

# Operating Procedure for the **GSB raw voltage recording**

(Version 2.0 , July 21st, 2011)

## Current supported mode :

Only 16 MHz observed bandwidth with 4bit/sample recording (56 GB/hr for each polarizations)

## Recording clusters :

GSB raw voltage dump recording system is consist of 32 nodes :

- (1) Node1-Node16 for acquisition
- (2) Node33-Node48 for recording with 64 \* 500 GB storage

## Observation set-up :

- (1) "ssh" log-in into [jroy@gsbm1](mailto:jroy@gsbm1)
- (2) Open required terminals using `./run_term.csh`
- (3) On "ACQ:SHM-WRITE" : `./run_rawdump.csh 1` (this will start writing the raw data in local shared memory)
- (4) On "ACQ:SHM-READ" :

**Edit the " run\_rawdump.csh" script for the duration of the scan (e.g. "set buffer\_count = 1200" in units of 250ms)**

`./run_rawdump.csh 1 3C147` (this will start writing the raw data into disks with a file name like "raw\_voltage1.dat.3C147.node0.scan0")

Restart the "run\_rawdump.csh" for second scan with source name.

For a continuous scan of more that 30 mins (buffer\_count = 7200), the recoding program brake the file recording into the second set of files with "scan1" extension

Data will be written into Node33-Node48 : /mnt/a/jroy, /mnt/b/jroy, /mnt/c/jroy, /mnt/d/jroy (64 data files and 16 timestamp files in total)

## Analysis set-up :

On "ANALYSIS" terminal :

1. Edit "/mnt/code/jroy/bin/rawdump/ANALYSIS/source.hdr" : Enter the source and frequency information

```
3C48 0.42866520506972 0.57960269899518 610000000 16666666 540000000 70000000
Source-name>>Precess-RA(rad)>>Precess-DEC(red)>>RF(Hz)>>BW(Hz)>>LO1(HZ)>>LO4(HZ)
```

2. Edit "gsb.hdr" for the keywords in "bold"

```
GSB_LTA = 8 /* 8 - fixed value */
GSB_ACQ_BW = 16.666666 /* 16.666 or 33.333 */
GSB_CHAN_MAX = 512 /* 256/512 */
GSB_STOKES = 2 /* 2 Total_Intensity; 4 Full_Stokes */
GSB_FSTOP = 1 /* 1 - ON, 0 - OFF */
GSB_RAWCORR = 0 /* 1 - ON(30ms), 0 - OFF */
GSB_IABEAM = 0:30 /* 1 - ON, 0 - OFF,:time res 30/60 */
GSB_PABEAM = 0:30 /* 1 - ON, 0 - OFF,:time res 30/60 */
GSB_RAWBEAM = 0:30 /* 1 - ON, 0 - OFF,:time res 30/60 */
GSB_NNODE = 16 /* no of nodes have raw data */
GSB_PHAS = 0 /* 1 - Load phase table, 0 - init */
```

Choices of keywords :

```
GSB_LTA = 1 (for 250 ms or 30 ms visibility), 8 (for 2sec visibility)
GSB_RAWCORR = 1 for 30 ms visibility, 0 for other mode
```

3. Edit "run\_offline.csh" :

```
set infile1 = "raw_voltage1.dat.3C48_610"
set infile2 = "raw_voltage2.dat.3C48_610"
set infile3 = "raw_voltage3.dat.3C48_610"
set infile4 = "raw_voltage4.dat.3C48_610"
set timefile = "timestamp_voltage.dat.3C48_610"
set outdir = /mnt/gsbifrddata2/jroy/TEST
set obs_length = 1200 (in units of 250ms)
```

4. Run the "run\_offline.csh" : ./run\_offline.csh

5. Final visibility products will be in gsbm2:\$outdir

6. Display of the binary visibility data :

(a). ssh log-in to "jroy@gsbm2"

(b). cd /mnt/code/jroy/bin/rawdump/ANALYSIS/

```
./gtax -v visibility file -o outfile -r refant -b baselines -c chansel -t timesel -n 0/1 -f fftsize
```

7. Data backup : "mt -f /dev/nst0 status" (LTO4 tape-drive is connected to gsbm2)

## [SOP to convert raw visibility data to Ita data](#)

1. The format conversion to be done in gsbm2.
2. **ssh log-in to `"jroy@gsbm2":$outdir` area**
3. Copy from `/mnt/code/gsbuser/bin/offline/`, files `gsb.hdr`, `antsys.hdr`, `sampler.hdr`, `scan.hdr` & `corrsel.hdr` to `Users_dir` in `$outdir`. DO NOT EDIT sample files kept in "offline" directory.
4. Update `scan.hdr` for source RA, DEC, MJD\_REF, Freq Params.
5. Update `corrsel.hdr` for "CHAN\_NUM" which will be either "0:511:1" OR "0:255:1".
6. Update `gsb.hdr` similar to the one used for ANALYSIS.
7. Creating LTA file in the following way `"/mnt/code/gsbuser/bin/offline/sclta -i corr.dat -l corr.lta -a antsys.hdr -s sampler.hdr -c corrsel.hdr -S scan.hdr -g gsb.hdr"`
8. Use `Itahdr`, `listscan` & `gvfits` from `/mnt/code/gsbuser/bin/offline/` for content checking, conversion to FITS.