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Table 8 - Offsets and step adjustments of UTC, until 1974 Dec. 31

Date (at 0h UT)			Offsets	Steps
1961	Jan.	1	-150×10^{-10}	
	Aug.	1	"	+0.050 s
1962	Jan.	1	-130×10^{-10}	
1963	Nov.	1	"	-0.100 s
1964	Jan.	1	-150×10^{-10}	
	April	1	"	-0.100 s
	Sept.	1	"	-0.100 s
1965	Jan.	1	"	-0.100 s
	March	1	"	-0.100 s
	July	1	"	-0.100 s
	Sept.	1	"	-0.100 s
1966	Jan.	1	-300×10^{-10}	
1968	Feb.	1	"	+0.100 s
1972	Jan.	1	0	-0.107 7580 s
	July	1	"	-1 s
1973	Jan.	1	"	-1 s

Table 9 - Relationship between TAI and UTC, until 1974 Dec. 31

Limits of validity (at 0 h UT)	TAI-UTC
1961 Jan. 1 - 1961 Aug. 1	1.422 818 0 s + (MJD - 37 300) × 0.001 296 s
Aug. 1 - 1962 Jan. 1	1.372 818 0 s + "
1962 Jan. 1 - 1963 Nov. 1	1.845 858 0 s + (MJD - 37 665) × 0.001 123 2 s
1963 Nov. 1 - 1964 Jan. 1	1.945 858 0 s + "
1964 Jan. 1 - April 1	3.240 130 0 s + (MJD - 38 761) × 0.001 296 s
April 1 - Sept. 1	3.340 130 0 s + " "
Sept. 1 - 1965 Jan. 1	3.440 130 0 s + " "
1965 Jan. 1 - March 1	3.540 130 0 s + " "
March 1 - July 1	3.640 130 0 s + " "
July 1 - Sept. 1	3.740 130 0 s + " "
Sept. 1 - 1966 Jan. 1	3.840 130 0 s + " "
1966 Jan. 1 - 1968 Feb. 1	4.313 170 0 s + (MJD - 39 126) × 0.002 592 s
1968 Feb. 1 - 1972 Jan. 1	4.213 170 0 s + " "
1972 Jan. 1 - July 1	10.000 000 0 s
July 1 - 1973 Jan. 1	11.000 000 0 s
1973 Jan. 1 - 1974 Jan. 1	12.000 000 0 s
1974 Jan. 1	13.000 000 0 s

Table 10 - Atomic time, collaborating laboratories.

ABREVIATION	LABORATOIRES
ASMW	Amt für Standardisierung, Messwesen und Warenprüfung, Berlin, Deutsche Demokratische Republik.
DHI	Deutsches Hydrographisches Institut, Hamburg, Bundesrepublik Deutschland.
DNM (1)	Division of National Mapping, Canberra, Australia.
F	Commission Nationale de l'Heure, Paris, France.
FOA	Research Institute of National Defence, Stockholm, Sweden.
IEN	Istituto Elettrotecnico Nazionale, Torino, Italia.
IGMA	Instituto Geographico Militar, Buenos Aires, Argentina.
ILOM	International Latitude Observatory, Mizusawa, Japan.
NBS	National Bureau of Standards, Boulder, USA.
NIS	National Institute for Standards, Cairo, U.A.R.
NPL	National Physical Laboratory, Teddington, U.K.
NPRL	National Physical Research Laboratory, Pretoria, South Africa.
NRC	National Research Council of Canada, Ottawa, Canada.
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.
PTB	Physikalisch-Technische Bundesanstalt, Braunschweig, Bundesrepublik Deutschland.
PTCH	Direction générale des PTT, Berne, Suisse.
RGO	Royal Greenwich Observatory, Herstmonceux, U.K.
RRL	Radio Research Laboratories, Tokyo, Japan.
TAO	Tokyo Astronomical Observatory, Tokyo, Japan.
TCL	Telecommunication Laboratories, Taiwan, Rep. of China.
TP (2)	Ústav Radiotechniky a Electroniky, Praha, Československo. Astronomický Ústav, Praha, Československo.
URSS	Laboratoire d'état de l'étalon de temps et de fréquence, URSS.
USNO	U.S. Naval Observatory, Washington, USA.
VSL	Van Swinden Laboratorium, Den Haag, Nederland.
ZIPE	Zentralinstitut Physik der Erde, Potsdam, Deutsche Demokratische Republik.

(1) In the previous Reports, the laboratory was designated by MSO.

(2) Both laboratories cooperate in the derivation of UTC(TP).
Previously, URE was written down instead of TP.

Table 11 - Laboratories keeping an independent local atomic time

Laboratory i	Equipment in atomic standards *	Information on AT(i)-UTC(i)	
F(1)	10 HP Cs st. 1 HP Cs tube with lab. electronics	AT(F)-UTC(OP) is published in Bull. H by OP	
NBS	8 HP Cs St. (2 lab. primary St. not used for AT(NBS))	Limits of validity, MJD, 0h AT(NBS)	AT(NBS)-UTC(NBS)-n sec. (3) in s.
		41683 - 41714	0.045 167 865 2 $-(95.04 \times 10^{-9})$(MJD-41683)
		41714 - 41803	0.045 164 918 96 $-(133.92 \times 10^{-9})$(MJD-41714)
		41803 - 42047	0.045 153 000 $-(129.6 \times 10^{-9})$(MJD-41803)
NRC	3 HP Cs St. 2 lab. primary st. (2)	AT(NRC)-UTC(NRC) = n seconds (3)	
ON	1 E Cs St. 2 HP Cs St.	AT(ON)-UTC(ON) = n seconds (3)	
PTB	6 HP Cs St. 1 lab. primary St. (4)	AT(PTB)-UTC(PTB) is published in PTB Time Service Bull.	
RGO	5 HP Cs.St.	GA2-UTC_G [≡ AT(RGO) - UTC(RGO)] = n seconds (3)	
USNO	32 HP Cs St.(5) 1 Hydrogen Maser	A1(USNO, MEAN) [≡ AT(USNO)] - UTC(USNO,MC) provisional values given in USNO series 7, final values in USNO series 11	

Notes * HP Cs St. = Hewlett-Packard cesium standards 5060A or 5061A,
E Cs St. = Ebauches S.A. cesium standard
The nominal number of standards is given. Except for USNO the number of effectively operating standards is often smaller.

(1) The standards are located as follows : Centre National d'Etudes Spatiales 1, Centre National d'Etudes des Télécommunications 3, Centre d'Etudes et de Recherches Géodynamiques et Astronomiques 1, Observatoires de Paris 4 et de Besançon 1, Laboratoire de Physique et de Métrologie des Oscillateurs 1. They are intercompared by the TV method and linked to the foreign laboratories through OP (see Table 12).

(2 The HP Cs St. are calibrated twice a week against Cs III, one of the two laboratory standards (2.1m) with a 2σ precision of about 1×10^{-12}. The other laboratory standard, still undergoing development during 1973, was used for a more accurate determination of the frequency of AT(NRC).

(3) n = TAI-UTC(integer number of seconds).

(4) AT(PTB) results from a reading of the 6 HP Cs St. considering the comparisons with the primary freq. st. CS1 of PTB. Precautions are taken in order to ensure the best uniformity of the scale. The AT(PTB) second is about 1×10^{-12}s shorter than the CS1 second. UTC(PTB) + 1 h = MEZ (PTB) is called the Official Time Scale (in Central European Time) which is disseminated, e.g., by the LF transmitter DCF77.

(5) 13 of which are equipped with the new "super" tube.

Table 12 - Equipment and links of the collaborating laboratories

Laboratory (i)	Equipment (1)	Source of UTC(i)	LORAN-C receptions	VLF and LF receptions	Television link with
DHI	1 HP Cs St.	Cs St.	Sylt (Norw.S.)	DCF77	PTB, TP, ZIPE
DNM	3 HP Cs St.	1 Cs St.		NLK, NWC	other laboratories in Australia
FOA	2 HP Cs St.	mean of 2 Cs St.	Sylt (Norw.S.)	GBR, NAA, OMEGA Haiku	other laboratories in Sweden
IEN	4 HP Cs St.	3 Cs St.	Sylt (Norw.S.) Estartit (Med.S.) Simeri Crichi (Med.S.)	GBR, NAA, MSF60, OMEGA (Aldra, Trinidad North Dakota)	other laboratories in Italy
IGMA	1 E Cs St.	Cs St.		OMEGA Trinidad (until 20 Aug.73) NLK, NAA, GBR	ONBA
ILOM	1 HP Cs St.	Cs St.	Iwo-Jima(NW Pac.)		RRL
NBS	see Table 11	All the Cs St.	Dana (East Coast)	NLK, WWVB OMEGA(13.1 kHz)	NRC, USNO
NPL	5 HP Cs St. 1 lab. Cs St. 2 Hydro. Mas.	1 Cs S.	Sylt (Norw.S.)	GBR, MSF60	transmitting station in Rugby
NPRL	1 HP Cs St.	Cs St.		GBR, NAA, NWC	
NRC	see Table 11	All the Cs St.	Nantucket (East Coast)		USNO, NBS
OMSF	2 E Cs St.	1 Cs St.	Estartit (Med.S.)	NAA	
ON	see Table 11	All the Cs St.	Sylt (Norw.S.) Estartit (Med.S.)		
ONBA	2 Cs St.	2 Cs St.		NAA OMEGA Trinidad	
OP	4 HP Cs St.	1 Cs St.	Sylt (Norw.S.) Estartit (Med.S.)		other laboratories in France
ORB	1 HP Cs St.	1 Cs St.	Sylt (Norw.S.)		
PTB	see Table 11		Sylt (Norw.S.)	GBR, NAA	DHI, TP
PTCH	1 E Cs St.	Cs St.	Sylt (Norw.S.)		

Table 12 - (cont.)

Laboratory i	Equipment (1)	Source of UTC(i)	LORAN-C receptions	VLF and LF receptions	Television link with
RGO	see Table 11	Selection of the Cs St.	Sylt (Norw.S.) Ejde (Norw.S.) Estartit (Med.S.)	GBR, MSF60 OMEGA Trinidad OMEGA Aldra	
RRL	several HP Cs St. 2 Hydrogen Masers	1 Cs St.	Iwo-Jima (NW Pac.)	NLK	TAO, ILOM
TAO	3 HP Cs St.	1 Cs St.	Iwo-Jima (NW Pac.)	NLK, NWC	ILOM, RRL
TCL	2 HP Cs St.	All the Cs St.	Iwo-Jima (NW Pac.) Tan-My (SE Asia)	NDT, NWC	
TP	1 HP Cs St.	Cs St.		GBR, NAA	DHI, PTB, ZIPE
URSS	Hydrogen Masers			RBW, GBR, OMA NAA	
USNO	see Table 11	Cs St.	(2)	(2)	NRC
VSL	1 Hp Cs St.	Cs St.	Sylt(Norw.S.)	DCF77	other laboratories in Holland

Notes

(1) HP Cs St. = Hewlett-Packard cesium standards 5060A or 5061A.

E Cs St. = Ebauches S.A. cesium standard

(2) The daily phase values Series 4 of the **USNO** give the values of UTC(USNO MC)-trasmitting station for :

the LORAN-C chains NW Pacific, Central Pacific, East Coast U.S.A., Norwegian Sea, Mediterranean Sea, North Atlantic, Southeast Asia and North Pacific

the LORAN-D West Coast, U.S.A.

the OMEGA stations ND (10.2, 13.1, 13.6 kHz),
T (13.6 kHz)

the VLF stations GBR, NAA, NLK, NBA.

TABLE 13 - TIME COMPARISONS BETWEEN LABORATORIES BY CLOCK TRANSPORTATION IN 1973 (FOR ABBREVIATIONS, SEE P. B-24).

DATE		MJD	TIME COMPARISONS			AUTHORITY
1973			(UNIT : 1 MICROSECOND)			
JAN	23	41705.6	UTC(USNO) - UTC(NPRL) =	2.3 ±	0.5	USNO DPV 318
JAN	24	41706.8	UTC(USNO) - UTC(NBS) =	-0.2	0.2	USNO DPV 314 (1)
FEB	8	41721.1	UTC(USNO) - UTC(CSIR) =	-38.2	0.5	USNO DPV 318 (2)
FEB	27	41740.0	UTC(ILOM) - UTC(RRL) =	23.0	0.2	LETTER FROM ILOM
MAR	1	41742.9	UTC(USNO) - UTC(IGMA) =	468.1	0.5	LETTER FROM USNO
APR	20	41792.2	UTC(USNO) - UTC(TCL) =	21.6	0.7	USNO DPV 331
APR	27	41799.3	UTC(USNO) - UTC(RRL) =	-2.5	0.5	USNO DPV 331
APR	27	41799.3	UTC(USNO) - UTC(TAO) =	14.8	0.5	USNO DPV 331
MAY	7	41809.3	UTC(USNO) - UTC(OP) =	-6.4	0.2	USNO DPV 328
MAY	8	41810.2	UTC(USNO) - UTC(ORB) =	-13.7	0.3	USNO DPV 328
MAY	11	41813.2	UTC(USNO) - UTC(DHI) =	-1.8	0.2	USNO DPV 328
MAY	14	41816.4	UTC(USNO) - UTC(NPL) =	-27.2	0.2	USNO DPV 328
MAY	15	41817.4	UTC(USNO) - UTC(RGO) =	15.9	0.2	USNO DPV 328
JUN	25	41858.3	UTC(USNO) - UTC(IEN) =	-5.7	0.2	USNO DPV 337
JUL	2	41865.9	UTC(NBS) - UTC(USNO) =	2.6	0.1	LETTER FROM NBS
JUL	6	41869.5	UTC(NBS) - UTC(OP) =	-3.1	0.2	LETTER FROM NBS
JUL	16	41879.2	UTC(NBS) - UTC(OP) =	-2.7	0.2	LETTER FROM NBS
JUL	16	41879.8	UTC(NBS) - UTC(USNO) =	2.7	0.1	LETTER FROM NBS
SEP	17	41942.3	UTC(USNO) - UTC(NPL) =	-30.7	0.2	USNO DPV 349
SEP	17	41942.6	UTC(USNO) - UTC(RGO) =	21.2	0.2	USNO DPV 349
SEP	26	41951.7	UTC(USNO) - UTC(OP) =	-4.7	0.2	USNO DPV 349
OCT	2	41957.2	UTC(USNO) - UTC(RRL) =	-4.5	0.2	USNO DPV 352
OCT	2	41957.2	UTC(USNO) - UTC(TAO) =	18.1	0.2	USNO DPV 352
OCT	24	41979.5	UTC(OP) - UTC(VSL) =	7.2	0.1	FROM OP AND BIH
NOV	21	42007.4	UTC(OP) - UTC(ZIPE) =	3.0	0.1	FROM OP AND BIH
NOV	21	42007.6	UTC(OP) - UTC(ASMW) =	-6.9	0.1	FROM OP AND BIH
NOV	23	42009.6	UTC(OP) - UTC(PTB) =	2.8	0.1	FROM OP AND BIH
DEC	7	42023.0	UTC(USNO) - UTC(DNM) =	93.3	0.2	USNO DPV 364
DEC	7	42023.8	UTC(USNO) - UTC(APO) =	25.5	0.2	USNO DPV 364 (3)
DEC	12	42028.6	UTC(OP) - UTC(TP) =	-15.4	0.1	FROM OP AND BIH
DEC	16	42032.1	UTC(USNO) - UTC(CSIR) =	24.0	0.2	USNO DPV 364 (2)

(1) UTC(USNO) IS WRITTEN INSTEAD OF UTC(USNO MC)
DPV:DAILY PHASE VALUES,SERIES 4,PUBLISHED BY USNO

(2) CSIR IS AN ABBREVIATION INSTEAD OF CSIRO : COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION,AUSTRALIA

(3) APO:AUSTRALIAN POST OFFICE,RESEARCH LABORATORIES,MELBOURNE,AUSTRALIA

TABLE 14 - INDEPENDENT ATOMIC TIMES

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

UNIT IS ONE MICROSECOND

DATE 1973	MJD	TAI - AT(I)						
		F	NBS (1)	NRC	ON	PTB	RGO	USNO
JAN 7	41689	-59.8	-45169.1	1.0	20.0	-370.4	12.9	-34399.4
JAN 17	41699	-59.9	-45167.8	0.8	19.7	-370.1	13.3	-34399.4
JAN 27	41709	-60.0	-45166.9	1.0	19.5	-370.0	13.7	-34399.4
FEB 6	41719	-60.1	-45165.8	1.1	19.2	-369.9	13.9	-34399.4
FEB 16	41729	-60.0	-45164.5	1.0	19.1	-369.6	14.2	-34399.3
FEB 26	41739	-60.1	-45163.2	1.2	19.0	-369.4	14.5	-34399.4
MAR 8	41749	-59.8	-45162.0	1.2	19.0	-369.0	15.0	-34399.6
MAR 18	41759	-60.0	-45160.5	1.3	18.8	-368.9	15.2	-34399.4
MAR 28	41769	-59.9	-45159.3	1.2	18.7	-368.7	15.8	-34399.5
APR 7	41779	-59.8	-45158.1	1.2	18.8	-368.4	16.1	-34399.6
APR 17	41789	-60.2	-45156.6	1.7	18.6	-368.5	16.1	-34399.5
APR 27	41799	-60.1	-45155.5	1.4	18.7	-368.2	16.7	-34399.6
MAY 7	41809	-60.1	-45154.1	1.5	18.7	-368.1	17.2	-34399.7
MAY 17	41819	-60.1	-45153.0	1.5	18.7	-367.8	17.6	-34399.8
MAY 27	41829	-60.3	-45151.7	1.7	18.5	-367.8	17.9	-34399.6
JUN 6	41839	-60.4	-45150.0	1.6	18.4	-367.7	18.2	-34399.7
JUN 16	41849	-60.4	-45149.0	1.5	18.4	-367.5	18.8	-34399.7
JUN 26	41859	-60.4	-45147.7	1.5	18.7	-367.3	19.2	-34399.7
JUL 6	41869	-60.4	-45146.7	1.7	18.6	-367.2	19.9	-34399.7
JUL 16	41879	-60.5	-45145.7	2.0	18.3	-367.2	20.3	-34399.6
JUL 26	41889	-60.3	-45144.8	2.0	18.4	-366.8	20.9	-34399.7
AUG 5	41899	-60.3	-45143.7	1.8	18.4	-366.6	21.3	-34399.8
AUG 15	41909	-60.2	-45142.5	1.6	18.5	-366.4	21.6	-34399.8
AUG 25	41919	-60.1	-45141.4	1.5	18.3	-366.3	21.8	-34399.7
SEP 4	41929	-60.2	-45140.3	1.0	17.9	-366.4	22.1	-34399.7
SEP 14	41939	-60.2	-45139.2	0.6	17.8	-366.3	22.3	-34399.6
SEP 24	41949	-60.2	-45138.2	-0.1	17.8	-366.2	22.7	-34399.6
OCT 4	41959	-60.2	-45137.0	-0.6	18.1	-366.0	23.2	-34399.7
OCT 14	41969	-60.2	-45135.8	-1.0	18.1	-366.0	23.4	-34399.6
OCT 24	41979	-60.2	-45134.6	-1.4	18.3	-365.7	24.0	-34399.7
NOV 3	41989	-60.2	-45133.3	-1.3	18.5	-365.5	24.4	-34399.8
NOV 13	41999	-60.5	-45131.9	-1.4	18.3	-365.6	24.6	-34399.6
NOV 23	42009	-60.6	-45130.8	-1.4	18.4	-365.5	24.9	-34399.5
DEC 3	42019	-60.7	-45129.5	-1.3	18.5	-365.4	25.1	-34399.4
DEC 13	42029	-60.9	-45128.3	-1.4	18.5	-365.4	25.2	-34399.3
DEC 23	42039	-60.8	-45127.4	-1.1	18.9	-365.1	25.7	-34399.6

(1) NBS On 1973 January 7, a time step of +1.7 μs was applied to UTC - UTC(NBS) in order to ensure a better agreement with the clock transportations between USNO and NBS.

TABLE 15 - COORDINATED UNIVERSAL TIME

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

UNIT IS ONE MICROSECOND

DATE 1973	MJD	UTC - UTC(I) ASMW	DHI (1)	FOA	IEN	ILOM (2)	NBS (3)	NPL
JAN 7	41689		5.2	55.0	-3.6	-31.4	-1.8	-21.3
JAN 17	41699	-7.5	5.9	56.1	-3.9	-31.3	-1.5	-21.9
JAN 27	41709	-8.6	5.9	57.1	-4.0	-29.0	-1.5	-22.4
FEB 6	41719	-7.7	5.6	57.3	-4.4	-27.7	-1.5	-23.0
FEB 16	41729	-8.1	5.3	57.4	-4.3	-26.7	-1.6	-23.3
FEB 26	41739	-8.5	5.1	57.5	-4.7	-25.1	-1.6	-23.7
MAR 8	41749	-7.9	4.5	57.5	-4.7	-23.6	-1.8	-24.0
MAR 18	41759	-7.7	3.7	57.3	-5.0	-22.0	-1.6	-24.6
MAR 28	41769	-7.6	2.9	57.2	-4.9	-20.4	-1.8	-25.0
APR 7	41779	-7.7	2.3	56.8	-5.0	-19.6	-1.9	-25.4
APR 17	41789	-7.8	0.9	56.3	-5.3	-18.5	-1.8	-26.0
APR 27	41799	-8.1	-0.4	56.0	-5.7	-17.8	-2.0	-26.2
MAY 7	41809	-7.9	-1.3	55.6	-5.9	-16.7	-1.8	-26.6
MAY 17	41819	-7.7	-2.0	55.2	-5.5	-16.3	-2.1	-27.0
MAY 27	41829	-8.6	-3.0	54.2	-5.5	-15.2	-2.1	-27.6
JUN 6	41839	-8.4	-1.6	53.2	-5.1	-14.7	-1.7	-28.0
JUN 16	41849	-8.6	-0.9	52.6	-5.1	-13.6	-2.0	-28.2
JUN 26	41859	-8.7	-0.4	51.8	-5.2	-12.7	-2.0	-28.4
JUL 6	41869	-8.6	-3.0	51.1	-5.1	-11.7	-2.2	-28.7
JUL 16	41879	-8.0		50.4	-5.1	-10.6	-2.6	-29.1
JUL 26	41889	-7.8		50.0	-5.1	-9.7	-3.0	-29.2
AUG 5	41899	-8.2		49.5	-5.2	-10.2	-3.1	-29.5
AUG 15	41909	-8.7		49.0	-5.1	-11.8	-3.2	-29.7
AUG 25	41919	-9.5		48.6	-5.1	-12.8	-3.5	-30.0
SEP 4	41929	-9.9		47.9	-4.9	-13.5	-3.6	-30.4
SEP 14	41939	-10.6		47.4	-4.5	-14.2	-3.8	-30.7
SEP 24	41949	-10.4		46.8	-4.5	-14.9	-4.1	-31.0
OCT 4	41959	-10.6		46.4	-4.1	-15.9	-4.2	-31.1
OCT 14	41969	-11.2		45.9	-4.1	-16.9	-4.3	-31.5
OCT 24	41979	-10.6		46.1	-4.1	-14.2	-4.4	-31.8
NOV 3	41989	-10.2		45.8	-4.3	-15.0	-4.4	-32.1
NOV 13	41999	-9.9		45.0	-4.9	-15.4	-4.4	-32.6
NOV 23	42009	-9.3		44.2	-5.3	-16.0	-4.5	-33.0
DEC 3	42019	-9.3		43.5	-6.0	-16.6	-4.5	-33.4
DEC 13	42029	-9.1		42.7	-6.7	-17.2	-4.6	-33.8
DEC 23	42039	-9.2	-4.5	42.4	-7.0	-18.3	-4.9	-33.8

TABLE 15 - (CONT.)

UNIT IS ONE MICROSECOND

DATE 1973	MJD	UTC - UTC(I) RGO	RRL (2)	TAO (2)	TCL (2) (6)	TP	USNO	VSL
JAN 7	41689	12.9	-2.9	9.0	12.9		-1.0	
JAN 17	41699	13.3	-2.8	9.2	14.3	-9.8	-1.0	
JAN 27	41709	13.7	-2.5	10.0	15.5	-10.9	-0.8	
FEB 6	41719	13.9	-2.3	10.6	16.6	-11.2	-0.9	
FEB 16	41729	14.2	-1.6	11.6	17.2	-11.2	-0.6	
FEB 26	41739	14.5	-2.0	11.6	17.5	-11.6	-0.5	
MAR 8	41749	15.0	-2.0	12.0	18.4	-11.8	-0.5	
MAR 18	41759	15.2	-1.8	12.9	19.2	-12.0	-0.3	
MAR 28	41769	15.8	-1.7	13.6	20.0	-12.2	-0.3	
APR 7	41779	16.1	-2.1	13.8	20.4	-12.4	-0.4	-21.6
APR 17	41789	16.1	-1.9	14.7	21.4	-12.7	-0.1	-21.2
APR 27	41799	16.7	-2.2	15.1	22.0	-13.4	-0.2	-20.0
MAY 7	41809	17.2	-2.1	15.8	22.7	-13.5	-0.1	-19.1
MAY 17	41819	17.6	-2.4	15.8	22.8	-12.5	-0.1	-17.5
MAY 27	41829	17.9	-2.4	16.1	23.3	-14.5	0.0	-16.2
JUN 6	41839	18.2	-2.5	16.4	23.6	-14.4	-0.1	-15.2
JUN 16	41849	18.8	-2.5	16.6	24.4	-14.1	0.1	-13.7
JUN 26	41859	19.2	-3.0	16.6	24.8	-14.6	0.2	-12.0
JUL 6	41869	19.9	-3.3	16.8	25.3	-14.4	0.1	-10.4
JUL 16	41879	20.3	-3.8	16.8	25.6	-15.0	0.1	-8.6
JUL 26	41889	20.9	-4.5	16.2	25.4	-15.1	-0.1	-7.0
AUG 5	41899	21.3	-5.1	15.8	25.5	-14.9	-0.2	-5.7
AUG 15	41909	21.6	-6.0	15.4	25.7	-14.9	-0.2	-4.2
AUG 25	41919	21.8	-6.7	15.2	25.7	-15.0	-0.2	-3.1
SEP 4	41929	22.1	-7.1	15.1	26.1	-15.3	-0.1	-2.2
SEP 14	41939	22.3	-7.7	15.0	26.4	-15.1	0.1	-0.7
SEP 24	41949	22.7	-8.3	14.6	26.8	-15.2	0.1	0.9
OCT 4	41959	23.2	-9.2	13.8	26.8	-15.3	0.0	2.7
OCT 14	41969	23.4	-9.9	13.4	26.8	-15.4	0.1	3.5
OCT 24	41979	24.0	-6.8	16.7	30.9	-15.5	0.0	4.2
NOV 3	41989	24.4	-7.1	16.4	31.4	-15.7	-0.1	5.0
NOV 13	41999	24.6	-7.4	17.0	32.0	-16.6	0.0	5.4
NOV 23	42009	24.9	-7.6	17.1	32.4	-17.1	0.1	5.9
DEC 3	42019	25.1	-7.9	17.4	32.9	-16.9	0.2	6.5
DEC 13	42029	25.2	-8.3	17.7	33.5	-17.6	0.3	6.9
DEC 23	42039	25.7	-8.5	17.4	33.6	-18.6	0.1	7.7

TABLE 15 - (CONT.)

UNIT IS ONE MICROSECOND

DATE 1973		MJD	UTC - UTC(I)						
			NRC	OMSF (4)	ON	OP	ORB	PTB	PTCH (5)
JAN	7	41689	1.0	-1.0	20.0	5.2		3.2	-2.5
JAN	17	41699	0.8	0.0	19.7	5.3	74.5	3.2	-1.6
JAN	27	41709	1.0	1.0	19.5	5.3	64.7	3.0	-1.2
FEB	6	41719	1.1	2.2	19.2	4.8	56.6	2.7	-0.6
FEB	16	41729	1.0	3.3	19.1	3.7	48.4	2.7	0.0
FEB	26	41739	1.2	5.6	19.0	2.5	40.9	2.6	1.2
MAR	8	41749	1.2	7.8	19.0	1.6	33.6	2.6	2.6
MAR	18	41759	1.3	8.7	18.8	0.3	25.7	2.3	3.7
MAR	28	41769	1.2	9.2	18.7	-0.7	18.0	2.2	4.6
APR	7	41779	1.2	-11.5	18.8	-1.9	10.5	2.1	5.8
APR	17	41789	1.7	-9.1	18.6	-3.5	2.2	1.7	7.0
APR	27	41799	1.4	-6.6	18.7	-4.5	-5.3	1.6	8.9
MAY	7	41809	1.5	-4.5	18.7	-5.2	-12.9	1.4	9.4
MAY	17	41819	1.5	-2.1	18.7	-5.0	-20.3	1.3	9.3
MAY	27	41829	1.7	-0.5	18.5	-5.2	-27.9	1.0	13.3
JUN	6	41839	1.6	2.3	18.4	-5.1	-34.4	0.8	17.2
JUN	16	41849	1.5	5.7	18.4	-5.0	-43.0	0.6	19.5
JUN	26	41859	1.5	9.3	18.7	-4.8	-51.0	0.4	19.9
JUL	6	41869	1.7	12.5	18.6	-4.7	-59.3	0.2	19.6
JUL	16	41879	2.0	15.0	18.3	-4.6	-67.5	-0.1	19.8
JUL	26	41889	2.0	18.0	18.4	-4.3	-75.5	-0.2	21.4
AUG	5	41899	1.8	21.0	18.4	-4.2	-83.1	-0.3	24.1
AUG	15	41909	1.6	24.3	18.5	-4.0	-90.4	-0.4	23.7
AUG	25	41919	1.5	27.5	18.3	-3.8	-98.9	-0.7	21.5
SEP	4	41929	1.0	30.6	17.9	-3.7	-106.8	-1.0	19.0
SEP	14	41939	0.6	34.0	17.8	-3.6	-115.4	-1.0	16.9
SEP	24	41949	-0.1	37.3	17.8	-3.5	-123.3	-0.9	14.9
OCT	4	41959	-0.6	41.5	18.1	-3.3	-131.6	-0.7	13.0
OCT	14	41969	-1.0	45.4	18.1	-3.3	-140.2	-0.8	11.0
OCT	24	41979	-1.4	49.1	18.3	-2.9	-148.1	-0.6	9.0
NOV	3	41989	-1.3	52.3	18.5	-2.7	-157.0	-0.4	6.8
NOV	13	41999	-1.4	55.5	18.3	-2.7	-165.5	-0.5	4.4
NOV	23	42009	-1.4	58.9	18.4	-2.6	-174.2	-0.4	2.1
DEC	3	42019	-1.3	62.4	18.5	-2.4	-182.9	-0.4	0.0
DEC	13	42029	-1.4	66.4	18.5	-2.2	-191.4	-0.4	-1.3
DEC	23	42039	-1.1	70.1	18.9	-1.8	-199.7	-0.3	-1.9

TABLE 15 - (CONT.)

NOTES

(1) DHI Crystal clock from MJD = 41 879 to MJD = 42 029.

(2) ILOM, RRL, TAO, TCL Uncertainty of ± 5 μs due to the lack of permanent synchronization of the Northwest Pacific LORAN-C chain with UTC(USNO).

(3) NBS On 1973 Jan. 7, a time step of + 1.7 μs was applied to UTC-UTC(NBS) in order to ensure a better agreement with the clock transportations between USNO and NBS.

(4) OMSF On 1973 April 4, change of master clock.

(5) PTCH The origin of UTC-UTC(PTCH) is not known ; we took arbitrarily UTC-UTC(PTCH) = 0 on 1972 Nov. 18.

(6) TCL The values of UTC-UTC(TCL) given in the Annual Report for 1972 must be corrected by addition of -10.1 μs.

TABLE 16 - COORDINATED UNIVERSAL TIME (FROM VLF MEASUREMENTS)

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

UNIT IS ONE MICROSECOND

DATE 1973		MJD			UTC - UTC(I)	
			DNM	IGMA	NPRL (1)	URSS (2)
JAN	7	41689	429	488	1	-20
JAN	17	41699	432	484	1	-23
JAN	27	41709	434	480	-1	-24
FEB	6	41719	444	476	-1	-24
FEB	16	41729	448	472	-2	-29
FEB	26	41739	461	469	-1	-22
MAR	8	41749	468	465	1	-15
MAR	18	41759	470	460	3	-13
MAR	28	41769	472	458	4	-14
APR	7	41779	471	455	0*	-12
APR	17	41789	474	453	0	-12
APR	27	41799	477	449	3	-10
MAY	7	41809	473	447	4	-9
MAY	17	41819	472	445	5	-6
MAY	27	41829		444	6	-3
JUN	6	41839		443	7	-1
JUN	16	41849		441	10	1
JUN	26	41859		440	10	2
JUL	6	41869	66	439	8	1
JUL	16	41879	67	439	6	3
JUL	26	41889	69	438	-2	4
AUG	5	41899	70	436	0*	7
AUG	15	41909	71	435	-2	10
AUG	25	41919	71	432	-1	11
SEP	4	41929	73	433	0	11
SEP	14	41939	74	432	1	10
SEP	24	41949	75	430	-4	9
OCT	4	41959	76	428	0*	13
OCT	14	41969	76	428	0	12
OCT	24	41979	78	427	5	9
NOV	3	41989	85	432	15	9
NOV	13	41999	89	434	24	12
NOV	23	42009	90	435	33	9
DEC	3	42019	93	435	45	6
DEC	13	42029	95	434	60	7
DEC	23	42039	96	436	81	7

(1) NPRL. * denotes arbitrary origins

(2) URSS. Arbitrary origin : UTC-UTC(URSS) = 0 for MJD = 41549

Table 17 - Coordinated Universal Time, complementary values of UTC-UTC(i)

Laboratory	Time scale		Date	UTC-UTC(i) (μ s)	Remarks
Australian Post Office, Research Laboratories, Melbourne, Australia	UTC(APO)	(1)	1973 Dec.7	+ 25.7	USNO clock transportation
CSIRO National Standards Lab. University of Sydney, Sydney, Australia	UTC(CSIRO)	(2)	1973 Feb. 8	- 39.0	"
			1973 Dec.16	+ 24.3	"
Zentralinstitut Physik der Erde, Potsdam, D.D.R.	UTC(ZIPE)		1973 Jan.17	+ 4.3	Data obtained by LORAN-C Receptions
			Feb.16	+ 4.4	
			March 18	+ 4.3	
			April 17	+ 3.5	
			May 17	+ 3.9	
			June 16	+ 3.5	
			July 16	+ 3.0	
			Aug. 15	+ 2.6	
			Sept.14	+ 1.4	
			Oct. 14	+ 1.0	
			Nov. 13	+ 0.7	
			Dec. 13	+ 0.4	

(1) UTC(APO) ≡ UTC (PMG APO2)
(2) UTC(CSIRO) ≡ UTC((CSIRO CS201)

Table 18 - Comparisons between the clock transportations and the LORAN-C or VLF links.

The table gives the differences between the clock transportation results and those obtained by LORAN-C or VLF for some pairs of laboratories. The clock transportations used to fix the origins are denoted by *.

This table is following on the Table 19 of the annual Report for 1972.

Time comparisons		Date	MJD	Difference in μ s clock tr. - LORAN-C or VLF
UTC (USNO) -	UTC (DHI)	1973 May 11	41813.2	- 0.3
	UTC (IEN)	1973 June 25	41858.3	- 0.3
	UTC (NBS)	1973 Jan. 24	41706.8	+ 0.4
		July 2	41865.9	- 0.3
		July 16	41879.8	0.0
	UTC (NPL)	1973 May 14	41816.4	- 0.4
		Sept. 17	41942.3	+ 0.2
	UTC (OP)	1973 May 7	41809.3	- 1.3
		Sept. 26	41951.7	- 1.2
	UTC (RGO)	1973 May 15	41817.4	- 1.7
		Sept. 17	41942.6	- 1.2
	UTC (RRL)	1973 Apr. 27	41799.3	- 0.5
		Oct. 2	41957.2	+ 4.6
	UTC (TAO)	1973 Apr. 27	41799.3	- 0.5
		Oct. 2	41957.2	+ 4.2
UTC (OP) -	UTC (DHI)	1973 May 11	41813.2	+ 1.1
	UTC (NBS)	1973 July 6	41869.5	+ 0.7
		July 16	41879.2	+ 0.7
	UTC (NPL)	1973 May 14	41816.4	+ 0.8
		Sept. 17	41942.3	+ 1.3
	UTC (PTB)	1973 Nov. 23	42009.6	+ 0.7
	UTC (RGO)	1973 May 15	41817.4	- 0.5
		Sept. 17	41942.6	0.0
UTC (RRL) -	UTC (TAO)	1973 Apr. 27	41799.3	0.0
		Oct. 2	41957.2	- 0.4

TABLE 21 - INTERNATIONAL ATOMIC TIME , WEIGHTS OF THE CLOCKS FOR 1972

THE WEIGHTS ARE GIVEN FOR INTERVALS OF TWO MONTHS ENDING AT THE GIVEN DATES

*** DENOTES THAT THE CLOCK WAS NOT USED

LAB.	CLOCK	41379	41439	41499	41559	41619	41679
F	12 133	100	100	11	19	10	0
F	12 134	100	100	89	93	19	22
F	12 158	100	100	83	***	***	***
F	12 195	100	100	100	55	77	43
F	12 206	100	59	100	100	77	81
F	12 207	100	100	18	9	14	18
F	12 347	***	***	***	0	100	100
F	12 439	100	96	5	***	0	0
F	12 475	***	0	***	***	***	***
F	99 2	100	0	0	***	***	0
FOA	11 55	***	0	73	0	0	0
FOA	11 200	***	0	33	30	50	51
NBS	11 121	100	0	1	1	2	2
NBS	11 137	100	13	18	25	37	21
NBS	11 157	100	100	35	49	0	0
NBS	11 167	100	100	85	65	90	31
NBS	11 169	100	32	5	8	0	10
NBS	12 323	100	100	100	89	79	41
NBS	12 324	100	100	100	31	46	46
NBS	12 352	100	***	0	100	52	***
NPL	11 334	0	36	11	7	10	11
NPL	12 316	0	***	***	***	0	***
NPL	12 418	0	56	79	99	100	100
NRC	11 139	100	100	0	0	0	***
NRC	11 217	***	***	0	98	30	22
NRC	12 122	100	100	97	80	53	72
OMSF	13 16	***	0	0	0	0	0
ON	11 173	100	100	91	100	74	55
ON	12 285	100	100	100	22	28	36
ON	13 14	100	100	100	100	100	69
PTB	12 144	100	100	100	100	58	48
PTB	12 320	100	84	59	25	35	***
PTB	12 389	***	0	100	100	100	87
PTB	12 394	***	0	19	36	50	74
PTB	12 395	100	100	100	100	100	100
PTB	12 462	100	50	54	***	0	75
RGO	11 123	***	***	***	***	***	0
RGO	11 199	100	21	8	3	***	***
RGO	12 202	100	***	***	0	100	91
RGO	12 348	100	99	100	100	100	100
RGO	12 484	***	***	0	100	100	100
USNO	11 207	100	7	15	15	23	0
USNO	11 222	100	15	***	***	***	***
USNO	11 265	100	100	71	23	32	30
USNO	11 276	100	100	100	100	100	83

TABLE 21 - (CONT.)

LAB.	CLOCK	41379	41439	41499	41559	41619	41679
USNO	12 147	100	100	55	45	66	65
USNO	12 330	100	25	6	6	7	***
USNO	12 345	***	0	57	49	***	***
USNO	12 346	***	0	100	100	100	100
USNO	12 351	100	74	38	9	***	***
USNO	12 353	100	45	***	***	***	***
USNO	12 405	100	17	39	61	86	100
USNO	12 421	100	10	***	***	***	***
USNO	12 426	100	***	***	***	***	***
USNO	12 430	100	100	13	5	7	10
USNO	12 436	100	50	99	100	***	***
USNO	12 444	100	81	56	70	84	100
USNO	12 496	***	0	86	***	***	***
USNO	12 497	***	***	0	13	29	50
USNO	12 519	***	***	***	***	0	15
USNO	12 530	***	***	***	0	***	***
USNO	12 532	***	***	***	***	0	18
USNO	12 533	***	***	***	0	100	100
USNO	12 543	***	***	***	***	0	8
USNO	12 547	***	***	***	***	0	***
USNO	12 549	***	***	***	***	0	99
USNO	12 577	***	***	***	***	***	0
USNO	14 571	***	***	***	***	***	0

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

11 HEWLETT-PACKARD 5060A   12 HEWLETT-PACKARD 5061A

13 EBAUCHES OSCILLATOM.   14 HEWLETT-PACKARD 5061A , OPTION 4

99 PROTOTYPE (HEWLETT-PACKARD TUBE)

TABLE 22 - INTERNATIONAL ATOMIC TIME , WEIGHTS OF THE CLOCKS FOR 1973

THE WEIGHTS ARE GIVEN FOR INTERVALS OF TWO MONTHS ENDING AT THE GIVEN DATES

*** DENOTES THAT THE CLOCK WAS NOT USED

LAB.	CLOCK	41739	41799	41859	41919	41979	42039
F	12 133	0	0	0	0	0	0
F	12 134	19	19	15	12	60	31
F	12 158	***	0	100	100	100	100
F	12 195	54	71	100	***	***	***
F	12 206	56	76	100	90	72	34
F	12 207	24	19	9	11	9	***
F	12 347	89	100	100	99	100	75
F	12 439	***	0	97	6	5	6
F	12 475	***	0	100	10	15	13
F	12 594	***	***	***	***	0	100
F	99 2	8	10	10	9	0	0
FOA	11 55	0	0	0	0	0	1
FOA	11 200	56	42	16	12	12	11
NBS	11 121	0	0	0	0	0	***
NBS	11 157	4	3	3	3	24	***
NBS	11 167	40	56	54	47	68	100
NBS	11 169	0	2	0	2	3	5
NBS	12 323	44	48	57	38	76	38
NBS	12 324	48	49	39	61	61	99
NBS	12 352	***	0	100	19	27	40
NBS	12 601	***	0	71	***	0	100
NPL	11 134	***	***	***	***	0	100
NPL	11 334	26	93	72	100	54	54
NPL	12 316	0	16	13	13	17	24
NPL	12 418	100	100	100	95	100	100
NRC	11 217	10	10	***	***	***	***
NRC	12 122	76	64	17	0	2	0
NRC	12 267	0	56	98	100	87	95
OMSF	13 16	0	***	***	***	***	***
OMSF	13 17	0	17	5	3	0	2
ON	11 173	69	74	31	13	15	12
ON	12 285	42	90	100	100	100	100
ON	13 14	0	2	2	3	6	46
ORB	11 491	***	***	***	0	11	6
PTB	12 144	60	79	100	81	77	73
PTB	12 320	***	***	0	100	57	36
PTB	12 389	100	100	100	100	100	97
PTB	12 394	92	100	100	100	95	51
PTB	12 395	100	100	100	88	100	100
PTB	12 462	12	***	***	***	***	0
PTCH	13 23	***	***	***	***	0	48
RGO	11 123	35	***	***	***	***	***
RGO	11 199	0	54	28	***	0	86
RGO	12 202	96	71	68	71	89	52
RGO	12 348	100	100	***	***	***	0

TABLE 22 - (CONT.)

LAB.	CLOCK	41739	41799	41859	41919	41979	42039
RGO	12 484	100	100	100	90	60	67
TP	12 335	***	***	***	***	0	8
USNO	11 207	7	4	0	8	***	***
USNO	11 265	25	26	17	24	24	***
USNO	11 276	81	74	22	16	15	10
USNO	12 147	59	50	48	66	64	70
USNO	12 345	***	***	0	97	43	6
USNO	12 346	100	72	52	43	48	61
USNO	12 405	79	100	30	32	28	29
USNO	12 408	0	99	8	6	***	***
USNO	12 430	10	9	9	21	***	***
USNO	12 444	97	100	100	96	100	97
USNO	12 497	73	99	100	98	100	100
USNO	12 511	0	100	***	***	***	***
USNO	12 519	35	***	***	***	***	***
USNO	12 532	23	28	36	45	45	100
USNO	12 533	86	100	19	28	***	***
USNO	12 543	19	31	13	12	***	***
USNO	12 549	83	77	97	82	88	85
USNO	12 563	***	***	***	0	96	***
USNO	12 573	***	***	***	0	79	23
USNO	12 577	13	27	35	46	60	86
USNO	12 583	***	***	0	4	5	***
USNO	12 591	0	23	34	25	23	29
USNO	12 592	0	100	96	58	86	69
USNO	14 431	***	***	0	97	0	0
USNO	14 571	100	100	100	100	100	100
USNO	14 651	***	***	0	63	66	100
USNO	14 653	***	***	***	0	100	41
USNO	14 654	***	***	***	0	100	41
USNO	14 656	***	***	***	0	49	27
USNO	14 660	***	***	***	0	100	100
VSL	12 503	***	***	***	***	***	0

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

11 HEWLETT-PACKARD 5060A 12 HEWLETT-PACKARD 5061A

13 EBAUCHES OSCILLATOM. 14 HEWLETT-PACKARD 5061A , OPTION 4

99 PROTOTYPE (HEWLETT-PACKARD TUBE)

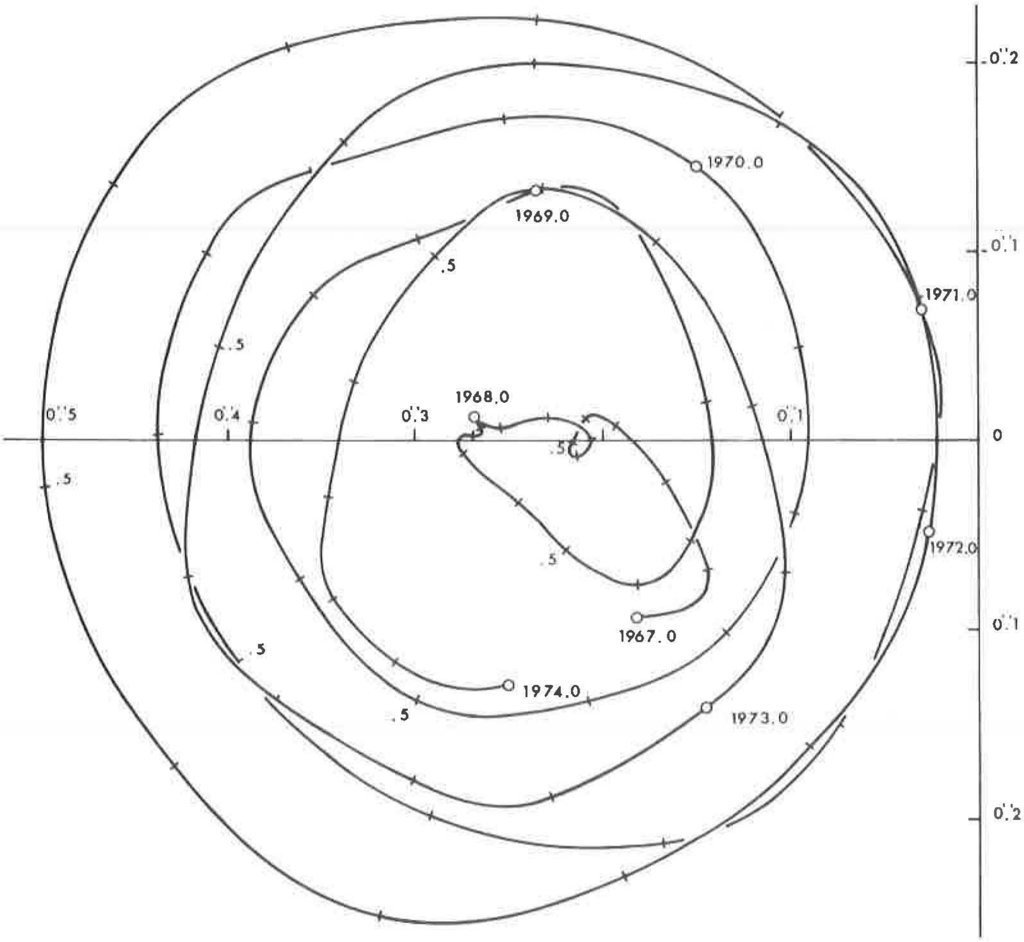


Fig. 1 - Path of the pole from 1967.0 to 1974.0
Smoothed values of Tables 6, obtained by the Vondrak's method, with the coefficient of smoothing which equilizes the internal and external standard deviations in x and y.

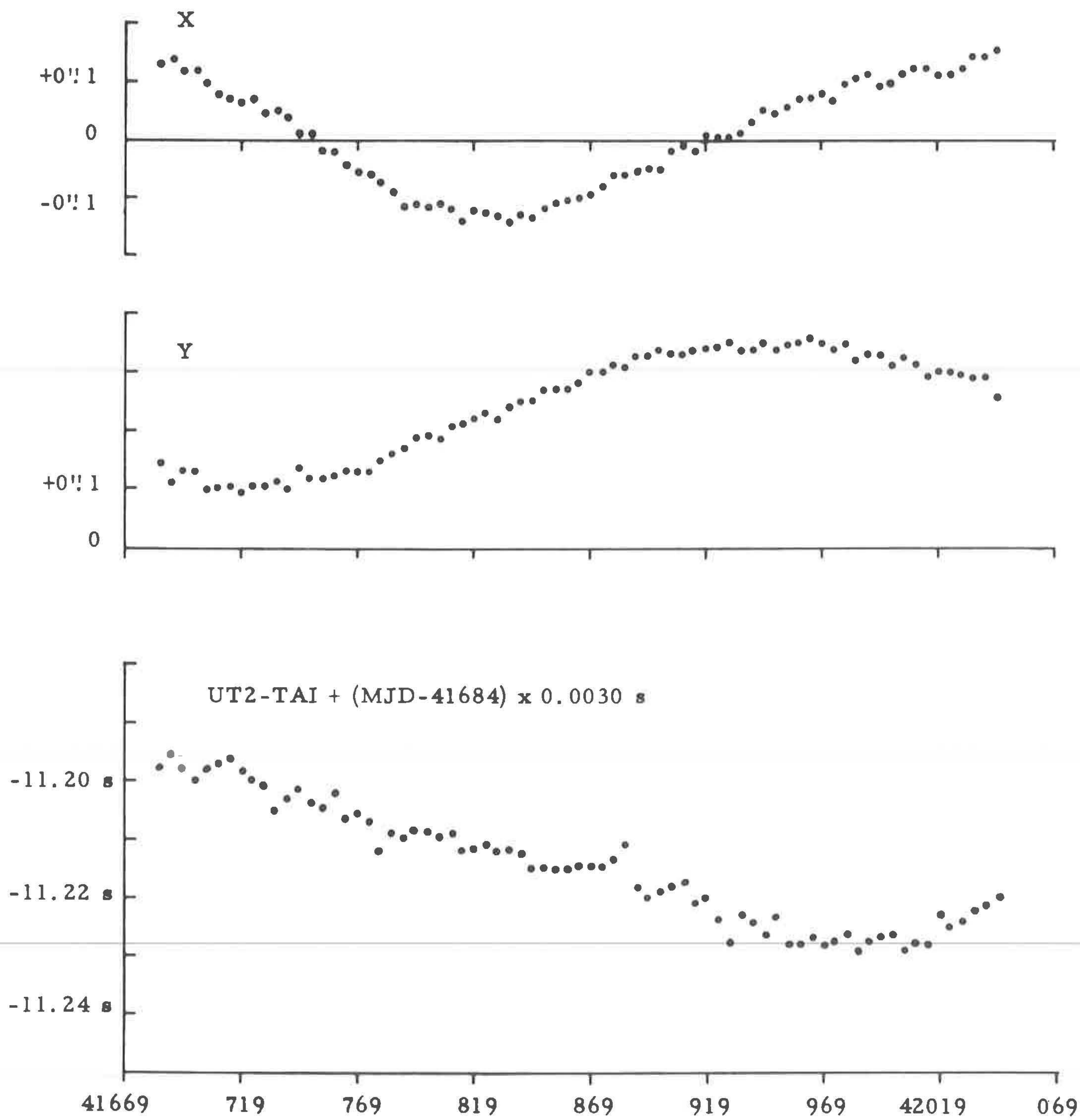


Fig. 2 - Raw data of x, y, UT2-TAI (table 6C for 1973), for every 5 days.

PART C

TIME SIGNALS

In the following tables, characteristics of the main time signal emissions are shown. They are established with all information received until April 1974. The addresses of the authorities responsible for the emissions are given next pages.

The carriers of the following time signals are standard frequencies.

Station	Accuracy of the carrier frequency in 10^{-10}
CHU	0.05
DCF77	0.02
FFH	0.2
GBR	0.2
HBG	0.02
IAM	0.5
IBF	0.1
JJY, JG2AS	0.5
LOL1	0.2
MSF (60 kHz)	0.2
MSF (h.f.)	0.2
NBA (V.L.F.), NDT	0.03
NSS (V.L.F.), NWC	0.03
OMA (all frequencies)	0.5
VNG	1
WWV	0.1
WWVB	0.1
WWVH	0.1
ZUO	0.5

CODE FOR THE TRANSMMISSION OF DUTI

Most of the time signals disseminate the difference UTI-UTC in integral multiples of 0.1 s. This correction is called DUT1.

CCIR code

A positive value of DUT1 is indicated by emphasizing a number (n) of consecutive seconds markers following the minute marker from seconds markers one to seconds marker (n) inclusive ; (n) being an integer from 1 to 7 inclusive.

$$DUT1 = (n \times 0.1)\,s$$

A negative value of DUT1 is indicated by emphasizing a number (m) of consecutive seconds markers following the minute marker from seconds marker nine to seconds marker (8 + m) inclusive ; (m) being an integer from 1 to 7 inclusive.

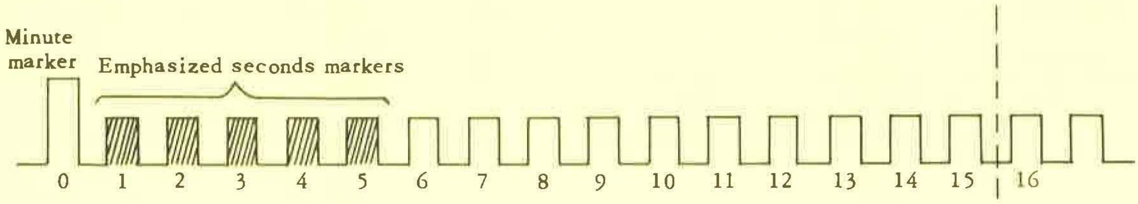
$$DUT1 = -\,(m \times 0.1)\,s$$

A zero value of DUT1 is indicated by the absence of emphasized seconds markers.

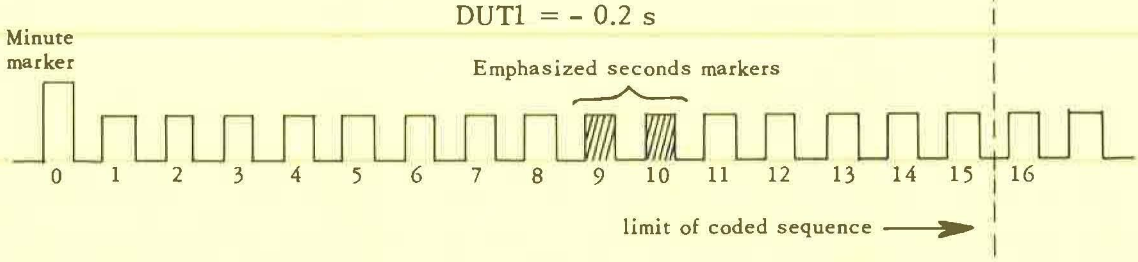
The appropriate seconds markers are emphasized by lengthening, doubling, splitting, or tone modulation of the normal seconds markers, as stated in following pages.

Examples :

DUT1 = + 0.5 s



DUT1 = - 0.2 s



Other transmissions of DUT1 :

by voice announcement or in Morse Code.

Reference : CCIR Report 517, Geneva (1971).

AUTHORITIES RESPONSIBLE FOR THE TIME SIGNAL EMISSIONS

Signal	Authority
CHU	National Research Council, Time and Frequency Section Physics Division (M-36) **Ottawa K1A OS1**, Ontario, Canada, Attn : Dr. C.C. Costain
DAM, DAN, DAO	Deutsches Hydrographisches Institut **2 Hamburg 4**, Federal Republic of Germany.
DCF77	Physikalisch-Technische Bundesanstalt, Laboratorium 1.22 **33 Braunschweig** Bundesallee 100, Federal Republic of Germany.
DGI, DIZ	Amt für Standardisierung, Messwesen und Warenprüfung Fachabteilung Elektrizität Arbeitsgebiet Zeit und Frequenznormale DDR **102 Berlin** Wallstrasse 16
FFH	Centre National d'Etudes des Télécommunications Groupement Etudes spatiales et Transmissions Département Dispositifs et Ensembles fonctionnels 38, rue du Général Leclerc **92131 Issy-les-Moulineaux**, France.
FTA91, FTH42 FTK77, FTN87	Observatoire de Paris, Service de l'Heure, 61, avenue de l'Observatoire, **75014 Paris**, France.
GBR MSF	National Physical Laboratory, Electrical Science Division **Teddington**, Middlesex, United Kingdom.
HBG	Service horaire HBG Observatoire Cantonal, CH - **2000 Neuchâtel**, Suisse.
IAM	Istituto Superiore Poste e Telecomunicazioni Viale di Trastevere, 189 00100 - **Roma**, Italy
IBF	Istituto Elettrotecnico Nazionale Galileo Ferraris Corso Massimo d'Azeglio, 42 10125 - **Torino**, Italy
JJY	Frequency Standard Division The Radio Research Laboratories Ministry of Posts and Telecommunications Midori-cho, Koganei, **Tokyo 184**, Japon

Signal	Authority
LOL	Director Observatorio Naval Av. Costanera Sur, 2099 Buenos Aires, Republica Argentina.
LQB9, LQC20	Servicio internacional de la Hora Gral. Savio 865 Villa Maipú San Martin, Pcia. de Buenos Aires Republica Argentina.
NBA, NDT, NPG, NPM, NPN, NSS, NWC	Superintendant U.S. Naval Observatory Washington, D.C. 20390 U.S.A.
OLB5, OMA	1° - Time information : Astronomický Ústav ČSAV, Budečská 6, 120 23 Praha 2, Vinohrady, Czechoslovakia. 2° - Standard frequency information : Ústav radiotechniky a elektroniky ČSAV, Lumumbova 1, 180 88 Praha 8, Kobylisy, Czechoslovakia.
PPE, PPR	Serviço da Hora Observatorio Nacional Rua General Bruce, 586 2000 Rio de Janeiro. GB.ZC. -08, Brasil.
RAT, RCH, RES RID, RIM, RKM RWM	Comité d'Etat des Normes Conseil des Ministres de l'URSS Moscou, USSR, Leninski prosp., 9.
VNG	Time and Frequency Standards Section A.P.O. Research Laboratories 59 Little Collins Street Melbourne, VIC. 3000, Australia
WWV, WWVH WWVB	Frequency-Time Broadcast Services Section Time and Frequency Division National Bureau of Standards Boulder, Colorado 80302, U.S.A.
YVTO	Direccion de Hidrografia y Navegacion Observatorio Cagigal Apartado Postal N° 6745 Caracas, Venezuela
ZUO	National Physical Research Laboratory P.O. Box 395 Pretoria South Africa

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
CHU	Ottawa Canada +45° 18' +75° 45'	3330 7335 14670	continuous	Second pulses of 300 cycles of a 1 kHz modulation. Minute pulses are 0.5 s long. A bilingual (Fr.-Eng.) announcement of time is made each minute. DUT1 : CCIR code by split pulses
DAM	Elmshorn Germany, F.R. +53° 46' - 9° 40'	8638.5 16980.4 4265 8638.5 6475.5 12763.5	11 h 55 m to 12 h 6 m 23 h 55 m to 24 h 6 m from 21 Sept. to 20 March 23 h 55 m to 24 h 6 m from 21 March to 20 Sept.	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' - 7° 12'	2614	11 h 55 m to 12 h 6 m 23 h 55 m to 24 h 6 m	As DAM (see above)
DAO	Kiel Germany, F.R. +54° 26' -10° 8'	2775	11 h 55 m to 12 h 6 m 23 h 55 m to 24 h 6 m	As DAM (see above)
DCF77	Mainflingen Germany, F.R. +50° 1' - 9° 0'	77.5	continuous, except second Tuesday of every month from 4 h to 8 h	The second marks are reduction to 1/4 of the carrier's amplitude of 0.1 s duration ; the reference point is the beginning of the pulse modulation. The second 59 marker is omitted Time code in BCD (year, month, day, hour, minute, day of the week) by lengthening second marks from marks N° 20 to N° 58 every minute. DUT1 : CCIR code by lengthening to 0.2 s
DGI	Oranienburg Germ.Dem.Rep. +52° 48' -13° 24'	185	5 h 59 m 30 s to 6 h 00 m 11 h 59 m 30 s to 12 h 00 m 17 h 59 m 30 s to 18 h 00 m	A2 type second pulses of 0.1 s duration for seconds 30-40, 45-50, 55-60. The last pulse is prolonged.
DIZ (1) see p. C-12	Nauen Germ.Dem.Rep. +52° 39' -12° 55'	4525	continuous except from 8 h 15 m to 9 h 45 m for maintenance if necessary	A1 type second pulses of 0.1s duration. Minute pulses prolonged to 0.5 s. Hour pulses marked by prolonged pulses for seconds 58, 59, 60. DUT1 : CCIR code by double pulse
FFH	Ste Assise France +48° 33' - 2° 34'	2500	continuous from 8 h to 16 h 25	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses prolonged to 0.5 s. DTU1 : CCIR code by lengthening to 0.1 s.
FTA91	Saint-André-de-Corcy France +45° 55' - 4° 55'	91.15	at 8 h, 9 h, 9 h 30 m, 13 h, 20 h, 21 h, 22 h 30 m.	A1 type second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DTU1 : in Morse code
FTH42 FTK77 FTN87	Pontoise France +49° 4' - 2° 7'	7428 10775 13873	at 9 h and 21 h at 8 h and 20 h at 9 h 30 m, 13 h, 22 h 30 m	A1 type second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DUT1 : in Morse code.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
GBR	Rugby United Kingdom +52° 22' + 1° 11'	16	at 3 h, 9 h, 15 h, 21 h	A1 type second pulses during the 5 minutes preceding the indicated times. DUT1 : CCIR code by double pulse
HBG	Prangins Switzerland +46° 24' - 6° 15'	75	continuous	Interruption of the carrier at the beginning of each second, during 100 ms. The minutes are identified by a double pulse, the hours by a triple pulse. No transmission of DUT1
IAM	Rome Italy +41° 52' -12° 27'	5000	10 m every 15 m from 7 h 30 m to 8 h 30 m and from 13 h to 14 h except Sat. afternoon and Sun. Advanced by 1 hour in summer.	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses of 20 cycles (Announcements 5 m before the emission of time signals).
IBF	Torino Italy +45° 2' - 7° 42'	5000	During 15 m preceding 7 h, 9 h, 10 h, 11 h, 12 h, 13 h, 14 h, 15 h, 16 h, 17 h, 18 h. 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 by Morse Code every ten minutes beginning at 0h 0m.. DUT1 : CCIR code by double pulse.
JG2AS	Chiba Japan + 35° 38' -140° 4'	40	from 23 h 30 m to 8 h (exc. Sun.) and from 8 h to 23 h 30 on Monday. Interruptions during communications.	A1 type second pulses of 0.5 sec. duration. Second 59 is omitted. No DUT1 code.
JJY	Koganei Japan +35° 42' - 139° 31'	2500 5000 10000 15000	continuous, except interruptions between minutes 25 and 34.	Second pulses of 8 cycles of 1600 Hz modulation. Minute pulses are preceded by a 600 Hz modulation. DUT1 : CCIR code by lengthening
LOL1	Buenos-Aires Argentina -34° 37' + 58° 21'	5000 10000 15000	11 h to 12 h, 14 h to 15 h, 17 h to 18 h, 20 h to 21 h 23 h to 24 h	Second pulses of 5 cycles of 1000 Hz modulation. Second 59 is omitted. Announcement of hours and minutes every 5 minutes, followed by 3 m of 1000 Hz and 440 Hz modulation. DUT1 : CCIR code by lengthening
LOL2 LOL3	Buenos-Aires Argentina -34° 37' +58° 21'	8030 17180	1 h, 13 h, 21 h	A1 second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DUT1 : CCIR code by double pulse
LQB9 LQC20	Planta Gral Pacheco -34° 26' +58° 37'	8167.5 17551.5	22 h 5 m, 23 h 50 m 10 h 5 m, 11 h 50 m	A1 second pulses during the 5 minutes preceding the indicated times. Second 59 is omitted, second 60 is prolonged. After the emission, OK is transmitted if the emission is correct, NV if not correct DUT1 : CCIR code by omission of second markers.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
MSF	Rugby United Kingdom + 52° 22' + 1° 11'	60	continuous except for an interruption for maintenance from 10 h 0 m to 14 h 0 m on the first Tuesday in each month	Interruptions of the carrier of 100 ms for the second pulses, of 500 ms for the minute pulses. The signal is given by the the beginning of the interruption. DUT1 : CCIR code by double pulse
MSF	Rugby United Kingdom + 52° 22' + 1° 11'	2500 5000 10000	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
NBA	Summit Canal Zone + 9° 3' + 79° 39'	24	Every even hour except 24 h and during Monday maintenance (12 h to 18 h)	Experimental FSK second pulses on 24 kHz. See (2), p. C-12. DUT1 : by Morse Code, each minute between seconds 56 and 59
NDT	Yosami Japan + 32° 58' - 137° 1'	17.4	to be determined	To be determined
NPG	Dixon, CA. USA + 38° 23' + 121° 46'	3268 6428.5 9277.5 12966	6 h, 12 h, 18 h, 24 h	CW second pulses during 5 minutes preceding the indicated times on the American Code time format DUT1 : by Morse Code, each minute between seconds 56 and 59
NPM	Lualualei, HI USA + 21° 25' + 158° 9'	4525 9050 13655 16457.5 22593	6 h, 12 h, 18 h, 24h	CW second pulses during 5 minutes preceding the indicated times on the American Code time format DUT1 : by Morse Code, each minute between seconds 56 and 59
NPN	Barragada Guam + 13° 28' - 144° 50'	4955 8150 13380 21760	6h, 12 h, 18 h, 24 h	CW second pulses during 5 minutes preceding the indicated times on the American Code time format DUT1 : by Morse Code, each minute between seconds 56 and 59
NSS	Annapolis, MD USA + 38° 59' + 76° 27'	21.4		Experimental FSK second pulses on 21.4 kHz when transmissions resume. See (2) p. C-12.
		88 5870 8090 12135 16180	5 h, 11 h, 17 h, 23 h (on Tuesday 17 h the frequency 134.9 kHz replaces 88 kHz)	CW second pulses during 5 minutes preceding the indicated times on the American Code time format.
		20225 25590	17 h, 23 h	DUT1 : by Morse Code, each minute between seconds 56 and 59

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
NWC	Exmouth Australia - 21° 48' -114° 9'	22.3	**Keyed from 28 to 30 minutes after every other even hour beginning 0 h UT**	**Experimental FSK second pulses during the indicated times on the American Code time format. DUT1 : by Morse Code, between seconds 56 and 58. See(1) p. C-12**
OLB5	Poděbrady Czechoslovakia + 50° 9' - 15° 8'	3170	continuous except from **6 h** to **12 h** on the first Wednesday of every month	A1 type, second pulses No transmission of DUT1
OMA	Liblice Czechoslovakia + 50° 4' - 14° 53'	50	continuous except from **6 h to 12 h** on the first Wednesday of every month	Interruption of the carrier of 100 ms at the beginning of every second, of 500 ms at the beginning of every minute. The precise time is given by the beginning of the interruption.
		2500	between minutes 5 and 15 25 and 30, 35 and 40, 50 and 60 of every hour except from 5 h to 11 h on the first Wednesday of every month	Pulses of 5 cycles of 1 kHz modulation (prolonged for the minutes). The first pulse of the 5th minute is prolonged to 500 cycles. No transmission of DUT1.
PPE	Rio de Janeiro Brasil - 22° 54' + 43° 13'	8721	0 h 30 m, 11 h 30 m, 13 h 30 m, 19 h 30 m, 20 h 30 m, 23 h 30 m	Second ticks, of A1 type, during the five minutes preceding the indicated hours. The minute ticks are longer DUT1 : CCIR Code by double pulse.
PPR	Rio de Janeiro Brasil - 22° 59' + 43° 11'	435 8634 13105 17194.4	01 h 30 m, 14 h 30 m, 21 h 30 m	Second ticks, of A1 type, during the five minutes preceding the indicated hours. The minute ticks are longer
RAT (3) see p. C-12	Moscow USSR + 55° 19' - 38° 41'	2500	between minutes 30 and 35, 41 and 45, 50 and 60 from 17 h 50 m to 24 h	Second pulses* at the beginning of the minute are prolonged to 0.5 s.
		5000	between minutes 30 and 35, 41 and 45, 50 and 60 from 1 h 30 m to 17 h	DUT1 + dUT1 by Morse Code each hour between minutes 11 and 12.
RBU (3)	Moscow USSR + 55° 19' - 38° 41'	$66\frac{2}{3}$	between minutes 0 and 5 from 0 h to 18 h 5 m and from 20 h to 22 h 5 m	A1 type. Second pulses . The pulses at beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1 : by Morse Code each hour between minutes 6 and 7.

* The information about the value and the sign of the DUT1 + dUT1 difference is transmitted after each minute signal by the marking of the corresponding second signals by additional impulses. In addition, it is transmitted in Morse Code as indicated.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
RCH (3) see p. C-12	Tashkent USSR + 41° 19' - 69° 15'	2500	between minutes 15 and 20; 25 and 30, 35 and 40, 45 and 50 from 0 h to 3 h 50 m from 5 h 35 m to 9 h 30 m from 10 h 15 m to 13 h 30 m from 14 h 15 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1 : by Morse Code each hour between minutes 51 and 52.
RID (3)	Irkutsk USSR + 52° 46' - 103° 39'	5004	between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 0 h to 1 h 10 m from 13 h 51 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1 : by Morse Code each hour between minutes 31 and 32.
		10004	between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 1 h 51 m to 13 h 10 m	
RIM (3)	Tashkent USSR + 41° 19' - 69° 15'	5000	between minutes 15 and 20, 25 and 30, 35 and 40, 45 and 50 from 0 h to 1 h 30 m from 2 h 15 m to 3 h 50 m from 18 h 15 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1 : by Morse Code each hour between minutes 51 and 52.
		10000	between minutes 15 and 20, 25 and 30, 35 and 40, 45 and 50 from 5 h 35 m to 9 h 30 m from 10 h 15 m to 13 h 30 m from 14 h 15 m to 17 h 30 m	
RKM (3)	Irkutsk USSR + 52° 46' - 103° 39'	10004	between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 0 h to 1 h 10 m, from 13 h 51 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1 : by Morse Code each hour between minutes 31 and 32.
		15004	between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 1 h 51 to 13 h 10 m	

* The information about the value and the sign of the DUT1 + dUT1 difference is transmitted after each minute signal by the marking of the corresponding second signals by additional impulses. It addition, in is transmitted in Morse Code as indicated.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
RTA (3) see p.C-12	Novossibirsk USSR + 55° 04' - 82° 58'	4996	between minutes 5 and 10, 15 and 20, 25 and 29, 35 and 39 from 0 h to 1 h 29 m from 18 h 5 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged. DUT1 + dUT1 : by Morse Code each hour between minutes 45 and 46.
		9996	between minutes 5 and 10, 15 and 20, 25 and 29, 35 and 39 from 3 h 5 m to 4 h 39 from 14 h 5 m to 17 h 29 m	
		14996	between minutes 5 and 10, 15 and 20, 25 and 29, 35 and 39 from 5 h 35 m to 9 h 29 m from 10 h 5 m to 13 h 29 m	
RWM (3)	Moscow USSR + 55° 19' - 38° 41'	10000	between minutes 30 and 35, 41 and 45, 50 and 60 from 1 h 30 m to 3 h from 17 h 50 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1 : by Morse Code each hour between minutes 11 and 12.
		15000	between minutes 30 and 35, 41 and 45, 50 and 60 from 3 h 50 m to 17 h	
RTZ (3)	Irkutsk USSR + 52° 18' - 104° 18'	50	between minutes 0 and 5 from 0 h to 19 h 5 m and from 21 h to 23 h 5 m	A1 type second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s DUT1 + dUT1 : by Morse Code each hour between minutes 6 and 7.
VNG	Lyndhurst Australia - 38° 3' -145° 16'	4500 7500 12000	9 h 45 m to 21 h 30 m continuous except 22 h 30 m to 22 h 45 m 21 h 45 m to 9 h 30 m	Seconds markers of 50 cycles of 1 kHz modulation ; 5 cycles only for seconds markers 55 to 58 ; seconds marker 59 is omitted ; 500 cycles for minute markers. During the 5th, 10th, 15th, etc... minutes, 5 cycles for seconds 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 seconds markers.

* The information about the value and the sign of the DUT1 + dUT1 difference is transmitted after each minute signal by the marking of the corresponding second signals by additional impulses. It addition, in is transmitted in Morse Code as indicated.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the time signals
WWV	Fort-Collins USA + 40° 41' +105° 2'	2500 5000 10000 15000 20000 25000	continuous	Pulses of 5 cycles of 1 kHz modulation. 59th and 29th second pulse omitted. Hour is identified by 0.8 second long, 1500 Hz tone. Beginning of each minute identified by 0.8 second long, 1000 Hz tone. DUT1 : CCIR code by double pulse. Additional information on UT1 corrections
WWVB	Fort Collins USA + 40° 40' +105° 3'	60	continuous	Second pulses given by reduction of the amplitude of the carrier. Coded announcement of the date and time and of the correction to obtain UT1. No CCIR code.
WWVH	Kauai USA + 21° 59' +159° 46'	2500 5000 10000 15000 20000	continuous	Pulses of 6 cycles of 1200 Hz modulation. 59th and 29th seconds pulse omitted. Hour identified by 0.8 second long 1500 Hz tone. Beginning of each minute identified by 0.8 second long, 1200 Hz tone. DUT1 : CCIR code by double pulse. Additional information on UT1 corrections.
YVTO	Caracas Venezuela + 10° 30' + 66° 56'	6100	12 h to 20 h 0 h 30 m to 1 h 30 m	Second pulses of 1 kHz modulation with 0.1 s duration. The minute is identified by a 800 Hz tone and a 0.5 s duration Between seconds 52 and 57 of each minute, voice announcement of hour, minute and second.
ZUO	Olifantsfontein South Africa - 25° 58' - 28° 14'	2500 5000 100000	18 h to 4 h continuous continuous	Pulses of 5 cycles of 1 kHz modulation. Second 0 is prolonged. DUT1 : CCIR code by lengthening

OTHER TIME SIGNALS

BPV, XSG, Shanghaï, China, P.R.
Latitude : + 31° 12', longitude : -121° 26'.
Characteristics and schedule not known.
For some emissions, see the time of emission, p. C-14.

Notes on the characteristics of time signals

(1) DUT1 information in CCIR code

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

A positive value of dUT1 is indicated by doupling 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

$$dUT1 = p \cdot 0.02 \text{ s.}$$

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

$$dUT1 = -(q \cdot 0.02) \text{ s}$$

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.

(2) NBA, NSS, NWC - Several U.S. Naval VLF stations transmit time signals on an experimental FSK format (NWC, NBA, NSS).

Both frequencies, MARK (assigned frequency) and SPACE (plus 50 Hz), are phase stabilized.

50 baud frequency shift keying will be employed with bit lengths of 20 ms.

Transition between frequencies will require approximately 2 ms.

The time of the halfway point of the transition will be maintained within ± 10 µs of the station clock.

This point will also be identical with the phase coincident point between the two carriers.

The zero crossing of the positive slope of the assigned carrier cycle will be controlled in time to ± 1 µs of the station clock.

The one second pulses for the American Code will consist of 300 ms of 20 ms reversals followed by 700 ms of steady signal of the assigned carrier cycle + 50 Hz (SPACE). The beginning of the second will occur at the half transition point at the start of the reversals (SPACE ⟶ MARK).

(3) 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 0.02 s, 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 20 th and 25th second so that $dUT1 = +0.02 \text{ s} \times p$. Negative values of DUT1 are transmitted by the marking of q second markers within the range between the 35 th and the 40 th second, so that $dUT1 = -0.02 \text{ s} \times q$.

Time of emission of the time signals in 1973

Unless otherwise stated, the values of UTC-signal are valid for the whole year 1972.

Signal	UTC-Signal (unit : 0.0001 s)	Remarks
BPV (10 MHz, 15 MHz)	- 196	
CHU	0	
DAM, DAN, DAO	0	
DCF77	0	
DGI	0	
DIZ	0	Irregularities on 1973 Sept. 25, Oct. 27
FFH	0	
FTA91	0	Emissions of 1973 Aug. 6 20 h, 21 h, 22 h 30, unreliable (FTA91; FTH42, FTK77, FTN87)
FTH42, FTK77, FTN87	0	
GBR	0	
HBG	0	
IAM	0	
IBF	0	
JJY	0	
LOL (all emissions)	0	
LQB9	- 1	
LQC20	- 4	
MSF	0	
NSS(h f)	0	
OLB5	+ 8	
OMA	0	
PPE	0	
RWM (and other t.s. from USSR)	0	
VNG	0	
WWV, WWVB, WWVH	0	
ZUO	0	

Time of emission of BPV on 9351 kHz, 13h UT.

The missing data can be interpolated, except when a step adjustment occurs (marked by —— in the following table).

UTC - BPV (9351 kHz)
(unit : 0.0001s)

Date	1973 Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	-8107	-7123	-6262	-5101	-4058	-3112	-2192	-1525	- 785	+ 171	+1155	+2074
2	8074	7091	6230	5063	4025	3083	2170	1500	762	202	1187	2109
3	8039	7063	6193	5035	3992	3051	2140	1483	732	228	1222	2139
4	8012	7029	6163	5001	3958	3024	2116	1462	712	261	1253	2173
5	7982	7002	6130	4964	3918	2992	2092	1441	675	294	1281	2201
6	7947	6974	6099	4928	-	2965	2060	1420	651	323	1318	2231
7	7920	6941	6065	4884	3850	2926	2043	1398	626	356	1348	2262
8	7885	6915	6025	4855	3820	2901	2019	1367	600	387	1379	2293
9	7853	6888	6002	4813	3794	2871	1994	1342	572	420	1414	2328
10	7824	6857	5966	4785	3761	2845	1969	1323	548	453	1445	2356
11	7788	6829	5876	4754	3760	2756	1976	1304	492	481	1473	2388
12	7761	6798	5833	4717	3729	2728	1952	1286	458	514	1503	2422
13	7730	6769	5800	4683	3696	2702	1929	1254	442	548	1538	2452
14	7700	6737	5770	4641	3666	2670	1902	1236	405	588	1566	2480
15	7672	6709	5724	4616	3634	2639	-	1213	389	611	1596	2509
16	7634	6682	5695	4577	3612	2611	1854	1186	366	645	1623	2543
17	7608	6650	5664	4534	-	2585	1829	1164	336	673	1655	-
18	7574	6624	5627	4499	3551	2550	1809	1154	315	704	1687	-
19	7541	6591	5585	4469	3521	2537	1786	1118	280	737	1717	2636
20	7509	6560	5555	4429	3495	2504	1764	1092	253	773	1746	2668
21	7474	6534	5521	4383	3461	2481	1771	1076	142	795	1774	-
22	7450	6501	5481	4355	3436	2450	1748	1050	109	837	1807	-
23	7421	6474	5442	4323	3413	2422	1728	1028	87	864	1835	-
24	7388	6443	5411	4285	-	2389	1707	1000	56	896	1864	2795
25	7360	6409	5388	4254	3344	2362	1680	983	- 18	932	1894	2824
26	7334	6386	5331	4223	3318	2333	1655	960	+ 12	961	1923	-
27	7301	6354	5293	4193	3287	2305	1628	934	43	992	1954	2879
28	7269	6321	5256	4160	3252	2276	1604	914	76	1026	1983	2913
29	7238		5221	4116	3229	2247	1599	890	113	1060	-	2943
30	7212		5178	4085	3202	2217	1574	861	134	1089	2041	-
31	7183		5142		3173		1544	839		1118		3003

Dépôt légal : 2ème trimestre 1974
Imprimeur : Observatoire de Paris
Le Gérant : R. Michard