

Points from Plan meeting on 09-Nov-2016
[generated by combining points from last 2 weeks]

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1. FE & OF related :

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26-Oct-2016:

1.1 Lband (band-5) spares (VBB+SSK) :

(i) report to be expected to be ready by end-Oct

==> DRAFT report with SSK; (SSK yet to return);

--> No update

(ii) status of spares : 2 sets were ready --> 4 sets to be made ready

==> x2 sets ready to go to antenna with v3 L-band full-band filter;

==> another x2 in ready condition with older version of filter,

==> [but already PCBs have come; 'v3' will replace v1/v2 shortly];

==> In the mean time x1 spare has gone to C9;

--> all x4 spares with NEW PCB (v3)

--> of these x4 spares, x2 on C4 & C9 [those x2 are to be investigated]

==> 5th feed - under refurbishment (changes in internal cabling); will

==> complete in ~1 month (end-Nov 2016)

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02-Nov-2016

1.1 120-250 (band-2) system :

(i) follow-up on test results reported earlier (HRB)

(ii) plans to produce a summary for discussion in user forum and then in GSG (HRB)

(iii) getting other items ready for mass production (SSK)

--> No update

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26-Oct-2016:

1.2 250-500 (band-3) system :

(i) Summary of phase centre height adjustment on antenna for 250-500 (SHR)

==> no update [same stool is in use for 130-260 feed tests]

(ii) Status and plans for completion on 30 antennas

==> x29 antennas already ready;

==> for 30th antenna, waiting for dipole from workshop

==> [in ~ 1 week (04-Nov-2016) expected to be ready]

--> dipole came ; mounting issue (on cone); now fixed (hole matching)

--> awaiting for HRB's return

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02-Nov-2016

1.2 250-500 (band-3) system :

- (i) Summary of phase centre height adjustment on antenna for 250-500 (HRB)
- (ii) Status and plans for completion on 30 antens (ANR)

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 26-Oct-2016:

1.3 Note from RF team about recommended setting for LO for 550-900 (band-4) system (including sub-bands) + extension of the same for all the bands, for cycle-31.

- ==> 'Note' is being updated by including tests from Control Room also;
- ==> updated 'final' note to be available by 28-Oct-2016;

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 02-Nov-2016

1.3 Note from RF team about recommended setting for LO for 550-900 (band-4) system (including sub-bands) + cross-check for similar info for all the bands for cycle-31.

- (i) finalise contents for 550-900 system (IK)
- (ii) discuss plans for other bands (IK)

--> IKA to update the note based on discussion on 02-Nov-16;

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 26-Oct-2016:

1.4 Updates on total power and temp monitoring tests (GP)

- ==> document awaiting monitoring test scheduled on 06-Nov-2016;
- ==> sample plots for C02 displayed [monitored RF power from Front End box as well as Common Box for both channels Ch1 & Ch2];

--> Test conducted; results being analysed [by 16-Nov-16];

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 02-Nov-2016

1.4 Plans for getting 2nd Common Box with Rabbit ready for taking to antenna focus for tests (ANR)

1.5 Optical Fibre : updates on procurement of fibre etc.

- > discrete components have been procured;
- > 100 km spool : indentor's recommendation given to purchase;

OTHER FE ITEMS :

- > update : 3 stage L-band LNA could be tuned T_LNA 20 K (with 45dB gain;
- > return loss better than -10 dB)

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2. RFI related :

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 26-Oct-2016:

2.1 Update on report on list of known RFI to be released to control room + users (PAR) :

- ==> partially done; next week full update

--> Updated report with YG for final clearance;

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02-Nov-2016

2.1 Report on list of known RFI to be released to control room + users (PAR)

(i) to finalise the document

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26-Oct-2016:

2.2 Report on GMRT RFI environment and update of work on related topics (PAR)

==> analysis in progress

--> during ESA Mars mission, noted ~ 402 MHz lines due to weather station uplink !

--> being located [ruled out NGN colony unit]

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02-Nov-2016

2.2 Update on RFI shielding for AC units (PAR)

--> awaiting identification of vendor which to interact with;

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26-Oct-2016:

2.3 Update on generating statistics of failure of LED lamps (RVS)

==>

--> 6/8 LED lamps : test ed for RFI - lot of RFI seen;

--> assembly very tight, no spoce to incorporate any shield !

--> trying split assembly units;

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02-Nov-2016

2.3 Update on solving RFI friendly UPS problem with vendor (RVS+PAR)

--> 08Nov16 vendor visited GMRT - agreed they will take x2 units &

--> reconfigure them using batch #1 boxes /shields;

--> in 2 weeks these 2 units may be ready;

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26-Oct-2016:

2.4 Update on solving RFI friendly UPS problem with vendor (RVS+PAR)

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02-Nov-2016

2.4 Update on cable TV follow-up action with admin (PAR)

--> DRAFT letter generated by Admin (it is OKed & to be

--> cleared after vetting by YG)

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26-Oct-2016:

2.5 Update on cable TV follow-up action with admin (PAR)

==> Awaiting admin action

3. Operations related :

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26-Oct-2016:

3.1 Plans for Miltech PC new order (CPK)

==> Indent has been modified to include condition : to first supply x1 unit
==> & after successful RFI clearance, then to accept the remaining 19 units;

--> Quote came : delivery 8-10 months (~ Rs 21 Lakh for x20 units)

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02-Nov-2016

3.1 Status of mass production work of shielded boxes for Rabbit and Switch (CPK+SN)

--> x25 boxes for switch ready;
--> awaiting PCB for Rabbit box (connection mismatch);

--> Tomorrow PCB to be collected from vendor

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26-Oct-2016:

3.2 Updated status of testing of M&C operations with new common box at antenna base

==> modified PCB now ready at vendor; in 2 days to reach GMRT;
==> 'online' commands worked well at antenna base;
==> However, monitoring issue remains : only ~ 1-in-20 FE/CB samples correct;
==> detailed discussion between CPK & Jitendra on planning for future tests;

--> within 1 week test will be conducted (to validate memory exceed
--> error comes or not); result will conclude about FE sending correct
--> bytes or incorrect bytes;

XXX ??--> Tomorrow PCB to be collected from vendor

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02-Nov-2016

3.2 Updated status of testing of M&C operations with new common box at antenna base

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26-Oct-2016:

3.3 GMRT M&C SKA proto system phase-2 work : plans and responsibilities

==> March-May 2016 meetings' minutes circulated -> work classification completed;
==> internal responsibilities have been proposed & currently under discussion;
==> Team needs additional manpower : x1 Technical Trainee & x1 Engineer Trainee;
==> Phase-2 file under NSTC processing;

--> order may go to TCS this week;

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02-Nov-2016

3.3 GMRT M&C as SKA prototype : plans for generating / updating the document to be shared with SKA-TM.

--> Inputs for that document given by Jitendra on 28-Oct-16;

OTHER

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4. Back-end related :

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26-Oct-2016:

4.1 Report on attenuator test measurements (BAK)

==> Repeat test is in progress; final report to be available by ~ 07-Nov-2016;

--> Sudhir repeated another round of tests; draft report discussed with BAK

--> & after 1 iteration final report will be available by 16-Nov-16;

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02-Nov-2016

4.1 Update on installation of BPFs on i/p side of GAB (BAK)

--> Installation completed; tests also OK;

--> higher bands (L) filters introduce additional loss (~ 4dB;

--> x2 switch + x1 BPF; expected)

--> lab set up to identify compensation to counter it by

--> reducing 'fixed' attenuation;

--> proto by 1 week; system implementation needs to be scheduled

--> ~ 2 weeks after proto success;

--> currently by-pass (no filter) path being used;

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26-Oct-2016:

4.2 Plans for generating amplitude correction files for DDC + general case (SHR)

==> Generated the scaling factors which need interpolation [512 -> 2048];

==> interpolation coding yet to be done (will take ~ 2 days);

==> testing of scaling & interpolation will take ~ 1 week (finish by 07-Nov-2016);

--> coefficients are 'over compensating' - further fine tuning in progress;

--> need to establish a scheme (by using narrow bands one at a time);

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02-Nov-2016

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26-Oct-2016:

4.3 Status of GWB-4 assembly and release (SHR+ICH) :

(i) assembling racks and nodes and peripherals

==> completed;

(ii) integration & testing for 2nd half 16 antenna correlator with new machines

==> GWB-v3 : configuration of rack-4 will be done these week;

==> rack-5 ready with old machines (tested already)

==> rack-6 also needs configuration; [by Friday 28-Oct-2016, will be configured]

==> correlator with 2 beams + DDC

==> ready with perfectly tuning or nearly there (by 11-Nov-2016);

--> on 2nd 16 antenna system :

--> rack-5 & 6 configured;

--> rack-4 (host) being done today ;

--> ot be released by tomorrow

(iii) power & cooling related issues

==> air flow has been improved ; air temp 18-20 C at the

==> outlet from GWB correlator rack (correlator on full load);

==> GSB temp issue remains

--> extra pedestal fans added but still 2 deg above target;

--> Elec team has aksed Voltas to check efficiency

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02-Nov-2016

4.2 Status of GWB-4 assembly and release (SHR+ICH) :

(i) integration and testing of 2nd 16-antenna system

(ii) plans for integrating into single 32-antenna system

--> time scale : GPUs to come in Dec; another 1.5 months for h/w imtegration

--> the s/w tests

(iii) power & cooling related issues

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26-Oct-2016:

4.4 Proposed plan for dual copy of data for raw voltage recording etc (BAK+GJS) :

(i) refinements of the first draft of the note

==> suggestions need to be included;

--> 2nd iteration on sugesions;

(ii) plans for getting first unit connected

==> making a set up in lab [ROACH board implementation for writing to T630];

--> set up ready - tests in progress;

--> Th eabove DRFAT can be finalized after these test results ar available;

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02-Nov-2016

4.3 Proposed plan for dual copy of data for raw voltage recording etc (BAK+GJS) :

(i) refinements of the first draft of the note

(ii) plans for getting first unit connected

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26-Oct-2016:

4.5 Status update on processing of tender reponses for Maser units (BAK)

- ==> one vendor visited site;
- ==> techo commercial clarifications obtained; next iteration in progress;
- ==> By 11-Nov-2016, conclusion may be reached regarding opening of finacial bids;

- > Maser : close tt final TEC report
- > accounts isue is resolved; EMD thru bank transfr (aftre due date)
- > 7 year pefrmance guarantee
- > one party's tech spec (standard or with 'option') will be confirmed within 2 days

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02-Nov-2016

4.4 Status update on processing of tender reponses for Maser units (BAK)

OTHER

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5. Other items :

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26-Oct-2016:

- 5.1 Update on cable wrap assembly related activities
- ==> Vendor (Zeniflex) promised delivery SS hose next week;
 - ==> as per 01Aug16 report, we may confirm the decision to use
 - ==> Finolex cables only in future;

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Minutes for Plan meeting of 23 Nov 2016

1. FE & OF related :

1.1 Noise temp & gain vs temperature for new LNAs (VBB/SSK) :

- (i) Update on understanding the noise diode calibration issues
- (ii) Update on results with low ppm resistors and comparison with existing designs
==> latest results show 2-3 deg K improvement in T_{lna} for 550-900 for low ppm vs normal resistors, and also the low ppm absolute values are slightly higher. Hence, now real improvement, in going to low ppm. To move towards repeating the test for the entire FE box.

1.2 Completion of 120-240 MHz Band-2 system (HRB) :

- (i) Updates from repeat measurements of response & comparison with control room values
- (ii) Results from optimisation with adjustable stool on E02
- (iii) Generation of final summary for discussion at GSG level
- (iv) Preparing for mass production
==> not discussed, but item is URGENT !

1.3 Status of 250-500 MHz Band-3 system (AP/HRB/ANR) :

- (i) Completion of 30 antenna system, including retrofitting of first version
- (ii) Updates from recent 30 antenna monitoring measurements
- (iii) Summary of phase centre measurements and decision about future plans
- (iv) LO settings for all sub-bands etc to be finalised.
==> 8 antennas to be retrofitted; to reach upto 5 units as spares in the long run; also to do quality check of sub-band filter and main BPF responses (SC) and LO settings for all sub-bands (IK).

1.4 Common box upgrade (VBB/SSK) :

- (i) Completion of box #2 with Rabbit and installation + testing at dish focus
- (ii) Plans for mass production
==> work on box #2 is ongoing (one more week); for mass production, will use 2 nos for cycling; work order for mechanical plates etc to be followed up; once sample unit is shown to work at antenna focus, mass production can start.

1.5 Apex radiation scheme (PAR/SRoy) :

- (i) Current status of measurements and interpretations
- (ii) Plans for next steps to be taken
==> not discussed

1.6 Walsh related matters (SC) :

- (i) Confirm status on all 30 antennas (S4 & S6 were not working at last report)
- (ii) Plans for regular maintenance & tests (as common box is upgraded)
==> S4 is also functional, only S6 needs to be checked; Walsh bit is checked in lab as part of standard clearance.

1.7 Polarisation calibration of upgraded systems (SC/?)

- (i) To set up a procedure for regular polarisation isolation tests
- (ii) Discussion about possibility for feed + dish modeling
==> reg poln isolation tests are being done for upgraded systems also, and results have been found useful for Band-3 system; SC to prepare a short concept note about

the possibilities of doing the calculation for feed + dish modeling and what can be learnt etc.

2. RFI related :

2.1 Spectral line RFI (PAR/SSK) :

(i) Update on cable TV problem

==> letters have been sent; to follow-up after couple of weeks

(ii) Digital TV follow-up

==> letter is still pending !

(iii) monitoring new lines

==> 402 MHz line in SW direction -- trying to locate the source

2.2 Satellinte RFI monitoring & avoidance system (PAR/SNK) :

(i) Update on present status for different kinds of satellites : GEOs, GSOs, GPS, LEOS...

==> GSOs and „ GPS (US) tbd for other GPS constellations; confirmed that regular cron job is running in control room, but need to check about alarm for LEOS (appears that alarm did show up in the log data?)

(ii) Tackling MUOS satellite

==> to cross check footprint & angle of avoidance for this (may need 10 deg or more?)

(iii) Plans for sending information to back-end reciever chain

(iv) Providing the facility to other interested observatories, including SKA

==> some discussion has happened, to be followed up next week

2.3 RFI from power lines and transformers (PAR/RVS) :

(i) review current status

(ii) specific follow-up actions

==> not discussed

2.4 RFI from air conditioning systems (PAR/RVS) :

(i) plans for mass production of the systems

==> not discussed

2.5 RFI from LED lamps (PAR/RVS) :

(i) Statistics of failures of existing units

(ii) Follow-up on attemptst to understand circuits for RFI friendly units and check with vendors.

==> appears too difficult to shield the RFI from the bad units; need to identify units with separate PCB ckt for driver, which can be shielded.

2.6 UPS RFI related :

==> not discussed ?

3. Operations related :

3.1 Mass production of shielded boxes for Rabbit card and network switch (CPK/SN) :

(i) procurement of problem PCB

==> 5 nos of sample PCBs received -- found OK; repeat order planned for 80 nos.

(ii) status of mass production of Rabbit card enclosure

(iii) status of mass production of network swtich enclosure

==> 28 units ready (need total of 35)

3.2 Work on final configuration at antenna base for space, UPS, RFI etc (JPK/RVS/PAR) :

(i) status of first 2 model antennas (C00 and C10) -- what has been done and what is still missing

==> C00 & C10 are mostly complete (item could be closed?)

(ii) plans for going beyond 2 antennas

==> mechanical has completed 9 or 10 antennas; 6 are complete with all changes (?)

(iii) update on improved RFI shielding at antenna shell

==> shielding test measurements done for present configuration; awaiting finger-lines to be added before repeating the tests (which antenna?)

3.3 Long-term plans for installation and release of final M&C system :

(i) growth plan for populating antennas with the systems

(ii) plans for switch-over -- to make it as seamless as possible.

==> not discussed

3.4 Procurement of central switch (CPK/JPK) :

(i) Specifications to be worked out (by Computer group)

(ii) Plans for procurement

==> Mangesh has identified HP make layer-3 manageable switch (48 port); specs being studied.

4. Back-ends related :

4.1 Analog Back-end related issues (NDS/SG/BAK) :

(i) Improvements in LO generation scheme -- current status and future plans

==> tested ADF-4350 system; found to be good, compared to FSW unit; test report in internal circulation; to work towards implementation for 2 antennas in GAB.

(ii) Completion and release of input side filters

==> installation for 30 antennas (all bands) completed; testing in progress.

(iii) Completion of 60:1 system and release for use; final report

==> draft report in internal circulation.

4.2 Power equalisation scheme and relate topics (BAK/SRoy) :

(i) Completion of attenuator testing and release of report

==> report under revision

(ii) Status of different modes of power monitoring & equalisation scheme, including formal release for users

==> SRoy to add options related to averaging time, ALC etc...

4.3 Updates on existing GWB-3 system :

(i) completion of DDC related works :

DDC correction seems to be overcorrecting -- Reddy to share the bandshapes;

==> no updates.

(ii) drop-out in visibility data :

for dropout problem : not clear what is happening -- is it temporal, is it a fn of level of correlations -- may want to try with artificial correlated noise source?

==> no updates.

4.4 Completion and release of first version of GWB-4 (SHR/ICH/SSK/BAK) :

(i) assembling of racks and nodes and peripherals :

all done except for some reorganisation of host m/cs when final 32 antenna system is being integrated;

- (ii) integration, testing and release of 2nd half 16-antenna system :
configuring of m/cs is done, testing is to start now; GPU delivery to be followed up;
==> second half 16 antenna system is under test (tbd by next week).
- (iii) power and cooling related issues :
for GWB things running ok; for GSB still has few deg higher temp -- improved cooling solution to be investigated for in-situ implementation.
==> GWB type soln for GSB planned for next MTAC -- need complete shutdown to do it.
- (iv) availability of components esp GPUs :
still awaiting delivery of the K40 GPUs;
==> expected by 15th Dec.
- (v) targets and plans for release of full 30-antenna system : when will it be ready and what features will be available in first release :
target release date depends on progress of (ii) above; regarding modes : doubtful ones are 400 MHz total intensity, 200 MHz full polar, 4 beams -- may or may not work for 30 antennas (due to I/O restrictions); similarly voltage mode will be programmed but may not work for all 30 antenna configuration; basic DDC and zoom modes ok.
==> no specific updates, except that code optimisation will need to be done.

4.5 Longer term plans for GWB-4 (SHR/ICH/SSK/BAK) :

- (i) Connectivity of GWB-4 with rest of the network, including GMRT--Pune link
 - (ii) Disks for data recording, including trials with SSD options
 - (iii) investigating next gen GPUs
 - (iv) migration to next version of CUDA (7.5 and beyond)
==> CUDA 7.5 is being tried in the new version of GWB
 - (iv) Additional modes and features in GWB system :
 - (a) 4 beams, with upto 2 voltage beams with coherent dedispersion
==> 4 beams (IA/PA) implemented but yet to be tested to shortest integrations; 2 voltage beams (1 with full BW and 2 with half BW are planned for new system)
 - (b) PA - IA beam mode
 - (c) beam formation with different phase centres
 - (d) improved I/O capabilities : change in data sending code; alternate n/w ?
 - (e) gated correlator : folding visibilities with pulsar period
 - (f) polyphase filter bank
 - (g) 2 inputs per Roach board
 - (h) time + DUT corrections
 - (i) net-sign correction
 - (j) full backward compatibility of off-line utilities
- ==> some work has been done, but not clear if this meets / works for all requirements.

4.6 Monitoring of temperature and other parameters of new back-ends (GJS/BAK) :

- (i) Summary of current status for temperature monitoring
- (ii) Plans for future enhancementst and release for regular use
- (iii) Monitoring of other health parameters
==> not discussed.

4.7 Other issues :

- (i) Cross-coupling tests in GAB + GWB
- (ii) Walsh related work
==> not discussed.

5. Other items :

5.1 Python assembly work (HSK/SSK) :

- (i) Summary of the work done so far and conclusions from the same
==> mech team to prepare a summary note; meanwhile, first assembly of new Python (what is its configuration?) will be ready by 7 Dec, and will be installed on antenna for tests.
 - (ii) Plans to decide for the final option to be adopted
==> to be taken up after note is circulated and new version is tested.
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Minutes for Plan meeting of 30 Nov 2016

1. FE & OF related :

1.1 Update on results from test range (HRB/SSK) : need to make it fully functional again and get data for 550-900 feed.

16 Nov : offset not yet fixed (to be done later with mechanical), but new data taken for E & H plane -- looks ok; to do cross-polar measurements.

====> no change in status.

1.2 Phase centre tests for 250-500 CDF (HRB): consolidated report on 250-500 existing measurements still awaited.

16 Nov : there is only one set of measurements -- to circulate as a simple report; and then decide if fresh measurements with adjustable stool are to be done.

====> simple report to be done within a week.

1.2e Completion of 120-240 MHz Band-2 system (HRB) :

(i) Updates from repeat measurements of response & comparison with control room values

====>

(ii) Results from optimisation with adjustable stool on E02

====>

(iii) Generation of final summary for discussion at GSG level

====>

(iv) Preparing for mass production

====>

1.3 Theoretical calculations vs observed performance for antenna sensitivity and related topics (SC/GP/ICH/DVL) :

(i) check status of updated document;

====> earlier document to be recirculated to wider audience

(ii) need to cross-check mismatch of values for band-3 (250-500);

====> will check and update.

(iii) need to see if QH losses have been incorporated into the calculations;

====> GP has done some of the work; need to circulate and get agreement.

(iv) does the study cover all the uGMRT bands.

====> right now 2 bands are included in the report (Band-3 and Band-5); for Band-4 radiation pattern values are now available and all other info is there and so it can be completed and reported.

(iv) can it be extended to deriving the final beam pattern for feed + antenna

16 Nov : some work has been done to include measured QH losses for 250-500 and avg mean value over the band for 550-900.

====> item (iv) is being looked into; additional item : to take up mismatch study separately, referring to some existing literature.

1.4 Total power monitoring at antenna (GP) :

(i) confirm if latest calculations relating to unit to unit variations have been incorporated in the updated document

====> yet to be completed.

(ii) results from recent tests

====> running of tests is having conflict with online system (JPK is looking into this)

(iii) labeling scheme for keeping track of the units to be taken up for refinement

and implementation

16 Nov : agreed to make spread-sheet per sub-system (for all antennas) and manage this manually at first and develop automated routine for it later on; generation of initial spread-sheet to be assigned to different team members for different sub-systems.

====> 250-500 spreadsheet is in use; 550-900 is getting going etc... regular back-up of the files to be worked out.

1.5 Temperature monitoring at FE and OF at antenna (GP) :

(i) status from recent tests and measurements for FE system

====> same as above

(ii) status of prototype for temp and power monitoring at OF rack at antenna base

16 Nov : sample data set taken but not long enough; to wait for next round of tests; prototype unit installed at C2 and connected to M&C system, but not being monitoring regularly; would like to do some more test and development before finalising the scheme.

====> (ii) is on-hold after prototype development.

1.4e Common box upgrade (VBB/SSK) :

(i) Completion of box #2 with Rabbit and installation + testing at dish focus

====> wiring is completed; populating and testing will happen; may go to antenna by next week.

(ii) Plans for mass production

23 Nov : work on box #2 is ongoing (one more week); for mass production, will use 2 nos for cycling; work order for mechanical plates etc to be followed up; once sample unit is shown to work at antenna focus, mass production can start.

====> work order given to mechanical team; plans for laying fibre for eth also to be tried out; to check with Ops group about ability of switch between serial port and eth port; meanwhile, shielded i/f connector for OF system is not available and purchase folder for this is lost...

1.6 L-band spares (VBB/SSK) :

(i) confirm current status of spares

====> 2 nos of full units as spare; 3 units have been brought down for maintenance.

(ii) finalisation of report by VBB

16 Nov : same status as last week.

====> report pending with SSK

1.7 LNAs for L-band (ANR) :

(i) status of spares from existing designs

====> some failed units are being retuned...

(ii) status of new 2-stage design installed on 2 antennas : working ok ?

====> since Aug 2015 and Apr 2016.

(ii) status of new 3-stage design : optimisation of RL was being attempted

16 Nov : 3-stage design appears to be working ok : 45 dB across the band; RL better than 10 dB across the band; Tlna ~ 20 K (by old noise comm calibration scheme); to try improve further, while assembling second unit.

====> want to reduce gain at freqs below 900 MHz, for improved RL in band of interest; meanwhile this ver (ver3 ; 3 stage with dir coupler) can be taken to antenna (2 units to be made ready).

1.8 Regular testing of L-band system (SKR) :

(i) update from latest round of tests

16 Nov : recent results on 11th Nov : 2 antennas with poor b'shape (S2 ch-1 -- CB

problem and W5 -- problem not identified); C14 showing poor deflection and falling at high freq -- checked for pointing and OF attn, now to try changing the feed.

====> no updates right now.

1.9 OF output 60:1 monitoring system (PAR) :

(i) status update on completion of 30 antenna system, including facility for monitoring in control room

====> this is now available under the standard monitoring tools; control part has some problem and needs login to control PC -- SOP for this to be provided to control room.

(ii) status of completion of design report

16 Nov : completed for 30 antennas, can be monitored from control room, need a formal SOP for operators and users; report still under internal circulation.

====> report had been circulated; may be closed.

1.10 Mass production of Band-4 (550-900) system :

(i) status of sub-band filters, stools etc.

(ii) status of number of antennas equipped with Band-4 system

16 Nov : PCBs for all 30 antennas now in hand for sub-band filters; 10th antenna still not ready; need to follow-up on availability of feed, hood and stools -- to follow-up.

====> delivery of next set of 10 nos delayed by two weeks to 20th Dec; HSK to request Fabromech for early delivery of 3-4 sets of hood + stools (4 dipole + cavity units are available).

2. RFI related :

2.1 Characterising RFI environment at GMRT (PAR) :

(i) document for control room and users to be released : final modifications waiting to be completed

====> YG + PAR to work on this final version.

(ii) study of RFI environment, including internally generated RFI in main building

====> tests of individual labs : with AC units and otherwise -- shows different labs in different light; agreed to identify the worst culprits by kind of equipment etc and provide an update.

(iii) absolute calibration of RFI levels at antenna : follow-up from controlled tests

16 Nov : no updates

====> no updates

2.2 Industrial RFI related matters (PAR/SSK) :

(i) updating our database

(ii) response to pending requests for clearance e.g. Serum Institute...

(iii) work out new action plan, given the current government policies

16 Nov : no updates

====> first meeting with Serum held last week (24th) -- need follow-up visit to their location for looking at specific instruments.

2.3 Mobile phone RFI (PAR) :

(i) Follow-up with BSNL and related matters

16 Nov : no updates

====> new line seen at 880 -- 885 range; identified as due new Reliance Jio systems (they are the only one to have got license in this range) -- it is strong enough to cause saturation in spite of filter; need to find the specific towers and then follow-up with Reliance.

2.4 RFI from air conditioning systems (PAR/RVS) :

(i) plans for mass production of the systems

16 Nov : not discussed

====> PAR thinks he has adequate parts for 30 nos of units to be assembled; need to identify which make is coming finally.

3. Operations related :

3.1 Interfacing of FE with new M&C system :

(i) latest status of testing with Rabbit card in common box at antenna base

16 Nov : Debugging of monitoring problem : still ongoing; performance appears to be partial and intermittent. Discussed various ramifications and implications : agreed to continue effort to debug antcomm to Rabbit connectivity for monitoring (at least up to common box monitoring) while going ahead with alternate approach of talking to Rabbit on serial port from other devices (e.g. another Rabbit or PC).

====> no new updates on this

(ii) status of parallel activity of 2nd common box with Rabbit to go to dish focus

16 Nov : 2nd common box being modified (about 50% of rewiring done); Rabbit with shielded box will be available end of this week; can hope to complete integration and testing in 2 weeks time and put on first antenna with RS-232 cable driving; later to convert that to ethernet over fibre; mass production may need only new plates to be made by workshop -- other aspects are in-house in FE lab.

====> see earlier activity

3.2 PC at antenna base (CPK/SN) :

(i) Follow-up with Miltech for 20 units -- can we speed-up the delivery period

16 Nov : new quote from Miltech says 3 months delivery, including phased delivery and early delivery of one unit to be explicitly mentioned in PO.

====> above was budgetary quote; formal quote expected shortly.

3.3e Long-term plans for installation and release of final M&C system :

(i) growth plan for populating antennas with the systems

(ii) plans for switch-over -- to make it as seamless as possible.

====> discussed, with two main scenarios considered at some first order detail;

Ops team to generate a concept note for the 2 main scenarios with pros and cons clearly mentioned and timelines also.

3.3 GMRT M&C system Ph-2 work :

(i) roles and responsibilities of GMRT team members

(ii) kick-off meeting with TCS and TRDDC

16 Nov : meeting tomorrow (17th) to finalise the plans

====> discussions are ongoing...

3.4 GMRT M&C system as SKA prototype :

(i) updating TM repository with relevant documents

(ii) preparing inputs for TM review committee

16 Nov : to aim to complete the repository + announcement within next week ; work for material for review committee started

====> discussions and work ongoing...

4. Back-ends related :

4.1 Documentation :

(i) any pending reports etc ?

16 Nov : GWB and RFI papers revised and submitted / getting ready to submit; Walsh paper needs to be looked into for revision; nothing really pending, except for the report on the attenuation values : new set of tests done and results look ok and will be updated shortly.

4.2 Updates on existing GWB-3 system :

(i) completion of DDC related works :

DDC correction seems to be overcorrecting -- Reddy to share the bandshapes;

23 Nov : no updates.

====> still awaiting action SHR.

(ii) drop-out in visibility data

16 Nov : DDC correction seems to be overcorrecting -- Reddy to share the bandshapes;

for dropout problem : not clear what is happening -- is it temporal, is it a fn of level of correlations -- may want to try with artificial correlated noise source?

====> this is now established to be outside the correlator -- in the mapping of input numbers in a particular task in AIPS (UVCOMPRESS).

4.3 Completion and release of first version of GWB-4 (SHR/ICH/SSK/BAK) :

(i) assembling of racks and nodes and peripherals :

16 Nov : all done except for some reorganisation of host m/cs when final 32 antenna system is being integrated;

(ii) integration, testing and release of 2nd half 16-antenna system :

configuring of m/cs is done, testing is to start now; GPU delivery to be followed up;

23 Nov : second half 16 antenna system is under test (tbd by next week).

====> testing shows some packet loss (very small) but appears not related to BW and data rate; maybe related to CX4 drivers -- need to generate proper stats.

(iii) power and cooling related issues :

for GWB things running ok; for GSB still has few deg higher temp -- improved cooling solution to be investigated for in-situ implementation.

23 Nov : GWB type soln for GSB planned for next MTAC -- need complete shutdown for it.

(iv) availability of components esp GPUs :

still awaiting delivery of the K40 GPUs;

23 Nov : expected by 15th Dec.

(v) targets and plans for release of full 30-antenna system : when will it be ready

and what features will be available in first release :

target release date depends on progress of (ii) above; regarding modes : doubtful ones are 400 MHz total intensity, 200 MHz full polar, 4 beams -- may or may not work for 30 antennas (due to I/O restrictions); similarly voltage mode will be programmed but may not work for all 30 antenna configuration; basic DDC and zoom modes ok.

23 Nov : need to plan the code optimisation that will be needed.

4.4 Plan for dual copy of data for various useful applications (!) (BAK+GJS) :

(i) refinements of the first draft of the note

(ii) plans for getting first unit connected and tested

(iii) plans for testing high speed recording to disks

16 Nov : lab set-up for grabbing and recording has been done; while continuing with this, need to work on the set-up for sending parallel copy of the data, including procurement of longer CX4 cables.

====> not discussed.

4.5 Update on time-stamping issues for GWB (SSK/SHR/YG) :

(i) follow-up on items from discussion note with YG (couple of months ago)

16 Nov : some changes have been made by SHR, but the sub-microsec correction still needs to be done; also to follow-up about h4k file.

====> not discussed.

4.6 RFI mitigation in digital back-end (KDB/YG) :

(i) time domain impulsive RFI filtering : current status and plans

(ii) spectral domain RFI filtering : current status and plans

(iii) beamformer RFI filtering : current status and plans

16 Nov : for (i) fraction thld and generation of counter being tested; reading code needs to be done; sync vs async operation -- both can be tried to be provided; need to see what further kinds of tests to be done; also some tests for optimum thld and replacement options. for (ii) offline version is working fairly well; need a plan for the implementation of real-time version and for the propagation of the flags/weights into the visibility data into the LTA file.

====> not discussed in detail.

4.7 Early digitisation work (BAK) :

(i) Update on current status

(ii) Discussion on long-term plans

====> not discussed.

4.8 Status update on processing of tender responses for Maser units (BAK)

(i) finalisation of processing of folder

(ii) planning for kind of environmental set-up required

16 Nov : most of the issues have been resolved, waiting for one party to complete the payment terms; pending issue about performance bank guarantee for different amounts of periods.

====> work is ongoing, but item not discussed.

=====

Points from the Plan meeting of 14 Dec 2016

1. FE & OF related :

1.1 Noise temp & gain vs temperature for new LNAs (VBB/SSK) :

- (i) Update on understanding the noise diode calibration issues
 - (ii) Update on results with low ppm resistors and comparison with existing designs
- 30 Nov : latest results show 2-3 deg K improvement in T_{lna} for 550-900 for low ppm vs normal resistors, and also the low ppm absolute values are slightly higher. Hence, now real improvement, in going to low ppm. To move towards repeating the test for the entire FE box.

====> repeat test will need preparation of cabling (1 month)

1.2 Completion of 120-240 MHz Band-2 system (HRB) :

- (i) Updates from repeat measurements of response & comparison with control room values
- (ii) Results from optimisation with adjustable stool on E02
- (iii) Generation of final summary for discussion at GSG level

====> planned next week (20-Dec-2016);

====> completed; follow-up needs to be taken up

(iv) Preparing for mass production

====> 3 weeks per antenna anticipated; x8 Antennas by April 2017 promised;

1.3 Status of 250-500 MHz Band-3 system (AP/HRB/ANR/SC) :

- (i) Completion of 30 antenna system, including retrofitting of first version
- (ii) Updates from recent 30 antenna monitoring measurements
- (iii) Summary of phase centre measurements and decision about future plans
- (iv) Quality check of the responses of sub-band filter and main BPF to be carried out
- (iv) LO settings for all sub-bands etc to be finalised.

====> v1->v2 for 9 antennas needed (+ 5 spares); 10 boxes ordered; 2 boxes getting ready in 1 week one antenna can be done; ~ 3 weeks per antenna anticipated;

====> report to be circulated by next week (20-Dec-2016)

====> first round sub-band filter measurements done & needs to be repeated;

====> 250-500 LO setting document /table already finalized;

====> 250-500 LO setting document /table already finalized;

====> 250-500 LO setting document /table already finalized;

- (i) Completion of box #2 with Rabbit and installation + testing at dish focus
 - (ii) Plans for mass production
- 30 Nov : for mass production, will use 2 nos for cycling; work order for mechanical plates etc to be followed up; once sample unit is shown to work at antenna focus, mass production can start; meanwhile, work request given to mech team; plans for laying fibre for eth connection also to be tried out; to check with Ops group about ability of switch between serial port and eth port (for ease of switching modes); shielded i/f connector for OF system is not available and PO folder for this is lost.

1.4 Common box upgrade (VBB/SSK) :

- (i) Current status of measurements and interpretations
- (ii) Plans for next steps to be taken

30 Nov & 14 Dec : not discussed

1.5 Apex radiation scheme (PAR/SRoy) :

- (i) Current status of measurements and interpretations
- (ii) Plans for next steps to be taken

30 Nov & 14 Dec : not discussed

1.6 Walsh related matters (SC) :

(i) Confirm status on all 30 antennas (S4 & S6 were not working at last report)

(ii) Plans for regular maintenance & tests (as common box is upgraded)

30 Nov : S4 is also functional, only S6 needs to be checked; Walsh bit is checked in lab as part of standard clearance.

1.7 Polarisation calibration of upgraded systems (SC/?)

(i) To set up a procedure for regular polarisation isolation tests

(ii) Discussion about possibility for feed + dish modeling

30 Nov : reg poln isolation tests are being done for upgraded systems also, and results have been found useful for Band-3 system; SC to prepare a short concept note about the possibilities of doing the calculation for feed + dish modeling and what can be learnt etc.

1.8 New filters for L-band :

(i) status update on installation of 1650 LPF : CSQ antennas completed; arm antennas was ongoing

====> all west arm will be completed by 16-Dec-2016;

(ii) delivery of remaining units of main L-band BPF from Epitome

16 Nov : arm antenna installation to be resumed; BPF completed and handed over to BE team -- this can be closed.

1.9 OF system updates :

(i) Pending issues with existing OF system

(ii) Procurement of cable, equipment etc

23 Nov & 14 Dec : no updates

2. RFI related :

2.1 Spectral line RFI (PAR/SSK) :

(i) Update on cable TV problem

23 Nov : letters have been sent; to follow-up after couple of weeks

(ii) Digital TV follow-up

23 Nov : letter is still pending !

(iii) monitoring new lines

23 Nov : 402 MHz line in SW direction -- trying to locate the source

2.2 Satellinte RFI monitoring & avoidance system (PAR/SNK) :

(i) Update on present status for different kinds of satellites : GEOs, GSOs, GPS, LEOS...

23 Nov : GSOs and ,, GPS (US) tbd for other GPS constellations; confirmed that regular cron job is running in control room, but need to check about alarm for LEOS (appears that alarm did show up in the log data?)

(ii) Tackling MUOS satellite

23 Nov : to cross check footprint & angle of avoidance (may need 10 deg or more?)

(iii) Plans for sending information to back-end reciever chain

(iv) Providing the facility to other interested observatories, including SKA

23 Nov : some discussion has happened, to be followed up next week

2.3 RFI from power lines and transformers (PAR/RVS) :

(i) review current status

(ii) specific follow-up actions

23 Nov : not discussed

2.4 RFI from LED lamps (PAR/RVS) :

(i) Statistics of failures of existing units

(ii) Follow-up on attempt to understand circuits for RFI friendly units and check with vendors.

23 Nov : appears too difficult to shield the RFI from the bad units; need to identify units with separate PCB ckt for driver, which can be shielded.

====> some dry-solder issue seen (after fixing, the LED lamp worked; in one case);

2.5 UPS RFI related (PAR/RVS) :

23 Nov & 13 Dec : not discussed ?

3. Operations related :

3.1 Mass production of shielded boxes for Rabbit card and network switch (CPK/SN) :

(i) procurement of problem PCB

23 Nov : 5 nos of sample PCBs received -- found OK; repeat order planned for 80 nos.

(ii) status of mass production of Rabbit card enclosure

====> 6 boxes ready (70 more needed);

(iii) status of mass production of network switch enclosure

23 Nov : 28 units ready (need total of 35)

====> now 32 (of 35) ready;

3.2 Work on final configuration at antenna base for space, UPS, RFI etc (JPK/RVS/PAR) :

(i) status of first 2 model antennas (C00 and C10) -- what has been done and what is still missing

23 Nov : C00 & C10 are mostly complete (item could be closed?)

(ii) plans for going beyond 2 antennas

23 Nov : mechanical has completed 9 or 10 antennas; 6 are complete with all changes (?)

(iii) update on improved RFI shielding at antenna shell

23 Nov : shielding test measurements done for present configuration; awaiting finger-lines to be added before repeating the tests (which antenna?)

3.3 Long-term plans for installation and release of final M&C system :

(i) growth plan for populating antennas with the systems

(ii) plans for switch-over -- to make it as seamless as possible.

30 Nov : two main scenarios considered at some first order detail; Ops team to generate a concept note for the 2 main scenarios with pros and cons clearly mentioned and timelines also.

3.4 Procurement of central switch (CPK/JPK) :

(i) Specifications to be worked out (by Computer group)

====> HP layer3 switch finalized; bidgetry quote Rs 3.5 lakh; indent prepared.

(ii) Plans for procurement

23 Nov : Mangesh has identified HP make layer-3 manageable switch (48 port); specs being studied.

OTHERS :

====> 1-2 STP students identified for rabbit firmware development + antenna

====> installation work;

4. Back-ends related :

4.1 Analog Back-end related issues (NDS/SG/BAK) :

(i) Improvements in LO generation scheme -- current status and future plans
23 Nov : tested ADF-4350 system; found to be good, compared to FSW unit; test report in internal circulation; to work towards implementation for 2 antennas in GAB.

====> PIU wiring in progress - in a week to finish;

(ii) Completion and release of input side filters

23 Nov : installation for 30 antennas (all bands) completed; testing in progress.

====> testing completed; power level adjustment for direct vs filter paths

====> in progress (2 weeks to complete);

(iii) Completion of 60:1 system and release for use; final report

23 Nov : draft report in internal circulation.

====> changes to DRAFT report in progress;

4.2 Power equalisation scheme and relate topics (BAK/SRoy) :

(i) Completion of attenuator testing and release of report

23 Nov : report under revision

(ii) Status of different modes of power monitoring & equalisation scheme, including formal release for users

23 Nov : SRoy to add options related to averaging time, ALC etc...

====> not discussed.

4.3 Updates on existing GWB-3 system :

(i) completion of DDC related works :

DDC correction seems to be overcorrecting -- Reddy to share the bandshapes;

23 Nov : no updates.

(ii) drop-out in visibility data :

for dropout problem : not clear what is happening -- is it temporal, is it a fn of level of correlations -- may want to try with artificial correlated noise source?

23 Nov : no updates.

====> problem perhaps in AIPS settings.

4.4 Completion and release of first version of GWB-4 (SHR/ICH/SSK/BAK) :

(i) assembling of racks and nodes and peripherals :

all done except for some reorganisation of host m/cs when final 32 antenna system is being integrated;

(ii) integration, testing and release of 2nd half 16-antenna system :

configuring of m/cs is done, testing is to start now; GPU delivery to be followed up;

23 Nov : second half 16 antenna system is under test (tbd by next week).

====> problem in ROACH (FPGA board) : 3/8 not recognizing PPS signals; one OK now after replacing with spare boards; other 2 need to be replaced with 'old' boards;

(iii) power and cooling related issues :

for GWB things running ok; for GSB still has few deg higher temp -- improved cooling solution to be investigated for in-situ implementation.

23 Nov : GWB type soln for GSB planned for next MTAC -- need complete shutdown to do it.

(iv) availability of components esp GPUs :

still awaiting delivery of the K40 GPUs;

23 Nov : expected by 15th Dec.

====> delayed further by 30 days (may come earlier)

(v) targets and plans for release of full 30-antenna system : when will it be ready

and what features will be available in first release :

target release date depends on progress of (ii) above; regarding modes : doubtful

ones are 400 MHz total intensity, 200 MHz full polar, 4 beams -- may or may not work

for 30 antennas (due to I/O restrictions); similarly voltage mode will be programmed but may not work for all 30 antenna configuration; basic DDC and zoom modes ok.

23 Nov : no specific updates, except that code optimisation will need to be done.

====> GSG decision later in time ...

4.5 Longer term plans for GWB-4 (SHR/ICH/SSK/BAK) :

(i) Connectivity of GWB-4 with rest of the network, including GMRT--Pune link

(ii) Disks for data recording, including trials with SSD options

(iii) investigating next gen GPUs

(iv) migration to next version of CUDA (7.5 and beyond)

23 Nov : CUDA 7.5 is being tried in the new version of GWB

(iv) Additional modes and features in GWB system :

(a) 4 beams, with upto 2 voltage beams with coherent dedispersion

23 Nov : 4 beams (IA/PA) implemented but yet to be tested to shortest integrations;

2 voltage beams (1 with full BW and 2 with half BW are planned for new system)

(b) PA - IA beam mode

(c) beam formation with different phase centres

(d) improved I/O capabilities : change in data sending code; alternate n/w ?

(e) gated correlator : folding visibilities with pulsar period

(f) polyphase filter bank

(g) 2 inputs per Roach board

(h) time + DUT corrections

(i) net-sign correction

(j) full backward compatibility of off-line utilities

23 Nov : some work has been done, but not clear if this meets / works for all requirements.

4.6 Monitoring of temperature and other parameters of new back-ends (GJS/BAK) :

(i) Summary of current status for temperature monitoring

(ii) Plans for future enhancement and release for regular use

(iii) Monitoring of other health parameters

23 Nov : not discussed.

====> GWB has temp monitors;

====> actual temp monitor sensors/cards added in rack (uses DAQ card);

4.7 Other issues :

(i) Cross-coupling tests in GAB + GWB

====> leakage < 30 dB; acceptable

(ii) Walsh related work

====> some tests in progress; porting to GWB (Python package being modified);

OTHERS :

====> GWB, Walsh & RFI related paper in Journal (referee comments being addressed);

====> may be accepted within 2 weeks.

5. Other items :

5.1 Python assembly work (HSK/SSK) :

(i) Summary of the work done so far and conclusions from the same

23 Nov : mech team to prepare a summary note; meanwhile, first assembly of new Python (what is its configuration?) will be ready by 7 Dec, and will be installed on antenna for tests.

(ii) Plans to decide for the final option to be adopted

23 Nov : to be taken up after note is circulated and new version is tested.

==> not discussed

=====

Minutes for Plan meeting of 21 Dec 2016

1. FE & OF related :

1.1 Update on results from test range (HRB/SSK) : need to make it fully functional again and get data for 550-900 feed.

16 Nov : offset not yet fixed (to be done later with mechanical), but new data taken for E & H plane -- looks ok; to do cross-polar measurements.

30 Nov : no change in status.

====> plans for correcting the offset -- next Monday 26th.; meanwhile, earlier data has been given to SC and he will produce an updated result for band-4 within the next week.

1.2 Phase centre tests for 250-500 CDF (HRB): consolidated report on 250-500 existing measurements still awaited.

16 Nov : there is only one set of measurements -- to circulate as a simple report; and then decide if fresh measurements with adjustable stool are to be done.

30 Nov : simple report to be done within a week.

====> single plot has been circulated, for 3 stool heights -- 1180, 1280, 1380 (the selected value is 1280) alongwith theoretical curve -- this needs to be redone with the latest code by SC (HRB to provide the info to SC for this and then produce the overlay plot).

1.3 Theoretical calculations vs observed performance for antenna sensitivity and related topics (SC/GP/ICH/DVL) :

(i) check status of updated document;

30 Nov : earlier document to be recirculated to wider audience

====> updated version has been circulated, includes Ae/Tsys for bands 2,3,4

(ii) need to cross-check mismatch of values for band-3 (250-500);

30 Nov : will check and update, including referring to some existing literature

====> some work has been done, but needs an internal cross-check & then discussion.

(iii) need to see if QH losses have been incorporated into the calculations;

30 Nov : GP has done some of the work; need to circulate and get agreement.

(iv) does the study cover all the uGMRT bands.

30 Nov : right now 2 bands are included in the report (Band-3 and Band-5); for Band-4 radiation pattern values are now available and all other info is there and so it can be completed and reported.

16 Nov : some work has been done to include measured QH losses for 250-500 and avg mean value over the band for 550-900.

====> new doc has QH losses included (makes ~ 2-3 deg increase in Tsys) -- TBC.

(iv) can it be extended to deriving the final beam pattern for feed + antenna

This is being looked into

====> first doc has been circulated by SC.

1.4 Total power monitoring at antenna (GP) :

(i) confirm if latest calculations relating to unit to unit variations have been incorporated in the updated document

30 Nov : yet to be completed.

====> updated & internally circulated;

(ii) results from recent tests

30 Nov : running of tests has conflict with online system (JPK is looking into this)

====> all x30 Ae data collection leads to 'online' ssystem hanging;

====> planning with x15 Ae (29Dec);

(iii) labeling scheme for keeping track of the units to be taken up for refinement and implementation

16 Nov : agreed to make spread-sheet per sub-system (for all antennas) and manage this manually at first and develop automated routine for it later on; generation of initial spread-sheet to be assigned to different team members for different sub-systems.

30 Nov : 250-500 spreadsheet is in use; 550-900 is getting going etc... regular back-up of the files to be worked out.

1.5 Temperature monitoring at FE and OF at antenna (GP) :

(i) status from recent tests and measurements for FE system

30 Nov : same as above

====> x2 Ae C13 & E2 taken today : test going on (10 AM to 6PM)

(ii) status of prototype for temp and power monitoring at OF rack at antenna base

16 Nov : sample data set taken but not long enough; to wait for next round of tests; prototype unit installed at C2 and connected to M&C system, but not being monitoring regularly; would like to do some more test and development before finalising the scheme.

30 Nov : (ii) is on-hold after prototype development.

1.6 L-band spares (VBB/SSK) :

(i) confirm current status of spares

30 Nov : 2 nos of full units as spare; 3 units have been brought down for maintenance.

(ii) finalisation of report by VBB

16 Nov : same status as last week.

30 Nov : report pending with SSK

1.7 LNAs for L-band (ANR) :

(i) status of spares from existing designs

30 Nov : some failed units are being retuned...

(ii) status of new 2-stage design installed on 2 antennas : working ok ?

30 Nov : working ok since Aug 2015 and Apr 2016 on 2 antennas.

(ii) status of new 3-stage design : optimisation of RL was being attempted

16 Nov : 3-stage design appears to be working ok : 45 dB across the band; RL better than 10 dB across the band; Tlna ~ 20 K (by old noise comm calibration scheme); to try improve further, while assembling second unit.

30 Nov : want to reduce gain at freqs below 900 MHz, for improved RL in band of interest; meanwhile this ver (ver3 ; 3 stage with dir coupler) can be taken to antenna (2 units to be made ready).

====> 2 K improvement seen (< 20 K) ; report to be available in 1 week

1.8 Regular testing of L-band system (SKR) :

(i) update from latest round of tests

16 Nov : recent results on 11th Nov : 2 antennas with poor b'shape (S2 ch-1 -- CB problem and W5 -- problem not identified); C14 showing poor deflection and falling at high freq -- checked for pointing and OF attn, now to try changing the feed.

30 Nov : no updates right now.

1.9 OF output 60:1 monitoring system (PAR) :

(i) status update on completion of 30 antenna system, including facility for monitoring in control room

30 Nov : this is now available under the standard monitoring tools; control part has

some problem and needs login to control PC -- SOP for this to be provided to control room.

(ii) status of completion of design report

16 Nov : completed for 30 antennas, can be monitored from control room, need a formal SOP for operators and users; report still under internal circulation.

30 Nov : report had been circulated; may be closed.

====> older PC (OS limitation) being replaced by new PC to avoid this issue;

1.10 Mass production of Band-4 (550-900) system :

(i) status of sub-band filters, stools etc.

====> x2 stools received on 20th Dec; & x2 hoods also; 11th Ae to be done tomorrow; 12th Ae by 1st week of Jan'17.

(ii) status of number of antennas equipped with Band-4 system

16 Nov : PCBs for all 30 antennas now in hand for sub-band filters; 10th antenna still not ready; need to follow-up on availability of feed, hood and stools -- to follow-up.

30 Nov : delivery of next set of 10 nos delayed by two weeks to 20th Dec; HSK to request Fabromech for early delivery of 3-4 sets of hood + stools (4 dipole + cavity units are available).

====> 1 more week delay due to from vendor's delay

2. RFI related :

2.1 Characterising RFI environment at GMRT (PAR) :

(i) document for control room and users to be released : final modifications waiting to be completed

30 Nov : YG + PAR to work on this final version.

(ii) study of RFI environment, including internally generated RFI in main building

30 Nov : tests of individual labs : with AC units and otherwise -- shows different labs in different light; agreed to identify the worst culprits by kind of equipment etc and provide an update.

(iii) absolute calibration of RFI levels at antenna : follow-up from controlled tests

16 Nov & 30 Nov : no updates

2.2 Industrial RFI related matters (PAR/SSK) :

(i) updating our database

(ii) response to pending requests for clearance e.g. Serum Institute...

====> awaiting call from Serum Institute for the next visit; asked all technical details of their planned equipments;

(iii) work out new action plan, given the current government policies

30 Nov : first meeting with Serum held last week (24th) -- need follow-up visit to their location for looking at specific instruments.

====> one site visited.

2.3 Mobile phone RFI (PAR) :

(i) Follow-up with BSNL and related matters

30 Nov : new line seen at 880 -- 885 range; identified as due new Reliance Jio systems (they are the only one to have got license in this range) -- it is strong enough to cause saturation in spite of filter; need to find the specific towers and then follow-up with Reliance.

2.4 RFI from air conditioning systems (PAR/RVS) :

(i) plans for mass production of the systems

30 Nov : PAR thinks he has adequate parts for 30 nos of units to be assembled; need

to identify which make is coming finally.

2.5e UPS RFI related (PAR/RVS) :

Need status update from discussions with vendor and follow-up action !!

====> today (21-Dec-2016) improved UPS is under test; vendor made changes to one unit; if successful, he will make similar changes to remaining 9 units;

====> OTHERS : LED bulb /lamp -> no success in shielding;

====> but LED tubelight - driver has been made RFI free

3. Operations related :

3.1 Interfacing of FE with new M&C system :

(i) latest status of testing with Rabbit card in common box at antenna base

16 Nov : Debugging of monitoring problem : still ongoing; performance appears to be partial and intermittent. Discussed various ramifications and implications : agreed to continue effort to debug antcomm to Rabbit connectivity for monitoring (at least up to common box monitoring) while going ahead with alternate approach of talking to Rabbit on serial port from other devices (e.g. another Rabbit or PC).

30 Nov : no new updates on this

====> antenna control part is working; FE monitoring still not working; Charu is looking into this...

(ii) status of parallel activity of 2nd common box with Rabbit to go to dish focus

16 Nov : 2nd common box being modified (about 50% of rewiring done); Rabbit with shielded box will be available end of this week; can hope to complete integration and testing in 2 weeks time and put on first antenna with RS-232 cable driving; later to convert that to ethernet over fibre; mass production may need only new plates to be made by workshop -- other aspects are in-house in FE lab.

30 Nov : item also being discussed under FE agenda item (in alternate week)

====> planned this week

3.2 PC at antenna base (CPK/SN) :

(i) Follow-up with Miltech for 20 units -- can we speed-up the delivery period

16 Nov : new quote from Miltech says 3 months delivery, including phased delivery and early delivery of one unit to be explicitly mentioned in PO.

30 Nov : above was budgetary quote; formal quote expected shortly.

3.3 GMRT M&C system Ph-2 work :

(i) roles and responsibilities of GMRT team members

====> meeting has been held; work plan will be discussed next Tuesday internal meeting.

(ii) kick-off meeting with TCS and TRDDC

16 Nov : meeting tomorrow (17th) to finalise the plans

30 Nov : discussions ongoing; kick-off meeting planned.

====> kick-off meeting held on 25th Nov; 4 deliverables identified : 1st delivery will be telescope tracking of 10 antennas; project plan discussed; start date : 5 Dec.

3.4 GMRT M&C system as SKA prototype :

(i) updating TM repository with relevant documents

====> completed.

(ii) preparing inputs for TM review committee

16 Nov : to aim to complete the repository + announcement within next week ; work for material for review committee started

30 Nov : discussions and work ongoing, including preparations for discussions with

TM review panel.

====> review meeting held on 20Dec16; 3 phases; 1st phase : requirement compatibility; architecture explanation given; scalability etc; need many upgradation of quality attributes; Jan17 1st week -> risk scenario to be discussed;

4. Back-ends related :

4.1 Documentation :

(i) any pending reports etc ?

16 Nov : GWB and RFI papers revised and submitted / getting ready to submit; Walsh paper needs to be looked into for revision; nothing really pending, except for the report on the attenuation values : new set of tests done and results look ok and will be updated shortly.

14 Dec : GWB, Walsh & RFI related paper in Journal (referee comments being addressed); may be accepted within 2 weeks.

====> RFI paper is already accepted; Walsh is in 2nd stage of revision; GWB ?

4.2 Updates on existing GWB-3 system :

(i) completion of DDC related works :

DDC correction seems to be overcorrecting -- Reddy to share the bandshapes;

30 Nov : still awaiting action from SHR.

====> no action taken yet.

(ii) drop-out in visibility data

16 Nov : DDC correction seems to be overcorrecting -- Reddy to share the bandshapes; for dropout problem : not clear what is happening -- is it temporal, is it a fn of level of correlations -- may want to try with artificial correlated noise source?

30 Nov : this is now established to be outside the correlator -- in the mapping of input numbers in a particular task in AIPS (UVCOMPRESS); to check if matter can be closed ?

====> no updates on this.

4.3 Completion and release of first version of GWB-4 (SHR/ICH/SSK/BAK) :

(i) assembling of racks and nodes and peripherals :

16 Nov : all done except for some reorganisation of host m/cs when final 32 antenna system is being integrated;

(ii) integration, testing and release of 2nd half 16-antenna system :

configuring of m/cs is done, testing is to start now; GPU delivery to be followed up;

30 Nov : testing shows some packet loss (very small) but appears not related to BW and data rate; maybe related to CX4 drivers -- need to generate proper stats.

14 Dec : problem in ROACH (FPGA board) : 3/8 not recognizing PPS signals; one OK now after replacing with spare boards; other 2 need to be replaced with 'old' boards;

====> system is configured with 8 compute nodes (T630s) with 2 nos of K20 each, 3 host m/c (T630s) with no GPUs + 1 spare T630; connected to 8 Roach boards, each with 2 ADCs and 2 x 10 Gbe links. Tests going on for some time now on arbitrary inputs to test data recovery -- there are occasional loss of eth packets (1 or 2 pkts per 10 sec) on 1-2 out of 16 links which changes randomly on reboot. Other than this, the acq and correlation code runs stably; further, Roach boards are showing spurious triggering. Need to find out where it is coming from; meanwhile, to try and see if possibility of false triggering can be reduced by opening the gate at 0.9 s or so.

(iii) power and cooling related issues :

for GWB things running ok; for GSB still has few deg higher temp -- improved cooling solution to be investigated for in-situ implementation.

23 Nov : GWB type soln for GSB planned for next MTAC -- need complete shutdown for it.

(iv) availability of components esp GPUs :

23 Nov : still awaiting delivery of the K40 GPUs; expected by 15th Dec.

14 Dec : delayed further by 30 days (may come earlier)

====> this is a serious matter and needs follow-up !!!

(v) targets and plans for release of full 30-antenna system : when will it be ready and what features will be available in first release :

target release date depends on progress of (ii) above; regarding modes : doubtful ones are 400 MHz total intensity, 200 MHz full polar, 4 beams -- may or may not work for 30 antennas (due to I/O restrictions); similarly voltage mode will be programmed but may not work for all 30 antenna configuration; basic DDC and zoom modes ok.

23 Nov : need to plan the code optimisation that will be needed.

EXTRA ITEM : network connectivity issues :

(i) extra IPs needed on .4 n/w for GWB 2nd half sytem

(ii) updated IP table for .4 n/w to be made available by computer group

(iii) updated n/w diagram from GWB & GSB n/w to core switch to Pune connection to be made available by computer group

(iv) to see if 3 1 Gbps connections can be given from gwbh1-3 to GMRT-NCRA switch

(v) to explore options for upgrading the switch e.g. 3 nos of 48 port switch

4.4 Plan for dual copy of data for various useful applications (!) (BAK+GJS) :

(i) refinements of the first draft of the note

(ii) plans for getting first unit connected and tested

(iii) plans for testing high speed recording to disks

16 Nov : lab set-up for grabbing and recoding has been done; while continuing with this, need to work on the set-up for sending parallel copy of the data, including procurement of longer CX4 cables.

30 Nov : not discussed.

4.5 Update on time-stamping issues for GWB (SSK/SHR/YG) :

(i) follow-up on items from discussion note with YG (couple of months ago)

16 Nov : some changes have been made by SHR, but the sub-microsec correction still needs to be done; also to follow-up about h4k file.

30 Nov : not discussed.

====> modified code has been made, but not yet tested; can try to see if it can be made available in the current release.

4.6 RFI mitigation in digital back-end (KDB/YG) :

(i) time domain impulsive RFI filtering : current status and plans

(ii) spectral domain RFI filtering : current status and plans

(iii) beamformer RFI filtering : current status and plans

16 Nov : for (i) fraction thld and generation of counter being tested; reading code needs to be done; sync vs async operation -- both can be tried to be provided; need to see what further kinds of tests to be done; also some tests for optimum thld and replacement options. for (ii) offline version is working fairly well; need a plan for the implementation of real-time version and for the propagation of the flags/weights into the visibility data into the LTA file.

30 Nov : not dicussed in detail.

====> For fractional thld option is still in debug mode; async operation design is under development; sync operation option can also be developed after that; both will come with some constraints on range of parameters available to user -- TBS; no progress on the real-time freq domain filtering, as time domain is still taking up most of the time... meanwhile, looking (with Sanjay) about the possibilities for

sending the flags to visibility and LTA data file...

emulator has come changes and improvements, including random location of the RFI.

4.7 Early digitisation work (BAK) :

(i) Update on current status

(ii) Discussion on long-term plans

30 Nov : not discussed.

====> parallel system set-up with spare GAB system (for 2 antennas) in Rx room and tests ongoing; also tested by sending digitised packets to antenna and loop back; using GWB2 for doing all the correlations.

4.8 Status update on processing of tender reponses for Maser units (BAK)

(i) finalisation of processing of folder

(ii) planning for kind of environmental set-up required

16 Nov : most of the issues have been resolved, waiting for one party to complete the payment terms; pending issue about performance bank guarantee for different amounts of periods.

30 Nov : work is ongoing, but item not discussed.

====>

5. Other items :

5.1 Python assembly work (HSK/SSK) :

(i) Summary of the work done so far and conclusions from the same

23 Nov : mech team to prepare a summary note; meanwhile, first assembly of new Python (what is its configuration?) will be ready by 7 Dec, and will be installed on antenna for tests.

====> earlier, report was circulated in Aug 2016, which appears to be quite clear and conclusive for the fact that the Finolex pipe with modified E06 arrangement (running on W1 for more than one year) is better than Igus pipe with same as E6 arrangement (running on C4 for more than one year, but has had one cut).

(ii) Plans to decide for the final option to be adopted

23 Nov : to be taken up after note is circulated and new version is tested.

14 Dec : not discussed

====> The W1 solution is adopted for now and 4-6 nos of python assembly have been provided to FE team (to check how many of these have been used) -- overall statistics to be generated.

(iii) Future requirements : there was a need expressed to have have a bigger hose to take care of extra cable requirements for future use. Current version is 30 mm ID hose; need to try ~ 50 mm ID; new hose of stainless steel material has been procured from a party in Mumbai and sample assembly is being made ready -- may go on antenna by early Jan; this will be 50 mm ID. Meanwhile, need a discussion to decide the final choice of ID.

=====

Minutes for the Plan meeting of 28 Dec 2016

1. FE & OF related :

1.1 Noise temp & gain vs temperature for new LNAs (VBB/SSK) :

(i) Update on understanding the noise diode calibration issues

(ii) Update on results with low ppm resistors and comparison with existing designs

30 Nov : latest results show 2-3 deg K improvement in T_{lna} for 550-900 for low ppm vs normal resistors, and also the low ppm absolute values are slightly higher. Hence, now real improvement, in going to low ppm. To move towards repeating the test for the entire FE box.

14 Dec : repeat test will need preparation of cabling (1 month)

====> no updates.

1.2 Completion of 120-240 MHz Band-2 system (HRB) :

(i) Updates from repeat measurements of response & comparison with control room values

14 Dec : planned next week (20-Dec-2016);

(ii) Results from optimisation with adjustable stool on E02

(iii) Generation of final summary for discussion at GSG level

14 Dec : completed; follow-up needs to be taken up

(iv) Preparing for mass production

14 Dec : 3 weeks per antenna anticipated; x8 Antennas by April 2017 possible;

====> no updates; person on leave.

1.3 Status of 250-500 MHz Band-3 system (AP/HRB/ANR/SC) :

(i) Completion of 30 antenna system, including retrofitting of first version

14 Dec : v1->v2 for 9 antennas needed (+ 5 spares); 10 boxes ordered; 2 boxes getting ready in 1 week one antenna can be done; ~ 3 weeks per antenna anticipated; 3 months should be enough to complete the tasks i.e. April 2017.

(ii) Updates from recent 30 antenna monitoring measurements

14 Dec : report to be circulated by next week (20-Dec-2016)

====> recent tests on Cygnus, with 18 antennas; basic results are fairly good :

comparison with theory curves and control room value at 325 MHz show reasonable agreement; 2 antennas with drop in deflection at higher freqs (C04 & E03) -- need to be checked; other antennas to be tested.

(iii) Summary of phase centre measurements and decision about future plans

(iv) Quality check of the responses of sub-band filter and main BPF to be carried out

14 Dec : first round sub-band filter measurements done & needs to be repeated;

(iv) LO settings for all sub-bands etc to be finalised.

14 Dec : 250-500 LO setting document /table already finalized;

====> no updates; person on leave.

1.4 Common box upgrade (VBB/SSK) :

(i) Completion of box #2 with Rabbit and installation + testing at dish focus

14 Dec : box no1 being tested today; later today planned to be put at dish focus (C-01);

box no2 has CH-2 problem when monitoring turned ON (telemetry group is looking into it)

(ii) Plans for mass production

30 Nov : for mass production, will use 2 nos for cycling; work order for mechanical plates etc to be followed up; once sample unit is shown to work at antenna focus, mass production can start; meanwhile, work request given to mech team; plans for

laying fibre for eth connection also to be tried out; to check with Ops group about ability of switch between serial port and eth port (for ease of switching modes); shielded i/f connector for OF system is not available and PO folder for this is lost. ==> one unit made ready and tested at antenna base (C01), including with online commands; then taken to the top and tested -- found one channel not being controlled for all bands (except 150 MHz); all other commands appeared to be working (to confirm if this was for both local as well as remote commands).

1.5 Apex radiation scheme (PAR/SRoy) :

(i) Current status of measurements and interpretations

(ii) Plans for next steps to be taken

30 Nov & 14 Dec : not discussed

==> email update from PAR : measurements for ampl and phase variation wrt elevation completed for all bands using C10. There is some disagreement about interpretation of data between PAR and SRoy, as to whether there is a systematic variation with elevation or not -- need a discussion to resolve this matter. Meanwhile, PAR would like to try the measurements on another antenna to check for repeatability.

1.6 Walsh related matters (SC) :

(i) Confirm status on all 30 antennas (S4 & S6 were not working at last report)

(ii) Plans for regular maintenance & tests (as common box is upgraded)

30 Nov : S4 is also functional, only S6 needs to be checked; Walsh bit is checked in lab as part of standard clearance.

==> both S4 and S6 are now working (tested at L-band); agreed that all 30 antennas are now cleared; agreed to prepare a SOP for regular tests to be done by control room which can then be included in standard PMQC test set-up for long-term monitoring of health of Walsh switching.

1.7 Polarisation calibration of upgraded systems (SC/?)

(i) To set up a procedure for regular polarisation isolation tests

30 Nov : reg poln isolation tests are being done for upgraded systems also, and results have been found useful for Band-3 system;

==> part 1 is control room tests -- need SOP in discussion with Ops group; 2nd part is FE team testing for antennas reported bad; joint discussion with Jayprakash : agreed to work on modifying the existing procedure for the uGMRT band, starting with the 250-500 Band-3 system.

(ii) Discussion about possibility for feed + dish modeling

30 Nov : SC to prepare a short concept note about the possibilities of doing the calculation for feed + dish modeling and what can be learnt etc.

==> SC not prepared for a discussion yet -- can take it up next time.

1.8 New filters for L-band (AP) :

(i) status update on installation of 1650 LPF : CSQ antennas completed; arm antennas was ongoing

16 Nov : arm antenna installation to be resumed;

14 Dec : all west arm will be completed by 16-Dec-2016;

==> E-arm completed; W-arm done 3 out of 6 antennas; will finish W-arm and S-arm by end of Jan. Some discussion about characterising the improvement; can check the Lband data with range going upto 1800 MHz and compare antennas with and without filter.

(ii) delivery of remaining units of main L-band BPF from Epitome

16 Nov : BPF completed and handed over to BE team -- this can be closed.

==> can be closed.

1.9 OF system updates :

(i) Pending issues with existing OF system

====> some spare units that were pending are being assembled.

(ii) Procurement of cable, equipment etc

23 Nov & 14 Dec : no updates

====> for cables, PO is gone; delivery is expected soon (?); OTDR procurement is on-going : order has been placed.

2. RFI related :

2.1 Spectral line RFI (PAR/SSK) :

(i) Update on cable TV problem

23 Nov : letters have been sent; to follow-up after couple of weeks

====> RFI team visited Junnar cable TV operator for getting response to letter that was sent to them -- they are claiming no responsibility for actions of the local cable TV operators. This needs to be followed up with admin for appropriate action.

(ii) Digital TV follow-up

23 Nov : letter is still pending !

====> no updates.

(iii) monitoring new lines

23 Nov : 402 MHz line in SW direction -- trying to locate the source

====> no progress.

2.2 Satellinte RFI monitoring & avoidance system (PAR/SNK) :

(i) Update on present status for different kinds of satellites : GEOs, GSOs, GPS, LEOS...

23 Nov : GSOs and ,, GPS (US) tbd for other GPS constellations; confirmed that regular cron job is running in control room, but need to check about alarm for LEOS (appears that alarm did show up in the log data?)

(ii) Tackling MUOS satellite

23 Nov : to cross check footprint & angle of avoidance (may need 10 deg or more?)

(iii) Plans for sending information to back-end reciever chain

(iv) Providing the facility to other interested observatories, including SKA

23 Nov : some discussion has happened, to be followed up next week

====> no updates.

2.3 RFI from power lines and transformers (PAR/RVS) :

(i) review current status

(ii) specific follow-up actions

23 Nov : not discussed

====> no updates.

2.4 RFI from LED lamps (PAR/RVS) :

(i) Statistics of failures of existing units

14 Dec : no updates so far from electrical team.

====> electrical team reminded about it.

(ii) Follow-up on attemptst to understand circuits for RFI friendly units and check with vendors.

23 Nov : appears too difficult to shield the RFI from the bad units; need to identify units with separate PCB ckt for driver, which can be shielded.

14 Dec : some dry-solder issue seen (after fixing, the LED lamp worked; in one case);

21 Dec : appears that there is no success in shielding attempt; but LED tubelight driver has been made RFI-free -- to discuss plans for further follow-up.

====> LED tube lights (20 W) from Syska and Philips investigated : latter has less intrinsic RFI; taken up for isolating the driver circuitry and putting it inside a shielded enclosure with AC & DC filter connector arrangement -- this appears to give acceptable RFI levels. RFI team is procuring 3 more units of Philips LED tubelight for similar modification and then use in the OFC lab for checking longer term behaviour.

2.5 UPS RFI related (PAR/RVS) :

23 Nov & 14 Dec : not discussed

21 Dec : today (21-Dec-2016) improved UPS is under test; vendor made changes to one unit; if successful, he will make similar changes to remaining 9 units; to check current status.

====> improved unit passed the test; all 10 are now modified accordingly and tested; 8 are found to be acceptable, but 2 are still showing higher levels of RFI -- this needs to be resolved; however, shielded cable is needed at i/p and o/p for all units -- NCRA to procure and add to the installation; last batch of 10 + 4 spares to be ordered. RFI team to circulate report.

3. Operations related :

3.1 Mass production of shielded boxes for Rabbit card and network switch (CPK/SN) :

(i) procurement of problem PCB

23 Nov : 5 nos of sample PCBs received -- found OK; repeat order planned for 80 nos.

====> still waiting for 80 nos PCBs to come.

(ii) status of mass production of Rabbit card enclosure

14 Dec : 6 boxes ready (70 more needed);

====> 10 boxes ready, 6 with new PCB; 4 with old PCB; further work stuck for 80 PCBs to come.

(iii) status of mass production of network switch enclosure

23 Nov : 28 units ready (need total of 35)

14 Dec : now 32 (of 35) ready;

====> same status of 32 out of 35.

3.2 Work on final configuration at antenna base for space, UPS, RFI etc (JPK/RVS/PAR) :

(i) status of first 2 model antennas (C00 and C10) -- what has been done and what is still missing

23 Nov : C00 & C10 are mostly complete (item could be closed?)

====> RFI related issues are pending : from RFI fingers on doors to RFI shielding at punctures. issue of back-up from UPS discussed and plan for control room to detect time on UPS and initiate procedure to shutdown the PC.

(ii) plans for going beyond 2 antennas

23 Nov : mechanical has completed 9 or 10 antennas; 6 are complete with all changes (?)

====> mech has done total of 12 antennas -- need more antennas with UPS work done ?;

elec to check if mech can continue with xmer shifted without UPS work; electrical rewiring work and shifting of items : RVS to check and confirm how many antennas done and update the spreadsheet; FE team to confirm the shifting of FE power supply on antennas where it is relevant and update the spreadsheet; Ops group has equipment in 6 of the 12 antennas; to check the progress with servo explicitly (looks they may have done the first 10 antenna) -- to add one column for them in spreadsheet.

(iii) update on improved RFI shielding at antenna shell

23 Nov : shielding test measurements done for present configuration; awaiting finger-lines to be added before repeating the tests (which antenna?)

====> folder in process for placing order for the finger-lines.

3.3 Long-term plans for installation and release of final M&C system :

(i) growth plan for populating antennas with the systems

====> Ops team has a plan for this; can be discussed in detail next time.

(ii) plans for switch-over -- to make it as seamless as possible.

30 Nov : two main scenarios considered at some first order detail; Ops team to generate a concept note for the 2 main scenarios with pros and cons clearly mentioned and timelines also.

====> Ops group can circulate a concept note in 2 weeks time, in time for next meet.

3.4 Procurement of central switch (CPK/JPK) :

(i) Specifications to be worked out (by Computer group)

14 Dec : HP layer3 switch finalized; bidgetry quote Rs 3.5 lakh; indent prepared.

(ii) Plans for procurement

23 Nov : Mangesh has identified HP make layer-3 manageable switch (48 port); specs being studied.

====> indent raised.

OTHERS :

====> 1-2 STP students identified for rabbit firmware development + antenna

====> installation work;

4. Back-ends related :

4.1 Analog Back-end related issues (NDS/SG/BAK) :

(i) Improvements in LO generation scheme -- current status and future plans

23 Nov : tested ADF-4350 system; found to be good, compared to FSW unit; test report in internal circulation; to work towards implementation for 2 antennas in GAB.

14 Dec : PIU wiring in progress - in a week to finish;

====> wiring completed; testing in progress.

(ii) Completion and release of input side filters

23 Nov : installation for 30 antennas (all bands) completed; testing in progress.

14 Dec : testing completed; power level adjustment for direct vs filter paths in progress (2 weeks to complete);

====> installation and testing completed (cmd is available in control room); fixed attn in GAB being reduced by 4 dB to compensate filter loss.

(iii) Completion of 60:1 system and release for use; final report

23 Nov : draft report in internal circulation.

14 Dec : changes to DRAFT report in progress;

====> still in progress

4.2 Power equalisation scheme and relate topics (BAK/SRoy) :

(i) Completion of attenuator testing and release of report

23 Nov : report under revision

====> still pending completion.

(ii) Status of different modes of power monitoring & equalisation scheme, including formal release for users

23 Nov : SRoy to add options related to averaging time, ALC etc...

14 Dec : not discussed.

====> SRoy to send updates to Nilesh regarding crashing of the program; couple of weeks for SRoy to release the option for automatic correction; to look at option for efficient script (with JPK); looking at prospects for having plotting and display front-end (similar to new 60:1 monitoring) -- BAK to check with Ganla and Nilesh about the feasibility and then call for a bigger meeting with SRoy etc.

4.3 Updates on existing GWB-3 system :

(i) completion of DDC related works :

16 Nov : DDC correction seems to be overcorrecting -- Reddy to share the bandshapes;

30 Nov & 14 Dec : still awaiting updates from SHR

====> sample correction curves looked at ; to try geometric mean or something similar -- somebody in the lab can help.

(ii) drop-out in visibility data :

for dropout problem : not clear what is happening -- is it temporal, is it a fn of level of correlations -- may want to try with artificial correlated noise source?

30 Nov : this is now established to be outside the correlator -- in the mapping of input numbers in a particular task in AIPS (UVCOMPRESS); matter can be closed ?

14 Dec : problem perhaps in AIPS settings; matter can be closed ?

====>

4.4 Completion and release of first version of GWB-4 (SHR/ICH/SSK/BAK) :

(i) assembling of racks and nodes and peripherals :

all done except for some reorganisation of host m/cs when final 32 antenna system is being integrated;

(ii) integration, testing and release of 2nd half 16-antenna system :

configuring of m/cs is done, testing is to start now; GPU delivery to be followed up;

23 Nov : second half 16 antenna system is under test (tbd by next week).

30 Nov : testing shows some packet loss (very small) but appears not related to BW and data rate; maybe related to CX4 drivers -- need to generate proper stats.

14 Dec : problem in ROACH (FPGA board) : 3/8 not recognizing PPS signals; one OK now after replacing with spare boards; other 2 need to be replaced with 'old' boards;

21 Dec : system is configured with 8 compute nodes (T630s) with 2 nos of K20 each, 3 host m/c (T630s) with no GPUs + 1 spare T630; connected to 8 Roach boards, each

with 2 ADCs and 2 x 10 Gbe links. Tests going on for some time now on arbitrary inputs to test data recovery -- there are occasional loss of eth packets (1 or 2

pkts per 10 sec) on 1-2 out of 16 links which changes randomly on reboot. Other than this, the acq and correlation code runs stably; further, Roach boards are

showing spurious triggering. Need to find out where it is coming from; meanwhile, to try and see if possibility of false triggering can be reduced by opening the

gate at 0.9 s or so.

====> zeroed the problem down to ADC + Roach board combination.

modified new GUI (most likely only m/c IDs to be changed -- to be done by NSR); to start looking at other changes needed in the host m/cs etc for taking the place of

a working system; IPs for the new host m/cs etc; getting the remaining T630s ready for refurbishment of 1st 16 antenna system.

(iii) power and cooling related issues :

for GWB things running ok; for GSB still has few deg higher temp -- improved cooling solution to be investigated for in-situ implementation.

23 Nov : GWB type soln for GSB planned for next MTAC -- need complete shutdown for it.

(iv) availability of components esp GPUs :

23 Nov : still awaiting delivery of the K40 GPUs; expected by 15th Dec.

14 Dec : delayed further by 30 days (but may come earlier?)

21 Dec : this is a serious matter and needs follow-up !!

(v) targets and plans for release of full 30-antenna system : when will it be ready and what features will be available in first release :

target release date depends on progress of (ii) above; regarding modes : doubtful

ones are 400 MHz total intensity, 200 MHz full polar, 4 beams -- may or may not work for 30 antennas (due to I/O restrictions); similarly voltage mode will be programmed

but may not work for all 30 antenna configuration; basic DDC and zoom modes ok.

23 Nov : no specific updates, except that code optimisation will need to be done.

14 Dec : need a discussion to decide the way forward on this...

4.5 Longer term plans for GWB-4 (SHR/ICH/SSK/BAK) :

(i) Connectivity of GWB-4 with rest of the network, including GMRT--Pune link

(ii) Disks for data recording, including trials with SSD options

(iii) investigating next gen GPUs

(iv) migration to next version of CUDA (7.5 and beyond)

23 Nov : CUDA 7.5 is being tried in the new version of GWB

(iv) Additional modes and features in GWB system :

(a) 4 beams, with upto 2 voltage beams with coherent dedispersion

23 Nov : 4 beams (IA/PA) implemented but yet to be tested to shortest integrations;

2 voltage beams (1 with full BW and 2 with half BW are planned for new system)

(b) PA - IA beam mode

(c) beam formation with different phase centres

(d) improved I/O capabilities : change in data sending code; alternate n/w ?

(e) gated correlator : folding visibilities with pulsar period

(f) polyphase filter bank

(g) 2 inputs per Roach board

(h) time + DUT corrections

(i) net-sign correction

(j) full backward compatibility of off-line utilities

23 Nov : some work has been done, but not clear if this meets / works for all requirements.

====> not discussed.

4.6 Monitoring of temperature and other parameters of new back-ends (GJS/BAK) :

(i) Summary of current status for temperature monitoring

(ii) Plans for future enhancement and release for regular use

(iii) Monitoring of other health parameters

14 Dec : GWB has temp monitors; actual temp monitor sensors/cards added in rack (uses DAQ card);

====> not discussed.

4.7 Other issues :

(i) Cross-coupling tests in GAB + GWB

14 Dec : leakage < 30 dB; acceptable? can we reach toward a conclusion on this?

====> some issues need a bit more of discussion before reaching a final conclusion.

(ii) Walsh related work.

14 Dec : some tests in progress; porting to GWB (Python package being modified);

====> work is still ongoing.

5. Other items :

5.1 Python assembly work (HSK/SSK) :

(i) Summary of the work done so far and conclusions from the same

23 Nov : mech team to prepare a summary note; meanwhile, first assembly of new Python (what is its configuration?) will be ready by 7 Dec, and will be installed on antenna for tests.

(ii) Plans to decide for the final option to be adopted

23 Nov : to be taken up after note is circulated and new version is tested.

14 Dec : separate discussion with HSK and email exchange -- need an updated version of the report.

=====