

# Possible redefinition of UTC

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9th Meeting of UTC contributing  
laboratories

BIPM, 12 September 2012



## Responsibilities on timescales

- General Conference on Weights and Measures (CGPM)
  - Defines of the second (units in general)
  - Adopts International Atomic Time (TAI)
  - Endorses UTC
- International Telecommunication Union (ITU)
  - Fixes de rules for t&f dissemination by signals
  - Rec ITU-R TF-460.6 (describes the process for synchronizing UTC to UT1 better than 1s)
- International Bureau of Weights and Measures (BIPM)
  - Calculates UTC based on data provided by ~ 70 institutes world-wide spread, coordinates activities for accomplishing this mandate
- International Earth Rotation and Reference Systems Service (IERS)
  - Monitors the rotation of the Earth, fixes and announces the application of leap seconds
- National institutes (69) maintain local approximations to UTC, UCT(k)

## Possible redefinition of UTC without leap seconds

- ~ 2000 Discussion started at the ITU-R, SG7 Science Services, WP7A Time signals and frequency standard emissions
- 2000-2010 WP7A studied the issue, considered different options, organized an open meeting (Torino, 2003), and worked on a proposal for an amended recommendation
- 2010 The Draft Recommendation ITU-R TF.460-6 (new proposed version) was submitted by WP7A to SG7; discussion came to a « dead-end » with a 10-year opposition from one administration, plus 2 more administrations joining this position
- 2011 SG7 sent the Draft Recommendation to the Radiocommunication Assembly 2012 (January) for « final decision »
- 2012 RA 2012 put back the recommendation to SG7-WP7A for a final decision at WRC 2015 – WRC 2012 Resolution 653 on the feasibility of a continuous UTC and involves the BIPM, CCTF, CGPM, IAU, IUGG, URSI, and other international organizations.

# Contributions to the discussion

- Dissemination of information
  - Metrologia Special Issue “Modern Time Scales”, August 2011
    - 14 articles; F. Arias, W. Lewandowski (eds.)
  - Royal Society Discussion Meeting, January 2012, London area
    - Invited participants only; T. Quinn, F. Arias (organizers)
- ITU-R
  - WP7A
  - BIPM representation at Radiocommunication Assembly 2012
  - Radiocommunication Bureau Seminar for RCC countries and Baltic States (this week)
  - ITU Seminar for Americas Region (20-21 Sept 2012)
- IAU GA 2012 (Beijing, August 2012)
  - Division I Working Group on UTC
    - A draft document representing the IAU position on redefinition of UTC for submission to the ITU

# Possible redefinition of UTC without leap seconds

## \* Access to UT1 is required for many applications

### Questions for analysis:

- Is the UTC system with leap seconds **still necessary**?
- For which users UTC is **the only way** to approximate UT1?
- Which are the drawbacks of using the **IERS predictions of UT1-UTC** for accessing to UT1?
- [Decorrelation with the solar regime in human activities? (**does correlation really exist?**) ]
- **Is the ITU the place for making recommendations on the definition of timescales?**
  - Authority for fixing rules and procedures for time and frequency signals emission
  - The international metrology coordination system would be more appropriate

**Timing Dialog** [X]

TRAIM Parameters

TRAIM Enabled

TRAIM Alarm Limit:  X 100ns      Output Rate:

TRAIM 1PPS Mode:

1PPS Timing

1PPS Time Offset:  ns

1PPS Antenna Cable Delay:  ns

Pulse Interval

1 PPS       100 PPS

GMT Correction

+  :

GPS Time       UTC Time

OK

Cancel

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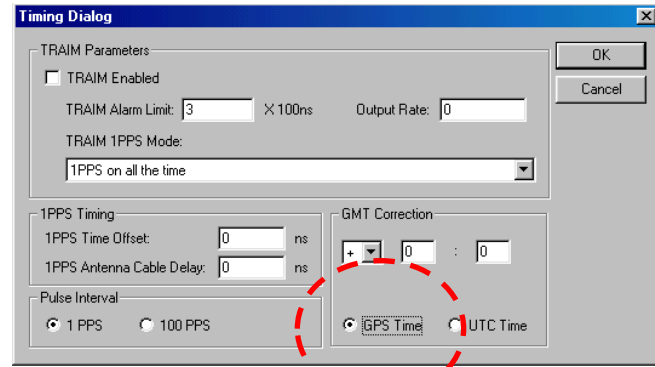
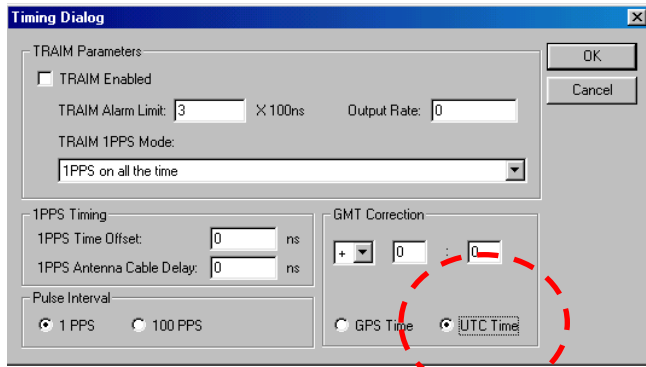
GMT Correction

+  :

GPS Time       UTC Time

OK

Cancel



**Motorola WinOncore12 - [Timing Window]**

File View Options Window Help

Open Save Signal Navigation Survey Satellites Cmd Mon Msg Timing About

Time and TRAIM Status Negative Sawtooth

**TRAIM Setup and Status**

Rate: 0  
 TRAIM: Disabled  
 Alarm: 300 ns  
 1PPS Control: Pulse is on all the time  
 Solution: Unknown  
 Algorithm: Neither possible  
 Pulse Status: On Sigma: 65535 ns  
 Pulse Sync: UTC Error: -14 ns

**Time**

Date: 09/04/2012  
 Time: 06:50:00 UTC GMT Offset: +00:00  
 UTC Offset: 15.999999994 seconds  
 Leap Second Pending: None  
 Present Leap Second: 16  
 Future Leap Second: 16

**Oscillator and Clock Parameters**

Clock Bias: 32 ns  
 Oscillator Offset: 97668 Hz  
 Temperature: 00.0° C

Channel	SVID	GPS Time Estimate
01	15	0.000073795
02	12	0.000073802
03	28	0.000073865
04	27	0.000073795
05	09	0.000073786
06	18	0.000073807
07	22	0.000073807
08	17	0.000073818
09	26	0.000073815

**Time: 06:50:00 UTC**

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