

## Minutes of the Plan meet of 7th Mar 2012

(follow-up of some pending topics from different areas)

1. Documentation on Plan website : (i) formation of a group for looking into a standard format for tech reports (YG)

==> Can have 2 senior engineers + 1-2 academic persons (Divya willing to help)

(ii) resurrection of "design doc" (APK)

==> old doc can't be found; need a fresh approach : Set of engineering docs :

(1) "detailed design doc"; (2) "production doc" ; (3) "testing/validation doc"

+ (4) "set of guidelines" (APK to take care of item 2). Production doc should allow/facilitate the mass production of the sub-item.

2. FE & OF related :

2.1 Raw dump procedure SoP : follow-up on matters from last week (HRB/GSS)

==> GSS has given his feedback; may be final by next week.

2.2 Update on curve fitting algorithm for beam shapes (from last week) -- HRB

==> take up next week for final version.

2.3 Scaled cone-dipole for 500-1000 MHz : status of tests with prototype -- pending from last 3 weeks (GSS)

==> single dipole tests need teflon spacer to be done at Pune w'shop -- results will be there by next week; full cross-dipole to be fabricated after that.

2.4 Update on refurbishing of 235/610 feeds (GSS) : final timeline to be worked out by GSS with HSK and GSS to send update. To check two weeks from now.

2.5 Discussion on plans for spare L-band feeds (APK + YG) :

==> total of 31 units are with us; 24 are modified for new system; all 31 will be modified and will serve well for next few years; Q: do we need few more?

A: to check how difficult this may be. To follow-up with RRI to see if the documents for mechanical and electronic components are available. Check again after 1 or 2 weeks.

2.6 Debugging the problem in new common box : Update on joint tests by FE and Ops groups (APK + CPK)

==> (i) common box modified for ECG amp with improved power supply arrangement is now ready -- ripple on this needs to be checked.

(ii) some changes in the band selector control ckt implemented so that it does not come close to becoming marginal in response (adding series resistance); to test all 3 common box types (normal, with Sirenza, with ECG) with this. Then put ECG box on W04. To check after 2 weeks.

2.7 New wideband OF systems : (i) response plots of newly intalled units (SSK)

==> discussed briefly, need a more detailed understanding of variation in power levels from antenna to antenna; collection of L-band response plots will be useful; to follow-up 2 weeks later.

(ii) connector interface between OF output and analog BE input to be finalised (SSK + BAK)

==> not discussed much, but email feedback from SSK mentions that a panel for conversion from SMA to TNC should be possible. To finalise next week.

3. RFI related matters :

3.1 Characterisation of military satellite RFI near 250 MHz (PAR/SSK) -- pending

from more than 2 weeks.

=> RFI group has produced one plot showing the lines (which was discussed); needs more quantitative estimates of (i) the power in these lines wrt pass band power in 250-500 band (ii) temporal variability of the power in the lines -- how much rms fluctuations they would produce in the wideband total power output.

3.2 Report on RFI test of palm size units -- pending for quite some time (SSK)

=> not discussed in detail due to shortage of time

3.3 Results from RFI tests of Miltec PC (PAR/SSK)

=> Good improvement is seen from previous version of Miltec PC. Final report with detailed comparison is needed from RFI group.

4. Operations :

4.1 Miltec PC : see item 3.3 above

=> order for 2 nos can now be cleared by RBS.

4.2 Analog multiplexer problem in common box : see item 2.6 above

4.3 New MCM card : Confirm that order for PCB manufacture has gone (CPK/RBS)

=> will happen today. Next week : confirm order, get estimated delivery date.

4.4 Final clearance regarding laptops with serial port for MCM work : (i) SoP

to be released (ii) final version of software (iii) procurement of extra units

=> All items taken care of. Matter can be closed (except GUI related topic)

4.5 Plans for integrated control environment with servo : joint meeting (RBS)

=> to arrange for a meeting; RBS/SS/YG to look into it.

Reminder : Response from users to requirements : to check the status of this

5. Back-ends : (most of the responses are from email updates by BAK)

5.1 Ordering of PCBs for analog back-end mass production -- to confirm (BAK)

=> PCBs are finalised; production to be scheduled in April, once 4 antenna system is tested with packetized design (when will this happen)?

5.2 Document on updated LO distribution scheme to be circulated (BAK)

=> Will be done by end of this week

5.3 Follow-up on GPU work on 2 node and 4 node cluster (HVR/SK)

=> no updates given

5.4 Follow-up on PoCo and packetised design degbugging (SCC/MM/BAK)

=> phase jump problem testing showed some missing data; triggering of h'ware not sync with proper PPS signal; locking shifted from samay1 to GPS1; fresh results by next week (SCC).

5.5 Update on SFP+ adapter work (KDB/BAK)

=> Quote has been received from MTE; to be processed and order to be placed.

5.6 Update on plans for shifting of back-ends to corr room during MTAC (BAK)  
=> Load testing going to check effect of new load on AC system & temp of GSB.

5.7 Reminder : BE team to circulate note on ADC characterisation within a week;  
to be discussed in 14th March meeting.  
=> First version has been circulated by SCC; can be put up on web page and  
discussed in detail two weeks later.

6. Other items :

6.1 Mechanical fabrication jobs at TIFR : final closing of the loop (YG)  
=> SKG to put Sangam Sinha and Kale in touch on the matter.

6.2 Environmental Chamber : update on completion and delivery (ANR/SSK)  
=> no firm result from the party, to give till end of next week as deadline for  
progress (including visit); to start work on alternative procedure.

6.3 Follow-up on plans for 15-m works (JNC)  
=> brief update from FE group : common box RF part is almost ready (will likely  
complete this week) ; work on OF is progressing.

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## Minutes of Plan meet of 14th Mar 2012

(follow-up of some pending topics from different areas)

1. Documentation on Plan website : (i) formation of a group for looking into a standard format for tech reports (YG) (ii) resurrection of "design doc" (APK)

==> APK to produce this version; YG to set-up the group. To check status after 2 weeks.

2. FE & OF related :

2.1 Raw dump procedure SoP : final version this week (from last week) (HRB/GSS)

==> GSS to give comments by end of week; HRB to produce updated version next week.

2.2 Update on curve fitting algorithm for beam shapes (from last week) (HRB)

==> HRB has taken new data for beam width measurement and done manual fits : these look reasonable. First results from Manisha -- some confusion about exactly what the algorithm does; Manisha to spend some time to improve the understanding and putting finishing touches to the code. Check next week.

2.3 Scaled cone-dipole for 500-1000 MHz : status of tests with prototype -- results from last week's testing pending (GSS)

==> GSS has results from single dipole 461-858 MHz; cross dipole design has been given for manufacture; fully assembled feed in cavity will be ready next week.

2.4 Cone dipole feed for 250-500 MHz : to initiate plans for mass production.

==> GSS to talk to old Pune and Hyd parties ; also discuss with HSK to see how to identify other possible parties. First response in two weeks from now.

2.5 Update on status of CSIRO feed work (JNC/HSK/APK)

==> Order for casting has gone; waiting for Godrej to give revised quote for machining of cast item. Follow-up 2 weeks later.

2.6 Update on testing of LNA stability in the lab : (i) test with tunable load (ii) test with spare cone-dipole feed (ANR/APK)

==> tunable loads have arrived from RAC, will start work soon; spare feed will come back by next week. Can check next week.

2.7 Update on 550-900 MHz filter prototype units (APK/ANR)

==> vendor has started work; will send measured response by end of this week; delivery by 1st week of April. To check 2 weeks from now.

2.8 New wideband OF systems :

(i) scheme for connector interface between OF o/p & analog BE i/p to be finalised  
(SSK+BAK)

==> Agreed that a panel is needed; will need to be mounted from the ceiling vertically downwards ; can take either bulkhead connector or adapter (if a locking version is available) -- BAK & SSK to look at the options and get back in two weeks time.

(ii) update on Mux-Demux order (SSK)

==> Waiting for delivery of sample pieces and Chinese version; to check 2 weeks later.

### 3. RFI related matters :

3.1 Characterisation of military satellite RFI near 250 MHz (PAR/SSK) -- brief follow-up from last week's discussion.

==> some discussion and possible options; SSK to consider and plan and report. Can check 2 weeks later.

3.2 Report on new mobile phone towers and discussion of the same is due (from two weeks ago) (PAR/SSK)

==> identification work still ongoing ; 2 more weeks needed.

3.3 Discussion on possible applications of RFI quiet PCs

==> Miltec may be OK in terms of price and performance; Quanmax with higher processors can be looked at. Immediate action items : (i) to get 2 nos of Miltec PCs and put them through a thorough tests at antenna base (RBS+SSK) (ii) enquire with Quanmax about new options (SSK). Matter to be reviewed ~ 3 weeks from now.

### 4. Operations :

4.1 New MCM card : Confirm PCB order gone; estimated date of delivery (CPK/RBS)

==> order gone; gerber file to be sent; delivery : 2 nos initially for wiring and testing; then clear the bulk order -- this process will take about a month. To check status after one month.

4.2 Plans for integrated control environment with servo : to fix a joint meet (RBS+SS+YG)

==> brief discussion has taken place between RBS & SS; meeting needs to be fixed. To check status after 2 weeks.

4.3 Response from users to requirements doc : to check the status of this

==> only response from OF side; FE is working on it; BE is working on it. 2 weeks more for final inputs.

4.4 New item : 8 bit vs 16 bit for monitoring for power

==> RBS confirmed that 12 bits is possible; agreed that this should be enough to meet most requirements; we should ensure that the design does not reduce the

data flow backwards to less number of bits -- can include in documentation of new MCM system; YG to inform user community in Fri meeting. Confirmation after 2 weeks.

5. Back-ends :

5.1 Analog back-end mass production -- to confirm email update given last week (BAK)

==> tests till early April; final PCB order in 2nd half of April. Can check status after 2 weeks.

5.2 Doc on updated LO distribution scheme to be circulated -- pending (BAK)

==> will be done by this week.

5.3 Updates on PoCo and packetised design degbugging (SCC/MM/BAK)

==> PoCo : mystery remains -- needs further thinking and checking; to go back to earlier status and cross check. Follow-up next week.

==> Packetised design : incrementing phase test shows regular pattern of ampl variation of cross, with slower periodicity of larger noise; to revert back to old timing sync scheme to cross-check. Follow-up next week.

5.4 Update on SFP+ adapter work order (KDB/BAK)

==> Quote has come; under process; check next week.

5.5 Update on plans for shifting of back-ends to corr room during MTAC (BAK)

==> Cooling issues need to be looked into in more detail (RVS/BAK/YG); check status again next week.

5.6 ADC characterisation note : (SCC/BAK)

==> to put up on web page and take up for discussion next week.

6. Other items :

6.1 Environmental Chamber : update on completion and delivery (ANR/SSK)

==> could not be discussed for lack of time; TBD next week.

6.2 Follow-up on plans for 15-m works (JNC)

==> could not be discussed for lack of time; TBD next week.

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## Minutes of Plan meet of 21st Mar 2012

follow-up of some pending topics from different areas) :

1. Documentation on Plan website : Follow-up action next week; Sanjay Dongare to be asked to send email updates about new items on the webpage

2. FE & OF related :

2.1 Raw dump procedure SoP : final version this week (from last week) (HRB/GSS)

=> to put the version on Plan page and fix a time for discussion.

2.2 Update on curve fitting algorithm for beam shapes (from last week) (HRB/ICH)

2.3 Scaled cone-dipole for 500-1000 MHz : status of full cross-dipole + feed integration (from last week) (GSS)

=> dipole will come tomorrow; next week may have some results.

2.4 Refurbishing of 235/610 feeds -- timeline (from 2 weeks ago) (GSS/HSK)

=> GSS has sent an enquiry to HSK, waiting for response ; needs more vigorous follow-up.

2.5 Spare L-band feed : to check response from RRI (from 2 weeks ago) (APK)

=> no response after initial reply. APK to follow-up. To take up again after 2 weeks.

2.6 Update on testing of LNA stability in the lab -- updates from last week :

(i) test with tunable load (ANR/APK)

(ii) test with spare cone-dipole feed (ANR/APK)

=> no progress on these items. To check again next week.

2.7 Testing of modified Common Box with 3 different kinds of amplifiers (from two weeks ago) (APK/ANR)

=> no progress so far; OF group agreed to give 4 nos Sirenza units to FE team; to report next week on status of testing.

3. RFI related matters :

### 3.1 Discussion on plans for Industrial RFI Survey (PAR/SSK)

=> There was a longish discussion on this : there are different angles to the matter, as highlighted by RFI team : (a) management related issues about granting of clearances to industries (which need to be examined in a different, smaller group -- YG to look into follow-up on this) (b) technical related issues about how and when the survey can be done -- RFI team to prepare a draft plan for this, for further discussion (can be scheduled for two weeks later).

## 4. Operations :

No major items this week !

Reminder : Response from users to requirements doc : should be over by next week.

## 5. Back-ends :

### 5.1 Doc on updated LO scheme (from last week) -- still pending (BAK)

=> updated version is sent by BAK, will become available on Plan website by today as ver 1.0.; Can be taken up in next week's Fri meeting for discussion on various possible design choices.

### 5.2 Updates on PoCo and packetised design debugging (SCC/MM/BAK)

(i) PoCo problem : old status check

=> few different checks tried, but no clear clue; agreed to go back to earlier ver and test and report next week.

(ii) Packetised corr : to resolve timing issue and check status

=> some new tests by SCC; need a discussion when Sandeep is back next week.

### 5.3 Update on SFP+ adapter work order (KDB/BAK)

=> agreed with purchase to put a new indent which is a more realistic estimate and then proceed. Check status after 2 weeks.

### 5.4 Update on plans for shifting of back-ends to corr room during MTAC (BAK)

(i) cooling issues (ii) rack layout (iii) timescales

=> 3 racks were planned for installation of new systems : one for pkt design; one for PoCo and GPU corrs; third rack for analog system -- now decided to keep the 4 ant analog system in receiver room by creating free slots in existing baseband racks; to release the 4 ant analog system in manual control mode by



next week (remote control ver by end of MTAC); to arrange all racks + new PCs in corr room in C-shaped structure around one of the hot air vents; to finalise i/f arrangement with OF team in next couple of days and give job order for panel by beginning of next week. Remaining items to be followed up 2 weeks later.

5.5 ADC characterisation note : to be taken up for discussion this week (SCC)  
=> not done

## 6. Other items :

6.1 Environmental Chamber : update on completion and delivery (ANR/SSK)

=> no response from party on telephone, fax or email; purchase asked for an official follow-up as one last step before closure; to start fresh folder with same specs (SSK/ANR).

6.2 Follow-up on status of 15-m works (JNC)

=> summary from the discussions :

(i) space within the tower is limited, hence another room is being constructed to accommodate additional electronics -- almost ready now;

(ii) screw drive in elevation with 1:1 GB retrofitted to provide extra brake was giving problem -- taken out for repair; meanwhile better designed GB is being looked for;

(iii) custom made AC getting ready for installation by end of March;

(iv) feed + electronics : OH feed to be mounted on the antenna is being made ready; common box is almost ready; control cabling to OH feed is to be tested;

(v) OF related : current drawn by system is being looked into; plan to finish the set-up by next week; ethernet connectivity to antenna shell from control room has been established; putting in the fibre from antenna base to be taken up after servo and electrical jobs are done;

(vi) servo : cabling for azimuth is done and antenna can be moved (some problem

of pick-up in az encoder needs to be debugged); then el axis will be taken up; target : to move antenna in az & el (with speed loop only) by April, and final movement by June (with full servo);

(vii) C&M system : delivery of almost final system has happened and it is being tested by Ops group right now; final round of testing needs to be done so that bugs can be found and fixed by PSL (as their contract is nearing an end); PSL will allow our engr to join in the training sessions -- 4 x 0.5 days, sometime

towards the end of this month; Deepak Bhong is helping by trying to use the system with the user manual etc. -- this will start soon, will go on as a background job with his other tasks at GMRT;

(viii) Back-ends : analog mixer (100 MHz baseband) completed and back-end with iBoB card is ready and tested (gives 2K FFT channels over the band); automation of LO setting and attenuator using prototype MCM card is to be completed; DDC needs to be developed - - to be looked into whether iBoB design can support this;

(ix) DAS : data acquired with python scripts and written into shared memory with C-prog to read it and process (ongoing); rest of the chain to be similar to existing GMRT DAS chain.

(x) To aim for completion of integration of sub-systems by mid of next month.

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# Minutes of Plan meet of 28th Mar 2012

(follow-up of some pending topics from different areas)

## 1. Documentation on Plan website :

(i) To confirm that current reports/docs are being put on the web-pages and Dongare is sending updates about these to all concerned

==> working for all except email to academic@ncra -- to find a way around this.

(ii) to try and finalise group for standardising format for tech reports

==> agreed that S. Sureshkumar and Divya Oberoi will take the first step of preparing the template for the reports; can be taken up 2 weeks from now.

(iii) "Detailed Design doc" template to be produced by APK (see MoM of 7th March)

==> APK has done 3/4 of the work; can check next week.

## 2. FE & OF related :

2.1 Raw dump procedure SoP : ver1 has been put on the web-site and is open for comments; to fix a date for review (HRB/GSS)

==> users to give feedback and revised ver to be made ready; current version to be given to Sanjit Rai for trying. To relook at the matter in 3 weeks.

2.2 Update on curve fitting algorithm for beam shapes (pending) (HRB/MJ/ICH)

==> no significant updates from MJ; HRB to take a fresh run on 2nd/3rd for testing el beam cuts ; can check for updates next week.

2.3 Scaled cone-dipole for 500-1000 MHz : first test results on fully assembled prototype feed should be at available (GSS)

==> 500-800 MHz version is working OK; for maximal BW some more testing is going on; some retuning of the dipole is required; agreed to take 2-prong approach : one set of feed + dipole to be used by GSS for continuing fine-tuning R&D, and one set to be integrated with FE system, tested in the lab and put on an antenna for sky tests; APK to coordinate the latter activity, which could happen by as early as next week.

2.4 Refurbishing of 4 nos of 235/610 feeds -- timeline (pending) (GSS/HSK)

==> rough estimate if first unit by end of May or so; then one unit every 3-4 weeks; hence, total time required till July-Aug; can look again in June.

2.5 Status update on 250-500 MHz feed :

(i) any new test results (HRB/GSS/NK)

==> taper measurements from antenna range summarized by GSS : -10 to -12 dB taper in both E and H over 250 to 500 is seen -- compares fairly well with the simulation results; individual freq patterns show basic behaviour OK, but some ripples in the E&H patterns; refined set of results will come; first round of results from SSK also discussed; some items may need follow-up (ii) first cut plans for mass production (see MoM of 14th March) (GSS/HSK)

==> no updates on this; to take up again next week

2.6 CSIRO feed : follow-up on response from parties for fabrication (from 2 weeks ago) (HSK/JNC/APK)

==> no updates today.

2.7 Update on testing of LNA stability in the lab -- (pending from 2 weeks) :

(i) test with tunable load (ANR/APK)

(ii) test with spare cone-dipole feed (ANR/APK)

==> ANR has not been able to do so far; feed has come; both can proceed now; can check status next week.

2.8 Testing of modified Common Box with 3 different kinds of amplifiers (pending for 3 weeks) (APK/ANR)

==> tested with ECG and present FE amplifiers; to test with Sirenza next week; there is still a small problem of 0 level going to -0.4 -- this needs to be checked with Ops group and come back with a recommendation. Check next week.

2.9 Update on 550-900 MHz filters (from 2 weeks ago) (APK)

==> results from 1st prototype OKayed; 4 units will be done (for each of 4 sub-band filters) -- will come in a month. Check in early May.

2.10 OF items :

(i) follow-up on Mux-Demux testing (SSK)

==> mux-demux tested OK; may want one more test with optical spec analyser; spectral channel properties sent by vendor, found OK; to verify temp range is ok and then bulk order can be released.

(ii) any updates on Laser shipment? (PAR/SSK)

==> No update on shipment date (still holding at May 15); check one month later

(iii) i/f panel with BE system

==> Interface panel location is fixed; job request given to w/shop; TNC bulkhead connector identified; looking for ready made cables from SMA to TNC; can find enough connectors for ~ 7-8 antenna system. To follow-up 2 weeks from now.

3. RFI related matters :

3.1 Report on current status of mobile towers in the GMRT vicinity is due (from 2 weeks ago) (PAR/SSK)

==> ~ 64 new towers with mixed operators in 20 km radius in last one year (total 151 sites) ! not clear how many operators on each tower and at what frequencies; needs some more work to sort it out -- procedure for doing this is reasonably well defined. Fringe towers (beyond 20 km circle) also to be reloaed at (BSNL may be the main party there); to check status again after 4 weeks.

3.2 New item : First report on RFI tests of digital temperature controller for split AC unit in antennas (PAR)

==> report is ready; can be put on web-page for local circulation.

3.3 Plan for characterising RFI (around 240 MHz) from military satellites (from 2 weeks ago) (SSK)

==> may be difficult expt as it is on the edge of the 250-500 MHz band.

3.4 Reminder : to convert brief plots of RFI test results of new Miltec PC into a formal report, including detailed comparisons with earlier version of Miltec PC -- needs to be finalised as a formal document (PAR/SSK)

==> final version is getting ready. Can check the status after 2 weeks.

#### 4. Operations :

4.1 Response from users to requirements doc : how much is done? (from 2 weeks ago) (RBS + all groups)

==> FE and BE groups have done some more work; may be another 2 weeks.

4.2 Power monitoring : (i) Confirmation of 12 bit scheme for power monitoring in MCM flow (RBS) (ii) YG to update user community in Fri meeting

==> both items OK

4.3 Confirm plans for joint meeting between servo and ops group (RBS/SS/YG)

==> has not happened yet... can check again 2 weeks later.

#### 5. Back-ends :

5.1 Updated LO scheme (from last week) : ver1 doc is available (on web-site?); to be discussed? can be discussed in this week's Fri meeting also, and some of the choices can be finalised after that (BAK/YG)

==> to be sent to Dongare; YG to take up in Friday meeting.

5.2 Updates on PoCo and packetised design degbugging (SCC/MM/BAK)

(i) PoCo problem : follow-up from last week

==> PoCo : to try with new GPS unit & to use 32 MHz IF signals for more rapid testing

(ii) Packetised corr : follow-up from last 2 weeks

==> Pkt design : time delay problem needs to be looked into and understood.

5.3 To check if OF to BE interconnect panel is finalised and given for fabrication (BAK/SSK)

==> see item 3.10 above

5.4 ADC characterisation note : to confirm if ver1 is on the web; to take up for brief discussion, as needed (SCC/KDB/BAK)

==> ver2 is almost ready and can be circulated and put on the web-page.

#### 6. Other items :

6.1 Environmental Chamber : check that new process has been initiated (ANR/SSK)

==> could not be discussed due to shortage of time

6.2 Follow-up on status of 15-m works (JNC) : any specific items needing urgent discussion

==> could not be discussed due to shortage of time

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