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BUREAU INTERNATIONAL DES POIDS ET MESURES
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1 - Coordinated Universal Time UTC and its local realizations UTC(k). Computed values of [*UTC-UTC*(*k*)] and uncertainties valid for the period of this Circular. From 2006 January 1, 0h UTC, *TAI-UTC* = 33 s.

Date 2006 0h UTC	AUG 27	SEP 1	SEP 6	SEP 11	SEP 16	SEP 21	SEP 26	Uncertainty/ns			Notes
MJD	53974	53979	53984	53989	53994	53999	54004	u_A	u_B	u	
Laboratory *k*				[*UTC-UTC*(*k*)]/ns							
AOS (Borowiec)	1.8	-5.0	10.3	5.9	-10.3	-1.0	1.7	1.5	5.1	5.3	
APL (Laurel)	7.4	26.1	32.4	32.7	26.5	20.8	20.6	1.5	5.0	5.2	
AUS (Sydney)	-388.8	-376.0	-361.5	-335.6	-308.6	-299.6	-292.0	1.5	5.0	5.3	
BEV (Wien)	36.6	43.9	42.0	40.6	37.4	27.3	23.8	2.0	5.0	5.4	
BIRM (Beijing)	-2025.4	-2048.7	-2073.8	-2103.2	-2125.0	-2140.6	-2166.7	3.5	20.0	20.3	
CAO (Cagliari)	-1086.0	-1062.4	-1053.2	-1047.2	-1024.6	-1017.1	-1009.3	1.5	7.1	7.2	
CH (Bern)	-8.2	-23.2	-25.4	-29.1	-29.4	-27.2	-29.3	0.7	5.0	5.1	(1)
CNM (Queretaro)	-13.5	-9.5	-5.7	0.2	1.7	4.5	3.1	4.9	19.8	20.4	
CNMP (Panama)	-5564.0	-5593.2	-5626.0	-5649.3	-5674.8	-5730.1	-5756.7	3.0	7.0	7.7	
CSIR (Pretoria)	-857.5	-929.5	-1016.5	-1086.6	-1179.9	-1259.1	-1336.5	2.5	20.0	20.2	
DLR (Oberpfaffenhofen)	-	-	-	-	-	-	-	-	-	-	
DTAG (Darmstadt)	-36.9	-8.8	28.6	56.9	70.1	99.1	131.3	3.0	10.0	10.5	
HKO (Hong Kong)	73.8	68.3	73.4	70.5	63.5	61.5	50.2	2.5	5.1	5.7	
IFAG (Wettzell)	-443.1	-412.8	-412.2	-409.7	-408.3	-395.5	-386.2	2.5	5.0	5.6	
IGMA (Buenos Aires)	-	-	-	-	-	-	776.3	5.0	20.0	20.6	
INPL (Jerusalem)	183.3	179.4	175.5	179.8	178.3	178.6	177.6	5.0	10.0	11.2	
IT (Torino)	17.2	19.8	25.1	27.0	26.1	23.3	19.7	0.6	1.3	1.4	
JATC (Lintong)	-8.0	-7.3	4.7	11.7	11.9	8.0	1.8	1.5	4.9	5.2	
JV (Kjeller)	-3030.3	-2966.1	-2916.7	-2839.4	-2763.2	-2739.1	-2710.9	5.0	20.0	20.6	
KRIS (Daejeon)	-9.7	-8.1	-8.3	-5.5	-7.6	-8.3	-11.3	0.7	5.0	5.1	
LDS (Leeds)	293.3	331.2	352.2	392.0	449.5	494.6	530.2	3.0	20.0	20.2	
LT (Vilnius)	89.1	96.7	99.1	114.2	129.2	108.0	114.1	1.5	5.1	5.3	
MIKE (Espoo)	-93.8	-128.5	-124.2	-122.6	-128.3	-123.8	-106.6	5.0	19.8	20.4	
MSL (Lower Hutt)	47.4	62.3	53.7	30.4	33.4	28.0	27.9	1.0	20.0	20.0	
NAO (Mizusawa)	231.7	238.7	258.5	249.3	242.7	256.8	250.3	3.0	20.0	20.2	(2)
NICT (Tokyo)	-1.3	0.8	1.2	0.6	0.3	2.5	2.7	0.7	4.8	4.8	
NIM (Beijing)	-53.2	-54.0	-49.3	-47.1	-51.6	-51.5	-54.1	1.5	19.8	19.8	
NIMB (Bucharest)	-981.8	-997.8	-999.2	-992.4	-1015.5	-1005.5	-1005.8	2.5	20.0	20.1	
NIMT (Bangkok)	-1146.0	-1144.6	-1141.3	-1139.7	-1135.5	-1134.8	-1135.6	1.0	20.0	20.0	
NIS (Cairo)	-	82.6	111.0	132.4	148.1	165.8	175.9	2.5	7.1	7.5	

Date 2006 0h UTC	AUG 27	SEP 1	SEP 6	SEP 11	SEP 16	SEP 21	SEP 26	Uncertainty/ns			Notes
MJD	53974	53979	53984	53989	53994	53999	54004	u_A	u_B	u	
Laboratory *k*				[*UTC*-*UTC*(*k*)]/ns							
NIST (Boulder)	-2.2	-5.4	-6.7	-8.8	-11.3	-13.0	-14.6	0.5	4.8	4.8	
NMC (Sofiya)	-4701.1	-4720.4	-4744.5	-4739.8	-4727.9	-4756.3	-4771.5	5.0	20.0	20.6	
NMIJ (Tsukuba)	-12.3	-13.7	-15.0	-17.3	-18.7	-22.3	-25.8	0.7	5.1	5.1	
NMLS (Sepang)	-467.3	-470.7	-480.1	-492.1	-492.0	-492.9	-499.0	2.0	20.0	20.1	
NPL (Teddington)	-1.8	-4.0	-2.8	-3.4	-4.1	-3.4	-3.6	0.6	1.3	1.4	
NPLI (New-Delhi)	-35.1	-17.9	2.1	15.5	35.9	49.9	71.4	4.0	7.1	8.1	
NRC (Ottawa)	8.7	16.7	18.3	21.2	20.7	22.6	29.2	0.7	5.1	5.1	
NTSC (Lintong)	-2.0	-1.4	7.3	12.4	15.3	13.6	7.8	1.5	4.8	5.0	
OMH (Budapest)	11385.0	11411.6	11435.4	11456.8	11472.0	11500.4	11523.9	2.5	20.0	20.2	
ONBA (Buenos Aires)	-	-	-	-	-	-	-	-	-	-	
ONRJ (Rio de Janeiro)	8132.0	8175.3	8223.6	8275.7	8330.3	8384.7	8437.3	7.0	19.9	21.1	
OP (Paris)	4.7	-3.1	-0.9	-3.9	-8.4	-6.3	-13.8	0.6	1.3	1.4	
ORB (Bruxelles)	10.0	12.5	16.1	17.6	22.6	24.4	25.0	0.7	5.0	5.1	
PL (Warszawa)	10.0	15.5	13.2	0.4	-6.9	-6.6	-9.0	1.5	4.8	5.1	
PTB (Braunschweig)	11.3	4.5	6.1	0.0	-5.1	-6.3	-5.0	0.3	0.9	0.9	
ROA (San Fernando)	91.6	95.5	88.0	74.9	70.4	75.8	73.3	0.7	5.0	5.1	
SCL (Hong Kong)	-52.3	-53.6	-41.1	-42.9	-39.7	-36.3	-46.7	3.9	9.9	10.6	
SG (Singapore)	-	28.8	43.4	44.9	47.0	43.2	54.9	2.0	7.1	7.3	
SMU (Bratislava)	-26.7	-38.2	-42.8	-41.1	-45.1	-40.2	-49.6	5.0	20.0	20.6	
SP (Boras)	8.7	7.3	8.5	0.9	2.9	-0.4	2.9	0.7	1.7	1.8	
SU (Moskva)	25.1	18.2	13.1	6.7	-0.9	-4.7	-7.9	3.0	5.0	5.8	
TCC (Concepcion)	-3189.5	-3203.9	-3266.0	-3310.0	-3315.2	-3341.6	-3367.4	1.5	20.0	20.1	
TL (Chung-Li)	2.9	4.4	6.0	2.4	1.9	2.8	2.0	0.7	4.8	4.9	
TP (Praha)	-58.3	-57.8	-51.7	-42.7	-42.1	-33.0	-28.9	1.5	5.1	5.3	
UME (Gebze-Kocaeli)	-67.0	-65.5	-66.0	-66.2	-65.4	-60.8	56.5	1.5	7.1	7.2	
USNO (Washington DC)	1.3	-1.0	-0.5	-2.0	-2.0	-1.1	-0.2	0.3	1.0	1.0	
VSL (Delft)	-10.7	-10.7	-7.9	-7.8	-11.9	-13.8	-20.1	0.6	1.3	1.4	
ZMDM (Belgrade)	3568.2	3598.0	3626.9	3644.7	3668.9	3703.7	3733.7	2.0	7.0	7.3	

- Notes on section 1:

(1) CH : Time step of UTC(CH) of -8.9 ns on MJD 53986.
(2) NAO : Change of master clock on MJD 53982.

2 - International Atomic Time TAI and Local atomic time scales TA(k). Computed values of [*TAI-TA*(*k*)].

Date 2006 0h UTC	AUG 27	SEP 1	SEP 6	SEP 11	SEP 16	SEP 21	SEP 26	
MJD	53974	53979	53984	53989	53994	53999	54004	
Laboratory *k*				[*TAI-TA*(*k*)]/ns				
CH (Bern)	53404.7	53417.0	53440.2	53445.7	53463.5	53483.8	53499.8	
F (Paris)	168359.0	168355.4	168356.7	168353.3	168352.1	168352.0	168346.7	
IT (Torino)	55989.3	56121.6	56250.0	56376.9	56511.9	56645.1	56778.9	
JATC (Lintong)	-40433.4	-40472.1	-40503.2	-40538.3	-40575.7	-40613.6	-40650.2	
KRIS (Daejeon)	13281.9	13354.5	13425.4	13498.6	13567.6	13638.4	13707.3	
NICT (Tokyo)	5.8	7.4	6.7	6.1	6.2	7.5	6.6	
NIST (Boulder)	-45296569.0	-45296764.7	-45296958.5	-45297153.1	-45297348.1	-45297542.3	-45297737.3	
NRC (Ottawa)	29958.5	29974.6	29993.1	30012.9	30029.5	30048.3	30071.8	
NTSC (Lintong)	3285.9	3307.4	3335.8	3361.2	3383.6	3405.9	3430.5	
ONRJ (Rio de Janeiro	-488.7	-523.1	-550.9	-580.3	-610.9	-640.9	-667.6	
PL (Warszawa)	-3807.3	-3812.0	-3816.4	-3824.2	-3836.3	-3847.4	-3857.4	
PTB (Braunschweig)	-358111.1	-358110.3	-358101.3	-358099.6	-358097.3	-358090.8	-358081.9	
SU (Moskva)	27242549.4	27242569.2	27242590.9	27242611.3	27242630.5	27242653.5	27242674.9	(1)
TL (Chung-Li)	463.6	467.3	471.8	476.3	480.6	486.1	492.2	
USNO (Washington DC)	-34982783.7	-34983089.3	-34983393.2	-34983697.7	-34984001.3	-34984304.6	-34984609.4	

- Note on section 2:

(1) SU : Listed values are *TAI-TA*(*SU*) - 2.80 seconds.

3 - Difference between the normalized frequencies of EAL (free atomic time scale) and TAI.

	Interval of validity	*f*(*EAL*)-*f*(*TAI*)	
Steering correction	53974 - 54004	6.820×10^{-13}	(2006 AUG 27 - 2006 SEP 26)
New correction	54004 - 54039	6.817×10^{-13}	(2006 SEP 26 - 2006 OCT 31)
New correction foreseen	54039 - 54069	6.817×10^{-13}	(2006 OCT 31 - 2006 NOV 30)

4 - Duration of the TAI scale interval.

TAI is a realization of coordinate time TT. The following tables give the fractional deviation *d* of the scale interval of TAI from that of TT (the SI second on the geoid), i.e. the fractional frequency deviation of TAI with the opposite sign: $d = -y_{TAI}$. In this section, a frequency over a time interval is defined as the ratio of the end-point phase difference to the duration of the interval. Whenever needed, the instability of EAL should be expressed as the quadratic sum of three components with τ in days: (1) a white frequency noise of $3.0\text{x}10^{-15} / \sqrt{\tau}$, (2) a flicker frequency noise of $0.5\text{x}10^{-15}$ and (3) a random walk frequency noise of $1.0\text{x}10^{-16} \text{ x } \sqrt{\tau}$. The relation between EAL and TAI is given in *Circular T* and the *Annual Report of the BIPM Time Section*.

In the first table, *d* is obtained, on the given periods of estimation by comparison of the TAI frequency with that of the given individual Primary Frequency Standards (PFS). In this table: u_A is the uncertainty originating in the instability of the PFS, u_B is the combined uncertainty from systematic effects, Ref(u_B) is a reference giving information on the stated value of u_B or is the *Circular T* where this reference was first given, $u_{l/lab}$ is the uncertainty in the link between the PFS and the clock participating to TAI, including the uncertainty due to the dead-time, $u_{l/TAI}$ is the uncertainty in the link to TAI, *u* is the quadratic sum of all four uncertainty values. All values are expressed in 10^{-15}.

Standard	Period of Estimation		*d*	u_A	u_B	Ref(u_B)	$u_{l/Lab}$	$u_{l/Tai}$	*u*	Note
SYRTE-JPO	53984	54004	11.1	0.8	6.3	T160	0.3	0.6	6.4	(1)
NMIJ-F1	53974	53984	-0.4	1.1	3.9	T213	0.6	1.9	4.5	(2)
PTB-CS1	53974	54004	-5.8	5.0	8.0	T148	0.0	0.3	9.4	(3)
PTB-CS2	53974	54004	5.8	3.0	12.0	T148	0.0	0.3	12.4	(3)

Notes:
(1) Report 5 Oct. 2006 by LNE-SYRTE.
(2) Report 2 Oct. 2006 by NMIJ.
(3) Continuously operating as a clock participating to TAI.

The second table gives the BIPM estimate of *d*, based on all available PFS measurements over the period MJD 53614-54004, taking into account their individual uncertainties and characterizing the instability of EAL as noted above. *u* is the computed standard uncertainty of *d*

Period of estimation	*d*	*u*	
53974-54004	$2.7\text{x}10^{-15}$	$1.7\text{x}10^{-15}$	(2006 AUG 27 - 2006 SEP 26)

5 - Relations of UTC and TAI with GPS time and GLONASS time.

[*UTC-GPS time*] = -14 s + C_0, [*TAI-GPS time*] = 19 s + C_0, global uncertainty is of order 10 ns.
[*UTC-GLONASS time*] = 0 s + C_1, [*TAI-GLONASS time*] = 33 s + C_1, global uncertainty is of order hundreds ns.

The C_0 values are obtained using the values [*UTC-UTC*(*OP*)] and the GPS data taken at the Paris Observatory, corrected for IGS precise orbits, clocks and ionosphere maps. The C_1 values are obtained using the values [*UTC-UTC*(*AOS*)] and the GLONASS data taken at the Astrogeodynamical Observatory Borowiec (AOS). N_0 and N_1 are the numbers of measurements, when N_0 or N_1 is 0, the corresponding values of C_0 or C_1 are interpolated.
The standard deviations σ_0 and σ_1 characterize the dispersion of individual measurements. The actual uncertainty of user's access to GPS and GLONASS times may differ from these values.
For this circular, σ_0 = 2.3 ns, σ_1 = 12.5 ns

Date 2006 0h UTC	MJD	C_0/ns	N_0	C_1/ns	N_1
AUG 27	53974	-7.9	45	-33.1	73
AUG 28	53975	-8.0	44	-46.0	85
AUG 29	53976	-8.7	44	-57.5	83
AUG 30	53977	-8.2	45	-81.4	86
AUG 31	53978	-8.9	44	-108.2	86
SEP 1	53979	-8.6	44	-127.9	88
SEP 2	53980	-10.2	46	-148.1	89
SEP 3	53981	-9.8	46	-172.2	81
SEP 4	53982	-8.1	44	-193.9	78
SEP 5	53983	-5.3	45	-209.6	85
SEP 6	53984	-6.6	43	-210.0	86
SEP 7	53985	-8.6	45	-207.8	73
SEP 8	53986	-11.2	44	-210.9	74
SEP 9	53987	-12.1	45	-207.8	89
SEP 10	53988	-10.5	48	-204.1	79
SEP 11	53989	-8.2	47	-206.2	83
SEP 12	53990	-6.4	47	-210.5	89
SEP 13	53991	-6.0	47	-210.4	86
SEP 14	53992	-5.1	47	-213.4	82
SEP 15	53993	-7.8	47	-219.4	73
SEP 16	53994	-7.8	47	-223.9	66
SEP 17	53995	-5.8	47	-225.8	70
SEP 18	53996	-3.2	48	-224.3	84
SEP 19	53997	-4.6	47	-220.4	89
SEP 20	53998	-4.9	47	-225.9	87
SEP 21	53999	-7.8	47	-233.0	89
SEP 22	54000	-6.1	43	-219.5	86
SEP 23	54001	-4.8	44	-200.9	80
SEP 24	54002	-5.8	45	-203.5	89
SEP 25	54003	-5.5	47	-214.0	80
SEP 26	54004	-7.6	47	-225.1	75

6 - Time links used for the computation of TAI and their uncertainties.

The time links used in the elaboration of this *Circular T* are listed in this section. The technique for the link is indicated as follows: GPS SC for GPS all-in-view single-channel C/A data; GPS MC for GPS all-in-view multi-channel C/A data; GPS P3 for GPS all-in-view multi-channel dual-frequency P code data; GPS GT for 'GPS time' observations; INT LK for internal cable link and TWSTFT for two-way satellite time and frequency transfer data.

For each link, the following uncertainties are provided: u_A is the statistical uncertainty evaluated by taking into account the level of phase noise in the raw data, the interpolation interval between data points and the effects with typical duration between 5 and 30 days. u_B is the estimated uncertainty on the calibration.

The calibration type of the link is indicated as: GPS EC for GPS equipment calibration; TW EC for two-way equipment calibration; LC (technique) for a link calibrated using 'technique'; BC (technique) for a link calibrated using 'technique' to transfer a past equipment calibration through a discontinuity of link operation.

The calibration dates indicate: the most recent calibration results for the two laboratories in the case of EC and
the most recent calibration of the link in the case of LC and BC,
NA stands for not available, in this case estimated values are provided

Link	Type	u_A/ns	u_B/ns	Calibration Type	Calibration Dates
AOS /PTB	GPS MC	1.5	5.0	GPS EC /GPS EC	2003 Sep/2003 Aug
APL /PTB	GPS MC	1.5	5.0	GPS EC /GPS EC	2003 Dec/2003 Aug
AUS /PTB	GPS MC	1.5	5.0	GPS EC/GPS EC	2002 Sep/2003 Aug
BEV /PTB	GPS MC	2.0	5.0	GPS EC/GPS EC	2001 Dec/2003 Aug
BIRM/PTB	GPS SC	3.5	20.0	NA /GPS EC	NA /2003 Aug
CAO /PTB	GPS MC	1.5	7.0	GPS EC/GPS EC	2004 Nov/2003 Aug
CH /PTB	GPS P3	0.7	5.0	GPS EC/GPS EC	2004 Nov/2004 Aug
CNM /PTB	GPS SC	5.0	20.0	NA /GPS EC	NA /2003 Aug
CNMP/PTB	GPS MC	3.0	7.0	GPS EC/GPS EC	2002 Oct/2003 Aug
CSIR/PTB	GPS MC	2.5	20.0	NA /GPS EC	NA /2003 Aug
DLR /PTB	NA				
DTAG/PTB	GPS MC	3.0	10.0	GPS EC/GPS EC	1998 May/2003 Aug
HKO /PTB	GPS MC	2.5	5.0	GPS EC/GPS EC	2004 Apr/2003 Aug
IFAG/PTB	GPS SC	2.5	5.0	GPS EC/GPS EC	2003 Jun/2003 Aug
IGMA/PTB	GPS MC	5.0	20.0	NA /GPS EC	NA /2003 Aug
INPL/PTB	GPS SC	5.0	10.0	GPS EC/GPS EC	1987 Jun/2003 Aug
IT /PTB	TWSTFT	0.5	1.0	LC (TWSTFT)	2005 Nov
JATC/NTSC	INT LK	0.2	1.0	NA	/2002 Aug
JV /PTB	GPS GT	5.0	20.0	NA /GPS EC	NA /2003 Aug
KRIS/PTB	GPS P3	0.7	5.0	GPS EC/GPS EC	2005 Aug/2004 Aug

Link	Type	u_A/ns	u_B/ns	Calibration Type	Calibration Dates
LDS /PTB	GPS SC	3.0	20.0	NA /GPS EC	NA /2003 Aug
LT /PTB	GPS MC	1.5	5.0	GPS EC/GPS EC	2001 Nov/2003 Aug
MIKE/PTB	GPS MC	5.0	20.0	NA /GPS EC	NA /2003 Aug
MSL /PTB	GPS P3	1.0	20.0	NA /GPS EC	NA /2004 Aug
NAO /PTB	GPS SC	3.0	20.0	NA /GPS EC	NA /2003 Aug
NICT/PTB	GPS P3	0.7	5.0	GPS EC/GPS EC	2005 Jun/2004 Aug
NIM /PTB	GPS MC	1.5	20.0	NA /GPS EC	NA /2003 Aug
NIMB/PTB	GPS MC	2.5	20.0	NA /GPS EC	NA /2003 Aug
NIMT/PTB	GPS P3	1.0	20.0	NA /GPS EC	NA /2004 Aug
NIS /PTB	GPS MC	2.5	7.0	GPS EC/GPS EC	2005 May/2003 Aug
NIST/PTB	TWSTFT	0.5	5.0	BC(GPS P3)	2005 May
NMC /PTB	GPS SC	5.0	20.0	NA /GPS EC	NA /2003 Aug
NMIJ/PTB	GPS P3	0.7	5.0	GPS EC/GPS EC	2002 Apr/2004 Aug
NMLS/PTB	GPS MC	2.0	20.0	NA /GPS EC	NA /2003 Aug
NPL /PTB	TWSTFT	0.5	1.0	LC(TWSTFT)	2005 Nov
NPLI/PTB	GPS MC	4.0	7.0	GPS EC/GPS EC	2005 Jul/2003 Aug
NRC /PTB	GPS P3	0.7	5.0	GPS EC/GPS EC	2003 Nov/2004 Aug
NTSC/PTB	GPS MC	1.5	5.0	GPS EC/GPS EC	2002 Aug/2003 Aug
OMH /PTB	GPS SC	2.5	20.0	NA /GPS EC	NA /2003 Aug
ONBA/PTB	NA				
ONRJ/PTB	GPS SC	7.0	20.0	NA /GPS EC	NA /2003 Aug
OP /PTB	TWSTFT	0.5	1.0	LC(TWSTFT)	2005 Nov
ORB /PTB	GPS P3	0.7	5.0	GPS EC/GPS EC	2003 Jul/2004 Aug
PL /PTB	GPS MC	1.5	5.0	GPS EC/GPS EC	2001 Oct/2003 Aug
ROA /PTB	TWSTFT	0.7	5.0	BC(GPS P3)	2005 May
SCL /PTB	GPS SC	4.0	10.0	GPS EC/GPS EC	1993 May/2003 Aug
SG /PTB	GPS MC	2.0	7.0	GPS EC/GPS EC	2004 Nov/2003 Aug
SMU /PTB	GPS SC	5.0	20.0	NA /GPS EC	NA /2003 Aug
SP /PTB	GPS P3	0.7	1.5	LC(TWSTFT)	2004 Aug
SU /PTB	GPS SC	3.0	5.0	GPS EC/GPS EC	2003 Apr/2003 Aug
TCC /PTB	GPS P3	1.5	20.0	NA /GPS EC	NA /2004 Aug
TL /PTB	GPS P3	0.7	5.0	GPS EC/GPS EC	2005 May/2004 Aug
TP /PTB	GPS MC	1.5	5.0	LC(GPS SC)	2003 Aug
UME /PTB	GPS MC	1.5	7.0	GPS EC/GPS EC	2005 Dec/2003 Aug
USNO/PTB	TWSTFT	0.5	1.1	BC(TW X-Band)	2005 May
VSL /PTB	TWSTFT	0.5	1.0	LC(TWSTFT)	2005 Nov
ZMDM/PTB	GPS MC	2.0	7.0	GPS EC/GPS EC	2005 Mar/2003 Aug