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Circular T 72 (1994 January 26)

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

(From 1993 July 1, 0hUTC, TAI-UTC = 28 s)

Date 1993 0hUTC		Nov 28	Dec 8	Dec 18	Dec 28
MJD		49319	49329	49339	49349
Laboratory k		UTC-UTC(k) (Unit = 1 microsecond)			
AOS (Borowiec)		-1.137	-1.085	-1.184	-1.275
APL (Laurel)		0.993	1.012	1.036	1.069
AUS (Canberra)		0.017	0.032	0.045	0.050
BEV (Wien)	(2)	-16.41	-17.94	10.69	9.63
CAO (Cagliari)		-4.239	-4.441	-4.673	-4.854
CH (Bern)		0.837	0.883	0.945	1.001
CRL (Tokyo)		2.463	2.381	2.347	2.312
CSAO (Lintong)	(3)	-0.795	-0.763	-0.752	-0.764
CSIR (Pretoria)		-3.512	-3.522	-3.488	-3.409
FTZ (Darmstadt)		0.460	0.354	0.251	0.105
IEN (Torino)		-0.091	-0.082	-0.096	-0.088
IFAG (Wettzell)		4.024	3.692	3.394	3.068
IGMA (Buenos Aires)		-0.78	-0.82	-0.86	-0.99
INPL (Jerusalem)		-0.207	-0.319	-0.425	-0.520
JATC (Lintong)	(4)	-2.343	-2.766	-2.648	-2.865
KRIS (Taejon)		-0.050	-0.130	-0.163	-0.214
LDS (Leeds)		0.141	0.145	-0.019	-0.044
MSL (Lower Hutt)		-	-	-1.321	-1.176
NAOM (Mizusawa)		-1.433	-1.402	-1.381	-1.362
NAOT (Tokyo)		-4.550	-3.701	-2.923	-2.192
NIM (Beijing)		7.55	7.79	7.79	7.72
NIST (Boulder)		-0.049	-0.022	0.002	0.024
NMC (Sofiya)		-	-	-	-
NPL (Teddington)		0.066	0.080	0.081	0.089
NPLI (New-Delhi)		-4.256	-4.122	-4.041	-3.883
NRC (Ottawa)		4.119	4.236	4.344	4.419
NRLM (Tsukuba)		-6.144	-6.424	-6.706	-6.981
OMH (Budapest)		5.185	5.329	5.477	5.606
ONBA (Buenos Aires)		2.00	2.36	2.69	3.12
ONRJ (Rio de Janeiro)		-9.450	-9.588	-9.790	-9.897
OP (Paris)		-0.209	-0.200	-0.188	-0.174
ORB (Bruxelles)		-1.476	-1.591	-1.590	-1.609
PKNM (Warszawa)		-0.125	0.004	0.076	0.068
PTB (Braunschweig)		2.735	2.720	2.721	2.722
RC (Habana)		-3.22	-3.44	-3.33	-3.50
ROA (San Fernando)		2.429	2.449	2.523	2.584
SCL (Hong Kong)		-	0.085	0.009	-0.070
SNT (Stockholm)		0.090	0.094	0.102	0.130
SO (Shanghai)	(5)	2.10	2.12	2.08	2.16
SU (Moskva)		-2.309	-2.399	-2.491	-2.588
TL (Chung-Li)		-1.971	-1.918	-2.047	-2.200
TP (Praha)		-1.504	-1.455	-1.390	-1.276
TUG (Graz)		3.642	3.710	3.781	3.851
USNO (Washington DC)	(USNO MC)	0.017	0.032	0.045	0.050
VSL (Delft)		-0.182	-0.289	-0.391	-0.317

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TÉL. (CENTRAL) : + 33 1 45 07 70 70 TELEX : BIPM 631351 F TÉLÉCOPIE : + 33 1 45 34 20 21

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

The following table gives the computed values of TAI-TA(k) (1).

Date 1993 0hUTC		Nov 28	Dec 8	Dec 18	Dec 28
MJD		49319	49329	49339	49349
Laboratory k		TAI-TA(k) (Unit = 1 microsecond)			
APL (Laurel)		2.456	2.475	2.499	2.532
AUS (Canberra)		-49.080	-49.229	-49.309	-49.421
CH (Bern)		-76.403	-76.397	-76.375	-76.359
CRL (Tokyo)		31.717	32.076	32.474	32.887
CSAO (Lintong)	(3)	16.631	16.491	16.329	16.144
F (Paris)		123.255	123.644	124.027	124.403
INPL (Jerusalem)		-171.913	-173.707	-175.521	-177.350
JATC (Lintong)	(4)	8.780	8.557	8.505	8.472
KRIS (Taejon)		-5.570	-5.380	-5.173	-5.014
NIM (Beijing)		-9.17	-8.92	-8.90	-8.95
NISA (Boulder)	(6)	-45106.663	-45107.036	-45107.412	-45107.790
NRC (Ottawa)		20.188	20.305	20.413	20.488
PTB (Braunschweig)		-360.665	-360.680	-360.679	-360.678
RC (Habana)	(7)	-326.00	-326.48	-326.41	-326.61
SO (Shanghai)	(5)	-45.46	-45.43	-45.46	-45.39
SU (Moskva)	(8)	27247.691	27247.601	27247.509	27247.412
USNO (Washington DC)	(9)	-34687.710	-34688.388	-34689.068	-34689.751

3 - Notes on sections 1 and 2.

(1) Values UTC-UTC(k) and TAI-TA(k) are published within 1 ns except for laboratories which are not linked through GPS common views.

(2) BEV . Time step of UTC(BEV) of - 30 μs on MJD = 49335.50

(3) CSAO. Corrected values :

MJD	UTC-UTC(CSAO)	TAI-TA(CSAO)
49299	-0.698	17.074
49309	-0.834	16.765

(4) JATC. Corrected values :

MJD	UTC-UTC(JATC)	TAI-TAI(JATC)
49299	-1.603	9.359
49309	-1.939	9.079

(5) SO .

MJD	UTC-UTC(SO)	TAI-TA(SO)
49299	2.08	-45.52
49309	2.01	-45.58

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

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

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

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

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

UTC - GPS time = -9 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, from Block I only, are first corrected for the precise satellite ephemerides and for the measured ionospheric delays, and then smoothed to obtain daily values of UTC(OP) - GPS time at 0hUTC; daily values of C0 are derived from them using linear interpolation of UTC - UTC(OP).

This procedure also allows the computation of daily standard deviations obtained from Block I and Block II data from Paris Observatory according to the International GPS Common-View Schedule. They are given in the following table in order to show the quality of the dissemination of GPS time from Block I and Block II satellites.

Date 1993 0hUTC	MJD	C0 (ns)	SD(ns) Block I	SD(ns) Block II
Nov 28	49319	51	5	45
Nov 29	49320	52	2	50
Nov 30	49321	49	4	50
Dec 1	49322	44	4	25
Dec 2	49323	39	3	34
Dec 3	49324	35	5	48
Dec 4	49325	36	3	43
Dec 5	49326	41	0	41
Dec 6	49327	46	9	28
Dec 7	49328	52	7	23
Dec 8	49329	62	3	53
Dec 9	49330	70	6	61
Dec 10	49331	71	5	47
Dec 11	49332	73	4	42
Dec 12	49333	72	1	48
Dec 13	49334	76	9	36
Dec 14	49335	69	6	43
Dec 15	49336	67	3	44
Dec 16	49337	68	6	40
Dec 17	49338	68	6	34
Dec 18	49339	69	7	35
Dec 19	49340	72	7	45
Dec 20	49341	78	6	39
Dec 21	49342	77	3	55
Dec 22	49343	77	4	42
Dec 23	49344	78	8	44
Dec 24	49345	80	3	41
Dec 25	49346	83	4	59
Dec 26	49347	84	6	58
Dec 27	49348	88	4	41
Dec 28	49349	91	8	40

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 SD of his daily GLONASS data. C1 is then derived using UTC - GPS time of section 4.

Date 1993 0hUTC	MJD	C1 (μs)	SD (μs)
Nov 28	49319	-17.84	0.04
Dec 8	49329	-18.29	0.04
Dec 18	49339	-18.51	0.04
Dec 28	49349	-18.93	0.04

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

Interval of validity		f(EAL)-f(TAI)
1993 Apr. 22 - 1993 Dec. 28	49099-49349	7.40×10^{-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	49289-49349	-2.3	3.0
PTB-CS2	49289-49349	+0.6	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:

$$1 + 0 \times 10^{-14} \pm 2 \times 10^{-14}$$

in SI second on the rotating geoid, for the two-month interval 49289-49349 .