List of topics for Plan meet of 12 Feb 2014 (follow-up of some pending topics from different areas) :

1. Documentation related :

1.1 Detailed design doc -- pending for long : from 29 Jan & before (SSK/BAK) : follow-up on subsystems to be converted : (i) OF Rx system to be completed (Satish Lokhande) -- hardcopies had been collected; doc to be made ready (ii) OF Tx to be started. Field measurements completed few weeks ago and were to be verified once more and then results were to be compiled; there was some problem of mismatch between simulation and actual results; work to proceed once that is resolved; also one spare unit is needed for testing; need status update on these matters.
==> testing completed in the lab; mismatch between theory and measurement problem resolved; so both (i) and (ii) can now move forward; can review after 2 weeks.

2. FE & OF related :

2.1 New LNA for 130-260 system -- from 29 Jan & before (VBB/SSK) :
(i) Variation of gain and Tsys with temperature : tests show new LNA (250-500) has ~5 to ~55 deg K varn in Tlna for variation of 0-60 deg K in env chamber, and gain change is ~ 0.2 to 0.3 dB -- confirmed with new test that waits for temp to stabilise after giving 10 deg steps (tests are now done with one monitor in contact with the device and one in the box, alongwith chamber temp monitor) follow-up action items now agreed upon are :
(a) to do once more to check repeatibility; then test the 130-260, 550-900 and Lband LNAs one by one. pending for updates from 15th Jan.
==> repeatibility not yet done; Lband test will be next and then 550-900.
(ii) update on scheme for fitting two temp monitors (one for LNA, one for box) in 130-260 MHz FE box for tests on bench followed by antenna tests : lab test with manual readings had been done (showed 15 deg temp difference between LNA body and FE box (open)); work ongoing to study online data from 3 antennas : W1 (130-260 FE box), W4 (250-500 FE box) and E2 (common box) was tested ok, and some long duration (8 hr) tests have been carried out on W1; need some data on W4 and E2; also 24 hr test to be done when no GTAC obs is on (e.g. Wed night) to get simultaneous reading on all 3 antennas for follow-up. Pending for VERY long now.
==> now in C4 and C10 we have dual temp in FE box;
(iii) mass production of temp monitoring system : since enough number of cards are now ready, agreed that temp monitor can be installed in any FE or CB box that goes up on an antenna (e.g. 250-500 being modified for notch filters etc) and a list to be maintained and updated by FE team. List was to be made ready by FE team.
==> no list ready yet;
(iv) planning for long-term implementation : ~ 300 temp monitor units will be needed for full GMRT -- plans for components, PCBs (one per unit) etc need to be presented, discussed and cleared -- pending for updates.
==> 25 units ready; 50 more can be done; balance indent for 300 PCBs raised; components yet to be bought for 300 nos.
Regular follow-up on all items after 2 weeks.

2.2 Mass production of 250-500 FE system -- from 15 Jan & before (ANR/SSK) :
(i) testing of 15 installed feeds : FE group has been doing weekly plots & results, and deflection plots have been added to these : some data had been taken for C6 (showed different lines in each poln -- RFI or internal?) & S2 (noisy bandshape -- effect of TV line?) : color grey scale plots discussed -- there are clear signatures of TV line(s) at 175 and 540 + one more around 220 (this needs to be checked) + military satellite + a few occasional bursts of RFI; further tests with feed at focus and pointed elsewhere show evidence for (a) different kinds of lines (b) harmonics of military satellite when antenna beam directly pointing to it etc... -- agreed to try an expt with 2 antennas -- feed at focus in one and feed pointing up in the other and record for 24 hrs as sky drifts by.
==> work in progress, but no output yet.
new issue of what to do with 22 cavities and 11 dipoles that have arrived? agreed to store safely till ready with FE box electronics, rather than to install feed only.

(ii) status of testing and installaton of FE boxes : ten antennas fitted + 2 spare units ready and tested : update on procurement of standard connector -- samples had come and modified units had been received from w'shop -- tested ok and ready for integration? Main delivery of 100 nos of male & female has happened. Action items : (a) to check if modified design with these connectors is working fine; to decide about order for full system (b) to check performance of FE box installed on C4, including new features like filters, temp monitors etc.
==> (a) units have been assembled but not tested; will test alongwith LNA in env chamber and then clear for final integration in FE box. (b) new box is basically working; monitoring channels for power and temp monitor need to be worked out with telemetry group.

(iii) plans for sub-band filters for 250-500 MHz system -- update on testing of sample units and results from these to be discussed; updated report with all 4 sub-bands over plotted was sent; roll-off is a bit slow on the higher freq side compared to existing L-band sub-band filters; insertion loss is better; agreed to put up one or two units in antennas and check the performance : all lab tests with manual settings using patch card + old MCM card were done successfully, and following were the pending action items :
(a) to discuss with Ops group about command for sub-band selection in 325 MHz system and see if the same can be tested in the lab.
==> matter has been discussed with JPK who is ready to implement the new command the moment hardware is on one antenna.
(b) 2 units to be made ready and install on ch1 of 2 antennas vs integeration in new FE box -- to be decided.
==> will be integrated in new box and then go on antenna.
(c) to check long-term plans for PCBs and chassis of this option (versus integrated design option)
==> simulation is going on for the integrated unit; will take a bit more time.

(iv) plans for notch filters in FE box for existing 250-500 antennas : aim is to put 540 & 175 TV notch filters in all 250-500 FE units that are currently insalled. For 540 (lumped ckt) -- one set was installed in ch 1 of 2 antennas (S2 & W4) in receiver room, and performance was found OK; 4 units fully assembled (1 BPF + 2 notch filters), tuned, tested and ready; 2 more 540 notch filters were to be made ready to complete the units for 3 antennas; 80 PCBs in hand for 540 filter, alongwith 12 nos of chassis; pending action items :

(a) to confirm the list of antennas where installed at present (C10, C4 & W1)
(b) status of installation in further antenna to be updated.
(c) status of work on getting 175 filter ready for this : more PCBs, chassis?
(d) plans for completing the job for all 250-500 antennas -- this is rather URGENT.
==> 175 + 540 notch filters in 250-500 FE : W1, C4, C10 done and ready for 3 more to go up in any of the remaing of the 8 antennas. 50 nos of 175 filter PCB will come today; 60 nos chassis request has been put.

(v) status of other auxiliary items :
-- noise source, power splitter, directional coupler etc : sample unit has been assembled / integrated on the bench; integrated noise on/off testing on bench yet to be done; integrated in new FE box; plans for testing to be finalised.
==> waiting for integrated testing.
-- post amp : Hitite 740 new stock for 30 antennas available; to check if post amp has been tested with slow rise power supply (no progress, but SSK wants to keep it on the agenda).
==> no update.
-- power monitor : status update on the older scheme with Galli amplifier : it is working ok now; feed-thru vs connectorised arrangement has been finalised; first 2 units have gone up in C4 FE box (any results?); plans for new units to be put in the new FE box.
==> 20 PCBs may come shortly; can borrow chassis from common box supply for now.
-- temp monitor : to check plans for final integrated testing in FE box.
==> this is on track and ok.
-- RFCM card : check if fully tested (some bit pattern matching tests were remaining) and can be used for actual control; finalise layout in new FE box : it was agreed that since new RFCM card can not do monitoring (without further changes), old RFCM card + patch card will be used for present in the new FE box; will upgrade later to new RFCM card with monitoring capabilities included; to check status of integration in new FE box.
==> this is on track.
==> Regular follow-up on all items after 2 weeks.

2.3 status of lab integration of final version of 250-500 box -- from 29 Jan and before (ANR/SSK/HSK) :
modelling shows that existing size of box is not adequate (inspite of double deckering of chassis); deeper FE boxes are needed -- 15 cm has been added (wt of new empty box is 15 kg); mech group has confirmed that this is ok (present depth is 468 mm, can be increased to 700 mm; also, rear member in the cage can be removed to further increase depth); also total weight of populated box will go up by a significant amount; action items :
(a) one sample box has been supplied by mech group -- to check status of 2nd unit.
==> 2nd box is ready with mech group -- will be taken by FE group when needed.
(b) work on integration of units into the box : semi-rigid cables and DC wiring was to be completed -- update on status of this is needed.
==> cables 90% done; then DC wiring to be done.
(c) estimate of total weight of populated new box is ~ 27 kg (!) -- this may make the box unwieldy to handle at the focus; agreed that it is too heavy; plans for weight reduction : integrate some of the smaller units into single units, e.g. integrated filter unit (TBD); dir coupler, noise source & power splitter can be combined into one unit?; some of the filter chassis can be combined into one unit?; also, bigger chassis can be plate + rail assemblies, rather than milled units. FE team to look into this and come up with the final recommendation for the next FE box; meanwhile, first box can be completed, tested and tried out on

antenna.
==> subband filter integration is being tried out; not clear if dir coupler + splitter (+ noise source) will give much weight reduction; agreed that for some cases, rail chassis may be a better option than milled chassis (also for cost and time of manufacture) -- to be explored further. Also, to look at options with mech group for other things that can be done to reduce the wt of the box itself.
Regular follow-up on all items after 2 weeks.

2.4 Next Gen Common Box -- from 18 Dec (ANR/SSK) : Like 250-500 FE box, final version of Common Box needs to be assembled and tested : final power & temp monitor, interface to Rabbit card, choice of a fresh RFCM card, new arrangement for power supply distribution -- FE team to make a list of changes and produce a block diagram showing all the units to be incorporated (and then see when & how these items will be ready) -- to check if block diagram is ready for circulation; can be postponed for a bit, till 250-500 FE box is finalised; to take up about one month later.
==> final power monitor, temp monitor is in hand; interface to Rabbit card is work in progress; same interface card may work, but will not support monitoring function -- this may need to go direclty to Rabbit card; no work done on integrated power supply card. new blk diagram may not be very diferent; to resolve later on if new box design will be needed or not.
Regular follow-up after 2 weeks.

2.5 Design of new RFCM card (v2) -- from 5 Feb 14 (SSK/Imran/Sougata) : Recently completed new RFCM card (v1) for Lband system spare, has no provision for monitoring; agreed to enhanced the design to ver2 by adding monitoring facilities and full compatibility with new MCM card so that it can be used in all FE systems. To report status of this discuss and about possible timescales for completion of this.
==> agreed to go for this; but first complete the exercise of seeing what best can be done right now with the existing card to add monitor points, and then move to design of new card.
Regular follow-up after 2 or 4 weeks.

2.6 Status of improved 500-1000 MHz CDF -- from 29 Jan & earlier (HRB/GSS/SSK) : there are 3 different versions of dipole (v1, v2a, v2b) and 2 versions of cone v1, v2) in trial phase; 3 test feeds have been built using these :
ver1 : dipole v1 + cone v1 : RL is OK, deflection is not good & falls with freq
ver2a : dipole v2a + cone v2 (mesh?) : RL is good; deflection is OK & flat with freq
ver2b : dipole 2b + cone v2 (solid?) : RL is v. good; deflection is good but not flat
Follow-up action items are as follows :
(i) simulation results for different combinations of the above were carried out and discussed in detail : it appears that dipole (rather than cavity) is dominant for deciding the RL behaviour (and also H-plane taper?); cone appears important for E-plane taper; best results for RL and good beam pattern match over large freq range appear to be for dipole v2b (triple sleeve) with cone v2 (66 deg).
To discuss the possibility of testing dipole v2b + cone v1 combination in lab and on antenna. Was waiting for v2b dipole to be free (or new one to be ready), and for 2 nos of FE boxes to be ready; need status update on this.
==> no dipoles from w'shop due to material cash purchase issues -- to be followed up separately; meanwhile to get back the dipole from Pune range and do the test.

(ii) simulation results for denser mesh case (higher order basis functions): new simulations are with finer planes rather than higher order basis functions; this

needs to be confirmed; also, 50 MHz shift that is seen needs to be understood;
also explore default number of current elements in simulation (from 19 Dec meet);
discussion with WiPLD indicates that increase in PolDeg may make a difference;
to update about this and plans for final strategy. Need update about repsonse
from WiPLD.
==> response from WiPLD has been received and new simulations can now be done.

(iii) there is noticeable difference in simulated and measured RL curves which
needs some study also (it appears that agreement was better for 250-500 CDF?).
==> wait till results of (ii) above and then decide what to do.

(iv) to do deflection tests for ver2 with a rigid stool design (and with finer
adjustment of the focus distance, if needed) and then bring down the ver2b feed
and replace with normalg 235/610 feed (or with v2b dipole + v1 cone combination?).
will need a spare 610 feed to be made ready using 550-900 LNA ? agreed to try
current ver2a with 1480 rigid stool (which is already on C10) to see if there is
any change in beamwidth -- HRB to get the data from control room and report status.
==> agreed to bring down the feed from C10 and put the newly ready spare 610 feed
alongwith new BPF and notch filter combo within the next week or so? to decide
by mid of next week, depending on other actions.

(v) to compare deflection and beamwidth results for new feeds with old 610
system -- first round of results were shown and are quite useful; extension to
later data shows stable behaviour for Aug to end Nov at 47 arcmin (when ver2b
with 1280 stool was there) + plus some other details; will be useful to see
values for ver2a with 1480 stool now.
==> updated data shows : after Nov 2013 results of beamwidth are not optimal (this
is ver2a dipole with ver2 cavity at 1480 height) -- agreed to change with ver2b dipole
with either ver2 or ver1 cavity at 1480 and compare results (unless deflection is
very poor).

(vi) to compare RL measurements for ver2 dipole in ver1 cavity (and vice versa?)
was waiting for C10 feed to come down -- see item (iii) above -- this is done
now (?) and can be rechecked when v1 cone is mated with v2b dipole (was held up
becuase of lack of ver2 dipole).
==> can complete this once the ver2 dipole is available.

(vii) any new ideas? discussion of 19th Dec came up with following action items:
(a) get 2 more v2b dipoles fabricated -- work underway, need status update UREGNT!
(b) design Kildall ring feed at 750 MHz using v2b dipole -- work ongoing; status
of request to workshop to be confirmed.
==> also stuck becuase of material procument problem !
(c) try simulation of CDF250-500 scaled by factor of 2 -- to be tried after (b)
status update on this needed.
==> can try with different dipole sleeve configuration.
(d) design Dual-ring feed 550-900 MHz (intial BFRs can be made for 650 & 800 MHz)
(e) repeat Radiation pattern measurement @ 800 MHz (include notch filter) for
CDF550-900 MHz (Cone v2, Dipole v2b) -- being tried by GS : need status update.
==> tests have been done (with 2 different log-periodic source antenna) and looks
like squint is gone -- will wait for detailed results for full comparison with
simulation results.

==> Regular follow-up on all items in 2 weeks (except issue of material procument)

2.7 Signal flow analysis (SFA) related items -- from 29 Jan & before (GBP/AP/ANR/SSK)
(i) SFA for OF system to be discussed, including addition of the scheme of 10 dB attn + 20 dB ampl -- first draft of the report has been released (by Ankur); to be discussed and follow-up action decided.
==> did not discuss as concerned youngsters (Ankur and Sajit) were not present; can be taken up 2 weeks later.
(ii) plans for SFA of 250-500 system : analysis had started, and some lab tests had also been done; and all data required had been taken; there were some problems in reconciling bench test results with analysis, for existing system -- these are resolved, and first draft report was circulated internally in FE team and some changes were required after the feedback received -- to check if report is ready for external release.
==> 2nd version has been done by GP and should be ready for release.
Regular follow-up on all aspects afer 2 weeks.

2.8 Walsh switching arrangement in FE -- from 29 Jan & before (SSK/SCC/PAR) :
Some tests have been done on the bench by FE group; first draft of report has been circulated.
(i) to devise a simple test using Lband system + radiation from apex to demonstrate the working of the system (on any antenna) -- need update on plans for this : on track for testing in 1st week of Jan? agreed to postpone for some time due to conflicts with other requirements; to decide when it can be taken up -- 3rd week of Feb?
==> no update on this for now.
(ii) plans for implementation in other systems e.g. 250-500 FE box (needs the new RFCM card to be ready?) -- meanwhile, for old RFCM card + patch PCB design shown to be working ok for nnew walsh opamp (OP37) + filter bank control; 10 nos of this PCB had come and were to be tested.
==> this is tested and done; now can be moved to integration of the new 250-500 box.
Regular follow-up after 2 weeks.

2.9 OF systems -- from 29 Jan & before (SSK/PAR) : Plans for further systems :
(i) plans for extending the wideband OF link to beyond 15 antennas : C12 had been completed as 16th antenna; C14 was getting completed -- to confirm the status; to decide plans for next few antennas.
==> C14 completed and released; will now go for next CSQ antenna -- to check after one month.
(iii) problem of manpower for assembling : update on plans for local manpower and plans for getting person from Argus to work at GMRT for 2 weeks -- to check if there is any progress on this front.
==> no progress and looks like not much interest.
Regular follow-up after 4 weeks.

2.10 Alternate fibre connectivity -- from 29 Jan and before (PAR/SSK) : Tata telecom has offer for 16 Mbps from E5 to from Kalyan to Nagar highway; Rs 8 lakhs per annum or so... to be discussed and follow-up after 2 weeks -- pending for long.
==> agreed that YG will check how this compares with other costs per unit bw we are paying and then take it up (noted that this may help during the time when regular route has a problem due to road work for Rajgurunagar to Nashik; also no end equipment may be required, except for media converter). Follow-up after 2 weeks.

3. RFI related matters :

3.1 RFI from TV signals (from cable to terrestial systems + boosters) -- from 15 Jan and before (PAR/SSK) : Cable TV leakage could be a bigger problem than boosters etc ? : tests had been planned to see how much is the leakage as a function of frequency and then see if operators can be requested to change the frequency or improve their set-up; results on 2 tests to be reported : 1st one at control room of operator and 2nd at some distance away to see which channel and operator is the culprit. Further tests had been done at N'gaon. Present thinking of RFI team is that the lines seen are from terrestial TV transmitters, rather than cable TV (!) -- likely to be in 175 to 229 MHz range. Follow-up action items :
(i) generate list of all the terrestial transmitters in neighbourhood (with large enough range) and their frequencies, and to check which ones are expected to affect us -- preliminary list has been made (A'nagar freq was to be confirmed) : to discuss follow-up action.
==> list has been expanded further (and circulated); few more data are needed.
(ii) for cable TV : to complete the round of data gathering from the nearby operators to keep as a log; list has been compiled for 2 out of 3 local operators; to discuss follow-up action.
==> rough version of list is ready, will be formalised and circulated soon.
(iii) to work out a plan for monitoring the GTAC data (30:1 data) for RFI in 325 and 243 band.
==> no updates.
Follow-up after 2 weeks.

3.2 Effect of military satellite RFI in 243 band -- from 29 Jan & before (PAR/SSK/SN) : 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 algorithm for prediction (for user's) :
(i) filter related action items :
(a) report on prototype filter by FE group has been circulated (?); old filter works only up to 1 GHz, and new version has been made that works upto Lband and was getting tested.
(b) meanwhile to try a test where this filter is inserted in the path (for 2 antennas) for a short time when 250-500 is selected -- put at ORX o/p in Ch1 of E2 & C6 (does it affect performance at other bands?) -- to check results and decide further action.
(c) FE team to make a full list of various filters put in various signal paths as part of upgrade (including for testing) -- this can be put up on the upgrade info page maintained by control room. This is somewhat urgent.
==> no significant updates.
(ii) Ops group to investigate and come up with algorithm to use in control room, after getting the relevant data from PAR. SN to update on the latest status, including plans for testing the algorithm being developed -- appears that Ops group is ready with a program and discussion with RFI group says that PAR will provide test cases for checking the algorithm; appropriate longer term action to be decided (including other satellites?); waiting for test to be completed.
==> no significant updates.
Follow-up after 2 weeks.

3.3 Satellite RFI at GMRT : generalised task force (FE + BE + Ops team) -- new item from 15 Jan onwards (PAR/KDB/SNK/JPK) : aim is to have a combined approach where Ops group can have prediction routine for all known satellites, FE group can help characterise their effects in different uGMRT bands, and BE group can come up with mitigation techniques. To follow-up on the initial discussion of

15 Jan.
==> no updates; follow-up after 2 weeks.

3.4 RFI testing of LED lights for GMRT labs & building -- from 20 Nov (PAR/SSK/RVS) :
Electrical group has indented for 5 W lamps + X Watt tube lights (after samples had been tested for RFI and cleared) -- delivered units had 5 W and 7 W lamps and latter found to generate RFI (not to be used at GMRT); mass installation done and tested; agreed to install in canteen as first location; tubelights were to go through mass installation testing before clearing for use; tubelights (50 nos) also failed the test; hence, only 5 W bulbs found suitable! plan was to keep the 5 W bulbs installed for a few months and then check for RFI and take a final decision about bulk purchase -- to check if this has been done or not.
==> may need to wait a bit longer for the control test? to check again after 2 weeks and decide follow-up action.

4. Operations :

4.1 Mass production of Rabbit MCM cards -- from 29 Jan & before (CPK/SN/NGK) :
(i) status check on how many cards are ready now (64 were done) and plans to speed up delivery
==> going at same speed, but can speed-up as needed.
(ii) to finalise plans for how many more MCM cards are needed -- discussion on 15 Jan may need some refinements, based on comments by NGK on the MoM (?) -- to discuss and take a final call on the matter.
==> not discussed in detail; one option is that since it is agreed that there are no strong technical issues or reasons for adding more cards, telemetry group can be left to decide if they need more cards to ease any perceived logistics problems. Can take up relevant items for regular follow-up 2 weeks later.

4.2 Mass production of shielded box for MCM cards -- from 29 Jan & before (CPK/PAR/SN/HSK): RFI test report of Akvira vs Physimech showed Akvira is better and this has been selected.
(i) status of ordering 2-3 more boxes from Akvira -- units have arrived and are under assembly and testing; plan is to make everything ready and put in the 37 pin shielded connectors as soon as they come and then do the test with dummy LED type loads; integration of system components was under progress -- ready for tests now?
(ii) status of work on shielded connectors that are required for antenna usage of MCM cards: waiting for 37 pin D-type 25 pairs to come -- expected by 10 Jan. To use existing connectors for the preliminary measurements -- status of this to be reported.
==> for items (i) & (ii) : work is ongoing, everything else appears to be ready, but fan power supply cards not available -- may need to make alternate arrangments for this; will go ahead with unshielded connector for now, as these are expected to come only by next month.
(iii) How to plan for the mass production? Ops group to report on discussions with Mech group and finalise drawings for 2 types of box : with and without provision for SPI port on chassis + 1 serial port on each box; aim to place final order on Akvira. RFI group to complete 2 more prototype units, and then hand over the matter to Ops group. To check if this moving forward or not.
==> Ops group to collect the final versions of the drawings for their records; other than that, waiting for the testing to finish.
Regular follow-up after 2 weeks.

4.3 Development of M&C software -- from 29 Jan & before (JPK/RU/SN/NGK) :
(i) discussion to confirm long-term plans for full system : whether M&C system with part old and part new running GTAC observations is feasible or not?
==> basic model and options discussed in detail with Ops Group members: issues related to FE support and FPS support; -- can be taken up to next level now.
YG to arrange follow-up as required.

5. Back-ends :

5.1 Documenations :
(i) Detailed design doc -- pending for long : from 29 Jan & before (BAK) : analog back-end was due sometime ago ! Hande had made the first version and was making the 2nd ver based on the feedback received - is it ready now?
==> work is ongoing; targeted for completion by end of this month.
(ii) ITRs for analog back-end systems and digital systems to be taken up :
analog back-end : Sandeep and Navnath to look into; pkt corr first level has been done and circulated -- waiting for feedback; GPU corr first version (by Reddy + Irappa) was in internal circulation -- can it be released now?
==> analog back-end has not started; no update from digital side.
Regular follow-up after 2 weeks.

5.2 Analog back-end for 8 antennas and beyond -- from 29 Jan & before (BAK) :
(i) appropriate attenuator settings for Lband & 250-500 done; 610 band was being finalised -- updated table had been circulated; few iterations need to be done and then updated table + report can be circulated by Ganla; now needs to be done to 16 antennas.
==> one more round of measurements for all 16 antennas is going on; updated table should be available in about 10 days.
(ii) status of work for having i/p side RF filters : to confirm plans with FE group for sharing mass production units; to check status of 8:1 switch : agreed that it is ok with FE group to share the designs, provided BE team is ok with the performance specs; ok to include BE requirements in order of PCBs and components (cost sharing to be worked out accordingly);
however, BE group to take care of mass assembly separately, as it will be done with in-house manpower by FE group for their filters.
final configurtion and layout of 8:1 switch to be done as part of finalisation of the PIU, requiring filter chassis etc. Need to discuss updates and way forward for this -- email discussion has taken place and needs some follow-up to resolve pending matters.
==> some sample chassis have been given by FE group; BE team is having some difficulty in integrating them into one PIU -- turns out these are individual sub-band units; to discuss if full integrated unit can be given from FE to BE; also if main BPF filtering enough? at least go get going with?
(iii) to check status, plans and timescales for 30 antenna system : 16 antenna system fully completed (from cabling from OF to cabling to corr wall panel); now working on 24 antenna system; some problems related to dry solder contacts -- to check status of these.
==> getting to the point where 24 antenna installation will complete soon; a work around has been found for the dry solder problem for now (by touch up of misbehaving units) -- a few units damaged in the process.
Regular follow-up after 2 weeks.

5.3 Power equalisation schemes for new back-ends -- from 29 Jan and before

(SSK/NSR/BAK/SRoy): Need updates on both of the following :
(i) option 1 : using detectors in GAB and local feedback loop -- monitoring set-up working; code for computing the attenuation values being finalised by DKN (from algorithm taken from NSR) -- testing was going on -- status update required.
==> pending due to absence of DKN.
(ii) option 2 : using correlator self outputs and computing gain corrections :
(a) Scheme is working; to check if circulated SOP is all right -- bugs etc to be reported back; SRoy to look at SOP and see if any updates are needed.
==> done and found ok; item can be closed.
(b) Plans for implementation of user controlled ALC mode : issue of timescales of the loop, kind of useful outputs that it can produce etc. 4 modes of operations had been discussed (see MoM of 3 Oct 2013) :
(i) on demand -- this is the current released mode.
(ii) repeatable at some interval specified by the user -- can it be script based?
(iii) automatic, should adjust in response to a stimulus in the input power -- needs a discussion.
(iv) should provide a reliable power monitoring scheme -- needs discussion.
Also, issues like logging of results etc to be discussed. Issues related to attenuation value accuracy and setting have been discussed : 5% (0.25 dB) ok; Agreed to have a document that spells out the main requirements (from user point of view) and possible solution options / techniques that can be taken up for discussion in Plan meeting for finalising the plan of action -- one round of discussion has taken place between SRoy and SSK and some follow-up action has been planned; some action items :
(a) to check unit to unit variations of attenuatiors for a couple of units and if settings are stable
(b) to check if requirement specification document is now ready and available for discussion and finalisation
(c) plan of action to be spelt out.
==> discussion between Nilesh and SRoy : median calculation can be added as an option; to see if an option can be added to predict the expected change in attn for a given change in sky direction; better option for saving the attenuation applied for future use / reference. Discussion about gain vs Tsys version causing changes in total power and the accuracy of correction required. Agreed that we are now closer to getting the requirement document ready for circulation.
To follow-up after 2 weeks.

5.4 GPU corr (GWB-II) : release of 4 node, 8 input, 200/250/400 MHz version -- from 5 Feb & before (SHR/SSK/BAK) : (NOTE : GWB-I is existing released system !) : agreed to make 4 T7500 nodes with C2050/C2075 Fermi GPUs + remaining 4 T7500 nodes as host machines (to take care that these are the ones that transient pipeline uses presently so that sharing is possible); this should have ALL basic modes : total intensity and full polar IFR modes; IA + PA BFR modes with process_psr pipeline attached; full GUI support; to come up in trial code section without affecting the presently released mode.

(i) 1.7 s time offset problem -- appears to be resolved. Need checking with few more long stretches of data (at Lband) to confirm. Check if this item can be closed?
==> can be closed.

(ii) update on code for providing basic beam modes : new version with separate kernel (outside phase shift kernel) for beam formation has been developed (compute load is 7% increase on 2050 GPU); IA mode tested on pulsar signal : addition of 7 antennas in single pol at 610 MHz with 200 MHz LPF -- to test with different

settting in pmon to check S/N effects. Other action items :
(a) process_psr pipeline to be done (SSK); -- tested? interface to GUI completed?
(b) GAC configuration via GUI to be completed
(c) plans for PA beam mode and for phasing algorithm : SHR will look into PA beam mode and SSK will look into the phasing part -- check status of this work.
==> (a) and (b) have been done, and test results for (a) have been circulated; for (b) confirmation tests from user can be carried out; work on (c) is ongoing.

(iii) modification GUI for supporting new modes, as well as having support for code in trial branch -- GUI v1 for GWB-II has been released; v2 with beam modes fully incorporated to be released soon? first version of this has been completed and is available (but not released) -- can it be done now?
==> GUI still needs some minor modifications and SOP nees to be updated -- will be done and released soon.

(iv) spikes in channels that are power of 2 : this problem needs to be discussed, understood and fixed.
==> no update.

5.5 Final online control for GPU corr -- from 29 Jan & before (SSK/JPK/NR/DVL) :
(i) status of full GUI compatibility : update on sideband flag support and issue of net_sign[] to be resolved : needed some change in GPU & DAS code. SSK to confirm if this has been fixed now.
(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; this should NOT be an issue in the new release? may need some testing on antenna signals.
==> no updates !
Regular follow-up next week.

5.7 8 antenna back-end tests and future plans -- from 29 Jan & earlier (DVL/YG) :
(i) to summarise currents status of testing of overall GWB performance from the recent tests : which bands are working ok, which are not; list of problematic issues : phase wraps, ripples in passband, spikes / RFI in passband, variation of self power levels (with time and across frequency), level of correlation coeffs etc.
(ii) review of scheme for quick testing of data using analysis script by Sachin
(iii) plans for further testing, including imaging exercise.
(iv) plans for running the new GWB back-end in parallel with all GSB observations at Lband, 610, 325 and 243 bands -- to check if this is happening regularly, and if script is in place for some automated analysis of GWB data.
==> For (i) & (ii) : some of the results and status will be summarised in Friday updates meeting this week; for (iii), need to select a particular source; for (iv), routine running is happening more regularly, automation of analysis pipeline still needs some work.
Regular follow-up next week.

5.8 Power and cooling requirements for projected back-end systems -- from 29 Jan and earlier (GSJ/BAK/RVS/YG) : some modifications have been made and some tests have been done and preliminary results circulted -- to discuss these and plan further activities; some specific action items :
(i) fan on and off to be tested.
(ii) scheme for monitoring of processor temperature to be refined -- for the main compute nodes.

(iii) plans for further testing.
==> no updates on this!

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Minues of Plan meet of 19 Feb 2014 (follow-up of some pending topics
from different areas) :

1. Documentation related :

1.1 Documentation : follow-up on level 2 (ITR) -- from 5 Feb & earlier :
(i) Check status of new items : work was ongoing for
(a) power monitor (Gaurav) -- rough draft ready, can first version be released?
(b) 250-500 main + sub-band filters (Sougata) -- is it started?
(c) 550-900 main + sub-band filters (Imran) -- is it started?
(following are to be taken up later : temp monitor, spares for 1420 feed)
==> (a) is ongoing, (b) and (c) will start shortly.
(ii) Also, can we look at which ITRs may be ready for conversion to NTRs : it was thought that filter design work can be taken up for this, once the ITR is done (to be kept pending till then).
==> Regular follow-up after 2 weeks.

1.2 Follow-up on level 3 (NTR) -- pending for long : from 5 Feb & long before
(SSK): to check status of report on design of OF system -- SSK to try and couple this with work on paper for MWSky.
==> SSK aims to have first version of MWSky paper (covering all of FE) ready by early next week. To check status next week.

2. FE & OF related :

2.1 Update on results from test range -- pending from 22 Jan & before (HRB/GSS/SSK) :
(i) phase centre tests for 250-500 CDF : to report on expt with 10 to 20 cm height change in 250-500 feed on one antenna to see how much change in sensitivity is seen. Need short note summarising the results : to check if last measurement with reduced height has been completed and results ready for release. Agreed to try alternative of cutting the support legs of one 250-500 feed cone to the 10 cm reduction, instead of shortened stool (to avoid fouling with cable assembly); modified structure was ready and test was to be done.
==> installed in C6 about one week ago and test data taken, being analysed.
(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 -- GSS to come back with refined version more relevant for GMRT, and to see if further expts with 250-500 or 500-1000 feed are useful : cross check of results from code (0.3 dB for 0.5 lambda) wrt curves from Kildall paper was confirmed, and work was on for GMRT specific case of 250-500 to get efficiency factor as a function of freq over the band, after porting the data for the feed pattern -- first results for cone-dipole at 400 MHz showed 50% less aperture efficiency than expected : error was found in the code, which is now corrected and getting better results (9.9 dB vs 11.6 dB expected); to discuss follow-up action.
==> few other second order issues : phase efficiency taken as 1.0 right now, may need to put in realistic phase response of feed pattern etc -- to read from a data file etc.
(iii) status of phase centre checking for ver1 550-900 CDF and CSIRO feeds -- waitng for results with new VVM set-up, after installation of new encoder + notch filter for mobile band :

(a) protection circuit for encoder and improved corrosion protection to be decided
==> GSS will check and decide action to be taken.
(b) new results from tests of ver2 550-900 CDF are available -- to be discussed.
==> results show reasonable E-H match at 610 and then degradation in shape and matching at 700 & 800. Partially supported by older measurements from Dec 2013 (with slightly different set-up)
Action items : (i) to compare simulation vs measurement at 610; (ii) to repeat with more frequency steps and then noise source instead of CW signal; (iii) to get back original ver 2b dipole from GMRT (after new dipoles are delivered).
Regular follow-up after 2 weeks.

2.2 RF dump tests for new feeds -- from 5 Feb & before (HRB/GSS/SSK/PAR/NK)
(i) new data and results for 130-260, 250-500, 550-900 (HRB/SSK/NK) : (a) follow-up on discussion of current results : understanding of bad antennas for 250-500 band : cause of failure of dipole on C4 to be confirmed.
==> no update on C4 -- to be confirmed asap; also, agreed for the monthly overlay plots, to make off-source and on-off plots for the comparisons.
(b) new expts with antennas tracking on-source & off-source for long duration (4-5 hr) were planned, and some work has been done -- status update from these.
==> not done.
(c) follow-up from analysis done by NK and plans for interferometric tests at 130-260 : interferometric test has been done; awaiting results / update from NK.
==> no update. YG to check and see what can be done.
(ii) scheme for (re)calculation of expected values across the broad bands to be finalised (and added to measured curves) -- (SSK/GP/HRB) : curves now being done with constant QH value and with variation of T_lna with freq incorporated; FE team to model the effect of the main BPF and see if the curves match better with data. New curves with effect of BPF included to be generated and circulated -- pending for long now.
==> no progress; needs a bit of push to complete the last 5% !
Regular follow-up after 2 weeks.

2.3 Follow-up on 550-900 MHz band filters -- from 5 Feb & before (ANR/SSK) :
(i) comparison of product obtained from ICON with in-house effort and finalisation of plans : technical comparison of individual filter responses shows in-house design to be slightly better; but need to complete integrated unit for insertion loss etc before taking a final decision, including plans for mass production. Tests with integrated unit using new PCB show insertaion loss increases to 3 dB now and some change in slope on higher side; to complete chassis and full integration and then repeat the tests and make detailed comparison with ICON results. This was waiting for chassis to come...
==> finally, chassis may come in 2-3 days. regular follow-up after 2 weeks.

2.4 Total power detector for FE & common boxes -- from 5 Feb & earlier (GP/ANR/SSK):
follow-up on plans for final scheme : 20 dB coupler for CB and 10 dB coupler for FE (at final output) with common 20 dB amplifier (maybe Galli-52 instead of Sirenza) -- sample unit ready and tested in the lab with 2 chans for 1 common box; lab monitoring of signals via MCM card now working :
(i) sample data from 2 units installed on E2 shows basic things are working ok: more sophisticated tests with on and off source tracking to be done (alongwith digital backend recording, if possible) -- first round of testing showed 11 dB deflection (for 12.4 dB expected), flat-top on-source waveform to be understood.
==> some further tests done with noise on-off but not yet finally concluded -- need to repeat at on and off source and also to try a weaker calibrator like Crab.

(ii) plans for building 70 units for CB : follow-up on status of mass production, including chassis (outsourced) -- expected date of delivery to be confirmed.
==> all the chassis have come and now units can be assembled and populated on upgraded antennas.
(iii) plans for prototype of the FE monitoring unit : 2 units had been assembled and found to give identical performance as per specs; problem of feed-thru vs connector was resolved in favour of feed-thru (as per original chassis design); all testing completed in the lab; was put up on C4 in original 250-500 FE box, but not tested -- was to be done alongwith further tests of E2 common box power detector.
==> online monitor channel yet to be identified (tbd with JPK) and then only real test can happen.
(iv) status of ITR on the work.
==> work in progress.
Regular follow-up after 2 weeks.

2.5 Fixing non-working L-band feeds (short-term problem) -- from 5 Feb & before (SSK/ANR) : we have 32 feeds, 3 not working (1 dismantled for making drawings of new feed); all are device failures, but not able to put new device and tune it; now some LNAs have been successfully assembled by Gopi and C3,W1,E2 & E5 have been fitted with these and found working ok.
(i) Spares : Agreed to have 5 LNAs ready and available as spares : device is available, PCBs ordered, chassis under request, gold plating of wire was to be completed last week; 8 new LNAs were being assembled : need status update.
==> gold plating completed; LNAs assembly in progress.
(ii) check status of alternate LNA designs :
(a) for MMIC ckt of Skyworks: MOQ was 3000; trying to get a few samples from vendor or from Argus; also scheduling a visit by Argus person to GMRT -- any updates?
==> no update on visit by Argus.
(b) third option agreed upon : to try and see if design used for 550-900 can be modified for 1-2 GHz use ; to also check the design done by Abhay Kulkarni -- ANR now looking into this design to see if it can be improved for our needs.
==> contacted Abhay to get the relevant design files.
Regular follow-up after 2 weeks.

2.6 Spares for L-band FE electronics -- from 5 Feb & before (ANR/SSK) :
(check which of these items are complete and can be closed)
(i) RFCM-type card status (3 nos of old RFCM cards are ready) : status of new RFCM card -- all tests cleared and agreed to (a) get 10 nos of this PCB for current LBand spares (under order now); (b) to enhance the design (ver2) by adding monitoring facilities and full compatibility with new MCM card so that it can be used in all FE systems and (c) to identify ~ 5 monitor points that can be added as additional features in old RFCM card, as an interim solution for use in other bands. To report status of item (a) & (c).
==> 10 nos of PCBs gone for fabrications; Imran & Sougata together working on (c) and 4 pts have been identified; trying to get 2 more from monitoring of unused or rarely used control bits; (b) will start after (c) is finished.
(ii) noise gen : PCB assembled; bench test completed; to integrate with one spare feed for final testing -- waiting for spare feed : status update needed.
==> no update.
(iii) timescale for integration : all components (except LNAs) for assembly of 3 feeds now ready : check (a) progress on LNAs (only 1 spare was ready on 20th Nov, 2nd was being assembled) (b) plans for integration of one unit, using the presently dis-assembled feed. Agreed to take these up after spare 610 feed is made ready (this should have completed by now). -- need status update on this.

==> 610 feed is completed; Lband integration is going on (missing Al strips).
(iv) finalisation of plans for having total of 7 working spare feeds -- from mechanical to electronics : (a) mechanical issues to be updated upon (see item 6.4) (b) shortfall in electronics for these to be checked and addressed.
Regular follow-up after 2 weeks.

2.7 Filters at different stages of receiver chain -- from 5 Feb & before (SSK) :
(i) scheme for filters at antenna base : 3 type of ckts being designed using the new device : 2, 4, 8 way switches with different possible applications : (a) notch filter bank switching in rx room (b) filter bank switching inside FE box (c) rcvr room monitoring. ckt for 2:1 and 4:1 versions assembled & tested -- 25 dB isolation achieved (changes from 25 to 17 dB with frequency for 8:1 switch); aim is to target (a) integrated units for 550-900 with 4 sub-band filters with integration of RFCM switch and compare against ICON units -- waiting for chassis (any updates?); (b) for 250-500, agreed to go ahead with the discrete design for now (which is now fully tested and ready for integration into new FE box) -- can work on integrated PCB be started now?
==> combined unit under design : looks like it may have separate switch unit, depending on mismatch problems being resolved or not.
(ii) to follow-up on refinements of the scheme for each FE box : update on 250-500 system (first to be done), alongiwth LPF from 1650 and above for HI band. sample PCB for 1650 LPF had come and was to be tested + other elements were to be assembled to produce the first unit for 250-500 system : 2 versions (1550 & 1650 MHz cut-off) assembled and tested; it was agreed that 1650 cut-off will be better (in combination with 1800 notch-filter). Action items :
(a) real-life testing of prototype unit, along with 1800 notch filter.
==> this is done now (for the case of full band selection of Lband BPF) -- results show that LPF gets rid of large part of the 1800 mobile, but not all of it; with notch filter, almost all of it is gone. Two options are possible : notch filter at rx room in the main signal path -- to test its low frequency response for flatness; LPF always in the path with notch filter switched in when needed. To evaluate the 2 options and decide.
(b) then install in antenna path for field tests -- to be combined with testing of switched filter bank at rx room.
Regular follow-up after 2 weeks.

2.8 Characterisation of new FE+OF systems -- from 5 Feb (PAR/SSK/SN) :
(i) Summary of L-band results and performance (along with new data from Dec and later) :
(a) stability of power levels -- can be checked with existing data; also can this be coupled with regular program for monitoring in the control room?
(b) antennas with large (~ 18 dB) slope across 400 MHz (e.g. C13, W1, S2...) to be checked and reported -- can this be closed after checking with new data from Dec?
(c) ripples and funny bandshapes to be characterised and compared with antenna base measurements to try and identify source of problem (e.g. S6 work was ongoing).
FE team to complete analysis of existing data from Dec etc and report findings.
==> S6 correction is over; some new data has been taken; will be compared with older measurements and intergrated results will be sent.

(ii) Summary of 250-500 band performance :
(a) stability of power levels and bandshapes; variation from antenna to antenna : some improvements in monthly plots have been suggested -- to check follow-up on this.
(b) presence of RFI in the band (TV lines etc) : list of freqs seen in data has been catalogued; now need to check with DD authorities about the frequencies of the 3

relevant tranmitters (Shirdi, Sangamner and Ahmednagar); (in addition to 175 and 540 Pune TV and 189 Junnar TV).
==> updated list of TV stations has now been made and will be circulated shortly (see also the RFI agenda item on this aspect).

(iii) to characterise the recommended attenuator settings for different bands : completed for Lband, 250-500, existing 610, only 130-260 / existing 150 -- to discuss once if values given to control room are optimal (e.g. 7,7 for Lband sub-bands) : this appears to be sub-optimal and need to be discussed...
==> results from tests by YG and DVL show that for 1280 band, 7,7 or 4,4 are too high as the correlation coeff is corrupted and 1,1 is required; FE team to test the power levels at OF o/p and cross-check against SFA values; also, at 1390 the problem appears to be somewhat less and may be related to having extra 10 dB gain stage; FE team to confirm which antennas have this modification.
==> Regular follow-up on all items after 2 weeks.

2.9 Releasing existing 610 MHz system as part of the wideband upgrade -- from 5 Feb (SSK/ANR) : Preliminary tests of existing 610 feed through the wideband path show that ~ 100 MHz usable bandwidth may be possible as part of phase-I uGMRT. Agreed that only RF filter needs to be changed to new 550-900 BPF (alongwith mobile band and TV notch filters) -- two sample units had been made ready and were put in FE ch1 of C8 & C12; initial RF deflection tests look encouraging : extra 10 MHz on lower side and 20 MHz on upper side, leading to a total BW of ~ 120 MHz (~ 565 to ~ 690 MHz) + some lower level response (5 dB down) upto 780 MHz; action items :
(i) to carry out 2nd round of interferometric tests to characterise the performance;
==> tbd by YG and DVL.
(ii) to check progress on completing of 5 more antennas that can be done with present hardware, following the path of the 250-500 upgraded antennas.
==> all items in hand, except chassis for BPF -- expected in a week or so.
(iii) to discuss finalisation of PCBs for the filters (microstrip option instead of lumped ckt) : for 540 filter, material (PCB, comps, chassis) is available for 12 nos; for mobile filter old design can be used, so new PCBs were to be ordered (material is available) and chassis request was to be put in. Need status update.
==> 100 PCBs that can work for either 175, 540 or satellite filter; of these 12 nos are wired up for 540 filter; 2 nos used for satellite filter. Will need a total of at least 120 nos of 540 filter for all GMRT (60 each for 2 bands); to order components for 120 nos of 540 filter; 20 nos of chassis are available; remaining to be made (likely to be outsourced). For mobile filter, 60 nos + 10% spare are needed; to add quantity to chassis request. To see if PCBs for 10 antennas can be ordered for this, given the available substrate material (which is also needed for other PCBs). Remaining PCBs can be done later on.
Regular follow-up on all items after 2 weeks.

2.10 Status of new CSIRO feeds : from 5 Feb & before (ANR/JNC) : to report on performance of the newly manufactured feeds -- new results are slightly better compared to ver2 (casting) but not as good as the original ver 1 (machined by Godrej) -- to decide follow-up action. Follow-up after 2 weeks.

2.11 New filters for Lband -- from 26 Dec & before (ANR/SSK) : Sample Lband full-band BPF had been designed -- has no slope with freq and better insertion loss, and maybe a better option than the existing main BPF; similarly, prototype design of new sub-band filters (with better insertion loss) has also been done.
==> Agreed to go ahead with the main BPF as a low priority job -- PCBs (stripline) does not need much work for assembly -- can be given for manufacture; new chassis

will be needed; population can be done as and when a FE box comes down.
Regular follow-up after 2 weeks.

2.12 Calibration scheme with radiator at apex of antenna -- from 5 Feb & before (SSK/PAR/SRoy/DO/YG): to follow-up on detailed discussion meeting in August : to schedule follow-up action appropriately, breaking the issue into smaller, more tractable items :
(i) testing of dynamic range of old vs new electronics with parallel set-up on 2 antennas (SRoy to work with FE team on this) -- antennas to use had been identified (C4 & C1 ?) and modifications to putting the dipoles etc was completed; first round of data had been taken, and second round was also done; discussion with SRoy has happened -- outcomes to be discussed.
==> earlier tests on C0 & C1; new tests on C4 (with new electronics); discussion using preliminary data appears to show that 1 dB compression pt has improved by 6 to 8 dB (from -6 to -10 dBm to about -1 to 0 dBm); change in phase (and also with ampl?) with change in elevation shows cyclic variation -- may be due to position shift? needs to be explored further; change with time shows ...
action items : (a) to check the change in 1 dB compression pt against SFA numbers (b) to repeat on another antenna with new electronics (C6) and one with old; later to try for other wavebands when new transmitter antenna arrives. (d) to get the plots done for the variation with antenna position (elevation etc) and then work on interpretation (e) later on, to move to the finer aspects of variation with time (see item (ii) below).
(ii) finer aspects of variation of ampl and phase with various external parameters (DO to work with FE team on this) -- need an update on the status of this.
(iii) plans for taking up other longer ranging goals to be discussed, including procurement of new broadband antenna (suitable unit has been identified and ordered -- expected date of delivery to be confirmed); feasibility of connecting noise source and radiating has been checked by PAR -- plans for this to be finalised.
==> antenna has been ordered, not clear about delivery date; noise source test not yet fully geared up -- can be followed up 2 weeks later.
Regular follow-up on all items after 2 weeks.

3. RFI related matters :

3.1 RFI testing of Miltech PC + peripherals for antenna base -- from 5 Feb and earlier (PAR/SSK/SN):
Integrated testing new i5 Miltech PC with peripherals -- using new shielded ports, connectors, shielded media converter + cables, Rabbit card (with Akvira make shielded box) showed good performance (new report with block diag and conclusions/ recommendations has been circulated); mech group had ordered 2 shielded boxes for Rabbit with Akvira (with modified connector diagrams and different back plates for extra SPI port). Tests were to be done with these new units (using feed through arrangement till shielded 37 pin D-type connectors come) : need status update on this work.
==> no update. Follow-up after 2 weeks.

3.2 RFI tests of ethernet switches for antenna base -- from 5 Feb & earlier (SN/BAK/SSK): Testing the available switches for RFI (as per 29 May discussion); plans for design of RFI box for ethernet switches :
(i) procurement & testing of switches : sample units from Cisco, HP, Dlink and DELL had come and have been tested for RFI -- conclusion from final report is that D-link is much better than others (but it is 2x more expensive than next best

option of CISCO by 20K); also, use of shielded CAT5 cable provides significant improvement; agreed to wait till RFI enclosure is ready and do full test with CAT5 for both D-link and CISCO and take a final decision; meanwhile BE group can borrow the units for testing in GAB system.
(ii) design of RFI enclosure (see item 6.6 below)
==> see discussion in 6.6 below. Follow-up as required after 2 weeks.

3.3 Mobile phone RFI -- from 5 Feb & earlier (SSK/PAR) :
Progress on identifying the operators at and around E06, and in Nagar, Junnar directions : letter had been sent to BSNL, some follow-up action was on -- they had agreed to change to 1800 at 3 locations (Ale, Gulanchwadi & Pargaon Mangarul) : to check status of this, including follow-up RFI test.
==> no updates from BSNL, it is likely to be status quo so far. needs follow-up after 2 weeks.

3.4 Follow-up on UPS RFI -- from 5 Feb & earlier (SSK/PAR/RVS) :
(i) procurement of units from Miltech (RVS) : both 1 and 3 kVA units are under discussion :
(a) RFI testing of 3 nos repaired 1 kVA units from Miltech showed significant RFI -- updated report comparing original Miltech 1 kVA test reports (with same load conditions) have been circulated; Miltech has offered to fix the problem with these units and electrical group is ready to give it a try (to transfer the order from servo to electrical) -- work ongoing to send units back to Miltech for improvement.
(b) Miltech has offered improved version for 3 kVA unit -- order has been placed for the same and unit is expected by early-mid Feb : Miltech will deliver along with improved 1 kVA units. Need status update on (a) and (b).
(ii) follow-up from RFI testing of Ador 3 kVA units -- 2 nos of tested and cleared units are in use : in C9 and C10. RFI team was to add some comparative statements at the end of the 2nd report quantifying the repeatibility and circulate (then this item can be closed).
==> not done yet -- PAR to be reminded.
(iii) Bigger units : agreed to order 2 nos of 4.5 kVA units with Ador, with option of 2 single phase o/p with different isolation transformers (3 + 1.5 kVA); expected delivery date is 31 Mar or before. To confirm status and then take up after 4-6 weeks. Need update on this.
==> no updates on this.
Regular follow-up after 2 weeks.

3.5 Discussion relating to Industrial RFI survey -- from 5 Feb & before (PAR/SSK) :
revised docs (from 2009 and 2012 discussions) had been circulated by RFI group and were discussed in 5 June meeting (is the document too exhaustive?) : follow-up action identified :
(i) a form had been prepared for use in the survey and had been discussed in detail and agreed that it is suitable for use; need to finalise plans for entering existing data into this form.
==> one possible candidate has been identified : will be done through contractor.
(iii) plans for starting survey asap with 2 teams (with extra manpower), lasting for one month, using SoI maps, form etc, to be finalised : 1st week of April was agreed as the start date -- check if this is confirmed by both sides; vehicle requirement (2 nos) to be discussed with admin, as well as accommodation request of DIC members; one more engineer needed for the job has been found? To check which of the above are fnalised and can be closed.
==> both are being followed; same manpower for making data entry will be used for survey.

Regular follow-up on all items after 2 weeks.

4. Operations :

4.1 Development of M&C software -- from 5 Feb & before (JPK/RU/SN/NGK) :
(i) plans for EPICS testing : one Rabbit card + one PC104 card with associated details and code given to TCS for PoC work; simple set-up of PC + EPICS talking to Rabbit (with our native protocol), to be set-up in our lab also, so that first version from TCS can be tested in our lab. Some issues about installation of EPICS modules.
==> installation is ok now.
(ii) plans for modbus learning & testing : simple set-up of PC + Rabbit card with modbus for "hello world" level -- first tests to be done alongwith item (i) above.
==> work is ongoing.
(iii) follow-up on interface of FE with new M&C system -- Naresh + Charu and Sougata have started work on this; will have full set-up of FE + Common box, but will start with M&C of common box using Rabbit card : initial h'ware connectivity may not be too much work as 32 lines have to be mapped to 16 lines on interface card; low level software for bit pattern setting may be enough to demonstrate basic connectivity; after that, packaging will be the issue. Need status update on the work.
==> team is able to set bits using the set-up of Rabbit talking to interface card.
(iv) plans for populating a few (5-6) antennas with Rabbit card (with or without PC) for testing. C3 and C6 have been completed, and moving to S3, W3 + C8, C11 (only PC104 required) for prototype testing : W3 was pending -- need status update.
==> instead of W3, S2 and S4 have been populated; S4 is working ok, but S2 has some O/F problem.
(v) plan for PoC testing : PC to PC104 on one eth port; PC to PC between ABR and CEB (for 2 level SACE); PC to Rabbit in GAB with PC to PC in CEB. to check status.
update on 12th Feb : INSTEAD OF S3, W3, S2 & S4 have been populated with new Rabbit MCM -- S4 is working fine, and S2 has some fibre problem...
==> Regular follow-up on all items after 2 weeks.

4.2 Identification of appropriate ethernet switches for antenna base (and GAB) -- from 5 Feb & before (SN/PAR/BAK) : Ops group to work with Comp team and RFI group to plan for trying some of the 16/24 port switches for antenna base use :
(i) need discussion on results from the tests to decide future action (see also 3.2)
(ii) plans for BE teams need for switches in GAB system (in receiver room) :
agreed to use 8-port switches for now though they are worse in RFI than the 24 port ones tested for antenna base use, and take a final decision later on; same for the SMPS power supply-- 2 nos ok for now; need some discussion on this matter, for long-term planning.
==> not discussed; can follow-up after 2 weeks.

4.3 Planning for proper space utilisation for new equipment at antenna base -- from 5 Feb & before (SN/CPK/RVS) : long-term plans for proper utilisation of the space at antenna base. Follow-up on 14 Aug discussion on first report : 2nd report has been generated and detailed discussion took place on 5 Feb.
Summary and action items are as follows :
(a) Doing a careful re-analysis of the total load (alongwith individual team members) and separating peak load (e.g. switch on load) from sustained load etc in table 2.
(b) Agreed that peak load requirement (e.g. in-rush current) can be balanced out by

synchronised delayed switching on of different units -- this is already implemented to some extent at present.
(c) New power consumption estimate to be made & final UPS capacity to be matched to it.
(d) Diagrams showing rack utilisation to be rechecked for consistency (including some adjustments for antenna to antenna variations?)
(e) Existing servo FPS units can be left where they are; if isolation transformer can be moved out from the rack, then space in that common rack is enough for all growth plans of FE and OF systems; this leaves some empty space in ABR rack bottom that can be utilised for further growth of telemetry system; all new servo growth to be accommodated in the servo racks (or in-situ replacement of existing units); with this, there should not be a crunch for space, but a careful relook in the updated report will help clarify the matter.
(f) the new UPS can have the isolation transformer(s) integrated into it, without increasing its footprint (only height may go up); UPS can be located in the space between the ABR and servo racks -- this has been done in one antenna with the new UPS and can be checked for suitability; final configuration of the UPS can be decided once the load calculations have been refined.
(g) extraneous items in the surrounding of the racks (electrical fittings etc) can be relocated, as far as possible, to make it convenient for people visiting for work.
(h) report to be updated for relevant items from (a) to (g) above.

Need a follow-up discussion on these issues.
==> Some of the relevant, action related items discussed vis-a-vis the updated report that has been circulated (sent to all GCs alonwith request to help with load measurements... matter can be taken up for a follow-up discussion 2 weeks later.

4.4 New, improved Miltech PC -- from 22 Jan and earlier (CPK/SN/PAR) : 2 units of Miltech PC with two changes (more screws on panels + panel mount pwrline filters instead of chassis mount) under order by Ops Group : to check status of the order.
==> delivery expected after 2 weeks. Regular follow-up after 2 weeks.

5. Back-ends :

5.1 GPU corr (GWB-II) : release of 4 node, 8 input, 200/250/400 MHz version -- from 12 Feb & before (SHR/SSK/BAK) : (NOTE : GWB-I is existing released system !) : agreed to make 4 T7500 nodes with C2050/C2075 Fermi GPUs + remaining 4 T7500 nodes as host machines (to take care that these are the ones that transient pipeline uses presently so that sharing is possible); this should have ALL basic modes : total intensity and full polar IFR modes; IA + PA BFR modes with process_psr pipeline attached; full GUI support; to come up in trial code section without affecting the presently released mode.

(i) update on code for providing basic beam modes : new version with separate kernel (outside phase shift kernel) for beam formation has been developed (compute load is 7% increase on 2050 GPU); IA mode tested on pulsar signal : addition of 7 antennas in single pol at 610 MHz with 200 MHz LPF -- to test with different settting in pmon to check S/N effects. Other action items :
(a) process_psr pipeline to be done (SSK) has been completed and interfaced to GUI; item can be closed once corresponding SOP is available and tested by user.
(b) GAC configuration via GUI -- has been completed; to be checked by user & closed.
==> all the jobs are pretty much done and tested internally; can be tried by users but SOP not yet ready + one or two features not yet under GUI... NSR will complete shortly; meanwhile testing can start.

(c) plans for PA beam mode and for phasing algorithm : SHR will look into PA beam mode and SSK will look into the phasing part -- check status of this work.
==> phasing part is working and tested; PA kernel yet to be completed. Need to decide where the intensity and stokes calc need to happen.
(ii) modification GUI for supporting new modes, as well as having support for code in trial branch -- GUI v1 for GWB-II has been released; v2 with beam modes fully incorporated to be released soon? first version of this has been completed and is available (but not released) -- can it be done now? Is the SOP ready?
==> GUI is almost done; SOP getting ready (see above).
(iii) spikes in channels that are power of 2 : this problem needs to be discussed, understood and fixed.
==> no work done on this.
Follow-up on relevant items next week.

5.2 GPU corr (GWB-III) : next gen system -- from 5 Feb & before (SHR/SSK/GSJ/BAK) : New improvements needed for finalising the design for the full 32 ant, dual pol system : 4 new DELL machines are in the rack and wiring + cabling is complete, running with analog noise source; new code with 2 x 10 Gbe I/) + improved logic for assigning specific threads to each core + env variables is completed (tested for 200 MHz / 8 bits and 400 MHz / 4 bits, 16 inputs and working ok with no pkt loss); ongoing action items :
(i) longer length of FFT (more than 2K channels) : to confirm if these have been tested and if so, upto what length?
==> a particular solution has been worked out that requires doubling the sampling rate... YG to check older emails from SHR and discuss...
(i) improvements in GPU code using K20 card (SHR/SSK) : cross-check on FFT code (done and can be closed); califbrating MAC performance vs data reshuffle load (done and no further improvements look possible; can be closed);
==> meeting with nvidia scheduled for this Fri.
(a) looking at XGPU code (with Pradeep of nvidia) -- walk through with Vinay (nvidia) had been done -- need to check if there is any progress on this;
(b) trying sample PA beamformer code to estimate load etc. -- need status update.
(ii) to start testing 400 MHz BW mode -- how best to conduct these tests? all changes in the main code to handle 4 bits etc have been done in GWB-II and now need to be ported to GWB-III and tested; need a discussion on this.
(iii) Layout and racks (GSJ/BAK) : layout diagram to be updated and long-term plan for racks to be initiated; 3 different kinds of President racks discussed -- to try and finalise after one more round of discussions including RVS (also, new vendor Jyoti Tech); meanwhile, agreed to get 2 nos of cyber racks on urgent basis -- to check status of this; also assembly of new GSB nodes in half-height rack to be confirmed.
==> order has gone for cyber racks; half-height rack from East Campus to come to GMRT.
(iv) procurement of accessories like network cards, disks, cables etc to be looked into -- to look at CX4 10 Gbe stock and decide on fresh purchase.
==> 20 nos of CX4 based dual 10 Gbe cards to be purchased -- these are compatible with T620, may give some trouble with R720 (for 2 GPUs).
(v) new purchase of Roach boards etc : follow-up on status of procurement -- expected date of delivery?
==> order is gone; delivery date is June ! to follow-up with Mo Ohady.
(vi) purchase of 4 more T620 machines & 8 K20s : status update on these 2 orders.
==> both orders are gone; both deliveries in March.
Regular follow-up on all items after 2 weeks.

5.3 Walsh modulation : prototype set-up on Roach board -- from 5 Feb (SCC/BAK): plans of BE team for implementing prototype scheme -- basic unit for switching using sq wave signal from GPIO pin tested ok; was put in main PoCo correlator and was being tested; walsh waveform delay functionality has been added now and can set delay from 1 to 2^32 clk samples (!); with this, variation of correlation with delay has been tested; to generate final plot showing this behaviour; confirm if issue of factor of 2 between expected and measured delay has also be understood; detailed follow-up action to be finalised.
==> no updates. to take up again next week.

5.4 Testing leakage, coupling and correlated noise in new back-end chain -- new item from 5 Feb (BAK/YG/++) : detailed tests had been done by Vikram Jaiswal (with SSK, SHR and YG) and report has been circulated; follow-up action item discussed between SCC, BAK & YG : for GAB systems, some follow-up action for testing the leakage has been initiated; need a more detailed discussion for actions for the GWB FPGA & GPU subsystem; procedure for testing to be done with GWB-II release modes to be clarified and tried out.
==> no updates. to take up again 2 weeks later.

5.5 SFP testing of final unit -- from 5 Feb and before (KDB/BAK) : SFP+ side working fine for both Cu and Opt; XAUI CX4 side is still flaky -- may still be marginal in timing. Update required from new tests after fresh inputs from vendor. Follow-up with MTE for PCB details and then with Vitesse -- is it resolved now?
==> not making progress; on SFP side everything is working; on CX4 side, 1 m is fine; 2 & 3 m work for some kinds of cables. to decide whether to pursue further or close the matter as it stands with a clear summary of what works and what does not? To discuss in detail during regular follow-up after 2 weeks.

5.6 RFI filtering -- from 5 Feb (KDB/BAK/YG) : to add the first version of the real-time RFI filtering block (after some modifications) into the packetizer of GWB-I (in one input out of two with different options like replace by median or by constant or by digital noise source sample or clip to threshold via s'ware registers) -- to report about performance of the same, include testing; and then to look into optimisation of resource usage.
==> basic tests done; to try with real antenna signal split into 2 copies and check both self and cross outputs; regular follow-up after 2 weeks.

5.7 Next-gen time & frequency standards -- from 5 Feb & before (NDS/BAK) :
(i) brief update from BE team from visit to NPL was provided in last discussion; waiting for detailed report to be circulated
(ii) plans for follow-up action
==> no updates; to follow-up after 2 weeks.

6. Other items :

6.1 New python assembly design -- from 5 Feb (HSK/SSK) : FE group wants the python configuration in E6 to be adopted for all antennas -- this needs to be discussed with mechanical group and finalised; FE and mech have dicussed about plans for modified python assembly that will give additional protection to cables; mech group had circulate a short note on their view of the matter, alongwith photos; this was discussed and existing vs E6 system was compared; Action item :
two approaches : (a) modified E6 design with hinge-like support to be put on one central square ant -- short-term solution (b) IGUS cable wrap -- new technology

prototype to be developed and tested on quadripod -- long-term solution. Need update on these from mech group.
==> work in progress; regular follow-up after 2 weeks.

6.2 Coexistence of 50-90 MHz RRI feed with 250-500 CDF on same face of turret -- from 5 Feb and before (HSK) : Mech group to check for possible solutions and report back, after looking at the drawings (awaited from RRI). Update from mech group about reverse engineering for making the drawings -- mech group has circulated a brief note : discussion showed that it is not compatible with 250-500 CDF (either cone has to be truncated or it height has to be raised by 30 cm to avoid conflict) -- may work with 550-900 CDF; mech group to try a solution for co-existence with Lband feed. Agreed to make a prototype that is matched to Lband and try -- HSK to take custody of the dipoles.
==> work in progress; regular follow-up after 2 weeks.

6.3 Problem of access to FE boxes with 500-1000 CDF feed -- from 5 Feb & before (HSK) : Update on new solution being designed by Mech group -- tested in situ and found working ok; agreed to use this for present; for future where bigger and heavier boxes will come into play, mech group will think of an improved solution, including an option for removing one feed and bringing the stool inside the basket; quick status update from mech group, with detailed follow-up later on.
==> quick discussion about various options : first to check with new heavier box and see if existing solution is practical; if not, then to work on new options; regular follow-up after 2 weeks.

6.4 Fabrication of 5 spare L-band feeds -- from 5 Feb & before (SSK/HSK) : drawing has been made in consultation with mech and FE but still waiting for signature of SSK (!) -- to be cleared today given for manufacture; order to Akvira for 3 nos (with enclosure) + 2 extra horns. Hence, total of 6 feeds will be ready + 1 dis-assembled unit -- so total of 7 spare feeds will become available. Need current status from mech group.
==> matter is still stuck because of finalisation of drawing ! to be closed by this Friday : matching with drawing to be done by mech group and FE team together certify that it is ok, and no further changes needed; regular follow-up after 2 weeks.

6.5 Design of RFI enclosure -- from 5 Feb & before (HSK/PAR) : (see item 3.2) inputs for front panel design given to R. Lolap for completion of drawing; prototype was to be fabricated in w'shop, but is now outsourced (?) -- getting ready for placing order (somewhat excessive cost due to all-machining design -- ok for prototype unit, but different solution can be looked at for mass production) -- to expedite the delivery as much as possible. Need status update.
==> order is placed; delivery of 2 nos expected by end of the month (on request). regular follow-up after 2 weeks.

6.6 Effect of increase in size and weight of FE boxes -- from 29 Jan & before (HSK/SSK) : Mech team to circulate existing drawing of turret to see how a longer FE box can be accommodated; and to do a first calculation about impact of weight increase which can be 50% for each FE box : capacity at turret; static & dynamic loading capacity of feed gearbox etc.
==> work in progress by HSK and team; will circulate a first note by early next week; to check status after 2 weeks.

6.7 Jobs at TIFR -- from 22 Jan (HSK/SKG) : to check the following :

(i) update on status of our jobs at TIFR -- check status after collecting 120 nos:
last set of 60 nos (bonus amount) still waiting in the pipeline -- need status of these.
==> no clear response from TIFR; agreed to forget for now and go ahead with our own effort by outsourcing. other miscellaneous chassis items need to be taken care of by mech group, as long as they are in the official list of orders. Regular follow-up after 2 weeks.

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