

CBC3 Fast Command Behavior

2018-04-11

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Fast Command Nomenclature



Fast Command encoding V1

- Fast Commands (LHC clock synchronous)

- L1-Trigger
- CalPulse
- BC0 (BC=0, EC=0)
- ReSync (clear FIFOs, reset FSMs)

Command_Frame: 110xxxx1

Sync_Code: 110

This three digit code is unique and does not appear elsewhere in the bitstream.

Serial commands are transmitted MSB first. Data sampled on positive edge of the CLK320

T1_cmd (<i>Serial Command</i>) (CBC3 naming convention)	B7	B6	B5	B4	B3	B2	B1	B0
ReSync (<i>Fast Reset</i>)	1	1	0	1	0	0	0	1
L1-Trigger (<i>Trigger</i>)	1	1	0	0	1	0	0	1
CalPulse (<i>Test Pulse Trigger</i>)	1	1	0	0	0	1	0	1
BC0 (<i>Orbit Reset</i>)	1	1	0	0	0	0	1	1
BC0 & ReSync	1	1	0	1	0	0	1	1
BC0 & L1-Trigger	1	1	0	0	1	0	1	1
BC0 & CalPulse	1	1	0	0	0	1	1	1

No other code is allowed for transmission

Sync Code

Command Code

The CBC DLL

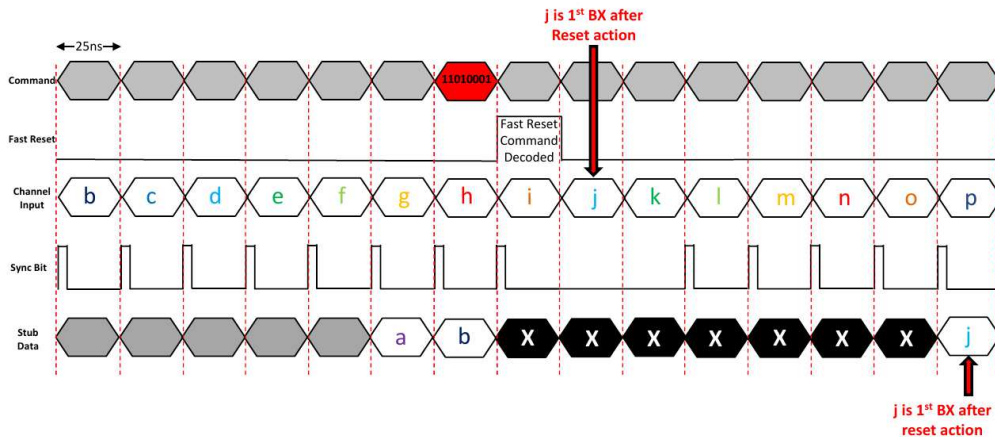
Used for shifting the sampling instant in order to maximize efficiency

- Doesn't affect the phase of the output data
- Doesn't affect the digital latency of the stub data, except:
- A non-zero "FCI delay" may be required for some DLL settings to ensure valid data (to be characterized further). This shifts the Stub and L1 data by the programmed number of 320 MHz cycles (0-2).

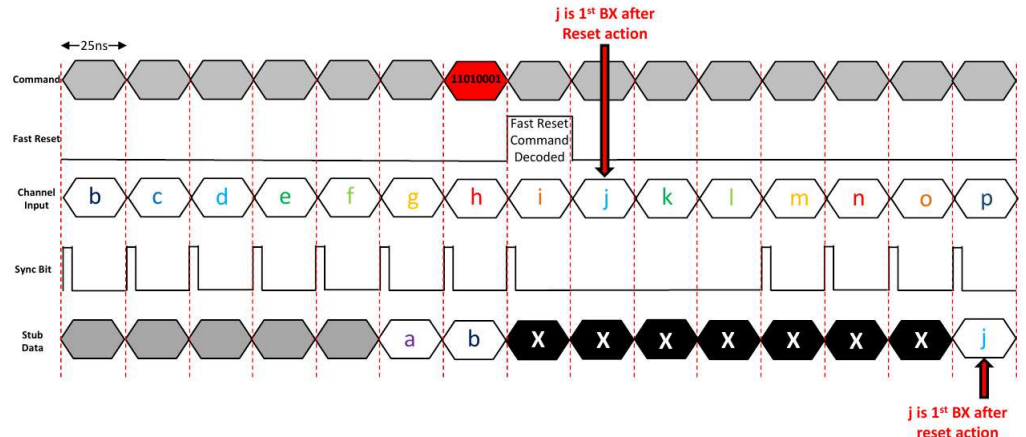
Stub data

- Emitted 6BX after the analog input signal with a DLL setting of 0
- Undefined for 7BX following “ReSync”
- The “Sync” bit disappears for 2-3 BX following “ReSync”
- Not affected in any way by “BC0”
- **The CBC3 and the CBC3.1 behavior with respect to stub data is identical**

Stub Data following Fast Reset Command (Case DLL lower settings)



Stub Data following Fast Reset Command (Case DLL higher settings)



L1 data

- At “ReSync” any current transmission is truncated and any pending data is discarded. The pipeline write and read pointers are reset.
- The first meaningful data will be available at **latency+3** after a “ReSync”
- “BC0” resets the ‘L1 counter’ in the L1 data frame. The first counter value after reset is 1
 - Exception: A trigger signal received in the same BX as BC0, or in the BX immediately after will result in a L1 package will result in a L1 frame with a counter value of Zero.
- **It remains to be verified if the CBC3 and CBC3.1 L1 Data behavior is identical in every way.**