BIPM ISSN 1143-1393

BUREAU INTERNATIONAL DES POIDS ET MESURES

Circular T 95 (1995 December 13)

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		Oct 29	Nov 8	Nov 18	Nov 28
MJD		50019	50029	50039	50049
Laboratory k		UTC-UTC(k) (Unit is one nanosecond)			
AOS (Borowiec)		-1948	-2054	-1692	-1096
APL (Laurel)		1925	1912	1906	1911
AUS (Canberra)		-471	-471	-412	-403
BEV (Wien)		12500	12015	11575	11083
BIRM (Beijing)	(1)	-	-	-	391
CAO (Cagliari)		-	-	-	-
CH (Bern)		118	111	109	114
CRL (Tokyo)		510	479	440	410
CSAO (Lintong)		-267	-308	-295	-287
CSIR (Pretoria)		3803	4159	4763	4716
FTZ (Darmstadt)		-222	-252	-234	-241
GUM (Warszawa)		-316	-317	-327	-333
IEN (Torino)		-31	-25	-47	-42
IFAG (Wettzell)		-4257	-4361	-4428	-4487
IGMA (Buenos Aires)		430	416	397	392
INPL (Jerusalem)		-2417	-2442	-2546	-2623
IPQ (Monte de Caparica)	(2)	-	-7581	-7682	-7784
JATC (Lintong)		1226	1251	1362	1480
KRIS (Taejon)		247	258	267	279
LDS (Leeds)		309	272	306	268
MSL (Lower Hutt)		-4977	-5288	-5277	-5328
NAOM (Mizusawa)		-3268	-3225	-3194	-3173
NAOT (Tokyo)		-4070	-3847	-3617	-3494
NIM (Beijing)		7783	7806	7891	7925
NIST (Boulder)		-13	-7	-6	0
NMC (Sofiya)		-	-	-	-
NPL (Teddington)		33	33	29	25
NPLI (New-Delhi)		-	-	-	-
NRC (Ottawa)		-27	-27	-7	-12
NRLM (Tsukuba)		-6180	-6036	-5907	-5770
OMH (Budapest)		11865	12054	12237	12521
ONBA (Buenos Aires)		10270	10233	10187	10095
ONRJ (Rio de Janeiro)		-4992	-4198	-2876	-1942
OP (Paris)		50	58	58	67
ORB (Bruxelles)		322	327	316	316
PTB (Braunschweig)		2266	2257	2243	2232
RC (Habana)		-	-	-	-
ROA (San Fernando)		176	151	116	98
SCL (Hong Kong)		-138	-25	118	238
SO (Shanghai)		1877	1829	1819	1789
SU (Moskva)		-7125	-7147	-7181	-7204
TL (Chung-Li)		-80	-95	-53	-47
TP (Praha)		-350	-341	-331	-312
TUG (Graz)		-322	-312	-298	-281
UME (Gebze-Kocaeli)		-3212	-3196	-3176	-3165
USNO (Washington DC)(USNO MC)		2	7	10	8
VSL (Delft)		-230	-234	-233	-238

PAVILLON DE BRETEUIL F - 92312 SÈVRES CEDEX

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).

Date 1995 0h UTC		Oct 29	Nov 8	Nov 18	Nov 28
MJD		50019	50029	50039	50049
Laboratory k		TAI-TA(k) (Unit is one nanosecond)			
APL (Laurel)		3388	3375	3369	3374
AUS (Canberra)	(3)	-64677	-64998	-65225	-65494
CH (Bern)		-65365	-65141	-64912	-64677
CRL (Tokyo)		61088	61503	61910	62324
CSAO (Lintong)		7539	7368	7252	7130
F (Paris)		148505	148836	149166	149497
IEN (Torino)		-549	-542	-547	-545
INPL (Jerusalem)		-310231	-311430	-312723	-314003
JATC (Lintong)		12922	-	-	-
KRIS (Taejon)		1650	1734	1819	1906
NIM (Beijing)		-7379	-7329	-7209	-7127
NISA (Boulder)	(4)	-45135884	-45136317	-45136756	-45137190
NRC (Ottawa)		25001	25045	25108	25147
PTB (Braunschweig)		-361134	-361143	-361157	-361168
RC (Habana)		-	-	-	-
SO (Shanghai)		-45724	-45739	-45776	-45789
SU (Moskva)	(5)	27242875	27242853	27242819	27242796
USNO (Washington DC)	(6)	-34734622	-34735275	-34735938	-34736602

3 - Notes on sections 1 and 2.

(1) BIRM. Beijing Institute of Radio Metrology and Measurement, Beijing, Popular Republic of China.

(2) IPQ . Instituto Português da Qualidade (Portuguese Institute for Quality), Monte de Caparica, Portugal.

(3) AUS . Corrected values of TAI-TA(AUS) :

MJD	TAI-TA(AUS)
49999	-64103 ns
50009	-64394 ns

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

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

(6) 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)
Oct 29	50019	30	50	10
Oct 30	50020	31	42	9
Oct 31	50021	27	47	10
Nov 1	50022	21	44	9
Nov 2	50023	17	50	10
Nov 3	50024	13	44	10
Nov 4	50025	15	50	11
Nov 5	50026	21	50	11
Nov 6	50027	22	45	9
Nov 7	50028	20	49	10
Nov 8	50029	21	46	10
Nov 9	50030	18	39	8
Nov 10	50031	15	53	11
Nov 11	50032	22	52	11
Nov 12	50033	34	50	10
Nov 13	50034	41	48	10
Nov 14	50035	42	51	10
Nov 15	50036	43	49	10
Nov 16	50037	47	41	8
Nov 17	50038	57	32	7
Nov 18	50039	66	37	8
Nov 19	50040	66	37	8
Nov 20	50041	69	40	9
Nov 21	50042	81	52	11
Nov 22	50043	85	42	9
Nov 23	50044	79	43	9
Nov 24	50045	70	44	9
Nov 25	50046	68	33	7
Nov 26	50047	71	44	9
Nov 27	50048	76	37	8
Nov 28	50049	78	43	9

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)
Oct 29	50019	-22795	57
Nov 8	50029	-23107	51
Nov 18	50039	-23399	53
Nov 28	50049	-23673	54

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

Interval of validity		f(EAL)-f(TAI)
1995 Oct. 29 - 1995 Dec. 28	50019-50079	7.35×10^{-13}

New steering correction foreseen for January-February 1996

1995 Dec. 28 - 1996 Feb. 26	50079-50139	7.34×10^{-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	49989-50049	+3.1	1.5
PTB CS3	49989-50049	+5.1	1.4
NIST-7	50019-50029	+2.2	1.0
BIPM estimate	49989-50049	+2.2	1.0