BIPM

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BUREAU INTERNATIONAL DES POIDS ET MESURES

Circular T 50 (1992 March 31)

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

(From 1991 January 1, 0hUTC, to 1992 July 1, 0hUTC, TAI-UTC=26s)
(From 1992 July 1, 0hUTC, until further notice, TAI-UTC=27s)

Date 1992 0hUTC	Jan 28	Feb 7	Feb 17	Feb 27
MJD	48649	48659	48669	48679
Laboratory k	UTC-UTC(k) (Unit = 1 microsecond)			
AOS (Borowiec)	-1.80	-1.69	-1.69	-1.76
APL (Laurel)	-0.97	-0.97	-0.99	-1.02
AUS (Canberra)	0.11	0.10	0.07	0.06
BEV (Wien)	-1.54	-2.63	-3.63	-4.70
CAO (Cagliari)	-0.89	-1.03	-1.16	-1.26
CH (Bern)	1.25	1.25	1.22	1.19
CRL (Tokyo)	2.50	2.49	2.50	2.48
CSAO (Lintong)	-2.31	-2.23	-2.15	-2.06
DPT (Pretoria)	-24.30	-24.20	-24.08	-23.98
FTZ (Darmstadt)	23.68	23.77	23.90	23.99
IEN (Torino)	-0.82	-0.83	-0.85	-0.85
IFAG (Wettzell)	1.32	1.35	1.26	1.24
IGMA (Buenos Aires)	-1.50	-1.50	-1.52	-1.53
INPL (Jerusalem)	-2.04	-2.20	-2.28	-2.27
JATC (Lintong)	0.19	0.04	-0.09	-0.12
KRIS (Taejon)	-0.04	-0.18	-0.26	-0.35
LDS (Leeds)	-21.62	-22.66	-23.67	-24.61
NAOM (Mizusawa)	-7.19	-7.03	-6.86	-6.71
NIM (Beijing)	7.87	7.82	7.81	7.75
NIST (Boulder)	-0.64	-0.58	-0.51	-0.42
NMC (Sofiya)	0.55	0.57	0.62	0.56
NPL (Teddington)	0.08	0.08	0.04	0.01
NPLI (New-Delhi)	18.85	20.60	22.13	23.31
NRC (Ottawa)	1.23	1.13	1.01	0.90
NRLM (Tsukuba)	-140.92	-148.39	-156.23	-164.30
OMH (Budapest)	-	2.61	2.40	2.37
ONRJ (Rio de Janeiro)	-	6.13	5.38	4.58
OP (Paris)	-0.77	-0.81	-0.85	-0.89
ORB (Bruxelles)	1.51	1.42	1.26	1.30
PEL (Lower Hutt)	-1.12	-1.23	-1.25	-1.16
PKNM (Warszawa)	0.65	0.64	0.72	0.82
PTB (Braunschweig)	3.25	3.25	3.24	3.24
RC (Habana)	-2.65	-2.62	-2.63	-2.55
ROA (San Fernando)	4.49	4.39	4.29	4.16
SNT (Stockholm)	0.19	0.18	0.17	0.19
SO (Shanghai)	2.35	2.23	2.27	2.20
SU (Moskva)	4.18	4.10	3.97	3.83
TAO (Tokyo)	1.18	1.17	1.13	1.09
TL (Chung-Li)	1.70	1.58	1.46	1.35
TP (Praha)	-1.14	-1.11	-1.06	-0.64
TUG (Graz)	3.59	3.92	4.27	4.58
USNO (Washington DC)(USNO MC)	0.11	0.10	0.07	0.06
VSL (Delft)	2.32	2.26	2.12	2.07
YUZM (Beograd)	-	-	-	-

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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).

Date 1992 0hUTC		Jan 28	Feb 7	Feb 17	Feb 27
MJD		48649	48659	48669	48679
Laboratory k		TAI-TA(k) (Unit = 1 microsecond)			
APL (Laurel)		-1.47	-1.48	-1.50	-1.52
AUS (Canberra)		-39.02	-39.10	-39.25	-39.39
CH (Bern)		-72.32	-72.36	-72.41	-72.47
CRL (Tokyo)		8.74	9.01	9.30	9.57
CSAO (Lintong)		22.73	22.61	22.49	22.38
F (Paris)		99.32	99.61	99.90	100.21
JATC (Lintong)		0.30	0.26	0.37	0.49
KRIS (Taejon)		-26.11	-26.70	-27.19	-27.77
NIM (Beijing)		-10.20	-10.23	-10.22	-10.27
NISA (Boulder)	(1)	-45082.31	-45082.67	-45083.03	-45083.37
NIST (Boulder)		-45182.46	-45183.14	-45183.80	-45184.43
NRC (Ottawa)		17.30	17.20	17.08	16.97
PTB (Braunschweig)		-360.15	-360.15	-360.16	-360.16
RC (Habana)	(2)	-298.75	-299.02	-299.28	-299.47
SO (Shanghai)		-45.09	-45.23	-45.18	-45.22
SU (Moskva)		2827254.18	2827254.10	2827253.97	2827253.83
USNO (Washington DC)	(3)	-34642.32	-34642.98	-34643.65	-34644.32

3 - Notes on sections 1 and 2.

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

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

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

4 - Information. UTC time step on the 1st of July 1992.

Bulletin C3 of the International Earth Rotation Service informs that a positive leap second will be introduced at the end of June 1992. The sequence of dates of the UTC second markers will be :

1992 June 30, 23h 59m 59s
1992 June 30, 23h 59m 60s
1992 July 1, 0h 0m 0s

5 - UTC - GPS time and TAI - GPS time.

UTC - GPS time = -7s + C0, TAI - GPS time = 19s + C0.

The GPS data are taken at the Paris Observatory, from Block I satellites, and are usually corrected for the measured ionospheric delays. They are smoothed to obtain daily values of UTC(OP) - GPS time at 0hUTC. UTC - GPS time is derived from them using linear interpolation of UTC - UTC(OP).

The r values are the residuals to the smoothed data for the middle of the 13-minute tracking period. The reference times are given for the first date of the table only. The r values are reported here only to show the quality of the synchronization.

UTC may be derived at any site from observation of any listed satellite, by interpolating C0 to the tracking time. The quality of the access to UTC mainly depends upon local conditions of observation.

			r(ns) Block I				
Date 1992 0hUTC	MJD	C0 (ns)	PRN 3 NAV11 22h20m	PRN11 NAV 8 2h56m	PRN13 NAV 9 8h48m	PRN 6 NAV 3 14h24m	PRN12 NAV10 17h20m
Jan 28	48649	156	-12	-2	11	-1	-2
Jan 29	48650	145	-6	-4	-8	6	13
Jan 30	48651	138	2	10	-8	5	14
Jan 31	48652	135	-2	-6	-7	-2	-
Feb 1	48653	136	12	6	-5	2	-
Feb 2	48654	139	-9	5	-14	-	4
Feb 3	48655	141	-8	-12	-4	5	5
Feb 4	48656	142	3	4	2	16	-
Feb 5	48657	138	-3	2	-11	-10	-
Feb 6	48658	132	-2	4	-6	9	-
Feb 7	48659	131	-5	0	3	-1	-
Feb 8	48660	132	2	4	-9	8	-
Feb 9	48661	131	4	-	4	5	0
Feb 10	48662	128	-1	-10	-14	10	-8
Feb 11	48663	124	5	-13	10	14	-9
Feb 12	48664	121	-4	-5	-13	9	-8
Feb 13	48665	118	1	1	-5	20	-4
Feb 14	48666	112	-3	-6	-13	21	1
Feb 15	48667	108	-7	-6	0	12	-4
Feb 16	48668	105	1	-2	-8	5	-3
Feb 17	48669	106	-6	4	-2	8	-1
Feb 18	48670	107	2	12	-2	3	-1
Feb 19	48671	100	-3	-3	-4	8	0
Feb 20	48672	94	-2	13	-14	8	-4
Feb 21	48673	91	6	-10	-4	10	5
Feb 22	48674	92	-2	4	-6	-	5
Feb 23	48675	89	-13	2	-5	3	-2
Feb 24	48676	87	9	1	-6	8	2
Feb 25	48677	85	3	5	-7	-	1
Feb 26	48678	83	-9	-2	-13	4	-5
Feb 27	48679	80	7	6	-6	10	2

Section 5 (Cont.)

For Block II satellites, the r values are computed with respect to C0 obtained from Block I only.

			r(ns) Block II				
Date 1992 0hUTC	MJD	C0 (ns)	PRN23 NAV23 1h 4m	PRN17 NAV17 1h52m	PRN15 NAV15 4h 0m	PRN14 NAV14 6h56m	PRN18 NAV18 8h 0m
Jan 28	48649	156	41	17	-2	-57	-57
Jan 29	48650	145	-19	70	-8	10	-117
Jan 30	48651	138	-31	39	110	27	-3
Jan 31	48652	135	-35	43	-16	93	4
Feb 1	48653	136	11	75	-11	40	-
Feb 2	48654	139	18	-22	-47	25	88
Feb 3	48655	141	24	40	-31	57	23
Feb 4	48656	142	-65	36	-17	-28	43
Feb 5	48657	138	29	24	9	2	-1
Feb 6	48658	132	-26	3	-9	37	-17
Feb 7	48659	131	-5	-84	75	6	-
Feb 8	48660	132	128	-40	59	20	37
Feb 9	48661	131	45	-28	32	-100	78
Feb 10	48662	128	8	21	103	27	-6
Feb 11	48663	124	58	84	-16	-37	-27
Feb 12	48664	121	-	3	-88	-21	31
Feb 13	48665	118	-16	-19	-16	33	41
Feb 14	48666	112	7	-47	34	-22	14
Feb 15	48667	108	26	-63	-2	-38	13
Feb 16	48668	105	-26	-58	16	-23	-4
Feb 17	48669	106	9	48	-18	-4	-21
Feb 18	48670	107	62	-40	-4	25	-22
Feb 19	48671	100	-4	-33	5	78	-30
Feb 20	48672	94	39	-12	-51	29	40
Feb 21	48673	91	10	-79	103	-32	12
Feb 22	48674	92	18	-9	1	7	18
Feb 23	48675	89	3	-4	11	-6	0
Feb 24	48676	87	-30	-	7	5	9
Feb 25	48677	85	51	12	13	-36	-3
Feb 26	48678	83	-56	39	-33	78	9
Feb 27	48679	80	-44	79	-34	2	11

Section 5 (Cont.)

			r(ns) Block II				
Date 1992 0hUTC	MJD	C0 (ns)	PRN24 NAV24 10h24m	PRN19 NAV19 10h40m	PRN16 NAV16 12h48m	PRN 2 NAV13 16h16m	PRN20 NAV20 19h28m
Jan 28	48649	156	6	-66	13	49	28
Jan 29	48650	145	-	-35	50	-6	93
Jan 30	48651	138	-26	-7	2	-12	10
Jan 31	48652	135	70	-19	-26	-19	27
Feb 1	48653	136	5	31	0	-50	31
Feb 2	48654	139	-23	-78	-32	135	-87
Feb 3	48655	141	-12	-	97	23	47
Feb 4	48656	142	-16	-21	34	119	24
Feb 5	48657	138	-94	-88	10	25	-3
Feb 6	48658	132	4	67	-6	7	23
Feb 7	48659	131	24	59	-73	-12	14
Feb 8	48660	132	-16	-74	49	-40	-43
Feb 9	48661	131	19	-115	-4	46	-61
Feb 10	48662	128	-48	-76	75	-49	9
Feb 11	48663	124	-40	-11	20	15	-34
Feb 12	48664	121	-61	18	40	87	50
Feb 13	48665	118	-24	23	102	34	55
Feb 14	48666	112	16	3	-4	22	-26
Feb 15	48667	108	-13	-15	32	50	19
Feb 16	48668	105	-	-30	-58	51	-11
Feb 17	48669	106	-18	-6	108	45	34
Feb 18	48670	107	-19	-33	38	54	-9
Feb 19	48671	100	14	9	-17	97	6
Feb 20	48672	94	-88	58	-18	18	66
Feb 21	48673	91	-91	-101	-57	9	-5
Feb 22	48674	92	-6	-14	-2	2	-8
Feb 23	48675	89	-4	-12	-3	17	-6
Feb 24	48676	87	1	-14	-8	-	-11
Feb 25	48677	85	42	-39	38	3	33
Feb 26	48678	83	21	-77	48	-47	-49
Feb 27	48679	80	59	-11	-109	74	-79

6 - UTC - GLONASS time.

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

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 5.

Date 1992 0hUTC	MJD	C1 (μs)	SD (μs)
Jan 28	48649	-8.64	0.06
Feb 7	48659	-8.67	0.06
Feb 17	48669	-8.71	0.05
Feb 27	48679	-8.79	0.05

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. The chosen two-month period of evaluation is also indicated. The last communicated estimate of the inaccuracy of the standard provides the uncertainty s of the D value.

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

Standard	Obs. period	D	s
CRL-Cs1	48499-48559	+1.3	9.5
NRC-CsV	48619-48679	+8.9	10.0
PTB-CS1	48619-48679	-2.0	3.0
PTB-CS2	48619-48679	+0.5	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, 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 48619-48679 .