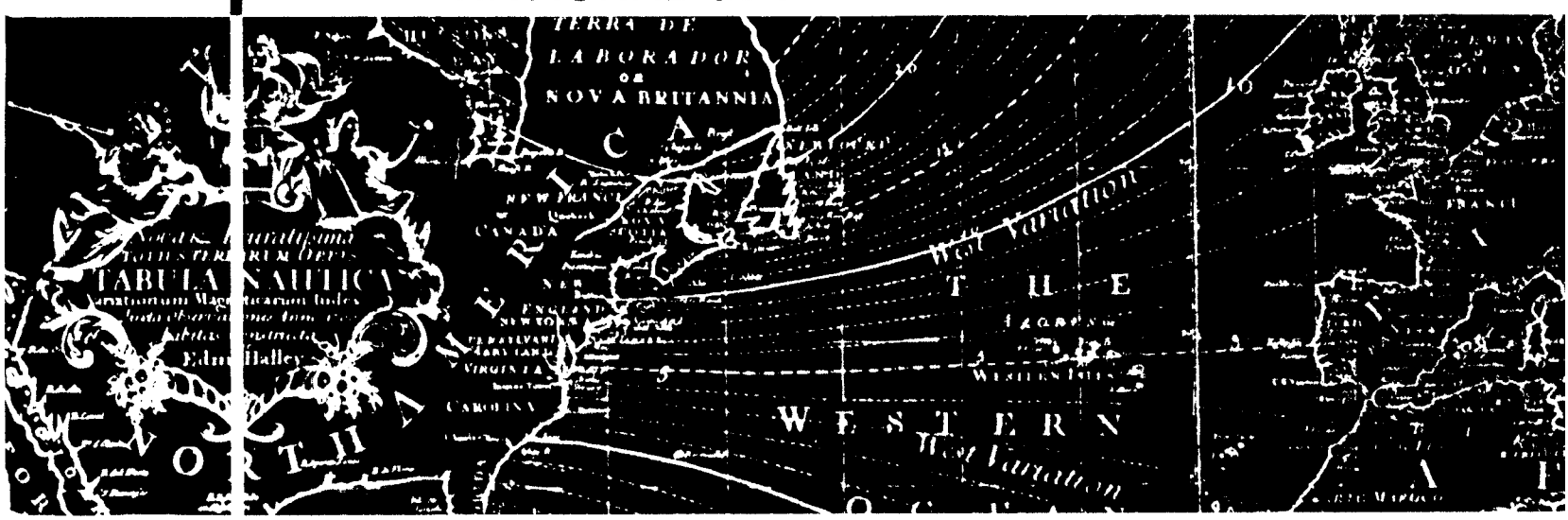
REPORT SE-43

WORLD DATA CENTER A
for
Solid Earth Geophysics

A DIRECTORY OF GEOMAGNETIC OBSERVATORIES WITH HIGH-RESOLUTION DIGITAL RESULTS, 1987

July 1987

NATIONAL GEOPHYSICAL DATA CENTER



WORLD DATA CENTER A

National Academy of Sciences
2101 Constitution Avenue, NW
Washington, DC 20418 USA

World Data Center A consists of the Coordination Office and the following eight Subcenters:

COORDINATION OFFICE
World Data Center A
National Academy of Sciences
2101 Constitution Avenue, NW
Washington, DC 20418 USA
[Telephone: (202) 334-3368]

GLACIOLOGY (Snow and Ice)
World Data Center A: Glaciology
(Snow and Ice)
Cooperative Inst. for Research in
Environmental Sciences
University of Colorado
Boulder, Colorado 80309 USA
Telephone: (303) 492-5171

MARINE GEOLOGY AND GEOPHYSICS
(Gravity, Magnetics, Bathymetry,
Seismic Profiles, Marine Sediment,
and Rock Analyses):
World Data Center A for Marine
Geology and Geophysics
NOAA, E/GC3
325 Broadway
Boulder, Colorado 80303-3328 USA
Telephone: (303) 497-6487

METEOROLOGY (and Nuclear Radiation)
World Data Center A: Meteorology
National Climatic Data Center
NOAA, E/CC
Federal Building
Asheville, North Carolina 28801 USA
Telephone: (704) 259-0682

OCEANOGRAPHY
World Data Center A: Oceanography
National Oceanographic Data Center
NOAA, E/OC
1825 Connecticut Avenue, NW
Universal Building, Room 406
Washington, DC 20235 USA
Telephone: (202) 673-5594

ROCKETS AND SATELLITES
World Data Center A: Rockets and
Satellites
NASA/Goddard Space Flight Center
Code 630.2
Greenbelt, Maryland 20771 USA
Telephone: (301) 286-7354

ROTATION OF THE EARTH
World Data Center A: Rotation
of the Earth
U.S. Naval Observatory
Washington, DC 20392-5100 USA
Telephone: (202) 653-1529 or 1527

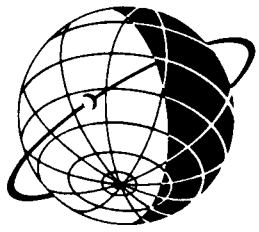
SEISMOLOGY
World Data Center A: Seismology
U.S. Geological Survey
Branch of Global Seismology
and Geomagnetism
Box 25046, Mail Stop 967
Denver Federal Center
Denver, Colorado 80225 USA
Telephone: (303) 236-1500

SOLAR-TERRESTRIAL PHYSICS (Solar and
Interplanetary Phenomena, Ionospheric
Phenomena, Flare-Associated Events,
Geomagnetic Variations, Aurora,
Cosmic Rays, Airglow):
World Data Center A
for Solar-Terrestrial Physics
NOAA, E/GC2
325 Broadway
Boulder, Colorado 80303-3328 USA
Telephone: (303) 497-6324

SOLID-EARTH GEOPHYSICS (Seismicity,
Earthquake Strong Motion, Tsunamis,
Gravimetry, Earth Tides, Recent
Movements of the Earth's Crust,
Magnetic Measurements, Paleomagnetism
and Archeomagnetism, Volcanology,
Geothermics):
World Data Center A
for Solid-Earth Geophysics
NOAA, E/GC1
325 Broadway
Boulder, Colorado 80303-3328 USA
Telephone: (303) 497-6521

World Data Centers conduct international exchange of geophysical observations in accordance with the principles set forth by the International Council of Scientific Unions. WDC-A is established in the United States under the auspices of the National Academy of Sciences. Communications regarding data interchange matters in general and World Data Center A as a whole should be addressed to World Data Center A, Coordination Office (see address above). Inquiries and communications concerning data in specific disciplines should be addressed to the appropriate subcenter listed above.

WORLD DATA CENTER A
for
Solid Earth Geophysics



REPORT SE-43

A DIRECTORY OF GEOMAGNETIC OBSERVATORIES WITH HIGH-RESOLUTION DIGITAL RESULTS, 1987

By

K.L. Svendsen
S.J. McLean
W.V. Flanagan

In cooperation with

IAGA/IUGG, Division V, Magnetic Observatories, Instruments, Indices, and Data

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
National Geophysical Data Center
Boulder, Colorado 80303, USA

July 1987

DESCRIPTION OF WORLD DATA CENTERS

World Data Centers conduct international exchange of geophysical observations in accordance with the principles set forth by the International Council of Scientific Unions (ICSU). They were established in 1957 by the International Geophysical Year Committee as part of the fundamental international planning for the IGY program to collect data from the numerous and widespread IGY observational programs and to make such data readily accessible to interested scientists and scholars for an indefinite period of time. WDC-A was established in the U.S.A.; WDC-B in the U.S.S.R.; and WDC-C in Western Europe, Australia, and Japan. This new system for exchanging geophysical data was found to be very effective, and the operations of the World Data Centers were extended by ICSU on a continuing basis to other international programs; the WDC's were under the supervision of the Comite International de Geophysique (CIG) for the period 1960 to 1967 and are now supervised by the ICSU Panel on World Data Centres.

The current plans for continued international exchange of geophysical data through the World Data Centers are set forth in the *Fourth Consolidated Guide to International Data Exchange through the World Data Centres,* issued by the ICSU Panel on World Data Centres. These plans are broadly similar to those adopted under ICSU auspices for the IGY and subsequent international programs.

Functions and Responsibilities of WDC's

The World Data Centers collect data and publications for the following disciplines: Meteorology; Oceanography; Rockets and Satellites; Solar-Terrestrial Physics disciplines (Solar and Interplanetary Phenomena, Ionospheric Phenomena, Flare-Associated Events, Geomagnetic Phenomena, Aurora, Cosmic Rays, Airglow); Solid Earth Geophysics disciplines (Seismology, Tsunamis, Gravimetry, Earth Tides, Recent Movements of the Earth's Crust, Rotation of the Earth, Magnetic Measurements, Paleomagnetism and Archeomagnetism, Volcanology, Geothermics), and Marine Geology and Geophysics. In planning for the various scientific programs, decisions on data exchange were made by the scientific community through the international scientific unions and committees. In each discipline, the specialists themselves determined the nature and form of data exchange, based on their needs as research workers. Thus, the type and amount of data in the WDC's differ from discipline to discipline.

The objects of establishing several World Data Centers for collecting observational data were: (1) to insure against loss of data by the catastrophic destruction of a single center, (2) to meet the geographical convenience of, and provide easy communication for workers in different parts of the world. Each WDC is responsible for: (1) endeavoring to collect a complete set of data in the field or discipline for which it is responsible, (2) safe-keeping of the incoming data, (3) correct copying and reproduction of data, maintaining adequate standards of clarity and durability, (4) supplying copies to other WDC's of data not received directly, (5) preparation of catalogs of all data in its charge, and (6) making data in the WDC's available to the scientific community. The WDC's conduct their operation at no expense to ICSU or to the ICSU family of unions and committees.

World Data Center A

World Data Center A, for which the National Academy of Sciences through the Geophysics Research Forum (GRF) and its Committee on Geophysical Data has overall responsibility, consists of the WDC-A Coordination Office and nine subcenters at scientific institutions in various parts of the United States. The GRF periodically reviews the activities of WDC-A and has conducted several studies on the effectiveness of the WDC system. As a result of these reviews and studies, some of the subcenters of WDC-A have been relocated so that they could more effectively serve the scientific community. The addresses of the WDC-A subcenters and Coordination Office are given inside the front cover.

The data received by WDC-A have been made available to the scientific community in various ways: (1) reports containing data and results of experiments have been compiled, published, and widely distributed; (2) synoptic-type data on cards, microfilm, or tables are available for use at the subcenters and for loan to scientists; (3) copies of data and reports are provided upon request.

CONTENTS

TABLES

ILLUSTRATIONS

APPENDICES

DISCLAIMER

Mention of a commercial company or product does not constitute an endorsement by the NOAA National Geophysical Data Center. Use for publicity or advertising purpose of information from this publication concerning proprietary products or the test of such products is not authorized.

INTRODUCTION

Since publication of the directory, "Geomagnetic Observatories 1978" [Report SE-21 of World Data Center A (WDC-A) for Solid Earth Geophysics, 1979], there have been important changes in instrumentation at the observatories, particularly in the method of recording. Although the first digital recording began in the early 1960's, only the last few years have brought a major transformation of the network. Today, more than half the world's standard observatories have joined the digital group. This change must be termed important progress. It is providing the geomagnetic research community with high-resolution data, computer ready, and usually more quickly. Many studies can now be easily made which before were not feasible.

Considering the intense current interest by the research community in digital geomagnetic data, members of Division V of the International Association of Geomagnetism and Aeronomy (IAGA) saw a need for a Directory of Digital Observatories to assist the data user. In September 1984 the Division first distributed questionnaires (see Appendix 3) to the world network, requesting details on each observatory's system. WDC-A was asked to compile and publish the results. Although some of the observatories responded slowly, another delaying factor was the difficulty of pinning down the facts -- many observatory systems were still being developed, and descriptions of the systems kept changing; many had only recently procured their instruments and had not begun installation. However, because this directory probably will be the only source of information on the digital observatories for the next few years, we felt that, rather than omitting those that were not yet recording, it was better to include all observatories with digital equipment on hand and to list as many facts as possible. Thus, this Directory shows the current situation, as near as it could be determined, as of May 1987.

We have made a primary separation of the observatories into two classes. Those that have programs of at least monthly absolute observations, and whose data are thus of potential use for studies of secular change, are ordinarily called "standard observatories" (Table 1a). In this Directory we refer to them as "observatories." Others, whose records are useful only for studies of short time variations, are referred to as "variation stations" (Table 1b). Instrumentation at the latter is simpler, less costly to operate, often temporary, and our list may not be complete.

Sampling rates vary extensively among the observatories, but one-minute values appear to have evolved as a standard output, replacing the traditional output of mean hourly values. Even at those observatories whose instruments sample the field more frequently, one-minute values are usually computed either as means or as selected individual values for distribution to users.

Missing information in Tables 1a through 10 indicates that the observatory did not supply the information. At the time of this publication, however, an observatory's system may still not have stabilized. See Appendix 3 for any questions concerning the table contents or table headings.

If we have omitted an observatory, misidentified an observatory, or made an error in the description, please inform us so that it can be corrected in any future edition of this Directory.

HOW TO OBTAIN DATA

This Directory is not intended to be a catalog of available data. On the contrary, those users accustomed to obtaining geomagnetic observatory data directly from the WDC's may be disappointed to learn that most of the digital data are not in the WDC's. Because of excessive cost and cumbersome logistics, no attempt is being made to collect all the digital data in the WDC system. Some observatories routinely deposit copies in one of the WDC's, but others await specific requests. In Table 9, in the columns under "High resolution," we list the observatories that routinely deposit their data in the WDC's, the observatories that will supply their data to a WDC upon request, and the observatories that require a direct request from the data user. In the second case, the WDC's will assist in obtaining data from the observatories.

If you want a listing of available data, the latest catalog is Report UAG-92, "Combined International Catalog of Geomagnetic Data," published in July 1985 by the National Geophysical Data Center, NOAA/NESDIS, 325 Broadway, Boulder, Colorado 80303, U.S.A. If you want to know the current digital data holdings in the WDC system, or have any question about the digital data described herein, please write to the above address.

Table 1a - Observatories producing one-minute values in at least three elements

ALGERIA
* Tamanrasset
AUSTRALIA
* Alice Springs
Canberra
Charters Towers
* Davis
Gnangara
Learmonth
Macquarie Island
Mawson
BELGIUM
Dourbes
BRAZIL
Vassouras
CANADA
Alert
Baker Lake
Cambridge Bay
Fort Churchill
Meanook
Mould Bay
Ottawa
Poste-de-la-Baleine
Resolute Bay
Saint John's
Victoria
Yellowknife
CHINA (see also Taiwan)
* Beijing
CZECHOSLOVAKIA
Hurbanovo
DENMARK
Brorfelde
Godhavn
Narssarssuaq
Thule
FINLAND
Nurmijarvi
Sodankyla
FRANCE
Chambon-la-Foret
Dumont d'Urville
Martin de Vivies
Pamatai
Port Alfred
Port-aux-Francais
GERMAN DEM. REP.
Niemegk
GERMAN FED. REP.
Furstenfeldbruck
Wingst
HUNGARY
* Nagycenk
Tihany
INDIA
* Alibag
Hyderabad
IRAQ
Baghdad
ISRAEL
* Amatsia
ITALY
Castel Tesino
L'Aquila
JAPAN
Hatizyo
Kakioka
Kanoya
Kanozan
Memambetsu
Mizusawa
Syowa
MADAGASCAR
* Tananarive
NETHERLANDS
Witteveen
NEW ZEALAND
Lauder
NORWAY
* Dombas
* Tromso
PAKISTAN
Karachi
POLAND
* Arctowski
Belsk
Hel
Hornsund
SAUDI ARABIA
* Riyadh
SOUTH AFRICA
Hartebeesthoek
Hermanus
Sanae
* Tsumeb
SPAIN
* Ebro

*Not yet operational (1987).

Table 1a - Observatories producing one-minute values in at least three elements (cont.)

SWEDEN		U.S.A.	(cont.)
	Abisko		Guam
	Kiruna		Honolulu
	Lovo		NORDA
	Lycksele		Newport
TAIWAN			San Juan
*	Lunping		Sitka
U.S.A.			Tucson
	Barrow	UNITED	KINGDOM
	Boulder		Argentine Islands
	College		Eskdalemuir
	Del Rio		Hartland
	Fredericksburg		Lerwick
	Fresno		

Note:

For some of the observatories up-to-date information was lacking at the time of going to press. Some of the equipment indicated as "Not yet operational (1987)" may now be in operation.

*Not yet operational (1987)

Table 1b - Variation stations producing one-minute values in at least three elements

AUSTRALIA
* Casey
* Toolangi

BRAZIL
Alcantara
Cachoeira Paulista
Eusebio
Ferraz

CANADA
* Back
* Churchill (MARIA)
* Contwoyto Lake
* Dawson City
Eskimo Point
* Fort McMurray
* Fort Simpson (MARIA)
* Fort Smith (MARIA)
Gillam
Glenlea
* Island Lake
* Pinawa
* Rabbit Lake
* Rankin Inlet

DENMARK
Daneborg
Danmarkshavn
Frederikshab
Godthab
Kuvdlorssuaq
Nord
Savigsivik
Scoresbysund
Sondre Stromfjord
Umanaq
Upernavik

FINLAND
Alta
Kautokeino
Kevo
Kilpisjarvi
Muonio
Pello
Soroya

GERMAN DEM. REP.
Warnkenhagen

JAPAN
Husafell
Isafjordur
Tjornes

NORWAY
Bear Island
New Aalesund

SWITZERLAND
Neuchatel

U.S.A.
Anchorage
Arctic Village
Cape Parry
Fort Simpson (SUNY)
Fort Smith (SUNY)
Fort Yukon
Inuvik
Iqaluit (Frob. Bay)
Lynn Lake
McMurdo
Norman Wells
Sach's Harbor
Siple
South Pole
Talkeetna
* Weston

U.S.S.R.
* Alma Ata
Arkhangelsk
* Ashkhabad
Cape Schmidt
Dixon Island
* Irkutsk
* Kaliningrad
* Leningrad
* Minsk
Moscow
* Murmansk
* Petropavlovsk
Tixie Bay
* Yakutsk
Yugorsky Shar

UNITED KINGDOM
Halley

*Not yet operational (1987)

Notes:

Iqaluit (Frob. Bay) = Iqaluit (Frobisher Bay)

Among the listed variation stations are some names that may be recognized as standard observatories (e.g., Alma Ata). These observatories are listed as variation stations because base lines for the digital equipment are not currently being monitored.

Two digital systems operate at each of the stations at Fort Churchill, Fort Simpson, and Fort Smith. The National Research Council of Canada operates one set at Churchill (Fort Churchill), Fort Simpson, and Fort Smith as part of the 13-station MARIA network. The State University of New York (SUNY) operates another set at Fort Simpson and Fort Smith as part of their 4-station network.

See the note for Table 1a.

Table 1c - Observatories/variation stations producing other high-resolution results

BELGIUM	GERMAN DEM. REP.
* Manhay	Sosa
CZECHOSLOVAKIA	ITALY
Budkov	Gibilmanna
FRANCE	PORTUGAL
Bangui	* Coimbra
M'Bour	ROMANIA
	Surlari

Notes:

See note for Table 1a.

"High-resolution" has been arbitrarily interpreted as a sampling rate of every three minutes or faster.

* Not yet operational (1987)

Table 2a - Digital observatories/variation stations
(alphabetically by name)

ABK		Abisko	68.36	18.82
ALC		Alcantara	-2.33	315.58
ALE		Alert	82.50	297.50
ABG	*	Alibag	18.64	72.87
ASP	*	Alice Springs	-23.33	134.00
AAA	*	Alma Ata	43.25	76.92
ALT		Alta	69.86	22.96
AMT	*	Amatsia	31.55	34.92
AMU		Anchorage	61.24	210.13
AVI		Arctic Village	68.13	214.43
ARC	*	Arctowski	-62.16	301.65
AIA		Argentine Islands	-65.26	295.74
ARK		Arkhangelsk	64.60	40.50
ASH	*	Ashkhabad	37.95	58.11
BKC	*	Back	57.68	265.80
BGH		Baghdad	33.50	45.00
BLC		Baker Lake	64.33	263.97
BNG		Bangui	4.44	18.57
BRW		Barrow	71.32	203.38
BJN		Bear Island	74.50	18.20
BJI	*	Beijing	40.04	116.18
BEL		Belsk	51.48	20.79
BOU		Boulder	40.14	254.76
BFE		Brorfelde	55.63	11.67
BDV		Budkov	49.08	14.02
CHP		Cachoeira Paulista	-22.73	315.00
CBB		Cambridge Bay	69.20	255.00
CNB		Canberra	-35.32	149.36
CPY		Cape Parry	70.17	235.28
CPS		Cape Schmidt	68.92	180.52
CSY	*	Casey	-66.28	110.53
CTS		Castel Tesino	46.05	11.65
CLF		Chambon-la-Foret	48.02	2.26
CTA		Charters Towers	-20.10	146.30
FCC	*	Churchill (MARIA)	58.77	265.90
COI	*	Coimbra	40.22	351.58
CMO		College	64.70	211.90
COW	*	Contwoyto Lake	65.73	248.75
DNB		Daneborg	74.30	339.80
DMH		Danmarkshavn	76.80	341.30
DVS	*	Davis	-68.58	77.97
DWC	*	Dawson City	64.07	220.58
DLR		Del Rio	29.94	259.08
DIX		Dixon Island	73.55	80.57
DOB	*	Dombas	62.07	9.12
DOU		Dourbes	50.10	4.60
DRV		Dumont d'Urville	-66.67	140.01
EBR	*	Ebro	40.82	0.49
ESK		Eskdalemuir	55.32	356.80

*Not yet operational (1987)

Table 2a - Digital observatories/variation stations (alphabetically by name) (cont.)

EKP		Eskimo Point	61.11	265.64
EUS		Eusebio	-3.88	324.79
FRZ		Ferraz	-62.08	301.61
FCC		Fort Churchill	58.77	265.90
FMC	*	Fort McMurray	56.73	248.62
FSP	*	Fort Simpson (MARIA)	61.75	238.77
FSP		Fort Simpson (SUNY)	61.75	238.77
FSM	*	Fort Smith (MARIA)	58.00	246.00
FSM		Fort Smith (SUNY)	58.00	246.00
FYU		Fort Yukon	66.57	214.73
FRD		Fredericksburg	38.21	282.63
FHB		Frederikshab	62.00	310.30
FRN		Fresno	37.09	240.28
FUR		Furstenfeldbruck	48.17	11.28
GIB		Gibilmanna	37.99	14.02
GIM		Gillam	56.38	265.36
GLL		Glenlea	49.60	262.90
GNA		Gnangara	-31.78	115.95
GDH		Godhavn	69.25	306.47
GHB		Godthab	64.17	308.27
GUA		Guam	13.58	144.87
HBA		Halley	-75.52	333.32
HBK		Hartebeesthoek	-25.88	27.71
HAD		Hartland	51.00	355.52
HTY		Hatizyo	33.07	139.83
HLP		Hel	54.61	18.82
HER		Hermanus	-34.43	19.23
HON		Honolulu	21.32	202.00
HRN		Hornsund	77.00	15.55
HRB		Hurbanovo	47.87	18.19
HSF		Husafell	64.67	338.97
HYB		Hyderabad	17.41	78.56
INK		Inuvik	68.25	226.70
IQL		Iqaluit (Frob. Bay)	63.45	291.70
IRT	*	Irkutsk	52.17	104.45
IFJ		Isafjordur	66.08	336.87
ISL	*	Island Lake	53.86	265.34
KAK		Kakioka	36.23	140.19
KNG	*	Kaliningrad	54.70	20.62
KNY		Kanoya	31.42	130.88
KNZ		Kanozan	35.25	139.96
KRC		Karachi	24.95	67.14
KAU		Kautokeino	69.02	23.05
KEV		Kevo	69.76	27.01
KIL		Kilpisjarvi	69.05	20.79
KIR		Kiruna	67.83	20.42
KUV		Kuvdlorssuaq	74.57	302.82
AQU		L'Aquila	42.38	13.32
LAU		Lauder	-45.04	169.68

*Not yet operational (1987)

Table 2a - Digital observatories/variation stations (alphabetically by name) (cont.)

LRM	Learmonth	-22.22	114.10
LNN *	Leningrad	59.95	30.71
LER	Lerwick	60.13	358.82
LOV	Lovo	59.35	17.83
LNP *	Lunping	25.00	121.17
LYS	Lycksele	64.62	18.77
LYN	Lynn Lake	56.85	258.93
MBO	M'Bour	14.39	343.04
MCQ	Macquarie Island	-54.50	158.95
MAB *	Manhay	50.30	5.68
AMS	Martin de Vivies	-37.83	77.57
MAW	Mawson	-67.61	62.88
MCM	McMurdo	-77.85	166.70
MEA	Meanook	54.62	246.67
MMB	Memambetsu	43.91	144.19
MNK *	Minsk	54.50	27.88
MIZ	Mizusawa	39.01	141.08
MOS	Moscow	55.48	37.31
MBC	Mould Bay	76.20	240.60
MUO	Muonio	68.02	23.53
MMK *	Murmansk	68.25	33.08
NMO	NORDA	30.35	89.64
NCK *	Nagycenk	47.63	16.72
NAQ	Narssarssuaq	61.10	314.80
NEU	Neuchatel	47.04	6.95
NAL	New Aalesund	78.92	11.95
NEW	Newport	48.26	242.88
NGK	Niemegk	52.07	12.68
NRD	Nord	81.60	343.24
NOW	Norman Wells	64.90	234.50
NUR	Nurmijarvi	60.52	24.65
OTT	Ottawa	45.40	284.45
PPT	Pamatai	-17.57	210.43
PEL	Pello	66.90	24.08
PET *	Petropavlovsk	52.90	158.43
PNW *	Pinawa	50.20	263.96
CZT	Port Alfred	-46.43	51.87
KGL	Port-aux-Francais	-49.43	70.22
PDQ	Poste-de-la-Baleine	55.27	282.22
RBL *	Rabbit Lake	58.22	256.33
RIT *	Rankin Inlet	62.82	267.88
RES	Resolute Bay	74.70	265.10
RYD *	Riyadh	24.70	46.67
SAH	Sach's Harbor	72.00	235.00
STJ	Saint John's	47.60	307.32
SJG	San Juan	18.12	293.85
SNA	Sanae	-70.30	357.65
SVS	Savigsivik	76.02	294.90
SCO	Scoresbysund	70.48	338.03

*Not yet opertational (1987)

Table 2a - Digital observatories/variation stations (alphabetically by name) (cont.)

SPL		Siple	-76.00	276.00
SIT		Sitka	57.07	224.67
SOD		Sodankyla	67.37	26.62
STF		Sondre Stromfjord	67.00	309.30
SOR		Soroya	70.54	22.22
SSA		Sosa	50.29	12.38
SPA		South Pole	-90.00	0.00
SUA		Surlari	44.68	26.25
SYO		Syowa	-69.00	38.58
TLK		Talkeetna	63.30	209.90
TAM	*	Tamanrasset	22.79	5.53
TAN	*	Tananarive	-18.92	47.55
THL		Thule	77.48	290.83
THY		Tihany	46.90	17.90
TIK		Tixie Bay	71.58	129.00
TJN		Tjornes	66.20	342.88
TOO	*	Toolangi	-37.53	145.47
TRO	*	Tromso	69.67	18.95
TSU	*	Tsumeb	-19.22	17.70
TUC		Tucson	32.25	249.17
UMQ		Umanaq	70.70	307.90
UPN		Upernavik	72.80	303.90
VSS		Vassouras	-22.40	316.35
VIC		Victoria	48.52	236.58
WRH		Warnkenhagen	54.00	11.07
WES	*	Weston	42.38	288.68
WNG		Wingst	53.75	9.07
WIT		Witteveen	52.82	6.67
YAK	*	Yakutsk	62.02	129.72
YKC		Yellowknife	62.50	245.50
YGS		Yugorsky Shar	69.47	61.42

Notes:

"Churchill" is a variation station, one in the MARIA network of Canada. It is located on the grounds of the Canadian standard observatory, "Fort Churchill."

For those users unfamilar with the observatory names and wishing to select observatories for data studies, we suggest use of the three letter codes and reference to the maps.

*Not yet operational (1987)

Table 2b -- Digital observatories/variation stations
(by decreasing latitude)

ALE		Alert	82.50	297.50
NRD		Nord	81.60	343.24
NAL		New Aalesund	78.92	11.95
THL		Thule	77.48	290.83
HRN		Hornsund	77.00	15.55
DMH		Danmarkshavn	76.80	341.30
MBC		Mould Bay	76.20	240.60
SVS		Savigsivik	76.02	294.90
RES		Resolute Bay	74.70	265.10
KUV		Kuvdlorssuaq	74.57	302.82
BJN		Bear Island	74.50	18.20
DNB		Daneborg	74.30	339.80
DIX		Dixon Island	73.55	80.57
UPN		Upernavik	72.80	303.90
SAH		Sach's Harbor	72.00	235.00
TIK		Tixie Bay	71.58	129.00
BRW		Barrow	71.32	203.38
UMQ		Umanaq	70.70	307.90
SOR		Soroya	70.54	22.22
SCO		Scoresbysund	70.48	338.03
CPY		Cape Parry	70.17	235.28
ALT		Alta	69.86	22.96
KEV		Kevo	69.76	27.01
TRO	*	Tromso	69.67	18.95
YGS		Yugorsky Shar	69.47	61.42
GDH		Godhavn	69.25	306.47
CBB		Cambridge Bay	69.20	255.00
KIL		Kilpisjarvi	69.05	20.79
KAU		Kautokeino	69.02	23.05
CPS		Cape Schmidt	68.92	180.52
ABK		Abisko	68.36	18.82
MMK	*	Murmansk	68.25	33.08
INK		Inuvik	68.25	226.70
AVI		Arctic Village	68.13	214.43
MUO		Muonio	68.02	23.53
KIR		Kiruna	67.83	20.42
SOD		Sodankyla	67.37	26.62
STF		Sondre Stromfjord	67.00	309.30
PEL		Pello	66.90	24.08
FYU		Fort Yukon	66.57	214.73
TJN		Tjornes	66.20	342.88
IFJ		Isafjordur	66.08	336.87
COW	*	Contwoyto Lake	65.73	248.75
NOW		Norman Wells	64.90	234.50
CMO		College	64.70	211.90
HSF		Husafell	64.67	338.97
LYS		Lycksele	64.62	18.77
ARK		Arkhangelsk	64.60	40.50
BLC		Baker Lake	64.33	263.97

*Not yet operational (1987)

Table 2b -- Digital observatories/variation stations (by decreasing latitude) (cont.)

GHB		Godthab	64.17	308.27
DWC	*	Dawson City	64.07	220.58
IQL		Iqaluit (Frob. Bay)	63.45	291.70
TLK		Talkeetna	63.30	209.90
RIT	*	Rankin Inlet	62.82	267.88
YKC		Yellowknife	62.50	245.50
DOB	*	Dombas	62.07	9.12
YAK	*	Yakutsk	62.02	129.72
FHB		Frederikshab	62.00	310.30
FSP		Fort Simpson (SUNY)	61.75	238.77
FSP	*	Fort Simpson (MARIA)	61.75	238.77
AMU		Anchorage	61.24	210.13
EKP		Eskimo Point	61.11	265.64
NAQ		Narssarssuaq	61.10	314.80
NUR		Nurmijarvi	60.52	24.65
LER		Lerwick	60.13	358.82
LNN	*	Leningrad	59.95	30.71
LOV		Lovo	59.35	17.83
FCC	*	Churchill (MARIA)	58.77	265.90
FCC		Fort Churchill	58.77	265.90
RBL	*	Rabbit Lake	58.22	256.33
FSM	*	Fort Smith (MARIA)	58.00	246.00
FSM		Fort Smith (SUNY)	58.00	246.00
BKC	*	Back	57.68	265.80
SIT		Sitka	57.07	224.67
LYN		Lynn Lake	56.85	258.93
FMC	*	Fort McMurray	56.73	248.62
GIM		Gillam	56.38	265.36
BFE		Brorfelde	55.63	11.67
MOS		Moscow	55.48	37.31
ESK		Eskdalemuir	55.32	356.80
PDQ		Poste-de-la-Baleine	55.27	282.22
KNG	*	Kaliningrad	54.70	20.62
MEA		Meanook	54.62	246.67
HLP		Hel	54.61	18.82
MNK	*	Minsk	54.50	27.88
WRH		Warnkenhagen	54.00	11.07
ISL	*	Island Lake	53.86	265.34
WNG		Wingst	53.75	9.07
PET	*	Petropavlovsk	52.90	158.43
WIT		Witteveen	52.82	6.67
IRT	*	Irkutsk	52.17	104.45
NGK		Niemegk	52.07	12.68
BEL		Belsk	51.48	20.79
HAD		Hartland	51.00	355.52
MAB	*	Manhay	50.30	5.68
SSA		Sosa	50.29	12.38
PNW	*	Pinawa	50.20	263.96
DOU		Dourbes	50.10	4.60

*Not yet operational (1987)

Table 2b -- Digital observatories/variation stations (by decreasing latitude) (cont.)

GLL		Glenlea	49.60	262.90
BDV		Budkov	49.08	14.02
VIC		Victoria	48.52	236.58
NEW		Newport	48.26	242.88
FUR		Furstenfeldbruck	48.17	11.28
CLF		Chambon-la-Foret	48.02	2.26
HRB		Hurbanovo	47.87	18.19
NCK	*	Nagycenk	47.63	16.72
STJ		Saint John's	47.60	307.32
NEU		Neuchatel	47.04	6.95
THY		Tihany	46.90	17.90
CTS		Castel Tesino	46.05	11.65
OTT		Ottawa	45.40	284.45
SUA		Surlari	44.68	26.25
MMB		Memambetsu	43.91	144.19
AAA	*	Alma Ata	43.25	76.92
WES	*	Weston	42.38	288.68
AQU		L'Aquila	42.38	13.32
EBR	*	Ebro	40.82	0.49
COI	*	Coimbra	40.22	351.58
BOU		Boulder	40.14	254.76
BJI	*	Beijing	40.04	116.18
MIZ		Mizusawa	39.01	141.08
FRD		Fredericksburg	38.21	282.63
GIB		Gibilmanna	37.99	14.02
ASH	*	Ashkhabad	37.95	58.11
FRN		Fresno	37.09	240.28
KAK		Kakioka	36.23	140.19
KNZ		Kanozan	35.25	139.96
BGH		Baghdad	33.50	45.00
HTY		Hatizyo	33.07	139.83
TUC		Tucson	32.25	249.17
AMT	*	Amatsia	31.55	34.92
KNY		Kanoya	31.42	130.88
NMO		NORDA	30.35	89.64
DLR		Del Rio	29.94	259.08
LNP	*	Lunping	25.00	121.17
KRC		Karachi	24.95	67.14
RYD	*	Riyadh	24.70	46.67
TAM	*	Tamanrasset	22.79	5.53
HON		Honolulu	21.32	202.00
ABG	*	Alibag	18.64	72.87
SJG		San Juan	18.12	293.85
HYB		Hyderabad	17.41	78.56
MBO		M'Bour	14.39	343.04
GUA		Guam	13.58	144.87
BNG		Bangui	4.44	18.57
ALC		Alcantara	-2.33	315.58
EUS		Eusebio	-3.88	324.79

*Not yet operational (1987)

Table 2b -- Digital observatories/variation stations (by decreasing latitude) (cont.)

PPT		Pamatai	-17.57	210.43
TAN	*	Tananarive	-18.92	47.55
TSU	*	Tsumeb	-19.22	17.70
CTA		Charters Towers	-20.10	146.30
LRM		Learmonth	-22.22	114.10
VSS		Vassouras	-22.40	316.35
CHP		Cachoeira Paulista	-22.73	315.00
ASP	*	Alice Springs	-23.33	134.00
HBK		Hartebeesthoek	-25.88	27.71
GNA		Gnangara	-31.78	115.95
HER		Hermanus	-34.43	19.23
CNB		Canberra	-35.32	149.36
TOO	*	Toolangi	-37.53	145.47
AMS		Martin de Vivies	-37.83	77.57
LAU		Lauder	-45.04	169.68
CZT		Port Alfred	-46.43	51.87
KGL		Port-aux-Francais	-49.43	70.22
MCQ		Macquarie Island	-54.50	158.95
FRZ		Ferraz	-62.08	301.61
ARC	*	Arctowski	-62.16	301.65
AIA		Argentine Islands	-65.26	295.74
CSY	*	Casey	-66.28	110.53
DRV		Dumont d'Urville	-66.67	140.01
MAW		Mawson	-67.61	62.88
DVS	*	Davis	-68.58	77.97
SYO		Syowa	-69.00	38.58
SNA		Sanae	-70.30	357.65
HBA		Halley	-75.52	333.32
SPL		Siple	-76.00	276.00
MCM		McMurdo	-77.85	166.70
SPA		South Pole	-90.00	0.00

Notes:

"Churchill" is a variation station, one in the MARIA network of Canada. It is located on the grounds of the Canadian standard observatory, "Fort Churchill."

For those users unfamilar with the observatory names and wishing to select observatories for data studies, we suggest use of the three letter codes and reference to the maps.

*Not yet operational (1987)

Table 3 -- Description of digital magnetometers

Observatory/station	Instrument type	Elements recorded	Instrument make and model No.
Abisko	Fluxgate	XYZ	EDA, modified by SGS
Alcantara	Fluxgate	DHZ	EDA FM100B
Alert	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
* Alibag	Quartz	DHZ	IZMIRAN
* Alice Springs	Fluxgate	XYZ	EDA FM105B
	Proton	F	ELSEC 595
* Alma Ata	Quartz	DHZ	SKB-FP CMVS-2
Alta	Fluxgate	XYZ	Helatronic 2450; Forster
* Amatsia	Fluxgate	DHZ	EDA FM100B
Anchorage	Fluxgate	DHZ	EDA FM100B
	Proton	F	
Arctic Village	Fluxgate	DHZ	EDA FM100B
* Arctowski	Quartz	DHZ	PSM
Argentine Islands	Fluxgate	DHZ	EDA FM100B
	Proton	F	Barringer GM122
Arkhangelsk	Quartz	DHZ	SKB-FP CMVS-2
* Ashkhabad	Quartz	DHZ	SKB-FP CMVS-2
* Back	Fluxgate	XYZ	Narod ring core
Baghdad	Fluxgate	XYZ	EDA, modified EPB model AMOSII
	Proton	F	PPM 105
Baker Lake	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
Barrow	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Bear Island	Fluxgate	XYZ	Own design
* Beijing	Fluxgate	XYZ	EDA,modified EPB model AMOSIII
	Proton	F	
Belsk	Quartz	DHZ	PSM
Boulder	Fluxgate	DHZ	Narod ring core
	Proton	F	EDA PPM105
Brorfelde	Fluxgate	DHZ	EDA FM100C
	Proton	F	EDA PPM105
Budkov		DHZ	Own make, MEC-1
Cachoeira Paulista	Fluxgate	DHZ	EDA FM100B
Cambridge Bay	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
Canberra	Proton	DIF	ELSEC, model AMO6920
Cape Parry	Fluxgate	DHZ	EDA FM100B
Cape Schmidt	Quartz	DHZ	SKB-FP CMVS-2
* Casey	Fluxgate	XYZ	EDA FM100C
Castel Tesino	Proton	DHZF	Own design
Chambon-la-Foret	Fluxgate	DHZ	Thomson CSF; VFO30
	Proton	F	Geometrics; 850G
Charters Towers	Fluxgate	XYZ	EDA FM105B
	Proton	F	ELSEC 595

*Not yet operational (1987)

Table 3 -- Description of digital magnetometers (cont.)

Observatory/station	Instrument type	Elements recorded	Instrument make and model No.
* Churchill (MARIA)	Fluxgate	XYZ	Narod ring core
* Coimbra	Proton	F	ELSEC G-866
College	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
* Contwoyto Lake	Fluxgate	XYZ	Narod ring core
Daneborg	Fluxgate	DHZ	EDA FM100B
Danmarkshavn	Fluxgate	DHZ	EDA FM100B
* Davis	Fluxgate	XYZ	EDA FM100C, modified by AD
* Dawson City	Fluxgate	XYZ	Narod ring core
Del Rio	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Dixon Island	Quartz	DHZ	SKB-FP CMVS-2
* Dombas	Fluxgate	DHZ	EDA FM100B
	Proton	F	Geometrics 826A
Dourbes	Optical Pumping	DIF	Varian ASMO
Dumont d'Urville	Fluxgate	XYZ	Thomson CSF VFO 31
	Proton	F	Geometrics G816
* Ebro	Fluxgate	DHZ	AMOS II
	Proton	F	AMOS II
Eskdalemuir	Fluxgate	XYZ	Argos
	Proton	F	ELSEC 820M
Eskimo Point	Fluxgate	XYZ	Narod ring core
Eusebio	Fluxgate	DHZ	EDA FM100B
Ferraz	Fluxgate	DHZ	EDA FM100B
Fort Churchill	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
* Fort McMurray	Fluxgate	XYZ	Narod ring core
* Fort Simpson (MARIA)	Fluxgate	XYZ	Narod ring core
Fort Simpson (SUNY)	Fluxgate	DHZ	EDA FM100B
* Fort Smith (MARIA)	Fluxgate	XYZ	Narod ring core
Fort Smith (SUNY)	Fluxgate	DHZ	EDA FM100B
Fort Yukon	Fluxgate	DHZ	Schonstedt HSM-3
Fredericksburg	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Frederikshab	Fluxgate	DHZ	EDA FM100B
Fresno	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Furstenfeldbruck	Fiber, balance	DHZ	Own design photoelectronic
Gibilmanna	Proton	F	ELSEC
Gillam	Fluxgate	XYZ	Narod ring core
Glenlea	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
Gnangara	Proton	DIF	ELSEC AMO 7920
Godhavn	Fluxgate	DHZ	EDA FM100C
	Proton	F	EDA PPM105

*Not yet operational (1987)

Table 3 -- Description of digital magnetometers (cont.)

Observatory/station	Instrument type	Elements recorded	Instrument make and model No.
Godthab	Fluxgate	DHZ	EDA FM100B
Guam	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Halley	Fluxgate	DHZ	EDA FM100B
	Proton	F	Barringer GM122
Hartebeesthoek	Proton	F	Own construction
		DHZ	Own construction
Hartland	Fluxgate	XYZ	Argos
	Proton	F	ELSEC 820M
Hatizyo	Proton	F	Kokusai Electric Corp. PMS-10
		DIZ	Eschenhagen,Sokkisha,MG-67-085
Hel	Quartz	DHZ	PSM
Hermanus	Proton	F	
		DHZ	Own construction
Honolulu	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Hornsund	Fluxgate	DHZ	PSM
Hurbanovo	Quartz	DHZ	CMVS-2
Husafell	Fluxgate	DHZ	EDA, modified by Meisei
	Proton	F	Kokusai
Hyderabad	Fluxgate	XYZ	EDA AMOS III
	Proton	F	EDA AMOS III
Inuvik	Fluxgate	DHZ	EDA FM100B
Iqaluit (Frob. Bay)	Fluxgate	DHZ	EDA
* Irkutsk	Quartz	DHZ	SKB-FP CMVS-2
Isafjordur	Fluxgate	DHZ	EDA, modified by Meisei
	Proton	F	Kokusai
* Island Lake	Fluxgate	XYZ	Narod ring core
Kakioka	Fluxgate	DHZ	Shimazu Corp. MB-160
	Proton	F	Kokusai Electronics Corp.
	Optical Pumping	DHZF	Nippon Electric Corp.
* Kaliningrad	Quartz	DHZ	SKB-FP CMVS-2
Kanoya	Fluxgate	DHZ	Shimazu Corp. MB-160
	Proton	F	Kokusai Electronics Corp.
Kanozan	Fluxgate	DHZ	Shimazu
	Proton	F	
	Fibre	DHZ	Sokkisha
Karachi	Fluxgate	XYZ	EDA AMOS III
	Proton	F	
Kautokeino	Fluxgate	XYZ	Helatronic 2450; Forster
Kevo	Fluxgate	XYZ	Helatronic 2450; Forster
Kilpisjarvi	Fluxgate	XYZ	Helatronic 2450; Forster
Kiruna	Fluxgate	XYZ	EDA FM100B
Kuvdlorssuaq	Fluxgate	DHZ	EDA FM100B
L'Aquila	Proton	DHZ	ELSEC, coils
	Proton	F	Geometrics PPM

*Not yet operational (1987)

Table 3 -- Description of digital magnetometers (cont.)

Observatory/station	Instrument type	Elements recorded	Instrument make and model No.
Lauder	Fluxgate	DHZ	AMOS II
	Proton	F	AMOS II
Learmonth	Fluxgate	XYZ	EDA FM105B
	Proton	F	ELSEC 595
* Leningrad	Quartz	DHZ	SKB-FP CMVS-2
Lerwick	Fluxgate	XYZ	Argos
	Proton	F	ELSEC 820M
Lovo	Fluxgate	XYZ	Own construction
	Proton	F	Geometrics G803
* Lunping	Fluxgate	XYZ	EDA AMOS III
	Proton	F	EDA AMOS III
Lycksele	Fluxgate	XYZ	EDA FM100
Lynn Lake	Fluxgate	DHZ	EDA FM100B
Macquarie Island	Proton	F	
	Fiber, Balance	XYZ	Own design photoelectronic
Martin de Vivies	Fluxgate	DHZ	Thomson CSF VFO 31
	Proton	F	Geometrics G816 or ELSEC 770
Mawson	Quartz	XYZ	Photoelectronic based on QHM'S
	Proton	F	
McMurdo	Fluxgate	DHZ	EDA
Meanook	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
Memambetsu	Fluxgate	DHZ	Shimazu Corp. MB-162
	Proton	F	Kokusai Electronics Corp.
* Minsk	Quartz	DHZ	SKB-FB CMVS-2
Mizusawa	Fluxgate	DHZ	Shimazu
	Proton	F	
	Suspension Type	DHZ	Sokkisha
Moscow	Quartz	DHZ	SKB-FP CMVS-2
Mould Bay	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
Muonio	Fluxgate	XYZ	Helatronic 2450; Forster
* Murmansk	Quartz	DHZ	SKB-FB CMVS-2
NORDA	Fluxgate	DHZ	Narod ring core
	Proton	F	EDA PPM 105
* Nagycenk	Quartz,liquid-damp	DHZ	MTA GGKI MTV-2
Narssarssuaq	Fluxgate	DHZ	EDA FM100C
	Proton	F	EDA PPM105
Neuchatel	Fluxgate	XYZ	EDA, modified by OC
	Proton	F	EDA, modified by OC AMOS II
New Aalesund	Fluxgate	XYZ	Own design
Newport	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Niemegk	Proton	YZF	Own construction
Nord	Fluxgate	DHZ	EDA FM100B

*Not yet operational (1987)

Table 3 -- Description of digital magnetometers (cont.)

Observatory/station	Instrument type	Elements recorded	Instrument make and model No.
Norman Wells	Fluxgate	DHZ	EDA FM100B
Nurmijarvi	Quartz	XYZ	PSM
Ottawa	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
Pamatai	Proton	DHZF	
Pello	Fluxgate	XYZ	Helatronic 2450; Forster
* Petropavlovsk	Quartz	DHZ	SKB-FB CMVS-2
* Pinawa	Fluxgate	XYZ	Narod ring core
Port Alfred	Fluxgate	DHZ	Thomson CSF VFO 31
	Proton	F	Geometrics G816 or ELSEC 770
Port-aux-Francais	Fluxgate	DHZ	Thomson CSF VFO 31
	Proton	F	Geometrics G816 or ELSEC 770
Poste-de-la-Baleine	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
* Rabbit Lake	Fluxgate	XYZ	Narod ring core
* Rankin Inlet	Fluxgate	XYZ	Narod ring core
Resolute Bay	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
* Riyadh	Fluxgate	XYZ	EDA FM100B
	Proton	F	EDA PMS 200
Sach's Harbor	Fluxgate	DHZ	EDA FM100B
Saint John's	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
San Juan	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Sanae	Fluxgate	DHZ	EDA FM105B
Savigsivik	Fluxgate	DHZ	EDA FM100B
Scoresbysund	Fluxgate	DHZ	EDA FM100B
Siple	Fluxgate	DHZ	EDA
Sitka	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Sodankyla	Quartz	XYZ	PSM 7711
Sondre Stromfjord	Fluxgate	DHZ	EDA FM100B
Soroya	Fluxgate	XYZ	Helatronic 2450; Forster
Sosa	Proton	F	Own design
South Pole	Fluxgate	DHZ	EDA
Syowa	Fluxgate	DHZ	EDA, modified by Meisei
	Proton	F	Kokusai
Talkeetna	Fluxgate	DHZ	EDA FM100B
* Tamanrasset	Fluxgate	DHZ	EDA,modified EPB model AMOSIII
	Proton	F	
* Tananarive	Fluxgate	DHZ	Thomson CSF TSM 3050
Thule	Fluxgate	DHZ	EDA FM100C
	Proton	F	EDA PPM105
Tihany	Quartz	DHZ	MTA GGKI MTV-2

*Not yet operational (1987)

Table 3 -- Description of digital magnetometers (cont.)

Observatory/station	Instrument type	Elements recorded	Instrument make and model No.
Tixie Bay	Quartz	DHF	SKB-FP CMVS-2
Tjornes	Fluxgate	DHZ	EDA, modified by Meisei
	Proton	F	
* Toolangi	Quartz	XYZ	Own design photoelectronic
* Tromso	Fluxgate	XYZ	Own construction
* Tsumeb	Proton	F	
		DHZ	Own construction
Tucson	Fluxgate	DHZ	EDA, modified by USGS FM100B
	Proton	F	EDA PPM105
Umanaq	Fluxgate	DHZ	EDA FM100B
Upernavik	Fluxgate	DHZ	EDA FM100B
Vassouras	Fluxgate	DHZ	EDA AMOS II
	Proton	F	EDA PPM
Victoria	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
Warnkenhagen	Proton	YZF	Own construction
* Weston	Fluxgate	DHZ	UCLA
Wingst	Fluxgate	XYZ	EDA FM100C
	Proton	F	Varian 75
Witteveen	Fluxgate	DI	Own constuction
	Proton	F	Geometrics
* Yakutsk	Quartz	DHZ	SKB-FB CMVS-2
Yellowknife	Fluxgate	XYZ	EPB design AMOS III
	Proton	F	EPB design Presentey PPM01
Yugorsky Shar	Quartz	DHZ	SKB-FP CMVS-2

*Not yet operational (1987)

Note:

Please note that WDC-A and Division V of IAGA neither endorse nor recommend any particular instrument. Addresses of the various manufacturers mentioned are given in Appendix 2.

Several abbreviations are used:

AD	Antarctic Division (Australia)
EPB	Earth Physics Branch (Canada)
MARIA	MARIA Project of the National Research Council (Canada)
OC	Observatoire Cantonal (Switzerland)
PSM	Polish Academy of Sciences
SGS	Geological Survey of Sweden
SUNY	State University of New York at Albany

Table 4 -- Description of recorded data

Observatory/station	Elements recorded	Sampling rate	Sampling method	Recorded medium	Estim. % complete
Abisko	XYZ	10.0 sec	Mean	Fl. disk	
Alcantara	DHZ	1.0 min	Inst	Cassette	
Alert	XYZF	1.0 sec	Inst	Cartridge	100
* Alibag	DHZ	1.0 sec	Inst		
* Alice Springs	XYZF	1.0 min	Mean	Cassette	
* Alma Ata	DHZ	1.0 min	Mean	Cassette	80
Alta	XYZ	20.0 sec	Mean	Cassette	95
* Amatsia	DHZ	1.0 min	Inst	Fl. disk	
Anchorage	DHZF	1.0 min	Inst	Reel	
Arctic Village	DHZ	1.0 min	Mean	Reel	95
* Arctowski	DHZ	30.0 sec			
Argentine Islands	DHZF	30.0 sec	Inst	Cassette	95
Arkhangelsk	DHZ	1.0 min	Mean	Reel	90
* Ashkhabad	DHZ	1.0 min	Mean		
* Back	XYZ	5.0 sec	Inst	Reel	95
Baghdad	XYZF	1.0 min	Inst	Reel	
Baker Lake	XYZF	1.0 sec	Inst	Cartridge	100
Barrow	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Bear Island	XYZ	10.0 sec	Inst	Reel	
				Fl. disk	
* Beijing	XYZF	1.0 min			
Belsk	DHZ	30.0 sec	Inst	Cassette	100
Boulder	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Brorfelde	DHZF	1.0 min	Inst	Cassette	100
Budkov	DHZ	2.0 min	Inst	Cassette	95
Cachoeira Paulista	DHZ	1.0 min	Inst	Cassette	
Cambridge Bay	XYZF	1.0 sec	Inst	Cartridge	100
Canberra	DIF	1.0 min	Inst	Reel	100
Cape Parry	DHZ	1.0 min	Mean	Reel	95
Cape Schmidt	DHZ	1.0 min	Mean	Reel	80
* Casey	XYZ	10.0 sec	Inst	Hard disk	
Castel Tesino	DHZF	1.0 min	Inst	Cassette	50
Chambon-la-Foret	DHZF	1.0 min	Inst	Reel	75
				Paper tape	100
Charters Towers	XYZF	1.0 min	Mean	Cassette	95
* Churchill (MARIA)	XYZ	5.0 sec	Inst	Reel	95
* Coimbra	F		Inst	Paper tape	
College	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
* Contwoyto Lake	XYZ	5.0 sec	Inst	Reel	95
Daneborg	DHZ	1.0 min	Fltr	Cassette	100
Danmarkshavn	DHZ	1.0 min	Fltr	Cassette	100
* Davis	XYZ	10.0 sec	Inst	Hard disk	95

*Not yet operational (1987)

Table 4 -- Description of recorded data (cont.)

Observatory/station	Elements recorded	Sampling rate	Sampling method	Recorded medium	Estim. % complete
* Dawson City	XYZ	5.0 sec	Inst	Reel	95
Del Rio	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Dixon Island	DHZ	1.0 min	Mean	Cassette	80
* Dombas	DHZF	10.0 sec	Inst	Reel	95
Dourbes	DIF	10.0 sec	Inst	Reel	95
Dumont d'Urville	XYZF	1.0 min	Inst	Reel	95
				Fl. disk	95
* Ebro	DHZF	1.0 min	Inst	Reel	95
Eskdalemuir	XYZF	1.0 min	Mean	Cartridge	100
Eskimo Point	XYZ	5.0 sec	Inst	Reel	95
Eusebio	DHZ	1.0 min	Inst	Cassette	
Ferraz	DHZ	1.0 min	Inst	Cassette	
Fort Churchill	XYZF	1.0 sec	Inst	Cartridge	100
* Fort McMurray	XYZ	5.0 sec	Inst	Reel	95
* Fort Simpson (MARIA)	XYZ	5.0 sec	Inst	Reel	95
Fort Simpson (SUNY)	DHZ	2.5 sec	Inst	Reel	
* Fort Smith (MARIA)	XYZ	5.0 sec	Inst	Reel	95
Fort Smith (SUNY)	DHZ	2.5 sec	Inst	Reel	
Fort Yukon	DHZ	1.0 min	Mean	Reel	95
Fredericksburg	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Frederikshab	DHZ	1.0 min	Fltr	Cassette	100
Fresno	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Furstenfeldbruck	DHZ	20.0 sec	Inst	Fl. disk	95
Gibilmanna	F	2.0 min	Inst	Paper tape	80
Gillam	XYZ	5.0 sec	Inst	Reel	95
Glenlea	XYZF	1.0 sec	Inst	Cartridge	100
Gnangara	DIF	1.0 min	Inst	Reel	100
Godhavn	DHZF	1.0 min	Inst	Cassette	100
Godthab	DHZ	1.0 min	Fltr	Cassette	100
Guam	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Halley	DHZF	30.0 sec	Inst	Cassette	95
Hartebeesthoek	FDHZ	12.0 sec	Inst	Cassette	90
Hartland	XYZF	1.0 min	Mean	Cartridge	100
Hatizyo	FDIZ	1.0 min	Inst	Reel	95
Hel	DHZ	30.0 sec	Inst	Cassette	100
Hermanus	FDHZ	12.0 sec	Inst	Cassette	100
Honolulu	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Hornsund	DHZ	30.0 sec			
Hurbanovo	DHZ	1.0 min	Mean	Cassette	100
Husafell	DHZF	1.0 sec	Inst	Reel	95

*Not yet operational (1987)

Table 4 -- Description of recorded data (cont.)

Observatory/station	Elements recorded	Sampling rate	Sampling method	Recorded medium	Estim. % complete
Hyderabad	XYZF	1.0 min	Inst	Reel	100
Inuvik	DHZ	1.0 min	Mean	Reel	95
Iqaluit (Frob. Bay)	DHZ	1.0 sec	Inst	Cassette	95
* Irkutsk	DHZ	1.0 min	Mean	Reel	80
Isafjordur	DHZF	1.0 sec	Inst	Reel	95
* Island Lake	XYZ	5.0 sec	Inst	Reel	95
Kakioka	DHZF	1.0 sec	Inst	Reel	100
	DHZF	1.0 min	Inst	Reel	100
* Kaliningrad	DHZ	1.0 min	Mean		
Kanoya	DHZF	1.0 min	Mean	Cassette	100
Kanozan	DHZF	1.0 min	Inst	Reel	100
Karachi	XYZF	1.0 min	Inst	Reel	
Kautokeino	XYZ	20.0 sec	Mean	Cassette	95
Kevo	XYZ	20.0 sec	Mean	Cassette	95
Kilpisjarvi	XYZ	20.0 sec	Mean	Cassette	95
Kiruna	XYZ	1.0 min	Inst	Reel	100
Kuvdlorssuaq	DHZ	1.0 min	Fltr	Cassette	100
L'Aquila	DHZF	1.0 min	Inst	Cassette	95
Lauder	DHZF	10.0 sec	Inst	Reel	100
Learmonth	XYZF	1.0 min	Mean	Cassette	
* Leningrad	DHZ	1.0 min	Mean		
Lerwick	XYZF	1.0 min	Mean	Cartridge	100
Lovo	XYZF	10.0 sec	Mean	Cassette	95
* Lunping	XYZF	1.0 min	Inst	Reel	
Lycksele	XYZ	1.0 min	Inst	Cassette	
Lynn Lake	DHZ	2.5 sec	Inst	Reel	
Macquarie Island	FXYZ	1.0 min	Mean	Cassette	95
Martin de Vivies	DHZF	1.0 min	Inst	Reel	95
Mawson	XYZF	1.0 min	Mean	Cassette	95
McMurdo	DHZ	1.0 sec	Inst	Reel	95
Meanook	XYZF	1.0 sec	Inst	Cartridge	100
Memambetsu	DHZF	1.0 min	Inst	Cassette	100
* Minsk	DHZ	1.0 min	Mean		
Mizusawa	DHZF	1.0 min	Inst	Reel	100
Moscow	DHZ	1.0 min	Mean	Cassette	80
Mould Bay	XYZF	1.0 sec	Inst	Cartridge	100
Muonio	XYZ	20.0 sec	Mean	Cassette	95
* Murmansk	DHZ	1.0 min	Mean		
NORDA	DHZF	1.0 min	Mean	Cartridge	95
* Nagycenk	DHZ	2.0 sec	Inst	Fl. disk	
Narssarssuaq	DHZF	1.0 min	Inst	Cassette	100
Neuchatel	XYZF	1.0 min	Mean	Reel	100
New Aalesund	XYZ	10.0 sec	Inst	Reel Fl. disk	
Newport	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95

*Not yet operational (1987)

Table 4 -- Description of recorded data (cont.)

Observatory/station	Elements recorded	Sampling rate	Sampling method	Recorded medium	Estim. % complete
Niemegk	YZF	1.0 min	Inst	Paper tape	100
Nord	DHZ	1.0 min	Fltr	Cassette	100
Norman Wells	DHZ	2.5 sec	Inst	Reel	
Nurmijarvi	XYZ	1.0 min	Mean	S. S. Mem.	95
Ottawa	XYZF	1.0 sec	Inst	Cartridge	100
Pamatai	DHZF	1.0 min	Inst	Paper tape	95
Pello	XYZ	20.0 sec	Mean	Cassette	95
* Petropavlovsk	DHZ	1.0 min	Mean		
* Pinawa	XYZ	5.0 sec	Inst	Reel	95
Port Alfred	DHZF	1.0 min	Inst	Reel Fl. disk	95
Port-aux-Francais	DHZF	1.0 min	Inst	Reel Fl. disk	95
Poste-de-la-Baleine	XYZF	1.0 sec	Inst	Cartridge	100
* Rabbit Lake	XYZ	5.0 sec	Inst	Reel	95
* Rankin Inlet	XYZ	5.0 sec	Inst	Reel	95
Resolute Bay	XYZF	1.0 sec	Inst	Cartridge	100
* Riyadh	XYZF	1.0 sec			
Sach's Harbor	DHZ	1.0 min	Mean	Reel	95
Saint John's	XYZF	1.0 sec	Inst	Cartridge	100
San Juan	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Sanae	DHZ	7.0 sec	Inst	Cassette	95
Savigsivik	DHZ	1.0 min	Fltr	Cassette	100
Scoresbysund	DHZ	1.0 min	Fltr	Cassette	100
Siple	DHZ	1.0 sec	Inst	Reel	
Sitka	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Sodankyla	XYZ	30.0 sec	Inst	Cassette	100
Sondre Stromfjord	DHZ	1.0 min	Fltr	Cassette	100
Soroya	XYZ	20.0 sec	Mean	Cassette	95
Sosa	F	1.0 min	Inst	Paper tape	90
South Pole	DHZ	1.0 sec	Inst	Reel	95
Syowa	DHZF	1.0 sec	Inst	Reel	95
Talkeetna	DHZ	1.0 min	Mean	Reel	95
* Tamanrasset	DHZF	1.0 min			
* Tananarive	DHZ	1.0 min	Inst	Paper tape	95
Thule	DHZF	1.0 min	Inst	Cassette	100
Tihany	DHZ	1.0 min		Fl. disk	95
Tixie Bay	DHF	1.0 min	Mean	Cassette	80
Tjornes	DHZF	1.0 sec	Inst	Reel	95
* Toolangi	XYZ	1.0 min	Inst	Fl. disk	
* Tromso	XYZ	10.0 sec	Inst	Reel Fl. disk	
* Tsumeb	FDHZ	12.0 sec	Inst	Fl. disk	90

*Not yet operational (1987)

Table 4 -- Description of recorded data (cont.)

Observatory/station	Elements recorded	Sampling rate	Sampling method	Recorded medium	Estim. % complete
Tucson	DHZ	40.0/sec	Inst	Cartridge	95
	F	30.0 sec	Inst	Cartridge	95
Umanaq	DHZ	1.0 min	Fltr	Cassette	100
Upernavik	DHZ	1.0 min	Fltr	Cassette	100
Vassouras	DHZF	1.0 min	Inst	Reel	
Victoria	XYZF	1.0 sec	Inst	Cartridge	100
Warnkenhagen	YZF	1.0 min	Inst	Paper tape	90
* Weston	DHZ	5.0 sec	Inst	Fl. disk	
Wingst	XYZF	1.0 min	Inst	Reel	98
Witteveen	DIF	20.0 sec	Inst	Cassette	100
* Yakutsk	DHZ	1.0 min	Mean		
Yellowknife	XYZF	1.0 sec	Inst	Cartridge	100
Yugorsky Shar	DHZ	1.0 min	Mean	Cassette	80

*Not yet operational (1987)

Note:

Inst = Instantaneous
Fltr = Anti-aliasing filter

Please note the double entries for Fort Simpson and Fort Smith. Two sets of equipment operate at both stations, one by the MARIA project of Canada, one by the State University of New York, U.S.A.

There are variations on what constitutes a mean value. For example, some one-minute values are means of 60 one-second values. In most cases such details were not supplied.

The estimated percentage of completeness of record reflects the state of development of the system at the time of the query. Normally, the percentage would be expected to increase with additional development

Table 5 -- Processing steps

Observatory/station	Clean	Ident	Fill	Comp	A'log	Drift	Calib	Refmt	Pack
Abisko									
Alcantara									
Alert	X	X	X		X	X		X	
* Alibag									
* Alice Springs	X				X	X		X	X
* Alma Ata	X							X	X
Alta					X			X	
* Amatsia				X		X			
Anchorage								X	
Arctic Village	X				X				
* Arctowski									
Argentine Islands									
Arkhangelsk	X	X		X				X	X
* Ashkhabad									
* Back	X							X	
Baghdad									
Baker Lake	X	X	X		X	X		X	
Barrow	X	X	X	X		X		X	X
Bear Island									
* Beijing									
Belsk	X	X		X		X			
Boulder	X	X	X	X		X		X	X
Brorfelde	X	X	X	X	X	X		X	
Budkov	X	X	X	X		X		X	
Cachoeira Paulista									
Cambridge Bay	X	X	X		X	X		X	
Canberra	X				X	X		X	X
Cape Parry	X				X				
Cape Schmidt	X	X		X				X	X
• Casey									
Castel Tesino	X	X			X				
Chambon-la-Foret				X	X	X		X	X
Charters Towers	X				X	X		X	X
* Churchill (MARIA)	X							X	
• Coimbra									
College	X	X	X	X		X		X	X
* Contwoyto Lake	X							X	
Daneborg	X	X			X			X	X
Danmarkshavn	X	X			X			X	X
* Davis									
* Dawson City	X							X	
Del Rio	X	X	X	X		X		X	X
Dixon Island	X	X		X	X			X	X
* Dombas		X		X			X		
Dourbes	X	X	X	X		X			X
Dumont d'Urville	X	X	X			X		X	
* Ebro	X	X		X	X	X		X	X
Eskdalemuir	X	X	X		X	X			

*Not yet operational (1987)

Table 5 -- Processing steps (cont.)

Observatory/station	Clean	Ident	Fill	Comp	A'log	Drift	Calib	Refmt	Pack
Eskimo Point	X							X	
Eusebio									
Ferraz									
Fort Churchill	X	X	X		X	X		X	
• Fort McMurray	X							X	
* Fort Simpson (MARIA)	X							X	
Fort Simpson (SUNY)									
* Fort Smith (MARIA)	X							X	
Fort Smith (SUNY)									
Fort Yukon	X				X				
Fredericksburg	X	X	X	X		X		X	X
Frederikshab	X	X			X			X	X
Fresno	X	X	X	X		X		X	X
Furstenfeldbruck	X		X		X				
Gibilmanna	X	X			X			X	
Gillam	X							X	
Glenlea	X	X	X		X	X		X	
Gnangara	X				X	X		X	X
Godhavn	X	X	X	X	X	X		X	
Godthab	X	X			X			X	X
Guam	X	X	X	X		X		X	X
Halley									
Hartebeesthoek	X	X				X		X	
Hartland	X	X	X		X	X			
Hatizyo		X		X					X
Hel	X	X		X		X			
Hermanus	X	X	X	X		X		X	X
Honolulu	X	X	X	X		X		X	X
Hornsund									
Hurbanovo									X
Husafell		X	X					X	
Hyderabad		X	X	X	X		X		
Inuvik	X				X				
Iqaluit (Frob. Bay)		X						X	X
* Irkutsk									
Isafjordur		X	X					X	
* Island Lake	X							X	
Kakioka	X	X	X	X	X	X		X	X
* Kaliningrad									
Kanoya	X	X	X	X	X		X	X	X
Kanozan		X	X	X	X	X			X
Karachi									
Kautokeino					X			X	
Kevo					X			X	
Kilpisjarvi					X			X	
Kiruna	X	X	X	X	X	X		X	X
Kuvdlorssuaq	X	X			X			X	X
L'Aquila	X	X		X	X	X		X	

*Not yet operational (1987)

Table 5 -- Processing steps (cont.)

Observatory/station	Clean	Ident	Fill	Comp	A'log	Drift	Calib	Refmt	Pack
Lauder	X	X			X	X		X	X
Learmonth	X				X	X		X	X
* Leningrad									
Lerwick	X	X	X		X	X			
Lovo	X	X	X	X	X	X		X	
* Lunping									
Lycksele	X		X	X		X		X	
Lynn Lake									
Macquarie Island	X				X	X		X	X
Martin de Vivies	X	X	X			X		X	
Mawson	X				X	X		X	X
McMurdo		X						X	X
Meanook	X	X	X		X	X		X	
Memambetsu	X	X	X	X	X		X	X	X
* Minsk									
Mizusawa		X	X	X	X	X			X
Moscow	X	X		X				X	X
Mould Bay	X	X	X		X	X		X	
Muonio					X			X	
• Murmansk									
• Nagycenk		X		X			X		
Narssarssuaq	X	X	X	X	X	X		X	
Neuchatel									
New Aalesund									
Newport	X	X	X	X		X		X	X
Niemegk	X	X	X	X		X			
Nord	X	X			X			X	X
NORDA	X	X	X		X	X		X	
Norman Wells									
Nurmijarvi			X	X	X	X		X	
Ottawa	X	X	X		X	X		X	
Pamatai	X	X	X	X	X	X		X	X
Pello					X			X	
* Petropavlovsk									
* Pinawa	X							X	
Port Alfred	X	X	X			X		X	
Port-aux-Francais	X	X	X			X		X	
Poste-de-la-Baleine	X	X	X		X	X		X	
• Rabbit Lake	X							X	
* Rankin Inlet	X							X	
Resolute Bay	X	X	X		X	X		X	
* Riyadh									
Sach's Harbor	X				X				
Saint John's	X	X	X		X	X		X	
San Juan	X	X	X	X		X		X	X
Sanae	X	X				X		X	
Savigsivik	X	X			X			X	X
Scoresbysund	X	X			X			X	X

*Not yet operational (1987)

Table 5 -- Processing steps (cont.)

Observatory/station	Clean	Ident	Fill	Comp	A'log	Drift	Calib	Refmt	Pack
Siple		X			X			X	
Sitka	X	X	X	X		X		X	X
Sodankyla	X	X	X	X	X				
Sondre Stromfjord	X	X			X			X	X
Soroya					X			X	
Sosa	X	X							
South Pole		X						X	X
Syowa		X	X					X	
Talkeetna	X				X				
* Tamanrasset									
* Tananarive				X	X	X			
Thule	X	X	X	X	X	X		X	
Tihany	X	X	X	X		X			
Tixie Bay	X	X		X				X	X
Tjornes		X	X					X	
* Toolangi									
* Tromso									
* Tsumeb	X	X	X	X		X		X	X
Tucson	X	X	X	X		X		X	X
Umanaq	X	X			X			X	X
Upernavik	X	X			X			X	X
Vassouras									
Victoria	X	X	X		X	X		X	
Warnkenhagen	X	X		X					
* Weston									
Wingst	X	X				X		X	
Witteveen	X	X	X			X		X	X
* Yakutsk									
Yellowknife	X	X	X		X	X		X	
Yugorsky Shar	X	X		X				X	X

Notes:

Clean = Removal of spikes or discontinuities
Ident = Identification of missing data
Fill = Fill-in gaps from other data source
Comp = Comparison with other data source (e.g., magnetograms)
A'log = Preparation of analog form
Drift = Adjustment for base-line drift
Refmt = Reformatted data
Pack = Packed for final data tape

*Not yet operational (1987)

Table 6 -- Description of processed data

Observatory/station	First year	Sampling rate	Sampling method	Disk file	Remote access	Analog form	Hourly values
Abisko							
Alcantara							
Alert	1980	1.0 min	Mean	No	Yes	Yes	P
* Alibag							
* Alice Springs		1.0 min	Mean	No	No	NS	D
* Alma Ata	1984	1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
Alta	1983	20.0 sec	Mean	No	No	Yes	No
* Amatsia		1.0 hr	Mean	No	No	Yes	P
Anchorage		1.0 min	Mean	Yes	Yes	Yes	No
Arctic Village		1.0 min	Mean				No
* Arctowski							
Argentine Islands	1981	1.0 min	Mean	No	No	NS	P
Arkhangelsk	1984	1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
* Ashkhabad		1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
* Back		5.0 sec	Inst	Yes		No	
Baghdad	1986			No	No	Yes	
Baker Lake	1969	1.0 min	Mean	No	Yes	Yes	P
Barrow	1975	1.0 min	Mean	No	Yes	Yes	P
Bear Island	1987			No	No		P
* Beijing							
Belsk	1984	1.0 min	Inst	No	No	Yes	P
Boulder	1978	1.0 min	Mean	No	Yes	Yes	P
Brorfelde	1980	1.0 min	Inst	Yes	No	Yes	P
Budkov	1985	2.0 min	Inst	No	No	NS	C
Cachoeira Paulista							
Cambridge Bay	1969	1.0 min	Mean	No	Yes	Yes	P
Canberra	1979	1.0 min	Inst				
		1.0 hr	Mean	No	No	NS	D
Cape Parry		1.0 min	Inst				
		1.0 min	Mean				No
Cape Schmidt	1986	1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
* Casey							
Castel Tesino	1983	1.0 min	Inst				
		1.0 hr	Mean	No	No	NS	D
Chambon-la-Foret	1981	1.0 min	Inst				
		1.0 hr	Mean	Yes	No	Yes	P
Charters Towers	1984	1.0 min	Mean	No	No	NS	D
* Churchill (MARIA)		5.0 sec	Inst	Yes		No	
* Coimbra							
College	1975	1.0 min	Mean	No	Yes	Yes	P
* Contwoyto Lake		5.0 sec	Inst	Yes		No	
Daneborg	1982	1.0 min	Inst	Yes	No	NS	No
Danmarkshavn	1982	1.0 min	Inst	Yes	No	NS	No
* Davis				Yes	No	NS	No
* Dawson City		5.0 sec	Inst	Yes		No	

*Not yet operational (1987)

Table 6 -- Description of processed data (cont.)

Observatory/station	First year	Sampling rate	Sampling method	Disk file	Remote access	Analog form	Hourly values
Del Rio	1982	1.0 min	Mean	No	Yes	Yes	P
Dixon Island	1984	1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
* Dombas	1981	10.0 sec	Inst	Yes	Yes	No	C
Dourbes	1968	1.0 min	Mean	No	No	NS	C
Dumont d'Urville	1973	1.0 min	Inst				
		1.0 hr	Mean	Yes	Yes	Yes	P
* Ebro		1.0 min	Inst	Yes	No	Yes	P
Eskdalemuir	1983	1.0 min	Mean	No	No	Yes	P
Eskimo Point	1986	5.0 sec	Inst	Yes		No	
Eusebio							
Ferraz							
Fort Churchill	1969	1.0 min	Mean	No	Yes	Yes	P
* Fort McMurray		5.0 sec	Inst	Yes		No	
* Fort Simpson (MARIA)		5.0 sec	Inst	Yes		No	
Fort Simpson (SUNY)		1.0 min	Inst				
* Fort Smith (MARIA)		5.0 sec	Inst	Yes		No	
Fort Smith (SUNY)		1.0 min	Inst				
Fort Yukon		1.0 min	Inst				No
Fredericksburg	1982	1.0 min	Mean	No	Yes	Yes	P
Frederikshab	1981	1.0 min	Inst	Yes	No	NS	No
Fresno	1982	1.0 min	Mean	No	Yes	Yes	P
Furstenfeldbruck	1984	1.0 min	Inst	No	No	No	D
Gibilmanna	1979	2.0 min	Inst				
		1.0 hr	Mean	No	No	NS	D
Gillam	1986	5.0 sec	Inst	Yes		No	
Glenlea	1969	1.0 min	Mean	No	Yes	Yes	P
Gnangara	1987	1.0 min	Inst	No	No	NS	D
Godhavn	1978	1.0 min	Inst	Yes	No	Yes	P
Godthab	1981	1.0 min	Inst	Yes	No	NS	No
Guam	1983	1.0 min	Mean	No	Yes	Yes	P
Halley	1981	1.0 min	Mean	No	No	NS	P
Hartebeesthoek	1972	1.0 min	Mean	No	No	No	P
Hartland	1983	1.0 min	Mean	No	No	Yes	P
Hatizyo	1980	1.0 min	Inst	No	No	Yes	P
Hel	1986	1.0 min	Inst	No	No	Yes	P
Hermanus	1974	1.0 min	Mean	No	No	No	P
Honolulu	1983	1.0 min	Mean	No	Yes	Yes	P
Hornsund	1986			No	No		
Hurbanovo	1982	1.0 min	Inst	No	No	NS	No
Husafell	1983	1.0 sec	Inst	No	No	Yes	No
Hyderabad		1.0 min	Inst				
		1.0 hr	Mean	No	No	Yes	P
Inuvik		1.0 min	Inst				
		1.0 min	Mean				No
Iqaluit (Frob. Bay)	1986	1.0 sec	Inst	No			No

*Not yet operational (1987)

Table 6 -- Description of processed data (cont.)

Observatory/station	First year	Sampling rate	Sampling method	Disk file	Remote access	Analog form	Hourly values
* Irkutsk		1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
Isafjordur	1983	1.0 sec	Inst	No	No	Yes	No
* Island Lake		5.0 sec	Inst	Yes		No	
Kakioka	1976	1.0 sec	Inst				
		1.0 min	Mean	No	No	Yes	P
* Kaliningrad		1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
Kanoya	1985	1.0 sec	Inst				
		1.0 min	Mean	No	No	Yes	P
Kanozan	1961	1.0 min	Inst				
		1.0 hr	Mean	No	No	Yes	P
Karachi							
Kautokeino	1983	20.0 sec	Mean	No	No	Yes	No
Kevo	1983	20.0 sec	Mean	No	No	Yes	No
Kilpisjarvi	1983	20.0 sec	Mean	No	No	Yes	No
Kiruna	1978	1.0 min	Inst				
		1.0 hr	Mean	Yes	No	Yes	P
Kuvdlorssuaq	1983	1.0 min	Inst	Yes	No	NS	No
L'Aquila	1982	1.0 min	Inst				
		1.0 hr	Mean	No	No	NS	C
Lauder	1982	10.0 sec	Inst	No	No	No	P
Learmonth	1986	1.0 min	Mean	No	No	NS	P
* Leningrad		1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
Lerwick	1983	1.0 min	Mean	No	No	Yes	P
Lovo	1983	1.0 min	Mean	Yes	Yes	Yes	C
* Lunping							
Lycksele	1986	1.0 min	Inst	Yes		Yes	P
Lynn Lake		1.0 min	Mean				
Macquarie Island	1986	1.0 min	Mean	No	No	NS	D
Martin de Vivies	1981	1.0 min	Inst				
		1.0 hr	Mean	Yes	No	Yes	P
Mawson	1985	1.0 min	Mean	No	No	NS	D
McMurdo	1983	1.0 sec	Inst	No		Yes	No
Meanook	1969	1.0 min	Mean	No	Yes	Yes	P
Memambetsu	1985	1.0 sec	Inst				
		1.0 min	Mean	No	No	Yes	P
* Minsk		1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
Mizusawa	1969	1.0 min	Inst				
		1.0 hr	Mean	No	No	Yes	P
Moscow	1984	1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
Mould Bay	1980	1.0 min	Mean	No	Yes	Yes	P
Muonio	1983	20.0 sec	Mean	No	No	Yes	No
* Murmansk		1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D

*Not yet operational (1987)

Table 6 -- Description of processed data (cont.)

Observatory/station	First year	Sampling rate	Sampling method	Disk file	Remote access	Analog form	Hourly values
NORDA	1986	1.0 min	Inst				
		1.0 min	Mean	No	No	Yes	D
* Nagycenk		1.0 min	Mean				
		1.0 hr	Mean	Yes	No		D
Narssarssuaq	1983	1.0 min	Inst	Yes	No	Yes	P
Neuchatel	1978	1.0 hr	Mean	Yes	No	Yes	
New Aalesund	1987			No	No		P
Newport	1983	1.0 min	Mean	No	Yes	Yes	P
Niemegk	1979	1.0 min	Inst				
		1.0 hr	Mean	No	No	No	P
Nord	1981	1.0 min	Inst	Yes	No	NS	No
Norman Wells		1.0 min	Mean				
Nurmijarvi	1983	1.0 min	Mean	Yes	Yes	NS	D
Ottawa	1969	1.0 min	Mean	No	Yes	Yes	P
Pamatai		1.0 min	Inst	No		Yes	P
Pello	1983	20.0 sec	Mean	No	No	Yes	No
* Petropavlovsk		1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
* Pinawa		5.0 sec	Inst	Yes		No	
Port Alfred	1974	1.0 min	Inst				
		1.0 hr	Mean	Yes	No	Yes	P
Port-aux-Francais	1972	1.0 min	Inst				
		1.0 hr	Mean	Yes	No	Yes	P
Poste-de-la-Baleine	1969	1.0 min	Mean	No	Yes	Yes	P
* Rabbit Lake		5.0 sec	Inst	Yes		No	
* Rankin Inlet	1986	5.0 sec	Inst	Yes		No	
Resolute Bay	1969	1.0 min	Mean	No	Yes	Yes	P
* Riyadh							
Sach's Harbor		1.0 min	Inst				
Saint John's	1969	1.0 min	Mean	No	Yes	Yes	P
San Juan	1983	1.0 min	Mean	No	Yes	Yes	P
Sanae	1977	1.0 min	Mean	No	No	No	P
Savigsivik	1984	1.0 min	Inst	Yes	No	NS	No
Scoresbysund	1980	1.0 min	Inst	Yes	No	NS	No
Siple	1983	1.0 sec	Inst	No	No	NS	No
Sitka	1978	1.0 min	Mean	No	Yes	Yes	P
Sodankyla	1984	1.0 hr	Mean	Yes	No	Yes	P
Sondre Stromfjord	1982	1.0 min	Inst	Yes	No	NS	No
Soroya	1983	20.0 sec	Mean	No	No	Yes	No
Sosa	1981	1.0 min	Inst				
		1.0 hr	Mean	No	No	No	D
South Pole	1982	1.0 sec	Inst	No	No	Yes	No
Syowa	1982	1.0 sec	Inst	No	No	Yes	No
Talkeetna		1.0 min	Inst				No
* Tamanrasset							
* Tananarive	1985	1.0 hr	Mean	No	No	Yes	No
Thule	1980	1.0 min	Inst	Yes	No	Yes	P
Tihany	1983	1.0 min	Mean	Yes	Yes	No	P

*Not yet operational (1987)

Table 6 -- Description of processed data (cont.)

Observatory/station	First year	Sampling rate	Sampling method	Disk file	Remote access	Analog form	Hourly values
Tixie Bay	1984	1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
Tjornes	1983	1.0 sec	Inst	No	No	Yes	
* Toolangi							
* Tromso				No	No		P
* Tsumeb		1.0 min	Mean	No	No	No	P
Tucson	1983	1.0 min	Mean	No	Yes	Yes	P
Umanaq	1983	1.0 min	Inst	Yes	No	NS	No
Upernavik	1982	1.0 min	Inst	Yes	No	NS	No
Vassouras							
Victoria	1969	1.0 min	Mean	No	Yes	Yes	P
Warnkenhagen	1980	1.0 min	Inst				
		1.0 hr	Mean	No	No	No	D
* Weston		1.0 min	Mean				
Wingst	1980	1.0 min	Inst	No	No	NS	P
Witteveen	1983	1.0 min	Mean	Yes	Yes	Yes	P
* Yakutsk		1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D
Yellowknife	1969	1.0 min	Mean	No	Yes	Yes	P
Yugorsky Shar	1985	1.0 min	Mean				
		1.0 hr	Mean	No	No	NS	D

Notes:

The entry under 'First year' refers to the full year of recording. Thus, some earlier data may be available on inquiry.

The column 'Disk file' refers to whether the data are maintained on a disk file.

The column 'Analog form' refers to whether digital results are available in analog form. The analog forms may or may not be simultaneously recorded.

NS = Not suitable for archiving

P = Hourly values derived and published

C = Hourly values derived, but used only for checking purposes

D = Hourly values derived from the digital record

*Not yet operational (1987)

Table 7 -- Absolute observations

Observatory/station	Frequency	Elements	Estimated drift	
			Elements	Rate of change
Abisko				
Alert	2/week	DIF		
Alibag				
Alice Springs	1/week			
Alta			XYZ	< 1nT/day
Amatsia	1/week	DIHZF		
Arctowski				
Argentine Islands	2/week	DHF		
Arkhangelsk			DHZ	5nT/month
Baghdad		DI		
Baker Lake	2/week	DIF		
Bangui				
Barrow	1/month	DHZ		
Bear Island	2/year	DHZ		
Beijing				
Belsk	1/day	DHZF		
Boulder	1/week	DHZ		
Brorfelde	1/week	DHF		
Budkov	3/month	DHF		
Cambridge Bay	2/week	DIF		
Canberra	1/week	DZF		
Cape Schmidt			DHZ	5nT/month
Casey	2/week			
Castel Tesino	1/month	DHZF		
Chambon-la-Foret	2/week	DIHZF		
Charters Towers	1/week	DIF		
Coimbra	10/week	DHZ		
College	2/week	DHZ		
Davis	1/week	DHF		
Del Rio	1/month	DHZ		
Dixon Island			DHZ	5nT/month
Dombas	1/month	DHZ		
Dourbes	1/week	DIHZF		
Dumont d'Urville	2/week	XYZF		
Ebro	5/week	DHZF		
Eskdalemuir	1/week	DHZF		
Fort Churchill	2/week	DIF		
Fredericksburg	2/week	DHZ		
Fresno	1/month	DHZ		
Furstenfeldbruck	1/week	DZF		
Glenlea	2/week	DIF		
Gnangara	1/week			
Godhavn	1/week	DHF		
Guam	2/week	DHZ		
Halley	2/week	DHF		

Table 7 -- Absolute observations (cont.)

Observatory/station	Frequency	Elements	Estimated drift	
			Elements	Rate of change
Hartebeesthoek	2/week	DHF		
Hartland	1/week	DHZF		
Hatizyo	2/week	DIF		
Hel		DHF		
Hermanus	6/month	DHF		
Honolulu	1/week	DHZ		
Hornsund		DHF		
Hurbanovo	2/week	DHZ		
Husafell	1/month			
Hyderabad	1/week	DIHZF		
Isafjordur	1/month			
Kakioka	1/week	DIF		
Kanoya	1/week	DIF		
Kanozan	1/week	DIF		
Karachi				
Kautokeino			XYZ	< 1nT/day
Kevo			XYZ	< 1nT/day
Kilpisjarvi			XYZ	< 1nT/day
Kiruna	1/month	XYZ		
L'Aquila	2/week	DHZF		
Lauder	1/week	DHF		
Learmonth				
Lerwick	1/week	DHZF		
Lovo	1/week	DHF		
Lunping				
Lycksele	1/month	XYZ		
M'Bour				
Macquarie Island	1/week	DHF		
Manhay				
Martin de Vivies	2/week	DIHZF		
Mawson	1/week	DHF		
Meanook	2/week	DIF		
Memambetsu	1/week	DIF		
Mizusawa	1/week	DIF		
Moscow			DHZ	5nT/month
Mould Bay	2/week	DIF		
Muonio			XYZ	< 1nT/day
NORDA	1/month	DIF		
Nagycenk	2/month	DHZF		
Narssarssuaq	1/week	DHF		
New Aalesund	2/year	DHZ		
Newport	2/week	DHZ		
Niemegk	2/week	DHF		
Nurmijarvi	1/week	DIHZF		
Ottawa	2/week	DIF		

Table 7 -- Absolute observations (cont.)

Observatory/station	Frequency	Elements	Estimated drift Elements	Estimated drift Rate of change
Pamatai				
Pello			XYZ	< 1nT/day
Port Alfred	2/week	DIHZF		
Port-aux-Francais	2/week	DIHZF		
Poste-de-la-Baleine	2/week	DIF		
Resolute Bay	2/week	DIF		
Riyadh				
Saint John's	2/week	DIF		
San Juan	2/week	DHZ		
Sanae	1/week	DHF		
Sitka	1/week	DHZ		
Sodankyla	1/week	DHZF		
Soroya			XYZ	< 1nT/day
Surlari				
Syowa	1/month			
Tamanrasset				
Tananarive	3/week	DIF		
Thule	1/week	DHF		
Tihany				
Tixie Bay			DHZ	5nT/month
Tjornes	1/month			
Tromso	1/month	DHZ		
Tsumeb	2/week	DHF		
Tucson	1/week	DHZ		
Vassouras	1/week	DHF		
Victoria	2/week	DIF		
Warnkenhagen	4/year	DHF		
Wingst	2/week	DHZF		
Witteveen	1/week	DIHZF		
Yellowknife	2/week	DIF		
Yugorsky Shar			DHZ	5nT/month

Note:
Some observatories that do not routinely perform absolute observations have given estimates of base-line drift.

Table 8 -- Observatories with facilities for digitizing magnetograms and description of output

Observatory/station	Routine use	Digitizing interval	Recording form	Hourly values	First year
Abisko	X	1 min	Cassette	X	1979
Alma Ata	X	1 hour	Paper	X	1975
Amatsia	X	Variable	Computer	X	1987
Arkhangelsk	X	1 min	Reel		
Bangui	X	2.5 min	Reel	X	1972
			Paper	X	1972
Brorfelde		1 min	Disk		
Budkov	X	2.5 min	Reel	X	1980
Dourbes	X	1 min	Reel	X	1960
			Paper	X	1960
Ebro		1 hour	Reel	X	1910
Furstenfeldbruck		1 min	Fl. disk		
Gnangara	X	1 hour	Cassette	X	1957
Hermanus		1 min	Computer		
Lovo	X	1 min	Cassette	X	1982
M'Bour	X	2.5 min	Reel	X	1972
			Paper	X	1972
Macquarie Island	X	1 hour	Cassette	X	1957
Manhay	X	Variable	Computer		
Mawson	X	1 hour	Cassette	X	1957
Moscow	X	1 min	Reel		
Nagycenk		Variable	Paper		
Nurmijarvi		Variable	Cassette		1975
Pamatai	X	2.5 min	Reel	X	1972
			Paper	X	1972
Port Moresby	X	1 hour	Cassette	X	1958
Sodankyla	X	1 min	Cassette	X	1980
Surlari	X	1 min	Cassette	X	1969
			Paper	X	1969
Tehran	X	30 min	Paper	X	1960
Toolangi	X	1 hour	Cassette		1957
Tsumeb		1 min	Computer		
Yugorsky Shar	X	1 min	Reel		

Table 9 -- Availability of digital data

Observatory\station	High-resolution Rout	Spec	Obsy	Hourly values Rout	Spec	Obsy	From magnetometer	From magnetograms
Abisko			X	X				X
Alcantara			X					
Alert	X			X			X	
* Alibag			X					
* Alice Springs		X			X		X	
* Alma Ata		X			X		X	
Alta	X							
* Amatsia	X			X			X	
Anchorage	X							
Arctic Village	X							
* Arctowski			X					
Argentine Islands		X			X		X	
Arkhangelsk		X			X		X	
* Ashkhabad			X			X	X	
* Back		X						
Baghdad			X					
Baker Lake	X			X			X	
Bangui				X				X
Barrow	X			X			X	
Bear Island			X			X	X	
* Beijing			X					
Belsk			X			X	X	
Boulder	X			X			X	
Brorfelde		X			X		X	
Budkov		X			X		X	
Cachoeira Paulista		X						
Cambridge Bay	X			X			X	
Canberra		X			X		X	
Cape Parry	X							
Cape Schmidt		X			X		X	
* Casey			X					
Castel Tesino			X			X	X	
Chambon-la-Foret		X			X		X	
Charters Towers		X			X		X	
* Churchill (MARIA)		X						
* Coimbra								
College	X			X			X	
* Contwoyto Lake		X						
Daneborg		X						
Danmarkshavn		X						
* Davis		X						
* Dawson City		X						
Del Rio	X			X			X	
Dixon Island		X			X		X	
* Dombas		X			X		X	

*Not yet operational (1987)

Table 9 -- Availability of digital data (cont.)

Observatory\station	High-resolution			Hourly values				
	Rout	Spec	Obsy	Rout	Spec	Obsy	From magnetometer	From magnetograms
Dourbes		X			X		X	
Dumont d'Urville		X			X		X	
* Ebro	X			X			X	
Eskdalemuir			X			X	X	
Eskimo Point		X						
Eusebio		X						
Ferraz		X						
Fort Churchill	X			X			X	
* Fort McMurray		X						
* Fort Simpson (MARIA)		X						
Fort Simpson (SUNY)	X							
* Fort Smith (MARIA)		X						
Fort Smith (SUNY)	X							
Fort Yukon	X							
Fredericksburg	X			X			X	
Frederikshab		X						
Fresno	X			X			X	
Furstenfeldbruck			X			X	X	
Gibilmanna		X			X		X	
Gillam		X						
Glenlea	X			X			X	
Gnangara		X			X		X	
Godhavn		X			X		X	
Godthab		X						
Guam	X			X			X	
Halley		X			X		X	
Hartebeesthoek		X			X		X	
Hartland			X			X	X	
Hatizyo			X			X	X	
Hel			X			X	X	
Hermanus		X			X		X	
Honolulu	X			X			X	
Hornsund			X					
Hurbanovo		X						
Husafell		X						
Hyderabad		X			X		X	
Inuvik	X							
Iqaluit (Frob. Bay)			X					
* Irkutsk			X			X	X	
Isafjordur		X						
* Island Lake		X						
Kakioka	X			X			X	
* Kaliningrad			X			X	X	
Kanoya		X			X		X	
Kanozan	X			X			X	

*Not yet operational (1987)

Table 9 -- Availability of digital data (cont.)

Observatory\station	High-resolution			Hourly values				
	Rout	Spec	Obsy	Rout	Spec	Obsy	From magnetometer	From magnetograms
Karachi			X					
Kautokeino	X							
Kevo	X							
Kilpisjarvi	X							
Kiruna		X			X		X	
Kuvdlorssuaq		X						
L'Aquila		X			X		X	
Lauder		X			X		X	
Learmonth		X			X		X	
* Leningrad			X			X	X	
Lerwick			X			X	X	
Lovo		X			X		X	
* Lunping		X						
Lycksele		X			X		X	
Lynn Lake	X							
M'Bour				X				X
Macquarie Island		X			X		X	
* Manhay								
Martin de Vivies	X			X			X	
Mawson		X			X		X	
McMurdo		X						
Meanook	X			X			X	
Memambetsu		X			X		X	
* Minsk			X			X	X	
Mizusawa	X			X			X	
Moscow		X			X		X	
Mould Bay	X			X			X	
Muonio	X							
* Murmansk			X			X	X	
NORDA	X			X			X	
* Nagycenk			X			X	X	
Narssarssuaq		X			X		X	
Neuchatel			X			X	X	
New Aalesund			X			X	X	
Newport	X			X			X	
Niemegk		X			X		X	
Nord		X						
Norman Wells	X							
Nurmijarvi		X			X		X	
Ottawa	X			X			X	
Pamatai	X			X			X	
Pello	X							
* Petropavlovsk			X			X	X	
* Pinawa		X						
Port Alfred	X			X			X	

*Not yet operational (1987)

Table 9 -- Availability of digital data (cont.)

Observatory\station	High-resolution			Hourly values				
	Rout	Spec	Obsy	Rout	Spec	Obsy	From magnetometer	From magnetograms
Port Moresby						X		X
Port-aux-Francais	X			X			X	
Poste-de-la-Baleine	X			X			X	
* Rabbit Lake		X						
* Rankin Inlet		X						
Resolute Bay	X			X			X	
* Riyadh			X					
Sach's Harbor	X							
Saint John's	X			X			X	
San Juan	X			X			X	
Sanae		X			X		X	
Savigsivik		X						
Scoresbysund		X						
Siple		X						
Sitka	X			X			X	
Sodankyla		X			X		X	
Sondre Stromfjord		X						
Soroya	X							
Sosa			X			X	X	
South Pole		X						
Surlari						X		X
Syowa		X						
Talkeetna	X							
* Tamanrasset			X					
* Tananarive		X			X		X	
Tehran				X				X
Thule		X			X		X	
Tihany			X			X	X	
Tixie Bay		X			X		X	
Tjornes		X						
* Toolangi			X					
* Tromso			X			X	X	
* Tsumeb		X			X		X	
Tucson	X			X			X	
Umanaq		X						
Upernavik		X						
Vassouras		X						
Victoria	X			X			X	
Warnkenhagen			X			X	X	
* Weston			X					
Wingst		X			X		X	
Witteveen		X			X		X	
* Yakutsk		X			X		X	
Yellowknife	X			X			X	
Yugorsky Shar		X			X		X	

*Not yet operational (1987)

Note:

Rout = Data are sent routinely to the World Data Center.
Spec = Data are available to the World Data Center upon request for specific time interval.
Obsy = Data must be requested directly from the operating institution.

Table 10 -- Bibliographies and miscellaneous information reported by observatories (alphabetically by name)

Alcantara

Digital recording estimated to begin by end of 1986.

Alice Springs

Digital recording estimated to begin mid-1988.

Alta

Luehr, H., 1980: Das Impulsintegrationsverfaren. Ein Saturationskern - Magnetometer mit digitaler Messwertdarstellung. Diss. Techn. Universitat Cardo-Wilhelmina zu Braunschweig. Braunschweig, p. 81.

Sucksdorff, C., K. Lehto, and T. Vaarnamo, 1984: First experiences on the operation of the EISCAT magnetometer network. In: Rosenberg, T. J. and J. Oksman (ed.), Proceedings of the Second United States-Finland Workshop on Magnetospheric and Ionospheric Phenomena in Auroral Regions, October 10-13, 1983. University of Maryland, College Park, Maryland, p. 34-39.

Arctowski

Digital recording estimated to begin early 1987.

Argentine Islands

La Cour magnetograms were used for hourly values until December 1983. Digitizing was manual on a table and sufficient points were selected to define the trace (including all turning points), more points for a more disturbed trace. The digitizing has now ceased. For the digital system, the IGS fluxgate-logger system is used. Up to December 1983 the data (cassettes) are kept, but have not been processed. From January 1984 the digital system will be used for hourly values.

Arhangelsk

Petrov, V. G. and V. A. Popov, 1984: Software for processing of digital magnetometer SMVS-2 data. Preprint IZMIRAN No. 50, p. 424 (in Russian).

Baghdad

Partial recording began January 1986, but instrumental problems prevent full operation.

Casey

Installation of digital equipment similar to that for Davis is planned for 1987.

Castel Tesino

Meloni, A., F. Molina, P. Palangio, Q. Taccetti, and Ana de Santis, 1984: Automatic digital recording of geomagnetic elements by means of a proton precession magnetometer. Geophysical Surveys 6 pp. 339-350.

Table 10 -- Bibliographies and miscellaneous information reported by observatories (alphabetically by name) (cont.)

Chambon-la-Foret

After 1986 recordings are expected to be essentially 100% complete.

Dixon Island

Same comments as for Arkhangelsk.

Dombas

Because of frequent problems with damage by lightning, the present equipment is awaiting replacement by another type.

Dourbes

De Vuyst, A. P., 1968: Information on the automatic magnetic observatory (ASMO) with analog chart-recorder and digital tape recorder. Institut Royal Meteorologique de Belgique.

De Vuyst, A. P., 1969: Digitization techniques of geomagnetic observations. Institut Royal Meteorologique de Belgique.

De Vuyst, A. P., 1971: Magetometre theodolite a protons. Institut Royal Meteorologique de Belgique.

De Vuyst, A. P., 1973: Proton and proton vector magnetometers. Institut Royal Meteorolgique de Belgique.

De Vuyst, A. P. and D., 1974: Magotteaux: Magnetogram treating system. Institut Royal Meteorologique de Belgique.

Dumont d'Urville

Bitterly, J., J. M. Cantin, R. Schlich, J. Folques, and D. Gilbert, 1984: Portable magnetometer theodolite with fluxgate sensor for Earth's magnetic field component measurements. Geophysical Surveys 6, 233-239.
Yearbooks contain short description of instrumental equipment. Observations magnetiques. Fascicules Institut de Physique de Globe de Strasbourg (yearly issue).

Eskimo Point

The magneometer presently operating will probably be replaced by a Narod ringcore.

Furstenfeldbruck

Beblo, M., 1984: Die Neuen Magnetometer des Observatoriums Furstenfeldbruck. Prot. Erdmag. Tiefenforschung, Grafrath, in press.

Goder, M., 1984: Bau und Einsatz einer opto-elektronischen Messanlage zur Registrierung der Variationen des Erdmagnetfeldes in drei Komponenten am Geophysikalischen Observatorium Furstenfeldbruck. Kipl.-Arbeit, Univ. Munchen, Inst. Geophysik, Jahrbucher Observatorium Furstenfeldbruck, Serie A. ff.

Table 10 -- Bibliographies and miscellaneous information reported by observatories (alphabetically by name) (cont.)

Gillam

Same comments as for Eskimo Point.

Gnangara

Digital recording is expected to begin in 1986.

Halley

See coments for Argentine Islands.

Hartebeesthoek

Data are not retained permanently on disk. Arrangements can be made to transfer data to an internationally accessible computer (special events only, 24-hour delay).

Hatizyo

For the results of geomagnetic observations at Hatizyo Hydrographic Observatory, from the beginning of observations in November 1979 to December 1982, refer to Data Report of Hydrographic Observations, Series of Geomagnetism, from No. 15 (1981) to No. 18 (1984). For subsequent data, refer to the annual geomagnetic observations at Hatizyo Hydrographic Observatory, beginning with No. 1 for 1983, published 1985.

Hel

Processing of digital data is expected to begin in late 1986.

Hermanus

Same comments as for Hartebeesthoek.

Hornsund

Same comments as for Hel.

Hurbanovo

Podsklan, J., I. Kovac, 1984: One year experience with CMVS-2 *magnetic variation station.* Geophysical Surveys 6.

Husafell

Sato et al., 1984: Operation plan for the Iceland-Syowa conjugate campaign in 1983-1985. Mem. of Nat. Inst. of Polar Res. Special Issue, No. 31, 169.

Hyderabad

Digital recording is expected to begin in mid-1986.

Isafjordur

Same comments as for Husafell.

Kakioka

Yanagihara et al., 1973: New standard magnetic observatory system at Kakioka (KASMMER). Geophys. Mag. 36, 217-281.

Table 10 -- Bibliographies and miscellaneous information reported by observatories (alphabetically by name) (cont.)

Kanoya

Same comments as for Kakioka.

Kautokeino

Same comments as for Alta.

Kevo

Same comments as for Alta.

Kilpisjarvi

Same comments as for Alta.

L'Aquila

Same comments as for Castel Tesino.

Meloni, A., F. Molina, P. Palangio, Q. Taccetti, and A. de Santis, 1984: Automatic digital recording of geomagnetic elements by means of a proton precession magnetometer. Geophysical Surveys 6, 339-350.

Lauder

Processing of the digital data has not been started.

Lunping

The digital equipment is expected to be operational by July, 1987.

Manhay

Trials have been made of an automatic device for digitizing magnetograms. It is based on the use of a video-camera connected to a mass-memory and then to an IBM 4341 computer. Complex software has been developed to determine the equations of the base lines, time lines and to obtain the coordinates of the records of D, H, and Z. The method seems satisfactory, and it may work routinely in a few months. The reliable interval of digitization would be about 3 to 5 minutes.

Martin de Vivies

Same comments as for Dumont d'Urville.

Memambetsu

Same comments as for Alta.

Muonio

Same comments as for Alta.

Pello

Same comments as for Alta.

Port Alfred

Same comments as for Dumont d'Urville.

Port-aux-Francais

Same comments as for Dumont d'Urville.

Table 10 -- Bibliographies and miscellaneous information reported by observatories (alphabetically by name) (cont.)

Siple

Operates only during auroral summer season, mid-November to mid-January.

Soroya

Same comments as for Alta

Syowa

Sato et al., 1984: Upper Atmosphere Physical Data, Syowa Station, 1981. JARE Data Rep. 84 (Upper Atmos. Phys. 1), 206.

Sato et al., 1984: Operation plan for the Iceland-Syowa conjugate campaign in 1983-1985. Mem. of Nat. Inst. of Polar Res. Special issue, No. 31, 169.

Tjornes

Same comments as for Husafell.

Toolangi

Digital recording is estimated to have begun about mid-1986.

Tromso

Installation of the digital system is expected to begin in 1987.

Tsumeb

Data will not be retained permanently on disk. Arrangements can be made to transfer data to an internationally accessible computer (special events only, 14-day delay). Equipment under construction in 1986.

Vassouras

The digital equipment is inoperable in Vassouras and has been moved (1987) to Rio de Janeiro, where it is operating.

Wingst

Schulz, G., 1983: Experience with a digital recording magnetometer system at Wingst Geomagnetic Observatory (Erdmagnetisches Observatorium Wingst). Dt. Hydrogr. Z. 36, 173-190.

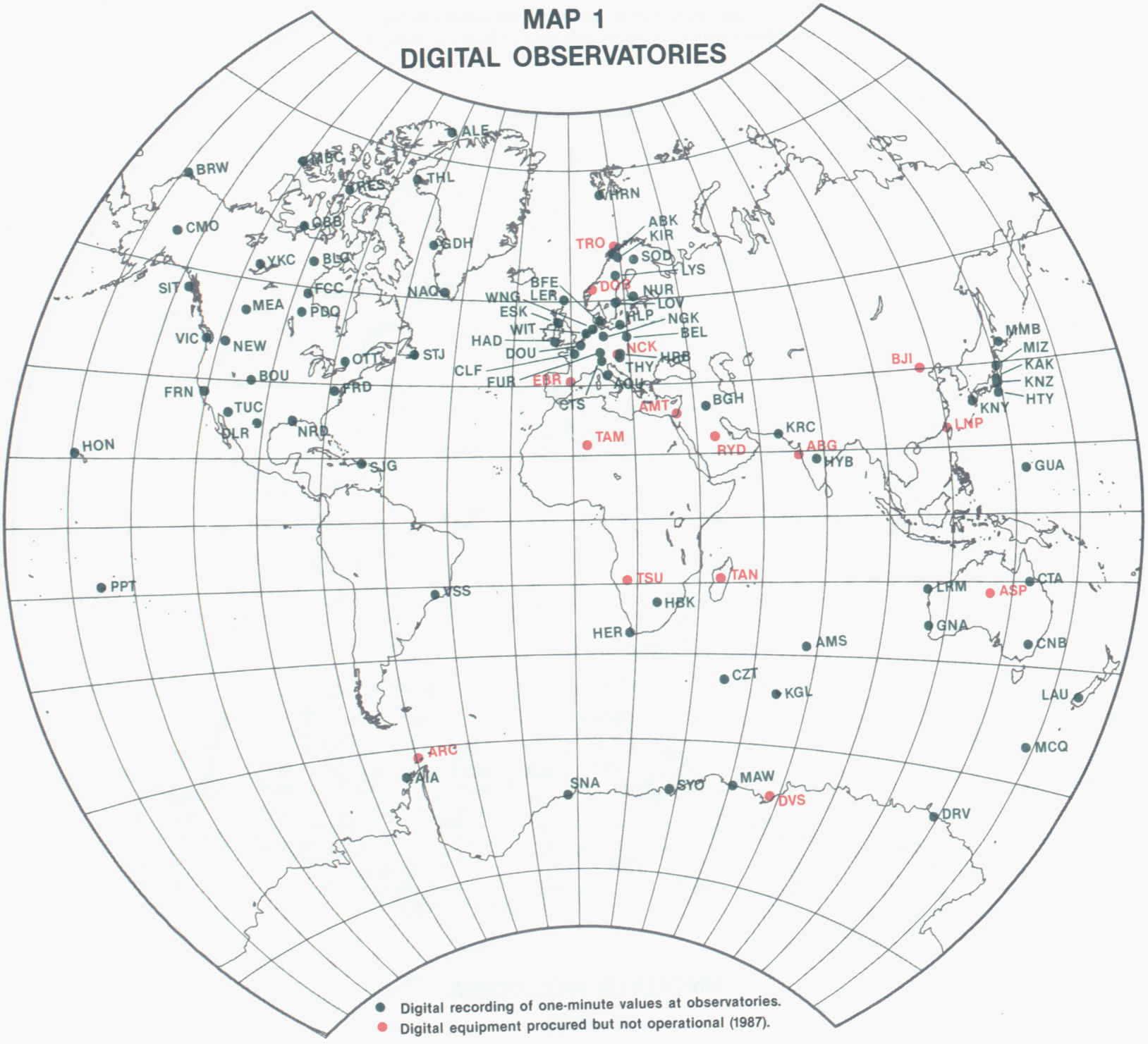
Witteveen

A computer program is planned for making analog records from the digital data in X, Y, and Z.

Yugorsky Shar

Same comments as for Arkhangelsk.

MAP 1
DIGITAL OBSERVATORIES



● Digital recording of one-minute values at observatories.
● Digital equipment procured but not operational (1987).

MAP 2
VARIATION STATIONS

● Digital recording of one-minute values at variation stations.

● Digital equipment procured but not operational (1987).

MAP 3
OBSERVATORIES WITHOUT HIGH-RESOLUTION DIGITAL RESULTS

*These observatories of the USSR operate digital systems, but without absolute control and are considered as variation stations in this publication.

AAE ADDIS ABABA
AAA *ALMA ATA
ALM ALMERIA
ANN ANNAMALAINAGAR
API APIA
ARS ARTI
ASH *ASHKHABAD
AVE AVERROES
BNG BANGUI
BIN BINZA
BOX BOROK
BDV BUDKOV
TEN CANARIAS
CCS CAPE CHELYUSKIN
CPA CHA-PA
CNH CHANGCHUN
CBI CHICHIJIMA
CRP CHIRIPA
COI COIMBRA
DLT DALAT
DIK *DIXON ISLAND
ETT ETTAYAPURAM
EYR EYREWELL
FUQ FUQUENE
GCK GROCKA
GZH GUANGZHOU
GUL GULMARG
HVN HAVANA
HIS HEISS ISLAND
HUA HUANCAYO
IBD IBADAN
IRT *IRKUTSK
ISK ISTANBUL KANDILLI
JAI JAIPUR
KGD KARAGANDA
KVA KARAVIA
KIV KIEV
KOD KODAIKANAL
LQA LA QUIACA
LZH LANZHOU
LAS LAS ACACIAS
LRV LEIRVOGUR
LNN *LENINGRAD
LSA LHASA
LUA LUANDA
LVV LVOV
MBO M'BOUR
MGD MAGADAN
MAB MANHAY
LMM MAPUTO
MNK *MINSK
MIR MIRNY

MLT MISALLAT
MOL MOLODEZHNAYA
MOS *MOSCOW
MUT MUNTINLUPA
MMK *MURMANSK
NAI NAIROBI
NMP NAMPULA
NKK NOVOKAZALINSK
NVL NOVOLAZAREVSKAYA
NVS NOVOSIBIRSK
ODE ODESSA
PAG PANAGYURISHTE
PTY PATACAMAYA
PEG PENDELI
PET *PETROPAVLOVSK
PIL PILAR
POD PODKAMMENAYA TUNGUSKA
PMG PORT MORESBY
QUE QUETTA
RFA RAIFA
ROB ROBURENT
SAB SABHAWALA
SFS SAN FERNANDO
SMG SAN MIGUEL
SPT SAN PABLO
SBA SCOTT BASE
SSH SHESHAN
SHL SHILLONG
SUA SURLARI
TNG TANGERANG
TKT TASHKENT
TTB TATUOCA
TFS TBILISI
TEH TEHRAN
TEQ TEOLOYUCAN
TIK *TIXIE BAY
TIO TIOUINE
TRW TRELEW
TRD TRIVANDRUM
TTG TUNTUNGAN
UJJ UJJAIN
UBA ULAN BATOR
WMQ URUMQI
VAL VALENTIA
VLA VLADIVOSTOK
VOS VOSTOK
CWE CAPE WELLEN
WIK WIEN-KOBENZL
WHN WUHAN
YAK *YAKUTSK
YSS YUZHNO-SAKHALINSK

Blank page retained for pagination

Appendix 1 -- Addresses to Use in Requesting Data or Information

WORLD DATA CENTERS

World Data Center A
NOAA/NGDC E/GC2
325 Broadway
Boulder, Colorado 80303
USA
Tel: (303)497-6215
Telex: 592811 NOAA MASC BDR

World Data Center B2
Soviet Geophysical Committee
Academy of Sciences of the USSR
Molodezhnaya 3
Moscow 117 296, USSR
Tel: 291-86-85
Telex: 411478 SGC SU

World Data Center C1 (Geomagnetism)
Division of Geophysics
Danish Meteorological Institute
Lyngbyvej 100
DK-2100 Copenhagen, Denmark
Tel: (01)292100
Telex: 27138 metin dk
Telegrams: METOBS

World Digital Data Center C1
for Geomagnetism
Geomagnetism Research Group
British Geological Survey
Murchison House-W. Mains Rd.
Edinburgh EH9 3LA, Scotland
Tel: (031)667-1000
Telex: 727343 SEISED G

World Data Center C2
for Geomagnetism
Faculty of Sciences
Kyoto University
Kyoto 606, Japan
Tel: (075)711 1812
Telex: 5422693 LIBKYU J

World Digital Data Center C2
for Geomagnetism
Indian Institute of Geomagnetism
Colaba, Bombay 400 005, India
Tel: (91 22)211378
Telex: 0115928 IIG IN
Telegrams: OBSERVATORY Bombay,
Colaba

OBSERVATORIES AND SPONSORING INSTITUTIONS (alphabetically by country)

A. Fares (Tamanrasset)
Centre National Astronomie, Astrophysique
et Geophysique (CNAAG)
B. P. 15-16 Bouzareah
Algiers, Algeria
Tel: 79-14-43
Telex: 53 337 CNAAG DZ

Dr. P. A. Hopgood (Alice Springs, Canberra, Charters Towers,
Learmonth, Macquarie Island, Mawson)
Geophysics Department
Bureau of Mineral Resources
P. O. Box 378
Canberra City, A.C.T. 2601, Australia
Tel: (062)499111
Telex: AA62109
Telegrams: BUROMIN

Dr. G. Burns (Casey, Davis)
Antarctic Division
Channel Highway
Kingston, Tasmania, 7150, Australia
Tel: 29 0209
Telex: AA57090
Telegrams: ANTARCTIC HOBART

Appendix 1 -- Addresses to Use in Requesting Data or Information (cont.)

Dr. P. Hammer (Toolangi)
Division of Theoretical and Space Physics
La Trobe University
Bundoora, Victoria, 3083, Australia
Tel: (03)478 3122
Telex: AA33143
Telegrams: LATROBE MELBOURNE

Dr. Peter Gregson (Gnangara)
Mundaring Geophysical Observatory
Mundaring, W. A. 6073, Australia
Tel: 295 1030
Telex: 93876
Telegrams: BUROMIN MUNDARING

J. Hus (Dourbes)
Centre de Physique du Globe
Institut Royal Meteorolgique
6381 Dourbes, Belgium
Tel: 74 43 00
74 67 87
74 02 79
74 09 41
74 02 48
Telex: 21315 meteor b

Dr. Y. Ottelet (Manhay)
Institut d'Astrophysique
University de Liege
4200 Cointe-Sclessin, Belgium
Tel: (04)52 99 80
Telex: 41 264 astrlg b

L. Muniz Baretto (Vassouras)
CNPq - Observatorio National
Rua General Bruce, No. 586 Sao Cristovao
20,921 Rio de Janeiro - RJ, Brazil
Tel: (021)580-7313
Telex: 2121288 obsn br

N. B. Trivedi (Alcantara, Cachoeira Paulista, Eusebio, Ferraz)
I. N. P. E.
Caixa Postal 515
12,200 Sao Jose dos Campos - SP, Brazil
Tel: (0123)229977
Telex: 11333530 inpe br

A. Vallance Jones (Back, Churchill, Contwoyto Lake, Dawson City,
Planetary Sciences Section Eskimo Point, Fort McMurray, Fort Simpson,
Herzberg Institute of Astrophysics Fort Smith, Gillam, Island Lake, Pinawa,
Ottawa, Canada K1A OR6 Rabbit Lake, Rankin Inlet)
Tel: (613)990-0706
Telex: 053-3715

Appendix 1 -- Addresses to Use in Requesting Data or Information (cont.)

G. Jansen van Beek
Geophysics Division
Geological Survey of Canada
1 Observatory Crescent
Ottawa, Ontario K1A 0Y3, Canada
Tel: (613)995-5474
Telex: 533117

(Alert, Baker Lake, Cambridge Bay, Fort Churchill, Glenlea, Meanook, Mould Bay, Ottawa, Poste-de-la-Baleine, Resolute Bay, Saint John's, Victoria, Yellowknife)

Information Services Section (No. 9)
Institute of Geophysics
State Seismological Bureau
Beijing, China
Tel: 691361
Telegrams: 3808

(Beijing)

M. Konecny
Geomagneticke Oddeleni
Ceskoslovenska Akademie Ved
Geofyzikalni Ustav
Bocni II, CP. 1401
11431 Prague 4 - Sporilov, Czechoslovakia
Tel: 761941-5
762541-5
Telex: 186 382 ionv c

(Budkov)

J. Podsklan
Slovak Academy of Sciences
Geophysical Institute
947 01 Hurbanovo, Czechoslovakia
Tel: Hurbanovo 2211
Telex: 98527 gfyz c

(Hurbanovo)

Dr. E. Kring Lauridsen
Geomagnetism Division
Danish Meteorological Institute
Lyngbyvej 100
DK-2100 Copenhagen, Denmark
Tel: (01)292100
Telex: 27138 metin dk
Telegrams: METOBS

(Brorfelde, Daneborg, Danmarkshavn, Frederikshab, Godhavn, Godthab, Kuvdlorssuaq, Narssarssuaq, Nord, Savigsivik, Scoresby Sund, Sondre Stromfjord, Thule, Umanaq, Upernavik)

Dr. C. Sucksdorff
Geomagnetism Division
Finnish Meteorological Institute
Box 503
SF-00101 Helsinki 10, Finland
Tel: (+358 0) 19291
Telex: 124436 efkl sf
Telegrams: METEO CENTER HELSINKI

(Alta, Kautokeino, Kevo, Kilpisjarvi, Muonio, Nurmijarvi, Pello, Sorya)

Appendix 1 -- Addresses to Use in Requesting Data or Information (cont.)

E. Kataja (Sodankyla)
Sodankyla Geophysical Observatory
SF-99600 Sodankyla, Finland
Tel: (993) 12 226
227
228
Telex: 37254 gefso sf

M. Menvielle (Chambon-la-Foret)
Geomagnetisme et Paleomagnetisme
Institut de Physique du Globe de Paris
4, Place Jussieu, Tour 24-25, 2e etage
75252 Paris CEDEX, France
Tel: 43 36 25 25
Telex: 202 810 volsisn

J. Bitterly (Dumont d'Urville, Martin-de-Vivies, Port Alfred, Port-aux-Francais)
Institut de Physique du Globe de Strasbourg
Universite Louis-Pasteur
5, rue Rene-Descartes
67084 Strasbourg CEDEX, France
Tel: (88) 61 48 20
Telex: 890518 ipgs

Y. Albouy (Bangui, M'Bour, Pamatai)
Services Scientifiques Centraux
ORSTOM
70-74, Route d'Aulnay
93140 Bondy, France
Tel: 847 31 95
849 52 44
Telex: 215203 sscby

Dr. A. Best (Niemegk, Sosa, Warnkenhagen)
Adolf-Schmidt-Observatorium
Heinrich-Hertz-Institut
Akademie der Wissenschaften der DDR
DDR-1824 Niemegk, German Democratic Republic
Tel: Niemegk 296 U. 295
Telex: 157528 obsnk dd

Dr. M. Beblo (Furstenfeldbruck)
Geophysikalisches Observatorium
Ludwigshohe 8
D-8080 Furstenfeldbruck, German Federal Republic
Tel: 0 81 41
9 24 70

Appendix 1 -- Addresses to Use in Requesting Data or Information (cont.)

Prof. D. Voppel (Wingst)
Deutsches Hydrographisches Institut
Postfach 220
2000 Hamburg 4, German Federal Republic
Tel: (040)31 90-5153
31 90-1
Telex: 211138 bmvhh d
Telegrams: HYDORDIENST HAMBURG

J. Vero (Nagycenk)
Geomagnetism Department
Geodetical and Geophysical Research
Hungarian Academy of Sciences
P. O. Box 5
H-9401 Sopron, Hungary
Tel: 11-121
Telex: 249125 mtage h

A. Kormendi (Tihany)
Geofizikai Obszervatorium
Kossuth L. U. 83
H-8237 Tihany, Hungary
Tel: 635-010
Telex: 22-6194 elgi h
Telegrams: ELGI BUDAPEST

Dr. Th. Saemundsson (Leirvogur)
Science Institute
University of Iceland
Dunhaga 3
Reykjavik 107, Iceland
Tel: (354-1)21340
Telex: 2307 isinfo is

R. G. Rastogi (Alibag)
Indian Institute of Geomagnetism
Colaba, Bombay 400 005, India
Tel: 21 12 45
21 45 39
Telex: 11-5928-IIG-IN

B. J. Srivastava (Hyderabad)
Hyderabad Geomagnetic Observatory
National Geophysical Research Institute
Hyderabad 500 007, India
Tel: 851931
Telex: 155-6478 ngri in

Appendix 1 -- Addresses to Use in Requesting Data or Information (cont.)

Dr. Karim Al-Rawi (Baghdad)
Space and Astronomy Research Center
Science Research Council
P. O. Box 2441 Jadiriyah
Baghdad, Iraq
Tel: 7765127
Telex: 213976 src
Telegrams: BATHILMI

Dr. A. Meloni (Castel Tesino, Gibilmanna, L'Aquila)
Istituto Nazionale di Geofisica
Via di Villa Ricotti 42
00161 Roma, Italy
Tel: (06) 42101
Telex: 610502 georom

A. Harada (Kakioka, Kanoya, Memambetsu)
Kakioka Magnetic Observatory
Kakioka, Yasato-machi, Niihari-gun
Ibaraki-ken 315-01, Japan
Tel: 02994-3-1151
Telex: 3655-878

T. Sato (Hatizyo)
Geodesy & Geophysics Division
Hydrographic Department
Maritime Safety Agency
3-1 Tsukiji 5-chome
Chuo-ku, Tokyo 104, Japan
Tel: (03)541-3811
-3819
Telex: 0 252-2452 hdjodc h

Dr. M. J. Tanaka (Kanozan, Mizusawa)
First Geodetic Division
Geographical Survey Institute
1 Hokugo, Yatabe-machi, Tsukuba-gun
Ibaraki-ken 305, Japan
Tel: 0298-64-1111
Telegrams: TSUKUBA CHIRIN

M. Ayukawa (Husafell, Isafjordur, Syowa, Tjornes)
Geomagnetism Division
National Institute of Polar Research
9-10, Kaga 1 chome
Itabashi-ku, Tokyo 173, Japan
Tel: (03)962-4711
-4716
Telex: 02723515 polrsc j

Appendix 1 -- Addresses to Use in Requesting Data or Information (cont.)

Dr. Rakotondrainibe (Tananarive)
Observatoire de Tananarive
B. P. 3843
Antananarivo, Madagascar
Tel: 253-53

J. A. As (Witteveen)
Geophysical Division
Royal Netherlands Meteorological Institute
P. O. Box 201
3730 AE DeBilt, Netherlands
Tel: (+31 30)76 6911
Telex: 47096 knmi nl

L. A. Tomlinson (Lauder)
Geophysical Observatory
D.S.I.R.
P. O. Box 2111
Christchurch 1, New Zealand
Tel: 791 540
Telex: 4432 antdiv nz
Telegrams: GEOFISIK

E. Gjoen (Dombas)
Geophysical Institute
University of Bergen
Allegt 70
N-5000 Bergen, Norway

Truls Lynne Hansen (Bear Island, New Aalesund, Tromso)
The Auroral Observatory
Institute of Mathematical and Physical Sciences
University of Tromso
P. O. Box 953
N-9001 Tromso, Norway
Tel: (083) 86060
Telex: 64124 aurob n

Dr. Shafatullah Khan (Karachi)
Applied Electronics Division
SUPARCO
P. O. Box No. 8402
Karachi 32, Pakistan
Tel: 461151
52
Telex: 25720 space pk
Telegrams: SUPARCO

Appendix 1 -- Addresses to Use in Requesting Data or Information (cont.)

Jan Reda (Arctowski, Belsk, Hel, Hornsund)
Institut Geofizyki
Ul. Pasteura 3
Skrytka Pocztowa 155
02-093 Warsaw, Poland
Tel: 22 53 43
41
Telex: 814892 igp pl

Lic. J. S. Pereira Vilela (Coimbra)
Instituto Geofisico
Universidade de Coimbra
3000 Coimbra, Portugal
Tel: 7 74 44
Telex: 52273 unicoi p

A. Soare (Surlari)
Observatorul Geofizic Surlari
8211 Moara Vlasiei
Ilfov, Romania

Dr. Ass'ad S. Abdo (Riyadh)
Seismological-Geophysical Observatory
College of Science
King Saud University
P. O. Box 2454
11451 Riyadh, Saudi Arabia
Tel: 4675346
Telex: 928-201012

Dr. G. J. Kuhn (Hartebeesthoek, Hermanus, Sanae, Tsumeb)
Magnetic Observatory of the CSIR
P. O. Box 32
Hermanus 7200, South Africa
Tel: (02831) 21196
97
Telex: 527819 sa

The Rev. J. O. Cardus, SJ (Ebro)
Observatorio del Ebro
Roquetas (Taragona), Spain
Tel: 977-500511

T. Bergmark (Abisko, Lovo)
Section Regional Geophysics
Geological Survey of Sweden
Box 670
751 28 Uppsala, Sweden
Tel: (+46 18) 15 52 80
Telex: 76154 geoswd s
Telegrams: GEOSURVEY

Appendix 1 -- Addresses to Use in Requesting Data or Information (cont.)

Vaino Bjornstrom (Kiruna)
Kiruna Geophysical Institute
Box 704
S-98127 Kiruna 1, Sweden
Tel: 0980/12240
Telex: 8754 geofysk s

Ove Klang (Lycksele)
Kiruna Geophysical Institue
Box 704
S-98127 Kiruna 1, Sweden
Tel: 0980/12240
Telex: 8754 geofysk s

G. Fischer (Neuchatel)
Observatoire de Neuchatel
CH-2000 Neuchatel, Switzerland
Tel: (038) 24 18 61
62

Dr. Y. N. Huang (Lunping)
Telecommunication Training Institute
168, Minchu Road, Panchiao
Taipei Hsien, Taiwan
Tel: (02) 963-9260
Telex: 31202 teltrains
Telegrams: TELTRAIN TAIPEI

D. A. Simmons (Argentine Islands, Halley)
Atmospheric Sciences Division
British Antarctic Survey
Madingley Road - High Cross
Cambridge CB3 OET, United Kingdom
Tel: (0223) 61188
Telex: 817725 cambas g
Telegrams: POLASURVEY CAMBRIDGE

A. C. Greenwood (Eskdalemuir, Hartland, Lerwick)
Geomagnetism Research Group
British Geological Survey
Murchison House - West Mains Road
Edinburgh EH9 3LA, United Kingdom
Tel: (031) 667-1000
Telex: 727343 seised g

Lanny Wilson (Barrow, Boulder, College, Del Rio,
U. S. Geological Survey Fredericksburg, Fresno, Guam, Honolulu,
Federal Center Box 25046 Stop 968 Newport, San Juan, Sitka, Tucson)
Denver, Colorado 80225, U. S. A.
Tel: (303) 236-1370
Telex: 5106014123 ESL UD

Appendix 1 -- Addresses to Use in Requesting Data or Information (cont.)

The Rev. John F. Devane, SJ
Dept. of Geology & Geophysics
Weston Observatory - Boston College
381 Concord Road
Chestnut Hill, Massachusetts 02167, U. S. A.
Tel: (617)899-0950

(Weston)

Brett Delana
Geophysical Institute
University of Alaska
Fairbanks, Alaska 99775-0800, U. S. A.
Tel: (907)474-7519
Telex: 35414 GEOPH INST FBK

(Arctic Village, Cape Parry, Fort Yukon, Inuvik, Sach's Harbor, Talkeetna)

Dr. Jai S. Kim
Dept. of Atmospheric Sciences
State University of New York (SUNY)
1400 Washington Ave.
Albany, NY 12222, U. S. A.
Tel: (518)442-4583

(Fort Simpson, Fort Smith, Lynn Lake, Norman Wells)

Mr. Kuno Smits
NORDA, Code 352
NSTL, Mississippi 39529, U. S. A.
Tel: (601)688-4607

(NORDA)

R. G. Hines
NOAA/ERL/SEL
325 Broadway
Boulder, CO 80303, U. S. A.
Tel: (303)497-5828
Telex: 592811 NOAA MASC BDR

(Anchorage)

L. J. Lanzerotti
AT & T Bell Laboratories, IE-439
Murray Hill, New Jersey 07974-2070, U. S. A.
Tel: (201)582-2279

(Iqaluit, McMurdo, South Pole)

T. J. Rosenberg
Institute for Physical Science and Technology
University of Maryland
College Park, MD 20742, U. S. A.
Tel: (301)454-4590

(Siple)

Dr. A. Zaitzev
Polar Geomagnetic Research Laboratory
IZMIRAN
Troitsk
142 092 Moscow Region, U. S. S. R.
Tel: 232-19-21
Telex: 412623 scstp sv

(Alma Ata, Arkhangelsk, Ashkhabad, Cape Schmidt, Dixon Island, Irkutsk, Kaliningrad Leningrad, Minsk, Moscow, Murmansk, Petropavlovsk, Tixie Bay, Yugorsky Shar)

Appendix 2 -- Addresses of Manufacturers of Magnetic Observatory Instruments

Argos (not available)

Barringer Research Ltd.
304 Carlingview Drive
Toronto, Ontario, CANADA M9W 5G2

Geophysical Institute (for CMVS)
Czechoslovak Academy of Sciences
Bocni II
14131 Praha 4-Sporilov
CZECHOSLOVAKIA

Develco Inc.
404 G Tasman Dr.
Sunnyvale, CA 94086, USA

Earth Physics Branch
Geological Survey of Canada
1 Observatory Crescent
Ottawa, Ontario, CANADA K1A 0Y3

EDA Instruments Inc.
4 Thorncliffe Park Drive
Toronto, Ontario, CANADA M4H 1H1

EG&G Geometrics
395 Java Drive
ul.Pasteura 3
Sunnyvale, CA 94086, USA

Helatronic (no longer in business)

IFG Company
1818 Bram Ct., Unit 5
Brampton, Ontario
CANADA L6W 3R6

Institute of Terrestrial Magnetism
IZMIRAN
142092 Troitsk
Moscow Region, USSR

Kokusai Electric Industry
5-34-10 Minamidai, Nakano-ku
Tokyo 164, JAPAN

The Littlemore Scientific Eng. Co.
(ELSEC), Railway Lane
Littlemore, Oxford OX4 4P2
UNITED KINGDOM

Lorand Eotvos Geophysical Institute
Columbus U. 17-23
1145 Budapest XIV
HUNGARY

Meisei Electric Corporation
Sasaki-Bill 2-5-7 Koishikawa
Bunkyo-ku
Tokyo 112, JAPAN

Dr. B. Barry Narod
Geophysics Instrumentation Group
310-2475 W. York Avenue
Vancouver, B.C., CANADA V6K 1C9

Nippon Electric Corporation
NEC Nakagawara Technical Center
5-22-5 Sumiyoshi-chou, Fuchu-shi
Tokyo 183, JAPAN

Institute of Geophysics (for PSM)
Polish Academy of Science,
Skrytka pocztowa 155
Warsaw 22, POLAND

Schonstedt Instrument Company
1775 Wiehle Avenue
Reston, VA 22090-5199, USA

Shimazu Corporation, Tokyo Branch
Tokuhin-bu, Eigyo-ka
Shinjuku-Mitsui Bill, 2-1-1
Nishi-Shinjuku
Shinjuku-ku, Tokyo 160, JAPAN

Sokkisha Corporation
Kancho-Eigyo-bu Tokuhin-ka
Keio-Yoyogi-Bill, 1-1-1 Tomigaya
Angeles
Shibuya-ku
Tokyo 151, JAPAN

Thomson Sintra
Route du Conquet
29283 Brest Cedex
FRANCE

Institute of Geophysics &
Planetary Physics
University of California, Los
Los Angeles, CA 90024, USA

Varian Associates
Instrument Group
611 Hansen Way
Palo Alto, CA 94303, USA

Appendix 3 -- The Questionnaire of September 1984

Observatory(ies)_____

1. Do you have a digital magnetometer? Yes_____ No_____
   If no, proceed to Part II.
   If yes, please answer the following questions.

2. Which type?

	Recording (encircle)	Maker's name, model No.
_____Quartz	D H I X Y Z F	_____
_____Fluxgate	D H I X Y Z F	_____
_____Proton	D H I X Y Z F	_____
_____Optical pumping	D H I X Y Z F	_____
_____Other (describe)	D H I X Y Z F	_____

3. What is the sampling rate? 2.5-min____ 1-min____ 20-sec____ 10-sec____
   Other (describe)_____

4. Are these instantaneous values? Yes____ No____
   If no, what do they represent?_____

5. What is the form of recording? Tape reel____Tape cassette____Paper tape____
   Punched cards____Listing____Other (describe)_____

6. On the average, how complete is the record? Essentially 100%____ 95%____
   Other _____%

7. Is the stability of the instrument monitored by absolute observations?
   Yes____ No____
   If yes, how frequently are observations made? Monthly____ Weekly____
   Times per week____ Other (describe)_____
   If yes, which elements are observed (encircle)? D I H X Y Z F
   If no, but you have the information, please give an estimate of maximum drift with time. Element(s)____ Change____nT per____

8. What steps do you take in processing the original record?

   ____Removal of spikes or discontinuities
   ____Identification of missing data
   ____Fill-in gaps from other data source
   ____Comparison with other data source (e.g., magnetograms)
   ____Preparation of analog form
   ____Adjustment for base-line drift (If not adjusted, are calibration data available with the tape? Yes____ No_____)
   ____Reformat
   ____Data packing
   ____Other (describe)

9. After processing, what is the final form of the data? Same as original_____
   instantaneous values? Yes____ No____
   2.5-min____ 1-min____ Other (describe)_____
   Mean values, Yes____ No____
   If yes, over what interval?_____

10. Are hourly values derived form this digital record? Yes____ No____
    If yes, are these the values that are published? Yes____ No____
    If yes, are these hourly values used to check the hourly values which are otherwise derived and published? Yes____ No____

11. What is the first date, or what is the time interval, for which you have a reliable digital record?_____

12. Are the data maintained on a disk file? Yes____ No____

13. Is it possible to have remote access to that computer and file? Yes____ No____

14. Are copies of the digital data sent routinely to the World Data Center? Yes____ No____
    If not, can they be made available? Yes, routinely____ No____
    Yes, for specifically requested time intervals____ No____
    (Please note that arrangements can be made for tape replacement.)

15. Are the digital results available in analog form? Yes____ No____

16. Are these analog data appropriate to archive at the World Data Center? Yes____ No____

17. Name of person to contact for information on system or on data_____

Part II. DIGITIZED MAGNETOGRAMS

1. Do you have a machine for digitizing magnetograms? Yes____ No____

2. Do you use this machine routinely? Yes____ No____

3. What is the digitizing interval? 2.5-min___1-min___Other(describe)_____

4. What is the form of recording? Tape reel____ Tape cassette____
   Paper tape____ Punched cards____ Listing____ Other (describe)_____

5. Is this the method you use for computing your hourly values? Yes____ No____

6. From what date, or what is the time interval, for which you have results available in this format?_____

7. Are copies of the data sent routinely to the World Data Center? Yes____ No____
   If not, can they be made available. Yes, routinely____ No____
   Yes, for specifically requested time intervals____ No____

COMMENTS (Please include list of any published references on system or data described in Parts I or II.)

Signature_____

Date_____

Addendum

Information for the Norwegian variation station Andoya was received too late for inclusion in the regular text. Pertinent information for Andoya follows:

AND 60.28 N 16.02 E
Fluxgate DHZ EDA FM100
10-sec instantaneous values on tape reel, listings, and plots.
Yearly absolute observations of D, H, Z
Missing data are identified; data are reformatted and packed.
Final format is same as original; hourly values are not derived.
First reliable data: November 1979
Data are normally retained on disk file for 3 months.
Remote access can be available to WDC.

Further information available from:

Halgeir Wold
Space Activity Division
Royal Norwegian Council for Scientific
and Industrial Research (NTNF)
P. O. Box No. 309 Blindern
N-0314 Oslo 3, Norway
Tel: (02) 143590
Telex: 18174 space n
Cable: "Satellite"

☆ U. S. GOVERNMENT PRINTING OFFICE: 1987--773-002--60,524

ERRATA

On pages 10, 13, and 49 the code for the Canadian observatory Poste-de-la-Baleine is given as PDQ. It should be PBQ.

On page 50, Map 2, Greenland:

DMS should be DMH
DBQ should be DNB
UNQ should be UMQ.

TITLES OF SE REPORTS

SE-1 Catalog of Tsunamis in Alaska
SE-2 Geodynamics International-9
SE-3 Summary of Earthquake Focal Mechanisms for the Western Pacific-Indonesian Region, 1929-1973
SE-4 Catalog of Tsunamis in Hawaii
SE-5 Geodynamics International-10
SE-6 Catalog of Seismograms and Strong-Motion Records
SE-7 Directory of Seismograph Stations
SE-8 Survey of Practice in Determining Magnitudes of Near Earthquakes, Part 2: Europe, Asia, Africa, Australia, the Pacific
SE-9 Survey of Practice in Determining Magnitudes of Near Earthquakes, Part 1: North, Central, and South America
SE-10 Geodynamics International-11
SE-11 The Information Explosion and Its Consequences for Data Acquisition, Documentation, and Processing: An Additional Aspect of the Limits to Growth
SE-12 Geodynamics International-12
SE-13 Bibliography of Statistical Aspects of Seismicity
SE-14 Directory of U.S. Data Repositories Supporting the International Geodynamics Project
SE-15 Geodynamics International-13
SE-16 Geodynamics International-14
SE-17 Annual Mean Values of Geomagnetic Components for Selected Observatories, 1940-73
SE-18 Homogeneous Magnitude System of the Eurasian Continent: P-Waves
SE-19 Geodynamics International-15
SE-20 Manual of Seismological Practice
SE-21 Geomagnetic Observatories, 1978
SE-22 Historical Seismogram Filming Project: First Progress Report
SE-23 Geodynamics International-16
SE-24 Historical Seismogram Filming Project: Second Progress Report
SE-25 Directory of World Seismograph Stations, Volume 1. The Americas—Part 1. United States, Canada, Bermuda
SE-26 Geodynamics International-17—Final Report
SE-27 Catalog of Significant Earthquakes, 2000 B.C.-1979
SE-28 Historical Seismogram Filming Project: Third Progress Report
SE-29 Strong-Motion Data from Japanese Earthquakes
SE-30 Progress Report on Selected Geophysical Activities of the United States, 1977-1981
SE-31 New Catalog of Strong Earthquakes in the U.S.S.R. from Ancient Times Through 1977
SE-32 Directory of World Digital Seismic Stations
SE-33 Historical Seismogram Filming Project: Fourth Progress Report
SE-34 Homogeneous Magnitude System of the Eurasian Continent: S and L Waves
SE-35 Documentation of Earthquake Algorithms
SE-36 Catalog of Submarine Volcanoes and Hydrological Phenomena Associated with Volcanic Events 1500 B.C. to December 31, 1899
SE-37 Inventory of Filmed Historical Seismograms and Station Bulletins at World Data Center A
SE-38 Catalog of Strong-Motion Accelerograph Records
SE-39 Tsunamis in Peru-Chile
SE-40 Earthquake Catalog for the Middle East Countries 1900-1983
SE-41 Directory of World Seismograph Stations, Volume II. East Asia. China, Japan, Korea, and Mongolia
SE-42 Catalog of Submarine Volcanoes and Hydrological Phenomena Associated with Volcanic Events January 1, 1900 to December 31, 1959
SE-43 A Directory of Geomagnetic Observatories with Digital Recording Magnetometers, 1987

To obtain information about ordering these publications, call (303) 497-6277 or FTS: 320-6277, or write to:

National Geophysical Data Center
NOAA, Code E/GC1
325 Broadway
Boulder, CO 80303