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BUREAU INTERNATIONAL DES POIDS ET MESURES

Circular T 94 (1995 November 16)

1 - Coordinated Universal Time UTC. Computed values of UTC-UTC(k).

(From 1994 July 1, 0hUTC, to 1996 January 1, 0hUTC, TAI-UTC = 29 s)
(From 1996 January 1, 0hUTC, until further notice, TAI-UTC = 30 s)

Date 1995 0h UTC		Sep 29	Oct 9	Oct 19	Oct 29
MJD		49989	49999	50009	50019
Laboratory k		UTC-UTC(k) (Unit is one nanosecond)			
AOS (Borowiec)		-1847	-2006	-1765	-1950
APL (Laurel)	(1)	2058	-	1931	1923
AUS (Canberra)		-491	-459	-463	-473
BEV (Wien)	(2)	-35885	-36464	-37039	12498
CAO (Cagliari)		-	-	-	-
CH (Bern)		157	140	125	116
CRL (Tokyo)		605	571	542	508
CSAO (Lintong)		-260	-291	-364	-269
CSIR (Pretoria)		2420	2693	3297	3801
FTZ (Darmstadt)		-234	-232	-232	-224
GUM (Warszawa)		-308	-311	-314	-318
IEN (Torino)		-13	-30	-28	-33
IFAG (Wettzell)		-3826	-3963	-4129	-4259
IGMA (Buenos Aires)		122	292	419	428
INPL (Jerusalem)		-2353	-2429	-2403	-2419
JATC (Lintong)		1018	1054	1054	1224
KRIS (Taejon)		193	200	229	245
LDS (Leeds)	(3)	370	400	298	307
MSL (Lower Hutt)		-4551	-4680	-4833	-4979
NAOM (Mizusawa)		-3354	-3343	-3300	-3270
NAOT (Tokyo)		-4541	-4418	-4242	-4072
NIM (Beijing)		7644	7685	7707	7781
NIST (Boulder)		-13	-16	-16	-15
NMC (Sofiya)		-	-	-	-
NPL (Teddington)		51	41	35	31
NPLI (New-Delhi)		-	-	-	-
NRC (Ottawa)		-85	-75	-59	-29
NRLM (Tsukuba)		-6621	-6477	-6332	-6182
OMH (Budapest)		11523	11648	11696	11863
ONBA (Buenos Aires)		8236	9278	10187	10268
ONRJ (Rio de Janeiro)		-7659	-6617	-5778	-4994
OP (Paris)		13	23	34	48
ORB (Bruxelles)		275	310	317	320
PTB (Braunschweig)		2308	2285	2282	2264
RC (Habana)		-809	-	-	-
ROA (San Fernando)		170	247	261	174
SCL (Hong Kong)		-581	-430	-	-140
SO (Shanghai)		1940	1945	1905	1875
SU (Moskva)		-7053	-7080	-7099	-7127
TL (Chung-Li)		-125	-104	-119	-82
TP (Praha)		-407	-401	-373	-352
TUG (Graz)		-381	-362	-348	-324
UME (Gebze-Kocaeli)		-3254	-3238	-3226	-3214
USNO (Washington DC)(USNO MC)		4	0	0	0
VSL (Delft)		-203	-206	-218	-232

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2 - International Atomic Time TAI and local atomic time scales TA(k).

The following table gives the computed values of TAI-TA(k).

Date 1995 0h UTC		Sep 29	Oct 9	Oct 19	Oct 29
MJD		49989	49999	50009	50019
Laboratory k		TAI-TA(k) (Unit is one nanosecond)			
APL (Laurel)		3521	-	3394	3386
AUS (Canberra)		-63817	-64059	-64328	-64712
CH (Bern)		-66020	-65806	-65589	-65367
CRL (Tokyo)		59846	60259	60671	61086
CSAO (Lintong)		7935	7774	7572	7537
F (Paris)		147505	147836	148169	148503
IEN (Torino)		-506	-534	-543	-551
INPL (Jerusalem)		-306776	-307930	-309059	-310233
JATC (Lintong)		13123	13020	12886	12920
KRIS (Taejon)		1461	1511	1587	1648
NIM (Beijing)		-7638	-7561	-7495	-7381
NISA (Boulder)	(4)	-45134580	-45135017	-45135452	-45135886
NRC (Ottawa)		24814	24867	24927	24999
PTB (Braunschweig)		-361092	-361115	-361118	-361136
RC (Habana)	(5)	-317179	-	-	-
SO (Shanghai)		-45613	-45629	-45714	-45726
SU (Moskva)	(6)	27242947	27242920	27242901	27242873
USNO (Washington DC)	(7)	-34732641	-34733300	-34733963	-34734624

3 - Notes on sections 1 and 2.

(1) APL . Interruption of the GPS time link between MJD = 49989 and MJD = 50009

(2) BEV . Time step of UTC(BEV) of - 50000 ns on MJD = 50014.4

(3) LDS . Power interruption on MJD = 50007

(4) NIST. TA(NISA) designates the scale AT1 of NIST.

(5) RC . Listed values are TAI-TA(RC) - 18 seconds.

(6) SU . Listed values are TAI-TA(SU) - 2.80 seconds.

(7) USNO. TA(USNO) designates the scale A1(MEAN) of USNO.

4 - [UTC - GPS time] and [TAI - GPS time].

[UTC - GPS time] = -10 s + C0 (until 1996 January 1, 0h UTC)
[UTC - GPS time] = -11 s + C0 (from 1996 January 1, 0h UTC)
[TAI - GPS time] = 19 s + C0.

Daily values of C0 are given in the following table. They are obtained as follows: the GPS data taken at the Paris Observatory, for highest elevation, are first corrected for precise satellite ephemerides and for measured ionospheric delays, and then smoothed to obtain daily values of [UTC(OP) - GPS time] at 0h UTC; daily values of C0 are derived from them using linear interpolation of [UTC - UTC(OP)].

For a given day, where N measurements are used for estimation of C0 :
- the dispersion of individual measurements is characterized by a standard deviation σ,
- the daily C0 value is characterized by the standard deviation of the mean $\sigma/\sqrt{N}$.

Date 1995 0h UTC	MJD	C0 (ns)	σ (ns)	$\sigma/\sqrt{N}$ (ns)
Sep 29	49989	34	32	9
Sep 30	49990	32	54	14
Oct 1	49991	35	38	12
Oct 2	49992	42	50	11
Oct 3	49993	43	38	11
Oct 4	49994	40	53	13
Oct 5	49995	32	51	11
Oct 6	49996	22	49	11
Oct 7	49997	20	29	7
Oct 8	49998	26	42	11
Oct 9	49999	32	65	17
Oct 10	50000	32	41	11
Oct 11	50001	24	43	12
Oct 12	50002	20	37	9
Oct 13	50003	19	48	12
Oct 14	50004	18	38	8
Oct 15	50005	15	41	9
Oct 16	50006	13	49	10
Oct 17	50007	12	41	9
Oct 18	50008	12	49	11
Oct 19	50009	11	49	10
Oct 20	50010	11	30	6
Oct 21	50011	13	55	12
Oct 22	50012	14	47	10
Oct 23	50013	17	44	9
Oct 24	50014	24	49	10
Oct 25	50015	29	47	10
Oct 26	50016	26	38	8
Oct 27	50017	20	47	10
Oct 28	50018	23	57	12
Oct 29	50019	27	50	10

5 - [UTC - GLONASS time].

[UTC - GLONASS time] = C1 (modulo 1 s).

From his current observations of both the GPS and GLONASS satellite systems Prof. P. Daly, University of Leeds, establishes and reports [GPS time - GLONASS time] at ten-day intervals, together with the standard deviation σ of his daily GLONASS data. C1 is then derived using [UTC - GPS time] of section 4.

Date 1995 0h UTC	MJD	C1 (ns)	σ (ns)
Sep 29	49989	-21699	52
Oct 9	49999	-22142	56
Oct 19	50009	-22488	48
Oct 29	50019	-22798	57

6 - Difference between the normalized frequencies of EAL and TAI.

Interval of validity		f(EAL)-f(TAI)
1995 Aug. 30 - 1995 Oct. 29	49959-50019	7.36×10^{-13}

New steering correction foreseen for November-December 1995

1995 Oct. 29 - 1995 Dec. 28	50019-50079	7.35×10^{-13}

7 - Duration of the TAI scale interval.

The following table gives the duration of the TAI scale interval, expressed as its departure d from the SI second on the rotating geoid, together with its relative uncertainty σ. This is obtained, on the given period of estimation, by comparison of the TAI frequency :

- with the frequency, corrected for the black-body radiation shift, of a given individual primary frequency standard (σ is then the last communicated estimate of the uncertainty of the standard frequency), and

- with a combination computed by the BIPM of all available measurements from PTB CS2, PTB CS3 and NIST-7 consistently corrected for the black-body radiation shift (σ is then estimated by the BIPM taking into account the individual uncertainties and parameters characteristic of TAI stability).

Standard	Period of estimation	d (10^{-14} s)	σ (10^{-14})
PTB CS2	49959-50019	+2.8	1.5
PTB CS3	49959-50019	+5.0	1.4
BIPM estimate	49959-50019	+2.4	1.0