

2012 BI Commissioning Plans

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From OP Schedule

Day	Shift	T (h)	Time BI (h)	Activity	Key	Intensity	
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SA	N	4	6	Instrumentation - orbit, Q, Q', wire scanner		Probe	BI Initial
SA	N	4		Dispersion, CO, Q, Q', C- measure and correct		Probe	
SU	M	8		RF capture and ADT first setup with probe		Probe	
SU	A	4	4	Feedbacks - recommissioning at injection (Q, orbit, radial)		Probe	OFC Initial
SU	A	4		Beta beating measurements and correction @ 450 GeV		Probe	
SU	N	8		Pre-cycle or ramp (no beam) - decay measurement at 450 GeV		Probe	
MO	M	8	8	Ramp to 4 TeV - test QFB & OFB - test dump at 4 TeV	First ramp	Probe	OFC Ramp
...							
THU	A	4		Experimental magnets ON		Nominal	
THU	A	4	4	Orbit feedback with dynamic reference in the ramp		Nominal	OFC Ramp
THU	N	8		Aperture at injection	Aperture injection	Probe	
...							
SA	N	8		Pre-cycle or ramp (no beam) - decay measurement at 450 GeV		Probe	
SU	M	8	3	BI shift		Nominal	BI Nominal
SU	A	8		Injection & dump protection 450 GeV		Nominal	
...							
WED	M	8		Collimation setup on flat top 4 TeV		Nominal	
WED	A	8	8	BI shift		Nominal	BI Nominal
WED	N	8		Pre-cycle or ramp (no beam) - decay measurement at 450 GeV		Nominal	
...							
SUN	M	8		ADT : injection and abort gap cleaning		50 ns	
SUN	A	8	8	BI shift		50 ns	BI 50ns
SUN	N	8		TOTEM & ALFA interlocks spare		No beam	

7 periods for BI commissioning / setup

BI Commissioning Overview

Period	Systems	Beam		Time [h]	
		Intensity	Ramp		
1	BI commissioning #1	BPM, OFC, BSRT, WS, FBCT, BTVDD/D	probe	no	6
2	Initial OFC checks	OFC	probe	no	4
3	OFC ramp check #1	OFC	probe	yes	8
4	OFC ramp check #2	OFC	1 bunch nom.	yes	4
5	BI commissioning #2	WCM, BPM, BCT, FBCT	1 bunch nom.	no	3
6	BI commissioning #3	BSRT, BGI, LDM	Multiple bunches	yes	8
7	BI commissioning #4	BPM, WS, BSRT, BBQ	50ns train(s)	yes	8

	Period	Systems	Beam		Time [h]
			Intensity	Need Ramp	
1	BI commissioning #1	BPM, OFC, BSRT, WS, FBCT, BTVDD/D	probe	no	6

- polarity checks
 - phase-in & test of synch orbit selection (if available)
- BPM (30mins per beam)
- Test of RF Switches in Pt5 - initial test of transient/offset while switching
- BPM/OFC (30mins)
- Verify steering & alignment (B1 & B2)
- BSRT (1hr/beam)
- measurement of linearity for LSS BPMs. Mapping of H/V positions to large aperture to check linearization equations (electronics & BPM geometry). **To be done before defining reference orbits or making aperture scans**
- BPM (3hrs)
- LHC-OFC - direct BST-driven synchronization
 - WS - initial checks (phase-in)
 - FBCT - phase-in
 - BTVDD/D - timing checks
- In Parallel

Period	Systems	Beam		Time [h]
		Intensity	Need Ramp	
2	OFC	probe	no	4

OFC

- Initial OFC checks B1 & B2 (4hrs – probe bunch)
- Verification of data streams & SW updates
- Internal Energy-FB to suppress Orbit-FB induced energy drifts

Period	Systems	Beam		Time [h]
		Intensity	Need Ramp	
3	OFC, AGM	probe	yes	8

OFC

- B1 & B2
- Increased Orbit-FB bandwidth in view of tight collimator settings
- 2-3 ramps + 2h at 4 TeV then squeeze with probe beam for feedback response and stability margin measurements

AGM (in // to OFC)

- Calibration during the ramp(s)

Period	Systems	Beam		Time [h]
		Intensity	Need Ramp	
4	OFC	1 bunch nom.	yes	4

OFC

- B1 & B2
- Test of OFC with dynamic references in the ramp

	Period	Systems	Beam		Time [h]
			Intensity	Need Ramp	
5	BI commissioning #2	WCM, BPM, BCT, FBCT	1 bunch nom.	no	3

LHC-WCM (30mins per beam) • Calibration and integration of new scope

BPM (2hrs) • scraping of nominal bunch to verify correct functioning of cable adapters & interlock BPMs (2 scrapings per beam)

BCT (in // to BPM) • check of linearity FBCT vs DCCT during scraping

	Period	Systems	Beam		Time [h]
			Intensity	Need Ramp	
6	BI commissioning #3	BSRT, BGI, LDM	Multiple bunches	yes	8

BSRT

- B1 & B2
- Test of new low-level software for multi bunch acquisition
- Cross calibration with wire scanners at 450GeV & 4TeV (large & small emittance if possible)

BGI (in // to BSRT)

- Calibration with WS (12 bunches)

LDM (in // to BSRT)

- verification of new optical layout

	Period	Systems	Beam		Time [h]
			Intensity	Need Ramp	
7	BI commissioning #4	BPM, WS, BSRT, BBQ	50ns train(s)	yes	8

BPM

- test & commission automatic IIR selection

BPM

- test of bunch selection for synchronous orbit mode for LSS BPMs & effect on calibrations

WS and BSRT in // to BPM

- test of bunch selection

BBQ

- Set up of BBQ for 50ns
- 1-2 test ramp & squeeze

Additional infos

Without beam:

LHC-OFC/OFSU/
BQBBQLHC

Dynamic orbit/Q/Q' reference
and COD bump changes
to be tested/integrated by OP

BLMs:

Commissioning and setup included in MP studies