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# TTC news

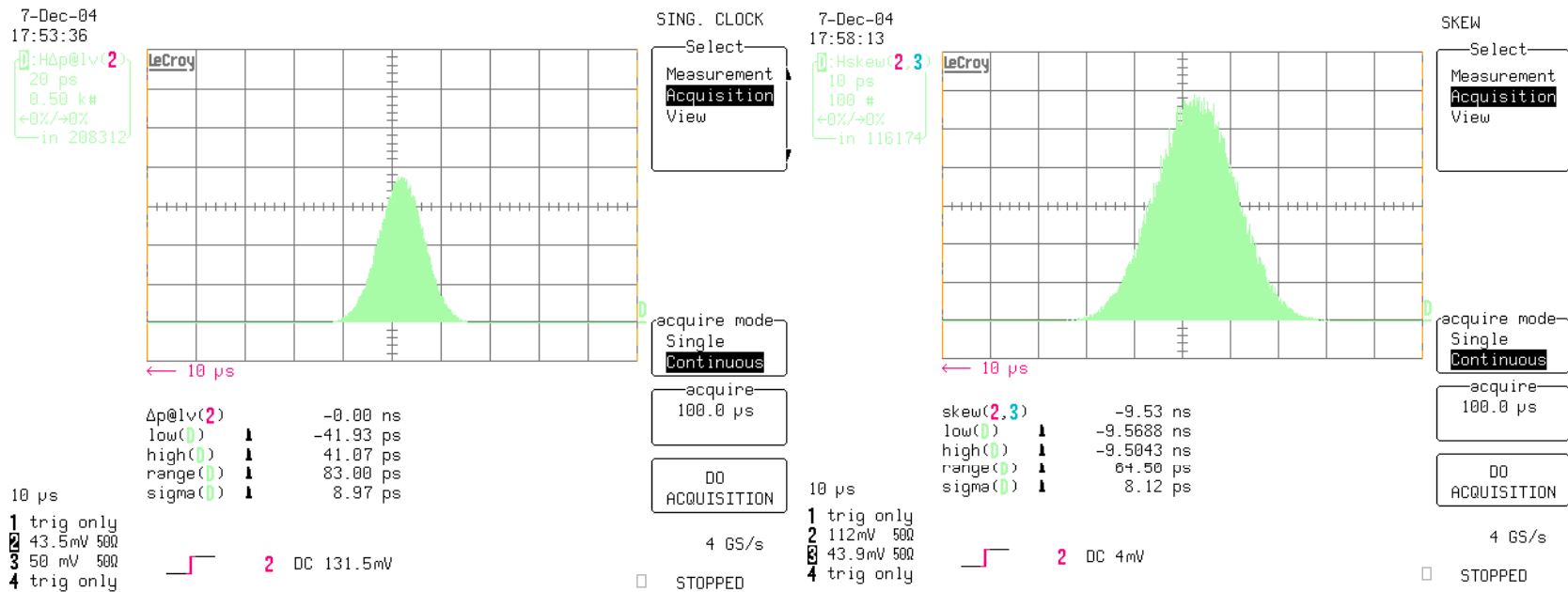
December 04

# Summary

- TTCrq
- TTCoc
- TTCex
- TTC fibres
- TTC relocation
- TTC commissioning
- TTC upgrade

# TTCrq

- Activity Dips problem, by [Paulo](#):
- Prototype status (1):
  - Production tests passed
  - Jitter analysed



# TTCrq

## ■ Prototype status (2)

- Temperature test running – 2 prototypes validated
- Radiation tests scheduled for the 14<sup>th</sup> of December on 2 of these boards (F. Anghinolfi). Main targets: LVDS driver and regulator.

## ■ Preproduction:

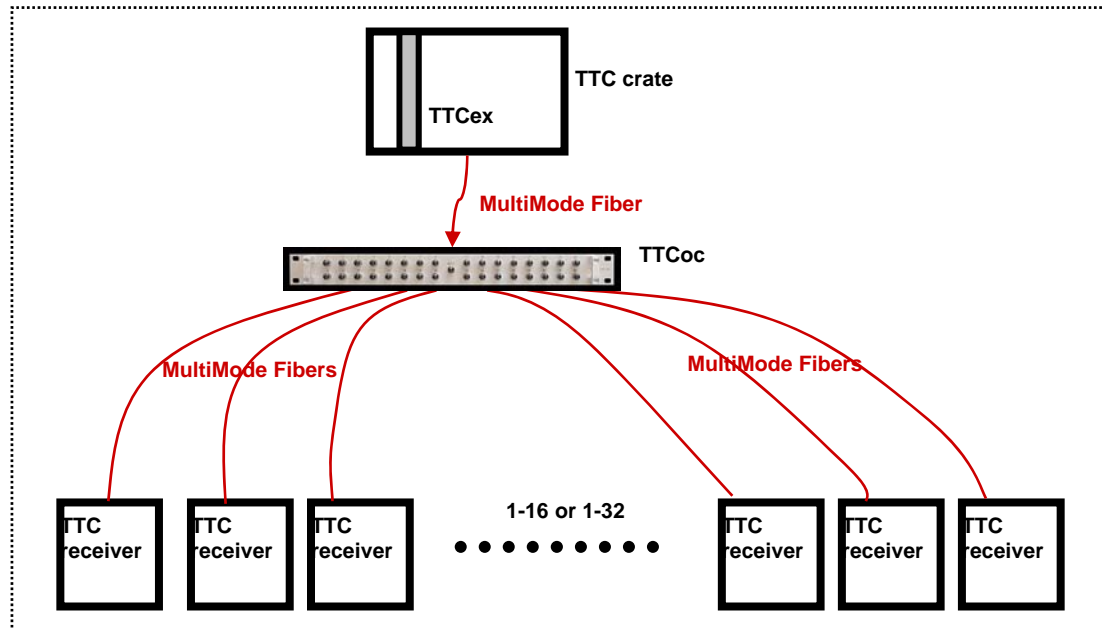
- 200 boards for urgent needs
  - 50 for Atlas
  - ~80 for CMS
  - 10 for Alice
- PCB & assembly at Barco (Belgium)
- Scheduled for mid January

## ■ Modifications of the previous version:

- If there is some interest, we can arrange a way to upgrade the old versions of the TTCrq at Millerin's workshop

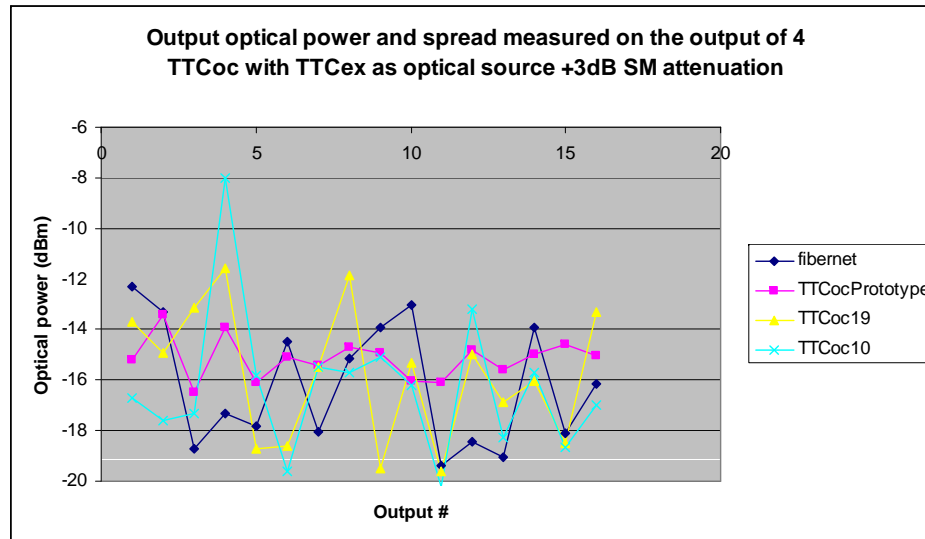
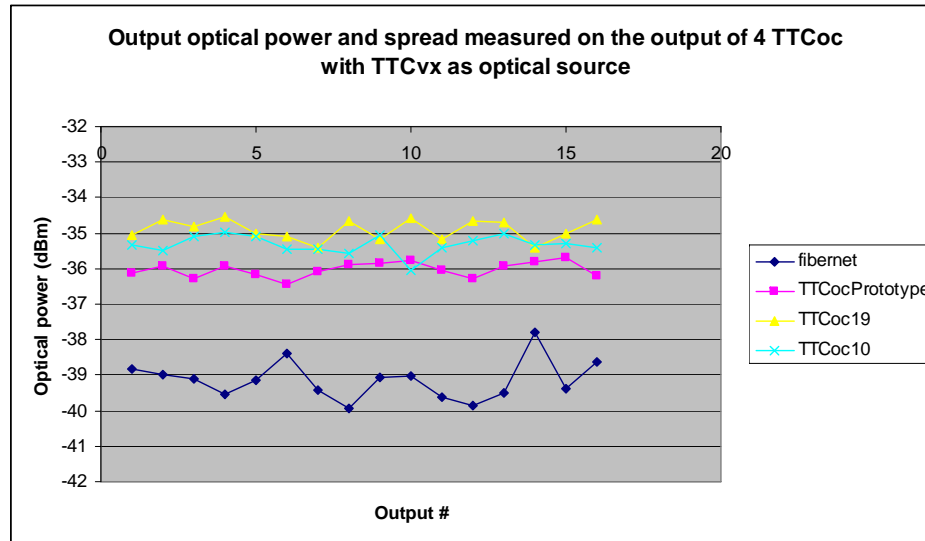
# TTCoc

## ■ Problem description:



- Single mode laser source
- Multimode system (including the coupler)

# TTCoc



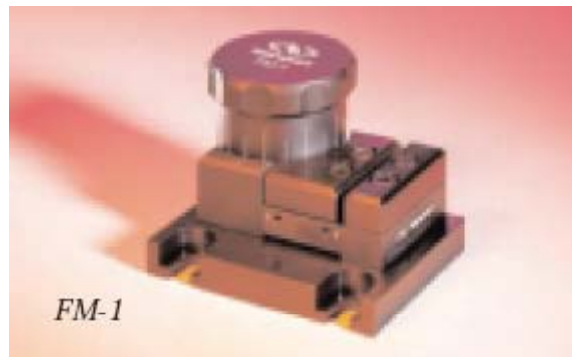
## Consequences:

- Insertion loss can be from -17 up to -5 dB on the outputs of the same 1/16 coupler (specs -14dB)
- The signal timing is very sensitive to the motion of the first MM patch (between the laser and the coupler)
- Multimode attenuators are not efficient because the signal is not really a multimode signal
- Singlemode attenuator effect is  $\sim x3$  because of the diameter change
- We can not specify the maximum spread of the coupler for this type of use

# TTCoc

## ■ Possible solutions (1):

- MM source
- Mode scrambler on the output of the laser source
  - Example from Newport – to be inserted on the input of the coupler



**Figure 5: Mode scrambler from Newport**  
Newport Price: 794 CHF.

- Proposed solution from FCI: “special jumper” to be inserted on the output of the laser pigtail.
  - Forces single mode signal (very directional and concentrated) to travel through multiple paths and have a broader and more even spatial distribution in the jumper fiber prior to reaching splitter.
  - 117€ and no need to change the couplers.
  - Samples have been ordered.

# TTCoc

## ■ Possible solutions (2):

- Single mode fibres up to the coupler, and then:
  - SM2SM coupler + SM fibres up to the TRR
  - SM2MM coupler + MM fibres up to the TRR. Samples ordered at Fibernet by Atlas.

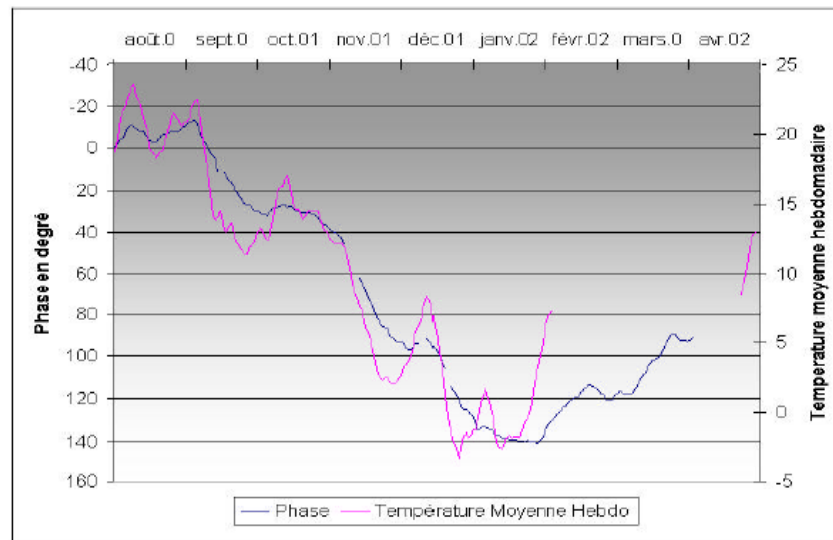
## ■ Offers:

	SM2SM 16	SM2SM 32	SM2MM 16	SM2MM 32	Scrambler + MM2MM 16	Scrambler + MM2MM 32
Fibernet	840\$ 633€	1380\$ 1041€	880\$ 664€	1420\$ 1071€		
Comcore (China)	480\$ 362€	799\$ 603€				
FCI (CAN- CH)	876€	1819€			388+117= 505€	950+117= 1067€
Comcore via Laser 2000 (F)	532€	830€				



# Fibres

- Long term tests (annual) – BA3-SR4, 18km
  - Made by Donat Stellfeld



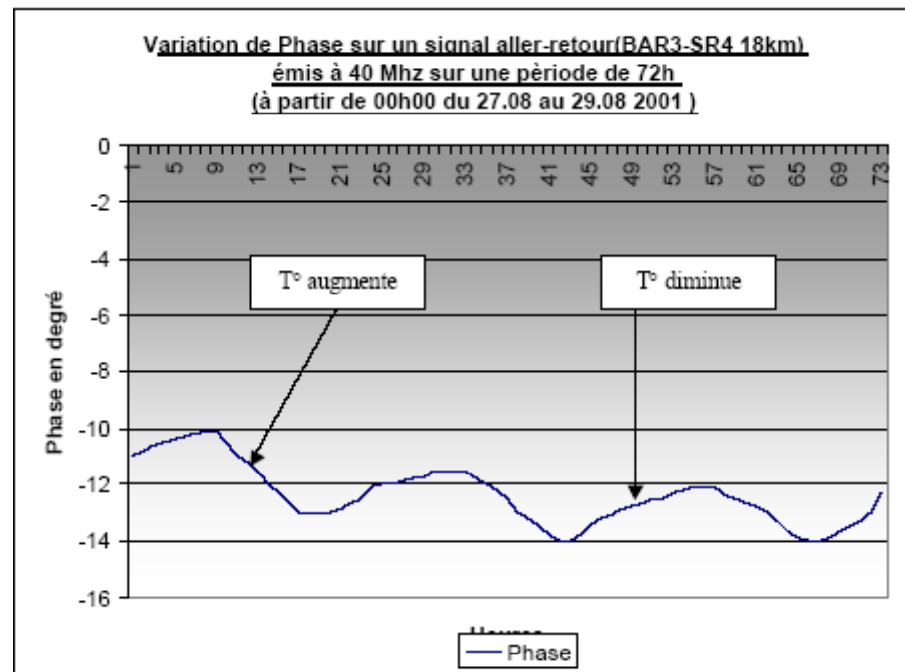
Courbe de comparaison entre la variation de phase sur un signal aller-retour (BA3-SR4 18km émis à 40MHz) et la température moyenne hebdomadaire.

- ~ 10 ns for 18 km and 25°C outdoor variation

# Fibres

## ■ Short term tests (diurnal)

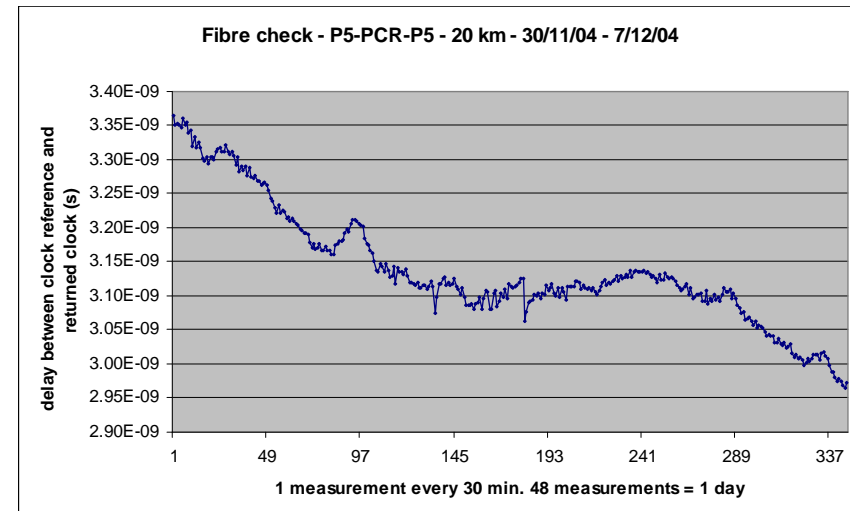
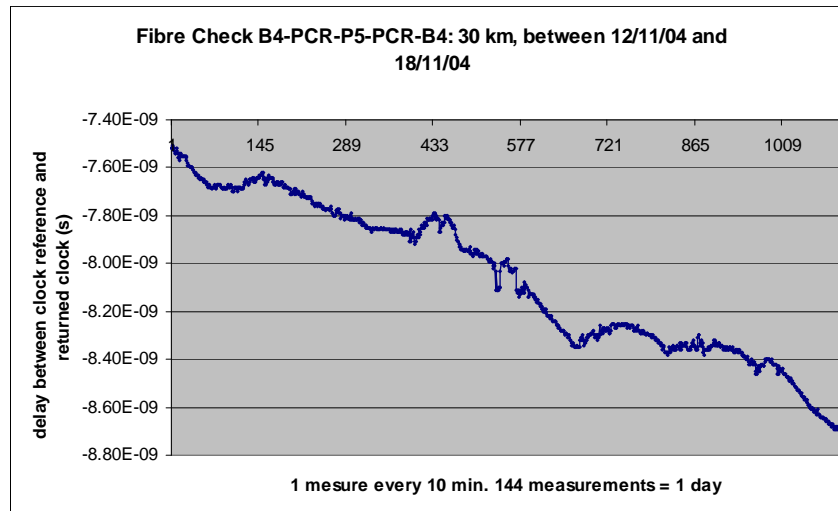
- Made by Donat Stellfeld



- ~270ps / 18km / 72 hours

# Fibres

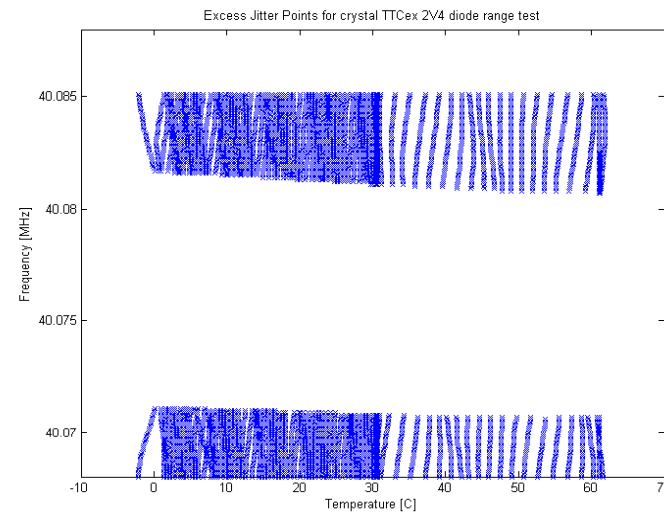
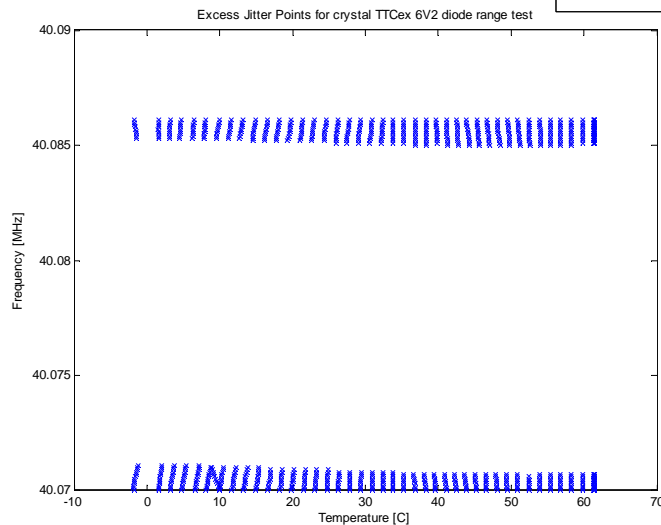
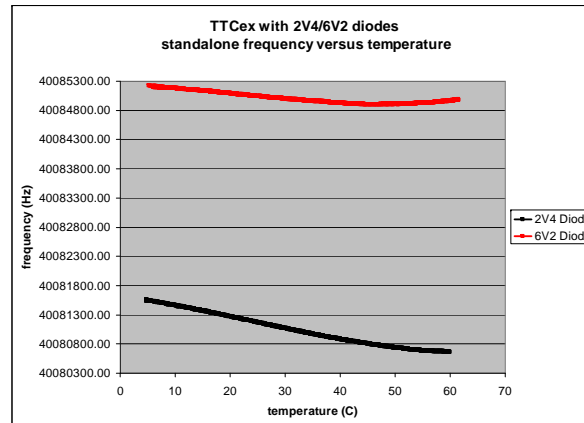
- Short term tests (diurnal) – P5-PCR-P5 - running
  - Made by Jan Troska and Sophie Baron



- 200ps / 10 km / 48 hours for small temperature change (max 6°C/48h)
- Could probably be up to 400 ps/ 48h for wider changes - test are still running
- Is it a problem?
- Temperature compensated fibres still exist on the market : divide by 15 the change against T

# TTCex – Clock generation

- Option 1: TTCex module modification to make the standalone clock fit with the TTCrq locking range (40.075-40.082MHz)
  - VCXO voltage reference diode 6V2 => 2V4



# TTCex – Clock generation

- Option 2: New VME form-factor module with clock generator. 40.0787MHz with ECL fanout.
  - 1 quartz 80.1574MHz : 19-50 CHF (QuartzCom-Fordahl) (features from Per Gallno)
  - Could be done 1<sup>st</sup> quarter of 2005

# TTC relocation

## ■ PCR - AB/CO lab – CCC

- Relocation in the AB/CO lab on the 10<sup>th</sup> of January for one year
- New fibres installed on the 15<sup>th</sup> of January
- PCR computer room dismantled on the 24<sup>th</sup> of January
- Simulated 40.078MHz will be available end of January
- 4 fibres available for the experiments. Possibly more punctually if needed (share with AB/CO)

# Commissioning in the experiments

- OTDR requested for fibres measurements
  - Precision?
    - $\geq 1$  m : classical OTDR (5000-20000 €)
    - $< 1$  m : photon counting technique (22000-26000 €)
  - Wavelength?
  - Single-mode or Multi-mode?
  - Can be purchased by the pool
- Other needs?

# TTC upgrade

- Define upgrade of modules with AB/CO on Q1 of 2005
  - Same principle
  - VME form factor (?)
  - Remote monitoring & diagnosis
  - Maintenance simplified
  - Spares easier to produce
  - NEED TO FIND A WAY FOR: extra TTCrx chips for receivers
    - PCR
    - Experiments