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BUREAU INTERNATIONAL DES POIDS ET MESURES

Circular T 117 (1997 October 13)
Circulaire T 117

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

(From 1997 July 1, 0h UTC, *TAI-UTC* = 31 s)

Date 1997 0h UTC	Aug 29	Sep 3	Sep 8	Sep 13
MJD	50689	50694	50699	50704
Laboratory k	*UTC-UTC(k)* (Unit is one nanosecond)			
AOS (Borowiec)	-987	-937	-853	-875
APL (Laurel)	2796	2849	2907	2971
AUS (Canberra)	251	229	218	207
BEV (Wien)	-	-	-	-
BIRM (Beijing)	-6885	-6944	-7007	-7072
CAO (Cagliari)	-1370	-1401	-1430	-1462
CH (Bern)	82	121	141	157
CNM (Queretaro)	-2109	-2054	-1997	-1944
CRL (Tokyo)	3	-6	-8	-7
CSAO (Lintong)	-40	-54	-37	-31
CSIR (Pretoria)	-142	-191	-289	-373
DLR (Oberpfaffenhofen)	-625	-673	-722	-767
DTAG (Darmstadt)	-601	-596	-587	-580
GUM (Warszawa)	766	774	786	803
IEN (Torino)	611	611	617	621
IFAG (Wettzell) (1)	-698	-619	-556	-570
IGMA (Buenos Aires)	55	58	49	48
INPL (Jerusalem)	-695	-623	-552	-470
IPQ (Monte de Caparica)	704	729	756	769
JATC (Lintong)	3458	3446	3480	3493
KRIS (Taejon)	-115	-86	-75	-59
LDS (Leeds)	16	13	13	15
MSL (Lower Hutt)	-5743	-5812	-5813	-5863
NAO (Mizusawa)	-1588	-1539	-1463	-1395
NIM (Beijing)	-2093	-2125	-2148	-2195
NIST (Boulder)	29	31	30	32
NML (Sydney)	634	641	653	652
NPL (Teddington)	71	71	77	81
NRC (Ottawa)	6	10	3	-1
NRLM (Tsukuba)	177	182	189	197
OMH (Budapest)	1066	1092	1121	1146
ONBA (Buenos Aires)	-	-	-	-
ONRJ (Rio de Janeiro)	-117	-103	-85	-67
OP (Paris)	44	37	33	29
ORB (Bruxelles)	316	296	294	291
PTB (Braunschweig)	1771	1772	1767	1768
ROA (San Fernando)	-12	-15	-7	0
SCL (Hong Kong)	-	-	-	-
SO (Shanghai)	946	937	932	895
SP (Boras)	437	460	464	487
SU (Moskva)	572	561	554	546
TL (Chung-Li)	636	615	608	596
TP (Praha)	184	189	194	193
TUG (Graz)	2936	2987	3027	3075
UME (Gebze-Kocaeli)	702	711	722	732
USNO (Washington DC)(USNO MC)	9	12	9	10
VSL (Delft)	-192	-181	-172	-161

ORGANISATION INTERGOUVERNEMENTALE DE LA CONVENTION DU MÈTRE

PAVILLON DE BRETEUIL F-92312 SÈVRES CEDEX TÉL. + 33 1 45 07 70 70 FAX + 33 1 45 34 20 21

1 - Coordinated Universal Time UTC. (Cont.)

Date 1997 0h UTC	Sep 18	Sep 23	Sep 28
MJD	50709	50714	50719
Laboratory k	*UTC-UTC(k)*	(Unit is one	nanosecond)
AOS (Borowiec)	-802	-700	-548
APL (Laurel)	3027	3074	3131
AUS (Canberra)	217	222	209
BEV (Wien)	-	-	-
BIRM (Beijing)	-7122	-7189	-7243
CAO (Cagliari)	-1489	-1509	-1526
CH (Bern)	175	195	232
CNM (Queretaro)	-1885	-1827	-1763
CRL (Tokyo)	-12	-17	-15
CSAO (Lintong)	-38	-55	-68
CSIR (Pretoria)	-468	-534	-619
DLR (Oberpfaffenhofen)	-813	-856	-903
DTAG (Darmstadt)	-566	-572	-573
GUM (Warszawa)	826	844	871
IEN (Torino)	622	625	627
IFAG (Wettzell)	-619	-662	-730
IGMA (Buenos Aires)	35	45	52
INPL (Jerusalem)	-404	-338	-292
IPQ (Monte de Caparica)	753	767	795
JATC (Lintong)	3473	3451	3423
KRIS (Taejon)	-36	-35	-16
LDS (Leeds)	17	27	1
MSL (Lower Hutt)	-5944	-5936	-6012
NAO (Mizusawa)	-1320	-1265	-1190
NIM (Beijing)	-2237	-2268	-2309
NIST (Boulder)	31	30	30
NML (Sydney)	690	697	751
NPL (Teddington)	82	81	81
NRC (Ottawa)	-4	-9	-14
NRLM (Tsukuba)	208	209	209
OMH (Budapest)	1157	1169	1168
ONBA (Buenos Aires)	-	-	-
ONRJ (Rio de Janeiro)	-55	-34	-20
OP (Paris)	27	27	22
ORB (Bruxelles)	294	283	279
PTB (Braunschweig)	1764	1766	1775
ROA (San Fernando)	7	11	14
SCL (Hong Kong)	-	-	-
SO (Shanghai)	889	905	896
SP (Boras)	494	501	516
SU (Moskva)	538	530	516
TL (Chung-Li)	589	577	567
TP (Praha)	204	205	210
TUG (Graz)	3105	3147	3187
UME (Gebze-Kocaeli)	746	771	785
USNO (Washington DC)(USNO MC)	9	10	8
VSL (Delft)	-160	-151	-140

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

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

Date 1997 0h UTC		Aug 29	Sep 3	Sep 8	Sep 13
MJD		50689	50694	50699	50704
Laboratory k		*TAI-TA(k)* (Unit is one nanosecond)			
AMC (Col. Springs)		-365026	-365019	-365022	-365023
APL (Laurel)		4259	4312	4370	4434
AUS (Canberra)		-80429	-80507	-80598	-80711
CH (Bern)		-44267	-44089	-43916	-43748
CRL (Tokyo)		89064	89271	89484	89699
CSAO (Lintong)		-922	-1001	-1049	-1108
F (Paris)		162929	162922	162915	162907
IEN (Torino)		4106	4153	4210	4258
INPL (Jerusalem)		-399519	-399274	-399030	-398775
JATC (Lintong)		12923	12886	12891	12873
KRIS (Taejon)		5287	5305	5302	5302
NIST (Boulder)		-45164942	-45165154	-45165368	-45165578
NML (Sydney)		670	676	689	688
NRC (Ottawa)		27049	27053	27046	27046
PTB (Braunschweig)		-361629	-361628	-361633	-361632
SO (Shanghai)		-46567	-46563	-46567	-46601
SU (Moskva)	(2)	27241572	27241561	27241554	27241546
USNO (Washington DC)		-34778337	-34778651	-34778970	-34779287

Date 1997 0h UTC		Sep 18	Sep 23	Sep 28
MJD		50709	50714	50719
Laboratory k		*TAI-TA(k)* (Unit is one nanosecond)		
AMC (Col. Springs)		-365028	-365028	-365031
APL (Laurel)		4490	4537	4594
AUS (Canberra)		-80816	-80933	-81033
CH (Bern)		-43577	-43404	-43214
CRL (Tokyo)		89910	90123	90335
CSAO (Lintong)		-1179	-1261	-1339
F (Paris)		162898	162892	162887
IEN (Torino)		4303	4355	4397
INPL (Jerusalem)		-398531	-398280	-398035
JATC (Lintong)		12825	12769	12713
KRIS (Taejon)		5312	5290	5297
NIST (Boulder)		-45165792	-45166005	-45166218
NML (Sydney)		726	734	788
NRC (Ottawa)		27043	27038	27033
PTB (Braunschweig)		-361636	-361634	-361625
SO (Shanghai)		-46604	-46586	-46593
SU (Moskva)	(2)	27241538	27241530	27241516
USNO (Washington DC)		-34779608	-34779926	-34780247

3 - Notes on sections 1 and 2.

(1) IFAG. Change of master clock between MJD = 50699 and MJD = 50704 .

(2) SU . Listed values are *TAI-TA(SU)* - 2,80 seconds.

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

Interval of validity		*f(EAL)-f(TAI)*
1997 Aug. 29 - 1997 Oct. 28	50689-50749	7.190×10^{-13}

New steering correction foreseen for November-December 1997

1997 Oct. 28 - 1997 Dec. 27	50749-50809	7.170×10^{-13}

5 - Duration of the TAI scale interval.

The following table gives the duration u_{TAI} of the TAI scale interval expressed as its relative departure d from the SI second on the rotating geoid, u_0, together with its uncertainty σ : $d = (u_{TAI}-u_0)/u_0$. 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 NIST-7, PTB CS2, PTB CS3 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})	σ (10^{-14})
PTB-CS2	50689-50719	+1.7	1.5
PTB-CS3	50689-50719	+4.0	1.4
BIPM estimate	50659-50719	+1.9	1.0

6 - [*UTC-GPS time*] and [*TAI-GPS time*].

[*UTC-GPS time*] = -12 s + C_0, [*TAI-GPS time*] = 19 s + C_0.

Daily values of C_0 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 C_0 are derived from them using linear interpolation of [*UTC-UTC(OP)*]. The global uncertainty of daily C_0 values is of order 10 ns.

In the following table, the standard deviation σ characterizes the dispersion of individual measurements, and N is the number of measurements used on a given day for estimation of the corresponding daily C_0 value.

Date 1997 0h UTC	MJD	C_0 (ns)	σ (ns)	$\sigma/\sqrt{N}$ (ns)
Aug 29	50689	25	53	12
Aug 30	50690	20	37	8
Aug 31	50691	16	55	13
Sep 1	50692	21	47	14
Sep 2	50693	20	47	11
Sep 3	50694	21	42	9
Sep 4	50695	25	45	10
Sep 5	50696	22	53	12
Sep 6	50697	18	45	10
Sep 7	50698	17	35	8
Sep 8	50699	15	61	13
Sep 9	50700	7	45	9
Sep 10	50701	-3	57	12
Sep 11	50702	1	31	7
Sep 12	50703	13	46	10
Sep 13	50704	14	46	10
Sep 14	50705	4	38	8
Sep 15	50706	-1	48	10
Sep 16	50707	2	39	8
Sep 17	50708	3	39	9
Sep 18	50709	5	42	10
Sep 19	50710	13	41	10
Sep 20	50711	24	34	9
Sep 21	50712	30	48	12
Sep 22	50713	30	59	15
Sep 23	50714	24	27	7
Sep 24	50715	14	24	7
Sep 25	50716	12	61	17
Sep 26	50717	22	53	15
Sep 27	50718	29	60	18
Sep 28	50719	19	41	11

7 - [*UTC-GLONASS time*] and [*TAI-GLOGNASS time*].

[*UTC-GLONASS time*] = 0 s + C_1, [*TAI-GLONASS time*] = +31 s + C_1.

Daily values of C_1 are given in the following table. They are obtained as follows: the GLONASS data taken at the NMi Van Swinden Laboratorium, Delft, The Netherlands, for highest elevation, are smoothed to obtain daily values of [*UTC(VSL)-GLONASS time*] at 0h UTC; daily values of C_1 are then derived from them using linear interpolation of [*UTC-UTC(VSL)*]. A time correction of + 1285 ns is also applied in order to ensure continuity of C_1 estimates on 1997, January 1 (MJD = 50449). The global uncertainty of daily C_1 values is of order several hundreds of nanoseconds.

In the following table, the standard deviation σ characterizes the dispersion of individual measurements, and N is the number of measurements used on a given day for estimation of the corresponding daily C_1 value.

Date 1997 0h UTC	MJD	C_1 (ns)	σ (ns)	$\sigma/\sqrt{N}$ (ns)
Aug 29	50689	-	-	-
Aug 30	50690	-	-	-
Aug 31	50691	-	-	-
Sep 1	50692	-	-	-
Sep 2	50693	-	-	-
Sep 3	50694	-	-	-
Sep 4	50695	-	-	-
Sep 5	50696	-	-	-
Sep 6	50697	-	-	-
Sep 7	50698	-	-	-
Sep 8	50699	-	-	-
Sep 9	50700	-	-	-
Sep 10	50701	221	16	7
Sep 11	50702	229	14	5
Sep 12	50703	233	20	7
Sep 13	50704	239	13	4
Sep 14	50705	248	28	9
Sep 15	50706	246	21	7
Sep 16	50707	237	23	8
Sep 17	50708	236	33	14
Sep 18	50709	226	22	8
Sep 19	50710	226	27	10
Sep 20	50711	-	-	-
Sep 21	50712	-	-	-
Sep 22	50713	-	-	-
Sep 23	50714	278	24	8
Sep 24	50715	271	7	3
Sep 25	50716	259	25	11
Sep 26	50717	256	15	7
Sep 27	50718	-	-	-
Sep 28	50719	267	21	7