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BUREAU INTERNATIONAL DES POIDS ET MESURES
Circular T 102 (1996 July 15)

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

(From 1996 January 1, 0hUTC, TAI-UTC = 30 s)

Date 1996 0h UTC		May 31	Jun 5	Jun 10	Jun 15
MJD		50234	50239	50244	50249
Laboratory k		UTC-UTC(k) (Unit is one nanosecond)			
AOS (Borowiec)		221	211	125	-69
APL (Laurel)	(1)	1742	1698	-160	-204
AUS (Canberra)		-177	-175	-150	-133
BEV (Wien)		4647	4497	4356	4176
BIRM (Beijing)		-1837	-1880	-1932	-1986
CAO (Cagliari)		-	-	-	-
CH (Bern)		212	189	174	169
CNM (Mexico)		-222	-223	-239	-255
CRL (Tokyo)		-55	-50	-57	-60
CSAO (Lintong)	(2)	-	-32	-1	-35
CSIR (Pretoria)		7164	7111	7023	7018
DLR (Oberpfaffenhofen)		-2178	-2188	-2194	-2205
DTAG (Darmstadt)		-412	-423	-427	-432
GUM (Warszawa)		-306	-299	-292	-283
IEN (Torino)		198	205	210	227
IFAG (Wettzell)		-4604	-	-4563	-4544
IGMA (Buenos Aires)		88	101	111	102
INPL (Jerusalem)		-517	-381	-276	-176
IPQ (Monte de Caparica)	(3)	-	-9857	-9	-12
JATC (Lintong)	(4)	-	3118	3218	3255
KRIS (Taejon)		105	89	90	104
LDS (Leeds)		100	107	119	128
MSL (Lower Hutt)		-4831	-4766	-4795	-4819
NAOM (Mizusawa)		-3005	-2999	-2996	-2983
NAOT (Tokyo)		-1231	-1138	-1049	-974
NIM (Beijing)		8398	8424	8442	8442
NIST (Boulder)		-17	-19	-21	-23
NPL (Teddington)		14	9	7	5
NRC (Ottawa)		-46	-49	-66	-71
NRLM (Tsukuba)		-3224	-3157	-3089	-3031
OMH (Budapest)		-	-	-	-
ONBA (Buenos Aires)		-12231	-12823	-13255	-13645
ONRJ (Rio de Janeiro)		13012	13767	14487	15152
OP (Paris)		39	35	25	18
ORB (Bruxelles)		35	47	45	42
PTB (Braunschweig)		2070	2068	2062	2056
ROA (San Fernando)		113	97	98	96
SCL (Hong Kong)		-	-	-	-
SO (Shanghai)		1293	1319	1314	1312
SP (Boras)		-7113	-7199	-7289	-7379
SU (Moskva)		-	-	-	-7657
TL (Chung-Li)		223	237	256	260
TP (Praha)		-13	-14	-14	-13
TUG (Graz)		221	239	258	274
UME (Gebze-Kocaeli)		38	43	44	86
USNO (Washington DC)(USNO MC)		-14	-14	-16	-22
VSL (Delft)		-446	-443	-440	-450

1 - Coordinated Universal Time UTC. (Cont.)

Date 1996 0h UTC		Jun 20	Jun 25	Jun 30
MJD		50254	50259	50264
Laboratory k		UTC-UTC(k)	(Unit is one	nanosecond)
AOS (Borowiec)		-162	-79	58
APL (Laurel)		-249	-288	-290
AUS (Canberra)		-100	-80	-49
BEV (Wien)		4021	-	-
BIRM (Beijing)		-2024	-2072	-2140
CAO (Cagliari)		-	-	-
CH (Bern)		163	157	160
CNM (Mexico)	(5)	-283	-1557	-1630
CRL (Tokyo)		-64	-64	-77
CSAO (Lintong)		-57	-46	-30
CSIR (Pretoria)		7038	7076	7094
DLR (Oberpfaffenhofen)		-2213	-2224	-2233
DTAG (Darmstadt)		-414	-404	-415
GUM (Warszawa)		-278	-274	-270
IEN (Torino)		248	263	280
IFAG (Wettzell)		-4556	-	-
IGMA (Buenos Aires)		117	117	113
INPL (Jerusalem)		-53	70	166
IPQ (Monte de Caparica)		-11	-6	-10
JATC (Lintong)		3296	3378	3462
KRIS (Taejon)		100	100	84
LDS (Leeds)		114	107	128
MSL (Lower Hutt)		-4864	-4901	-4884
NAOM (Mizusawa)		-2959	-2941	-2934
NAOT (Tokyo)		-887	-811	-730
NIM (Beijing)		8444	8472	8496
NIST (Boulder)		-18	-23	-27
NPL (Teddington)		8	9	2
NRC (Ottawa)		-69	-68	-73
NRLM (Tsukuba)		-2960	-2890	-2828
OMH (Budapest)		-	-	-
ONBA (Buenos Aires)		-14082	-14725	-15442
ONRJ (Rio de Janeiro)		15664	16186	16625
OP (Paris)		17	12	10
ORB (Bruxelles)		27	38	43
PTB (Braunschweig)		2058	2057	2048
ROA (San Fernando)		101	90	85
SCL (Hong Kong)		-	-31	-10
SO (Shanghai)		1284	1288	1296
SP (Boras)		-7473	-7570	-7663
SU (Moskva)		-7664	-7674	-
TL (Chung-Li)		257	267	284
TP (Praha)		-5	-6	-10
TUG (Graz)		302	320	338
UME (Gebze-Kocaeli)		103	110	116
USNO (Washington DC)(USNO MC)		-18	-16	-19
VSL (Delft)		-447	-443	-444

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

The following tables give the computed values of TAI-TA(k).

Date 1996 0h UTC		May 31	Jun 5	Jun 10	Jun 15
MJD		50234	50239	50244	50249
Laboratory k		TAI-TA(k) (Unit is one nanosecond)			
APL (Laurel)		3205	-	1303	1259
AUS (Canberra)		-70192	-70357	-70421	-70497
CH (Bern)		-59421	-59271	-59116	-58960
CRL (Tokyo)		70029	70240	70444	70657
CSAO (Lintong)	(2)	-	4921	4887	4789
F (Paris)		155685	155864	156041	156221
IEN (Torino)		71	110	157	211
INPL (Jerusalem)		-338875	-339534	-340218	-340899
JATC (Lintong)	(4)	-	13470	13576	13616
KRIS (Taejon)		3481	3530	3606	3725
NIM (Beijing)		-5966	-5913	-5883	-5857
NISA (Boulder)	(6)	-45145271	-45145491	-45145710	-45145930
NRC (Ottawa)		26289	26316	26329	26355
PTB (Braunschweig)		-361330	-361332	-361338	-361343
SO (Shanghai)		-46257	-46228	-46227	-46228
SU (Moskva)	(7)	-	-	-	27242344
USNO (Washington DC)	(8)	-34748809	-34749141	-34749473	-34749803

Date 1996 0h UTC		Jun 20	Jun 25	Jun 30
MJD		50254	50259	50264
Laboratory k		TAI-TA(k) (Unit is one nanosecond)		
APL (Laurel)		1214	1175	1173
AUS (Canberra)		-70642	-70766	-70866
CH (Bern)		-58806	-58652	-58488
CRL (Tokyo)		70863	71070	71275
CSAO (Lintong)		4702	4648	4599
F (Paris)		156401	156577	156760
IEN (Torino)		264	314	355
INPL (Jerusalem)		-341550	-342194	-342855
JATC (Lintong)		13668	13761	13857
KRIS (Taejon)		3794	3870	3927
NIM (Beijing)		-5846	-5807	-5758
NISA (Boulder)	(6)	-45146142	-45146365	-45146585
NRC (Ottawa)		26387	26417	26443
PTB (Braunschweig)		-361342	-361343	-361352
SO (Shanghai)		-46251	-46247	-46238
SU (Moskva)	(7)	27242336	27242326	-
USNO (Washington DC)	(8)	-34750129	-34750457	-34750789

3 - Notes on sections 1 and 2.

(1) APL . Time step of UTC(APL) between MJD = 50239 and MJD = 50244 due to a reconfiguration of the laboratory.

(2) CSAO.

MJD	UTC-UTC(CSAO)	TAI-TA(CSAO)
50204	-361 ns	5046 ns
50209	-228 ns	5114 ns
50214	-94 ns	5183 ns

(3) IPQ . Time step of UTC(IPQ) of -9850 ns on MJD = 50239.58

(4) JATC.

MJD	UTC-UTC(JATC)	TAI-TA(JATC)
50204	2250 ns	12826 ns
50209	2456 ns	13000 ns
50214	2679 ns	13182 ns

(5) CNM . Change of master clock on MJD = 50258 .

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

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

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

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

Interval of validity		f(EAL)-f(TAI)
1996 Apr. 26 - 1996 Jun. 30	50199-50264	7.32×10^{-13}

New steering correction foreseen for July-August 1996

1996 Jun. 30 - 1996 Aug. 29	50264-50324	7.31×10^{-13}

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

[UTC - GPS time] = -11 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 1996 0h UTC	MJD	C0 (ns)	σ (ns)	$\sigma/\sqrt{N}$ (ns)
May 31	50234	10	40	8
Jun 1	50235	16	40	8
Jun 2	50236	20	54	12
Jun 3	50237	21	60	13
Jun 4	50238	15	46	10
Jun 5	50239	11	45	10
Jun 6	50240	15	35	8
Jun 7	50241	20	41	9
Jun 8	50242	23	47	10
Jun 9	50243	16	50	11
Jun 10	50244	6	52	11
Jun 11	50245	5	46	10
Jun 12	50246	5	44	9
Jun 13	50247	7	50	11
Jun 14	50248	9	42	9
Jun 15	50249	12	41	9
Jun 16	50250	11	46	10
Jun 17	50251	5	49	10
Jun 18	50252	3	48	10
Jun 19	50253	3	41	9
Jun 20	50254	1	46	10
Jun 21	50255	-6	41	9
Jun 22	50256	-10	36	8
Jun 23	50257	-6	44	9
Jun 24	50258	2	45	10
Jun 25	50259	9	46	10
Jun 26	50260	14	51	11
Jun 27	50261	17	48	10
Jun 28	50262	18	39	8
Jun 29	50263	15	48	10
Jun 30	50264	15	47	10

6 - [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 five-day intervals, together with the standard deviation σ of his daily GLONASS data. C1 is then derived using [UTC - GPS time] of section 5.

Date 1996 0h UTC	MJD	C1 (ns)	σ (ns)
May 31	50234	-28975	42
Jun 5	50239	-29108	46
Jun 10	50244	-29261	39
Jun 15	50249	-29380	47
Jun 20	50254	-29506	42
Jun 25	50259	-29630	50
Jun 30	50264	-29780	50

7 - Duration of the TAI scale interval.

The following table gives the duration uTAI of the TAI scale interval expressed as its departure d from the SI second on the rotating geoid, together with its relative uncertainty σ : uTAI = 1 + d in SI second. 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, NIST-7, SU MCsR 102 and LPTF-F01 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	50199-50264	+2.6	1.5
BIPM estimate	50199-50264	+2.2	1.0