8 input, 200 MHz version -- to confirm if this mode is now working with online control, and the data is "imageable" for (a) 32 MHz case and (b) 110 MHz case.

==> images not yet seen for any mode; 32 MHz data is there and DVL is working

on it. then take test data with 110 MHz setting;
also couple of timing related bugs : one node had 2 sec offset; inversion of PPM signal needs to be corrected; 75 msec offset; these need to be fixed urgently;
(ii) update on testing K20 card : further updates on single node optimisation, including plans with nvidia colleagues.

==> no update.

(iii) plans for purchase of couple of host machines : update on current status of testing of eval units from DELL, and possible follow-up action.

==> report circulated; results discussed; to be followed up by YG.

(iv) status and plans about configuration of 8 node cluster : to clarify present configuration of machines for support for (a) release of 4-node, 8-input system to user (b) R&D effort for wideband corr tests (c) transient pipeline testing.

(d) release of new directory and login structure to support (a), (b) & (c) above.

(v) plans for procurement of bigger IB switch.

==> new directory structure done for release mode and interfaced with online control via GUI; need to do the same for trial mode; need to think about transient pipeline; 18 port switch ordered.

5.4 8 antenna back-end plans for further astronomical tests -- from 20 Mar (DVL/YG) : implementation plan of tests proposed by DVL to be drawn up with BE team -- DVL to report on current status and future plans.

==> (i) 32 MHz on cal few hrs, (ii) 8-10 hrs, (iii) repeatability test; then repeat some of these in imaging for target + calibrator and repeat. Check status after 2 weeks.

6. Other items :

6.1 System Release : Plans for integrated testing and release of 2-RF band (250 and L-band), 8-antenna system :

(1) To finalise list of 12 (14) antennas with broadband links -- close this matter?

==> final list : W1,W4,W6, S2,S4,S6, E2,E6, C4,C6,C9,C10,C11,C13

BB OF link is there in all, except E6 has old RF PIU; C9,C11 have CWDM units; S2 and W3 have extra loss in fibre route which needs resplicing.

(2) To check and confirm performance of OF link for these 12 antennas : need a status update.

OF group has given summary of above; this matter needs follow-up.

(3) To check L-band performance for these 12 antennas : proper power levels and band shapes for (a) full band and (b) each 110 MHz sub-band : need a status update with plots / numbers etc.

==> FE/OF are looking into this and chasing down the problems; BE group is doing some work for checking the levels. This needs to be monitored closely.

(4) To outline schedule for completion of 250-500 MHz feeds for at least 10 of the above 12 antennas -- this can be reviewed and closed if found going on track.

==> 6 + 1 have new feeds and it appears to be going OK.

(5) To outline schedule for completion of 250-500 MHz FE box (may not be the final version) for same set of 10 antennas as in item (4) above -- to check status.

==> E2,S2,C6,W1 + C10 done (?); needs follow-up.

(6) To outline schedule for completion of new common box (may not be the final version) for same set of 10 antennas as in item (4) above -- to check status.

==> E2, W1, W4, S2, S4 are done now; this is good progress and appears going OK.

(7) To check performance and availability of 8-antenna broadband analog back-end system (do we need to expand it to 10 or 12 antenna system by the target date?) -- need a discussion on this.

==> expansion to 12 antennas agreed upon.

(8) To plan for 8 antenna back-end to be released in few useful modes :

(a) 100/110 MHz BW mode (b) 200/250 MHz BW mode (c) 400 MHz BW mode (d) basic beamformer mode (?) -- need a more detailed discussion on these aspects.

==> not discussed in detail; needs follow-up to resolve the situation and come up with clear deliverables.

(9) To fix a target date for release of the above system : around mid to end July; to check which items may fall behind the schedule.

==> target date is OK; +/- 2 dB variation in power levels between antennas agreed to be OK.

6.2 Updates on 15-m related activities and presently pending matters -- from 27 Feb (JNC).

==> no updates on this.

6.3 Follow-up on FPA related activities -- from 27 Feb (JNC/YG) :

(i) LAN connection to the FPA and further testing of the unit

==> no updates.

(ii) details about connectivity and signal flow for digital part to be looked into.

==> no updates.

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Minutes of Plan meet of 15 May 2013 (follow-up of some pending topics from different areas) :

1. Documentation related :

1.1 Documentation : follow-up on level 2 (ITR) -- from 25 Apr & earlier : conversion of older reports : FE should be ready with 250-500 LNA report (ANR); and 250-500 CDF feed report (HRB).

==> LNA report will be ready within a day or two; HRB yet to put enough effort into CDF report -- to try & expedite. FE team to look at some other possible reports : Test range and Signal Flow Analysis. TO check after 2 weeks.

1.2 Documentation : SoP for antenna base work -- from 25 Apr & before (SSK/ANR/HRB) : updated version to be made ready for (i) installation of upgrade systems and (ii) ensure proper working of existing systems. To check status of work on part (i) for (a) feeds (HRB) -- updated version to be released (b) FE boxes (ANR) -- first version should be circulated (c) Common Box (SSK) -- to check if any work has been done (d) OF system (PAR) -- 2nd draft should be circulated.

==> (a) -- HRB urged to complete and circulate ; same for PAR (that looks final); ANR has done one round of internal circulation -- to add some mods and circulate (similar job for FE and CB); to check again next week.

2. FE & OF related :

2.1 Update on RF dump tests for new feeds -- from 1 May & before (HRB/GSS/SSK/DVL)

(i) new data and results for 130-260, 250-500, 550-900 (HRB/SSK) : further data for 130-260 & 250-500 to be provided by FE group to NK, and results from this.

==> some data has been sent; to try and send 130-260 data for both antennas; also to try and send data for all the new 250-500 antennas (either ant base or at CEB).

(ii) scheme for (re)calculation of expected values across the broad bands to be finalised (and added to measured curves) -- (SSK and team) : updates from Gaurav Parikh about the calculations and from DVL/YG about providing the Tsky values.

==> no progress to report; needs to be revived. To check after 2 weeks.

2.2 Tests of 130-260 system on C10 vs other antennas -- from 1 May (NK/HRB) : to

follow-up on action items : (i) to confirm if both C10 and W1 are working and released (deflection tests from FE to be checked) (ii) RF dump data to be taken for 2 antennas for analysis by FE group and NK (iii) interferometric tests to be done on 2 antenna system by NK.

==> confirmed that both antennas are fully working for this band, and RF dump data taken by HRB shows proper deflection (raw data needs to be sent to NK for both antennas); NK to initiate correlation tests. Follow-up after 2 weeks.

2.3 Mass production of 250-500 feeds -- from 25 Apr (HSK/HRB/SSK) :

(i) to update on production and delivery status (for in-house and out-sourced) -- check total number of complete feeds (dipole + cavity) now available with FE group.

==> total # of dipoles ready is 16 of which 9 are installed on antennas; total # of cavities received is 10, of which 9 are installed, and 1 is being used as a test unit; 2 more cavities will come by tomorrow; 2 more by 31st May (all 4 are

in-house). This will take the count to about 14 feeds; 10 nos of full feed is going to Quality Engg -- PO is in processing/approval stage. Waiting for sample from Physimech and then set of 10 can be order with them -- if that does not work, then will go to Fabromech + in-house; total final number to aim for is 35 feeds.

(ii) final decision about mass production with outsourced parties -- to check if order for 8 nos has gone to Quality Engg (alongwith proper specifications of all corrections needed, including Brass --> Copper !); check update from Physimech.

==> see above.

(iii) follow-up on antennas being outfitted with 250-500 CDF : check how many done and what is planned.

==> 9 antennas are fitted : C0,C6,C10,C13,E2,W1,W6,S2,S4; next : follow the OF broadband antennas and remove 50 MHz where needed.

Problem of coexistence of 50-90 MHz RRI feed with 250-500 CDF on same face of turret -- HSK to check for a mechanical sound option...

Problem of access to boxes with 500-1000 CDF feed -- HSK to look into it.

2.4 Work orders for CSIRO feed with 2 parties -- from 25 Apr (HSK/JNC/ANR) :

(i) check if sample feed from both vendors now available;

==> one is with FE group (needs some work to fill gaps and porosity) + later on a mounting structure needs to be made ready. (note : weight reduction is from 142 kg to 82+5 kg) ; can think of reducing wall thickness for future versions.

(ii) what tests have been done in preparation for using these feeds on antennas?

==> present tests show reduced performance wrt original CSIRO feed; to check again after filling operations are completed to see if there is improvement or not. Follow-up after 2 weeks.

2.5 Status of improved 500-1000 MHz CDF -- from 25 Apr & earlier (HRB/GSS/SSK) :

(i) to check if WiPLD server PC has been moved to computer room

==> item not taken up for discussion.

(ii) follow-up on immediate action items (#s 1 to 3) from 20 Mar discussions :

1. repeat the deflection tests for ver2 and see

==> repeatability is there, but need to do put a rigid stool of this height.

2. compare the deflections wrt other antennas with old 610 system

==> has been done; data set needs to be shared with team members.

3. finer adjustment of focus distance for ver2

==> TBD later on.

(iii) slightly longer term follow-up items from 20 Mar discussion :

4. try a solid cone ?

==> it is on the way from wshop (it is a ver2 cone)

5. try ver2 dipole in ver1 cavity and verify that results don't degrade?

==> will try as soon as feasible.

6. try new polariser + LNA in old feed : what will we learn? (are there enough components?)

==> feasibility yet to be done in detail -- to do this first; then to check practical issues about when it is convenient to do.

(iv) comparison of measured parameters with simulations : follow-up on interaction with Yogesh Karandikar : update on action items discussed in 20 Mar and 30 & 16 Jan meetings to be reported :

7. try more complicated / different dipole geometry in the standard cavity to see if another solution gives same or better RL performance?

8. try simulation with denser mesh (higher order of basis functions)?

==> to approach WiPLD experts for advice and YG to discuss with Yogesh and see in what way he can continue to help.

Follow-up on all items after 2 weeks.

2.6 Follow-up on delivery of 550-900 MHz filters -- from 25 Apr & before (ANR/SSK) : delivery of prototype meeting full specs -- update on final 2 changes being tried by vendor and plans for delivery.

==> new version after offset correction attempt still shows freq offset; they found some variation of thickness of plating across the PCB and new PCB is being fabricated; next update by end-May. Follow-up after 3 weeks.

2.7 Fabrication of spare L-band feed -- from 25 Apr & before (SSK/HSK) : to check status of orders on 3 parties (Physimech, Fabromech, Akivra Engg).

==> one unit will be shipped to site this week (Akivra), other two are trying for end-May; problem is with sheet metal losing shape due to heat during brazing op. Target is to get 5 new feeds done. Follow-up after 2 weeks.

2.8 Finalisation of design for total power detector for FE boxes -- from 25 Apr and earlier (ANR/SSK) : to check about final test results from prototype unit & report on the same to be circulated by now.

==> prototype tested with broadband L-band signals at rx room output and found to be OK (no saturation); now to test low-power end by putting in 250-500 FE box (lab test). Then to go for mass production : pow det device and coupler are already ordered (200 nos only right now); final choice of amplifier scheme to be frozen after testing in FE box. Right now, with stocks, about 25 dual pol systems can be built; it has integrated PCB for coupler, ampl, detector and 4 nos are available (1 no populated for prototype -- can populate the others); rest of the decisions can be taken after FE box lab test. To follow-up after 2 weeks and check the status.

2.9 Calibration scheme with radiator at apex of antenna -- from 10 Apr and before (SSK/PAR/SRoy/DO/YG): to check if the following tests have been completed (from 20 Mar) and report is available :

(i) control expt with two RF cables used in loop-back fashion (at o/p of common box).

==> see below

(ii) azimuth expt with back and forth movement and also with the loop;

==> see below

(iii) temp performance of 40 m length of cable in env chamber.

==> all these tests have been done; and results will be presented next week, if time is available. To follow-up next week, if possible.

2.10 Characterisation of new OF systems -- from 1 May and 25 Apr & before (PAR/SSK) : status of follow-up on action items :

(i) follow-up on results from swap of C6 & S2 systems.

==> right now both are working; to keep a check and see what happens.

(ii) antennas requiring OF system adjustments -- status of order of attenuators; resolving any other issues leading to varn of levels.

==> delivery in June.

(iii) status check on how many antennas with broadband links are giving reliable signal level performance : results from latest measurements by BE group to be discussed, including 3 antennas where 10 dB extra gain has been added.

==> item not discussed in enough detail; can be taken up next week.

3. RFI related matters :

3.1 Follow-up on UPS RFI -- from 25 Apr & earlier (SSK/PAR/RVS) :

- (i) status with Miltech about improvements in 1 kVA unit tried at GMRT.
==> not clear if something can be done about this or not; may close the matter.
- (ii) procurement of 3 kVA unit from Miltech (RVS) -- to confirm if indent has been placed, after clearing the doubts about RFI specifications.
==> RFI group has given requirements to RVS -- need to follow-up with him.
- (iii) follow-up from RFI testing of Consul unit -- line filters etc (RVS/PAR).
==> it does work better, but not clear why as the inside configuration of the unit is not clear to us.
- (iv) discussion & conclusions from report on comparative study from different units (PAR + all).
==> need to see the latest updated version of the report (after 5 Feb 2013 ver)
Follow-up after 2 weeks.

3.2 RFI testing of Miltech PC -- from 25 Apr & earlier (pending for long!) (PAR/SSK): tests with peripherals using new shielded ports, connectors, cables + Rabbit card etc as termination loads : new results to be reported and plans for finalisation of comprehensive report (with comparison with older tests) to be discussed.
Follow-up from comments of 10 Apr.
==> not discussed much (see item 3.3) -- YG to organise a detailed discussion session on these topics.

3.3 RFI tests of ethernet switches for antenna base -- from 25 Apr & earlier (SN/BAK/SSK): RFI tests on integrated system with OF transceiver + switch + Miltech PC + MCM cards using shielded RJ45 connectors and CAT6 cables to be done and results reported. Follow-up from discussions of 10 Apr.
==> agreed to try basic tests with few minimum connections and then expand as needed. To follow-up after 2-3 weeks.

3.4 Radiation from CAT5 cable -- from 3 Apr & earlier, but matter dragging from 25 Jul onwards ! (SSK/PAR): Follow-up on action from 3 Apr discussions : to install shielded CAT6 cable in conference room as trial and finalise the scheme for all other public places in the building.
==> waiting for quotes (by end of this week) and then order of the units; check status after 2 weeks.

4. Operations :

4.1 Miltec PC purchase related -- from 25 Apr (CPK/JPK/SN) : follow-up on delivery status of 2 nos of i7 model with improved RFI properties (due on 11th March).
==> no response from vendor; to try via formal approach via purchase. To check again after 2 weeks.

4.2 Identification of appropriate ethernet switches for receiver room usage -- from 25 Apr (SN/PAR/BAK) : Initial study has been done; BAK to release the note and to be taken up for discussion.
==> waiting for the note to be produced; should we worry about the RFI properties of these switches. Follow-up after 2 weeks.

4.3 Identification of appropriate ethernet switches for antenna base -- from 25 Apr (SN/PAR/BAK) : RFI group has identified 24-port switches (is there a RFI report on these available?) and the discussion needs to be taken up with comp

group and Ops group : to check the outcome of this process.

==> outline of the process discussed; Ops Group to discuss and come back with a plan of action that can be discussed and finalised. Follow-up after 2 weeks.

4.4 Mass production of shielded box for MCM cards -- from 25 Apr (PAR/SN/HSK): 120 nos asked for by PAR; 2 nos from trial outsourced parties being looked at for now. Product from Akvira Engg has been found to be suitable (is there a report?); to check if unit from Physimech has come and can be tested; choice of connectors to be finalised.

==> Akvira product was tested by installing the electronics and testing RFI and found OK; Pysimech unit will come within next few days and can be checked; final vendor choices can be made after that; meanwhile, dimensions of connectors on front and back plates (6 mm thick) needs to be finalised before mass prodn can be done; to check with PAR. Further discussion with CPK et al : RFI filtered connectors come in restricted pin-out configurations (e.g. 64 pin connector needs to be split into 2 x 32 pin connector) -- this needs a prototype to be built and then some discussion to understand the implications and finalise the choices etc. Follow-up after 2 weeks.

5. Back-ends :

5.1 Power equalisation schemes for new back-ends -- from 25 Apr (SKS/NSR/BAK):

(i) option 1 : using detectors in GAB and local feedback loop -- status update on completion of monitoring set-up, start of work on the code etc.

==> no updates on this.

(ii) option 2 : using correlator self outputs and computing gain corrections : status update on scheme being implemented by SKS and NSR.

==> update from NSR : can read the self corr values from corr visibility data in shm; need to check the self bandshapes to ensure that data is being read correctly; last part of the calculation routine needs to be done; later on, to port it into the GUI.

Follow-up on both items after 2 weeks.

5.2 GPU corr status -- from 1 May, 17 Apr, 20 Mar & before (SHR/GSJ/BAK/DVL) : updates on following items, pending from last discussion :

(i) release of 4 node, 8 input, 200/250 MHz version -- to confirm status and test results for 32 & 110 MHz data sets : (a) time offset & PPM problems fixed? (SHR)

==> offset problem fixed by adhoc change in time in GPU corr (root cause needs to be tracked down); PPM inversion problem is fixed.

(b) update on 32 MHz imaging (DVL) (c) status & plans for 110 MHz imaging (DVL)

==> few hrs test data taken on 2nd May shows basic things OK for 32 MHz mode; a few more detailed follow-ups are possible with the data which YG & DVL have discussed and DVL will report on follow-up from the same; for 110 MHz mode, no tests have been done as yet and so status is unclear.

(ii) update on testing K20 card : any updates on single node optimisation, including work with nvidia (SHR/SSK).

==> test code given to nvidia for optimisation work; possible weak spots (SHR) : global memory read for doing MAC (after FFT) appears to be bottleneck and same for integration of MAC output data. SHR to communciate to Pradeep and follow-up discussion to be organised. To check status next week.

(iii) plans for purchase of couple of host machines : (a) update on discussions with DELL (b) return of eval unit (c) plans for indenting sample units (GSJ/SHR).

==> max I/O speed achieved with R720 is not enough; higher speed CPU cores may

do the job, but power consumption above 115 W in R720 with GPU card is not allowed!
Can this be relaxed for server class (vs blades) -- need clarifications (b) we may want to keep the eval unit if different family of processors can be put : different speed, power and cache combination ? TBC with DELL. (c) reqd specs sent to them; nearest matching specs quote sent by them; iterations for different service options etc (also different processors) done; looks like net price for R720 and T620 may be very similar ! to try and finalise and send off the indent by the end of week.

(iv) status and plans about configuration of 8 node cluster : to clarify present configuration of machines for (a) directory structure for trial mode (b) directory structure for transient pipeline (c) status of R&D effort for wideband corr tests.

==> (a) being done on m/c side; will do with NSR on online side by end of the week;

(b) nothing is being done by this group for transient pipeline structure...

(c) 4 nodes are almost identical in BIOS etc; only IB interconnect instead of 10 GBe; one node is hosting the sample K20; no decision has been taken about the 2nd K20 from nvidia.

(v) plans for procurement of bigger IB switch : current status.

==> 18-port IB switch waiting for quote to come.

Follow-up on some items next week; others after 2 weeks.

5.3 Final online control for GPU corr -- from 25 Apr (SSK/JPK/NR/DVL) :

(i) update on full GUI compatibility.

==> this is all done for 32 MHz BW and can be closed; except maybe for one test with 110 MHz BW signals ?

(ii) follow-up on long-term items like stable performance, provision for control of FPGA and other peripherals for different modes.

==> basic link from GUI to FPGA control has been established; need to work out the methodology for handling different modes. Also to start looking at options where a peripheral like sig gen may need to be controlled via GUI for different modes of operation.

Follow-up after 2 weeks.

5.4 RFI mitigation in BE systems -- new item (BAK/KDB/NMR) : status update on

(a) real-time implementation on FPGA systems

==> Earlier snapshot mode was demonstrated; continuous time version has now been made ; for single channel it uses 25% of FPGA resources (more than 20% is used in the MAD calculation and the rest is needed for the clipping); future will require using same MAD value for longer durations -- validity of this has to be established.

can try to optimise further with use of DSP48 slices to reduce footprint; will need a 4 stream version (with MAD applied to data length 4x longer); then try to integrate with GPU correlator, 2-ant signal.

(b) real-time implementation on GPU systems

==> No specific updates on this; efforts are ongoing working in collaboration with nvidia for optimisation of the basic routines on GPU.

5.5 8 antenna back-end plans for further astronomical tests -- from 25 Apr (DVL/YG) :

status report on tests done so far, learnings from these, and plans for future tests -- DVL to update.

==> from DVL : need some more time to come back with a comprehensive plan and discussion. Can check after 1-2 weeks.

6. Other items :

6.1 Jobs at TIFR -- from 10 Apr (HSK/SKG) : to follow-up on the following :

(i) update on status of our jobs on-going at TIFR -- collection of jobs done + any new jobs.

==> 120 units (OF system) expected to be ready for pick-up around 20th. Another 180 such units remain to be done by TIFR.

(ii) requirements from different groups : back-end and OFC were in; but FE is still pending -- is this done now?

==> FE does need new chassis -- will give their requirements within a week.

(iii) follow-up on split of jobs between in-house, out-sourcing and TIFR (also rate contract proposal) -- status of rate contract to be updated.

==> out-sourcing with rate contract -- folder is in processing stage; some will be done in-house; may not give any jobs to TIFR.

Follow-up on all items after 2 weeks.

6.2 6.1 System Release : Plans for integrated testing and release of 2-RF band (250 and L-band), 8-antenna system :

(1) To finalise list of 12 (14) antennas with broadband links -- close this matter?

(2) To check and confirm performance of OF link for these 12 antennas : need a status update.

==> this needs a detailed discussion and follow-up.

(3) To check L-band performance for these 12 antennas : proper power levels and band shapes for (a) full band and (b) each 110 MHz sub-band : need a status update with plots / numbers etc.

==> this need a detailed discussion and follow-up.

(4) To check schedule for 250-500 MHz feeds for at least 10 of the above 12 antennas -- 6+1 were done by 1st May (?)

==> 9 are up on antennas and this appears to be going well; test data is needed from these antennas.

(5) To check schedule for 250-500 MHz FE box (may not be the final version) for same set of 10 antennas as in item (4) above -- 5 were done by 1st May.

==> to be discussed in detail next week.

(6) To check schedule for new common box (may not be the final version) for same set of 10 antennas as in item (4) above -- 5 were done by 1st May.

==> to be discussed in detail next week.

(7) To check status and performance of 12-antenna broadband analog back-end system.

==> some tests have been done to test 8-antenna system with L-band signals; can see if the same can be done with 250-500 system; matter of 200 MHz LPFs needs to be taken up.

(8) To plan for 8 antenna back-end to be released in few useful modes :

(a) 100/110 MHz BW mode (b) 200/250 MHz BW mode (c) 400 MHz BW mode (d) basic beamformer mode -- need a more detailed discussion on these aspects.

==> this needs some follow-up and discussion.

(9) To check against the target date of mid to end July, which items may be falling behind the schedule.

==> target date still holding.

=====

Minutes of the Plan meet of 22 May 2013 (follow-up of some pending topics from different areas) :

1. Documentation related :

1.1 Detailed design doc -- pending for long : from 17 Apr & before (SSK/BAK) : follow-up on subsystems to be converted : (i) OF Rx system to be completed (Satish Lokhande) (ii) OF Tx to be started (iii) analog BE system to be completed. ==> OF Rx : info has been collected (in hard copy format) and is waiting to be converted into soft copy and put in required format. Follow-up after 2 weeks.

1.2 Follow-up on level 3 (NTR) -- pending for long : from 1 May & before (SSK/DO): To check status of report on design of OF system. ==> no updates -- need to check SSK and follow-up after 2 weeks.

1.3 Documentation : SoP for antenna base work -- from 25 Apr & before (SSK/ANR/HRB) : updated version to be made ready for (i) installation of upgrade systems and (ii) ensure proper working of existing systems. To check status of work on part (i) for (a) feeds (HRB) -- updated version to be released (b) FE boxes (ANR) -- first version should be circulated (c) Common Box (SSK) -- to check if any work has been done (d) OF system (PAR) -- 2nd draft should be circulated. ==> ANR --> Parikh ! PAR has released but needs to give to Dongare; other 2 need to complete incorporation of comments and feedback and release. To follow up next week and see if matter can be closed.

2. FE & OF related :

2.1 Update on results from test range -- from 1 May & before (GSS/SSK) : (i) phase centre tests for 250-500 CDF : to report on expt with additional 10 to 20 mm height increase in 250-500 feed on one antenna to see how much change in sensitivity is seen. ==> HRB has tried 250-500 CDF with increase of ~ 70 mm -- reduced the deflection by ~ 1-2 dB at 325 MHz (HRB to confirm the exact figures) -- data for full band to be reported upon; to try with decrease of height (ongoing). (ii) update on calculation (based on reference paper) of the expected deflection at 450 or 500 MHz and comparison with measurements to see if we are losing significant sensitivity -- any improvements from last update? ==> report for first order calculations has been circulated by GSS -- briefly discussed : thumb rule ~ 0.5 lambda can lead to ~ 2 dB reduction. GSS will refine the calculations to make them more relevant to GMRT and report back. To check if we can try some further experiments with 250-500 and ver 550-900 feeds. (iii) status of phase centre checking for ver2 550-900 CDF and CSIRO feeds. ==> no progress as VVM etc not available; can resume by 1st week of June. Follow-up on all after 2 weeks.

2.2 New LNA for 130-260 system -- from 1 May & before (VBB/SSK) : (i) FE team to confirm earlier test results on variation of gain and T_{sys} with temperature; (ii) discussion about how this can be fitted into the real system to be put on the antennas (iii) also to update status of environmental chamber.

==> env chamber works OK inside the lab -- can try to use it for some time inside; no clear updates about the results for 130-260 LNA testing... To follow-up after 2 weeks.

2.3 Mass production of 250-500 FE system -- from 17 Apr (and 1 May?) & before (ANR/SSK) :

(i) status of testing and installation of new feeds : to check if we are doing OK with target of 3 feeds per month; bottleneck of type-N connectors resolved or not?

==> appears to be going ok.

(ii) status of testing and installation of FE boxes : to check if we are meeting the target of 2 boxes per month : are there any bottlenecks or problems?

==> 5 had been installed; 1 new one is ready; 1 new one is giving some out of band lines due to mismatch between QH and LNA ? ANR + Imran etc are checking...

(iii) status of testing and installation of modified Common Boxes : to check the schedule.

==> ~5 units are up on antennas; one unit used for fixing the problematic unit in E2; there may be a stability issue that may need some detailed investigation.

(iv) status of lower priority items : notch filter at 540, dir coupler, power splitter for noise, noise src, additional supply for new post ampl, temp monitor and power monitor, chassis, RFCM card, phase switch + opamp...

==> power splitter PCB will be coming soon and then will be put in appropriate chassis; power monitor further tests as described by Gaurav Parikh are ongoing; no updates about the other items.

Follow-up on all items after 2 weeks.

2.4 Signal flow analysis related items -- from 1 May and before (GP/ANR/SSK)

(i) new version of L-band analysis to be released : last job of results from measurements at antenna base to be included and report to be updated.

==> measurements at W04 to be completed in 2 weeks to close the matter.

(ii) to try system with extra amplifier at receiver room to check 6 dB margin : to check if all antennas have been modified with new scheme of 10 dB attn + 20 dB ampl; if this modification (and new ampl in CB) have been included in the signal flow analysis.

==> GP to include this modification in signal flow analysis before releasing; PAR to update about how many antennas modified till date.

(iii) plans for trying analysis of 250-500 system; also generating a first cut block diagram of the 250-500 MHz receiver : to check if (a) analysis has started

(b) missing items (like temp monitor) added to blk diagram (c) list of parts, items to be ordered, jobs to be done for making new version FE box is ready.

==> not much progress on any of the items (not clear who is in-charge of the 250-500 MHz block diagram?).

Follow-up on all items after 2 weeks.

2.5 Slope across the band for wideband systems -- from 1 May (ANR/SSK) :

It is max for L-band system and needs to be investigated : exactly how much; where does it come from (ampl, band pass filters, cable loss with freq etc)?; different solutions may be relevant for full band and sub-band modes of operation? FE team to investigate and report preliminary results and signal flow analysis to be modified to take into account these features.

==> not much progress reported -- discussed in some detail about what to do; needs follow-up. Check after 2 weeks.

2.6 Directional coupler for 250-500 FE system -- from 1 May and before (ANR/SSK) :

follow-up on status of two alternate options : (i) new design on alternate PCB

substrate (for reducing the loss) (ii) extracting the working design from the older system and making a final prototype with it.

==> PCB has been given for fabrication; to check after 2 weeks.

2.7 Filters at different stages of receiver chain -- from 1 May & before (SSK) :

(i) scheme for filters at antenna base : schematic of present scheme, and status of the development of the prototype.

(ii) to follow-up on refinements of the scheme for each FE box -- draft document showing these was to have been circulated by now.

Draft document with the above to be circulated in time for a discussion.

==> no fresh updates on this. Check after 2 weeks.

2.8 Finalisation of design for temperature detectors for FE system -- from 1 May and before (SSK) : detailed discussion on the problem of incompatibility of designs and follow-up plans for the same.

==> no updates and no discussion... MATTER NEEDS TO BE RESOLVED URGENTLY !!

2.9 Spares for L-band FE electronics -- from 17 Apr (ANR/SSK) :

(i) RFCM-type card status : new design / PCB -- current status of cards (old + new).

(ii) LNA tuning results and generation of spares : update from Gopi's work : to report about possible vendors for toroids and gold-plated Cu wires.

(iii) filters : update about chassis from w'shop and ordering of connectors.

(iv) noise gen : has to be assembled.

(v) post-ampl and phase switch also need to be checked : to update about PCB and chassis (from w'shop) and status of integration work.

(vi) timescale for integration? : when can it start?

(vii) need a detailed discussion to look at the progress and plans for getting the required spares, as progress has been slow (see MoM of 17 Apr for example).

==> no updates at all ! Follow-up again after 2 weeks.

2.10 Calibration scheme with radiator at apex of antenna -- from 10 Apr and before (SSK/PAR/SRoy/DO/YG): to check if the following tests have been completed (from 20 Mar) and report is available :

(i) control expt with two RF cables used in loop-back fashion (at o/p of common box).

(ii) azimuth expt with back and forth movement and also with the loop;

(iii) temp performance of 40 m length of cable in env chamber.

==> 5 different kinds of tests done :

(a) stability of ampl and phase, including instrumental effects

(b) varn of ampl and phase, with antenna movement in ele and az

(c) varn of ampl and phase and ambient temp with 2 kinds of loopback

(d) varn of ampl and phsae and ambient temp with long stretches of 24 hrs or more

(e) ,,,

Lots of interesting results... needs to be summarised properly... and then reviewed for drawing final conclusions and deciding follow-up.

Check after 2 weeks.

2.11 Characterisation of new OF systems -- from 1 May and 25 Apr & before (PAR/SSK) : status of follow-up on action items :

status check on how many antennas with broadband links are giving reliable signal level performance : results from latest measurements by BE group to be discussed, including 3 antennas where 10 dB extra gain has been added.

==> this and related issues discussed in some detail with BE and FE teams; finally agreed that FE+OF team will provide a current status update within the next few days about status of getting at least one poln (same channel) from 8

antennas with proper signal levels at BE input. THIS MATTER IS URGENT AS ALL TESTS OF BROADBAND SIGNALS IN NEW BE SYSTEM ARE WAITING FOR THESE SIGNALS !!
Follow-up next week.

2.12 OF systems -- from 10 Apr, 20 & 6 Mar and before (SSK/PAR)

(i) Plans for further systems : component ordering for remaining items (WDM, pig-tails etc) -- to check delivery.

(ii) completion of chassis to be confirmed.

(iii) follow-up on antennas where the next systems are being installed -- C13 completed? Next antenna started?

==> items not discussed in much detail; to follow-up again after 2 weeks.

2.13 M&C for new FE systems with new MCM cards -- from 1 May (SSK/PAR/CPK/SN) :

The scheme for control of new FE systems with old / new MCM cards needs to be taken up for discussion and plans made accordingly.

==> not discussed; YG to schedule a separate discussion session on this.

Check after 2 weeks.

3. RFI related matters :

3.1 Effect of military satellite RFI in 243 band -- from 3 Apr & before (PAR/SSK) :

follow-up action on testing for saturation effects, decision about appropriate location of switchable filter, possibility about control room (ops group) being able to come up with predictions for user's observations.

==> not discussed due to shortage of time.

3.2 Mobile phone RFI -- from 17 Apr and earlier (SSK/PAR) :

to check (i) progress on multiple SIM cards (ii) if more units of the particular phone can be / have been purchased (iii) progress on identifying the operators at and around E06, and in Nagar, Junnar directions (follow-up with BSNL etc).

==> not discussed due to shortage of time.

3.3 Discussion relating to Industrial RFI survey -- from 3 Apr, but pending for a long time (PAR/SSK) : revised docs (from 2009 and 2012 discussions) were to have been circulated by RFI group for discussion in today's meeting, for identifying a way forward.

==> not discussed due to shortage of time -- needs to be scheduled sometime soon !

4. Operations :

4.1 Mass production of Rabbit MCM cards -- from 25 & 10 Apr and before (CPK/SN) :

(i) status of testing of cards to be updated.

==> testing of 32 new MCM cards is completed.

(ii) follow-up on decision for procuring 80 more cards (follow-up from 20 Mar by YG and CPK)

==> matter needs further discussions -- YG to organise a meeting for this, after talking to Ops Group.

Follow-up after 4 / 2 weeks.

4.2 Development of M&C software -- from 25 Apr & before (JPK/RU/SN/NGK/YW) :

(i) update on HRS & SRS work with TCS (JPK/SN)

==> work is progressing; some delay in providing feedback from NCRA; and some unresolved issues to be taken care of; HRS doc should come soon.

(ii) plans to organise larger discussions regarding major decision items (all)

==> meeting to be called in next 1-2 weeks (see also item 4.2 and 2.13)

Follow-up after 2 weeks.

4.3 Using new MCM card on ethernet of PC for upgraded analog backend -- from 1 May

(JPK/NS/CPK/BAK) : (i) completion of s'ware (by NMS) for all commands

& tests in receiver room -- to check compatibility with web-based version

(ii) schedule for implementing in 8 antenna system -- SOP released? Option for going back to web-based version added?

==> NS will work on integrated software during next 2 weeks ; no update on SOP; to check after 2 weeks.

4.4 Monitoring of 3-phase power at each antenna -- from 25 Apr (SN/RVS) : Ops group to report on tests done at antenna base.

==> C8 antenna to be taken up for testing; results after 2 weeks.

5. Back-ends :

5.1 Analog back-end for 8 antennas -- from 1 May (BAK) : SOP for restored 8 ant system to be released.

==> TBD ; check again after 2 weeks.

New Item : allowing for 250-500 MHz support : requires LO scheme going below the current 600 MHz; option for using sig gen + ampl + power splitters needs to be activated asap for this -- NDS to look into this. To check status after 2 weeks.

5.2 Analog back-end beyond 8 antennas -- from 1 May and before (BAK) :

(i) status of implementation of new layout : drawing was to be circulated by Hande; to check status of low loss cable wiring.

==> done for 16 ants ; drawing to be circulated.

(ii) plans to expand from 8 to 12 antenna system by July release date.

==> generally OK, with same facilities as present system.

(iii) filter bank choices in the system : to check status of PCBs and fabrication of units; to initiate discussion about installation of RF filters on input side.

==> For LPF filters at output (400, 200, 100 MHz) : prototype units tested; mass prodn components will come after 1.5 mos and assembly will start after that.

For BPF filters at input : will take the same units as finally ordered by FE; need to resolve that mass prodn quantities will be matched for this requirement!

Follow-up after 2 weeks on specific issues; others after 1 month.

5.3 GPU corr status -- from 15 May & before (SHR/GSJ/SSK/BAK/DVL) : updates on following items, pending from last discussion :

(i) release of 4 node, 8 input, 200/250 MHz version -- to confirm status and test results for 32 & 110 MHz data sets : (a) root cause of time offset problem to be understood (SHR) (b) updates on 32 MHz imaging (DVL) (c) plans for 110 MHz imaging (DVL) (d) incorporation of beam modes in the basic code (SSK/YG).

==> to take single antenna beamformer and expand to multi antenna system and also take care of the phasing. Check after 2 weeks for implementation of this.

(ii) update on testing K20 card : any updates on single node optimisation, including work with nvidia (SHR/SSK)

==> to check with Pradeep and summarize next week.

(iii) plans for purchase of couple of host machines : (a) update on discussions with DELL (b) return of eval unit (c) plans for indenting sample units (GSJ/SHR).

==> work and discussions ongoing; can be summarized next week.

(iv) status and plans about configuration of 8 node cluster : to clarify present configuration of machines for (a) directory structure for trial mode.

==> TBC (not needed for GUI)

5.4 Packetised corr, new modes -- from 25 Apr & earlier (SCC/BAK/DVL) :

(i) updates on antenna tests of 2K and 4K pt FFTs (with full delay) -- imaging of test data to be confirmed.

==> zeroth order imaging has been done; PC is looking at detailed analysis.

(ii) 10 Gbe link in pkt design (to allow integration with GPU design) -- repeat tests (with GPU corr also running in parallel) to verify performance, and imaging of test data to be done.

==> data has been taken ; need to check if analysis has been done...

Can follow-up after 2 weeks.

5.5 8 antenna back-end plans for further astronomical tests -- from 25 Apr (DVL/YG) :

status report on tests done so far, learnings from these, and plans for future tests -- DVL to update.

==> Can check again next week.

5.6 Next-gen time & frequency standards -- from 25 Apr (NDS/BAK) :

(i) completion of tests at GMRT and summary of the same by NDS -- to check about response from NPL.

(ii) plans for visit to NPL -- is this clearer now?

(iii) look into OCXOs from Oscilloquartz -- to be taken up during visit to NPL

(iv) follow-up on T4Science -- can this aspect be closed?

==> no detailed discussion of items; information item : symmetricom visit on Friday to interact for identifying a place for housing the unit. Follow-up after 2 weeks.

5.7 Power and cooling requirements for projected back-end systems -- pending from 25 & 10 Apr, 20 & 6 Mar, 9 Jan & earlier (BAK/RVS/YG) : to take up follow-up matters from the first round of tests; to check if new set of tests have been done and what the results are; to plans follow-up meeting between BAK/RVS/YG.

==> brief discussion happened between the 3 and some follow-up action items agreed upon; to take up for discussion after 2 weeks.

6. Other items :

Nothing here this week !

=====

Minutes of Plan meet of 29 May 2013 (follow-up of some pending topics from different areas) :

1. Documentation related :

1.1 Documentation : follow-up on level 2 (ITR) -- from 15 May & earlier : conversion of older reports : FE should be ready with 250-500 LNA report (ANR); and 250-500 CDF feed report (HRB). FE team to explore 2 new reports : Test Range and Signal Flow Analysis.

==> ANR has released LNA ITR; HRB is working on his doc (about 40% done) -- may need about 2 weeks or longer; Test range in about 4-6 weeks; SFA should come faster. To check status after 2 weeks.

1.2 Documentation : SoP for antenna base work -- from 22 & 15 May & before (SSK/ANR/HRB) : updated version to be made ready for (i) installation of upgrade systems and (ii) ensure proper working of existing systems. To check status of work on part (i) for (a) feeds (HRB) -- updated version to be released (b) FE boxes (ANR) -- first version should be circulated (c) Common Box (SSK) -- to check if any work has been done (d) OF system (PAR) -- 2nd draft should be circulated. FE team to finalise as many of these as possible !

==> HRB : not yet released; PAR : status not known; ANR : needs some more time for a few measurements; Common Box to be done alongwith FE as they are very similar. Follow-up after 2 weeks.

2. FE & OF related :

2.1 Update on RF dump tests for new feeds -- from 15 May & before (HRB/GSS/SSK/DVL)

(i) new data and results for 130-260, 250-500, 550-900 (HRB/SSK) : further data for 130-260 (2 antennas) & 250-500 (all antennas) to be provided by FE group to NK, and results from this.

==> no new data yet; matter discussed for some time; not clear why new data is not available; to try to get data at receiver room.

(ii) scheme for (re)calculation of expected values across the broad bands to be finalised (and added to measured curves) -- (SSK and team) : updates from Gaurav Parikh about the calculations and from DVL/YG about providing the Tsky values.

==> DVL is working on Tsky (can also add the interpolation routine for Source flux); discussed again with GRP et al about what needs to be done (as they have not been able to discuss with APK).

2.2 Tests of 130-260 system on C10 vs other antennas -- from 15 May (NK/HRB) :

to follow-up on action items : (i) RF dump data to be taken for 2 antennas for analysis by FE group and NK (iii) interferometric tests to be done on 2 antenna system by NK.

==> see item 2.1 above; no further updates.

2.3 Mass production of 250-500 feeds -- from 15 May (HSK/HRB/SSK) : Production and delivery status (for in-house and out-sourced) :

(i) check current stock with FE : should be 16 dipoles + 12 cavities (how many are installed on antennas now -- 10th antenna done?)

==> S6 now installed ; 2 more will come by end of next week;

(ii) ongoing mass production : order to Quality Engg for 10 nos; sample unit from Physimech; status and plans of in-house work.

==> order for 10 nos released to Quality Engg yesterday; sample from Pysimech not come yet -- may take 2 weeks; 2 nos from in-house work by mid-June ok.

Follow-up after 2 weeks.

2.4 Coexistence of 50-90 MHz RRI feed with 250-500 CDF on same face of turret -- from 15 May (HSK) : Mech group to check for possible solutions and report back.

==> waiting for drawings for 50-90 MHz system (from RRI).

Follow-up after 2 weeks.

2.5 Problem of access to FE boxes with 500-1000 CDF feed -- from 15 May (HSK) : Mech group to propose possible solution that is suitable for FE team members.

==> prototype model is being made that will be attachable to the CP basket;

can check after 2 weeks.

2.6 Work orders for CSIRO feed with 2 parties -- from 25 Apr (HSK/JNC/ANR) :

(i) check if sample feed from both vendors now available;

==> 2nd party (Quality Engg) is finding it difficult to fabricate -- may 2 weeks.

(ii) whether filling operation is over and new lab tests have been done on feed

==> aluminium aerosol spray to be acquired for filling the porosity; silver epoxy filling of joints will also be done at that time.

Can check after 2 weeks.

2.7 Status of improved 500-1000 MHz CDF -- from 15 May & earlier (HRB/GSS/SSK) :

(i) to check if WiPLD server PC has been moved to computer room

==> not done yet; as computer group is replacing with new machines... and to be done one month later... tbc

(ii) follow-up on immediate action items (#s 1 to 3) from 20 Mar discussions :

1. repeat the deflection tests for ver2 with a rigid stool design

==> not done yet.

2. to share the results of deflections wrt other antennas with old 610 system

==> not done yet.

3. finer adjustment of focus distance for ver2

==> not done yet.

(iii) slightly longer term follow-up items from 20 Mar discussion :

4. status of tests with newly delivered ver2 solid cone

==> solid cone is in the lab, but not tested yet; waiting for dipole -- may have come and could be getting ready.

5. try ver2 dipole in ver1 cavity and verify that results don't degrade?

==> not done yet.

6. try new polariser + LNA in old feed : what will we learn? (are there enough components?) -- feasibility study to be completed.

==> feasibility ok, will need a new plate for mounting -- WO given to workshop.

(iv) comparison of measured parameters with simulations : follow-up on interaction with Yogesh Karandikar -- update on items from 20 Mar and 30 & 16 Jan meetings :

7. try more complicated / different dipole geometry in the standard cavity to see if another solution gives same or better RL performance?

8. simulation with denser mesh (higher order of basis functions)? to contact WiPLD experts for help and advice (in addition to Karandikar).

==> no update yet.

2.8 Follow-up on delivery of 550-900 MHz filters -- from 15 May & before (ANR/SSK) : delivery of prototype meeting full specs -- update on final 2 changes being tried

by vendor and plans for delivery.

==> fresh responses have been received from vendor; these look reasonable, except for one small change in one band and check the result and then ship the prototype units. To follow-up after the prototypes are tested in house to see how to proceed. Check after 2 weeks.

2.9 Fabrication of 5 spare L-band feeds -- from 15 May & before (SSK/HSK) : to check if (i) 1st unit from Akvira Engg has been delivered and is acceptable (ii) status of orders on other 2 parties (PhysiMech, Fabromech).

==> 1st unit from Akvira will go to the FE lab today; work with Physimech and Fabromech is still ongoing, may come by 3rd week of June.

2.X FE power supplies at all antennas -- new item (SSK/ANR) : matter came up while discussing SoP : about 20 antennas are having FE supply, some are home made, some are the original supplies; need to produce a status doc on this and then to initiate action to take care of short term and long term requirement.

2.10 Finalisation of design for total power detector for FE boxes -- from 15 May and earlier (ANR/SSK) : (i) final test results from prototype unit with 250-500 system in lab (ii) finalisation of amplifier scheme (iii) plan for population of 25 (?) units in hand (iv) plans for procurement for full mass production (v) plans for final ITR report on the design.

==> 250-500 test to be done this week; amplifier may need change of components to adapt to Sirenza on 2nd prototype unit to get better and flatter gain response; and test with L-band system and then take a final decision for mass production. Check after couple of weeks.

2.11 Characterisation of new OF systems -- from 15 May and 25 Apr & before (PAR/SSK) : status of follow-up on action items :

(i) check if swapped C6 & S2 systems still working ok.

==> still holding ok.

(ii) status check on how many antennas with broadband links are giving reliable signal level performance : follow-up on discussion of last week, and status update on available antennas.

==> measurements have been done on 23rd/24th and results are being compiled. To circulate a set of results for the antennas selected last week + any others that are showing good performance.

2.12 Walsh switching arrangement in FE -- from 1 May, 3 Apr and before (SSK) : matter is pending for a long time. FE group to come back with clear statement about (a) what is feasible and (b) how to go about doing the tests (vis-a-vis of action items minuted in meeting of 19 Dec 2012); does new system need new RFCM card?

==> nothing done. to be followed later on. To check after 1 month.

3. RFI related matters :

3.1 Follow-up on UPS RFI -- from 15 May & earlier (SSK/PAR/RVS) :

(i) status with Miltech about improvements in 1 kVA unit tried at GMRT -- to be closed?

(ii) procurement of 3 kVA unit from Miltech (RVS) -- to confirm if indent has been placed, after clearing the doubts about RFI specifications.

(iii) follow-up from RFI testing of Consul unit -- line filters etc (RVS/PAR)

(iv) discussion & conclusions from report on comparative study from different units -- final decision to be taken and this item to be closed (PAR + all).

3.2 RFI testing of Miltech PC -- from 25 Apr & earlier (pending for long!) (PAR/SSK): tests with peripherals using new shielded ports, connectors, cables + Rabbit card etc as termination loads : new results to be reported and plans for finalisation of comprehensive report (with comparison with older tests) to be discussed. Follow-up from comments of 10 Apr.

3.3 RFI tests of ethernet switches for antenna base -- from 15 May & earlier (SN/BAK/SSK): RFI tests on integrated system with OF transceiver + switch + Miltech PC + MCM cards using shielded RJ45 connectors and CAT6 cables to be done and results reported. Follow-up from discussions of 15 May about doing a set of basic tests.

3.4 Radiation from CAT5 cable -- from 15 May & earlier (SSK/PAR): Follow-up on action from 3 Apr discussions : to install shielded CAT6 cable in conference room as trial and finalise the scheme for all other public places in the building -- to check if quotes received and order placed. ==> vendors not able to get response about availability of shielded cable (Dlink)

4. Operations :

4.1 Miltec PC purchase related -- from 15 May (CPK/JPK/SN) : follow-up on delivery status of 2 nos of i7 model with improved RFI properties (due on 11th March). ==> Miltech PCs have arrived; to give one for RFI testing (bare PC) and one for installation of software; later to connect to peripherals : rabbit card, eth output to optical transceiver to short patch of fibre to optical back to copper and connect a laptop or 2nd Miltech PC (put in item 3.2 above). To check status after 2 weeks.

4.2 Identification of appropriate ethernet switches for antenna base -- from 15 May (SN/PAR/BAK) : RFI group has identified 24-port switches (is there a RFI report on these available?) and the discussion needs to be taken up with comp group and Ops group : Ops group to present plan of action on this topic. ==> HP, Dlink, DELL and Cisco switches : all have the same FCC specs as per RFI properties; can we design a shielded enclosure that meets the desired level ; though we don't need 24 ports, it may be that we may have to go that due to common availability. Dlink may be the cheapest and the simplest. To try 16/24 port; Where to place the switch in the rack to be decided. To start a RFI study activity with a sample existing switch. Study at antenna base for utilisation of space for new systems. To split the item into 2 items and follow-up after 2 weeks.

4.3 Mass production of shielded box for MCM cards -- from 15 May (CPK/PAR/SN/HSK): 120 nos asked for by PAR; 2 nos from trial outsourced parties being looked at for now. Check the following : (i) report on testing of product from Akvira Engg (ii) status of unit from Physimech (iii) choice of final vendor(s) for mass prodn; (iv) matter of filtered connectors (2x32 pin vs 64 pin) to be resolved. ==> Sample units from both Akvira and Physimech have been tested (draft report to finalised and sent) that shows 20 dB extra leakage in Physimech for 250-600 MHz range; can finalise with Akvira for mass prodn based on this final report; as per PAR suitable RFI shielded connectors are 25, 37 and 50 -- both groups to sit together and decide how to make a mapping PCB with connectors that can mount

on the chassis. To check status after 2 weeks.

5. Back-ends :

5.1 Identification of appropriate ethernet switches for receiver room usage -- from 15 May and earlier (SN/PAR/BAK) : To check if BAK has released the note and can be taken up for discussion.

==> Note has been released and needs to be discussed.

5.2 Power equalisation schemes for new back-ends -- from 15 May (SKS/NSR/BAK):

(i) option 1 : using detectors in GAB and local feedback loop -- status update on completion of monitoring set-up, start of work on the code etc.

==> detector card h'ware is ready; remaining chain and software needs to be done.

(ii) option 2 : using correlator self outputs and computing gain corrections : status update on scheme being implemented by SKS and NSR.

==> testing of feedback loop is underway -- scaling of large numbers is an issue; can follow-up on both schemes 2 weeks later.

5.3 GPU corr status -- from 15 May & before (SHR/GSJ/BAK/DVL) :

updates on following items, pending from last discussion :

(i) release of 4 node, 8 input, 200/250 MHz version : (a) root cause of time offset problem to be understood (SHR) (b) updates on 32 MHz imaging (DVL) (c) plans for 110 MHz imaging (DVL) (d) incorporation of beam modes in the basic code (SSK/YG).

==> 32 MHz found a problem of LO below RF not working -- being fixed now; memory org and usage for GPU for polar and beam modes; and then go ahead with sample beam mode implementation.. packetizer has samples of data substituted with counter -- this needs to be addressed and fixed at some point of time !

(ii) update on testing K20 card : any updates on single node optimisation, including work with nvidia (SHR/SSK)

==> ~ 20% improvement by Pradeep; need a discussion to work out the way forward.

(iii) plans for purchase of couple of host machines : (a) update on discussions with DELL (b) return of eval unit (c) plans for indenting sample units (GSJ/SHR)

(d) possibility of using 2 nos of R720 units purchased recently

==> ...

(iv) status and plans about configuration of 8 node cluster : to clarify present configuration of machines for directory structure for trial mode

==> agreed that GUI does not need a separate support for trial mode, and only separate dirs are needed.

(v) plans for procurement of bigger IB switch : current status.

==> no updates.

5.4 Final online control for GPU corr -- from 25 Apr (SSK/JPK/NR/DVL) :

(i) update on full GUI compatibility -- can this item be closed now?

==> new issues about sideband flag; varying # of channels is supported ? -- TBC.

(ii) follow-up on long-term items like provision for control of FPGA and other peripherals (like sig generator) for different modes -- details of existing provisions to be discussed and plans for final configuration to be finalised.

==> follow-up 2 weeks later.

5.5 8 antenna back-end plans for further astronomical tests -- from 25 Apr (DVL/YG) :

status report on tests done so far, learnings from these, and plans for future tests -- DVL to update.

==> different levels of flagging in different data sets..

6. Other items :

6.1 Jobs at TIFR -- from 10 Apr (HSK/SKG) : to follow-up on the following :

(i) update on status of our jobs at TIFR -- collection of 120 completed items + status of 180 pending jobs.

==> 120 pieces had 1 mm difference in depth and needs to be corrected -- may take 2 weeks. Then remaining 180 pieces may take 2 mos or longer -- agreed that we can keep that going, and do the others in-house or out-sourced and not give any further jobs to TIFR.

(ii) requirements from different groups : back-end and OFC were in; but FE is still pending -- is this done now?

==> FE has still not given full requirements; now will need to add FE box requirement also.

(iii) follow-up on split of jobs between in-house, out-sourcing and TIFR (also rate contract proposal) -- status of rate contract to be updated.

==> order has been released with Akvira Engg for one year of work.

6.2 System Release : Plans for integrated testing and release of 2-RF band (250 and L-band), 8-antenna system :

(1) To finalise list of 12 (14) antennas with broadband links --

List is as follows :
close this matter?

(2) To check and confirm performance of OF link for these 12 antennas : need a status update if all antennas done with final version of OF system.

(3) To check L-band performance for these 12 antennas : proper power levels and band shapes for (a) full band and (b) each 110 MHz sub-band : need a status update with plots / numbers etc. **THIS IS URGENT and NEEDS REGULAR FOLLOW-UP.**

(4) To check schedule for 250-500 MHz feeds for at least 10 of the above 12 antennas -- 9 were done last time; need RF dump data from these for tests.

(5) To check schedule for 250-500 MHz FE box (may not be the final version) for same set of 10 antennas as in item (4) above -- 5 were done by 1st May. Need detailed discussion about problems of stability etc.

==> 7 are done now; 8th will be done on C0 or S6 by next week; 2 more will get done once boxes are available from HSK; need to cultivate parties for mass production of new FE boxes, as refurbishing old ones appears to be difficult !!

(6) To check schedule for new common box (may not be the final version) for same set of 10 antennas as in item (4) above -- 5 were done by 1st May. Need status update.

==> 2 antennas had to be brought down : E2 and W1 due to device failure and short. The ECG008 ver is showing line at ~ 5 GHz. The ECG ckt is having various issues : power supply, lines etc; can replace with Sirenza (which will likely have gain falling below 50 MHz) -- agreed to assemble 2 boxes with this and test in the lab and put up on antennas for checking the performance.

Also, agreed that old boxes will be re-used for this (at least for now).

(7) To check status and performance of 12-antenna broadband analog back-end system. Need to look into LO scheme for handling 250-500 MHz signals ! Also, plans for LPFs etc.

(8) To plan for 8 antenna back-end to be released in few useful modes :

(a) 100/110 MHz BW mode (b) 200/250 MHz BW mode (c) 400 MHz BW mode (d) basic beamformer mode (?) -- need a more detailed discussion on these aspects. Some aspects need discussion and follow-up.

(9) To check against the target date of mid to end July, which items may be falling behind the schedule.

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