

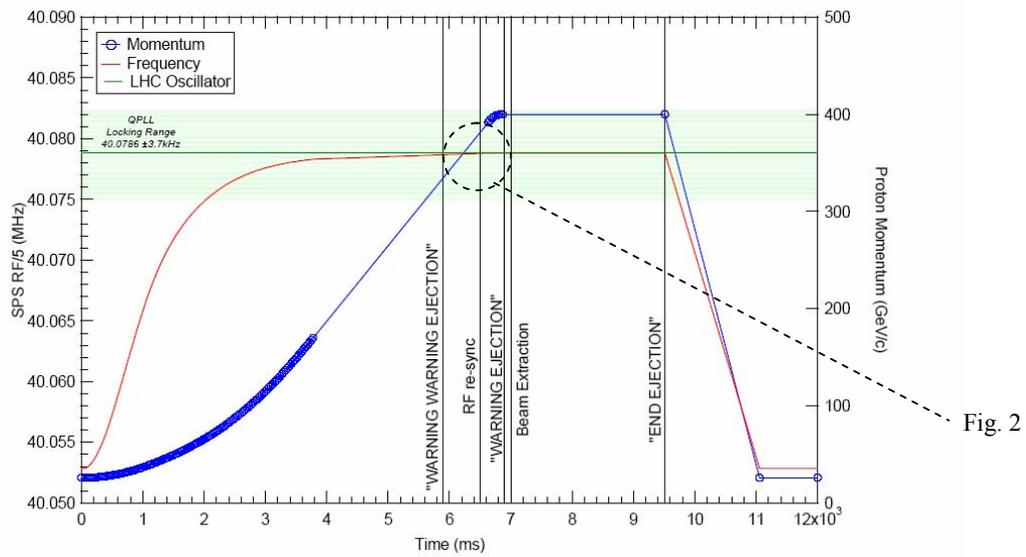
October 2004 25 ns run

Here follow the description of the signals sent to experiments via TTC during the 25ns run (week 41).

1. 40 MHz

The 40 MHz signal transmitted by the TTC system is generated by the RF. It is the green line drawn on fig. 1. It is fixed to $F_{top} = 40.078834$ MHz, which is the equivalent frequency of the RF of the LHC, on flat top, at the energy of 400GeV.

This frequency is fixed and does not vary during the 25ns run.



Variation of Proton Momentum and thus the calculated RF frequency during the SPS Cycle of the June 2004 25ns Test Beams.
The SPS RF frequency switches to the LHC Oscillator Frequency at the point labelled "Re-sync".
TTC system distributes the LHC Oscillator signal at all times, together with the 'real' SPS orbit signal.
This implies a frequency difference between the two signals outside the extraction window.
Data provided by Jorg Wenninger (CERN/AB/OP)

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JT/CERN/PHI/CME

Figure 1

During a complete cycle (12 seconds), the SPS RF varies from 40.053MHz up to F_{top} . At the "RF re-sync" timing, the RF is "re-phased" to F_{top} . This happens about 6.5s after the beginning of the cycle. This means that, a few ms after this re-phasing, there is no difference between the 2 clocks, generated by the same source. This re-phasing is done as in fig. 2:

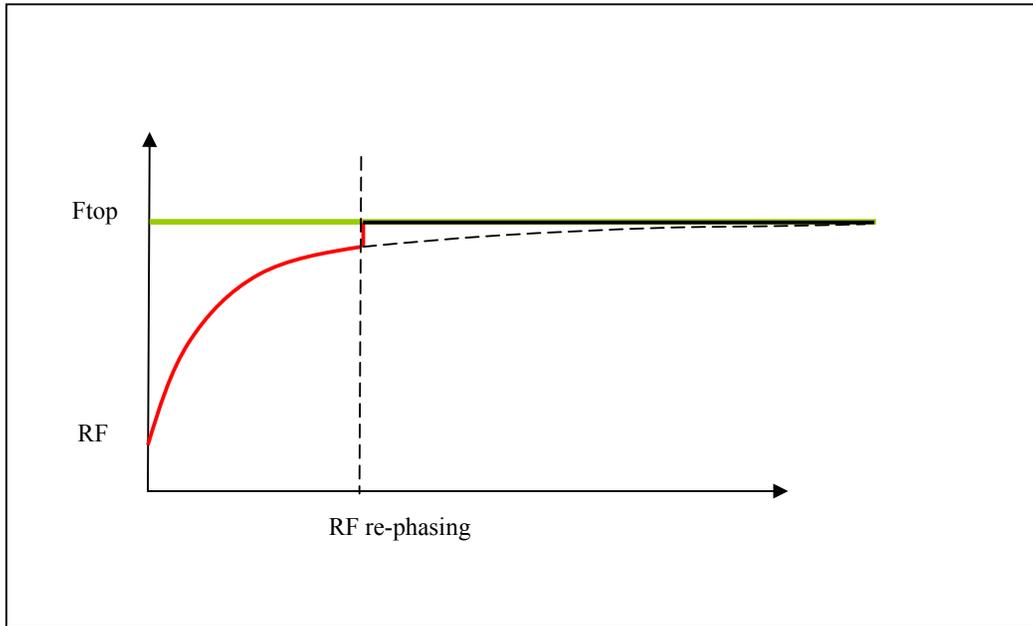


Figure 2

2. orbit

The orbit is a 40ns pulse synchronized to the RF.

Orbit Frequency = $RF/924$

That means that on the flat top, orbit and 40 MHz are theoretically perfectly synchronized.