BIPM ISSN 1143-1393

BUREAU INTERNATIONAL DES POIDS ET MESURES

Circular T 89 (1995 June 16)

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

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

Date 1995 0h UTC		Apr 22	May 2	May 12	May 22
MJD		49829	49839	49849	49859
Laboratory k		UTC-UTC(k) (Unit is one nanosecond)			
AOS (Borowiec)		-1341	-1345	-1389	-2079
APL (Laurel)		1233	1320	1420	1577
AUS (Canberra)		-378	-424	-432	-454
BEV (Wien)		-	-	-	-
CAO (Cagliari)		-7416	-7640	-7918	-8175
CH (Bern)		141	242	292	310
CRL (Tokyo)		1085	1060	1040	1010
CSAO (Lintong)		-342	-406	-386	-376
CSIR (Pretoria)		-1060	-1008	-976	-878
FTZ (Darmstadt)		-92	-108	-120	-141
GUM (Warszawa)		-94	-100	-107	-116
IEN (Torino)	(1)	640	674	88	95
IFAG (Wettzell)		-1809	-1835	-1879	-1973
IGMA (Buenos Aires)	(2)	-2287	-2168	-2120	-1980
INPL (Jerusalem)		-2475	-2460	-2436	-2388
JATC (Lintong)		225	273	324	415
KRIS (Taejon)		190	203	195	188
LDS (Leeds)		-53	-36	-33	-42
MSL (Lower Hutt)		-3478	-3444	-3452	-3447
NAOM (Mizusawa)		-2519	-2606	-2686	-2756
NAOT (Tokyo)		-1601	-1677	-1688	-1764
NIM (Beijing)		7334	7351	7353	7354
NIST (Boulder)		40	50	48	51
NMC (Sofiya)		-	-	-	-
NPL (Teddington)		105	111	116	118
NPLI (New-Delhi)		-	-	-	-
NRC (Ottawa)		234	274	298	346
NRLM (Tsukuba)		-8899	-8754	-8602	-8458
OMH (Budapest)		9701	9855	9925	9968
ONBA (Buenos Aires)		-	-	-	-
ONRJ (Rio de Janeiro)		-18468	-18785	-19034	-19278
OP (Paris)		-123	-116	-108	-102
ORB (Bruxelles)		-11	-46	-5	-11
PTB (Braunschweig)		2458	2454	2453	2460
RC (Habana)		-	-	-	-
ROA (San Fernando)		2203	2289	2289	2249
SCL (Hong Kong)		-110	-185	-246	-341
SNT (Stockholm)		-81	-123	-105	-
SO (Shanghai)		1964	1997	1984	1966
SU (Moskva)		-6734	-6744	-6755	-6772
TL (Chung-Li)		-488	-431	-375	-305
TP (Praha)		-614	-591	-565	-554
TUG (Graz)		-617	-612	-589	-590
UME (Gebze-Kocaeli)		-3366	-3472	-3507	-3485
USNO (Washington DC)(USNO MC)		12	12	8	3
VSL (Delft)		-138	-162	-172	-165

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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		Apr 22	May 2	May 12	May 22
MJD		49829	49839	49849	49859
Laboratory k		TAI-TA(k) (Unit is one nanosecond)			
APL (Laurel)		2696	2783	2883	3040
AUS (Canberra)		-59746	-60031	-60255	-60480
CH (Bern)		-69345	-69144	-68948	-68753
CRL (Tokyo)		53190	53611	54031	54441
CSAO (Lintong)		9928	9734	9624	9505
F (Paris)		142008	142359	142697	143046
IEN (Torino)		-	-202	-205	-211
INPL (Jerusalem)		-276988	-279277	-281597	-283935
JATC (Lintong)		13718	13660	13616	13561
KRIS (Taejon)		1307	1309	1306	1300
NIM (Beijing)		-8389	-8352	-8321	-8296
NISA (Boulder)	(3)	-45127638	-45128067	-45128499	-45128926
NRC (Ottawa)		24062	24085	24090	24165
PTB (Braunschweig)		-360942	-360946	-360947	-360940
RC (Habana)		-	-	-	-
SO (Shanghai)		-45592	-45518	-45542	-45584
SU (Moskva)	(4)	27243266	27243256	27243245	27243228
USNO (Washington DC)	(5)	-34722011	-34722675	-34723339	-34724004

3 - Notes on sections 1 and 2.

(1) IEN . Time step of UTC(IEN) of + 600 ns on MJD = 49840.4

(2) IGMA.

MJD	UTC-UTC(IGMA)
49809	-2503 ns
49819	-2459 ns

(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)
Apr 22	49829	32	45	10
Apr 23	49830	32	45	11
Apr 24	49831	33	28	6
Apr 25	49832	32	26	6
Apr 26	49833	34	45	10
Apr 27	49834	39	46	11
Apr 28	49835	40	39	8
Apr 29	49836	36	28	6
Apr 30	49837	32	50	11
May 1	49838	32	56	12
May 2	49839	37	40	9
May 3	49840	38	38	9
May 4	49841	37	35	8
May 5	49842	35	52	11
May 6	49843	35	39	9
May 7	49844	33	49	11
May 8	49845	30	45	10
May 9	49846	28	41	9
May 10	49847	26	40	9
May 11	49848	22	47	10
May 12	49849	17	28	6
May 13	49850	17	50	11
May 14	49851	19	37	8
May 15	49852	21	39	8
May 16	49853	16	32	7
May 17	49854	12	28	6
May 18	49855	13	44	10
May 19	49856	13	53	12
May 20	49857	14	37	8
May 21	49858	13	36	8
May 22	49859	16	20	5

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)
Apr 22	49829	-16376	47
May 2	49839	-16561	42
May 12	49849	-16771	47
May 22	49859	-16981	39

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

Interval of validity		f(EAL)-f(TAI)
1995 Apr. 22 - 1995 Jun. 21	49829-49889	7.38×10^{-13}

New steering correction foreseen for July-August 1995

1995 Jun. 21 - 1995 Aug. 30	49889-49959	7.37×10^{-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	49799-49859	-0.5	3.0
PTB-CS2	49799-49859	+0.8	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:

$$1 - 0.3 \times 10^{-14} \pm 2.0 \times 10^{-14}$$

in SI second on the rotating geoid, for the two-month interval 49799-49859 .

* 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.