Command References

rspctl (Expert mode)

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-bash-4.2$ rspctl -X
rspctl usage:

-- RCU control ------------------------------------------------------------------
rspctl --rcu                    [--select=<set>]  # show current rcu control setting
rspctl --rcu=0x00000000         [--select=<set>]  # set the rcu control registers
 mask       value
 0x0000007F INPUT_DELAY  Sample delay for the data from the RCU.
 0x00000080 INPUT_ENABLE Enable RCU input.

 0x00000100 LBL-EN       supply LBL antenna on (1) or off (0)
 0x00000200 LBH-EN       sypply LBH antenna on (1) or off (0)
 0x00000400 HB-EN        supply HB on (1) or off (0)
 0x00000800 BANDSEL      low band (1) or high band (0)
 0x00001000 HB-SEL-0     HBA filter selection
 0x00002000 HB-SEL-1     HBA filter selection
            Options : HBA-SEL-0 HBA-SEL-1 Function
                      0         0      210-270 MHz
                      0         1      170-230 MHz
                      1         0      110-190 MHz
                      1         1      all off
 0x00004000 VL-EN        low band supply on (1) or off (0)
 0x00008000 VH-EN        high band supply on (1) or off (0)

 0x00010000 VDIG-EN      ADC supply on (1) or off (0)
 0x00020000 LBL-LBH-SEL  LB input selection 0=LBL, 1=LBH
 0x00040000 LB-FILTER    LB filter selection
                    0    10-90 MHz
                    1    30-80 MHz
 0x00080000 ATT-CNT-4    on (1) is  1dB attenuation
 0x00100000 ATT-CNT-3    on (1) is  2dB attenuation
 0x00200000 ATT-CNT-2    on (1) is  4dB attenuation
 0x00300000 ATT-CNT-1    on (1) is  8dB attenuation
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  0x00800000 ATT-CNT-0    on (1) is 16dB attenuation

  0x01000000 PRSG         pseudo random sequence generator on (1), off (0)
  0x02000000 RESET        on (1) hold board in reset
  0x04000000 SPEC_INV     Enable spectral inversion (1) if needed. see --specinv
  0x08000000 TBD          reserved
  0xF0000000 RCU VERSION  RCU version, read-only

rspctl [ --rcumode        |
         --rcuprsg        |
         --rcureset       |
         --rcuattenuation |
         --rcudelay       |
         --rcuenable      |
       ]+ [--select=<set>] # control RCU by combining one or more of these options with RCU selection

       --rcumode=[0..7] # set the RCU in a specific mode
         Possible values: 0 = OFF
                          1 = LBL 10MHz HPF 0x00017900
                          2 = LBL 30MHz HPF 0x00057900
                          3 = LBH 10MHz HPF 0x00037A00
                          4 = LBH 30MHz HPF 0x00077A00
                          5 = HB 110-190MHz 0x0007A400
                          6 = HB 170-230MHz 0x00079400
                          7 = HB 210-270MHz 0x00078400
       --rcuprsg[=0]              # turn psrg on (or off)
       --rcureset[=0]             # hold rcu in reset (or take out of reset)
       --rcuattenuation=[0..31]   # set the RCU attenuation (steps of 0.25dB)
       --rcudelay=[0..127]        # set the delay for rcu's (steps of 5ns or 6.25ns)
       --rcuenable[=0]            # enable (or disable) input from RCU's

rspctl --specinv[=0] [--select=<set>] # enable (or disable) spectral inversion
rspctl --mode=[0..7] [--select=<set>] # set rcumode in a specific mode
                                      # enable(or disable) input from RCU's
                                      # enable(or disable) spectral inversion
                                      # set the hbadelays to 253

--- Signalprocessing ---------------------------------------------------------
rspctl --weights                    [--select=<set>]  # get weights as complex values
  Example --weights --select=1,2,4:7 or --select=1:3,5:7
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rspctl --weights=value.re[,value.im][--select=<set>][--beamlets=<set>] # set weights as complex value
OR      --weights="(value.re,value.im)(value.re,value.im)" [--select=<set>][--beamlets=<set>] # set multiple
weights
    as complex value for the same amount of selected beamlets
rspctl --aweights                   [--select=<set>]  # get weights as power and angle (in degrees)
rspctl --aweights=amplitude[,angle] [--select=<set>]  # set weights as amplitude and angle (in degrees)
rspctl --subbands                   [--select=<set>]  # get subband selection
rspctl --subbands=<set>             [--select=<set>]  # set subband selection
  Example --subbands sets: --subbands=0:39 or --select=0:19,40:59
rspctl --xcsubband                                    # get the subband selection for cross correlation
rspctl --xcsubband=<int>                              # set the subband to cross correlate
rspctl --wg                         [--select=<set>]  # get waveform generator settings
rspctl --wg=freq [--phase=..] [--amplitude=..] [--select=<set>]  # set waveform generator settings


--- Status info ------------------------------------------------------------------------------------
rspctl --version             [--select=<set>]  # get version information
rspctl --status              [--select=<set>]  # get status of RSP boards
rspctl --tdstatus            [--select=<set>]  # get status of TD5 boards
rspctl --spustatus           [--select=<set>]  # get status of SPU board
rspctl --realdelays[=<list>] [--select=<set>]  # get the installed 16 delays of one or more HBA's
rspctl --regstate                              # show update status of all registers once every second
rspctl --latency                               # show latency of ring and all lanes


--- Statistics -------------------------------------------------------------------------------------
rspctl --statistics[=(subband|beamlet)]        # get subband (default) or beamlet statistics
           [--select=<set>]                    #
           [--duration=<seconds>]              #
           [--integration=<seconds>]           #
           [--directory=<directory>]           #
rspctl [--xcangle] --xcstatistics  [--select=first,second] # get crosscorrelation statistics (of pair of RSP boards)
           [--duration=<seconds>]              #
           [--integration=<seconds>]           #
           [--directory=<directory>]           #


--- Miscellaneous ----------------------------------------------------------------------------------
rspctl --clock[=<int>]                         # get or set the clock frequency of clocks in MHz
rspctl --rspclear            [--select=<set>]  # clear FPGA registers on RSPboard
rspctl --hbadelays[=<list>] [--select=<set>]   # set or get the 16 delays of one or more HBA's
rspctl --tbbmode[=transient | =subbands,<set>] # set or get TBB mode, 'transient' or 'subbands', if subbands
then specify subband set
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rspctl --datastream[=0|1|2|3]                # set or get the status of data stream to cep
rspctl --swapxy[=0|1] [--select=<set>]       # set or get the status of xy swap, 0=normal, 1=swapped
rspctl --bitmode[=4|8|16]                    # set or get the number of bits per sample



--- Raw register control ----------------------------------------------------------------------
 ### WARNING: to following commands may crash the RSPboard when used wrong! ###
rspctl --readblock=RSPboard,hexAddress,offset,datalength     # read datalength bytes from given address

rspctl --writeblock=RSPboard,hexAddress,offset,hexData       # write data to given address
In all cases the maximum number of databytes is 1480
Address order: BLPID, RSP, PID, REGID
```

beamctl

- (Undocumented) -J/--remotehost: Use a remote server to host the beamserver?

```
-bash-4.2$ beamctl -h
Usage: beamctl <rcuspec> <dataspec> <digpointing> [<digpointing> ...] FOR LBA ANTENNAS
       beamctl <rcuspec> <anapointing> [<anapointing> ...] [<dataspec> <digpointing> [<digpointing> ...]]
FOR HBA ANTENNAS
       beamctl --calinfo
where:
  <rcuspec>      = --antennaset --rcus --band (or --antennaset --rcus --rcumode)
  <dataspec>     = --subbands --beamlets
  <digpointing>  = --digdir
  <anapointing>  = --anadir
with option arguments:
  --antennaset=name # name of the antenna (sub)field the RCU's are part of, may not conflict with band
                    # name = LBA_INNER | LBA_OUTER | LBA_SPARSE_EVEN | LBA_SPARSE_ODD |
                    # LBA_X | LBA_Y | HBA_ZERO |  HBA_ONE | HBA_DUAL | HBA_JOINED |
                    # HBA_ZERO_INNER | HBA_ONE_INNER | HBA_DUAL_INNER | HBA_JOINED_INNER
  --rcus=<set>      # subselection of RCU's
  --band=name       # name of band selection, may not conflict with antennaset
                    # name = 10_90 | 30_90 | 110_190 | 170_230 | 210_250
  --subbands=<set>  # set of subbands to use for this beam
  --beamlets=<list> # list of beamlets on which to allocate the subbands
                    # beamlet range = 0..247 when Serdes splitter is OFF
                    # beamlet range = 0..247 + 1000..1247 when Serdes splitter is ON
  --digdir=longitude,latitude,type[,duration]
                    # lon,lat are floating point values specified in radians
```

```
                # type is SKYSCAN or almost any other coordinate system
                # SKYSCAN will scan the sky with a L x M grid in the (l,m) plane
 --anadir=longitude,latitude,type[,duration]
                # direction of the analogue HBA beam
 --rcumode=0..7    # Old-style RCU mode to use (DEPRECATED; only available for
                   compatibility with existing scripts. Please use antenna-
                   set + band selection. The rcumode selected here must not
                   conflict with the selected antennaset)
 --help            # print this usage

The order of the arguments is trivial.

This utility connects to the CalServer to activate the antennas in set --antennaSet
containing the selected RCU's. The CalServer sets those RCU's in the mode
specified by --rcumode. Another connection is made to the BeamServer to create a
beam on the selected antennafield pointing in the direction specified with --digdir.
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