

5. Repeat steps 3 and 4 above till you get the optimum levels for each antenna.

At the point when you are satisfied with 30-to-1 power levels, then start the command file.

Command file saved as "astro@shivneri:/odisk/gtac/cmd/pmqc/deflection.cmd"

FOR TGC:

1. On cmcuser@192.168.70.2 run "ifpeq0.sh" for 0th Iteration from userX window.
2. then run the script by using "launch\_script 'ofmpeq.py'".
3. Please run "ifpeq1.sh" for 1st/successive Iteration from userX window.
4. then run the script by using "launch\_script 'ofmpeq.py'".
5. Repeat steps 3 and 4 above till you get the optimum levels for each antenna.

- For TGC :
1. Record ON Source data Manually.
  2. Record OFF Source data Manually.

## 10. Phasing

### 10.1. GSB phasing

```
> ssh -X cmcuser@cmserver(192.168.70.2)
> cd ~/bin
```

```
> cd /home/cmccuser/utility_scripts/phase
```

```
> phase\_gsb.pl -r C09 -t 30 -s 4
```

Note :to load zero phasing using the following command. restart scan

```
> ./phase_zero_gsb.pl
```

## 10.2. GWB phasing

```
> ssh -X cmccuser@cmccserver(192.168.70.2)
```

```
> cd ~/bin
```

```
> ./phase_gwb.pl -r C09 -t 30 -p TST -c 100 -C 1500 -l rantsol
```

```
-h # This help message
```

```
-r # ref antenna (default first antenna)
```

```
-t # recording time in sec. (default 20sec )
```

```
-p # prj ( default first project)
```

```
-c # start chan no (default first chan)
```

```
-C # end chan no (default last chan)
```

```
-w # wide band phasing on (default off)
```

```
-a # list of phasing antennas (default project antennas)
```

```
-l # rantsol / xtract / flagcal / zero (default rantsol)
```

Note :

1. By Default no. of Antenna added for project will be phased.
2. use w option to enable wind band phasing
3. to load zero phasing by using -l zero

```
> ./phase_gwb.pl -l zero ( restart das scan)
```

or

```
>./phase_zero_gwb.pl (enter and restarted das scan)
```

## 11. MNC ScriptManager

### 11.1 Login to AGN using “MNCGMRTScriptManager”

```
>ssh -X cmccuser@cmccserver(192.168.70.2)
```

```
>password : ****.***
```

```
>MNCScriptManager // Script terminal like User
```

```
>cmcuser@cmsserver:/opt/tangoworkspace/CentralNode/Scripting/MNCScriptManager
```

-----OR-----

```
>MNCScriptManager Enter
```

Scripting hosts configured:

```
1 : AGN1 // Select AGN form 1 to 5 only.
2 : AGN2
3 : AGN3
4 : AGN4
5 : AGN5
6 : AGN6 // only for Engineers can log in
// Operator is not allowed to login at agn6
7 : CPX // only Super Operator has Access to
cpx.
```

```
Enter your choice : 1 //Select AGN index number
```

```
>MNCGMRTScriptManager[2]: login("Test_Operator",'gmrt.123')
```

```
[Success] - Login successful
```

```
Result[2]: 'Test_Operator Logged in successfully!'
```

```
>MNCGMRTScriptManager[12]: execute_command('C01','SERVO', 'hold')
```

```
>MNCGMRTScriptManager[12] : help “cmd name”
```

```
>MNCGMRTScriptManager[12] : exit
```

- get\_api\_list , get\_node\_child,...
- launch\_script , validate, pause,stop\_script
- some commands.

## 11.2 Tune Telescope Using “MNCGMRTScriptManager”

### A) Load source and Track array

```
>MNCGMRTScriptManager[12] : load_source '3c286'
```

```
>MNCGMRTScriptManager[12] : track_array 0 // 0 is default subarray of AGN 1.
```

## B) FPS Configurations

### a) Reboot

>MNCGMRTScriptManager[12] : fpsboot 0 (enter) // for all ants in subarray 0

### b) Initialisation

>MNCGMRTScriptManager[12] : initfps 0 (enter)

### c) FPS Count Load

>MNCGMRTScriptManager[12] : ldfpspos(0) //(0 for user0)

### d) Calibration

>MNCGMRTScriptManager[12] : runclbrt 0 (enter) // Calibrate all ants in subarray 0

### e) Feed Rotation

>MNCGMRTScriptManager[12] : mvfps325 0 (enter)

>MNCGMRTScriptManager[12] : mvfps1420 0 (enter)

>MNCGMRTScriptManager[12] : mvfps150 0 (enter)

>MNCGMRTScriptManager[12] : mvfps610 0 (enter)

### f) FPS Reset through MCM 0

>MNCGMRTScriptManager[12] : fpsrst 'c00'

Sr. No.	Methods for Feed Position System.	Description of Command	Example
1.	fpsboot	To Boot FPS Subsystem	❖ fpsboot 'c01,c02' ❖ fpsboot 'c01'
2.	initfps	To Initialize FPS Subsystem after reset.	❖ initfps 'c01' ❖ initfps 0
3.	ldfpspos	To Load fps old encoder counts and new absolute encoders counts.	❖ ldfpspos( 'c01') ❖ ldfpspos 0 (subarray id)
4.	runclbrt	To Calibrate FPS ( Valid for old FPS)	❖ runclbrt 'c02' ❖ runclbrt 0
5.	mvfps150 mvfps325 mvfps610 mvfps1420	To mvfps to the frequency band2,band3,band4 and band5.	❖ mvfps150 'c01' ❖ mvfps150(0) ❖ mvfps325 ❖ mvfps610(0) ❖ mvfps1420(0)

6.	fpsrst	To Boot/reset FPS System	❖ fpsrst 'c01,c02' ❖ fpsrst 'c01'
----	--------	--------------------------	--------------------------------------

## C) Front End Settings

### a) Set URF Sys

>MNCGMRTScriptManager[12] :

```
>seturfsys(subar/antname,rf_ch1, rf_ch2, rf_swap,sol_atten_ch1,sol_atten_ch2,
fe_ngcal,                                fe_walsh_sw,fe_walsh_grp,
fe_ngcycle,rfcm_sw,setwalsh,walshfreq,noisefreq)
```

```
>seturfsys(0,'725','725',0,0,0,0,0,0,0,0,0,0) // default 610 Mhz setup
```

where,

1.band\_select\_ch1 and ch2 :-

150,190,235,290,325,350,410,470,600,610,685,725,770,850,1060,1170,1280,1390,1420

2 rf\_swap val = 0,1;

3. sol\_atten\_ch1 val = 0,14,30,44,-1,1;

4. sol\_atten\_ch2 val = 0,14,30,44,-1,1;

5. fe\_ngcal val = -1,0,1,2,3;

6. fe\_walsh\_sw val = 0,1;

7. fe\_walsh\_grp = 0,1;

8. fe\_ngcycle val = 0,25,50,100;

9. rfcem\_sw = 0,1

**b) Walsh Setup : Note : Use SIGCON system to set Walsh Parameters.**

### c) RF Swap

```
>MNCGMRTScriptManager[12] : set_rfswap(arguments)
```

### d) RF Termination

```
>MNCGMRTScriptManager[12] : set_cbterm(arg1,arg2)
```

**Example** : set\_cbterm('c01,c02',1,0,0,1)

set\_cbterm('c01,c02',1,0)

set\_cbterm('c02')

```
set_cbterm(1)
```

### e) FE Termination

```
>MNCGMRTScriptManager[12] : set_feterm(arg1,arg2)
```

Example : set\_feterm 'c02'

```
set_feterm('c02,c01',1,2)
```

```
set_feterm('c02,c01',1)
```

```
set_feterm(0)
```

### f) Noise ON

```
>MNCGMRTScriptManager[12] : set_ngon(100)
```

Note : Set Noise generator ON(100/50/25)

### g) Noise OFF

```
>MNCGMRTScriptManager[12] : set_ngoff //set noise generator OFF
```

### h) Get FECB parameters

```
>MNCGMRTScriptManager[12] : get_fecb_para // get current set parameter to fecb
```

## D) LO (SIGCON) Setup

```
> MNCGMRTScriptManager[12] : setilo(subar or antname,chan1_lo,chan2_lo)
```

```
> MNCGMRTScriptManager[12] : setilo (0,540,540) # 0 is sub array
```

```
> MNCGMRTScriptManager[12] : setilo('C00',540,540)
```

## E) IF (SIGCON) Setup

```
>MNCGMRTScriptManager[12]:setif(subar/antname,ch1_gain,ch1_attn,ch2_gain,ch2_attn,ch1_bw,ch2_bw,ch1_alc,ch2_alc)
```

```
>MNCGMRTScriptManager[12] : setif('c00',4,12,4,12,16,16,1,1) # first argument for individual or list of ants.
```

```
>MNCGMRTScriptManager[12] : setif(0,4,12,4,12,16,16,1,1) # first argument is sub array
```

```
>MNCGMRTScriptManager[12] : setif(0,4,12,4,12,32,32,1,1) # IF setup for GSB with ALC ON
```

## F) GAB Parameters settings

### a) GAB LO

```
>MNCGMRTScriptManager[12] : set_gab_lo(subar,LO1,LO2)
```

```
>MNCGMRTScriptManager[12] :set_gab_lo(0,500000,500000) // set for all array
```

```
>MNCGMRTScriptManager[12]: set_gab_lo('C00',500000,500000) // for individual ant
```

### b) GAB Attn

```
>MNCGMRTScriptManager[12] :set_gab_attn('C02','14.5','14.0',timeout=0) // set gab attn
```

```
>MNCGMRTScriptManager[12] :set_gab_attn(0,'10.5','10.5') // set for all array
```

### c) GAB LPF

```
>MNCGMRTScriptManager[12] : set_gab_lpf(subar,GAB_BW1,GAB_BW2) // set LPF
```

```
>MNCGMRTScriptManager[12]:set_gab_lpf(0,200,200 // 0 is sub array
```

```
>MNCGMRTScriptManager[12]: set_gab_lpf('C00',200,200)
```

### d) GAB Full Config

```
>MNCGMRTScriptManager[12]:set gabconf <lo_freq_Ch1> <lo_freq_Ch2> <attn_Ch1>
<attn_ch2><i/p_mode1_Ch1><i/p_mode1_Ch2><mixer/direct_path_Ch1><mixer/direct_path
_Ch2><i/p_mode2_Ch1><i/p_mode2_Ch2><filter_RF_Ch1><filter_RF_Ch2><LPF_freq_Ch1
> <LPF_freq_Ch2> <Spare_Ch1> <Spare_Ch2>
```

```
>set_gab('C02',,550000,550000,12,12,0,0,0,0,0,0,3,3,200,200,0,0)
```

```
>set_gab(0,550000,550000,12,12,0,0,0,0,0,0,3,3,200,200,0,0)
```

// Note : It sets all parameters of GAB except GAB LO.

Note : set GAB LO exclusively

e.g > set\_gab\_lo('C00',550000,550000)

## G) OFC Parameters settings

```
>MNCGMRTScriptManager[12] : setofatten(0,9,9) # ofatten setup // to sub array 0
```

```
>MNCGMRTScriptManager[12] : setofatten('C00','C01',9,9) # ofatten setup // to ant list
```

## H) Correlator Configuration

### a) GSB /GWB Parameters Setup

**Note** : to use cmd line core config please use GUI and save prjcode\_date.csv file. Time being

carefully update GSB LO5 `GSB_BB_LO,149000000.0:156000000.0`

```
>MNCGMRTScriptManager[12]:corr_setup('BOTH','/opt/tangoworkspace/CentralNode/Configuration/CsvFiles/correlator/prjcode_date.csv')
```

**Note:** 1. Start the acq for GSB and GWB ... wait for initialisation

2. then start collect for both GSB and GWB

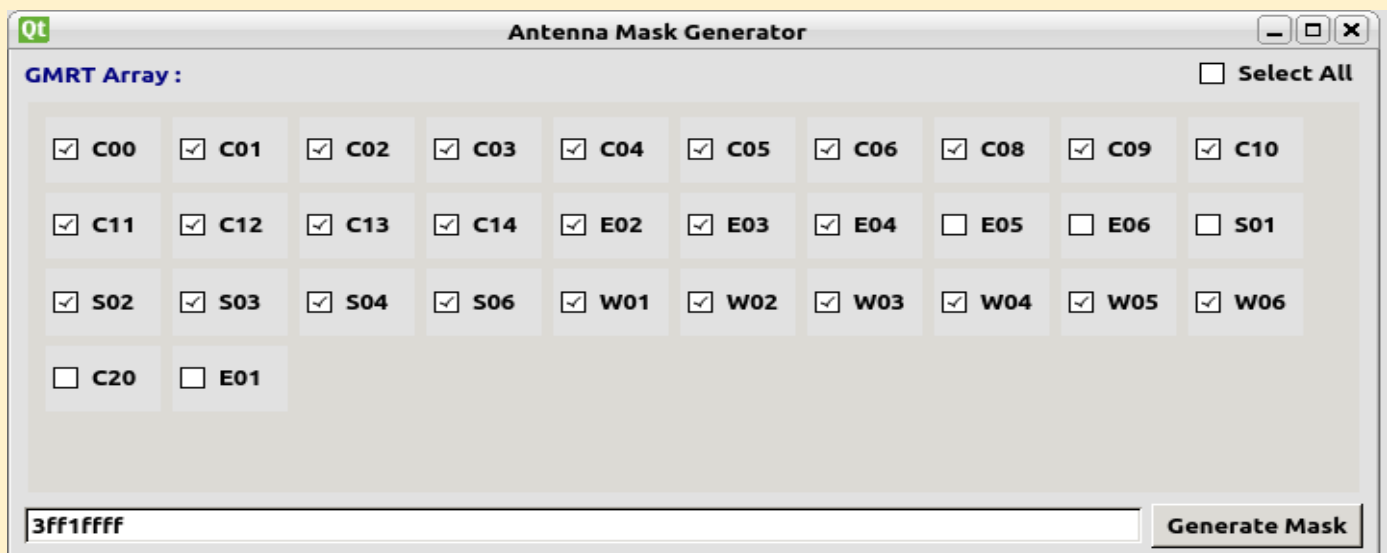
### b) Init DAS Chain

```
>MNCGMRTScriptManager[12]:init_corr('BOTH','/opt/tangoworkspace/CentralNode/Configuration/CsvFiles/correlator/prjcode_date.csv')
```

### c) Create Project

```
>MNCGMRTScriptManager[12] : create_proj('BOTH','TEST','3fffffff','observer','prj_title')
```

**Note :** `3fffffff` is Ant mask for all ants except C20 and E01. you can also generate the mask by using TGC GUI => Utilities => AntennaMask



### d) Associate Project

```
>MNCGMRTScriptManager[12] : associate('0','19TGC01', 'BOTH','3fffffff','1')
```

**Note :** `3fffffff` antenna mask can be changed as per no or ants in Array.

### e) add Source

```
>MNCGMRTScriptManager[12] : load_source(target)
```

```
>MNCGMRTScriptManager[12]: target = '3C48' # define the target
```

```
>MNCGMRTScriptManager[12]: addpsource(target,'BOTH') //add source to BOTH GSB and GWB.
```

```
>MNCGMRTScriptManager[12]: addpsource(target,'gsb') // add source to GSB.
```

```
>MNCGMRTScriptManager[12]: addpsource(target,'gwb') // add source to GWB.
```



### f) Set Source

Note : set source for both GSB and GWB (BOTH/GSB/GWB depends on users requirement)

```
>MNCGMRTScriptManager[12]: set_source('BOTH',0,target) OR
```

```
>MNCGMRTScriptManager[12]: set_source('GWB',0,target) OR
```

```
>MNCGMRTScriptManager[12]: set_source('GSB',0,target)
```

### g) Set Frequency parameters

Note : set frequency(TPA) separately for GSB and GWB.

```
>MNCGMRTScriptManager[12] :set_frequency('gsb',0,591,591,540,540,51,51,3) # tpa values for GSB
```

```
>MNCGMRTScriptManager[12]:set_frequency('gwb',0,550,550,0,0,550,550,3) # tpa values for GWB
```

### h) Start Project (Start das scan)

Note : strtndas for both GSB and GWB

```
>MNCGMRTScriptManager[12] :start_proj('both',0) #Stop Project (Stop das scan)
: stop_proj('both',0) # stpndas for both GSB and GWB
```

### i) Start cmd file

```
>MNCGMRTScriptManager[12] : launch_script('/data1/gtac/cmd/prjcode/date/tmp.py')
```

### j) Stop cmd file

### k) Halt Corr Chain.

```
>MNCGMRTScriptManager[12] : halt_corr('both') # hltndas for both GSB and GWB
```

## H) Servo Commands

### a) Apply Servo brakes

```
>MNCGMRTScriptManager[12] : brake('Ant Name','elevation axis','azimuth axis')
: brake 'c01,c02'
: brake 'c01,c02' , 'e','a'
: brake 'c01,c02' , 'e'
```

**b) Release brakes**

```
>MNCGMRTScriptManager[2]: hold 'c00,c05,c10'
```

**c) StopTracking**

```
>MNCGMRTScriptManager[2]: stop_track_array('c00,c05,c10')
```

```
>MNCGMRTScriptManager[2]: stop_track_array('c00,c05,c10')
```

**d) Off Source Tracking**

**i) Track Source with Offsets in Elevation axis**

**ii) Track Source with Offsets in AZimuth axis**

**iii) Track Source with Offsets in Declination**

**iv) Track Source with Offsets in Right Ascension**

**e) Position in Antenna Coordinate System.**

```
MNCGMRTScriptManager[2]: amv('c01,c02,' azimuth angle', 'elevation angle')
```

```
>amv('c01,c02','80:00:00','50:00:00')
```

```
>amv('c01,c02','80:00:00','50:00:00','60:00:00','70:00:00')
```

**f) Position in Astronomical coordinate System**

```
MNCGMRTScriptManager[2]:> amv('c01,c02','RA',Dec') for each antenna.
```

```
> amv('c01,c02','80:00:00','50:00:00')
```

```
> amv('c01,c02','80:00:00','50:00:00','60:00:00','70:00:00')
```

**g) Servo reset**

```
MNCGMRTScriptManager[2]: reset_servo 'c01,c03'
```

**h) Stow Antenna :-**

```
MNCGMRTScriptManager[2]: stow ('c00') axis = is default.
```

**i) Release Stow**

```
MNCGMRTScriptManager[2]: stow_release ('c00','a') # Azimuth axis stow
release
```

```
MNCGMRTScriptManager[2]: stow_release ('c00','e') # Eleve axis stow release
: stow_release ('c00','b') # both axes stow release
:stow_release(0,timeout=100) # for all ants in subarray 0
```

**j) Park Antennas**

```
MNCGMRTScriptManager[2]: park 'C01' # park C01
```

: park 0,timeout=120

# park ants in subarray 0

**k) Scan Source****i) azel**

MNCGMRTScriptManager[2]: scan\_az\_el('Ant Name',az value', 'elevation value')

: scan\_az\_el 'c01'

: scan\_az\_el('C01,C02',1,2)

: scan\_az\_el(1)

**ii) radec**

MNCGMRTScriptManager[2]: scan\_ra\_dec(Ant Name',RA, 'Dec')

: scan\_ra\_dec 'c01'

: scan\_ra\_dec('C01,C02',1,2)

: scan\_ra\_dec(1)

**H) Pointing offsets Commands****a. Load ant offsets for all ants**

MNCGMRTScriptManager[2] :load\_ant\_offset(0)

**b. Load ant offsets for selective ants****>load\_ant\_offset(0,ants='C00,C02',offset\_file='/opt/tangoworkspace/CentralNode/Configuration/CsvFiles/Pointing/NLDANTO.001')**