TYPICAL RF CLOCK FREQUENCY CHANGES

AN EXHAUSTIVE LIST …

NAME	DESCRIPTION	MAGNITUDE**	RATE**	ACC MODES	BEAM MODES
RF resync	*Unchanged, described in the EDMS document LHC MODES:* ***LHC-OP-ES-0022,***				
RF/DUMP check	RF-vs-dump cable inversion check, change individually RF1 and RF2 by 1000Hz then back.	+1000 Hz	220 Hz/s***	ALL	SETUP (before resync)
RAMP	RF goes from 450GeV to 7Tev (or 3.5TeV)	+870 Hz for protons, +5500 Hz for ions	<0.5 Hz/s	ALL	RAMP
RAMP DOWN	RF goes from 7Tev (or 3.5TeV) to 450GeV	-870 Hz for protons, -5500 Hz for ions	<0.5 Hz/s	ALL	RAMP DOWN
INJECTION test	Injection tests with offset energy	+/- 2400 Hz	220 Hz/s	BEAM SETUP, MD	INJ&DUMP,CIRC&DUMP
DUMP PROTECTION test	+/-1000 Hz for loss maps	+/- 1000 Hz	220 Hz/s	BEAM SETUP, MD	ADJUST
CHROMATICITY and/or DISPERSION measurements	Typically, done manually, both beam, at flat top or flat bottom, but could also be automated for any time (even in ramp)	+/-50 Hz	220 Hz/s	ALL	INJECTION MODES* (flat bottom), FLAT TOP
TIDAL adjustment	After reaching flat top, value to be set according to the tide of the moment	+/-15 Hz	220 Hz/s	ALL	FLAT TOP
Other ORBIT adjustments		+/-15 Hz	220 Hz/s	ALL	FLAT TOP

*INJECTION MODES = Injection Probe Beam, Injection Setup Beam, Injection Physics Beam.

**These values are applied to RF CLOCKS (400MHz). They have to be divided by 10 to be applied to the BUNCH CLOCKS (40MHz) delivered to experiments.

*** The rate of 220Hz/s used for all the trims is a constant that could easily be reduced if needed.