TWSTFT Working Group Meeting

8-9 October 2002

PTB
Braunschweig, Germany

IEN TW station status report

IEN TW station status report to the meeting of TWSTFT WG

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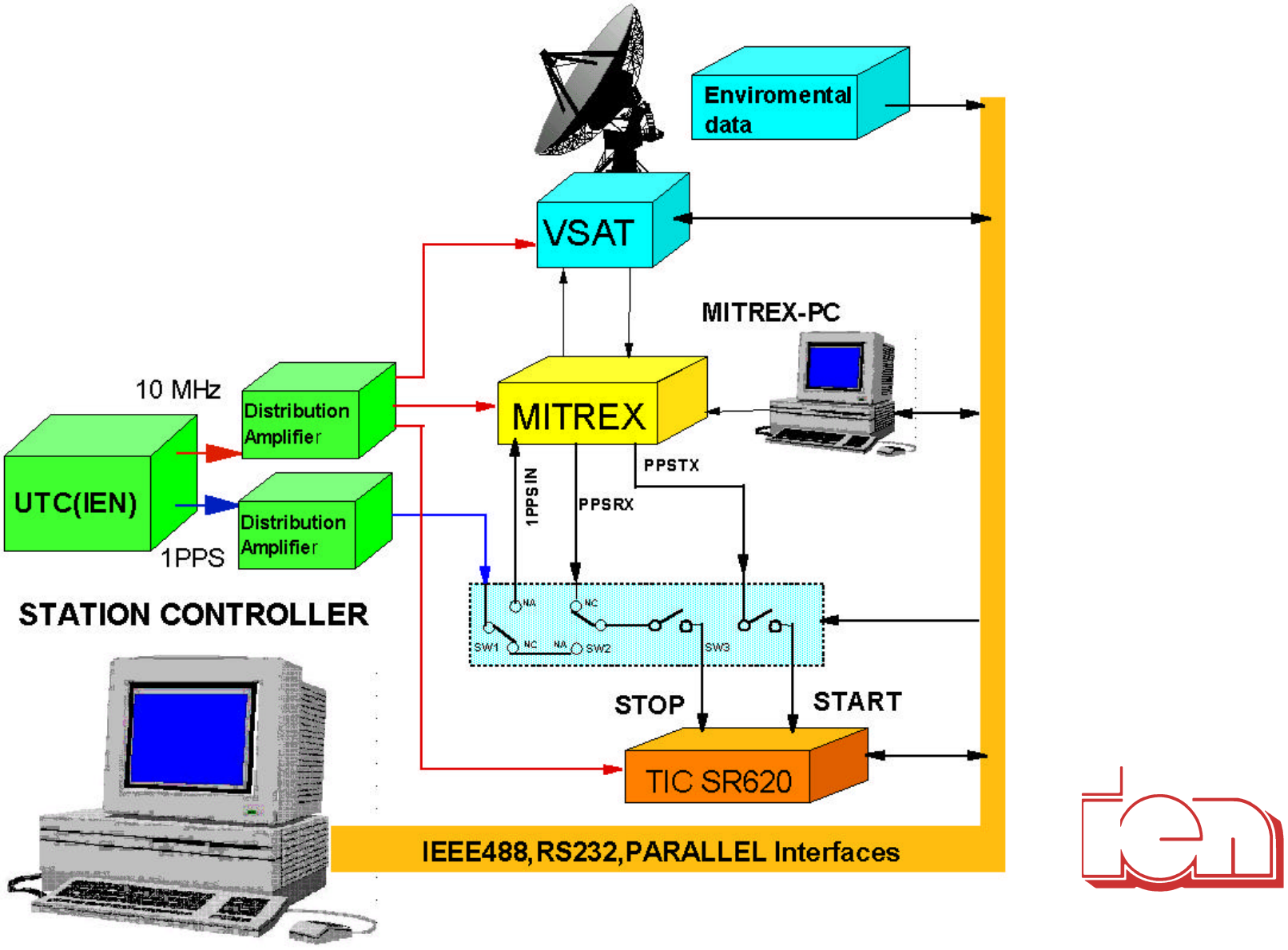

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IEN TW station setup

Modem type: University of Stuttgart/MITREX 2500A

Modem serial no: Italy 1

Antenna: 1.8m, VSAT Prodelin

Degree of automation: 100%

Reference name: UTC(IEN)

Reference type: 1 Cs

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Station status

• TWSTFT station has operated regularly since April 2001 to July 2002. Then (MJD 52477) the LNA failed.

• The new LNA (Vertex-RSI model LKE-12S80) was recently installed and since MJD 52549 IEN TW station has restarted its routine operations

•During the the inactivity period the IEN-NPL slot was used by the NPL for calibration purposes

•Automation completed: automatic data analysis and FTP server upload

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Upgrade in automation software

- At 15.00UTC measurement data are processed and the final ITU file is produced
- Automatic uploading on FTP server
- Any operator upgrade or correction files resident on the server is logged in the “twlog.nnn” file
- The counter “nnn” increment every time the twlog file is updated or modified

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Details on the fitting software

- Quadratic model with residual filter
- Data which are 3σ out of the fit residual average are filtered
- Refitting of the new set of data
- Definitive fit when no more outliers are present

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Calibration and contribution to TAI

- BIPM Calibration with Circular T (GPS data) of IEN-PTB link
- CALR value (IEN side): -253 ns (calculated on MJD52294)
- IEN-PTB link used in TAI calculation starting from MJD52334
- GPS link used as backup during TWSTFT failure
- GPS receiver changed during TWSTFT failure

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GPS timing receivers at IEN

NBS/TTR5

•Serial No.031

•Local delay: 253 ns

•Out of operation since MJD52525

3S Navigation

•Serial No.1003

•Local delay: 1693 ns

Local delay: receiver + antenna

Both receivers were calibrated during last BIPM circulation campaign (MJD 52331-52337)

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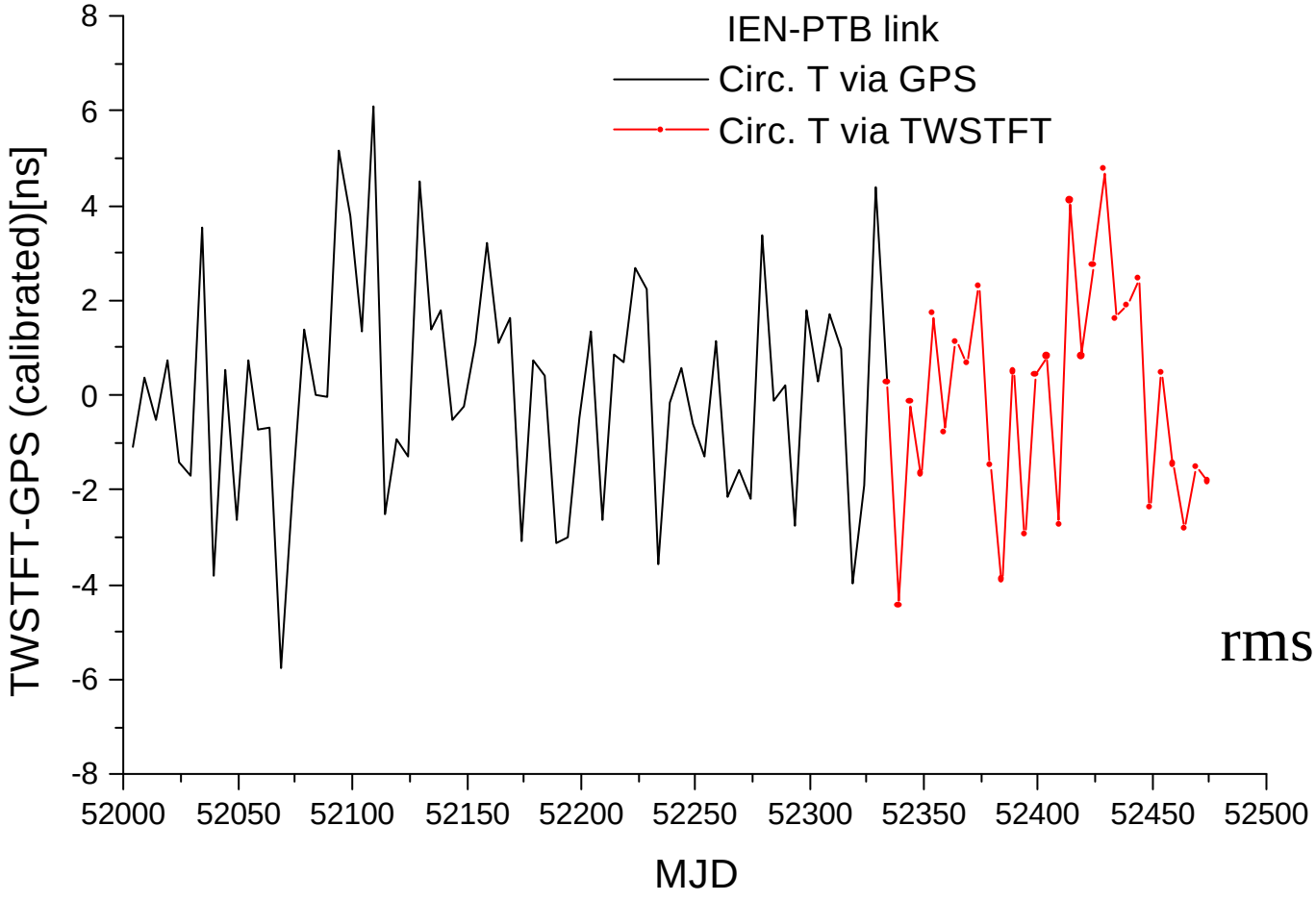
Long-term stability



rms = 2.3 ns

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Frequency comparison experiment

IEN-NIST two way link was used of IEN-CSF1 to NIST-F1, using UTC(IEN) and UTC(NIST) as transfer standards.

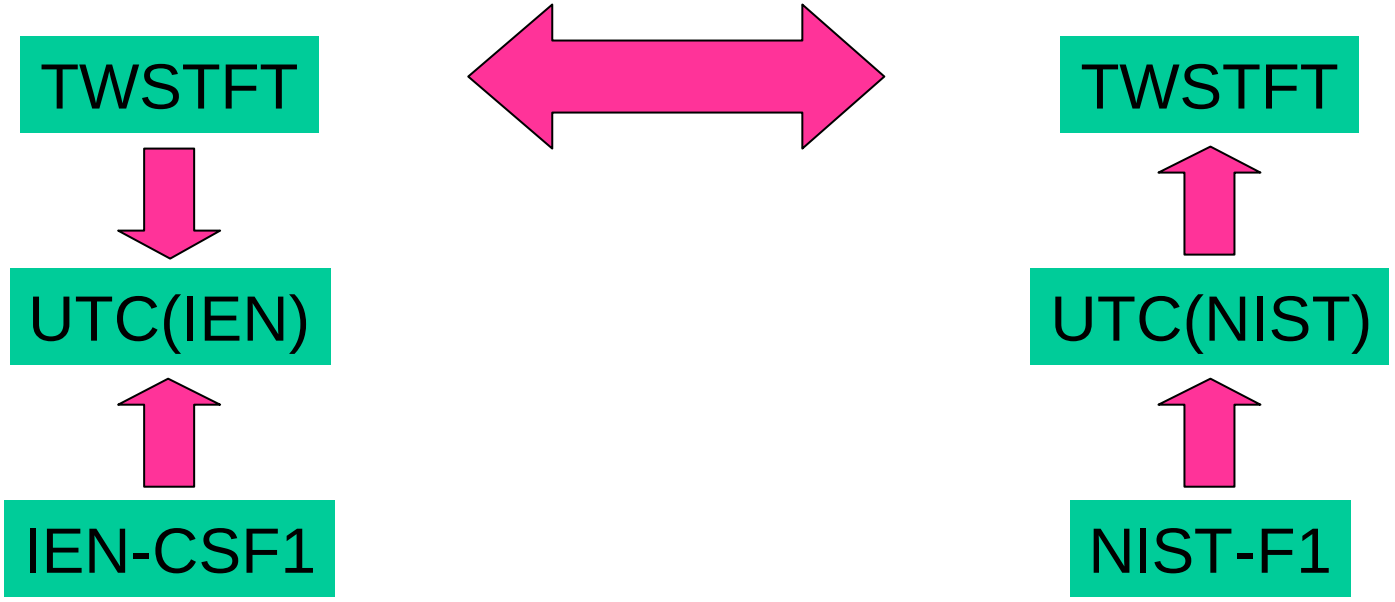
Running continuously the fountain during the 2 day TWSTFT measurement interval it is possible to reject the noise of UTCs transfer standards.

This is relevant in the case of UTC(IEN), which is very noisy because generated by a an HP5071A Cs clock. Partial rejection achieved when fountain operation is not continue.

Experimental results was reported at CPEM02

CPEM 2002 Ottawa

Istituto Elettrotecnico Nazionale GALILEO FERRARIS



Synchronous measurements with Fountain and TWSTFT, rejects the noise of UTC(IEN)

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New TWSTFT equipment at IEN

- Completely installed within the 2002
- Modem SATRE079 (Double receiving channel, Carrier phase option)
- Transceiver with all the LNBs (10.95-11.45 GHz, 11.45-11.95 GHz, 11.70-12.20 GHz, 12.25-12.70 GHz)
- At the moment only one LNB usable at a time
- High quality phase-stabilised cables (Andrew FSJ1-50A)
- Reference cable arranged for the use of a satellite simulator
- New equipment kept as backup (has to be approved by INTELSAT etc.)