

Minutes of Plan meet of 1st August 2012 (follow-up of some pending topics from different areas) :

1. Documentation related :

1.1 Documentation : follow-up on level 2 (ITR) : conversion of older reports (SSK/DO)  
==> BAK and SSK to pick a few cases from their groups where existing report can be converted to ITR; ask Dongare that when new reports are submitted to him, to suggest to the authors to convert to ITR format. Check the situation after 2 weeks.

1.2 Discussion of level 3 (NTR) ? (SSK/DO)  
==> SSK to send email to Plan group asking for email feedback on existing draft. Take up for discussion after that, maybe 2 weeks later.

2. FE & OF related :

2.1 SoP for RF dump procedure : release final version -- from 18 July & earlier (HRB)  
==> draft is still with GSS; problem of longer dumps has been solved -- to be tested at antenna. Relook next week.

2.2 SoP for antenna base work release -- from 18 July and earlier (SSK/ANR/HRB)  
==> no progress. FE group wants 3 more weeks. To check after 3 weeks.

2.3 Cone-dipole for 250-500 MHz : follow-up on results from 3 antenna testing (GSS/HRB/SSK/NK)  
==> NK is still busy with understanding the data and has done more tests this week; can follow-up next week. Meanwhile, HRB to try and repeat RF beam shape and sensitivity tests. To check status next week.

2.4 Cone-dipole for 500-1000 MHz on C11 : follow-up on investigations by FE team -- pending from 18th July (urgent) (HRB/HSK/GSS)  
==> no progress due to lack of availability of antenna (high wind speeds); FE group to try this week and report next week. **THIS IS URGENT !**

2.5 Status update on refurbishing of 235/610 feeds -- from 27 June (GSS/HSK)  
==> two feeds repaired in w'shop and sent; one is now OK (RL of 9 dB or better) -- can be used; other feed still has problems : only 2 dB or so improvement to 5 dB peak in the RL curve. To try and test on antenna (if this data is already NOT available with GSS). To continue with the 2 remaining feeds at w'shop. To check status after 3 weeks.

2.6 Update on 130-260 system (feed testing + FE box work) -- from 18 July (HRB/GSS/SSK)  
==> (i) feed + refl + 2 BFR configuration has been tested; 149.5 to 240 MHz BW is obtained; appears that dipole has been damaged; to test the dipole RL and compare against earlier measurement to verify problem with dipole and then get new dipole made at w'shop. To follow-up after 2 weeks.  
(ii) FE box : still keeping target of 2nd week of Aug; problem with alignment of chassis -- polariser chassis has to be remade. Note : material for further polarisers is not available. To follow-up after 2 weeks.

2.7 Testing of modified Common Box on W04 & full signal flow -- from 25 July & earlier (SSK/ANR/BAK) : continuation of tests/measurements of power levels to back-end section to be reported and discussed.

==> BE team to do the measurements for L-band (and also the other bands) and report back next week.

2.8 Calibration scheme with radiator at apex of antenna -- follow-up from last week (SSK/GSS/PAR)

==> FE group needs one more week; to take up next week.

2.9 Status of mass installation of new OF systems & characterisation of installed units -- from 18 July (SSK/PAR)

==> FE group is trying to consolidate the integration effort and get all units for 4-5 antennas ready with a target to install from 1st week of Sep; to check status after 3 weeks.

2.10 Status of delivery of lasers & mux-demux -- from 18 July (SSK/PAR)

==> 19 + 10 lasers will reach us this week (are with the company in India); full order of mux-demux is in Delhi and should come by next week. No firm date for the remaining ~ 70 lasers. To follow-up after 2 weeks.

2.11 Status of environmental chamber testing -- from last week (ANR/SSK)

==> erected with water tank etc.; one unit is working fine; some problem with data acq and cooling rate in 2nd unit -- require visit from vendor. PAR is following-up. To check after 2 weeks.

### 3. RFI related matters :

3.1 Improved version of Miltech PC RFI report -- from 18 July (SSK/PAR)

==> still waiting for connectors; SSK to check with vendor during next visit to H'bad. To check for RFI tests after 2 weeks.

### 4. Operations :

4.1 Status of mass production of Rabbit MCM cards -- from last week (CPK/SN)

==> PCB fabrication will be done by 6 Aug; still waiting for 2 components; but agreed to take available components (when PCB is ready) to vendor and initiate the assembly work; all testing will be done inhouse after completing assembly (as needed). To follow-up after 3 weeks.

4.2 Status of Miltec PC testing -- from last week (urgent) (CPK/SN)

==> still waiting for connectors (see item 3.1 above); check next week.

4.3 Update on using new MCM card on serial port of PC for upgraded analog backend -- from 25 July and earlier (JPK/CPK/BAK)

==> conceptually, no unresolved matters remain; only a test or demo needs to be done using the 2 MCM cards available at present. To check after one month.

4.4 Monitoring of 3-phase power at each antenna -- from 18 July (SN/RVS)

==> SN and RVS have discussed : main goal is yes/no monitoring of 3 ph input power (including generator status); sample monitoring h'ware (off-the-shelf)

was purchased by electrical many years ago, but not found suitable for use; agreed to do a market survey (SN to talk with RVS to see how best to do this) and see if any suitable products are available (RFI properties and ease of interface to MCM are important properties, besides cost) and then decide whether in-house solution is required; to check after one month.

#### 4.5 Ethernet switches for antenna base (new item) :

==> agreed that we need to start work on this; comp group (BAK) to identify major brands for 16-port 100/1000 sw and procure samples for RFI testing; can check after one month.

### 5. Back-ends :

#### 5.1 Updates on PoCo testing : any new updates ? (MM/DVL/BAK)

==> no update this week; to check next week.

#### 5.2 Packetised corr : results from recent tests and plans (SCC/BAK)

==> 8 antenna (16 input) unit wired up and ready, but GPS distribution has a loading problem -- being looked into. 12 channels (8 from one pol and 4 from another pol) input can be given and tested. Some results should be there next week.

#### 5.3 GPU Corr : release of 8 node system and related issues (SHR/SSK/BAK)

==> 8 node system now fully assembled; testing in phases is going on; should have results by next week.

#### 5.4 Improved user interfaces for GPU Corr -- from last week (SSK/SHR/DVL)

==> BAK to check if control m/c has arrived from Pune; DVL to follow-up on being able to run it independently. To check status next week.

#### 5.5 Update on control and user interface for GPU corr -- from last week :

check if conversion of LTA to FITS is working; is control machine available now? (SSK/BAK/DVL)

==> Ita to fits appears to be ok (some more final checking being done by DVL); master PC for GPU control has not yet been transferred from Pune; check next week.

#### 5.6 Plans for next-gen time & frequency standards -- from 4 July & before (NSD/BAK)

==> some literature has been collected but no detailed follow-up is yet to be done; also, to see if we can contact other observatories to see what they are using (can start by checking with DO about Haystack); follow-up after 3 weeks.

### 6. Other items :

#### 6.1 Status update on FPA work -- to discuss outcomes from last week's meeting (JNC/YG/SSK)

==> Updates from last week's discussions : (i) front-end part (vivaldi elements + LNAs) are all ready and have been tested; only waterproof cover remains to be done (FE group updated that this has now been done) (ii) rack with downconverters is also ready and had been tested earlier, using sig gen for LO source (may need a recheck) -- FE group to look into this (iii) digitiser + beam former digital circuit needs to be powered on and checked for functioning; FPGA code etc needs to be better understood (YG to check if BE group can look into this) (iv)

arrangement needs to be made for putting the FPA outside the lab for sky tests, with cables coming inside the shed -- may need a wheeled arrangement -- FE group to look into this (v) current set of documentation (and notes) about various parts of the system to be circulated by JNC to all.  
To take for follow-up after 3 weeks.

6.2 Update of back-end for 15m (BAK) :

==> proposal to replace the iBoB unit with one of the earlier Roach boards. To check what is the effort required & balance the various pros and cons to see what approach will work best.

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Minutes of the Plan meet of 22nd August 2012 (follow-up of some pending topics from different areas) :

1. Documentation related :

1.1 Documentation : follow-up on level 2 (ITR) : conversion of older reports, pending from 1 Aug 2012 -- SSK & BAK were to identify couple of reports from their groups for conversion; also, Dongare was to be informed to suggest authors submitting new reports to do so in ITR format (SSK/BAK/DO)

==> Dongare is taking follow-up action and some reports are getting converted. SSK is looking at some of the reports from FE group for conversion; BAK needs to do the same for BE group. Follow-up after one month.

1.2 Documentation : Discussion of level 3 (NTR) -- from 1 Aug 2012 : draft has already been put up on website by Dongare -- to discuss and try to arrive at final format version of NTR (SSK/DO)

==> no further comments received; format can be frozen; next : to identify possible reports for NTR : (a) new OF system (b) final wideband feeds (c) GPU corr (d) updated signal flow analysis for u-GMRT... Can recheck status of matters after one month.

2. FE & OF related :

2.1 SoP for RF dump procedure : check if released version can be put on web-site (HRB)  
==> it is now on the web-site and matter can be closed for now (!)

2.2 Final release of RF beam shape analysis package -- from last week, 25 July & earlier -- waiting for inputs from DO; also top-level write-up needed? (DO/MS/HRB)  
==> software released to FE group; final write-up pending with DO ; to check 2 weeks later.

2.3 SoP for antenna base work release -- from 1 Aug and earlier (SSK/ANR/HRB)  
==> no progress; to check 2 weeks later.

2.4 Cone-dipole for 250-500 MHz : follow-up on results from 3 antenna testing (GSS/HRB/SSK/NK) -- to check RF beam shapes by HRB and updates from NK  
==> no recent RF dump data taken; new results from NK for CygA measurements for C06, S02, W01 for July 18 & 19 : trends are similar to earlier results; but some differences are there : peak sensitivity appears a bit less than earlier measurements (of 1 yr ago); variation from day to day appears ~ 10-15%; another spectral line detected (431.7 MHz); can use it for measurement of sensitivity of different baselines -- shows good values (slightly higher than self results) for all baselines except one (W01-S02);  
action items : agreed to carry out a series of RF dump tests at receiver room and compare for absolute value, stability and repeatability of the sensitivity (HRB+NK); also carry out some more spectral line tests and flux cal + phase cal combo tests (NK) for testing sensitivity. To look for a follow-up after 2 weeks.

2.5 Status update on refurbishing of 235/610 feeds -- from 1 Aug and earlier (GSS/HSK)

==> 4 feeds modified at w'shop and now back with FE : 2 are tested -- both still show problems; to see what the other two show; can follow-up after 2 weeks.

2.6 Follow-up on delivery of 550-900 MHz filters -- from 27 June (ANR/SSK)

==> expected delivery for the sample versions is 2nd week of October. Follow-up after 6 weeks.

2.7 Fabrication of spare L-band feed -- from 25 July and earlier (SSK/HSK)

==> drawing was to be made -- spare feed w/o electronics to be given to wshop (will happen this week); to check the status after one month.

2.8 Follow-up on spares for L-band feeds -- from 25 July and earlier (ANR/SSK)

==> PCB indent to be raised (informal quotes done); chassis drawings given to w'shop; control cards : PCB layout being redone etc... -- follow-up after 1 month.

2.9 Calibration scheme with radiator at apex of antenna -- follow-up from 8 Aug; first report by FE group to be made available (SSK/GSS/PAR)

==> first results (from CW tests at W04) discussed : ~ -100 dBm from sig gen at apex is a good power level; coupling between antennas, when parked, is negligible; 1 dB compression point can be determined; need more follow-up on tests of (a) stability with time (b) stability with elevation position of dish; FE group to release preliminary note that can be circulated to all interested parties (including S.Roy and D.Oberoi). Formal follow-up after 2 weeks.

2.10 Testing of modified Common Box on W04 & full signal flow -- from 25 July & earlier (SSK/ANR/BAK) : back-end team to report tests/measurements of power levels -- item pending for more than 2 week now -- need an update.

==> first results : 5 dB difference between total power in two channels (for all bands in L and 610, 325 bands) at BB input; absolute power : -31 dBm instead of -27 dBm; action items : agreed to repeat the measurements, get firm numbers, tabulate values at antenna base input, antenna base output (going to OF), at OF output / baseband input; then check with signal flow analysis values to see how they compare and then decide about the corrections required; also cross check about change in power level with bandwidth. FE and BE teams to work jointly on this. Next followup in 2 weeks time.

2.11 Status of mass installation of new OF systems and characterisation of installed units -- from 1 Aug & earlier (SSK/PAR)

==> item not discussed -- to be taken up next week.

2.12 Status of environmental chamber testing -- from last week & earlier (ANR/SSK)

==> visit of vendor did not happen due to misunderstanding; to be rescheduled. Follow-up after 2 weeks.

### 3. RFI related matters :

3.1 Mobile phone RFI -- from 16 Aug (SSK/PAR) : results from characterising the effect at E6 from far away towers; the iPhone option was to be followed up -- any results from this?

==> item not discussed -- can be taken up next week.

3.2 Quick discussion on UPS RFI report -- from last week (SSK/PAR)

==> As this is a very important documnt, some refinement is needed, including

comparison with earlier UPS versions, before report can be considered released.  
Follow-up after 2 weeks.

#### 4. Operations :

4.1 Status of Miltec PC testing -- from last week (CPK/SN); confirm if new parts have come and everything working OK; also, any updates / new learnings from visit of Miltec person to GMRT.

==> PC is working with all attachments and now ready for further testing.

4.2 Status of mass production of Rabbit MCM cards -- from 1 Aug & earlier (CPK/SN)

==> visit to H'bad done; work has started (no pending issues); 1.5 mos for completing PCB + assembly; not clear about testing. Follow-up after 2 months.

#### 5. Back-ends :

5.1 Updates on PoCo testing : (MM/DVL/BAK)

==> no updates for now; to take up whenever new updates are available !

5.2 Packetised corr : conclusion from recent tests and plans (SCC/BAK)

==> delay and fringe correction now appear to be working fine; to do some more detailed tests for comparison; also to start looking at how to go to next step : conversion to fits and making images etc. Follow-up after 2 weeks.

5.3 GPU Corr : any new developments ? future plans (SHR/SSK/BAK)

==> no changes in hardware being done now; waiting for new GPUs and infiniband; to have a detailed discussion including feedback from CASPER meeting, and plan next steps accordingly. Follow-up after 2 weeks.

5.4 Update on status of final online control for GPU corr -- from 25 July (SSK/JPK)

Also, confirm if LTA to FITS working properly (instead of "quick fix")

==> no updates ! Need follow-up urgently on status of this work; to check with SSK and schedule a discussion in next week's meeting.

5.5 User SoPs for new back-end systems -- from last week (IMH/BAK)

==> SoPs for GPU and pktized design are due. Still working on SoPs for other systems; to check status after 2 weeks.

5.6 Plans for next-gen time & frequency standards -- from 1 Aug & before (NSD/BAK)

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

#### 6. Other items (left-over from last week) :

6.1 Follow-up on work on FPA system -- from 1 Aug (JNC/YG)

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

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Minutes of Plan meet of 29th August 2012 (follow-up of some pending topics from different areas) :

1. Documentation related :

1.1 Detailed design doc : follow-up check on 3 action items -- from 8 Aug & earlier (SSK)

==> format is now frozen; fibre-optic rx being put under this format, then tx to be done; can check with other groups for identifying similar items (e.g. analog BE system); to follow-up after 2 weeks.

2. FE & OF related :

2.1 Update on 130-260 system : (i) feed testing & (ii) FE box work -- from 16 Aug & earlier (HRB/GSS/SSK)

==> (i) new copper dipole still under fabrication in w'shop : may take 1-2 weeks  
(ii) FE box modified with new LNA + post-amp, polarizer (130-260), BPF (130-260) assembled in a spare FE box; wiring completed; testing going on -- results by next week; should be able to integrate with older ver of feed and do sky tests. new FE box getting ready (powder coating); will also need a new unit of the control card (FE to check with telemetry that new Rabbit will work with old RFCM or not); follow-up next week.

2.2 Status of improved 500-1000 MHz cone-dipole for C11 : summary of improvements made (new dipole, better notch filters etc) and plans for retest on C11 -- from 16 Aug & before (HRB/HSK/GSS)

==> new dipole has come; response is over 700 to 1000 GHz; can be tuned with sleeves -- to be tried and reported back after 2 weeks; notch filters are under design (see also item 2.6). To check after 2 weeks.

2.3 Update on directional coupler design for 250-500 FE system -- from 8 Aug (ANR/SSK)

==> microstrip design ready for prototype fabrication (2 units) -- gives 20 dB isolation; < 0.1 dB insertion loss, over 250 to 500 (looks promising!).

May need 2 weeks (including chassis?). To check after 2 weeks.

2.4 Update on mass production of 250-500 FE system -- from 8 Aug (ANR/SSK)

==> out of 10 FE boxes, 1 for 130-260, few for other bands, remaining for 250-500; LNAs for 5 antennas ready (a few more needed for spares of existing 235 system); polarizer available for all antennas -- mounting to be done; BPF : can go ahead with mass prodn of PCB and chassis for all 30 antennas; to do one check that postamp (MAV-11) is Ok wrt signal flow analysis and freeze as final config if OK; power detector : to be finalised (BE group has got a stand-alone box -- can be used; BE & FE groups to discuss and pool the resources (one month); same can be done for temp monitor. Interim follow-up after 2 weeks.

2.5 Testing of modified Common Box on W04 & full signal flow -- from last week & earlier (SSK/ANR/BAK) : follow-up on back-end teams measurements.

==> 5 dB difference understood, will be corrected for; variation with setting of different RF bands requires change of attn in OF chain -- control path for this is set-up and checked (user interface in control room needs to be finalised);



to check values for operating point and allowed ranges at input to final BE system.  
Follow-up after 2 weeks.

2.6 Discussion of filters at different stages of receiver chain -- for discussion (ALL)  
==> agreed that different filters (mostly notch filters) are needed in the system;  
not clear if they can all be at antenna base or some need to be in FE system (where?)  
with or without switching capability; effect of insertion loss needs to be taken  
into account; FE group to circulate list of proposed filters with specs; follow-up  
after 3 weeks.

2.7 Status of mass installation of new OF systems and characterisation of installed  
units -- from 1 Aug & earlier (SSK/PAR)  
==> W04 is final; others have differences in PIUs & lasers; 4 have final RF PIUs  
which can be modified for attenuator control -- to be checked and done; to check  
correspondence between wideband 250 feeds and final RF PIUs and see if simple swap  
can help solve the matter; 5 more new antennas to be done during MTAC; follow-up  
on basic items by next week, remaining items after 3 weeks.

### 3. RFI related matters :

3.1 Mobile phone RFI -- from 16 Aug (SSK/PAR) : results from characterising  
the effect at E6 from far away towers; the iPhone option was to be followed  
up -- any results from this?  
==> E6 antenna availability is an issue; iPhone waiting from response from Divya;  
to check again after 2 weeks.

3.2 Follow-up on estimating effect of military satellite RFI at 243 band --  
from 16 Aug & earlier (SSK). To check if first draft of report is ready.  
==> prelim report discussed : 240-270 MHz; 44 satellites; 20 over Indian Ocean;  
results from step wise exercise of change in level (see earlier discussison) is  
not there -- to check next week.

3.3 Miltec PC RFI testing and improved report -- from 16 Aug (SSK/PAR)  
==> tests done; report getting ready; check status next week.

3.4 Radiation from CAT5 cable -- follow-up from 25 July (SSK/PAR)  
==> file for components is under processing; should come in few weeks; follow-up  
after 3 weeks.

### 4. Operations :

4.1 Status of Miltec PC testing -- can it be cleared as fully functional? plans  
for next step (CPK/SN)  
==> need final confirmation of performance with MCM card and final system; check  
next week.

4.2 Update on using new MCM card on serial port of PC for upgraded analog  
backend -- from 1 Aug and earlier (JPK/CPK/BAK)  
==> one card to be taken by BE group from Ops group and tried out; to check  
status after 2 weeks.

4.3 Monitoring of 3-phase power at each antenna -- from 1 Aug (SN/RVS)

==> joint discussion with RVS + SN : to check availability of devices (RVS thinks such devices are available). To check after 2 weeks.

#### 4.4 Ethernet switches for antenna base -- from 1 Aug (SN/BAK/SSK)

==> email update from BAK+SN : (i) MU to give one 16 port Procurve switch for RFI tests (also check availability of other brands for RFI testing) (ii) telemetry group to double check expected data rates from antenna base to CEB (for 1 Gbps limit); to check status after 3 weeks.

### 5. Back-ends :

#### 5.1 Status of analog FE mass production (BAK)

==> 4 antennas done; 4 more underway -- may be ready in one week; to check status after 2 weeks.

#### 5.2 Update on status of final online control for GPU corr -- from 25 July (SSK/JPK)

Also, confirm if LTA to FITS working properly (instead of "quick fix")  
==> LTA to FITS is almost done, except for final integration facility -- to be done and released by next week; integration of online control with 8 node GPU correlator to be taken up and reported upon after 2 weeks (target to complete one month from now); to start looking at possible options for GUI for system (Nilesh to look at and report after 2 weeks).

#### 5.3 Update on SFP+ work & future plans -- from 8 Aug (KDB/BAK)

==> Final unit received from MTE; tests done and basically working; some issues about driving longer cables (on CX4) and copper cables (on SFP side) -- some tunable parameters need to be looked at and understood; may need some follow-up with MTE / Vitesse -- to be looked into. To follow-up after 2 weeks.

#### 5.4 Plans for next-gen time & frequency standards -- from 1 Aug & before (NSD/BAK)

==> item not discussed; visit from Symmetricom is happening on 30th Aug; can be taken up next week.

### 6. Other items :

#### 6.1 Follow-up on work on FPA system -- from 1 Aug (JNC/YG)

==> water proof cover has been put; one sig gen serviced and repaired; JNC has mailed some of the docs; follow-up discussion is needed; to check after 2 weeks.

#### 6.2 Follow-up on 15m work -- from 22 Aug (JNC)

==> specs of auxiliary gear-box frozen and enquiry has been sent to vendor; problem with elevation motor -- replaced with (repaired) spare; servo is now working; scanning mode is now working -- being used for looking at bright sources for checking pointing; back-end has been checked and SOP released; Roach based version being looked at; FE : some problem in control section which may need to have the feed brought back to GMRT; also notch filter for 1800 mobile band is needed (FE group to check if same filter will be useful for GMRT also); 1-3 GHz feed getting ready -- needs to be tested -- agreed to be done on the test range; 1-3 GHz LNA : student from Pune univ now working 1 day of the week at GMRT for improved LNA design (may need 3 to 4 months). Follow-up on required items after 2 weeks.

