SOP FOR GSB PA VOLTAGE MODE

1. To setup for PA voltage beam mode, save GSB configuration as :

2. Run gsb acq for dasconsole, and wait till it says READY FOR INIT.
3. Run initndas command from online, and wait till acq gets the minute pulse.
4. Do init project and start scan.
5. Do phasing if it is required to phase the array.
6. Once on target and ready to record voltage beam data, run the following on **gsbm1** machine, with a gsbuser login:

```
$ cd /mnt/code/gsbuser/bin/released
$ ./run_PAvoltage.dual.new.csh  30  /mnt/b/gsbuser/<date>  /mnt/c/gsbuser/<date>  test.raw
help :<script name>  <run time (sec)>  <dir for R1,L1>      <dir for R2,L2>       <datafile>
                                       (on nodes 33,34)    (on nodes 33,34)
```

    This starts data acquisition / recording for GSB PA VOLTAGE BEAM mode for a duration of <run time> secs.
7. Stop / Halt DAS chain after observation done.
8. Some NOTES to keep in mind :
    1. Data for one polarisation (R) is recorded on node 33, time spliced into 2 parts (R1,R2 — see details below), each of which is written in parallel to separate files on node 33, to optimise disk writing speed; similarly, data for the other polarisation (L) is recorded on node 34, in 2 separate files (for L1 and L2).
    2. Identical data directories / paths with the given names must exist on disks on both nodes 33 & 34, otherwise the program will give error.
    3. Although same disks can be used for recording of R1 (L1) and R2 (L2) on the nodes, it is better to use different disks for R1 (L1) and R2 (L2) on node 33 (node 34) to get optimal performance (minimise chance for buffer loss) during recording of the data files.
    4. The common 'timestamp' file is recorded only on node33.
    5. R1,R2 are time sliced data of R-pol with 4MB data in each slice, written alternatively as R1-R2-R1-R2...(for 16MHz Mode); same applies for L1,L2. The size of each slice is **8MB for 32MHz Mode**.
    6. This works with 16/32 MHz, 256/512 channels, & Total Intensity.
    7. The 32MHz, 512 channels mode may give data (buffer) loss.
    8. For 16MHz ACQ BW : ./run_PAvoltage.dual.new.16MHz.csh
        For 32MHz ACQ BW : ./run_PAvoltage.dual.new.csh

9. Some further details about the format of the recorded data :
    1. Each of the R1,R2 and L1,L2 data files contain time sliced data which contain successive voltage spectra i.e. Discrete Fourier Transforms of the Nyquist sampled phased array beam voltage data.

2. Since the original time series is a real voltage signal, only one half of the voltage spectra are recorded.

3. For the "256 channel" mode, there are 512 frequency locations recorded per spectrum (i.e. data is from a 1024 point DFT); whereas for the "512 channel" mode, there are 1024 frequency locations recorded per spectrum (i.e. data is from a 2048 point DFT).

4. The spectra are stored as alternating real, imaginary values (each of which is a 8-bit integer, in 2's complement format) for the successive spectral channels from the first to the last channel, except for the case of DC and Nyquist spectral channels (which have real-only values): the real part of the 1st channel location has the value for the DC channel, and the imaginary part of the 1st channel location has the value for the Nyquist channel.

5. For cases where the sideband flag is positive (e.g. LO frequency less than RF frequency), the frequency channels are arranged in increasing order of radio frequency; and for cases where the sideband flag is negative (e.g. LO frequency more than RF frequency), the frequency channels are arranged in decreasing order of radio frequency.