GBT Spectrometer

SPEAD Packet Format for Low-Bandwidth Modes: Multiple Sub-bands

0x53	0x04	0x03	0x05	0x0000	0x0008
1	0x001		Heap counter		
1	0x002		Heap size		
1	0x003		Heap offset		
1	0x004		Packet payload length		
1	0x020		Time counter		
1	0x021		Mode		
1	0x022		Status bits		
0	0x023		Payload data offset		

Payload data (8192 bytes long; each sample is an 8-bit signed value):

Sub0_PolA_Re_0, Sub0_PolA_Im_0, Sub0_PolB_Re_0, Sub0_PolB_Im_0,
Sub1_PolA_Re_0, Sub1_PolA_Im_0, Sub1_PolB_Re_0, Sub1_PolB_Im_0,
... [sub-bands 2 to 6 here] ...
Sub7_PolA_Re_0, Sub7_PolA_Im_0, Sub7_PolB_Re_0, Sub7_PolB_Im_0,

... [time samples 1 to 254 here] ...

Sub0_PolA_Re_255, Sub0_PolA_Im_255, Sub0_PolB_Re_255, Sub0_PolB_Im_255,
Sub1_PolA_Re_255, Sub1_PolA_Im_255, Sub1_PolB_Re_255, Sub1_PolB_Im_255,
... [sub-bands 2 to 6 here] ...
Sub7_PolA_Re_255, Sub7_PolA_Im_255, Sub7_PolB_Re_255, Sub7_PolB_Im_255

8 bytes

Notes:

1. A heap is always one packet long in these modes. Therefore, the heap counter is the same as the packet counter, and the heap offset is always zero.
2. The ordering of the data within the payload is indicated in the diagram above. For example, Sub0_PolA_Re_0 is interpreted as:
   - Sub0 = sub-band 0
   - PolA = polarisation A
   - Re = the real component of the signal
   - 0 = sample at time instant 0
3. Each packet therefore contains samples from 256 time instances and 8 different sub-bands.
4. The centre frequencies and bandwidth of each sub-band are not stored in the packet header. They are instead passed to the HPC software via the status shared memory.

GBT Spectrometer

SPEAD Packet Format for Low-Bandwidth Modes: Single Sub-band

0x53	0x04	0x03	0x05	0x0000	0x0008
1	0x001		Heap counter		
1	0x002		Heap size		
1	0x003		Heap offset		
1	0x004		Packet payload length		
1	0x020		Time counter		
1	0x021		Mode		
1	0x022		Status bits		
0	0x023		Payload data offset		
Payload data (8192 bytes long; each sample is an 8-bit signed value): PolA_Re_0, PolA_Im_0, PolB_Re_0, PolB_Im_0, ... [time samples 1 to 2046 here] ... PolA_Re_2047, PolA_Im_2047, PolB_Re_2047, PolB_Im_2047					

8 bytes

Notes:

1. A heap is always one packet long in these modes. Therefore, the heap counter is the same as the packet counter, and the heap offset is always zero.
2. The ordering of the data within the payload is indicated in the diagram above. For example, PolA_Re_0 is interpreted as:
   PolA = polarisation A
   Re = the real component of the signal
   0 = sample at time instant 0
3. Each packet therefore contains samples from 2048 time instances.