Controls Hardware

Beam Sync Downtime

Maintenance Day Feb 15th 2012

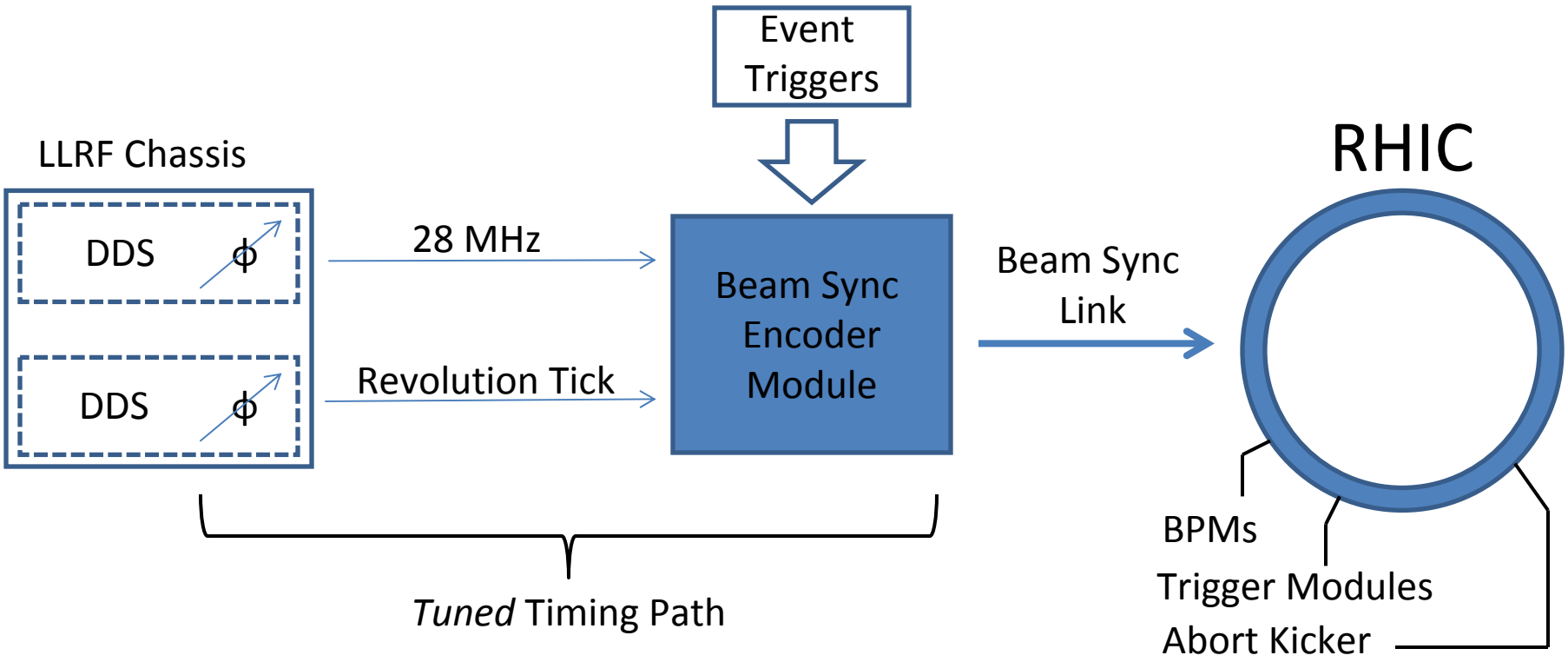
- Motivation: Diagnose Occasional Alarms From Yellow Beam Sync Encoder Module
- Diagnostic Maintenance Planned
  (Swap Blue & Yellow Encoder Modules)
- Maintenance Performed as Planned
- Incorrect Timing Observed While Attempting to Recover Machine
- System Diagnosed and Restored
- ≈2 Hours Downtime

Beam Synchronous Link

- Serial Data Link
- Distributes Timing Information
- Separate Links For Blue and Yellow
- Similar to Event Link
- Carrier Derived From 28MHz RF Signal
- Link Timing Follows Δf as Energy Changes
- Events Stay Aligned to Bunches

Structure

(Single Ring)



Issues

- Leaving Boards Swapped Would Require Re-Timing
  (Slightly Different Timing Between Identical Modules)
- Impact Statement Was Incomplete
- Timing Shifts Were Misdiagnosed
- Work Planning Did Not Include Some Required Persons/Groups
- With Proper Planning, Downtime Was Preventable