BIPM

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BUREAU INTERNATIONAL DES POIDS ET MESURES

Circular T 88 (1995 May 18)

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

(From 1994 July 1, 0hUTC, TAI-UTC = 29s)

Date 1995 0h UTC		Mar 23	Apr 2	Apr 12	Apr 22
MJD		49799	49809	49819	49829
Laboratory k		UTC-UTC(k) (Unit is one nanosecond)			
AOS (Borowiec)		-994	-1200	-1255	-1341
APL (Laurel)		1070	1132	1180	1233
AUS (Canberra)		-488	-478	-437	-378
BEV (Wien)		-	-	-	-
CAO (Cagliari)		-6872	-6941	-6990	-7416
CH (Bern)		-21	-17	32	141
CRL (Tokyo)		1167	1140	1114	1085
CSAO (Lintong)		-370	-379	-311	-342
CSIR (Pretoria)		-1018	-1116	-1093	-1060
FTZ (Darmstadt)		-14	-37	-68	-92
GUM (Warszawa)	(1)	-1103	-798	-534	-94
IEN (Torino)		595	597	620	640
IFAG (Wettzell)		-1667	-1700	-1725	-1809
IGMA (Buenos Aires)		-2686	-	-	-
INPL (Jerusalem)		-2250	-2357	-2442	-2475
JATC (Lintong)		468	331	332	225
KRIS (Taejon)		175	187	180	190
LDS (Leeds)	(2)	-933	-915	-82	-53
MSL (Lower Hutt)		-3414	-3444	-3450	-3478
NAOM (Mizusawa)		-2279	-2361	-2438	-2519
NAOT (Tokyo)		-1415	-1551	-1602	-1601
NIM (Beijing)		7312	7312	7322	7334
NIST (Boulder)		14	31	39	40
NMC (Sofiya)		-	-	-	-
NPL (Teddington)		73	84	94	105
NPLI (New-Delhi)		-	-	-	-
NRC (Ottawa)		148	178	208	234
NRLM (Tsukuba)		-9351	-9200	-9053	-8899
OMH (Budapest)		9455	9558	9660	9701
ONBA (Buenos Aires)		-	-	-	-
ONRJ (Rio de Janeiro)		-17992	-17921	-18052	-18468
OP (Paris)		-128	-125	-123	-123
ORB (Bruxelles)		-13	-23	-5	-11
PTB (Braunschweig)		2497	2483	2472	2458
RC (Habana)		-	-	-	-
ROA (San Fernando)		2038	2038	2090	2203
SCL (Hong Kong)		11	-9	-60	-110
SNT (Stockholm)		-52	-76	-113	-81
SO (Shanghai)		1986	1980	1994	1964
SU (Moskva)		-6687	-6701	-6721	-6734
TL (Chung-Li)		-663	-603	-545	-488
TP (Praha)		-618	-599	-606	-614
TUG (Graz)		-665	-650	-636	-617
UME (Gebze-Kocaeli)		-3162	-3231	-3289	-3366
USNO (Washington DC)(USNO MC)		22	20	17	12
VSL (Delft)		-80	-108	-118	-138

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		Mar 23	Apr 2	Apr 12	Apr 22
MJD		49799	49809	49819	49829
Laboratory k		TAI-TA(k) (Unit is one nanosecond)			
APL (Laurel)		2533	2595	2643	2696
AUS (Canberra)		-59021	-59249	-59452	-59746
CH (Bern)		-69948	-69744	-69555	-69345
CRL (Tokyo)		51932	52353	52771	53190
CSAO (Lintong)		10289	10150	10088	9928
F (Paris)		140937	141302	141666	142008
INPL (Jerusalem)		-270078	-272385	-274694	-276988
JATC (Lintong)		13998	13871	13868	13718
KRIS (Taejon)		1365	1349	1326	1307
NIM (Beijing)		-8475	-8453	-8426	-8389
NISA (Boulder)	(3)	-45126335	-45126767	-45127199	-45127638
NRC (Ottawa)		24028	24041	24053	24062
PTB (Braunschweig)		-360903	-360917	-360928	-360942
RC (Habana)		-	-	-	-
SO (Shanghai)		-45619	-45607	-45566	-45592
SU (Moskva)	(4)	27243313	27243299	27243279	27243266
USNO (Washington DC)	(5)	-34720011	-34720678	-34721344	-34722011

3 - Notes on sections 1 and 2.

(1) GUM . Change of master clock on MJD = 49825.708

(2) LDS . Resynchronization of UTC(LDS) on MJD = 49812 after a power failure.

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

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

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

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

[UTC - GPS time] = -10 s + C0, [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)
Mar 23	49799	35	51	12
Mar 24	49800	31	39	9
Mar 25	49801	26	35	7
Mar 26	49802	23	30	7
Mar 27	49803	20	47	10
Mar 28	49804	16	40	9
Mar 29	49805	16	39	9
Mar 30	49806	25	38	9
Mar 31	49807	32	44	10
Apr 1	49808	32	40	9
Apr 2	49809	27	38	10
Apr 3	49810	25	52	12
Apr 4	49811	30	51	11
Apr 5	49812	39	70	16
Apr 6	49813	37	42	9
Apr 7	49814	31	39	9
Apr 8	49815	30	42	10
Apr 9	49816	30	37	8
Apr 10	49817	29	41	9
Apr 11	49818	27	47	10
Apr 12	49819	24	41	9
Apr 13	49820	24	44	10
Apr 14	49821	28	54	12
Apr 15	49822	30	48	11
Apr 16	49823	31	45	10
Apr 17	49824	33	45	10
Apr 18	49825	33	31	7
Apr 19	49826	31	35	8
Apr 20	49827	31	42	9
Apr 21	49828	31	50	11
Apr 22	49829	32	45	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)
Mar 23	49799	-15896	35
Apr 2	49809	-16049	43
Apr 12	49819	-16190	36
Apr 22	49829	-16376	47

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

Interval of validity		f(EAL)-f(TAI)
1995 Feb. 21 - 1995 Apr. 22	49769-49829	7.39×10^{-13}

New steering correction foreseen for May-June 1995

1995 Apr. 22 - 1995 Jun. 21	49829-49889	7.38×10^{-13}

7 - Duration of the TAI scale interval.

The following table gives the departure D of the duration of the TAI scale interval from the SI second on the rotating geoid as realized by a given primary standard occasionally evaluated or continuously operating as a clock. In the later case the chosen two-month period of observation is also indicated. The last communicated estimate of the inaccuracy of the standard provides the uncertainty σ of the D value.

D and σ are expressed in units of 10^{-14} second.

Standard	Obs. period	D	σ
PTB-CS1	49769-49829	-1.7	3.0
PTB-CS2	49769-49829	+1.3	1.5

The estimate of the duration of the TAI scale interval, computed by the BIPM, from all the available measurements of the TAI frequency, obtained by comparison with primary frequency standards continuously observed or occasionally evaluated (*CRL, *LPTF, *NIST, NRC, PTB, SU), is:

$$1 + 0.2\times10^{-14} \pm 2.0\times10^{-14}$$

in SI second on the rotating geoid, for the two-month interval 49769-49829 .

* The frequencies of the primary frequency standards Cs1 from CRL, JPO from LPTF, and NIST-7 from NIST, are corrected for the black body radiation shift.