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Table 9 - Offsets and step adjustments of UTC, until 1985 Dec. 31

Date(at 0h UTC)			Offsets	Steps
1961	Jan.	1	-150×10^{-10}	
	Aug.	1	"	+ 0.050s
1962	Jan.	1	-130×10^{-10}	
1963	Nov.	1	"	- 0.100s
1964	Jan.	1	-150×10^{-10}	
	April	1	"	- 0.100s
	Sept.	1	"	- 0.100s
1965	Jan.	1	"	- 0.100s
	March	1	"	- 0.100s
	July	1	"	- 0.100s
	Sept.	1	"	- 0.100s
1966	Jan.	1	-300×10^{-10}	
1968	Feb.	1	"	+ 0.100s

Date(at 0h UTC)			Offsets	Steps
1972	Jan.	1	0	- 0.107 7580s
	July	1	"	- 1s
1973	Jan.	1	"	- 1s
1974	Jan.	1	"	- 1s
1975	Jan.	1	"	- 1s
1976	Jan.	1	"	- 1s
1977	Jan.	1	"	- 1s
1978	Jan.	1	"	- 1s
1979	Jan.	1	"	- 1s
1980	Jan.	1	"	- 1s
1981	July	1	"	- 1s
1982	July	1	"	- 1s
1983	July	1	"	- 1s
1985	July	1	"	- 1s

Table 10 - Relationship between TAI and UTC, until 1985 Dec. 31

Limits of validity(at 0h UTC)							TAI - UTC
1961	Jan.	1	-	1961	Aug.	1	1.422 818 0s + (MJD - 37 300) x 0.001 296s
	Aug.	1	-	1962	Jan.	1	1.372 818 0s + " "
1962	Jan.	1	-	1963	Nov.	1	1.845 858 0s + (MJD - 37 665) x 0.001 123 2s
1963	Nov.	1	-	1964	Jan.	1	1.945 858 0s + " "
1964	Jan.	1	-		April	1	3.240 130 0s + (MJD - 38 761) x 0.001 296s
	April	1	-		Sept.	1	3.340 130 0s + " "
	Sept.	1	-	1965	Jan.	1	3.440 130 0s + " "
1965	Jan.	1	-		March	1	3.540 130 0s + " "
	March	1	-		July	1	3.640 130 0s + " "
	July	1	-		Sept.	1	3.740 130 0s + " "
	Sept.	1	-	1966	Jan.	1	3.840 130 0s + " "
1966	Jan.	1	-	1968	Feb.	1	4.313 170 0s + (MJD - 39 126) x 0.002 592s
1968	Feb.	1	-	1972	Jan.	1	4.213 170 0s + " "
1972	Jan.	1	-		July	1	10s (integral number of seconds)
	July	1	-	1973	Jan.	1	11s
1973	Jan.	1	-	1974	Jan.	1	12s
1974	Jan.	1	-	1975	Jan.	1	13s
1975	Jan.	1	-	1976	Jan.	1	14s
1976	Jan.	1	-	1977	Jan.	1	15s
1977	Jan.	1	-	1978	Jan.	1	16s
1978	Jan.	1	-	1979	Jan.	1	17s
1979	Jan.	1	-	1980	Jan.	1	18s
1980	Jan.	1	-	1981	July	1	19s
1981	July	1	-	1982	July	1	20s
1982	July	1	-	1983	July	1	21s
1983	July	1	-	1985	July	1	22s
1985	July	1					23s

TABLE 11 - Atomic time, collaborating laboratories

AOS	Astronomical Latitude Observatory, Borowiec, Polska
APL	Applied Physics Laboratory, Laurel, USA
ASMW	Amt fur Standardisierung, Messwesen und Warenprüfung, Berlin, Deutsche Demokratische Republik
ATC	Australian Telecommunications Commission, Melbourne, Australia
AUS	Consortium of laboratories in Australia
BEV	Bundesamt für Eich-und, Vermessungswesen, Wien, Österreich
BAO	Beijing Observatory, Beijing, China
CAO	Astronomical Observatory of Cagliari University, Cagliari, Italy
CSAO	Shaanxi Astronomical Observatory, Lintong, China
DDR	Consortium of laboratories in Deutsche Demokratische Republik
DHI	Deutsches Hydrographisches Institut,Hamburg,Bundesrepublik Deutschland
DNM	Division of National Mapping, Canberra, Australia
F	Commission Nationale de l'Heure, Paris, France
FTZ	Fernmeldetechnisches Zentralamt, Darmstadt,Bundesrepublik Deutschland
IEN	Istituto Elettrotecnico Nazionale, Torino, Italia
IFAG	Institut für Angewandte Geodäsie, Franfurt am Main, Bundesrepublik Deutschland
IGMA	Instituto Geografico Militar, Buenos-Aires, Argentina
ILOM	International Latitude Observatory, Mizusawa, Japan
INTI	Instituto Nacional de Tecnologia Industrial, Buenos Aires, Argentina
KSRI	Korea Standards Research Institute, Korea
MSSD	Measurement Standards and Services Division, Colombo, Sri Lanka
NBS	National Bureau of Standards, Boulder, USA
NIM	National Institute of Metrology, Beijing, China
NIS	National Institute for Standards, Cairo, Arab Republic of Egypt
NML	National Measurement Laboratory, CSIRO, Australia
NPL	National Physical Laboratory, Teddington, U.K.
NPLI	National Physical Laboratory, New-Dehli, India
NPRL	National Physical Research Laboratory, Pretoria, South Africa
NRC	National Research Council of Canada, Ottawa, Canada
NRLM	National Research Laboratory of Metrology, Tsukuba, Japan
OAB	Observatoire Astronomique Bouzaréah, Alger, République Algérienne
OFM	Office Fédéral de Métrologie, Berne, Suisse
OMH	Orszagos Mérésügyi Hivatal, Budapest, Hungary
OMSF	Instituto y Observatorio de Marina, San Fernando, España
ON	Observatoire de Neuchâtel, Neuchâtel, Suisse
ONBA	Observatorio Naval, Buenos-Aires, Argentina
ONRJ	Observatorio National, Rio de Janeiro, Brazil
OP	Observatoire de Paris, Paris, France
ORB	Observatoire Royal de Belgique, Bruxelles, Belgique
PAGA	Philippine Atmospheric, Geophysical and Astronomical Services Administration, Philippines
PEL	Physics and Engineering Laboratory, New-Zealand
PKNM	Polski Komitet Normalizacji i Miar, Warszawa, Polska
PTB	Physikalisch-Technische Bundesanstalt, Braunschweig, Bundesrepublik Deutschland

TABLE 11 - Atomic time, collaborating laboratories (cont.)

PTCH	Direction générale des PTT, Berne, Suisse
RGO	Royal Greenwich Observatory, Herstmonceux, U.K.
RO	Royal Observatory, Hong-Kong
RRL	Radio Research Laboratories, Tokyo, Japan
SIS	Singapore Institute of Standards and Industrial Research, Singapore
SO	Shanghaï Observatory, Shanghaï, China
STA	Swedish Telecommunications Administration, Stockholm, Sweden
SU	Laboratoire d'état de l'étalon de temps et de fréquences, URSS
TAO	Tokyo Astronomical Observatory, Tokyo, Japan
TL	Telecommunication Laboratories, Taiwan, China
TP(1)	Ústav Radiotechniky a Electroniky, Praha, Československo Astronomický Ústav, Praha, Československo
TPC	Telecommunication Public Corporation, Indonesia
TUG	Technische Universität Graz, Österreich
USNO	U.S. Naval Observatory, Washington D.C., USA
VSL	Van Swinden Laboratorium, Den Haag, Nederland
YUZM	Bureau Fédéral des Mesures et Métaux Précieux, Belgrade, République Socialiste Fédérative de Yougoslavie
ZIPE	Zentralinstitut Physik der Erde, Potsdam, Deutsche Demokratische Republik

(1) Both laboratories cooperate in the derivation of UTC (TP).

TABLE 12 - Laboratories keeping an independent local atomic time

Laboratory (i)	Equipment in atomic standards(1)	Information on TA(i)-UTC(i): Interval of validity (in MJD at 0h UT)	TA(i)-UTC(i) in s
DDR	4 Ind. Cs (2)	year 1984	TA(DDR)-UTC(ASMW) is sent to BIH
F	18 Ind. Cs (3)	year 1984	TA(F)-UTC(OP) is published in Bulletin H by OP (LPTF)
NBS	16 Ind. Cs 2 lab. Cs 2 H Maser (4)	year 1984	TA(NBS)-UTC(NBS) is published in the NBS T and F Bulletin
NRC	1 Ind. Cs 1 2.1 m lab. Cs 3 1 m lab. Cs (5)	year 1984	21.999 968 931
OFM	6 Ind. Cs 2 prototype Cs	45700-45819	22.000 011 300 $+(19.748 \times 10^{-9})(MJD-45700)$
		45819-45879	22.000 013 650 $+(24.983 \times 10^{-9})(MJD-45819)$
		45879-45969	22.000 015 149 $+(29.067 \times 10^{-9})(MJD-45879)$
		45969-	22.000 017 65) $+(26.0 \times 10^{-9})$ (MJD-45969)
PTB	10 Ind. Cs 1 lab. Cs (6)	year 1984	22.000 363 400
RGO	6 Ind. Cs	year 1984	21.999 926 09
RRL	1 lab. Cs 7 Ind. Cs 2 H Maser	year 1984	published in RRL Standard Frequency and Time Service Bulletin
SO	1 lab. Cs 3 Ind. Cs 3 H Masers	year 1984	TA(SO)-UTC(SO) is published by the SO Atomic Time Bulletin
USNO	35 Ind. Cs 3 H Masers (2 VLG II B serial # 18,19 1 VLG II P 10)	year 1984	A.1(USNO,MEAN) - UTC(USNO,MC): final values in USNO series 11. (7)

TABLE 12 - (cont.)

(1) Ind. Cs designates an industry made Cs standard ; lab. Cs a laboratory Cs standard and H Maser an Hydrogen Maser.

(2) The standards are located as follows:

ASMW 3 Cs
ZIPE 1 Cs

(3) The standards are located as follows (at the end of 1984).

Centre Electronique de l'Armement (Rennes)	2 Cs
Centre National d'Etudes Spatiales	2 Cs
Centre National d'Etudes des Télécommunications	3 Cs
Centre d'Etudes et de Recherches Géodynamiques et Astronomiques	3 Cs
Electronique Serge Dassault (Suresnes)	1 Cs
Hewlett-Packard (Orsay)	1 Cs
Observatoire de Paris : Laboratoire Primaire du Temps et des Fréquences (LPTF)	5 Cs
Observatoire de Besançon	1 Cs

They are intercompared by the TV method and linked to the foreign laboratories through OP (LPTF) (see Table 13).

(4) The laboratory primary standards control TA(NBS) via an accuracy algorithm. One of the two primary standards usually operates as a contributing member clock. Three of the commercial standards provide the reference for WWV and WWVB but do not contribute directly to TA(NBS) ; they are available for NBS time scales back-up and are compared to TA(NBS) to within 0.1 s. The hydrogen masers are passively operated.

(5) The 2.1 meter primary cesium clock, CsV, operated continuously during 1984 except for the interval (MJD) 45830-45849 (both ovens were reloaded with cesium), producing the scale of proper time PT(NRC CsV). The time scales UTC(NRC) and TA(NRC) were derived from PT(NRC CsV) according to the following expressions given in microseconds :

$$UTC(NRC) = PT(NRC\ CsV) - (MJD - 43144) \times 0.000\ 97 + 52.041$$

$$TA(NRC) = PT(NRC\ CsV) - (MJD - 43144) \times 0.000\ 97 + 20.972$$

with integral seconds disregarded.

Three 1 meter laboratory cesium clocks, CsVIA, -B, and -C, operated continuously as primary standards during 1984 producing the scales of proper time PT(NRC CsVIA), PT(NRC CsVIB) and PT(NRC CsVIC).

(6) TA(PTB) and UTC(PTB) are derived directly from a local oscillator moniitored by the primary clock CS1.
MEZ(D) = UTC(PTB) + 1h or MESZ(D) = UTC(PTB) + 2h (summer time) is the legal time of the Federal Republic of Germany.

(7) TA(USNO) is designated by A.1 (USNO,MEAN) in USNO publications.

Table 13 - Equipment and links of the collaborating laboratories in 1984

Laboratory (i)	Equipment (1)	Source of UTC(i)	LORAN-C reception (2)	Television link with	GPS reception
AOS	1 Ind. Cs	1 Cs,1 Rb		TP,ZIPE	
APL(3)	2 Ind. Cs 1 H Maser	1 Cs + microstepper		USNO	
ASMW	3 Ind. Cs	corrected mean of 3 Cs	7970-W	ZIPE,TP,PTB	
ATC	7 Ind. Cs	1 Cs + microstepper		other lab. in Australia	(4)
BEV	1 Ind. Cs	1 Cs	7970-W 7990-M 7990-X 7990-Y (5)	TUG,lab.in Czechoslovakia	
CAO	2 Ind. Cs	1 Cs	7990-M 7990-X 7990-Z	IEN, other lab. in Italy	
CSAO	4 Ind. Cs 3 H Masers	all the Cs	9970-Y	lab. in China	
DHI	2 Ind. Cs	1 Cs + microstepper	7970-W	PTB,TP,ZIPE	
DNM(6)	4 Ind. Cs	all the Cs		other lab. in Australia	(4)
FTZ	7 Ind. Cs	1 Cs	7970-W		
IEN	6 Ind. Cs	1 Cs + microstepper	7990-M 7990-X 7990-Z	CAO, other lab. in Italy	
IFAG	3 Ind. Cs 1 H Maser	1 Cs	7970-W		
IGMA	3 Ind. Cs	1 Cs + microstepper		ONBA, INTI, other lab. in Argentina	
ILOM	5 Ind. Cs	1 Cs	9970-M 9970-X	RRL,TAO,NRLM	
NBS	see Table 12	13 Cs 1 lab. Cs 2 H Maser	9940-M 9960-Z		*
NIM	3 Ind. Cs	1 Cs + microstepper	9970-Y	Lab. in China	

Table 13 - (cont.)

Laboratory (i)	Equipment (1)	Source of UTC(i)	LORAN-C reception (2)	Television link with	GPS reception
NML	3 Ind. Cs 2 H Masers	all the Cs		other lab. in Australia	(4)
NPL	7 Ind. Cs 1 lab. Cs	1 Cs	7970-W	transmitting station at Rugby	
NPLI	3 Ind. Cs	1 Cs			
NPRL(7)	2 Ind. Cs	1 Cs			
NRC	see Table 12	Cs V	9960-M		* (since 1984 July 8)
NRLM	3 Ind. Cs 2 lab. Cs	1 Cs	9970-M	ILOM,RRL,TAO	
OAB	3 Ind. Cs	1 Cs	7990-Z		
OFM	see Table 12	all the Cs	7970-W 7990-Z	PTCH other lab. in Switzerland	
OMH	1 Ind. Cs	1 Cs		TP,SU	
OMSF	6 Ind. Cs	all the Cs	7990-Z		
ON	5 Ind. Cs	all the Cs	7970-W 7990-Z		
ONBA(7)	2 Ind. Cs	2 Cs		IGMA other lab. in Argentina	
ONRJ(7)	2 Ind. Cs	2 Cs		other lab. in Brasil	
OP	5 Ind. Cs	1 Cs	7970-W 7990-Z	19 lab. in France, ORB, PTCH	*
ORB	2 Ind. Cs	1 Cs	7970-W	OP	
PKNM	4 Ind. Cs	corrected mean of 4 Cs	7970-W (5)		
PTB	see Table 12	Ind. Cs steered by PTB primary standard	7970-W	ASMW,DHI,TP,ZIPE and other lab.	*

Table 13 - (cont.)

Laboratory (i)	Equipment (1)	Source of UTC(i)	LORAN-C reception (2)	Television link with	GPS reception
PTCH	2 Ind. Cs	2 Cs	7970-W	OFM,OP and other lab.in Switzerland	
RGO	see Table 12	selection of the Cs	7970-M 7970-W 7990-Z 9980-X		
RRL	see Table 12	1 Cs	9970-M	ILOM,TAO,NRLM	* (since 1984 Aug. 7)
SO	see Table 12	1 Cs + microstepper	9970-Y	lab. in China	
STA	3 Ind. Cs	1 Cs	7970-W	other lab. in Sweden	
SU	2 lab. Cs 3 Ind. Cs 4 H Masers 4 H clocks	2 lab. Cs 1 Cs 4 H Masers 4 H clocks	7970-W 7990-X 7990-Y 9970-X	other lab. in URSS, TP,OMH, ASMW	
TAO	5 Ind. Cs	1 Cs + microstepper	9970-M 9970-Y	ILOM,RRL,NRLM	*
TL	4 Ind. Cs	1 Cs + microstepper	9970-M		
TP	1 Ind. Cs	1 Cs + microstepper		DHI,PTB,AOS,SU ZIPE,ASMW,OMH	
TUG	2 Ind. Cs	1 Cs	7970-W 7990-M	BEV	*
USNO (8)	see Table 12	Cs	(9)	APL	*
VSL	4 Ind. Cs	Cs	7970-M 7970-W 9980-X	other lab. in Holland	*
ZIPE	1 Ind. Cs	1 Cs	7970-W	ASMW,DHI PTB,TP,AOS	

Notes

(1) Ind. Cs designates an industry made Cs standard ; lab. Cs a laboratory Cs standard and H.Maser an Hydrogen Maser. Rb designates a Rubidium standard

(2) LORAN-C stations :

7970-M	Norwegian Sea chain,	Ejde
7970-W	.. ..	Sylt
7990-M	Mediterranean chain,	Simeri Crichi
7990-X	.. ..	Lampedusa
7990-Y	.. ..	Kargabarun
7990-Z	.. ..	Estartit
9940-M	West Coast chain,	Fallon
9960-M	Northeast Coast chain,	Seneca
9960-X	.. ..	Nantucket
9960-Z	.. ..	Dana
9970-M	Northwest Pacific chain,	Iwo Jima
9970-X	.. ..	Hokkkaido
9970-Y	.. ..	Gesashi
9980-M	North Atlantic chain,	Angissog
9980-X	.. ..	Ejde

(3) Weekly Cs clock transfers are carried out between APL and USNO

(4) ATC, DNM, NML, are linked by television to the Tidbinbilla Deep Space Communications Centre, where GPS receptions are made

(5) Reception of the Soviet Union LORAN chain 8000

(6) Microwave link with Orroral facility of NASA (National Aeronautics and Space Administration).

(7) NPRL, ONBA, ONRJ are linked to the other laboratories by VLF receptions.

(8) USNO Time Service Publication, Series 16, entitled Precise Time Transfer Report, lists UTC(USNO MC) - UTC(Reference Clock). Difference from Satellite Communication terminals as well as many international timing centers using the Global Positioning System are reported. USNO Time Service Publication, Series 17, entitled Transit Satellite Reports, lists UTC(USNO MC) - UTC(Satellite Clock) and also the frequency offset of each satellite. Series 17 is available via the Automated Data Service and the General Electric Mark 3 international computer network (RC28 catalog).

(9) The daily phase values Series 4 of USNO gives the values of UTC(USNO MC) - transmitting station for :

the LORAN-C chains
the OMEGA stations A, H, L, ND
the VLF station GBR
the US TV Network NBC
the NNSS and GPS satellite systems

These data are also available via the Automated Data Service (ADS) and the General Electric Mark 3 international computer network (RC28 catalog).
The ADS may be accessed on 202 - 653.1095 (CCITT x 21 standard).

TABLE 14 - TIME COMPARISONS BETWEEN LABORATORIES BY CLOCK TRANSPORTATION IN 1984

UNLESS OTHERWISE STATED,THE TRANSPORTATION WAS CARRIED OUT BY THE FIRST MENTIONED LABORATORY

DATE	MJD	TIME COMPARISONS	UNCERT.	SOURCE
1984		(UNIT : 1 MICROSECOND)		
JAN 19	45718.4	UTC(ILOM) - UTC(RRL) = -1.78	0.1	ILOM LETTER
JAN 31	45730.0	UTC(USNO) - UTC(ATC) = 3.2	0.2	USNO DPV 893 (1)
FEB 1	45731.3	UTC(USNO) - UTC(DNM) = 1.5	0.2	USNO DPV 893
FEB 20	45750.0	UTC(USNO) - UTC(NBS) = -2.19	0.05	USNO DPV 897
MAR 12	45771.56	UTC(PTB) - UTC(ONBA) = 1.80	0.06	PTB LETTER
MAR 12	45771.63	UTC(PTB) - UTC(IGMA) = 32.04	0.06	PTB LETTER
MAR 12	45771.66	UTC(PTB) - UTC(INTI) = 37.61	0.06	PTB LETTER
MAR 16	45775.8	UTC(PTB) - UTC(ONRJ) =-518.64	0.05	ONRJ LETTER
MAR 28	45787.56	UTC(OP) - UTC(VSL) = -1.15	0.03	OP LETTER
APR 18	45808.25	UTC(PTB) - UTC(OP) = -1.070	0.020	PTB LETTER
APR 25	45815.4	UTC(USNO) - UTC(OP) = 1.814	0.010	USNO LETTER
APR 26	45816.5	UTC(NPL) - UTC(SU) = 31.55	0.03	NPL LETTER
APR 26	45816.5	UTC(USNO) - UTC(ON) = 13.70	0.02	USNO DPV 905
APR 30	45820.3	UTC(USNO) - UTC(BEV) = -0.98	0.04	USNO DPV 905
APR 30	45820.5	UTC(USNO) - UTC(TUG) = -1.587	0.042	USNO LETTER
MAY 2	45822.3	UTC(USNO) - UTC(IFAG) = -18.32	0.05	USNO DPV 905
MAY 4	45824.5	UTC(USNO) - UTC(FTZ) = 4.13	0.05	USNO DPV 905
MAY 8	45828.0	UTC(USNO) - UTC(DNM) = -48.8	0.2	USNO DPV 910
MAY 8	45828.4	UTC(USNO) - UTC(PTB) = 2.949	0.038	USNO LETTER
MAY 10	45830.2	UTC(USNO) - UTC(DHI) = 1.50	0.03	USNO DPV 905
MAY 11	45831.3	UTC(USNO) - UTC(NPL) = -1.44	0.01	USNO DPV 905
MAY 11	45831.4	UTC(USNO) - UTC(ATC) = 4.8	0.2	USNO DPV 910
MAY 15	45835.3	UTC(PTB) - UTC(IFAG) = -20.308		IFAG LETTER
MAY 16	45836.95	UTC(USNO) - UTC(NML) = 3.7	0.2	USNO DPV 910
MAY 23	45843.4	UTC(IEN) - UTC(OP) = 17.24	0.04	IEN LETTER
MAY 25	45845.0	UTC(IEN) - UTC(CSAO) = 23.68	0.05	IEN LETTER
JUL 6	45887.0	UTC(TAO) - UTC(NRLM) = -9.85	0.01	TAO LETTER
JUL 10	45891.0	UTC(TAO) - UTC(ILOM) = -4.48	0.02	TAO LETTER
JUL 16	45897.0	UTC(TAO) - UTC(RRL) = -6.54	0.01	TAO LETTER
JUL 31	45912.8	UTC(USNO) - UTC(NML) = 1.9	0.1	USNO DPV 918
AUG 7	45919.5	UTC(USNO) - UTC(RGO) = -9.8	0.1	USNO DPV 918
AUG 8	45920.3	UTC(USNO) - UTC(NPL) = -3.0	0.1	USNO DPV 918
AUG 9	45921.2	UTC(USNO) - UTC(ORB) = -19.8	0.2	USNO DPV 918
AUG 9	45921.6	UTC(USNO) - UTC(NRC) = -6.89	0.06	USNO DPV 919
AUG 10	45922.4	UTC(USNO) - UTC(STA) = -0.93	0.2	STA LETTER
AUG 13	45925.3	UTC(USNO) - UTC(VSL) = 1.8	0.2	USNO DPV 918
AUG 19	45931.99	UTC(USNO) - UTC(TAO) = 1.1	0.1	USNO DPV 920
AUG 20	45932.1	UTC(USNO) - UTC(RRL) = -6.0	0.1	USNO DPV 920

TABLE 14 - (CONT.)

DATE	MJD	TIME COMPARISONS	UNCERT.	SOURCE
1984		(UNIT : 1 MICROSECOND)		
AUG 22	45934.1	UTC(USNO) - UTC(BAO) = -5.3	0.1	USNO DPV 920
AUG 24	45936.0	UTC(USNO) - UTC(CSAO) = 9.1	0.1	USNO DPV 920
AUG 30	45942.1	UTC(USNO) - UTC(SO) = -10.7	0.1	USNO DPV 920
OCT 5	45978.5	UTC(USNO) - UTC(IEN) = -14.7	0.2	USNO DPV 932
NOV 4	46008.97	UTC(USNO) - UTC(DNM) = -67.2	0.1	USNO DPV 932
NOV 6	46010.0	UTC(TAO) - UTC(RRL) = -8.646	0.010	TAO LETTER
NOV 9	46013.0	UTC(TAO) - UTC(NRLM) = -9.926	0.010	TAO LETTER
NOV 11	46015.9	UTC(USNO) - UTC(ATC) = 0.1	0.1	USNO DPV 932
NOV 13	46017.0	UTC(TAO) - UTC(ILOM) = -6.423	0.010	TAO LETTER
NOV 13	46017.1	UTC(USNO) - UTC(NML) = -2.5	0.1	USNO DPV 932
DEC 8	46042.2	UTC(USNO) - UTC(RRL) = -6.65	0.04	USNO DPV 934

COMPLEMENTARY RESULTS FOR THE PREVIOUS YEAR

DATE	MJD	TIME COMPARISONS	UNCERT.	SOURCE
1983				
MAR 20	45413	UTC(SU) - UTC(NPLI) = -122.0	0.1	SU LETTER
DEC 9	45677.5	UTC(ONRJ) - UTC(ONBA) = 534.9	0.1	ONRJ LETTER

(1) UTC(USNO) STANDS FOR UTC(USNO MC)
DPV : DAILY PHASE VALUES , SERIES 4 , PUBLISHED BY USNO .

TABLE 15 - INDEPENDENT ATOMIC TIMES

TA(I) DENOTES THE ATOMIC TIME OF THE LABORATORY I

UNIT IS ONE MICROSECOND

DATE 1984	MJD	TAI - TA(I) DDR	F	NBS	NRC	OFM
JAN 10	45709	-1.95	-18.26	-45066.89	23.01	-11.85
JAN 20	45719	-2.02	-17.84	-45067.05	22.94	-12.12
JAN 30	45729	-2.11	-17.50	-45067.32	23.15	-12.31
FEB 9	45739	-2.18	-17.11	-45067.53	23.23	-12.51
FEB 19	45749	-2.17	-16.77	-45067.79	23.28	-12.63
FEB 29	45759	-2.23	-16.41	-45067.96	23.25	-12.91
MAR 10	45769	-2.35	-16.01	-45068.16	23.20	-13.17
MAR 20	45779	-2.46	-15.63	-45068.41	23.34	-13.40
MAR 30	45789	-2.49	-15.22	-45068.65	23.41	-13.59
APR 9	45799	-2.61	-14.85	-45068.94	23.44	-13.84
APR 19	45809	-2.66	-14.38	-45069.19	23.45	-14.14
APR 29	45819	-2.82	-13.98	-45069.46	23.45	-14.42
MAY 9	45829	-2.80	-13.58	-45069.70	23.37	-14.68
MAY 19	45839	-2.96	-13.13	-45069.97	23.28	-14.95
MAY 29	45849	-3.09	-12.65	-45070.22	23.22	-15.22
JUN 8	45859	-3.20	-12.19	-45070.48	23.29	-15.56
JUN 18	45869	-3.19	-11.70	-45070.75	23.31	-15.92
JUN 28	45879	-3.36	-11.20	-45071.07	23.26	-16.23
JUL 8	45889	-3.44	-10.74	-45071.34	23.22	-16.56
JUL 18	45899	-3.70	-10.23	-45071.66	23.06	-16.83
JUL 28	45909	-3.76	-9.73	-45071.96	23.02	-17.08
AUG 7	45919	-3.74	-9.26	-45072.23	22.96	-17.30
AUG 17	45929	-3.77	-8.75	-45072.54	22.91	-17.50
AUG 27	45939	-3.91	-8.22	-45072.80	22.84	-17.82
SEP 6	45949	-4.05	-7.71	-45073.08	22.73	-18.04
SEP 16	45959	-4.17	-7.25	-45073.31	22.65	-18.31
SEP 26	45969	-4.33	-6.78	-45073.52	22.59	-18.54
OCT 6	45979	-4.46	-6.27	-45073.75	22.47	-18.79
OCT 16	45989	-4.56	-5.76	-45073.96	22.42	-19.11
OCT 26	45999	-4.68	-5.28	-45074.18	22.32	-19.34
NOV 5	46009	-4.76	-4.82	-45074.41	22.20	-19.62
NOV 15	46019	-4.76	-4.33	-45074.68	22.08	-19.93
NOV 25	46029	-4.90	-3.85	-45074.87	22.01	-20.16
DEC 5	46039	-4.97	-3.41	-45075.13	21.86	-20.44
DEC 15	46049	-4.95	-2.99	-45075.39	21.65	-20.63
DEC 25	46059	-5.01	-2.56	-45075.64	21.46	-20.73

TABLE 15 - (CONT.)

UNIT IS ONE MICROSECOND

DATE 1984	MJD	TAI - TA(I) PTB	RGO	RRL	SO (*)	USNO
JAN 10	45709	-362.03	59.57	4.93	-45.11	-34487.22
JAN 20	45719	-361.94	59.59	4.83	-45.09	-34487.60
JAN 30	45729	-361.90	59.65	4.62	-45.13	-34488.07
FEB 9	45739	-361.82	59.85	4.50	-45.16	-34488.49
FEB 19	45749	-361.82	59.84	4.23	-45.10	-34488.95
FEB 29	45759	-361.71	60.05	4.03	-44.82	-34489.32
MAR 10	45769	-361.58	60.25	3.91	-44.81	-34489.75
MAR 20	45779	-361.53	60.39	3.65	-44.91	-34490.19
MAR 30	45789	-361.47	60.51	3.47	-44.96	-34490.61
APR 9	45799	-361.47	60.63	3.22	-44.99	-34491.04
APR 19	45809	-361.38	60.83	2.99	-44.99	-34491.43
APR 29	45819	-361.33	60.89	2.78	-45.05	-34491.84
MAY 9	45829	-361.28	61.11	2.65	-45.12	-34492.26
MAY 19	45839	-361.24	61.32	2.44	-45.03	-34492.66
MAY 29	45849	-361.20	61.44	2.19	-45.02	-34493.05
JUN 8	45859	-361.16	61.51	1.96	-44.82	-34493.48
JUN 18	45869	-361.13	61.95	1.77	-44.77	-34493.82
JUN 28	45879	-361.10	62.27	1.59	-44.68	-34494.18
JUL 8	45889	-361.10	62.50	1.28	-44.73	-34494.55
JUL 18	45899	-361.07	62.73	1.09	-44.85	-34494.95
JUL 28	45909	-361.11	63.01	0.87	-45.04	-34495.32
AUG 7	45919	-361.10	63.10	0.80	-45.32	-34495.71
AUG 17	45929	-361.15	63.15	0.58	-45.42	-34496.13
AUG 27	45939	-361.17	63.24	0.45	-45.48	-34496.51
SEP 6	45949	-361.15	63.33	0.20	-45.46	-34496.91
SEP 16	45959	-361.17	63.29	-0.03	-45.58	-34497.28
SEP 26	45969	-361.12	63.30	-0.26	-45.61	-34497.66
OCT 6	45979	-361.10	63.35	-0.43	-45.70	-34498.03
OCT 16	45989	-361.12	63.31	-0.60	-45.68	-34498.39
OCT 26	45999	-361.08	63.30	-0.79	-45.75	-34498.76
NOV 5	46009	-361.04	63.19	-0.91	-45.88	-34499.11
NOV 15	46019	-361.01	63.17	-1.06	-45.84	-34499.51
NOV 25	46029	-360.94	63.12	-1.28	-45.90	-34499.87
DEC 5	46039	-360.94	63.08	-1.60	-45.97	-34500.27
DEC 15	46049	-360.90	63.19	-1.85	-46.09	-34500.68
DEC 25	46059	-360.85	63.19	-2.07	-46.27	-34501.03

(*) SO . Improvement of the origin on 1984 January 1st using clock transportation result .
(UTC -UTC(SO))new - (UTC - UTC(SO))old = - 0.65µs .

TABLE 16 - PRIMARY STANDARDS USED AS CLOCKS

UNIT IS ONE MICROSECOND

TAI-LAB.STD.

DATE 1984	MJD	PTB CS1	NRC CSV	NRC CSVI A	NRC CSVI B	NRC CSVI C
JAN 10	45709	1.37	41.49	30.25	39.29	35.37
JAN 20	45719	1.48	41.42	30.18	39.20	35.25
JAN 30	45729	1.49	41.62	30.38	39.39	35.43
FEB 9	45739	1.60	41.68	30.42	39.45	35.45
FEB 19	45749	1.64	41.72	30.48	39.47	35.48
FEB 29	45759	1.71	41.69	30.42	39.39	35.43
MAR 10	45769	1.82	41.62	30.38	39.28	35.35
MAR 20	45779	1.87	41.76	30.58	39.33	35.43
MAR 30	45789	1.91	41.81	30.61	39.29	35.40
APR 9	45799	1.96	41.84	30.64	39.33	35.43
APR 19	45809	2.01	41.84	30.60	39.34	35.43
APR 29	45819	2.07	41.82	30.51	39.43	35.49
MAY 9	45829	2.11	41.74	30.32	39.45	35.46
MAY 19	45839	2.15	-	30.11	39.45	35.41
MAY 29	45849	2.19	-	29.91	39.43	35.36
JUN 8	45859	2.23	41.63	29.73	39.38	35.29
JUN 18	45869	2.26	41.64	29.52	39.21	35.21
JUN 28	45879	2.29	41.57	29.28	39.04	35.11
JUL 8	45889	2.29	41.53	29.22	38.92	35.06
JUL 18	45899	2.29	41.36	29.05	38.64	34.86
JUL 28	45909	2.29	41.31	29.00	38.50	34.77
AUG 7	45919	2.29	41.24	28.92	38.39	34.63
AUG 17	45929	2.25	41.18	28.88	38.42	34.46
AUG 27	45939	2.24	41.09	28.90	38.43	34.34
SEP 6	45949	2.20	40.97	28.86	38.44	34.20
SEP 16	45959	2.24	40.89	28.75	38.42	34.05
SEP 26	45969	2.27	40.82	28.71	38.43	33.88
OCT 6	45979	2.29	40.69	28.63	38.43	33.72
OCT 16	45989	2.30	40.63	28.60	38.42	33.55
OCT 26	45999	2.31	40.52	28.58	38.42	33.49
NOV 5	46009	2.36	40.39	28.49	38.32	33.44
NOV 15	46019	2.40	40.26	28.39	38.23	33.28
NOV 25	46029	2.37	40.08	28.23	38.22	33.14
DEC 5	46039	2.50	40.03	28.23	38.34	33.12
DEC 15	46049	2.51	39.81	28.09	38.38	33.00
DEC 25	46059	2.53	39.61	28.06	38.41	32.90

See notes , p. B - 31

NOTES

(1) The time scale under the headline PTB CS 1 is a coordinate time scale at sea level derived from the scale of proper time applying a gravitational frequency correction of -0.00066us/d .

(2) The time scales under the headline NRC Cs V, Cs VI A, Cs VI B, Cs VI C are the scales of proper time PT(NRC Cs V),PT(NRC Cs VI A), PT(NRC Cs VI B),PT(NRC Cs VI C) produced directly by the primary frequency standards Cs V , Cs VI A , Cs VI B ,Cs VI C of NRC used as clocks . The gravitational frequency correction to these time scales of proper time to obtain coordinate times at sea level is -0.00097us/d .
The operation of NRC Cs V was interrupted for the interval (MJD) 45830-45849 for reloading the cesium ovens . The interruption was bridged with the help of NRC Cs VI C .

TABLE 17 - COORDINATED UNIVERSAL TIME

UTC(I) DENOTES THE APPROXIMATION TO UTC KEPT BY THE LABORATORY

UNIT IS ONE MICROSECOND

DATE 1984	MJD	UTC - UTC(I) AOS (1)	APL	ASMW	AUS	BEV (2)	CAO
JAN 10	45709	2.79	-0.69	1.50	-13.88	-	1.88
JAN 20	45719	2.84	-0.74	1.59	-14.00	-5.24	2.02
JAN 30	45729	2.97	-0.87	1.52	-14.18	-5.66	2.07
FEB 9	45739	2.98	-0.93	1.43	-14.28	-6.20	2.11
FEB 19	45749	3.07	-1.06	1.42	-14.48	-6.55	2.20
FEB 29	45759	3.13	-1.06	1.39	-14.60	-7.15	2.31
MAR 10	45769	3.31	-1.22	1.50	-14.71	-7.67	2.38
MAR 20	45779	3.37	-1.40	1.82	-14.85	-8.10	2.47
MAR 30	45789	3.36	-1.50	1.82	-14.98	-8.67	2.53
APR 9	45799	3.65	-1.67	1.72	-15.17	-8.87	2.73
APR 19	45809	4.00	-1.66	1.68	-15.27	-1.71	2.77
APR 29	45819	4.41	-1.73	1.53	-15.44	-1.94	3.07
MAY 9	45829	4.11	-1.70	1.55	-15.52	-2.06	3.07
MAY 19	45839	4.03	-1.67	1.40	-15.71	-	-
MAY 29	45849	4.01	-1.70	1.25	-15.82	-2.74	2.93
JUN 8	45859	4.15	-1.74	1.12	-15.90	-2.94	2.60
JUN 18	45869	4.23	-1.81	1.10	-16.13	-3.24	2.70
JUN 28	45879	4.02	-1.94	0.92	-16.38	-3.44	2.74
JUL 8	45889	4.05	-1.98	0.83	-16.47	-3.64	2.78
JUL 18	45899	3.84	-2.01	0.56	-16.67	-3.79	2.84
JUL 28	45909	0.34	-2.02	0.48	-16.94	-4.02	2.91
AUG 7	45919	0.35	-2.12	0.49	-17.10	-4.19	2.95
AUG 17	45929	0.34	-2.15	0.46	-17.34	-4.25	-
AUG 27	45939	0.24	-2.12	0.31	-17.52	-4.28	-
SEP 6	45949	0.05	-2.29	0.17	-17.83	-4.27	-
SEP 16	45959	0.07	-2.27	0.07	-17.95	-4.51	3.60
SEP 26	45969	-0.19	-2.33	-0.09	-18.03	-4.74	-
OCT 6	45979	-0.32	-2.34	-0.21	-18.26	-4.97	-
OCT 16	45989	-0.62	-2.35	-0.28	-18.43	-5.08	-
OCT 26	45999	-0.81	-2.36	-0.37	-18.76	-4.95	-
NOV 5	46009	-0.71	-2.35	-0.41	-19.06	-4.99	3.64
NOV 15	46019	-0.66	-2.42	-0.33	-19.18	-4.75	3.56
NOV 25	46029	-0.81	-2.46	-0.27	-19.42	-4.77	3.72
DEC 5	46039	-0.87	-2.52	-0.15	-19.53	-4.68	-
DEC 15	46049	-0.80	-2.49	0.06	-19.77	-4.61	-
DEC 25	46059	-0.82	-2.51	0.13	-20.04	-4.62	-

TABLE 17 - (CONT.)

UNIT IS ONE MICROSECOND

DATE 1984	MJD	UTC - UTC(I) CSAO *	DHI *	FTZ	IEN *	IFAG *	ILOM
JAN 10	45709	6.90	0.91	3.41	-13.29	-27.63	-3.50
JAN 20	45719	6.85	0.97	3.39	-13.39	-26.79	-3.48
JAN 30	45729	6.83	1.01	3.52	-13.66	-26.01	-3.55
FEB 9	45739	6.92	1.07	3.45	-13.85	-25.29	-3.60
FEB 19	45749	6.73	1.07	3.46	-14.11	-24.13	-3.72
FEB 29	45759	6.60	1.14	3.42	-14.36	-23.48	-3.81
MAR 10	45769	6.63	1.20	3.38	-14.66	-22.61	-3.85
MAR 20	45779	6.44	1.17	3.37	-14.99	-21.92	-3.99
MAR 30	45789	6.43	1.10	3.32	-15.27	-21.28	-4.10
APR 9	45799	6.41	1.02	3.31	-15.59	-20.54	-4.29
APR 19	45809	6.80	0.90	3.30	-15.87	-19.84	-4.44
APR 29	45819	7.24	0.46	3.30	-15.82	-19.15	-4.51
MAY 9	45829	7.11	0.54	3.28	-16.03	-18.66	-4.64
MAY 19	45839	7.03	0.68	3.26	-15.93	-18.05	-4.74
MAY 29	45849	7.16	0.90	3.19	-15.80	-17.61	-4.86
JUN 8	45859	7.44	1.14	3.18	-15.87	-17.21	-4.88
JUN 18	45869	7.52	1.44	3.12	-15.89	-16.83	-4.93
JUN 28	45879	7.49	1.66	3.09	-16.15	-16.50	-4.95
JUL 8	45889	7.65	1.83	3.03	-16.17	-16.20	-5.00
JUL 18	45899	7.89	1.71	3.04	-16.22	-16.12	-5.01
JUL 28	45909	7.95	1.68	2.97	-16.18	-15.77	-4.98
AUG 7	45919	7.98	1.78	2.91	-16.31	-15.27	-5.00
AUG 17	45929	7.80	1.93	2.88	-16.21	-14.84	-5.09
AUG 27	45939	7.78	1.93	2.84	-16.22	-14.42	-5.21
SEP 6	45949	7.56	1.87	2.79	-16.16	-13.94	-5.26
SEP 16	45959	7.43	1.92	2.67	-16.20	-13.35	-5.32
SEP 26	45969	7.40	1.91	2.56	-16.30	-12.89	-5.27
OCT 6	45979	7.24	1.86	2.34	-16.35	-12.48	-5.39
OCT 16	45989	7.04	1.84	2.04	-16.51	-12.00	-5.60
OCT 26	45999	6.80	1.78	1.82	-16.59	-11.58	-5.66
NOV 5	46009	6.43	1.57	1.62	-16.66	-11.02	-5.81
NOV 15	46019	6.04	1.46	1.53	-16.91	-10.39	-6.03
NOV 25	46029	5.62	1.26	1.50	-16.93	-9.77	-6.17
DEC 5	46039	5.07	1.09	1.34	-16.93	-9.04	-6.37
DEC 15	46049	4.61	0.95	1.26	-16.82	-8.30	-6.55
DEC 25	46059	4.02	0.77	1.26	-17.04	-7.38	-6.75

TABLE 17 - (CONT.)

UNIT IS ONE MICROSECOND

DATE 1984	MJD	UTC - UTC(I) NBS	NIM	NPL *	NRC	NRLM	OAB
JAN 10	45709	-1.99	-5.25	-1.71	-8.06	-9.74	-123.82
JAN 20	45719	-2.04	-4.56	-1.82	-8.13	-9.58	-123.92
JAN 30	45729	-2.18	-4.07	-1.86	-7.92	-9.70	-123.68
FEB 9	45739	-2.27	-3.69	-2.10	-7.84	-10.35	-123.43
FEB 19	45749	-2.40	-3.60	-2.09	-7.79	-10.41	-123.36
FEB 29	45759	-2.46	-3.54	-1.94	-7.81	-10.17	-123.06
MAR 10	45769	-2.54	-3.13	-1.74	-7.87	-9.97	-122.71
MAR 20	45779	-2.66	-2.93	-1.67	-7.73	-10.04	-122.35
MAR 30	45789	-2.78	-2.93	-1.65	-7.66	-10.03	-121.94
APR 9	45799	-2.91	-3.05	-1.73	-7.63	-10.12	-121.42
APR 19	45809	-3.00	-3.08	-1.70	-7.62	-10.15	-121.00
APR 29	45819	-3.13	-3.23	-1.98	-7.62	-10.16	-120.10
MAY 9	45829	-3.21	-3.26	-2.20	-7.69	-10.23	-119.58
MAY 19	45839	-3.30	-3.28	-2.46	-7.79	-10.26	-118.99
MAY 29	45849	-3.35	-3.42	-2.68	-7.85	-10.30	-118.39
JUN 8	45859	-3.41	-3.47	-2.93	-7.78	-10.32	-117.52
JUN 18	45869	-3.44	-3.39	-3.20	-7.76	-10.34	-116.71
JUN 28	45879	-3.51	-3.18	-3.39	-7.81	-10.36	-115.85
JUL 8	45889	-3.53	-3.10	-3.45	-7.85	-10.37	-114.61
JUL 18	45899	-3.59	-2.95	-3.52	-8.01	-10.42	-112.41
JUL 28	45909	-3.62	-2.85	-3.84	-8.05	-10.41	-110.05
AUG 7	45919	-3.69	-2.59	-4.08	-8.11	-10.42	-107.99
AUG 17	45929	-3.76	-2.08	-4.23	-8.16	-10.43	-106.12
AUG 27	45939	-3.79	-1.84	-4.41	-8.23	-10.42	-104.10
SEP 6	45949	-3.83	-1.32	-4.54	-8.34	-10.38	-
SEP 16	45959	-3.82	-1.12	-4.68	-8.42	-10.36	-
SEP 26	45969	-3.80	-0.73	-4.88	-8.48	-10.29	-
OCT 6	45979	-3.80	-0.47	-5.07	-8.60	-10.05	-
OCT 16	45989	-3.76	-0.34	-5.19	-8.65	-9.88	-222.79
OCT 26	45999	-3.74	-0.09	-5.10	-8.74	-9.73	-220.73
NOV 5	46009	-3.74	0.18	-5.02	-8.87	-9.52	-218.74
NOV 15	46019	-3.74	0.46	-5.02	-8.99	-9.35	-216.83
NOV 25	46029	-3.69	1.09	-4.71	-9.06	-9.17	-214.77
DEC 5	46039	-3.68	1.71	-4.64	-9.21	-9.08	-212.63
DEC 15	46049	-3.67	2.12	-4.43	-9.42	-9.01	-210.52
DEC 25	46059	-3.64	2.27	-4.12	-9.60	-8.94	-208.84

TABLE 17 - (CONT.)

UNIT IS ONE MICROSECOND

DATE 1984	MJD	UTC - UTC(I) OFM	OMH (3)	OMSF	ON *	OP	ORB
JAN 10	45709	-0.37	1.34	2.98	12.79	0.14	-15.94
JAN 20	45719	-0.44	1.50	2.93	12.83	0.29	-16.32
JAN 30	45729	-0.44	1.75	2.89	12.85	0.32	-16.89
FEB 9	45739	-0.44	1.72	2.92	12.87	0.37	-17.33
FEB 19	45749	-0.36	1.72	2.83	13.00	0.38	-17.38
FEB 29	45759	-0.44	-	2.85	13.07	0.47	-17.61
MAR 10	45769	-0.51	-	2.45	13.06	0.55	-18.10
MAR 20	45779	-0.54	1.73	2.41	12.95	0.64	-18.46
MAR 30	45789	-0.53	1.64	2.16	12.94	0.75	-18.78
APR 9	45799	-0.58	1.41	2.19	13.03	0.81	-19.05
APR 19	45809	-0.68	1.39	2.12	12.92	0.94	-19.46
APR 29	45819	-0.77	1.47	2.09	12.82	1.09	-19.48
MAY 9	45829	-0.78	1.51	2.04	12.87	1.26	-19.73
MAY 19	45839	-0.80	1.37	2.39	12.85	1.45	-19.98
MAY 29	45849	-0.82	1.57	2.41	12.80	1.69	-20.22
JUN 8	45859	-0.91	1.37	2.55	12.79	1.70	-20.31
JUN 18	45869	-1.02	0.44	2.49	12.75	1.63	-20.22
JUN 28	45879	-1.08	0.62	2.36	12.60	1.56	-20.20
JUL 8	45889	-1.12	0.61	2.32	12.48	1.55	-20.50
JUL 18	45899	-1.10	0.99	2.19	12.32	1.61	-20.33
JUL 28	45909	-1.06	1.03	2.20	12.21	1.59	-20.56
AUG 7	45919	-0.99	1.35	2.09	12.16	1.49	-20.66
AUG 17	45929	-0.90	1.70	2.13	12.15	1.46	-20.56
AUG 27	45939	-0.93	1.51	1.98	12.09	1.44	-20.82
SEP 6	45949	-0.86	1.54	2.02	12.11	1.42	-21.03
SEP 16	45959	-0.83	1.70	1.93	12.16	1.38	-20.93
SEP 26	45969	-0.78	1.73	1.96	12.27	1.33	-20.74
OCT 6	45979	-0.76	1.92	2.04	12.37	1.26	-20.68
OCT 16	45989	-0.83	1.76	1.96	12.35	1.20	-20.88
OCT 26	45999	-0.80	1.87	2.00	12.45	1.01	-21.45
NOV 5	46009	-0.82	1.67	2.10	12.57	0.85	-21.57
NOV 15	46019	-0.87	2.03	1.98	12.57	0.72	-21.72
NOV 25	46029	-0.83	2.01	2.11	12.64	0.66	-21.86
DEC 5	46039	-0.85	1.90	2.25	12.77	0.57	-21.90
DEC 15	46049	-0.79	2.47	2.41	13.00	0.38	-22.22
DEC 25	46059	-0.62	-	2.31	12.86	0.19	-22.32

TABLE 17 - (CONT.)

UNIT IS ONE MICROSECOND

DATE 1984	MJD	UTC - UTC(I) PKNM	PTB	PTCH (4)	RGO	RRL	SO *
JAN 10	45709	-3.07	1.37	-0.84	-14.34	-5.57	-10.49
JAN 20	45719	-3.10	1.46	0.32	-14.32	-5.56	-10.51
JAN 30	45729	-3.24	1.50	1.38	-14.27	-5.61	-10.59
FEB 9	45739	-3.32	1.58	2.50	-14.06	-5.63	-10.61
FEB 19	45749	-3.17	1.58	3.74	-14.07	-5.77	-10.59
FEB 29	45759	-3.32	1.69	5.06	-13.85	-5.86	-10.36
MAR 10	45769	-3.36	1.82	6.27	-13.66	-5.85	-10.49
MAR 20	45779	-3.19	1.87	7.51	-13.52	-5.97	-10.73
MAR 30	45789	-3.33	1.93	8.91	-13.40	-6.01	-10.92
APR 9	45799	-3.38	1.94	10.17	-13.28	-6.12	-11.10
APR 19	45809	-3.18	2.02	11.33	-13.08	-6.24	-11.26
APR 29	45819	-3.30	2.07	12.40	-13.02	-6.36	-11.48
MAY 9	45829	-3.58	2.12	13.48	-12.80	-6.40	-11.57
MAY 19	45839	-3.93	2.16	14.50	-12.59	-6.50	-11.53
MAY 29	45849	-4.30	2.20	15.41	-12.47	-6.64	-11.56
JUN 8	45859	-4.48	2.24	-3.35	-12.40	-6.76	-11.42
JUN 18	45869	-4.77	2.27	-4.10	-11.97	-6.86	-11.43
JUN 28	45879	-5.08	2.30	-4.86	-11.64	-6.91	-11.39
JUL 8	45889	-5.08	2.30	-5.50	-11.41	-7.09	-11.45
JUL 18	45899	-4.91	2.32	-6.21	-11.18	-7.16	-11.54
JUL 28	45909	-4.75	2.29	-6.90	-10.90	-7.27	-11.71
AUG 7	45919	-4.57	2.30	-7.71	-10.81	-7.21	-11.95
AUG 17	45929	-4.21	2.25	-8.64	-10.76	-7.32	-11.98
AUG 27	45939	-3.67	2.23	-9.46	-10.66	-7.33	-11.98
SEP 6	45949	-3.45	2.25	-10.15	-10.58	-7.47	-11.98
SEP 16	45959	-3.11	2.23	-10.80	-10.62	-7.61	-12.13
SEP 26	45969	-2.99	2.28	-11.42	-10.61	-7.74	-12.17
OCT 6	45979	-2.72	2.30	-11.98	-10.56	-7.83	-12.28
OCT 16	45989	-2.45	2.28	-12.66	-10.60	-7.92	-12.28
OCT 26	45999	-1.88	2.32	-12.98	-10.61	-8.04	-12.38
NOV 5	46009	-1.34	2.36	-13.37	-10.72	-8.06	-12.50
NOV 15	46019	-0.63	2.39	-13.60	-10.74	-8.11	-12.41
NOV 25	46029	-0.11	2.46	-13.79	-10.79	-8.16	-12.42
DEC 5	46039	0.21	2.47	-14.00	-10.83	-8.30	-12.43
DEC 15	46049	0.98	2.50	-14.19	-10.72	-8.52	-12.48
DEC 25	46059	1.33	2.55	-14.24	-10.72	-8.61	-12.59

TABLE 17 - (CONT.)

UNIT IS ONE MICROSECOND

DATE 1984	MJD	UTC - UTC(I) STA	SU	TAO	TL	TP (5)	TUG (6)
JAN 10	45709	-1.72	28.39	-0.77	68.75	1.87	3.30
JAN 20	45719	-2.48	28.81	-0.69	69.83	2.61	3.75
JAN 30	45729	-3.40	27.90	-0.66	70.82	3.14	4.09
FEB 9	45739	-4.03	29.23	-0.59	72.56	3.39	4.50
FEB 19	45749	-4.27	29.06	-0.61	73.44	3.66	4.88
FEB 29	45759	-4.43	28.98	-0.55	74.54	3.63	-4.71
MAR 10	45769	-4.49	29.07	-0.51	75.58	3.62	-4.29
MAR 20	45779	-4.47	28.90	-0.51	76.74	3.34	-3.90
MAR 30	45789	-4.60	29.10	-0.51	78.03	3.03	-3.51
APR 9	45799	-4.60	28.99	-0.55	79.43	2.64	-3.15
APR 19	45809	-4.55	28.92	-0.57	80.67	2.28	-2.76
APR 29	45819	-4.28	29.46	-0.62	81.86	2.53	-2.40
MAY 9	45829	-4.31	29.02	-0.65	82.90	2.93	-2.01
MAY 19	45839	-4.25	28.89	-0.70	84.13	3.14	-1.63
MAY 29	45849	-4.05	29.01	-0.69	85.33	3.33	-1.24
JUN 8	45859	-3.74	28.92	-0.72	86.69	3.39	-0.83
JUN 18	45869	-3.47	28.87	-0.69	87.65	3.44	-0.47
JUN 28	45879	-3.28	28.64	-0.65	88.81	3.30	-0.10
JUL 8	45889	-3.12	28.20	-0.58	89.72	2.77	0.26
JUL 18	45899	-2.68	28.30	-0.52	90.62	2.65	0.62
JUL 28	45909	-2.43	28.20	-0.45	91.70	2.18	0.97
AUG 7	45919	-2.11	28.11	-0.38	92.68	1.64	1.29
AUG 17	45929	-1.90	28.34	-0.26	93.75	1.76	1.61
AUG 27	45939	-1.56	28.44	-0.14	94.65	2.29	1.97
SEP 6	45949	-1.25	28.42	-0.08	95.45	2.36	2.32
SEP 16	45959	-1.00	28.48	-0.04	96.45	2.64	2.66
SEP 26	45969	-0.83	28.24	0.06	97.49	2.70	3.00
OCT 6	45979	-0.66	28.31	0.19	98.62	1.76	3.35
OCT 16	45989	-0.39	28.36	0.32	99.97	1.50	3.69
OCT 26	45999	-0.20	28.09	0.42	101.08	1.59	4.01
NOV 5	46009	-0.11	28.31	0.48	101.96	1.81	4.35
NOV 15	46019	0.06	28.62	0.53	103.08	2.85	4.72
NOV 25	46029	0.13	29.16	0.60	104.18	3.48	-3.91
DEC 5	46039	0.19	28.58	0.65	105.16	4.21	-3.58
DEC 15	46049	0.34	28.37	0.68	106.54	3.32	-3.23
DEC 25	46059	0.37	26.85	0.81	107.74	1.24	-2.90

TABLE 17 - (CONT.)

UNIT IS ONE MICROSECOND

DATE 1984	MJD	UTC - UTC(I) USNO	VSL (7)	YUZM (8)	ZIPE
JAN 10	45709	0.12	-0.15	-	-0.73
JAN 20	45719	0.08	-0.14	-	-0.65
JAN 30	45729	-0.05	-0.21	-	-0.61
FEB 9	45739	-0.12	-0.28	-	-0.51
FEB 19	45749	-0.26	-0.30	-	-0.47
FEB 29	45759	-0.33	-0.25	-	-0.33
MAR 10	45769	-0.38	-0.31	-	-0.24
MAR 20	45779	-0.47	-0.33	-	-0.12
MAR 30	45789	-0.54	-0.37	-	0.05
APR 9	45799	-0.63	-0.40	-	0.17
APR 19	45809	-0.68	-0.39	-	0.39
APR 29	45819	-0.75	-0.29	-	0.50
MAY 9	45829	-0.82	-0.21	-	0.61
MAY 19	45839	-0.90	-0.14	-	0.56
MAY 29	45849	-0.94	-0.03	-	0.57
JUN 8	45859	-1.01	0.05	-	0.64
JUN 18	45869	-1.03	0.09	-	0.69
JUN 28	45879	-1.05	0.15	-	0.58
JUL 8	45889	-1.08	0.20	-	0.54
JUL 18	45899	-1.13	0.28	-	0.33
JUL 28	45909	-1.17	0.36	-	0.33
AUG 7	45919	-1.23	0.46	-	0.36
AUG 17	45929	-1.31	0.51	-	0.35
AUG 27	45939	-1.36	0.51	-	0.23
SEP 6	45949	-1.40	0.49	-	0.09
SEP 16	45959	-1.44	0.62	-	-0.08
SEP 26	45969	-1.47	0.75	-	-0.23
OCT 6	45979	-1.51	0.87	-	-0.42
OCT 16	45989	-1.52	1.01	-	-0.60
OCT 26	45999	-1.55	1.14	-	-0.81
NOV 5	46009	-1.58	1.25	-65.16	-0.72
NOV 15	46019	-1.65	1.43	-65.88	-0.67
NOV 25	46029	-1.67	1.60	-66.33	-0.78
DEC 5	46039	-1.73	1.77	-66.94	-0.84
DEC 15	46049	-1.80	1.93	-67.38	-0.79
DEC 25	46059	-1.80	2.10	-67.94	-0.78

TABLE 17 - (CONT.)

NOTES

(1) AOS . Time step of UTC(AOS) of 3.500 µs on MJD = 45907.25

(2) BEV . Time step of UTC(BEV) of -7.3µs on MJD = 45803.5

(3) OMH . The apparent step on MJD = 45869 results from a successive temporary change of the delay in the TV network .

(4) PTCH. Time step of UTC(PTCH) of 66.22µs on MJD = 45700
Change of master clock on MJD = 45852

(5) TP . The apparent step on MJD = 45979 results from a successive temporary change of the delay in the TV network .

(6) TUG . Time step of UTC(TUG) of 10.00µs on MJD = 45754.33
Time step of UTC(TUG) of 9.00µs on MJD = 46023.73

(7) VSL . Time step of UTC(VSL) of 7µs on MJD = 45700

(8) YUZM. The origin of UTC-UTC(YUZM) was given by a clock transportation on MJD = 44959.59

* Improvement of the origins on 1984 January 1st using clock transportation results (See Table 18) . The following corrections give :

(UTC-UTC(I))new - (UTC-UTC(I))old in µs

lab.	corr.	lab.	corr.
CSAO	+0.28	NPL	-0.40
DHI	+0.70	ON	+0.50
IEN	+0.30	SO	-0.65
IFAG	+0.34		

TABLE 17 A - COORDINATED UNIVERSAL TIME (VLF)

UTC(I) DENOTES THE APPROXIMATION TO UTC KEPT BY THE LABORATORY

UNIT IS ONE MICROSECOND

DATE 1984	MJD	UTC - UTC(I) IGMA	INTI	NPRL	ONBA
JAN 10	45709	34	38	11	-1
JAN 20	45719	-	-	11	-
JAN 30	45729	32	35	12	-2
FEB 9	45739	28	31	12	-7
FEB 19	45749	31	34	12	-4
FEB 29	45759	33	36	11	-2
MAR 10	45769	32	35	11	-2
MAR 20	45779	1	37	11	0
MAR 30	45789	-2	35	12	-1
APR 9	45799	-5	32	12	-3
APR 19	45809	-3	34	12	0
APR 29	45819	-4	33	12	0
MAY 9	45829	-3	34	12	2
MAY 19	45839	0	37	12	5
MAY 29	45849	-1	36	12	5
JUN 8	45859	-	-	12	-
JUN 18	45869	-1	37	13	6
JUN 28	45879	-1	38	14	7
JUL 8	45889	-4	35	15	4
JUL 18	45899	-7	33	15	2
JUL 28	45909	-6	34	15	4
AUG 7	45919	-7	34	16	4
AUG 17	45929	-5	36	17	7
AUG 27	45939	-5	35	18	7
SEP 6	45949	-6	35	19	8
SEP 16	45959	-6	33	20	8
SEP 26	45969	-6	32	22	10
OCT 6	45979	-7	30	25	10
OCT 16	45989	-8	27	27	10
OCT 26	45999	-10	24	29	10
NOV 5	46009	-4	30	31	18
NOV 15	46019	-3	29	31	20
NOV 25	46029	-5	26	31	19
DEC 5	46039	-2	28	33	23
DEC 15	46049	-	-	34	-
DEC 25	46059	0	28	35	28

TABLE 18 - COMPARISONS BETWEEN THE CLOCK TRANSPORTATIONS AND THE BIH RESULTS

THE TABLE GIVES THE DIFFERENCES BETWEEN THE CLOCK TRANSPORTATION RESULTS AND THOSE DERIVED FROM THE DATA OF TABLE 17 (BEFORE ROUNDING-OFF)

DATE 1984	MJD	TIME COMPARISONS	DIFFERENCE CLOCK TR. - BIH (UNIT : 1 MICROSECOND)
JAN 19	45718.4	UTC(ILOM) - UTC(RRL)	0.30
FEB 20	45750.0	UTC(USNO) - UTC(NBS)	-0.05
MAR 28	45787.6	UTC(OP) - UTC(VSL)	-0.05
APR 18	45808.2	UTC(PTB) - UTC(OP)	0.008
APR 25	45815.4	UTC(USNO) - UTC(OP)	0.048
APR 26	45816.5	UTC(NPL) - UTC(SU)	0.31
APR 26	45816.5	UTC(USNO) - UTC(ON)	0.12
APR 30	45820.3	UTC(USNO) - UTC(BEV)	0.21
APR 30	45820.5	UTC(USNO) - UTC(TUG)	-0.014
MAY 2	45822.3	UTC(USNO) - UTC(IFAG)	-0.11
MAY 4	45824.5	UTC(USNO) - UTC(FTZ)	0.05
MAY 8	45828.4	UTC(USNO) - UTC(PTB)	0.014
MAY 10	45830.2	UTC(USNO) - UTC(DHI)	0.11
MAY 11	45831.3	UTC(USNO) - UTC(NPL)	-0.02
MAY 15	45835.3	UTC(PTB) - UTC(IFAG)	0.109
MAY 23	45843.4	UTC(IEN) - UTC(OP)	-0.19
MAY 25	45845.0	UTC(IEN) - UTC(CSAO)	0.72
JUL 6	45887.0	UTC(TAO) - UTC(NRLM)	-0.08
JUL 10	45891.0	UTC(TAO) - UTC(ILOM)	-0.05
JUL 16	45897.0	UTC(TAO) - UTC(RRL)	0.08
AUG 7	45919.5	UTC(USNO) - UTC(RGO)	-0.2
AUG 8	45920.3	UTC(USNO) - UTC(NPL)	-0.1
AUG 9	45921.2	UTC(USNO) - UTC(ORB)	-0.4
AUG 9	45921.6	UTC(USNO) - UTC(NRC)	-0.01
AUG 10	45922.4	UTC(USNO) - UTC(STA)	-0.14
AUG 13	45925.3	UTC(USNO) - UTC(VSL)	0.0
AUG 19	45931.99	UTC(USNO) - UTC(TAO)	0.0
AUG 20	45932.1	UTC(USNO) - UTC(RRL)	0.0
AUG 24	45936.0	UTC(USNO) - UTC(CSAO)	0.0
AUG 30	45942.1	UTC(USNO) - UTC(SO)	-0.1
OCT 5	45978.5	UTC(USNO) - UTC(IEN)	0.1
NOV 6	46010.0	UTC(TAO) - UTC(RRL)	-0.094
NOV 9	46013.0	UTC(TAO) - UTC(NRLM)	0.028
NOV 13	46017.0	UTC(TAO) - UTC(ILOM)	0.079
DEC 8	46042.2	UTC(USNO) - UTC(RRL)	-0.03

TABLE 19 - INTERNATIONAL ATOMIC TIME , BI-MONTHLY RATES OF TAI-CLOCK FOR 1984

THE RATES ARE AVERAGED OVER INTERVALS OF TWO MONTHS ENDING AT THE GIVEN DATES

UNIT IS NS/DAY , 0.0 DENOTES THAT THE CLOCK WAS NOT USED

LAB.	CLOCK	45759	45819	45879	45939	45999	46059
APL	14 773	-125.23	-129.70	-125.87	-127.61	-126.47	-124.89
APL	14 793	222.06	218.71	226.73	226.51	226.81	227.24
APL	42 6	0.0	-1.85	-0.73	-4.68	-3.59	-3.07
ASMW	13 29	0.0	46.00	44.60	58.20	56.08	73.10
ASMW	16 76	-30.94	-47.41	-56.52	-65.51	-66.59	-52.14
ASMW	16 165	-14.48	-18.80	-20.30	-21.05	-23.78	-14.14
AUS	11 205	0.0	0.0	-101.87	-110.12	-101.07	-111.20
AUS	12 201	0.0	0.0	0.0	0.0	-40.22	-41.30
AUS	12 288	0.0	0.0	-1.97	-8.56	-10.67	0.65
AUS	12 338	0.0	0.0	9.90	-12.90	-9.06	0.0
AUS	12 590	0.0	0.0	0.0	0.0	0.0	101.19
AUS	14 902	0.0	0.0	-50.97	0.0	0.0	-88.80
AUS	22 109	0.0	0.0	0.0	0.0	0.0	-355.53
AUS	22 195	0.0	0.0	-97.25	-100.55	-93.78	-108.02
AUS	22 823	0.0	0.0	16.10	18.91	31.45	41.77
AUS	24 443	0.0	0.0	-153.41	0.0	0.0	-166.20
AUS	24 719	0.0	0.0	19.07	15.24	0.0	0.0
AUS	24 777	0.0	0.0	-136.29	-145.01	-144.13	0.0
AUS	24 844	0.0	0.0	53.93	47.57	51.72	62.55
AUS	34 20	0.0	0.0	0.0	39.81	31.41	27.91
AUS	44 1	0.0	0.0	8.75	8.42	13.05	8.52
AUS	44 2	0.0	0.0	30.20	31.35	35.58	30.59
AUS	44 3	0.0	0.0	0.72	-4.96	0.0	0.0
BEV	16 71	-48.54	-34.70	-26.44	-14.76	-14.59	6.60
CAO	16 52	8.39	2.94	-24.96	0.0	0.0	0.0
CAO	16 183	7.31	11.79	-7.59	0.0	0.0	0.0
F	12 158	-291.70	-312.08	-294.87	-286.52	-313.72	0.0
F	12 195	282.19	0.0	0.0	251.44	244.13	255.46
F	12 347	-88.08	-70.25	-46.35	-23.27	-30.65	-42.96
F	12 439	-45.69	-33.96	-25.28	-42.69	-35.94	-49.76
F	14 134	-0.45	-2.41	3.75	6.44	5.08	2.94
F	14 500	-31.88	-33.01	-33.53	-19.67	-24.96	-25.09
F	14 594	-211.12	-206.15	-197.63	-194.91	-199.46	-210.46
F	14 753	9.75	30.00	47.74	67.81	79.90	95.84
F	16 106	0.0	0.0	0.0	0.0	-18.01	-11.23
F	22 120	-26.07	-33.48	-17.88	6.67	2.23	0.0
F	24 407	-130.92	-126.63	-123.19	-123.01	-127.61	-131.85
F	24 645	-81.28	-75.56	-83.97	-85.59	-78.38	-84.52
F	24 842	-118.04	-117.67	-121.22	-118.35	-116.60	-121.91
FTZ	14 312	-0.19	-3.02	-6.39	-6.11	0.0	0.0

TABLE 19 - (CONT.)

LAB.	CLOCK	45759	45819	45879	45939	45999	46059
FTZ	14 895	0.0	-1.21	-2.98	-0.27	-17.24	-8.49
FTZ	24 217	-0.02	-2.18	-3.62	-4.21	-17.45	-9.16
FTZ	24 482	1.27	-0.86	-3.87	0.0	0.0	0.0
FTZ	24 656	-0.28	-0.56	-4.96	-5.07	-17.87	-9.00
FTZ	24 674	-0.58	-2.78	-3.15	-3.83	-17.66	-10.79
IEN	12 469	0.0	-23.68	0.0	0.0	0.0	0.0
IEN	12 609	0.0	0.0	0.0	100.15	96.07	91.17
IEN	14 893	32.93	29.18	37.39	38.60	32.82	33.78
IEN	16 84	0.0	0.0	0.0	109.77	116.94	138.17
IFAG	16 131	133.19	121.99	114.42	110.97	124.07	129.70
IFAG	16 138	-70.68	-67.76	-59.62	-52.27	-27.73	-7.81
IFAG	16 173	83.85	71.07	44.50	35.13	47.40	69.25
IFAG	41 1	228.20	0.0	0.0	0.0	0.0	0.0
ILOM	11 176	1316.53	1596.28	1792.45	1958.48	2064.00	2167.01
ILOM	14 614	0.0	-630.84	-614.16	-593.66	-612.06	-633.28
ILOM	14 885	48.55	51.15	41.97	51.42	0.0	0.0
ILOM	24 315	-53.16	-60.17	-54.83	-50.73	-55.11	-65.68
ILOM	34 146	0.0	-23.65	-23.04	-15.24	-16.80	-22.94
NBS	11 169	0.0	0.0	72.07	56.88	46.50	56.16
NBS	12 352	-527.80	-526.90	-538.46	-538.24	-526.61	-518.44
NBS	13 61	-121.91	-138.21	-168.57	-186.59	0.0	0.0
NBS	14 323	-78.45	0.0	0.0	-101.55	-92.67	-91.25
NBS	14 324	-33.95	-26.25	-17.19	-14.39	-12.93	-19.00
NBS	14 601	-91.18	-95.11	-86.33	-69.67	-69.08	-79.67
NBS	18 8	269.05	215.55	211.98	215.69	256.63	237.91
NBS	18 113	-1024.31	-1032.91	-1048.83	-1071.46	-1049.61	-1002.72
NBS	22 375	0.0	0.0	0.0	76.33	68.81	40.93
NBS	24 316	0.0	0.0	0.0	-98.36	-97.11	-99.21
NBS	34 165	0.0	0.0	32.90	-4.58	0.0	0.0
NBS	40 14	0.0	0.0	-94.41	0.0	0.0	0.0
NIM	22 615	0.0	0.0	0.0	0.0	-50.89	-82.85
NIM	22 633	0.0	0.0	0.0	0.0	-23.82	-0.39
NIM	22 640	0.0	0.0	0.0	0.0	6.24	14.63
NPL	12 316	-254.38	0.0	0.0	0.0	0.0	0.0
NPL	12 418	-89.85	-86.72	-47.49	-36.79	-55.63	0.0
NPL	24 813	0.0	0.0	0.0	0.0	9.61	22.14
NPL	34 64	0.0	0.0	0.0	0.0	-10.81	-0.77
NRC	14 267	-15.33	-14.60	-17.52	-23.25	-26.03	-30.27
NRC	90 5	5.80	3.27	0.0	-8.02	-9.27	-14.81
NRC	90 61	5.07	2.77	-20.13	-6.96	-5.72	-8.99
NRC	90 62	3.87	0.86	-6.09	-10.93	-0.24	0.76
NRC	90 63	2.76	1.32	-6.31	-13.28	-14.98	-10.04
NRLM	12 363	13.80	43.35	51.74	41.74	49.80	58.78
NRLM	14 906	-10.54	-1.53	-3.07	-0.94	12.12	13.19
OAB	16 189	7.56	47.27	71.40	202.34	0.0	201.18

TABLE 19 - (CONT.)

LAB.	CLOCK	45759	45819	45879	45939	45999	46059
OFM	16 69	-95.80	-79.67	-94.07	-96.99	-101.60	-96.72
OFM	16 77	3.57	0.64	-3.62	5.38	8.46	13.90
OFM	17 206	36.64	38.09	37.29	38.86	38.97	46.43
OFM	17 208	-171.84	-177.36	-176.80	-164.99	-167.26	-163.19
OFM	21 179	0.0	0.0	0.0	0.0	-62.95	-64.63
OFM	99 1	-26.01	-66.42	-100.45	-147.85	-179.89	-208.57
OFM	99 2	116.78	107.22	0.0	0.0	0.0	0.0
OFM	99 5	-117.98	-138.95	-125.62	-90.66	-76.25	-97.06
OMH	22 67	4.41	-2.86	-16.71	18.57	6.23	-2.89
OMSF	14 896	20.47	8.83	26.66	14.30	20.23	26.59
OMSF	16 113	-48.10	-73.30	-68.81	-62.94	0.0	-68.17
OMSF	16 177	0.0	0.0	0.0	0.0	0.0	14.07
OMSF	22 223	208.28	188.58	227.94	205.84	208.86	216.40
OMSF	24 569	5.00	0.72	20.69	7.75	9.47	0.0
ON	12 285	-23.23	-27.66	-23.88	-21.66	-12.88	-9.82
ON	12 863	5.87	-3.57	-6.23	-20.64	-13.23	2.22
ON	13 14	32.71	45.70	13.27	37.77	26.24	43.04
ON	16 114	-23.11	-29.09	-0.34	-8.07	22.20	-1.20
ON	24 796	2.06	1.16	3.65	-3.49	-6.99	-6.54
ORB	12 205	-110.06	-105.48	-123.26	-136.83	-149.09	-145.95
ORB	12 804	16.96	18.25	37.89	41.69	45.65	35.46
PKNM	16 124	0.0	0.0	0.0	0.0	0.0	27.39
PKNM	16 125	72.47	84.39	46.79	25.04	31.76	52.00
PKNM	16 154	-8.92	-23.43	-84.69	-83.87	-83.87	-31.66
PKNM	24 144	-19.74	-28.43	-20.69	-16.07	-16.33	-16.69
PTB	12 320	-39.77	-35.62	-40.65	-43.89	-43.25	-42.41
PTB	12 462	-1.82	0.31	-1.84	-6.67	-8.05	-3.38
PTB	14 394	-39.27	-32.16	-30.21	-29.66	-26.00	-26.41
PTB	14 395	-51.59	-48.42	-49.63	-45.03	-47.59	-46.41
PTB	14 867	-203.16	-216.50	-217.48	-218.83	0.0	0.0
PTB	16 119	-82.90	-96.51	-119.99	-128.01	-118.73	-109.61
PTB	24 103	-18.33	-17.21	-13.43	-13.92	-13.79	-14.90
PTB	92 1	6.82	5.64	3.75	-0.77	1.68	3.75
PTCH	16 64	0.0	-36.81	-61.87	-77.05	-59.79	-20.70
PTCH	16 140	112.55	124.41	0.0	0.0	0.0	0.0
RGO	11 123	-172.02	-173.20	-195.95	0.0	0.0	0.0
RGO	12 348	0.0	0.0	-85.25	-77.14	-81.82	-74.92
RGO	12 484	-207.88	-188.19	-165.22	-153.94	-163.34	-180.44
RGO	14 202	-481.11	-508.84	-533.45	-555.92	-584.87	0.0
RGO	14 560	-105.17	-110.57	-94.51	-58.18	-59.05	-61.87
RGO	14 868	-125.35	-126.97	-126.14	-126.83	-126.96	-129.59
RGO	20 133	-223.70	0.0	0.0	-362.33	-361.58	-346.42
RRL	12 290	0.0	0.0	0.0	-62.88	-73.59	-84.77
RRL	14 764	0.0	0.0	0.0	-4.86	-11.52	-9.99
RRL	14 865	0.0	0.0	0.0	-306.39	-313.40	-319.35

TABLE 19 - (CONT.)

LAB.	CLOCK	45759	45819	45879	45939	45999	46059
RRL	14 932	0.0	0.0	0.0	-131.25	-145.49	-158.00
RRL	22 725	0.0	0.0	0.0	-209.99	0.0	0.0
RRL	22 729	0.0	0.0	0.0	53.73	51.91	46.01
SO	12 67	328.48	391.87	448.79	460.41	452.37	417.96
SO	12 997	-103.64	-107.70	-99.84	-115.25	-108.69	-105.13
SO	16 180	0.0	0.0	0.0	0.0	3.29	-4.11
STA	14 900	-96.68	-98.57	-111.87	-118.99	-109.22	-113.66
STA	16 137	0.0	-27.19	-47.28	-43.53	-35.66	-26.00
STA	24 376	-90.00	-85.68	-81.44	-70.83	-77.99	-89.10
TAO	11 310	-27.06	-57.51	-48.71	-59.51	0.0	0.0
TAO	12 204	0.0	-95.32	-116.30	-150.11	-178.33	-183.76
TAO	14 390	-50.54	-52.37	-52.43	-64.88	-79.43	-80.99
TAO	24 75	-142.62	-148.20	-147.67	-106.48	-54.23	-57.83
TAO	24 498	0.0	-95.78	-100.87	-96.10	-95.83	-106.09
TL	12 115	5.86	-8.20	-57.04	-50.46	-72.15	-82.89
TL	12 477	108.66	156.63	241.46	201.82	170.89	184.37
TL	22 145	117.52	124.36	117.64	98.83	109.02	111.45
TP	12 335	-744.20	-814.31	-851.26	-902.78	-991.76	-1156.79
TUG	12 524	151.88	131.88	134.02	136.45	114.60	104.11
TUG	24 654	39.25	38.48	38.52	34.19	34.12	34.99
USNO	12 532	22.47	73.14	107.49	0.0	0.0	0.0
USNO	12 573	-116.09	-122.39	0.0	0.0	0.0	0.0
USNO	12 752	-155.38	-167.19	-165.33	-165.88	-171.55	-170.34
USNO	12 778	228.64	226.78	232.44	232.05	232.48	230.22
USNO	14 57	0.0	-491.00	-508.01	-477.18	0.0	0.0
USNO	14 345	192.50	179.59	168.79	169.93	169.06	177.33
USNO	14 571	-89.24	-83.68	-72.82	-64.11	-67.21	-74.70
USNO	14 573	0.0	0.0	0.0	0.0	-48.31	-54.19
USNO	14 656	0.0	2.81	1.33	1.75	2.93	2.12
USNO	14 660	-77.02	-66.87	-59.37	-57.81	-57.28	-72.80
USNO	14 834	-84.86	0.0	0.0	-121.38	-121.09	-130.74
USNO	14 862	223.73	224.10	234.85	236.25	240.29	237.99
USNO	14 871	110.46	109.02	99.24	89.82	93.81	82.55
USNO	14 875	-140.62	-141.09	-146.68	-150.61	-146.37	-142.04
USNO	16 68	0.0	0.0	0.0	0.0	0.0	59.91
USNO	16 78	153.04	141.96	125.88	145.80	0.0	0.0
USNO	24 25	-252.14	-246.46	-267.52	-275.23	-275.22	-252.24
USNO	24 28	-107.48	-96.00	-87.16	-75.63	-81.80	-91.92
USNO	24 33	57.13	55.75	55.28	0.0	0.0	0.0
USNO	24 35	-75.80	-78.22	-83.07	-85.59	-93.94	-91.41
USNO	24 94	8.03	2.99	0.59	-11.24	-12.20	-23.51
USNO	24 117	-90.33	-101.82	-87.85	-87.33	-83.87	-94.66
USNO	24 264	0.0	0.0	0.0	-76.81	-90.93	-105.30
USNO	24 300	-332.24	-339.65	-331.15	-328.70	-331.26	-326.70
USNO	24 301	-136.67	-138.17	-137.37	-138.82	-148.30	-150.02

TABLE 19 - (CONT.)

LAB.	CLOCK	45759	45819	45879	45939	45999	46059
USNO	24 343	-39.42	-40.69	-34.63	-34.70	-31.25	-34.00
USNO	24 423	-41.65	-42.88	-43.59	-45.36	-42.78	-44.70
USNO	24 452	-1.55	-0.29	3.02	3.46	10.57	3.88
USNO	24 585	-43.91	-45.94	-37.90	-33.97	0.0	0.0
USNO	24 586	-84.12	-86.47	-82.39	-84.51	-84.56	-92.52
USNO	24 605	13.46	24.80	23.28	17.31	22.00	20.90
USNO	24 653	14.59	20.26	24.53	24.15	39.11	32.00
USNO	24 688	-41.66	-43.63	-49.65	-49.80	-48.83	-43.68
USNO	24 846	-32.61	-32.80	-27.38	-22.48	-23.40	-34.45
USNO	24 946	0.0	-45.65	-39.21	-27.17	0.0	0.0
USNO	24 950	41.98	0.0	0.0	0.0	0.0	0.0
USNO	34 98	-29.31	-30.34	-31.45	-30.51	-26.58	-26.23
USNO	34 100	0.0	0.0	0.0	0.0	0.0	-115.32
USNO	34 157	0.0	-117.41	-113.96	-115.37	-113.49	-108.53
USNO	34 257	0.0	0.0	0.0	0.0	-18.04	-9.03
USNO	34 268	0.0	0.0	0.0	0.0	-26.50	-7.41
USNO	34 277	0.0	0.0	0.0	0.0	-17.78	-18.14
USNO	34 278	0.0	0.0	0.0	0.0	19.60	-17.12
USNO	34 281	0.0	0.0	0.0	0.0	-41.33	0.0
USNO	34 282	0.0	0.0	0.0	0.0	0.0	-7.84
USNO	34 285	0.0	0.0	0.0	0.0	0.0	-21.47
USNO	34 313	0.0	0.0	0.0	0.0	0.0	-61.00
USNO	34 314	0.0	0.0	0.0	0.0	0.0	-30.82
USNO	40 18	0.0	0.0	-110.39	-147.30	0.0	0.0
USNO	40 19	0.0	0.0	-110.38	-147.29	0.0	0.0
USNO	43 8	0.0	0.0	0.0	158.93	103.56	-69.45
VSL	14 503	-192.49	-186.09	-177.29	-178.05	-173.58	-168.46
VSL	22 34	-3.61	-7.34	-14.38	-13.11	-11.17	-10.06
VSL	22 489	127.57	118.05	0.0	0.0	-135.76	-201.13
VSL	24 190	0.0	0.0	0.0	0.0	0.0	-16.48
YUZM	22 189	0.0	0.0	0.0	0.0	0.0	-54.87
ZIPE	12 979	-21.59	-15.45	-5.94	-5.02	-17.21	0.0

THE CLOCKS ARE DESIGNATED BY THEIR MODEL (2 DIGITS) AND SERIAL NO.
THE CODES FOR THE MODELS ARE

11	HEWLETT-PACKARD 5060A	
12 OR 22	HEWLETT-PACKARD 5061A	(22 001 EQUIVALENT TO 12 1001)
13 OR 23	EBAUCHES , OSCILLATOM B5000	(23 001 EQUIVALENT TO 13 1001)
14 OR 24	HEWLETT-PACKARD 5061A OPT.4	(24 001 EQUIVALENT TO 14 1001)
OR 34	HEWLETT-PACKARD 5061A OPT.4	(34 001 EQUIVALENT TO 14 2001)
16 OR 26	OSCILLOQUARTZ 3200	(26 001 EQUIVALENT TO 16 1001)
17 OR 27	OSCILLOQUARTZ 3000	(27 001 EQUIVALENT TO 17 1001)
18 OR 28	FREQ. AND TIME SYSTEMS INC. 4000	
19	ROHDE AND SCHWARZ XSC	
20	FREQ. AND TIME SYSTEMS INC. 5000	
25	HEWLETT-PACKARD 5062C	(ADD 1000 TO THE SERIAL NO.)

40 HYDROGEN MASERS (NBS TYPE) 41 HYDROGEN MASERS (OSCILLOQUARTZ)
42 HYDROGEN MASERS (NASA RESEARCH) 43 HYDROGEN MASERS(APL TYPE)
44 AUSTRALIAN HYDROGEN MASERS
90 LABORATORY CS STANDARD NRC 91 LABORATORY CS STANDARD NBS
92 LABORATORY CS STANDARD PTB 99 PROTOTYPE CS

TABLE 20 - INTERNATIONAL ATOMIC TIME , WEIGHTS OF THE CLOCKS FOR 1984

THE WEIGHTS ARE GIVEN FOR INTERVALS OF TWO MONTHS ENDING AT THE GIVEN DATES
*** DENOTES THAT THE CLOCK WAS NOT USED

LAB.	CLOCK	45759	45819	45879	45939	45999	46059
APL	14 773	49	58	91	170	200	200
APL	14 793	200	200	192	200	200	200
APL	42 6	***	0	0	0	200	200
ASMW	13 29	***	0	200	133	170	68
ASMW	16 76	42	62	58	50	44	62
ASMW	16 165	200	200	200	200	200	185
AUS	11 205	***	***	0	175	188	182
AUS	12 201	***	***	***	***	0	200
AUS	12 288	***	***	0	198	200	177
AUS	12 338	***	***	0	24	48	***
AUS	12 590	***	***	***	***	***	0
AUS	14 902	***	***	0	***	***	0
AUS	22 109	***	***	***	***	***	0
AUS	22 195	***	***	0	200	199	162
AUS	22 823	***	***	0	200	109	58
AUS	24 443	***	***	0	***	***	0
AUS	24 719	***	***	0	200	***	***
AUS	24 777	***	***	0	158	200	***
AUS	24 844	***	***	0	200	200	179
AUS	34 20	***	***	***	0	176	192
AUS	44 1	***	***	0	0	200	200
AUS	44 2	***	***	0	0	200	200
AUS	44 3	***	***	0	0	***	***
BEV	16 71	15	16	15	23	38	26
CAO	16 52	80	92	52	***	***	***
CAO	16 183	96	97	99	***	***	***
F	12 158	6	6	8	10	24	***
F	12 195	86	***	***	0	196	176
F	12 347	18	21	18	14	11	16
F	12 439	75	46	27	40	89	117
F	14 134	200	200	200	200	200	200
F	14 500	184	193	156	165	200	200
F	14 594	165	149	189	120	135	178
F	14 753	43	21	14	10	9	9
F	16 106	***	***	***	***	0	199
F	22 120	51	72	88	40	30	***
F	24 407	73	102	140	200	200	200
F	24 645	0	195	191	200	197	200
F	24 842	200	200	200	200	200	200
FTZ	14 312	131	200	200	200	***	***

TABLE 20 - (CONT.)

LAB.	CLOCK	45759	45819	45879	45939	45999	46059
FTZ	14 895	***	0	200	200	127	182
FTZ	24 217	200	200	200	200	167	192
FTZ	24 482	200	200	200	***	***	***
FTZ	24 656	200	200	200	200	169	189
FTZ	24 674	200	200	200	200	164	199
IEN	12 469	***	0	***	***	***	***
IEN	12 609	***	***	***	0	200	200
IEN	14 893	195	200	191	200	200	200
IEN	16 84	***	***	***	0	197	33
IFAG	16 131	132	183	156	120	142	149
IFAG	16 138	111	90	101	100	40	16
IFAG	16 173	22	21	23	23	30	29
IFAG	41 1	0	***	***	***	***	***
ILOM	11 176	0	0	0	0	0	0
ILOM	14 614	***	0	45	21	35	35
ILOM	14 885	45	54	81	94	***	***
ILOM	24 315	51	51	70	96	200	180
ILOM	34 146	***	0	200	195	200	200
NBS	11 169	***	***	0	53	43	73
NBS	12 352	58	41	55	129	175	168
NBS	13 61	14	15	15	15	***	***
NBS	14 323	62	***	***	0	162	200
NBS	14 324	0	149	83	88	98	132
NBS	14 601	98	79	156	126	78	78
NBS	18 8	96	0	15	13	16	18
NBS	18 113	5	7	7	14	38	1
NBS	22 375	***	***	***	0	195	21
NBS	24 316	***	***	***	0	200	200
NBS	34 165	***	***	0	9	***	***
NBS	40 14	***	***	0	***	***	***
NIM	22 615	***	***	***	***	0	12
NIM	22 633	***	***	***	***	0	23
NIM	22 640	***	***	***	***	0	179
NPL	12 316	26	***	***	***	***	***
NPL	12 418	48	46	38	18	18	***
NPL	24 813	***	***	***	***	0	80
NPL	34 64	***	***	***	***	0	125
NRC	14 267	200	200	200	200	200	200
NRC	90 5	186	200	***	0	200	200
NRC	90 61	165	157	103	129	130	132
NRC	90 62	179	200	198	200	180	200
NRC	90 63	179	200	195	197	200	200
NRLM	12 363	145	16	14	20	23	37
NRLM	14 906	0	108	200	200	119	104
OAB	16 189	3	3	3	0	***	0

TABLE 20 - (CONT.)

LAB.	CLOCK		45759	45819	45879	45939	45999	46059
OFM	16	69	0	39	81	113	126	170
OFM	16	77	0	200	200	189	200	200
OFM	17	206	200	200	200	200	200	196
OFM	17	208	200	200	200	175	200	200
OFM	21	179	***	***	***	***	0	200
OFM	99	1	5	3	3	0	2	2
OFM	99	2	190	160	***	***	***	***
OFM	99	5	57	87	166	36	16	17
OMH	22	67	197	198	164	59	74	73
OMSF	14	896	200	183	144	170	200	200
OMSF	16	113	24	30	42	58	***	0
OMSF	16	177	***	***	***	***	***	0
OMSF	22	223	148	49	38	49	49	58
OMSF	24	569	96	119	68	72	169	***
ON	12	285	200	200	200	200	189	194
ON	12	863	0	194	200	74	101	112
ON	13	14	39	22	26	22	39	68
ON	16	114	56	46	19	20	16	28
ON	24	796	200	200	200	196	200	200
ORB	12	205	109	121	71	32	22	30
ORB	12	804	85	81	78	67	62	62
PKNM	16	124	***	***	***	***	***	0
PKNM	16	125	32	25	29	20	17	19
PKNM	16	154	10	11	0	8	7	0
PKNM	24	144	86	75	95	153	200	200
PTB	12	320	200	200	200	200	200	200
PTB	12	462	200	200	200	200	200	200
PTB	14	394	200	188	200	200	200	200
PTB	14	395	200	200	200	200	200	200
PTB	14	867	200	175	200	198	***	***
PTB	16	119	200	174	58	29	26	37
PTB	24	103	200	200	200	200	200	200
PTB	92	1	200	200	200	200	200	200
PTCH	16	64	***	0	20	17	29	18
PTCH	16	140	3	3	***	***	***	***
RGO	11	123	200	200	105	***	***	***
RGO	12	348	***	***	0	193	200	199
RGO	12	484	7	9	13	12	14	24
RGO	14	202	6	5	4	4	5	***
RGO	14	560	60	41	79	29	18	16
RGO	14	868	200	200	200	200	200	200
RGO	20	133	48	***	***	0	200	89
RRL	12	290	***	***	***	0	109	60
RRL	14	764	***	***	***	0	199	200
RRL	14	865	***	***	***	0	198	171

TABLE 20 - (CONT.)

LAB.	CLOCK	45759	45819	45879	45939	45999	46059
RRL	14 932	***	***	***	0	62	40
RRL	22 725	***	***	***	0	***	***
RRL	22 729	***	***	***	0	200	200
SO	12 67	0	0	0	2	3	4
SO	12 997	0	200	193	155	200	200
SO	16 180	***	***	***	***	0	196
STA	14 900	0	200	123	76	114	142
STA	16 137	***	0	32	63	102	100
STA	24 376	15	11	11	19	59	167
TAO	11 310	0	15	33	41	***	***
TAO	12 204	***	0	29	9	6	6
TAO	14 390	200	200	200	169	82	53
TAO	24 75	200	200	200	27	0	5
TAO	24 498	***	0	200	200	200	182
TL	12 115	0	84	0	9	8	8
TL	12 477	0	0	0	2	4	5
TL	22 145	0	169	200	67	96	131
TP	12 335	0	0	1	0	0	0
TUG	12 524	135	83	69	68	55	36
TUG	24 654	200	200	200	200	200	200
USNO	12 532	0	0	4	***	***	***
USNO	12 573	14	10	***	***	***	***
USNO	12 752	178	160	200	200	200	200
USNO	12 778	200	200	200	200	200	200
USNO	14 57	***	0	44	31	***	***
USNO	14 345	63	60	61	100	127	134
USNO	14 571	153	194	178	96	75	97
USNO	14 573	***	***	***	***	0	200
USNO	14 656	***	0	200	200	200	200
USNO	14 660	0	88	75	90	109	125
USNO	14 834	200	***	***	0	200	185
USNO	14 862	200	200	178	200	161	170
USNO	14 871	148	156	181	135	140	89
USNO	14 875	62	81	200	200	200	200
USNO	16 68	***	***	***	***	***	0
USNO	16 78	33	37	40	58	***	***
USNO	24 25	0	195	64	47	53	63
USNO	24 28	177	166	93	43	39	72
USNO	24 33	88	68	57	***	***	***
USNO	24 35	200	200	200	200	191	200
USNO	24 94	15	16	25	28	38	76
USNO	24 117	200	184	162	200	200	179
USNO	24 264	***	***	***	0	63	35
USNO	24 300	0	3	3	4	8	200
USNO	24 301	195	199	200	200	185	200

TABLE 20 - (CONT.)

LAB.	CLOCK	45759	45819	45879	45939	45999	46059
USNO	24 343	200	200	200	200	200	200
USNO	24 423	200	200	200	200	200	200
USNO	24 452	200	200	200	200	198	200
USNO	24 585	0	200	192	200	***	***
USNO	24 586	200	200	200	200	200	193
USNO	24 605	174	167	200	200	200	200
USNO	24 653	19	20	20	24	40	119
USNO	24 688	200	200	200	200	200	200
USNO	24 846	200	200	200	200	200	178
USNO	24 946	***	0	200	84	***	***
USNO	24 950	0	***	***	***	***	***
USNO	34 98	200	200	200	200	200	200
USNO	34 100	***	***	***	***	***	0
USNO	34 157	***	0	200	200	200	200
USNO	34 257	***	***	***	***	0	155
USNO	34 268	***	***	***	***	0	35
USNO	34 277	***	***	***	***	0	200
USNO	34 278	***	***	***	***	0	9
USNO	34 281	***	***	***	***	0	***
USNO	34 282	***	***	***	***	***	0
USNO	34 285	***	***	***	***	***	0
USNO	34 313	***	***	***	***	***	0
USNO	34 314	***	***	***	***	***	0
USNO	40 18	***	***	0	0	***	***
USNO	40 19	***	***	0	0	***	***
USNO	43 8	***	***	***	0	0	0
VSL	14 503	73	191	169	140	143	117
VSL	22 34	120	200	198	200	200	200
VSL	22 489	27	106	***	***	0	0
VSL	24 190	***	***	***	***	***	0
YUZM	22 189	***	***	***	***	***	0
ZIPE	12 979	21	27	42	102	172	***

THE CLOCKS ARE DESIGNATED BY THEIR MODEL (2 DIGITS) AND SERIAL NO.
THE CODES FOR THE MODELS ARE

11	HEWLETT-PACKARD 5060A	
12 OR 22	HEWLETT-PACKARD 5061A	(22 001 EQUIVALENT TO 12 1001)
13 OR 23	EBAUCHES , OSCILLATOM B5000	(23 001 EQUIVALENT TO 13 1001)
14 OR 24	HEWLETT-PACKARD 5061A OPT.4	(24 001 EQUIVALENT TO 14 1001)
OR 34	HEWLETT-PACKARD 5061A OPT.4	(34 001 EQUIVALENT TO 14 2001)
16 OR 26	OSCILLOQUARTZ 3200	(26 001 EQUIVALENT TO 16 1001)
17 OR 27	OSCILLOQUARTZ 3000	(27 001 EQUIVALENT TO 17 1001)
18 OR 28	FREQ. AND TIME SYSTEMS INC. 4000	
19	ROHDE AND SCHWARZ XSC	
20	FREQ. AND TIME SYSTEMS INC. 5000	
25	HEWLETT-PACKARD 5062C	(ADD 1000 TO THE SERIAL NO.)

40 HYDROGEN MASERS (NBS TYPE)
41 HYDROGEN MASERS (OSCILLOQUARTZ)
42 HYDROGEN MASERS (NASA RESEARCH)
43 HYDROGEN MASERS(APL TYPE)
44 AUSTRALIAN HYDROGEN MASERS
90 LABORATORY CS STANDARD NRC
91 LABORATORY CS STANDARD NBS
92 LABORATORY CS STANDARD PTB
99 PROTOTYPE CS

TABLE 21 - MEASUREMENTS OF THE EAL AND TAI FREQUENCY

GRAVITATIONAL FREQUENCY CORRECTIONS ARE APPLIED . THE FREQUENCIES ARE EXPRESSED AT SEA LEVEL .

INTERVAL	CENTRAL	F(EAL) - F(STANDARD) IN 10**-13			
MJD	DATE	NBS6	NRC CsV	PTB CS1	RRL CS1
44969-45049	1982 FEB 9		8.93	8.39(2)	
45029-45109	1982 APR10	7.35			
45049-45129	1982 APR30		8.15	8.28	
45149-45229	1982 AUG 8		7.47(1)	7.71	
45229-45309	1982 OCT27		8.18	7.62	
45309-45389	1983 JAN15		7.86	8.62	
45389-45469	1983 APR 5		8.32	8.52	
45469-45549	1983 JUN24		7.15	8.06	
45489-45569	1983 JUL14	7.34			
45549-45629	1983 SEP12		7.44	7.98	
45629-45699	1983 NOV25		7.54	8.10	
45699-45759	1984 JAN30		8.58	8.59	
45759-45819	1984 MAR30		8.49	8.65	
45789-45849	1984 APR29				6.45
45819-45879	1984 MAY29		-	8.43	
45879-45939	1984 JUL28		7.18	7.91	
45889-45949	1984 AUG17	7.24			
45939-45999	1984 SEP26		7.04	8.19	
45959-46019	1984 OCT16	7.70			
45999-46059	1984 NOV25		-	8.43	7.53

INTERVAL	CENTRAL	F(TAI) - F(STANDARD) IN 10**-13			
MJD	DATE	NBS6	NRC CsV	PTB CS1	RRL CS1
44969-45049	1982 FEB 9		0.53	-0.01(2)	
45029-45109	1982 APR10	-1.00			
45049-45129	1982 APR30		-0.15	-0.02	
45149-45229	1982 AUG 8		-0.48(1)	-0.24	
45229-45309	1982 OCT27		0.38	-0.18	
45309-45389	1983 JAN15		0.06	0.82	
45389-45469	1983 APR 5		0.52	0.72	
45469-45549	1983 JUN24		-0.65	0.26	
45489-45569	1983 JUL14	-0.46			
45549-45629	1983 SEP12		-0.36	0.18	
45629-45699	1983 NOV25		-0.26	0.30	
45699-45759	1984 JAN30		0.78	0.79	
45759-45819	1984 MAR30		0.49	0.65	
45789-45849	1984 APR29				-1.55
45819-45879	1984 MAY29		-	0.43	
45879-45939	1984 JUL28		-0.82	-0.09	
45889-45949	1984 AUG17	-0.76			
45939-45999	1984 SEP26		-0.96	0.19	
45959-46019	1984 OCT16	-0.30			
45999-46059	1984 NOV25		-	0.43	-0.47

(1) COMPUTED JUST AFTER A FULL EVALUATION OF NRC-CSV
(2) THIS FREQUENCY WAS COMPUTED USING TWO INTERPOLATED VALUES (SEE NOTE (1) ,P. B-45 ,ANNUAL REPORT FOR 1982)

TABLE 22 - MEAN DURATION OF THE TAI SCALE INTERVAL IN SI SECOND AT SEA LEVEL .

FOR THE MONTHS	MEAN DURATION	UNCERTAINTY (one sigma)
1979 JAN - FEB	1 + 0.6*10**-13	0.5*10**-13
1979 MAR - APR	+ 0.4	0.5
1979 MAY - JUN	+ 0.7	0.5
1979 JUL - AUG	+ 0.8	0.5
1979 SEP - OCT	+ 0.8	0.5
1979 NOV - DEC	+ 0.2	0.5
1980 JAN - FEB	1 - 0.3*10**-13	0.5*10**-13
1980 MAR - APR	- 0.5	0.5
1980 MAY - JUN	- 0.1	0.5
1980 JUL - AUG	+ 0.3	0.5
1980 SEP - OCT	+ 0.5	0.5
1980 NOV - DEC	+ 0.1	0.5
1981 JAN - FEB	1 - 0.3*10**-13	0.5*10**-13
1981 MAR - APR	- 0.4	0.5
1981 MAY - JUN	+ 0.0	0.5
1981 JUL - AUG	+ 0.6	0.5
1981 SEP - OCT	+ 0.8	0.5
1981 NOV - DEC	+ 0.5	0.5
1982 JAN - FEB	1 + 0.1*10**-13	0.5*10**-13
1982 MAR - APR	+ 0.0	0.5
1982 MAY - JUN	+ 0.2	0.5
1982 JUL - AUG	+ 0.5	0.5
1982 SEP - OCT	+ 0.5	0.5
1982 NOV - DEC	+ 0.2	0.5
1983 JAN - FEB	1 - 0.2*10**-13	0.5*10**-13
1983 MAR - APR	- 0.4	0.5
1983 MAY - JUN	- 0.1	0.5
1983 JUL - AUG	+ 0.4	0.5
1983 SEP - OCT	+ 0.4	0.5
1983 NOV - DEC	+ 0.1	0.5
1984 JAN - FEB	1 - 0.5*10**-13	0.5*10**-13
1984 MAR - APR	- 0.4	0.5
1984 MAY - JUN	+ 0.1	0.5
1984 JUL - AUG	+ 0.5	0.5
1984 SEP - OCT	+ 0.6	0.5
1984 NOV - DEC	+ 0.3	0.5

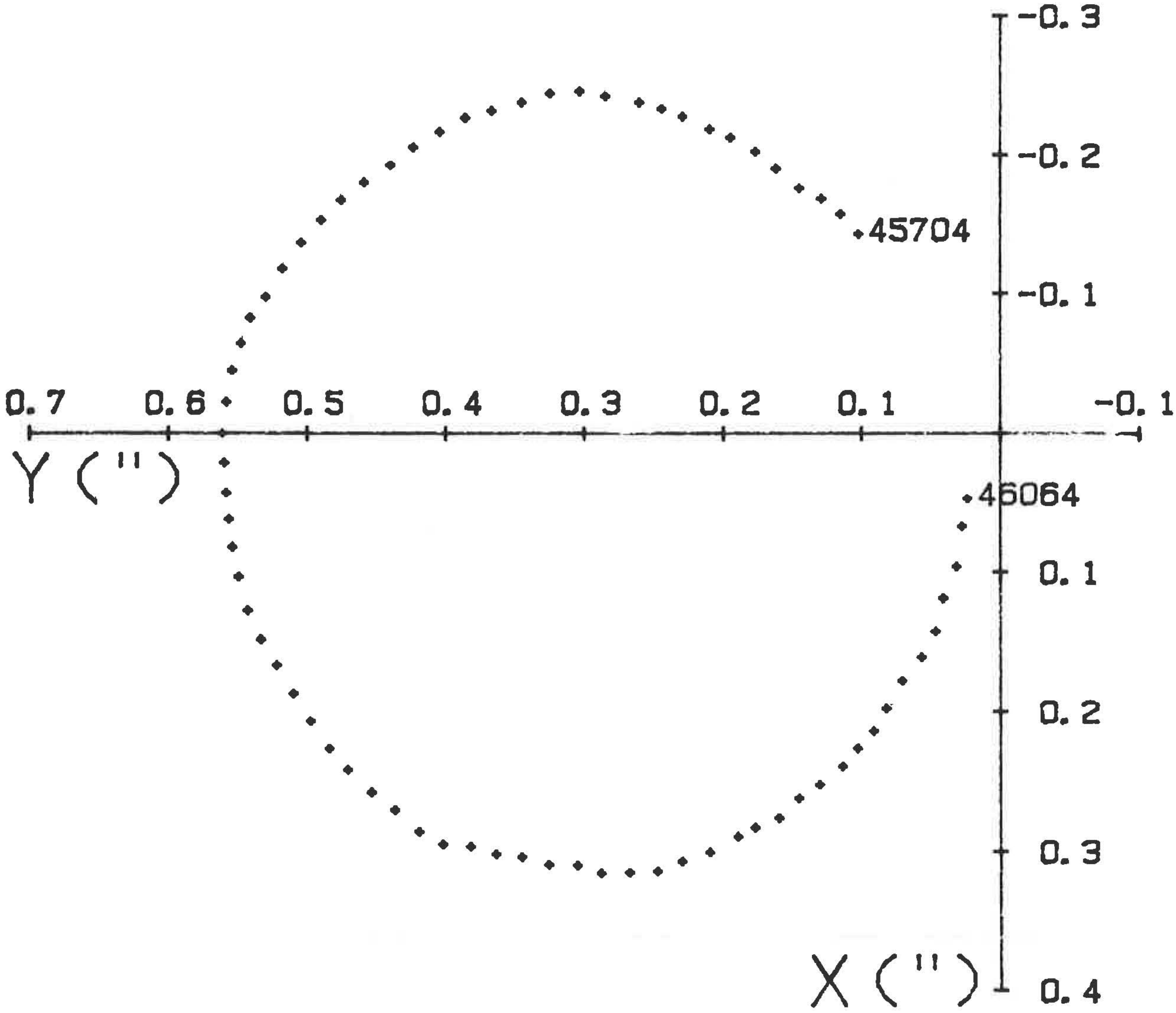

Figure 1. Path of the pole from 1984 Jan 5 to Dec 30 (MJD 45704 - 46064). Raw Values of Table 6.

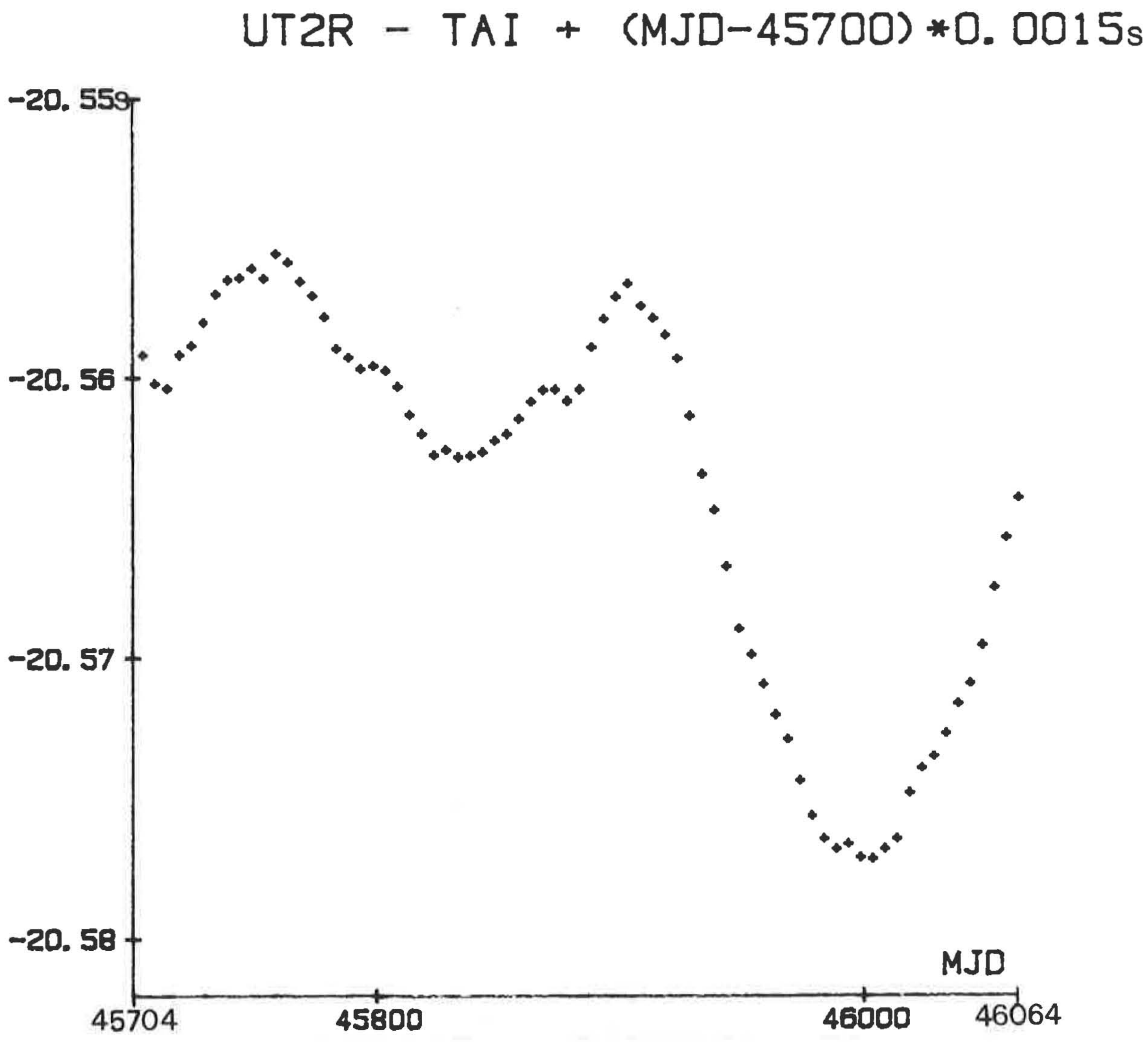

Figure 2. Raw values of UT2R - TAI at 5-day interval (Table 6).

The following conventional formula is used :

$UT2-UT1 = 0.0220 \sin 2\pi t - 0.0120 \cos 2\pi t - 0.0060 \sin 4\pi t + 0.0070 \cos 4\pi t$,

the unit being the second and t being the date in besselian years.

UT2R is corrected for the effect of zonal tides for periods up to 35 days.

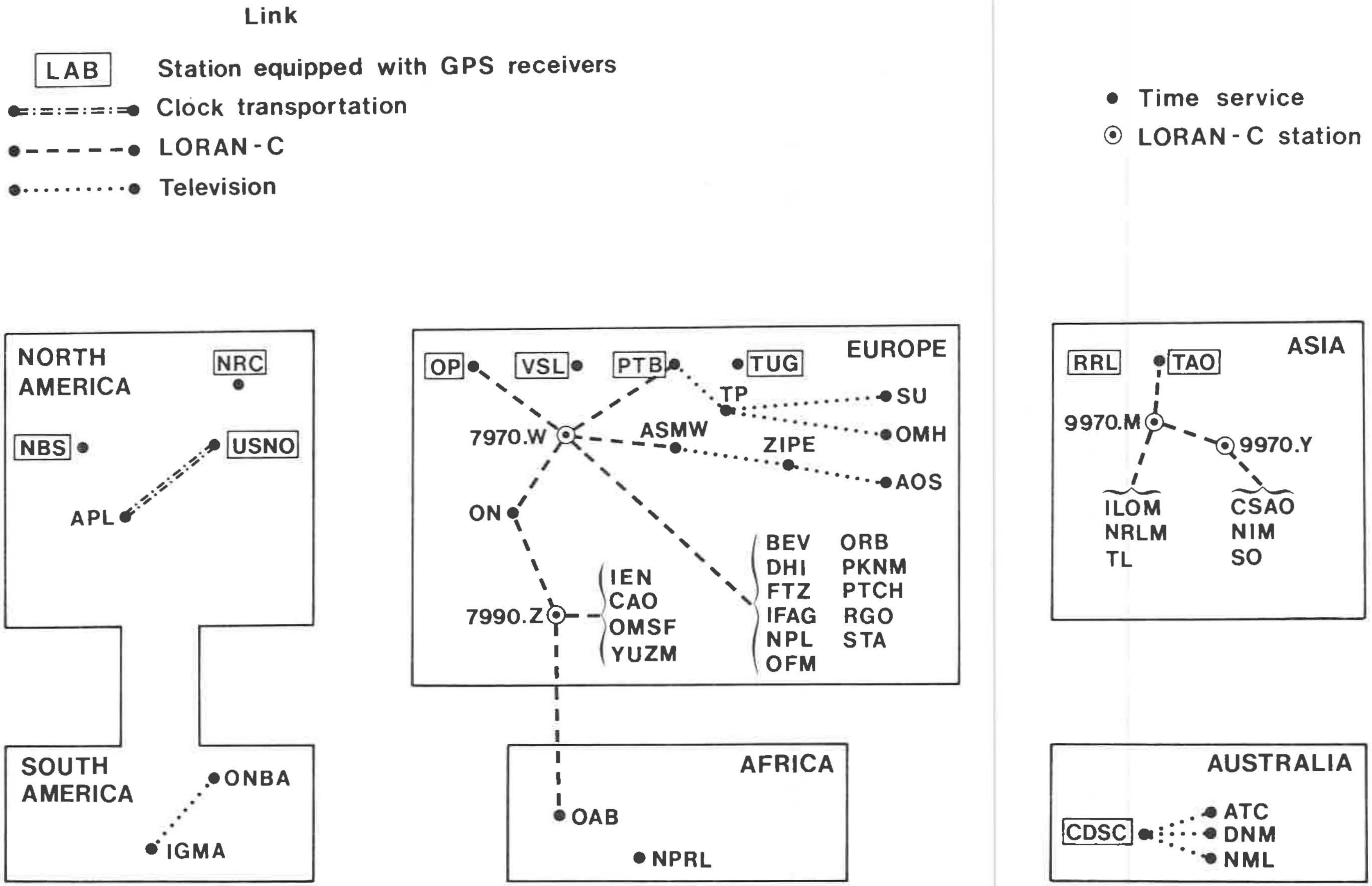

Fig. 3. Time links used by the BIH (31 Dec. 1984)

The links GPS-7970W via OP and PTB are averaged.
In Australia, CDSC stands for Tidbinbilla Deep Space Communications Center.
For ONBA, IGMA, and NPRL, VLF and clock transportations provide the link with other laboratories.

PART C

TIME SIGNALS (1985)

The time signal emissions reported thereafter follow the UTC system, in accordance with the Recommandations 460-3 of the International Radio Consultative Committee (CCIR), unless otherwise stated.

Their maximum departure from the Universal Time UT1 is thus 0.9 second.

AUTHORITIES RESPONSIBLE FOR THE TIME SIGNAL EMISSIONS

Signal	Authority
ATA	National Physical Laboratory Hillside Road New Dehli – 110012, India
BPM	Shaanxi Astronomical Observatory Academia Sinica P. O. Box 18 – Lintong Shaanxi , China
BSF	Telecommunication Laboratories Directorate General of Telecommunications Ministry of Communications P. O. Box 71 – Ching-Li 320 Taiwan, China
CHU	National Research Council, Electrical and Time Standards Section Physics Division (M-36) Ottawa K1A OS 1, Ontario, Canada Attn : Dr. J. Vanier
DAM, DAN, DAO	Deutsches Hydrographisches Institut Postfach 220 2000 Hamburg 4, Federal Republic of Germany
DCF77	Physikalisch-Technische Bundesanstalt, Laboratorium 1-21 Federal Republic of Germany Bundesallee 100 D33 Braunschweig
DGI, Y3S	Amt für Standardisierung, Messwesen und Warenprüfung Fachabteilung Elektrizität und Magnetismus Fachgebiet Zeit und Frequenz Fürstenwalder Damm 388 DDR 1162 Berlin
EBC	Instituto y Observatorio de Marina San Fernando Cadiz, Spain

Signal	Authority
FTH42, FTK77, FTN87	Laboratoire Primaire du Temps et des Fréquences Observatoire de Paris 61, avenue de l'Observatoire 75014 Paris, France
GBR	1/ Time information : Royal Greenwich Observatory Herstmonceux Castle Hailsham, East Sussex BN27 1 RP, United Kingdom 2/ Standard Frequency information : National Physical Laboratory Electrical Science Division Teddington, Middlesex TW11 OLW, United Kingdom
HBG	Service horaire HBG Observatoire Cantonal CH – 2000 Neuchâtel, Suisse
HLA	Time and Electromagnetics Standards Laboratory Korea Standards Research Institute P. O. Box 3, Taedok Science Town Taejon, Ch'ungnam 300-31 Republic of Korea
IAM	Istituto Superiore delle Poste e delle Telecomunicazioni Ufficio 8°, Rep. 3° - Viale Europa 00100 – Roma, Italy
IBF	Istituto Elettrotecnico Nazionale Galileo Ferraris Strada delle Cacce, 91 10135 – Torino, Italy
JJY, JG2AS	Frequency Standard Division The Radio Research Laboratories Ministry of Posts and Telecommunications Koganei, Tokyo 184, Japan
LOL	Director Observatorio Naval Av. España 2099 1107 – Buenos-Aires, Republica Argentina

Signal	Authority
MSF	National Physical Laboratory Electrical Science Division Teddington, Middlesex TW11 OLW United Kingdom
OLB5, OMA	1/ Time information : Astronomický Ústav ČSAV, Budečská 6, 120 23 Praha 2, Vinohrady, Czechoslovakia. TELEX : 122 486 2/ Standard frequency information : Ústav radiotechniky a elektroniky ČSAV, Lumumbova 1, 182 51 Praha 8, Kobylisy, Czechoslovakia. TELEX : 122 646
PPE, PPR	Serviço da Hora Observatório Nacional (CNPq) Rua General Bruce, 586 20921 Rio de Janeiro – RJ, Brasil
RBU, RCH, RID, RTA, RTZ, RWM, UNW3, UPD8, UQC3, USB2, UTR3	Comité d'État des Normes Conseil des Ministre de l'URSS Moscou 117049, URSS, Leninski prosp., 9
VNG	Telecom Australia Research Laboratories Reference Measurements Section Box 249 Clayton, Victoria 3168, Australia
WWV, WWVH WWVB	Time and Frequency Services Group Time and Frequency Division, 524.00 325 Broadway National Bureau of Standards Boulder, Colorado 80303, U.S.A.
YVTO	Direccion de Hidrografia y Navegacion Observatori Cagigal Apartado Postal N°6745 Caracas, Venezuela
Y3S	See DGI
ZUO	National Physical Research Laboratory P. O. Box 395 Pretoria South Africa

TIME - SIGNALS EMITTED IN THE UTC SYSTEM

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of time signals
ATA	Greater Kailash New Dehli India 28° 34'N 77° 19'E	5 000 10 000 15 000	12h 30m to 3h 30m continuous 3h 30m to 12h 30m	Second pulses of 5 cycles of a 1 kHz modulation. Minute pulses of 100 ms duration. (The time signals are advanced by 50ms on UTC).
BPM	Pucheng China 35° 0'N 139° 31'E	5 000 10 000 15 000	from 14h to 24h continuous from 0h to 14h	UTC time signals (the signals are emitted in advance on UTC by 20ms). Second pulses of 10ms of 1 kHz modulation. Minute pulses of 300ms of 1 kHz modulation. From minutes 0 to 10, 15 to 25, 30 to 40, 45 to 55. UT1 time signals are emitted from minutes 25 to 29, 55 to 59.
BSF	Chung-Li Taiwan China 24° 57'N 121° 9'E	5 000 15 000	continuous except interruption between minutes 35 and 40	(a) From min. 5 to 10, 15 to 20, 25 to 30, 45 to 50, 55 to 60, second pulses of 5ms duration without 1 kHz modulation. (b) From min. 0 to 5, 10 to 15, ..., 50 to 55, second pulses of 5ms duration with 1 kHz modulation. The 1 kHz modulation is interrupted 40ms before and after the pulses. (c) Minute pulses are extended to 300ms. (d) DUT1, CCIR code by lengthening.
CHU	Ottawa Canada 45° 18'N 75° 45'W	3 300 7 335 14 670	continuous	Second pulses of 300 cycles of a 1 kHz modulation, with 29th and 51st to 59th pulses of each minute omitted. Minute pulses are 0.5s long. Hour pulses are 1.0s long, with the following 1st to 10th pulses omitted. A bilingual (Fr. Eng.) announcement of time is made each minute following the 50th second pulse. FSK time code after 10 cycles on the 31st to 39th seconds. Broadcast is single side band ; upper side band with carrier reinserted: DUT1 : CCIR code by split pulses.
DAM	Elmshorn Germany, F.R. 53° 46'N 9° 40'E	8 638.5 16 980.4 4 265 8 638.5 6 475.5 12 763.5	11h 55 m to 12h 06m 23h 55m to 24h 06m from 21 Oct. to 29 March 23h 55m to 24h 06m from 30 March to 20 Oct.	New international system, then second pulses from minutes 0.5 to 6.0 (minute pulses prolonged). A1 Type DUT1 : CCIR code by doubling, after minute pulses 1 to 5
DAN	Osterloog Germany, F.R. 53° 38'N 7° 12'E	2 614	11h 55m to 12h 06m 23h 55m to 24h 06m	As DAM (see above)
DAO	Kiel Germany, F.R. 54° 26'N 10° 8'E	2 775	11h 55m to 12h 06m 23h 55m to 24h 06m	As DAM (see above)
DCF77	Mainflingen Germany, F.R. 50° 1'N 9° 0'E	77.5	continuous	At the beginning of each second (except the 59th second) the carrier amplitude is reduced to about 25% for a duration of 0.1s or 0.2s respectively. Coded transmission of year, month, day, hour, minute and day of the week in a BCD code from second marker N° 20 to N° 58 (the second marker durations of 0.1s or 0.2s correspond to a binary 0 or a binary 1 respectively). Zonal time code by the second markers N° 16 to 18. Second marker N° 15 with a duration of 0.2s indicates that the reserve antenna is in use. No transmission of DUT1.

Notes : see p. C-11

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of time signals
DGI	Oranienburg Germ. Dem. Rep. 52° 48'N 13° 24'E	182	5h 59m 30s to 6h 00m 11h 59m 30s to 12h 00m 17h 59m 30s to 18h 00m	A2 type second pulses of 0.1 s duration for seconds 30-40, 45-50, 55-60. The last pulse is prolonged. (one hour earlier in summer time)
EBC	San Fernando Spain 36° 28'N 6° 12'W	12 008 6 840	10h 00m to 10h 25m 10h 30m to 10h 55m	Second pulses of 0.1 s duration of a 1 kHz modulation. Minute pulses of 0.5s duration of 1 250 Hz modulation DUT1, CCIR code, double pulse. Type A3H
FTH42 FTK77 FTN87 (2)	Ste Assise France 48° 33'N 2° 34'E	7 428 10 775 13 873	at 9h and 21h at 8h and 20h at 9h 30m, 13h, 22h 30m,	A1 type second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DUT1 : in morse code.
GBR (3)	Rugby United Kingdom 52° 22'N 1° 11'W	16	2h 55m to 3h 00m 8h 55m to 9h 00m 14h 55m to 15h 00m 20h 55m to 21h 00m	A1 type second pulses lasting 100ms, lengthened to 500 ms at the minute. The reference point is the start of carrier rise. Uninterrupted carrier is transmitted for 24 s from 54m 30s and from 0m 6s. DUT1 : CCIR code by double pulses.
HBG	Prangins Switzerland 46° 24'N 6° 15'E	75	continuous	Interruption of the carrier at the beginning of each second, during 100ms. The minutes are identified by a double pulse, the hours by a triple pulse. No transmission of DUT1.
HLA	Taedok Science Town Republic of Korea 36° 23' N 127° 22' E	5 000	1h to 8h on Monday to Friday	Pulses of 9 cycles of 1800 Hz modulation. 59th and 29th second pulses omitted. Hour identified by 0.5 second long 1500 Hz tone. Beginning of each minute identified by 0.5 second long 1800 Hz tone. Voice announcement of hours and minutes each minute following 52nd second pulse. BCD time code given on 100 Hz subcarrier. DUT1 : CCIR code by double pulse.
IAM	Rome Italy 41° 47'N 12° 27'E	5 000	7h 30m to 8h 30m 10h 30m to 11h 30m except Sat. afternoon, Sund., and national holidays. Advanced by 1h in summer.	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses of 20 cycles. Voice announcements every 15m beginning at 0h 0m. Time announcement by Morse code beginning at 0h 5m. DUT1 : CCIR code by double pulse.
IBF	Torino Italy 45° 2'N 7° 42'E	5 000	During 15m preceding 7h, 9h, 10h, 11h, 12h, 13h, 14h, 15h, 16h, 17h, 18h. Advanced by 1 hour in summer.	Second pulses of 5 cycles of 1 kHz modulation. These pulses are repeated 7 times at the minute. Voice announcements at the beginning and end of each emission. Time announcement (C.E.T.) by Morse code every ten minutes beginning at 0h 0m. DUT1 : CCIR code by double pulse.
JG2AS	Sanwa Ibaraki Japan 36° 11'N 139° 51'E	40	continuous, except interruptions during communications.	A1 type second pulses of 0.5 s duration. Second 59 is of 0.1 s. No DUT1 code.
JJY	Sanwa Ibaraki Japan 36° 11'N 139° 51'E	2 500 5 000 8 000 10 000 15 000	continuous, except interruption between minutes 35 and 39.	Second pulses of 8 cycles of 1 600 Hz modulation. Minute pulses are preceded by a 600 Hz modulation. DUT1 : CCIR code by lengthening.

Notes : see p. C-11

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of time signals
LOL1 (1)	Buenos-Aires Argentina 34° 37'S 58° 21'W	5 000 10 000 15 000	11h to 12h, 14h to 15h, 17h to 18h, 20h to 21h, 23h to 24h	Second pulses of 5 cycles of 1 000 Hz modulation. Second 59 is omitted. Announcement of hours and minutes every 5 minutes, followed by 3m of 1 000 Hz or 440 Hz modulation. DUT1 : CCIR code by lengthening.
LOL2 LOL3 (1)	Buenos-Aires Argentina 34° 37'S 58° 21'W	4 856 8030 17 180	1h 13h, 21h,	A1 second pulses during the 5 minutes preceding the indicated times. Second 29 is omitted. Minute pulses are prolonged. DUT1 : CCIR code by double pulse.
MSF	Rugby United Kingdom 52° 22'N 1° 11'W	60	continuous except for an interruption for maintenance from 10h 0m to 14h 0m on the first Tuesday in each month.	Interruptions of the carrier of 100ms for the second pulses, of 500ms for the minute pulses. The signal is given by the beginning of the interruption. BCD NRZ code, 100 bits/s (month, day of month, hour, minute), during minute interruptions. BCD PWMcode, 1 bit/s (year, month, day of month, day of week, hour, minute) from seconds 17 to 59 in each minute. DUT1 : CCIR code by double pulse.
MSF	Rugby United Kingdom 52° 22'N 1° 11'W	2 500 5 000 10 000	between minutes 0 and 5, 10 and 15, 20 and 25, 30 and 35, 40 and 45, 50 and 55.	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses are prolonged. DUT1 : CCIR code by double pulse.
OLB5	Poděbrady Czechoslovakia 50° 9'N 15° 9'E	3 170	continuous except from 6h to 12h on the first Wednesday of every month	A1 type, second pulses. No transmission of DUT1.
OMA (4)	Liblice Czechoslovakia 50° 4'N 14° 53'E	50	continuous (from 6h to 12h on the first Wednesday in each month, emitted from Poděbrady with reduced power)	Interruption of the carrier of 100ms at the beginning of every second, of 500ms at the beginning of every minute. The precise time is given by the beginning of the interruption. Phase coded announcement of date, UT and local civil time. No DUT1 code.
OMA	Liblice Czechoslovakia 50° 4'N 14° 53'E	2 500	continuous except from 6h to 12h on the first Wednesday of every month	Pulses of 100 cycles of 1 kHz modulation (prolonged for the minutes) No DUT1 code
PPE	Rio-de-Janeiro Brasil 22° 54'S 43° 13'W	8 721	0h 30m, 11h 30m, 13h 30m, 19h 30m, 20h 30m, 23h 30m	Second ticks, of A1 type, during the five minutes preceding the indicated hours. The minute ticks are longer. DUT1 : CCIR code by double pulse.

Notes : see p. C–11

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
PPR	Rio-de-Janeiro Brasil 22° 59' S 43° 11' W	435 4 244 8 634 13 105 17 194,4 22 603	1h 30m, 14h 30m, 21h 30m	Second ticks, of A 1 type, during the five minutes preceding the indicated hours. The minute ticks are longer.
RBU (5)	Moscow USSR 55° 48' N 38° 18' E	66 2/3	continuous	A1X type second pulses. The pulses at beginning of the minute are prolonged to 0.5 s.
RCH (5)	Tashkent USSR 41° 19' N 69° 15' E		between minutes 0 and 10, 30 and 40	A1X type second pulses. The pulses at the beginning of the minute are prolonged to 0.5 s.
		2 500	0h to 3h 40m 5h 00m to 23h 40m	
		10 000	5h 00m to 13h 10m	
RID (5)	Irkutsk USSR 52° 26' N 104° 2' E	5 004 10 004 15 004	The station simultaneously operates on three frequencies between minutes 20 and 30 50 and 60.	A1X type second pulses. The pulses at the beginning of the minute are prolonged to 0.5 s.
RTA (5)	Novosibirsk USSR 55° 4' N 82° 58' E		between minutes 0 and 10, 30 and 40	A1X type second pulses. The pulses at the beginning of the minute are prolonged to 0.5 s.
		10 000	0h to 5h 10m 14h to 23h 40m	
		15 000	6h 30m to 13h 10m	
RWM (5)	Moscow USSR 55° 48' N 38° 18' E	4 996 9 996 14 996	The station simultaneously operates on three frequencies between minutes 10 and 20, 40 and 50	A1X type second pulses. The pulses at the beginning of the minute are prolonged to 0.5 s.
RTZ (5)	Irkutsk USSR 52° 26' N 104° 2' E	50	between minutes 0 and 5, from 0h to 20h 05 from 22h to 23h 05 in winter from 0h to 19h 05 from 21h to 23h 05 in summer	A1X type second pulses. The pulses at the beginning of the minute are prolonged to 0.5 s.

Notes : see p. C-11

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
UNW3	Molodechno USSR 54° 26' N 26° 48' E	25	from 7h 43m to 7h 52m from 19h 43m to 19h 52m in winter from 7h 43m to 7h 52m from 20h 43m to 20h 52m in summer	A1N type 0.1 second pulses of 0.025s duration. Second pulses are prolonged to 0.1 s. 10 second pulses are prolonged to 1 s and minute pulses are prolonged to 10s. No transmission of DUT1 code.
UPD8	Arkhangelsk USSR 64° 24'N 41° 32'E	25	from 8h 43m to 8h 52m from 11h 43m to 11h 52m	A1N type 0.1 second pulses of 0.025 duration. Second pulses are prolonged to 0.1 s. 10 second pulses are prolonged to 1 s and minute pulses are prolonged to 10s. No transmission of DUT1 code.
UQC3	Chabarovsk USSR 48° 30' N 134° 51' E	25	from 0h 43m to 0h 52m, from 6h 43m to 6h 52m from 17h 43m to 17h 52m in winter from 2h 43m to 2h 52m from 6h 43m to 6h 52m from 18h 43m to 18h 52m in summer	A1N type 0.1 second pulses of 0.025s duration. Second pulses are prolonged to 0.1s ; 10 second pulses are prolonged to 1s and minute pulses are prolonged to 10s. No transmission of DUT1 code.
USB2	Frunze USSR 43° 04'N 73° 39'E	25	from 4h 43m to 4h 52m from 9h 43m to 9h 52m from 21h 43m to 21h 52m in winter from 4h 43m to 4h 52m from 10h 43m to 10h 52m from 22h 43m to 22h 52m in summer	A1N type 0.1 second pulses of 0.025s duration. Second pulses are prolonged to 0.1s. 10 second pulses are prolonged to 1s and minute pulses are prolonged to 10s. No transmission of DUT1 code.
UTR3	Gorki USSR 56° 11' N 43° 58' E	25	from 5h 43m to 5h 52m from 13h 43m to 13h 52m from 18h 43m to 18h 52m in winter from 7h 43m to 7h 52m from 14h 43m to 14h 52m from 19h 43m to 19h 52m in summer	A1N type 0.1 second pulses of 0.025s duration. Second pulses are prolonged to 0.1s ; 10 second pulses are prolonged to 1s and minute pulses are prolonged to 10s. No transmission of DUT1 code.

Notes : see p. C-11

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
VNG	Lyndhurst Australia 38° 3' S 145° 16' E	4 500 7 500 12 000	9h 45m to 21h 30m continuous except 22h 30m to 22h 45m 21h 45m to 9h 30m	Second markers of 50 cycles of 1 kHz modulation; 5 cycles only for second markers 55 to 58 ; second marker 59 is omitted ; 500 cycles for minute markers. During the 5th, 10th, 15th, etc... minutes, 5 cycles for second markers 50 to 58. Identification by voice announcement during 15th, 30th, 45th and 60th minutes. DUT1 : CCIR code by 45 cycles of 900 Hz modulation immediately following the normal second markers.
WWV	Fort-Collins USA 40° 41' N 105° 2' W	2 500 5 000 10 000 15 000 20 000	continuous	Pulses of 5 cycles of 1 kHz modulation. 59th and 29th second pulses omitted. Hour is identified by 0.8 second long 1 500 Hz tone. Beginning of each minute identified by 0.8 second long 1 000 Hz tone. DUT1 : CCIR code by double pulse. BCD time code given on 100 Hz subcarrier, includes DUT1 correction.
WWVB	Fort-Collins USA 40° 40' N 105° 3' W	60	continuous	Second pulses given by reduction of the amplitude of the carrier. Coded announcement of the date, time, correction to obtain UT1, daylight savings time in effect, and leap year. No CCIR code.
WWVH	Kauai USA 21° 59' N 159° 46' W	2 500 5 000 10 000 15 000	continuous	Pulses of 6 cycles of 1 200 Hz modulation. 59th and 29th second pulses omitted. Hour identified by 0.8 second long 1 500 Hz tone. Beginning of each minute identified by 0.8 second long 1 200 Hz tone. DUT1 : CCIR code by double pulse. BCD time code given on 100 Hz subcarrier, includes DUT1 correction.
YVTO	Caracas Venezuela 10° 30' N 66° 56' W	6 100	continuous	Second pulses of 1 kHz modulation with 0.1s duration. The minute is identified by a 800 Hz tone and a 0.5s duration. Second 30 is omitted. Between seconds 40 and 50 of each minute, voice announcement of the identification of the station. Between seconds 52 and 57 of each minute, voice announcement of hour, minute and second.
Y3S (6)	Nauen Germ. Dem. Rep. 52° 39' N 12° 55' E	4 525	continuous except from 8h 15m to 9h 45m for maintenance if necessary	A1 type second pulses of 0.1s duration. Minute pulses prolonged to 0.5s. DUT1 : CCIR code by double pulse.
ZUO	Olifantsfontein South Africa 25° 58' S 28° 14' E	2 500 5 000	18h to 4h continuous	Pulses of 5 cycles of 1 kHz modulation. Second 0 is prolonged. DUT1 : CCIR code by lengthening.
ZUO	Johannesburg South Africa 26° 11' S 28° 4' E	100 000	continuous	Pulses of 5 cycles of 1 kHz modulation. Second 0 is prolonged. DUT1 : CCIR code by lengthening.

Notes : see p. C-11

NOTES ON THE CHARACTERISTICS OF TIME SIGNALS

(1) No recent information on these time signals.

(2) FTH42, FTK77, FTN87 could be cancelled in 1985.

(3) Changes are to be expected in the modulation system used by GBR outside the time signals. Details are not yet available. Some standard-frequency and phase-tracking receivers may not work without modification . Extended tests may be scheduled at short notice.

(4) OMA, 50 kHz

a. The main transmitter in Liblice radiates approx. 7 kW and the stand-by transmitter in Podebrady approx. 50 W.

b. The details of the time code were published in Nomenclature des stations de radiorepérage et des stations effectuant des services spéciaux - Liste VI, Volume I, édition 7 de U.I.T. in Geneva in July 1980.

(5) The radiostations of the USSR emit UT1 information in accordance with the CCIR code. Furthermore they give an additional information dUT1 specifying more precisely the difference UT1 - UTC down to multiples of 0.02s, the total value of the correction being DUT1 + dUT1. Positive values of dUT1 are transmitted by the marking of p second markers within the range between the 21th an 24th second so that dUT1 = + 0.02s x p. Negative values of dUT1 are transmitted by the marking of q second markers within the range between the 31th and the 34th second, so that dUT1 = - 0.02s x q.

(6) DUT1 information in CCIR code.
dUT1 information. This additional information specifies more precisely the difference UT1 - UTC down to multiples of 0.02s, the total value of the correction being DUT1 + dUT1.

A positive value of dUT1 is indicated by doubling a number (p) of consecutive seconds markers from seconds marker 21 to seconds marker (20 + p) inclusive ; (p) being an integer from 1 to 5 inclusive.

$$dUT1 = p.0.02s.$$

A negative value of dUT1 is indicated by doubling a number (q) of consecutive seconds markers following the minute marker from seconds marker 31 to seconds marker (30 + q) inclusive ; (q) being and integer from 1 to 5 inclusive.

$$dUT1 = -(q.0.02)s.$$

The seconds marker 28 following the minute marker is doubled as parity bit, if the value of (p) or (q) is an even number or if dUT1 = 0.

Time-information. During the last 20 seconds of each minute in a BCD-Code an information about the value "minute" and "hour" in the UTC time scale of the following minute marker is given.

UNCERTAINTY OF THE CARRIER FREQUENCY

The carriers of the following time signals are standard frequencies.

Station	Relative uncertainty of the carrier frequency in 10^{-10}
ATA	0.1
BPM	0.1
BSF	0.2
CHU	0.05
DCF77	0.005
EBC	0.1
GBR	0.02
HBG	0.005
IAM	0.5
IBF	0.1
JJY,JG2 AS	0.1
LOL1	0.1
MSF(60kHz)	0.02
MSF(h.f.)	0.02
OMA(all frequencies)	0.5
RBU,RTZ	0.05
RCH,RID,RTA,RWM	0.5
UNW3,UPD8,UQC3,USB2,UTR3	0.1-0.2
VNG	0.1
WWV	0.1
WWVB	0.1
WWVH	0.1
ZUO	0.1

TIME OF EMISSION OF THE TIME SIGNALS IN THE UTC SYSTEM, IN 1984

The following deviations of the time of emission of time signals, from UTC, have been reported to the BIH, or observed.

ATA	UTC-ATA = -0.0500s
BPM	UTC-BPM = -0.0200s
OLB5	UTC-OLB5= 0.0008s