**Operation** Manual

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# **1. Introduction**

This document will provide information about configuration of GMRT Subsystems using New TANGO based Next Generation GMRT Monitoring and Control (M&C) System Software developed by TCS and NCRA. Now onward it is formally called the Tango Based GMRT Control and monitor (TGC) system.

# 1.1. CMC Server Login :-

- > ssh -X cmcuser@cmsserver(192.168.70.2)
- > password : \*\*\*.\*\*\*
- >gui.sh

\*\*\*\*\*OR\*\*\*\*

- > ssh -X cmcuser@cmsserver(192.168.70.2)
- > cd /opt/tangoworkspace/CentralNode/Utility
- > cd ./gui.sh &



\*\*\*\* LOG ON using above login screen\*\*\*\*\*\*

\* Workstation 0

Username : Test\_Super\_Operator1

**Password :** \*\*\*\*.\*\*\*

Operation

\*Workstation 1 (Use any one of the workstation out of Six)

**Username :** Test\_Operator

**Password :** \*\*\*\*.\*\*\*

Note : if maximum number of allowed users exceeds then refer Troubleshooting Section, point no 12.0 which is Part of SOP to clear login sessions.

# 1.2. LMC Login :-

>ssh -X lmcuser@192.168.31.2

[any of the ip from 192.168.31.2 .... 192.168.60.2]

> Password : - \*\*\*\*.\*\*\*

>/opt/tangoworkspace/ControlNode/Utility/gui.sh

Username : Test\_Lmc

Password : \*\*\*\*.\*\*\*

Applications Places Sy	stem 🗾	9	) 🕤 (	20				. 🛛 🌅	2				69 🤇	F	ri Sep 21, 12:11	L:36 🚺 ob	server
0						Central M	lonitoring &	Control : Op	perator S	tation 0 (on cm	sserver)						_ = ×
Super Operator@cmsser	ver															_	
IST Date : 21-09-2018 IST	: 12:11:36	LST : 1	1:38:10	UTC: 06:41:36	Server Status :	Server Up State	Manual Mo	de M&C Statu	us : NOT (	DK			1	X 🕤 S	uper Operator T	est_Super_Operat	ior1 🛃
Current Observation : NA	Backend	Status	Subtask		Owner		No of	Operator Arra	iys: 7	GMRT Alarms	<b>4</b> ®					Re	eports
Next Observation due : NA	GSB	Running	2		Op	erator Station 1	Maintenance	Array Antenn	ae : 1	Alarm	Wind Alarm						
Next Observation at : NA	GWB	Running	1		Op	erator Station 1	No of	f LMC Configur	ed: 34	Smoke Alarm	Temperature Alar	m				Sub	parrays
<u>View</u> <u>Control</u> <u>M</u> onitor	<u>U</u> tilities	Recent	:														
											k .						
Activity Messages :						Detailed Resp.	Filter	History E	Notifi	cations :					Fi	lter Histor	ry 🔯
										Alarm Name		Alarm Type	Alarm Descript	tion	D;	ate/Time	-6
									AGN0	OFCSNT_intruder_det	ected ALARM		alarm for Agn0 - OFCSNT in	truder	Wed Sep 19 12:1	10:38 2018	
									AGNO	alarmStatus	ALARM		alarm for AGN0		Wed Sep 19 12:1	10:37 2018	
									AGN0	_OFCSNT_fire_detected	d ALARM		alarm for Agn0 - OFCSNT in	truder	Wed Sep 19 12:1	10:37 2018	
									AGNO	_Subsystem_OFCSNT	ALARM		alarm for AGN0		Wed Sep 19 12:1	10:37 2018	
GMRT M&C System Version : 3.2													1		1		
		ASMON	PHASING	CALLSHEET 30	-to-1												

CSB DAS DASMON PHASING CALLSHEET 30-to-1 CRCuser@cmcsserver: ... C Central Monitoring & C...

# 2. Switching Between ONLINE & TGC

In online USER-terminal, use run files 'ONLCTRL.001' and 'TGCCTRL.001'. please use the following commands to switch between ONLINE and TGC.

# 2.1 Control Switching ONLINE to TGC System

a. ssh -X observer@shivneri

```
>***@****
   > run tgcctrl
     or
                             for suba 5.
     > run tgc5ctrl
     or
     >tgcctrl.sh -m -g -s 4
                                # for selective system switching
              -m MCMControl
              -g GABControl
              -s <SUBARRAY Number>
b. > ssh -X lmcuser@192.168.70.21
   > cd /usr/local/gmrtSys
   >./mcm_ctrl.sh
   usage:->./mcm_ctrl.sh <0 allmcm> <TGC> <space separated antenna
   list, otherwise all antenna> // antenna names in small letter e.g. c00 c01
   and not c0
```

**Notes :** 1. This runfile will disable all MCMs, disable online control of the servo, and starts all device-client processes on antenna-base PC. It loads GAB TGC-firmware (In this case 'gabs' ondisp window will show disconnected status). To monitor servo window, issue 'enastry' command in online-terminal

# 2.2 Control Switching TGC to ONLINE System

# >run onlctrl or >run onl1ctrl for suba 1. >onlctrl.sh -m -g -s 4 # for selective control switching -m MCMControl -g GABControl -s <Subarray Number>

**Notes :-** This runfile will stop all TGC mcm-deviceclients running on individual antennaPCs, and load GAB-Online firmware (Check 'gabs' window in ondisplay.5).Also, it aborts the ongoing tracking for given antenna.

e.g >ssh -X lmcuser@192.168.70.21 (ngmnc) > ssh -X lmcuser@192.168.70.21 > cd /usr/local/gmrtSys >./mcm\_ctrl.sh usage:->./mcm\_ctrl.sh <0 allmcm> <ONL> <space separated antenna list, otherwise all antenna> // antenna names in small letter e.g. c00 c01 and not c0

# **3.Antennas Array Configuration**

# 3.1 How to Allocate Antenna in Separate AGN (Array) :-

Step 1. Open another terminal and login on cmcserver using cmcuser

> ssh -Y cmcuser@cmsserver // gmrt.123 is password

> Password : \*\*\*\*.\*\*\*

> /opt/tangoworkspace/CentralNode/Utility/gui.sh &

\*\*\* OR \*\*

**Step 1.** Open one more GUI on any one of the client pc in the control room where the New M&C Environment of GUI is set. (tgcserver3 or tgcservr4)

>/opt/tangoworkspace/CentralNode/Utility/gui.sh &

**Step 2.** Select Operator0 workstation to login as "Test\_Super\_Operator" using root password

**Step 3**. To Allocate required antenna in two separate subarray(AGNs) that is in to any one of the AGN/Array i.e. (1 to 5)

Go To TGC GUI Select "Control" Menu Select "Manage\_pool" Tab

Onera	tor0 Array		IMCC			N	o of Anto	nna: 31	Select Al
opera	LOIO_AITA	y O CED	LINCS				IO. OF AIICE	anna. 31	Select Al
C00	C01	C02	C03	C04	C05	C06	C08	C09	C10
C11	C12	C13	C14	E02	E03	E04	E05	E06	S01
<b>S02</b>	<b>503</b>	<b>504</b>	506	- W01	W02	() W03	W04	W05	🔲 W06
C20									
1						Crea	ate 🛛 🗚	llocate	Destroy
ssign Op	erator Arra	УС							
Operat	tor1_Array	<u>y c</u> ] (		м	ode: Auto	omatic Moo	de Set Ma	anual	Deallocate
Operal	tor1_Array			M	ode: Auto	omatic Mod	de Set Ma	anual	Deallocate
Operat	tor1_Array	y r		M	ode: Auto	omatic Moo	de Set Ma	anual	Deallocate
Operat	tor1_Array	y c) , , , , , , , , , , , , , , , , , , ,	C05	M M	ode: Auto	anual Mode	de <b>Set Ma</b>	anual	Deallocate
Operat Operat Operat Operat Operat Operat Operat	tor1_Array	y c)	C05	M M C06 E04	ode: Auto ode: Ma C08	anual Mode	de Set Ma 2 Set Ma 1 C10 1 S01	anual	Deallocate

**Step 4.** Select require antennas in any one or more subarrays and Click **Allocate** Button.

**Step 5**. Now You need to Open one more GUI for that Open another terminal and login on cmcserver using cmcuser

> ssh -Y cmcuser@cmsserver

> Password : \*\*\*\*.\*\*\*

>/opt/tangoworkspace/CentralNode/Utility/gui.sh

\*\*\*\*OR\*\*\*\*

**Step 6**: Open one more GUI on any one of the client pcs in control room where the New M&C Environment of GUI is set.

>/opt/tangoworkspace/CentralNode/Utility/gui.sh &

Here is the login Screen to Select Any one of workstations (1 to 6) Except Workstation 0 to login as "Test\_Operator" using it's password



Note : Login to the Respective Workstation where the Superoprator has Given Antenna Access. For Example. Suppose the Super Operator defined Antenna in the AGN4 then use Workstation 4 to take control As Test Operator using Following Steps.

**Step 7.** To Accept required antenna in AGN that is in any one of the AGN from 1 to 5. **Go To** M&C GUI Select "Control" Menu Select "Manage Array" Tab

3				Manage J	Array				
Assign Sub	Array	ssign Proj	ect						
Operator	4_Array			No.	of Antenn	a: 28 Re	elease Ant	enna	Select All
C01	C02	C03	C05	C06	C08	C09	C10	C11	C12
C13	C14	E02	E03	🗍 E04	C E05	E06	S01	S02	<b>S03</b>
<b>S04</b>	<b>S06</b>	🗌 W01	🗌 W02	0W03	W04	W05	W06		

**Step 8.** Select require antennas in any one or more subarrays and Click **Allocate** Button.

# 3.2 Resource Allocation to AGN (Array)

Go To M&C GUI  $\implies$  Select "Control" Menu  $\implies$  Select "Manage Pool" Tab CEB LMC's"  $\implies$  Select "GSB/GWB/GAB  $\implies$  Select "operator2\_Array" Tab and Click  $\implies$  Create/Allocate/Destroy button as per requirement of add,update or

Release

# 3.3 How to Monitor Antenna Array Status :-

Go To TGC GUI Select "View" Menu Select "Sky Plot" Submenu

- 1. Click on "Array Status" tab.
- 2. Select Respective AGN to Check Allocated Antenna Status in different Sub arrays from drop down list of AGNs.

				Sk	y Plot													
													15	ST Date	: 14-1	1-201	IST:	21
Plot Polar Plot Array Status																		
ect AGN AGN4																F	ags Des	criț
AGN4 Sub Array 0	TRK E	RRORS	_	_	_	_		_	_			_		_		_	_	
Project Code : 18NJS02 , Total Ant- 30		C00	C01	C02	C03	C04	C05	C06	C08	C09	C10	C11	C12	C13	C14	E02	E03	
BACKEND : GWB	AZ	28'12"	29'11"	17'52"	12'16"	26'21"	26'4"	202d	28'3"	44'5"	7'52"	18'49"	20'24"	201d	3'45"	8'38"	16d46	
Phase Center : 3C48	EL	15'9"	16'19"	15'31"	0'51"	13'47"	14'9"	38d16	15'48"	13'20"	1'41"	9'19"	9'23"	38d25	33'22"	17'0"	6d43*	
Target : 3C48	Flag	77	N					77	77	N				NZZ	77		77	
Rise Time(HMS): 17:11:19.57 , Set Time(HMS): 4:7:44.28				-	_	-	-											
Tracking: AZ(dms): 226:57:7.93 EL(dms): 67:39:29.23		E04	EOS	EDE	501	CO 2	503	504	506	WOI	1002	MOR	WO4	14/05	WOS	1		
TrackCorr: NA	A.77	204	EOS	EGO	301	302	305	304	300	WOI	1102	1105	1104	1105	moo.		1	
OFFSET: RA: 0 DEC: 0	AZ	17:34	21.13.	10022	2010	-140	211	29.43	33 44	45 44	-140	18 41	8.9.	20 37	26 40	_		
AZ: 0 EL: 0	EL	10'57"	13'28"	10016	37d45	45d54	7'30"	6'30"	2'12"	14 47	21d30	9'2"	8.5"	8'43"	14 46"			
								the second se			100	The second se						

# 4. Antenna Array Tracking & Monitoring

# 4.1 How to manage Antenna source catalog.

Go To **TGC** GUI Select "**Control**" Menu Select " **Operation Control**" Sub menu

- A. Manage :
- 1. To Upload New Catalog
  - **a.** Use the browse button to add required Name of the Catalog of it's absolute path

 $/opt/tangoworkspace/CentralNode/Configuration/CsvFiles/Catalogs/src_list.csv$ 

- b. Click on Upload Button.
- c. Please select type of the catalog by clicking on type1 or type **2** and User Catalog or GMRT Catalog.
- 2. Use Catalog.

To Use Newly added catalog Click on Click Box of Respective Catalog Name anand press the Use catlog button.

3. Remove Catalog

To Remove catalog from Use select to name of catalog which you don't want to use press Remove Catalog Button.

# Note : only Those catalogs can be removed which are being added by user(owner) and not in use.

# 4.2 How to Send Antenna Array on Source.

Go To **TGC** GUI  $\Longrightarrow$  Select "**Control**" Menu $\Longrightarrow$  Select "**Operation Control**" Sub menu

- 1. In Operation Control Window Click on "SUBAC" tab.
- 2. Select "LMC" Radio Button.
- To Select No. of Antenna Use Check Boxes for individual antenna or use the Select All Checkbox

- 4. Use Drop down box to Select Sub Array 0. (Subarray wise Selection)
- Type Source name in "Input Box" and Press the Enter Key. Example : 3C48 Enter
- Click on "Catalog Button" to Add, Remove, Edit or Update Source List and Source Parameters.

				Opera	ation Con	trol						
UBAC Multi Sul	barray I	Data Contr	ol									
) СМС 📵 ЦМС	-					No. c	of Ant	enna:	30 🛽	🖌 Sele	ect All	Sub Array 0
🥣 COO 🛛 🗹 CO	)1 🔽	C02 🗹	С03 🔽	C04	🗹 C05	🗹 C06		C08		C09	🗹 C10	
🖌 C11 🛛 🖉 C1	2	C13 🗹	C14	E02	🗹 E03	🗹 E04		E05		E06	501	
🗹 502 🛛 🗹 50	13 👿 :	504 🗹	S06 🔽	( W01	👿 W02	👿 W03	3	W04		W05	🗹 W06	5
GTS-Time : 20 Source Name Precessed ou RA(hms) :01:3 Source Curre	18-11-14 : 3C48 t to epoc 7:41.30 nt Az(dm	18:35:01 ch :2018.8 DEC(dm is) : 62:12	7 s): 33:09 ::36.89, E	:35.10 L(dms)	): 34:24:5	2.30						
* GTS-Time : 20 * Source Name * Precessed ou * RA(hms) :01:3 * Source Curre * Rise time(hm	118-11-14 : 3C48 t to epoc 37:41.30 , nt Az(dm s) :17:11	18:35:01 ch :2018.8 , DEC(dm is) : 62:12 :19.57 , S	;7 s): 33:09: ::36.89, E et time(h	:35.10 : <b>L(dms</b> ) <b>ms) :</b> 4:	): 34:24:5 7:44.28	2.30						
* GTS-Time : 20 * Source Name * Precessed ou * RA(hms) :01:: * Source Curre * Rise time(hm	0UT	18:35:01 ch :2018.8 DEC(dm is) : 62:12 :19.57 , S	7 s):33:09 ::36.89,E et time(h	:35.10 iL(dms) ms) :4:	): 34:24:5 :7:44.28	2.30			(	Track	c Array	Stop Array

7. Select Track "IN" or "OUT" and Click on "Track Array" Button.

# 4.1 How to Monitor Antenna Tracking Status :-

a) Skyplot :-

Go To TGC GUI 📥 Select "View " Menu 📥 Select " Skyplot" Submenu

- 1. Click on "Skyplot" tab.
- 2. Select Respective **AGN** to Check Antenna tracking to Astronomical Source for all Sub arrays by selecting drop down list of required AGNs.
- 3. Use Filter button

- 4. Click on Auto Scale Checkbox.
- 5. Use Option button.



b) Polar plot :-

Go To TGC GUI Select "**View**" Menu Select " **Skyplot**" Submenu

- 1. Click on "Polar Plot" tab.
- 2. Select Respective AGN to Monitor Antenna Polar Status in different Sub arrays from drop down list of AGNs.



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# 5. Antenna Sub System Configuration

# **5.1 Feed Position System Configuration**

Go To **TGC GUI** Select "**Control**" Menu Select "**Sub-System**" SubMenu

Select "Antenna-LMC" Click on "FPS" tab Select all" antenna from

label Click Box / Use Filter Click on button from list of **FPS** Commands.

					Subsyste	m Antenn	a LMC				
ECB FPS	OFCSNT	SERVO	GAB LM	ICSys							
ntennae								No. of	f Antenna	30 👿 Select All	Filter
S C00	🕑 C01	👿 C02	🗹 C03	👿 C04	💕 C05	🗹 C06	👿 C08	🗹 C09	🛃 C10		
🖌 C11	🕑 C12	🗹 C13	🗹 C14	🗹 E02	🕑 E03	🗹 E04	🗹 E05	👿 E06	🖌 S01		
S02	503	S04	🛃 S06	👿 W01	👿 W02	🕑 W03	W04	🕑 W05	👿 W06		
MV FPS 14	20										
CALIBRAT	FINE	TUNE	FINEDTUN	FPSS	TOP	PSBOOT	LD FPS P	05			
CALIBRAT	420 MV	FPS 150	MV FPS	375 MV	FPS 700	RD BRKC	LD FPS P	RD LRPM L	MT		
CALIBRAT MV FPS 1 RD MAX /	420 FINE 420 MV ANG RD	FPS 150	FINEDTUNI MV FPS	375 MV	FPS 700	RD BRKC		RD LRPM L	MT		
CALIBRAT MV FPS 1 RD MAX A RD TNG F	420 MV 420 MV ANG RD PNT RD	FPS 150 MAX PWN UAO ANG	FINEDTUNI MV FPS RD MI RD VER	510N R	FPS 700 FI RD RPM DN UNCPRESET		LD FPS P	RD LRPM L RD LRPM L RUNFREE	MT		
CALIBRAT MV FPS 1 RD MAX 4 RD TNG F	420 MV 420 MV ANG RD PNT RD CNT DIFF	FPS 150 MAX PWN UA0 ANG SET DOM	FINEDTUNI MV FPS M RD MI RD VER MON TIME	N ANG	FPS 700 FI RD RPM DN UNCPRESET	RD BRKCP CNT   RE CNT   RUND	LD FPS P	OS RD LRPM L RT RD S RUNFREE SET MAX A	MT	MAX PWM	
CALIBRAT MV FPS 1 RD MAX 4 RD TNG F SET BRKC	420 MV 420 MV ANG RD PNT RD CNT DIFF ANG SE	TUNE FPS 150 MAX PWI UAO ANG SET DOM	FINEDTUNI MV FPS RD MI RD VER MON TIME	N ANG (1 SION R SET LRP	FPS 700 FI FPS 700 RD RPM DN UNCPRESET M LMT S SET RPM L	RD BRKCM CNT   RE CNT   RUND ET MAINTE	LD FPS P	OS RD LRPM L RT RD S RUNFREE SET MAX A	MT TOP CNT NG SET	MAX PWM	

#### a) Load FPS Counts

1. on lmcuser@192.168.70.21

>/usr/local/gmrtSys/fpscopyload.py

2. In tgc GUI Control-> SystemVariable-> FPS Load-- this will upload the latest FPS Count file.

> Click on 'Apply' (Don't need to save this file..)

3. TGC-GUI - Select FPS system and issue "ldfpspos" command without any argument.

4. TGC-GUI - Select FPS

>initfps 0

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>mvfps 1420, 150, 700, 325

In case of feed rotation problem is there --

\* Select sigcon system -- issue rebootfps command

\* Select FPS system -- issue FPSBOOT, Calibrate command

Rotate Feed at 1420, 150, 700, 375

## **5.2 FrontEnd Settings**

GoTo TGC GUI \_\_\_\_\_Select "Control" Menu \_\_\_\_\_Select " Sub-System" SubMenu

Select "Antenna-LMC Click on "FECB" taby "Select all" antenna from

Click Box/Use Filte Select "SET URF\_SYS" Cmd with input Parameters.

mmand : C00 C01 C02 C03	C04 C05 C06 C08 C09 C10 C11 C12 C	Subsystem Antenna LMC									
		FECB FPS OFCSNT SERVO GAB LMCSys									
Parameter	Parameter Value	Antennae No. of Antenna: 30 😽 Select All Filter									
band_select_ch1	725										
band_select_ch2	725	Ø C00 Ø C01 Ø C02 Ø C03 Ø C04 Ø C05 Ø C06 Ø C08 Ø C09 Ø C10	a								
rf_swap	0	🦉 C11 🦉 C12 🦉 C13 🞯 C14 🞯 E02 🞯 E03 🧭 E04 🮯 E05 🧭 E06 🞯 S01	S.								
sol_atten_ch1	0	So S									
sol_atten_ch2	0 List of arguments for selecte	d command									
fe_ngcal	0										
fe_walsh_sw	0	Frequently used commands									
fe_walsh_grp	0	SET URF SYS									
fe_ngcycle	0	CB TERM INIT RAW MON RESET RESTORE RF ATTN									
rfcm_sw	0	RF CM_SW RF NGCAL RF NGSET RF ON RF SWAP RF TERM									
		SEL FEBOX SEL UFEBOX SET DOMON TIME SET MAINTENANCE SET RESET SET RF SYS									
		SET TIME SET TIME SYS SET WAISH SET WAISHGEP									
		JET THE JET ON OTO JET THEOTON									

URF\_SYS 725 725 0 0 0 0 0 0 0 0

Parameters	Band 2(130-230)	Band 3(250-500)	Band 4(550-900)	Band 5(1000-1450)
Band Select ch1	150	470	725	1420
Band Select ch2	150	470	725	1420
Rf_swap	0	0	0	0
sol_atten_ch1	14	0	0	0
sol_atten_ch2	14	0	0	0
fe_ngcal	0	0	0	0
fe_walsh_sw	0	0	0	0
fo_walsh_grp	0	0	0	0
fe_ngcycle	0	0	0	0

lango based GMRT	Control and monitor	system (TGC)		
rfcm_sw	0	0	0	0

# **5.3 Fiber Optics Settings**

Go To TGC GUI \_\_\_\_ Select "Control" Menu \_\_\_\_ Select "Sub-System" Submenu

Select "Antenna-LMC" Click on "OFCSNT" tab 📥 " Select all" antenna from

Click Box/Use Filte Select "SET ATTN" Cmd with input Parameters.

Qt					Subsyste	m Antenn	a LMC				_ 0 ×	Comma	nd · C00 C01 C02 C	03 004 005 0	06 C08 C09 C10 C11 C12 C
FECB I	PS OFCS	NT SERVO	GAB LI	MCSys											
Antenna	10							No. of	Antenna: 30	Select All	Filter		Ch 1	9	Parameter Value
C0	o 😿 coi	C02	C03	C04	C05	C06	C08	C09	C10				Ch 2	ql	
C1	1 😿 C12	C13	C14	E02	E03	E04	E05	E06	<b>S</b> 01					1	
50	2 503	S04	S06	W01	W02	W03	W04	W05	W06			-			
												-			
Frequer	ntly used c	ommands										¢			
SET A														List of an	guments for selected command
IN	π	QUIT	SET ATTN	SET D	OMON TIME	SET M/	UNTENANC	E SET R	ESET			1			
SET	пме														
												Res	Clear		Execute
	_		1.51 703	2 2 3	-				14 (B)						

#### > command : SET ATTN

# 5.4 Analog Back End Settings(GAB)

GoTo **TGCGUI** Select "Control" Menu Select "Sub-System"Submenu

Select "Antenna-LMC" Click on "GAB" tab Select all" antenna from

Click Box/Use Filter \_\_\_\_\_\_ Select "SET GAB CONF" Cmd with its input value.

GAB Parameters	Band 2(130-230)	Band 3(250-500)	Band 4(550-900)	Band 5(1000-1450)
Lo Freq Ch1	300	500	550/750/950	1060/1260/1460
Lo Freq Ch1	300	500	550/750/950	1060/1260/1460
Attn Ch1	12	12	12	12
Attn Ch2	12	12	12	12
	Operation		•	N

I/p Mode1 Ch1	0	0	0	0
I/p Mode1 Ch1	0	0	0	0
Mixer. Path ch1	0	0	0	0
Mixer. Path ch2	0	0	0	0
I/p Mode2 ch1	0	0	0	0
I/p Mode2 ch2	0	0	0	0
Filter RF ch1	7	6	3	1
Filter RF ch2	7	6	3	<sup>1</sup> 1
LPF Freq Ch1	100/200	100/200/400	100/200/400	100/200/400

# 5.5 IFLO(SIGCON) Settings

Go To TGC GUI 🔄 Select "Control" Menu 🔄 elect "Sub-System" Submenu

Select "Antenna-LMC" 🦾 🛛 Click on "SIGCON" 🔄 ab "Select all" antenna

Click Box/Use Filter 🔁 Select " required IFLO" Cmds with its input value.

#### 1. First Local Oscillation (LO1) Settings :

Using this "**Set firstlo**" signal conditioning command, set First Local Oscillator (LO1) In step of 1 Mhz upto 600 MHz and In step of 5 Mhz above 600 MHz upto 1600 MHz.

Subsystem	Command :	C02-> SIGCON->	set firstlo (on c02)
LMCSys FPS GAB C02 SERVO OFCSNT FECB SIGCON	Parameter	Parameter Value	valid/Range Value
LMC Name : CO2	ILO_ch1	540	100 to 1600
	ILO_ch2	540	100 to 1600
SET IF       set ifatten       set ofatten       SET sigcon         set firstlo       SET IF       SET sigcon       set ifatten       SET MAINTENANCE         SET DESCT       SET SUBJOONNAL OF DOMON TIME INTERNAL       DOMON       SET MAINTENANCE			
SET WALSHPATERN SET WALSHFREQ SET NGFREQ NG	Reset	Clear E	xecute Cancel

#### 2. Intermediate Frequency (IF) Parameters Settings :

Using this "SET IF" command set IF parameters like Bandwidth (32 MHz/16

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MHz/6 MHz) , GAIN Values between 0 to 30 dBm , IF Attenuation Values for 0 to 30 dBm and ALC ON and OFF settings for both IF Channels ( ch1-130 and ch2-175) respectively.

Subsystem	Comman	d : CO2-> SIGCON	-> SET IF (on c02)
LMCSys   FPS   GAB C02   SERVO   OFCSNT   FECB   SIGCON	Parameter	Parameter Value	valid/Range Value
LMC Name : 🔽 C02	pre_attn_ch1	4	0 to 30.5
	pre_attn_ch2	4	0 to 30.5
SET IF set firstlo set ifatten set ofatten SET sigcon	post_gain_ch1	12	0 to 30.5
	post_gain_ch2	12	0 to 30.5
set firstlo SET IF SET sigcon set ifatten set ofatten SET MAINTENANCE	IFBW_CH1	32	32,16,6
SET RESET         SET SHUTDOWN         SET DOMON TIME INTERVAL         DOMON         rebootsrv         rebootfps	IFBW_CH2	32	32,16,6
SET WALSHPATERN SET WALSHFREQ SET NGFREQ NG	IFALC_CH1	1	1,0
	IFALC_CH2	1	1,0
	Reset	Clear	Execute Cancel

#### 3. SET sigcon: Using this command universally one can set set all IF and LO

Jonna Arrenti.			Barrier Station	and the second states
LMCSys FPS GAB C02 SERVO OFCSNT FECB SIGCON		arameter	Parameter value	valid/kange value
LMC Name : 🔽 C02		ILO_ch1	540	100 to 1600
		ILO_ch2	540	100 to 1600
Frequently used commands	р	re_attn_ch1	10	0 to 30.5
SET IF set firstlo SET sigcon set ifatten set ofatten	р	re_attn_ch2	10	0 to 30.5
	po	ost_gain_ch1	10	0 to 30.5
set firstlo SET IF SET sigcon set ifatten set ofatten SET MAINTENANCE	po	ost_gain_ch2	10	0 to 30.5
SET RESET SET SHUTDOWN SET DOMON TIME INTERVAL DOMON rebootsrv rebootfps		IFBW_CH1	16	32,16,6
SET WALSHPATERN SET WALSHFREQ SET NGFREQ NG		IFBW_CH2	16	32,16,6
		IFALC_CH1	1	1,0
		IFALC_CH2	1	1,0
		Reset	Clear	Execute Can

parameters.

#### 4. Set ifatten :-

Subsystem				
LMCSys   FPS   GAB CO2   SERVO   OFCSNT   FECB SIGCON		Parameter	Parameter Value	valid/Range Value
LMC Name : 🔽 C02		pre_attn_ch1	4	0 to 30.5
		pre_attn_ch2	4	0 to 30.5
SET IF set firstlo set ifatten SET sigcon set ofatten		post_gain_ch1	12	0 to 30.5
		post_gain_ch2	12	0 to 30.5
set firstlo         SET IF         SET sigcon         set ifatten         SET MAINTENANCE           SET RESET         SET SHUTDOWN         SET DOMON TIME INTERVAL         DOMON         rebootsrv         rebootfps           SET WALSHPATERN         SET WALSHFREQ         SET NGFREQ         NG		Reset	Clear	Execute Cancel
5. Set of attun :-				

#### Subsystem LMCSys | FPS | GAB C02 | SERVO | OFCSNT | FECB SIGCON | eter Pa LMC Name : 🔽 C02 ofcatten\_ch1 3 0 to 15 ofcatten\_ch2 3 0 to 15 Frequently used commands SET IF set firstlo set ofatten set ifatten SET sigcon set firstlo SET IF SET sigcon set ifatten set ofatten SET MAINTENANCE SET RESET SET SHUTDOWN SET DOMON TIME INTERVAL DOMON rebootsrv rebootfps SET WALSHPATERN SET WALSHFREQ SET NGFREQ NG Clear Reset Execute

- 6. SET MAINTENANCE :- To put System in Maintenance mode.
- **7. SET RESET** :- To give power ON reset to System.
- **8. SET SHUTDOWN** : To Shutdown system.
- 9. SET DOMON TIME INTERVAL :- domon time interval is in second

Subsystem	د د	ommand : C02-> 9	SIGCON-> SET DO	MON TIME INT 😣
LMCSys FPS GAB C02 SERVO OFCSNT FECB SIGCON		Parameter	Parameter Value	valid/Range Value
LMC Name : 🔽 CO2 09-04-2019 21:27:09 :Command Successful	c	domonTimeInterval	10	-1 to 64
Frequently used commands       SET IF     set firstlo       set ofatten     set ifatten   SET sigcon				
set firstlo         SET IF         SET sigcon         set ifatten         set ofatten         SET MAINTENANCE           SET RESET         SET SHUTDOWN         SET DOMON TIME INTERVAL         DOMON         rebootfps				
SET WALSHPATERN SET WALSHFREQ SET NGFREQ NG	20	019/04/09 21:27:0 ommand forwade	08 :Command is v d to Device Server	alid
<u></u>	1 L	Reset Cle	ar E	xecute Cancel

- **10. rebootsrv :-** Boot Servo through MCM 0.
- 11. rebootfps : Boot FPS through MCM0

#### **12.SET WALSHPATTERN**



#### **13.SET WALSHFREQ**

Subsystem	Command :	C02-> SIGCON-> S	ET WALSHFRE 🔘
LMCSys   FPS   GAB C02   SERVO   OFCSNT   FECB SIGCON	Parameter	Parameter Value	valid/Range Value
LMC Name : 🔽 CO2	walshfreq		0,1,2,3
Frequently used commands       SET IF     set firstlo       set ofatten     set ifatten			
set firstlo         SET IF         SET sigcon         set ifatten         set ofatten         SET MAINTENANCE           SET RESET         SET SHUTDOWN         SET DOMON TIME INTERVAL         DOMON         rebootfry         rebootfps			
SET WALSHPATERN SET WALSHFREQ SET NGFREQ NG	Reset	ClearEx	ecute Cancel

#### **14.SET NGFREQ**

Subsystem	Command :	C02-> SIGCON-> S	ET NGFREQ (on
LMCSys FPS GAB C02 SERVO OFCSNT FECB SIGCON	Parameter	Parameter Value	valid/Range Value
LMC Name : 0 C02	noisefreq	0	0,1,2,3
Frequently used commands			
SET IF set firstlo set ofatten set ifatten SET sigcon			
set firstlo SET IF SET sigcon set ifatten set ofatten SET MAINTENANCE			
SET RESET         SET SHUTDOWN         SET DOMON TIME INTERVAL         DOMON         rebootsrv         rebootfps			
SET WALSHPATERN SET WALSHFREQ SET NGFREQ NG			

#### 15. WALSH PATTERN & WALSH Frequency Settings

#### Note: set using GUI.

8					Subsy	stem Anten	na LMC				_ D X	Command : C		
FECB	FPS	OFCSN	SIGCON	SERVO	GAB	LMCSys						Parameter	Parameter Value	valid/Range Value
Antenn	ae							No. of Ar	tenna: 29	Select All	Filter	walshpattern		0,1,2,3,4,5,6,7
	00	C01	C02	<b>C04</b>	COS	C06	C08	C09	C10	C11		walshseq		0,1
C	12	C13	C14	E02	E03	E04	E05	E06	S01	S02				
S	03	504	<b>S06</b>	W01	W02	W03	W04	W05	- W06					
Freque	ntly u NALSI	i <mark>sed com</mark> r	nands											
Freque SET_V DO	NALS	HPATERN	nands NG R	EBOOTFP	SET IF	BOOTSRV	RESET	RF C	M_SW	SET OFATTEN	Â			
Freque SET_V DO SET SET	ntly u WALSI MON DOM	ISEC COMP HPATERN ON TIME T SET	NG R SET FIRS	EBOOTFP TLO	SET IF	SET IFA	RESET	RF C	M_SW ENANCE ET_WALSH	SET OFATTEN	) () ()			

>walshpatern <walshpattern> <walshseq>

where "walshpattern" :0 - WalshOff,

- :1 CH1=Cal1 & CH2=WalshOff,
- :2 CH1=WalshOff & CH2=Cal32
- :3 CH1=Cal1 & CH2=Cal32,
- :4 Cal1,
- :5 Cal32
- :6 CH1:Basic & CH2=WalshOff,
- : 7 CH1=Walsh Off & CH2=Basic

"walshseq" : 0 - OFF , : 1 - ON

#### 16.NG

Subsystem	1X Command : C02-> SIGCON-> NG (or			
LMCSys FPS GAB C02 SERVO OFCSNT FECB SIGCON	Parameter	Parameter Value	valid/Range Value	
LMC Name : [7 C02	fe_ngcycle		0,25,50,100	
Frequently used commands       SET IF       set firstlo       set ofatten       SET sigcon				
set firstlo         SET IF         SET sigcon         set ifatten         set ofatten         SET MAINTENANCE           SET RESET         SET SHUTDOWN         SET DOMON TIME INTERVAL         DOMON         rebootsrv         rebootfps				
SET WALSHPATERN SET WALSHFREQ SET NGFREQ NG	Reset	Clear E	xecute Cancel	

# 5.6 How To Start DAS chain (GSB/GWB)

Go To TGC GUI Select "Control" Menu Select "BackEnd" Submenu

Select "Correlator Control" 📥 Click on "BackEnd Initialization" tab

Click "Backend Selection" Select "CorrSetup " Cmd with its input value.

- 1. Click on "Backend Initialisation" tab.
- 2. Set GSB and GWB Parameters.

ckend initializatio	n Backend projects		
			SaveLoa
GSB Parameter	rs:	GWB Paramete	es:
Mode	REALTIME *	Mode	REALTIME
	-	LTA Integration	4 -
LTA Integration	8	Gain Eq	ON <u>-</u>
Gain Eq	1 -	Stokes Params	TOTAL INTENSITY _
Stokes Params		Acquisition B/W	200 <u>•</u> MH2
Stokes Fardins		Final B/W	1 MH:
Acquisition B/W	32 • MHz	Edge frequency	1 .
Final B/W	0 MHz	Channels	Min Max Incr 0 2048 1
Edge frequency	• •	Beam1	OFF Time Res 1 •
Channels	Min Max Incr 0 2 512 1 2	Beam2 Beam3	OFF         •         Time Res         1         •           OFF         •         Time Res         1         •
Beam1	OFF Time Res 60 T	Beam4	OFF Time Res 1 •
Beam2	OFF • Time Res 60 •	DDC Set Freq. CTRI	OFF ·
		RF Filtering	OFF .
BB_LO	149-156	Beam Integ	8
CD Mode	OFF *	Beam Steering	OFF ·
Hosts	gsbm1_shivneri *	Hosts	gwbh6_shivneri -
GSB Control		GWB Control	ONLINE
dob control		Fstop	ON -
Fstop	ON		
Backend Selecti	on: 🔾 GSB 🔾 GWB 💿 Both		Antennas-Hosts Conf

3. Set AntMask, BandMask and CorrMask and GSB/GWB Servers using Antenna-Host Config Button . Click Ok to Set.

Í	Antenna Selection (on cmsserver)								×	
Antenna For	r AntMask	c								Select All
<b>⊘ C00</b>	<b>⊡ C01</b>	<b>√ C02</b>	<b>✓ C03</b>	<b>√ C04</b>	🗹 C05	<b>∀ C06</b>	<b>√ C08</b>	<b>⊘ C09</b>	🗹 C10	
✓ C11	🗹 C12	✓ C13	<b>√</b> C14	<b>√</b> E02	<b>✓ E03</b>	<b>✓ E04</b>	✓ E05	<b>✓ E06</b>	<b>√</b> S01	
<b>√</b> S02	<b>√ S03</b>	<b>√</b> S04	<b>√ S06</b>	<b>∀ W01</b>	<b>∀ W02</b>	<b>₩03</b>	<b>∀ W04</b>	<b>∀ W05</b>	<b>∀ W06</b>	
C20	🗌 E01									
Band Mask:	USB	•								
Corr Mask:	CorrCTL	L1	•							
CCD C										-
USB Serv	vers:	DMA	-			NB Servers	:			
IFR Serv		DM4				k server:	GWBHO			
BM1 Ser	ver: NO	DE 33			BN	A1 Server:	gwbh7			
BM2 Ser	ver: NO	DE 34			BN	A2 Server:	gwbh8	•		
					BN	43 Server:	gwbh9	•		
					BN	44 Server:	gwbh10	·		•
1									ок	Cancel

4. Band Mask : should be set to always "USB" for GSB ,GWB or both GSB and GWB.

5. Click the CorrSetup Button.

□To Start GSB Das Chain in Release Mode.
> ssh -Y observer@astro8
> cd /home/observer/bin/released
>./ifr_dasconsole
=> use Start menu to Start all window
=> kill sockemd
□To Start GWB Das Chain Release Mode.
> ssh -Y observer@astro8
> cd /home/observer/bin/gwb-release
> /gwbcorr
=> use Start menu to Start all window => kill sockcmd Window.

6. Click to start the ACQ programme in **GSB AND/OR GWB ifr\_dasconsole** window and wait till it reaches at ready for init for gsb.

- 7. Start Collect for Both GSB and GWB.
- 8. Click on the init button for Backend Initialisation to init Both GSB AND/OR GWB.
- 9. Wait for Minutes Pulse Trigger in GSB.
- 10. Enter Project Code, Project Title, Project Observer.

					-	Backend C	ontrol - C	orrelator				
ckend initia	alization Ba	kend proj	ects									
MRT Array :												Select Al
C00	Z C01 S C	2 🕑 CO	03 🞯 CO	4 🕑 CO5	i 👿 coe	5 🛛 🕑 C08	C09		LO			
C11	C12 C12	13 🕑 C1	14 🕑 E02	2 🕑 E03	E04	E05	E06	1 S	1			
S02	🖌 503 🛛 🐼 50	14 🕑 S0	96 🕑 W0	1 🕑 WO	2 😿 WO	3 😿 W04	s 🐷 wo	w 🕑 🛛	06			
C20	E01											
reate New	Project											Delete Delete Forcefully
B Project I	Details:	GSB Runni	ing Project	s:			0 61	/B Proje	ct Details:	GWI	8 Running Projects	
	-	_					and the second second		_	_		
	-		Bac	kend Con	trol - Nev	v Project (	on cmsse	rver)			<u> </u>	
	Copy From	<u>.</u>								Retrie	eve	
	Antenna :								Select All	Filter		
	C00	🕑 C01	🗹 C02	C03	S C04	🕑 C05	🕑 C06	C08	C09	C10	78	
	S C11	C12	🗹 C13	🗹 C14	🗹 E02	E03	🗹 E04	<b>E</b> 05	🕑 E06	<b>S</b> 01	E.	
	S02	<b>S03</b>	<b>S</b> 04	<b>S</b> 06	🖌 W01	💕 W02	Sow 🔊	🕑 W04	💕 W05	🞯 W06		
	C20	E01										
	*Project Co	de :	NJS012									
	*Project Tit	le :	TEST									
	*Principal I	vestigato	r: njs									
	Project Detai	ls successfu	ully saved to	projectDet	ails.csv file	Both	( ÷)	ave	Add	Can	cel	
	1											

11. Start Project (add) for Both GSB and GWB.

To TGC GUI Select "Control" Menu	u Select "BackEnd" Subment
Select "Correlator Control" 🚞	Click on "BackEnd Project" tal
Select Antenna List 📥 Click on the C	reate New Project.

Jackend initialization Backend projects	
GMRT Array :	🧭 Select A
Ø C00 Ø C01 Ø C02 Ø C03 Ø C04 Ø C05 Ø C06 Ø C08 Ø C09 Ø C10	
C11 C12 C13 C14 C14 E02 C13 C14 E03 C14 E03 C14 E05 C E06 S0 501	
💕 502 😻 503 💕 504 💕 506 😻 W01 💕 W02 💕 W03 😻 W04 😻 W05 😻 W06	
C20 E01	
Create New Project	Delete Delete Forcefully
GSB Project Details: GSB Running Projects:	1 GWB Project Details: GWB Running Projects:
Project Code : 18Nj501 Project Title : gsb P. I. : gsb	Project Code : 18NjS02 Project Title : GWB P. I. : GWB
CO0 CO1 CO2 CO3 CO4 CO5 CO6 CO6 CO9 CO9 CO	CO0 CO1 CO2 CO3 CO4 CO5 CO6 CO8 CO9 CO9 CO
C11 C12 C13 C14 C602 C603 C604 C605 C606 C 501	C11 C12 C13 C14 E02 E03 E04 E05 E06 501
S02 503 504 S06 W01 W02 W03 W04 W05 W06	502 S03 S04 S06 W01 W02 W03 W04 W05 W06
10 Duringt Association	
12. Project Association	
To TGC GUI Select "Control" Me	enu 📫 Select" <b>Operation Control</b> " Subm
To TGC GUI Select "Control" Me	enu 📫 Select" <b>Operation Control</b> " Subm on " <b>BackEnd Project</b> " tab 🔂 Select <b>Ante</b> r
To TGC GUI Select "Control" Me Select "Data Control" Click of Click on Assign Project	enu 🛱 Select" <b>Operation Control</b> " Subm on " <b>BackEnd Project</b> " tab i Select <b>Ante</b> r
To TGC GUI Select "Control" Me Select "Data Control" Click of t Click on Assign Project	enu 🗭 Select" <b>Operation Control</b> " Subm on " <b>BackEnd Project</b> " tab 🕁 Select <b>Ante</b> r Ma

el	ect Project fo	r Association/Disas	sociation						
	Proje	ect Code	Proje	ect Title	Princ	ipal Investigat	or	GWB	÷
	18	NJS02	(	GWB GWB					
								Sub Allay 0	
								Associate	
								Disassociate	e
							1		
0	iect SubArray	Association & Anto	ennae Mask deta	ils			K		
1	SubArray	Operator	Project Code	Backend	Phase Center	Frequency	1		
i	Sub Array 0	Operator Station 4	18NJS01	GS8	(iii)	6	C00,C01,C	02,003,004,005.00	06,
	Sub Array 0	Operator Station 4	18NJS02	GWB	8		C00,C01,C	02,003,004,005,00	06,
	Sub Array o								
2	and king o								

# 13. Phase centre and Frequency parameter (tpa) settings.

Write Source name and Click on set source

Enter Frequency parameters and Click on Set freq

**Start Project** to start the Data aca Scan(DAS)

Use Stop Project to Stop DAS.

				Operati	on Control		
BAC Multi Subarray Data Control							
SB ç							Manage Ar
rr Control							
orrelator Project Details							Get Current Setting
SUBAC Operator	Backend	Proj Code	Proj Name	PhsCenter	FANT_MASK	Frequency	
Sub Array 4 Operator Station	4 GS8	N]5012	TEST	3C286	3ffff7ff	591 591 540 540 0 0 3 0 0 0 0 1	

# 6. Preparation for Observation

# 6.1 Source List

First "scp" the old source list given by the user to **192.168.70.2** machine and then using following steps one can convert old say "**src.list**" to "**src.csv**" format.

Note : before copy make sure that old src.list has to be run through "mksrclist" programme to correct any irregularity between SRCName,RA,DEC and epoch in terms of space if any and create new format source list using following steps..

- 1. login as cmcuser at 192.168.70.2
- 2. ssh -X cmcuser@cmsserver(192.168.70.2)
- 3. cd /data1/gtac/cmd/prjcode/date //sample directory structure/format
- 4. > conv\_csv.py src.list > src.csv // converting old src list to new csv format.

# 6.2 Command file conversion from obs.cmd to tgc.py :-

Simple command file script template is located in following area defalt area of TGC

>ssh -X cmcuser@cmsserver(192.168.70.2)

>/data1/gtac/cmd/prjcode/date/Int\_Loop\_cmd.py

First "scp" the gtac command file from astro@lenyadri or astro@ shivneri:/odisk/gta/cmc/prjcode/obs.cmd provided by the user to **192.168.70.2** machine and then using following steps one can convert old say "**obs.cmd**" to "**obs.py**" format.

- 1. login as cmcuser at 192.168.70.2
- 2. ssh -X cmcuser@cmsserver(192.168.70.2)
- 3. cd /data1/gtac/cmd/prjcode/date //sample directory structure/format
- 4. > /home/cmcuser/bin/conv\_cmd.py obs.cmd > obs.py // converting old .cmd file format to to new TGC working .py format. c) How to Start command(observation) File using script

# 7. How To Start Observation through Script using GUI.

# 7.1 Continuum Observation for Both GSB and GWB.

- **Step 1.** Rotate feed to desired frequency band.
- Step 2. Set RF,LO,IF, GAB,OFC => Refer "5. Antenna SubSystem Configuration"
- Step 3. Configure Correlator (GSB and GWB).
- Step 4. Start DAS chain
- Step 5. Set TPA
  - (1) GWB -Give TPA : Note for continuum obs DDCLO is zero (0 0)

Formula: RF1 RF2 +/-GABLO +/-GABLO DDCLO DDCLO 3/12

Default TPA for GWB							
Freq. Band	USB(3)	LSB(12)					
Band 5	1060 1060 1060 1060 0 0 3	1460 1460 -1460 -1460 0 0 12					
Band 4	550 550 550 550 0 0 3	950 950 -950 -950 0 0 12					
Band3	-	500 500 -500 -500 0 0 12					
Band2	100 100 100 100 0 0 3	300 300 -300 -300 0 0 12					

#### Note : Select GAB filter Bandwidth accordingly

(2) In case of GSB, the same as ONLINE shall be followed i.e. no change in TGC.

Default TPA for GSB							
Freq. Band	LSB(12)	USB(3)					
1420 MHz	1409 1409 1460 1460 51 51	-					
1390 MHz	-	1371 1371 1320 1320 51 51					
1280 MHz	-	1281 1281 1230 1230 51 51					
1170 Mhz	-	1151 1151 1100 1100 51 51					
725 MHz	-	591 591 540 540 51 51					
470 MHz	-	306 306 255 255 51 51					
150 MHz	156 156 218 218 62 62	-					

Step 5. Check fringe status and Start cmd file

# 7.2 Spectral Line Observation for Both GSB and GWB.

A. GSB

Step 0. Login as observer@astro8 machine

Setp 1.

Note : setup LO5 carefully.

a. login to bblo machine.

> ssh -X elab@bblo

> \*\*\*\*\*\*\* ( .elab123)

b. set lo5 using following cmd file.

> bbloset -a 61.4500

#### B. GWB

#### Step 0. Login as observer@astro8 machine.

>gwb\_tune.pl <LINE FREQ: MHz.> <GAB LO> <CHANNELs> <FINAL\_BW>

GAB LO : From 100MHz to 1500 MHz

CHANNELs: 1024/2048/4096/8192/16384

FINAL\_BW : 100/50/25/12.5/6.25/3.125/1.5625

Example :

> /home/observer/bin/gwb\_tune.pl 1420.4 1460 8192 12.5

Step 1. Rotate feed to desired frequency band.

Step 2. Set RF,LO,IF, GAB,OFC => Refer "5. Antenna SubSystem Configuration"

**Step 3.** Configure Correlator (GSB and GWB).

Step 4. Start a DAS chain. for both GSB and GWB.

Step 5. Use the following formulae to set TPA values for spectral mode.

In GWB give TPA for given project, as follows -

RF1 RF2 (+/-)GABLO (+/-)GABLO DDCLO DDCLO

Note : +sign is for the USB, and -sign is for LSB. and for GWB last 3/12 value doesn't matter.

#### In GSB give TPA for given project, as follows -

RF1 RF2 LO1 LO2 LO5 LO5 (3-USB/12-LSB).

\* Note that +sign is for the USB, and -sign is for LSB. Last 3/12 value Matters in GSB.

Step 6. Check fringe status and Start cmd file

#### 7.3 Pulsar Observation (beam configuration)

(a) Using the Control->backend->Correlator Control window, select the appropriate Bem configuration, and send the core config command.

(b) Using the Control->backend->Beam Control, configure the beam settings. Left pannel of IA/PA init and scan header parameters keep as it is for time being, only associate the projects.

(i) at the bottom, "Beam Selection" - select desired beam.

(ii) Send "beam-setup" command

(iii) Start the pulsar consoles - observer@astro8:/home/observer

> /home/observer/bin/released/gsb\_dasconsole-33-34

> /home/observer/bin/gwb-release/gwb\_psr\_das

> start all programs.

(iv) give "beam init" from the GUI.

(v) give "Beam start" (After sending this command, you need to restart GWB scan, otherwise only previously antennas will get add into the GAC and not selected under the currently associated project).

(vi) give "beam stop/start" and beam finish command as per the requirement.

#### 7.4 How to start/run command file using TGC GUI.

GUI <u>Select</u> "Control" Menu<u>Select</u>"Observation program" Submenu

Browse the observation script "Input Box" 📥 Click on "Upload" Button 📥

And Click on 🖙 "Validate" Butto Click on "Execute" to run the script.

Contraction of the second		Observation Program		
Menu ro	ogram File :			
/data1/gt	tac/cmd/poonam/36_	.095/band5/obs.py	Browse	Upload
19-04-201	19 07:55:44 : File uploa	aded Successfully as 14795858_o	obs.py	
Validate	Validation Complet	te: Script file is valid		
Abort	Pause			Execute
19-04-201 /opt/tang 19-04-201	19 07:55:48 : [Respons goworkspace/Central	se][Validation] : Validating script Node/Scripting/UploadBox/147	t 795858_obs.py for srcid	83e681df
'/opt/tan 19-04-201	goworkspace/Central 19 07:55:48 : [Respons	lNode/Scripting/UploadBox/147	795858_obs.py'	

You can Abort or Pause the running script and also check the status of running script using **Abort**, **Pause** and **Status** Button provided on the gui respectively.

# 8. Pointing Procedure (Grid, Cross and Self)

# 8.0 How to create pointing cmd file

1. Login to TGC Machine.

>cmcuser@cmsserver:~\$ gridpntg\_cmd\_create.py

Usage: gridpntg\_cmd\_create.py Source\_name Obs\_band (in MHz) track (outer/inner) <EL\_or\_AZ\_or\_Both> <No\_of\_grids> <Command\_file>

e.g > gridpntg\_cmd\_create.py 3C48 1390 outer both

2. launch cmd file from MNCScript Manager or through GUI for /data1/gtac/cmd/pntg/pointing.py

# 8.1 How to update/load Model Pointing offsets.

1. To Copy pointing offsets file login to cmsserver

> ssh -X cmcuser@cmsserver(192.168.70.2)

> password : \*\*\*\*.\*\*\*

2. Goto directory

>cd /opt/tangoworkspace/CentralNode/Configuration/CsvFiles/Pointing

3. Run the programme to copy offsets.

>./copy\_online\_offset.pl

4. Go to TGC GUI either using Super Operator or GUI running at workstation(AGN)

M&C GUI i Control Pointing

View	Contr	rol <u>M</u> or	nitor <u>U</u> tiliti	ies <u>R</u> ec	ent							
Qt						Pointi	ng					
Anter	nae								Sele	ct All Sui	b Array 0 🌐	Filter
	C00	C01	C02	C03	C04	C05	C06	C08	<b>C</b> 09	C10	1	8
	C11	C12	C13	C14	<b>X</b> (20)	E 602	E 603	E04	E COS	E 606		-
			CI3	C14	C20	EUZ	EU3	E04	EUS	E00		
	S01	S02	S03	S04	S06	W01	W02	W03	W04	W05		
Pointi	na Proc	oduro :										Execute
Former	ing Proc	edure.									Type	command manually
Pointi	ng Com	mand Ref	erence		Console			Detailed	Resp.		100%	
GRID	POINTIN	NG			06-03-2019	17:05:42: [Com	nand) (SET /		Valid comman	d Command	forwarded to	Device Server
SCAN	POINTI	NG			06-03-2019	uo-u3-zu19 17/03/42 [Lommano] [SET_AZEL_CORK] Valid command. Lommand rorwaded to Device Server 06-03-2019 17/03/42 [Response] [AGN0] [SET_AZEL_CORR] [S03] SERVO:11:set_azel_corr is not allowed in DECONDECTED						
					06-03-2019 17:05:52 : [Response] [AGN0] [SET_AZEL_CORR] [W06] [E03] [C02] [E05] [W01] [E04] [S06] [C11] [C13] [C06] [C06] [C04] [W05] [C03] [E03] [E03] [S01] [S04] [W02] [E06] [C10] [S03] [C05] [W03] [C13]							
					[C14] [C01] [	W04] Comman	d Successful	,] [E02] [30 I]	[soul [mor] [	rool (cos) (c	10] [302] [00.	51[1105][Cit]
Data	Recordi	na :									A	alvsis Program
An	tennae	Offsets:							Browse	Save	e File	Jpdate Offset
		Antenn	ae Axis	(AZ)	Az-Offset	Axis(EL)			El	Offset		6
		C00	AZ		0.100	EL	0.000					
		C01	AZ	(	0.833	EL	0.217					
		C02	AZ	(	0.033	EL	-0.017					
		C03	AZ	(	0.517	EL	0.000					
		C04	AZ	1	0.517	EL	0.283					
		C05	AZ		0.017	EL	-0.050					

06.03.3010.17:0E:43 - [Command] [CDV] [MOE] [CEDUO] [CET ATEL CODD] command exclused

5. Click on the Browse button

>/opt/tangoworkspace/CentralNode/Configuration/CsvFiles/Pointing/el\_offset.cs

6. click **open** or **double click** to load and check table values get updated.

 $\verb+/opt/tangoworkspace/CentralNode/Configuration/CsvFiles/Pointing/az_offset.csv$ 

- 7. select Antenne list (checkbox)
- 8. click on **update offset** button to load offsets to antennas.

Anten	nae Offsets:				Browse	Save File	Update Offset	
	Antennae	Axis(AZ)	Az-Offset	Axis(EL)	1	El-Ol	ffset	L.
<b>V</b>	C00	AZ	-0.100	EL	0.000			
	C01	AZ	0.833	EL	0.217			
	C02	AZ	0.033	EL	-0.017			
	C03	AZ	0.517	EL	0.000			
	C04	AZ	-0.517	EL	0.283			
	COS	AZ	-0.017	EL	-0.050			

# 8.2 How to calculate Pointing offsets :-

**Option 1: Using TGC GUI :-**

M&C GUI  $\implies$  Control  $\implies$  Pointing

>Grid Pointing :- grid\_pointing < source\_name > < corr\_backend > < Axis > < track\_mode > < min\_offset > < spacing > < points > < record\_time > < subarray\_id >

>grid\_pointing 3C48 GSB BOTH 1 -28 7 9 85 0 ------ For Example L Band

Freq. Band	Good Point Calibrato r	Corr Backend GSB/ GWB/ BOTH	Axis E/A/ B	track_ mode inner(0 ) outer(1 )	minimu m offsets	spacing	poi nts	record _time	Subar
Band 3	3C48	GSB	Ε	1	-68	17	9	48	0
Band 4	3C286	GWB	Α	0	-44	11	9	48	0
Band 5	3C147	вотн	E/A	1	-28	7	9	48	0

#### 

Qt				Po	ointing					X
Antennae						V	Select Al	l Sub Ar	ray 0 📩	Filter
<b>⊘ C00</b>	<b>☑</b> C01	<b>√</b> C02	<b>✓ C03</b>	<b>☑</b> C04	✓ C05	<b>✓ C06</b>	<b>⊘ C08</b>	<b>∀ C09</b>	<b>√</b> C10	*
✓ C11	✓ C12	🗹 C13	🗹 C14	🗹 E02	<b>✓ E03</b>	🗹 E04	🗹 E05	🗹 E06	<b>√</b> S01	
<b>√</b> S02	<b>√</b> S03	<b>√</b> S04	<b>√</b> S06	<b>∀</b> W01	🗹 W02	<b>√</b> W03	<b>₩04</b>	🗹 W05	<b>₩06</b>	-
hint : grid < record_	_pointing < time > < su	source_na	ame > < co	rr_backend	> < Axis > <	track_mod	le > < min_	offset > < :	spacing > <	points >
Pointing C	ommand R	eference		Console 🗸 Detailed Resp. 🚺 0%					0%	
and the second se			27							
GRID POI										

#### **Option 2: Using Observation Program**

GUI 🖾 Select "Control" Menu	Select"Observation program" Submenu
Browse the pointing script $\implies$	Click on "Upload"Button
And Click on 📥 "Validate" Buttor	$\square \Longrightarrow$ Click on "Execute" to run the script.

- 1. /opt/tangoworkspace/CentralNode/Scripting/UploadBox/pointing\_gsb.py
- 2. /opt/tangoworkspace/CentralNode/Scripting/UploadBox/pointing\_gwb.py
- 3. /opt/tangoworkspace/CentralNode/Scripting/UploadBox/pointing\_both.py

Note : Make relevant changes in source name and track and freq.

# 8.3 Pointing data Analysis and apply to Antennas

a. Pointing data Analysis :-

> ssh -X observer@oper2: /odisk/online1/pointing

>mkdir "DDMMYY" e.g mkdir 10oct2019.

>/home/observer/bin/pntg.pl -f /rawdata/2feb/test.lta -c 20 -C 150 -a both -r C09

b. Update or Load pointing offsets to antenna using section 8.1 (Steps 1 to 8)

# 8.4 How to Use pointing model (use pointing)

c. pointing model

Go to GUI \_\_\_\_ Select "Control" Menu\_\_\_\_ Select "Expert Console" Submenu\_\_\_\_

Select "LMCs" tab 📖 Select All antennas 🦳 > Click on " Servo " Subsystei

Command Terminal : Use pointing 1 and Click execute

# 9. Power Equalisation

# 9.1. GSB Power Equalisation

#### Step 1 : Login to machine.

> ssh -X <u>cmcuser@cmsserver(192.168.70.2)</u>

#### > cd /home/cmcuser/bin/

> ./gsb_peq	// This will oper	n External Power e	eq GUI from	gsbm4 Machine
-------------	-------------------	--------------------	-------------	---------------

COO CO1	C01 C02		C03		C04		C05		C06		C08		C09		C10		C11		C12		C13	3	C14		S01					
ANTENNA																														
ATTEN P1	20	*	24	*	24	*	24	*	24	*	24	*	20	*	22	*	20	*	18	*	18	*	18	*	20		20	*	20	1414
GAIN P1	11.0	*	4.0	*	4.0	*	4.0	*	4.0	*	4.0	*	14.0	*	10.0	*	14.0	*	14.0	*	14.0	*	13.0	*	12.0	*	12.0	*	12.0	
ATTEN P2	18	*	24	*	24	*	24	*	24	*	24	*	22	*	22	*	20	*	18	*	20	4	22	4	18		20	++	22	4
GAIN P2	14.0	*	4.0	*	4.0	*	4.0	4	4.0	*	4.0	*	8.0	*	9.0	4	13.0	*	14.0	*	13.0	4	12.0	4	13.0	*	12.0	4	12.0	414
	502		503		504		<b>S06</b>		E02		E03		E04		E05		E06		W01		W02		W03		W04		W05		W06	
ANTENNA																														
ATTEN P1	22	*	20	*	18	*	20	*	20	*	20	*	24	*	24	*	18	*	24	*	24	*	24	*	26	*	20	*	18	* *
GAIN P1	11.0	*	14.0	*	13.0	*	12.0	*	12.0	-	11.0	*	4.0	*	4.0	*	14.0	*	4.0	*	4.0	4	4.0	*	8.0		12.0	*	14.0	4 4
ATTEN P2	22	*	20	*	20	*	20	4	20	*	22	*	24	*	24	*	20	*	24	*	24	*	24	*	26	*	18	*	18	4 4
GAIN P2	12.0	*	14.0	*	13.0		11.0	4	13.0	*	9.0	*	4.0	*	4.0	*	13.0	*	4.0	*	4.0	*	4.0	*	8.0	*	14.0		14.0	4
#### Step 2: Set power eq level, channel range and Click power eq button.

#### Step 3: Open MNCScriptManager

> launch\_script ('/opt/tangoworkspace/CentralNode/Scripting/UploadBox/ifpowereq.py')

// this loads IF attenuations and gains to antennas

Step 4: Open dasmon.pl on gsbm4 machine & monitor bandmon the power level.

Step 5: Repeat step 2 and 3 till the power level equalizes to optimum level 120 counts.

## 9.2. GWB Power Equalisation

#### A. Option 1: Using TGC GUI :-

Step 1: Login to machine cmcuser@192.168.70.2

**Step 2**: Open Power GWB power eq GUI.

GoTo TGCGUI Select"Control"Menu Select "TuneReceiver"Submenu

 $\Rightarrow$  Select "Power Equalization"  $\Rightarrow$  Select inputs  $\Rightarrow$  click equalise

			Pov	ver Equalisa	tion Config	uration				
ntennae:	🗌 Actual \	/alue				🗹 Sel	ect All Se	elect SubArra	ay 🛊	Load
S C00	🗹 C01	S C02	🗹 С03	👿 C04	🗹 C05	🗹 C06	<b>C</b> 08	🕑 С09	👿 C10	
12.0	12.0 🗘	12.0 🗘	12.0 📮	12.0 🗘	12.0 🗘	12.0 🗘	12.0 🗘	12.0	12.0 🗘	
12.0	12.0 🗘	12.0	12.0 🗘	12.0 🗘	12.0	12.0 🗘	12.0 🗘	12.0	12.0 🗘	
🗹 C11	👿 C12	🗹 C13	🗹 C14	<b>C20</b>	<b>E02</b>	<b>E03</b>	<b>E04</b>	<b>E05</b>	<b>E06</b>	
12.0	12.0 🗘	12.0 🗘	12.0 🗘	12.0	12.0 🗘	12.0 🗘	12.0 🗘	12.0	12.0	
12.0	12.0	12.0	12.0	12.0	12.0 🜲	12.0	12.0	12.0	12.0	
S01	S02	S03	S04	S06	<b>W01</b>	<b>W02</b>	<b>W03</b>	<b>W04</b>	<b>W05</b>	
12.0 🗘	12.0 🗘	12.0	12.0	12.0 🗘	12.0 🗘	12.0 🗘	12.0 🗘	12.0 🜲	12.0 🗘	
12.0 🗘	12.0	12.0 🗘	12.0	12.0 🗘	12.0 🗘	12.0 🗘	12.0 🗘	12.0	12.0	
Reference P	oint : gwb		No. of Ite	ration :	1	:	O Bandv	vidth :	200	
Set Point :	gab	;	No. of Int	egration :	1	\$	-	Begining	: 250	
Threshold :	20		Power Le	vel:	120		(  Chann	End :	900	
tatus Mess	age:							Ch Se	ange Attn v lected Ante	alue fo
								A+	to Ch2+	2.0
								AL	LILLIZ .	20
								AL	ur chz.	2.0 ,
									Apply	2.0 ,
									Apply	2.0

Note : In GWB power equalise reads GWB Total output Power and algorithm set at GAB Attenuations.

Step 3 : before power eq start please Enable datamon for GWB.

M&C GUI 📥 Con	ntrol 📫 Expert Ta	ab 📫 digital backer	nd 🖙 GWB 🖙
---------------	-------------------	---------------------	------------

DATASERVER => enadatamon <PRJCODE> 5 1'

Step 4: Open monitoring window Bandplot

M&C GUI  $\implies$  Monitor-  $\implies$  bandplot  $\implies$  GWB

Note : 'datatime' stamp should be updating it means data is coming !! and also Use filter settings : select relevant project code and log scale for bandmon.

Step 5 : Change all attunations to default value 12.0,12.0 and Click apply

Step 4 : Set reference point at "gwb"setpoint at "gab"Threshold at "10 or 20", set No. iteration "1", No. of Integration "1", Power level "120" and Channel 250 to 900.

**Step 5** : Select relevant SubArray

Step 6 : Click on the power eq button.

Step 7 : Repeat step 7 till the power level equalizes to optimum level 120 counts.

#### B. Option 2: Using External Power eq. GUI :-

#### Step 1 : Login to machine.

- > ssh -X <u>cmcuser@cmsserver(192.168.70.2)</u>
- > cd /home/cmcuser/bin/

>./gwb\_peq // This will open External Power eq GUI from gwbh6 Machine



#### Step 2: Set power eq level, channel range and Click power eq button.

#### Step 3: Open MNCScriptManager

> launch\_script ('/opt/tangoworkspace/CentralNode/Scripting/UploadBox/gwbpowereq.py')

 ${\it //}$  this loads gab attenuations and gains to antennas

Step 4: Open dasmon.pl on gwbh6 machine & monitor bandmon the power level.

Step 5: Repeat step 2 and 3 till the power level equalize to optimum level 120 counts.

## 9.3. 30 to1 Power Equalisation

A. Option 1

#### Step 1 : Login to machine

>ssh -X <u>cmcuser@cmsserver(192.168.70.2)</u>

>cd /home/cmcuser/bin/

> ./ifpeq.sh 0 CYGA 325 32 # This is first Iteration

Usage : ./ifpeq.sh ITERATION SOURCE FREQUENCY IF-BW ITERATION = 0 (for First) and 1 (for Intertative/repeating) SOURCE = VIRGOA/CYGA/CASA/CRAB/NG/\* FREQUENCY = 150/235/325/610/1060/1170/1280/1390/1420/\* IF-BW = 6/16/32 MHz

- Step 2: Set iteration number, Source Name, Frequency and Bandwidth.
- Step 3: Open MNCScriptManager

> launch\_script ('/opt/tangoworkspace/CentralNode/Scripting/UploadBox/ofmpeq.py')

// this IF attenuations and gains to antennas

#### Step 4: Repeat two Iteration by setting Iteration flag to 1

> ./ifpeq.sh 1 CYGA 325 32

#### B. Option 2

[observer@oper2 ~]\$ mkdeflcmd\_ofm.pl -h

USAGE : /home/observer/bin/mkdeflcmd\_ofm.pl <source> <frequency> <bw> <online> <track> <flag-ants>

Example : /home/observer/bin/mkdeflcmd\_ofm.pl casa 610 32 shivneri outer "C05,E03,W02,S01"

**ONLINE : shivneri/lenyadri/tgc** 

#### FOR ONLINE:

- 1. Please run /ifpeq0 for 0th Iteration from userX window.
- 2. "run ofmpeq" 3times from userX.
- 3. Please run /ifpeq1 for 1st/successive Iteration from userX window.
- 4. "run ofmpeq" 3times from userX.

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 <u>cmcuser@cmsserver(192.168.70.2)</u>
- > cd ~/bin

> cd /home/cmcuser/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 <u>cmcuser@cmsserver(192.168.70.2)</u>

 $> cd \sim /bin$ 

> ./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 cmcuser@cmsserver(192.168.70.2)

>password : \*\*\*\*.\*\*\*

>MNCScriptManager // Script terminal like User

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

#### >MNCScriptManager Enter

1:AGN1

2:AGN2

3: AGN3

4: AGN4

5: AGN5

6 : AGN6

Scripting hosts configured:

// Select AGN form 1 to 5 only.

// only for Engineers can log in

// Operator is not allowed to login at agn6

// only Super Operator has Access to

7	:	CPX

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 subarry

- 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	<ul><li>✤ fpsboot 'c01,c02'</li><li>♦ fpsboot 'c01'</li></ul>
2.	initfps	To Initialize FPS Subsystem after reset.	<ul><li>initfps 'c01'</li><li>initfps 0</li></ul>
3.	ldfpspos	To Load fps old encoder counts and new absolute encoders counts.	<ul> <li>♦ ldfpspos( 'c01')</li> <li>♦ ldfpspos 0 (subarray id)</li> </ul>
4.	runclbrt	To Calibrate FPS ( Valid for old FPS)	<ul><li>✤ runclbrt 'c02'</li><li>♦ runclbrt 0</li></ul>
5.	mvfps150 mvfps325 mvfps610 mvfps1420	To mvfps to the frequency band2,band3,band4 and band5.	<ul> <li>mvfps150 'c01'</li> <li>mvfps150(0)</li> <li>mvfps325</li> <li>mvfps610(0)</li> <li>mvfps1420(0)</li> </ul>

0.	fpsrst	To Boot/reset FPS S	ystem
ron	t End Settin	gs	
) Set	URF Sys		
>MN	ICGMRTScriptMa	anager[12] :	
>set	turfsys(subar/a	ntname,rf_ch1, rf_ch2, rf_swa	ap,sol_atten_ch1,sol_atten_ch2,
fe_n	igcal,		fe_walsh_sw,fe_walsh_gr
fe_n	gcycle,rfcm_sw,	setwalsh,walshfreq,noisefreq	)
>set	urfsys(0,'725','7	25',0,0,0,0,0,0,0,0,0,0,0)	// default 610 Mhz setup
whe	re,		
1.ba	and_select_ch1	and ch2 :-	
150, 20	,190,235,290,32	5,350,410,470,600,610,685,7	25,770,850,1060,1170,1280,1390,1
2 r	f_swap val = 0	,1;	
3. s	sol_atten_ch1	<b>val =</b> 0,14,30,44,-1,1;	
4. s	sol_atten_ch2	<b>val =</b> 0,14,30,44,-1,1;	
5. f	fe_ngcal val =	-1,0,1,2,3;	
6 1	fe_walsh_sw v	<b>al =</b> 0,1;	
0.1	fe walsh grn=	= 0,1;	
7. 1	ie_waisii_grp		
7. f 8. f	fe_ngcycle val	= 0,25,50,100;	

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)

Operation

set\_cbterm('c02')

```
Tango based GMRT Control and monitor system (TGC)
                  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)
   q) 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)

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

 $\label{eq:mncgmrtscriptManager[12]:set_gabconf__<lo_freq_Ch1> <lo_freq_Ch2> <attn_Ch1> <attn_ch2><i/p_mode1_Ch1><i/p_mode1_Ch2><mixer/direct_path_Ch1><mixer/direct_path_Ch2><i/p_mode2_Ch1><i/p_mode2_Ch2><filter_RF_Ch1><filter_RF_Ch2><LPF_freq_Ch1> <<LPF_freq_Ch2> <Spare_Ch1> <Spare_Ch2> <$ 

>set\_gab('C02',,550000,550000,12,12,0,0,0,0,0,0,3,3,200,200,0,0)

>set\_gab(0,550000,550000,12,12,0,0,0,0,0,3,3,200,200,0,0)

// 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

Manual

carefully update GSB LO5 GSB\_BB\_LO,149000000.0:156000000.0

>MNCGMRTScriptManager[12]:corr\_setup('BOTH','/opt/tangoworkspace/CentralNode/Configu ration/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/Configura tion/CsvFiles/correlator/prjcode\_date.csv')

c) Create Project

>MNCGMRTScriptManager[12] : create\_proj('BOTH','TEST',<mark>'3ffffffff</mark>,'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** 

Q	t	Antenna Mask Generator									DX)
G	MRT Arra	y:								Selec	t All
	<b>☑ C00</b>	<b>⊘ C01</b>	<b>⊡ C02</b>	✓ C03	<b>⊡ C04</b>	✓ C05	<b>⊡ C06</b>	<b>⊡ C08</b>	<b>⊡ C09</b>	<b>⊡ C10</b>	
	<b>⊡ C</b> 11	✓ C12	✓ C13	<b>⊡</b> C14	✓ E02	✓ E03	<b>⊽ E04</b>	🗌 E05	🗌 E06	S01	
	<b>√ S02</b>	<b>√ S03</b>	<b>√</b> S04	<b>√ 506</b>	<b>∀ W01</b>	<b>∀ W02</b>	<b>∀ W03</b>	<b>∀ W04</b>	<b>∀ W05</b>	<b>∀ W06</b>	
	🗆 C20	🗌 E01									
	Bff1ffff									ienerate M	ask

#### 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') GWB.	//	add source to

#### 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)
 OR

#### 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')

## 12. Troubleshooting

## 12.0 Unable to login TGC // allowed maximum instances exceeded

If the maximum number of allowed users exceeds a certain number then it can be clear all login sessions using the following steps.

Step 1: login to CMC machine.

> ssh -X cmcuser@192.168.70.2

Step 2: run the script to clear login session from AGN

>cd /home/cmcuser/bin

>./remove\_user\_login.py AGN0

>./remove\_user\_login.py AGN1

>./remove\_user\_login.py AGN2

### Removes users from Super user
### Removes users from AGN1
### Removes users from AGN2

>./remove\_user\_login.py AGN3
>./remove\_user\_login.py AGN4
>./remove\_user\_login.py AGN5
Step 3: Now try to login TGC

### Removes users from AGN3
### Removes users from AGN4
### Removes users from AGN5

## 12.1 Antenna LMC system showing "disconnect" status

Step 0:- First Check the status of LMC by running the ping\_LMC.py script kept at the below location in cmsserver machine (192.168.70.2) as cmcuser

>ssh -X cmcuser@cmsserver(192.168.70.2

>cd utility\_scripts/Ping\_Python

>./python ping\_LMC.py

#### Step 1 :- login to ngmnc(192.168.70.21) as lmcuser

- > ssh -Y lmcuser@192.168.70.21 (ngmnc)
- > password :\*\*\*\*.\*\*\*
- > cd /usr/local/gmrtSys

#### Step 2 :- First fire the starter script using following command

>./lmc\_strtr.sh c00,c01,e02...etc // comma separated list of antenna

**Usage** : ./lmc\_strtr.sh or (antlmc,ceb,eant,want etc.)

Step 3: Select List of Antenna using Master Control window using Test\_Super\_Operator Login(Operator Station 0)

**TGC GUI** Select "Control" Menu Select "Master Control" SubMenu

Select "Antenna node" tab 📥 Click on "List of Antenna " to start/stop/restart

Click on button **to issue** Command (**also change mode**)

#### Step 4: To Monitor LMC Connecting status

**TGC GUI**  $\square$  Select "**View**" Menu $\square$  Select "**DashBoard**" SubMenu  $\square$ 

Select "CMC Status" tab 🗁 Click on "AGN "

		Mascer	Control		(		
IRT Status : NOT	OK IST:	22:43:24	Pa	rk All	HALT-Em	hergency	HALT-Norm
IC Mode : Man	ual Mode	Change Mode :	Auto			<u>L1</u>	AC-Antenna :
rvices							
Service	8	Status	D	escriptio	on	Dat	e/Time
Alarm		OK	Ala	arm serv	vice	22	:43:24
Archive	er	NOT OK	The l	ogger s	ervice	22	:43:24
Batch		OK	The Sc	ripting	service	22	:43:24
					start	Stop	Restar
de Instances	Antonn	Noda					
ggregation Node	Ancenna			Change	e Mode :	Local	Remote
Node		IP Address	1	Status		м	ode
C00		192.168.31.2		ОК		Rer	note
C01		192.168.32.2		ок		Rer	note
C02		192.168.33.2		OK		Ren	note
соз		192.168.34.2		OK		Ren	note
C04		192.168.35.2		ок		Rer	note
C05		192.168.36.2		OK		Rer	note
C06		192.168.37.2		ок		Ren	note
C08		192.168.38.2		NOTO	ĸ	Rer	note
C09		192.168.39.2		ок		Rer	note
C10		192.168.40.2		ок		Rer	note
C11		192.168.41.2		OK		Ren	note
C12		192.168.42.2		ок		Ren	note
C13		192.168.43.2		ок		Rer	note
C14		192.168.44.2		OK		Rer	note
C20		192.168.70.21		OK		Lo	ocal
E02		192.168.45.2		ок		Rer	note
		192.168.46.2		ок		Ren	note
E03							
E03 E04		192.168.47.2		ок		Rer	note

## 12.2 Antenna's not tracking to the Source.

First ensure that all Servo IO-DS are connected ?

a. If Servo is disconnected:-login to servo pc104 using root@192.168.x.3 machine.

#### >cd deviceClient0.5/

>sh ./stop\_client.sh

&

> sh ./start\_client.sh

- b. If Servo is communicating:- Check whether it is in manual mode?
- c. Try Restarting BATH programme of Non tracking LMC.

For Example:

lmcuser@c01:/opt/tangoworkspace/ControlNode/Utility/starterDsScripts\$./BATCH

Note : At present array\_status give last status, if servo/LMC is not communicating.

- (i) Check servo of that LMC is up.
- (ii)Give command "dsrestart BATCH" to LMCsys in expert console.

## 12.3 How to Restart GSB or GWB dataserver ds if corrconfig fails

To TGC GUI Select "Control" Menu Select "Expert Console" Submenu

"Digital Backend" tab i Select "GSB or GWB" radio button Select "CLMCSys"

"GWBSys" Sub system Select "dsrestart" Cmd with its argument as "dataserver"

Click "Execute" Button Select "dsrestart" Cmd with its argument as "dataserver"

#### 12.4 Correlator DS shows Disconnected Status.

Operation

Note : Disconnected status means the 'Client' program is not communicating to the Sub-system Tango device-server.

To Start Simulated DS clients login to the GSB LMC and GWB LMC. First Make sure that GSB, GWB All IOs are communicating (OK status in dashboard) If Disconnected Then only start it.

```
a) GSB
```

```
> ssh -X gsbuser@gsbm1
> ****.***
> cd /home/gsbuser/lmcuser/bin
> launch.sh * No argument = will start both corrct11 and collect.
```

or

> launch.sh corrctl1 (this starts collect client on gsbm1 machine) &

> launch.sh collect (this starts collect client on gsbm4 machine)

b) GSB (BEAM Clients)

> ssh gsbuser@gsbm1:/mnt/code/gsbuser/lmcuser//bin/launch.sh <node1> <node2> e.g. 33 34 or 47 48

c) GWB

> ssh gpuuser@gwbh6:/home/gpuuser/lmcuser/bin/launch.sh corrctl1
> ssh gpuuser@gwbh6:/home/gpuuser/lmcuser/bin/launch.sh collect

> gpuuser@gwbh6:/home/gpuuser/lmcuser/bin/launch.sh

<no argument both deviceclient starts>

d) GWB (BEAM Clients)

> gpuuser@ gwbh6 : /home/gpuuser/lmcuser/bin/beamlaunch.sh

## 12.5 Key Points to Remember

Make sure that no previous console-GUI running of GSB/GWB.

- 1. Sockcmd is not required.
- 2. Give Corr config commands whenever you open a new GUI.
- 3. Project code Limit is strictly Seven Character's only.
- 4. Project code characters should be **CAPITAL LETTERS** only.
- 5. Project code Handling for two corr/subarray at a time is in progress, command can be issued Sequentially.
- 6. USB band is always taken for the band-mask
- 7. In OperationControl->DataControl window addsource, setsource need for the subarray.
- 8. For Default catalog no need to give addsource.
- 9. Set Optical fiber Attenuations using SIGCON System only. time being, do not use OFC.

## **12.6 Present Constraints**

## 12.7 Power ON Miltech PC Remotely & Reset OFC

Step 1: Open respective antennae Rabbit MCM IP (192.168.xx.4) on any browser.



For C03 antenna , Open 192.168.34.4 IP in browser.It will show you below New MCM Monitoring Window page.

Step 2: Click on the button "<u>Click Here to set New MCM</u>".

	OF	C CONTROL PARAMETERS		
CH1 Attenuation	00 dB	CH2 Attenuation	00 dB	
	OFC	MONITORING PARAMETERS	,	
Parameters	LASER Tx1	LASER Tx2	LASER Tx3	LASER Tx4
DC Power (-5v)	-4.98 V	-4.91 V	-5.03 V	NC
RF Amp Voltage	5.032 V	4.958 V	5.038 V	NC
Bias Voltage 1	-0.96 V	-0.98 V	-2.84 V	NC
Bias Voltage 2	-2.80 V	-2.74 V	-0.91 V	NC
APC Voltage	0.750 V	0.834 V	0.523 V	NC
Bias Current	55.69 mA	53.45 mA	58.57 mA	NC
Optical O/P Power	9.499 dBm	9.320 dBm	9.718 dBm	NC
Temp.	16.69	NC	NC	NC
	SEN	TINEL SYSTEM PARAMETERS	;	
State	ΝΟΤ ΟΚ	Temp.	16.26	
Smoke Detector	1	Intruder Detector	1	
		Click Hara to SET New MCM		

# Step 3: After clicking on this button below New MCM Control window Page will open.

w 🗙 🚱 New MCM Control W	/indow × +	
e   192.168.34.4/MCM_Set.zhtn	ml	
	New MCM Control Window	
	IP : 192.168.34.4 Antenna : System : OFC	
	CH1 dB CH2 dB Submit	
	RFI Test	
	Spectrum Spreader       Choose SS ▼         Frequency Doubler       Choose FDB ▼         Frequency Divider       Choose FDV ▼	
	MILTEC REMOTE ON/OFF	
	Miltec Remote ON/OFF Choose ON/C V Submit	
	Network Setting	
	IP Address192.168.34.4PasswordSubnet Mask255.255.255.0Gateway Address192.168.34.1Submit	
	Designed @ Telemetry Lab - GMRT	

# Step 4: Select ON Command from Drop Down Menu to Remotely ON Miltec Machine.

S New MCM Monitoring Window × S New M	CM Control Window × +	- 0 ×
← → C ③ Not secure   192.168.34.4/M	CM_Set.zhtml	🖈 🛛 🖪 🗯 🍪 E
		^
	New MCM Control Window	
	IP:192.168.34.4 Antenna: System:OFC RESET	
	Set Attenuation	
	CH1 dB CH2 dB Submit	
	RFI Test	
	Spectrum Spreader Choose SS 🗸	
	Frequency Doubler Choose FDB 🗸	
	Frequency Divider Choose FDV 🗸 Submit	
	MILTEC REMOTE ON/OFF	
	Miltec Remote ON/OFF Choose ON/OI Submit Choose ON/OFF	
	On Off	
	Network Setting	
	TD Addross 192 168 34 4 Dessword	
	Subnet Mask 255 255 255 0	
H $\mathcal{P}$ Type here to search		へ Image: つう (14 PM) ENG 5:14 PM US 18-Aug-20 いい (14 PM) US 18-Aug-20 いいの (14 PM) (14

## Step 5: Click on the Submit button.

Tango based GMRT Control and monitor system (TGC)

## 12.8 All Miltech PCs Power ON-OFF

Following Shell Script is available to to power on and off Antenna Base Miltech PCs through ofcsnt Rabbit-Card.

Step 1: login to CMC machine.

> ssh -X cmcuser@192.168.70.2

Step 2: Run the script to Miltech PC ON

>~/bin/PCON.sh

Step 3: Run the script to Miltech PC OFF

> ~/bin/PCOFF.sh

## \*\* Start LMC Software if not Running :-

cmcuser@cmsserver (192.168.70.2): /opt/tangoworkspace/ControlNode/Utility/launch.sh

#### \*\* Stop LMC Software if not Running :-

cmcuser@cmsserver(192.168.70.2):/opt/tangoworkspace/ControlNode/Utility/gui.sh

## 12.9 if GWB ACQ getting Kill in (multi-subarray)

Sometimes acq-kill problems occur, although this problem is associated with allowed I/O budget, and modifications to multi-subarray functionality.

Before starting Multi sub array observation issue copy ms cmd.

> observer@shivneri:/>/home/observer/bin/copy\_ms2\_sw.pl

#### to Restore back :-

> observer@shivneri:/>more /home/observer/bin/restore\_def\_sw.pl

## 12.10 If only GWB Halted

If only GWB o gets halted ( or only one correlator halted) then initialize only one correlator, and re-associate the project code of "BOTH" and issue a fresh halt command.

## 12.11 Power fail and LMCs allocation and deallocation

Many times LMCs goes and come back, antenna allocation/deallocation to the AGN node (Operator Workstation) happens automatically, but this reallocation happens only when data acquisition scan isstopped. Therefore, whenever LMCs go and come back due to power-failure, please re-allocate that antenna manually whenever datascan gets stopped.

## 12.12 AGN hung Problem

Whenever, suddenly antenna based PC is not communicating (i.e. LMC is down) due to the electrical power failure or network problem, an audio alarm will be raised about "<Antenna> LMC down". Around this time, you will notice that the GUI is running very slowly, or got stuck (in this case, you can not login to the other GUI.

Restart the AGN by typing 'restartagn <1-5>' in the linux commad-terminal

Step 1: login to CMC machine.

```
> ssh -X cmcuser@192.168.70.2
```

Step 2: Restart the AGN

```
>restartagn 1
```

Operation

or

> restartagn 2

Note :

1. Above command will restart the given AGN<1-5>, it takes  $\sim 1$  min to restart. After that login to the GUI to verify everything is ok or not.

2. You do not need to restart the correlator, only re-start the observing script if it was running previously.

## 12.13 Authorisation error

If GSB/GWB gives authorisation error, just re-allocate ownership again to the given 'Operator station <id>' from the master-control by using 'manage\_pool'.

## 12.14 Cmcserver / GUI slow

'cmc' is slow due to 'mysqld' process taking continuously more cpu time, then kill OLD/stale GUI processes ('mainwindow.py').

>cmcuser@cmsserver:~\$ /home/cmcuser/bin/kill\_allGUI.sh

## 13.Annexure

## **A.Command File Templates**

a) Single Sub-array TGC Command file
#!/usr/bin/python
# import required libraries for TGC
# Do not remove following line
# For single subar observation default subar is 0

from tgcall import \*

# user code starts here# Any valid python syntax can be usedimport time

# addlist

add\_user\_catalog('/home/cmcuser/prjcode\_src\_list.csv','type1') use\_catalog('prjcode\_src\_list','type1')

# Define correlator to use for observation backend\_correlator = 'BOTH' # For GSB+GWB.

# psource\_added
psource\_added = list()

# Loop

while True:

# source : 3C286

target = '3C286'

load\_source(target)

print(target)

track\_array(0,1)# First argument is subar\_id and second argument is for outer and inner track, for outer it is 1 and for inner it is 0

 $track_array(0,1)$ 

if target in psource\_added:

pass

else:

 $addpsource(target, backend\_correlator)$ 

psource\_added.append(target)

set\_source(backend\_correlator,0,target)

gotosrc(0,maxtime=300) # maxtime is in seconds

start\_proj (backend\_correlator,0) # Strtndas

time.sleep(300) # recording time

stop\_proj (backend\_correlator,0) # Stpndas

# source : 1459+716
target = '1459+716'
load\_source(target)
print(target)
track\_array(0)

track\_array(0)

Operation

if target in psource\_added:

pass

else:

addpsource(target,backend\_correlator) psource\_added.append(target) addpsource(target,backend\_correlator) set\_source(backend\_correlator,0,target) gotosrc(0,maxtime=300) # maxtime is in seconds start\_proj (backend\_correlator,0) # Strtndas time.sleep(1800) # recording time stop\_proj (backend\_correlator,0) # Stpndas

## b) Muli Sub-array TGC Command file

#!/usr/bin/python

# import required libraries for TGC

# Do not remove following line

from tgcall import \*

import time

# user code starts here

# Any valid python code can be used

# addlist

add\_user\_catalog('/data1/gtac/cmd/prjcode/prjcode\_src\_list.csv','type1')
use\_catalog('prjcode\_src\_list','type1')

# 0 suba array will always have all antenna subar0 = 0 subar1 = 1 subar2 = 2 subar4 = 4

# define backend\_correlator correlator

backend\_correlator = 'BOTH' # BOTH/GWB/GSB

```
# psource_added
psource_added = list()
# Outer track / inner track
# track bit = 1
                  // 1 for outer track
# track bit = 0 // 0 for inner track
track_bit = 1
# Target source 1
target = '3C147' # source name
load_source(target)
print(target)
track_array(subar0,track_bit)
# for tracking one can use common subar i.e. suba array 0
gotosrc(0,maxtime=300) # maxtime is maximum time for time out in seconds
if target in psource_added:
   pass
else:
   addpsource(target,backend_correlator)
```

```
psource_added.append(target)
```

```
set_source(backend_correlator,subar2,target)#backend_correlator=BOTH/GSB/GWB
set_source(backend_correlator,subar4,target)#backend_correlator=BOTH/GSB/GWB
```

```
# start interferometer scan for subar 2
start_proj (backend_correlator,subar2) # subar2 is id
# start interferometer scan for subar 4
start_proj (backend_correlator,subar4) # subar4 id
time.sleep(60) # record time in seconds
# stop interferometer scan for subar 2
stop_proj (backend_correlator,subar2)
# stop interferometer scan for subar 4
```

stop\_proj (backend\_correlator,subar4)

# Target source 2

target = '3C48' # source name

load\_source(target)

print(target)

track\_array(subar0,track\_bit) # for tracking one can use common subar i.e. suba array 0

```
track_array(subar0,track_bit)
```

gotosrc(0,maxtime=300) # maxtime is maximum time for time out in seconds

if target in psource\_added:

pass

else:

addpsource(target,backend\_correlator)

psource\_added.append(target)

set\_source(backend\_correlator,subar2,target)#backend\_correlator= BOTH/GSB/GWB

set\_source(backend\_correlator,subar4,target)#backend\_correlator= BOTH/GSB/GWB

# start interferometer scan for subar 2

start\_proj (backend\_correlator,subar2) # subar2 is id

# start interferometer scan for subar 4

start\_proj (backend\_correlator,subar4) # subar4 id

# pulsar command can be added here

time.sleep(60) # record time in seconds

# pulsar command can be added here

# stop interferometer scan for subar 2

stop\_proj (backend\_correlator,subar2)

# stop interferometer scan for subar 4

stop\_proj (backend\_correlator,subar4)

Antenna Name	Host Name	LMC IP Address	Antenna Name	IP Phone Number
C00	c00	192.168.31.2	7	
C01	c01	192.168.32.2	6	
C02	c02	192.168.33.2	5	
C03	c03	192.168.34.2	1	
C04	c04	192.168.35.2	3	
C05	c05	192.168.36.2	19	
C06	c06	192.168.37.2	20	
C08	c08	192.168.38.2	24	
C09	c09	192.168.39.2	4	
C10	c10	192.168.40.2	12	
C11	c11	192.168.41.2	9	
C12	c12	192.168.42.2	2	
C13	c13	192.168.43.2	11	
C14	c14	192.168.44.2	10	
E02	e02	192.168.45.2	17	
E03	e03	192.168.46.2	18	
E04	e04	192.168.47.2	21	
E05	e05	192.168.48.2	22	
E06	e06	192.168.49.2	23	
S01	s01	192.168.50.2	26	
S02	s02	192.168.51.2	27	
S03	s03	192.168.52.2	28	
S04	s04	192.168.53.2	29	
S06	s06	192.168.54.2	30	
W01	w01	192.168.55.2	8	

# **B.** Antenna IP and Antenna IP Phone

W02	w02	192.168.56.2	12	
W03	w03	192.168.57.2	14	
W04	w04	192.168.58.2	15	
W05	w05	192.168.59.2	16	
W06	w06	192.168.60.2	25	

# 14. API List

Sr. No.	Name of API the Package (Method)	Help	Example
1.	set_local_mode	To Put lmcs to local mode	<ul> <li>set_local_mode 'gsb'</li> <li>set_local_mode('cant')</li> <li>set_local_mode(0)</li> <li>set_local_mode('c01,c02')</li> </ul>
2.	set_remote_mode	To Put lmcs to local mode	<ul> <li>set_remote_mode 'gsb'</li> <li>set_remote_mode('cant')</li> <li>set_remote_mode(0)</li> <li>set_remote_mode('c01,c02')</li> </ul>
3.	start_node	To Start Antenna(LMC)	<ul><li>start_node('gsb')</li><li>start_node('c01')</li></ul>
4.	restart_node	To restart antenna(LMC)	<ul><li>restart_node('gsb')</li><li>restart_node('c01')</li></ul>
5.	stop_node	To Stop Antenna(LMC)	<ul><li>stop_node('gsb')</li><li>stop_node('c01')</li></ul>
6.	halt_node	Halt normal / emergency LMC	<ul> <li>halt_node('gsb',mode='nor mal / emergency')</li> <li>halt_node('c01',mode='nor mal / emergency ')</li> <li>halt_node('agn1',mode='nor mal/emergency')</li> </ul>

7.	lmc	To get lmc obj	✤ lmc('C01')
8.	launch_script	To launch script	launch_script 'scriptpath'
9.	get_state	To get state of the host device server	♦ get_state 'agn1'
10	execute_command	To forward command for further processing	execute_command('C00','setLo cal')
11	get_node_child		
12	list_global_variable		
13	resume_script		
14	get_value		
15	status_script		
16	set_global_variable		
17	subscribe_to_attrib ute		
18	get_device_name		
19	get_mode		
20	schedule		
21	validate_script		
22	pause_script		
23	stop_script		
24	get_lst		
25	connect_to_host		
26	set_value		

Operation

27	set_host_ds_state'	
28	open_script	
29	connect_to_script_h ost	
30	command_schedule r'	
31	get_time	
32	'auth': ['switch_user', 'login', 'logout']	

'beamapi': ['beam\_stop',

'beam\_stop\_record',

'beam\_setup',

'get\_data',

'beam\_finish',

'beam\_start\_record',

'beam\_start',

'beam\_init'],

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'power\_equalise',

'ensure\_track',

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'set\_auto\_mode',

'gotosrc',

'zero\_phase',

'stop\_track\_array',

'track\_array',

'grid\_pointing',

'cmc',

'track\_off',

'delete\_array',

'set\_manual\_mode',

'abort\_power\_equalise',

'trkazoff',

'allocate\_operator\_array',

'list\_alias',

'list\_array',

'get\_opr\_array',

'get\_sub\_array',

'phase',

'create\_array',

'trkdecoff',

'create\_operator\_array',

'trkeloff',

'define\_group',

'list\_opr\_array',

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'delete\_operator\_array',

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'set\_alias'],

'corrapi': ['get\_data',

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'associate',

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'stop\_proj',
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'generate\_antenna\_mask',
'set\_source\_agn',
'init\_corr',
'del\_proj',

'create\_proj'],

#### 'fecb': ['sel\_febox',

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'setngstate',

'fecb',

'setwalsh',

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'set\_feterm',

'get\_fecb\_para',

'rfattn',

'sel\_ufebox',

'set\_ngoff',

'set\_fecb\_default',

'set\_walsh',

'setrfsys',

'setcbterm',

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'set\_ngon',

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'setrfngcal',

'setfeterm',

'set\_rfswap',

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### 'gab': ['set\_gab\_mixer',

'set\_gab\_lpf',

'set\_lpf',

'set\_gab\_lo',

'set\_conf',

'set\_gab\_conf',

'set\_gab\_attn',

'set\_lo',

'set\_mixer',

'gab'],

# 'helper': ['get\_db\_configuration',

'check\_grp',

'check\_user\_logged',

'hierarchy\_check',

'get\_secs',

'generate\_device\_name',

'get\_instance',

'search\_source',

'get\_project\_code',

'get\_src\_id',

'check\_subnode',

'list\_node\_level',

'list\_client\_logged\_user',

'list\_node\_commands',

'preprocess\_subnode',

'preprocess',

'wait',

'list\_node\_logged\_user',

'list\_command\_subnode\_name',

'get\_alias\_node',

'get\_node\_from\_opr',

'list\_attributes',

'list\_node\_attributes',

'list\_command\_node\_name',

'get\_api\_list',

'check\_arg\_count',

'list\_ds\_commands',

'get\_node\_from\_array'],

'ofcsnt': ['ofcsnt', 'get\_of\_attn', 'get\_attn', 'set\_of\_attn', 'set\_attn'],

'services': ['status\_service', 'stop\_service', 'get\_alarm', 'start\_service'],

'servo': ['scanradec',

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'track\_off',

'hold'],

### 'sigcon': ['walshpattern',

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'setofatten',

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'set32dig',

'set64dig'],

'tune\_receiver': ['command\_formation',

'set\_config\_param',

'display\_values',

'read\_csv',

'set\_tune\_receiver',

'get\_default\_values',

'get\_file\_values',

'tune'],

### 'userproc': ['load\_if\_attn',

'get\_suba\_freq',

'sysCmd',

'get\_prjcode',

'set\_gab',

'load\_ant\_offset',

'au\_bell',

'set\_default\_tpa',

'show\_fps',

'srvrst',

'create\_antmask',

'observe\_source',

'set\_bblo',

'strtndas',

'set\_fecb',

'amvelev',

'load\_gab\_attn',

'start\_corr',

'init\_proj',

'stpndas'],

# 'utilities': ['modify\_catalog\_entity',

'rise\_set',

'list\_source',

'list\_catalog',

'precess\_coord',

'remove\_catalog',

'load\_source',

'add\_sys\_catalog',

'use\_catalog',

'del\_sys\_catalog',

'add\_catalog\_entity',

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'deletef\_catalog',

'del\_usr\_catalog',

'list\_source\_details',

'list\_catalog\_in\_use',

'add\_user\_catalog']}