

Status of CLIC timing work

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EUROTeV TPMON task

Aim

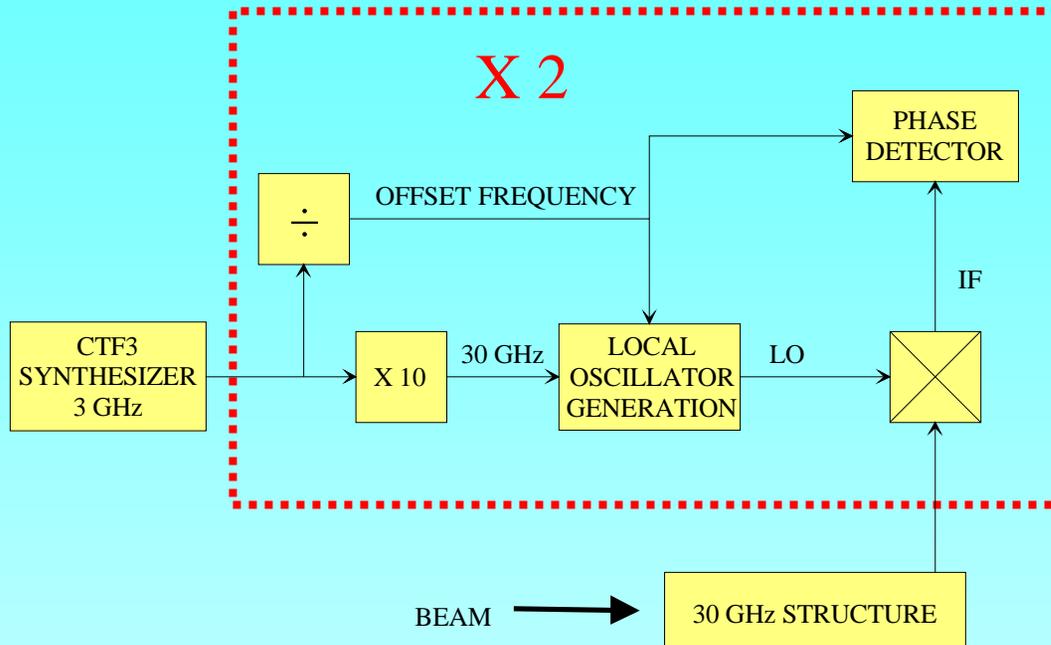
- Develop, build and test RF beam timing measurement system aiming for 10fs resolution
- Can we do this at 30GHz?
- Test with beam in CTF3

Requirements

- Single-shot
- ± 50 MHz bandwidth
- 10fs resolution (0.1 degree at 30GHz)
- ± 5 degree range
- 6dB amplitude range

For more details see CLIC note and EUROTeV report
“Aims and initial progress of TPMON task”, January 2006

Some of the issues with tests in CTF3

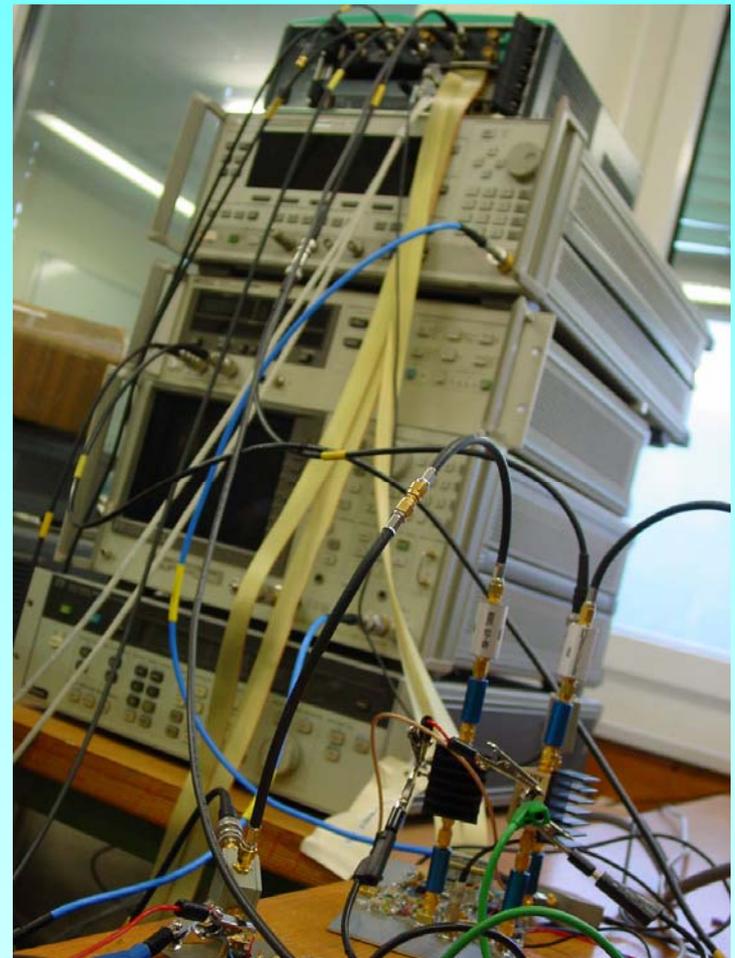


- Beam jitter > 10fs: compare two systems
- Pick-up should not be a limitation: let's use a PETS
- Low jitter oscillators do exist: too expensive to buy
- Multiplying oscillator to 30GHz: first tests OK
- Phase detector ?????

Automatic set up for characterization of phase detectors at IF's in the range 150MHz to 1GHz

Why did we start with this?

- Choice of suitable phase detector not evident
- Until phase detector chosen could not finalize choice of IF
- Until IF known could not design RF part



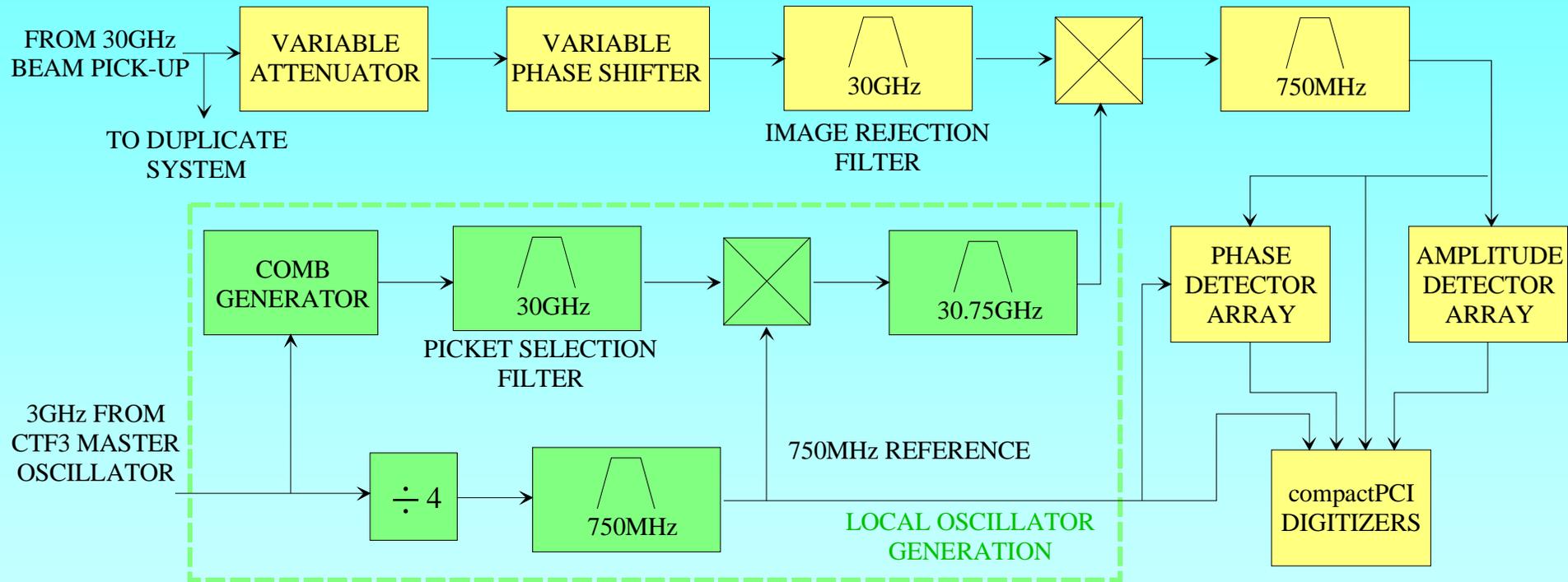
Things to be done in near future

- Further work on 750MHz phase detector to get noise below 0.03 degrees. PCB version
- Closer look at local oscillator generation limitations
- Better characterization of phase detectors
- Temperature stability of many components
- Other phase detectors

Complete system for CTF3 tests this year

- Order attenuators, mixers, amplifiers etc.
- Order data acquisition cards
- Specify and order filters
- Acquisition software
- Put it all together

Complete system



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