REPORT UAG-15

Supersedes Report UAG-11, June 1970

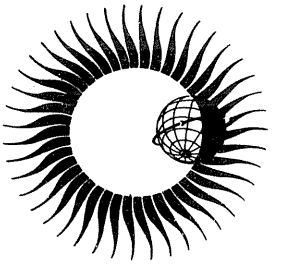
WORLD DATA CENTER A

Upper Atmosphere Geophysics

CATALOGUE OF DATA

ON

SOLAR-TERRESTRIAL PHYSICS



July 1971

WORLD DATA CENTER A

National Academy of Sciences

2101 Constitution Avenue, N. W. Washington, D. C. U.S.A., 20418

World Data Center A consists of the Coordination Office

and nine subcenters:

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National Academy of Sciences
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World Data Center A:
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World Data Center A:
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U. S. Naval Observatory
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Telephone (704) 254-0961

Oceanography:
World Data Center A:
Oceanography
National Oceanic and Atmospheric Administration
Rockville, Maryland, U.S.A. 20852
Telephone (202) 698-3753

Rockets and Satellites:
World Data Center A:
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Goddard Space Flight Center
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Tsunami:
World Data Center A:
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Lamont-Doherty Geological Observatory
Palisades, New York, U.S.A. 10964
Telephone (914) 359-2900 Ext. 209

Notes:

(1) 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.

(2) 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).

(3) Inquiries and communications concerning data in specific disciplines should be addressed to the appropriate subcenter listed above.

Master Station List

Solar and Interplanetary Phenomena

Ionospheric Phenomena

Flare-Associated Events

Geomagnetic Phenomena

Aurora

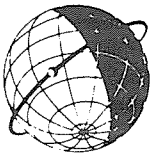
Cosmic Rays

Airglow

Miscellany

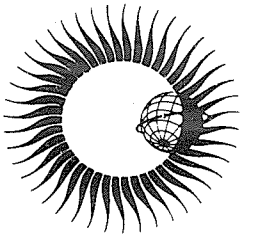
WORLD DATA CENTER A

Upper Atmosphere Geophysics



CATALOGUE OF DATA ON SOLAR-TERRESTRIAL PHYSICS IN WORLD DATA CENTER A SUBCENTERS

Solar and Interplanetary Phenomena
Ionospheric Phenomena
Flare-Associated Events
Geomagnetic Phenomena
Aurora
Cosmic Rays
Airglow



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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

ENVIRONMENTAL DATA SERVICE
Asheville, North Carolina, USA 28801

July 1971

SUBSCRIPTION PRICE: $9.00 a year; $2.50 additional for foreign mailing; single copy price varies.* Checks and money orders should be made payable to the Superintendent of Documents. Remittance and correspondence regarding subscriptions should be sent to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

*PRICE THIS ISSUE $1.50

INTRODUCTION

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 IGY Committee (CSAGI) as part of the fundamental international planning for the International Geophysical Year 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 Comité International de Géophysique (CIG) for the period 1960 to 1967 and are now supervised by the ICSU Panel on World Data Centers.

The current plans for continued international exchange of solar-terrestrial data through the World Data Centers are set forth in the STP NOTES No. 6 "Guide for International Exchange of Data in Solar-Terrestrial Physics" which was adopted by the Inter-Union Commission on Solar-Terrestrial Physics in 1969. These plans are broadly similar to those adopted under ICSU auspices for the IGY and IQSY.

Functions and Responsibilities of WDC's

The World Data Centers collect data and publications for the following disciplines: Glaciology; Gravimetry; Longitude and Latitude; Meteorology; Oceanography; Rockets and Satellites; Seismology; Solar-Terrestrial Physics disciplines (Solar and Interplanetary Phenomena, Ionospheric Phenomena, Flare-Associated Events, Geomagnetic Phenomena, Aurora, Cosmic Rays, Airglow); Tsunami; UMP disciplines (Recent Movements of the Earth's Crust, Paleomagnetism, Volcanology; Geochemistry, Properties of rocks under high pressure and temperatures, Geothermics, Deep drilling). 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) safekeeping 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 catalogues of all data in its charge, (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 Board and its Committee on Data Interchange and Data Centers has over-all responsibility, consists of the WDC-A Coordination Office and nine subcenters at scientific institutions in various parts of the United States. The GRB 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. Several of the discipline centers of WDC-A dealing with solar-terrestrial physics were consolidated in the WDC-A for Upper Atmosphere Geophysics during the period 1 July 1966 to 1 July 1968. The WDC-A for Rockets and Satellites was moved from the National Academy of Sciences to a location adjacent to the National Space Science Data Center at NASA Goddard Space Flight Center on 1 January 1969. The World Data Center A for Tsunamis was moved from NOAA-Rockville to NOAA-Honolulu in May 1969. The WDC-A for Glaciology was moved from the American Geographical Society in New York to the U. S. Geological Survey Project Office for Glaciology in Tacoma, Washington on 1 October 1970. The addresses of several subcenters were changed when the National Oceanic and Atmospheric Administration (NOAA) was established in October 1970. The addresses of the WDC-A subcenters and Coordination Office are given inside the front cover. There are very close connections between the three WDC-A subcenters (WDC-A for Upper Atmosphere Geophysics, WDC-A for Rockets and Satellites, WDC-A for Geomagnetism) which exchange solar-terrestrial geophysical data; if it is more convenient, data may be sent to one WDC-A subcenter through another one.

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.

Catalogue of Data

All the data associated with the various disciplines of solar-terrestrial physics received by WDC-A, or known to be available are listed in this catalogue which supersedes all previous WDC-A catalogues for these disciplines. The geographical location of the holdings is specified in each section.

World Data Center A Coordination Office
July 1971

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GENERAL EXPLANATORY NOTES

This Catalogue presents the holdings in Solar-Terrestrial Physics at the three World Data Center A subcenters concerned with these disciplines: WDC-A, Upper Atmosphere Geophysics, Boulder, Colorado; WDC-A, Rockets and Satellites, Greenbelt, Md.; and WDC-A, Geomagnetism, Boulder, Co. Their complete mailing addresses are on the inside cover of this Catalogue.

The Catalogue is arranged by the classification scheme (see Table of Contents, p. 2) of the "Guide for International Exchange of Data in Solar-Terrestrial Physics", issued as STP Notes No. 6 under the auspices of the Inter-Union Commission on Solar-Terrestrial Physics*. The main sections are separated by thumb prints. A detailed table of contents heads each section, accompanied by additional explanatory text or maps indicating the location of stations currently reporting, when appropriate.

On the lefthand pages are presented samples of the data and special information on data holdings. The recommended standardized computerized formats are specified. On the facing righthand pages are given holdings at each geographic location under the headings: At Boulder; At Greenbelt; At Boulder - Geomagmagnetism. Under the station lists further information is given when appropriate concerning holdings in Computer Format Publications, Photographs, or Microfilm.

To present the data in as concise a format as possible for the user, the holdings at Boulder are given by symbols on the catalogue pages which are defined as follows:

A = complete (12 months)
B = moderately complete (6 to 11 months)
C = some data (1 to 5 months)
W = World Days only
Q = data exist but not held at WDC-A; query WDC-A to assist in obtaining these data
P = data presumed to exist but not held at WDC-A; WDC-A will attempt to ascertain availability of these data upon request
S = Program stopped operations (See MASTER STATION LIST for actual date).

Since operating dates are not known for all stations, there can be errors in the "P" entries. "Blanks" in the yearly columns not preceded by an "S" indicate the operating status of the program is not known.

FACILITIES - METHOD OF ORDERING - COST OF COPYING

At Boulder - Upper Atmosphere Geophysics

Facilities Visitors are welcome at the WDC to consult the data collection. Space is available for scientists to work with the data and records on the premises. However, arrangements for such visits should be made in advance since space is limited. Available equipment are desk calculators, microfilm readers and reader-printers and scaling tables for reading ionograms or solar flare patrol film. Special arrangements can be made for the use of an XDS Time-Sharing Computer or the CDC 3800 Computer.

The WDC will, whenever possible, help interested scientists to obtain data not now in the WDC files. This will include searches for the existence of the desired data.

Scientists are urged to keep the Data Center informed of the observational and experimental programs of their laboratories, whether in progress or planned, in accordance with recommendations in STP Notes No. 6.

Method of Ordering Requests can be made by letter, telephone calls, or visits to the WDC. If the data are to be furnished free on a data exchange basis, no further documentation is needed. However, if asked to reimburse the WDC for the cost of copying the data, the requester must send a purchase order or authorizing letter stating:

Type of Data and format of output
Stations involved
Dates and time (be sure to specify whether UT or Local Time desired)
Parameters required or other specific information
For magnetic tape
1) Specify whether providing blank tape or paying WDC for supplying tape
2) Indicate type of computer on which tape is to be used. WDC can provide BCD tapes at 200, 556, or 800 BPI; 7 track.

* Copies of STP Notes No. 6 are available from the IUCSTP Secretariat, c/o National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, D. C., U.S.A. 20418, or from World Data Center A, Upper Atmosphere Geophysics, NOAA, Boulder, Colorado, U.S.A. 80302.

The requests should be sent to:

World Data Center A
Upper Atmosphere Geophysics
National Oceanic and Atmospheric Administration
Boulder, Colorado, U.S.A. 80302

with remittances payable in U.S. dollars to:

National Oceanic and Atmospheric Administration

mailed to above address.

Foreign orders must be paid in advance. For orders estimated to be under $50, a check or money order will be requested by WDC-A rather than a purchase order.

Please allow at least three weeks for duplication of data.

Cost of Copying

The costs quoted below are subject to change. Mailing and shipping charges may be in addition to the costs shown.

For large orders estimated to cost more than $500, separate cost accounting projects are established at the Data Center on an actual cost basis. These costs will usually average less than costs calculated from the charges at fixed rates as given below.

There is a minimum charge for data copies of $10.00.

Standing orders for data (normally filled on a monthly basis) can be arranged.

Fixed rate charges:

35 mm film copies of ionograms in 500 to 1000 ft. lengths	.08 per ft.
Film cutting and splicing charge for selected intervals.	4.00 per interval
in 100 ft. lengths (top-side)	5.00 per 100 ft. roll
35 mm film copies of original recordings or tabulations reduced to 35 mm microfilm	5.00 per 100 ft. roll
16 mm film copies of all-sky camera film sprocketed for movie projection	9.00 per 100 ft. roll
16 mm film copies of Hα flare films sprocketed for movie projection	.20 per ft.
35 mm microfilm (camera negative) of data sheets	.15 per frame
Electrostatic copies of data sheets - letter size	.25 per sheet
Electrostatic copies reduced from out-size original data sheet to letter size	.45 per sheet
Duplicates of punched cards on file	8.00 per thousand
Duplicates of interpreted punched cards on file	13.00 per thousand
Negative - 8" x 10" size	6.00 per negative
Glossy prints of existing negative in 8" x 10" size	1.75 per print
Magnetic tapes (new blanks)-7 track	12.00 per reel

Data retrieved from collections stored on magnetic tapes will be furnished on an actual-cost basis, i.e., computer charges, plus cards, tape and handling. Estimates for specific data requests will be furnished. See specific data section for detailed information on computerized holdings.

BOOKLETS

1. "Ionospheric Data", monthly, purchased through SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C., 20402, beginning with the issue for January 1971. Subscription price: $10.00 annually for domestic mailing (airmail $9.60 additional); $12.50 for foreign surface mailing (foreign airmail quoted on request); and single copy price $1.00. Checks or money orders in U.S. currency made payable to the Superintendent of Documents should accompany the request including Catalog Order Number C55.218.

   Back issues of Ionospheric Data available on 35 mm microfilm from WDC-A, 1944 onward . . . . . $5.00 per year

   Also, a limited free distribution on a data exchange basis.

2. "Solar-Geophysical Data", monthly, purchased through SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C., 20402. Annual subscription price as below. Checks or money orders in U.S. currency made payable to the Superintendent of Documents should accompany the request including Catalog Order Number C52.18.

	Annual	Add for Foreign Mailing	Single copy
Part I and II	$30.50	$8.00	
Part I	$15.50	$4.00	$1.25
Part II	$15.50	$4.00	$1.25

   Back issues are available only at single issue price:

   February 1967 through September 1967 at 45 cents
   October 1967 through June 1969 at 75 cents

   Back issues of Solar-Geophysical Data available on 35 mm microfilm from WDC-A,
   1956 through 1966 . . . . . $ 5.00 per year
   1967 onward . . . . . $10.00 per year

   Also, a limited free distribution on a data exchange basis.

3. World Data Center A - Upper Atmosphere Geophysics Reports, UAG-series, irregular publication schedule, cover variety of subjects, purchased through SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C., 20402. Subscription price $9.00 annually for domestic mailing, $11.50 for foreign mailing. Single issue price varies.

   UAG-1 "IQSY Night Airglow Data" by L. L. Smith, F. E. Roach and J. M. McKennan of Aeronomy Laboratory, ESSA Research Laboratories, July 1968, single copy price $1.75 [Catalog No. C52.16/2:1]

   UAG-2 "A Reevaluation of Solar Flares, 1964-1966" by Helen W. Dodson and E. Ruth Hedeman of McMath-Hulbert Observatory, The University of Michigan, August 1968, single copy price 30 cents. [Catalog No. C52.16/2:2]

   UAG-3 "Observations of Jupiter's Sporadic Radio Emission in the Range 7.6-41 MHz, 6 July 1966 through 8 September 1968" by James W. Warwick and George A. Dulk, Department of Astro-Geophysics, University of Colorado, October 1968, single copy price 30 cents. [Catalog No. C52.16/2:3]

   UAG-4 "Abbreviated Calendar Record 1966-1967" by J. Virginia Lincoln, Hope I. Leighton and Dorothy K. Kropp of Aeronomy and Space Data Center, Space Disturbances Laboratory, ESSA Research Laboratories, January 1969, single copy price $1.25. [Catalog No. C52.16/2:4]

   UAG-5 "Data on Solar Event of May 23, 1967 and its Geophysical Effects" compiled by J. Virginia Lincoln, World Data Center A, Upper Atmosphere Geophysics, ESSA, February 1969, single copy price 65 cents. [Catalog No. C52.16/2:5]

   UAG-6 "International Geophysical Calendars 1957-1969" by A. H. Shapley and J. Virginia Lincoln, ESSA Research Laboratories, March 1969, single copy price 30 cents. [Catalog No. C52.16/2:6]

UAG-7 "Observations of the Solar Electron Corona: February 1964-January 1968" by Richard T. Hansen, High Altitude Observatory, Boulder, Colorado and Kamuela, Hawaii, October 1969, single copy price 15 cents. [Catalog No. C52.16/2:7]

UAG-8 "Data on Solar Geophysical Activity October 24-November 6, 1968", Parts 1 and 2, compiled by J. Virginia Lincoln, World Data Center A, Upper Atmosphere Geophysics, ESSA, March 1970, single copy price (includes Parts 1 and 2) $1.75. Part 1 [Catalog No. C52.16/2:8/1], Part 2 [Catalog No. C52.16/2:8/2]

UAG-9 "Data on Cosmic Ray Event of November 18, 1968 and Associated Phenomena" compiled by J. Virginia Lincoln, World Data Center A, Upper Atmosphere Geophysics, ESSA, April 1970, single copy price 55 cents. [Catalog No. C52.16/2:9]

UAG-10 "Atlas of Ionograms" edited by A. H. Shapley, ESSA Research Laboratories, May 1970, single copy price $1.50 [Catalog No. C52.16/2:10]

UAG-11 "Catalogue of Data on Solar-Terrestrial Physics", compiled by J. Virginia Lincoln and H. Patricia Smith, World Data Center A, Upper Atmosphere Geophysics, ESSA, June 1970, single copy price $1.50 [Catalog No. C52.16/2:11]

UAG-12 "Solar-Geophysical Activity Associated with the Major Geomagnetic Storm of March 8, 1970", Parts 1, 2 and 3, compiled by J. Virginia Lincoln and Dale B. Bucknam, World Data Center A, Upper Atmosphere Geophysics, NOAA, April 1971, single copy price (includes Parts 1-3) $3.00. Part 1 [Catalog No. C52.16/2:12/1], Part 2 [Catalog No. C52.16/2:12/2], Part 3 [Catalog No. C52.16/2:12/3]

UAG-13 "Data on the Solar Proton Event of November 2, 1969 through the Geomagnetic Storm of November 8-10, 1969", compiled by Dale B. Bucknam and J. Virginia Lincoln, World Data Center A, Upper Atmosphere Geophysics, NOAA, May 1971, single copy price 50 cents. [Catalog No. C52.16/2:13]

UAG-14 "An Experimental, Comprehensive Flare Index and Its Derivation for 'Major' Flares, 1955-1969", compiled by Helen W. Dodson and E. Ruth Hedeman, McMath-Hulbert Observatory, The University of Michigan, July 1971, single copy price cents. [Catalog No. C52.16/2:14]

4. "Preliminary Report and Forecast of Solar Geophysical Data", weekly, prepared by Space Environment Services Center of the Space Environment Laboratory of ERL-NOAA, available on request to WDC-A.

At Greenbelt

Facilities World Data Center A for Rockets and Satellites, Code 601, Goddard Space Flight Center, Greenbelt, Maryland, U.S.A. 20771, collects and exchanges the following types of information and data:

Reports of sounding rocket launches
Reports of satellite and space probe launchings
Detailed descriptive information on spacecraft experiments
Scientific reports on results of experiments which receive a limited distribution
Data supporting conclusions when not included in the published reports
Precise positional observations, orbital elements, and ephemerides which are of great scientific interest and value.

Original (raw) data or calibrated (reduced or analyzed) data are not normally deposited in the subcenters for rockets and satellites.

The WDC-A subcenter for rockets and satellites will attempt to acquire data from other sources to satisfy requests for scientific study. The subcenter endeavors to maintain contact with space science investigators and, in some cases, may obtain data on an individual request basis directly from an investigator. The subcenter can acquire data from other rocket and satellite subcenters and from U.S. National archives, e.g., the National Space Science Data Center. The subcenter also provides facilities for scientists who wish to participate in on-site study of data. Advance notice of such a visit enables the staff to provide better services to the user.

The World Data Center A for Rockets and Satellites, because of its location contiguous to the National Space Science Data Center, can effectively cooperate with this institution in obtaining reduced and analyzed data to satisfy scientific requests. For details of obtaining data see "Data Catalog Satellite and Rocket Experiments" of the National Space Science Data Center, NASA, Goddard Space Flight Center, Greenbelt, Md., U.S.A. 20771.

Method of Ordering

The World Data Center A for Rockets and Satellites periodically prepares and distributes catalogues and reports. The publications contain up-to-date listings of information on rockets and satellites and the data and/or reports received during the publication period. The publications are distributed to scientists, institutions, other WDC subcenters, and to the Committee on Space Research (COSPAR).

These catalogues are supplemented from time to time. They include:

1. Summaries of sounding rocket launches (including meteorological research and development launches)
2. Listings of scientists and institutions conducting sounding rocket experiments
3. Launch sites for sounding rockets
4. Listings of artificial earth satellites and space probes (including launch, experiments, and orbit information)
5. Bibliographical listings of reports and reprints (by author and subject).

Cost of Copying

Scientists may borrow materials from the subcenter whenever duplicate copies are available. Otherwise, duplicate copies are made for the requester at a cost not to exceed the cost of copying and transmittal.

At Boulder - Geomagnetism

Facilities

World Data Center A for Geomagnetism, NOAA, Boulder, Colorado U.S.A. 80302*, collects and exchanges the following types of geomagnetic and earth current data:

Normal magnetograms and mean hourly values
Rapid-run magnetograms
2.5 minute digitization of magnetograms
C and K indices
Q indices
Tables of Special Events
Mean annual values of magnetic elements
Reports of special projects
Tellurigrams and mean hourly values
Rapid-run tellurigrams.

* This WDC-A is scheduled to move from Rockville, Maryland to Boulder, Colorado in the fall of 1971.

The subcenter also provides facilities for scientists who wish to particpate in on-site study of data. Advance notice of such a visit enables the staff to provide better services to the user.

Method of Ordering

Scientific organizations and individual scientists may order documents from the WDC-A for Geomagnetism directly or through their national organization responsible for communication with the centers. Scientists may borrow materials from the subcenter whenever duplicate copies are available. Otherwise, duplicate copies are made for the requester at a cost not to exceed the cost of copying and transmittal.

Cost of Copying

Charges for reproduction of geomagnetic data are as follows:

Magnetograms	Normal	Rapid-run
Full-size photostat	$ 1.00 each 25.00 per month	$ 1.75 each 37.00 per month
Half-size photostat	0.25 each 6.00 per month	0.30 each 7.50 per element-month
Royfax copies (full-size)	0.60 each 15.00 per month	0.60 each 15.00 per element-month
Enlarged paper prints (prepared from microfilm)	0.60 each	0.60 each
Xerox copies	6.00 per month	6.00 per month
Microfilm	1.50 per month 8.00 per year	1.50 per month 8.00 per year

Hourly Values

Photostat, Xerox, or enlarged paper prints	0.30 per element-month

K-indices

Photostat, Xerox, or enlarged paper prints	0.30 per month

All prices subject to change. Remittances are payable in advance in U.S. dollars to National Oceanic and Atmospheric Administration.

Because of the various forms in which geomagnetic data are received (microfilm, publications, photostats, etc.) not all types of reproductions are available for each kind of record. For example, photostats and microfilm copies of selected records can only be furnished when the original or paper copies are available. Most of the data are on microfilm. The type of copy furnished would depend on the source material. For information concerning the types of reproduction available for specific data and cost of copying, user should write to the World Data Center A for Geomagnetism.

The magnetograms from most observatories contain the recordings for a 24-hour period. Since the records from different observatories may not show the same 24-hour period, the interval (UT) for which the copies of the recordings are required should be specified.

When requesting copies of rapid-run magnetograms from United States observatories, the element(s) required should be specified because there is a separate record for each element (D, H, Z) for each 24 hour period.

The 2.5 minute values for observatories listed in this catalogue were scaled from the magnetograms by means of a semi-automatic scaling machine and are stored on IBM-compatible magnetic tape. Hourly values computed from these 2.5 minute values are also available. The cost of copying these data will be furnished on request.

MASTER STATION LIST

All of the stations listed in the catalogue sections to follow are grouped into a master station list, alphabetically by station name. The scientific program or programs at the station (indicated by letter-number as in Table of Contents), geographic coordinates, geomagnetic coordinates, computed magnetic dip, L-shell value, and opening and closing dates are given. For stations with programs in cosmic rays, the cutoff rigidities and station altitudes are also presented.

For all stations the geographic coordinates were converted by an electronic computer program to give geomagnetic coordinates with the value ϕ = 78.5°N and λ = 291.0°E adopted for the geomagnetic north pole. Geomagnetic latitude is measured from this pole, and geomagnetic longitude from the geographic meridian extending from the geographic north pole through the geomagnetic north pole.

Another computer program computed the magnetic dip and L-value at 0 km altitude for each station based upon the Jensen and Cain field, epoch November 1966. The cosmic ray cutoff rigidities in Bv were calculated using the 6-degree quiescent magnetic field coefficients by Finch-Leaton for epoch 1955.0.

For each station an attempt is being made to prepare as complete a data information bank as possible. The facts now tabulated are source of data with addresses of both sponsoring institution and station itself, reporting times used, type of equipment operated, observing schedules, form of original records, method of scaling and data reduction, form of data submitted to WDC's, etc.

Special Notes:

For opening and closing dates:
- \- continuous operation.
- \--- intermittent operation.
- ( ) holdings in WDC-A begin or end with these dates, not necessarily dates of program operation.

Preferred name: a single geographic location may appear in the list in two or more places depending upon the name used by the different programs, though an attempt has been made to consolidate all such programs under one preferred name.

Equivalent name: other names used are given in a table which follows the master list.

"Lat" : minus sign represents south latitude.
"Long" : all longitudes are given as east longitudes.
"Altitude" : M = meters
SL = sea level

Note: Since the geographic coordinates have been taken from many different sources, stations are asked to check the entries carefully and to report any inaccuracies promptly to WDC-A, Upper Atmosphere Geophysics, NOAA, Boulder, Colorado, U.S.A., 80302.

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
ABASTUMANI	A8	41.75	42.83	36.67	120.29	60.0	1.54			(12/1957)-
	C1	41.75	42.83	36.67	120.29	60.0	1.54			(7/1957)-
	C3	41.75	42.83	36.67	120.29	60.0	1.54			(12/1957)-
	G	41.90	42.70	36.84	120.22	60.1	1.55			(7/1957)-
ABERDEEN	C5	45.50	261.50	55.14	322.85	74.2	3.23			1/1966---
ABERYSTWYTH	B7	52.42	355.93	55.91	80.22	68.4	2.58			1/1964 - 12/1965 -
	B10	52.42	355.93	55.91	80.22	68.4	2.58			1/1964 -
ABISKO	D1	68.40	18.90	66.04	115.08	77.1	5.73			1/1921 ---
	E1	68.40	18.90	66.04	115.08	77.1	5.73			(8/1958)-(4/1959)
ACCRA	B1	05.63	359.83	09.66	70.27	-10.2	1.00			8/1961 - 7/1963
	B8	05.63	359.82	09.66	70.27	-10.2	1.00			12/1962 -
	B14	05.60	359.83	09.63	70.28	-10.3	1.00			(7/1957)-(3/1958)
ADAK	B1	51.90	183.40	47.22	239.99	63.1	2.11			10/1945 - 12/1965
	B11	51.90	183.40	47.22	239.49	63.1	2.11			10/1960 -
	B13	51.90	183.35	47.21	239.95	63.1	2.11			2/1962 - 10/1962
	C6	51.90	183.50	47.24	240.08	63.1	2.11			(7/1957)-(12/1965)
	D1	51.87	183.35	47.18	239.96	63.0	2.10			9/1964 - 1/1966
ADDIS ABABA	B6	09.03	38.77	05.38	109.15	-00.4	0.96			(7/1966)-
	C6	09.03	38.77	05.38	109.15	-00.4	0.96			6/1960 --- 1/1961
	D1	09.03	38.77	05.38	109.15	-00.4	0.96			1/1958 -
	D2	09.03	38.77	05.38	109.15	-00.4	0.96			
ADELAIDE	B10	-34.60	138.40	-44.60	212.14	-66.6	2.00			(1/1968)-
	B13	-34.60	138.40	-44.60	212.14	-66.6	2.00			8/1957 -(12/1958)
AGINCOURT	D1	43.78	280.73	55.05	347.02	74.3	3.32			9/1898 - 3/1969
AHMEDABAD	A8	23.01	72.60	13.84	143.93	32.2	1.00			6/1967 -
	B1	23.00	72.60	13.83	143.92	32.2	1.00			2/1953 -
	B2	23.02	72.50	13.86	143.83	32.2	1.01			6/1968 -
	B6	23.00	72.60	13.83	143.92	32.2	1.00			(11/1964)-
	B7	23.00	72.60	13.83	143.92	32.2	1.00			(8/1957)-(12/1959)
	B8	23.00	72.60	13.83	143.92	32.2	1.00			7/1957 ---
	B10	23.00	72.60	13.83	143.92	32.2	1.00			(7/1957)-(12/1958)
	C4	23.01	72.60	13.84	143.93	32.2	1.00			6/1967-
	F1	23.01	72.60	13.84	143.93	32.2	1.00	15.94	SL	7/1957 - 6/1964
	F1	23.01	72.60	13.84	143.93	32.2	1.00	15.94	SL	9/1968 -
	F3	23.01	72.60	13.84	143.93	32.2	1.00	15.94	SL	7/1957 - 12/1962
AKITA	B1	39.70	140.10	29.47	205.45	53.6	1.34			12/1949 -
	B9	39.73	140.14	29.50	205.48	56.6	1.35			1/1964 -
AKLAVIK	E1	68.10	225.00	69.96	263.92	80.9	8.87			(12/1957)-(10/1958)
ALAMOGORDO	B8	32.26	318.40	42.28	31.73	56.2	1.68			11/1962 - 11/1964
ALBUQUERQUE	F1	35.03	253.30	43.73	316.11	63.3	1.89	4.47	1567M	9/1968 -
ALDAN	E1	58.70	125.40	47.48	191.02	74.7	2.63			(1/1958)---(5/1959)
ALERT	B1	82.60	297.40	85.77	168.77	85.8	311.26			8/1957 - 12/1958
	C9	82.60	297.40	85.77	168.77	85.8	311.26			8/1957 - 12/1958
	D1	82.50	297.50	85.86	168.18	85.8	308.21			10/1961 -
	E1	82.50	297.75	85.85	167.75	85.7	302.57			(11/1957)---(2/1959)
	F1	82.50	297.60	85.86	168.00	85.8	305.94	0.00	66M	10/1965 -
	F3	82.50	297.60	85.86	168.00	85.8	305.94	0.00	66M	10/1965 -
ALIBAG	D1	18.63	72.87	09.46	143.62	23.0	0.96			1/1904 -
ALIGARH	F1	27.90	78.07	18.10	149.64	41.0	1.07			7/1969 -
ALLAKAKET	E1	66.50	207.40	65.16	250.63	77.0	5.70			(9/1965)-(3/1966)
ALMA ATA	A7	43.20	76.90	33.40	150.69	62.9	1.53			(8/1957)- 8/1962
	B1	43.20	76.90	33.40	150.69	62.9	1.53			1/1945---
	B7	43.25	76.92	33.45	150.72	62.9	1.53			(7/1957)-
	B8	43.25	76.92	33.45	150.72	62.9	1.53			1/1964 -
	B10	43.25	76.92	33.45	150.72	62.9	1.53			(1/1964)-
	B14	43.50	76.92	33.69	150.76	63.2	1.55			(9/1958)-
	C1	43.20	76.90	33.40	150.69	62.9	1.53			10/1957 - 10/1962
	D1	43.25	76.92	33.45	150.72	62.9	1.53			1/1963 -
	D2	43.25	76.92	33.45	150.72	62.9	1.53			
	F1	43.20	76.90	33.40	150.69	62.9	1.53	6.69	806 M	7/1957 -
	F3	43.20	76.90	33.40	150.69	62.9	1.53	6.69	806 M	1/1962 -
ALMERIA	D1	36.85	357.53	40.63	75.29	52.5	1.40			1/1955 -
ALOUSHTA	D1	44.68	34.42	41.01	113.58	62.6	1.70			
ALSBJERG	B4	56.68	09.10	57.29	95.91	71.2	0.86			(10/1970)-
	B12	56.68	09.10	57.29	95.91	71.2	0.86			(1/1970)-
AMBERLEY	D1	-43.15	172.72	-47.65	252.52	-68.4	2.37			1/1929 -
AMDERMA	B8	69.76	61.68	60.98	147.26	80.3	5.45			1/1964 -
AMSTERDAM	F1	52.35	04.90	54.06	89.21	68.3	2.46	2.69	SL	6/1952 - 11/1962
	F2	52.35	04.90	54.06	89.21	68.3	2.46	2.69	SL	6/1952 - 11/1962
ANCHORAGE	B1	61.20	210.10	60.92	258.12	73.7	4.11			4/1949 - 12/1965
	B8	61.20	210.15	60.93	258.17	73.7	4.11			4/1962 -
	B12	61.17	210.08	60.88	258.13	73.7	4.10			4/1964 - 12/1967
	B13	61.17	210.08	60.88	258.13	73.7	4.10			11/1957 - 12/1958
	C6	61.17	210.08	60.88	258.13	73.7	4.10			(7/1957)-
	D1	61.23	210.13	60.95	258.13	73.8	4.11			7/1957 - 9/1958
	D2	61.10	210.45							
ANDENES	B5	69.10	16.00	67.17	113.67	77.3	6.15			
ANDOYA	B4	69.30	16.00	67.34	113.94	77.4	6.24			7/1964 -
	B5	69.30	16.00	67.34	113.94	77.4	6.24			
ANNAMALAINAGAR	D1	11.40	79.68	01.53	149.35	5.2	0.92			10/1957 -
ANNETTE IS	B12	55.25	228.39	59.03	280.43	73.8	3.70			1/1964 - 12/1967
ANN ARBOR	C4	42.24	276.27	53.27	341.65	73.2	3.03			10/1958---7/1961
ANTOFAGASTA	B2	-23.62	289.72	-12.12	358.80	-17.7	1.08			9/1962 - 7/1963
	B12	-23.62	289.72	-12.12	358.80	-17.7	1.08			12/1957 - 11/1958
APATITY	F1	67.55	33.30	62.80	125.28	77.2	5.04	0.65	182M	1/1962 - 8/1968
	F1	67.55	33.30	62.80	125.28	77.2	5.04	0.65	182M	10/1968 -
	F3	67.55	33.30	62.80	125.28	77.2	5.04	0.65	182M	4/1965 - 9/1967
APIA	D1	-13.80	188.22	-16.06	260.24	-29.4	1.05			1/1905 -
	D2	-13.80	188.22	-16.06	260.24	-29.4	1.05			7/1957 --- 12/1965
ARCETRI	A1	43.75	11.25	44.59	91.45	60.8	1.69			6/1872 ---
	A5	43.75	11.25	44.59	91.45	60.8	1.69			(7/1957)- 12/1959
	A6	43.75	11.25	44.59	91.45	60.8	1.69			1/1965 ---
	C1	43.75	11.25	44.59	91.45	60.8	1.69			6/1915 ---
	C3	43.75	11.25	44.59	91.45	60.8	1.69			(7/1957)--- 12/1964
	C6	43.75	11.25	44.59	91.45	60.8	1.69			(4/1964)---(5/1967)

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
ARCTICA II (NP-7	B1	86.40	296.60	82.08	177.45	86.5	114.90			7/1957 - 3/1959
	C9	59.40	296.60	82.08	177.45	86.5	114.90			7/1957 - 3/1959
	D1	85.82	268.13	DRIFT						7/1957 - 3/1959
	E1	86.40	296.60	82.08	177.45	86.5	114.90			7/1957 - 3/1959
ARCTICA I (NP-6)	B1	82.40	09.50	77.57	142.97	83.1	25.98			7/1957 - 9/1959
	C9	82.40	09.50	77.57	142.97	83.1	25.98			7/1957 - 9/1959
	D1	83.60	94.72	DRIFT						7/1957 - 3/1959
	E1	82.40	09.50	77.57	142.97	83.1	25.98			7/1957 - 9/1959
ARCTICA (NP-12)	D1	79.08	187.22	DRIFT						5/1963 - 4/1964
ARCTICA (NP-16)	B1	78.08	176.48	DRIFT						6/1968 -
ARCTICA (NP-8)	B1	80.00	165.00	DRIFT						6/1960 - 10/1961
	C9	80.00	165.00	DRIFT						6/1960 - 10/1961
	D1	77.32	188.30	DRIFT						5/1959 - 2/1962
ARCTICA(NP-10)	B1	78.00	165.00	DRIFT						12/1962 - 4/1964
	C9	78.00	165.00	DRIFT						
	D1	76.62	166.38	DRIFT						11/1961 - 5/1962
ARCTICA(NP-11)	B1	79.00	165.00	DRIFT						7/1962 - 10/1962
	C9	79.00	165.00	DRIFT						7/1962 - 10/1962
ARCTICA(NP-13)	B1	81.00	165.00	DRIFT						7/1964 - 9/1966
	C9	81.00	165.00	DRIFT						7/1964 - 12/1965
ARCTIC ICE FLO	D1	83.52	193.05	DRIFT						7/1957 --- 10/1958
	E1	80.00	195.00	DRIFT						(11/1957)-(3/1958)
ARECIBO	A14	18.50	293.17	29.99	02.38	51.2	1.43			
	B1	18.50	293.17	29.99	02.38	51.2	1.43			(6/1963)-
	B3	18.50	293.17	29.99	02.38	51.2	1.43			
	B6	18.50	293.17	29.99	02.38	51.2	1.43			
	B13	19.80	293.17	29.99	02.38	51.2	1.43			1/1965 - 12/1966
AREQUIPA	B12	-16.73	288.13	-05.24	357.24	-6.3	1.05			12/1957 - 11/1958
	D1	-16.47	288.52	-04.98	357.61	-5.8	1.05			1/1958 -
ARGENTINE IS	B1	-65.20	295.70	-53.73	03.33	-58.1	2.35			7/1957 -
	B13	-65.25	295.73	-53.78	03.35	-58.1	2.36			1/1957 - 12/1966
	D1	-65.25	295.73	-53.78	03.25	-58.1	2.36			1/1957 -
ARKHANGELSK	E1	64.60	40.50	58.94	128.39	76.3	4.08			(3/1958)---(5/1959)
ARLIS III	E1	75.00	210.00	DRIFT						(2/1964)-(3/1964)
AROSA	A2	46.78	09.68	47.81	91.16	63.7	1.93			
	A7	46.78	09.68	47.81	91.16	63.7	1.93			
	C1	46.78	09.68	47.81	91.16	63.7	1.93			
ASCENSION IS	B5	-07.98	345.58	-01.24	53.83	-30.4	1.09			
ASHKHABAD	B1	37.90	58.30	30.44	133.28	56.3	1.36			3/1957 -
	B7	37.93	58.37	30.46	133.35	56.3	1.36			(7/1957)-
	B10	37.93	58.37	30.46	133.35	56.3	1.36			1/1958 -
	B14	37.77	58.37	30.30	133.31	56.1	1.36			(3/1959)-(5/1962)
	D1	37.95	58.10	30.52	133.11	56.3	1.36			9/1958 -
	D2	39.95	58.10	30.52	133.11	56.3	1.36			
	D3	37.95	58.10	30.52	133.11	56.3	1.36			
	G	37.95	58.10	30.52	133.11	56.3	1.36			1/1964 - 2/1966
ASO	D1	32.88	131.02	22.00	198.06	46.3	1.16			7/1957 -
	D2	32.53	131.01							
	G	32.88	131.02	22.00	198.06	46.3	1.16			(8/1957)-
ATHEN2	A1	38.00	23.00	36.71	100.76	54.5	1.39			9/1967 -
	A2	38.00	23.00	36.71	100.76	54.5	1.39			10/1967 -
	B9	38.00	23.00	39.71	100.76	54.5	1.39			(11/1970)-
ATHENS	A1	37.99	23.75	36.56	101.47	54.5	1.39			(11/1968)-
	B1	38.00	23.60	36.60	101.33	54.5	1.39			12/1943 ---
	B8	38.00	23.60	36.60	101.33	54.5	1.39			10/1963 -
	B9	38.00	23.60	36.60	101.33	54.5	1.39			(11/1970)-
	C1	37.97	23.72	36.54	101.44	54.5	1.39			(7/1957)---
	C6	38.00	23.81	36.56	101.53	54.6	1.39			(1/1968)---
	D1	38.05	23.87	36.59	101.61	54.6	1.32			1/1959 -
	F1	38.00	24.70	36.38	102.38	54.6	1.39	8.72	110M	11/1969
ATTU	C6	52.83	186.83	48.71	242.59	64.1	2.22			
AUCKLAND	B1	-37.00	175.00	-41.26	252.74	-62.8	1.84			1/1967 -
	B11	-37.00	175.00	-41.26	252.74	-62.8	1.84			(12/1969)-
	D2	-36.51	174.45							
BAGNEUX	B14	48.80	02.30	51.21	84.79	65.5	2.16			3/1957 -
BAGUIO	A1	16.40	120.60	05.05	189.24	18.1	0.91			(7/1957)---
	A2	16.40	120.60	05.05	189.24	18.1	0.91			(7/1957)---
	B1	16.40	120.60	05.05	189.24	18.1	0.91			3/1952 - 1/1964
	D1	16.42	120.60	05.07	189.24	18.2	0.95			1/1964 -
	D2	16.42	120.60	05.07	189.24	18.2	0.95			
BAIE ST PAUL	B1	47.38	289.45	58.87	357.97	75.8	3.99			11/1961 - 2/1962
	B8	47.38	289.45	58.87	357.97	75.8	3.99			2/1963 - 11/1965
	D2	47.38	289.45	58.85	357.97	75.8	3.99			
	D3	47.38	289.45	58.85	357.97	75.8	3.99			
BAKER LAKE	B1	64.30	264.00	73.74	315.31	86.0	14.79			3/1951 - 2/1959
	B7	64.30	264.00	73.74	315.31	86.0	14.79			(7/1957)- 3/1959
	B11	64.30	264.00	73.74	315.31	86.0	14.79			7/1960 -
	C9	64.30	264.00	73.74	315.31	86.0	14.79			3/1951 - 2/1959
	D1	64.33	263.97	73.77	315.23	86.0	14.84			1/1951 -
	D2	64.33	263.97	73.77	315.23	86.0	14.84			
	E1	64.30	264.00	73.74	315.31	86.0	14.79			(8/1957)---(5/1959)
BAKOU	A6	40.80	48.60	34.78	125.24	59.2	1.49			(7/1964)---(2/1967)
	C1	40.80	48.60	34.78	125.24	59.2	1.49			(3/1958)---(2/1967)
BANGKOK	A2	13.70	100.60	02.38	169.89	10.4	0.91			5/1968 -
	B1	13.70	100.60	02.38	169.89	10.4	0.91			8/1963 -
	B6	13.70	100.60	02.38	169.89	10.4	0.91			(7/1966)-
	B14	13.55	100.90	02.22	170.18	10.1	0.92			3/1966 - 2/1968
BANGUI	B1	04.60	18.60	04.99	88.57	-14.7	0.99			2/1958 --- 9/1966
	B14	04.36	18.58	04.75	88.50	-15.2	0.99			5/1958 -
	D1	04.43	18.57	04.83	88.50	-15.1	0.98			1/1952 -
	D2	04.43	18.57	04.83	88.50	-15.1	0.98			
BARBADOS	B1	13.12	300.40	24.46	10.06	43.1	1.30			1/1957 - 6/1957
	B10	13.12	300.40	24.46	10.06	43.1	1.30			6-1964 - 11/1965
	C6	13.12	300.40	24.46	10.06	43.1	1.30			(1/1960)---

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
BARCELONA	A2	41.40	02.02	44.16	81.40	58.1	1.60			(7/1957)-(12/1957)
BARENTSBURG	D1	78.63	16.38	74.55	132.47	81.4	15.08			
BARROW	B1	71.30	203.20	68.54	241.11	79.9	8.02			12/1949 - 11/1965
	B5	71.30	203.20	68.54	241.11	79.9	8.02			
	B8	71.52	203.67	68.80	241.12	80.1	8.25			4/1958 - 12/1958
	B12	71.52	203.67	68.80	241.12	80.1	8.25			4/1964 - 12/1967
	C8	71.52	203.67	68.80	241.12	80.1	8.25			(4/1958)-(12/1958)
	C9	71.30	203.20	68.54	241.11	79.9	8.02			12/1949 - 11/1965
	D1	71.30	203.25	68.54	241.15	79.9	8.03			1/1949-
	D2	71.30	203.25	68.54	241.15	79.9	8.03			7/1957-
	E1	71.60	203.60	68.86	240.95	80.2	8.30			(10/1957)---(11/1966)
	E4	71.60	203.60	68.86	240.95	80.2	8.30			(1/1957)-(12/1959)
BAR I	B8	69.60	219.80	70.20	256.90	80.9	9.16			1/1967 -
	C8	69.60	219.80	70.20	256.90	80.9	9.16			1/1967
	D2	69.90	219.80	70.20	569.90	80.9	9.16			
	E1	69.60	219.80	70.20	256.90	80.9	9.16			(11/1964)---(3/1966)
BARTER ISLAND	D1	70.13	216.33	69.97	253.12	80.7	8.99			7/1957 - 12/1958
BATTLE CREEK	B13	42.30	274.80	53.24	339.83	73.2	3.01			7/1957 - 12/1958
BAUDOUIN	B1	-70.40	23.30	-67.79	62.48	-64.4	5.20			4/1958 --- 12/1960
	B8	-70.40	23.30	-67.79	62.48	-64.4	5.20			2/1965 -
	C9	-70.40	23.30	-67.79	62.48	-64.4	5.20			4/1958 --- 12-1960
	D1	-70.43	24.30	-68.00	63.19	-64.5	5.27			7/1957 --- 12/1966
	D2	-70.43	24.30	-68.00	63.19	-64.5	5.27			
	E1	-70.40	23.30	-67.79	62.48	-64.4	5.20			(5/1958)---(4/1960)
BEARLEY	C6	52.00	358.00	55.10	82.10	68.1	2.50			1/1967 ---
BEAR ISLAND	D1	74.50	19.20	71.08	124.55	79.6	9.54			1/1951 -
BEDFORD	B8	42.48	288.72	53.97	357.13	72.8	3.10			3/1963 -
BEIRUT	A1	33.88	35.50	30.32	111.39	49.7	1.25			(7/1957)---
	A2	33.88	35.50	30.32	111.39	49.7	1.25			(7/1957)---
BELFAST	F1	54.58	354.07	58.31	79.61	70.0	2.90	1.92		3/1966 -
	F3	54.58	354.07	58.31	79.61	70.0	2.90	1.92		3/1966 -
BELGRANO	B1	-77.90	321.40	-67.24	15.91	-65.9	4.57			7/1958 -
	B8	-77.97	321.20	-67.29	15.76	-65.9	4.58			4/1964 -
	E1	-77.97	321.20	-67.29	15.76	-65.9	4.58			(3/1958)---(10/1964)
	E2	-77.97	321.20	-67.29	15.76	-65.9	4.58			(1/1964)---(12/1965)
BELOIT	D1	39.48	261.87	49.24	324.87	69.2	2.27			7/1957 - 1/1959
BELSK	D1	51.83	20.80	50.43	104.05	68.2	2.27			1/1960 -
	F3	51.83	20.78	50.43	104.03	68.2	2.27		180M	1/1966 -
BENNINGTON	C6	42.80	286.80	54.26	354.72	73.3	3.16			4/1963 --- 4/1966
BEOGRAD	A1	44.80	20.51	43.76	100.74	62.1	1.74			8/1957 - 1/1960
	B1	44.80	20.50	43.77	100.73	62.1	0.87			3/1958 -
BERGEN	F1	60.40	05.30	61.48	95.09	73.3	3.69	1.13	SL	4/1958 -
	F3	60.40	05.30	61.48	95.09	73.3	3.69	1.13	SL	12/1956 -
BERKELEY	F1	37.86	237.70	44.07	298.24	62.8	1.88	4.54	70M	(7/1957)- 8/1959
	F3	37.86	237.70	44.07	298.24	62.8	1.88	4.54	70M	(7/1957)- 8/1959
BERLIN-ADLERSHOF	A8	52.43	13.53	52.42	97.57	68.5	2.39			(7/1957)-
	C3	52.43	13.53	52.42	97.57	68.5	2.39			(7/1957)-
BERMUDA	B13	32.37	295.33	43.83	05.07	64.3	2.04			(7/1957)-(2/1963)
BERVERLY HILLS	C6	34.15	241.42	41.08	303.30	60.0	1.70			4/1962 --- 2/1964
BETTLES	E1	66.90	208.40	65.70	251.01	77.4	5.96			(10/1957)---(4/1965)
BIALKOW	G	51.47	16.67	50.89	100.03	67.8	2.27			(9/1958)-(11/1959)
BIG DELTA	D1	64.00	214.27	64.26	259.30	76.4	5.24			7/1957 - 1/1959
	D2	64.00	214.27	64.26	259.30	76.4	5.24			7/1957 - 1/1959
BIG PINE	C4	37.50	241.90	44.44	302.88	63.3	1.91			11/1960 - 10/1961
BILLERICA	B1	42.60	288.70	54.09	357.11	72.9	3.12			11/1965 - 9/1970
BILL	B14	43.20	254.80	52.01	315.62	71.1	2.69			7/1957 - 8/1965
BIRD	E1	56.50	265.80	66.45	323.97	82.2	7.04			(7/1957)-(1/1959)
BJURAKAN	A8	40.35	44.28	35.06	121.22	58.5	1.48			(6/1958)---(7/1960)
	C3	40.35	44.28	35.06	121.22	58.5	1.48			(6/1958)---(7/1960)
BLAUVELT	C6	41.07	286.03	52.52	353.84	72.1	2.91			2/1960 --- (2/1966)
BLOSSOM POINT	B2	38.42	282.90	49.78	350.16	70.3	2.59			9/1962 - 9/1966
BOGOTA	B1	04.50	285.80	15.95	354.61	23.8	0.90			8/1945 - 6/1967
BOLOGNA	A8	44.50	11.30	45.30	91.79	61.6	1.74			(1/1964)---
	C3	44.50	11.30	45.30	91.79	61.6	1.74			(1/1964)---
	F3	44.50	11.30	45.30	91.79	61.6	1.74	5.22	50M	7/1957 -
BOMBAY	B1	19.00	72.80	09.84	143.60	23.8	0.90			8/1945 -
BONN	A8	50.74	07.10	52.10	90.50	67.1	2.28			(1/1967)-(9/1967)
	C3	50.74	07.10	52.10	90.50	67.1	2.28			(1/1967)-(9/1967)
	C6	50.57	06.70							5/1967 -
BORDEAUX	A8	44.85	359.70	47.94	80.40	61.8	1.83			(11/1968)-
	C3	44.85	359.70	47.94	80.40	61.8	1.83			(11/1968)-
BOROK	D1	58.03	38.97	53.01	123.17	72.8	2.87			
	D2	58.03	38.97	53.01	123.17	72.8	2.87			8/1957 -
BOULDER	A1	40.00	254.70	48.85	316.44	68.3	2.32			9/1951 -
	A4	40.00	254.70	48.85	316.44	68.3	2.32			10/1967 -
	A6	40.00	254.70	48.85	316.44	68.3	2.32			10/1967 -
	A8	40.10	254.90	48.97	316.64	68.4	2.34			(7/1957)-(9/1960)
	A15	40.03	254.70	48.88	316.43	68.3	2.32			(1/1960)---
	B1	40.00	254.70	48.85	316.44	68.3	2.32			7/1958 ---
	B2	40.60	254.87	49.46	316.47	68.9	2.39			10/1964 -
	B4	40.60	254.70	48.85	316.44	68.3	2.32			3/1968 - 2/1970
	B12	40.03	254.70	48.88	316.43	68.3	2.33			10/1957 - 12/1958
	B13	40.03	254.70	48.88	316.43	68.3	2.33			7/1957 - 12/1959
	B14	40.10	254.90	48.97	316.64	68.4	2.34			6/1957 -
	C1	40.00	254.70	48.85	316.44	68.3	2.32			10/1967 -
	C3	40.03	254.70	48.88	316.43	68.3	2.33			(7/1957)-
	C4	40.03	254.70	48.88	316.43	68.3	2.33			7/1959 -
	C5	40.03	254.70	48.88	316.43	68.3	2.33			12/1965 ---
	C6	40.03	254.70	48.88	316.43	68.3	2.33			(7/1957)-
	D1	40.13	254.77	48.99	316.48	68.4	2.34			1/1961 -
	D2	40.13	254.77	48.99	316.48	68.4	2.34			5/1964 -
BRAZZAVILLE	B2	-04.20	344.73	02.63	53.60	-23.2	1.06			6/1966 -

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
BRENTWOOD	C6	51.63	00.30	54.29	84.23	67.8	2.43			3/1966 ---
BREST	B14	48.45	355.58	52.20	77.78	65.3	2.19			3/1957
BRETIGNY	B2	48.60	357.52	51.96	79.84	65.3	2.19			6/1966 -
BRISBANE	B1	-27.50	152.90	-35.74	226.87	-57.4	1.51			6/1943 -
	B7	-27.50	153.00	-35.73	226.98	-57.4	1.51			(7/1957)-(12/1958)
	B10	-27.00	153.00	-35.23	226.88	-56.9	1.49			7/1957 - 12/1958
	B13	-27.30	153.00	-35.53	226.94	-57.2	1.50			7/1957 - 12/1959
	D2	-27.25	152.50							
	F1	-27.53	152.92	-35.77	226.90	-57.5	1.51			12/1960 -
BUCHAREST	A6	44.41	26.10	42.31	105.83	61.9	0.86			7/1958 -
	C1	44.41	26.10	42.31	105.83	61.9	0.86			7/1958 -
BUDAPEST	B1	47.40	19.20	46.52	100.54	64.5	1.95			1/1956 ---
	F3	47.50	18.90	46.67	100.30	64.6	1.96	4.44	410M	4/1966 -
BUDKOV	D1	49.07	14.02	49.13	96.37	65.8	2.10			
	D2	49.07	14.02	49.13	96.37	65.8	2.10			
BUENOS AIRES	A1	-34.55	301.30	-23.21	09.22	-32.2	1.07			(1/1964)-
	A2	-34.55	301.30	-23.21	09.22	-32.2	1.07			(1/1964)-
	A8	-34.55	301.30	-23.21	09.22	-32.2	1.07			1/1967 -
	B1	-34.50	301.50	-23.17	09.40	-32.2	1.20			2/1950 -
	C1	-34.55	301.30	-23.21	09.22	-32.2	1.07			5/1967 -
	C3	-34.55	301.30	-23.21	09.22	32.2	1.07			1/1967 -
	F1	-34.58	301.50	-23.25	09.40	-32.3	1.20	10.63	SL	7/1957 - 12/1966
	F1	-34.58	301.50	-23.25	09.40	-32.3	1.20	10.63	SL	1/1967 -
	F3	-34.58	301.50	-23.25	09.40	-32.3	1.20	10.63	SL	11/1957 - 12/1961
BUNIA	B1	01.50	30.20	-00.36	99.31	-20.6	1.00			10/1957 - 11/1960
	D1	01.53	30.18	-00.32	99.30	-20.5	0.99			1/1959 ---
BURLINGTON	D1	39.28	257.73	48.54	320.11	68.2	2.31			7/1957 - 1/1959
BYRD STATION	B1	-80.00	240.00	-70.60	336.02	-73.9	7.09			7/1957 -
	B2	-80.00	240.50	-70.56	336.25	-73.8	7.05			8/1962 -
	B8	-80.02	240.47	-70.58	336.27	-73.8	7.06			12/1962
	B11	-80.00	240.00	-70.60	336.02	-73.9	7.09			10/1961
	B13	-79.98	239.98	-70.59	335.99	-73.9	7.08			(5/1959)-(12/1961)
	B14	-80.00	240.00	-70.60	336.02	-73.9	7.09			3/1958 - 10/1964
	C8	-80.02	240.47	-70.58	336.27	-73.8	7.06			12/1962-
	C9	-80.00	240.00	-70.60	336.02	-73.9	7.09			7/1957-
	D1	-80.00	240.00	-70.60	336.02	-73.8	7.09			7/1957 -
	D2	-80.00	240.00	-70.60	336.02	-73.8	7.09			1/1958 -
	E1	-80.02	240.47	-70.58	336.27	-73.8	7.06			(6/1957)-
	G	-80.02	240.47	-70.58	336.07	-73.8	7.06			(1/1968)-
CALCUTTA	A15	23.00	88.60	12.31	158.96	31.1	0.98			(3/1969)-
	B1	23.00	88.60	12.31	158.96	31.1	0.98			5/1936 -
	B6	23.00	88.60	12.31	158.96	31.1	0.98			
CALGARY	D2	51.08	245.90	58.30	302.13	75.3	3.70			
	F1	51.08	245.90	58.30	302.13	75.3	3.70	1.09	1128M	1/1964 -
CAMBRIDGE	A8	52.17	00.03	54.89	84.35	68.2	2.50			7/1957 - 12/1958
	B6	52.20	00.10	54.87	84.34	68.2	2.50			
	B10	52.20	00.10	54.87	84.34	68.2	2.50			7/1957 - 12/1959
	B13	52.22	00.10	54.89	84.35	68.2	2.50			(7/1957)-(10/1957)
	C3	52.17	00.03	54.89	84.35	68.2	2.50			7/1957 - 12/1958
	C7	52.17	00.03	54.89	84.35	68.2	2.50			(1/1970)-(12/1970)
CAMBRIDGE TUNNEL	F3	-42.85	147.40	-51.64	224.50	-72.7	2.83	1.89	110M	9/1957 -
CAMDEN	B12	-34.00	150.40	-42.51	225.55	-64.5	1.88			9/1957 - 12/1958
	D2	-32.75	151.50							
	E1	-34.10	150.70	-42.56	225.90	-64.5	1.88			(9/1957)-(2/1958)
	G	34.07	150.63	-42.54	225.82	-64.5	1.88			7/1957 - 12/1958
CAMPBELL IS	B1	-52.50	169.20	-57.29	253.20	-75.8	4.01			4/1945 -
	B8	-52.50	169.20	-57.29	253.20	-75.8	4.01			(3/1968)-
	B11	-52.60	169.20	-57.29	253.20	-75.8	4.01			2/1970 -
	B13	-52.60	169.20	-57.29	253.20	-75.8	4.01			(1/1968)---
	C6	-52.50	169.20	-57.29	253.20	-75.8	4.01			(12/1968)-
	E1	-52.60	169.20	-57.38	253.26	-75.8	4.03			(10/1957)-(10/1958)
CANARY ISLANDS	A6	28.00	344.70	34.35	59.53	12.9	0.95			5/1967 -
	A8	28.00	344.70	34.35	59.53	12.9	0.95			4/1967-
	B2	28.00	344.70	34.35	59.53	12.9	0.95			
	C1	28.00	344.70	34.35	59.53	12.9	0.95			4/1967 -
	C3	28.00	344.70	34.35	59.53	12.9	0.95			4/1967 -
	G	28.30	344.70	34.35	59.53	12.9	0.95			(1/1970)-
CANBERRA	B1	-35.30	149.00	-43.99	224.29	-65.9	1.99			3/1937 ---
	C6	-35.20	149.10	-43.87	224.38	-65.8	1.98			3/1964 ---
CAPE CHELYUSKIN	D1	77.72	104.28	66.26	176.46	86.5	9.56			1/1935 ---
	D2	77.72	104.28	66.26	176.46	86.5	9.56			
	E1	77.80	104.30	66.34	176.48	86.5	9.63			(12/1957)---(3/1964)
CAPE HALLETT	B1	-72.30	170.20	-74.70	278.15	-84.1	21.23			1/1957 - 2/1964
	B8	-72.30	170.30	-74.68	278.23	-84.1	21.15			(3/1960)- 11/1963
	C8	-72.30	170.30	-74.68	278.23	-84.1	21.15			(3/1960)-(11/1960)
	C9	-72.30	170.20	-74.70	278.15	-84.1	21.23			7/1957 - 2/1964
	D1	-72.32	170.22	-74.71	278.21	-84.1	21.25			7/1957 - 12/1963
	E1	-72.30	170.20	-74.70	278.15	-84.1	21.23			(6/1957)---(10/1958)
	E3	-72.30	170.20	-74.70	278.15	-84.1	21.23			(6/1957)--- 12/1964
	F1	-72.32	170.20	-74.72	278.19	-84.1	21.27	0.04		1/1962 -
CAPE JONES	B8	54.70	280.20	65.26	345.87	80.5	6.29			7/1959 - 6/1965
	C8	54.70	280.20	65.26	345.87	80.5	6.29			7/1959 - 6/1965
CAPE KARIKARI	B5	-34.00	173.50	-38.63	250.28	-60.3	1.68			
CAPE KENNEDY	B1	28.40	279.40	39.63	346.72	61.4	1.77			3/1958 - 6/1966
	B5	28.40	279.40	39.63	346.72	61.4	1.77			
CAPE PARRY	B5	70.17	235.28	73.72	269.94	83.8	14.06			
CAPE RACE	C6	46.67	306.83	57.61	20.45	71.6	3.29			(2/1969)-
CAPE SCHMIDT	B1	68.90	179.50	62.61	226.73	76.8	5.12			1/1960 - 6/1962
	E1	69.00	180.50	62.85	227.36	76.9	5.19			(11/1957)---(4/1964)
	F1	68.87	180.50	62.73	227.48	76.8	5.15	0.60	SL	5/1967 - 5/1969
	F2	68.87	180.50	62.73	227.48	76.8	5.15	0.60	SL	(11/1958)--- 5/1969
CAPE SHALAUROV	E1	73.20	143.30	62.80	199.75	82.3	6.37			(2/1958)---(4/1959)

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
CAPE WELLEN	D1	66.17	190.17	61.79	237.10	74.9	4.57			1/1933 -
	D2	66.17	190.17	61.79	237.10	74.9	4.57			
	E1	66.20	190.10	61.81	237.01	75.0	4.58			(2/1958)---(4/1959)
CAPE ZEVGARI	B1	34.60	33.00	31.49	109.23	50.5	1.27			1/1964 -
CAPE ZHELANIA	E1	77.00	68.60	67.17	156.98	83.5	9.53			(11/1957)---(3/1958)
CAPETOWN	A6	-33.93	18.40	-32.65	79.86	-65.7	1.01			3/1958 -(12/1965)
	B1	-34.10	18.30	-32.79	79.72	-65.8	1.83			1/1948 - 5/1971
	C1	-33.93	18.40	-32.65	79.86	-65.7	1.01			3/1958 -
	F3	-33.93	18.40	-32.65	79.86	-65.7	1.01	4.96	103M	(10/1957)- 11/1958
CAPRI F	A6	40.55	14.22	40.92	93.16	57.3	1.51			(7/1957)--- 5/1965
	C1	40.55	14.22	40.92	93.16	57.3	1.51			(7/1957)--- 4/1965
	D1	40.55	14.22	40.92	93.16	57.3	1.51			(7/1957)-
CAPRI S	A4	40.55	14.22	40.92	93.16	57.3	1.51			
	A6	40.55	14.22	40.92	93.16	57.3	1.51			(7/1957)-
	C1	40.55	14.22	40.92	93.16	57.3	1.51			(7/1957)-
CAP TOBIN	D1	70.42	338.03	75.65	81.65	78.7	10.85			10/1957 - 8/1959
	E1	70.48	338.04	75.70	81.80	78.7	10.91			
CARNARVON	A6	-25.00	114.00	-36.48	183.38	-59.5	1.47			4/1967 -
	A8	-25.00	114.00	-36.48	183.38	-59.5	1.47			6/1966 -
	B5	-25.00	114.00	-36.48	183.38	-59.5	1.47			
	B8	-25.00	114.00	-36.48	183.38	-59.5	1.47			(8/1966)-
	C1	-25.00	114.00	-36.48	183.38	-59.5	1.47			6/1966 -
		-25.00	114.00	-36.48	183.38	-59.5	1.47			6/1966 -
CARROLLTON		39.37	266.53	45.71	89.45	69.8	2.49			7/1957 - 1/1959
CARTUJA		37.18	356.40	41.17	74.23	53.0	1.42			(7/1957)-(12/1957)
		37.18	356.40	41.17	74.23	53.0	1.42			9/1969 -
CASABLANCA	B1	33.60	352.40	38.45	69.02	48.3	1.31			9/1951 - 2/1958
CASEY	B1	66.17	110.32	-77.67	178.71	-81.7	37.88			2/1969 -
	B8	66.17	110.32	-77.67	178.71	-81.7	37.88			3/1969 -
	C7	-66.17	110.32	-77.67	178.71	-81.7	37.88			
	D2	-66.17	110.32	-77.67	178.71	-81.7	37.88			(1/1968)---
	E1	-66.20	110.35	-77.70	178.77	-81.7	37.08			4/1969 ---
	F1	-66.20	110.35	-77.70	178.77	-81.7	37.08		SL	4/1969 -
	F3	-66.20	110.35	-77.70	178.77	-81.7	37.08		SL	4/1969 -
CASPER	D1	42.85	253.70	51.51	314.45	70.6	2.62			7/1957 - 1/1959
CASSINO	B5	-32.20	307.83	-21.14	15.23	-31.3	1.19			
CASTELLACCIO	D1	44.43	08.93	45.71	89.45	61.4	1.75			1/1933 -
CATANIA	A1	37.50	15.08	37.80	92.99	53.5	1.38			(7/1957)---
	A2	37.50	15.08	37.80	92.99	53.5	1.38			(7/1957)---
	A5	37.50	15.08	37.80	92.99	53.5	1.38			(9/1968)---
	A6	37.50	15.08	37.80	92.99	53.5	1.38			(7/1957)---
	C1	37.50	15.08	37.80	92.99	53.5	1.38			(1/1964)-
CEBU	D1	10.30	123.90	-00.92	192.69	5.1	0.93			7/1961 - 12/1961
	D2	10.30	123.90	-00.92	192.69	5.1	0.93			
CEDAR RAPIDS	B12	41.87	269.68	52.43	334.02	72.4	2.87			1/1951 - 6/1958
CHACALTAYA	F1	-16.31	291.80	-04.81	00.77	-4.8	1.06	13.10	5220M	7/1963 --- 8/1969
	F1	-16.31	291.80	-04.81	00.77	-4.8	1.06	13.10	5220M	10/1966 -
	F3	-16.31	291.80	-04.81	00.77	-4.8	1.06	13.10	5220M	(5/1957)---
CHA-PA	D1	22.35	103.83	10.93	173.25	29.8	0.98			7/1957 -
CHAMBON-LA-FORET	D1	48.02	02.27	50.47	84.39	64.8	2.11			1/1936 -
	D2	48.02	02.16							(7/1957)-(12/1959)
CHAMICAL	B5	-30.33	293.69	-18.84	02.45	-26.9	1.14			
CHARCOT	D1	-69.38	139.02	-78.27	234.49	-87.6	77.13			7/1957 - 12/1958
CHELTENHAM	F2	38.70	283.20	50.07	350.50	70.6	2.62		72M	3/1936 - 10/1956
CHETIREKHSTOLB	E1	70.70	162.40	62.10	213.50	78.7	5.41			(3/1958)---(12/1959)
CHICAGO	F1	41.83	272.30	52.58	336.85	72.6	2.91	1.72	SL	3/1951 -
CHICLAYO	B1	-06.80	280.20	04.50	349.24	5.6	1.04			7/1957 - 5/1959
	D1	-06.80	280.20	04.50	349.24	9.3	1.04			8/1957 - 2/1960
CHIMBOTE	B1	-09.10	281.40	02.24	350.51	5.6	1.04			7/1957 - 5/1959
	D1	-09.10	281.40	02.24	350.51	5.6	1.04			10/1957 - 1/1960
CHINA LAKE	C6	35.50	342.20	42.12	58.81	52.2	1.46			(8/1958)---(2/1962)
CHITA	B1	52.00	113.50	40.51	182.02	70.9	2.00			1/1946 ---
CHOTEAU	E1	47.80	247.80	55.44	305.84	73.3	3.16			(7/1957)---
CHRISTCHURCH	B1	-43.60	172.80	-48.07	252.78	-68.7	2.42			12/1953 -
	C6	-43.60	172.80	-48.07	252.78	-68.7	2.42			(2/1962)- 5/1968
	D2	-44.99	170.97							1/1902 - 12/1930
	F2	-43.55	172.60	-48.06	252.55	-68.7	2.42	2.71	SL	1/1947 ---
	F3	-43.55	172.60	-48.06	252.55	-68.7	2.42	2.71	SL	(10/1957)-(3/1959)
CHURCHILL	B1	58.80	265.80	68.69	322.63	83.4	8.59			8/1943 -
	B5	58.80	265.80	68.69	322.63	83.4	8.60			
	B7	58.80	265.90	68.70	322.77	83.4	8.60			(7/1957)-(6/1960)
	B8	58.02	266.00	67.96	323.39	83.0	8.03			6/1957 -
	C8	58.02	266.00	67.96	323.39	83.0	8.03			6/1957 -
	C9	58.80	265.80	68.69	322.63	83.4	8.59			8/1943 -
	D1	58.80	265.90	68.70	322.77	83.4	8.60			7/1957 -
	E1	58.80	265.90	68.70	322.77	83.4	8.60			(7/1957)-(12/1959)
	E4	58.80	265.90	68.70	322.77	83.4	8.60			(1/1968)-
	F1	58.75	265.90	68.66	322.80	83.4	8.56	0.21	39M	5/1957 - 12/1964
	F1	58.75	265.90	68.66	322.80	83.4	8.56	0.21	39M	4/1964 -
	F3	58.75	265.90	68.66	322.80	83.4	8.56	0.21	39M	5/1957 - 12/1964
CLARK LAKE	C4	33.20	243.60	40.50	305.60	59.4	1.67			
CLIMAX	A3	39.37	253.82	48.10	315.58	67.5	2.25			
	A6	39.37	253.82	48.10	315.58	67.5	2.25			1/1942 ---
	A7	39.37	253.82	48.10	315.58	67.5	2.25			1/1941 ---
	A7	39.37	253.82	48.10	315.58	67.5	2.25			1/1958 - 7/1963
	C1	39.37	253.82	48.10	315.58	67.5	2.25			7/1957 -
	C2	39.37	253.82	48.10	315.58	67.5	2.25			
	F1	39.37	253.80	48.10	315.58	67.5	2.25	3.03	3400M	9/1951 -
CLONCURRY	B14	-20.70	140.50	-30.58	212.35	-50.6	1.28			11/1957 - 6/1960
CLORINDA	B12	-25.33	302.10	-14.03	10.33	-20.6	1.11			3/1958 - 11/1958
CLYDE	B1	70.50	291.40	82.00	00.96	84.4	38.32			10/1957 - 10/1958
	C9	70.50	291.40	82.00	00.96	84.4	38.32			10/1957 - 10/1958

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
COCOS IS	B1	-12.20	96.80	-23.33	164.86	-45.2	1.10			12/1961 -
COIMBRA	D1	40.22	351.58	45.03	70.25	57.0	1.60			7/1866 -
COLD BAY	B6	55.20	197.25	52.87	250.62	67.3	2.63			12/1968 -
COLD LAKE	B8	54.50	249.70	62.22	304.68	78.4	4.84			12/1963 - 5/1964
COLLEGE	B1	64.90	212.20	64.66	256.51	76.6	5.42			7/1941 ---
	B2	64.87	212.20	64.60	256.39	76.6	5.39			9/1962 - 10/1966
	B8	64.86	212.15	64.62	256.51	76.6	5.40			2/1956 -
	B10	64.86	212.15	64.62	256.51	76.6	5.40			(11/1968)-
	B12	64.85	212.17	64.61	256.54	76.6	5.40			(11/1957)-(3/1958)
	B12	64.85	212.17	64.61	256.54	76.6	5.40			1/1964-12/1967
	B13	64.85	212.17	64.61	256.54	76.6	5.40			1/1956 -(6/1960)
	C8	64.86	212.15	64.62	256.51	76.6	5.40			2/1956 -
	C9	64.90	212.20	64.66	256.51	76.6	5.42			7/1941 -
	D1	64.87	212.17	64.63	256.52	76.6	0.82			7/1941 -
	D2	64.87	212.17	64.63	256.52	76.6	0.82			7/1957 -
	E1	64.86	212.15	64.62	256.51	76.6	5.40			(9/1957) ---
	E4	64.86	212.15	64.62	256.51	76.6	5.40			(9/1957)---
	F1	64.85	212.10	64.60	256.48	76.6	5.39	0.54	91M	7/1957 --- 3/1968
	F4	64.85	212.10	64.60	256.48	76.6	5.39	0.54	91M	
	F5	64.85	212.10	64.60	256.48	76.6	5.39	0.54	91M	
COLLM	B9	51.32	13.00	51.47	96.49	67.6	2.28			2/1962 -
	B10	51.31	13.00	51.46	96.48	67.6	2.28			2/1962 -
COLOGNE	B10	50.93	06.92	52.31	90.42	67.2	2.30			7/1957 - 6/1958
COLOMBO	B7	06.90	79.87	-02.96	149.07	-5.9	0.92			(7/1957)--- 12/1970
	F3	06.90	79.80	-02.96	149.01	-5.9	0.92	17.46	SL	7/1957 - 12/1958
COLOMB BECHAR	B2	30.82	03.07	33.69	79.13	43.4	1.19			6/1966 - 7/1966
COLUMBUS	C6	39.63	272.97	50.45	338.02	70.9	2.63			
CONCEPCION	B1	-36.60	287.00	-25.12	356.15	-35.5	1.21			10/1957 -
COOK	B14	-30.60	130.40	-41.35	202.39	-63.4	1.74			7/1958 -
COONAWARRA	B14	-12.40	130.90	-23.17	201.20	-39.3	1.09			3/1956 ---
COPENHAGEN	C5	55.38	12.40	55.42	98.19	70.4	2.73			
	D1	55.85	12.45	55.85	98.52	70.7	2.79			1/1907 -
	D2	55.85	12.45	55.85	98.52	70.7	2.79			(1/1964)-(12/1965)-
CORAL HARBOUR	B8	64.20	276.60	75.08	335.14	85.4	16.78			7/1959 - 8/1964
	C8	64.20	276.60	75.08	335.14	85.4	16.78			7-1959 - 8/1964
CORDOBA	F1	-31.40	295.80	-19.94	04.36	-28.2	1.15	11.45	434M	(7/1964)-
CUBA	B1	23.00	278.00	34.17	345.51	55.4	1.52			8/1964 -
	D1	22.97	277.85	34.14	345.34	55.3	0.87			8/1964 -
CULGOORA	C1	-30.32	149.57	-38.99	223.83	-60.9	1.66			1/1965 -
	C4	-30.32	149.57	-38.99	223.83	-60.9	1.66			11/1964 ---
CUZCO	D1	-13.53	288.03	-02.04	357.11	-0.5	1.05			10/1965 - 5/1966
DABROWA GORNIC	A1	50.33	19.22	49.31	101.86	67.0	2.16			(11/1957)-(12/1959)
	A2	50.33	19.22	49.31	101.86	67.0	2.16			(11/1957)-(12/1959)
DACCA	F1	23.70	90.30	12.89	160.61	32.4	0.99	16.22	SL	1/1964 -
	F3	23.70	90.30	12.89	160.61	32.4	0.99	16.22	SL	6/1966 -
DAKAR	B1	14.70	342.60	21.62	54.63	16.9	0.99			5/1949 -
DALLAS	D1	32.98	263.25	42.96	327.75	63.2	1.88			1/1964
	D2	32.98	263.25	42.96	327.75	63.2	1.88			
	F1	32.78	263.20	42.75	327.72	62.6	1.86	4.35	208M	2/1964 -
DANVILLE	B11	40.00	272.00	50.74	336.79	71.1	2.66			(10/1963)-
DARJEELING	F3	27.03	88.30	16.35	159.01	39.0	1.04	15.35	2176M	7/1957 - 6/1960
DARMSTADT	C6	49.51	08.41	50.67	91.17	66.1	2.17			(7/1968)-
DAR ES SALAAM	B6	-06.51	39.18	-09.96	106.59	-36.0	1.06			(7/1966)-
DAVAO	D1	07.08	125.58	-04.05	194.50	-1.8	0.93			4/1965 -
DAVIS	B8	-68.60	78.00	-76.75	119.89	-72.6	13.87			(10/1969)-
	B13	-68.60	78.00	-76.75	119.89	-72.6	13.87			2/1971 -
	D2	-68.60	78.00	-76.75	119.89	-72.6	13.87			3/1970 -
	E1	-68.60	78.00	-76.75	119.89	-72.6	13.87			(7/1957)---
DEBRE ZEIT	C6	08.75	38.96	05.07	109.28	-1.1	0.96			(2/1968)-
	G	08.75	38.97	05.07	109.28	-1.1	0.96			(12/1966)-
DECEPCION	B1	-63.00	299.30	-51.59	06.05	-56.1	2.17			1/1951 - 11/1967
DEEP RIVER	F1	46.10	282.50	57.44	349.02	75.8	3.76	1.02	145M	7/1957 - 12/1963
	F1	46.10	282.50	57.44	349.02	75.8	3.76	1.02	145M	4/1962 -
	F2	46.10	282.50	57.44	349.02	75.8	3.76	1.02	145M	7/1957 --- 7/1959
	F3	46.10	282.50	57.44	349.02	75.8	3.76	1.02	145M	7/1957 -
DELAWARE	E1	40.30	276.90	51.38	342.68	71.7	2.76			(7/1957)-(5/1961)
DELHI	A2	28.60	77.10	18.89	148.83	42.3	1.08			(4/1965)-
	A8	28.60	77.10	18.89	148.83	42.3	1.08			NA --- 12/1968
	B1	28.60	77.10	18.89	148.83	42.3	1.08			9/1945 -
	B6	28.60	77.10	18.89	148.83	42.3	1.08			10/1964 -
	B7	28.63	77.22	18.91	148.94	42.3	1.08			(7/1957)---
	B8	28.63	77.22	18.91	148.94	42.3	1.08			(7/1957)-
	B14	28.80	77.30	19.07	149.04	42.6	1.08			6/1958 -
	C6	28.60	77.10	18.89	148.83	42.3	1.08			(1/1964)---
DENVER	F1	39.75	255.00	48.64	316.85	68.1	2.31	2.91	1600M	1/1963 -
	F1	39.75	255.00	48.64	316.85	68.1	2.31	2.91	1600M	1/1965 -
	F3	39.75	255.00	48.64	316.85	68.1	2.31	2.91	1600M	5/1965
DERWOOD	C6	39.12	282.85	50.48	350.05	70.9	2.67			3/1958 --- 5/1959
DE BILT	B1	52.10	05.20	53.76	89.36	68.1	2.43			11/1949 -
	B7	52.10	05.18	53.77	89.34	68.1	2.43			(7/1957)-
	B9	52.10	05.20	53.76	89.36	68.1	2.43			7/1968 -
DIXON	B1	73.50	80.40	62.98	161.40	83.6	6.95			7/1957 ---
	B7	73.50	80.40	62.98	161.44	83.6	6.95			7/1957 ---
	B8	73.50	80.40	62.98	161.44	83.6	6.95			7/1964 -
	D1	73.55	80.57	63.02	161.57	83.6	6.98			1/1933 -
	D2	73.55	80.57	63.02	161.57	83.6	6.98			
	E1	73.50	80.40	62.98	161.44	83.6	6.95			(11/1957)---(3/1959)
DJIBOUTI	B1	11.50	42.80	07.05	113.54	6.1	0.95			10/1951-
DODAIRA	G	36.00	139.20	25.71	205.11	49.2	1.24			(4/1964)-
DOMBAS	D1	62.07	09.12	62.25	100.10	74.1	3.98			1/1916 -
DOURBES	A1	50.80	04.35	52.70	87.83	67.1	2.31			(7/1957)-
	A2	50.80	04.35	52.70	87.83	67.1	2.31			(7/1957)-
	A6	50.80	04.35	52.70	87.83	67.1	2.31			(7/1957)-
	A8	50.18	05.25	51.93	88.40	66.6	2.25			(7/1957)-
	B1	50.10	04.60	51.99	87.72	66.6	2.25			6/1957 -
	C1	50.80	04.35	52.70	87.83	67.1	2.31			(7/1957)-
	C3	50.18	05.25	51.93	88.40	66.6	2.25			(7/1957)-
	C6	50.80	04.35	52.70	87.83	67.1	2.31			(1/1964)---
	D1	50.10	04.60	51.99	87.72	66.6	2.25			1/1952 -
	D2	50.10	04.60	51.99	87.72	66.6	2.25			(9/1957)---(11/1965)
	F1	50.10	04.60	51.99	87.72	66.6	2.25	3.24	225M	1/1969 -
	F1	50.10	04.60	51.99	87.72	66.6	2.25	3.24	225M	1/1969 -
	F3	50.10	04.60	51.99	87.72	66.6	2.25	3.24	225M	1/1969 -

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
DUNEDIN	B8	-45.90	170.60	-50.71	251.41	-70.9	2.74			(7/1969) ---
	B13	-45.90	170.60	-50.71	251.41	-70.9	2.74			2/1958 ---
	D2	-45.80	170.50							
DUNSINK	C1	53.38	353.67	57.26	78.44	69.2	2.74			(7/1957)--- 9/1964
	C6	53.38	353.67	57.26	78.44	69.2	2.74			(7/1957)- 7/1965
DURBAN	B8	-29.92	30.93	-31.20	93.22	-64.5	1.00			(6/1970)-
	B12	-29.92	30.93	-31.20	93.22	-64.5	1.00			(9/1957)-(12/1958)
	B13	-29.92	30.93	-31.20	93.22	-64.5	1.00			(9/1957)-
	C6	-29.92	30.93	-31.24	93.15	-64.5	1.00			(2/1965)---
	C8	-29.92	30.93	-31.20	93.22	-64.5	1.00			
	D2	-29.92	30.93	-31.24	93.15	-64.5	1.00			(1/1969)-
DURHAM	F1	43.10	289.10	54.59	357.61	73.2	3.19	1.41	SL	12/1964 -
EASTER ISLAND	D1	-27.17	250.58	-18.21	322.61	-37.3	1.14			3/1958 -
EAST GRAND FORK	B2	48.92	262.98	58.68	323.56	76.9	3.99			2/1963 - 7/1966
EDINBURGH	A6	55.92	356.82	59.02	83.33	70.8	3.05			(7/1957)---(8/1958)
	B8	55.95	356.81	59.03	83.32	70.8	3.05			7/1957 - 12/1965
	C1	55.92	356.82	59.02	83.33	70.8	3.05			(7/1957)- 9/1958
	C6	55.92	356.82	59.02	83.33	70.8	3.05			(7/1957)--- 8/1958
	D2	55.92	356.82	59.02	83.33	70.8	3.05			
EGILSSTADIR	E1	65.10	245.50	71.38	289.84	83.4	10.72			(1/1966)-
EGLIN AFB	B1	30.38	273.30	41.26	339.58	62.5	1.83			3/1964 - 1/1969
	B5	30.38	273.30	41.26	339.58	62.5	1.83			
EIELSON AFB	D1	64.66	213.00	64.61	257.48	76.6	0.82			9/1966 -
EIGHTS	B1	-75.23	282.84	-63.80	355.30	-66.4	3.88			12/1961 --- 9/1965
	B8	-75.23	282.84	-63.80	355.30	-66.4	3.88			5/1963 - 10/1965
	D1	-75.23	282.83	-63.80	355.29	-66.4	3.88			6/1963 - 10/1965
	D2	-75.23	282.83	-63.80	355.29	-66.4	3.88			
	D3	-75.23	282.83	-63.80	355.29	-66.4	3.88			
	E1	-75.23	282.83	-63.80	355.29	-66.4	3.88			(3/1963)---(9/1965)
ELIZABETHVILLE	B1	-11.60	27.50	-12.66	94.03	-47.1	1.16			4/1952 -(6-1960)
	D1	-11.63	27.42	-12.67	93.95	-47.1	1.17			10/1932 -
ELLSWORTH	B1	-77.70	318.90	-66.91	14.73	65.8	4.48			7/1957 - 11/1962
	B13	-77.72	318.83	-66.93	14.68	-65.8	4.48			4/1957 -(12/1962)
	C9	-77.70	318.90	-66.91	14.73	-65.8	4.48			7/1957 -
	E1	-77.80	318.80	-67.00	14.61	-65.8	4.50			(3/1957)---(12/1962)
	E2	-77.80	318.80	-67.00	14.61	-65.8	4.50			1/1960 --- 9/1962
	E3	-77.80	318.80	-67.00	14.61	-65.8	4.50			(7-1957)---(12/1967)
	F1	-77.72	318.80	-66.93	14.66	-65.8	4.48	0.79	SL	3/1957 - 12/1962
EL ARENOSILLO	B5	37.10	353.27	41.69	70.98	53.0	1.44			
EL INFIERNILLO	F1	-33.17	289.72	-21.67	358.85	-31.0	1.17	11.45	4343M	1/1968 -
	F3	-33.17	289.72	-21.67	358.85	-31.0	1.17	11.45	4343M	6/1964 --- 5/1967
ELTANIN SHIP	B14	-60.00								4/1962 - 4/1965
EMBUDO	F3	35.20	253.32	43.93	316.09	63.4	1.90	4.36	2622M	12/1964 ---
EMMABODA	B1	56.77	15.47	56.12	101.91	71.3	2.89			4/1970 -
ENKOPING	B14	59.50	17.30	58.31	105.42	72.9	3.30			4/1958 -
	C6	59.50	17.30	58.31	105.42	72.9	3.30			1/1960 -
	D2	59.33	17.83	58.05	105.77	72.8	3.26			
ENNADAI LAKE	E1	61.30	258.80	70.14	311.11	84.0	9.78			(7/1957)---(9/1958)
ESKALEMUIR	D1	55.32	356.80	58.47	82.90	70.4	2.95			1/1908 -
	D2	55.32	356.80	58.47	82.90	70.4	2.95			(1/1964)-(12/1965)
ESPANOLA	D1	35.82	253.93	44.63	316.62	64.2	1.95			7/1957 - 1/1959
ESTACION LOS CER	F3	-33.30	289.30	-21.80	358.47	-31.3	1.17		512M	1/1967 -
ESTACION MACUL	F3	-33.27	289.40	-21.77	358.56	-31.2	1.17		570M	2/1958 - 2/1967
EUREKA	B1	80.00	274.10	86.53	236.41	87.6	3346.			7/1957 - 1/1959
	C9	80.00	274.10	86.53	236.41	87.6	3346.			7/1957 - 1/1959
FANNING	B14	03.92	200.62	03.77	268.85	10.0	0.98			(7/1957)-(11/1957)
	D1	03.90	200.62	03.75	268.85	9.9	0.98			8/1957 - 12/1958
FAREWELL	B8	62.50	206.13	61.33	253.48	74.0	4.24			11/1957 - 12/1958
	E1	62.50	206.10	61.33	253.46	74.0	4.24			(9/1957)---(12/1958)
	E4	62.50	206.10	61.33	253.46	74.0	4.24			(9/1957)---(12/1959)
FARGO	E1	46.90	263.20	56.72	324.50	75.5	3.55			(8/1957)-(6/1966)
FLETCHERS ICE	B1	75.90	235.70	77.97	253.99	86.6	29.60			6/1957 - 1/1959
	C9	75.90	235.70	77.97	353.99	86.6	29.60			6/1957 - 1/1959
	E1	80.00	195.00	DRIFT						(11/1957)---(6/1959)
FLIN FLON	E1	54.70	258.00	63.69	314.77	80.1	5.54			(7/1957)-(12/1958)
FLORENCE	B8	43.81	11.20	44.66	91.42	60.8	1.70			4/1963 -
FORT ARCHAMBAULT	B1	09.20	18.35	09.54	89.25	-3.3	0.97			1/1969 -
	B10	09.20	18.35	09.54	89.25	-3.3	0.97			1/1969 -
	D2	09.20	18.35	09.54	89.25	-3.3	0.97			
FORT CHIMO	B1	58.10	291.60	69.60	00.91	80.7	8.27			12/1948 --- 12/1958
	C9	58.10	291.60	69.60	00.91	80.7	8.27			12/1948 --- 12/1958
FORT DAVIS	C4	30.63	256.48	39.84	320.58	59.3	1.66			(7/1957)-
FORT MONMOUTH	B1	40.40	285.90	51.84	353.71	71.7	2.83			3/1955 - 12/1965
	B12	40.25	285.98	51.70	353.81	71.6	2.81			1/1958 - 12/1958
	C6	40.40	285.90	51.84	353.71	71.7	2.83			9/1958 -(9/1967)
FORT MYERS	B2	26.53	278.13	37.70	345.41	59.3	1.67			9/1962 -
FORT NORMAN	B1	64.90	234.50	69.08	277.87	81.0	8.17			7/1957 - 3/1958
	C9	64.90	234.50	69.08	277.87	81.0	8.17			7/1957 - 3/1958
FORT WAINWRIGHT	B5	64.82	212.37	64.63	256.75	76.6	5.40			
FORT YUKON	B8	66.57	214.75	66.63	256.84	78.2	6.41			2/1958 -
	C8	66.57	214.75	66.63	256.84	78.2	6.41			2/1958 -
	D1	66.57	214.70	66.62	256.79	78.1	6.41			7/1957 - 12/1958
	D2	66.57	214.75	66.63	256.84	78.2	6.41			
	E1	66.57	214.75	66.63	256.84	78.2	6.41			(2/1958)---
FREDRICKSBURG	D1	38.20	282.63	49.55	349.84	70.2	2.56			1/1956 -
	D2	38.20	282.63	49.55	349.84	70.2	2.56			(7/1957)-
	F2	38.30	282.50	49.65	349.68	70.3	2.57	2.18	100M	10/1956 - 12/1968
FREETOWN	D1	08.46	346.79	14.78	57.77	1.3	1.01			7/1961 - 2/1967
	D2	08.46	346.79	14.78	57.77	1.3	1.01			
FREIBURG/BREISAC	A1	48.00	07.80	49.35	89.86	64.8	2.07			(7/1957)-(12/1959)
	A6	48.10	07.50	49.50	89.61	64.9	2.08			(1/1956)-
	B1	48.10	07.60	49.48	89.71	64.9	2.08			6/1957 -
	B7	48.05	07.59	49.44	89.68	64.9	2.09			1/1956 -
	B10	48.05	07.59	49.44	89.68	64.9	2.08			(7/1957)- 12/1961
	B13	48.10	07.50	49.50	89.61	64.9	2.08			(1/1965)-
	F1	48.00	07.80	49.35	89.86	64.8	2.07	4.10	1200M	4/1957 - 4/1969
	F2	48.00	07.80	49.35	89.86	64.8	2.07	4.10	1200M	1/1957 -
	F3	48.00	07.80	49.35	89.86	64.8	2.07	4.10	1200M	1/1959 -

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
FRITZ PEAK	E1	39.90	254.52	48.73	316.26	68.2	2.31			(6/1957)---
	E3	39.90	254.52	48.73	316.26	68.2	2.31			(7/1957)-(12/1958)
	G	39.90	254.52	48.73	316.26	68.2	2.31			8/1955 ---
FROBISHER BAY	B1	63.80	291.40	75.30	00.70	82.7	14.58			9/1957 --- 1/1959
	B8	63.80	291.30	75.30	00.52	82.7	14.60			4/1963 - 6/1965
	B13	63.75	291.43	75.25	00.75	82.7	14.49			8/1957 - 10/1959
	C8	63.80	291.30	75.30	00.52	82.7	14.60			4/1963 - 6/1965
	C9	63.80	291.40	75.30	00.70	82.7	14.58			9/1957 --- 1/1959
	C10	63.80	291.40	75.30	00.70	82.7	14.49			(1/1964)-
FRONT ROYAL	B14	38.80	281.80	50.12	348.79	70.7	2.63			11/1957 - 8/1965
FUQUENE	D1	05.47	286.27	16.93	355.08	33.3	0.95			10/1954 -
FURSTENFELDBRUCK	D1	48.17	11.28	48.82	93.33	65.0	2.06			1/1939 -
	D2	48.17	11.28	48.82	93.33	65.0	2.06			
GAINESVILLE	B13	29.60	277.70	40.75	344.69	62.3	1.83			7/1957 - 1/1959
GARCHY	B1	47.30	03.10	49.62	84.89	64.2	2.03			10/1959
	B10	47.30	03.10	49.62	84.89	61.2	2.03			1/1966 -
	D2	47.30	03.10	49.62	84.89	64.2	2.03			
GDANSK	A2	54.35	18.65	53.23	103.39	69.9	0.86			(10/1957)-(12/1959)
GENOVA	B1	44.60	09.00	45.85	89.58	61.6	1.76			5/1956 -
	B7	44.55	08.95	45.82	89.51	61.6	1.76			1/1958 -
	B13	44.60	09.00	45.85	89.58	61.6	1.76			4/1966 -
	D1	44.55	08.95	45.82	89.51	61.6	1.76			
GESASHI	C6	24.28	153.98	15.66	220.20	31.9	1.05			
GIFU	G	35.58	137.08	25.12	203.26	49.0	1.23			(7/1957)-
GILA BEND	B14	32.87	247.29	40.76	309.98	59.8	1.69			11/1967 -
GIZA	C3	30.03	31.22	27.37	106.37	43.4	1.16			(12/1957)-(3/1958)
GNANGARA	D1	-31.78	115.95	-43.23	185.78	-66.4	1.86			7/1957 -
GODHAVN	B1	69.30	306.50	79.92	32.67	81.6	20.62			11/1951 ---
	B8	69.30	306.17	79.96	32.04	81.7	20.81			11/1963 -
	B10	69.30	306.17	79.96	32.04	81.7	20.81			
	B13	69.30	306.50	79.92	32.67	81.6	20.62			(7/1957)-
	B14	69.30	306.50	79.92	32.67	81.6	20.62			
	C8	69.30	306.17	79.96	32.04	81.7	20.81			(11/1963)-
	C9	69.30	306.50	79.92	32.67	81.6	20.62			11/1951 ---
	D1	69.23	306.48	79.86	32.52	81.6	20.44			1/1926 -
	D2	69.23	306.48	79.86	32.52	81.6	20.44			(1/1964)-(12/1965
	E1	69.30	306.17	79.96	32.04	81.7	20.81			(4/1957)-(4/1959)
	F2	69.33	306.50	79.95	32.73	81.6	20.70	0.03	SL	(1/1938)-(7/1970)
GONZALES VIDELA	D1	-64.82	297.15	-53.37	04.38	-57.6	2.32			(2/1961)-(12/1961)
	E1	-64.80	297.10	-53.35	04.35	-57.6	2.32			(8/1957)---(6/1958)
GOOSE BAY	F1	53.33	299.50	64.65	11.90	76.9	5.27	0.52	46M	11/1964 -
	F2	53.33	299.50	64.65	11.90	76.9	5.27	0.52	46M	11/1964 -
GORKY	A8	56.10	44.30	50.30	126.69	72.0	2.60			(7/1957)---
	B1	56.10	44.30	50.30	126.69	72.0	2.60			3/1958 -
	B10	56.16	44.28	50.36	126.70	72.0	2.61			(7/1957)- 3/1960
	C3	56.10	44.30	50.30	126.69	72.0	2.60			(7/1957)---
	C4	56.10	44.30	50.30	126.69	72.0	2.60			(7/1957)---
GOTTINGEN	D1	51.53	09.97	52.27	93.70	67.7	2.33			(7/1957)-(12/1958)
	D2	51.53	09.97	52.27	93.70	67.7	2.33			
	F1	51.52	09.90	52.28	93.62	67.7	2.33	3.00	273M	(7/1957)- 2/1959
GRAFTON	C3	42.78	282.55	54.12	349.29	73.6	3.16			7/1957 -(12/1961)
	C6	42.78	282.55	54.12	349.29	73.6	3.16			7/1957 -(12/1961)
GRAHAMSTOWN	B1	-33.30	26.50	-33.64	87.87	-65.6	1.83			3/1958 ---
	C3	-33.30	26.50	-33.64	87.80	-65.6	1.83			(5/1958)-(11/1958)
GRAND BAHAMA	B1	26.60	281.80	37.93	349.56	59.8	1.70			6/1957
GRAZ	B1	47.10	15.50	46.96	96.91	64.2	1.94			8/1947 -
	B6	47.10	15.50	46.96	96.91	64.2	1.94			(10/1965)-
GREAT WHALE	B8	55.28	282.17	66.59	347.29	81.0	6.93			3/1963 -
	B13	55.28	282.17	66.59	347.29	81.0	6.93			(6/1962)-(12/1962)
	C8	55.28	282.17	66.59	347.29	81.0	6.93			3/1963 -
	D1	55.27	282.22	66.58	347.36	81.0	6.92			1/1965 ---
	D2	55.27	282.22	66.58	347.36	81.0	6.92			1/1965 ---
	E1	55.27	282.22	66.58	347.36	81.0	6.92			(7/1957)-
	E4	55.27	282.22	66.58	347.36	81.0	6.92			(1/1968)-
	G	55.27	282.22	66.58	347.36	81.0	6.92			(1/1968)-
GREENBELT	C6	39.03	283.17	50.40	350.44	70.8	2.66			(4/1966)-
GROCKA	D1	44.63	20.77	43.55	100.92	62.0	1.73			1/1958 -
	D2	44.63	20.77	43.55	100.92	62.0	1.73			
GUAM	D1	13.58	144.87	03.97	212.89	12.3	0.96			7/1957 -
	D2	13.58	144.87	03.97	212.89	12.3	0.96			7/1957 -
GUAYAQUIL	B12	-02.60	279.60	08.67	348.48	17.2	1.06			12/1957 - 11/1958
GULMARG	F3	34.07	74.40	24.61	147.10	51.1	1.21	11.91	2743M	2/1968
HADDAM	C6	41.47	287.50	52.94	355.65	72.3	2.96			(12/1965)---
HAFELEKAR	F1	47.32	11.30	48.00	92.97	64.3	1.97	4.37	2290M	10/1956 - 3/1959
	F1	47.32	11.30	48.00	92.97	64.3	1.97	4.37	2290M	5/1968 -
	F2	47.32	11.30	48.00	92.97	64.3	1.97	4.37	2290M	1/1932 -
	F3	47.32	11.30	48.00	92.97	64.3	1.97	4.37	2290M	6/1958 -
HAIFA	B1	32.82	34.98	29.38	110.63	48.1	1.23			1/1960 -
	B6	32.82	34.98	29.38	110.63	48.1	1.23			11/1964 -
	B8	32.82	34.98	29.38	110.63	48.1	1.23			1/1963 - 10/1966
	F3	32.82	34.90	29.40	110.55	48.1	1.23	10.96	SL	(3/1958)-(2/1959)
HALEAKALA	A6	20.75	203.07	20.73	267.70	38.7	1.13			4/1964 -
	A7	20.75	203.07	20.73	267.70	38.7	1.13			2/1964 --- 11/1965
	C1	20.75	203.07	20.73	267.70	38.7	1.13			4/1964 -
	C3	20.75	203.07	20.73	267.70	38.7	1.13			6/1964 ---(6/1966)
	C6	20.75	203.07	20.73	267.70	38.7	1.13			1/1964 ---(8/1967)
	F1	20.71	203.70	20.81	268.32	38.7	1.13	13.30	100M	6/1963 - 4/1967
	G	20.75	203.07	20.73	267.70	38.7	1.13			1/1961 -(12/1965)
HALIFAX	B13	44.62	296.50	55.96	10.83	72.1	3.22			(7/1957)-(12/1958)
HALLE	F1	51.48	11.90	51.84	95.52	67.7	2.31	3.07	100M	8/1960 -
	F2	51.48	11.90	51.84	95.52	67.7	2.31	3.07	100M	4/1956 -
HALLEY BAY	B1	-75.50	333.40	-65.76	24.28	-64.3	4.19			6/1957 -
	B7	-75.52	333.30	-65.77	24.21	-64.3	4.19			7/1957 - 12/1958
	B8	-75.52	333.30	-65.77	24.21	-64.3	4.19			
	B10	-75.52	333.30	-65.77	24.21	-64.3	4.19			7/1957 ---
	C9	-75.50	333.40	-65.76	24.28	-64.3	4.19			6/1957 -
	D1	-75.52	333.38	-65.78	24.26	-64.3	4.19			7-1957 -
	D2	-75.52	333.38	-65.78	24.26	-64.3	4.19			
	E1	-75.52	333.30	-65.77	24.21	-64.3	4.19			(7/1957)---(7/1964)

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
HAMMAGUIR	B5	30.85	356.93	34.91	72.92	43.7	1.21			
HANOVER	B1	43.70	287.80	55.18	355.95	73.8	3.30			11/1968 -
	B13	43.70	287.70	55.18	355.82	73.8	3.30			(7/1957)-(10/1958)
	E1	43.70	287.80	55.18	355.95	73.8	3.30			(1/1958)-(5/1966)
HARTLAND	D1	51.00	355.52	54.64	79.01	67.4	2.43			7/1957 -
	D2	51.00	355.52	54.64	79.01	67.4	2.43			
HAUTE PROVENCE	A6	43.93	05.72	45.86	86.07	60.9	1.73			(1/1962)---
	C1	43.93	05.72	45.86	86.07	60.9	1.73			(1/1962)---
	G	43.93	05.72	45.86	86.07	60.9	1.73			(7/1957)-
HEALY	D1	63.85	211.03	63.50	256.56	75.7	4.95			7/1957 - 12/1958
	E1	64.00	211.00	63.63	256.38	75.8	4.99			(3/1958)---(3/1959)
HEISS IS	B1	80.60	58.00	71.29	156.00	83.8	14.10			7/1957 -
	B8	80.62	58.05	71.31	156.06	83.9	14.13			1/1964 -
	C8	80.62	58.05	71.31	156.06	83.9	14.13			(1/1964)-(12/1965)
	C9	80.60	58.00	71.29	156.00	83.8	14.10			7/1957 -
	D1	80.62	58.05	71.31	156.06	83.9	14.13			7/1958 -
	D2	80.62	58.05	71.31	156.06	83.9	13.97			
	E1	80.70	58.00	71.38	156.16	83.9	14.26			(12/1957)---(3/1964)
	F1	80.33	57.80	71.07	155.50	83.7	13.71	0.09	20M	1/1958 ---
	F3	80.33	57.80	71.07	155.50	83.7	13.71	0.09	20M	3/1958 --- 1/1967
HEL	D1	54.60	18.82	53.43	103.68	70.0	2.58			1/1934 ---
HELWAN	D1	29.87	31.33	27.20	106.44	43.2	1.15			1/1903 - 3/1960
HERMANUS	B1	-34.42	19.22	-33.30	80.52	-65.8	1.01			6/1971 -
	B8	-34.43	19.23	-33.30	80.52	-65.8	1.01			12/1963 -
	D1	-34.42	19.23	-33.29	80.52	-65.8	1.01			1/1933 -
	D2	-34.42	19.23	-33.29	80.52	-65.8	1.01			(7/1957)-
	F1	-34.42	19.20	-33.28	80.49	-65.8	1.01	4.90	26M	6/1957 - 5/1964
	F1	-34.42	19.20	-33.28	80.49	-65.8	1.01	4.90	26M	9/1964 -
	F3	-34.42	19.20	-33.28	80.49	-65.8	1.01	4.90	26M	6/1957 - 5/1962
HERSTMONCEUX	A1	50.90	00.33	53.60	83.86	67.2	0.87			(7/1957)-
	A6	50.90	00.33	53.60	83.86	67.2	0.87			(7/1957)-
	C1	50.90	00.33	53.60	83.86	67.2	0.87			(7/1957)-
	C6	50.90	00.33	53.60	83.86	67.2	0.87			(1/1964)-(9/1964)
	F1	50.88	00.30	53.58	83.82	67.2	0.87	2.92	23M	4/1957 - 6/1960
	F3	50.88	00.30	53.58	83.82	67.2	0.87	2.92	23M	4/1957 - 12/1959
HIRAISO	A8	36.37	140.63	26.20	206.34	49.5	1.25			(7/1957)-
	C3	36.37	140.63	26.20	206.34	49.5	1.25			(7/1957)-
	C6	36.37	140.63	26.20	206.34	49.5	1.25			(7/1957)-
HOBART	B1	-42.90	147.20	-51.71	224.29	-72.7	2.85			12/1945 ---
	B13	-42.50	147.20	-51.32	224.17	-72.4	2.79			(7/1957)-
	C6	-42.83	147.55	-51.59	224.67	-72.6	2.83			1/1961 ---
	D2	-42.87	147.33	-51.66	224.43	-72.7	2.84			
	E1	-43.00	147.40	-51.78	224.55	-72.8	2.86			(8/1957)---(12/1958)
	F1	-42.92	147.20	-51.73	224.29	-72.7	2.85	1.89	SL	3/1967 -
	F2	-42.92	147.20	-51.73	224.29	-72.7	2.85	1.89	SL	7/1955 - 11/1959
	F3	-42.92	147.20	-51.73	224.29	-72.7	2.85	1.89	SL	12/1955 -
HOKKAIDO	C6	42.75	143.71	32.82	208.18	56.4	1.45			(2/1969)-
HOLLANDIA	A8	-02.50	140.50	-12.48	210.26	-20.7	0.98			1/1957 - 12/1962
	B1	-02.50	140.80	-12.45	210.56	-20.7	0.98			12/1957 - 2/1959
	C3	-02.50	140.50	-12.48	210.26	-20.7	0.98			1/1957 - 12/1962
	C6	-02.50	140.50	-12.48	210.26	-20.7	0.98			10/1957 - 3/1963
	D1	-02.57	140.52	-12.55	210.28	-20.8	0.98			7/1957 - 8/1962
HONG KONG	B1	22.33	114.20	10.85	183.01	30.0	0.99			7/1969 -
	B6	22.33	114.20	10.85	183.01	30.0	0.99			(1/1963)-
	C6	22.33	114.20	10.85	183.01	30.0	0.99			(3/1960)---
	F2	22.33	114.20	10.85	183.01	30.0	0.99			8/1970 -
HONOLULU	B6	21.30	202.30	21.11	266.82	39.2	1.14			9/1964 -
	C1	21.30	201.90	21.03	266.43	39.2	1.14			7/1957 - 9/1963
	C3	21.30	201.90	21.03	266.43	39.2	1.14			7/1957 - 8/1959
	C6	21.30	201.93	21.03	266.43	39.2	1.14			11/1958 ---
	D1	21.32	202.00	21.07	266.53	39.2	1.14			1/1902 -
	F1	21.30	202.30	21.11	266.82	39.2	1.14	13.23	100M	(7/1957)-(4/1967)
	F3	21.30	202.30	21.11	266.82	39.2	1.14	13.23	100M	(7/1957)-(12/1958)
HOUGATON	B11	47.00	271.00	57.61	334.19	76.4	3.80			(10/1961)-
HOUSTON	A6	30.00	265.00	40.18	330.21	60.5	1.72			1/1967 -
	C1	30.00	265.00	40.18	330.21	60.5	1.72			3/1966 -
	C3	30.00	265.00	40.18	330.21	60.5	1.72			3/1966 -
HOWRAH	F2	22.58	88.30	11.91	158.64	30.2	0.98	16.43	SL	(7/1957)-(12/1958)
HUANCAYO	A6	-12.05	284.67	-00.62	353.81	1.3	1.04			(7/1957)-
	A8	12.05	284.67	-00.62	353.81	1.3	1.04			5/1969 -
	B1	-12.00	284.70	-00.57	353.84	1.4	1.04			11/1937 ---
	B8	-12.01	284.67	-00.58	353.81	1.3	1.04			6/1961 -
	B12	-12.05	284.67	-00.62	353.81	1.3	1.04			8/1957 - 12/1958
	B12	-12.05	284.67	-00.62	353.81	1.3	1.04			12/1957 - 11/1958
	C1	-12.05	284.67	-00.62	353.81	1.3	1.04			(7/1957)-
	C3	-12.05	284.67	-00.62	353.81	1.3	1.04			5/1969 -
	C6	-12.05	284.67	00.62	353.81	1.3	1.04			(7/1957)-
	D1	-12.05	284.67	00.62	353.81	1.3	1.04			1/1922 -
	D2	-12.05	284.67	00.62	353.81	1.3	1.04			
	F1	-12.05	284.60	-00.62	353.74	1.2	1.04	13.45	3400M	1/1952 -
	F2	-12.05	284.60	-00.62	353.74	1.2	1.04	13.45	3400M	6/1936 -(12/1968)
	G	-12.00	284.70	-00.57	353.84	1.4	1.04			5/1958 - 12/1959
HURBANOVO	C1	47.87	18.18	47.17	99.78	64.9	1.99			
	C6	47.87	18.18	47.17	99.78	64.9	1.99			6/1969 ---
	D1	47.87	18.18	47.17	99.78	64.9	1.99			7/1890 -
HYDERABAD	B1	17.30	78.50	07.52	148.84	19.4	0.94			5/1963 -
	C1	17.43	78.45	07.65	148.81	19.7	0.95			(7/1957)---(5/1965)
	C3	17.43	78.45	07.65	148.81	19.7	0.95			(1/1958)---(1/1960)
	D1	17.42	78.55	07.63	148.90	19.6	0.95			1/1965 -
	F4	17.60	28.50							(4/1966)-
IBADAN	B1	07.40	03.90	10.62	74.66	-7.0	0.99			1/1951 -
	B7	07.43	03.90	10.65	74.66	-6.9	0.99			1/1957 - 12/1958
	B10	07.43	03.88	10.66	74.64	-6.9	0.99			(8/1957)-(12/19[illegible]8)
	B14	07.43	03.90	10.65	74.66	-6.9	0.99			3/1958 - 5/19[illegible]
	D1	07.43	03.90	10.65	74.66	-6.9	0.99			1/1956 -
	D2	07.43	03.90	10.65	74.66	-6.9	0.99			

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
IKOMASAN	A1	34.68	135.68	24.12	202.10	48.1	1.21			(7/1957)-
	A2	34.68	135.68	24.12	202.10	48.1	1.21			(7/1957)-
	A6	34.68	135.68	24.12	202.10	48.1	1.21			(1/1964)-
	C1	34.68	135.68	24.12	202.10	48.1	1.21			(7/1957)-
ILE DU LEVANT	B5	43.05	06.47	44.87	86.48	60.0	1.67			
ILO	B1	-17.40	288.80	-05.91	357.89	-7.4	1.06			2/1959 - 5/1959
INUBO	C6	35.70	140.85	25.56	206.62	48.6	1.23			(2/1970)-
INUVIK	E1	68.35	226.20	70.41	264.63	81.2	9.32			(8/1969)-
	F1	68.35	226.20	70.41	264.63	81.2	9.32	0.18	21M	7/1964 -
	F3	68.35	226.20	70.41	264.63	81.2	9.32	0.18	21M	7/1964 -
INVERCARGILL	B11	-46.40	168.30	-51.72	249.22	-71.7	2.89			(12/1969)-
	D2	-46.40	168.30	-51.72	249.22	-71.7	2.89			
	E1	-46.60	168.40	-51.79	249.37	-71.8	2.90			(7/1957)-(12/1958)
	F1	-46.50	168.30	-51.72	249.22	-71.7	2.89	1.86	SL	(11/1957)-(3/1960)
	F3	-46.50	168.30	-51.72	249.22	-71.7	2.89	1.86	SL	(7/1958)-(12/1958)
INVERNESS	B1	57.40	355.80	60.61	83.35	71.7	3.32			11/1951 - 6/1963
IRKUTSK	A8	52.27	104.30	40.83	174.59	72.0	2.05			(12/1958)---
	B1	52.50	104.00	41.07	174.35	72.3	2.07			1/1957 -
	B7	52.47	104.03	41.04	174.38	-72.2	2.06			11/1957 - 2/1964
	B10	52.47	104.03	41.04	174.38	72.2	2.06			(4/1958)-
	B14	52.27	104.30	40.83	174.59	72.0	2.05			(11/1958)-(12/1965)
	C1	52.27	104.30	40.83	174.59	72.0	2.05			(9/1963)---
	C3	52.27	104.30	40.83	174.59	72.0	2.05			(12/1958)---
	D1	52.17	104.45	40.73	174.70	71.9	2.04			7/1887 -
	D2	52.47	104.03	41.04	174.38	72.2	2.06			
	F1	52.47	104.30	41.04	174.38	72.2	2.06	3.74	433M	12/1957 --- 12/1966
	F1	52.42	104.30	41.04	174.38	72.2	2.06	3.74	433M	4/1967 -
	F2	52.47	104.30	41.04	174.38	72.2	2.06	3.74	433M	6/1953 --- 12/1960
	F3	52.47	104.30	41.04	174.38	72.2	2.06	3.74	433M	11/1957 -
ISTANBUL	A1	41.02	28.97	38.48	107.34	58.5	1.52			(7/1957)---
	A2	41.02	28.97	38.48	107.34	58.5	1.52			(7/1957)---
	C1	41.02	28.97	38.48	107.34	58.5	1.52			(7/1957)---
ITHACA	A8	42.45	283.48	53.83	350.58	73.3	3.11			(7/1957)- 4/1965
	C3	42.45	283.48	53.83	350.58	73.3	3.11			(7/1957)- 4/1965
	C6	42.45	283.48	53.83	350.58	73.3	3.11			(12/1957)-(12/1958)
	E1	42.50	283.50	53.88	350.60	73.3	3.12			(6/1957)--- 1/1968
	E3	42.50	283.50	53.88	350.60	73.3	3.12			(6/1957)---(12/1958)
	E4	42.50	283.50	53.88	350.60	73.3	3.12			(6/1957)---(12/1959)
IVALO	D1	68.60	27.48	64.71	121.94	77.4	5.55			8/1957 - 1/1959
	E1	68.60	27.42	64.72	121.89	77.4	5.56			(1/1958)- 12/1970
JAMAICA	A14	18.00	283.20	29.38	351.48	50.4	1.38			(1/1971)-
	A15	18.00	283.20	29.38	351.48	50.4	1.38			2/1970 ---
	B1	18.00	283.20	29.38	351.48	50.4	1.38			4/1962 -
	B6	18.00	283.20	29.38	351.48	50.4	1.38			(1/1965)-
	B8	18.00	283.20	29.38	351.48	50.4	1.38			10/1965 ---(12/1970)
JARVIS ISLAND	D1	-00.38	199.97	-00.58	269.07	1.0	0.98			8/1957 - 1/1959
JICAMARCA	B1	-11.95	283.14	00.55	352.31	0.9	1.04			(4/1962)-
	B3	-11.95	283.14	00.55	352.31	0.9	1.04			(6/1963)-
	D2	-11.95	283.14	00.55	352.31	0.9	1.04			
JODRELL BANK	A8	53.23	357.70	56.32	82.51	69.0	0.87			(7/1957)-(1/1959)
	C3	53.23	357.70	56.32	82.51	69.0	0.87			(7/1957)-(1/1959)
JOHANNESBURG	B1	-26.10	28.10	-26.95	91.35	-62.9	1.55			5/1946 -
	B2	-25.87	27.70	-26.65	91.02	-62.8	0.99			11/1965 -
	B7	-26.01	28.01	-26.85	91.29	-62.9	1.55			7/1957 - 12/1958
	B10	-26.17	28.08	-27.02	91.32	-63.0	1.55			1/1958 - 12/1958
	B14	-26.17	28.08	-27.02	91.32	-63.0	1.55			
JOHNSTON ATOLL	B5	16.75	190.48	14.33	256.34	30.2	1.05			
JULIACA	B1	-15.50	289.80	-04.00	358.84	-3.7	1.06			3/1959 - 5/1959
JULIANEHAAB	D1	60.72	313.97	70.82	35.52	-77.4	7.18			9/1959 --- 5/1965
	E1	60.80	314.00	70.90	35.62	77.4	7.22			(10/1957)-(11/1957)
JULIUSRUH/RUGEN	B1	54.60	13.40	54.49	98.66	69.9	2.62			4/1957 -
	B7	54.63	13.38	54.52	98.66	-70.0	2.63			8/1957 - 12/1965
JUNGFRAUJOCH	F1	46.55	07.90	47.94	89.32	63.5	1.92	4.48	3550M	10/1958
JUPITER	C6	27.02	279.88	38.28	347.36	60.0	1.71			(1/1969)-
KAGOSHIMA	B5	31.25	131.07	20.38	198.24	44.0	1.13			
KAKIOKA	D1	36.23	140.18	26.02	205.95	49.4	1.25			1/1913 -
	D2	36.23	140.18	26.02	205.95	49.4	1.25			1/(7/1957)-(12/1958)
	G	36.23	140.18	26.02	205.95	49.4	1.25			(7/1957)-(5/1964)
KAMENICE	B13	48.90	22.00	47.40	103.80	65.9	2.03			1/1968 -
KANDILLI	A1	41.07	29.07	38.51	107.45	58.5	1.52			(1/1965)-
	A2	41.07	29.07	38.51	107.45	58.5	1.52			(1/1965)-
	C1	41.07	29.07	38.51	107.45	58.5	1.52			(1/1965)-
	D1	41.07	29.07	38.52	107.45	58.5	1.52			1/1947 -
KANO	B2	11.97	08.52	14.20	80.15	3.6	0.98			9/1964 - 11/1966
KANOYA	D1	31.42	130.88	20.54	198.05	44.2	1.13			7/1957 -
	D2	31.25	130.53							1/1958 -
KANZELHOHE	A1	46.68	13.90	46.87	95.20	63.7	1.90			(7/1957)-(12/1959)
	A2	46.68	13.90	46.87	95.20	63.7	1.90			(7/1957)-(12/1959)
	A7	46.68	13.90	46.87	95.20	63.7	1.90			(7/1957)-(9/1964)
	C1	46.68	13.90	46.87	95.20	63.7	1.90			(7/1957)-(7/1966)
KARLSRUHE	A2	49.00	08.40	50.18	90.91	65.7	2.13			(7/1957)-(12/1959)
KARYSTOS	B5	38.02	24.42	36.46	102.12	54.6	1.39			
KASHIMA	B2	35.95	140.65	25.79	206.41	49.0	1.24			12/1966 -
KAUAI	B2	22.13	200.33	21.53	264.71	39.9	1.15			8/1965 -
KAZACHIE	E1	70.80	136.30	60.01	196.33	81.5	5.29			(12/1957)---(4/1959)
KAZAN	D1	55.83	48.85	49.33	130.36	72.1	0.84			1/1909 -
KEKAHA	B14	22.00	200.30	21.40	264.71	39.7	1.14			4/1958 - 8/1965
KERGUELEN	B1	-49.40	70.30	-57.39	128.05	-67.4	3.67			2/1953 -
	B8	-49.35	70.27	-57.34	128.03	-67.4	3.66			2/1962 -
	B13	-49.30	70.50	-57.33	128.32	-67.5	3.66			3/1964 -
	B14	-49.30	70.50	-57.33	128.32	-67.5	3.66			6/1957 -(3/1959)
	C6	-49.40	70.30	-57.39	128.05	-67.4	3.67			(1/1968)-
	D1	-49.35	70.20	-57.33	127.95	-67.4	3.66			10/1957 -
	D2	-49.35	70.20	-57.33	127.95	-67.4	3.66			(1/1957)-
	E1	-49.35	70.22	-57.33	127.97	-67.4	3.66			(7/1957)-(3/1959)
	F1	-49.35	70.20	-57.33	127.95	-67.4	3.66	1.19	SL	7/1957 - 1/1964
	F1	-49.35	70.20	-57.33	127.95	-67.4	3.66	1.19	SL	2/1964 -
	F3	-49.35	70.20	-57.33	127.95	-67.4	3.66	1.19	SL	7/1957 - 6/1962
	G	-49.35	70.22	-57.33	127.97	-67.4	3.66			1/1964 -

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
KERMADEC	B1	-29.20	182.10	-32.31	257.72	-53.3	1.41			4/1943 ---
KEVO	B8	69.75	26.48	65.89	122.49	-77.8	6.08			1/1970
KHABAROVSK	B1	48.50	135.10	37.83	200.03	63.9	1.72			(10/1961)-
	B14	48.52	135.12	37.85	200.05	63.9	1.72			(12/1958)-(12/1965)
KHARKOV	B10	49.43	36.92	45.14	117.55	66.9	2.00			(8/1957)-(1/1960)
	C1	49.43	36.92	45.14	117.55	66.9	2.00			(7/1967)-
KHEYSA IS	B5	80.62	58.05	71.31	156.06	83.9	14.13			
KIEL	C3	54.30	10.10	54.86	95.36	69.7	2.62			5/1967 -
	F1	54.33	10.10	54.89	95.38	69.7	2.63	2.29	54M	7/1957 - 12/1964
	F1	54.33	10.10	54.89	95.38	69.7	2.63	2.29	54M	9/1964 -
	F3	54.33	10.10	54.89	95.38	69.7	2.63	2.29	54M	7/1957 -
KIEV	A6	50.45	30.50	47.28	112.23	67.4	2.11			(1/1964)---
	A8	50.45	30.50	47.28	112.17	67.4	2.11			(7/1964)---
	B14	50.45	30.50	47.28	112.23	67.4	2.11			(8/1960)-(12/1965)
	C1	50.45	30.50	47.28	112.23	67.4	2.11			(7/1957)-
	C3	50.45	30.50	47.28	112.23	67.4	2.11			(7/1964)---
	D1	50.72	30.30	47.57	112.17	67.6	0.86			7/1958 -
	D2	50.72	30.30	47.57	112.17	67.6	0.86			5/1959 -
	F1	50.72	30.30	47.57	112.17	67.6	2.13			11/1969 -
KING SALMON	B8	58.38	203.39	57.01	254.19	70.6	3.24			9/1957 - 12/1958
KINSHASA-BINZA	B1	-04.50	15.20	-03.16	83.44	-34.7	1.07			2/1952 -
	D1	-04.27	15.37	-03.06	83.63	-34.4	0.99			1/1953 -
KIRUNA	B1	67.80	20.40	65.24	115.56	76.8	5.44			3/1949 ---
	B5	67.90	20.50	65.31	115.76	76.9	5.47			
	B8	67.80	20.40	65.24	115.56	76.8	5.44			6/1958 -
	C6	67.80	20.40	65.24	115.56	76.8	5.44			(1/1957)-
	C8	67.80	20.40	65.24	115.56	76.8	5.44			(6/1958)-
	C9	67.80	20.40	65.24	115.56	76.8	5.44			3/1949 ---
	D1	67.83	20.42	65.26	115.61	76.9	5.45			7/1950 -
	D2	67.83	20.42	65.26	115.61	76.9	5.45			(7/1957)-
	E1	67.90	20.50	65.31	115.76	76.9	5.47			(3/1957)---
	F1	67.83	20.40	65.27	115.60	76.9	5.45	0.54	390M	1/1970 -
	F3	67.83	20.40	65.27	115.60	76.9	5.45	0.54	390M	11/1956 --- 8/1968
KISLOVODSK	A2	43.73	42.52	38.65	120.60	62.0	1.64			(1/1957)---(9/1962)
	A3	43.73	42.52	38.65	120.60	62.0	1.64			(1/1964)-
	A6	43.73	42.52	38.65	120.60	62.0	1.64			(1/1964)-
	A7	43.73	42.52	38.65	120.60	62.0	1.64			(7/1957)-
	A8	43.73	42.52	38.65	120.60	62.0	1.64			(7/1957)---
	C3	43.73	42.52	38.65	120.60	62.0	1.64			(7/1957)---
KJELLER	A8	60.22	10.75	60.24	100.03	73.2	3.54			(7/1967)-
	B1	60.00	11.10	59.97	100.18	73.1	3.49			4/1942 --- 1/1959
	B7	60.00	11.10	59.97	100.18	73.1	3.49			7/1957 - 1/1959
	C3	60.22	10.75	60.24	100.03	73.2	3.54			(7/1967)-
KNOB LAKE	B12	54.80	293.18	66.29	03.13	79.0	6.27			(3/1958)-(7/1958)
	B13	54.80	293.18	66.29	03.13	79.0	6.27			5/1958 - 2/1966
	E1	54.80	293.18	66.29	03.13	79.0	6.27			(6/1958)---(5/1966)
KODAIKANAL	A2	10.20	77.50	00.57	147.10	2.5	0.92			(7/1957)-
	A4	10.20	77.50	00.57	147.10	2.5	0.92			(7/1957)-(12/1959)
	A6	10.20	77.50	00.57	147.10	2.5	0.92			(7/1957)-
	A8	10.20	77.50	00.57	147.10	2.5	0.92			(1/1966)---(7/1967)
	B1	10.20	77.50	00.57	147.10	2.5	0.92			7/1952 ---
	C1	10.20	77.50	00.57	147.10	2.5	0.92			(7/1957)-
	C3	10.20	77.50	00.57	147.10	2.5	0.92			(1/1966)---(7/1967)
	D1	10.23	77.47	00.60	147.07	2.6	0.92			1/1902 ---
	F1	10.23	77.40	00.61	147.00	2.6	0.92	17.47	2443M	7/1957 - 6/1964
	F3	10.23	77.40	00.61	147.00	2.6	0.92	17.47	2443M	7/1957 - 12/1963
KOENJI	F2	35.71	139.60	25.46	205.50	48.8	1.23	11.58	SL	5/1959 ---
	F3	35.71	139.60	25.46	205.50	48.8	1.23	11.58	SL	10/1956 ---
KOLBERG	B9	52.23	13.82	52.17	97.74	68.3	2.36			1/1964 - 12/1965
KONTAGORA	D1	10.40	05.45	13.27	76.97	0.1	0.98			12/1964 -
KOOTWIJK	B10	55.15	05.83	56.51	91.77	70.2	2.78			(7/1957)-(12/1958)
KOROR	D1	07.33	134.50	-03.23	203.54	-0.8	0.92			7/1957 --- 3/1966
	D2	07.33	134.50	-03.28	203.54	-0.8	0.92			7/1957 --- 12/1958
KOTELNY IS	E1	76.00	137.90	65.20	195.13	84.5	8.09			(12/1958)-(2/1959)
KOTZEBUE	B13	66.88	197.40	63.68	242.10	76.1	5.17			11/1957 -(12/1958)
	D1	66.88	197.40	63.68	242.10	76.1	5.17			7/1957 - 12/1958
	D2	66.90	197.50	63.71	242.16	76.1	5.17			
	E1	66.90	197.50	63.71	242.16	76.1	5.17			(8/1957)---
	E4	66.90	197.50	63.71	242.16	76.1	5.17			(8/1957)-
KOUROU	B5	05.00	307.00	16.04	16.60	28.5	1.16			
KRAKOW	A8	50.05	19.95	48.90	102.41	68.8	2.13			(10/1957)-(3/1960)
	C3	50.05	19.95	48.90	102.41	66.8	2.13			(10/1957)-(3/1960)
KRISTINEBERG	E1	65.10	18.60	63.17	111.25	75.6	4.56			(8/1957)---(4/1959)
KRONOGARD	B5	66.22	19.78	69.95	113.95	76.2	4.89			
KSARA	D1	33.82	35.88	30.19	111.73	49.7	1.25			10/1930 -
KUHLUNGSBORN	B9	55.00	12.70	55.01	98.24	70.2	2.68			(7/1957)-
	B10	53.40	12.60	53.52	97.22	69.1	2.49			(7/1957)-
	B12	54.12	11.77	54.36	96.84	69.6	2.58			(7/1957)-
	B13	54.12	11.77	54.36	96.84	69.6	2.58			(7/1957)-
	B14	54.12	11.77	54.36	96.84	69.6	2.58			(7/1957)-
	C6	54.12	11.77	54.36	96.84	69.6	2.58			(7/1957)-
	E2	54.12	11.77	54.36	96.84	69.9	2.58			
	F1	54.12	11.70	54.38	96.78	69.6	2.58	2.43	70M	1/1964 - 12/1967
	F2	54.12	11.70	54.38	96.78	69.6	2.58	2.43	70M	1/1957 - 12/1967
	F3	54.12	11.70	54.38	96.78	69.6	2.58	2.43	70M	7/1957 - 12/1967
KULA	F1	20.73	203.60	20.81	268.22	38.7	1.13	13.30	915M	7/1966 -
	F3	20.73	203.60	20.81	268.22	38.7	1.13	13.30	930M	7/1966 -
KURE	C6	28.22	182.63	24.08	246.34	42.7	0.95			(2/1969)-
KUYPER	D1	-06.03	106.73	-17.50	175.55	-32.8	1.00			7/1899 - 12/1961
LAE	D2	-06.73	147.00	-15.96	217.38	-28.1	1.02			
	F1	-06.73	147.00	-15.96	217.38	-28.1	1.02	15.52	SL	7/1957 ---
	F3	-06.73	147.00	-15.96	217.38	-28.1	1.02	15.52	SL	7/1957 ---

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
LAKE TRAVERSE	E1	45.96	281.95	57.28	348.33	75.7	3.73			(4/1966)---
LA PAZ	B1	-16.50	291.90	-05.00	00.87	-5.2	1.06			10/1957 ---
LA QUIACA	B1	-22.10	294.40	-10.62	03.20	-14.7	1.07			6/1958 - 1/1959
	D1	-22.10	294.40	-10.62	03.20	-14.7	1.07			1/1920 ---
LAS ACACIAS	O1	-35.00	302.32	-23.70	10.11	-32.9	1.21			1/1964 -
LATROBE	C6	40.30	280.62	51.57	347.23	71.8	2.80			(4/1966)---
LAUDER	B13	-45.05	169.67	-50.06	250.06	-70.4	2.65			(1/1962)-
	E1	-45.05	169.67	-50.06	250.06	-70.4	2.65			(12/1969)---
LEADVILLE	D1	39.28	253.72	48.00	315.51	67.4	2.24			7/1957 - 1/1959
LEEDS	F1	53.82	358.40	56.74	83.57	69.4	2.72	2.20	100M	1/1955 --- 12/1966
	F1	53.82	358.40	56.74	83.57	69.4	2.72	2.20	70M	1/1965 -
LEIRVOGUR	B8	64.18	338.30	70.22	71.04	76.0	6.23			3/1966 -
	D1	64.18	338.30	70.22	71.04	76.0	6.23			8/1957 -
	D2	64.18	338.30	70.22	71.04	76.0	6.23			8/1957 -
LENINGRAD	B1	60.00	30.70	56.29	117.38	73.5	0.85			1/1939 ---
	D1	59.95	30.70	26.24	117.34	73.5	3.23			1/1947 -
LERWICK	D1	60.13	358.82	62.53	88.59	73.2	3.79			1/1923 -
	D2	60.13	358.82	62.53	88.59	73.2	3.79			(1/1964)-(12/1965)
	F1	60.13	358.82	62.53	88.59	73.2	3.79		83M	1/1965 - 1/1967
LIMA	B2	-11.77	282.83	-00.38	352.00	1.1	1.04			11/1966 -
	B11	-11.77	282.83	-00.38	352.00	1.1	1.04			1/1966 -
LIMEIL	F1	48.73	02.40	21.12	84.85	65.4	2.16	3.64		2/1959 - 11/1960
	F3	48.73	02.40	51.12	84.85	68.4	2.16	3.64		11/1957 - 12/1960
LINCOLN	F1	40.82	263.30	50.73	326.24	70.6	2.59	2.22	350M	5/1957 - 5/1962
	F3	40.82	263.30	50.73	326.24	70.6	2.59	2.22	350M	5/1957 - 5/1962
LINDAU	A14	51.65	10.13	52.36	93.91	67.8	2.34			4/1964---
	B1	51.60	10.10	52.31	93.86	67.8	2.33			12/1947 -
	B4	51.65	10.13	52.36	93.91	67.8	2.34			(10/1970)-
	B6	51.60	10.10	52.31	93.86	67.8	2.34			10/1964-
	B7	51.65	10.13	52.36	93.91	67.8	2.34			9/1957 - 12/1959
	B9	51.65	10.13	52.36	93.91	67.8	2.34			9/1957 -
	B11	51.65	10.13	52.36	93.91	67.8	2.34			
	B12	51.65	10.13	52.36	93.91	67.8	2.34			
	C6	51.65	10.13	52.36	93.91	67.8	2.34			(7/1957)-(9/1961)
	E1	51.65	10.13	52.36	93.91	67.8	2.34			
	F1	51.60	10.10	52.31	93.86	67.8	2.33	3.00	140M	5/1959 -
	F1	51.60	10.10	52.31	93.86	67.8	2.33	3.00	140M	11/1964 -
	F3	51.60	10.10	52.31	93.86	67.8	2.33	3.00	140M	5/1959 ---
	G	51.65	10.13	52.36	93.91	67.8	2.33			9/1969 -
LISBON	F3	38.73	350.80	43.74	68.93	55.3	1.53	6.65	103M	1/1958 - 4/1961
LITTLE AMERICA	B1	-78.20	197.80	-74.04	312.02	-79.2	12.71			7/1957 - 12/1958
	C9	-78.20	197.80	-74.05	312.02	-79.2	12.71			7/1957 - 12/1958
	D1	-78.18	197.80	-74.03	311.97	-79.2	12.70			7/1957 - 12/1958
	E1	-78.20	197.80	-74.05	312.00	-79.2	12.71			3/1957 --- 9/1958
	E3	-78.20	197.80	-74.05	312.00	-79.2	12.71			3/1957 --- 9/1958
LITTLETON	C6	60.10	358.80	62.50	88.54	73.2	3.79			(7/1967)-
L-AQUILA	D1	42.38	13.32	42.86	92.94	59.4	1.61			5/1958 -
LJUBLJANA	A2	46.03	13.18	46.39	94.23	63.1	1.85			(7/1957)-(12/1959)
LOCARNO	A2	46.17	08.80	47.40	90.04	63.2	1.88			(7/1957)-(7/1962)
	A6	46.17	08.80	47.40	90.04	63.2	1.88			(1/1964)-(7/1966)
	C1	46.17	08.80	47.40	90.04	63.2	1.88			(5/1968)-
LOCKHEED	A6	33.93	241.62	40.89	303.58	59.8	1.69			1/1959 -
	C1	33.93	241.62	40.89	303.58	59.8	1.69			1/1959 -
	C6	33.93	241.62	40.89	303.58	59.8	1.69			7/1958 - 2/1961
LOGAN	B13	41.67	248.33	49.55	308.70	68.5	2.36			(9/1961)-
LOGRONO	D1	42.45	357.50	46.06	77.20	59.3	0.88			7/1957 -
LOMNICKY STIT	A7	49.20	20.22	48.04	102.28	66.1	2.06			(7/1965)-
	F1	49.20	20.20	48.04	102.26	66.1	2.06	4.00	2634M	1/1958 ---
	F3	49.20	20.20	49.04	102.26	66.1	2.06	4.00	2634M	1/1968 - 8/1967
	G	49.60	20.22	48.42	102.46	66.4	2.09			(7/1957)-(12/1959)
LONDON	F1	51.53	359.90	54.28	83.77	67.7	2.43	2.73	45M	7/1960 --- 5/1965
	F3	51.53	359.90	54.28	83.77	67.7	2.43	2.73	45M	7/1957 - 6/1959
LONGYEARBYEN	B1	78.20	15.70	74.36	130.94	85.4	169.92			6/1956 - 8/1959
	C9	78.20	15.70	74.36	130.94	85.4	169.92			6/1956 - 8/1959
LOPARSKAYA	E1	68.25	33.08	63.47	125.78	77.5	5.29			
	G	68.25	33.08	63.47	125.78	77.5	5.29			10/1957 ---(12/1965)
LORING AFB	D1	46.95	292.12	58.45	01.46	75.1	3.84			10/1966 -
LOURENCO MARQUES	D1	-25.92	32.58	-27.67	95.82	-62.4	1.55			1/1957 -
LOVO	D1	59.35	17.83	58.06	105.78	72.8	3.26			1/1928 -
LOVOZERO	D1	67.97	35.02	62.91	126.96	77.4	5.15			
	D2	67.97	35.02	62.91	126.96	77.4	5.15			8/1957 -
LOWER HUTT	B10	-41.23	174.92	-45.38	254.09	-66.4	2.15			(7/1957)-(12/1958)
LUANDA	D1	-08.92	13.17	-07.19	80.56	-42.8	1.13			1/1956 -
LULEA	B1	65.60	22.10	62.98	114.63	75.9	4.64			9/1947 -
LUNPING	A1	25.18	121.17	13.85	189.47	35.2	1.03			6/1967 -
	A2	25.18	121.17	13.85	189.47	35.2	1.03			6/1967 -
	D1	25.00	121.17	13.67	189.48	34.8	1.03			7/1965 -
LVOV	C1	49.82	24.02	47.89	106.07	66.7	2.09			(4/1964)---(4/1967)
	D1	49.90	23.75	42.02	105.86	66.8	2.09			7/1929 -
LWIRO	B1	-02.30	28.80	-03.81	97.19	-29.4	1.55			2/1952 - 8/1967
	B7	-02.30	28.80	-03.81	97.19	-29.4	1.55			1/1959 - 12/1959
	C3	-02.25	28.60	-03.72	97.00	-29.3	0.98			(7/1957)-(5/1959)
	D1	-02.25	28.80	-03.76	97.20	-29.3	1.03			7/1958 -
	G	-02.25	28.80	-03.76	97.20	-29.3	1.03			12/1957 - 12/1959
LYCKSELE	B1	64.70	18.80	62.77	111.03	75.5	4.44			3/1957 -
	D1	64.70	18.80	62.77	111.03	75.5	4.44			
	E1	64.70	18.80	62.77	111.03	75.5	4.44			(9/1957)---(4/1959)
MACAU	A8	22.20	113.55	10.71	182.40	29.7	0.98			5/1958 - 3/1960
	B1	22.20	113.60	10.71	182.45	29.7	0.99			5/1958 - 6/1961
	B14	22.20	113.55	10.71	182.40	29.7	0.98			(4/1959)-(8/1959)
	C3	22.20	113.55	10.71	182.40	29.7	0.98			5/1958 - 3/1960
	F3	22.22	113.60	10.73	182.45	29.8	0.99	16.28	65M	7/1959 - 10/1964

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
MACQUARIE IS	B1	-54.50	150.00	-61.07	243.15	-79.0	5.31			5/1950 - 11/1958
	B8	-54.50	150.00	-61.07	243.15	79.0	5.31			1/1968 -
	B13	-54.50	158.90	-61.09	243.04	-79.1	5.32			7/1957 - 12/1970
	D1	-54.50	158.95	-61.08	243.09	-79.1	5.32			1/1951 -
	D2	-54.50	158.95	-61.08	243.09	-79.1	5.32			1/1967 -
	E1	-54.50	159.00	-61.07	243.15	-79.0	5.31			(3/1958)---
	F3	-54.50	159.00	-61.07	243.15	-79.0	5.31	0.55	SL	7/1957 - 6/1963
MADISON	B11	43.00	271.00	53.64	335.04	73.4	3.06			1/1961 -
MADRAS	B1	13.10	80.30	03.16	150.13	9.3	0.91			9/1945 -
MADRID	A2	40.40	356.32	44.31	75.23	57.0	1.58			(7/1957)---(3/1959)
MAJURO	D1	07.08	171.38	01.32	239.65	5.7	0.97			9/1964 - 2/1966
MAKATEA	B8	-54.50	159.00	-61.07	243.15					
	G	-16.20	211.98	-13.71	283.99	-27.3	1.05			(5/1963)-(12/1965)
MAKERERE	D2	00.33	32.50	-01.95	101.34	-22.9	0.97			
	F1	00.33	32.50	-01.95	101.34	-22.9	0.97	14.98	1196M	1/1958 ---
	F3	00.33	32.50	-01.95	101.34	-22.9	0.97	14.98	1196M	2/1965 --- 10/1969
MALVERN	B3	52.12	357.68	55.28	81.84	68.2	2.52			(3/1966)-
MANHAY	D1	50.30	05.68	51.96	88.89	66.7	2.25			1/1932 -
MANILA	A1	14.70	121.10	03.37	189.78	14.5	0.94			(7/1957)-
	A2	14.70	121.10	03.37	189.78	14.5	0.94			6/1963 -
	A6	14.70	121.10	03.37	189.78	14.5	0.94			(1/1964)-
	A8	14.70	121.10	03.37	189.78	14.5	0.94			3/1962 -
	B1	14.70	121.10	03.37	189.78	14.5	0.92			1/1964 -
	B8	14.70	121.10	03.37	189.78	14.5	0.94			4/1963 -
	C1	14.70	121.10	03.37	189.78	14.5	0.94			5/1963 -
	C3	14.70	121.10	03.37	189.78	14.5	0.94			3/1962 -
	C6	14.70	121.10	03.37	189.78	14.5	0.94			2/1962 -
	D2	14.70	121.10	03.37	189.78	14.5	0.94			
MARCUS	C5	26.51	128.15	15.48	195.89	36.9	1.05			(5/1968)-
	C6	26.51	128.15	15.48	195.89	36.9	1.05			(5/1968)-
MARION IS	B1	-46.80	37.90	-48.94	94.34	-63.3	2.69			7/1957 - 5/1958
MAR CHIQUITA	B5	-37.77	302.58	-26.48	10.21	-35.8	4.89			
MARUYAMA	G	35.02	139.97	24.80	205.91	47.9	1.22			(7/1957)-(2/1964)
MAUI	B1	20.80	203.50	20.86	268.11	38.8	1.13			7/1944 -
	B8	20.80	203.50	20.86	268.11	38.8	1.13			11/1962 - 11/1965
	C6	20.83	203.30	20.85	267.91	38.8	1.13			(1/1964)---
	D2	21.71	203.74							7/1957 -
MAUNA LOA	A7	19.51	204.42	19.78	269.30	37.3	1.12			12/1965 -
MAWSON	B1	-67.60	62.90	-73.08	102.92	-68.8	8.67			2/1958 ---
	B8	-67.60	62.90	-73.08	102.92	-68.8	8.67			
	C8	-67.60	62.90	-73.08	102.92	-68.8	8.67			
	C9	-67.60	62.90	-73.08	102.92	-68.8	8.67			2/1958 ---
	D1	-67.60	62.88	-73.08	102.90	-68.8	8.67			7/1955 -
	D2	-67.60	62.88	-73.08	102.90	-68.8	8.67			1/1967 ---
	E1	-67.60	62.90	-73.08	102.92	-68.8	8.67			(7/1957)---
	F1	-67.60	62.80	-73.06	102.81	-68.8	8.65	0.22	SL	4/1957 -
	F3	-67.60	62.80	-73.06	102.81	-68.8	8.65	0.22	SL	5/1955 -
MAYNARD	B1	42.43	288.55	53.93	358.43	72.7	3.08			10/1970 -
	B4	42.43	288.55	53.93	358.43	72.7	3.08			7/1964 -
	B7	42.43	288.55	53.93	358.43	72.7	3.08			10/1970 -
MCMATH-HULBERT	A1	42.67	276.70	53.73	342.12	73.5	3.10			7/1937 --
	A5	42.67	276.70	53.73	342.12	73.5	3.10			1/1945 -
	A6	42.67	276.70	53.73	342.12	73.5	3.10			2/1958 -
	C1	42.67	276.70	53.73	342.12	73.5	3.10			2/1958 -
	C3	42.67	276.70	53.73	342.12	73.5	3.10			(7/1957)-
	C6	42.67	276.70	53.73	342.12	73.5	3.10			(1/1955)-
MCMURDO	B8	-77.85	166.70	-79.00	294.35	-82.2	32.47			2/1962 -
	C8	-77.85	166.70	-79.00	294.35	-82.2	32.47			2/1962 -
	D1	-77.85	166.70	-79.00	294.35	-82.2	32.47			3/1966 -
	D2	-77.85	166.70	-79.00	294.35	-82.2	32.47			
	F1	-77.85	166.70	-79.00	294.35	-82.3	32.74	0.01	48M	5/1960 - 6/1964
	F1	-77.85	166.70	-79.00	294.35	-82.3	32.74	0.01	48M	7/1964 -
	F3	-77.85	166.70	-79.00	294.35	-82.3	32.74	0.01	48M	1/1964 -
	G	-77.85	166.70	-79.00	294.35	-82.3	32.74			2/1967 -
MEANOOK	B1	54.60	246.70	61.81	301.07	77.8	4.66			7/1957 - 1/1959
	B8	54.60	246.70	61.81	301.07	77.8	4.66			3/1958 - 12/1959
	B12	54.62	246.67	61.83	301.02	77.8	4.67			(5/1958)-(12/1958)
	D1	54.62	246.67	61.83	301.02	77.8	4.67			1/1916 -
	D2	54.62	246.67	61.83	301.02	77.8	4.67			
	E1	54.62	246.67	61.83	301.02	77.8	4.67			(8-1957)-(11/1970)
	E3	54.62	246.67	61.83	301.02	77.8	4.67			(8/1957)-(12/1959)
MELBOURNE	B8	-37.45	144.60	-46.69	219.83	-68.5	2.21			3/1967 -
	E1	-37.90	145.10	-47.07	220.51	-68.8	2.25			(7/1957)---(7/1958)
MELVILLE AFB	D1	53.28	299.47	64.61	11.85	76.9	5.25			11/1966 -
MEMAMBETSU	D1	43.90	144.20	34.01	208.42	57.5	1.05			7/1950 -
	D2	43.58	144.20	33.69	208.47	57.2	1.48			(7/1957)-
	G	43.58	144.20	33.69	208.47	57.2	1.48			(8/1957)-
MEMPHIS	C6	35.00	270.00							
MEUDON	A5	49.33	02.50	51.67	02.50	65.9	2.20			(7/1957)-(12/1957)
	A6	49.33	02.50	51.67	02.50	65.9	2.20			(7/1957)-
	C1	49.33	02.50	51.67	02.50	65.9	2.20			(7/1957)---
MEXICO CITY	B1	19.40	260.30	29.16	326.54	46.3	0.89			3/1958 -
	F1	19.33	260.80	29.14	327.08	46.4	1.28	9.53	2268P	7/1957 -
	F2	19.33	260.82	29.14	327.08	46.4	1.28	9.53	2268M	7/1957 -
MIDWAY	D1	28.22	182.63	24.08	246.34	42.7	1.15			5/1964 - 1/1966
MIEDZESZYN	B1	52.20	21.20	50.70	104.60	68.5	2.31			7/1958 -
MILLSTONE HILL	B1	42.60	288.50	54.09	356.86	72.9	3.12			4/1963 ---
	B3	42.60	288.50	54.09	356.86	72.9	3.12			(4/1960)-
MINA AGUILAR	F1	-23.10	294.30	-11.62	03.10	-16.3	1.09	12.51	4000M	7/1957 -
MINSK	D1	54.10	26.52	51.49	110.38	69.9	2.47			1/1961 -
MIRNY	B1	-66.50	93.00	-76.97	146.87	-76.5	19.64			2/1957 -
	B7	-66.55	93.02	-77.02	146.84	-76.5	19.81			1/1966 -
	B8	-66.55	93.02	-77.02	146.84	-73.5	19.81			3/1961 -
	C9	-66.50	93.00	-76.97	146.87	-76.5	19.64			2/1957 -
	D1	-66.55	93.02	-77.02	146.84	-76.5	19.81			7/1956 -
	D2	-66.55	93.02	-77.02	146.84	-76.5	19.81			(8/1957)-(12/1958)
	E1	-66.55	93.02	-77.02	146.84	-76.5	19.81			(3/1957)---(10/1958)
	F1	-66.55	93.00	-77.02	146.81	-76.5	19.79	0.04	22M	4/1958 -
	F2	-66.55	93.00	-77.02	146.81	-76.5	19.79	0.04	22M	7/1957 - 1/1967
	G	-66.55	93.00	-77.02	146.81	-76.5	19.79			(3/1958)-(10/1958)

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
MISALLAT	D1	29.52	30.90	26.94	105.94	42.5	1.15			1/1960 -
MISENO	B13	40.80	15.10	40.98	94.10	57.6	1.52			2/1960 - 3/1963
MOCA	D1	03.35	08.67	05.73	78.57	-17.3	1.00			10/1958 -
	D2	03.35	08.67	05.73	78.57	-17.3	1.00			(1/1964)---
MOISIE	B13	50.18	293.90	61.66	03.91	76.6	4.57			7/1960 - 12/1963
MONTE DEI CAPPUC	F3	45.05	07.75	46.54	88.54	62.1	1.80			10/1967 -
MONTEVIDEO	B4	-35.00	304.00	-23.76	11.62	-33.2	1.21			9/1963 -
MONTREAL	C3	45.50	286.40	49.79	83.99	75.1	3.63			(9/1957)---(4/1959)
MONT JOLI	B13	48.60	291.80	60.10	01.06	76.1	4.22			2/1958 -3/1960
MOOSE RIVER	B11	51.00	279.00	62.16	343.73	-79.0	5.07			10/1963
MOOSONEE	B8	51.50	279.33	62.68	344.08	79.3	5.24			9/1963 -
	E1	51.50	279.33	62.68	334.08	79.3	5.24			1/1968 -
MOSCOW	A8	55.47	37.32	50.85	120.49	71.2	2.56			(7/1957)---
	B1	55.50	37.30	50.89	120.49	71.2	2.56			3/1944 ---
	B7	55.47	37.32	50.85	120.49	71.2	2.56			7/1957 - 12/1958
	B10	55.47	37.32	50.85	120.49	71.2	2.56			(7/1957)---(12/1965)
	B13	55.47	37.32	50.85	120.49	71.2	2.56			(2/1958)-(12/1960)
	B14	55.47	37.32	50.85	120.49	71.2	2.56			(3/1958)-(12/1964)
	C1	55.47	37.32	50.85	120.49	71.2	2.56			(7/1957)-(1/1965)
	C2	55.47	37.32	50.85	120.49	71.2	2.56			(2/1964)---
	C3	55.47	37.32	50.85	120.49	71.2	2.56			(7/1957)---
	D1	55.48	37.32	50.86	120.50	71.2	2.56			7/1919 -
	F1	55.47	37.30	50.86	120.47	71.2	2.56	2.46	200M	7/1957 --- 6/1966
	F1	55.47	37.30	50.86	120.47	71.2	2.56	2.46	200M	2/1966 ---
	F2	55.47	37.30	50.86	120.47	71.2	2.56	2.46	200M	1/1952 ---
	F3	55.47	37.30	50.86	120.47	71.2	2.56	2.46	200M	6/1957 ---
MOSCOW UNIVERSIT	F3	55.47	37.32	50.85	120.49	71.2	2.56	2.46	200M	6/1957 - 7/1966
MOSHIRI	B13	44.37	142.27	34.29	206.69	58.3	1.52			11/1962 -
MOULD BAY	D1	76.20	242.60	79.10	256.35	87.4	34.47			1/1962 -
	E1	76.30	240.60	79.16	255.92	87.4	38.05			(10/1965)-(4/1966)
MOUNT KOBAU	E1	49.11	119.50	37.71	187.03	67.3	1.78			(1/1967)-
MOUSSALLA	F1	42.18	25.58	40.25	104.56	59.6	1.58		2925M	3/1964 -
M BOUR	D1	21.30	55.00	14.60	127.04	29.5	1.01			(7/1957)-
MT ABU	G	24.60	72.70	15.41	144.23	35.3	1.02			(11/1957)---
MT NORIKURA	A7	36.10	137.55	25.69	203.58	49.7	1.24			(7/1957)-
	A7	36.10	137.55	25.69	203.58	49.7	1.24			(1/1964)-
	F1	36.12	137.50	25.69	203.58	49.7	1.24	11.39	2770M	11/1956 - 8/1968
	F1	36.12	137.50	25.69	203.58	49.7	1.24	11.39	2770M	9/1968 -
	F2	36.12	137.50	25.69	203.58	49.7	1.24	11.39	2770M	8/1955 -
	F3	36.12	137.50	25.69	203.58	49.7	1.24	11.39	2770M	12/1968 -
MT WASHINGTON	F1	44.30	288.70	55.79	357.07	74.0	3.39	1.24	1900M	7/1954 -
MT WELLINGTON	F1	-42.92	147.20	-51.73	224.29	-72.7	2.85	1.89	725M	7/1956 - 1/1967
MT WILSON	A1	34.23	241.91	41.24	303.86	60.1	1.71			(1/1957)-
	C2	34.23	241.94	41.24	303.84	60.1	1.71			(2/1964)---
	D1	34.23	241.94	41.24	303.86	60.1	1.71			7/1926 - 6/1958
MUNDARING	B1	-32.00	116.20	-43.45	186.08	-66.6	1.88			(7/1957)-
	D1	-30.32	115.88	-41.77	185.65	-65.0	1.76			
	D2	-32.00	116.20	-43.45	186.08	-66.6	1.88			
MUNICH	F1	48.20	11.60	48.78	93.65	65.1	2.06	4.14	500M	1/1957 --- 1/1970
MUNTINLUPA	D1	14.37	121.02	03.04	189.72	13.8	0.94			7/1888 ---
MUOSTAKH	E1	71.60	130.10	60.50	192.11	82.8	5.63			(2/1958)---(4/1960)
MURCHISON BAY	D1	80.05	18.25	75.20	137.48	82.0	17.45			8/1957 - 7/1959
	E1	80.10	18.30	75.23	137.66	82.1	17.54			(9/1957)-(3/1958)
	F1	80.05	18.20	75.21	137.46	82.0	17.46	0.06	SL	8/1957 - 4/1959
	F3	80.05	18.20	75.21	137.46	82.0	17.46	0.06	SL	8/1957 - 4/1959
MURMANSK	B1	69.00	33.00	64.16	126.47	77.8	6.32			7/1957 -
	B7	68.95	33.05	64.10	126.46	77.8	5.56			1/1959 -
	B8	68.97	33.08	64.12	126.50	77.8	5.57			6/1964 -
	B10	68.95	33.05	64.10	126.46	77.8	6.32			11/1958 ---1/1966
	B14	68.97	33.08	64.12	126.50	77.8	5.57			(5/1959)-(12/1965)
	D1	68.25	33.08	63.47	125.78	77.5	5.29			7/1957 -
	E1	68.97	33.08	64.12	126.50	77.8	5.57			(9/1957)---(12/1963)
	F1	68.97	33.00	64.13	126.44	77.8	5.57	0.50	90M	12/1958 - 12/1961
NAGYCENK	B9	47.63	16.72	47.22	98.30	64.7	1.98			1/1967 -
	D1	47.63	16.72	47.22	98.30	64.7	1.98			1/1961 -
	D2	47.63	16.72	47.22	98.30	64.7	1.98			
NAINITAL	G	29.40	79.45	19.45	151.09					(1/1965)-
NAIROBI	B1	-01.30	36.80	-04.39	105.25	-25.6	1.01			2/1952 -
	B6	-01.30	36.80	-04.39	105.25	-25.6	1.01			(10/1964)-
	B10	-01.30	36.80	-04.39	105.25	-25.6	1.01			
	B11	-01.30	36.80	-04.39	105.25	-25.6	1.01			
	B12	-01.30	36.80	-04.39	105.25	-25.6	1.01			
	D1	-01.32	36.82	-04.41	105.26	-25.6	1.01			9/1969 ---
NANCAY	A8	44.40	02.20	47.01	82.74	61.4	1.78			2/1964 -
	A10	44.40	02.20	47.01	82.74	61.4	1.78			(1/1958)-
	C3	44.40	02.20	47.01	82.74	61.4	1.78			(7/1957)---
NANTUCKET ISLAND	C6	41.27	289.90	52.77	358.63	71.9	2.92			(1/1958)-
NARSSARSSUAQ	B1	61.20	314.60	71.21	36.79	77.5	7.38			(2/1969)-
	B6	61.20	314.60	71.21	36.79	77.5	7.38			12/1950 -
	B8	61.20	314.60	71.21	36.79	77.5	7.38			
	B12	61.20	314.60	71.21	36.79	77.5	7.38			11/1966 -
	B13	61.20	314.60	71.21	36.79	77.5	7.38			8/1969 -
	C8	61.20	314.60	71.21	36.79	77.5	7.38			1/1963 -(12/1964)
	C9	61.20	314.60	71.21	36.79	77.5	7.38			
	E1	61.20	315.00	71.17	37.37	77.4	7.32			12/1950 -
NARYAN MAR	E1	67.60	53.10	59.95	139.86	78.5	4.79			
NATAL	B1	-05.70	324.80	03.87	33.70	-6.6	1.05			(10/1958)-(4/1959)
	B5	-05.70	324.80	03.87	33.70	-6.6	1.05			8/1957 -
NEDERHORST DEN	A8	52.27	05.00	52.27	89.26	68.2	2.45			
	B10	52.23	05.08	53.91	89.32	68.2	2.45			(7/1957)-
	C1	52.27	05.00	53.96	89.26	68.2	2.45			7/1957 - 12/1958
	C3	52.27	05.00	53.96	89.26	68.2	2.45			(8/1957)---
	F1	52.27	05.00	53.96	89.26	68.2	2.45	2.76	-2M	(7/1957)-
	F1	52.27	05.00	53.96	89.26	68.2	2.45	2.76	-2M	2/1959 - 1/1965
										2/1967 -

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
NEUSTRELITZ	A8	53.28	13.08	53.31	97.61	69.0	2.48			1/1960 -
	B8	53.28	13.01	53.33	97.54	69.0	2.48			2/1959 -
	B9	53.90	11.60	54.19	96.55	69.5	2.56			1/1964 -
	B13	53.28	13.08	53.31	97.61	69.0	2.48			6/1968 -
	C3	53.28	13.08	53.31	97.61	69.0	2.48			1/1960 -
	C6	53.28	13.08	53.31	97.61	69.0	2.48			(7/1957)-
NEWPORT	D1	48.26	243.01	55.09	300.20	72.6	3.06			3/1966 -
	D2	48.26	243.01	55.09	300.20	72.6	3.06			
NICOSIA	B14	35.17	33.28	31.99	109.65	51.4	1.29			(7/1957)-(11/1957)
NIEMEGK	D1	52.07	12.68	52.25	96.57	68.2	2.36			7/1890 -
	D2	52.07	12.68	52.25	96.57	68.2	2.36			
NIIGATA	G	37.70	138.82	27.37	204.57	51.4	1.28			(7/1957)-
NITSANIM	D1	31.73	34.60	28.39	110.00	46.4	1.20			1/1963 -
NORD	B6	81.67	343.33	80.84	133.94	83.1	38.17			
	B13	81.67	343.33	80.84	133.94	83.1	38.17			1/1964 -
	E1	81.67	343.33	80.84	133.94	83.1	38.17			(9/1957)---(12/1965)
NORFOLK IS	B1	-29.00	168.00	-34.75	243.22	-56.4	1.50			2/1964 -
NORIL SK	B1	69.40	88.10	58.50	164.81	83.0	5.12			1/1969 -
	B8	69.40	88.10	58.50	164.81	83.0	5.12			3/1964 -
	C8	69.40	88.10	58.50	164.81	83.0	5.12			
	C9	69.40	88.10	58.50	164.81	83.0	5.12			
	E1	69.40	88.10	58.50	164.81	83.0	5.12			1/1969 -
NORTHFIELD	F1	44.47	266.80	54.71	329.58	74.1	3.20	1.43	300M	9/1957 - 8/1959
NORTHWAY	B11	62.97	218.05	64.09	263.82	76.4	5.16			10/1963 -
	D1	62.97	218.05	64.09	263.82	76.4	5.16			7/1957 - 12/1958
	E1	63.00	218.00	64.10	263.75	76.4	5.17			(3/1958)---(4/1959)
NORWAY STATION	D1	-70.50	357.47	-63.79	43.86	-62.7	3.98			1/1961 - 2/1962
NORWICH	B13	43.70	287.67	55.18	355.78	73.8	3.30			8/1957 - 1/1966
NOVOKAZALINSK	D1	45.77	62.12	37.64	138.42	65.0	1.70			7/1965 -
NOVOLAZARREVSKAY	D1	-70.77	11.82	-66.17	53.60	-63.7	4.63			1/1960 -
	D2	-70.77	11.82	-66.17	53.60	-63.7	4.63			
	E1	-70.77	11.82	-66.17	53.60	-63.7	4.63			(4/1965)-(10/1965)
NOWY SACZ	A2	49.63	22.72	47.96	104.79	66.5	2.08			(10/1957)-(12/1959)
NURMIJARVI	B1	60.50	24.60	57.86	112.53	73.6	3.39			1/1957 -
	B8	60.52	24.65	57.87	112.58	73.6	3.39			(1/1967)-
	D1	60.52	24.65	57.87	112.58	73.6	3.39			1/1953 -
	D2	60.52	24.65	57.87	112.58	73.6	3.39			(7/1957)-
NY-ALESUND	E1	79.00	12.00	75.44	131.45	81.5	16.52			(1/1969)-
OAKLAND	C6	37.78	237.80	44.01	298.37	62.7	1.87			4/1959 --- 9/1963
OASIS	D1	-66.30	100.72	-77.46	160.71	-78.8	25.95			7/1957 - 11/1958
	E1	-66.30	100.80	-77.46	160.86	-78.8	26.11			(7/1957)-(11/1957)
ODESSA	D1	46.78	30.88	43.68	111.11	64.4	1.84			1/1896 ---
	D2	46.78	30.88	43.68	111.11	64.4	1.84			
OHIRA	B14	35.60	140.50	25.43	206.32	48.5	1.23			6/1958 -
OKINAWA	B1	26.30	127.80	15.25	195.58	36.6	1.05			5/1946 -
	B4	26.30	127.80	15.25	195.58	36.6	1.05			2/1964 -
	B12	26.50	128.00	15.46	195.75	36.9	1.05			(1/1958)-(4/1958)
	C6	26.50	128.00	15.46	195.75	36.9	1.05			(7/1957)-
OLENEK	E1	68.50	112.50	57.00	181.01	82.9	4.65			(11/1957)---
ONAGAWA	D1	38.43	141.47	28.32	206.82	51.9	1.31			
	D2	38.26	142.28							(7/1957)-(12/1958)
ONDREJOV	A8	49.92	14.98	49.75	97.68	66.6	2.15			(10/1958)-
	C1	49.92	14.98	49.75	97.68	66.6	2.15			(7/1957)-
	C3	49.92	14.98	49.75	97.68	66.6	2.15			(10/1958)-
	C4	49.92	14.98	49.75	97.68	66.6	2.15			
	C6	49.92	14.98	49.75	97.68	66.6	2.15			(2/1964)---(5/1965)
	G	49.92	14.98	49.75	97.68	66.6	2.15			(7/1957)-(12/1959)
ONSALA	C3	57.40	11.92	57.40	99.04	71.7	3.02			(7/1957)-(9/1959)
ORLANDO	B4	28.55	272.67	39.39	339.06	60.5	1.72			3/1968 - 2/1970
ORRORAL	B2	-35.62	148.95	-44.31	224.31	-66.2	0.80			11/1965 -
O DAY	E1	57.60	265.80	67.52	323.36	82.8	7.72			(10/1957)-(4/1958)
O HIGGINS	E1	-63.30	302.10	-51.96	08.07	-56.2	2.20			(4/1957)-(7/1958)
OSHKOSH	C6	44.02	270.47	54.61	334.19	74.1	0.81			7/1958 -
OTTAWA	A8	45.40	284.58	56.80	351.52	75.2	3.62			(7/1957)-
	A10	45.40	284.58	56.80	351.52	75.2	3.62			6/1968 -
	B1	45.40	284.10	56.79	351.14	75.2	3.62			1/1942 -
	B2	45.35	284.12	56.74	351.17	75.2	3.61			9/1962 -
	B4	45.40	284.10	56.79	351.14	75.2	3.61			10/1959 -
	B7	45.40	284.30	56.80	351.40	75.2	3.62			(7/1957)-(12/1958)
	B8	45.40	284.30	56.80	351.40	75.2	3.62			2/1956 -
	B10	45.40	284.30	56.80	351.40	75.2	3.62			8/1957 - 10/1957
	B13	45.40	284.20	56.79	351.14	75.2	3.62			7/1957 - 12/1958
	C1	45.40	284.58	56.80	351.52	75.2	3.62			(7/1957)-(6/1966)
	C3	45.40	284.58	56.80	351.52	75.2	3.62			(7/1957)-
	D1	45.40	284.40	56.80	351.52	75.2	3.62			7/1968 -
	D2	45.20	284.50	56.61	351.61	75.1	3.58			
	E1	45.20	284.50	56.61	351.61	75.1	3.58			(7/1957)-
	E4	45.20	284.50	56.61	351.61	75.1	3.58			(7/1957)-
	F1	45.40	284.40	56.80	351.52	75.2	3.62	1.08	57M	4/1954 -
	F3	45.40	284.40	56.80	351.52	75.2	3.62	1.08	57M	12/1954 -
OUAGADOUGOU	B1	12.40	358.50	16.56	70.28	6.0	0.99			5/1966 -
	B2	13.42	358.50	17.56	70.49	8.4	1.00			6/1966 -
OULU	B6	65.08	25.87	61.83	117.21	75.8	4.41			1/1967 - 12/1968
	B8	65.00	25.40	61.84	116.76	75.8	4.39			(10/1967)-
	B10	65.08	25.87	61.83	117.21	75.8	4.41			(1/1967)-
	E1	65.08	25.87	61.83	117.21	75.8	4.41			(1/1968)- 1/1971
	F1	65.00	25.40	61.84	116.76	75.8	4.39	0.81	SL	5/1964 -
	F3	65.00	25.40	61.84	116.76	75.8	4.39	0.81	SL	4/1964 ---
PALEHUA	A6	20.71	203.70	20.81	268.32	38.7	1.13			
	C1	20.71	203.70	20.81	268.32	38.7	1.13			
PALMYRA ISLAND	D1	05.88	197.82	05.15	265.81	13.2	0.99			10/1957 - 8/1958
PANAGYURISHTE	D1	42.52	24.18	40.85	103.36	59.9	1.60			1/1948 -

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
PANAMA	B1	09.40	280.10	20.68	348.50	37.9	0.93			6/1951 - 12/1958
	B12	09.40	280.10	20.68	348.50	37.9	1.18			(8/1957)-(11/1958)
	B12	09.40	280.10	20.68	348.50	37.9	1.18			4/1958 - 11/1958
	B14	09.00	280.50	20.30	348.94	37.4	0.93			1/1958 - 2/1967
PANSKA VES	B9	50.53	14.57	50.41	97.59	67.0	2.20			1/1961 -
	B13	50.52	14.57	50.40	97.58	67.0	2.20			1/1960 -
	B14	50.52	14.57	50.40	97.58	67.0	2.20			(7/1957)-
	C6	50.53	14.57	50.41	97.59	67.0	2.20			(3/1953)---
	F1	50.07	14.40	50.01	97.20	66.7	2.17	3.53	SL	2/1959 - 9/1962
	F3	50.07	14.40	50.01	97.20	66.7	2.17	3.53	SL	1/1958 - 12/1961
PARAMARIBO	A8	05.80	304.80	16.96	14.37	31.0	0.97			(7/1957)-(5/1967)
	B1	05.80	304.80	16.96	14.37	31.0	0.97			7/1957 -
	C3	05.80	304.80	16.96	14.37	31.0	0.97			(7/1957)-(5/1967)
	C6	05.80	304.80	16.96	14.37	31.0	0.97			(1/1960)---(12/1966)
	D1	05.82	304.78	16.98	14.35	31.0	1.18			7/1957 -
	D2	05.82	304.78	16.98	14.35	31.0	1.18			
PARIS-SACLAY	B1	48.10	02.30	50.54	84.45	64.9	2.11			6/1960 -
PAXSON	B8	63.04	214.50	63.45	260.47	75.8	4.92			3/1967 -
PEARCE	B14	-31.70	116.00	-43.15	185.83	-66.3	1.86			2/1954 - 8/1957
PENN STATE U	A8	41.00	282.00	52.33	348.46	72.3	2.90			1/1965 -
	B7	40.82	282.13	52.15	349.04	72.2	2.88			7/1957 - 12/1960
	C3	41.00	282.00	52.33	348.86	72.3	2.90			1/1965 -
PENTICTON	A8	48.30	240.40	55.63	296.79	72.7	3.13			8/1964 -
	C3	49.30	240.40	55.63	296.79	72.7	3.13			8/1964 -
PETROPAVLOVSK	D1	53.10	158.63	44.66	218.59	64.3	2.03			
	D2	53.10	158.63	44.66	218.59	64.3	2.03			8/1957 -
PIC DU MIDI	A7	43.00	00.10	46.08	80.06	59.9	0.88			(7/1957)-
	A7	43.00	00.10	46.08	80.06	59.9	0.88			7/1967 ---
	F1	42.93	00.20	45.99	80.14	59.8	1.70	5.36	2860M	8/1957 - 9/1964
	F1	42.93	00.20	45.99	80.14	59.8	1.70	5.36	2860M	11/1964 -
	F3	42.93	00.20	45.99	80.14	59.8	1.70	5.36	2860M	12/1957 - 12/1965
PILAR	D1	-31.67	296.12	-20.21	04.64	-28.5	1.16			1/1905 -
PIONERSKAYA	D1	-69.73	95.50	-80.33	146.55	-77.2	31.15			7/1957 - 12/1958
PIRKULI	A8	40.80	48.60	34.78	125.24	59.2	1.49			(12/1959)-(2/1962)
	C3	40.80	48.60	34.78	125.24	59.2	1.49			(12/1959)-(2/1962)
PITTSBURG	C6	40.50	279.78	51.73	346.18	72.0	2.82			(2/1958)-
PLAISANCE	D1	-20.43	57.67	-26.98	122.50	-54.7	1.33			1/1896 -
PLATEAU	B8	-79.25	40.50	-77.20	52.51	-69.9	9.93			1/1966 - 1/1969
	B13	-79.25	40.50	-77.20	52.51	-69.9	9.93			
	D1	-79.25	40.50	-77.20	52.51	-69.9	9.93			2/1966 - 11/1968
	D2	79.47	40.58							
	E1	-79.25	40.50	-77.20	52.51	-69.9	9.93			1/1966 - 1/1969
PLUM IS	B12	43.00	289.00	54.49	357.48	73.1	3.18			8/1964 - 12/1965
POCATELLO	E1	42.80	247.60	50.54	307.51	69.3	2.47			(7/1957)-(6/1963)
POINT ARGUELLO	B1	35.60	239.40	42.15	300.73	61.0	1.76			7/1963 -
	B5	35.60	239.40	42.15	300.73	61.0	1.76			
POINT MUGU	B5	34.12	240.88	40.96	302.73	59.8	1.69			
POITIERS	B1	46.60	00.30	49.50	81.75	63.5	1.99			7/1948 -
	B13	46.57	00.35	49.46	81.79	63.5	1.98			1/1963 -
	C6	46.57	00.35	49.46	81.79	63.5	1.98			(9/1968)-
POONA	G	18.52	73.87	09.24	144.56	22.6	0.96			1/1958 ---
POPAYAN	B1	02.45	283.38							5/1970 -
PORT CLARENCE	C6	64.50	194.57	61.03	242.03	74.0	4.25			(2/1969)-
PORT LOCKROY	B1	-64.80	296.50	-53.34	03.92	-57.7	2.32			5/1948 - 12/1961
PORT MORESBY	B1	-09.40	147.10	-18.60	217.83	-32.8	1.05			5/1961 -
	D1	-09.40	147.15	-18.59	217.88	-32.8	1.05			7/1957 -
	D2	-09.40	147.15	-18.59	217.88	-32.8	1.05			10/1959 -
PORT STANLEY	B1	-51.70	302.20	-40.38	09.09	47.5	1.58			12/1945 -
	B2	-51.68	302.17	-40.36	09.07	-47.5	1.58			9/1962 -
	B6	-51.70	302.20	-40.38	09.09	-47.5	1.58			9/1962 -
	B7	-51.70	302.20	-40.38	09.09	-47.5	1.58			7/1957 - 12/1959
	B14	-51.70	302.15	-40.38	09.05	-47.5	1.58			(7/1957)-(11/1957)
POTSDAM	A2	52.55	13.07	52.62	97.70	68.5	2.40			(7/1957)-(12/1959)
	A8	52.55	13.07	52.62	97.20	68.5	2.40			(7/1957)-
	C2	52.55	13.07	52.62	97.20	68.5	2.40			1/1957 -
	C3	52.55	13.07	52.62	97.20	68.5	2.40			(7/1957)-
POWELL	C6	40.06	277.00	51.14	342.83	71.5	2.74			1/1958 - 9/1958
PREDIGTSTUHL	F1	47.70	12.88	18.10	149.64	41.0	1.07		1614M	5/1969 -
	F3	47.70	12.88	18.10	149.64	41.0	1.07		1614M	11/1966 -
PREOBRAZHENIE	E1	74.70	112.90	63.20	181.11	85.7	7.30			(3/1958)-(3/1958)
PRESQUE ISLE	E1	46.58	291.98	58.08	01.27	74.9	3.76			(5/1964)-(6/1966)
PRESTON	C6	53.80	357.42	56.92	82.57	69.4	2.73			(5/1957)-
PRETORIA	B14	-25.80	28.30	-26.70	91.62	-62.7	1.54			2/1958 -
PRICE	D1	39.62	249.22	47.68	310.33	66.8	2.18			7/1957 - 1/1959
PRINCE ALBERT	B2	53.22	254.07	61.68	310.69	78.5	4.73			9/1962 - 8/1963
	B3	53.22	254.07	61.68	310.69	78.5	4.73			(2/1964)-
	B8	53.20	254.30	61.69	310.98	78.5	4.74			1/1963 - 6/1967
PROSPECT HILL	A9	42.38	288.75	53.87	357.18	72.8	3.08			1/1967 -
PROVIDENYA	B1	64.40	186.60	59.58	235.74	73.3	3.95			3/1957 -
PRUHONICE	B1	50.00	14.60	49.90	97.36	66.6	2.16			4/1958 -
	B9	49.98	14.55	49.89	97.30	66.6	2.16			(5/1964)-
	B13	49.99	14.55	49.90	97.31	66.6	2.16			1/1959 - 2/1960
	B14	49.94	14.55	49.86	97.28	66.6	2.16			(7/1957)-(1/1961)
	D1	49.98	14.55	49.89	97.30	66.6	2.16			1/1946 -
PUERTO RICO	B1	18.50	292.80	29.99	01.97	51.3	1.43			12/1950 - 6/1963
	B4	18.50	292.80	29.99	01.97	51.3	1.43			9/1963 -
	B8	18.50	292.80	29.99	01.97	51.3	1.43			
	B10	18.50	292.80	29.99	01.97	51.3	1.43			1/1957 - 8/1960
	B12	18.50	292.80	29.99	01.97	51.3	1.43			(12/1969)-
	D1	18.12	293.85	29.60	03.12	50.7	1.42			1/1926 -
	D2	18.12	293.85	29.60	03.12	50.7	1.42			
PULKOVO	A8	59.77	30.32	56.14	116.91	73.4	3.20			(9/1957)-(1/1958)
	C2	59.77	30.32	56.14	116.91	73.4	3.20			(2/1964)---
	C3	59.77	30.32	56.14	116.91	73.4	3.20			(9/1957)-(1/1958)
	C7	59.77	30.32	56.14	116.91	73.4	3.20			

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
PULLMAN	B4	46.72	242.83	53.57	300.67	71.4	2.83			3/1964 -
	B8	46.72	242.83	53.57	300.67	71.4	2.83			1/1958 -(12/1959)
	B12	46.72	242.83	53.57	300.67	71.4	2.83			10/1957 -
	C3	46.72	242.83	53.57	300.67	71.4	2.83			12/1965 ---
	E1	46.72	242.83	53.57	300.67	71.4	2.83			(8/1957)-(11/1966)
PYONG YANG	A1	39.07	125.78	27.90	192.95	55.3	1.32			(5/1958)-(1/1959)
	A2	39.07	125.78	27.90	192.95	55.3	1.32			(5/1958)-(1/1959)
PYRAMIDA	E1	78.20	15.20	74.44	130.69	81.2	14.54			(11/1957)---(1/1959)
QUETTA	B1	30.20	67.00	21.65	139.76	45.4	1.13			10/1957 - 12/1964
	O1	30.18	66.95	21.64	139.71	45.4	1.13			10/1953 -
QUITO	B2	-00.62	281.42	10.72	350.25	21.6	0.99			9/1962 -
RABAT	B1	33.90	353.20	38.59	69.94	48.6	1.32			2/1958 ---
	B14	33.90	353.20	38.59	69.94	48.6	1.32			3/1958 -
	C6	33.90	353.20	38.59	69.94	48.6	1.32			(7/1957)---(6/1959)
RAMSEY	C6	41.05	285.85	52.49	353.62	72.1	2.91			(7/1958)---(5/1968)
RAPID CITY	E1	44.03	256.95	53.12	317.88	72.2	2.86			(8/1957)-(12/1958)
	G	44.03	256.95	53.12	317.88	72.2	2.86			(9/1957)-(12/1958)
RAROTONGA	B1	-21.20	200.20	-20.91	273.64	-68.2	1.13			2/1945 -
REDMOND	E1	44.30	238.70	50.50	297.09	68.5	2.43			(8/1957)-(6/1963)
REGGANE	B5	26.72	00.17	30.26	75.13	36.4	0.93			
REGINA	E1	50.40	255.50	59.15	313.80	76.8	4.02			(7/1957)-(12/1958)
RESOLUTE BAY	B1	74.70	265.10	82.99	289.27	89.0	93.98			1/1949 -
	B2	74.68	265.12	82.98	289.42	89.0	93.69			9/1962 -
	B4	74.70	265.10	82.99	289.27	89.0	93.98			9/1959 -
	B5	74.70	265.10	82.99	289.27	89.0	93.98			
	B7	74.70	265.10	82.99	289.27	89.0	94.10			7/1957 - 5/1961
	B8	75.20	265.98	83.50	287.51	88.90	113.10			9/1959 -
	C8	75.20	265.98	83.50	287.51	88.90	163.10			9/1959 -
	C9	74.70	265.10	82.99	289.27	89.0	93.98			1/1949 -
	D1	74.70	265.10	82.99	289.27	89.0	94.10			11/1953 -
	D2	74.70	265.10	82.99	289.27	89.0	94.10			
	E1	74.70	265.10	82.99	289.27	89.0	94.10			(9/1957)---(3/1959)
	F1	74.69	265.00	82.96	289.18	89.1	93.39	0.00	17M	10/1956 - 7/1966
	F1	74.69	265.00	82.96	289.18	89.1	93.39	0.00	17M	3/1966 -
	F3	74.69	265.00	82.96	289.18	89.1	93.39	0.00	17M	10/1956 - 7/1966
REYKJAVIK	B1	64.10	338.20	70.16	70.82	76.0	6.20			7/1944 - 12/1964
	B8	64.13	338.22	70.19	70.88	76.0	6.21			4/1965 -
	C8	64.13	338.22	70.19	70.88	76.0	6.21			(4/1965)-
	C9	64.10	338.20	70.16	70.82	76.0	6.20			7/1944 - 12/1964
	E1	64.10	338.10	70.18	70.70	76.0	6.21			(11/1958)---
RIGA	A8	56.95	24.07	54.64	109.77	71.6	2.83			(11/1959)---(5/1966)
	C3	56.95	24.07	54.64	109.77	71.6	2.83			(11/1959)---(5/1966)
RIO DE JANEIRO	F1	-22.90	316.70	-12.46	24.15	-25.3	1.13	11.73	SL	9/1957 - 12/1962
ROBURENT	B13	44.30	07.88	45.79	88.36	61.3	1.74			4/1966 -
	O1	44.30	07.88	45.79	88.36	61.3	1.74			9/1964 -
	O2	44.30	07.88	45.79	88.36	61.3	1.74			7/1964 -
ROCHESTER	B13	43.30	282.70	54.65	349.54	73.9	3.25			12/1961 -
ROCK BANK	B14	-37.70	144.60	-46.94	219.89	-68.7	2.24			1/1955 -(12/1958)
ROME	A1	41.90	12.50	42.56	91.97	58.8	1.58			(7/1957)-
	A2	41.90	12.50	42.56	91.97	58.8	1.58			(7/1957)-
	A4	41.90	12.50	42.56	91.97	58.8	1.58			(7/1957)-
	B1	41.80	12.50	42.46	91.93	58.7	1.58			1/1951 -
	B12	42.03	11.83	42.82	91.37	58.9	1.59			8/1957 - 8/1958
	C1	41.90	12.50	42.56	91.97	58.8	1.58			(6/1965)---
	C2	41.90	12.50	42.56	91.97	58.8	1.58			(1/1965)-
	C6	41.90	12.50	42.56	91.97	58.8	1.58			(1/1964)-
	F1	41.90	12.50	42.56	91.97	58.8	1.58	6.32	60M	7/1957 - 1/1967
	F1	41.90	12.50	42.56	91.97	58.8	1.58	6.32	60M	4/1966 -
	F3	41.90	12.50	42.56	91.97	58.8	1.58	6.32	60M	1/1958 - 11/1964
ROSARIO	A1	-32.92	300.63	-21.57	08.68	-30.3	7.32			7/1970 -
	A2	-32.92	300.63	-21.57	08.68	-30.3	7.32			10/1967 -
ROSCHINO	E1	60.20	29.60	56.67	116.58	73.6	3.28			(2/1958)---(4/1959)
	E3	60.20	29.60	56.67	116.58	73.6	3.28			(1/1958)---(1/1960)
ROSTOV	B1	47.20	39.68	42.50	119.20	65.1	1.84			1/1957 -
	B7	47.22	39.68	42.52	119.19	65.2	1.84			6/1958 -
	B10	47.22	39.68	42.52	119.19	65.2	1.84			7/1958 -
SACRAMENTO PEAK	A1	32.72	254.25	41.61	317.68	61.1	1.75			1/1951 -
	A2	32.72	254.25	41.61	317.68	61.1	1.75			1/1951 -
	A4	32.72	254.25	41.61	317.68	61.1	1.75			(7/1957)---
	A6	32.72	254.25	41.61	317.68	61.1	1.75			(7/1957)-
	A7	32.72	254.25	41.61	317.68	61.1	1.75			10/1957 -
	C1	32.72	254.25	41.61	317.68	61.1	1.75			(7/1957)-
	C3	32.72	254.25	41.61	317.68	61.1	1.75			(7/1957)--- 8/1961
	C6	32.72	254.25	41.61	317.68	61.1	1.75			(7/1957)--- 8/1961
	F1	32.72	254.20	41.60	319.62	61.1	1.75	4.98		5/1951 - 6/1968
	G	32.72	254.20	41.60	317.62	61.1	1.75			(7/1957)-(12/1964)
SAGAMORE HILL	A8	42.61	289.20	54.10	357.14	72.9	3.11			10/1965 -
	B6	42.61	289.20	54.10	357.14	72.9	3.11			
	B11	42.61	289.20	54.10	357.14	72.9	3.11			1/1965 -
	C3	42.38	289.11							10/1965 -
	C4	42.38	289.11							1/1966 -
SAINT KILDA	B4	-37.70	138.50	-44.69	212.27	-66.7	2.00			2/1964 -
SAINT MAUR	F1	48.70	02.30	51.11	84.74	65.4	2.15			
SAINT SANTIN	B3	44.11	02.03	46.77	82.45	61.1	1.76			(11/1965)-
SALEKHARD	B1	66.50	66.70	57.33	148.95	79.4	4.38			7/1957 -
	E1	66.50	66.70	57.33	148.95	79.4	4.38			(3/1958)---(4/1959)
SALISBURY	B1	-37.70	138.60	-44.68	212.39	-66.7	2.00			6/1960 -
SALISBURY (RHODE	B1	-17.80	31.00	-19.42	96.15	-55.2	1.30			1/1958 - 12/1958
SALTHOLM	B13	55.62	12.80	55.57	98.71	70.6	2.76			5/1960 - 12/1961
SALTSJOBADEN	C1	59.27	18.25	57.91	106.10	72.8	3.24			(7/1957)---
SANAE	B1	-70.30	357.60	-63.62	44.13	-62.6	3.95			6/1962 -
	B8	-70.30	357.65	-63.63	44.17	-62.6	3.95			(5/1964)-
	B13	-70.30	357.65	-63.63	44.17	-62.6	3.95			(6/1970)-
	C8	-70.30	357.65	-63.63	44.17	-62.6	3.95			(5/1964)-
	O1	-70.30	357.65	-63.63	44.17	-62.6	3.95			6/1962 -
	O2	-70.30	357.65	-63.63	44.17	-62.6	3.95			
	E4	-70.46	357.51	-63.75	43.92	-62.7	3.97			(1/1969)-
	F1	-70.46	357.51	-63.75	43.92	-62.7	3.97	1.02	53M	2/1964 -
	G	-70.46	357.51	-63.75	43.92	-62.7	3.97			6/1967 -

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
SANDUR	C6	65.00	336.00	71.39	69.43	76.6	6.88			(1/1969)-
SAN FERNANDO	C6	36.47	353.80	40.98	71.33	52.2	1.41			(3/1968)---
	D1	36.47	353.80	40.98	71.33	52.2	1.41			1/1881 -
SAN JOSE	B6	-23.32	314.14	-12.57	21.72	-23.7	1.09			(12/1964)-
	B8	-23.21	314.14	-12.57	21.72	-23.7	1.09			3/1963 -
	B14	-23.22	314.15	-12.58	21.73	-23.7	1.12			3/1958 -
	D2	-23.22	314.15	-12.58	21.73	-23.7	1.12			
SAN MIGUEL	A1	37.77	334.35	45.63	50.89	56.6	1.68			(1/1964)-
	D1	37.77	334.35	45.63	50.89	56.6	1.68			1/1911 -
SAN NICOLAS IS	B5	33.23	240.58	40.04	302.64	58.8	1.64			
SAN SALVADOR	B1	24.10	285.50	35.54	353.83	57.5	1.61			11/1958 - 2/1965
SANTIAGO	A2	-33.57	289.32	-22.07	358.49	-31.6	1.17			(7/1957)---(8/1961)
	B2	-33.13	289.32	-21.63	358.49	-31.0	0.91			8/1963 -
	F3	-33.50	289.34	-22.00	358.51	-31.5	1.17	11.43	570M	(2/1958)---(12/1963)
SAO PAULO	A8	-22.55	313.37	-11.86	21.05	-22.2	1.09			10/1967 ---
	B1	-23.50	313.50	-12.82	21.09	-23.6	1.09			5/1953 - 5/1965
	B12	-23.50	313.50	-12.82	21.09	-23.6	1.09			12/1957 - 11/1958
	C3	-22.55	313.37	-11.86	21.05	-22.2	1.09			10/1967 ---
	C6	-22.55	313.37	-11.86	21.05	-22.2	1.09			4/1963 ---
	D2	-22.19	310.93							
SAPPORO	F2	43.08	141.30	32.93	206.04	57.1	1.46	8.22	54M	7/1957 -
SARDINIA	B5	39.56	09.24	40.95	87.95	56.0	1.48			
SASKATOON	E1	52.10	253.40	60.49	310.45	77.6	4.35			(7/1957)-
	E3	52.10	253.40	60.49	310.45	77.6	4.35			(7/1957)-(12/1959)
SCHAUINSLAND	C1	47.92	07.92	49.25	89.94	64.8	2.06			(7/1957)---(5/1963)
SCHWARZENBURG	B1	46.60	06.70	48.23	88.15	63.5	1.93			12/1950 -
SCITUATE	C6	42.20	287.28	53.67	355.35	72.8	3.07			3/1965 ---
SCOTT BASE	B1	-77.90	166.80	-79.01	294.63	-82.2	32.60			3/1957 -
	B11	-77.90	166.80	-79.01	294.63	-82.2	32.60			(12/1969)-
	B13	-77.90	166.80	-79.01	294.63	-82.2	32.60			(12/1969)-
	C9	-77.80	166.80	-78.95	294.18	-82.3	32.61			3/1957 -
	D1	-77.85	166.78	-78.98	294.39	-82.3	32.63			7/1957 -
	E1	-77.90	166.80	-79.01	294.63	-82.2	32.60			(3/1957)---(9/1958)
SDR STROMFJORD	B8	67.00	310.00	77.34	35.47	80.4	14.18			2/1970 -
SEATTLE	B1	47.75	237.58	53.63	294.41	70.9	2.81			1/1958 - 10/1960
	B13	47.75	237.58	53.63	294.41	70.9	2.81			7/1957 -(7/1961)
	C3	47.75	237.58	53.63	294.41	70.9	2.81			4/1962 --- 11/1965
	D2	47.63	237.65	53.33	294.54	70.9	2.79			
SENDAI	G	38.09	140.56	27.91	206.06	51.6	1.30			(7/1957)-
SEOUL	A1	35.58	127.00	26.47	194.12	53.2	1.28			(11/1964)-(2/1967)
	A2	35.58	127.00	26.47	194.12	53.2	1.28			(11/1964)-(2/1967)
	B1	37.39	126.95	26.28	194.09	53.0	1.27			10/1966 ---
	D1	37.58	127.05	26.47	194.17	53.2	1.28			
	F3	37.50	127.00	26.39	194.13	53.1	1.28	10.79	50M	2/1964 --- 12/1965
SHATSK	D1	53.98	41.85	48.66	123.69	70.5	1.28			(7/1957)-
SHEEP MOUNTAIN	B8	61.82	212.50	61.95	259.77	74.6	4.41			3/1967 -
SHEMAKHA	C2	40.77	48.58	34.75	125.21	59.2	1.49			(8/1966)---
SHEPHERD BAY	B8	68.82	266.57	78.33	312.40	87.8	29.01			8/1963 -
	C8	68.82	266.57	78.33	312.40	87.8	29.01			8/1963 -
	D1	68.82	266.57	78.33	312.40	87.8	29.01			7/1966 -
	G	68.82	266.57	78.33	312.40	87.8	29.01			8/1963 -
SHINGLETON	E1	46.40	273.50	57.22	337.48	76.1	3.73			(6/1957)-(6/1959)
SHODA JIMA	G	34.55	134.27	23.88	200.85	48.1	1.20			(9/1957)-(3/1959)
SIKTIVKAR	E1	61.80	50.80	54.76	134.70	75.6	3.41			(1/1958)---(4/1964)
SIMFEROPOL	A5	44.40	33.98	40.81	113.10	62.3	1.69			
	A8	44.40	33.98	40.81	113.10	62.3	1.69			(11/1957)---
	B1	44.80	34.10	41.18	113.33	62.7	1.71			1/1957 --- 12/1959
	B10	44.40	34.00	40.81	113.10	62.3	1.69			12/1957 - 12/1958
	B14	44.83	34.07	41.21	113.31	62.7	1.71			(5/1959)-(12/1965)
	C1	44.40	33.98	40.81	113.10	62.3	1.69			(7/1957)-
	C2	44.40	33.98	40.81	113.10	62.3	1.69			(1/1964)---
	C3	44.40	33.98	40.81	113.10	62.3	1.69			(11/1957)---
	D1	44.83	34.07	41.21	113.31	62.7	1.71			(7/1957)-(12/1959)
	F1	44.73	34.00	40.81	113.10	62.3	1.69	5.51	570M	1/1961 --- 1/1965
	F3	44.73	34.00	40.81	113.10	62.3	1.69	5.51	570M	2/1958 --- 1/1965
	G	44.40	34.00	40.81	113.10	62.3	1.69			(7/1957)-(12/1959)
SIMOSATO	D1	33.57	135.93	23.03	202.43	46.6	1.18			9/1954 -
	D2	33.57	135.93	23.03	202.43	46.6	1.18			(7/1957)-(12/1958)
SINGAPORE	B1	01.30	103.80	-10.11	172.69	-18.3	0.94			11/1948 -
	B2	01.42	103.82	-9.99	172.71	-18.0	0.91			9/1962 -
	B6	01.30	103.80	-10.11	172.69	-18.3	0.91			9/1962 -
	B7	01.30	103.80	-10.11	172.69	-18.3	0.91			1/1964 - 12/1965
	B8	01.30	103.80	-10.11	172.69	-18.3	0.91			
	B10	01.32	103.82	-10.09	172.71	-18.3	0.91			7/1964 - 12/1965
	B14	01.30	103.80	-10.11	172.69	-18.3	0.91			7/1958 - 12/1968
	C6	01.30	103.80	-10.11	172.69	-18.3	0.91			
SITKA	D1	57.07	224.67	60.00	275.34	74.1	3.91			1/1902 -
	D2	57.07	224.67	60.00	275.34	74.1	3.91			7/1957 -
SITKINAK	C6	56.58	205.83	55.81	257.57	69.7	3.03			(2/1969)-
SLOPE POINT	E4	-46.70	169.00	-51.78	250.06	-71.7	2.90			(1/1969)-
SLOUGH	A8	51.48	359.43	54.32	83.27	67.7	2.43			(7/1967)-
	B1	51.50	359.40	54.35	83.25	67.7	2.43			1/1931 -
	B2	51.43	359.30	54.30	83.11	67.6	2.43			9/1962 -
	B6	51.43	359.30	54.30	83.11	67.6	2.43			9/1962 -
	B14	51.48	359.43	54.32	83.27	67.7	2.43			(7/1957)-(3/1959)
	C3	51.48	359.43	54.32	83.27	67.7	2.43			(7/1967)-
	C6	51.48	359.43	54.32	83.27	67.7	2.43			(1/1964)---
SOCORRO	F3	34.04	253.07	42.75	316.08	62.2	1.82		1677M	3/1968 -
SODANKYLA	B1	67.40	26.60	63.79	120.00	76.8	5.12			8/1957 -
	B6	67.40	26.60	63.79	120.00	76.8	5.12			7/1965 - 11/1966
	B8	67.40	266.60	63.79	120.00	76.8	5.12			6/1964 -
	D1	67.37	26.63	63.76	119.99	76.8	5.11			1/1914 -
	D2	67.37	26.63	63.76	119.99	76.8	5.11			(7/1957)-
	E1	67.40	26.60	63.79	120.00	76.8	5.12			(1/1957)---(1/1971)

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
SOFIA	B1	42.67	23.30	41.17	102.59	60.0	0.87			
	B9	42.67	23.30	41.17	102.59	60.0	0.87			1/1964 - 12/1965
	B13	42.67	23.30	41.17	102.59	60.0	0.87			
	B14	42.67	23.30	41.17	102.59	60.0	0.87			
	F1	42.67	23.30	41.17	102.59	60.0	0.87	6.15		
SOGRA	B13	62.80	46.25	56.38	131.70	75.8	3.63			(3/1964)-
	D2	62.80	46.25	56.38	131.70	75.8	3.63			(1/1964)-
SOMERTON	C6	51.05	357.27	54.34	80.83	67.4	2.41			(5/1960)---
SONDRE STROMFJORE	1	67.00	310.00	77.34	35.47	80.4	14.18			
SONMIANI	B5	25.20	66.75	16.74	138.75	36.8	1.04			
SONNEBERG	A2	50.37	11.18	50.93	94.27	66.9	2.22			(7/1957)-(12/1959)
SOUTH HADLEY	A2	42.25	287.42	53.72	355.52	72.8	3.07			(10/1957)---(3/1959)
SOUTH POINT	B2	18.93	204.30	19.19	269.31	36.4	1.11			11/1962 - 6/1965
SOUTH POLE	B1	-90.00	00.00	-78.50	360.00	-74.2	13.48			7/1957 -
	B8	-90.00	00.00	-78.50	360.00	-74.2	13.48			1/1963 -
	C8	-90.00	00.00	-78.50	360.00	-74.2	13.48			1/1963 -
	C9	-90.00	00.00	-78.50	360.00	-74.2	13.48			7/1957 -
	D1	-90.00	346.48	-78.50	360.00	-74.2	14.08			1/1959 -
	D2	-90.00	00.00	-78.50	360.00	-74.2	13.48			
	E1	-90.00	00.00	-78.50	360.00	-74.2	13.48			(4/1957)---(8/1965)
	F1	-89.98	00.00	-78.49	00.09	-74.1	12.72	0.11	2820M	2/1964 -
	F3	-89.98	00.00	-78.49	00.09	-74.1	12.72	0.11	2820M	5/1964 -
SOUTH UIST	B5	57.20	352.80	61.01	80.11	71.7	3.36			
SOYA SHIP	B1	-60.00								(11/1958)---(4/1962)
	G	-60.00								11/1956 - 4/1962
SREDNIKAN	D1	62.43	152.32	53.07	210.57	73.1	3.10			1/1936 -
STANFORD	A9	37.43	237.83	43.67	298.51	62.4	1.85			(4/1960)---
	B1	37.40	237.80	43.63	298.49	62.4	1.85			1/1943 ---
	B3	37.43	237.83	43.67	298.51	62.4	1.85			
	B4	37.43	237.83	43.67	298.51	-62.4	1.85			7/1964
	B6	37.40	237.80	43.63	298.49	62.4	1.85			
	B8	37.43	237.83	43.67	298.51	62.4	1.85			1/1958 --- 12/1959
	B12	37.43	237.83	43.67	298.51	62.4	1.85			8/1957 - 12/1958
	B13	37.43	237.83	43.67	298.51	62.4	1.85			7/1957 -(2/1963)
	C6	37.43	237.83	43.67	298.51	62.4	1.85			(1/1964)-
	D2	37.26	237.90			62.4	1.85			
STAR HILL	B14	43.34	284.75	54.75	352.11	73.8	3.25			1/1967 -
STOCKHOLM	C6	59.15	18.05	57.84	105.84	72.7	3.23			8/1968 -
STONYHURST	D1	53.85	357.53	56.94	82.71	69.4	2.73			7/1865 ---
ST JOHNS	B1	47.60	307.30	58.50	21.24	72.0	3.43			5/1945---
	B2	47.73	307.27	58.63	21.23	72.1	3.45			9/1962 -
	D1	47.60	307.30	59.50	21.24	72.0	3.43			8/1968 -
ST JOSEPH	C6	39.80	265.00							
SUFFIELD	B13	50.22	248.83	57.95	305.95	75.3	3.66			(6/1962)-(12/1962)
SUKKERTOPPEN	D1	65.42	307.10	76.12	28.74	80.3	12.79			1/1964 - 12/1965
	D2	65.42	307.10	76.12	28.74	80.3	12.79			1/1964 - 12/1965
SULPHUR MOUNTAIN	F1	51.20	244.39	58.16	300.33	75.0	3.65	1.14	2283M	7/1957 -
	F1	51.20	244.39	51.20	244.39	75.0	3.65	1.14	2283M	3/1963 -
	F3	51.20	244.39	51.20	244.39	75.0	3.65	1.14	2283M	7/1957 ---
SURINAM	B5	05.83	303.69	17.06	13.21	31.6	0.97			
SURLARI	D1	44.68	26.25	42.54	106.07	62.2	1.72			1/1949 -
SVERDLOVSK	B1	56.70	61.10	48.46	140.70	73.6	2.61			5/1944 ---
	B14	56.73	61.07	48.50	140.69	73.6	2.62			(3/1959)-(12/1965)
	D1	56.73	61.07	48.50	140.69	73.6	2.62			1/1929 -
	F2	56.80	60.63	48.62	140.36	73.6	2.63	2.30	290M	3/1952 ---
SWANSEA	B7	51.63	356.00	55.14	79.85	67.8	2.49			10/1957 - 12/1958
	B10	51.63	356.00	55.14	79.85	67.8	2.49			(7/1957)-(6/1958)
SWARTHMORE	F1	39.90	284.65	51.31	352.20	71.4	2.76	1.92	80M	9/1963 -
	F3	39.90	284.65	51.31	352.20	71.4	2.76	1.92	80M	6/1964 -
SWIDER	D1	52.12	21.25	50.62	104.60	68.4	2.30			1/1921 -
SYDNEY/FLEURS	A9	-33.87	150.77	-42.33	225.93	-64.3	1.87			(7/1957)---
	A10	-33.87	150.77	-42.33	225.93	-64.3	1.87			(7/1957)---
	C1	-33.87	150.77	-42.33	225.93	-64.3	1.87			(7/1957)--- 12/1964
	C4	-33.87	150.77	-42.33	225.93	-64.3	1.87			(7/1957)--- 1/1964
	F1	-33.60	151.10	-42.01	226.23	-64.0	1.85	4.69	43M	1/1958 - 12/1959
SYLT	C6	54.75	8.02	55.70	93.64	70.0	2.70			(1/1969)-
SYOWA BASE	B1	-69.00	39.60	-69.66	77.69	-65.5	6.09			2/1959 -
	B8	-69.00	39.60	-69.66	77.69	-65.5	6.09			2/1966
	B13	-69.00	39.60	-69.66	77.69	-65.5	6.09			1/1968 -
	C8	-69.00	39.60	-69.66	77.69	-65.5	6.09			2/1966
	C9	-69.00	39.60	-69.66	77.69	-65.5	6.09			2/1959 -
	D1	-69.00	39.58	/69.65	77.67	-65.5	6.09			1/1958 -
	D2	-69.00	39.58	-69.65	77.67	-65.5	6.09			
	E1	-69.03	39.60	-69.68	77.64	-65.5	6.10			(2/1959)-(4/1962)
	E4	-69.03	39.60	-69.68	77.64	-65.5	6.10			2/1967 -
	F1	-69.03	39.60	-69.68	77.64	-65.5	6.10	0.42	15M	3/1960 - 12/1961
	F1	-69.03	39.60	-69.68	77.64	-65.5	6.10	0.42	15M	3/1967 -
	F2	-69.03	39.60	-69.68	77.64	-65.5	6.10	0.42	15M	(7/1957)-(1/1958)
	F3	-69.03	39.60	-69.68	77.64	-65.5	6.10	0.42	15M	3/1959 ---
	G	-69.03	39.60	-69.68	77.64	-65.5	6.10			(2/1959)-(4/1962)
TAHITI	B1	-17.70	210.70	-15.42	283.06	-30.2	1.07			12/1957 -
	D1	-17.55	210.38	-15.34	282.72	-30.0	1.06			4/1958 -
	D2	-17.55	210.38	-15.34	282.72	-30.0	1.06			
TAIPEI	A1	24.95	121.23	13.67	189.51	34.7	1.02			(1/1964)-
	A2	24.95	121.23	13.67	189.51	34.7	1.02			(1/1964)-
	B1	25.00	121.20	12.67	189.51	34.8	1.03			3/1950 -
	B6	25.00	121.20	12.67	189.51	34.8	1.03			3/1969 -6/1970
	B7	24.95	121.23	13.71	189.90	34.9	1.03			1/1965 - 12/1965
	B11	25.00	121.20	12.67	189.51	34.8	1.03			3/1969 -
	B14	24.95	121.23	13.62	189.54	34.7	1.02			6/1967 -
TAKEYAMA	F3	35.22	139.62	24.97	205.57	48.2	1.22			3/1968 -
TALARA	B1	-04.60	278.70	06.64	247.66	13.1	1.04			2/1955 - 12/1965
	D1	-04.63	278.70	06.61	347.66	13.0	1.00			7/1957 - 1/1960

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
TALKEETNA	E1	62.30	209.90	61.88	257.00	74.5	4.39			(8/1964)---(5/1966)
TAMANRASSET	B1	22.80	05.53	25.39	79.53	28.5	1.05			12/1955 -
	D1	22.80	05.53	25.39	79.56	28.5	1.05			4/1932 -
	D2	22.80	05.53	25.39	79.56	28.5	1.05			
	G	22.78	05.53	25.37	79.56	28.4	1.05			(7/1957)-(12/1959)
TANANARIVE	B1	-18.80	47.50	-23.58	112.43	-53.8	1.29			11/1951 -
	D1	-18.92	47.55	-23.71	112.42	-53.9	1.30			1/1902 -
TANGERANG	D1	-06.17	106.63	-17.64	175.44	-33.0	0.89			1/1964 -
TARTAGUL	B5	-22.77	296.18	-11.31	04.87	-15.7	0.97			
TASHKENT	C1	41.33	69.30	32.37	143.74	60.6	1.47			(7/1957)-
	D1	41.33	69.62	32.33	144.02	60.6	1.47			1/1900 -
TATSFIELD	B14	51.28	00.01	54.02	83.74	67.5	2.40			(7/1957)-(11/1957)
	C6	51.50	00.00	54.23	83.85	67.7	2.42			(7/1957)---(6/1964)
TATUOCA	D1	-01.20	311.48	09.57	20.78	15.0	1.02			8/1957 -
TBILISI	B1	41.70	44.80	36.29	122.06	60.0	1.54			6/1963 -
	B14	41.72	44.82	36.30	122.08	60.1	1.54			(11/1959)-(12/1965)
	D1	42.08	44.70	36.67	122.08	60.4	1.55			1/1905 -
	D2	42.08	44.70	36.67	122.08	60.4	1.55			(7/1957)---
	F1	42.08	44.70	36.67	122.08	60.4	1.55	6.67	510M	1/1958 ---
	F2	42.08	44.70	36.67	122.08	60.4	1.55	6.67	510M	4/1953 --- 3/1968
	F3	42.08	44.70	36.67	122.08	60.4	1.55	6.67	510M	2/1960 ---
TEHRAN	A4	35.70	51.40	29.33	126.54	53.2	1.30			6/1965 -
	B1	35.70	51.40	29.33	126.54	53.2	1.30			4/1963 -
	C1	35.70	51.40	29.33	126.54	53.2	1.30			6/1965 -
	D1	35.73	51.38	29.37	126.53	53.2	1.30			7/1957 -
	F1	35.67	51.43	29.30	126.56	53.2	1.30	10.56	1400M	11/1969 -
TEL AVIV	C1	32.10	34.50	28.77	110.00	47.0	1.21			10/1969 -
TENERIFE	D1	28.48	343.72	34.99	58.62	41.8	1.22			1/1959 -
TEOLOYUCAN	D1	19.75	260.82	29.56	327.05	47.0	1.29			1/1914 -
TERRE ADELIE	B1	-66.70	140.00	-75.69	230.89	-89.5	38.08			2/1951 ---
	B5	-66.40	140.01	-75.41	230.44	-89.7	35.74			
	C9	-66.70	140.00	-75.69	230.89	-89.5	38.08			2/1951 ---
	D1	-66.67	140.00	-75.66	230.84	-89.5	37.84			7/1957 -
	D2	-66.67	140.00	-75.66	230.84	-89.5	37.84			
	F1	-66.40	140.01	-75.41	230.44	-89.7	35.74	0.01	45M	9/1967 - 3/1968
	F2	-66.40	140.01	-75.41	230.44	-89.7	35.74	0.01	45M	4/1968 -
THE HAGUE	B4	52.10	04.40	53.92	88.57	68.1	2.44			10/1959 -
THESSALONIKA	C1	40.95	23.00	39.57	101.71	58.1	1.52			(1/1964)---(10/1967)
THULE/CAMP TUTO	B1	76.40	291.30	87.90	01.92	85.4	169.92			2/1956 - 6/1966
	B4	76.40	291.30	87.90	01.92	85.4	169.92			3/1964 -
	B8	76.55	291.18	88.05	01.23	85.4	179.47			5/1958 -
	B14	76.60	291.30	88.10	02.10	85.4	181.17			4/1958 - 11/1962
	C8	76.55	291.18	88.05	01.23	85.4	179.47			(5/1958)-
	C9	76.40	291.30	87.90	01.92	85.4	169.92			2/1956 - 6/1966
	D1	76.55	291.17	88.05	01.16	85.4	180.51			7/1932 - 12/1952
	D2	76.60	291.30	88.10	02.10	85.4	181.17			
	E1	76.55	291.17	88.05	01.16	85.4	180.51			(11/1957)---
	E4	76.55	291.17	88.05	01.16	85.4	180.51			(1/1958)---
	F1	76.55	291.17	88.05	01.16	85.4	180.51	0.00	260M	8/1957 - 9/1964
	F1	76.55	291.17	88.05	01.16	85.4	180.51	0.00	260M	2/1964 -
	F3	76.55	291.17	88.05	01.16	85.4	180.51	0.00	260M	1/1962 -
	G	76.55	291.17	88.05	01.16	85.4	180.51			10-1958 - 3/1959
THULE/QANAQ	B1	77.50	290.80	89.00	357.52	85.6	264.41			9/1968 -
	C8	77.50	290.80	89.00	357.52	85.6	264.41			
	C9	77.50	290.80	89.00	357.52	85.6	264.41			9/1968 -
	D1	77.48	290.83	88.98	357.93	85.6	263.45			1/1956 -
	G	77.50	290.80	89.00	357.55	85.6	263.45			1/1969 -
THUMBA	B1	08.60	76.90	-00.96	146.33	-1.3	0.92			10/1964 -
	B5	08.60	76.90	-00.96	146.33	-1.3	0.92			
TIHANY	D1	46.90	17.90	46.29	99.11	64.0	1.91			1/1949 -
TIRUCHIRAPALLI	B1	10.80	78.70	01.04	148.33	3.8	0.92			2/1949 -
TIXIE BAY	B1	71.60	128.90	60.45	191.35	82.9	5.64			7/1957 -
	B8	71.60	128.90	60.45	191.35	82.9	5.64			1/1964 -
	D1	71.58	129.00	60.44	191.41	82.9	5.63			1/1944 -
	D2	71.58	129.00	60.44	191.41	82.9	5.63			
	E1	71.60	128.90	60.45	191.35	82.9	5.64			(12/1957)---
	E4	71.60	128.90	60.45	191.35	82.9	5.64			(1/1969)-
	F1	71.55	128.90	60.40	191.36	82.9	5.62	0.53	SL	8/1966 -
	F2	71.55	128.90	60.40	191.36	82.9	5.62	0.53	SL	12/1957 -
	G	71.60	128.90	60.45	191.35	82.9	5.64			(1/1969)-
T-3	E1	80.00		DRIFT						(11/1964)--- 10/1965
TOGO	B1	10.80	00.00	14.70	71.46	1.9	0.99			7/1965 - 2/1967
	B10	10.80	00.00	14.70	71.46	1.9	0.99			6/1965 -
TOKYO	A1	35.67	139.55	25.41	205.46	48.8	1.23			(7/1957)-
	A2	35.67	139.55	25.41	205.46	48.8	1.23			(7/1957)-
	A6	35.67	139.55	25.41	205.46	48.8	1.23			(7/1957)-
	A8	35.67	139.55	25.41	205.46	48.8	1.23			(7/1957)-
	B1	35.70	139.50	25.44	205.41	48.8	1.23			8/1943 -
	B7	35.71	139.50	25.45	205.41	48.8	1.23			7/1957 -
	B12	35.70	139.48	25.44	205.39	48.8	1.23			7/1957 - 1/1959
	C1	35.67	139.55	25.41	205.46	48.8	1.23			(7/1957)-
	C3	35.67	139.55	25.41	205.46	48.8	1.23			(7/1957)-
TOKYO/ITABASHI	F1	35.67	139.75	25.43	205.64	48.7	1.23	11.61	20M	11/1969 -
	F2	35.67	139.75	25.43	205.64	48.7	1.23	11.61	20M	1/1948 -
	F3	35.67	139.75	25.43	205.64	48.7	1.23	11.61	20M	7/1957 -
TOKYO/MABASHI	F2	35.67	139.75	25.43	205.64	48.7	1.23	11.61	42M	(1/1959)---(12/1964)
	F3	35.67	139.75	25.43	205.64	48.7	1.23	11.61	42M	(5/1958)---(10/1959)
TOLEDO	B8	39.88	355.95	43.88	74.67	56.4	1.55			1/1970-
	D1	39.88	355.95	43.88	74.67	56.4	1.55			1/1947 -
	D2	39.88	355.95	43.88	74.67	56.4	1.55			(1/1964)---(9/1967)
TOMSK	B1	56.50	84.90	45.92	159.57	75.4	2.52			1/1957 -
	B7	56.47	84.93	45.88	159.59	75.4	2.52			12/1957 -
	B10	56.47	84.93	45.88	159.59	75.4	2.52			9/1957 -
	D1	56.47	84.93	45.88	159.59	75.4	2.52			1/1958 -

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
TONANZINTLA	C1	19.03	261.70	28.94	328.09	46.2	1.28			(7/1957)-(12/1957)
TONOPAH	B5	38.00	243.50	45.19	304.48	64.1	1.96			
TOOLANGI	D1	-37.53	145.47	-46.66	220.84	-68.4	2.21			1/1919 -
	D2	-37.53	145.47	-46.66	220.84	-68.4	2.21			
TORONTO	C3	43.90	280.60	55.16	346.84	74.4	3.34			(7/1957)-(12/1959)
	G	43.90	280.60	55.16	346.84	74.4	3.34			(6/1969)-
TORTOSA	A1	40.82	00.50	43.90	79.66	57.4	1.57			(7/1957)---(12/1964)
	B1	40.80	00.30	43.92	79.45	57.4	1.58			5/1957 -
	C1	40.82	00.50	43.90	79.66	57.4	1.57			(11/1964)-(1/1967)
	C6	40.82	00.50	43.90	79.66	57.4	1.57			(1/1962)---(9/1965)
	D1	40.82	00.50	43.90	79.66	57.4	1.57			1/1905 -
TORUN	C3	53.08	18.55	52.05	102.61	69.0	2.41			10/1960 ---
TOTTORI	B14	35.53	134.22	24.86	200.71	49.4	1.23			(4/1965)-(8/1965)
TOWNSVILLE	B1	-19.30	146.70	-28.47	218.79	-48.1	1.24			6/1946 -
	B4	-19.30	146.70	-28.47	218.79	-48.1	1.24			10/1966 -
	D2	-19.30	146.70	-28.47	218.79	-48.1	1.24			
	G	-19.30	146.70	-28.47	218.79	-48.1	1.24			(7/1964)-(9/1964)
TOYOKAWA	A8	34.83	137.37	24.40	203.60	48.0	1.21			(7/1957)-
	B13	34.83	137.37	24.40	203.60	48.0	1.21			(7/1957)-
	B14	34.83	137.37	24.40	203.60	48.0	1.21			(7/1957)-(12/1965)
	C3	34.83	137.37	24.40	203.60	48.0	1.21			(7/1957)-
	C6	34.83	137.37	24.40	203.60	48.0	1.21			(10/1960)---
TRAPPES	B14	48.77	02.01	51.24	84.48	65.5	2.16			7/1957 -(12/1958)
TRELEW	B1	-43.20	294.70	-31.72	03.17	-40.7	1.33			4/1958 -
	D1	-43.25	294.68	-31.71	03.15	-40.8	1.33			7/1957 -
TRIESTE	A1	45.65	13.75	45.92	94.63	62.8	1.82			(1/1966)-
	A2	45.65	13.75	45.92	94.63	62.8	1.82			(1/1966)-
	A8	45.65	13.75	45.92	94.63	62.8	1.82			3/1966 -
	C3	45.65	13.75	45.92	94.63	62.8	1.82			3/1966 -
TRINIDAD	B3	10.75	298.43	22.15	07.88	40.6	1.26			(3/1961)-
	C6	10.75	298.43	22.15	07.88	40.6	1.26			5/1964 -
	D2	10.42	298.62	21.81	08.08	40.7	1.26			
TRIVANDRUM	B1	08.50	77.00	-01.07	146.42	-1.6	1.43			1/1957 - 10/1964
	D1	08.48	76.95	-01.08	146.37	-1.6	0.92			10/1957 -
TROMSO	B1	69.70	19.00	67.14	116.80	77.6	6.32			8/1932 ---
	B2	69.65	18.93	67.11	116.68	77.6	6.30			8/1966 -
	B7	69.70	19.00	67.14	116.80	77.6	6.32			7/1957 - 12/1958
	B8	69.70	19.00	67.14	116.80	77.6	6.32			(1/1965) - (12/1970)
	B13	69.50	19.20	66.94	116.69	77.5	6.21			(1/1963)-(12/1963)
	C6	69.65	18.93	67.11	116.68	77.6	6.30			10/1968 -
	C9	69.70	19.00	67.14	116.80	77.6	6.32			8/1932 ---
	D1	69.67	18.95	67.13	116.72	77.6	6.31			1/1930 -
	D2	69.67	18.95	67.13	116.72	77.6	6.31			
	E1	69.70	19.00	67.14	116.80	77.6	6.32			(9/1957)---
	F3	69.70	19.00	67.14	116.80	77.6	6.32		SL	9/1957 - 3/1960
TRUJILLO	B12	-08.10	280.25	03.20	349.34	7.0	1.04			12/1957 - 11/1958
TSUMEB	B1	-19.20	17.70	-18.15	82.82	-57.3	1.34			7/1957 -
	B4	-19.20	17.70	-18.15	82.82	-57.3	1.34			(10/1970)-
	B6	-19.20	17.70	-18.15	82.82	-57.3	1.34			10/1967 - 5/1969
	B7	-19.23	17.72	-18.18	82.83	-57.3	1.34			7/1957 - 12/1958
	B12	-19.23	17.72	-18.18	82.83	-57.3	1.34			
	D1	-19.22	17.70	-18.16	82.81	-57.3	1.34			7/1964 -
	G	-19.22	17.70	-18.16	82.81	-57.3	1.34			(7/1965)---
TUCSON	A3	31.96	248.40	40.03	311.41	59.1	1.65			(1/1970)---
	D1	32.25	249.17	40.43	312.18	59.5	1.67			1/1910 -
	D2	32.25	249.17	40.43	312.18	59.5	1.67			1/1957 -
	G	32.23	249.05	40.39	312.06	59.5	1.67			(4/1964)-(12/1965)
TUCUMAN	B1	-26.90	294.60	-15.42	03.33	-22.1	1.11			7/1957 ---
	B13	-26.90	294.60	-15.42	03.33	-22.1	1.11			(4/1963)-(3/1964)
TULSA	D1	35.92	264.22	45.97	328.33	66.3	0.83			7/1961 -
TUNGSTEN	D2	62.00	231.85							
	E1	61.00	232.00	65.07	279.60	78.2	5.68			(7/1969)-
UEDINENIE IS	E1	77.50	82.30	66.76	164.73	84.9	9.68			(12/1957)---(3/1959)
ULAN BATOR	D1	47.85	106.75	36.38	176.46	67.6	1.73			1/1966 -
	D2	47.85	106.75	36.38	176.46	67.6	1.73			
ULASKA	B2	64.97	212.48	64.78	256.68	76.7	5.47			11/1965 -
UNALASKA	B8	53.88	193.47	50.91	247.95	65.7	2.42			10/1957 - 12/1958
	B13	53.88	193.47	50.91	247.95	65.7	2.42			7/1957 -(5/1959)
UPOLO POINT	C6	20.25	204.17	20.46	268.89	38.2	1.13			(1/1969)-
UPPER VAN NORMANA	1	34.05	241.51	40.99	303.43	59.9	1.69			(7/1965)-
	A3	34.05	241.51	40.99	303.43	59.9	1.69			(2/1969)-
	A4	34.05	241.51	40.99	303.43	59.9	1.69			(2/1966)-
	A5	34.05	241.51	40.99	303.43	59.9	1.69			(2/1971)-
	A8	34.05	241.51	40.99	303.43	59.9	1.69			(7/1968)-
	A9	33.91	241.62	40.88	303.65	59.8	1.69			(1/1967)-
	C1	34.05	241.77	41.04	303.71	59.9	1.70			11/1967 -
	C2	34.05	241.51	40.99	303.43	59.9	1.69			(2/1970)-
	C3	34.05	241.51	40.99	303.43	59.9	1.69			(2/1968)-
UPPSALA	B1	59.80	17.60	58.53	105.90	73.1	3.35			1/1952 -
	E1	59.80	17.60	58.53	105.90	73.1	3.35			(7/1957)-
	F1	58.85	17.92	58.51	106.23	73.1	3.35	1.43	SL	9/1956 ---
	F3	58.85	17.92	58.51	106.23	73.1	3.35	1.43	SL	9/1956 ---
URANIUM CITY	E1	59.50	251.40	67.26	303.17	81.8	7.26			(9/1957)---(12/1958)
URBANA	B11	40.00	272.00	50.74	336.79	71.1	2.66			7/1958 -
USHUAIA	B1	-54.80	291.70	-43.30	00.55	-50.6	1.69			11/1957 -
	B14	-54.80	291.70	-43.30	00.55	-50.6	1.69			1/1969 -
	F1	-54.80	291.70	-43.30	00.50	-50.6	1.69	5.68	SL	7/1957 ---
	F3	-54.80	291.70	-43.30	00.50	-50.6	1.69	5.68	SL	11/1957 - 11/1960
USSURISK	A8	43.00	132.00	32.15	198.03	58.8	1.46			(6/1959)---
	C1	43.00	132.00	32.15	198.03	58.8	1.46			(11/1957)-
	C2	43.00	132.00	32.15	198.03	58.8	1.46			(3/1966)-
	C3	43.00	132.00	32.15	198.03	58.8	1.46			(6/1959)---
	D1	43.68	132.17	32.84	198.11	59.5	1.49			1/1936 ---

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
UTRECHT	C1	52.08	05.13	53.76	89.28	68.1	2.43			(7/1957)-(10/1959)
	F1	52.08	05.13	53.76	89.28	68.1	2.43	2.76	1M	2/1967 -
	F3	52.08	05.13	53.76	89.28	68.1	2.43	2.76	1M	2/1967 -
UTSJOKI	B8	69.75	27.00	65.80	122.88					(1/1967)-
	E1	69.75	27.00	65.80	122.88					(1/1965)- 12/1970
VALENTIA	D1	51.93	349.75	56.64	73.46	68.2	2.63			1/1900 -
VAL-JOYEUX	B6	48.82	02.02	51.28	84.51	65.5	2.17			11/1964 -
VALLEY COTTAGE	C6	40.67	286.22	52.12	354.09	71.8	2.86			1/1958 ---
VAL D OR	B8	48.00	282.20	59.32	348.43	77.0	4.20			8/1959 -
VANIMO	B1	-02.70	141.30	-12.60	211.09	-21.0	0.98			7/1964 -
VASSOURAS	D1	-22.40	316.35	-11.94	23.87	-24.3	1.12			7/1915 -
VEGA BAJA	B5	18.47	293.58	29.96	02.82	51.1	1.43			
	D2	18.29	293.75							
VERKHOYANSK	E1	67.60	133.40	56.69	195.33	79.8	4.25			(1/1958)---
VERMILLION	E1	42.80	263.10	52.66	325.52	72.2	2.85			(7/1957)---(5/1963)
VICTORIA	B1	48.40	236.60	54.08	293.04	71.2	2.86			7/1957 - 1/1959
	D1	48.52	236.58	54.19	292.97	71.3	2.88			7/1957 -
	D2	48.52	236.58	54.19	292.97	71.3	2.88			
	E1	48.50	236.60	54.18	293.00	71.3	2.88			(8/1957)---(4/1959)
	F1	48.50	236.60	54.18	293.00	71.3	2.88	1.86	71M	8/1964 -
VIK	B5	63.42	341.00	69.02	73.19	75.5	5.66			
VOLGOGRAD	B5	48.68	44.35	43.14	123.82	66.6	1.93			
VOSTOK	B1	-78.40	106.90	-89.17	94.93	-78.4	74.27			3/1958 -
	B8	-78.28	106.50	-89.07	101.44	-78.3	74.20			12/1964 -
	C8	-78.28	106.50	-89.07	101.44	-78.3	74.20			(12/1964)-
	C9	-78.40	106.90	-89.17	94.93	-78.4	74.27			3/1958 -
	D1	-78.45	106.87	-89.17	91.44	-78.4	73.54			1/1958 ---
	D2	-78.45	106.87	-89.17	91.44	-78.4	73.54			
	E1	-78.50	106.90	-89.18	87.99	-78.3	73.03			(5/1958)---
	F1	-78.50	106.90	-89.18	87.99	-78.3	73.03	0.00		7/1963 -
	F3	-78.50	106.90	-89.18	87.99	-78.3	73.03	0.00		9/1965 --- 1/1967
WAKE ISLAND	B11	20.00	166.00	13.16	232.23	27.2	0.96			10/1960 -
WAKKANAI	B1	45.40	141.70	35.27	206.04	59.5	1.56			3/1947 -
	B13	45.40	141.70	35.27	206.04	59.5	1.56			(7/1957)-(12/1962)
WALLOPS IS	B1	37.90	284.50	49.31	352.12	69.9	2.54			7/1963 -
	B5	37.90	284.50	49.31	352.12	69.9	2.54			
WALTAIR	B10	17.72	83.30	07.48	153.48	19.9	0.94			(7/1957)-(12/1959)
WARRENSBURG	B14	38.77	266.27	49.01	330.18	69.3	2.42			3/1961 - 5/1965
WASHINGTON	A1	38.67	282.98	50.03	350.24	70.5	2.61			(7/1957)-(3/1968)
	A11	38.67	282.98	50.03	350.24	70.5	2.61			(1/1964)-
	B1	38.70	282.90	50.06	350.14	70.6	2.62			6/1931 - 9/1968
	B8	38.70	282.90	50.06	350.14	70.6	2.61			1/1963 - 2/1965
	B13	38.67	282.98	50.03	350.24	70.5	2.61			10/1957 - 6/1959
	C1	38.67	282.98	50.03	350.24	70.5	2.61			7/1957 - 2/1959
	C3	38.67	282.98	50.03	350.24	70.5	2.61			2/1958 - 4/1959
	C5	38.67	282.98	50.03	350.24	70.5	2.61			(1/1964)-
WEISSENAU	C4	47.80	09.50	48.82	91.43	64.7	2.03			(8/1966)-
	F1	47.80	09.50	48.82	91.43	64.7	2.03	4.16	427M	10/1956 - 3/1959
	F3	47.80	09.50	48.82	91.43	64.7	2.03	4.16	427M	6/1957 -
WELLESLEY	C6	42.28	288.70	53.77	357.12	72.7	3.07			4/1968 -
WELLINGTON	A1	-41.23	174.92	-45.38	254.09	-66.4	2.15			(7/1957)-(3/1960)
	A2	-41.23	174.92	-45.38	254.09	-66.4	2.15			(7/1957)-(3/1960)
	B11	-41.20	175.00	-45.38	254.09	-66.4	2.15			(12/1969)-
	B13	-41.23	174.92	-45.38	254.09	-66.4	2.15			8/1957 ---
	F1	-41.28	174.77	-45.46	253.95	-66.5	2.16	3.42	125M	(7/1957)---(6/1965)
	F3	-41.28	174.77	-45.46	253.95	-66.5	2.16	3.42	125M	(11/1964)---(6/1965)
WENDELSTEIN	A1	47.70	12.00	48.23	93.81	64.6	2.01			(7/1957)-
	A4	47.70	12.00	48.23	93.81	64.6	2.01			(7/1957)-
	A6	47.70	12.00	48.23	93.81	64.6	2.01			(7/1957)-
	A7	47.70	12.00	48.23	93.81	64.6	2.01			(7/1957)-
	C1	47.70	12.00	48.23	93.81	64.6	2.01			(7/1957)-
WESTON	D1	42.38	288.68	53.87	357.09	72.8	3.08			7/1960 -
WEST NYACK	C6	41.08	286.07	52.53	353.89	72.2	2.92			7/1967 -
WETASKIWIN	B13	52.97	246.55	60.23	301.86	76.7	4.19			(10/1957)-(12/1958)
WHITE HORSE	E1	60.70	224.90	63.39	272.61	76.4	4.93			(9/1966)-(12/1966)
WHITE MOUNTAIN	F1	37.58	241.75	44.49	302.69	63.4	1.91	4.48	3800M	8/1965 -
WHITE SANDS	B1	32.30	253.50	41.10	316.94	60.5	1.72			(7/1957)-
	B5	32.30	253.50	41.10	316.64	60.5	1.72			
	C6	32.40	253.13	41.14	316.51	60.5	1.72			(7/1957)-
WIEN-KOBENZL	D1	48.27	16.32	47.91	98.20	65.2	2.03			1/1929 -
WIESE IS	E1	79.90	77.00	69.35	163.85	85.0	12.33			(11/1957)---(12/1959)
WILDWOOD	B8	60.56	208.75	60.07	257.42	73.1	3.89			3/1967 -
WILKES	B1	-66.90	110.50	-78.40	179.02	-81.6	37.27			7/1957 - 1/1969
	B8	-66.90	110.50	-78.40	179.02	-81.6	37.27			
	C8	-66.90	110.50	-78.40	179.02	-81.6	37.27			
	C9	-66.90	110.50	-78.40	179.02	-81.6	37.27			7/1957 - 4/1969
	D1	-66.25	110.58	-77.75	179.20	-81.7	37.73			7/1957 - 1/1967
	D2	-66.25	110.58	-77.75	179.20	-81.7	37.73			7/1957 - 1/1967
	E1	-66.28	111.53	-77.78	180.95	-82.0	39.20			(4/1957)--- 3/1969
	E4	-66.28	111.53	-77.78	181.01	-82.0	39.20			(4/1957)---(12/1967)
	F1	-66.28	111.53	-77.78	181.01	-82.0	39.20	0.01	SL	3/1962 - 4/1969
	F3	-66.28	111.53	-77.78	181.01	-82.0	39.20	0.01	SL	(8/1957)-(12/1958)
	F4	-66.28	111.53	-77.78	181.01	-82.0	39.20	0.01	SL	1/1968 - 3/1969
WILLIAMS BAY	E1	42.60	271.50	53.29	335.73	73.1	3.00			(7/1957)-(3/1962)
	E4	42.60	271.50	53.29	335.73	73.1	3.00			(1/1959)---(12/1960)
WINGST	D1	53.75	09.07	54.55	94.05	69.3	2.57			1/1939 -
	D2	53.75	09.07	54.55	94.05	69.3	2.57			(1/1964)-(12/1967)
WINNIPEG	B1	49.80	265.60	59.85	326.55	77.9	4.32			5/1951 -
	B4	49.80	265.60	59.85	326.55	77.9	4.32			9/1959 -
	B7	49.90	262.80	59.63	322.99	77.6	4.23			12/1957 - 12/1958
WITTEVEEN	D1	52.82	06.67	54.15	91.20	68.7	2.49			7/1891 -
	D2	52.82	06.67	54.15	91.20	68.7	2.49			(9/1957)-

MASTER STATION LIST

STATION NAME	OBS PROG	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	GEOMAGNETIC LAT	GEOMAGNETIC LONG	COMPUTED DIP	L-VALUE	CUT-OFF RIGIDITY	ALT-ITUDE	OPEN - CLOSE DATES
WOOMERA	B1	-31.00	136.30	-41.24	209.15	-63.2	1.74			5/1961 -
	B2	-31.38	136.87	-41.56	209.86	-63.5	1.77			10/1962 - 10/1965
	B5	-31.10	136.78	-41.29	209.71	-63.2	1.75			
	C6	-31.10	136.78	-41.29	209.71	-63.2	1.75			(2/1968)-
WRANGEL ISLAND	E1	71.00	181.40	64.79	226.06	78.5	6.14			(12/1957)---(3/1959)
WROCLAW	A1	51.10	17.08	50.46	100.23	67.5	2.24			(10/1957)---(3/1967)
	A2	51.10	17.08	50.46	100.23	67.5	2.24			(10/1957)---(3/1967)
	C1	51.10	17.08	50.46	100.23	67.5	2.24			(3/1964)---(11/1965)
YAKUTSK	B1	62.00	129.60	50.94	193.75	76.5	3.08			2/1957 -
	B8	62.00	129.60	50.94	193.75	76.5	3.08			(3/1971)-
	B12	62.00	129.60	50.94	193.75	76.5	3.08			(1/1956)-
	B12	62.00	129.60	50.94	193.75	76.5	3.08			(1/1956)-
	D1	62.02	129.72	50.97	193.83	76.5	3.08			1/1931 -
	D2	62.02	129.72	50.97	193.83	76.5	3.08			(1/1963)-
	E1	62.10	129.70	51.05	193.81	76.6	3.09			(1/1957)-
	E3	62.10	129.70	51.05	193.81	76.6	3.09			(1/1959)---
	E4	62.10	129.70	51.05	193.81	76.6	3.09			(1/1969)---
	F1	62.02	129.72	50.97	193.83	76.5	3.08	1.70	105M	7/1957 --- 11/1969
	F2	62.02	129.72	50.97	193.83	76.5	3.08	1.70	105M	7/1953 ---
	F3	62.02	129.72	50.97	193.83	76.5	3.08	1.70	105M	7/1957 ---
	G	62.10	129.70	51.05	193.81	76.6	3.09			(7/1957)-
YAMAGAWA	B1	31.20	130.60	20.30	197.81	44.0	1.13			12/1946 -
	B10	31.20	130.62	20.30	197.83	44.0	1.13			7/1957 -
YAP ISLAND	C6	09.53	138.17	-00.73	206.77	3.9	0.94			(2/1969)-
YAUCA	D1	-15.53	285.33	-04.08	354.52	-5.0	1.05			9/1957 - 1/1960
YELLOWKNIFE	B1	62.40	245.60	68.95	293.30	82.1	8.33			11/1957 - 1/1959
	C9	62.40	245.60	68.5	293.30	82.1	8.33			11/1957 - 1/1969
	D1	62.43	245.60	68.98	293.27	82.1	8.35			7/1957 - 7/1958
	E1	62.40	245.60	68.95	293.30	82.1	8.33			(7/1957)---(10/1958)
YOKOSHIBA	B14	35.63	140.50	25.46	206.31	48.6	1.23			(9/1957)-(12/1958)
YUZHNO SAKHALI	B1	47.00	143.00	36.97	206.89	60.9	1.54			3/1957 -
	D1	46.95	142.72	36.89	206.66	60.9	1.63			1/1942 -
ZAMBOANGA	G	06.90	122.07	-04.39	191.02	-2.5	0.93			(5/1959)-(11/1959)
ZARIA	B1	11.85	07.65	13.57	79.12	1.7	0.98			
	B14	11.85	07.65	13.57	79.12	1.7	0.98			10/1968 -
	D1	11.15	07.65	13.57	79.12	1.7	0.98			1/1964 -
	D2	11.15	07.65	13.57	79.12	1.7	0.98			
ZARYA SHIP	B1	SHIP.								(8/1959)-(11/1964)
ZUGSPITZE	F1	47.42	10.98	48.16	92.70	64.4	0.87	4.24	2960M	1/1957 ---
	F3	47.42	10.98	48.16	92.70	64.4	0.87	4.24	2960M	10/1957 - 2/1960
ZURICH	A2	47.38	08.57	48.60	90.34	64.3	1.99			1/1949 -
	C1	47.38	08.57	48.60	90.34	64.3	1.99			(7/1957)-
ZVENIGOROD	E1	55.72	36.85	51.17	120.21	71.4	2.59			(7/1957)---(12/1959)
	G	55.72	36.85	51.17	120.21	71.4	2.59			(8/1957)-(12/1959)

STATION NAME EQUIVALENTS

EQUIVALENT NAME AND PROGRAMS	PREFERRED NAME
AEROSPACE SOLAR OBS	UPPER VAN NORMAN
AFCRL SAGAMORE HILL-C3	SAGAMORE HILL
AGIA PARASKEVI-C6,B9	ATHENS
AGINCOURT-D1	OTTAWA
AKITA-KEN-B1	AKITA
AKITA-SHI-B1	AKITA
AMUNDSEN-SCOTT-E,B1	SOUTH POLE
ANACAPRI-C1	CAPRI F
ANACAPRI-C1	CAPRI S
APATITY-F1	MURMANSK
AWARUA-F1,F3	INVERCARGILL
AZORES D1	SAN MIGUEL
BAD REICHENHALL	PREDIGTSTUHL
BAFFIN-B1	CLYDE
BALBOA-B14	PANAMA
BANDA-D2	FORT ARCHAMBAULT
BARKING SANDS-B5	KAUAI
BASE GENERAL BELGRANO-E	BELGRANO
BASE RO	BAUDOUIN
BAURU-D2	SAO PAULO
BELGRADE	BEOGRAD
BELGRANO	ELLSWORTH
BELVOIR-B1	WASHINGTON
BISDEE-C6	HOBART
BLINDERN	KJELLER
BOEING-C3	SEATTLE
BOSTON	BILLERICA
BOSTON	BEDFORD
BREISACH	FREIBURG/BREISACH
BUKHTA TIKHAYA	HEISS IS
BUKHTA TUKSY	TIXIE BAY
CAMP TORUGUERO	VEGA BAJA
CANBERRA-B2	ORRORAL
CAPE CANAVERAL-B1	CAPE KENNEDY
CASEY	WILKES
CENTRO GEOFISICO-B1	CUBA
CHABOT OBS.-C6	OAKLAND
CHALATS MEUDON	MEUDON
CHUNG-LI	TAIPEI
COUGAR MT-D2	SEATTLE
CRIMEE-C1	SIMFEROPOL
CRACOW	KRAKOW
CU BOULDER-C4,C6	BOULDER
CUIDAD UNIVERSITY-F1	MEXICO CITY
DAPANGO-B1	TOGO
DAVAD-D2	CEBU
DIXON ISLAND-E,D1	DIXON
DOMINION ASTRO. OBS D2	PENTICTON
DRAO-C3	PENTICTON
DUMONT D URVILLE-F1,B1	TERRE ADELIE
EBRO-C1	TORTOSA
EL CERRILLO	MEXICO CITY
EL SEGUNDO-A9	UPPER VAN NORMAN
ELLSWORTH-B1	BELGRANO
ESK-D2	BRISBANE
ESSA BOULDER-A8,B1,C3	BOULDER
EUGENIDES PLANETARIUM-A2	ATHEN2
EYVINDORA-E	EGILSSTADIR
FAIRBANKS-B1,B2	COLLEGE
FALKLAND IS. B1,B2	PORT STANLEY
FANNING IS-D1	FANNING
FLEURS	SYDNEY/FLEURS
FLOIRAC	BORDEAUX
FORMOSA	TAIPEI
FORT BELVOIR-C6	WASHINGTON
FORT CHURCHILL-D1	CHURCHILL
FRAUNHOFER	FREIBURG/BREISACH
GODLEY HEAD-B1	CHRISTCHURCH
GRANADA-A2	CARTUJA
GREENWICH	HERSTMONCEUX
HALLE/SAALE-F2	HALLE
HALLETT STATION-E	CAPE HALLETT
HANDS-C6	BOULDER
HAO BOULDER-C1,C6,C4	BOULDER
HARESTUA-C3,A8	KJELLER
HARINGHATA	CALCUTTA
HARVARD-C4	FORT DAVIS
HAVANA-D1	CUBA
HAWAII	HONOLULU
HAWAII-C6	HALEAKALA
HOBART	CAMBRIDGE TUNNEL
HUMAIN-A8,C3,C6	DOURBES
ICAROS ATHENS-A2	ATHENS
JAKUTSK	YAKUTSK
JOROA-D2	CUBA
KAMPALA-F1,F3	MAKERERE
KARAVIA-B1	ELIZABETHVILLE
KENORA-B1	WINNIPEG
KITT PEAK	TUCSON
KOBENHA	COPENHAGEN
KOKUBUNJI-B1,B7,B12	TOKYO
KOLN	COLOGNE
KONTINKANGAS-F1,F3	OULU
KRASNAYA PAKHRA-B1	MOSCOW
LAEM CHABANG-B14	BANGKOK

EQUIVALENT NAME AND PROGRAMS	PREFERRED NAME
LEGON-D2,B14,B8	ACCRA
LEOPOLDVILLE-B1,D1	KINSHASA-BINZA
LOS ANGELES-C6	LOCKHEED
MACAO	MACAU
MAKAPUU PT-C3,F1,F3	HONOLULU
MITAKA-C1,A4,A1	TOKYO
MONTE CAPELLINO-D1	GENOVA
MONTE MARIO-C1	ROME
MOOR PARK-C6	PRESTON
MOSCOW UNIV.-F1,C1	MOSCOW
MURMANSK-F1,F3	APATITY
MUSSALA	MOUSSALLA
NANCAY	SAINT SANTIN
NARSARSSUAK	NARSSARSSUAQ
NASA-GSFC	GREENBELT
NBS BOULDER-A8,B1,C3	BOULDER
NERA-UTRECHT-F1	NEDERHORST DEN BERG
NEWCASTLE	CAMDEN
NEW DELHI	DELHI
NIZAMIAH	HYDERABAD
NOME-C6	PORT CLARENCE
NORTH POLE 10-D1	ARCTICA(NP-10)
NORTH POLE 6-D1	ARCTICA I (NP-6)
NORTH POLE 7-D1	ARCTICA II (NP-7)
NORTH POLE 8-D1	ARCTICA (NP-8)
OAHU-C6	HONOLULU
OSLO	KJELLER
PALO ALTO-D2	STANFORD
PAMATAI	TAHITI
PARIS	BAGNEUX
PEAK MOUSALLA	MOUSSALLA
PENDELI-D1	ATHENS
POINT BARROW-E, B1	BARROW
POLE STATION-B1	SOUTH POLE
PONTIAC-C6	MCMATH-HULBERT
PORT AUX FRANCAIS F1,F3,D1,D2	KERGUELEN
PORT LOCKROY	ARGENTINE IS
PRAGUE-F3	PANSKA VES
PRAGUE	PRUHONICE
PRAHA-C6	PANSKA VES
PROVIDENIE BAY	PROVIDENYA
QUEBEC	BAIE ST PAUL
QUEZON CITY	MANILA
RAMEY AFB-B1	PUERTO RICO
RAOUL ISLAND-B1	KERMADEC
RESIPATRON	O HIGGINS
ROI BAUDOUIN-D-1	BAUDOUIN
ROMA-B1	ROME
ROSTOV-ON-DON	ROSTOV
RUDE SKOV-C5,D1,D2	COPENHAGEN
SALONIQUE	THESSALONIKA
SAN FERNANDO OBS	UPPER VAN NORMAN
SAN JUAN-D1	PUERTO RICO
SANAE STATION-D1	SANAE
SAN FRANCISCO-B1,B8,B12,B13	STANFORD
SAN MIGUEL-C1,C3,A1,A8	BUENOS AIRES
SANTIAGO	ANTOFAGASTA
SAO JOSE DOS CAMPOS	SAN JOSE
SCARAMANGA STATION-B1	ATHENS
SHOWA	SYOWA BASE
SIMEIS-C1,A8,C3	SIMFEROPOL
SKY-H1	EIGHTS
SOTTENS	SCHWARZENBURG
SOUTH ATLANTIC-B2	PORT STANLEY
SPAIN SC-04-C6	SAN FERNANDO
STEPANOVKA-D2	ODESSA
STOCKHOLM-C1	SALTSJOBADEN
STOCKHOLM	ENKOPING
SYOWA BAY	SYOWA BASE
TARAVAO	TAHITI
TIKHAYA BAY-F1,F3,D1	HEISS IS
TIKSY BAY	TIXIE BAY
TOKYO-KOENJI-F2	KOENJI
TREMSDORF-C3,A8	POTSDAM
TROY	GRAFTON
TUBINGEN-C4	WEISSENAU
UCCLI-C6,C1,A1,A2,A6	DOURBES
UNIVERSIDADE MACKENZIE-C3 A8	SAO PAULO
UNIVERSITY PARK	PENN STATE U
UNIV. OF CANTERBURY-D2	CHRISTCHURCH
UNIV OF MICH-C4	ANN ARBOR
USNO-A1,A2	WASHINGTON
USNRL-A8	WASHINGTON
VANNOVSKAYA-G	ASHKHABAD
VLADIVOSTOK-D1	USSURISK
VOROSHILOV-C1	USSURISK
WASHINGTON STATE U-C3	PULLMAN
WATHEROO-B1,D1	MUNDARING
WEDDELL SEA-B1	ELLSWORTH
WELLINGTON	LOWER HUTT
WILKES-B1	CASEY
WILLFORD HALL OBS-C6A	PRESTON
WINKFIELD-B2,B6	SLOUGH
YUZHNO SAKHALINSK	YUZHNO SAKHALI
ZIMENKI-C3,A8	GORKY

A. SOLAR AND INTERPLANETARY PHENOMENA

(other than flare - associated events)

In the catalogue lists for these subsections the stations are arranged by geographic longitude from east to west to permit the user to estimate the adequacy of 24-hour coverage of the various solar phenomena in the WDC-A holdings. For section A.8 "Total Radio Flux Measurements" (and also in C.3 "Solar Radio Events, Fixed Frequency") the data are also listed in order of radio frequency.

For the appropriate sections the availability of data in computerized format is indicated.

Many of these data are found in standard publications. Some of these will be given under the catalogue holdings. Lists of publications can be found in:

Annals of the IQSY, Vol. 1, pp. 308, 309, M.I.T. Press, 1968
AFCRL Geophysics and Space Data Bulletin, Vol. IV, No. 2, Second Quarter 1967
World Data Center A-Upper Atmosphere Geophysics Report UAG-4, Abbreviated Calendar Record 1966-1967, pp. 164-169, December 1968: see p. 3.

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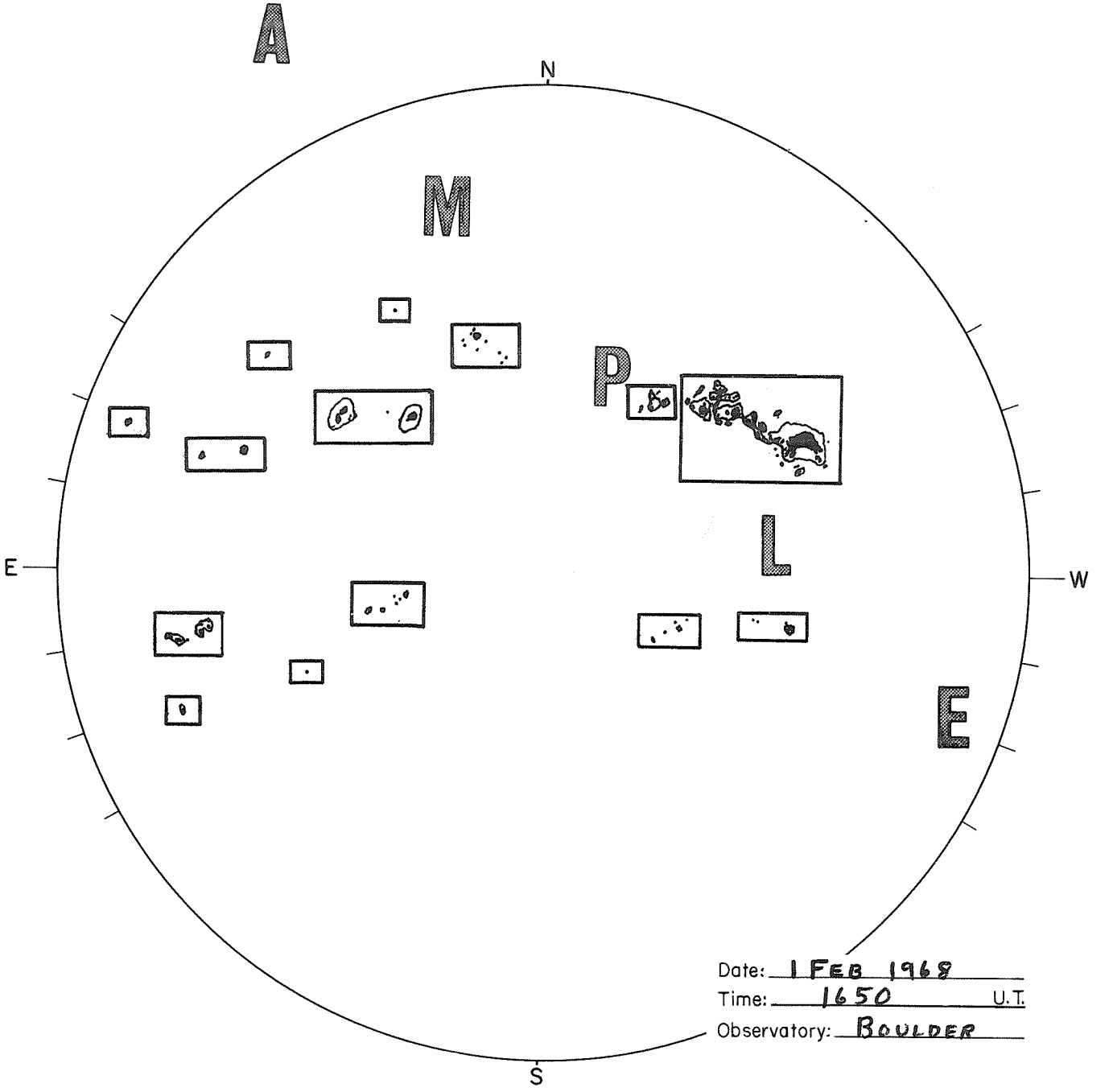
A.1

CATANIA POSITIONS AND CLASSIFICATIONS OF SUNSPOT-GROUPS

Date	Universal Time	Image quality	b	l	Type	f	R	h	A_p	A_c
9-7-1968	0515	2-3	+11°	185°	D	13		22	318	171
			+10	160	E	21		46	1378	985
			-16	184	J	1		29	106	61



Date: 1 FEB 1968
Time: 1650 U.T.
Observatory: BOULDER

A.1 SUNSPOT POSITIONS, AREAS, AND CLASSIFICATIONS AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
UCCLE	50N	4	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
LOCARNO	46N	9	B	A	A	A	A	A	A	A	A	A					
AROSA	47N	10	B	A	A	A	A	A	A	A	A	A					
ARCETRI	43N	11	B	A	A	A	A	A	A	A	A	A	A	A	B	B	C
ROME	41N	12	C	A	A	A	A	A	A	A	A	A	A	A	A	A	C
BERLIN	52N	13												A	A	B	
TRIESTE	45N	13										A	A	A	B		
CATANIA	37N	15	B	A	A						B	B	A	A	A	A	C
WROCLAW	51N	17	C	A	A		B	A	A	A	A	B	C				
BUCHAREST	44N	26			A	A	A	A	A	A							
ISTANBUL	41N	28	B	A	A						A	A	A	A	A	A	C
KANDILLI	41N	29									A	A	A	A	A	A	C
BEIRUT	33N	35	B	A	A	A	A	B	C	B	A	A	A	B	B	A	
TEHERAN	36N	51														Q	Q
BAGUIO	16N	120	B	A	A	A	A	A	A	A	A	A	A	A	A	B	C
MANILA	14N	121												A	A	A	C
TAIPEI	25N	121	B	A	A					A	A	A	A	A	A	A	
LUNPING	25N	121											B	A	A	A	C
SEOUL	37N	127								C	A	A	B	B	C	C	
IKOMASAN	35N	135	B	B	A	A	A	A	A	A	A	A	A	C			
MITAKA	35N	139	B	A	A	A	A	A	B	A	A	A	B	B	C		
TOKYO	36N	140							B	A	A	A	B	B	A		
PALEHUA	20N	204														Q	Q
MT WILSON	34N	242	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
UPPER VAN NORMAN	35N	242									Q	Q	Q	Q	Q	Q	Q
BOULDER	40N	255									C	A	A	A	A	A	C
SACRAMENTO PK	32N	255							B	A	B	A	A	A	B		
WASHINGTON	38N	283	B	A	A	A	A	A	A	A	A	A	B	A	A	A	C
RAMEY	19N	293														A	C
ROSARIO	33S	300														C	C
SAN MIGUEL	34S	302								A	A	A	A	A	A	A	C

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

COMPUTER FORMAT:

1. Mt. Wilson - (one card/sunspot/day) January 1967 to date.
2. Sacramento Peak - (one card/sunspot/day) January 1968 - October 1969.
3. Solar Active Regions (as published in Solar-Geophysical Data) January 1969 to date.

A.1

REPUBLIC OF THE PHILIPPINES
Department of Commerce and Industry
WEATHER BUREAU
Manila
- 0 -

SUNSPOT OBSERVATIONS MADE AT THE WEATHER BUREAU ASTRONOMICAL OBSERVATORY AT DILIMAN, QUEZON CITY DURING THE MONTH OF DECEMBER, 1970.

Instrument used: 6'' Refractor
2500mm fl

Method: Projection, 20 cm image
64.5 X eyepiece

a	*c d*	*e*	*f*	*g*	*R*	*j*	*k*	*l*	*m*	*REMARKS*
Day	Vis	U.T.	Gr	Sp		N-Gr.	S-Gr	N-s	S-s	
02	F	0520	9	30	120	5	4	17	13	
02	F	2[illegible]0	8	26	106	4	4	13	13	
04	F	0[illegible]2	6	30	90	3	3	7	23	
05	F	0[illegible]0	7	39	109	3	4	10	29	
05	G	2348	8	60	140	4	4	16	44	
06	G	2345	8	38	118	4	4	12	26	
08	F	0036	8	41	121	4	4	20	21	
09	F	0116	6	51	111	4	2	34	17	
10	F	0030	6	49	109	3	3	35	14	
10	G	2354	8	80	[illegible]0	4	4	51	29	
15	F	0104	9	28	[illegible]8	7	2	21	7	
16	F	0120	9	37	127	6	3	23	9	
20	F	0019	7	46	116	4	3	24	22	
21	G	0000	7	58	128	4	3	35	23	
23	F	0040	7	32	102	5	2	15	17	
24	G	0012	7	36	106	6	1	25	11	
24	F	2350	6	34	94	5	1	24	10	
26	F	0051	7	21	91	6	1	11	10	
27	F	0114	5	12	62	5	0	12	00	
28	G	0006	5	10	60	4	1	8	2	
29	G	0015	6	14	74	5	1	9	5	
30	F	0018	5	19	69	4	1	10	9	
-x-x-x-x-x-			-x-x-x-	-x-x-x-						
22 days										
SUN			154	791	2331	99	55	437	354	
MEAN					106.0					

c - *Solar image:* *E, G, F, P, VP*

e - *Universal Time*

f - *No. of groups*

g - *No. of Spots*

j - *No. of Groups N hemisphere*

k - *No. of groups S hemisphere*

l - *No. of spots N hemisphere*

m - *No. of spots S hemisphere*

R - *10f + g*

AT BOULDER

PUBLICATIONS:

1. Solar-Geophysical Data, National Oceanic and Atmospheric Administration, Boulder, Colorado.
2. СОЛНЕЧНЫЕ ДАННЫЕ (Solar Data), USSR Academy of Science.
3. "Photoheliographic Results" Greenwich Royal Observatory Bulletin, (1951-1960 in WDC):

   Positions and areas of sunspots for each day in the year.
   General catalogue of groups of sunspots for the year including CMP, duration, first seen and last seen dates, corrected mean area and mean position.
   Total areas of sunspots and faculae by west and east hemispheres for each day.
   Mean areas and mean heliographic latitude of sunspots and faculae for each solar rotation.

4. "Heliographic Maps of the Photosphere for the Year" by M. Waldmeier, Publikationen der Eidgenössischen Sternwarte Zürich, (1938-1967 in WDC):

   Heliographic maps of the photosphere by solar synodic rotation periods to ±50° latitude; sunspot group at state of its highest evolution and faculae.
   Evolution tables of sunspot-groups day by day by Zürich classification A, B, C, etc.

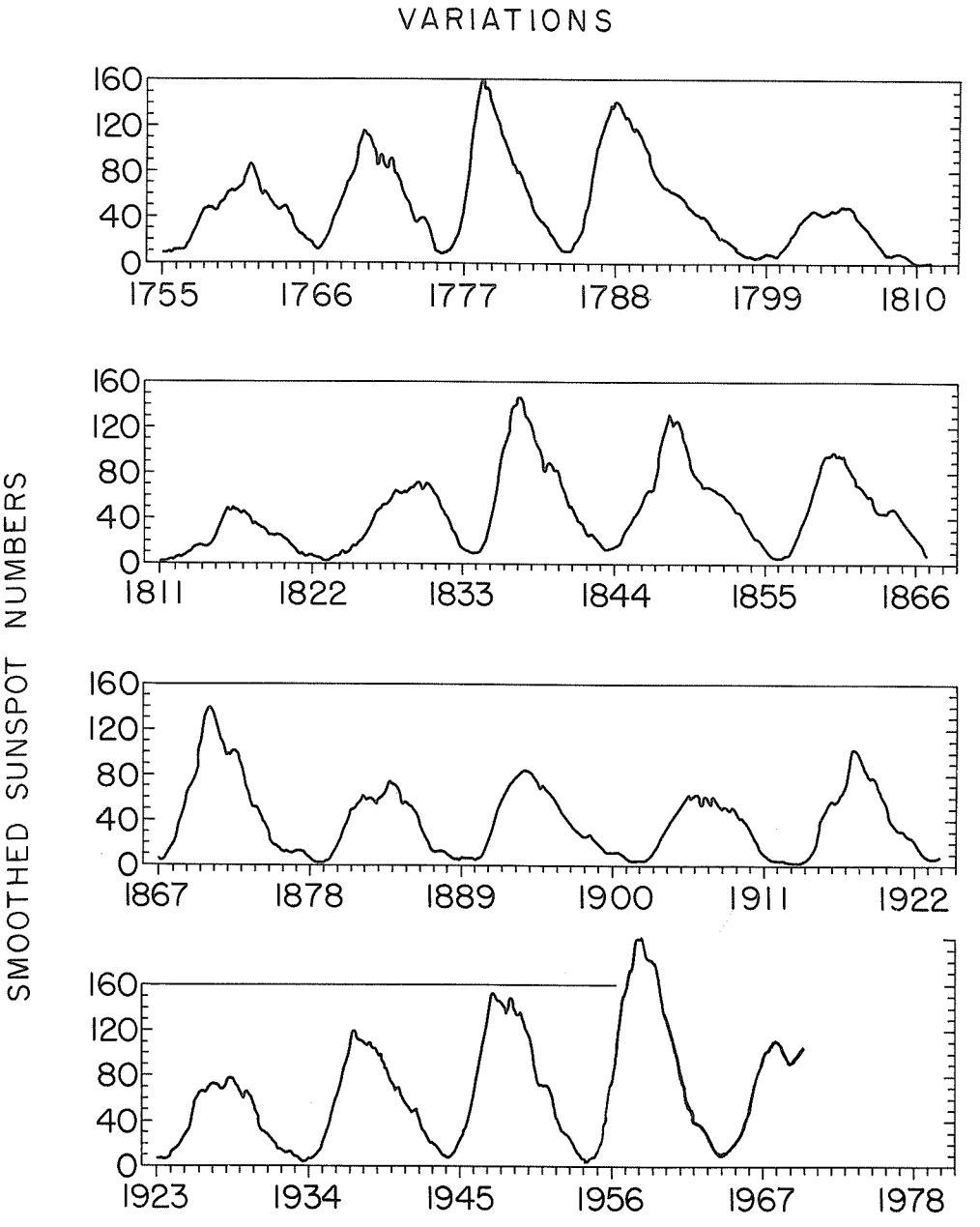
5. "Sunspot Areas 1907-1970" by R. S. Harrington and M. Miranian, United States Naval Observatory Circular No. 133, U. S. Naval Observatory, Washington, D. C. 20390, June 18, 1971. (Monthly means).

PHOTOGRAPHS:

1. Prints - Upper Van Norman 6/1966 - 4/1969.
2. Prints and drawings - Culgoora 4/1967 to date.
3. Prints - Sacramento Peak 9/1963 - 9/1965.

MOVIES:

"The Sun in Action" - Time-lapse techniques are used to show continuous changes and motions of features on the sun. 16mm B/W Silent print - 400' reel can be purchased on lent.


VARIATIONS
SMOOTHED SUNSPOT NUMBERS
160
120
80
40
0
1755
1766
1777
1788
1799
1810
1811
1822
1833
1844
1855
1866
1867
1878
1889
1900
1911
1922
1923
1934
1945
1956
1967
1978
ZURICH SUNSPOT NUMBERS

A.2 SUNSPOT NUMBERS

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
HERSTMONCEUX	51N	0	B	A	A	A	A								C	B	C
TORTOSA	40N	0	B	A	A	A			A	A							
BARCELONA	41N	2	B														
MEUDON	49N	2	B	A	A												
UCCLE	50N	4	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
FREIBURG	48N	8	B	A	A												
KARLSRUHE	49N	8	B	A	A												
ZURICH	47N	8	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
SONNEBERG	50N	11	B	A	A												
ROME	41N	12	C	A	A	A	A	A	A	A	A	A	A	A	A	A	C
POTSDAM	52N	13	B	A	A												
TRIESTE	55N	13										A	A	A	B		
KANZELHOHE	46N	14	B	A	A												
LJUBLJANA	46N	15	B	A	A												
ONDREJÓV	50N	15	B	A	A												
CATANIA	37N	15										B	A	A	A	A	C
DABROWA GORNIC	50N	19	C	A	A												
GDANSK	54N	19	C	A	A												
BEOGRAD	44N	20	B	A	A	C											
SKALNATE PLESO	49N	20	C	B	A												
NOWY SACZ	50N	21	C	A	A												
WARSAW	52N	21	B	A	A		B		C								
ATHENS-1	37N	23	B	C						A	A	B	B	C	B	B	C
ATHENS-2	38N	23				C							C	B	B	B	C
THESSALONIKA	40N	23								C	B	C	B				
BUCHAREST	44N	26	B	A	A	A	A	A	A	A							
ISTANBUL	41N	28	B	A	A						A	A	A	A	A	A	C
KANDILLI	41N	29									A	A	A	A	A	A	C
KIEV	50N	30	B	A	A	A	C	C									
BEIRUT	33N	35	B	A	A	A	A	B	C	B	A	A	A	B	B	A	
KISLOVODSK	43N	42	B	A	A	A	C	C									
WROCLAW	51N	57	C	A	A		B	A	A	A	A	B	C				
TASHKENT	41N	69	B	A	A	A	C	C									
DELHI	28N	77								C	B	B	B	A	A	B	C
KODAIKANAL	10N	77	B	A	C							B	B	C	B	C	
BANGKOK	30N	100												C		B	C
BAGUIO	16N	120										A	A	A	A	B	C
TAIPEI	25N	121	B	B	A					A	A	A	A	A	A	A	
LUNPING	25N	121											B	A	A	A	C
MANILA	14N	121												A	A	A	C
PYONGYANG	39N	125		B	C												
SEOUL	37N	127								C	A	A	B	B	C	C	
VOROSHILOV	43N	132	C	A	A	A	C	C									
IKOMASAN	34N	135	B	B	A	A	A	A	A	A	A	A	A	C			
TOKYO	36N	140							B	A	A	A	B	B	A		
WELLINGTON	41S	174	B	A	A	C											
SACRAMENTO PK	33N	254													A		
BOULDER	40N	255									C	A	A	A	A	A	C
LATROBE	40N	281									C	C					
AAVSO R-A	41N	286	B	A	A	A	A	A	A	A	A	A	A	A	B	A	C
SOUTH HADLEY	42N	287	C	B	C												

KEY TO SYMBOLS

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Swiss Federal Observatory, Zürich (Switzerland)

SUNSPOT-BULLETIN

1970, No. 2

Provisional Sunspot - Numbers for February 1970

Dependent on observations at Zürich Observatory and its stations in Locarno and Arosa.

Day	R	Day	R
1	154	15	115
2	120	16	139
3	79	17	142
4	68	18	143
5	[illegible]	19	120
6	[illegible]	20	125
7	107	21	128
8	97	22	125
9	123	23	164
10	133	24	166
11	175	25	173
12	153	[illegible]	143
13	145	[illegible]	150
14	124	28	146

Mean = 129.8

Predictions of the Smoothed Monthly Sunspot-Numbers

March	94	June	90
April	93	July	88
May	91	August	87

March 2, 1970

M. Waldmeier

Reproduction permitted if mention of authorities

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
SANTIAGO	34S	290	B	B	B	B	B										
TUCUMAN	26S	295							C								
ROSARIO	33S	300														C	C
SAN MIGUEL	34S	302			B					A	A	A	A	A	A	A	C
CARTUJA	37N	357	B														
MADRID	40N	357	B	B	C												

KEY TO SYMBOLS

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S = Program STOPPED operations (see MASTER STATION LIST for actual date)

C O M P U T E R F O R M A T:

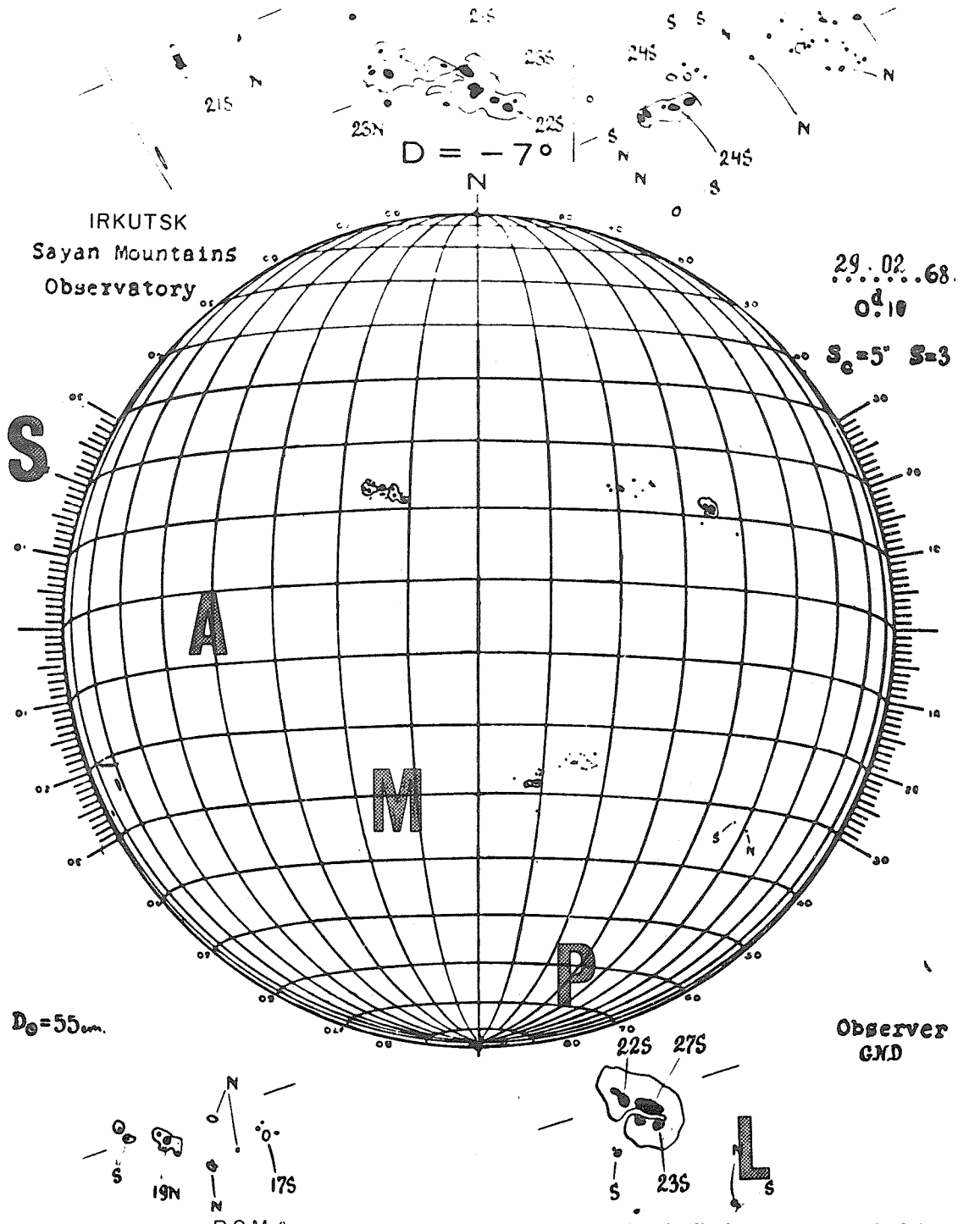
Zürich (Rz) numbers on magnetic tape from 1932 to date.
R_A' and Rz on punched cards from October 1965 to date.

P U B L I C A T I O N S:

IAU Quarterly Bulletin on Solar Activity - Zürich (Rz) numbers.
Solar-Geophysical Data - Rz and R_A' numbers.

M I C R O F I L M:

IAU Quarterly Bulletin on Solar Activity on 4 rolls of 35 mm microfilm from 1/1917 through 6/1968.



Longitudinal sunspot magnetic fields

4754 10 IX 0745 80	12 IX 1110 43	18 IX 1020 82	19 IX 0845 92
4755 10 IX 0710 55	12 IX 1050 83	13 IX 0825 93	4756 12 IX 1115 95

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
ROME	41N	12									A	A	A	A	A	C	
BERLIN	52N	13											A	A	B		
PULKOVO	59N	30								B	B	B	C	C	B	C	
SIMFEROPOL	44N	34								B	A	A	C	A	B		
CRIMEA(SIMEIS)	44N	34														A	C
MOSCOW IZMIRAN	55N	37								B	B	B	B	B	B	C	
URAL	55N	37														B	
KISLOVODSK	43N	42								B	A	A	B	A	B	A	C
SHEMAKAH	40N	48										C		B	B	A	
IRKUTSK	52N	104								A	A	A	C	A	B	B	C
USSURISK	43N	132										B	B	A	B	A	C
MT WILSON	34N	242	A	A	B	A	A	A	A	A	A	B	A	A	A	C	
UPPER VAN NORMAN	35N	242													Q	Q	Q

KEY TO SYMBOLS

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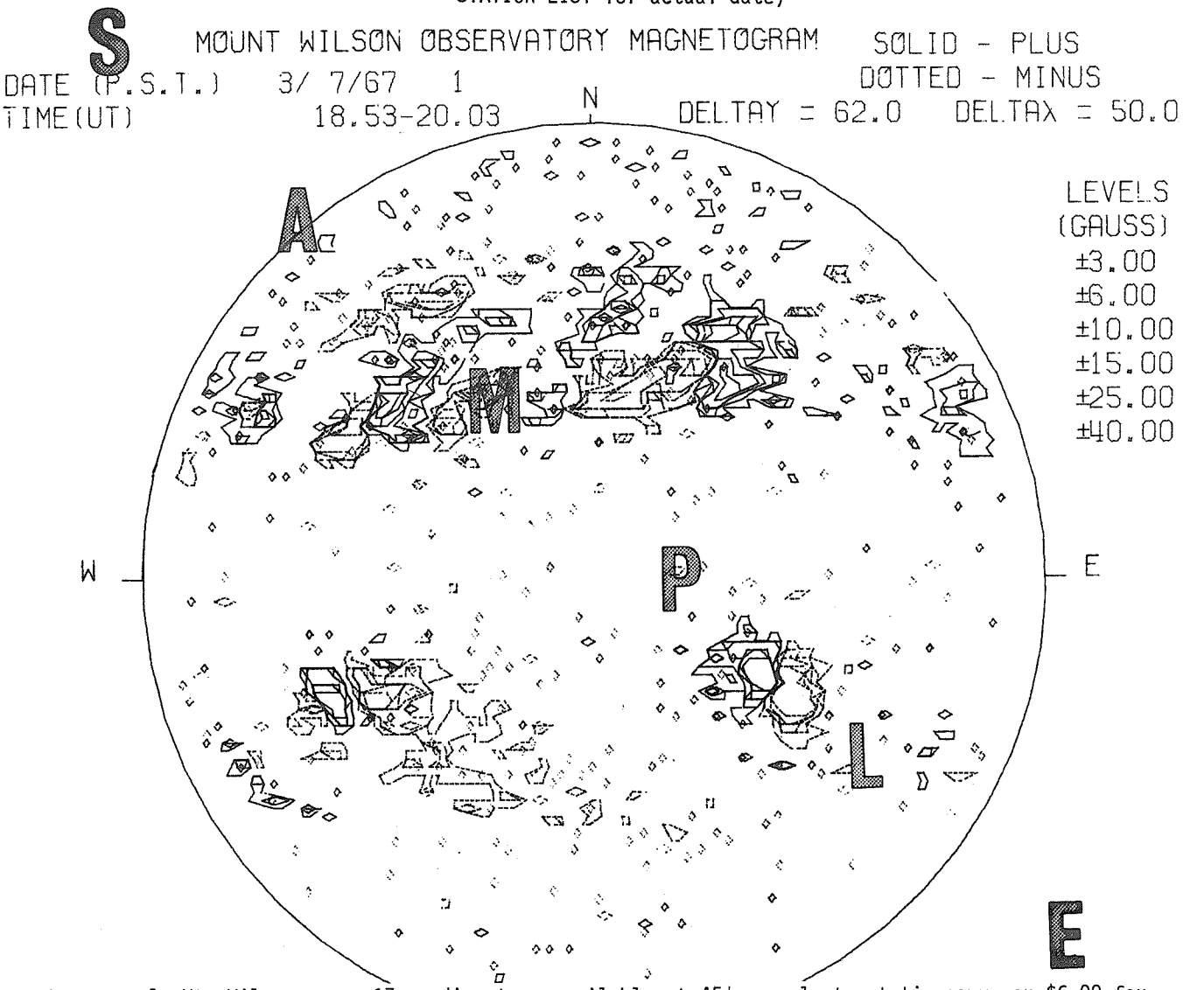
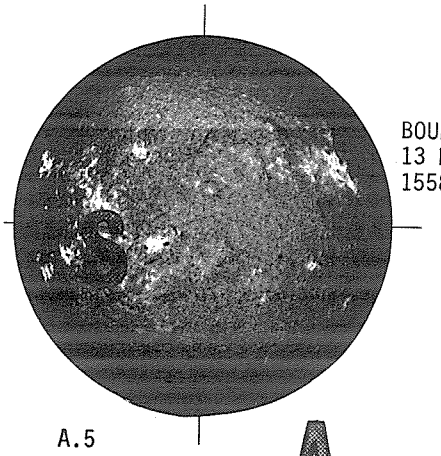
S = Program STOPPED operations (see MASTER STATION LIST for actual date)



Large scale Mt. Wilson maps, 17 cm diameter, available at 45¢ per electrostatic copy, or $6.00 for negative, and $1.75 for glossy print of negative.

A.4



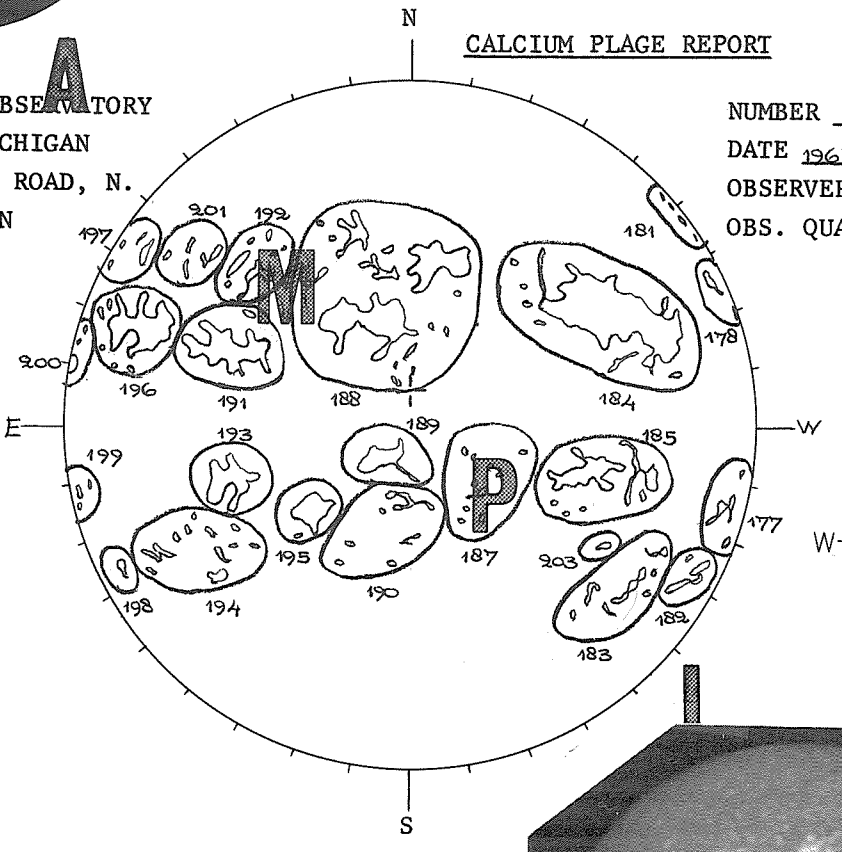
BOULDER Hα
13 MAY 1970
1558 UT

A.5

McMATH-HULBERT OBSERVATORY
UNIVERSITY OF MICHIGAN
895 LAKE ANGELUS ROAD, N.
PONTIAC, MICHIGAN

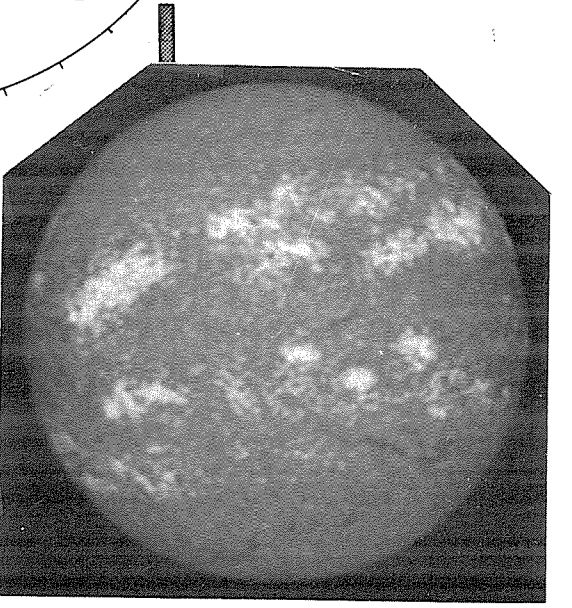
CALCIUM PLAGE REPORT

NUMBER 6575
DATE 1968 FEB. 09D 18H 40M UT
OBSERVER OLSON
OBS. QUALITY POOR



WAVELENGTH K232 3933.7 Å

Number	Act.	Lat.	Mer. Dist.	Area	Int.
9177	1	S 15	W 75	13 00	2
178	1	N 20	W 77	10 00	2.5
181	1	N 35	W 77	08 00	1.5



1968 Feb. 2 18h40m

A.4 H-ALPHA OBSERVATIONS (OTHER THAN FLARES)

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
ROME	41N	12										B	A	A	A	A	
CALTECH	34N	242														Q	Q
UPPER VAN NORMAN	35N	242										Q	Q	Q	Q	Q	Q
BOULDER	40N	255												B	A	A	C
SACRAMENTO PEAK	32N	255									C	A	A	A	A	C	
MCMATH-HULBERT	42N	277	A	A	A	A	A	A	A			A	A	A	A	C	
ROSARIO	33S	300															C
TEHRAN	35N	309													C	B	

PHOTOGRAPHS:

Daily scout film, 35 mm, in Photographic Journal of the Sun, Rome, 1968 to date.
Boulder daily scout film, 35 mm, 3/1968 to date.
Tehran daily scout film, 35 mm, 10/1969 to date.

MOVIE:

Continuous solar movie covering 6-20 July 1959 by Henry J. Smith, 16 mm. Copies may be purchase or lent.

A.5 CALCIUM PLAGES, POSITIONS, AREAS, MAXIMUM INTENSITIES

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
MEUDON	49N	2	B														
ARCETRI	43N	11	B	A	A												
ROME	41N	12									B	A	B				
CATANIA	37N	15												B	A	B	C
SIMEIS	44N	34	B	A	B												
KODAIKANAL	10N	77	B	A	A												
IKOMASAN	34N	135				A	A	A		A	A	A	B				
UPPER VAN NORMAN	35N	242															Q
MCMATH-HULBERT	42N	277	B	A	A	A	A	A	A	A	A	A	A	A	A	A	B

COMPUTER FORMAT:

1. Daily McMath plages (one card/plage/day) 1962 to date.
2. Monthly summary McMath plages (one card/plage region) 1962-1968.
3. Region data as published in Solar-Geophysical Data on magnetic tape Jan. 1969 to date

PUBLICATIONS:

1. Solar-Geophysical Data - Daily plage for McMath or Catania.

PHOTOGRAPHS:

1. McMath daily scout pictures, 15 cm diameter, 1955 to date.
2. Daily scout film, 35 mm, in Photographic Journal of the Sun, Rome, 1968 to date.

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C = 1-5 Months

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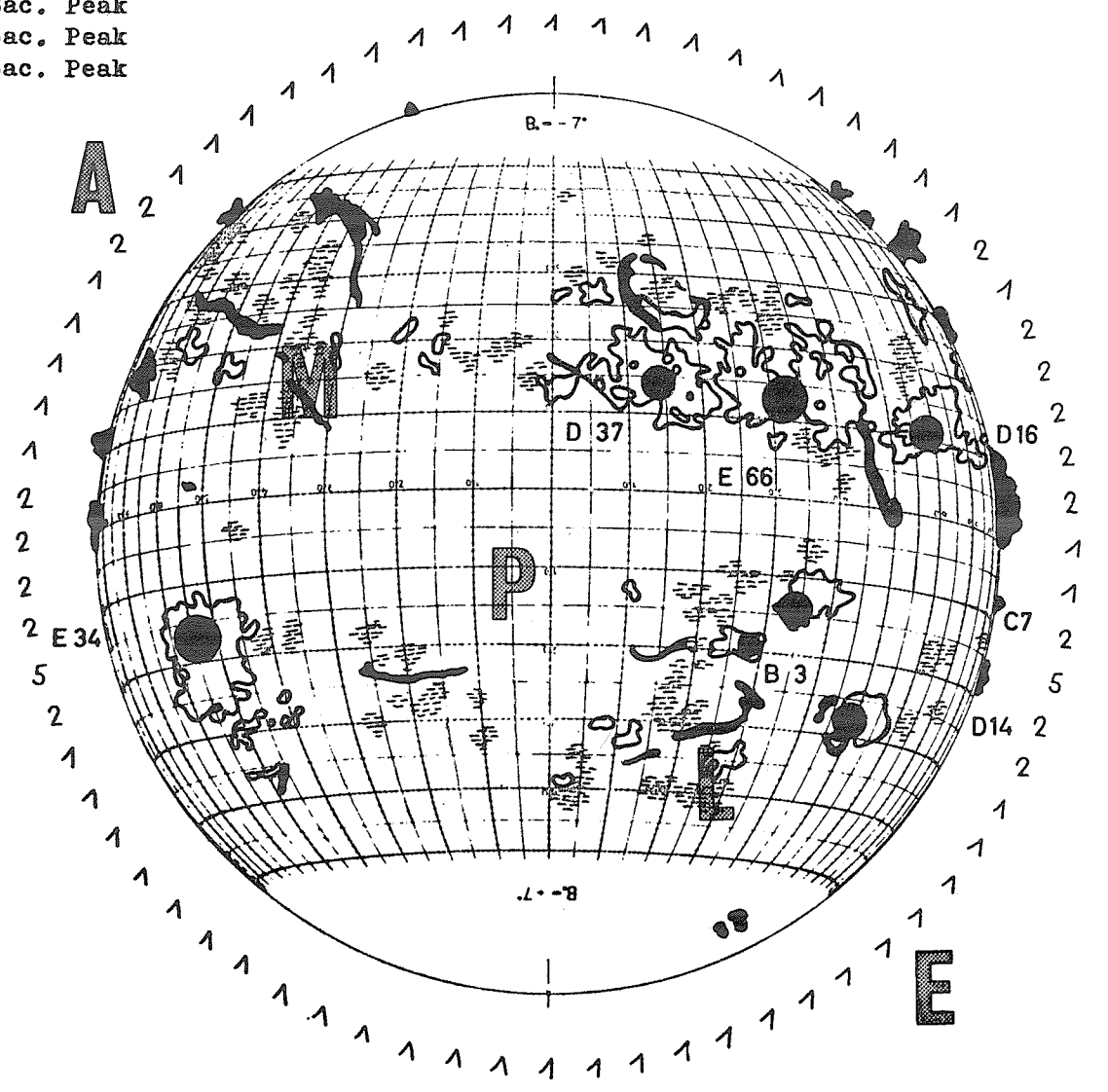
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

Plages 2.46 Anacapri
Filam. 6.07 Sac. Peak
Promin. 16.07 Sac. Peak
Corona 17 Sac. Peak

FRAUNHOFER INSTITUT

1969 Feb. 25 R= 1
Map of the Sun



McMath Plages

936	15S	87W	5
937	18N	81W	8
941	11N	62W	29
943	25N	53W	14
945	27S	49W	11
946	18N	26W	87
951	35S	27W	4
952	19S	23W	6
953	13S	35W	11
955	14N	0	3
957	17S	57E	53
958	31S	9W	4
959	2S	7W	1
960	39N	3E	1
961	28S	49E	5

A.6 COMBINED AND SPECIAL OPTICAL OBSERVATIONS

AT BOULDER

SOLAR MAPS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
FREIBURG	48N	7	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
WENDELSTEIN	47N	12	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
CAPRI S	40N	14				B	A	A	A	A	A	A	A				
ISTANBUL	41N	28								C							
MITAKA	35N	139	B	A	A				A	A	A	A	A	B			
MANILA	14N	239							C	A	A	A	A	A	A	B	C

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

PUBLICATIONS:

1. Carte Synoptiques de la Chromosphere Solaire, etc., by Observatoire de Paris, Meudon, (1931-1937 in WDC) & (1945-1967 in WDC) contains:

   Tables of centers of activity by mean position, age at CM, importance.
   Tables of filaments by mean position, importance, height, events and rotations of visibility.
   Chart of positions of filaments to ± 60° latitude.

2. Photographic Journal of the Sun, Rome, contains:

   Hα chromosphere pictures; daily K232 chromosphere pictures on 35 mm film by solar rotation, 1/1968 to date.

3. Solar-Geophysical Data, NOAA, (monthly), contains daily photographs or map contours for selected optical and radio data.

4. Solar Activity Catalogues, by Fred C. Jonah, LTV Astronautics Div., H. Dodson-Prince and E. Ruth Hedeman, McMath-Hulbert Obs., Univ. of Michigan, published by NASA, MSC, Houston, Texas.

   Data for 1954-1963 contain:

Major flares	Geomagnetic Storms
Important Sunspot Groups	Solar Terrestrial Effects
Plages	Important Balloon Flights
Important Solar Radio Emission	Chronological Catalogue of Major Solar Events

5. Annals of the IGY, Vol. XVI, Part I, IGY Calendar Record, Part III Calendar Record for IGC 1959, Pergamon Press, London, 1962-1963.

6. Annals of IQSY, Vol. 2, Solar and Geophysical Events 1960-1965, M.I.T. Press, Cambridge, Mass. and London, England, 1968.

7. IQSY NOTES, STP NOTES and Solar-Geophysical Data. The Solar and Geophysical Calendar Record continued with provisional data as "Abbreviated Calendar Record".

   IQSY NOTES, Nos. 17-21 Data for 1966.
   STP NOTES, Nos. 1-5, 7 Data for Jan. 1967 - Nov. 1969.
   Solar-Geophysical Data, Data for Dec. 1969 to date.

   A "Condensed Calendar Record" appears in STP NOTES, Nos. 7 onwards, Data for Dec. 1969 to date.

8. World Data Center A, Upper Atmosphere Geophysics Report UAG-4, NOAA, January 1969, Abbreviated Calendar Record 1966-1967. See p. 3.

9. Preliminary Report and Forecast of Solar-Geophysical Activity, weekly, published by Space Environment Services Center, NOAA, Boulder, Colorado, U.S.A. 80302.

A.6

Alle Angaben in Weltzeit

Fleckenmeldung reduziert auf 12h WZ

Rune / Schwabe: 2 2

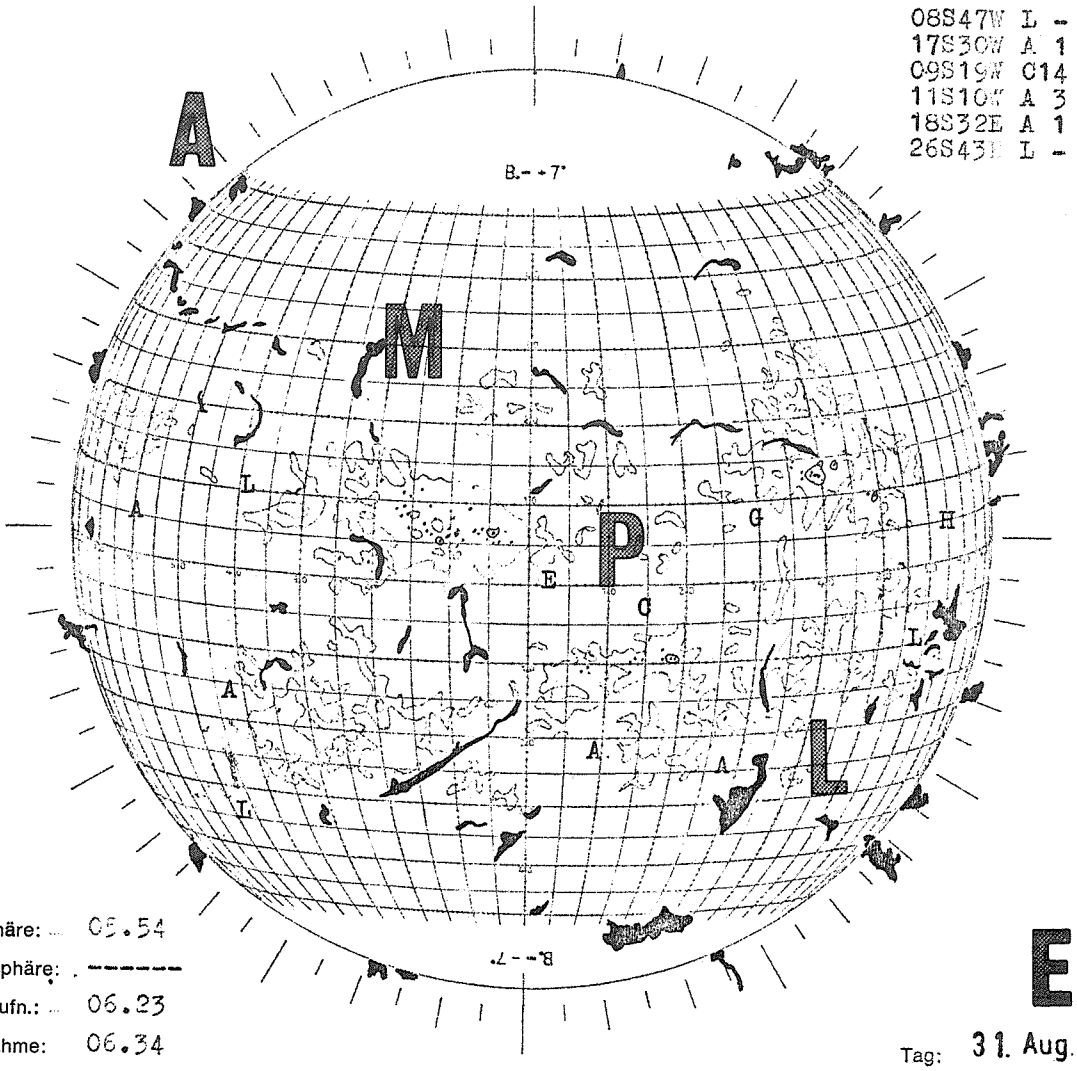
R 161 / A.int := 104

$B_0 = -7°$ $P_0 =$

S

09N52W H 2 436
13N42W G12 -79
07N05E E44 -99
03N19E A 3 -34
09N30E L - -24
12N65E A 1 959

08S47W L - -79
17S30W A 1 -13
09S19W C14 -45
11S10W A 3 -35
18S32E A 1 448
26S43E L - 848



Photosphäre: 08.54
Chromosphäre: ------
Integralaufn.: 06.23
H_α-Aufnahme: 06.34
K_3-Aufnahme: 06.40
Protub.-Aufn.:
Korona 5303:
Korona 6374:

E

Tag: 31. Aug. 1968

Station: Wendelstein

Beobachter: Ig.

A.6 COMBINED AND SPECIAL OPTICAL OBSERVATIONS

AT BOULDER

PROMINENCES AND FILAMENTS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
HERSTMONCEUX	50N	0	B	A	A					C							
MEUDON	49N	2	B	A	A	A	A	A	A	A	A	A	A	B	B	B	C
UCCLE	50N	4	B	A	B	A	A	A	A	A	A	A	B	C	A	A	
HAUTE PROVENCE	44N	5						A	A					B	B	A	C
LOCARNO	46N	8								A	A	B					
ZURICH	47N	8	B	A	A	C				A	A	B					
AROSA	46N	9								B	C	C					
ARCETRI	34N	11									A	B	B	B		C	C
ROME	41N	12									C	B	C				
WENDELSTEIN	47N	12	B	A	A	A	C			B	B	A	A	A	B	A	C
KANZELHOHE	46N	13	B	A	A	A	A			C	A	B					
CAPRI F	40N	14								C	C						
CAPRI S	40N	14	B	A	A	A	A	A	A	A	A	A	A	A	A	B	C
CATANIA	37N	15	C		A					A	A	A	B	A	A	A	C
ONDREJOV	50N	15	B	A	C												
WROCLAW	51N	17								B	B						
CAPETOWN	33S	18		B	A	A	A	B	A	A	A						
ATHENS	37N	23	B	A	C			B	B	B	B	A	B				C
THESSALONIKA	40N	23									C	C	C				
LVOV	49N	24								C	C	A	C		C		
BUCHAREST	44N	26								A	A	B	A	A	A	B	C
KANDILLI	41N	29									B	B					
KIEV	50N	30								C	C	B	C		C	A	
SIMEIS	44N	34	B	A	A												
KHARKOV	50N	36	C	B	B		C	C	C	C	C	B	C		C		
MOSCOW (UNIV)	55N	37	B	A	A	B	C	C									
MOSCOW IZMIRAN	55N	37	C	B	A	B	B	B	B	C	C		C			A	
ABASTUMANI	41N	42	C	B	B	B	C	C	C	C	C	B	C		B	A	
KISLOVODSK	43N	42								B	A	A	A	A	A	A	C
TASHKENT	41N	44	B	A	A											A	
BAKOU	40N	48								B	C	A	C				
ALMA ATA	43N	77	C	C													
KODAIKANAL	10N	77	B	A	A	B	A	B	A	A	A	A	A	A	A	A	C
HYDERABAD	17N	78	B	A	A	B				B	C						
IRKUTSK	52N	104									C						
SIBERIA	52N	104														A	
CARNARVON	25S	114											B	A	A	C	
MANILA	14N	121								A	A	A	A	A	A	A	C
USSURISK	43N	132								B	B	B			B	A	
IKOMASAN	34N	135								A	A	A	A				
MITAKA	35N	139	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
CULGOORA	30S	147									A	A	B	C		C	C
SYDNEY	36S	151	B	A	A					A							
CAPE WELLEN	66N	190													B		
HONOLULU	21N	202	B	B	A	A	A	A	C								
HALEAKALA	20N	204								B	A	A	A	A	B	S	
LOCKHEED	33N	242			B	A	B	A	A	A	A	A	A	C			
MT WILSON	31N	242	B	A													
CLIMAX	39N	254	B	A	A	B	A	A	A	A	B	B					
BOULDER	40N	255											C	B	A	C	

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IQSY PROMINENCES AND FILAMENTS

PAGE 1 OF 3 PAGES

STATION	STATION NO.	DATE (Mo and Year)
SACRAMENTO PEAK OBSERVATORY		DECEMBER 1968

WAVE LENGTH	BAND PASS	CINEMATOGRAPHIC	VISUAL
6563.8	0.4 Å	X	X

HOURS OF PATROL: DISC SEE FLARE PATROL LIMB

DATE	PHENOMENON	IMPORTANCE	TIME U.T. BEGIN	TIME U.T. END	POSITION (Heliographic) LATITUDE	POSITION (Heliographic) MERIDIAN DISTANCE	REMARKS
1	NO OBSERVATIONS -WX						
2	NO OBSERVATIONS -WX						
3	DSD	0	2228	2301	S 21	E 55	Flare Associated
4	NO PHENOMENA OBSERVED						
5	APR	1	1408	2353	S 15	E Limb	
5	APR	1	1408	2353	N 16	E Limb	
5	APR	1	1408	2353	S 32	W Limb	
6	APR	1	1409	2355	N 37	E Limb	
6	APR	1	2050	2355	S 19	W Limb	
6	---	1	2100	2355	S 06	E Limb	Region of BSLs
7	NO PHENOMENA OBSERVED						
8	APR	1	1530	2329	N 45	E Limb	
8	DSD	1	2243	2319	[illegible]	E 61	
9	NO PHENOMENA OBSERVED						
10	BSL	1	1710	1820	N 09	W Limb	
10	APR	0	1410	2320	N 27	W Limb	
11	---	0	<1459	1644	S 20	E Limb	Faint Loops
11	DSD	1	1553	1625	N 17	W 27	Flare Associated
11	---	0	1459	2330	N 13	W Limb	Region of BSLs

IKOMASAN

Prominence (Hα - Visual)

Quadrants							
N E		S E		S W		N W	
No.	Area	No.	Area	No.	Area	No.	Area
1	30	1	110	0	0	3	490
0	0	1	60	0	0	4	430
0	0	3	530	1	40	4	550
0	0	1	120	1	40	2	660
1	10	2	60	1	40	1	100
0	0	2	1020	1	800	1	640
0	0	1	1840	1	1010	2	490
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
0	0	1	30	1	800	1	50
1	120	3	490	2	680	1	80
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

A.6 COMBINED AND SPECIAL OPTICAL OBSERVATIONS

AT BOULDER

PROMINENCES AND FILAMENTS (CONT'D)

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
SACRAMENTO PK	32N	255	B	A	A	A	A	A	A	A	A	A	A	A	B	S	
HOUSTON	30N	265											B	B	B	C	
PALEHUA	21S	268													C		
WASHINGTON	38N	283	B	A	C												
HUANCAYO	12S	285	B	A	A	A	A	B	A	A	A	A	A	A	A	B	
OTTAWA	54N	285	B	A	B		B	C	A	B	A	B					
CANARY ISLANDS	28N	345											B	A	A	C	
DUBLIN	53N	354	C														
DUNSINK	53N	354								B							
EDINBURGH	56N	357	B	B													

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P U B L I C A T I O N S:

IGY SOLAR ACTIVITY REPORT SERIES, World Data Center A, Intermediate Report of Surges and Active Prominence Regions (combines data by each day for all stations), Data for July - Sept., 1957, April 1958 - Dec. 1964.

IQSY CORONAL INTENSITIES

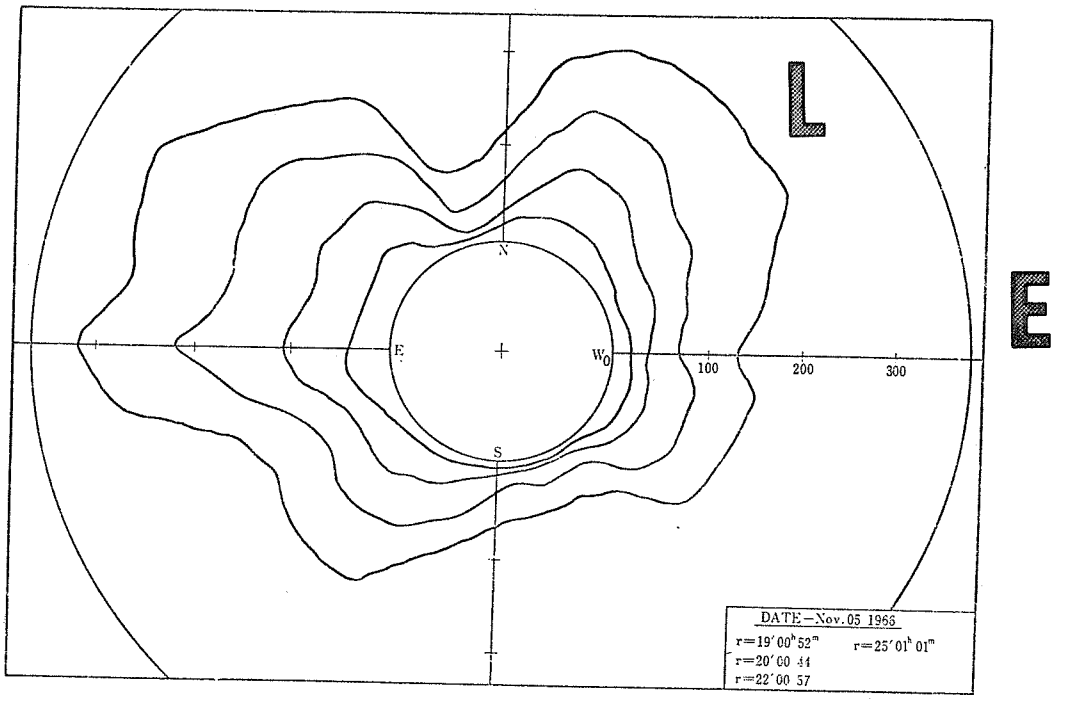
(absolute values in millionths of the brightness of one angstrom at the same wave length at the center of the solar disk)

Station PIC DU MIDI Month Juin Yr. 1968

	Date	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
2I	5h44	I7	I9	I6	I2	I4	I5	I6	I8	2I	22	24	28	8I	86	I54
2I	6h5I	7	6	7	7	8	8	9	8	9	8	9	I2	24	32	I8
22	7h54	I8	I4	I2	I0	9	II	II	I5	2I	I9	25	34	69	85	I42
22	8h0	4	4	5	6	3	6	5	4	4	6	4	3	9	I7	I2
24	6h00	x	x	x	x	I7	I9	22	22	25	27	30	58	I03	I70	I24
24	I4h00	3	4	4	7	5	5	4	4	6	5	6	I3	2I	I8	35
25	5h44	I6	I7	I8	I6	I8	I9	2I	23	27	29	35	59	76	I28	95
25	7h00	4	4	5	6	5	6	5	5	4	5	7	9	I5	I7	I4
26	9h40	x	x	x	x	I7	20	24	29	34	46	54	59	69	76	8I
27	8h45	2I	I8	2I	24	26	28	24	23	27	32	34	36	48	65	73
28	9h04	20	22	24	23	26	22	28	33	38	43	48	54	60	78	93

Give date to nearest tenth of day. Give intensities in λ5303 emission on first line of date; intensities in λ6374 emission on second line of date. Use x when no observations were obtained; use a - when intensity was below threshold of visibility.

MT. NORIKURA ELECTRON CORONA



A.7 OPTICAL OBSERVATIONS OF THE CORONA

AT BOULDER

λ 5303

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
PIC-DU-MIDI	43N	0	B	A	A	B	A	A	A	A	A	A	A	A	A	A	C
AROSA	47N	10	C	B	B	B	B	B	B	B	B	B	B				
WENDELSTEIN	47N	12	B	A	A	A	A	A	A	A	B	A	A	A	A	A	C
KANZELHOHE	46N	13	B	A	A	A	A	A	B	C							
LOMNICKI STIT	49N	20									B	A	A	A	A	A	C
KISLOVODSK	43N	42	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
ALMA ATA	43N	77	C	B	A	A	A	B									
MT NORIKURA	36N	137	B	A	A	A	B	B	A	A	A	A	A	A	A	B	C
CLIMAX	39N	254	B	A	A	A	A	A	A	A	A	C	Q	Q	Q	Q	
SACRAMENTO PK	32N	255	C	A	A	A	A	A	A	A	A	C	Q	Q	Q	Q	Q

PUBLICATIONS:

1. IAU Quarterly Bulletin on Solar Activity, Zürich, contains daily intensities and coronal isophotes.
2. IGY Solar Activity Report #13, World Data Center A - Indices of solar corona 7/1957 - 12/1959.
3. Solar Geophysical Data, NOAA - three intensity levels on daily charts, 1/1969 to date.

ELECTRON CORONA

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
MT NORIKURA	36N	137							B	A	A	A			Q	Q	
MAUNA LOA	21N	203									Q	Q	Q	Q	Q	Q	
HALEAKALA	20N	204								Q	Q				Q	Q	
CLIMAX	39N	254	A	A	A	A	Q	Q	Q						Q	Q	

PUBLICATIONS:

1. IGY Solar Activity Report Series, World Data Center A - data from Climax 9/1956 - 12/1960.
2. Tokyo Astronomical Obs. Bulletin of Solar Phenomena - data from Mt. Norikura 1964 - 1966.
3. World Data Center A, Upper Atmosphere Geophysics Report UAG-7, ESSA - data from Haleakala and Mauna Loa, 2/1964 - 1/1968. See p. 3.

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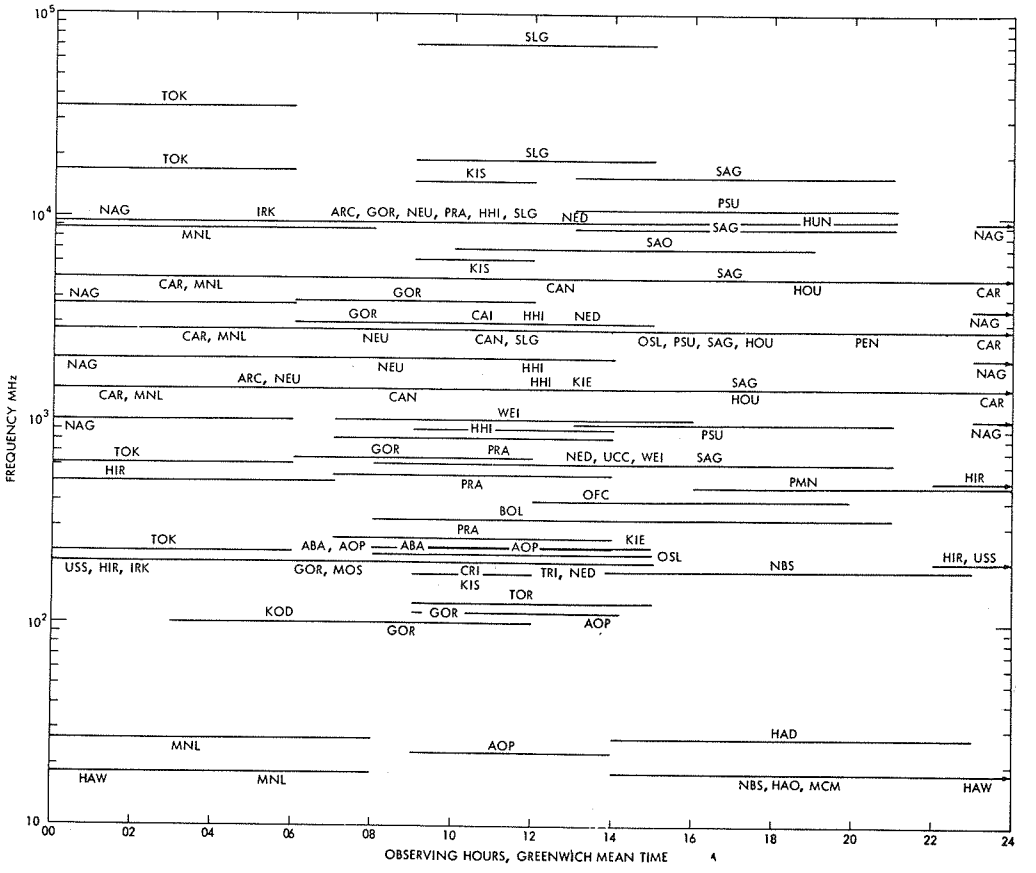
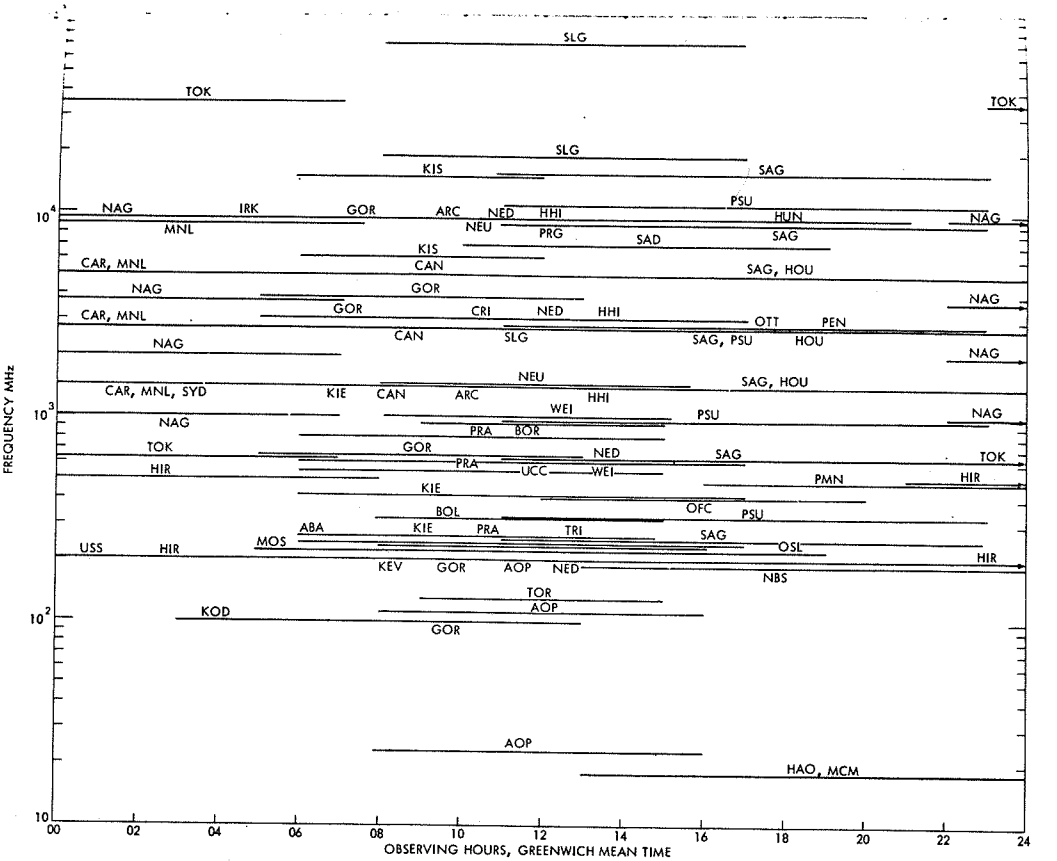


FIXED FREQUENCY SOLAR RADIO EVENTS, 1st & 4th QUARTERS

Observing Hours Currently Covered



OBSERVING HOURS FOR BURST OBSERVATIONS, 2nd & 3rd QUARTERS

Observing Hours Currently Covered

AT BOULDER

A.8 TOTAL RADIO FLUX MEASUREMENTS

BY LONGITUDE

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
CAMBRIDGE	52N	0	B	A														81
CAMBRIDGE	52N	0	B	A														175
UCCLE	50N	4	B	A	A	A	A											169
UCCLE	50N	4	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	600
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	200
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	B	S	600
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	3000
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	B	A	A	B	S	9500
BONN	50N	7													A	C		10500
BERNE	47N	7																36
HARESTUA	60N	10	B	B	B	B	B	B	B	B	B	B	A	A	B	B	C	225
KIEL	54N	10												C	A	A	C	240
KIEL	54N	10												C	A	A	C	420
KIEL	54N	10												C	A	A	C	1420
ARCETRI	34N	11							B	A								225
ARCETRI	34N	11	B	A	A	A												186
BOLOGNA	44N	11								A	A	A	A	A	A	A		327
BERLIN	52N	13	B	A	A	A	A	A	A	A	A	A	A	A	A			1470
BERLIN	52N	13	B	A	A	A	A	A	A	A	A	A	A	A	A			9490
BERLIN	52N	13														A	C	1490
BERLIN	52N	13														A	C	9500
NEUSTRELITZ	53N	13								B	B	A	B	A				2000
NEUSTRELITZ	53N	13					A	A	A	A	A	A	A	A	C			9140
NEUSTRELITZ	53N	13				A	A	A	A	A	A	A	B	A	B			1490
POTSDAM	52N	13							B	A	A	A	A	A	B	B	C	23
POTSDAM	52N	13	B	A	B	A	A		B	A	A	A	A	A	B	A	C	234
POTSDAM	52N	13	B	B					B	B	B	A	A	A	B	B		111
TRIESTE	45N	13										B	A	A	C			239
TRIESTE	45N	13													B	C		235
BERLIN	52N	13														B	C	234
POTSDAM	52N	13														C	C	113
TRIESTE	45N	13														A	C	237
ONDREJOV	49N	14					B	A				C	B	B	A	A	C	9400
ONDREJOV	49N	14			B	B	B	A				B	A	A	A	A	C	808
ONDREJOV	49N	14		C	A	B	B	A	A	A	A	A	A	A	A	A	C	260
ONDREJOV	49N	14	B	A	A	A	B	A	A	A	A	B	A	A	A	A	C	536
RIGA	56N	24	C	C	C	C			C	B	B	C						220
LWIRO	02S	28	B	A	C													169
KIEV	50N	30								B	A	B	B	C				210
KIEV	50N	30													B	A	C	204
SIMFEROPOL	44N	34										C						1000
SIMFEROPOL	44N	34			B	C				A	B	B	B	B	B			3100
SIMFEROPOL	44N	34	C	A	A	B	C			B	B							220
SIMEIS(SIBERIAN	44N	34													A	A	C	3100
MOSCOW IZMIRAN	55N	37	C	A	A	A	A	C		A	A	A	A	A	B			202
MOSCOW IZMIRAN	55N	37	C	B	A	B	A	C										545
MOSCOW IZMIRAN	55N	37													C	A	C	206
ABASTUMANI	41N	42	C	A	A	A	A	C		B	A	A	A	A	B	A	C	221
KISLOVODSK	43N	42								B	A	B	B	B	C			6100
KISLOVODSK	43N	42								C	B	B	B	B	C			15000

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DAILY VALUES OF SOLAR FLUX AT 2800 MC/S (OTTAWA-ARO)

AND 2700 MC/S (PENTICTON-DRAO) -- SERIES "C"

Flux in watts/m^2/cycles/sec bandwidth (x 10^{-22}) -- 2 polarizations

1968	OTTAWA				PENTICTON	
	Observed			adj. to 1 A.U.	Observed	Adj. to 1 A.U.
Dec.	14:00	17:00	20:00	17:00	19:35	19:35
1	143.8	144.2	146.8	140.2	144.2	140.2
2	154.2	154.2	150.1	149.9	148.4	144.2
3	154.1	154.1	152.5	149.6	144.8	140.6
4	150.4	152.3	151.8	147.9	146.1	141.9
5	146.0	151.0*	150.0	146.6*	143.5	139.3
6	145.5	147.2	144.3	142.9	142.0	137.9
7	143.6	144.5	147.0	140.2	140.7	136.5
8	146.2	[146.2]	146.3*	141.8	141.0*	136.8*
9	149.4	150.1	149.3	145.6	144.4	140.1
10	148.9	152.6	152.4	148.0	147.1	142.7
11	149.7	148.2	148.2	143.6	142.7	138.3
12	142.0	143.4	143.4	139.0	139.9	135.6
13	135.1	135.7	135.9	131.5	129.6	125.6
14	136.2	138.6	136.5	134.3	129.0	125.0
15	138.4	138.4	134.4	134.1	130.9	126.8
16	129.3	131.0	129.2	127.0	126.3	122.3
17	131.0	134.5	137.5	130.2	129.9	125.7
18	137.3	138.3	139.1	133.9	133.7	129.4
19	145.7	146.6	146.5	141.9	136.9	132.5
20	151.5	149.5*	150.5*	144.7*	143.8	139.2
Mean	147.7	148.4	148.4	143.9	142.8	138.4

*Adjusted for Burst

[ ] Interpolated

DAILY VALUES OF SOLAR FLUX AT 2700 MHz (PENTICTON - DRAO) SERIES "C"

FLUX IN WATTS/M^2/CYCLES/SECOND BANDWIDTH (x 10^{-22}) - 2 POLARIZATIONS

ADJUSTED TO 1 ASTRONOMICAL UNIT AT 1935 U.T.

1968 Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	1968 Dec.
1	153.5	234.2	149.0	133.6	133.4	150.6	123.3	129.5	123.7	134.4	153.5	140.2
2	151.1	232.5	152.1	131.8	139.5	141.9	114.7	128.8	130.1	132.1	147.6	144.2
3	158.9	224.2	142.8	125.8	146.4	140.0	113.7	134.5	137.0	138.9	143.7	140.6
4	167.6	204.8	132.6	119.0	149.4	138.6	114.5	133.5	138.8	138.0	135.3	141.9
5	173.6	179.0	127.8	117.4	145.6	136.2	116.4	128.7	133.7	141.4	130.0	139.3
6	185.7	160.5	126.3	115.3	140.3	145.4	121.1	137.4	131.8	141.8	129.8	137.9
7	207.7	156.0	120.0	116.3	135.9	149.2	131.7	133.9	136.8	139.8	127.0	136.5
8	203.2	144.5	113.2	121.4	134.9	149.4	138.2	136.4	144.1	138.4	128.8	136.8
9	204.0	142.2	113.2	128.9	128.2	144.8	145.5	138.6	146.9	133.3	131.8	140.1
10	189.3	146.3	114.6	125.4	130.5	146.7	151.1	140.6	150.7	129.7	132.8	142.7
11	189.2	146.2	119.2	128.6	123.8	142.2	155.4	144.9	147.6	130.1	127.8	138.3
12	192.2	144.6	120.9	127.6	120.3	139.4	156.5	153.8	149.8	132.2	127.0	135.6
13	186.7	138.6	118.5	131.8	123.6	140.1	150.9	166.0	148.3	127.8	128.3	125.6
14	174.6	137.1	120.4	127.5	130.2	137.8	151.0	180.6	139.3	125.9	127.3	125.0
15	165.5	133.5	116.6	127.6	132.6	137.3	141.1	177.5	130.2	133.5	126.4	126.8
16	155.4	130.5	119.8	126.8	139.1	134.3	144.9	170.8	126.0	134.3	124.0	122.3
17	153.9	130.1	125.3	121.8	155.4	136.2	135.8	166.2	---	138.0	135.9	125.7
18	---	127.0	121.1	---	168.9	139.9	129.2	159.6	126.5	144.2	142.9	129.4
19	131.9	128.0	120.5	---	173.7	144.2	130.2	152.8	123.4	146.8	137.3	132.5
20	127.6	132.9	120.4	114.4	178.2	149.8	127.3	136.9	120.9	150.3	131.8	139.2

AT BOULDER

A.8 TOTAL RADIO FLUX MEASUREMENTS

BY LONGITUDE (CONTINUED)

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
KISLOVODSK	43N	42	C	A	B	A	A	A	C	B								178
GORKY	56N	44											A	A	A	A	C	650
GORKY	56N	44											B	A	A	A	C	100
GORKY	56N	44											B	A	B			3800
GORKY	56N	44	B	B									A	A	A	A	C	2950
GORKY	56N	44	C	B	B	B				B	C		A	A	B	A	C	9100
GORKY	56N	44	C	B	C								B	B	A	B	C	200
GORKY	56N	44												A	B	B	C	950
DELHI	28N	77								C	C	C	C	A				2000
KODAIKANAL	10N	78													A	B		100
IRKUTSK	52N	104								C	B	B	B	B	C			9570
IRKUTSK	52N	104	C	B	A	C	B	A	C	B	B	C						209
IRKUTSK	52N	104														C	C	9750
IRKUTSK	52N	104														C	C	9700
IRKUTSK	52N	104														B		9620
MANILA	14N	121											C	A	A	A	B	1415
MANILA	14N	121											C	A	A	A	B	2695
MANILA	14N	121											C	A	A	A	B	4995
MANILA	14N	121											C	A	A	A	B	8800
MANILA	14N	121														A	B	606
USSURISK	43N	132			B	A	A	C		A	A	B	A	A	A	A	C	208
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	1000
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	2000
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	3750
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	9400
MITAKA	35N	139												C				35000
MITAKA	35N	139											C	A	B	B		612
MITAKA	35N	139								B	A	B	A	A	B	B		17000
MITAKA	35N	139	B	A	B	B	B	A	A									3000
MITAKA	35N	139	B	A	B	B	B	A	A	C			C					9500
MITAKA	35N	139	B	A	B	B	B	A	A	C	A	B	A	A				227
MITAKA	35N	139	B	B	B	B	B	A	B									67
MITAKA	35N	139	B	B	B	B	B	A	B									100
HIRAISO	36N	140							B	A	A	A	B	A	A	A	C	500
HIRAISO	36N	140	B	B	A	A	A	A	B	A	A	A	B	A	A	A	C	200
SEATTLE	47N	238									B							223
PENTICTON	49N	241								C	A	A	A	A	A	A	C	2700
UPPER VAN NORMAN	35N	242												Q	Q	Q	Q	3000
BOULDER NBS	40N	255	C	A														467
BOULDER NBS	40N	255	C	A	A	B												167
HUANCAYO	12S	284													B	A	C	9400
OTTAWA	54N	285	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	2800
SAGAMORE HILL	42N	288												A	A	A	B	15400
SAGAMORE HILL	42N	288										A	A	A	A	A	B	8800
SAGAMORE HILL	42N	288										B	A	A	A	A	B	4995
SAGAMORE HILL	42N	288									C	A	A	A	A	A	B	606
SAGAMORE HILL	42N	288									C	A	A	A	A	A	B	1415
SAGAMORE HILL	42N	288									C	A	A	A	A	A	B	2695
SAGAMORE HILL	42N	288													C			35000
SAN MIGUEL	34S	302											A	A	A	A	C	408

KEY TO SYMBOLS

A = 12 Months
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C = 1-5 Months

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S = Program STOPPED operations (see MASTER STATION LIST for actual date)

GORKY

FLUX DENSITY AND VARIABILITY

December 1968

Frequency 100 Mc/s

Date	UT	Flux density 10^{-22} Wm^{-2}(c/s)$^{-1}$ 6-8	8-10	10-12	Day	Variability 6-8	8-10	10-12	Remarks
1		5	6	6	6	0	0	0	
2		5	6	6	6	0	1	1	
3		5,5	5,5	7	6	0	1	1	
4		-	6	6	6	-	0	0	
5		19	29	56	35	2	2	2	
6		19	9	9	12	2	2	2	
7		5,5	6,5	7	6	0	0	0	
8		7	6	8	7	0	0	0	
9		7	7	7	7	0	0	0	
10		5	5,5	5	5	0	0	0	
11		9	9	67	28	1	1	2	
12		23	8	8	13	1	1	1	
13		12,5	13	16	14	1	1	1	
14		16	12	15	14	1	1	1	
15		9	13,5	13	12	0	1	1	
16		9,5	11	-	10	0	0	-	
17		-	-	-	-	-	-	-	
18		-	-	-	-	-	-	-	
19		6,5	6	6,5	6	0	0	0	
20		6	6	7	6	0	0	0	
21		11	8	8	9	1	0	0	
22		5	9	8	7	0	0	0	
23		7	5	8,5	7	1	1	1	
24		-	-	-	-	-	-	-	
25		-	-	-	-	-	-	-	
26		26	22	34	27	1	1	1	
27		32	16	54	35	1	1	1	
28		-	-	-	-	-	-	-	
29		12	6	6	8	1	1	1	
30		-	-	-	-	-	-	-	
31		-	-	-	-	-	-	-	
				Mean:	12				

A.8 TOTAL RADIO FLUX MEASUREMENTS

AT BOULDER

BY LONGITUDE

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
VILLA ELISA	34S	302											B	C				2695
SAO PAULO	22S	314											C	A	A	C	C	7000
JODRELL BANK	53N	357	B	A	C													80
JODRELL BANK	53N	357	B	A	C													200
JODRELL BANK	53N	357	B	A	C													2000
BORDEAUX	44N	359												C	A	A	C	930
SLOUGH	51N	359													A	A		19000
SLOUGH	51N	359													A	A		2800
SLOUGH	51N	359													A	A		71000
SLOUGH	51N	359													C	A		9400
SLOUGH	51N	359													C	A		37000

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SOLAR RADIO EMISSION TOY-69-25

SINGLE-FREQUENCY OBSERVATIONS

Daily Data March 1969

Observing Station: TOYOKAWA, JAPAN. Frequency: 3750 MHz

Flux Density
10^{-22} W M^{-2} (Hz)$^{-1}$

Date	U.T. 0-3	3-6	23-24	Day
1	182	178	172	177
2	172	172	159	168
3	159	159	149	156
4	149	149	149	149
5	149	148	143	147
6	143	143	145	144
7	145	144	146	145
8	146	146	145	146
9	145	145	148	146
10	146	145	146(a)	146
11	146	146	142	145
12	142	142	147	144
13	146	147	144(b)	146
14	144	146	153	148
15	154	153	182	163
16	181	180	194	185
17	194	194	206	198
18	207	211(E)	212	210
19	212	212	213	212
20	212	211	224	216
21	224	224	233	227
22	235	232	224	230
23	223	228	210	220
24	210	209	-	210
25	194	192	-	193
26	191	193	205	196
27	202	195	-	199
28	188	188	-	188
29	189	190	193	191
30	193	193	200	195
31	200	201	201	201

Mean: 178.7

NOTE: (a) 2300-2327, (b) 2300-2330, No observations.
(E) Eclipse.

AT BOULDER

A.8 TOTAL RADIO FLUX MEASUREMENTS

BY FREQUENCY

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
POTSDAM	52N	13							B	A	A	A	A	A	B	B	C	23
BONN	50N	7											B					36
MITAKA	35N	139	B	B	B	B	B	A	B									67
JODRELL BANK	53N	357	B	A	C													80
CAMBRIDGE	52N	0	B	A														81
GORKY	56N	44											B	A	A	A	C	100
MITAKA	35N	139	B	B	B	B	B	A	B									100
KODAIKANAL	10N	78													A	B		100
POTSDAM	52N	13	B	B					B	B	B	A	A	A	B	B		111
POTSDAM	52N	13														C	C	113
BOULDER NBS	40N	255	C	A	A	B												167
LWIRO	02S	28	B	A	C													169
UCCLE	50N	4	B	A	A	A	A											169
CAMBRIDGE	52N	0	B	A														175
KISLOVODSK	43N	42	C	A	B	A	A	A	C	B								178
ARCETRI	34N	11	B	A	A	A												186
GORKY	56N	44	C	B	C								B	B	A	B	C	200
HIRAISO	36N	140	B	B	A	A	A	A	B	A	A	A	B	A	A	A	C	200
JODRELL BANK	53N	357	B	A	C													200
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	200
MOSCOW IZMIRAN	55N	37	C	A	A	A	A	C		A	A	A	A	A	B			202
KIEV	50N	30													B	A	C	204
MOSCOW IZMIRAN	55N	37													C	A	C	206
USSURISK	43N	132			B	A	A	C		A	A	B	A	A	A	A	C	208
IRKUTSK	52N	104	C	B	A	C	B	A	C	B	B	C						209
KIEV	50N	30								B	A	B	B	C				210
RIGA	56N	24	C	C	C	C			C	B	B	C						220
SIMFEROPOL	44N	34	C	A	A	B	C			B	B							220
ABASTUMANI	41N	42	C	A	A	A	A	C		B	A	A	A	A	B	A	C	221
SEATTLE	47N	238									B							223
ARCETRI	34N	11							B	A								225
HARESTUA	60N	10	B	B	B	B	B	B	B	B	B	B	A	A	B	B	C	225
MITAKA	35N	139	B	A	B	B	B	A	A	C	A	B	A	A				227
POTSDAM	52N	13	B	A	B	A	A		B	A	A	A	A	A	B	A	C	234
BERLIN	52N	13														B	C	234
TRIESTE	45N	13													B	C		235
TRIESTE	45N	13														A	C	237
TRIESTE	45N	13										B	A	A	C			239
KIEL	54N	10												C	A	A	C	240
ONDREJOV	49N	14		C	A	B	B	A	A	A	A	A	A	A	A	A	C	260
BOLOGNA	44N	11								A	A	A	A	A	A	A		327
SAN MIGUEL	34S	302											A	A	A	A	C	408
KIEL	54N	10												C	A	A	C	420
BOULDER NBS	40N	255	C	A														467
HIRAISO	36N	140							B	A	A	A	B	A	A	A	C	500
ONDREJOV	49N	14	B	A	A	A	B	A	A	A	A	B	A	A	A	A	C	536
MOSCOW IZMIRAN	55N	37	C	B	A	B	A	C										545
UCCLE	50N	4	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	600
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	B	S	600
SAGAMORE HILL	42N	288									C	A	A	A	A	A	B	606

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OBSERVATOIRE ROYAL DE BELGIQUE

Département de Radioastronomie et Physique Solaire.

3, avenue Circulaire - Uccle - Bruxelles 18.

DENSITE DE FLUX, VARIABILITE

Fréquence 600 Mlz.

JUILLET 1968.

Date	5 - 9 TU		9 - 12 TU		12 - 15 TU		15 - 19TU		$\bar{f}$	$\bar{v}$
	f	v	f	v	f	v	f	v		
1	--	-	67	0	67	0	66	0	66	0
2	65	0	65	0	65	0	65	0	65	0
3	65	0	64	0	66	0	68	0	66	0
4	--	-	65	0	67	0	68	0	67	0
5	63	0	63	0	63	0	64	0	63	0
6	68	0	78	1	65	0	65	0	69	0
7	67	0	65	0	65	0	66	0	66	0
8	68	0	68	0	68	0	90	0	74	0
9	--	-	68	0	68	0	67	0	68	0
10	--	-	--	-	--	-	--	-	--	-
11	74	0	74	0	74	0	74	0	74	0
12	73	0	72	0	91	1	72	0	76	0
13 a	(72)	(0)	(73)	(0)	(76)	(0)	76	0	(74)	(0)
14	68	0	68	0	69	0	69	0	69	0
15	68	0	68	0	68	0	69	0	68	0
16	71	0	68	0	68	0	68	0	69	0
17	68	0	69	0	70	0	71	0	69	0
18	68	0	68	0	68	0	68	0	68	0
19	68	0	68	0	68	0	68	0	68	0
20	68	0	68	0	68	0	68	0	68	0
21	64	0	65	0	67	0	67	0	65	0
22	66	0	65	0	67	0	68	0	66	0
23	67	0	66	0	68	0	68	0	67	0
24	70	0	72	0	73	0	(72)	(0)	(71)	(0)
25	68	0	68	0	69	0	69	0	68	0
26	68	0	67	0	66	0	66	0	67	0
27 b	(67)	(0)	(64)	(0)	64	0	65	0	(65)	(0)
28	(65)	0	65	0	65	0	65	0	(65)	0
29	--	-	65	0	64	0	64	0	64	0
30	65	0	66	0	65	0	64	0	65	0
31	62	0	63	0	63	0	65	0	64	0

f : moyenne tri-horaire de densité de flux en unité $10^{-22} W.m^{-2}.Hz^{-1}$

v : variabilité en échelle 0, 1, 2, 3.

a : les observations débutent à 06 h.
pas d'observations entre 11h46 et 13h12.

b : pas d'observations entre 08 h. et 11h28.

A.8 TOTAL RADIO FLUX MEASUREMENTS

AT BOULDER

BY FREQUENCY

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
MANILA	14N	121														A	B	606
MITAKA	35N	139											C	A	B	B		612
GORKY	56N	44											A	A	A	A	C	650
ONDREJOV	49N	14			B	B	B	A				B	A	A	A	A	C	808
BORDEAUX	44N	359												C	A	A	C	930
GORKY	56N	44												A	B	B	C	950
SIMFEROPOL	44N	34										C						1000
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	1000
MANILA	14N	121											C	A	A	A	B	1415
SAGAMORE HILL	42N	288									C	A	A	A	A	A	B	1415
KIEL	54N	10												C	A	A	C	1420
BERLIN	52N	13	B	A	A	A	A	A	A	A	A	A	A	A	A			1470
BERLIN	52N	13														A	C	1490
NEUSTRELITZ	53N	13				A	A	A	A	A	A	A	B	A	B			1490
DELHI	28N	77								C	C	C	C	A				2000
JODRELL BANK	53N	357	B	A	C													2000
NEUSTRELITZ	53N	13								B	B	A	B	A				2000
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	2000
MANILA	14N	121											C	A	A	A	B	2695
SAGAMORE HILL	42N	288									C	A	A	A	A	A	B	2695
VILLA ELISA	34S	302											B	C				2695
PENTICTON	49N	241								C	A	A	A	A	A	A	C	2700
OTTAWA	54N	285	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	2800
SLOUGH	51N	359													A	A		2800
GORKY	56N	44	B	B									A	A	A	A	C	2950
MITAKA	35N	139	B	A	B	B	B	A	A									3000
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	3000
UPPER VAN NORMAN	35N	242												Q	Q	Q	Q	3000
SIMFEROPOL	44N	34			B	C				A	B	B	B	B	B			3100
SIMEIS(SIBERIAN	44N	34													A	A	C	3100
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	3750
GORKY	56N	44											B	A	B			3800
MANILA	14N	121											C	A	A	A	B	4995
SAGAMORE HILL	42N	288										B	A	A	A	A	B	4995
KISLOVODSK	43N	42								B	A	B	B	B	C			6100
SAO PAULO	22S	314											C	A	A	C	C	7000
MANILA	14N	121											C	A	A	A	B	8800
SAGAMORE HILL	42N	288										A	A	A	A	A	B	8800
GORKY	56N	44	C	B	B	B				B	C		A	A	B	A	C	9100
NEUSTRELITZ	53N	13					A	A	A	A	A	A	A	A	C			9140
HUANCAYO	12S	284													B	A	C	9400
ONDREJOV	49N	14					B	A				C	B	B	A	A	C	9400
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	9400
SLOUGH	51N	359													C	A		9400
BERLIN	52N	13	B	A	A	A	A	A	A	A	A	A	A	A	A			9490
BERLIN	52N	13														A	C	9500
MITAKA	35N	139	B	A	B	B	B	A	A	C			C					9500
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	B	S	9500
IRKUTSK	52N	104								C	B	B	B	B	C			9570
IRKUTSK	52N	104														B		9620

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Daily Flux Density and Polarization

Frequency: 9400 MHz. Month: January, Year: 1970
Station: Huancayo, Perú

S Total Flux Density of 2 Polarizations
Unit: 10^{-22} w.m.$^{-2}$Hz^{-1}

Date	12-15 UT	15-18 UT	18-21 UT	Daily Mean	Polarization Percent and Sense 12-15 UT	15-18 UT	18-21 UT	Daily Mean
1	307	306	305	306	0.61 l	0.9 l	0.91 l	0.8 l
2	298	297	294	296	0.4 l	0.6 l	0.9 l	0.6 l
3	295	294	290	293	0.6 l	0.8 l	0.4 l	0.6 l
4	288	288	289	288	0.5 l	0.8 l	0.9 l	0.7 l
5	289	290	286	288	0.2 l	0.2 l	0.4 l	0.3 l
6	-	282	282	282	-	0.5 l	0.6 l	0.6 l
7	284	280	279	281	0.3 l	0.4 l	0.3 l	0.3 l
8	279	284	280	281	0.1 l	0.3 l	0.3 l	0.2 l
9	286	289	288	288	0.1 l	0.2 l	0.3 l	0.2 l
10	298	298	298	298	0.4 l	0.4 l	0.4 l	0.4 l
11	314	314	314	314	0.4 l	0.9 l	0.8 l	0.7 l
12	316	318	315	316	0.2 l	0.3 l	0.4 l	0.3 l
13	316	318	320	318	0.0	0.1 l	0.0	0.0
14	312	314	314	313	0.3 r	0.1 l	0.2 l	0.0
15	326	327	324	326	0.2 r	0.2 r	0.1 r	0.2 r
16	-	318	316	317	-	0.2 r	0.1 r	0.2 r
17	322	322	321	322	0.2 r	0.1 r	0.2 l	0.0
18	318	320	317	318	0.0	0.4 l	0.4 l	0.3 l
19	323	325	322	323	0.2 l	0.4 l	0.5 l	0.4 l
20	-	-	324	-	-	-	0.1 r	-
21	330	332	330	331	0.0	0.0	0.0	0.0
22	320	320	320	320	0.3 r	0.1 l	0.1 l	0.0
23	312	312	312	312	0.1 r	0.1 l	0.3 l	0.0
24	309	309	305	308	0.2 r	0.2 l	0.1 r	0.2 r
25	307	306	302	305	0.2 r	0.2 l	0.1 l	0.0
26	300	303	298	300	0.4 l	0.5 l	0.8 l	0.6 l
27	310	312	309	310	0.4 l	0.9 l	0.9 l	0.7 l
28	323	323	323	323	0.9 l	1.2 l	1.7 l	1.3 l
29	316	316	312	315	0.9 l	1.6 l	2.0 l	1.5 l
30	313	310	308	310	1.0 l	1.0 l	1.2 l	1.1 l
31	307	309	309	309	1.4 l	1.7 l	1.6 l	1.6 l

Monthly Means: 307.0 Units. 0.42 % Left.

A.8 TOTAL RADIO FLUX MEASUREMENTS

AT BOULDER

BY FREQUENCY (CONTINUED)

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
IRKUTSK	52N	104														C	C	9700
IRKUTSK	52N	104														C	C	9750
BERNE	47N	7													A	C		10500
KISLOVODSK	43N	42								C	B	B	B	B	C			15000
SAGAMORE HILL	42N	288												A	A	A	B	15400
MITAKA	35N	139								B	A	B	A	A	B	B		17000
SLOUGH	51N	359													A	A		19000
MITAKA	35N	139												C				35000
SAGAMORE HILL	42N	288													C			35000
SLOUGH	51N	359													C	A		37000
SLOUGH	51N	359													A	A		71000

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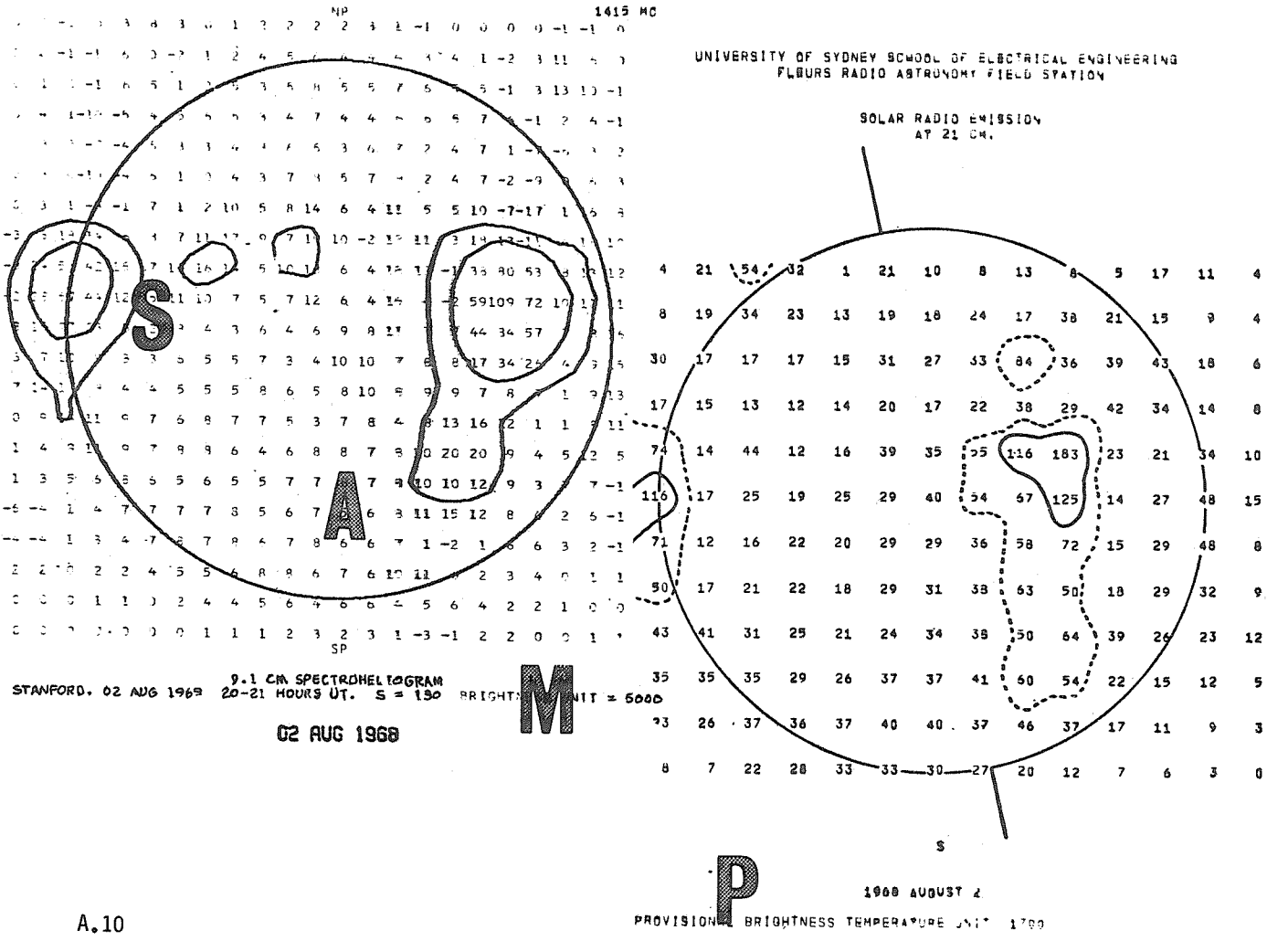
COMPUTER FORMAT:

1. Ottawa, daily noon flux on magnetic tape, as observed from 2/1947 - 12/1963, adjusted to 1 A.U. from 1/1964 to date.
2. Ottawa, daily noon flux (one card/day), observed and adjusted to 1 A.U., 10/1965 to date.
3. Sagamore Hill noon flux (one card/day), 1/1967 to date.
4. Manila noon flux (one card/day), 12/1967 to date.

PUBLICATIONS:

IAU Quarterly Bulletin on Solar Activity - Daily averages for many stations.

A.9



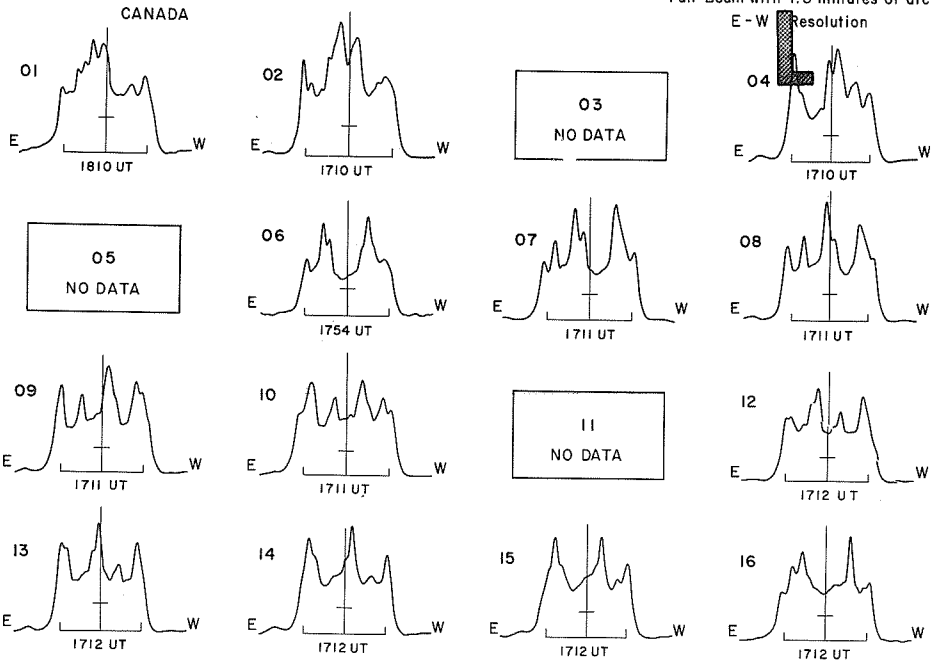
A.10

EAST-WEST SOLAR SCANS

June 1968

ALGONQUIN RADIO OBSERVATORY
CANADA

10.7 cm
Fan-Beam with 1.5 minutes of arc
E-W Resolution



A.9 RADAR AND RADIO MAPS OF THE SUN

AT BOULDER

STATION	DIA CM	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	WAVELENGTH CM
FLEURS	15	36S	151	B	A	A	A	A	B		C	A	B	B	B	A	A		21
PROSPECT HILL	15	42N	289											B	B	B	A		8.6
STANFORD	15	37N	238				B	C	B	B	A	A	A	A	A	A	A		9.1
UPPER VAN NORMAN	20.5	34N	242									Q	Q	A	A	Q	Q		3
EL CAMPO		29N	264					C	A	A	A	A	A	A	A	A			38.2 MHz

PUBLICATIONS:

1. Solar-Geophysical Data, NOAA - Daily maps reduced to 6 cm diameter, of Stanford, 3/1962 to date; Fleurs, 12/1964 to date; Prospect Hill 4/1970 to date.

A.10 RADIO EAST-WEST SCANS OF SOLAR DISK

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY OR WAVELENGTH
FLEURS	33S	150										B	A	A	A	C		43 CM
FLEURS	33S	150									C	A	A	A	A	A	B	21 CM
NANCAY	47N	2									C	A	A	A	A	A	C	408 MHZ
NANCAY	47N	2	B	A	A	A	A	A	A	A	B	A	B	B	A	A	C	169 MHZ
NEDERHORST	52N	5									A	A	A	A				136 MHZ
NEDERHORST	52N	5									A	A	A	A				252 MHZ
OTTAWA	54N	285												B	A	A	B	10 CM

PUBLICATIONS:

1. IAU Quarterly Bulletin on Solar Activity, Zürich - Fleurs data from 7/1957 - 12/1962.
2. Solar-Geophysical Data, NOAA - Fleurs 21 cm. from 10/1965 to date; 43 cm. from 4/1966 to date; Ottawa 10 cm. from 6/1968 to date; Nancay 408 MHz from 11/1965 to date and 169 MHz from 1/1957 to date.

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SOLAR X-RAYS MEASURED BY SATELLITE SOLRAD 9-EXPLORER 37

NAVAL RESEARCH LABORATORY

1-8A HOURLY AVERAGES FOR FEBRUARY

(10^{-3} ERGS/SQ.CM/SEC.)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	0,75	0,96	0,92	0,63	0,58	0,82	0,89	0,63	1,04	0,83	0,79	1,10	0,72	0,60	0,93	0,69	0,55	0,57	0,57	0,57	0,66	0,84	1,13
2	1,48	0,90	1,30	1,13	1,40	2,92	0,85	0,84	1,27	1,61	1,28	0,97	0,88	1,69	2,19	1,57	1,42	1,61	2,38	1,74	3,15	7,88	27,2
3	2,44	3,70	3,62	2,65	1,37	1,98	4,76	2,46	0,89	0,47	5,71	1,28	0,75	1,34	1,21	0,95	1,12	1,54	2,02	1,05	0,66	0,55	0,80
4	0,46	0,50	0,86	0,47	0,61	1,07	0,88	1,18	0,50	0,43	0,43	0,4[illegible]7	2,20	0,91	0,89	0,94	1,79	0,50	0,56	0,48	0,43	0,50	
5	0,81	0,58	0,48	0,40	0,35	0,37	0,38	0,44	0,57	0,30	0,30	0,2[illegible]2	0,33	0,46	0,38	0,35	0,28	0,30	0,47	0,29	0,28	0,25	
6	0,29	0,32	0,33	0,42	0,56	0,36	0,37	0,41	0,32	0,33	0,28	0,3[illegible]9	0,38	0,33	0,40	0,85	1,08	0,66	0,85	0,64	0,48	0,57	
7	1,05	1,50	2,39	1,73	0,70	0,77	1,36	0,77	1,03	0,45	0,99	0,54	0,95	0,52	0,52	0,81	0,55	0,51	0,47	0,49	0,50	0,65	0,74
8	0,89	0,70	1,13	0,91	1,63	1,68	1,21	3,46	4,98	1,93	1,13	0,91	1,78	1,12	0,89	1,20	1,36	1,90	1,63	1,82	2,89	1,52	1,81
9	2,75	2,70	1,74	1,61	1,49	1,89	29,3	5,94	1,29	0,90	2,46	2,43	11,4	6,40	5,28	5,69	3,09	2,96	2,57	3,12	2,23	4,50	6,16
10	10,1	5,63	5,28	6,42	4,58	4,31	3,60	4,23	4,41	2,50	2,20	1,34	2,23	2,04	1,98	2,27	2,95	6,04	4,90	5,93	7,46	4,72	2,70
11	2,22	1,88	34,0	14,2	3,50	6,38	8,71	187,	43,9	8,20	4,24	8,90	5,36	4,55	3,96	13,2	7,35	2,11	2,22	6,04	9,09	186,	34,3
12	53,0	5,42	4,22	4,75	5,05	14,1	4,50	7,60	19,7	2,84	4,13	2,70	3,59	7,93	4,52	2,28	2,38	3,34	6,62	3,22	2,54	3,01	1,69
13	3,19	1,78	2,85	2,21	1,67	2,73	2,30	1,70	5,83	[illegible]	2,70	2,32	1,27	1,47	1,69	1,76	1,34	1,38	1,65	1,08	0,97	1,69	9,50
14	1,86	1,34	1,63	2,60	5,69	1,60	2,09	1,66	1,73	1,58	2,37	2,89	2,41	2,02	2,67	1,47	1,27	1,47	6,26	1,94	1,07	1,11	1,24
15	2,31	1,80	2,28	1,92	1,46	2,32	1,63	1,43	1,53	1,53	3,69	2,66	1,51	2,36	1,95	3,29	3,12	5,06	2,80	4,02	2,46	1,57	2,46
16	1,47	1,25	4,72	2,39	4,42	1,90	1,82	1,88	9,42	4,43	2,50	2,00	2,12	2,18	1,48	1,50	1,54	1,72	3,66	1,74	1,96	2,57	2,09
17	1,48	2,20	1,73	2,07	1,39	1,67	1,54	1,40	3,05	1,58	1,45	1,78	3,19	1,90	1,87	5,33	5,20	2,98	1,84	2,00	2,19	2,54	10,1
18	3,21	1,57	1,59	2,32	14,4	14,6	7,72	1,85	1,71	1,52	1,42	1,47	1,42	1,38	1,57	1,25	1,14	1,13	3,88	1,76	1,16	5,23	1,30
19	1,38	1,39	1,70	26,2	12,3	1,94	1,52	1,51	4,19	3,92	2,14	1,31	1,66	1,89	1,66	3,16	1,79	1,89	3,01	3,31	3,55	2,55	4,99
20	2,48	1,70	1,66	1,46	1,40	1,15	1,29	2,51	1,58	29,4	42,4	16,3	5,86	3,13	2,28	2,06	1,85	6,10	2,29	1,17	1,06	1,46	1,00
21	1,74	0,95	1,30	1,04	1,20	1,00	1,[illegible]01	1,56	4,03	2,06	1,63	1,88	1,66	2,83	4,31	3,90	3,47	4,07	3,47	2,37	3,25	1,67	
22	1,39	1,09	1,24	2,11	1,65	1,25	1,28	1,68	0,97	1,14	1,39	2,20	1,51	0,95	1,22	1,21	1,19	0,93	1,40	0,99	1,30	0,94	0,98
23	1,19	1,14	1,28	1,25	1,44	1,57	1,97	0,96	1,09	1,11	1,35	1,28	1,03	1,01	2,00	3,26	1,49	3,64	1,52	1,13	1,46	1,37	1,63
24	0,85	0,88	1,08	1,39	0,89	0,84	0,83	0,97	2,28	4,30	1,54	1,27	1,19	0,92	1,06	0,86	2,88	0,74	1,05	0,92	0,87	0,98	1,84
25	0,76	1,36	0,81	0,81	1,16	1,11	0,76	1,56	1,09	0,88	0,87	0,83	0,64	0,68	0,95	0,63	1,24	0,77	0,62	0,52	1,58	0,69	1,07
26	0,61	1,36	0,74	0,70	0,80	1,06	1,37	0,85	1,27	1,03	1,02	0,82	2,47	5,55	5,55	3,92	2,22	1,54	1,49	1,23	0,99	0,89	0,70
27	0,69	0,69	0,69	0,85	0,95	2,49	1,12	1,14	1,05	1,00	0,85	0,96	1,23	0,80	0,88	0,78	1,08	1,05	1,12	4,06	1,73	1,13	0,85
28	1,66	1,58	1,17	1,04	1,72	1,73	1,86	1,82	1,49	1,49	0,94	1,01	1,77	27,6	1,92	2,69	2,13	2,11	2,31	24,0	2,57	2,51	1,67

A.11 SOLAR X-RAY AND UV BACKGROUND LEVELS

AT BOULDER

SATELLITE	BAND	SOURCE	64	65	66	67	68	69	70	71
SOLRAD	0-8A	USNRL	A	A	A	A	A	C	A	C
SOLRAD	8-12A	USNRL	A	A	A	A	A	C	A	C
SOLRAD	44-60A	USNRL	A	A	A	A	A	C		
OSO-5	9.1-10.5A	LEIC/UC-LONDON						B	A	C
SOLRAD	8-20A	UNSRL							A	C

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AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
60-007B-01	SOLRAD 1 (Greb 1)	X-rays and L-α Study	Friedman	03/11/60	0660-1160
62-006A-01	OSO 1	Solar Spectrometer (10-400A)	Neupert	03/07/62	0362-0562
64-001D-01	SOLRAD 7A (Greb 5)	Solar X-ray (2-60A), UV (1225-1350A) Flux	Kreplin	01/11/64	0164-0265
64-054A-20	OGO 1	Ionization Chamber	Winckler	09/05/64	0964-1267
65-007A-02	OSO 2	Solar X-rays (2-8, 8-20, 44-60A)	Chubb	02/03/65	0265-0365
65-058C-02	ERS 17	X-ray Detectors	Vette	07/20/65	0765-1165
65-093A-01	Explorer 30	Solar X-ray and Ultra-violet Monitor	Kreplin	11/18/65	1165-0867
66-049A-23	OGO 3	10-50 kev Solar Flux X-ray	Winckler	06/07/66	0666-1267
66-058A-05	Explorer 33	Electron & Proton Detectors	Van Allen	07/01/66	0666-0968
67-070A-01	Explorer 35	Electron & Proton Detectors	Van Allen	07/19/67	0767-0968
67-100A-08	OSO 4	Solar X-ray Telescope	Giacconi	10/18/67	1067-0568

NOTE:
For all AT GREENBELT entries the 4-digit numbers under DATA SET are month and year, e.g., 0760 = July 1960.

PROTON ENERGY GREATER THAN 30 MEV. HOURLY AVERAGES. IMP6 SOLAR PROTON MONITOR. JHU/APL AND GSFC

YEAR 1969

DATE	DAY OF YEAR	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
9 1	244	0.60	0.63	0.57	0.61	0.61	0.64	0.62	0.63	0.61	0.62	0.59	0.62	0.62	0.63	0.64	0.62	0.63	0.60	0.60	0.60	0.59	0.59
9 2	245	0.61	0.59	0.63	0.60	0.61	0.61	0.59	0.60	0.60	0.60	0.60	0.59	0.60	0.61	0.62	0.59	0.62	0.59	0.60	0.62	0.58	0.62
9 3	246	0.61	0.63	0.62	0.61	0.63	0.60	0.61	0.64	0.66	1.35	20.9	10.4	1.49	0.64	0.58	0.63	0.60	0.59	0.58	0.59	0.58	0.61
9 4	247	0.56	0.57	0.60	0.61	0.60	0.61	0.63	0.64	0.58	0.60	0.60	0.59	0.61	0.59	0.61	0.57	0.57	0.59	0.58	0.59	0.60	0.59
9 5	248	0.61	0.59	0.59	0.58	0.59	0.59	0.59	0.58	0.60	0.59	0.61	0.58	0.59	0.60	0.58	0.58	0.61	0.60	0.57	0.58	0.60	0.57
9 6	249	0.63	0.59	0.58	0.62	0.58	0.59	0.57	0.62	0.60	0.60	0.58	[illegible]	0.58	0.59	0.58	0.54	0.60	0.59	18.3	0.66	0.66	0.62
9 7	250	0.58	0.63	0.57	0.59	0.57	0.57	0.56	0.59	0.58	0.58	0.57	[illegible]	0.58	0.58	0.59	0.61	0.59	0.60	0.56	0.60	0.59	0.61
9 8	251	0.60	0.58	0.59	0.60	0.57	0.59	0.60	0.57	0.60	0.60	0.62	[illegible]	0.61	0.61	0.60	0.60	0.57	0.60	0.59	0.57	0.58	0.58
9 9	252	0.58	0.58	0.58	0.58	0.58	0.62	0.59	0.57	0.58	0.58	0.55	0.59	0.58	0.59	0.61	0.60	0.58	0.59	0.56	0.56	0.58	0.59
9 10	253	0.60	0.59	0.57	0.57	0.61	0.69	0.64	0.59	0.59	0.59	0.59	0.58	0.58	0.59	0.59	0.58	0.59	0.55	0.56	0.59	0.59	0.60
9 11	254	0.58	0.59	0.60	0.58	0.62	0.60	0.59	0.59	0.57	0.63	0.58	0.60	0.60	0.61	0.60	0.60	0.62	0.57	0.60	0.61	0.62	0.60
9 12	255	0.59	0.61	0.58	0.61	0.60	0.62	0.60	0.63	0.57	0.59	0.62	0.61	0.58	0.60	0.62	0.60	0.62	0.63	0.62	0.62	0.60	0.63
9 13	256	0.59	0.62	0.60	0.64	0.61	0.60	0.58	0.61	0.60	0.61	0.62	15.8	48.7	95.5	5.13	1.09	0.58	0.63	0.62	0.63	0.63	0.61
9 14	257	0.63	0.61	0.61	0.60	0.59	0.59	0.59	0.59	[illegible]	0.60	0.61	0.61	0.63	0.62	0.60	0.59	0.60	0.61	0.61	0.64	0.61	0.62
9 15	258	0.60	0.58	0.55	0.58	0.60	0.60	0.61	0.58	0.60	[illegible]	0.61	0.53	0.60	0.56	0.57	0.55	0.59	0.58	0.55	0.61	0.60	0.58
9 16	259	0.58	0.58	0.57	0.60	0.57	0.61	0.62	0.60	0.58	0.61	0.60	0.62	0.58	0.58	0.58	0.61	0.59	0.61	0.56	0.60	13.8	0.63
9 17	260	0.59	0.57	0.60	0.62	0.59	0.59	0.61	0.58	0.60	0.58	0.54	0.57	0.59	0.59	0.58	0.57	0.58	0.58	0.59	0.60	0.58	0.59
9 18	261	0.61	0.59	0.58	0.58	0.58	0.60	0.60	0.59	0.56	0.58	0.59	0.61	0.57	0.55	0.60	0.57	0.56	0.56	0.60	0.58	0.57	0.57
9 19	262	0.60	0.56	0.57	0.59	0.58	0.57	0.58	0.58	0.61	0.55	0.59	0.59	0.57	0.57	0.51	0.60	0.55	0.56	0.61	0.57	0.59	0.59
9 20	263	0.58	0.55	0.58	0.57	93.0	129.	2.67	1.50	0.95	0.64	0.58	0.58	0.61	0.60	0.56	0.58	0.62	0.58	0.57	0.59	0.57	0.58
9 21	264	0.59	0.58	0.60	0.60	0.58	0.57	0.61	0.62	0.58	0.59	0.61	0.59	0.60	0.58	0.57	0.62	0.60	0.61	0.59	0.61	0.59	0.58
9 22	265	0.58	0.59	0.58	0.57	0.59	0.60	0.58	0.59	0.57	0.59	0.58	0.62	0.58	0.59	0.58	0.60	0.61	0.58	[illegible]	0.59	0.56	0.58
9 23	266	0.60	0.58	0.59	0.61	0.59	0.[illegible]	[illegible]	0.57	0.58	0.60	0.61	0.584	2.42	0.59	7.56	37.8	0.81	0.63	0.60	0.62	0.57	0.57
9 24	267	0.59	0.55	0.56	0.59	0.61	0.60	0.58	0.58	0.59	0.60	0.60	0.60	0.62	0.59	0.60	0.60	0.58	0.58	0.58	[illegible]	0.53	0.55
9 25	268	0.59	0.58	0.59	0.57	0.57	0.57	0.58	0.62	1.21	[illegible]	1.60	1.40	1.23	1.09	0.98	0.95	0.82	0.75	0.73	0.73	0.72	[illegible]
9 26	269	0.68	0.62	0.63	[illegible]	0.61	0.65	0.62	0.62	0.65	0.63	0.66	0.62	0.63	0.61	0.64	666.	0.61	0.59	0.61	0.61	0.60	[illegible]
9 27	270	0.64	0.62	0.62	0.67	0.60	0.61	0.59	0.60	0.63	0.61	0.65	0.61	0.62	0.60	0.64	1.76	0.64	0.65	0.60	0.65	0.62	0.68
9 28	271	0.70	[illegible]	0.74	0.70	0.72	0.74	0.66	0.61	0.63	0.62	0.66	0.63	0.55	0.63	0.61	0.62	0.59	0.57	0.60	0.59	0.60	0.59
9 29	272	0.60	0.58	0.59	0.61	0.61	0.61	0.58	[illegible]	0.57	0.58	0.57	0.59	0.58	0.58	0.56	0.59	0.55	0.55	0.55	0.55	0.56	0.52
9 30	273	0.53	0.52	18083	0.53	0.54	0.53	3.24	0.58	1.97	1.86	0.75	0.56	0.59	0.54	0.54	[illegible]	0.53	0.55	0.56	0.51	0.55	0.53

A.12 ENERGETIC SOLAR PROTONS AND SOLAR ELECTRONS AT BOULDER

SATELLITE	ENERGY RANGE	SOURCE	67	68	69	70	71
EXPLORER 34	10MEV	JHU/APL-GSFC	B	B	CS		
EXPLORER 34	30MEV	JHU/APL-GSFC	B	B	CS		
EXPLORER 34	60MEV	JHU/APL-GSFC	B	B	CS		
EXPLORER 41	10MEV	JHU/APL-GSFC			B	B	
EXPLORER 41	30MEV	JHU/APL-GSFC			B	B	
EXPLORER 41	60MEV	JHU/APL-GSFC			B	B	
ATS-1	5-21MEV	AEROSPACE				C	
ATS-1	21-70MEV	AEROSPACE				C	
PIONEER 6	0.6-13 MEV	U OF CHICAGO			B	A	C
PIONEER 6	13-175 MEV	U OF CHICAGO			B	A	C
PIONEER 6	175 MEV	U OF CHICAGO			B	A	C
PIONEER 7	0.6-13 MEV	U OF CHICAGO			B	A	C
PIONEER 7	13-175 MEV	U OF CHICAGO			B	A	C
PIONEER 7	175 MEV	U OF CHICAGO			B	A	C
PIONEER 8	13.9 MEV	U OF NEW HAMP			C	A	C
PIONEER 8	64 MEV	U OF NEW HAMP			C	A	C
PIONEER 9	13.9 MEV	U OF NEW HAMP			C	A	C
PIONEER 9	64 MEV	U OF NEW HAMP			C	A	C

KEY TO SYMBOLS

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P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

EXPERIMENT NAME- GALACTIC AND SOLAR COSMIC RAY NSSDC ID 67-073A-09

ORIGINAL EXPERIMENT INSTITUTION- U OF MINNESCTA

INVESTIGATORS- W.R. WEBBER, U OF NEW HAMPSHIRE , DURHAM, N.H.

DATE LAST USEFUL DATA RECORDED- C8/27/67

EXPERIMENT BRIEF DESCRIPTION
THIS COSMIC-RAY TELESCOPE EXPERIMENT WAS DESIGNED TC MEASURE THE DIFFERENTIAL ENERGY SPECTRA CF PRCTONS, HELIUM NUCLEI, AND HEAVIER NUCLEI UP TO Z = 10, WITHIN THE ENERGY RANGE OF 50 TC 2000 MEV PER NUCLEON AND AT A MAXIMUM SAMPLING RATE OF ONCE PER 288 MSEC. THE TELESCOPE CONSISTED OF TWO DETECTORS, A SCINTILLATOR WITH ITS ASSOCIATED PHOTOMULTIPLIER (PM) TUBE AND A SCINTILLATOR AND A CERENKOV ELEMENT SANDWICH WITH BOTH ELEMENTS OPTICALLY COUPLED TO THE SAME PM TUBE. A 70-NANOSEC COINCIDENCE CIRCUIT COUPLED THE TWO DETECTORS TO FORM THE TELESCOPE. PULSES FROM EACH PM TUBE WERE PULSE HEIGHT ANALYZED. SAMPLED PULSE HEIGHTS, THE COINCIDENCE COUNT RATE, AND THE COUNT RATE OF THE FIRST DETECTOR WERE TELEMETERED. THE RESOLUTION OF THE OGO 4 DETECTOR DETERIORATED SHORTLY AFTER LAUNCH, PROBABLY DUE TO PARTIAL SEPARATION OF AN OPTICAL INTERFACE IN ONE ELEMENT OF THE TELESCOPE. THIS RESULTED IN A REDUCED EFFICIENCY FOR DETECTING PROTONS GREATER THAN ABOUT 200 MEV, WITH THE WORST RESOLUTION NEAR THE CERENKOV THRESHOLD OF 320 MEV. APPROXIMATELY 28 DAYS OF DATA WERE OBTAINED.

DATA SET NAME- ORIGINAL REDUCED COSMIC-RAY DATA ON TAPE NSSDC ID 67-073A-09A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME SPAN OF DATA- C7/30/67 TO C8/27/67

DATA SET BRIEF DESCRIPTION
THESE REDUCED DATA CONSIST OF TWO EXPERIMENTER-GENERATED, 556-BPI, BINARY MAGNETIC TAPES WRITTEN ON THE CDC 1604 COMPUTER. THE DATA ON THE TAPES ARE ORDERED BY ORBIT PASS, AS INDICATED BY THE MAXIMUM VALUE OF THE MCILWAIN L PARAMETER. THE FIRST TAPE BEGINS ON JULY 30, 1967, AT 0204 UT AND ENDS ON AUGUST 14, 1967, AT 0150 UT. THE SECOND TAPE BEGINS ON AUGUST 14, 1967, AT 0150 UT AND ENDS ON AUGUST 27, 1967, AT 0307 UT. THE DATA CONSIST OF 37-SEC AVERAGED TELESCOPE RATES AND 18-SEC AVERAGED SINGLES RATES. THE TAPE CONTAINS NINE-BIT WORD TELESCOPE RATES, NINE-BIT WORD SINGLES RATES, TIME (UT), ALTITUDE, LATITUDE, LONGITUDE, MCILWAIN L, AND MAGNETIC FIELD.

DATA SET NAME- ORIGINAL SINGLES AND TELESCOPE RATE PLOTS ON MICROFILM NSSDC ID 67-073A-09B

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME SPAN OF DATA- C7/30/67 TO C8/27/67

DATA SET BRIEF DESCRIPTION
THESE DATA CONSIST OF ONE REEL OF 16-MM MICROFILM. BOTH THE SINGLES COUNT RATES AND THE TELESCOPE RATES ARE PLOTTED ON THE SAME SCALE AS A FUNCTION OF TIME. (THE TELESCOPE RATES ARE SCALED BY A FACTOR OF 100.) THE VERTICAL SCALE IS LOGARITHMIC COUNTS PER SEC WHILE THE HORIZONTAL SCALE IS LINEAR UT FOR ONE ORBIT PERIOD. IN ADDITION TO THE TIME SCALE, MCILWAIN L VALUES, ALTITUDE, AND LATITUDE ARE ALSO INDICATED. THE DATA PLOTTED ARE FOR THE SAME PERIOD COVERED BY THE COSMIC-RAY DATA TAPES IN DATA SET 67-073A-09A.

A.12 ENERGETIC SOLAR PROTONS AND SOLAR ELECTRONS

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
59-009A-04	Explorer 7	Radiation & Solar Protons	Van Allen	10/13/59	1059-0261
60-001A-01	Pioneer 5	Proportional Counter Telescope	Simpson	03/11/60	0360-0560
60-001A-03	Pioneer 5	Ionization Chamber/GM Tube	Winckler	03/11/60	0360-0760
61-020A-03	Explorer 12	Charged Particles	Van Allen	08/16/61	0861-1261
61-020A-04	Explorer 12	Cosmic Rays	McDonald	08/16/61	0861-1261
62-006A-10	OSO 1	Proportional Counters	Hess	03/07/62	0362-0763
62-051A-04	Explorer 14	Cosmic Ray Scintillation	McDonald	10/02/62	1062-0863
62-067B-02	Injun 3	Pulse Scintillator	O'Brien	12/13/62	1262-1063
62-067B-07	Injun 3	Proton Spectrometer	O'Brien	12/13/62	1262-1063
63-046A-03	Explorer 18	Cosmic Ray Range vs. Energy Loss	Simpson	11/27/63	1163-0664
63-046A-04	Explorer 18	Cosmic Rays	McDonald	11/27/63	1163-0564
63-046A-05	Explorer 18	Ionization Chamber and GM Counters	Anderson	11/27/63	1163-0365
64-054A-12	OGO 1	Solar Cosmic Rays	Anderson	09/05/64	0965-0566
64-054A-18	OGO 1	Cosmic Ray Spectra and Fluxes	Simpson	09/05/64	0964-1167
64-054A-20	OGO 1	Ionization Chamber 5 channel .05-4 Mev	Winckler	09/05/64	0964-1267
64-060A-03	Explorer 21	Cosmic Ray Range vs. Energy Loss	Simpson	10/04/64	1064-0465
64-060A-05	Explorer 21	Ionization Chamber and GM Counters	Anderson	10/04/64	1064-0965
64-076B-03	Explorer 25	Geiger Mueller Counter	Van Allen	11/21/64	0265-0766
64-076B-04	Explorer 25	Solid State Detector	Van Allen	11/21/64	0265-0766
64-077A-04	Mariner 4	Cosmic Ray Telescope	Simpson	11/28/64	1164-1065
65-042A-03	Explorer 28	Cosmic Ray Range vs. Energy Loss	Simpson	05/29/65	0565-0567
65-042A-05	Explorer 28	Ionization Chamber and GM Counters	Anderson	05/29/65	0565-0167
65-081A-07	OGO 2	Low-energy Proton, Alpha Particle Measurement	Simpson	10/14/65	1065-1266
65-081A-08	OGO 2	Galactic and Solar Cosmic Ray	Webber	10/14/65	1065-1065
65-105A-03	Pioneer 6	Cosmic Ray Telescope	Fan	12/16/65	1265-0870
66-049A-01	OGO 3	Solar Cosmic Rays	Anderson	06/07/66	0666-0267
66-049A-03	OGO 3	Cosmic Ray Spectra and Fluxes	Simpson	06/07/66	0666-0868
66-058A-04	Explorer 33	Ionization Chamber and GM Counters	Anderson	07/01/66	0766-0667
66-075A-06	Pioneer 7	Cosmic Ray Telescope	Simpson	08/17/66	0866-0870
67-051A-01	Explorer 34	Low Energy Solid State Telescope	Brown	05/24/67	0567-0569
67-051A-03	Explorer 34	Cosmic Ray Proton	Simpson	05/24/67	0567-0569
67-051A-04	Explorer 34	Lepeda, Low Energy Particles	Frank	05/24/67	0667-0767
67-051A-07	Explorer 34	Solar Proton Monitor	Bostrom	05/24/67	0567-0569
67-070A-01	Explorer 35	Electron and Proton Detectors	Van Allen	07/19/67	0767-0570
67-073A-09	OGO 4	Galactic and Solar Cosmic Ray	Webber	07/28/67	0767-0867

Pioneer 6/7 Solar Wind Velocity and
Co-rotation Delay Times for
November, 1968

DATE 1968	PIONEER VI				PIONEER VII			
	Time (Z)	Pass	U_H+	TAU	Time (Z)	Pass	U_H+	TAU
Nov. 1	G1728	1052	414.1	-12.32	G0005	807	400.5	+5.44
2	G1604	1053	424.	-12.35	G2314	809	325.2	+5.4
3	G1521	1054	364.8	-12.27				
4	G1[illegible]20	1055	410.6	-12.37	G0025	810	360.4	+5.42
5	G[illegible]0	1056	426.8	-12.41				
6	G1600	1057	586.	-12.61				
7	G1617	1058	421.6	-12.45				
8								
9								
10								
11								
12					G0021	818	430.1	+5.44
13								
14								
15					G[illegible]019	821	352.3	+5.40
16					G0026	822	444.5	+5.45
17					G0016	823	408.9	+5.43
18					G0014	824	407.3	+5.43
19					G0002	825	371.4	+5.41
20					G1918	827	407.4	+5.44
21					G1910	828	432.3	+5.45
22					G2158	829	481.2	+5.47
23								
24								
25								
26					G0042	832	443.1	+5.46
27					G0049	833	411.1	+5.44
28					G0011	834	398.7	+5.44
29					G0000	835	405.7	+5.44
30					G0006	836	437.6	+5.46

A.13 SOLAR WIND

AT BOULDER

SPACE PROBE	SOURCE	MEASUREMENT	67	68	69	70	71
PIONEER 6	NASA AMES	VELOCITY AND CO-ROTATION DELAY	A	A	A	A	C
PIONEER 7	NASA AMES	VELOCITY AND CO-ROTATION DELAY	A	A	A	A	C
PIONEER 6	MIT	VELOCITY AND NUMBER DENSITY			B	C	
PIONEER 7	MIT	VELOCITY AND NUMBER DENSITY			C		

AT BOULDER

SATELLITE	SOURCE	MEASUREMENT	69	70	71
VELA 2	LASL	VELOCITY	B		
VELA 3	LASL	VELOCITY	A	B	
VELA 4	LASL	VELOCITY	B		
VELA 5	LASL	VELOCITY	C	B	

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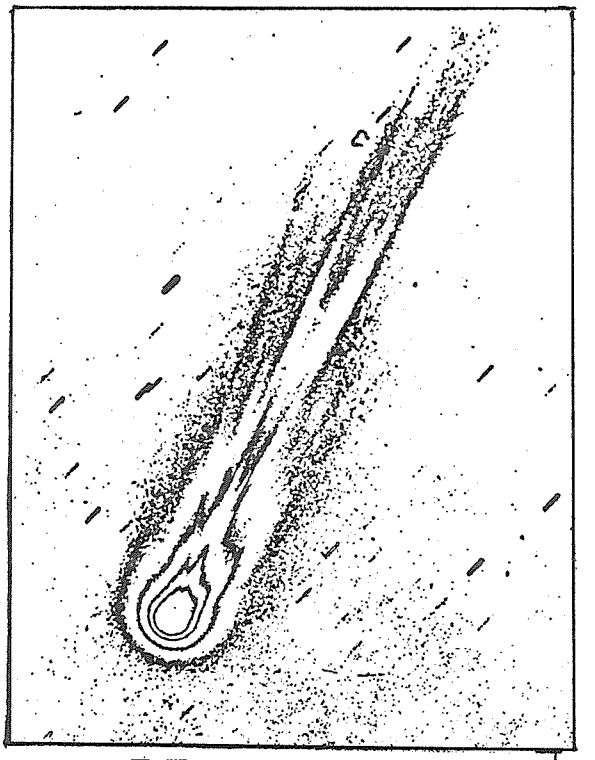
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
61-010A-02	Explorer 10	Plasma Probe	Bridge	03/25/61	0361-0361
62-041A-06	Mariner 2	Solar Plasma Analyzer	Neugebauer	08/27/62	0862-1262
63-046A-01	Explorer 18	Retardation Potential Analyzer	Serbu	11/27/63	1163-1163
63-046A-06	Explorer 18	Solar Wind Protons	Wolfe	11/27/63	1163-0464
63-046A-07	Explorer 18	Plasma Faraday Cup	Bridge	11/27/63	1163-1264
64-060A-01	Explorer 21	Retardation Potential Analyzer	Serbu	10/04/64	1064-0965
64-060A-06	Explorer 21	Solar Wind Protons	Wolfe	10/04/64	1064-1264
64-060A-07	Explorer 21	MIT Faraday Cup	Bridge	10/04/64	1064-0965
65-042A-01	Explorer 28	Retardation Potential Analyzer	Serbu	05/29/65	0665-0567
65-105A-02	Pioneer 6	Solar Wind Plasma Faraday Cup	Bridge	12/16/65	1265-0469
65-105A-06	Pioneer 6	Plasma Probe	Wolfe	12/16/65	1265-1068
66-075A-02	Pioneer 7	Solar Wind Plasma Faraday Cup	Bridge	08/17/66	0866-1268
66-075A-03	Pioneer 7	Plasma Probe	Wolfe	08/17/66	0866-1168
67-051A-04	Explorer 34	Low-Energy Proton and Electron Differential Energy Analyzer	Van Allen	05/24/67	0667-0767
67-051A-08	Explorer 34	Electrostatic Analyzer	Ogilvie	05/24/67	0567-0168
67-123A-02	Pioneer 8	Plasma Probe	Wolfe	12/13/67	1267-0168
67-123A-07	Pioneer 8	Plasma Wave Measurement	Scarf	12/13/67	1267-1068
68-014A-24	OGO 5	Plasma Wave Detector	Crook	03/04/68	0368-0968
68-100A-02	Pioneer 9	Plasma Probe	Wolfe	11/08/68	1168-0369
68-100A-07	Pioneer 9	Plasma Wave Detector	Scarf	11/08/68	1168-0369

A.14



A.15

DATE 1968	OBSERVING PERIOD	JUPITER OBSERVATIONS	INTENSITY	BURSTINESS	FREQ. RANGE MHZ	JUPITER LONGITUDE	Io RANGE
1 10	0309 1338	0654 0754	2	STRONG	13-24	237.9-274.2	346.6-355.1
		0942 1018	3	STRONG	12-16	339.4- 1.2	10.3- 15.4
1 11	0307 1339	1154 1314	3	MODERATE	16-33	209.8-258.2	232.5-243.8
1 12	0307 1340						
1 13	0309 1340	0408 0426	1	WEAK	26-30	229.5-240.4	213.8-216.3
		0642 0715	2	MODERATE	13-20	322.6-342.6	235.6-240.2
		0753 0848	2	STRONG	13-22	5.5- 38.8	245.6-253.4
1 14	0307 1340						
1 15	0307 0925	0756 0900	1	MODERATE	12-19	308.7-347.4	293.1-302.2
1 15	1000 1341						
1 16	0307 1336						
1 17	0339 1338						
1 18	0307 1337						
1 19	0308 1345						
1 20	0226 1340	0801 0819	2	STRONG	11-18	345.1-35[illegible].0	231.9-234.4
		0920 1006	2	MODERATE	13-18	32.8- 6[illegible]	243.1-249.6
1 21	0222 1340	0344 0443	3	MODERATE	11-18	340.3- 16.0	39.2- 47.5
1 22	0217 1337	0748 0808	1	WEAK	12-14	278.5-290.6	277.2-280.0
1 23	0213 1336	0606 0639	3	MODERATE	14-17	7.6- 27.5	106.3-111.0
1 24	0209 1338	0558 0612	1	MODERATE	14-16	153.4-161.9	308.7-310.7
1 25	0204 1342						
1 26	0202 1337						
1 27	0203 1340	0514 0623	1	WEAK	14-29	218.8-260.5	193.4-203.1
		1100 1129	2	STRONG	12-18	68.0- 85.5	242.3-246.4
1 28	0202 1340	0853 1015	1	STRONG	12-17	141.9-191.5	68.0- 79.6
1 29	0213 1349	0528 0536	1	MODERATE	15-17	168.7-173.5	242.5-243.7
		0618 0713	3	STRONG	14-22	198.9-232.2	249.6-257.4
		0942 1050	2	MODERATE	13-17	322.2- 3.4	278.4-288.1
1 30	0202 1336	0708 0802	3	STRONG	12-18	19.8- 52.5	100.2-107.8
1 31	0202 1342						
2 1	0156 1337	0158 0212	2	MODERATE	27-35	133.8-142.3	103.5-105.5
2 2	0205 1341						
2 3	0203 1335	0625 0731	1	STRONG	12-28	236.6-276.5	188.6-198.0
		0815 0855	1	MODERATE	12-14	303.1-327.3	204.2-209.8
		0927 1007	1	STRONG	12-16	346.7- 10.9	214.4-220.0
2 4	0207 1338						
2 5	0233 1337	0724 0959	3	STRONG	12-26	213.6-307.3	244.2-266.1
2 6	0207 1331	0556 0617	2	STRONG	14-16	311.1-323.8	75.3- 78.3
		0840 1015	3	STRONG	15-17	50.3-107.7	98.5-111.9
2 7	0202 1337	0709 0723	2	MODERATE	12-15	145.9-154.4	289.2-291.2
		0920 1120	2	STRONG	11-18	225.1-297.7	307.7-324.7

A.14 COMET TAILS, INTERPLANETARY SCINTILLATIONS, ZODAICAL LIGHT

COMET TAILS

AT BOULDER

1. Miscellaneous IQSY observations of comets by USSR observatories, Hamburg Observatory and Kodaikanal Observatory.
2. 1967 sample comet observation from Cordoba Observatory, Argentina.
3. Atlas of Cometary Forms, NASA SP-198, 1969, 17 comets from 1835 - 1962.
4. Miscellaneous observations by Jamaica, Tel Aviv.

ZODIACAL LIGHT

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
65-068A-01	Gemini 5	Zodiacal Light Photography	Ney	08/21/65	0865-0865
66-047A-01	Gemini 9	Zodiacal Light Photography	Ney	06/03/66	0666-0666
66-066A-01	Gemini 10	Zodiacal Light Photography	Ney	07/18/66	0766-0766

A.15 SPORADIC RADIO EMISSIONS FROM JUPITER

AT BOULDER

A.15 Observations at 18 and 22 MHz for Feb.-June, 1970 and Feb.-July 1971 by Jamaica.

P U B L I C A T I O N S:

IGY Solar Activity Report Series, World Data Center A - University of Colorado 7.6-41 MHz observations, 1/1960 - 6/1966.

World Data Center A - Upper Atmosphere Geophysics Report UAG-3, ESSA Research Lab. - University of Colorado 7.6-41 MHz observations, 7/1966 - 8/1968. See p. 3.

A.16 SOLAR RADIATION

AT GREENBELT

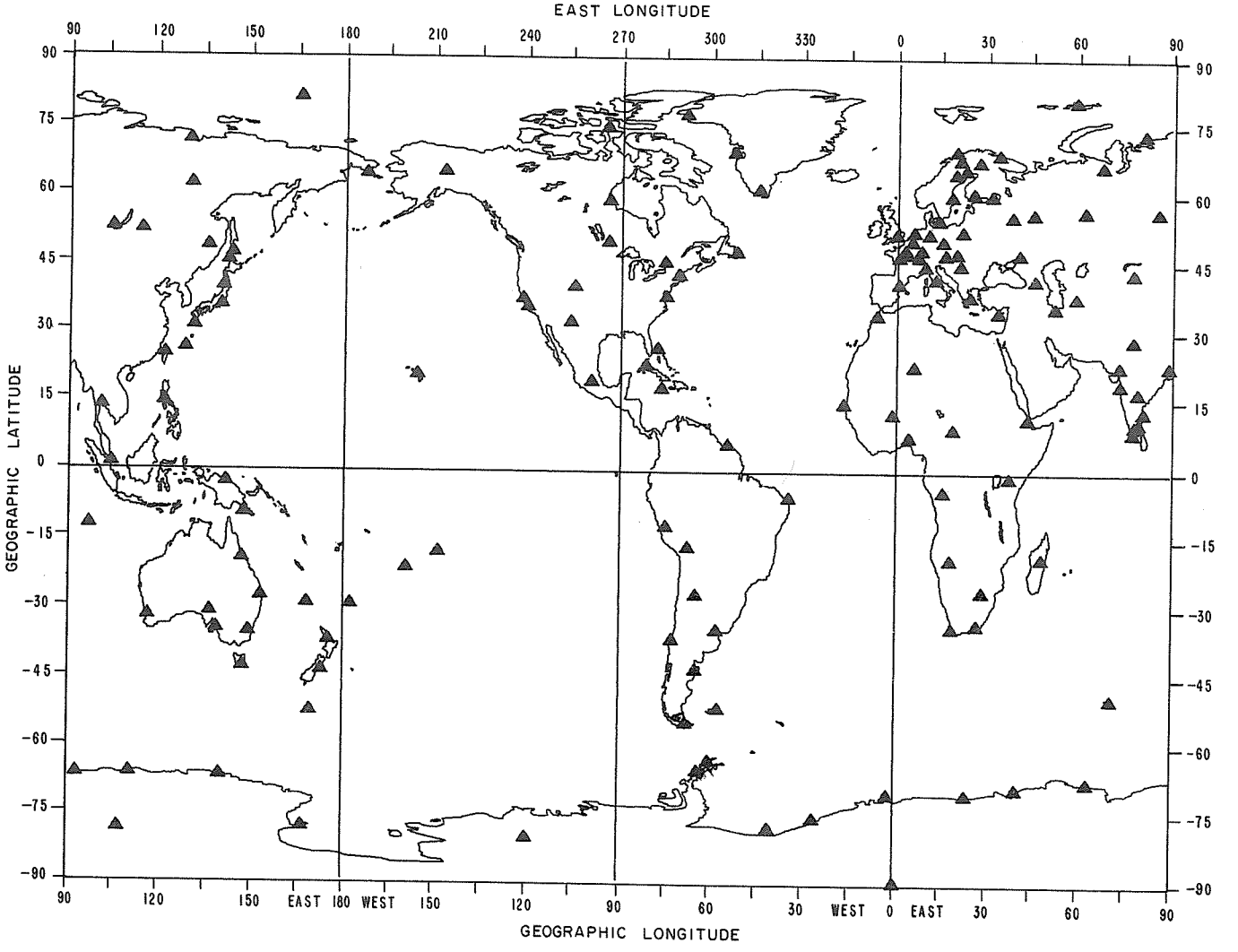
NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
59-009A-01	Explorer 7	Thermal Radiation	Suomi	10/13/59	1159-0560
62-002A-01	Tiros 4	Low-Resolution Omnidirectional Radiometer	Suomi	02/08/62	0262-0662

B. IONOSPHERIC PHENOMENA

(other than flare - associated events)

The map shows all the stations that are currently submitting data. With the exception of the topside soundings in each section of the catalogue, the stations are arranged by geographic latitude in descending order north to south. For Section B.1 in addition to the summary of data from 1957 to date, there are listings by the year from 1967 through 1970 of the daily hourly values, f-plots and ionograms to assist the user in readily determining the network available in any given year. The data on magnetic tape are indicated in a separate section. The station names and two hourly indicators are taken from "List of Ionospheric Vertical Incidence Sounding Stations with Recommended Names and Identification" by Piggott and Shapley published in IQSY Notes No. 11, March 1965, pp. 34-41. This list was adopted for the identification of station data and for other purposes by the Working Group for Ionosphere, of the III IQSY Assembly held in Madrid, March 1965.

IONOSPHERE VERTICAL INCIDENCE SOUNDING STATIONS 1971



B. IONOSPHERIC PHENOMENA

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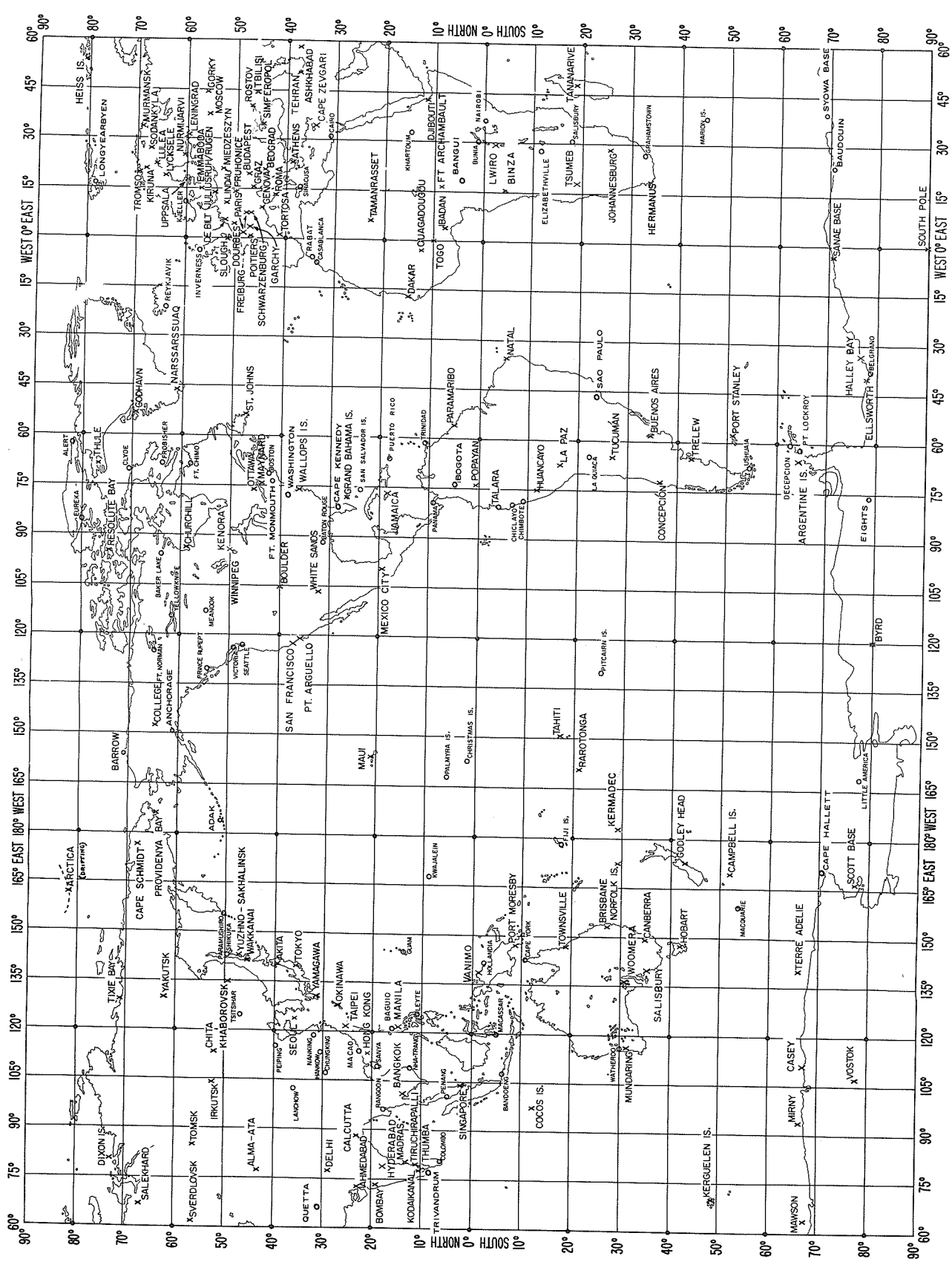

IONOSPHERE VERTICAL SOUNDINGS STATIONS, JULY 1971
x OPERATING
o NOT OPERATING
USCOMM-ESSA-IER

AT BOULDER

B.1 IONOSPHERE VERTICAL SOUNDINGS

BASED ON DAILY - HOURLY VALUES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	INDICATOR	COMPUTER CODE
ARCTICA (NP 6)	87N		B	A	B	S												XG	
ALERT	82N	298	C	A	S													AL	J82
FLETCHERS ICE	82N		B	A	S													XC	982
ARCTICA(NP 13)	81N									B	A	B	S					XG	
ARCTICA (NP 8)	80N					B	B	S										XG	
EUREKA	80N	275	C	A	C	S												EU	980
HEISS IS	80N	58	B	A	B	A	A	A	A	A	A	A	A	C	Q	Q	Q	BT	280
ARCTICA (NP 7)	79N		B	A	C	S												XG	
ARCTICA(NP 11)	79N							C	S									XG	
ARCTICA(NP 10)	78N							C	A	C	S							XG	
ARCTICA(NP 16)	78N	176												C				XG	
LONGYEARBYEN	78N	15	B	A	B	S												LG	178
THULE/QANAQ	77N	291													Q	Q	C	TH	
THULE/TUTO	76N	292	B	A	A	B	A	A	A	A	A	B	S					TH	J76
RESOLUTE BAY	74N	266	B	A	A	A	A	A	A	A	A	A	A	A	B	B	C	RB	974
DIXON	73N	80	B	A	A	B	B		B	B	A	A	A	A	C	Q	Q	DI	373
BARROW	71N	204	B	A	A	A	A	A	B	A	B	S						BW	771
TIXIE BAY	71N	128	C	B	B	B	C			B	A	C	B	B	Q	Q	Q	TX	471
CLYDE	70N	292	C	B	S													CR	J70
GODHAVN	69N	307	B	A	B	B	A	A	B	A	A	A	A	A	A	A	C	GO	J69
MURMANSK	69N	33	B	A	A	A	A	A	B	A	A	A	A	A	B	C	Q	MM	168
TROMSO	69N	19	B	A	A	B	A	A	A	A	A	B	B	A	A	A	C	TR	169
CAPE SCHMIDT	68N	179				A	A	B	C										
KIRUNA	67N	20	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	KI	167
SODANKYLA	67N	26	C	A	A	A	A	A	A	A	A	A	A	A	A	A	C	SO	166
SALEKHARD	66N	66	C	A	C	A	A	A	A	A	A	A	A	A	A	B	Q	SD	266
LULEA	65N	22	B	A	A	A	A	A	A	A	B	B	P	C	P			LU	165
BAKER LAKE	64N	264	B	A	C	S												BL	964
COLLEGE	64N	213	B	A	A	A	A	A	B	B	A	A	A	A	B	A	C	CO	764
FORT NORMAN	64N	235	C	S														FN	864
LYCKSELE	64N	18	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	LY	164
PROVIDENYA	64N	186	B	A	A	A	A	A	A	A	A	A	A	A	B	Q	Q	PD	664
REYKJAVIK	64N	339	B	A	A	A	A	A	A	A	S							RK	A64
FROBISHER BAY	63N	292	C	B	C	S												FB	J63
YAKUTSK	62N	129	B	A	B	A	A	A	A	A	A	A	A	A	C	Q	Q	YA	462
YELLOWKNIFE	62N	246	C	B	C	S												YE	862
ANCHORAGE	61N	211	B	A	A	A	A	A	B	A	A	S						AN	761
NARSSARSSUAQ	61N	315	C	A	A	A	A	A	B	A	A	A	A	A	A	A	C	NQ	J61
KJELLER	60N	11	B	A	C	S												OS	059
LENINGRAD	60N	30	B	B	B	A	A	A	B	A	A	A	A	A	A	B	Q	LD	160
NURMIJARVI	60N	24	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	NU	159
UPPSALA	59N	17	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	UP	158
CHURCHILL	58N	266	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	CH	958
FORT CHIMO	58N	292		C	S													FC	J58
INVERNESS	57N	356	B	A	A	A	A	A	B	S								IN	056
EMMABODA	56N	15														Q	Q		
GORKY	56N	44		B	A	B	A	A	A	A	A	A	A	A	A	B	Q	GK	156
SVERDLOVSK	56N	61	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	SV	256
TOMSK	56N	84	B	A	B	A	A	A	A	A	A	A	A	A	A	B	Q	TK	356
MOSCOW	55N	37	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	MO	155

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months
W = World Days Only
+ = Ionograms and f-plots only, for some years

Q = Data exist but not held at WDC-A; QUERY WDC-A to assit in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

Hourly Values - these are monthly tables of hourly values and monthly medians normally for the following parameters: foF2, foF1, foE, foEs, fbEs, fmin, fxI, dfS, h'F, h'Es, h'E, M(3000)F2 or MUF(3000)F2, Es types. On the average there are 12 sheets of data per month. Most of the data have been microfilmed on 35 mm film. One 100 foot roll will contain several years of data for one station at a cost of $5.00, e.g., Huancayo for 1957 - 1964 is on one roll. Electrostatic copies are reduced from out-size single characteristic monthly daily-hourly original sheets to letter size at 45¢ per sheet. For the letter size daily sheets of all characteristics, electrostatic copies are 25¢ per sheet.

HOURLY VALUES

IONOSPHERIC DATA

BOULDER LAT. 40.0N LONG. 105.3W SWEEP 0.25 MC TO 20.0 MC IN 27 SEC. 105.0W TIME

YR-MO	C
1966 11	00

foF2

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
1	35	34	33	29	31	26	25	54	75	71	81	88	95	94	86	80	82	71
		U F	F	U F	U F	U F											J R	
2	28	27		32	33	34	40	56	67	73	80	92	87	104	102	101	88	74
3	30	32	33	33	32	30	33	54	67	80	81	91	96	101	100	92	80	63
4	29	31	32	34	33	32	29	55	68	82	84	93	91	92	87	93	C	63
5	26	27	29	29	29	29	29	58	71	85	85	92	102	95	86	80	70	63
6	25	28	28	29	28	27	29	57	76	82	85	76	84	84	90	90	86	70
7	26	28	29	29	28	26	27	51		77	82	82	83	83	80	80	80	61
8	30	33	33	32	32	31	30	C	C	C	C	92	89	86	90	92	82	68
9	30	32	32	32	34	34	35	62	76	76	81	86	87	92	92	86	77	60
10	30	31	33	34	33	31	32	56	75	92	95	94	104	94	92	90	85	70
11	33	35	37	37	31	32	33	58	87	88	85	90	98	98	97	J R 86	75	60
12	36	38	36	32	33	34	35	56	84	87	82	95	101	104	114	105	90	65
13	33	33	35	36	35	37	37	52	65	80	83	100	102	102	97	95	90	66
14	33	33	32	35	36	33	32	53	76	86	80	90	96	98	92	89	78	62
15	26	28	31	33	34	34	35	56	80	84	87	98	C	C	C	E	C	C
16	C	C	C	C	C	C	C	C	C	C	C	99	112	98	94	78	80	66
17	36	36	33	31	31	31	33	53	73	C	90	95	87	99	104	104	92	67
18	33	A	34	33	30	31	32	50	76	75	93	100	105	106	100	97	92	77
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	92	91	90	86	85	80	64

B.1 IONOSPHERE VERTICAL SOUNDINGS

AT BOULDER

BASED ON DAILY - HOURLY VALUES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	INDICATOR	COMPUTER CODE
JULIUSRUH/RU	54N	13	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	JR	055
MEANOOK	54N	247	C	A	C	S												ME	855
CHITA	52N	113	B	A	A	A	A	A	C	P	P							CX	452
DE BILT	52N	5	B	A	A	A	A	A	A	A	A	A	C	A	A	C	Q	DT	053
IRKUTSK	52N	104	C	B	B	A	A	A	A	A	A	A	A	A	B	C	Q	IR	352
MIEDZESZYN	52N	21		C	B	A	A	A	A	A	A	A	A	A	A	B	C	MZ	152
ADAK	51N	184	B	A	A	A	B	A	A	A	A	S						AD	651
LINDAU	51N	10	B	A	A	A	A	A	A	A	A	A	A	A	C	Q	Q	LI	050
SLOUGH	51N	360	B	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	SL	051
DOURBES	50N	4	B	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	DB	049
PRUHONICE	50N	14			A	A	A	A	A	A	A	A	A	A	A	B	Q	PQ	052
WINNIPEG	49N	266	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	WI	949
FREIBURG	48N	7	B	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	FR	048
KHABAROVSK	48N	135					C	A	A	A	A	A	B	B	B	C	Q	KB	548
PARIS SACLAY	48N	2				B	A	A	A	B	B	A	B	A	Q	Q		SC	047
VICTORIA	48N	237	B	A	C	S												VI	848
BAIE ST PAUL+	47N	289					C	C										XG	
BUDAPEST	47N	19	B	A	A	S				B	A	B	B	A	C	Q	Q	BU	147
GARCHY	47N	3			C	B	B	B	A	A	A	A	A	A	B	B	Q	GY	042
GRAZ	47N	15	C	A	A	A	A	A	A	A	A	A	A	A	B	C	C	GZ	146
ROSTOV	47N	39	B	B	B	A	A	A	A	A	A	A	A	A	A	B	Q	RV	149
SEATTLE+	47N	237		B	B	C													
ST JOHNS	47N	308	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	SJ	J47
YUZHNO SAKHALINSK	47N	143	B	A	A	B	A	A	B	B	A	A	A	B	B	Q	Q	SA	547
POITIERS	46N	0	B	A	A	A								A	A	C	Q	PT	046
SCHWARZENBURG	46N	6	B	A	B	A	A	A	A	B	A	A	A	A	A	C	Q	SZ	045
OTTAWA	45N	285	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	OT	945
WAKKANAI	45N	141	B	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	KK	545
BEOGRAD	44N	20						C	A	A	A	A	A	A	A	A	C	BE	145
GENOVA	44N	9	B	A	A	A	A	A	B	A	A	A	A	A	A	A	Q	GV	044
SIMFEROPOL	44N	34	B	A	B	S												SF	144
ALMA ATA	43N	76	B	B	A	A	A	A	A	A	A	A	A	A	A	B	Q	AA	343
HANOVER+	43N	287												Q	Q	Q	Q		
MILLSTONE HILL+	43N	288											A	A	B	A	C	MH	
BILLERICA	42N	289									C	B	B	A	A	B	S		J43
MAYNARD	42N	288														C	Q		
ROMA	41N	12	C	A	A	A	A	A	A	A	A	A	A	A	A	A	C	RO	041
TBILISI	41N	44							C	A	A	A	A	A	Q	Q	Q	TB	142
BOULDER	40N	255		C	B	A	B		B	A	A	A	A	A	A	A	C	BC	840
FORT MONMOUTH	40N	286	B	A	A	A	B	A	A	A	A	S						FM	J40
TORTOSA	40N	0	B	A	B	A	B	A	A	B	A	B	A	A	A	B	C	EB	040
AKITA	39N	140	B	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	AL	539
ATHENS	38N	23				C	A	A	B	A	C	P	P	C	P	P	P	AT	138
WASHINGTON	38N	283	B	A	A	A	A	A	A	A	A	A	A	B	S			WA	938
ASHKHABAD	37N	58	B	A	A	B	A	A	B	A	A	A	A	A	B	Q	Q	AS	237
SAN FRANCISCO+	37N	238	B	A	C				A	A	A	A	B	A	A	A	C	ST	837
SEOUL+	37N	127											C		B	C		SL	
WALLOPS IS+	37N	285							B	A	A	A	A	A	A	A	C	WP	937
POINT ARGUELLO+	35N	240							B	A	A	B	A	A	A	A	C	PA	836
TEHRAN	35N	51							B	A	A	B						TE	236

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months
W = World Days Only
\+ = Ionograms and f-plots only, for some years

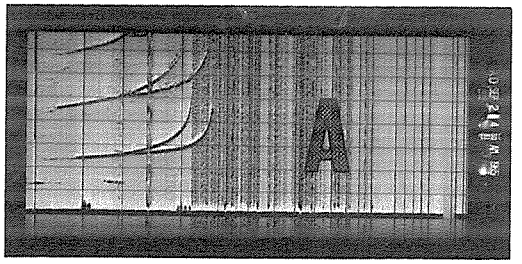
Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

B.1

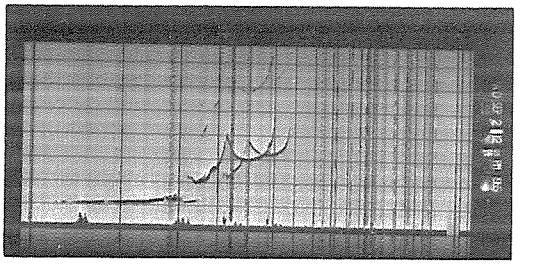
Ionograms - the original sounding record, usually on 35 mm film. Normally, soundings are taken quarter-hourly, and more frequently during Regular World Days and Alerts. The monthly length of film is 900 to 3000 feet depending upon station, copies at $.08 per foot on 35 mm film for minimum of 500 feet. If short intervals requested, film cutting and splicing charge is $4.00 per interval in addition to a charge of $.08 per foot of 35 mm film.

S

*IONOGRAMS 1.0-20.0 MHz



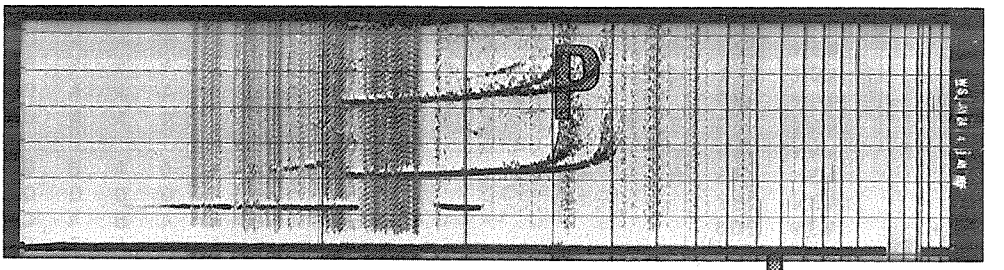
NIGHT



DAY

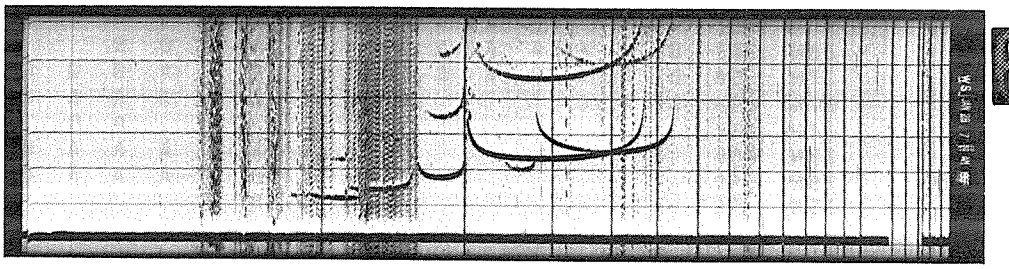
M

*IONOGRAMS 0.25-20.0 MHz



NIGHT

L



E

DAY

AT BOULDER

B.1 IONOSPHERE VERTICAL SOUNDINGS

BASED ON DAILY - HOURLY VALUES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	INDICATOR	COMPUTER CODE
TOKYO	35N	139	B	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	TO	535
CAPE ZEVGARI	34N	32								B	B	B	A	C	Q	B	Q	CV	135
CASABLANCA	33N	353	B	C	S													CA	033
RABAT	33N	354		B	C	A	Q	Q	S					Q				RT	034
HAIFA+	32N	34				C	B												
WHITE SANDS	32N	254	B	A	A	A	A	A	B	A	A	A	A	A	A	A	C	WS	832
YAMAGAWA	31N	130	B	A	A	A	A	A	A	A	A	A	A	A	A	A	Q	YG	431
EGLIN AFB+	30N	273								C	C		C		C				
QUETTA	30N	67	C	B	C	C	C	C		S								QT	230
CAPE KENNEDY+	28N	280		B	A	A	A	A	A	A	A	B	S					CC	929
DELHI	28N	77	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	DH	328
GRAND BAHAMA	26N	282	B	A	A	B	B	B	A	A	A	A	A	A	A	A	C	GB	926
OKINAWA	26N	127	B	A	A	C	B	B	A	A	A	A	B	B	C	C	C	OK	426
TAIPEI	25N	121	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	TP	424
SAN SALVADOR+	24N	286		C	A	A	A	A	A	A	C	S						SS	J24
AHMEDABAD	23N	72	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C		223
CALCUTTA	23N	88	B	A	B	C				B	A	B	A	A	C	P	P	CU	322
CUBA	23N	278								C	B			B	C				
HONG KONG	22N	114													C	C	Q		
MACAU	22N	113		B	A	C	C	S										MC	422
TAMANRASSET	22N	5	C	B	B	A	A	B	B	A	A	A	A	A	A	C	Q	TN	022
MAUI	20N	204	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	MA	720
BOMBAY	19N	72	A	A	A	A	A	A	A	A	A	A	B	B	A	B	Q	BM	219
MEXICO CITY	19N	261		C	A	A	A	A	A	A	A	A	A	A	A	A	C	MX	919
ARECIBO+	18N	293											Q	Q	Q	Q	Q		
JAMAICA+	18N	284						C	A	A	A	A	A	B		B	C	JA	918
PUERTO RICO+	18N	293	B	A	A	A	A	B	C	S								PR	J18
HYDERABAD	17N	78							B	A	A	A	B	A	C	Q	Q	HY	317
BAGUIO	16N	120	B	A	A	A	A	A	A	S								BG	416
DAKAR	14N	343	B	A	A	A	A	A	A	A	A	A	A	A	Q	Q	Q	DK	A14
MANILA	14N	121								A	A	A	A	A	A	A	C	MN	414
BANGKOK	13N	100							C	A	A	A	A	B	A	B	C	BK	314
BARBADOS+	13N	300	C							C	C		C						
MADRAS	13N	80	B	A	A	A	A	A	A	C		B						MD	313
OUAGADOUGOU	12N	359										B	B	A	A	B	Q		012
DJIBOUTI	11N	42	B	B	A	A	A	A	B	A	A	A	A	A	Q	Q	Q	DJ	111
KODAIKANAL	10N	77	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	KO	310
TIRUCHIRAPALLI	10N	78	B	A	A	A	A	A	A	B	A	A	C	B	C	Q		TI	311
TOGO	10N	0									C	A	C	S					011
FORT ARCHAMBAULT	09N	18													B	B	Q		109
PANAMA	09N	281	B	A	S													PN	909
THUMBA	08N	76								C	B	B	A	A	A	B	Q		309
TRIVANDRUM	08N	77	B	A	A	A	A	A	A	B	S							TM	308
IBADAN	07N	3	B	A	A	A	A	A	A	A	A	A	B	B	B	B	Q	IB	007
ACCRA+	05N	359					C	C	C										
PARAMARIBO	05N	305	B	A	B	A	A	C		A	B	A	A	B			P	PM	J06
BANGUI	04N	18		B	A	B	S			B	A	C	S					BI	104
BOGOTA	04N	286	C	A	A	C		C	A	B	A	A	B	S				BG	J05
POPAYAN	02N	76														Q	Q		
BUNIA	01N	30	C	A	A	B	S											BN	102

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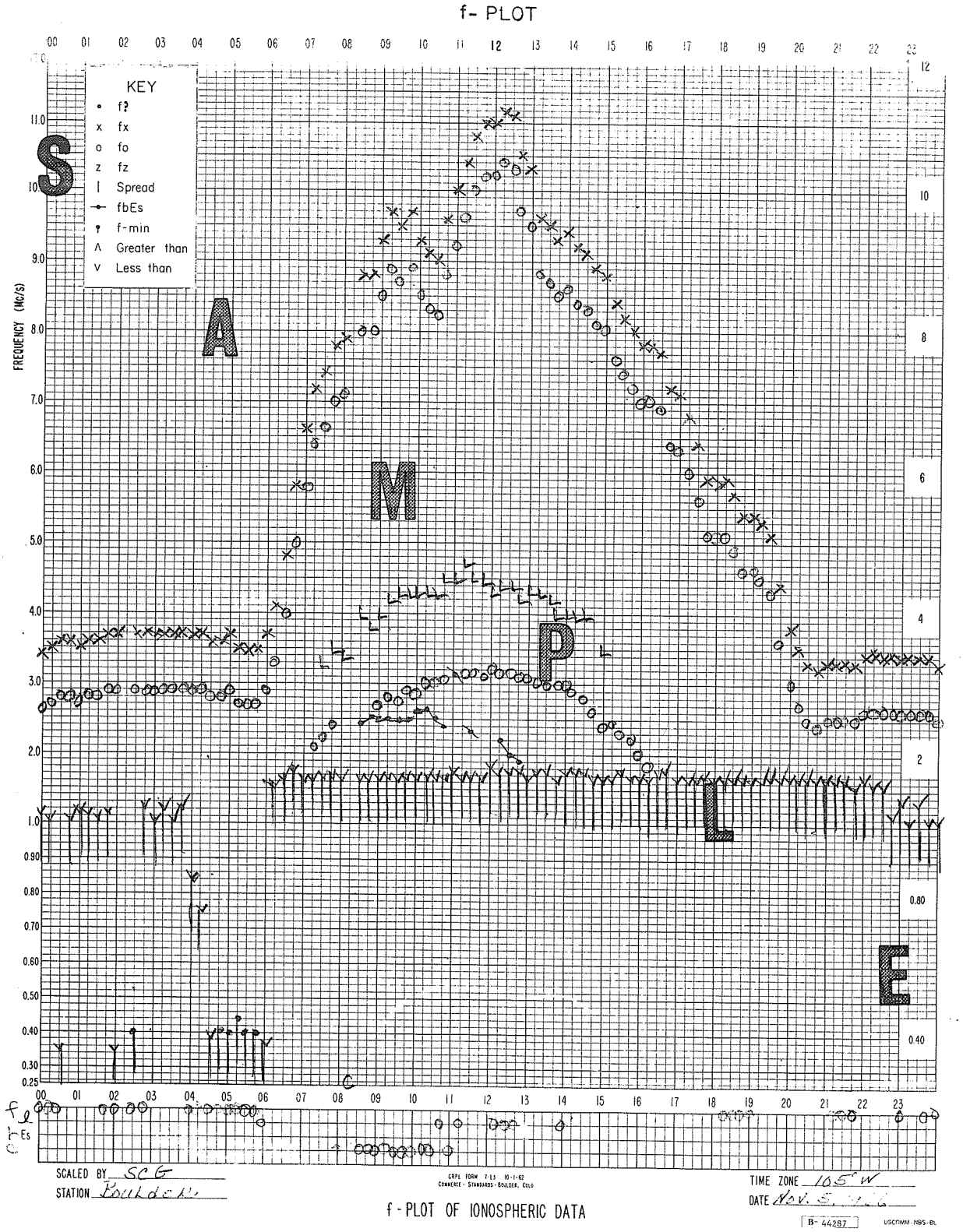
B.1


f- PLOT
KEY
f?
fx
fo
fz
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (Mc/s)
SAMPLE
SCALED BY SCG
STATION Boulder
TIME ZONE 105° W
DATE Nov. 5
f-PLOT OF IONOSPHERIC DATA

B.1 IONOSPHERE VERTICAL SOUNDINGS

AT BOULDER

BASED ON DAILY - HOURLY VALUES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	INDICATOR	COMPUTER CODE
SINGAPORE	01N	103	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	SI	301
NAIROBI	01S	36								A	B	B	A	B	Q	Q		NR	10J
HOLLANDIA	02S	140	C	A	C	S												HL	50K
LWIRO	02S	28	C	B	A	A				A	A	A	B	S				LW	10K
VANIMO	02S	141								B	A	B	A	A	A	C	C	VA	50L
KINSHASA BINZA	04S	15	B	A	A	A	A	B	B	B	B	B	B	B	A	Q	Q	LB	10M
TALARA	04S	279	B	A	A	A	A	A	A	A	A	S						TA	90M
NATAL+	05S	325		B	B	B	A	A	C	B	C	C	Q	C	Q	Q		NL	A0N
CHICLAYO	06S	281	B	A	S													CY	90P
CHIMBOTE	09S	281	B	A	C	S												CM	90R
PORT MORESBY	09S	147					B	A	A	A	A	A	A	A	B	B	C	PY	50R
ZARYA SHIP	10S				C	B	B	C	C	C	C	C						XF	
ELIZABETHVILLE	11S	27	B	A	A	B	S											EZ	11J
JICAMARCA+	11S	284												C				JI	
COCOS IS	12S	96					C	A	B	A	A	A	A	A	A	A	C	CS	31K
HUANCAYO	12S	285	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	HU	91K
JULIACA	15S	290			C	S													J1N
LA PAZ	16S	292	C	A		B	C	C	B	B	B	C	B	C	Q	Q		LP	J10
ILO	17S	289			C	S													J1P
SALISBURY	17S	31		A	S														11P
TAHITI	17S	211	C	A	B	A	A	A	A	B	A	B	A	A	Q	Q	Q	TT	71P
TANANARIVE	18S	47	B	A	A	A	A	A	A	A	A	A	A	A	Q	Q	Q	IV	21Q
TOWNSVILLE	19S	146	B	A	B	A	B	B	A	A	A	A	A	A	A	A	C	TV	51R
TSUMEB	19S	17	B	A	A					B	A	C	B	C	Q	Q		TS	11R
RAROTONGA	21S	201	C	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	RA	72J
LA QUIACA	22S	295		C	S													LQ	J2K
SAO PAULO	23S	314	B	A	A	A	B	A	B	P	S							SP	J2L
JOHANNESBURG	26S	28	B	A	A	A	A	A	A	B			A	A	B	A		JO	120
TUCUMAN	26S	295	B	A	A	B	B	C	A	B	B	B	Q	A	B	Q		TU	J20
BRISBANE	27S	152	B	A	A	B	A	A	A	A	A	A	A	A	A	A	C	BR	52P
KERMADEC	29S	183								B	A	A	B	A	C	B	Q	KC	62R
NORFOLK IS	29S	168								B	A	A	A	A	A	A	C	NI	630
WOOMERA	31S	136					C	A	A	A	A	A	A	A	Q	Q	Q	WO	53J
MUNDARING	32S	116	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	MU	43K
GRAHAMSTOWN	33S	26		B	C	S					B							GR	13L
BUENOS AIRES	34S	302	C	A	B	A	A	A	A	A	A	A	A	A	B	Q	Q	BA	J3M
CAPETOWN+	34S	18	B	A	A	A	A	B	A	B	B		B	A	B	A	Q	CT	13M
HERMANUS	34S	19															Q		
SALISBURY	34S	138						C	A	A	A	A	C	A	A	C	Q	SR	53M
CANBERRA	35S	149	B	A	A	B	B	A	A	A	A	A	A	A	A	A	C	CB	53N
CONCEPCION	36S	287	C	A	A	A	A	C	A	A	B	B	B	B	Q	Q		CP	J30
AUCKLAND	37S	175											A	A	A	B	Q		63P
HOBART	42S	147	B	A	C		B	A	A	A	A	A	A	A	A	A	C	HO	54K
GODLEY HEAD	43S	172	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	GH	64L
TRELEW	43S	295		B	B	B	A	A		C	C	P	P					TW	J4L
MARION IS	46S	37	B	C	S													MR	140
KERGUELEN	49S	70	B	A	A	B	A	A	A	B	B	A	A	A	A	Q	Q	KG	24R
PORT STANLEY	51S	303	B	A	A	A	A	A	A	A	A	A	A	B	A	C	Q	PS	J5J
CAMPBELL IS	52S	169	B	B	A	B	A	A	A	A	A	A	A	A	A	B	Q	CI	65K
MACQUARIE IS	54S	159	B	B	S													MQ	55M

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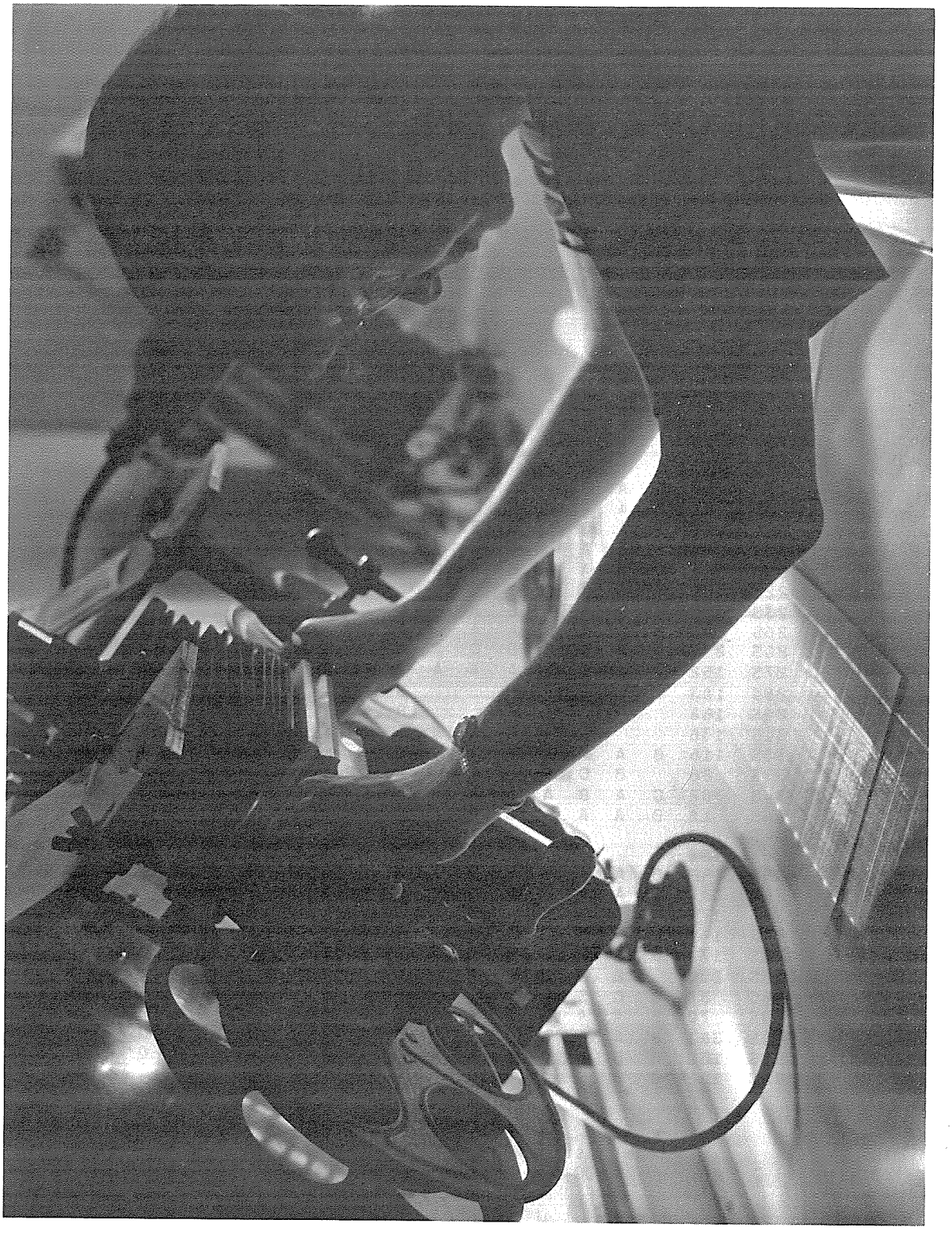
B.1



AT BOULDER

B.1 IONOSPHERE VERTICAL SOUNDINGS

BASED ON DAILY - HOURLY VALUES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	INDICATOR	COMPUTER CODE
USHUAIA	54S	292	C	B	C		C	A	C	C	Q	C	Q	Q	Q			UA	J5M
SOYA SHIP	60S			C	C	B	B	C										XD	
DECEPCION	63S	300	C	A				C	C				S					DE	J6L
ARGENTINE IS	65S	296	B	A	A	A	A	B	A	A	A	A	A	A	A	C	Q		J6M
CASEY	66S	110													B	C	Q		460
MIRNY	66S	93	B	A	A	A	A	A	A	A	A	A	C	Q	Q	Q	Q	MI	360
TERRE ADELIE	66S	140	B	A	A	A	A	A	A	A	A	A	A	B	Q	Q	Q	DU	560
WILKES	66S	110	B	B	A	A	A	A	C	A	A	A	A	A	C	S		WL	460
MAWSON	67S	62		C	B	B	A	A	A	A	A	A	A	A	A	C	Q	MW	26P
SYOWA BASE	69S	39			B	A	A	C				B	A	A	C	Q	Q	SW	16R
BAUDOUIN	70S	23		B	C	S				B	A	C						BB	170
SANAE	70S	358						B	A	A	A	B	A	A	A	C	Q	QM	070
CAPE HALLETT	72S	170	B	A	A	A	A	A	A	C	S							HT	67K
EIGHTS+	75S	283					C	C			B	S						EI	
HALLEY BAY+	75S	334	B	A		B	A	A	A	B	A	A	B	B	B	Q	Q	HB	A70
BELGRANO+	77S	322						Q	C	B	A	B	Q	Q	Q			GE	A7Q
ELLSWORTH	77S	319	B	A	B	A	A	B										EL	A7P
SCOTT BASE	77S	166	B	A	A	A	A	A	A	A	A	A	A	A	A	B	C	SB	67Q
LITTLE AMERICA	78S	198	B	A	S													LA	77Q
VOSTOK	78S	106		B	A	A	A			B	A	A	B	Q	Q	Q	Q	VO	47P
BYRD STATION	80S	240	B	A	A	A	A	B	A	A	A	A	B	C	Q	Q	Q	BD	880
SOUTH POLE	90S		B	A	A	A	A	B	B	A	A	A	Q	Q	Q	Q		PO	090

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PUBLICATIONS:

1. "Ionospheric Data" Tables of Monthly Medians and other statistics for each hour of the day for the principal characteristics derived from ionograms. See page 3.

COMPUTER FORMAT:

1. See page 96.

B.1

SPECIAL WORLD INTERVALS
and
RETROSPECTIVE WORLD INTERVALS
for Ionospheric Programs
1957 - 1967

1957	
June 30 - July 3	Oct. 22-23
Aug. 24, 29-30	Nov. 26-27
Sept. 2-4, 12-13	
1958	
Mar. 5, 15, 23-25, 30-31	Oct. 23-25
June 6-8, 20-22	Nov. 26-27
July 8-9, 30-31	Dec. 13-14
Aug. 17-18, 24, 27-28	
1959	
Jan. 24-25	June 11-12
Feb. 11-12, 25-26	July 15-16
Mar. 26-28	Sept. 4-5, 20-21
Apr. 10-11	Nov. 23-24, 28-29
May 12-13	Nov. 30 - Dec. 2
1960	
Feb. 5-6	Aug. 16-18
Mar. 31 - Apr. 3	Sept. 4-6
Apr. 28-30	Oct. 6-8
May 1, 7-9	Nov. 12-17
June 4-6	
1961	
Mar. 6-7, 27-28	Sept. 24-26, 29-30
May 6-7	Oct. 1-2, 28-29
July 12-18, 27-28	Nov. 3-4
Aug. 30-31	Dec. 1-3
1962	
Jan. 10-11	Aug. 1-2, 22-23
Feb. 16-17	Sept. 12-13
Mar. 2-3	Oct. 8-9
Apr. 7-8, 22-23	Dec. 18-21
July 26-27	
1963	
Jan. 13-15, 30 - Feb. 1	Sept. 13-30
May 1-3	Oct. 28-31
Aug. 18-19	
1964	
Jan. 3-4	Sept. 6-9, 21-24
Mar. 4-5, 27 - April 3	
1965	
Feb. 5-9	June 14-18
1966	
Mar. 12-31	Aug. 28 - Sept. 6
July 7-11	
1967	
Jan. 28-30	May 24-31
1968	
June 9-13	Nov. 18-20
Oct. 27 - Nov. 6	
1969	
Mar. 21-26	Nov. 2
1970	
Mar. 6-10	

Special World Intervals & Retrospective World Intervals have been designated through the auspices of the World Days Program, first under the International Geophysical Year Committee and now under the International Ursigram and World Days Service.

AT BOULDER

1968

STATION	GEOGRAPHIC LAT	LONG EAST	HOURLY VALUES	F PLOTS	IONO-GRAMS
HEISS IS	80N	58	C	C	
ARCTICA(NP 16)	78N	176	C		
RESOLUTE BAY	74N	266	A	A	A
DIXON	73N	80	A	A	
TIXIE BAY	71N	128	B	B	BW
GODHAVN	69N	307	A	A	A
MURMANSK	69N	33	A	A	
TROMSO	69N	19	A		
KIRUNA	67N	20	A		
SODANKYLA	67N	26	A	B	
SALEKHARD	66N	66	A	A	AW
LULEA	65N	22	C		
COLLEGE	64N	213	A		A
LYCKSELE	64N	18	A		
PROVIDENYA	64N	186	A	A	CW
YAKUTSK	62N	129	A	A	CW
NARSSARSSUAQ	61N	315	A	A	A
LENINGRAD	60N	30	A	A	BW
NURMIJARVI	60N	24	A	AW	
UPPSALA	59N	17	A		
CHURCHILL	58N	266	A	A	A
GORKY	56N	44	A	A	AW
SVERDLOVSK	56N	61	A	A	
TOMSK	56N	84	A	A	BW
MOSCOW	55N	37	A	A	AW
JULIUSRU/RU	54N	13	A	AW	
DE BILT	52N	5	A		
IRKUTSK	52N	104	A	A	AW
MIEDZESZYN	52N	21	A		
LINDAU	51N	10	A	AW	
SLOUGH	51N	360	A	AW	AW
DOURBES	50N	4	A		
PRUHONICE	50N	14	A		
WINNIPEG	49N	266	A	A	A
FREIBURG	48N	7	A		
KHABOROVSK	48N	135	B	B	CW
PARIS SACLAY	48N	2	A		
BUDAPEST	47N	19	A	AW	
GARCHY	47N	3	A		
GRAZ	47N	15	A	AW	
ROSTOV	47N	39	A	A	AW
ST JOHNS	47N	308	A	A	A
YUZHNO SAKHALI	47N	143	B	B	BW
SCHWARZENBURG	46N	6	A		
POITIERS	46N	0	A		
OTTAWA	45N	285	A	A	A
WAKKANAI	45N	141	A	A	AW
BEOGRAD	44N	20	A		
GENOVA	44N	9	A		
ALMA ATA	43N	76	A	A	AW
BILLERICA	42N	289	A		
MILLSTONE HILL	42N	288			A
ROMA	41N	12	A		
TBILISI	41N	44	A	A	AW
BOULDER	40N	255	A	B	A
TORTOSA	40N	0	A		
AKITA	39N	140	A	A	CW
WASHINGTON	38N	283	B	C	B
ATHENS	38N	58	C		
ASHKHABAD	37N	58	A	A	
SAN FRANCISCO	37N	238		A	A
WALLOPS IS	37N	285	B	A	A
POINT ARGUELLO	35N	240	A		A
TOKYO	35N	139	A	A	
CAPE ZEVGARI	34N	32	C	C	
WHITE SANDS	32N	254	A	A	A
YAMAGAWA	31N	130	A	A	AW
DELHI	28N	77	A		
GRAND BAHAMA	26N	282	A		Q
OKINAWA	26N	127	A	A	A
TAIPEI	25N	121	A	A	B
AHMEDABAD	23N	72	A		
CALCUTTA	23N	88	A		
CUBA	23N	278	B	C	B
TAMANRASSET	22N	5	A		
MAUI	20N	204	A	AW	A
BOMBAY	19N	72	B		
MEXICO CITY	19N	261	A	A	A
ARECIBO	18N	293			Q
JAMAICA	18N	284		B	B
HYDERABAD	17N	78	A		
DAKAR	14N	343	A		
MANILA	14N	121	A	A	A
BANGKOK	13N	100	B		B
OUAGADOUGOU	12N	359	A		
DJIBOUTI	11N	42	A		
KODAIKANAL	10N	77	A		
TIRUCHIRAPALLI	10N	78	A		
THUMBA	08N	76	A		
IBADAN	07N	3	B		
PARAMARIBO	05N	305	B		
SINGAPORE	01N	103	A	AW	AW
NAIROBI	01S	36	B		
VANIMO	02S	141	A		
KINSHASA BINZA	04S	15	B		
PORT MORESBY	09S	147	A		
JICAMARCA	11S	283			C
COCOS IS	12S	96	A		
HUANCAYO	12S	285	A	A	A
LA PAZ	16S	292	C		
TAHITI	17S	211	A		
TANANARIVE	18S	47	A		
TOWNSVILLE	19S	146	A		
TSUMEB	19S	17	C		
RAROTONGA	21S	201	A		
JOHANNESBURG	26S	28	A		
TUCUMAN	26S	295	A		
BRISBANE	27S	152	A		
KERMADEC	29S	183	A		
NORFOLK IS	29S	168	A		
WOOMERA	31S	136	A		
MUNDARING	32S	116	A		C
BUENOS AIRES	34S	302	A		A
CAPETOWN	34S	18	A		
SALISBURY	34S	138	A		
CANBERRA	35S	149	A		C
CONCEPCION	36S	287	A		A
AUCKLAND	37S	175	A		
HOBART	42S	147	A		
GODLEY HEAD	43S	172	A	CW	
KERGUELEN	49S	70	A	CW	
PORT STANLEY	51S	303	A	BW	BW
CAMPBELL IS	52S	169	A		
ARGENTINE IS	65S	296	A		
TERRE ADELIE	66S	140	B		
WILKES	66S	110	A		
MAWSON	67S	62	A		
SYOWA BASE	69S	39	A		BW
SANAE	70S	358	A		
HALLEY BAY	75S	333	B		
BELGRANO	77S	322	Q		C
SCOTT BASE	77S	166	A		
BYRD STATION	80S	240	C		A
SOUTH POLE	90S	0			C

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B.1 IONOSPHERE VERTICAL SOUNDINGS

AT BOULDER

1969

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	HOURLY VALUES	F PLOTS	IONOGRAMS
RESOLUTE BAY	74N	266	B	B	B
DIXON	73N	80	C	C	
GODHAVN	69N	307	A	A	A
MURMANSK	69N	33	B	B	CW
TROMSO	69N	19	A		
KIRUNA	67N	20	A		
SODANKYLA	67N	26	A	B	
SALEKHARD	66N	66	A	A	BW
COLLEGE	64N	213	A		B
LYCKSELE	64N	18	A		
PROVIDENYA	64N	186	B	B	CW
YAKUTSK	62N	129	C	C	
NARSSARSSUAQ	61N	315	A	A	A
LENINGRAD	60N	30	B	B	BW
NURMIJARVI	60N	24	A	AW	
UPPSALA	59N	17	A		
CHURCHILL	58N	266	A	A	A
GORKY	56N	44	A	A	BW
SVERDLOVSK	56N	61	A	A	
TOMSK	56N	84	A	A	AW
MOSCOW	55N	37	A	A	AW
JULIUSRUH/RU	54N	13	A	AW	
DE BILT	52N	5	A		
IRKUTSK	52N	104	B	B	CW
MIEDZESZYN	52N	21	A		
LINDAU	51N	10	C	CW	
SLOUGH	51N	360	A	AW	AW
DOURBES	50N	4	A		
PRUHONICE	50N	14	A		
WINNIPEG	49N	266	A	A	A
FREIBURG	48N	7	A		
KHABORVSK	48N	135	B	B	CW
BUDAPEST	47N	19	C	CW	
GARCHY	47N	3	B		
GRAZ	47N	15	B		
ROSTOV	47N	39	A	A	
ST JOHNS	47N	308	A	A	B
YUZHNO SAKHALI	47N	143	B	B	
POITIERS	46N	0	A		
SCHWARZENBURG	46N	6	A		
OTTAWA	45N	285	A	A	A
WAKKANAI	45N	141	A	A	AW
BEOGRAD	44N	20	A		
GENOVA	44N	9	A		
ALMA ATA	43N	76	A	B	AW
MILLSTONE HILL	43N	288			B
BILLERICA	42N	289	A		
ROMA	41N	12	A	C	
BOULDER	40N	255	A	C	A
TORTOSA	40N	0	A		C
AKITA	39N	140	A	A	AW
ASHKHABAD	37N	58	B	B	
SAN FRANCISCO	37N	238		A	A
WALLOPS	37N	285	B	A	A
SEOUL	37N	127			B
POINT ARGUELLO	35N	240	A		A
TOKYO	35N	139	A	A	CW
WHITE SANDS	32N	254	A	A	A
YAMAGAWA	31N	130	A	A	AW
DELHI	28N	77	A		
CAPE KENNEDY	28N	280			C
GRAND BAHAMA	26N	282	A		Q
OKINAWA	26N	127	C	C	C
TAIPEI	25N	121	A	A	
AHMEDABAD	23N	72	A		
CUBA	23N	278	C	C	
CALCUTTA	23N	88	C		
TAMANRASSET	22N	5	A		
HONG KONG	22N	114	C	CW	
MAUI	20N	204	A	AW	A
BOMBAY	19N	72	A		
MEXICO CITY	19N	261	A	A	A
ARECIBO	18N	293			Q
HYDERABAD	17N	78	C		
MANILA	14N	121	A	A	A
BANGKOK	13N	100	A		
OUAGADOUGOU	12N	359	A		
KODAIKANAL	10N	77	A		
TIRUCHIRAPALLI	10N	78	A		
FORT ARCHAMBAULT	09N	18	B		
THUMBA	08N	76	A		
IBADAN	07N	3	B		
SINGAPORE	01N	103	A		CW
VANIMO	02S	141	A		
KINSHASA BINZA	04S	15	A		
PORT MORESBY	09S	147	B		
COCOS IS	12S	96	A		
HUANCAYO	12S	285	A	A	A
TOWNSVILLE	19S	146	A		
RAROTONGA	21S	201	A		
JOHANNESBURG	26S	28	B	AW	
TUCUMAN	26S	295	B		
BRISBANE	27S	102	A		
KERMADEC	29S	183	C		
NORFOLK IS	29S	168	A		
MUNDARING	32S	116	A		
BUENOS AIRES	34S	302	B		A
CAPETOWN	34S	18	A	AW	
SALISBURY	34S	138	A		
CANBERRA	35S	149	A		C
CONCEPCION	36S	287			C
AUCKLAND	37S	175	A		
HOBART	42S	147	A		
GODLEY HEAD	43S	172	A		
KERGUELEN	49S	70	A		
PORT STANLEY	51S	303	A	CW	
CAMPBELL IS	52S	169	A		
ARGENTINE IS	65S	296	A		
WILKES	66S	110	C		
CASEY	66S	110	B		
MAWSON	67S	62	A		
SYOWA BASE	69S	39	C		CW
SANAE	70S	358	A		
HALLEY BAY	75S	333	B		
SCOTT BASE	77S	166	A		
BELGRANO	77S	322	Q		C
BYRD STATION	80S	240			C

KEY TO SYMBOLS

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C = 1-5 Months
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IUWDS International Geophysical Calendar for 1970

1970 JANUARY

S	M	T	W	T	F	S
				1	2	[3
4	5	6	△7	8	9	10
11	12	⑬	△14	⑮]	16	17
18	19	20	△21	22	23	24
25	26	27	△28	29	30	31

1970 FEBRUARY

S	M	T	W	T	F	S
1	2	3	△4	5	6	7
8	9	⑩	△11	⑫	13	14
15	16	17	△18	19	20	21
22	23	24	△25	26	27	28

1970 MARCH

S	M	T	W	T	F	S
1	2	3	△4	5	6	[7]
8	9	⑩	◇11	⑫	13	14
15*	16*	17*	△18*	19*	20*	21*
22	23	24	△25	26	27	28
29	30	31				

1970 APRIL

S	M	T	W	T	F	S
			△1	2	3	4
5	6	7	△8	9	10	11
12	13	⑭	△15	⑯	17	18
19	20	21	[△22	23	24	25
26	27	28	△29	30		

1970 MAY

S	M	T	W	T	F	S
					1	2
3	[4]	[5]	[△6]	7	8	9
10	11	⑫	△13	⑭	15	16
17	18	19	△20	21	22	23
24	25	26	△27	28	29	30
31						

1970 JUNE

S	M	T	W	T	F	S
	1	2	△3	4	5	[6
[7	[8	[9	[△10	11	12	13]
14]	15	⑯	◇17	⑱	19	20
21*	22*	23*	△24*	25*	26*	27*
28	29	30				

1970 JULY

S	M	T	W	T	F	S
			△1	2	3	4
5	6	7	△8	9	10	11
12	13	⑭	△15	⑯	17	18
19	20	21	△22	23	24	25
26	27]	[28]	[△29]	[30]	31[	

1970 AUGUST

S	M	T	W	T	F	S
						1
2	3	4	△5	6	7	8
9	[10	[11	[△12]	[13	[14	15
16	17	⑱	△19	⑳	21	22
23	24	25	△26	27	28	29
30	[31]–					

1970 SEPTEMBER

S	M	T	W	T	F	S
		–[1]	△2	3	4	5
6	7	8	△9	10	11	12
13	14	⑮	◇16	⑰	18	19
20*	21*	22*	[△23]*	24*	25*	26*
27	28	29	△30			

1970 OCTOBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	△7	8	9	10
11	12	⑬	△14	⑮	16	17
18	19	[20]	[△21]	[22]	23	24
25	26	27	△28	29	30	31

1970 NOVEMBER

S	M	T	W	T	F	S
1	2	3	△4	5	6	7
8	9	10	△11	12	13	14
15	[16]	[△17]	[△18]	19	20	21
22	23	24	△25	26	27	28
29	30					

1970 DECEMBER

S	M	T	W	T	F	S
		1	△2	3	4]	5]
6]	7	8	△9	10	11	[12
[13	[14	⑮	◇16	⑰	18	19
20*	21*	[22*	[△23]*	24*	25*	26*
27	28	29	△30	31		

1971 JANUARY

S	M	T	W	T	F	S
					1	2
[3	4	5	△6	7	8	9
10	11	⑫	△13	⑭	15]	16
17	18	19	△20	21	22	23
24	25	26	△27	28	29	30
31						

⑭ Regular World Day (RWD)

⑬ Priority Regular World Day (PRWD)

◇16 Quarterly World Day (QWD) also a PRWD and RGD

△12 Regular Geophysical Day (RGD)

5 Day of Solar Eclipse

6 7 World Geophysical Interval (WGI)

[2 Day with unusual meteor shower activity, Northern Hemisphere

3] Day with unusual meteor shower activity, Southern Hemisphere

* Micropulsation Interval Day

All of the Geophysical Calendars presenting the Regular World Days used for data submission are available in World Data Center A - Upper Atmosphere Geophysics Report UAG-6, "International Geophysical Calendars 1957-1969", March 1969. Single copy price 30 cents through Superintendent of Documents, Government Printing Office, Washington, D. C. 20402. [Catalog No. C52.16/2:6]

B.1 IONOSPHERE VERTICAL SOUNDINGS

AT BOULDER

1970

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	HOURLY VALUES	F PLOTS	IONOGRAMS
RESOLUTE BAY	74N	266	B	B	A
GODHAVN	69N	307	A	A	A
TROMSO	69N	19	A		
MURMANSK	69N	33	C		
KIRUNA	67N	20	A		
SODANKYLA	67N	26	A	A	
SALEKHARD	66N	66	B	B	BW
COLLEGE	64N	213	A		B
LYCKSELE	64N	18	A		
NARSSARSSUAQ	61N	315	A	B	B
NURMIJARVI	60N	24	A	AW	
LENINGRAD	60N	30	B	B	CW
UPPSALA	59N	17	A		
CHURCHILL	58N	266	A	A	A
GORKY	56N	44	B	B	BW
SVERDLOVSK	56N	61	B	B	B
TOMSK	56N	84	B	B	B
MOSCOW	55N	37	B	B	BW
JULIUSRUH/RU	54N	13	A	AW	
DE BILT	52N	5	C		
MIEDZESZYN	52N	21	B		
IRKUTSK	52N	104	C	C	CW
SLOUGH	51N	360	A		BW
DOURBES	50N	4	A		
PRUHONICE	50N	14	A		
WINNIPEG	49N	266	A	A	A
FREIBURG	48N	7	A		
KHABORVSK	48N	135	C	C	CW
GARCHY	47N	3	B		
GRAZ	47N	15	C		
ST JOHNS	47N	308	A	A	
ROSTOV	47N	39	B	B	
POITIERS	46N	0	C		
SCHWARZENBURG	46N	6	C		
OTTAWA	45N	285	A	A	A
WAKKANAI	45N	141	A	A	
BEOGRAD	44N	20	A		
GENOVA	44N	9	A		
ALMA ATA	43N	76	B	B	BW
MILLSTONE HILL	43N	288			A
BILLERICA	42N	289	B		
MAYNARD	42N	288	C		
ROMA	41N	12	A		
BOULDER	40N	255	A		A
TORTOSA	40N	0	B		
AKITA	39N	140	A	A	
SAN FRANCISCO	37N	238		A	A
SEOUL	37N	127	C	C	C
WALLOPS	37N	285	A	B	A
POINT ARGUELLO	35N	240	A		B
TOKYO	35N	139	A	A	
CAPE ZEVGARI	34N	32	B		
WHITE SANDS	32N	254	A	A	A
YAMAGAWA	31N	130	A	A	
DELHI	28N	77	B		
GRAND BAHAMA	26N	282	A		Q
OKINAWA	26N	127	C	C	C
TAIPEI	25N	121	B	B	
AHMEDABAD	23N	72	A		
TAMANRASSET	22N	5	C		
HONG KONG	22N	114	C	CW	
MAUI	20N	204	A	BW	A
BOMBAY	19N	72	B		
MEXICO CITY	19N	261	A	A	A
JAMAICA	18N	284		B	B
MANILA	14N	121	A	A	A
BANGKOK	13N	100	B		B
OUAGADOUGOU	12N	359	B		
KODAIKANAL	10N	77	A		
TIRUCHIRAPALLI	10N	78	B		
FORT ARCHAMBAU	09N	18	B		
THUMBA	08N	76	B		
IBADAN	07N	3	B		B
POPAYAN	02N	76			C
SINGAPORE	01N	103	B		AW
VANIMO	02S	141	B		
NATAL	05S	325			A
PORT MORESBY	09S	147	B		
COCOS IS	12S	96	A		
HUANCAYO	12S	285	A	A	B
LA PAZ	16S	292			C
ARECIBO	18S	193			Q
TOWNSVILLE	19S	146	A		
RAROTONGA	21S	201	B		
JOHANNESBURG	26S	28	B	BW	
JOHANNESBURG	26S	28	A	BW	
BRISBANE	27S	152	A		
KERMADEC	29S	183	B		
NORFOLK IS	29S	168	A		
MUNDARING	32S	116	A		
CAPETOWN	34S	18	A	BW	
SALISBURY	34S	138	C		
CANBERRA	35S	149	A		
AUCKLAND	37S	175	B		
HOBART	42S	147	A		
GODLEY HEAD	43S	172	B		
PORT STANLEY	51S	303	C	CW	
CAMPBELL IS	52S	169	B		
ARGENTINE IS	65S	296	C		
CASEY	66S	110	C		
MAWSON	67S	62	C		
SANAE	70S	358	C		
SCOTT BASE	77S	166	B		

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months
W = World Days Only
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S = Program STOPPED operations (see MASTER STATION LIST for actual date)

International Geophysical Calendar for 1971

(See other side for information on the use of this Calendar)

JANUARY

S	M	T	W	T	F	S
					1	2
[3	4	5	6	7	8	9
10	11	(12)	(13)	(14)	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FEBRUARY

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	(9)	◇10◇	(11)	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

MARCH

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	(16)	(17)	(18)	19	20
21*	22*	23*	24*	25*	26*	27*
28	29	30	31			

APRIL

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	(13)	(14)	(15)	16	17
18	19	20	21	[22	23	24
25	26	27	28	29	30	

MAY

S	M	T	W	T	F	S
						1
2	3	4	[5]	[6]	7	8
9	10	(11)	◇12◇	(13)	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

JUNE

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	[8]	[9]	[10]	[11]	[12]
13	14	(15)	(16)	(17)	18	19
20*	21*	22*	23*	24*	25*	26*
27	28	29	30			

JULY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	(20)	(21)	[22]	23	24
25	26	27]	[28]	[29]	[30]	31]

AUGUST

S	M	T	W	T	F	S
1]	2]	3	4	5	6	7
8	9	[10	[11	[12	[13	[14
15	16	(17)	◇18◇	(19)	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	(14)	(15)	(16)	17	18
19*	20*	21*	22*	23*	24*	25*
26	27	28	29	30		

OCTOBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	(19)	(20)	[(21)]	[22]	23
24	25	26	27	28	29	30
31						

NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	(16)	◇17◇	(18)	19	20
21	22	23	24	25	26	27
28	29	30				

DECEMBER

S	M	T	W	T	F	S
			1	2	3	4
5]	6]	7]	8	9	10	11
[12]	[13]	[(14)]	(15)	(16)	17	18
19*	20*	21*	[22*	[23*	24*	25*
26	27	28	29	30	31	

1972 JANUARY

S	M	T	W	T	F	S
						1
2	[3	[4	5	6	7	8
9	10	11	12	13	14	15
16	17	(18)	◇19◇	(20)	21	22
23	24	25	26	27	28	29
30	31					

(12) Regular World Day (RWD)

(13) Priority Regular World Day (PRWD)

◇10◇ Quarterly World Day (QWD) also a PRWD and RGD

6 Regular Geophysical Day (RGD)

25 Day of Solar Eclipse

* Micropulsation Interval Day

9 10 World Geophysical Interval (WGI)

[3 Day with unusual meteor shower activity, Northern Hemisphere

15] Day with unusual meteor shower activity, Southern Hemisphere

24 25 Airglow and Aurora Period

Note: International Hydrological Decade Field Year, April 1, 1971 - Sept. 30, 1972.

OPERATIONAL EDITION, AUGUST 1970

B.1 IONOSPHERE VERTICAL SOUNDINGS

AT BOULDER

1971

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	HOURLY VALUES	F PLOTS	IONOGRAMS
THULE	77N	290	C		C
RESOLUTE BAY	74N	266	C	C	C
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GODHAVN	69N	307	C	C	C
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SODANKYLA	67N	26	C	C	
CASEY	66N	110	Q		
LYCKSELE	64N	18	C		
COLLEGE	64N	213	C		C
NARSSARSSUAQ	61N	315	C	C	
NURMIJARVI	60N	24	C	CW	
UPPSALA	59N	17	C		
CHURCHILL	58N	266	C	C	C
JULIUSRUH/RU	54N	13	C		
WINNIPEG	49N	266	C	C	C
ST JOHNS	47N	308	C	C	C
GRAZ	47N	15	C		
OTTAWA	45N	285	C	C	C
BEOGRAD	44N	20	C		
BEOGRAD	44N	20	C		
MILLSTONE HILL	42N	288			C
ROMA	41N	12	C		
BOULDER	40N	255	C		C
TORTOSA	40N	0	C		
AKITA	39N	140	C	C	
SAN FRANCISCO	37N	238		C	C
WALLOPS	37N	285	C	C	C
POINT ARGUELLO	35N	240	C		C
WHITE SANDS	32N	254	C	C	C
OKINAWA	26N	127	C	C	C
GRAND BAHAMA	26N	282	C		Q
TAIPEI	25N	121	C		
AHMEDABAD	23N	72	C		
MAUI	20N	204	C	CW	C
MEXICO CITY	19N	261	C	C	C
ARECIBO	18N	293			Q
JAMAICA	18N	284		C	
MANILA	14N	121	C	C	C
BANGKOK	13N	100	C		
KODAIKANAL	10N	77	C		
VANIMO	02S	141	C		
NATAL	05S	325			C
PORT MORESBY	09S	147	C		
COCOS IS	12S	96	C		
HUANCAYO	12S	285	C	C	
TOWNSVILLE	19S	146	C		
BRISBANE	27S	152	C		
NORFOLK IS	29S	168	C		
MUNDARING	32S	116	C		
CANBERRA	35S	149	C		
HOBART	42S	147	C		
CAMPBELL IS	52S	169	C		
SCOTT BASE	77S	166	C		

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B = 6-11 Months
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\+ = Ionograms and f-plots only, for some years
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P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
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M O V I E S:

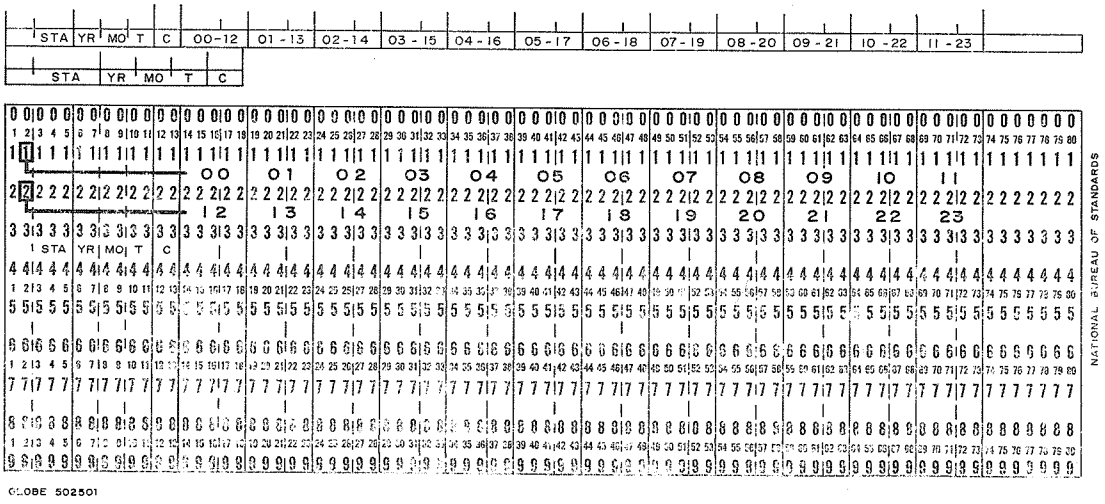
1. A Large-Scale Ionospheric Disturbance of Short Duration, by Vaughn Agy, NOAA Research Lab., 16 mm color movie film with sound, $10.00 minimum charge for loan.
2. Polar Blackouts During the IGY, by Vaughn Agy, NOAA Research Lab., 16 mm color movie with sound, $10.00 minimum charge for loan.

B.1

Ionospheric Phenomena in Computerized Format

A considerable amount of vertical soundings daily hourly values are now in computerized format in WDC-A. The punched card format is given below for convenience of the user.

CARD COLUMN	DESCRIPTION	REMARKS
1 - 2	Type Card	Column 1 one punch - Ionospheric Data 2 one punch - Hours 00 thru 11 2 two punch - Hours 12 thru 23
3 - 5	Station Code	See section B.1
6 - 11	Date code	Year - Month - Day
12 - 13	Characteristic code	See table below
14 - 73	Hourly Measurements	Divided into five columns per hour
		First three columns - hourly reading
		fourth column - qualifying symbol
		fifth column - descriptive symbol
74 - 80	Blank	



The card images have been packed on magnetic tape in the following manner:

They are written 556 BPI-Bits-Per-Inch, BCD-Binary-Coded-Decimal mode, even parity, 7 track. The tapes are sorted in the following order:

> The stations are on the tape in north to south order. Within the stations, they are sorted according to month, going from month 1 to month 12. Within the month, they are sorted according to characteristic, going from characteristic 00 to 42. Within the characteristic, they are sorted according to days, going from day 1 to day 31. Within the days, they are sorted according to half days, with the first half of the day first and the second half of the day second. EOF at the end of the tape. (EOF-End-of-File)

Thus the cost of obtaining particular data from the tapes will vary considerably depending upon whether information is requested by time period or by station. Present costs are approximately $20.00 per one year of one station plus cost of tape. The table on the opposite page lists the data currently in computer format.

B.1 IONOSPHERE VERTICAL SOUNDINGS

AT BOULDER

VERTICAL SOUNDINGS DAILY-HOURLY TABULATIONS ON MAGNETIC TAPE

STATION	COMPUTER CODE NO	BEGIN DATE		END DATE		
ADAK	651	1/1957	-	12/1965	+	MAGNETIC TAPE
ALERT	J82	1/1957	-	12/1958		MAGNETIC TAPE
ANCHORAGE	761	1/1957	-	12/1965	+	MAGNETIC TAPE
BARROW	771	7/1957	-	11/1965		MAGNETIC TAPE
BOGOTA	J05	1/1966	-	6/1967		PUNCHED CARDS
BOGOTA	J05	4/1962	-	5/1962		MAGNETIC TAPE
BOGOTA	J05	7/1957	-	12/1959	+	MAGNETIC TAPE
BOGOTA	J05	8/1960	-			MAGNETIC TAPE
BOGOTA	J05	10/1962	-	12/1965		MAGNETIC TAPE
BOULDER	840	1/1966	-	3/1969	+	PUNCHED CARDS
BOULDER	840	5/1963	-	12/1965		MAGNETIC TAPE
BOULDER	840	7/1970	-	4/1971		MAGNETIC TAPE
BRISBANE	52P	1/1966	-	12/1967		MAGNETIC TAPE
BYRD STATION	88-	1/1964	-	2/1967		PUNCHED CARDS
BYRD STATION	88-	10/1964	-	2/1967	+	PUNCHED CARDS
BYRD STATION	88-	5/1964	-	12/1964	+	MAGNETIC TAPE
BYRD STATION	88-	7/1957	-	12/1963	+	MAGNETIC TAPE
CANBERRA	53N	1/1966	-	12/1967		MAGNETIC TAPE
CAPE KENNEDY	929	3/1958	-	12/1958		MAGNETIC TAPE
CAPE KENNEDY	929	5/1964	-			MAGNETIC TAPE
CHICLAYO	90P	7/1957	-	12/1958		MAGNETIC TAPE
CHIMBOTE	90R	7/1957	-	5/1959	+	MAGNETIC TAPE
CHURCHILL	958	1/1943	-	12/1960		MAGNETIC TAPE
CHURCHILL	958	1/1963	-	12/1964		MAGNETIC TAPE
CHURCHILL	958	10/1965	-	6/1970		MAGNETIC TAPE
COLLEGE	764	1/1957	-	12/1965		MAGNETIC TAPE
COLLEGE	764	1/1966	-	12/1967	+	PUNCHED CARDS
CONCEPCION	J30	1/1966	-	11/1966	+	PUNCHED CARDS
CONCEPCION	J30	10/1957	-	2/1962		MAGNETIC TAPE
CONCEPCION	J30	12/1962	-	4/1965		MAGNETIC TAPE
CONCEPCION	J30	12/1967	-	12/1968		PUNCHED CARDS
ELLSWORTH	A7P	7/1957	-	12/1958		MAGNETIC TAPE
EUREKA	980	1/1957	-	12/1959		MAGNETIC TAPE
FLETCHERS ICE	982	7/1957	-	12/1958		MAGNETIC TAPE
FROBISHER BAY	J63	1/1957	-	12/1959		MAGNETIC TAPE
FT MONMOUTH	J40	7/1957	-	12/1965	+	MAGNETIC TAPE
GARCHY	042	1/1961	-	1/1966	+	MAGNETIC TAPE
GODHAVN	J69	1/1966	-	9/1970		PUNCHED CARDS
GODHAVN	J69	7/1957	-	12/1965	+	MAGNETIC TAPE
GRAND BAHAMA	926	1/1966	-	6/1966		PUNCHED CARDS
GRAND BAHAMA	926	1/1967	-	3/1967	+	PUNCHED CARDS
GRAND BAHAMA	926	6/1957	-	6/1961	+	MAGNETIC TAPE
GRAND BAHAMA	926	10/1961	-	12/1965		MAGNETIC TAPE
HOBART	54K	1/1966	-	12/1967		MAGNETIC TAPE
HUANCAYO	91K	1/1957	-	12/1965	+	MAGNETIC TAPE
HUANCAYO	91K	1/1966	-	8/1970	+	PUNCHED CARDS
ILO	J1P	2/1959	-	5/1959		MAGNETIC TAPE
JULIACA	J1N	4/1959	-	5/1959		MAGNETIC TAPE
KENORA	948	10/1965	-	6/1970		MAGNETIC TAPE
KIRUNA	167	1/1965	-	8/1966		MAGNETIC TAPE
LA PAZ	J10	1/1964	-	8/1965		MAGNETIC TAPE

+ DATA NOT CONTINUOUS - LESS THAN 6 MONTHS MISSING

The URSI-STP Committee has made the following recommendations that the characteristic codes for punched cards given in the Handbook (Piggott and Rawer) be amended as in the table below.

CHARACTERISTIC CODES — REVISED

USED FOR IONOSPHERIC MEASUREMENTS — JAN.1969

		FREQUENCIES			PARAMETERS	HEIGHTS					
CARD COL 13		0	1	2	3	4	5	6	7	8	9
CARD COL 12 / LAYER	0										
F2	0	00 foF2	01 fxF2	02 fzF2	03 M(3000)F2	04 h'F2	05 hpF2	06 h'Ox	07 MUF(3000)F2	08	09
F1	1	10 foF1	11 fxF1		13 M(3000)F1	14 h'F1		16 h'F	17 MUF(3000)F1		
E	2	20 foE		22 foE2		24 h'E		26 h'E2			
Es	3	30 foEs	31 fxEs	32 fbEs	33 fEs	34 h'Es		36 Type Es			
Other	4	40 foF1.5		42 fmin	43 M(3000)F1.5	44 h'F1.5	45 h		47 fm2	48 fm3	
Spread F and Oblique	5	50 foI	51 fxI	52 fmI	53 M(3000)I	54 h'I			57 dfS		

Recommendation 8 of the URSI-STP Committee, Brussels, September 1968 is "The URSI-STP Committee recommends that the station codes at present in use at ITSA, WDC-A, be adopted as the standard station indicators for computer identification. All stations changing to computer methods of data handling are requested to obtain code numbers from ITSA, WDC-A, Boulder, U.S.A." The code for computer identification can be found in the B.1 Ionosphere Vertical Soundings section adjacent to the station indicator used on the ionogram film. (Complete lists can be furnished on request, and new computer identification codes will be assigned upon request by WDC-A, Upper Atmosphere Geophysics, NOAA, Boulder, Colorado, U.S.A., 80302.)

B.1 IONOSPHERE VERTICAL SOUNDINGS

AT BOULDER

VERTICAL SOUNDINGS DAILY-HOURLY TABULATIONS ON MAGNETIC TAPE

STATION	COMPUTER CODE NO	BEGIN DATE		END DATE		
LA PAZ	J10	2/1961	-	3/1961		MAGNETIC TAPE
LA PAZ	J10	7/1961	-	12/1961		MAGNETIC TAPE
LA PAZ	J10	10/1957	-	12/1960		MAGNETIC TAPE
LA PAZ	J10	10/1962	-	8/1963		MAGNETIC TAPE
LITTLE AMERICA	77Q	7/1957	-	12/1958		MAGNETIC TAPE
LYCKSELE	164	1/1965	-	8/1966		MAGNETIC TAPE
MAUI	720	1/1957	-	12/1965	+	MAGNETIC TAPE
MAUI	720	1/1966	-	12/1970		PUNCHED CARDS
MAWSON	26P	1/1966	-	12/1966		MAGNETIC TAPE
MEANOOK	855	1/1957	-	12/1959		MAGNETIC TAPE
MUNDARING	43K	7/1967	-	9/1967		MAGNETIC TAPE
NARSSARSSUAQ	J61	1/1966	-	5/1970	+	PUNCHED CARDS
NARSSARSSUAQ	J61	8/1957	-	12/1958		MAGNETIC TAPE
NARSSARSSUAQ	J61	8/1959	-	12/1964	+	MAGNETIC TAPE
NATAL	A0N	3/1958	-	1/1959		MAGNETIC TAPE
NATAL	A0N	10/1959	-	12/1959		MAGNETIC TAPE
NORFOLK ISLAND	63-	1/1966	-	12/1967		MAGNETIC TAPE
OKINAWA	426	1/1957	-	2/1960	+	MAGNETIC TAPE
OKINAWA	426	1/1961	-	12/1965	+	MAGNETIC TAPE
OKINAWA	426	1/1966	-	12/1968	+	PUNCHED CARDS
OKINAWA	426	3/1969	-			PUNCHED CARDS
OKINAWA		12/1969	-	6/1970	+	PUNCHED CARDS
OTTAWA	945	10/1965	-	6/1970		MAGNETIC TAPE
PANAMA	909	7/1957	-	12/1958		MAGNETIC TAPE
PORT MORESBY	50R	1/1966	-	12/1967		MAGNETIC TAPE
PUERTO RICO	J18	1/1957	-	10/1957		MAGNETIC TAPE
PUERTO RICO	J18	1/1958	-	12/1958		MAGNETIC TAPE
PUERTO RICO	J18	6/1959	-	9/1959		MAGNETIC TAPE
RESOLUTE BAY	974	1/1963	-	12/1964		MAGNETIC TAPE
RESOLUTE BAY	974	10/1965	-	6/1970		MAGNETIC TAPE
REYKJAVIK	A64	1/1964	-	12/1964		MAGNETIC TAPE
REYKJAVIK	A64	2/1957	-	12/1961	+	MAGNETIC TAPE
SAN FRANCISCO	837	1/1957	-	1/1959		MAGNETIC TAPE
SAN SALVADOR	J24	12/1958	-	12/1959	+	MAGNETIC TAPE
SOUTH POLE	09-	1/1966	-	12/1966		PUNCHED CARDS
SOUTH POLE	09-	2/1964	-	3/1964		PUNCHED CARDS
SOUTH POLE	09-	6/1965	-			PUNCHED CARDS
SOUTH POLE	09-	9/1964	-	11/1964	+	PUNCHED CARDS
SOUTH POLE	09-	7/1957	-	12/1964	+	MAGNETIC TAPE
ST JOHNS	J47	7/1957	-	5/1959		MAGNETIC TAPE
ST JOHNS	J47	10/1965	-	6/1970		MAGNETIC TAPE
TALARA	90M	1/1957	-	12/1965	+	MAGNETIC TAPE
TAMANRASSET	022	1/1961	-	1/1966	+	MAGNETIC TAPE
THULE	J76	1/1966	-	6/1966		PUNCHED CARDS
THULE	J76	7/1957	-	12/1965		MAGNETIC TAPE
TOWNSVILLE	51R	1/1966	-	12/1967		MAGNETIC TAPE
UPPSALA	158	1/1965	-	6/1966		MAGNETIC TAPE
VICTORIA	848	1/1957	-	12/1959		MAGNETIC TAPE
WALLOPS	937	6/1969	-	6/1969		PUNCHED CARDS
WALLOPS	937	1/1970	-	1/1970		PUNCHED CARDS
WALLOPS	937	7/1970	-	1/1971	+	PUNCHED CARDS
WASHINGTON	938	1/1957	-	12/1965		MAGNETIC TAPE
WASHINGTON	938	1/1966	-	9/1968	+	PUNCHED CARDS
WHITE SANDS	832	1/1966	-	10/1970	+	PUNCHED CARDS
WHITE SANDS	832	7/1957	-	12/1965		MAGNETIC TAPE
WILKES	460	8/1957	-	1/1959	+	MAGNETIC TAPE
YELLOWKNIFE	862	1/1957	-	12/1959		MAGNETIC TAPE

+ DATA NOT CONTINUOUS - LESS THAN 6 MONTHS MISSING

B.1

Ionospheric Electron Density

Composites of electron density (hourly median electron density values obtained by composite method); hourly height profiles of electron density (or plasma frequency); or hourly values of electron density with height; or hourly values of height for constant electron densities; including values of special profile parameters.

Special profile parameters

The parameters hc and qc are estimates of the real height and characteristic thickness, respectively, of the F2 layer peak.* These are described in the URSI Handbook of Ionogram Interpretation and Reduction (Piggott and Rawer, 1961), to be reprinted as a World Data Center A, Upper Atmosphere Geophysics, Report UAG.

* As an alternative to hc (or h max), the real height of 95% of foF2, designated h(9.95) is given by some of the tabulations.

A special issue of "Radio Science", Volume 2 (new Series), No. 10, October 1967, was devoted to the "Analysis of Ionograms for Electron Density Profiles".

Electron density data may be available in one of two formats, and generally in both from March 1962 onwards:

FORMAT NO. 1 gives electron density at fixed 10 km intervals between the highest and lowest heights obtained by the calculation.

LOC.	ZONE	TIME	Q	COMPOSITE KM	ELECTRON DENSITY 00	10	20	30	40	50	STATION WP 60	70	80	90	SCAT	HMIN	HMAX	SHMAX
68	01	29 0000		200			5.3	9.1	17.0	37.6	72.3	109	147	184	55.0			
				300	213	234	249	256	260	260						217	343	176
68	01	30 0100		200		5.2	7.2	10.4	16.0	27.5	48.6	80.9	115	147	52.0			
				300	177	202	221	236	245	249	249					210	354	177
68	01	26 0200		200			5.3	7.4	11.0	18.8	35.4	65.8	105	142	51.6			
				300	180	214	242	263	276	283	285	285				219	358	195
68	01	23 0300		200		4.1	7.8	14.9	28.9	56.4	90.1	126	165	202	45.6			
				300	235	263	281	291	294	294						206	339	190
68	01	22 0400		200					8.0	39.1	94.5	150	198	240	52.9			
				300	271	290	299	304	304							237	333	188
68	01	24 0500		100							5.2	7.0	9.5	13.1	51.1			
				200	18.5	26.8	40.0	59.3	85.3	115	147	179	206	227				
				300	245	255	261	261	261							155	325	193

FORMAT NO. 2 gives true height, H, at selected $\log_{10} f_N$ between fmin and foF2, Z* $\left(\frac{dH}{d\log(f_N^2)}\right)$ Z** $\left(\frac{d^2H}{d(\log f_N^2)^2}\right)$, the integral from hmin to H and the electron density at H.

WALLOPS ISLAND, VIRGINIA 68 01 29 1200
FOR 008CM. F=0.557400. FH=1.422485. SIN I=0.936672.

TAIL	LOG FX	LOG FN	H*	H	Z*	Z**	INTEGRAL	EL/CC	RESIDUAL
A102	0.2000	EXTRAP		114.00	0.000			3.11549+004	(SD******)
	0.300	114	0	114.00	0.000	0.00	0.000	4.93772+004	-0.000
	0.310	114	0	114.00	0.000	0.00	0.000	5.17043+004	-0.000
	0.400	116	0	114.31	3.416	18.98	0.210	7.82576+004	
	0.470	120	0	115.22	9.594	44.13	1.073	1.08026+005	
	0.500	127	0	116.22	23.794	236.67	2.244	1.24030+005	
	0.510	131	0	116.78	32.312	425.89	2.957	1.29875+005	
	0.520	142	0	117.72	61.429	1455.88	4.205	1.35996+005	
	0.530	175	0	119.85	151.684	4512.74	7.180	1.42405+005	
	0.538	300	OV	125.44	546.531	24677.91	15.309	1.47750+005	
	0.550	230	0	130.51	192.133	-001622.56	23.016	1.56145+005	
	0.560	221	0	134.03	159.681	-001622.56	28.632	1.63503+005	
	0.580	218	0	140.08	142.937	-000418.61	38.987	1.79278+005	
	0.600	225	0	145.90	147.970	125.83	49.913	1.96574+005	

LOGFM=1.0777 HMAX=295.27 S= 54.172 SHMAX= 1481.707 1.77324+006

B.1 PROFILE PARAMETERS OR IONOSPHERIC ELECTRON DENSITY

N(H) PROFILES

AT BOULDER

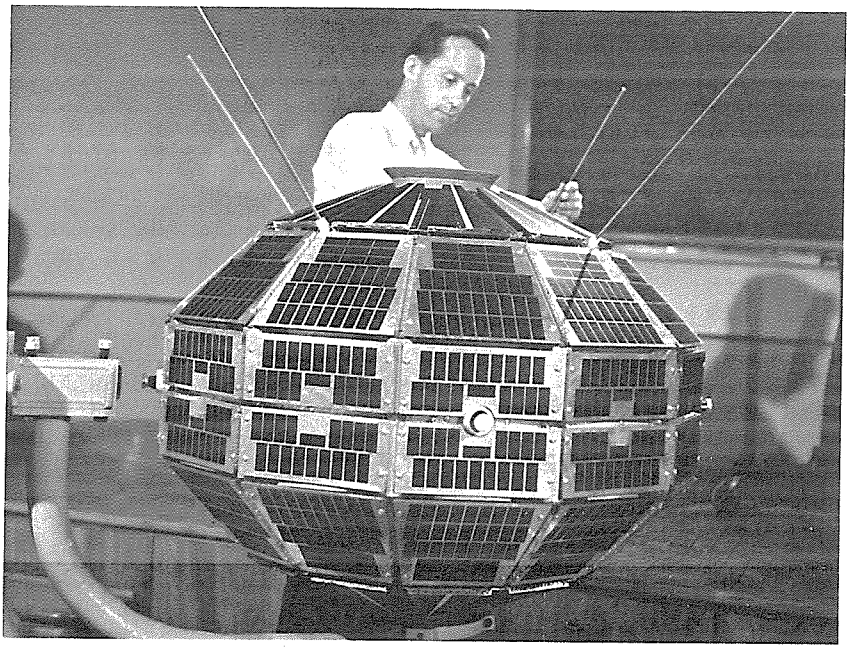
STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	INDICATOR
THULE	76N	292				B	A	B	A	A	A	Q	S					TH
GODHAVN	69N	307					C	A	A	B	A	A	Q	Q	S			GO
MURMANSK	68N	33																MM
ANCHORAGE	61N	211						C	C	C	C							AN
NARSSARSSUAQ	61N	315						B	B	C	A	A	C	C	S			NQ
INVERNESS	57N	356	C															IN
TOMSK	56N	84								AW	AW	AW	BW	AW	AW			TK
MOSCOW	55N	37	BW	AW						AW	AW	AW	AW	BW				MO
IRKUTSK	52N	104								AW	BW							IR
ADAK	51N	184			B	A	B	B	A	A	B							AD
SLOUGH	51N	360	BW	BW						AW	AW							SL
FREIBURG	48N	7	C	C														FR
ROSTOV	47N	39								AW	AW							RV
ST JOHNS	47N	308			B	B	C											SJ
BOULDER	40N	255					B	C	C	C	C	C	B	C	S			BC
FT MONMOUTH	40N	286			B	A	B	A	A	A	A	S						FM
WASHINGTON	38N	283	BW	AW														WA
ASHKHABAD	37N	58								AW	BW							AS
WALLOPS ISLAND	37N	285							C	A	A	A	A	C	Q	Q	Q	WP
POINT ARGUELLO	35N	240							C	C	A	C	S					PA
WHITE SANDS	32N	254			B	A	A	C	Q	C	Q	Q	Q	Q	S			WS
CAPE KENNEDY	28N	280								C	A	C	S					CC
DELHI	28N	77		B	C													DH
GRAND BAHAMA	26N	282			A	A	C	B	A	A	B	Q	Q	Q	S			GB
OKINAWA	26N	127			B	C		C	Q	C	C	Q	Q	Q	S			OK
TAIPEI	25N	121								B								TP
SAN SALVADOR	24N	286								C	C	S						SS
AHMEDABAD	23N	72	C	C	C													AH
MEXICO CITY	19N	261						C	C	C	A	C	S					MX
JAMAICA	18N	284									C							JA
PUERTO RICO	18N	293	B		A	A	A	C	S									PR
MANILA	14N	121				B	A	C		C	Q	C	B	Q	S			MN
PANAMA	09N	281	BW	AW														PN
IBADAN	07N	3	B	A														IB
BOGOTA	04N	286				C	C			A	A	C	C	S				BG
SINGAPORE	01N	257	BW	CW														SI
TALARA	04S	279	BW	AW		A	A	C		A	B	S						TA
HUANCAYO	12S	285	BW	AW		A	A	C		A	A	A	C	C	S			HU
LA PAZ	16S	292									B	S						LP
JOHANNESBURG	26S	28													C	B		JO
BUENOS AIRES	34S	302								BW	BW							BA
PORT STANLEY	51S	303								AW	AW							PS

KEY TO SYMBOLS

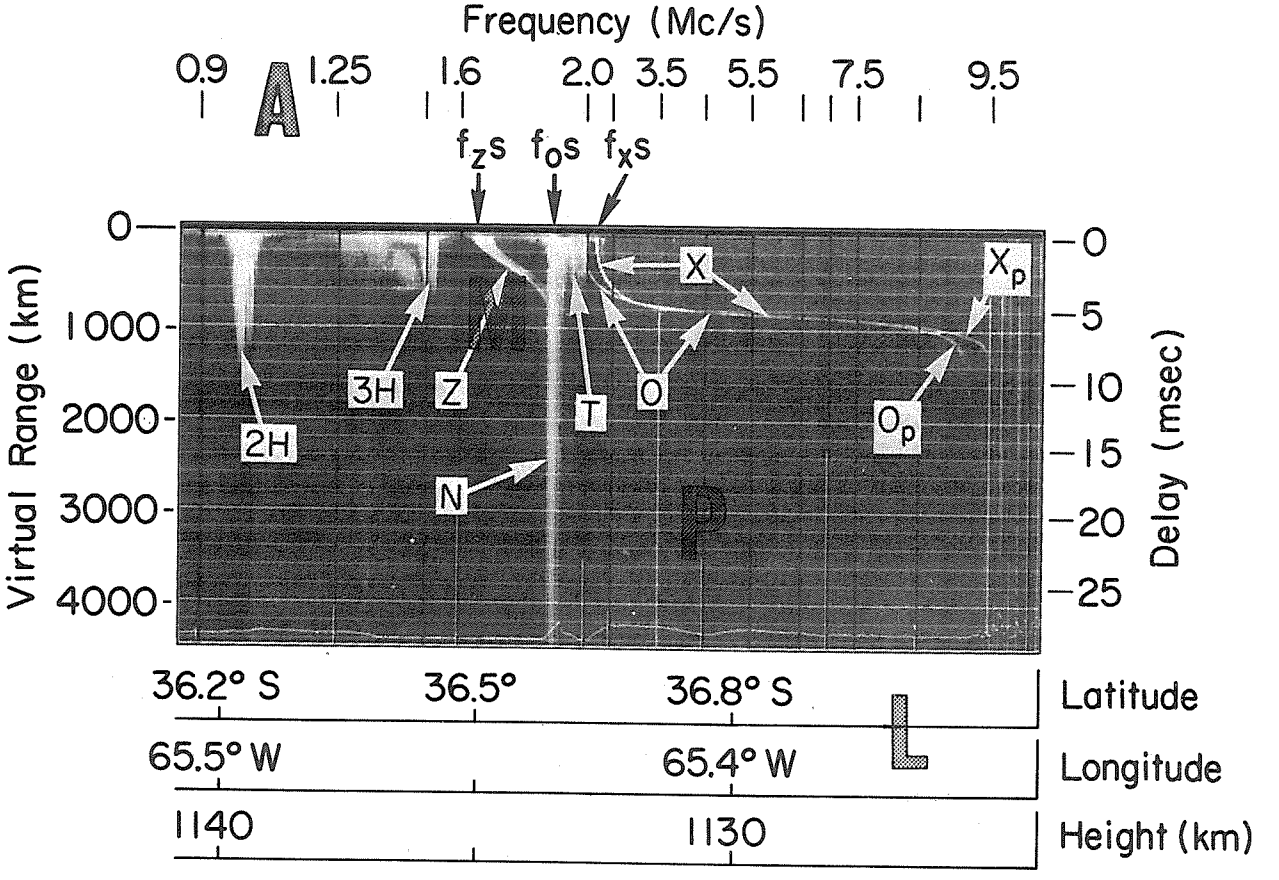
A = 12 Months
B = 6-11 Months
C = 1-5 Months
W = World Days Only

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

ALOUETTE I



S



E

P.2 TOPSIDE-VERTICAL INCIDENCE SOUNDINGS

AT BOULDER

ALOUETTE 1 - 1962 BETA ALPHA 1

STATION	DATE BEGINNING	FILM HELD THROUGH	STATION CLOSING DATE
ANTOFAGASTA, CHILE	9/30/1962	7/28/1963	8/1963
BOULDER, COLORADO, U.S.A	1/25/1966	12/5/1969	
BYRD, ANTARCTICA	2/11/1966	1/22/1968	
CANARY ISLANDS	11/30/1967	3/22/1968	
COLLEGE, ALASKA, U.S.A.	9/29/1962	10/10/1966	11/1966
EAST GRAND FORKS, MINN. U.S.A.	2/18/1963	6/20/1966	
FORT MYERS, FLORIDA, U.S.A.	9/30/1962	10/3/1969	
JOHANNESBURG, REP OF SOUTH AFR	11/11/1965	1/8/1966	
KANO, NIGERIA	9/3/1964	10/26/1966	11/1966
KASHIMA, JAPAN	8/15/1966	8/11/1967	
KAUAI, HAWAII, U.S.A.	8/10/1965	11/8/1968	
ORORAL, AUSTRALIA	11/23/1965	5/8/1970	
OTTAWA, ONTARIO, CANADA	9/29/1962	3/18/1970	
OUAGADOUGOU, UPPER VOLTA	11/14/1967	9/29/1969	
PRINCE ALBERT, SASK. CANADA	9/30/1962	8/23/1963	8/1963
QUITO, ECUADOR	9/30/1962	10/15/1969	
RESOLUTE BAY, N.W.T., CANADA	9/29/1962	11/26/1968	
SANTIAGO, CHILE	8/6/1963	10/18/1969	
SINGAPORE	9/30/1962	8/20/1969	
SOUTH ATLANTIC (PORT STANLEY)	9/30/1962	11/19/1969	
SOUTH POINT, HAWAII, U.S.A.	11/7/1962	6/10/1965	6/1965
ST JOHN S, NFLD., CANADA	9/30/1962	9/22/1969	3/1970
TROMSO, NORWAY	8/17/1966	11/14/1969	
ULASKA, ALASKA, U.S.A.	11/29/1965	9/30/1969	
WINKFIELD, ENGLAND	9/29/1962	9/26/1969	
WOOMERA, AUSTRALIA	10/1/1962	10/31/1965	11/1965

Swept-Frequency Topside Sounder. Launched September, 1962 and still in operation. Data are being received on a continuing basis. Ionograms are on 35 mm film in 100 foot rolls. There are approximately 5000 rolls available from the above telemetry stations (dates are not necessarily inclusive for each station).

PUBLICATIONS:

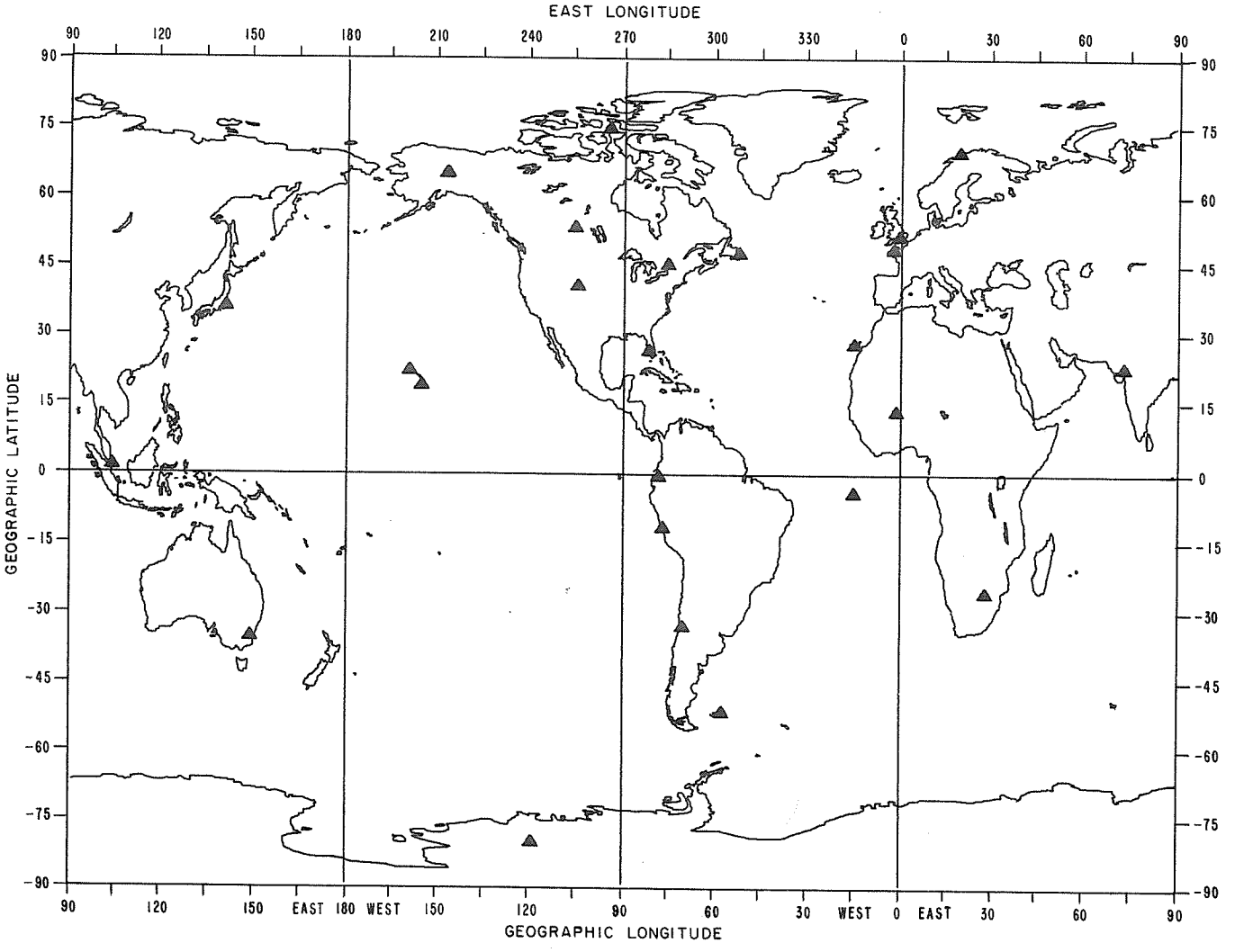
1. Alosyn Data, Defence Research Telecommunications Establishment, Ottawa - Alouette 1 topside sounder synoptic data which consist of tabulations of selected ionospheric parameters from the ionograms. The parameters are listed in the order in which the ionograms were recorded, one tabulation row for each ionogram. The parameters are compiled for all sounder data recorded during the month at the following stations:

Antofagasta, Chile	Resolute Bay, N.W.T., Canada
College, Alaska, U.S.A.	Santiago, Chile
East Grand Forks, Minn., U.S.A.	South Atlantic (Port Stanley), Falkland Is.
Fort Myers, Florida, U.S.A.	South Point, Hawaii, U.S.A.
Ottawa, Ont., Canada	St. John's, Nfld., Canada
Prince Albert, Sask., Canada	Winkfield, England
Quito, Ecuador	Woomera, Australia

The data are tabulated covering the period of September 29, 1962 to Nov. 30, 1968 and include:

1. Time of observation (universal and local).
2. Latitude, longitude, and height of the satellite.
3. Solar zenith angle and magnetic dip angle at the satellite.
4. Gyrofrequency and plasma frequency at the satellite.
5. Observed extraordinary wave frequency and its accuracy.
6. Quality of the reflection trace at the satellite.
7. Observed ordinary and extraordinary wave penetration frequencies of the F2 layer.
8. Maximum frequency of observation of sporadic E.
9. Strength of signal returned from the earth (strong, weak, no echoes).
10. Three-hourly magnetic Kp index.

TOPSIDE-VERTICAL INCIDENCE SOUNDINGS TELEMETRY STATIONS 1971



Ionograms from Alouette 1, Alouette 2, Explorer 20 and ISIS 1 Satellites are available. Time charts providing a graphical indication of the duration of Alouette 1 operations can be furnished on request. Some reduced data are available. The map shows all the telemetry stations currently reporting. The data summaries are in alphabetical order. 35 mm film copies of ionograms available at $5.00 per roll, when ordered through Boulder.

PUBLICATIONS: (continued)

2. Electron Density vs. Real Height, Department of Communications, Ottawa - Sept. 29, 1962 - July 27, 1968.
3. Electron Densities and Scale Heights in the Topside Ionosphere: Alouette 1 Observations in Midlatitudes, by Thomas, Rycroft and Colin, NASA, May 1, 1963 - Jan. 28, 1964.
4. Electron Densities and Scale Heights in the Topside Ionosphere: Alouette 1 Observations Over The American Continents, by Chan, Colin, and Thomas, NASA, Mar. 1, 1963 - Oct. 31, 1963.
5. Electron Densities and Scale Heights in the Topside Ionosphere: Alouette 1 Observations Recorded at Hawaii, by Colin and Chan, NASA, Nov. 7, 1962 - Nov. 30, 1963.

COMPUTER FORMAT:

1. Electron density profiles for selected Alouette 1 ionograms reduced by ISIS experimenters covering period Sept. 29, 1962 - June 19, 1965.

B.2 TOPSIDE-VERTICAL INCIDENCE SOUNDINGS

AT BOULDER

ALOUETTE 2 - 1965 98A

STATION	DATE BEGINNING	FILM HELD THROUGH	STATION CLOSING DATE
BOULDER COLORADO, U.S.A.	11/29/1965	3/25/1970	
BRETIGNY	8/11/1967	11/19/1967	
BYRD, ANTARCTICA	1/19/1967	10/4/1968	
COLLEGE, ALASKA, U.S.A.	11/29/1965	10/3/1966	
EAST GRAND FORKS, MINN. U.S.A.	11/30/1965	5/21/1966	
FORT MYERS, FLORIDA, U.S.A.	11/29/1965	12/30/1969	
JOHANNESBURG, REP. OF SOUTH AFRICA	12/8/1965	12/21/1969	
KANO, NIGERIA	11/30/1965	10/15/1966	
KASHIMA, JAPAN	12/8/1966	2/26/1969	
KAUAI, HAWAII, U.S.A.	12/2/1965	12/7/1969	
LIMA, PERU	11/11/1966	8/1/1969	9/1969
ORORAL, AUSTRALIA	12/1/1965	11/9/1969	
OTTAWA, ONTARIO, CANADA	11/29/1965	2/1/1970	
OUAGADOUGOU, UPPER VOLTA	8/12/1967	11/18/1969	
QUITO, ECUADOR	11/29/1965	7/5/1969	
RESOLUTE BAY, N.W.T., CANADA	11/29/1965	5/9/1968	
SANTIAGO, CHILE	11/29/1965	8/11/1969	
SINGAPORE	12/1/1965	12/11/1969	
SOUTH ATLANTIC (PORT STANLEY)	12/5/1965	5/29/1969	
ST JOHN S, NFLD., CANADA	11/30/1965	12/6/1969	3/1970
TROMSO, NORWAY	8/16/1966	2/1/1969	
ULASKA, ALASKA, U.S.A.	11/29/1965	10/18/1968	
WINKFIELD, ENGLAND	11/29/1965	1/5/1970	

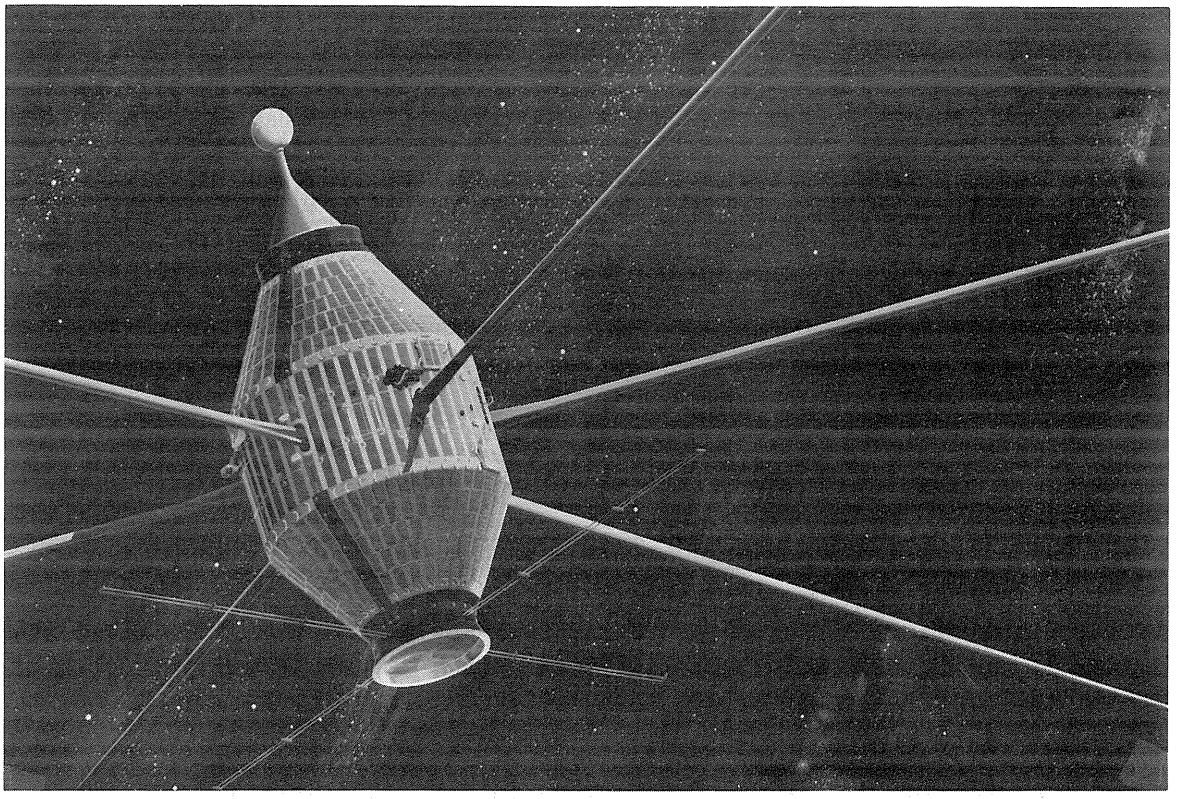
Swept-Frequency Topside Sounder. Launched November, 1965 and still in operation. Data are being received on a continuing basis. Ionograms are on 35 mm film in 100 foot rolls. There are approximately 1400 rolls available at the present time from the above telemetry stations (dates are not necessarily inclusive for each station).

PUBLICATIONS:

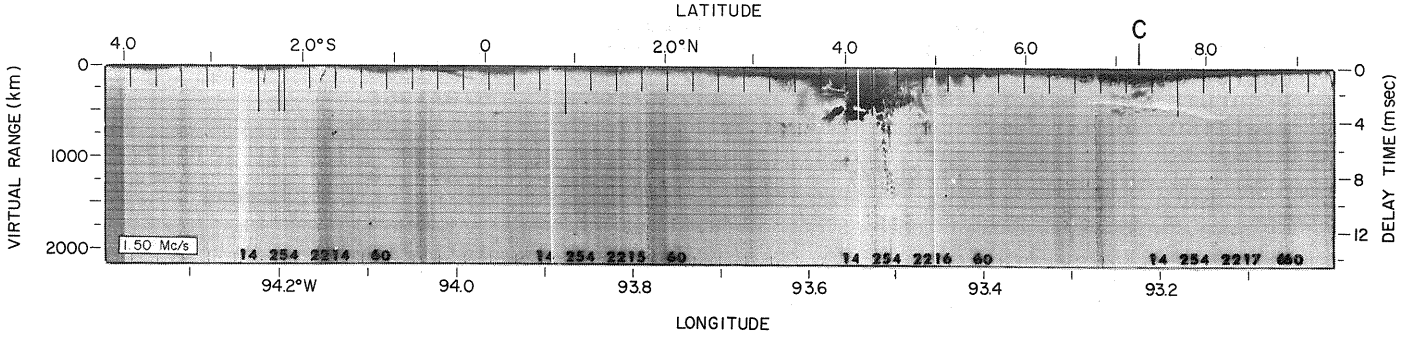
1. Alouette II - Data Available, Department of Communications, Ottawa - Nov. 29, 1965 - Dec. 31, 1965.

2. Alouette II, Electron Density vs. Real Height, Department of Communications, Ottawa, Dec. 15, 1965 - Dec. 29, 1967.

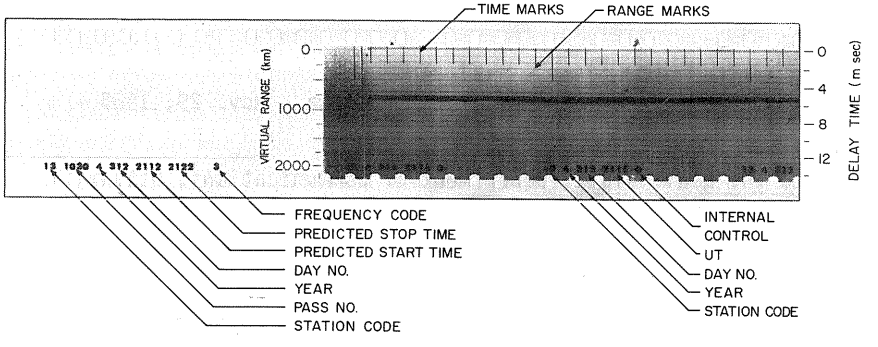
EXPLORER XX



SAMPLE FIXED FREQUENCY IONOGRAMS



IONOGRAM SCHEMATIC



FREQUENCY CODE

1 - 7.22 MHz/sec
2 - 5.47 MHz/sec
3 - 3.72 MHz/sec
4 - 2.85 MHz/sec
5 - 2.00 MHz/sec
6 - 1.50 MHz/sec

AT BOULDER

EXPLORER 20 - 1964 51A

Fixed Frequency Topside Sounder (1.50, 2.00, 2.85, 3.72, 5.47 and 7.22 MHz) Launched August 1964 - completed December 30, 1965: a total of 907 rolls of 35 mm film covers this experiment. The film is organized by orbit. Each orbit includes ionograms from all telemetry stations which took data for that orbit, along with the orbital information. One 100 foot roll may contain 1-10 orbits, depending on the number of stations telemetering, copies $5.00 per roll.

B.2 TOPSIDE-VERTICAL INCIDENCE SOUNDINGS

AT BOULDER

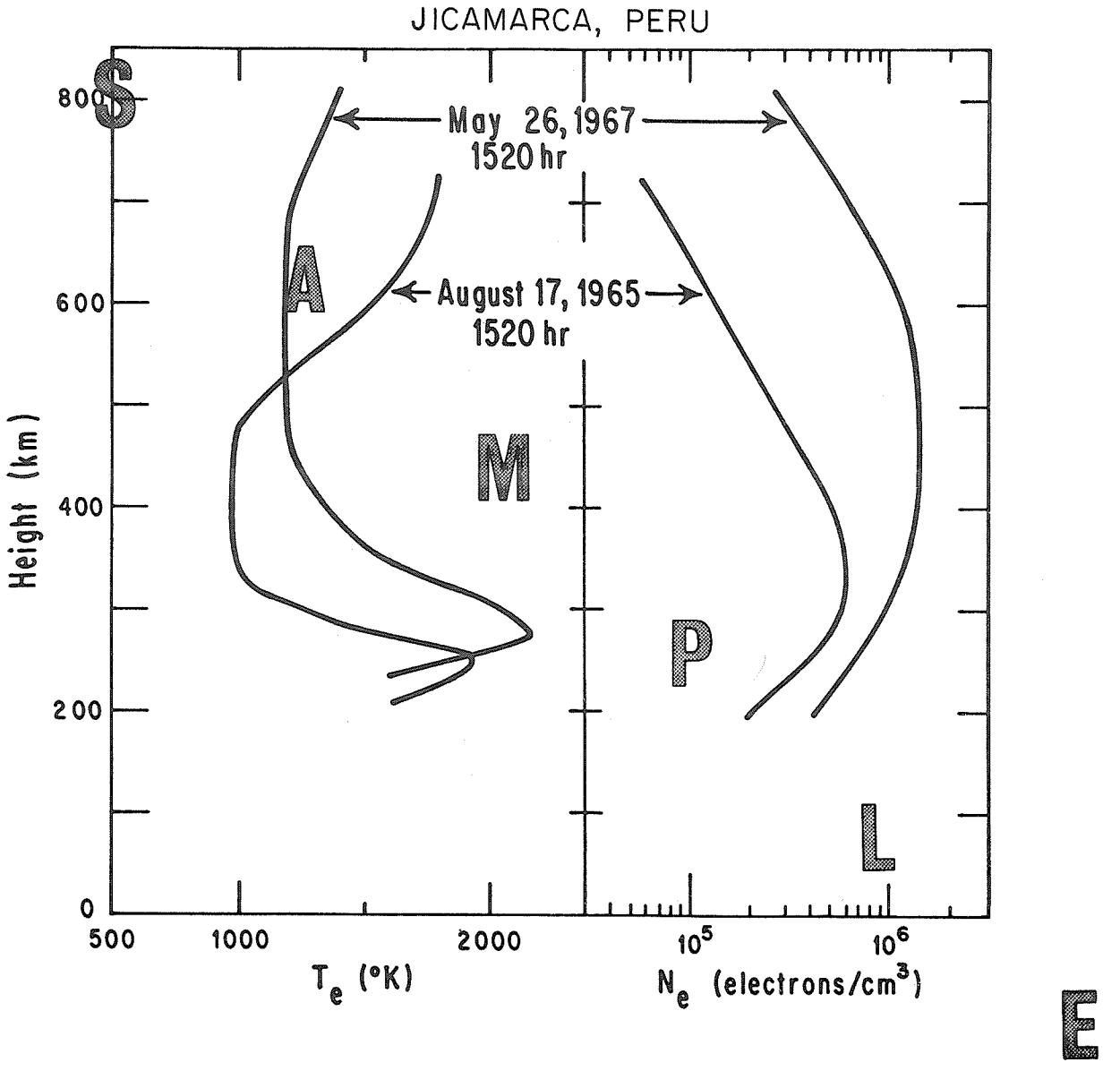
ISIS 1 - 1969 009A

STATION	DATE BEGINNING	FILM HELD THROUGH	STATION CLOSING DATE
BOULDER	2/3/69	9/26/69	
BRETIGNY	11/8/69	11/20/69	
FORT MYERS	1/31/69	11/10/69	
JOHANNESBURG	1/31/69	8/8/69	
KAUAI	2/2/69	9/10/69	
LIMA	2/1/69	8/18/69	
ORORAL	1/30/69	9/21/69	
OTTAWA	1/30/69	12/21/69	
OUAGADOUGOU	2/2/69	1/1/70	
QUITO	1/31/69	4/29-69	
RESOLUTE BAY	1/30/69	11/22/69	
SANTIAGO	1/31/69	9/16/69	
SINGAPORE	2/3/69	9/10/69	
SOUTH ATALNTIC	2/2/69	9/29/69	
ST JOHNS	1/31/69	9/15/69	
TROMSO	2/3/69	9/16/69	
ULASKA	1/31/69	9/1/69	
WINKFIELD	1/30/69	6/9/69	

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
62-015A-01	Ariel 1	Radio Frequency Capacitance Probe	Sayers	04/26/62	0462-0762
62-049A-01	Alouette 1	Sweep Frequency Topside Ionosonde	Nelms	09/29/62	0962-1068
63-009A-01	Explorer 17	Mass Spectrometer	Reber	04/03/63	0463-0663
63-009A-02	Explorer 17	Electrostatic Probe	Brace	04/03/63	0463-0763
63-009A-03	Explorer 17	Pressure Gauge	Newton	04/03/63	0463-0663
63-024A-03	Tiros 7	Langmuir Probe	Brace	05/19/63	0663-0763
63-046A-01	Explorer 18	Retarding Potential Analyzer	Serbu	11/27/63	1163-1163
64-051A-01	Explorer 20	Fixed Frequency Ionosonde	Knecht	08/25/64	0864-1265
64-060A-01	Explorer 21	Retarding Potential Analyzer	Serbu	10/04/64	1064-0465
64-064A-02	Explorer 22	Langmuir Probe	Brace	10/10/64	1064-0565
65-042A-01	Explorer 28	Retarding Potential Analyzer	Serbu	05/29/65	0565-0567
65-098A-01	Alouette 2	Sweep Frequency Ionosonde	Nelms	11/29/65	1165-1270
67-042A-01	Ariel 3	Langmuir Probe	Sayers	05/05/67	0567-0468
67-042A-06	Ariel 3	Radio Frequency Capacitance Probe	Sayers	05/05/67	0567-0468
69-009A-01	ISIS 1	Sweep Frequency Sounder	Nelms	01/30/69	0169-0370
69-009A-02	ISIS 1	Fixed Frequency Sounder	Calvert	01/30/69	0169-0370

B.3


JICAMARCA, PERU
S
A
M
P
L
E
May 26, 1967
1520 hr
August 17, 1965
1520 hr
Height (km)
800
600
400
200
0
500
1000
2000
10^5
10^6
T_e (°K)
N_e (electrons/cm^3)

B.3 INCOHERENT SCATTER SOUNDINGS

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
PRINCE ALBERT	53N	254								Q	Q						
MALVERN	52N	357										Q	Q	Q	Q	Q	Q
SAINT SANTIN	44N	2									C	B	A	B			
SAINT SANTIN	44N	2									C	B	A	B	Q	Q	Q
MIT/MILLSTONE	42N	288				Q	Q	Q	A	A	A	A	Q	Q	Q	Q	Q
STANFORD	37N	237										Q	Q	Q	Q	Q	S
ARECIBO	18N	293							Q	Q	Q	Q	Q	Q	Q	Q	Q
TRINIDAD	11N	298					Q	Q									
JICAMARCA	11S	284								Q	Q	Q	Q	Q	Q		
JICAMARCA	11S	284							Q	Q	Q	Q	Q	Q	Q	Q+	Q+

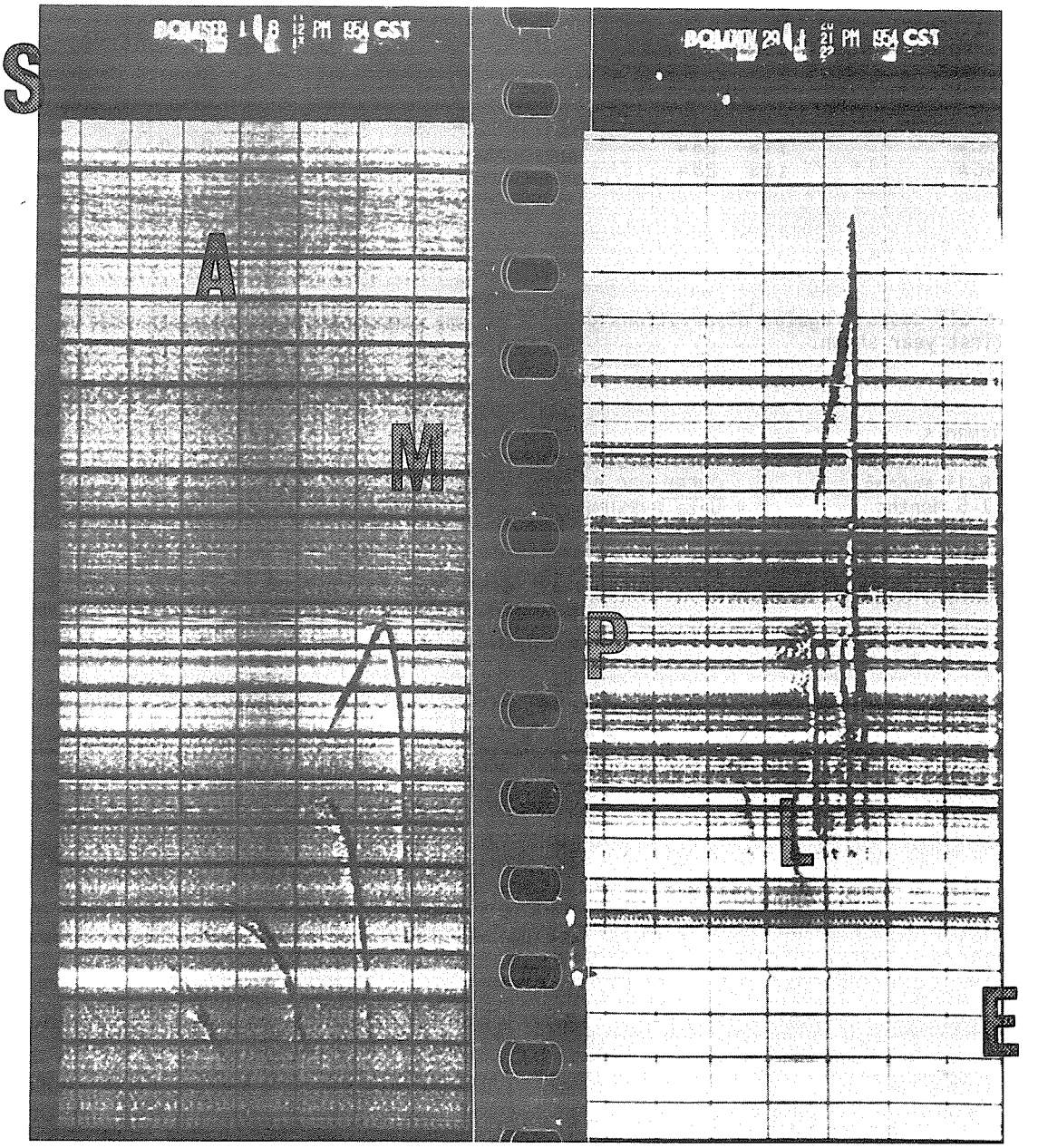
NOTE: In all cases, regular observations did not become common until 1 - 2 years following the first year shown.

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

B.4



SAMPLE OBLIQUE INCIDENCE SOUNDINGS

B.4 OBLIQUE INCIDENCE SOUNDINGS

AT BOULDER

TRANSMITTER STATION	GEOGRAPHIC LAT	LONG EAST	YEAR 59	60	61	62	63	64	65	66	67	68	69	70	71	RECEIVER
THULE	76N	292						B								PULLMAN
ANDOYA	69N	16						B								PULLMAN
ANDOYA	69N	16						B								MAYNARD
LINDAU	51N	10												Q	Q	TSUMEB
LINDAU	51N	10												Q	Q	ALSBJERG
WINNIPEG	49N	263	C	C												RESOLUTE BAY
OTTAWA	45N	285	C	A	B											THE HAGUE
OTTAWA	45N	285		B	B											RESOLUTE BAY
SAN FRANCISCO	37N	238						B								MAYNARD
ORLANDO+	28N	272										B	C	C		BOULDER
OKINAWA	26N	127						A	A	A	A	B	B	B		ST KILDA
OKINAWA	26N	127								C	B	A	B			TOWNSVILLE
PUERTO RICO	18N	293					C	B								MONTEVIDEO
PUERTO RICE	18N	293						B								MAYNARD

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P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

Summary of Sounding Rocket Launching Reports Received During Period 1 July - 31 December 1969

Date (UT)	Time (UT)	Rocket Number or Type	Sponsoring Country	Launching Site	Experiments: Aurora and Airglow (1)	Atmospheric Physics (2)	Ionosphere (3)	Energetic Particles (4)	Magnetic Fields (5)	Solar Physics (6)	Astronomy (7)	Planetology (8)	Biology (9)	Test and Other (0)	Approx. Altitude (km)	Principal Experimenter(s)
1967																
08 Jul.	0010	S4H	United Kingdom	South Uist			C								73	E. R. Williams
12 Jul.	0011	S4H	United Kingdom	South Uist			C								81	E. R. Williams
1968																
03 Feb.	1712	P5H	United Kingdom	South Uist			C E	C							140	D. A. Bryant
29 Feb.	2118	P6H	United Kingdom	South Uist			C E	C							N/A	D. A. Bryant
06 Mar.	1636	P7H	United Kingdom	South Uist			E	B							N/A	J. W. C. Wilson P. Rothwell
25 Mar.	2114	P8H	United Kingdom	South Uist			E	B							135	J. W. C. Wilson P. Rothwell
29 Mar.	1353	S8H	United Kingdom	South Uist		B	C A								88	E. R. Williams
01 Jun.	1750	P18H	United Kingdom	South Uist			C E								131	K. Bullough
22 Jun.	1515	S4H	United Kingdom	South Uist			C E			F					101	A. P. Willmore D. J. Gilmore
02 Jul.	1343	S5H	United Kingdom	South Uist			C			F					N/A	A. P. Willmore D. J. Gilmore
08 Jul.	1455	S6H	United Kingdom	South Uist			C E			F					100	A. P. Willmore D. J. Gilmore
24 Jul.	0019	NASA 14.349 UA	U.S.A.	Wallops Island	E	G	D								104	J. B. Pearce
24 Jul.	0954	NASA 14.348 UA	U.S.A.	Wallops Island	E	G	D								105	J. B. Pearce
01 Aug.	1027	P13H	United Kingdom	South Uist			C A			E F					93	J. E. Hall D. A. Bryant
07 Aug.	1312	S9H	United Kingdom	South Uist		B	C A								93	E. R. Williams
20 Sep.	1932	Nike-Tomahawk	Norway/Denmark/Sweden/United Kingdom	Andoya	X		X	X	X						239	B. Landmark K. Folkestad G. Skovli M. Jespersen O. H. Olesen W. Riedler D. K. Burrows
01 Oct.	2144	Nike-Tomahawk	Norway/Denmark/United Kingdom	Andoya	X		X	X	X						230	B. Landmark R. Armstrong K. Folkestad K. Maseide G. Skovli J. Troim K. Aarsnes M. Jespersen O. H. Olesen D. A. Bryant
02 Oct.	0217	MP-12	U.S.S.R.	Volgograd		G									174	Central Aerological Observatory†
08 Oct.	0226	MP-12	U.S.S.R.	Volgograd		V									125	Institute of Experimental Meteorology†

† No principal experimenter given.

B.5 IONOSPHERIC OR AERONOMICAL ROCKETS

AT GREENBELT

Summaries of sounding rocket launchings are available, compiled from reports of sounding rocket launchings, National Reports to COSPAR, and other reports received by WDC-A for Rockets and Satellites. The following table lists launching sites for ionospheric or aeronomical rockets.

Sponsoring Launching Site	Geographical Latitude	Longitude East
ARGENTINA		
Chamical	30.33S	293.69
Mar Chiquita	37.77S	302.58
Tartagul (Vespucio)	22.77S	296.18
AUSTRALIA		
Carnarvon	25.00S	114.00
Woomera	31.10S	136.78
BRAZIL		
Cassino (1966 Solar Eclipse)	32.20S	307.83
Natal (Barreira do Inferno)	05.70S	324.80
CANADA		
Cape Parry	70.17N	235.28
Fort Churchill	58.80N	265.80
Resolute Bay	74.70N	265.10
FRANCE		
Dumont d'Urville	66.40S	140.01
Hamaguir, Algeria	30.85N	356.93
Ile du Levant	43.05N	06.47
Kourou	05.00N	307.00
Reggane, Algeria	26.72N	00.17
Vik	63.42N	341.00
GREECE		
Karystos, Euboea (Evvoia)	38.02N	24.42
INDIA		
Thumba	08.60N	76.90
INDONESIA	Western part of Java,	
LAPAN Space Center	Pameungpeuk area	
ITALY		
Sardinia	39.56N	09.24
JAPAN		
Kagoshima	31.25N	131.07
NETHERLANDS		
Surinam (Coronie)	05.83N	303.69
NEW ZEALAND		
Cape Karikari	34.00S	173.50
NORWAY		
Andoya	69.30N	16.00
PAKISTAN		
Sonmiani	25.20N	66.75
SPAIN		
El Arenosillo	37.10N	353.27
SWEDEN		
Kiruna (Esrange)	67.90N	20.50
Kronogard	66.22N	19.78
UNITED KINGDOM		
South Uist, Scotland	57.20N	352.80
U.S.A.		
Ascension Island	07.98S	345.58
Barking Sands (Kauai) Hawaii	22.07N	200.23
Cape Kennedy, Florida	28.40N	279.40
Eglin AFB, Florida	30.38N	273.30
Fort Wainwright, Alaska	64.82N	212.37
Johnston Atoll	16.75N	190.48
Point Arguello, Calif.	35.60N	239.40
Point Barrow, Alaska	77.30N	203.20
Point Mugu, California	34.12N	240.88
San Nicolas Isl., Calif.	33.23N	240.58
Tonopah, Nev.	38.00N	243.50
Vega Baja (Camp Tortoquero) P.R.	18.47N	293.58
Wallops Island, Virginia	37.90N	284.50
White Sands, New Mexico	32.30N	253.50
USNS Croatan	Western N.Atlantic and eastern South Pacific Oceans	
U.S.S.R.		
Kheysa Island	80.62N	58.05
Volgograd	48.68N	44.35
Mid-Latitudes of U.S.S.R. Ship "Professor Vize"	45-50N	

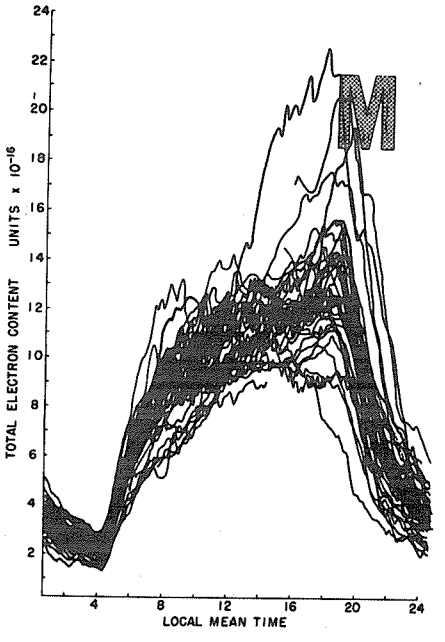

Fig. 4(a)

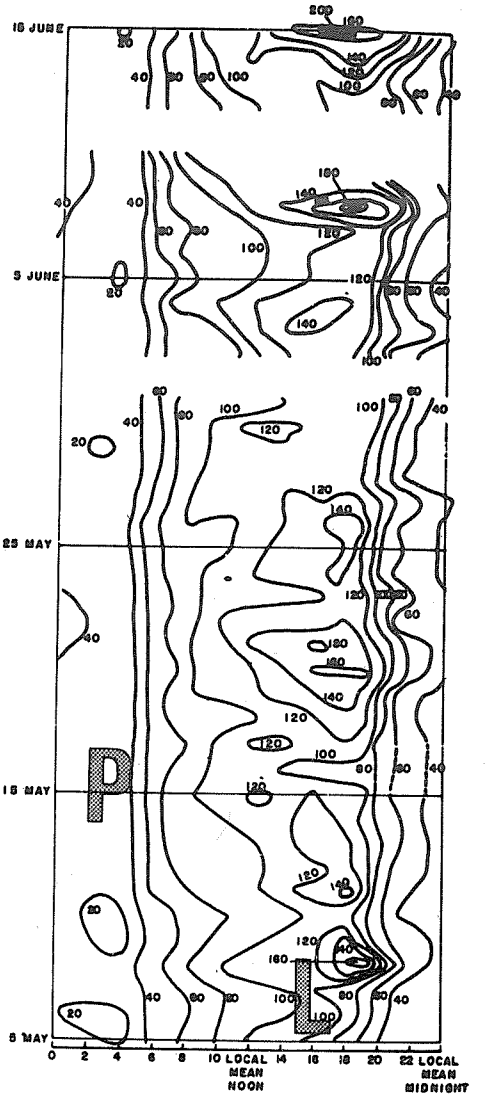

Fig. 4(b) Isopleths of constant electron content. Units x 10^{-15} electrons/mr^2

Fig. 4 Observations of the 136 MHz beacon of the Early Bird synchronous satellite made at the Sagamore Hill Radio Astronomy Observatory, Massachusetts, USA

B.6 TOTAL ELECTRON CONTENT - SATELLITE BEACONS

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
KIRUNA	68N	21								C	A	C					
OULU	65N	25											Q	Q			
KJELLER	60N	11								C							
COLD BAY	55N	197												Q	Q	Q	Q
KUHLUNGSBORN	54N	12								C							
LINDAU	52N	10								C	A	A	A	A	C		
BREISACH	48N	8									C	A	C	B			
VAL-JOYEUX	44N	4								C	A	B	B				
FLORENCE	44N	11								C	C	B					
GRAZ	41N	15								C	C	A	A	A	C		
TORTOSA	41N	0								C	A	A	A	A	C		
UNIV PARK	41N	282								C	C	B					
URBANA	38N	273									C						
ASHKABAD	37N	58															
HAIFA	33N	35									C						
SAGAMORE HILL	33N	254								C	B	A					
COLLEGE STA	30N	264								C	B	B	B	B	C		
DELHI	28N	77								C	A	A	A	Q	Q	Q	
TAIPEI	25N	121													Q	Q	
AHMEDABAD	23N	72								C	A	A	A				
HONG KONG	22N	114							Q	Q	Q	Q	Q	Q			
HONOLULU	21N	201								C	A	A	A	A	A		
BANGKOK	13N	100								P	P	B	P	P			
ADDIS ABABA	09N	38										B	B				
SINGAPORE	01N	103						C	C								
NAIROBI	01S	36								C	A	B	B				
DAR ES SALAAM	06S	39										B	B				
TSUMEB	19S	17											Q	Q	Q		
SAN JOSE	23S	315								C	C						
TUCUMAN	27S	295									C	C					
BRISBANE	28S	153								C	B	C	C				
PORT STANLEY	51S	303							C								

KEY TO SYMBOLS

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P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
64-047A-01	SYNCOM 3	Faraday Rotation	Darosa	08/19/64	0964-0369
65-105A-04	Pioneer 6	Two-frequency Beacon Receiver	Eshleman	12/16/65	1265-0766
65-105A-08	Pioneer 6	Superior Conjunction Faraday Rotation	Levy	12/16/65	0868-1268
66-075A-04	Pioneer 7	Two-frequency Beacon Receiver	Eshleman	08/17/66	0866-0569
66-075A-08	Pioneer 7	Superior Conjunction Faraday Rotation	Levy	08/17/66	1168-1268
66-110A-15	ATS 1	Faraday Rotation	Darosa	12/07/66	0167-1269
67-060A-02	Mariner 5	Two-frequency Beacon Receiver	Eshleman	06/14/67	0667-1167
67-123A-03	Pioneer 8	Two-frequency Beacon Receiver	Eshleman	12/13/67	1267-0869
68-100A-03	Pioneer 9	Two-frequency Beacon Receiver	Eshleman	11/08/68	1168-0769

B.7

ABSORPTIONS-DEKREMENTE L/DB JANUAR 1969 1200 TU

(ABSORPTION LOSS)

FREIBURG

F/MHZ	1.725 I	1.725 II	2.05 I	2.05 II	2.44 I	2.44 II	2.90 I	2.90 II	B	C
TAG										
1	46.2	45.1	42.2	44.2	40.7	46.0	35.4	33.5	241	2.9
2	43.3	44.4	47.7	49.2	46.9	49.0	28.0+	28.0+	136	6.9
3	39.6	39.0	37.1	41.2	34.1	36.8	31.5	35.0	275	2.9
4	46.7	46.7	52.5	52.5	38.2	40.8	28.0+	24.9+	240	4.5
5	39.7	39.7	43.8	42.7	35.8	38.6	39.4	43.5	279	3.9
6	45.6	46.7	43.3	41.2	46.0	48.4	44.5	43.5	213	5.9
7	43.3	43.3	46.4	47.9	35.5	38.6	44.0	44.5	185	5.1
8	33.0	37.3	29.0	41.9	43.9	40.8	38.6	39.5	225	3.7
9	34.1	33.0	35.3	38.4	48.5	44.0	20.4+	18.5+	258	2.1
10	37.3	37.3	27.0	31.2	22.8	25.0	22.6	24.5	240	1.6
11	29.0<	28.5<	23.4<	26.4<	21.2<	20.3<	22.6	23.3	230	0.9
12	39.6	37.3	27.8	[illegible]	17.0<	22.5<	20.2	25.1	193	1.2
13	25.4<	27.5<	23.2<	[illegible]	20.0	19.1	26.6	26.9	180	2.9
14	30.0	34.1	18.9<	[illegible]	16.5	24.5	23.6	27.6	193	2.4
15	37.3	37.3	30.0	34.1	22.0	30.2	28.5	31.5	219	2.7
16	36.3	36.3	27.2	31.6	30.6	36.7	27.4	33.4	229	3.3
17	36.3	38.6	31.1	37.8	28.7	38.4	25.8	30.1	259	2.2
18	37.9	39.1	36.2	37.3	35.2	34.3	37.2	36.7	219	4.5
19	28.5	24.5	22.2	23.1	20.0	21.1	23.3+	18.0+	134	3.7
20	C	C	C	C	C	[illegible]	C	C	G	G
21	C	C	C	C	C	[illegible]	C	C	G	G
22	20.4<	24.5<	30.5<	26.8<	21.7	22.0	31.6	30.4	183	3.1
23	33.0	36.2	27.4	31.3	24.3	28.7	33.6	35.9	221	3.3
24	30.0<	34.0<	30.5	29.1	25.0	23.8	29.8	31.0	241	2.1
25	30.5<	31.5<	28.6<	28.6<	30.1	34.7	37.7	35.8	148	5.4
26	25.5<	29.5<	15.1<	22.7<	21.7	28.0	32.5	35.0	130	4.0
27	19.8	20.6	12.4<	14.1<	19.6<	20.2<	17.6	25.0	107	2.9
28	20.6<	17.5<	15.9<	17.9<	20.0	20.0	14.7	16.3	112	2.5
29	16.3<	14.8<	11.7<	25.7<	20.9	22.0	23.4	20.3	107	3.0
30	36.4	35.3	41.7	42.2	35.6	36.2	34.3	36.3	237	5.1
31	37.8	33.0	28.7<	29.8<	20.3	22.3	17.6	23.7	227	3.8
MEDIAN COUNT	42		38		52		58		29	29
MEDIAN	37.3		37.2		30.4		29.1		148	3.3

B.7 ABSORPTION - METHOD A1 (PULSE ECHO)

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
RESOLUTE BAY	74N	266	B	A	B	B	C	S									
DIXON	73N	80	C	A	A	B	B		B	B	A	A	Q	Q	Q		
TROMSO	69N	19	B	A	S												
MURMANSK	68N	33			A	A	A	A	A	A	A	A	A				
BAKER LAKE	64N	264	C	B	C	S											
KJELLER	60N	11	B	A	C	S											
CHURCHILL	58N	266	B	A	B	C	S										
TOMSK	56N	84	C	A	A	A	A	B	A	A	A	A	A	A	C		
MOSCOW	55N	37	B	A	S												
JULIUSRUH/RU	54N	13	C	C	A	A	A	C	B	A	A	S					
ABERYSTWYTH	52N	356								A	A						
DE BILT	52N	5	B	A	A	A	A	A	A	A	A	A	C	B	A	C	Q
IRKUTSK	52N	104	C	B	B	A	A	A	A	C	S						
LINDAU	51N	10	C	A	A	S											
SWANSEA	51N	356	C	A	S												
WINNIPEG	49N	263	C	A	S												
FREIBURG	48N	7	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q
ROSTOV	47N	39		B	B	A	A	B	A	A	A	B	A	A	B		
OTTAWA	45N	285	B	A	S												
GENOVA	44N	9		A	A	A	A	A	B	A	B	A	A	B	B	A	
ALMA ATA	43N	76	B	A	A	B	A	C		A	A	A	A	A	B	C	
PENN STATE U	40N	283	B	A		C	S										
ASHKHABAD	37N	58	B	A	A	B	C	B		A	A	B	B	B			
TOKYO	35N	139	B	A	A	A	A	A	A	A	A	A	A	A			
DELHI	28N	77	B	B	A					B	C						
TAIPEI	25N	121									B	S					
AHMEDABAD	23N	72	C	A	C	S											
IBADAN	07N	3	A	A	S												
COLOMBO	06N	79	B	A	A					A	A	A	A	A	A	A	S
SINGAPORE	01N	103								A	A	S					
LWIRO	02S	28			A	S											
TSUMEB	19S	17	B	A	S												
JOHANNESBURG	26S	28	C	A	S												
BRISBANE	27S	153	B	B	S												
PORT STANLEY	51S	303	B	B	A												
MIRNY	66S	93									A	A					
HALLEY BAY	75S	334	B	A	S												

KEY TO SYMBOLS

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C = 1-5 Months

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Absorption--Method A2 (Riometer)

Method A2 (Riometer) data consist of monthly tables of values of absorption (in dB) occurring at the hours obtained by the cosmic-noise technique (riometer). For selected stations the original strip charts or microfilm of the strip chart recordings are held.

ABSORPTION

A2 (RIOMETER)

Atmospheric Absorption of 27.6 Mc/s Cosmic Noise

Maximum Absorption During Each Hour, in Tenths of Decibels

(Time in Tenths of Hours)

April 1964 — Time in UT — Observatory: Kiruna

	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
	Abs-Time	Abs-Time	Abs-Time	Abs-Time	Abs-Time	Abs-Time	Abs-Time	Abs-Time	Abs-Time
1	E	E	E	E	E	E	E	2 077	2 087
2	8 002	5 019	24 029	27 035	60 049	54 050	32 060	16 070	18 082
3	13 005	20 015	16 020	65 038	60 040	38 050	12 065	6 070	E
4	6 000	3 010	20 029	23 032	6 040	20 057	28 061	12 070	10 088
5	E	E	E	E	26 049	27 050	8 060	6 074	2 080
6	E	E	E	E	E	4 050	E	2 078	E
7	17 000	5 010	5 021	3 030	E	E	2 060	7 079	13 081
8	E	3 016	E	E	2 040	E	E	E	E
9	E	E	E	2 031	7 049	12 053	6 060	E	E
10	3 000	3 010	6 020	6 030	3 040	5 050	E	3 079	4 082
11	E	E	E	E	E	E	2 069	E	3 086
12	E	E	E	E	E	E	3 065	3 070	4 084
13	E	E	3 024	4 030	4 040	4 050	4 060	4 076	10 088
14	E	E	E	E	E	E	E	3 078	3 088
15	E	E	E	E	E	E	E	E	E
16	E	6 015	24 027	20 030	2 044	3 050	E	E	E
17	E	28 018	29 020	4 030	E	E	E	E	E
18	3 001	E	E	E	E	E	E	E	E
19	29 005	13 010	16 020	32 033	15 040	10 051	9 060	7 072	5 089
20	5 000	22 019	24 021	8 039	5 040	7 058	8 061	12 079	42 088

AT BOULDER

B.8 ABSORPTION - METHOD A2 (RIOMETER)

HOURLY VALUES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
HEISS IS	80N	58								A	A	A	B	A	A		
DIXON	73N	80								B	B	B	A	A	A		
TIXIE BAY	71N	128								A				C			
KEVO	69N	26														B	
MURMANSK	68N	33								B	A	A	A	A	A	C	
KIRUNA	67N	20		B	B	B	A	A	A	B	A	A	A	A	A	B	
SODANKYLA	67N	26														B	Q
OULU	65N	25														C	
COLLEGE	64N	213			B	A	A	A	B								
FROBISHER BAY	63N	292							B	B							
ANCHORAGE	61N	211							A	A	C						
CHURCHILL	58N	266	B	A	A												
EDINBURGH	55N	357		B	B												
GREAT WHALE	55N	283							B	B							
CAPE JONES	54N	281							B	A		S					
MEANOOK	54N	247		B	A	S											
NEUSTRELITZ	53N	11			B	A	A	C	B	A	A	A	A				
BAIE ST PAUL	47N	290							B	A							
PULLMAN	46N	243		A	A	S											
OTTAWA	45N	285	C	A													
ALMA ATA	43N	76								A	A	A	A				
FLORENCE	43N	11							B	A	A	C					
WASHINGTON	38N	283							A	A	C	S					
SAN FRANCISCO	37N	238		A	A	S											
DELHI	28N	77	B														
AHMEDABAD	23N	72	B	A	A	S				B	A						
PUERTO RICO	18N	293			A	S											
MIRNY	66S	92					B	C			Q	Q					
SYOWA BASE	69S	39													A		
EIGHTS	75S	283							B	B		S					
BYRD STATION	80S	240							A	A							
SOUTH POLE	90S	0							A	A							

KEY TO SYMBOLS

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C = 1-5 Months

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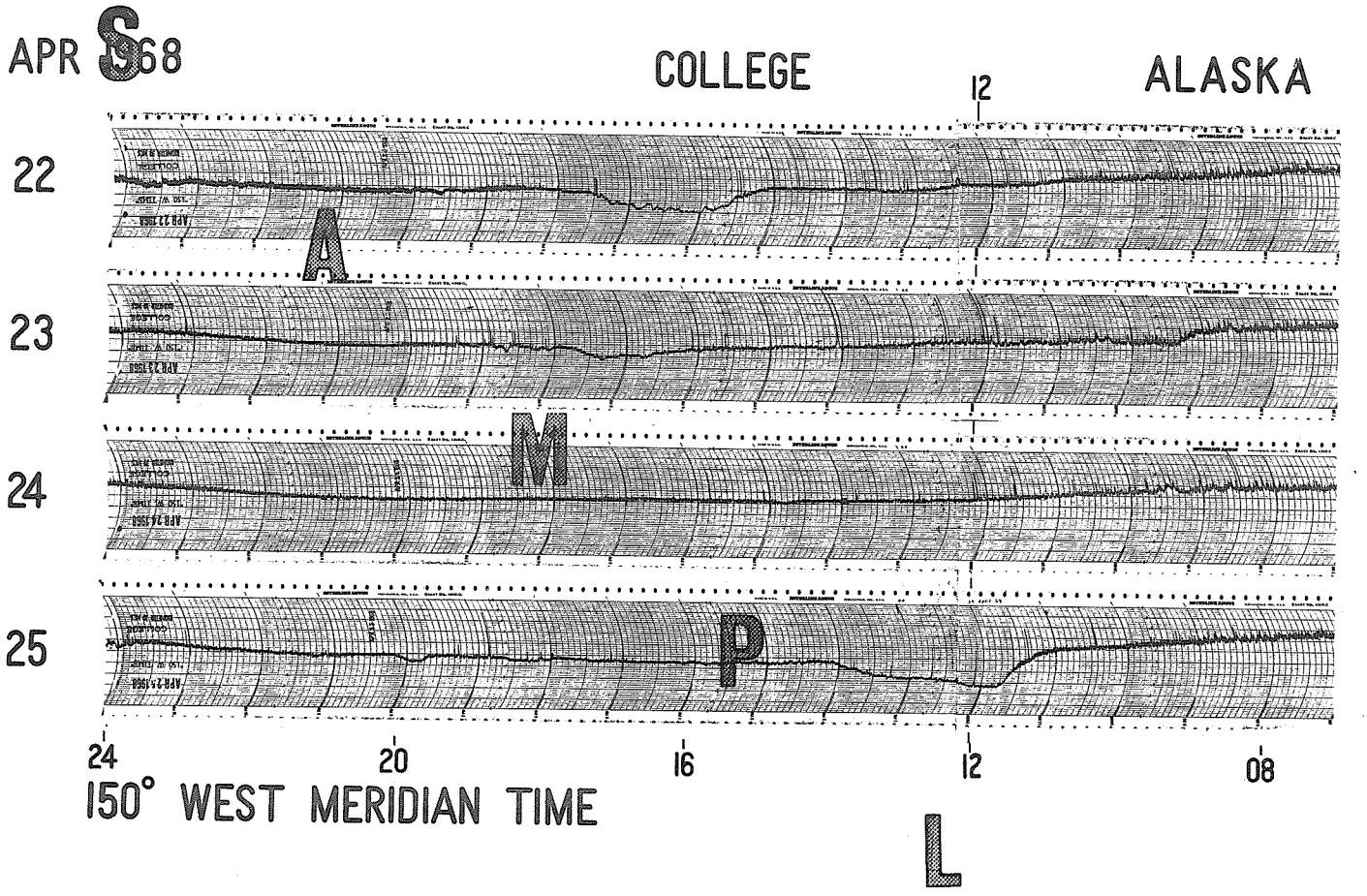
B.8


APR 68
COLLEGE
ALASKA
12
22
23
24
25
A
M
P
L
E
24
20
16
12
08
150° WEST MERIDIAN TIME

STRIP CHARTS

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
THULE	76N	292		B				Q	Q	Q	Q	Q	Q	Q	Q	Q	
RESOLUTE BAY	74N	266			Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	A	Q
BARROW	71N	204		B	S												
AMDERMA	69N	61								P	P						
BAR 1	69N	220											B	A	A	Q	Q
GODHAVN	69N	307							Q		Q	Q	Q	Q	Q		
NORILSK	69N	88								Q	Q	B					
TROMSO	69N	19									Q	Q	Q	Q	Q	Q	Q
UTSJOKI	69N	27											Q	Q	Q	Q	Q
SHEPHERD BAY	68N	267							Q	Q	Q	Q	Q	Q	Q	Q	
KIRUNA	67N	20										A	A	A	A	B	
SDR STROMFJORD	67N	310														Q	Q
FT YUKON	66N	215		C									A	A	A	Q	Q
OULU	65N	25														Q	Q
COLLEGE	64N	213	B	A					B	A	A	A	A	A	A	C	Q
CORAL HARBOR	64N	277			Q	Q	Q	Q	Q	Q	S						
REYKJAVIK	64N	339									B	A	A	A	A	Q	
FROBISHER BAY	63N	292							B	A	C	S					
PAXSON	63N	215											B	A	A	B	Q
FAREWELL	62N	207	C	A	S												
YAKUTSK	62N	129															Q
ANCHORAGE	61N	211						B	A	A	A	A	A	A	B		
SHEEP MOUNTAIN	61N	213											B	A	A	Q	Q
NARSSARSSUAQ	61N	314										Q	Q	Q	Q	Q	Q
WILDWOOD	60N	209											B	A	A	Q	Q
NURMIJARVI	60N	24											Q	Q	Q	Q	Q
CHURCHILL	58N	266				Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	A	Q
KING SALMON	58N	204	C	A	S												
EDINBURGH	55N	357								Q	Q						
GREAT WHALE	55N	283							B	A	A	A	A	A	A	A	
CAPE JONES	54N	281			Q	Q	Q	Q	A	A	B	S					
COLD LAKE	54N	249							Q	Q							
PRINCE ALBERT	53N	255							Q	Q	Q	Q	Q	S			
UNALASKA	53N	194	C	A	S												
MOOSONEE	51N	280							Q	Q	Q	Q	Q	Q	Q	Q	
VAL D≠OR	48N	283			Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
BAIE ST PAUL	47N	290							B	A	B	S					
OTTAWA	45N	285	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
BOSTON	42N	289							Q	B	B	A	Q	B	Q	Q	Q
TOLEDO	39N	355														Q	Q
ATHENS	37N	23							Q	Q							
ALAMOGORDO	32N	319						Q	Q	Q	S						
HAIFA	32N	35							Q	Q	Q	Q					
DELHI	28N	77							Q	Q	A	Q	Q	Q	Q	Q	Q
MAUI	20N	204						Q	Q	Q	Q	S					
JAMAICA	18N	284									Q	Q	Q	Q	Q	S	
MANILA	14N	121							Q	Q	Q	Q	Q	Q	Q	Q	
ACCRA	05N	360						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
HUANCAYO	12S	285					Q	Q	Q	Q	Q		Q	Q	Q	Q	
SAN JOSE	23S	315							Q	R	Q	Q	Q	Q	Q	Q	

KEY TO SYMBOLS

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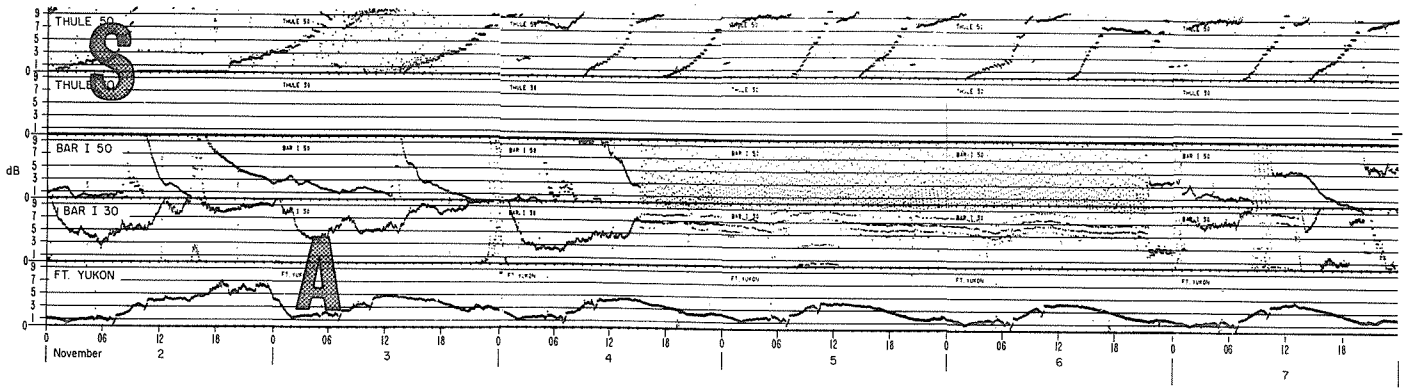
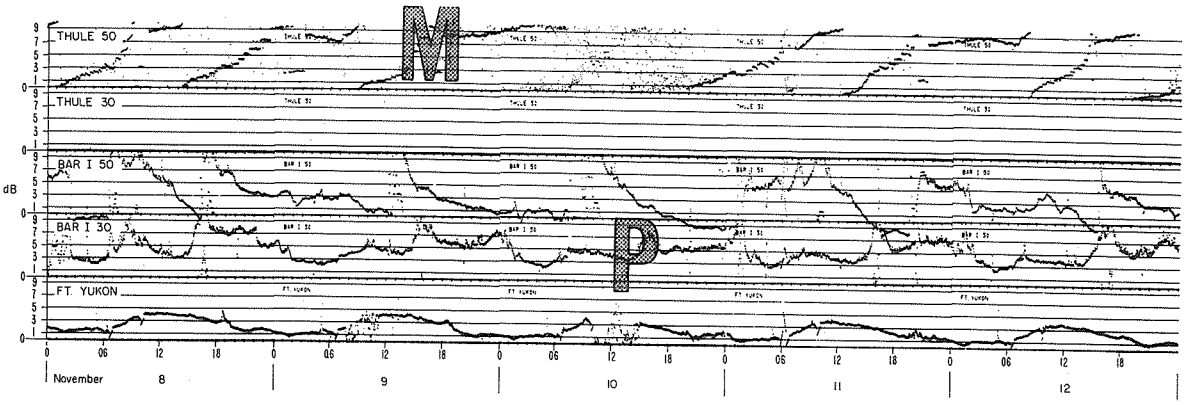
B.8

November 2-12, 1969





SAMPLE

B.8 ABSORPTION - METHOD A2 (RIOMETER)

AT BOULDER

STRIP CHARTS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
CARNARVON	25S	114										C	Q	Q	Q	Q	Q
DURBAN	29S	30														Q	Q
HERMANUS	34S	19						Q	Q	Q	Q	Q	Q	Q	Q	Q	
MELBOURNE	37S	144											Q	Q			
KERGUELEN	49S	70						Q		Q	Q						
CAMPBELL IS	52S	169												Q	Q	Q	Q
MACQUARIE	54S	150												Q	Q	Q	Q
CASEY	66S	110													Q	Q	Q
MAWSON	67S	62												Q	Q	Q	
DAVIS	68S	78													Q	Q	Q
SYOWA BASE	69S	39											B	A	A		
SANAE	70S	358								B	A	C					
BAUDOUIN	70S	23									Q	Q					
CAPE HALLETT	72S	170				B	Q	Q	Q	S							
EIGHTS	75S	283							B	A	B	S					
BELGRANO	77S	322								B	A	A	A				
MCMURDO	77S	166						C	Q	Q	Q	Q	Q	Q	Q		
VOSTOK	78S	106								C	A	A	A	A	A	A	
BYRD STATION	80S	240							A	A	A	A	A	A	A	A	Q
SOUTH POLE	90S	0							A	A	A	A	A	A	A	A	Q

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B.9

Method A3 (CW Field-Strength) data consist of monthly tables of hourly or half-hourly values of absorption obtained by measurement of the field strength of sky-wave signals at either short distance or at oblique incidence on suitable frequencies. Some unscaled strip charts, used primarily for relative field-strength for evidence of sudden ionospheric disturbances, are also available.

Transmitter: Kiel-radio Frequency: 2775 kHz Recept. station: Kolberg

Power: 0.5 kW Reduct. factor: Distance: 340 km

Month: April 1964 Geograph. coord. of refl. point: φ = 53° 19' ; λ = 12° 01'

Time: [GMT]	06.00 06.15	06.30 06.45	07.00 07.15	07.30 07.45	08.00 08.15	08.30 08.45	09.00 09.15	09.30 09.45	10.00 10.15	10.30 10.45
Date	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB
1.	-		29,0	27,0	27,0	24,0	22,0	18,0	17,5	15,5
2.	47,0	[illegible]5	48,0	52,5	51,0	49,0	45,5	41,0	36,5	37,0
3.	44,0	40,5	41,5	-	-	-	-	-	-	-
4.	-	37,0	37,0	35,0	34,0	33,0	31,0	28,0	30,0	29,0
5.	-	-	-	-	-	-	-	-	-	-
6.	43,5	42,5	39,5	39,5	37,5	36,0	35,0	34,0	33,0	31,0
7.	46,5	44,5	43,5	40,5	41,5	34,5	35,5	35,0	35,5	32,0
8.	50,5	50,5	44,5	42,5	41,5	38,0	35,0	32,0	34,5	30,0
9.	48,0	48,0	43,5	42,5	39,5	35,0	34,0	32,5	29,5	29,0
10.	42,0	43,0	40,5	35,0	34,5	31,5	26,0	29,0	24,5	27,5
11.	37,5	34,0	34,0	31,5	34,0	30,5	26,5	-	26,5	24,5
12.	40,0	39,5	34,5	33,0	30,0	28,[illegible]	26,5	24,5	20,5	21,0
13.	40,0	34,0	33,0	31,0	23,0	26,5	24,0	28,0	26,5	25,0
14.	36,0	31,5	32,0	28,0	27,5	22,5	21,0	26,5	27,0	19,0
15.	45,0	44,0	41,0	37,5	34,0	-	24,0	25,5	23,0	23,0
16.	42,0	41,0	-	34,5	33,5	29,5	26,0	23,5	24,5	21,0
17.	38,0	37,5	-	32,5	29,5	26,5	26,5	23,5	22,0	20,5
18.	43,0	-	-	-	33,0	28,0	28,5	26,0	21,5	23,0
19.	38,0	36,5	37,5	33,0	32,5	31,0	25,0	-	28,5	27,0
20.	42,5	43,5	42,5	37,5	34,5	33,0	32,5	25,5	25,5	23,0
21.	40,0	38,5	34,5	30,5	26,5	24,5	22,0	20,5	19,0	17,0
22.	41,0	35,0	35,0	30,5	38,5	24,5	22,0	22,5	20,0	20,0
23.	45,5	41,0	30,5	34,0	29,5	24,0	22,5	22,0	19,0	19,5
24.	33,5	33,0	33,5	-	24,5	23,0	21,0	21,0	17,0	19,0
25.	41,0	37,5	36,0	30,5	27,0	25,5	22,0	23,0	20,5	15,5
26.	42,0	38,0	35,5	36,0	29,5	25,0	21,5	23,0	16,0	18,0
27.	48,0	48,5	41,5	36,5	31,5	27,0	22,0	21,0	20,5	20,5
28.	51,5	50,0	45,5	40,0	33,0	26,0	24,5	-	-	-
29.	33,0	31,0	30,5	25,5	26,5	28,0	25,5	24,5	25,0	21,0
30.	34,5	35,0	31,0	-	25,0	23,0	17,5	21,0	18,5	20,5
31.										
Median										

B.9 ABSORPTION - METHOD A3 (CW FIELD STRENGTH)

AT BOULDER

TABULATIONS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
KUHLUNGSBORN	54N	11	B	A	B	B	A	B	B	A	A	A	A	A	A	A	C
NEUSTRELITZ	53N	11								A	A	A	A	A	A	A	C
DE BILT	52N	5												B	A	C	Q
KOLBERG	52N	13								A	A	S					
COLLM	51N	13						B	A	A	A	A	A	A	A	Q	Q
LINDAU	51N	10	C	B	A	A	A	A	A	A	A	A	A	A	C		
PANSKA VES	50N	14					A		C	A	A	S					
PRUHONICE	50N	14								C	A	A	A	A	A	A	
NAGYCENK	47N	16											Q	A	Q	Q	
SOFIA	42N	23								A	A						
AKITA	39N	140								A	A	S					
ATHENS	38N	23														C	C

B.9 FIELD-STRENGTH STRIP CHARTS (UNSCALED)GTH)

AT BOULDER

STRIP CHARTS (UNSCALED)

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
ANCHORAGE	61N	211	B	A	A	A	A	A	B	A	A	A	A	B	B	C	
ADAK	51N	184	B	A	A	A	A	A	A	A	A	S					
BOULDER	40N	255				B	A	A	B	A	A	B	A	A			
FT MONMOUTH	40N	286		C	A	A	A	A	A	A	A	B	C	S			
FT BELVOIR	38N	283	B	A	A	A	A	A	A	A	A	A	A	C			
WHITE SANDS	32N	253	B	A	A	A	B	A	A	A	A	A	A	A	A	C	
OKINAWA	26N	128	B	A	A	A	A	A	A	A	A	A	A	B	A	C	
PUERTO RICO	18N	293	B	A	A	A	A	A	B	S							
TRINIDAD	10N	299								B	A	A	B	A	B	C	
HUANCAYO	12S	285	B	A	A	A	A	A	A	A	A	A	A	A	A	C	

KEY TO SYMBOLS

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B.10

Drift measurements are of four methods:

D1 - intercomparison of fading signals at three or more antennas spaced a few wavelengths apart

D2 - radio observations on drifting meteor trails

D3 - radio-star scintillations with three or more antennas spaced many wavelengths apart

D4 - observations of characteristic reflection features at widely spaced sites

[D5 - chemical releases from rockets] (cf COSPAR Information Bulletin No. 45, p. 14, Decision 20, August 1968)

IRKUTSK — IONOSPHERIC DRIFTS

Дата Date	Время Time GMT	Слой, высота (км) Region Height (км)	V м/сек. m/s	Ф град. deg.	Vx м/сек. m/s	Vy м/сек. m/s
		Январь — 1968 год January				
3	03.09	130 E	97	317	—66	+72
	04.36	120 E	161	27	+73	+143
	08.35	250 F_2	240	180	00	—240
	13.06	330 F_2	337	00	00	+337
4	00.35	250 F_2	136	237	—113	—75
	01.05	110 Es	124	241	—108	—61
	01.35	110 Es	97	229	—73	—64
	02.05	110 Es	55	251	—52	—18
	02.35	110 Es	113	221	—73	—86
	03.05	105 Es	104	244	—93	—46
	03.35	110 Es	264	212	—141	—223
	04.05	110 Es	107	225	—76	—75
	04.35	130 E	152	236	—127	—84
	06.05	125 E	216	00	00	+216
	06.35	100 E	182	22	+68	+169
	11.35	225 F_2	234	318	—157	+174
	19.05	335 F_2	107	282	—104	+22
	19.35	305 F_2	147	270	—147	00
	20.05	300 F_2	120	270	—120	00
	20.35	305 F_2	87	231	—67	—55

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
MURMANSK	68N	33		C	A	C				B	A	C	S				
COLLEGE	64N	213												Q			
GORKY	56N	44	B	A	A	C	S										
TOMSK	56N	84	C	A	B	A	B	B	B	A	A	B	A	B			
KOOTWIJK	55N	5	B	A	S												
MOSCOW	55N	37	CW	AW	AW					B	B	S					
KUHLUNGSBORN	54N	11	B	A	B	B	A	B	B	A	A	A	A	A	A	A	C
ABERYSTWYTH	52N	356								A	A						
CAMBRIDGE	52N	0	B	B	B	S											
IRKUTSK	52N	104		B	B	A	A	B	C	B	B	B	B	C			
NEDERHORST	52N	5	B	A	S												
DE BILT	52N	5														C	Q
COLLM	51N	13						B	A	A	A	A	A	A	A	A	C
SWANSEA	51N	356	B	C	S												
COLOGNE	50N	6	B	C	S												
KHARKOV	50N	36	C	A	A	Q	S										
FREIBURG	48N	7	B	A	A	A	A	S									
GARCHY	47N	3										P	P	P			
ROSTOV	47N	39		BW	AW	BW				AW	BW		BW	CW			
OTTAWA	45N	285	C	S													
SIMEIS	44N	34	C	B	S												
ALMA ATA	43N	76								B	B	B	B	C	C		
ASHKHABAD	37N	58		A	A	B	B	B	C	B	B	B	B				
YAMAGAWA	31N	130	B	A	B	C	C	C	C	A	A	C	C	C			
AHMEDABAD	23N	72	B	B	S												
PUERTO RICO	18N	293	A		B	B											
WALTAIR	17N	83	B	A	B	S											
BARBADOS+	13N	300								B	B						
TOGO	10N	0									B	B	S				
IBADAN	07N	3	C	B	S												
SINGAPORE	01N	103								B	C	S					
JOHANNESBURG	26S	28		A	S												
BRISBANE	27S	153	B	A	S												
ADELAIDE	34S	138												Q	Q	Q	
LOWER HUTT	41S	174	B	A	S												
HALLEY BAY	75S	334	B	A						C	A						

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B.11

IONOSPHERIC SCINTILLATIONS FROM SATELLITE BEACONS

In the polar regions there often occur columns of enhanced ionization aligned with the earth's magnetic field, known as field aligned irregularities. These irregularities of the ionosphere occur in association with the aurora and other high-latitude phenomena. Owing to variations in refractive index and to multipath effects produced by these irregularities, signals propagating through the ionosphere during times when such irregularities are present suffer perturbations which have characteristics similar to "noise". These perturbations have been studied extensively over the past decade by radio-astronomy techniques and are known as radio-star scintillations. Since they are related to the aurora, the occurrence statistics are similar to that of the aurora: the diurnal maximum occurs near magnetic midnight; the day-to-day fluctuations are similar; seasonal variations maximize near equinoxes; and they are more frequent during solar maximum periods.

During the past several years they have been noted to affect signals from satellites in the polar regions. On such signals they produce an effect very similar to a noise-enhancement. The data signals will sometimes be nearly unusable and command functions from the ground to the spacecraft will sometimes become scrambled. These effects are common in the 100 MHz to 400 MHz region. Such effects diminish according to the inverse square of the frequency. Thus recent spacecraft utilize frequencies in the range of 1700 MHz. Similar irregularities occur also in the equatorial regions and are observed during acquisition of satellite signals at stations located within about ± 10° from the geomagnetic equator.

The scintillation signals as received during satellite acquisition may provide a means of studying such scintillations in addition to the usual radio astronomical methods. Further, such studies may help in design of spacecraft telemetry and in determining best locations for satellite data acquisition stations. Thus the WDC will attempt to preserve records for certain of the existing stations in the polar and equatorial regions.

Recordings held are the strip charts from some of the telemetry sites for selected periods.

B.11 IONOSPHERIC SCINTILLATIONS FROM SATELLITE BEACONS

AT BOULDER

STRIP CHARTS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
OULU	65N	25											Q	Q	Q	Q	
BAKER LAKE	64N	264				B	B	B	B	B							
COLLEGE	64N	212							C	B	A	A	A				
NORTHWAY	63N	218							C								
CAMPBELL IS	52S	169												Q	Q	Q	
ADAK	51N	183					C	B									
MOOSE RIVER	51N	279							C								
HOUGATON	47N	271					C	C									
MADISON	43N	271					A	C									
DANVILLE	40N	272							C								
URBANA	40N	272		B	A	B	B	B	A	B							
TAIPEI	25N	121													Q	Q	
WAKE ISLAND	20N	166				C		C									
LIMA	11S	282										A	B				
AUCKLAND	37S	175													Q	Q	
WELLINGTON	41S	174													Q	Q	
INVERCARGILL	46S	168													Q	Q	
SCOTT BASE	77S	166													Q	Q	
BYRD	80S	240					C										

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PUBLICATIONS:

The following list of publications is from work done by The Joint Satellites Studies Group:

1. Auroral Oval and Scintillation Boundary, AFCRL, Bedford #68-0380, July 1968.
2. Geophysical Aspects of Radio Star and Satellite Ionosphere Scintillations from book Spread F and Its Effects Upon Radio Wave Propagation and Communication, pp 247-266, 1966.
3. Latitudinal Effects on Satellite Scintillations, AFCRL #66-864, Dec. 1966.
4. Measurements of Radio Star and Satellite Scintillations at a Sub-Auroral Latitude, AFCRL #65-40, Jan. 1965.
5. Relation of Sudden Frequency Deviations to the Spectrum and Other Characteristics of Solar Microwave Bursts, J. Atmos. and Terr. Phys., Vol. 31, 1969.
6. Scintillation Boundary, J. Geophys. Res., Vol. 74, Feb. 1969.
7. Scintillation Observations of Synchronous Satellites, AFCRL #69-0011, Jan. 1969.
8. Studies of Latitudinal Variations of Irregularities by Means of Synchronous and 1000 Kilometer Satellites, Space Research, Vol. 7.
9. Synoptic Study of Scintillations of Ionospheric Origin in Satellite Signals, AFCRL, April 1965.
10. 136 MHz Early Bird Scintillations, Summer, 1965 Observations, AFCRL #66-0859, Oct. 1966.
11. Geomagnetic Control of Satellite Scintillations, J. Geophys. Res., Vol. 68, 1963.
12. The Statistics of Satellite Scintillations at a Sub-Auroral Latitude. J. Geophys. Res., Vol. 69, 1964.

IONOSPHERIC BACK-AND FORWARD-SCATTER

Little data in WDC-A. Stations are invited to report their experimental arrangement, the outline of the observing schedule, and the data reduction and analysis made or intended. The information will be catalogued and inquiries referred to the experimenter.

S

Kühlungsborn
(54°07'N ; 11°46'E)

September 1963

A

33 Mc/s Radar Observations

of E_s-propagated ground-backscatter and
of long-duration (> 0,3 s) meteor echoes

- = no occurrence
x = no observation

M

P

L

E

Date	Occurrence of E_s-propagated ground-backscatter (Direction/Intensity, 0-3)							Mean daily meteor echo rate (h^{-1})
	13.35	15.05	16.35	18.05	19.35	21.05	22.35 UT	
1.	-	-	-	-	-	-	-	17
2.	-	-	-	-	-	-	-	21
3.	-	-	-	-	-	-	-	23
4.	-	-	-	-	-	-	-	23
5.	-	-	-	-	-	-	-	16
6.	-	-	-	-	-	-	-	25
7.	-	-	-	-	-	-	-	14
8.	-	-	-	-	-	-	-	24
9.	-	-	-	-	-	-	-	25
10.	-	-	-	-	-	-	-	28
11.	-	-	-	-	-	-	-	5
12.	-	-	-	-	-	-	-	17
13.	-	-	-	-	-	-	-	14
14.	-	-	-	-	-	-	-	20
15.	-	-	-	-	-	-	-	29
16.	-	-	-	-	-	-	-	30

E

B.12 IONOSPHERIC BACK AND FORWARD SCATTER

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
BARROW	71N	204								B	A	A	B	Q	Q	Q	Q
COLLEGE	64N	213	C	C	S												
YAKUTSK	62N	129	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
NARSSARSSUAQ	61N	315													C	B	C
ALSBJERG	56N	9														Q	Q
ANNETTE	55N	229								A	A	A	A	S			
KNOB LAKE	54N	294		C	S												
KUHLUNGSBORN	54N	11	B	A	B	B	A	B	B	A	A	A	A	B	A	A	C
MEANOOK	54N	247		B	S												
LINDAU	51N	10														Q	Q
PULLMAN	46N	243	C	A	S												
PLUM ISLAND	43N	289								C	A	S					
MILLSTONE	42N	288							B	C							
CEDAR RAPIDS	41N	269		B	S												
ROMA	41N	12	C	B	S												
BOULDER	40N	255	C	A	S												
FT MONMOUTH	40N	290		B	S												
SAN FRANCISCO	37N	238	C	A	S												
TOKYO	35N	139	BW	AW	CW	S											
OKINAWA	26N	127		C	S												
PANAMA	09N	281	C	C	S												
NAIROBI	01S	36													Q	Q	Q
HUANCAYO	12S	285	C	A	S												
AREQUIPA	16S	289	C	B	S												
ANTOFAGASTA	23S	290	C	B	S												
DURBAN	29S	30	C	S													
CAMDEN	34S	150	C	A	S												

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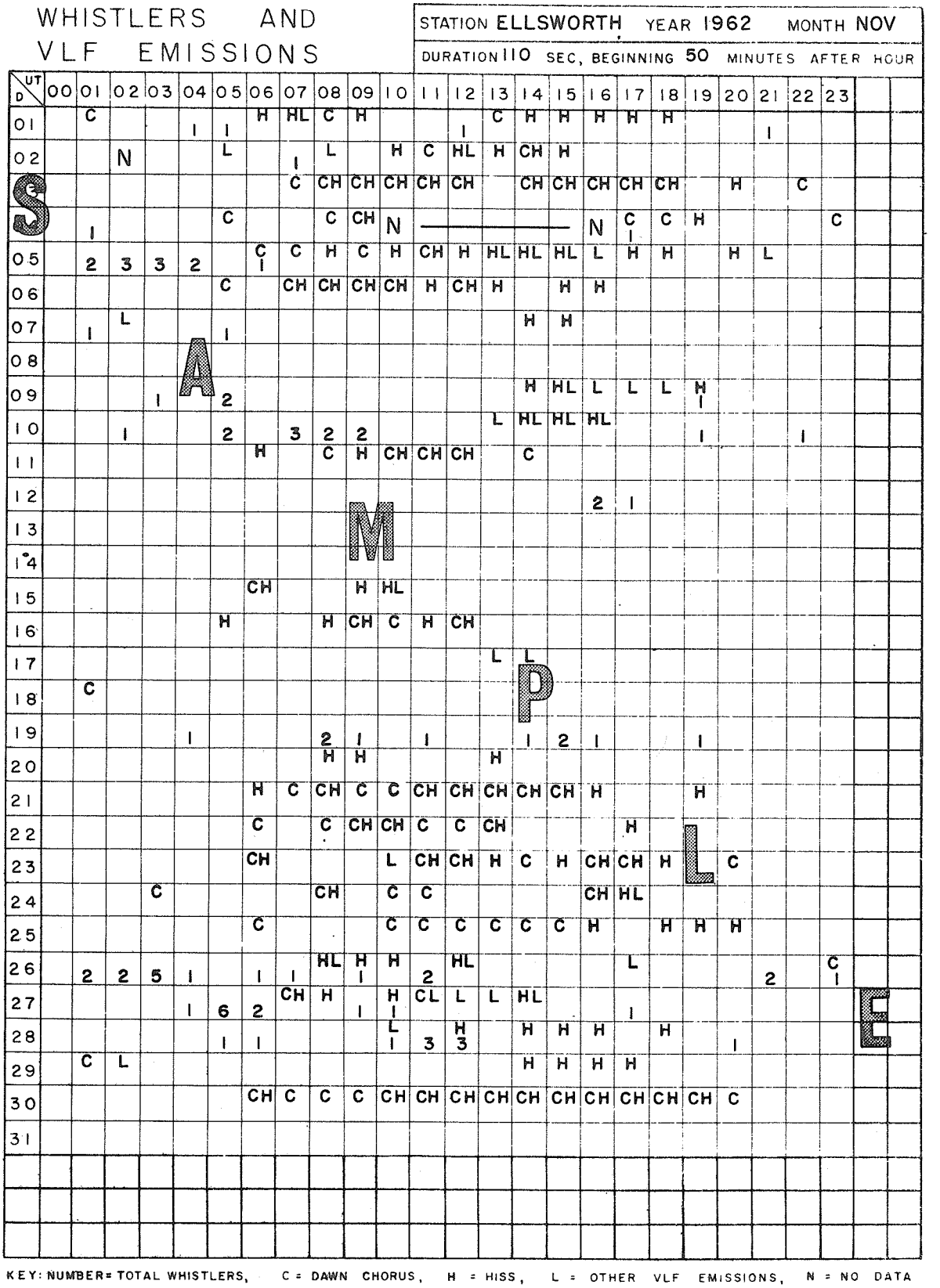
MOVIES:

1. Influence of Ionospheric Waves on HF Sweep-Frequency Backscatter, by Thomas A. Croft, Radio Science Laboratory, Stanford University, Stanford, California, 16 mm color movie film, no sound, $10.00 minimum charge for loan.

B.13

These data consist of monthly aural data summaries and continuous VLF noise recordings.



AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
NORD	81N	344								A	S						
GODHAVN	69N	307	B	A	A	A	A	A	B	A							
TROMSO	69N	19							A	S							
KOTZEBUE	66N	198	C	A	S												
COLLEGE	64N	213		A	B	C	S										
FROBISHER BAY	63N	292	C	C	B	S											
SOGRA	62N	46								B	A	A	B	C			
ANCHORAGE	61N	211	C	A	S												
NARSSARSSUAQ	61N	315							A	A							
GREAT WHALE	55N	283						C	S								
MOSCOW	55N	37	C	B	A	A	S										
SALTHOLM	55N	12				B	A	S									
KNOB LAKE	54N	294		B	B	B	B	A	A	B	A	C	S				
KUHLUNGSBORN	54N	11	B	A	B	B	A	B	B	A	A	A	A	C			
NEUSTRELITZ	53N	11												B	A	A	
UNALASKA	53N	194	B	A	C	S											
CAMBRIDGE	52N	0	C	S													
WETASKIWIN	52N	247	C	A	S												
ADAK	51N	184						B	S								
MOISIE	50N	294				B	B		B	S							
PRUHONICE	50N	14			A	C	S										
SUFFIELD	50N	249						B	S								
FREIBURG	48N	7									A	A	A				
MONT JOLI	48N	292		B	A	C	S										
SEATTLE	47N	238	B	A	A	A	B	S									
POITIERS	46N	0							A	A	A	A	A	A	A	A	
OTTAWA	45N	285	B	A	S												
WAKKANAI	45N	141	B	A	A	A	A	A	S								
GENOVA	44N	9										B	A	C			
HALIFAX	44N	300	B	B	S												
MOSHIRI	44N	142						C	A	A	A	A	A	A	A	B	
ROBURENT	44N	7										B	A	C			
HANOVER	43N	288	C	C	S												
NORWICH	43N	288	C	A	A	A	A	A	A	A	A	C	S				
ROCHESTER	43N	283					C	A	A	C	A	C	S				
BATTLE CREEK	42N	275	B	A	S												
BOULDER	40N	255	B	A	C	S											
MISENO	40N	15				B	B	A	C	S							
WASHINGTON	38N	289	C	A	B	S											
SAN FRANCISCO	37N	238	B	A	A	A	C	A	C	S							
TOYOKAWA	34N	137	B	A	A	A	A	A	A	A	A	B					
BERMUDA	32N	296	C	B	B	A	A	B	C	S							
GAINESVILLE	29N	278	C	B	C	S											
ARECIBO	18N	294									A	C	S				
TUCUMAN	26S	294							B	C							
BRISBANE	27S	153	B	A	A	S											
DURBAN	29S	30	C	B	C					A	B	C					
ADELAIDE	34S	138	C	A	S												
WELLINGTON	41S	174	C	A	A	A	B	A	Q	Q	Q	Q	Q	Q	Q		
HOBART	42S	147	B	A	S												
DUNEDIN	45S	170		B	C	A	C	S									
LAUDER	45S	169						B	Q	Q	Q	Q	Q	Q	Q		
KERGUELEN	49S	70								B	A	A	B	C			
MACQUARIE	54S	158	B	A	C	S											
ARGENTINE ISLAND	65S	296	B	A	A	A	B	B	C	A	A	C	S				
SANAE	70S	357														Q	Q
ELLSWORTH	77S	319	B	A	A	A	A	B	S								
SCOTT BASE	77S	166													Q	Q	
BYRD STATION	80S	240			B	B	B	S									

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These data consist of monthly tables of hourly values of the noise power in dB for each frequency on which measurements are made. Most stations observe on several frequencies in the range 0.013 to 20 MHz.

MONTH-HOUR VALUES OF RADIO NOISE.

STATION ENKOPING, SWEDEN LAT. 59.5 N LONG. 17.3 E MARCH 1966

HR. LST	FREQUENCY (MHz) .013					.051					.160					.495				
	F_{am}	D_u	D_ℓ	V_{dm}	L_{dm}	F_{am}	D_u	D_ℓ	V_{dm}	L_{dm}	F_{am}	D_u	D_ℓ	V_{dm}	L_{dm}	F_{am}	D_u	D_ℓ	V_{dm}	L_{dm}
00	150			10.0	15.8	117	4.0	5.3	* 9.5	*14.0	95	6.0	2.3	* 6.8	*10.5	105	2.0	8.0	* 1.0	* 1.5
01	150	1.3		11.0	16.5	116	5.1	4.6	*10.0	*15.5	97	5.9	6.0	* 6.5	*10.0	105	4.0	10.2	* 3.0	* 3.5
02	150	2.0		12.0	18.5	117	4.0	6.0	10.5	16.0	* 93			* 6.5	* 9.0	101	7.0	5.5	* 4.0	* 5.0
03	149	3.0		11.0	17.0	117	4.0	7.5	10.0	15.0	97	7.7	4.1	* 5.3	* 9.3	97	6.0	9.3		
04	150	2.0	5.3	11.3	17.0	117	2.0	8.0	9.5	14.5	94	5.1	3.0	* 6.0	* 9.5	79	14.9	8.9		
05	150	2.0	6.0	11.0	18.0	113	4.1	7.7	*10.0	*14.5	* 97					* 72				
06	148	3.5	4.0	11.5	17.0	107	3.9	6.0	*10.5	*15.5	81	8.0	4.0	* 4.0	* 6.3	60	13.3	5.0	* 2.5	* 4.0
07	144	2.0	4.0	11.5	17.5	103	8.2	6.2	9.8	13.8	83	8.2	4.2	* 2.8	* 5.3	65	6.4	8.3	* 2.5	* 4.5
08	142	4.0	4.0	11.0	16.5	99	11.9	6.0	*11.3	*15.5	86	9.9	7.0	* 7.8	*14.0	55	8.0	2.0	* 3.0	* 4.5
09	142	2.1	4.1	11.3	17.3	99	13.2	5.1	*12.8	*16.0	87	6.0	5.3	* 6.3	*10.5	* 57			* 2.8	* 5.0
10	142	4.0	4.9	*12.3	*18.5	99	10.3	6.0	*13.0	*18.0	85	4.7	8.0	* 6.5	*10.0	55	5.3	2.0	* 3.0	* 5.5
11	142	4.0	4.0	11.5	17.5	103	7.1	6.0	11.5	16.5	85	6.1	2.8	* 5.0	* 8.0	55	8.0	3.9	* 2.5	* 5.0
12	143	3.0	5.0	10.5	16.0	103	7.2	12.2	*13.0	*18.5	* 82			* 4.5	* 8.0	55	2.1	2.3	* 1.5	* 3.5
13	144	2.0	4.0	* 9.3	*14.5	105	4.9	12.9	*13.0	*16.0	81	4.0	5.1	* 4.5	* 7.0	55	7.5	2.0	* 3.5	* 5.0
14	144	2.0	2.1	8.5	13.0	101	10.9	8.0	*12.5	*19.5	80	7.0	7.1	* 4.5	* 7.5	57	4.3	6.0	* 2.0	* 3.0
15	144	4.0	2.0	8.5	13.0	102	9.2	7.1	*10.5	*14.0	83	4.7	7.4	* 6.0	*10.0	65	11.0	4.0	* 1.3	* 3.0
16	144	3.6	3.6	7.0	11.0	104	10.7	7.1	* 6.0	*10.0	85	4.0	6.7	* 5.5	* 9.0	70	18.7	7.6	* 3.5	* 4.3
17	144	3.6	4.0	7.5	12.0	107	8.0	8.0	*11.5	*17.5	85	8.0	4.3	* 4.8	* 9.5	89	7.5	7.5	* 2.5	* 3.5
18	144	5.5	2.0	7.5	12.0	109	7.9	4.2	8.0	12.5	91	4.0	6.0	* 5.3	* 9.0	96	6.3	16.1		
19	146	4.0	3.5	7.5	12.0	113	4.3	6.0	7.0	11.0	93	4.1	5.9	* 6.5	*10.3	96	4.3	8.3	* 4.0	* 5.0
20	146	5.6	2.0	7.5	12.0	115	3.7	7.6	6.0	10.0	93	6.1	2.0	* 4.5	* 7.0	99	5.5	7.5	* 1.5	* 2.0
21	146	4.0	2.0	7.5	12.8	115	6.0	5.5	8.0	12.5	93	8.0	6.0	* 6.5	*10.3	96	9.9	3.9		
22	148	3.5	2.0	7.5	12.3	115	6.0	4.1	9.0	13.5	95	4.1	7.2	* 6.3	* 9.0	103	4.0	5.1	* 1.5	* 2.0
23	148	3.5	2.0	9.5	14.0	117	4.0	6.0	8.5	13.0	97	4.0	7.5	* 6.5	* 9.5	101	5.5	4.0	* 1.5	* 2.0

F_{am} = median value of effective antenna noise in dB above kT_0b

D_u = ratio of upper decile to median in dB.

D_ℓ = ratio of median to lower decile in dB.

V_{dm} = median deviation of average voltage in dB below mean power.

L_{dm} = median deviation of average logarithm in dB below mean power.

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
THULE	76N	292		B	B	B	C	B	S								
MURMANSK	68N	33			C	A	A	A	A	B	B	S					
ENKOPING	59N	17		B	B	A	A	A	B	A	A	A	A	B	Q		
SVERDLOVSK	56N	61			B	B	A	B	A	B	B	S					
MOSCOW	55N	37		B	A	A	B	C	B	B	S						
KUHLUNGSBORN	54N	11	B	A	B	B	A	B	B	A	A	A	A	A	A	A	C
IRKUTSK	52N	104		C	A	B		B	B	A	A	S					
SLOUGH	51N	360	B	A	C	S											
TATSFIELD	51N	0	C														
KIEV	50N	30				C	B	A	A	A	A	S					
PANSKA VES	50N	14	B	A	B	A					C	C					
PRUHONICE	50N	14	B	A	B	A	C										
BAGNEUX	48N	2	B	A	S												
BREST	48N	356	B	A													
KHABAROVSK	48N	135		C	A	B	B	A	B	B	A	S					
TRAPPES	48N	2	B	A													
SIMFEROPOL	44N	34		C	B	B	B		C	A	A	S					
ALMA ATA	43N	76		C	A	C	B	B	A	A	A						
BILL	43N	255	C	B	A	C	C	C	A	A	B	S					
STAR HILL	43N	285											A	A	C	S	
TBILISI	41N	44			C	A	B	A	A	B	A	S					
BOULDER	40N	255	B	A	A	B	A	A	A	A	B	B	S				
FRONT ROYAL	38N	282	C	A	B	A	A	A	B	A	B	S					
WARRENSBURG	38N	267					B	B	A	B	C	S					
ASHKHABAD	37N	58			B	B	B	C	S								
NICOSIA	35N	33	C	S													
OHIRA	35N	140		B	A	A	A	A	A	A	B	A	A	B	Q		
TOTTORI	35N	134									C	S					
YOKOSHIBA	35N	140	C	A	S												
TOYOKAWA	34N	137	B	A	A	A	A	A	A	A	A				C		
RABAT	33N	354	B	B	B	A	B	B	B	C	B	B	A	B	Q		
GILA BEND	32N	248											C	A	C	S	
DELHI	28N	77		Q	Q	B	A	B	A	A	B	B	A	B	Q		
TAIPEI	25N	121											B	B	Q		
KEKAHA	22N	201		B	A	B	A	A	A	B	B	S					
MACAU	22N	113			C	S											
BANGKOK	13N	100										C	Q	Q	S		
ZARIA	11N	7												Q	C		
BALBOA	09N	281		B	A	A	A	A	A	B	A	B	C	S			
IBADAN	07N	3		B	C	B	B	C	S								
ACCRA	05N	360	B	C	S												
BANGUI	04N	18		B													
FANNING	03N	201	C	S													
SINGAPORE	01N	103		B	A	A	A	B	A		B	B	S				
COONAWARRA	12S	130	C	S													
CLONCURRY	20S	40	C	A	S												
SAN JOSE	23S	315		C	B	A	B	C	B	A	B	A	A	B	Q		
PRETORIA	26S	28		B	B	A	A	A	A	A	B	B	A	B	Q		
COOK	30S	130		B	A	A	A	A	A	A	A	B	Q	Q	Q		
PEARCE	31S	116	C	S													
ROCK BANK	37S	144	C	B	S												
KERGUELEN	49S	70	B	A	C	S											
PORT STANLEY	51S	303	C	S													
USHUAIA	54S	292													Q		
ELTANIN SHIP	60S							B	A	B	C	S					
BYRD STATION	80S	240		B	B	A	A	B	C	C	S						

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S = Program STOPPED operations (see MASTER STATION LIST for actual date)

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
67-042A-04	Ariel 3	Terrestrial Radio (Thunderstorm) Noise	Murphy	05/05/67	0567-0468

C. FLARE-ASSOCIATED EVENTS

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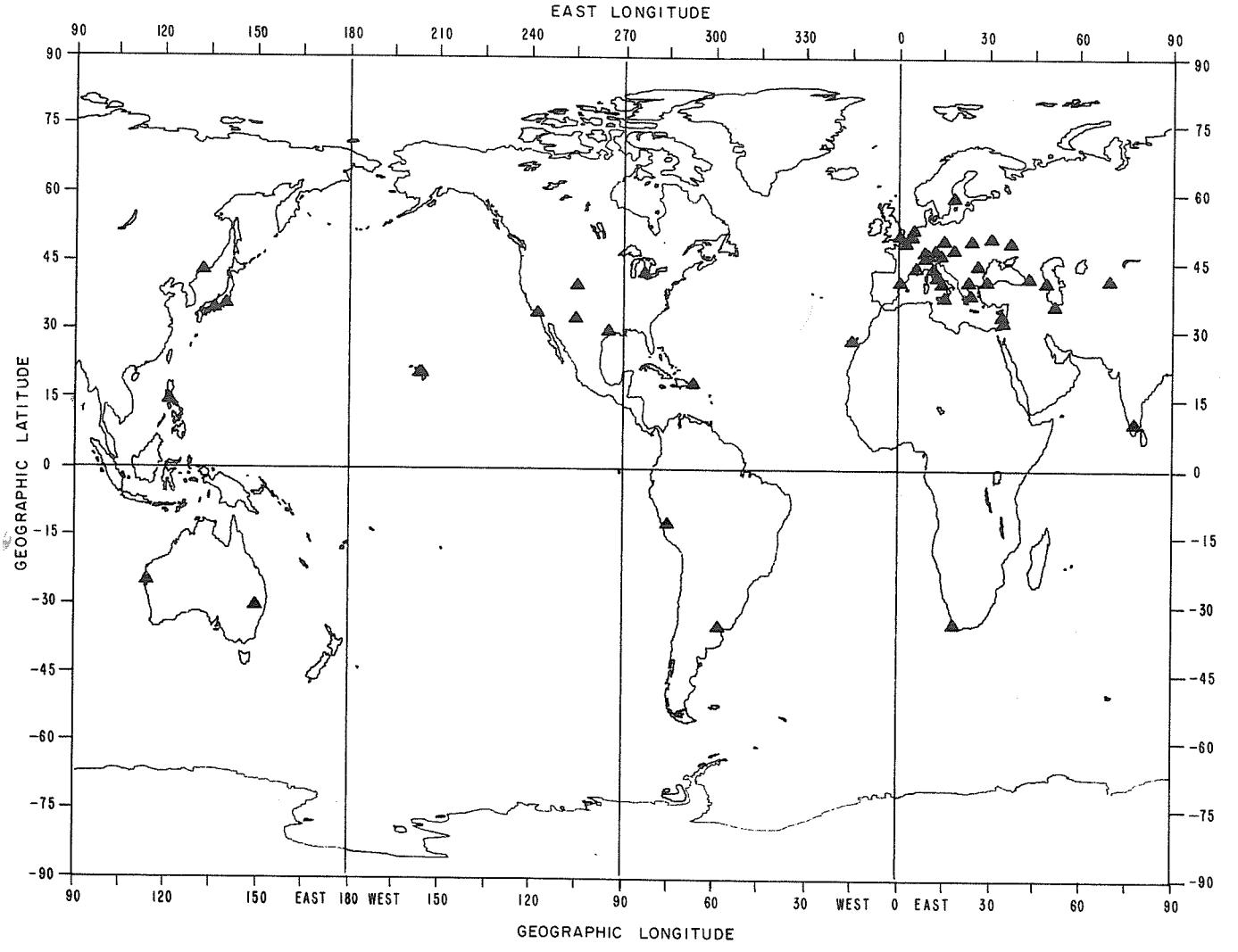
H-α FLARE STATIONS 1971



STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
HERSTMONCEUX	50N	0	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
TORTOSA	40N	0								C	B	A	C				
MEUDON	49N	2	B	A	A	A	A	A	A	A	A	A	B	B	B	B	C
UCCLE	50N	4	B	A	B	A	A	A	A	A	A	A	B	B	A	A	
HAUTE PROVENCE	44N	5						A	A				C	A	A	A	C
NERA	52N	5	C	A	B	C	C	B	B	A	A	A	A	C	B	C	
UTRECHT	52N	5	B	A	B												
LOCARNO	46N	8		B	A	C	A	A	A	A	A	A	A	A	A	B	C
SCHAUINSLAND	48N	8	C	A	B	C	B	A	C								
ZURICH	47N	8	B	A	A	B	A	A	A	A	A	A	A	A	A	B	C
AROSA	46N	9	C	B	B	C	A	A	A	B	C	B	B	B	C	C	C
ARCETRI	34N	11	B	A	A	A	A	A	A	A	A	A	A	A	B	B	C
ROME	41N	12									B	B	A	A	A	A	C
WENDELSTEIN	47N	12				B	A	A	A	B	B	A	A	A	B	A	C
KANZELHOHE	46N	13	B	A	A	A	A			A	A	B					
CAPRI-F	40N	14	B	B	B	C	B	A	B	A	A	B	B	B	B	B	C
CAPRI-S	40N	14	B	A	A	A	A	A	A	A	B	A	A	A	A	B	C
ONDREJOV	49N	14	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
CATANIA	37N	15								A	A	A	A	A	A	A	C
WROCLAW	51N	17								B	A						
CAPETOWN	33S	18		B	A	A	A	A	A	A	A	C	B	A	A	A	C
HURBANOVO	47N	18													B	A	C
SALTSJOBADEN	59N	18	B	A	A	B	A	B	B	C	C	B					
ATHENS	37N	23	B	A	B	C		B	A	A	A	A	A	B			C
THESSALONIKA	40N	23								A	B	C	B				
LVOV	49N	24								B	A	B	C		C	B	C
BUCHAREST	44N	26		B	A		B	B	B	A	A	B	A	A	A	A	C
ISTANBUL	41N	28	B	A	A	A	B	B	B	B	A	B	A	A	A	A	C
KANDILLI	41N	29									A	A	C				
KIEV	50N	30	B	A	A	A	A	A	A	B	A	A	B	B	B	A	C
KIEV (UNIV)	50N	30	B	A	A	A	A	A	A	A	A						
SIMEIS	44N	34	B	A	A	A	A	A	A	B	B	C	C	C	A	B	C
TEL-AVIV	32N	34													C		
KHARKOV	50N	36	B	A	B	A	A	B	B	C	B	B	A	B	B	B	C
MOSCOW (UNIV)	55N	37	B	A	B	A	B	B									
MOSCOW IZMIRAN	55N	37	B	A	A	B	A	A	A	A	B				C	B	C
ABASTUMANI	41N	42	B	A	A	A	B	A	A	A	A	A	A	B	B	A	C
BAKOU	40N	48	C	B	B	A	A	A	A	B	B	A	C				
TEHRAN	35N	51													C	B	C
TASHKENT	41N	69	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
ALMA ATA	43N	77	C	A	B	A	A	B									
KODAIKANAL	10N	77	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
HYDERABAD	17N	78	B	A	A	B	B	A	B	A	C						
IRKUTSK	52N	104							C	B	B	B	A	A	A	A	C
CARNARVON	25S	114											B	A	A	A	C
MANILA	14N	121							B	A	A	A	A	A	A	A	C
USSURISK	43N	132	C	A	A	A	A	A	A	A	A	B		B	A	A	C
IKOMASAN	34N	135	B	A	A	A	A	A	A	A	A	A	A	C			
MITAKA	35N	139	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
TOKYO	35N	139												B			

KEY TO SYMBOLS

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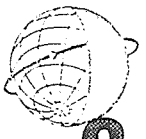
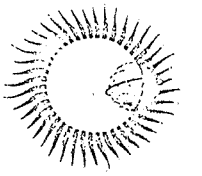
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

The flares are scaled in accordance with the recommendations of IAU Commission 10 as of January 1, 1966.





FLARE DATA

Sta. Mitaka (Tokyo) Month May Year 1968

Date	Time of Observation UT.			Helio. Position		Imp.	Obs.	H-α Line		Maximum Area			H-α Intensity		Remarks
	Beg.	End.	Max.	Lat.	Mer. Dist.			Time	Width	Time	Apparent	Corr. in sq. deg.	Time	%	
1	0009	0019	0012	15N	08E	Sn	C	–	–	0012	70	0.8	–	–	
	0156	0205	0201	22N	61E	Sn	C	–	–	0201	50	1.2	–	–	
	0310	0323	0312	18N	68E	Sn	C	–	–	0312	50	–	–	–	4
	0325	0334	0328	23N	62E	Sn	C	–	–	0328	70	1.7	–	–	8
	0343	0400	0345	18N	07E	Sn	C	–	–	0345	70	0.8	–	–	4
	0431	0455	0437	18N	68E	1n	C	–	–	0437	120	–	–	–	
2	0311	0323	0312	18N	07W	Sn	C	–	–	0312	70	0.8	–	–	5
	0505	0517	0509	18N	47E	Sn	C	–	–	0509	80	1.3	–	–	
	0512	0533	0516	17N	06W	Sn	C	–	–	0516	170	1.9	–	–	
	0516	0519	0517	15N	53E	Sn	C	–	–	0517	110	2.0	–	–	
4	0025	0042	0029	19N	26W	Sf	C	–	–	0029	60	0.8	–	–	
	0428	0600	0429	20N	18E	1b	C	–	–	0429	220	2.6	–	–	
	0543	0559	0555	21N	16E	Sf	C	–	–	0555	100	1.2	–	–	5
	0645	0651	0649	10N	09W	Sf	C	–	–	0649	70	0.7	–	–	
	2309	2321	2317	20N	43W	Sb	C	–	–	2317	80	1.2	–	–	8
	2332	2345	2333	20N	07E	Sn	C	–	–	2333	60	0.7	–	–	
	2352	2422	2400	19N	07E	Sn	C	–	–	2400	100	1.1	–	–	5
5	0052	0116	0106	17N	33E	1n	C	–	–	0106	180	2.3	–	–	5
	0211	0220	0213	18N	45E	Sn	C	–	–	0213	70	1.1	–	–	
	0220	0241	0223	17N	47W	Sn	C	–	–	0223	80	1.2	–	–	5
	0311	0321	0312	20N	06E	Sn	C	–	–	0312	80	0.9	–	–	5
	0423	0515	0428	17N	33E	1n	C	–	–	0428	360	4.7	–	–	5
	0459	0521	0507	21N	03E	Sn	C	–	–	0507	80	0.9	–	–	
	0517	0540	0522	17N	33E	Sn	P	–	–	0522	130	1.7	–	–	
	0531	0540	0534	21N	03E	Sn	P	–	–	0534	170	1.9	–	–	5
6	0150	0229	–	18N	25E	Sn	C	–	–	0150	140	1.8	–	–	
	0212	0231	0216	16N	42E	Sn	C	–	–	0216	80	1.2	–	–	4
9	0320	0338	0330	17N	46W	Sn	C	–	–	0330	50	0.8	–	–	

Send one copy to World Data Center C, Observatoire de Meudon, 92 Meudon, France;
one copy to World Data Center A, Upper Atmosphere Geophysics, NOAA, Boulder, Colorado, U.S.A. 80302;
one copy to World Data Center B, Molodezhnaya, 3, Moscow B-296, U.S.S.R.
Reports should be sent airmail monthly.

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
CULGOORA	30S	147									A	A	B	A	A	A	C
SYDNEY	36S	151	B	A	A	C				A							
WELLINGTON	41S	174	C														
HONOLULU	21N	202	B	A	A	A	A	A	B								
HALEAKALA	20N	204								B	A	A	A	A	B	A	C
LOCKHEED	33N	242			A	A	A	A	A	A	A	A	A	C		A	C
MT WILSON	31N	242	B	A													
CLIMAX	39N	254	B	A	B	B	A	A	A	A	A	B					
BOULDER	40N	255											C	A	A	A	C
SACRAMENTO PK	32N	255	B	A	A	A	A	A	A	A	A	A	A	A	B		
TONANZINTLA	19N	261	B														
HOUSTON	30N	265											B	A	A	C	
PALEHUA	21S	268													C	C	B
MCMATH-HULBERT	42N	277	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
WASHINGTON NRL	38N	283	B	A	C	S											
HUANCAYO	12S	285	B	A	A	A	A	B	A	A	A	A	A	A	B	B	C
OTTAWA	54N	285	B	A	B		A	A	A	B	A	B	S				
RAMEY	18N	292													C	A	B
SAN MIGUEL	34S	302											B	B	B	B	
CANARY ISLANDS	28N	345											B	A	A	A	C
DUNSINK	53N	354	B	A	A	A	A	B	A	B	S						
EDINBURGH	56N	357	B	B	S												

Hα PATROL FILM

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
CARNARVON	25S	114											B	A	A	A	C
BOULDER	40N	258											C	A	A	A	C
CANARY ISLANDS	28N	345											B	A	A	A	C
HOUSTON	30N	365											B	A	A	C	

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S = Program STOPPED operations (see MASTER STATION LIST for actual date)

COMPUTER FORMAT:

1. Flare reports - from each observatory reporting - July 1955 to date
2. Hours of flare patrol - most observatories - Jan. 1965 to date
3. Grouped flares 1955-1964; Feb. 1967 to date as published in Solar-Geophysical Data, NOAA.
4. Event log - Preliminary reports of flare-associated events in time sequence. Includes flares, radio emission bursts, SID, x-ray bursts. (listing only)

PUBLICATIONS:

1. Solar-Geophysical Data, NOAA, publishes all of the individual station reports together with a grouped report. The flares are divided into "confirmed" and "unconfirmed" events.
2. I.A.U. Quarterly Bulletin on Solar Activity, Zürich, These reports included all individual station reports through Dec. 1962, and since then have included only a flare event list -- now limited to those that are "confirmed".

C.2 C.2 SOLAR MAGNETIC FIELD IN ACTIVE REGIONS AND THEIR SHORT-TERM CHANGES

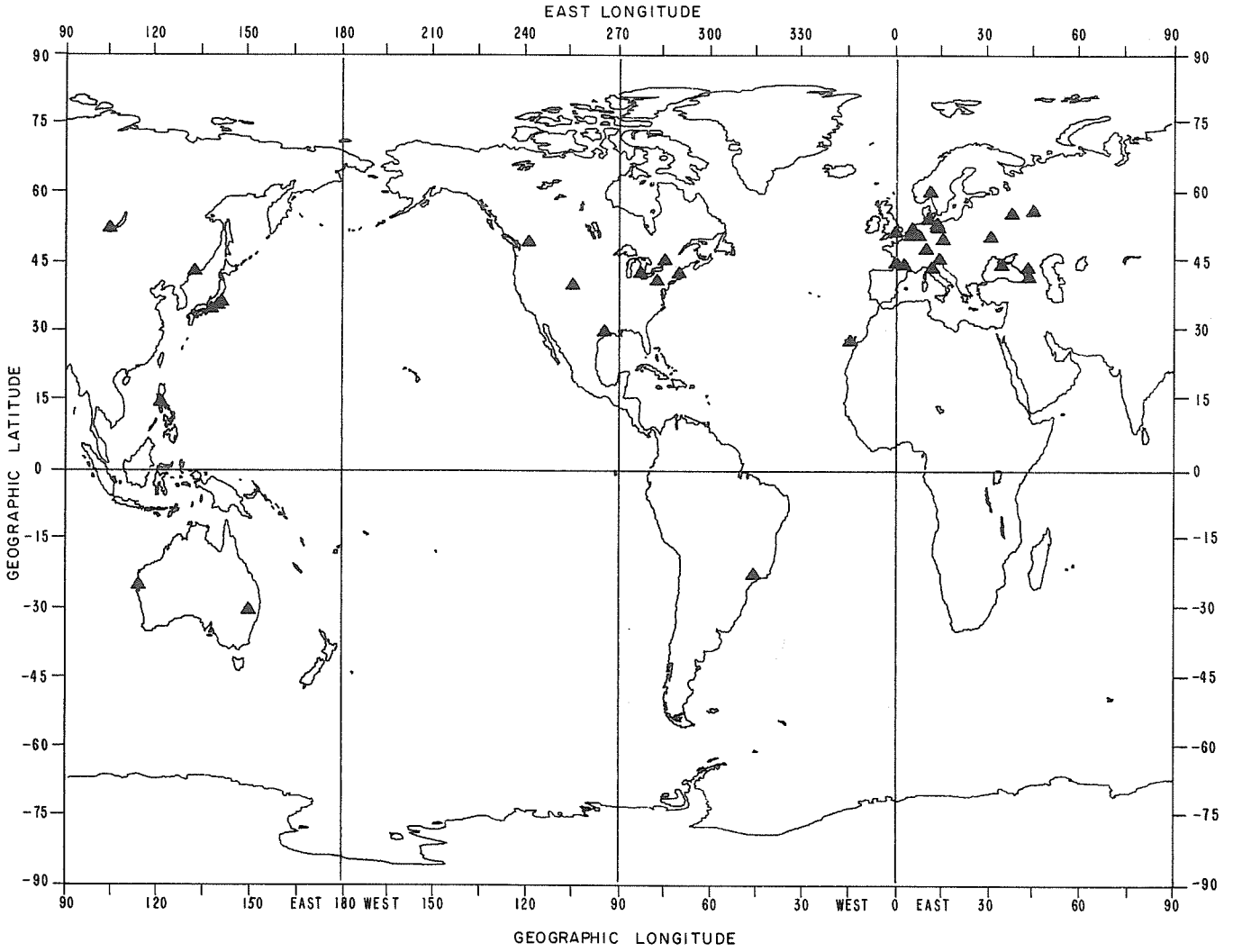
No data at Boulder.

Stations known to be capable of such measurements are Meudon, Culgoora, Lockheed, Kitt Peak, Climax, Sacramento Peak and San Fernando Observatory.

C.3

The data consist of tabulations and for a few selected events, copies of the strip chart records. The map indicates the stations currently reporting.

SOLAR RADIO OBSERVING STATIONS 1971



C.3 SOLAR RADIO EVENTS FIXED FREQUENCY

AT BOULDER

BY LONGITUDE

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
SLOUGH	51N	0												A	A	B		2800
SLOUGH	51N	0												A	A	A		19000
SLOUGH	51N	0												A	A	A		71000
SLOUGH	51N	0												B		A		9400
SLOUGH	51N	0													C	A		37000
CAMBRIDGE	52N	0	B	A														81
CAMBRIDGE	52N	0	B	A														175
UCCLE	50N	4	B	A	A	A	A											169
UCCLE	50N	4	B	A	A	A	A	A	A	A	A	A	A	B	A	A	C	600
NEDERHORST	52N	5									B	A	A	A	A	B	S	610
NEDERHORST	52N	5			C	A	A	A	A		C	A	B	C	A	B	S	9500
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	200
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	C							550
NEDERHORST	52N	5	B	A	B	B	A	A	A	A	B	B	A	A	A	B	Q	3000
BERNE	47N	7													A	A	C	10500
BONN	50N	7												B				35000
WEISSENAU	47N	9												C				611
WEISSENAU	47N	9												C				1000
HARESTUA	60N	10	B	B	B	B	B	B	B	B	B	B	A	A	B	B	C	225
KIEL	54N	10													A	A	C	240
KIEL	54N	10													A	A	C	420
KIEL	54N	10													A	A	C	1420
ARCETRA	43N	11									C	A	A					9285
ONSALA	57N	11	C	B	B													150
ROME	41N	12							B	A	A							18
ROME	41N	12							B	A	A	B						27
TRIESTE	45N	13													B	C		235
TRIESTE	45N	13										B	A	A	C			239
POTSDAM	52N	13														C	C	113
TRIESTE	45N	13														B	C	237
BERLIN	52N	13	B	A	A	A	A	A							B			900
BERLIN	52N	13	B	A	A	A	A	A	A	A	A	A	A	A	A			1470
BERLIN	52N	13	B	A	A	A	A	A	A	A	A	A	A	A	B			9490
BERLIN	52N	13	C	A	A	A	A				B	A	B	C				3000
BERLIN	52N	13													B			2920
BERLIN	52N	13													A	A	C	9500
BERLIN	52N	13													B	A	C	1490
NEUSTRELITZ	53N	13								B	B	A	B	A				2000
NEUSTRELITZ	53N	13					A	A	A	A	A	A	A	A	C			9140
NEUSTRELITZ	53N	13				A	A	A	A	A	A	A	B	A	B			1490
NEUSTRELITZ	53N	13	C	A	A	A	A				B	A	A	A	B			2920
POTSDAM	52N	13	B	A	A	A	A		B	B	B	B	A	A	B	B	C	23
POTSDAM	52N	13	B	A	B	A	A		B	A	A	A	A	A	A	A	C	234
POTSDAM	52N	13	B	B					B	B	B	A	A	A	B	B		111
POTSDAM	52N	13	E										C	B				40
ONDREJOV	49N	14					B	A				C	B	B	A	A	C	9400
ONDREJOV	49N	14			B	B	B	A				B	A	A	A	A	C	808
ONDREJOV	49N	14		C	A	B	B	A	A	A	A	A	A	A	A	A	C	260
ONDREJOV	49N	14	B	A	A	A	B	A	A	A	A	B	A	A	A	A	C	536
TORUN	53N	18		C	A	C	A											127

KEY TO SYMBOLS

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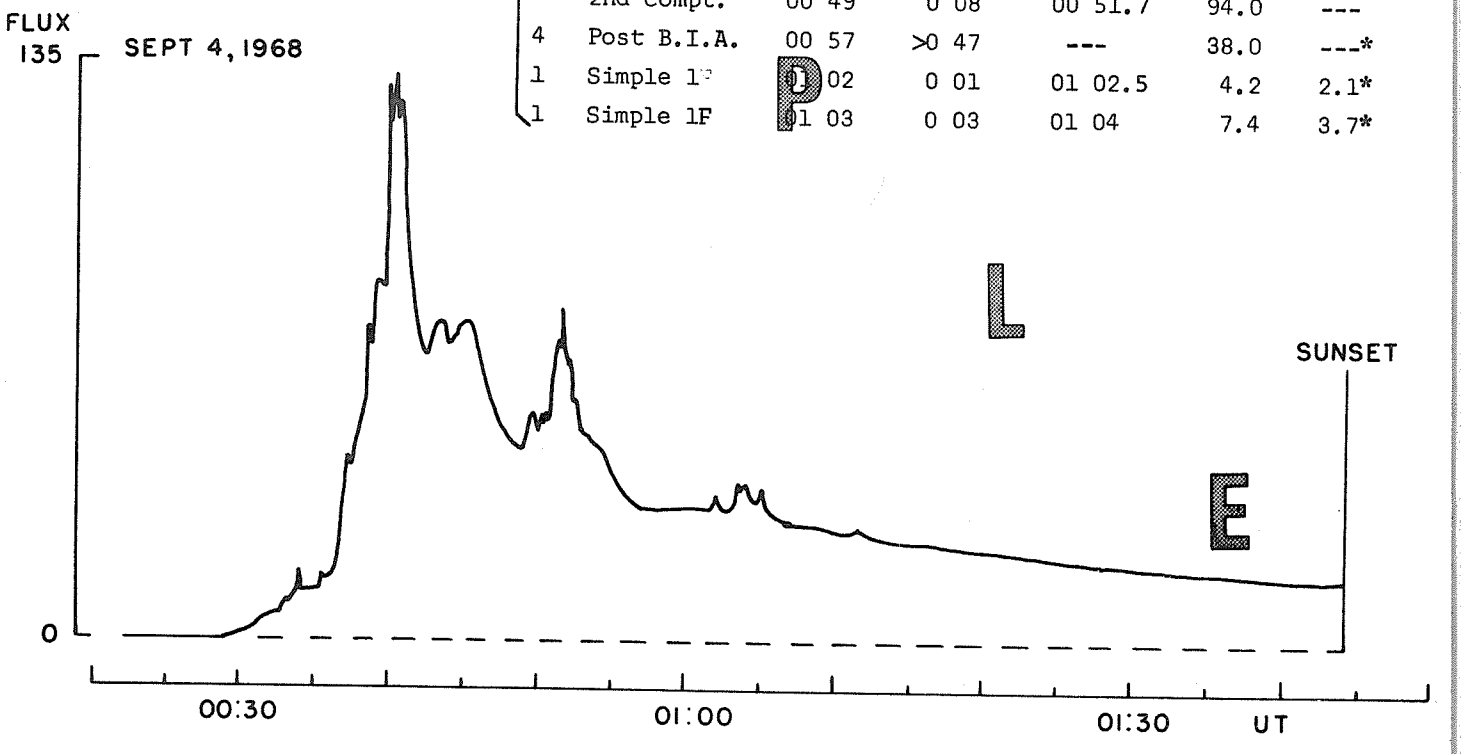
OTTAWA

OUTSTANDING EVENTS - SOLAR RADIATION AT 2700 & 2800 Mc/s

DATE 1968	URANE KEY	CLASS	START U.T.	DURATION	MAXIMUM U.T.	PEAK FLUX	MEAN FLUX
Sept.			H M	H M	H M		
1	3	Simple 3A	00 42	0 55	00 43	4.0	2.0*
	7	Irregular Activity	00 47	0 02	00 48	7.9	---*
	3	Simple 3A	16 15	0 50	16 30	2.0	1.0
	1	Simple 1	16 17.5	0 03.5	16 19	2.6	1.3
		Spike	16 22	---	16 22	2.0	---
	1	Simple 1	16 23	0 01	16 23.4	3.0	1.2
	3	Simple 3	20 05	0 25	20 12	2.6	1.3
	3	Simple 3	20 45	3 25	21 40	3.2	1.6
2	2	Simple 2F	01 04	0 03	01 05	15.0	8.0*
	3	Simple 3	20 05	2 50	21 35	5.0	2.5
3	3	Simple 3	16 20	0 50	16 25	2.0	1.0
4	6	Complex F	00 29	0 28	00 40.5	135.0	48.0*
		1st Compt.	00 29	0 20	00 40.5	135.0	---
		2nd Compt.	00 49	0 08	00 51.7	94.0	---
	4	Post B.I.A.	00 57	>0 47	---	38.0	---*
	1	Simple 1	01 02	0 01	01 02.5	4.2	2.1*
	1	Simple 1F	01 03	0 03	01 04	7.4	3.7*



C.3 SOLAR RADIO EVENTS FIXED FREQUENCY

AT BOULDER

BY LONGITUDE

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
KRAKOW	50N	19	C	B	A	C												810
RIGA	56N	24	C	C	C	C			C	B	B	C						220
GRAHAMSTOWN	33S	26		B														125
LWIRO	02S	28	B	A	C													169
KIEV	50N	30													B	A	C	204
PULKOVO	59N	30	C	C														9375
GIZA	30N	31	C	C														81
SIMFEROPOL	44N	34										C						1000
SIMFEROPOL	44N	34												B	B	A		3100
SIMFEROPOL	44N	34		B	A	B	C											210
SIMFEROPOL	44N	34								B	C							220
MOSCOW IZMIRAN	55N	37	C	A	A	A	A	C		A	A	A	A	A	B	A	C	202
MOSCOW IZMIRAN	55N	37	C	B	A	B	A	C										545
ABASTUMANI	41N	42	C	A	A	A	A	B	B	A	A	A	A	B	B	A	C	221
KISLOVODSK	43N	42								B	A	B	B	B	C			6100
KISLOVODSK	43N	42								C	B	B	B	B	C			15000
KISLOVODSK	43N	42	C	A	B	A	A	A	C	B								178
BJURAKAN	40N	44	B	B	C	C												191
GORKY	56N	44											A	A	A			650
GORKY	56N	44											B	A	A	A	C	100
GORKY	56N	44											B	A	A			3800
GORKY	56N	44	C	B	B								A	A	A	A	C	2950
GORKY	56N	44	C	B	B	B				B	C		A	A	A	A	C	9100
GORKY	56N	44	C	B	C								B	B	A	B	C	200
GORKY	56N	44												A	B	B	C	950
PIRKULI	40N	48			C	A	A	C										234
KODAIKANAL	10N	77										B	C	B	A	A	C	100
HYDERABAD	17N	78		C														30
IRKUTSK	52N	104														C	C	9700
IRKUTSK	52N	104								C	B	B	B	B	C			9570
IRKUTSK	52N	104	C	B	A	C	B	A	C	B	B	C						209
IRKUTSK	52N	104													B	B		9620
MACAO	22N	113		B	A	C												60
CARNARVON	25S	114										Q	Q	Q	Q	Q		1420
CARNARVON	25S	114										Q	Q	Q	Q	Q		2695
CARNARVON	25S	114										Q	Q	Q	Q	Q		4995
MANILA	14N	121														A	C	606
MANILA	14N	121											C	A	A	A	C	1415
MANILA	14N	121											C	A	A	A	C	2695
MANILA	14N	121											C	A	A	A	C	4995
MANILA	14N	121											C	A	A	A	C	8800
MANILA	14N	121						B	A				B	A				27
MANILA	14N	121						B	A	A	A	A	A	A				18
USSURISK	43N	132			B	A	A	C		A	A	B	A	A	B	A	C	208
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	1000
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	2000
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	3750
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	9400
MITAKA	35N	139												C				35000
MITAKA	35N	139											C	A	B	B		612

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Heinrich-Hertz-Institut für solar-terrestrische Physik (HHI/24)

Outstanding solar events April 1970

Date	Frequ. MHz	Starting Time U.T. h m s	Time of Max U.T. h m s	Duration Minutes	Q.B. Type	Max.Flux.Density s.u. Inst.	Smooth	Spectr. Type	Frequency range MHz
S 2.	234	10 13 49	10 13 59	0.32	F	150	10	III	287-111
	111	11 18 17	11 18 20	0.35	C	1700	600		isol.
	111	11 52 39	11 52 46	0.63	C	200	20	III	234-111
	111	12 09 03	12 09 05	0.20	S	175	60		isol.
	111	12 49 41	12 49 44	4.63	F	1700	30	partly III	111- 40
3.	23	10 [A]05	10 28 13	3.78	F	25000	350	III/V	793- 23
	234	10 [A]54	10 30 05	0.47	C	1400	200	III	793- 23
	111	10 29 58	10 30 14	0.33	C	1000	150	III	793- 23
	111	10 56 32	10 57 02	3.30	C	400	15	partly III	111- 23
	23	10 56 32	10 57 40	4.25	C	2000	100	partly III	111- 23
4.	111	08 02 41	08 02 44	0.45	C	250	20		isol.
	234	14 08 33	14 08 53	0.38	C	175	8		isol.
5.	111	07 36 10	07 36 35	0.82	C	100	20	partly III	234- 23
	23	07 36 40	07 36 44	0.43	S	3000	1000	partly III	234- 23
	23	08 21 35	08 21 43	0.68	C	1200	240	III	111- 23
6.	111	11 42 13	11 42 30	2.02	C	800	60	partly III	287- 30
	234	11 43 01	11 44 06	1.38	C	130	13	partly III	287- 30
7.	23	07 28 43	07 28 45	0.38	S	2000	700	III	40- 23
	234	14 36 06	14 36 08	1.68	C	120	3		isol.
	234	14 53 42	14 53 44	1.02	F	200	6		isol.
8.	111	07 45 58	07 50 49	8.40	C	600	25	III	111- 23
	23	07 48 07	07 48 23	3.12: [1]	C	10000	500	III	111- 23
	111	08 31 17	08 31 30	0.68	C	350	35		isol.
	111	08 59 38	08 59 56	0.68	C	200	20		isol.
	23	09 52 24	09 52 39	0.77	C	4000	1000	III	40- 23
	23	10 21 48	10 21 56	0.57	S	3000	1000	III	30- 23
	111	12 11 37	12 11 41	0.17	S	200	70	III	111- [F]
	23	12 11 41	12 11 50	0.43	S	4000	1500	III	111- [3]
	111	13 53 55	13 53 57	0.48	F	600	60		isol.
	23	14 04 55	14 05 13	4.03	F	4000	300	III	287- 23 [2]
9.	111	06 50 36	06 51 32	1.38	C	600	60		isol.
	111	07 29 42	07 39 46	10.10	F	800	2		isol.
	111	09 10 47	09 11 26	2.28	F	300	5		isol.

1) disturbed by transmitter

2) 367 MHz, 234 MHz, 111 - 30 MHz partly calibration

AT BOULDER

C.3 SOLAR RADIO EVENTS FIXED FREQUENCY

BY LONGITUDE

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
MITAKA	35N	139								B	A	B	A	A	B	B		17000
MITAKA	35N	139	B	A	B	B	B	A	A									3000
MITAKA	35N	139	B	A	A	A	B	A	A	C			C					9500
MITAKA	35N	139	B	A	A	A	A	A	A	A	A	B	A	A				227
MITAKA	35N	139	B	A	A	B	B	A	B									100
MITAKA	35N	139	B	B	B	B	B	A	B									671
HIRAISO	36N	140														A		100
HIRAISO	36N	140							A	A	A	A	B	A	A	A	C	500
HIRAISO	36N	140	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	200
HONOLULU	21N	202		C	A	A	A	C										18
HONOLULU	21N	202	C	A	B													200
HALEAKALA	20N	204								B	B	A						18
HALEAKALA	20N	204								B	B	C						107
PENTICTON	49N	241								C	A	A	A	A	A	A	B	2700
UPPER VAN NORMAN	35N	242												Q	Q	Q	Q	3000
PULLMAN	47N	243									C	B	A	C	C			486
BOULDER ESSA	40N	255										B	A	A	C			184
BOULDER ESSA	40N	255				C	A	A	A	A	A	B	B					108
BOULDER HAO	40N	255	C	A	A	A	A	A	A	A	A	A	A	A	C			18
BOULDER HAO	40N	255	C	A	A	A	A	A	A	A	A	A	A	A	C			27
BOULDER NBS	40N	255	C	A														467
BOULDER NBS	40N	255	C	A	A	B												167
SACRAMENTO PK	32N	255	C	A	A	C	C											18
HOUSTON	30N	265										Q	Q	Q	Q	Q		1420
HOUSTON	30N	265										Q	Q	Q	Q	Q		2695
HOUSTON	30N	265										Q	Q	Q	Q	Q		4995
MCMATH HULBERT	42N	277	C	A	A	B	A	C		A	A	A	A	A	C			18
PENN STATE	41N	282									A	A	A	A	B	B	C	2700
PENN STATE	41N	282									A	A	A	A	B	B	C	10700
PENN STATE	41N	282									B	B	B	B	B	B	C	328
PENN STATE	41N	282									C	A	A	A	B	B	C	960
WASHINGTON NRL	38N	283		B	C													3200
WASHINGTON NRL	38N	283		B	C													9530
GRAFTON	42N	283	C	A	A	B	B	C										18
HUANCAYO	12S	284													B	A	C	9400
ITHACA	42N	284									C							430
ITHACA	42N	284	C	A														201
TORONTO	43N	285	B	A	A													320
OTTAWA	54N	285	B	A	A													50
OTTAWA	54N	285	B	A	A													500
OTTAWA	54N	285	B	A	A	A	A	A	A	A	A	A	A	A	A	A	B	2800
SAGAMORE HILL	42N	288													B	A	C	35000
SAGAMORE HILL	42N	288												A	A	A	C	15400
SAGAMORE HILL	42N	288										A	A	A	A	A	C	8800
SAGAMORE HILL	42N	288										B	A	A	A	A	C	4995
SAGAMORE HILL	42N	288									C	A	A	A	A	A	C	606
SAGAMORE HILL	42N	288									C	A	A	A	A	A	C	1415
SAGAMORE HILL	42N	288									C	A	A	A	A	A	C	2695
SAN MIGUEL	34S	302											A	A	B	A	C	408
PARAMARIBO	05N	305	B	A	A	A	A	A	A	A	B	A	C					200

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Outstanding Occurrences in Flux Density

Frequency: 9400 Mhz. Month: February, Year: 1970

Date	Type	Starting Time UT	Time of Maximum UT	Duration Minutes	Total Flux Density 10^{-22} w m^{-2} Hz^{-1} Peak	Total Flux Density 10^{-22} w m^{-2} Hz^{-1} Mean	Polarization at time of Max. Degree Percent	Polarization at time of Max. Sense r, l & 0	Polarization Process r & l
1	-	-	-	-	-	-	-	-	-
2	1S	1406.2	1406.6	1.1	14.7	4.1	-	-	-
28	Precursor	2127.2	2138.3	11.1	5.5	4.1	30.7	1	1
	46eC	2138.3	2140.8	7.9	263.0	77.6	7.9	1	1
	29p.1.	2146.2	2150.6	71.1U	40.5	38.3	8.3	1	1
3	-	-	-	-	-	-	-	-	-
4	2OS	1709.0	1724.0	[illegible]	7.5	3.2	-	-	-
5-8	-	-	-	-	-	-	-	-	-
9	2OS	1336.3	1351.2	32.7	5.9	2.6	-	-	-
	1S	2112.0	2112.6	2.7	9.9	4.8	-	-	-
10	46C	1309.4	1315.0	9.8	41.1	20.2	18.1	1	1
	1S	1517.0	1517.8	2.3	43.1	14.5	10.0	1	1
	2OS	1525.1	1539.7	36.5	9.3	4.5	18.8	1	1
28	Precursor	1617.6	1621.0	3.4	7.5	3.3	-	-	-
	46eC	1621.0	1621.5	1.2	41.1	25.1	5.3	1	1
	29p.1.	1622.2	1622.2	11.6	18.9	10.1	14.7	1	1
28	Precursor	1656.3	1659.0	3.1	9.4	4.0	-	-	-
	3C	1659.4	1700.2	1.0	54.2	23.5	21.8	1	1
	29p.1.	1700.4	1700.4	37.9	22.4	12.6	29.3	1	1
	3S	1853.4	1854.5	2.2	26.2	10.4	-	-	-
	29p.1.	1855.6	1901.2	11.6	7.5	3.4	-	-	-
	2OS	1940.3	1942.2	10.1	16.8	5.2	20.8	1	1
	3S	2005.2	2006.0	1.6	20.6	13.5	21.3	1	1
	29p.1.	2006.8	2008.0	27.4	11.2	3.0	-	-	-

C.3 SOLAR RADIO EVENTS FIXED FREQUENCY

AT BOULDER

BY LONGITUDE

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
PARAMARIBO	05N	305	B	A	A	A	A	A	A	A	B	A	C					545
SAO PAULA	22S	314											C	A	A	C	C	7000
CANARY IS	28N	345											Q	Q	Q	Q		1420
CANARY IS	28N	345											Q	Q	Q	Q		2695
CANARY IS	28N	345											Q	Q	Q	Q		4995
JODRELL BANK	53N	357	B	A	C													80
JODRELL BANK	53N	357	B	A	C													200
JODRELL BANK	53N	357	B	A	C													2000
BORDEAUX	44N	359												C	A	A	B	930

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ACTIVITE SOLAIRE

Evénements remarquables sur 600 MHz.

UCCLE — JUILLET 1968.

Date	Début T.U.	Max. T.U.	Durée min.	Type	Densité de Flux 10^{-22} W.m.$^{-2}$ Hz.$^{-1}$ max.inst.	Densité de Flux moy.	Type CRPL	Remarques
5	0958,7	0959,2	1,3	s	9	5	Minor	?
	1113,7	1114,7	1,8	c	5	-	Minor	
6	0714,5	0719,2	6,	f	18	-	group	
	0838,3	0839	2,	s	5	3	Minor	
	0941,7	0947,5	62	ES	206	34	Major	
7	0810	0813	4,3	f	14	-	group	?
8	1707,7	1709,8	47,5	EC	1098	111	Major	
9	1813,8	1819,5	17	c		12	group	
11	1129,2	1130,2	3,3	s	5	3	Minor	
12	1255	1256	2,8	f	11	-	group	?
	1343,5	1414	48,5	C	280	68	Major	
17	1443	1455	62	RF	15	7	R and F	
20	0812,5	0819,5	15	RF	27	6	and F	?
	1211,5	1016	9,5	RF	13	7	and F	?
26	1232,8	1233,8	4,5	c	17	6	Minor	?
	1245,2	1246	3,5	s	10	4	Minor	?
31	0537,8	0540,7	22,7	s	(14)	-	R and F	?
	1057,3	1057,8	0,8	c	33	-	Minor	?
	1121,8	1121,8	0,6	s	9	-	Minor	?
	1400,2	1400,5	0,7	s	6	-	Minor	

AT BOULDER

C.3 SOLAR RADIO EVENTS FIXED FREQUENCY

BY FREQUENCY

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
BOULDER HAO	40N	255	C	A	A	A	A	A	A	A	A	A	A	A	C			18
GRAFTON	42N	283	C	A	A	B	B	C										18
HALEAKALA	20N	204								B	B	A						18
HONOLULU	21N	202		C	A	A	A	C										18
MANILA	14N	121						B	A	A	A	A	A	A				18
MCMATH HULBERT	42N	277	C	A	A	B	A	C		A	A	A	A	A	C			18
ROME	41N	12							B	A	A							18
SACRAMENTO PK	32N	255	C	A	A	C	C											18
POTSDAM	52N	13	B	A	A	A	A		B	B	B	B	A	A	B	B	C	23
BOULDER HAO	40N	255	C	A	A	A	A	A	A	A	A	A	A	A	C			27
MANILA	14N	121						B	A				B	A				27
ROME	41N	12							B	A	A	B						27
HYDERABAD	17N	78		C														30
POTSDAM	52N	13	E										C	B				40
OTTAWA	54N	285	B	A	A													50
MACAO	22N	113		B	A	C												60
JODRELL BANK	53N	357	B	A	C													80
CAMBRIDGE	52N	0	B	A														81
GIZA	30N	31	C	C														81
HIRAISO	36N	140														A		100
GORKY	56N	44											B	A	A	A	C	100
KODAIKANAL	10N	77										B	C	B	A	A	C	100
MITAKA	35N	139	B	A	A	B	B	A	B									100
HALEAKALA	20N	204								B	B	C						107
BOULDER ESSA	40N	255				C	A	A	A	A	A	B	B					108
POTSDAM	52N	13	B	B					B	B	B	A	A	A	B	B		111
POTSDAM	52N	13														C	C	113
GRAHAMSTOWN	33S	26		B														125
TORUN	53N	18		C	A	C	A											127
ONSALA	57N	11	C	B	B													150
BOULDER NBS	40N	255	C	A	A	B												167
UCCLE	50N	4	B	A	A	A	A											169
LWIRO	02S	28	B	A	C													169
CAMBRIDGE	52N	0	B	A														175
KISLOVODSK	43N	42	C	A	B	A	A	A	C	B								178
BOULDER ESSA	40N	255										B	A	A	C			184
BJURAKAN	40N	44	B	B	C	C												191
GORKY	56N	44	C	B	C								B	B	A	B	C	200
HIRAISO	36N	140	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	200
HONOLULU	21N	202	C	A	B													200
JODRELL BANK	53N	357	B	A	C													200
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	B	Q	200
PARAMARIBO	05N	305	B	A	A	A	A	A	A	A	B	A	C					200
ITHACA	42N	284	C	A														201
MOSCOW IZMIRAN	55N	37	C	A	A	A	A	C		A	A	A	A	A	B	A	C	202
KIEV	50N	30													B	A	C	204
USSURISK	43N	132			B	A	A	C		A	A	B	A	A	B	A	C	208
IRKUTSK	52N	104	C	B	A	C	B	A	C	B	B	C						209
SIMFEROPOL	44N	34		B	A	B	C											210
SIMFEROPOL	44N	34								B	C							220

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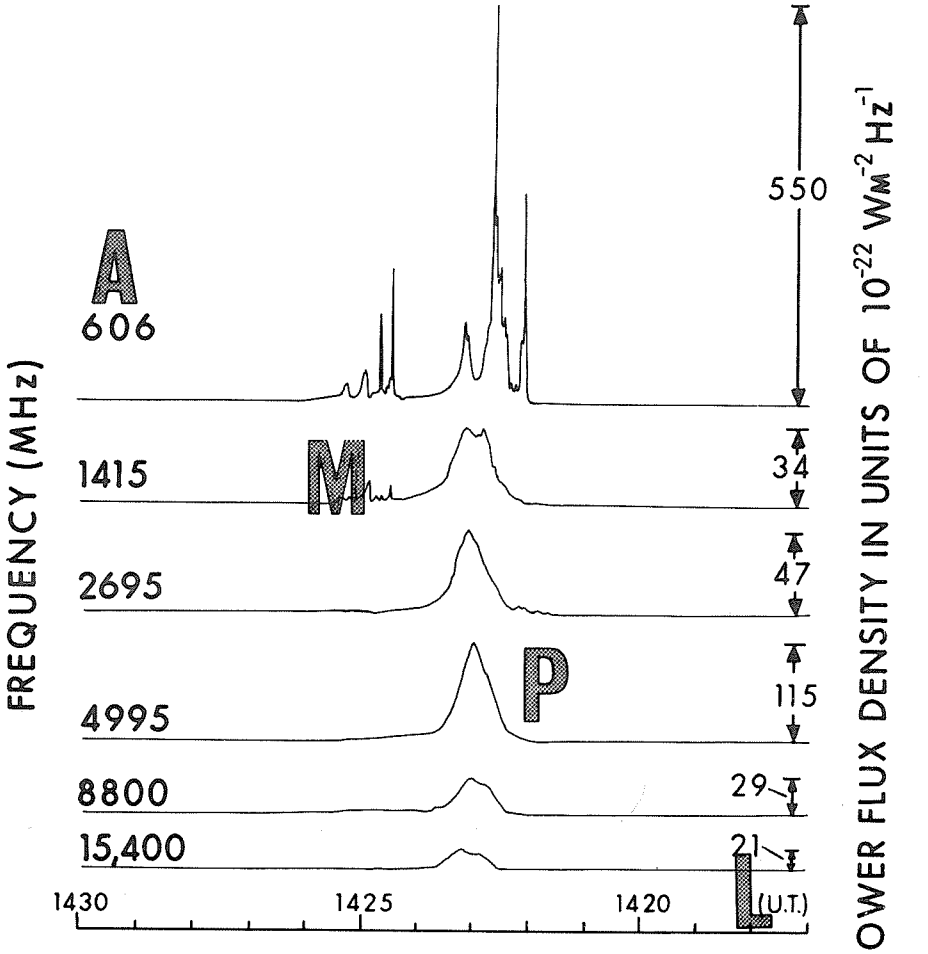
S



COMPLEX AND SIMPLE 2 RADIO BURST OBSERVED ON 10 AUGUST, 1969 AT SAGAMORE HILL RADIO OBSERVATORY HAMILTON, MASS.

E

C.3 SOLAR RADIO EVENTS FIXED FREQUENCY

AT BOULDER

BY FREQUENCY

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
RIGA	56N	24	C	C	C	C			C	B	B	C						220
ABASTUMANI	41N	42	C	A	A	A	A	B	B	A	A	A	A	B	B	A	C	221
HARESTUA	60N	10	B	B	B	B	B	B	B	B	B	B	A	A	B	B	C	225
MITAKA	35N	139	B	A	A	A	A	A	A	A	A	B	A	A				227
PIRKULI	40N	48			C	A	A	C										234
POTSDAM	52N	13	B	A	B	A	A		B	A	A	A	A	A	A	A	C	234
TRIESTE	45N	13													B	C		235
TRIESTE	45N	13														B	C	237
TRIESTE	45N	13										B	A	A	C			239
KIEL	54N	10													A	A	C	240
ONDREJOV	49N	14		C	A	B	B	A	A	A	A	A	A	A	A	A	C	260
TORONTO	43N	285	B	A	A													320
PENN STATE	41N	282									B	B	B	B	B	B	C	328
SAN MIGUEL	34S	302											A	A	B	A	C	408
KIEL	54N	10													A	A	C	420
ITHACA	42N	284									C							430
BOULDER NBS	40N	255	C	A														467
PULLMAN	47N	243									C	B	A	C	C			486
HIRAISO	36N	140							A	A	A	A	B	A	A	A	C	500
OTTAWA	54N	285	B	A	A													500
ONDREJOV	49N	14	B	A	A	A	B	A	A	A	A	B	A	A	A	A	C	536
MOSCOW IZMIRAN	55N	37	C	B	A	B	A	C										545
PARAMARIBO	05N	305	B	A	A	A	A	A	A	A	B	A	C					545
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	C							550
UCCLE	50N	4	B	A	A	A	A	A	A	A	A	A	A	B	A	A	C	600
MANILA	14N	121														A	C	606
SAGAMORE HILL	42N	288									C	A	A	A	A	A	C	606
NEDERHORST	52N	5									B	A	A	A	A	B	S	610
WEISSENAU	47N	9												C				611
MITAKA	35N	139											C	A	B	B		612
GORKY	56N	44											A	A	A			650
MITAKA	35N	139	B	B	B	B	B	A	B									671
ONDREJOV	49N	14			B	B	B	A				B	A	A	A	A	C	808
KRAKOW	50N	19	C	B	A	C												810
BERLIN	52N	13	B	A	A	A	A	A							B			900
BORDEAUX	44N	359												C	A	A	B	930
GORKY	56N	44												A	B	B	C	950
PENN STATE	41N	282									C	A	A	A	B	B	C	960
SIMFEROPOL	44N	34										C						1000
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	1000
WEISSENAU	47N	9												C				1000
MANILA	14N	121											C	A	A	A	C	1415
SAGAMORE HILL	42N	288									C	A	A	A	A	A	C	1415
CANARY IS	28N	345											Q	Q	Q	Q		1420
CARNARVON	25S	114										Q	Q	Q	Q	Q		1420
HOUSTON	30N	265										Q	Q	Q	Q	Q		1420
KIEL	54N	10													A	A	C	1420
BERLIN	52N	13	B	A	A	A	A	A	A	A	A	A	A	A	A			1470
BERLIN	52N	13													B	A	C	1490
NEUSTRELITZ	53N	13				A	A	A	A	A	A	A	B	A	B			1490

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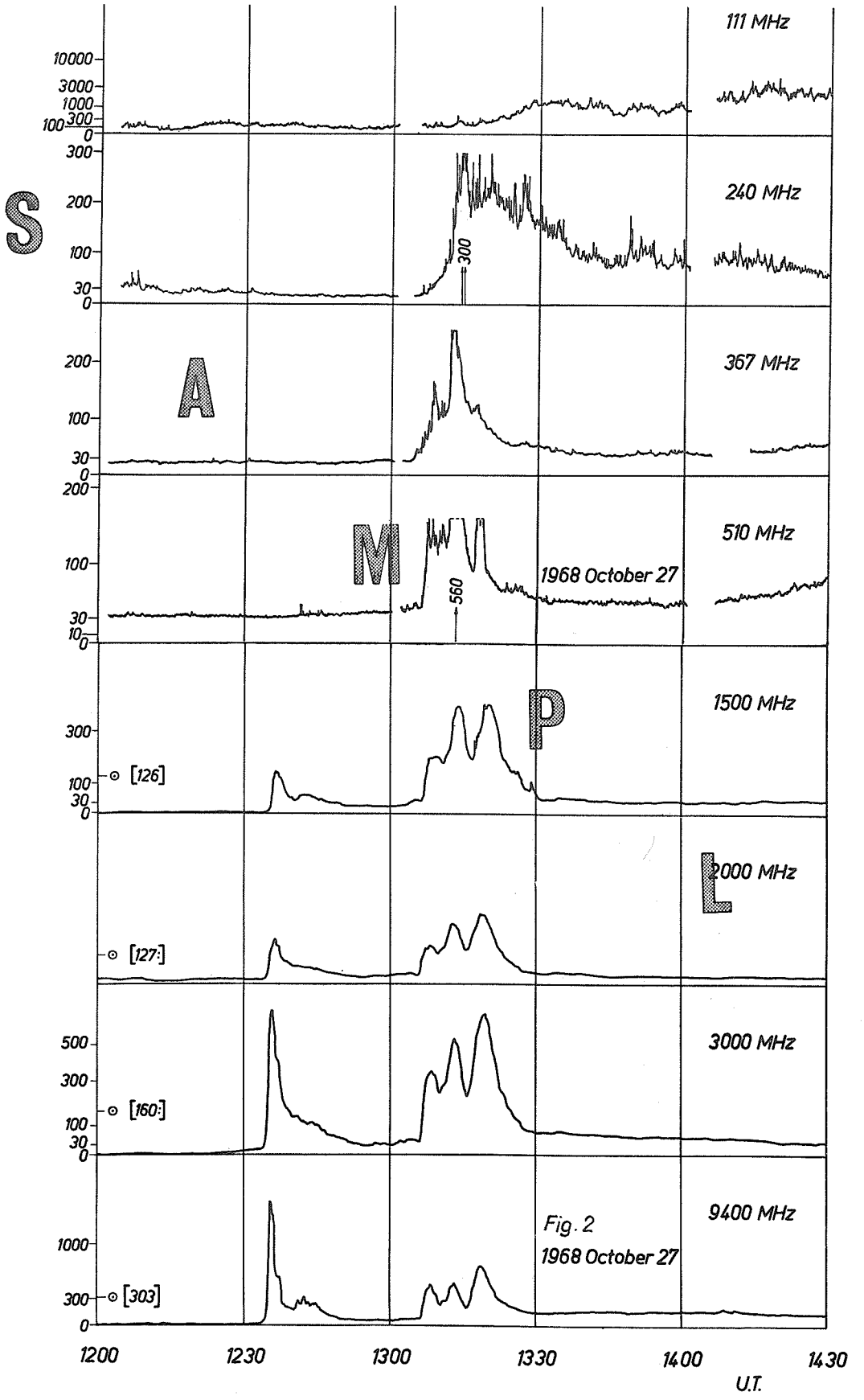

Fig. 2
1968 October 27

Type IV burst observed at HHI October 27, 1968.

C.3 SOLAR RADIO EVENTS FIXED FREQUENCY

AT BOULDER

BY FREQUENCY

STATION	GEOGRAPHIC LAT	LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	2000
JODRELL BANK	53N	357	B	A	C													2000
NEUSTRELITZ	53N	13								B	B	A	B	A				2000
CANARY IS	28N	345											Q	Q	Q	Q		2695
CARNARVON	25S	114										Q	Q	Q	Q	Q		2695
HOUSTON	30N	265										Q	Q	Q	Q	Q		2695
MANILA	14N	121											C	A	A	A	C	2695
SAGAMORE HILL	42N	288									C	A	A	A	A	A	C	2695
PENN STATE	41N	282									A	A	A	A	B	B	C	2700
PENTICTON	49N	241								C	A	A	A	A	A	A	B	2700
SLOUGH	51N	0												A	A	B		2800
OTTAWA	54N	285	B	A	A	A	A	A	A	A	A	A	A	A	A	A	B	2800
BERLIN	52N	13													B			2920
NEUSTRELITZ	53N	13	C	A	A	A	A				B	A	A	A	B			2920
GORKY	56N	44	C	B	B								A	A	A	A	C	2950
UPPER VAN NORMAN	35N	242												Q	Q	Q	Q	3000
BERLIN	52N	13	C	A	A	A	A				B	A	B	C				3000
MITAKA	35N	139	B	A	B	B	B	A	A									3000
NEDERHORST	52N	5	B	A	B	B	A	A	A	A	B	B	A	A	A	B	Q	3000
SIMFEROPOL	44N	34												B	B	A		3100
WASHINGTON NRL	38N	283		B	C													3200
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	3750
GORKY	56N	44											B	A	A			3800
CANARY IS	28N	345											Q	Q	Q	Q		4995
CARNARVON	25S	114										Q	Q	Q	Q	Q		4995
HOUSTON	30N	265										Q	Q	Q	Q	Q		4995
MANILA	14N	121											C	A	A	A	C	4995
SAGAMORE HILL	42N	288										B	A	A	A	A	C	4995
KISLOVODSK	43N	42								B	A	B	B	B	C			6100
SAO PAULA	22S	314											C	A	A	C	C	7000
MANILA	14N	121											C	A	A	A	C	8800
SAGAMORE HILL	42N	288										A	A	A	A	A	C	8800
GORKY	56N	44	C	B	B	B				B	C		A	A	A	A	C	9100
NEUSTRELITZ	53N	13					A	A	A	A	A	A	A	A	C			9140
ARCETRA	43N	11									C	A	A					9285
PULKOVO	59N	30	C	C														9375
SLOUGH	51N	0												B		A		9400
TOYOKAWA	34N	137	B	A	B	A	A	A	A	A	A	A	A	A	A	A	C	9400
HUANCAYO	12S	284													B	A	C	9400
ONDREJOV	49N	14					B	A				C	B	B	A	A	C	9400
BERLIN	52N	13	B	A	A	A	A	A	A	A	A	A	A	A	B			9490
BERLIN	52N	13													A	A	C	9500
MITAKA	35N	139	B	A	A	A	B	A	A	C			C					9500
NEDERHORST	52N	5			C	A	A	A	A		C	A	B	C	A	B	S	9500
WASHINGTON NRL	38N	283		B	C													9530
IRKUTSK	52N	104								C	B	B	B	B	C			9570
IRKUTSK	52N	104													B	B		9620
IRKUTSK	52N	104														C	C	9700
BERNE	47N	7													A	A	C	10500
PENN STATE	41N	282									A	A	A	A	B	B	C	10700

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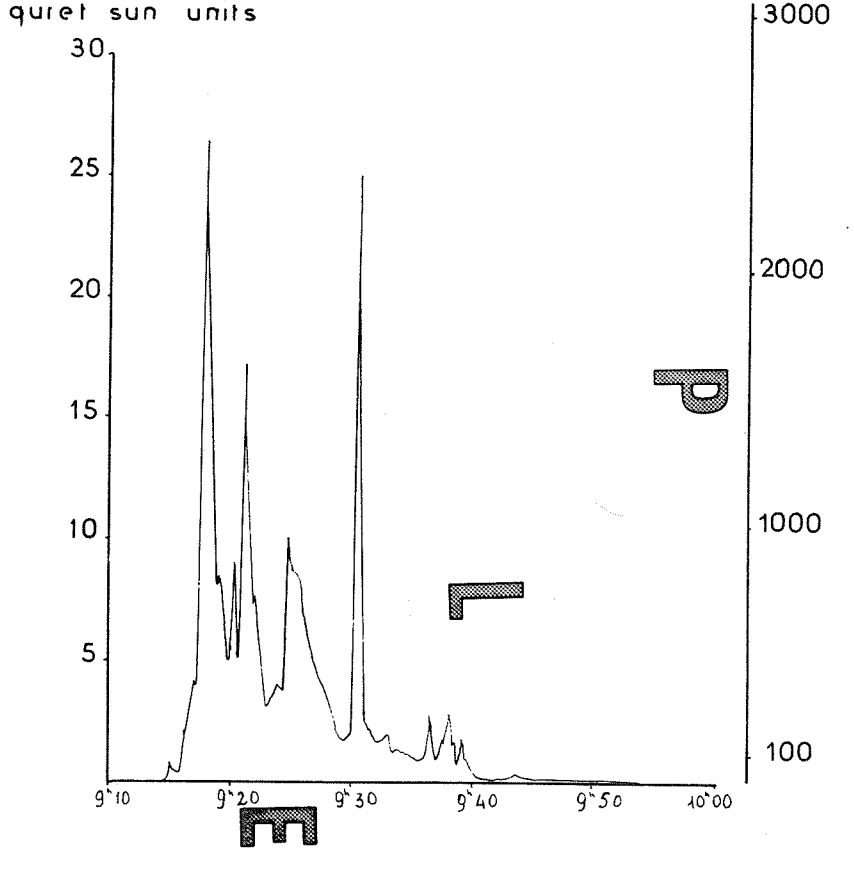
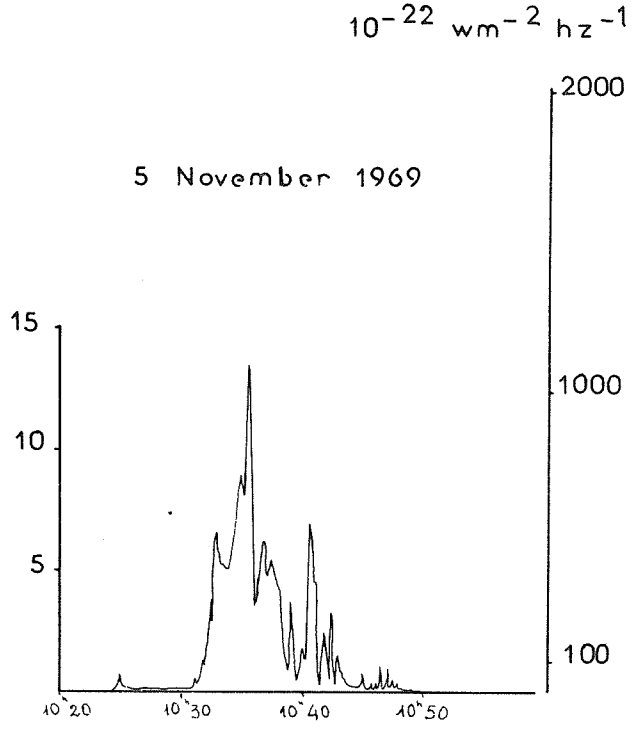
BORDEAUX 930 MHz

24 November 1969





COMPUTER FORMAT:

1. Radio events - Fixed Frequencies (one card/event by observatory)

Worldwide	- 1/1969 to date	Manila	- 12/1967 to date
AFCRL	- 4/1966 to date	Ottawa	- 4/1966 to date
Boulder	- 4/1966 - 7/1966	Penn State	- 4/1966 to date
	3/1967 - 1/1968	Sao Paulo	- 11/1967 to date
	7/1968 - 6/1969	San Miguel	- 10/1967 to date
		Washington State	- 7/1966 - 12/1967

2. Event log - Preliminary reports of flare-associated events in time sequence. Includes radio emission bursts, flares, SID, x-ray bursts (listing only)

PUBLICATIONS:

1. Solar-Geophysical Data, NOAA.Western Hemisphere grouped reports - 4/1966 - 12/1968. Worldwide grouped reports 1/1969 to date.
2. IAU Quarterly Bulletin on Solar Activity, Zurich, all data are published.

C.3 SOLAR RADIO EVENTS FIXED FREQUENCY

AT BOULDER

BY FREQUENCY

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	FREQUENCY MHZ
KISLOVODSK	43N	42								C	B	B	B	B	C			15000
SAGAMORE HILL	42N	288												A	A	A	C	15400
MITAKA	35N	139								B	A	B	A	A	B	B		17000
SLOUGH	51N	0												A	A	A		19000
SAGAMORE HILL	42N	288													B	A	C	35000
BONN	50N	7												B				35000
MITAKA	35N	139												C				35000
SLOUGH	51N	0													C	A		37000
SLOUGH	51N	0												A	A	A		71000

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C.4

In addition to the tabulations of observing period and outstanding events by spectral band, A. D. Fokker has made a "Collection of Spectral Diagrams of Solar Radio Type IV Events" from fixed frequency observations for the following events:

April	1, 1960,	∿0900 UT	Nov.	15, 1960,	∿0230 UT
May	4, 1960,	∿1030	Mar.	26, 1961,	∿1030
May	13, 1960,	∿0500	July	12, 1961,	∿1030
May	26, 1960,	∿0915	July	18, 1961,	∿0930
June	1, 1960,	∿0830	Sept.	16, 1963,	∿1410
Nov.	10, 1960,	∿1015	Sept.	26, 1963,	∿0715
Nov.	11, 1960,	∿0315	Oct.	4, 1965,	∿1000
Nov.	12, 1960,	∿1330	Jan.	17, 1966,	∿1030

FT. DAVIS, TEXAS

DATE AND OBSERVING TIMES U.T.	IMPORTANT BURSTS FREQUENCY RANGE dm (580-300 Mc/s)	INT	m (300-30 Mc/s)	INT	Dkm (30-10 Mc/s)	INT	SPECTRAL TYPE	REMARKS
JANUARY 1969								
5								
1415-2349			1432-1438	1			IIIGG	
			1454-1456	2			IIIG	
	1459	1	1459-1501	2			IIIG	
	1503-1505	2	1503-1505	2	1503-1505	1	IIIGG	
	1518-1519	1	1518-1519	2	1518-1519	2	IIIG	
			1614-1615	2	1614-1615	2	IIIG	
			1714-2123	2	1714-2123	2	IIIN	
	1721-1724	1	1721-1724	3	1721-1724	3	IIIGG	
	1733-1734	1	1732-1734	2	1732-1734	3	IIIGG, V	
			1909-1910	2	1909-1910	2	IIIG	
	1917-1923	2	1915-1925	2	1915-1925	3	IIIGG	
	1928-1929	1	1928-1932	2	1928-1932	2	IIIGG	
			1937	1	1937	2	IIIG	
			2019-2021	2	2019-2021	3	IIIG	
			2334-2337	1	2334-2335	2	IIIG	
			2341-2344	1			IIIG	
6								
1541-2349			1607-1610	2	1607-1610	2	IIIG	
			1628-2053	2	1628-2053	2	IIIN	
			1725-1820	1			IIN	
	1759-1800	1	1759-1800	2	1759-1800	3	IIIG	
			1808-1811	1	1808-1811	2	IIIG	
			1820-2349	1			II	
			1839-1840	2	1839-1840	2	IIIG	
			1854-1856	1	1854-1856	2	IIIG	
	1954-1955	2	1954-1956	2	1954-1956	3	IIIG	
	2018	2	2018	3	2018	3	IIIG	
	2023-2024	2	2023-2025	3	2023-2025	3	IIIGG	
	2044-2047	2	2044-2047	2	2044-2047	3	IIIGG	
			2115-2118	2	2115-2118	3	IIIGG	
			2242-2243	1	2242-2243	1	IIIG	
			2251-2252	1			IIIG	
7								
1415-2350			1415-2350	1			IIN	
			1536-1539	2	1536-1539	2	IIIGG	
			1649-1651	2	1650-1651	2	IIIG	
			1823-2218	1	1823-2218	1	IIIN	
			2000-2001	1	2000-2001	2	IIIG	
	2208-2209	1	2207-2212	2	2207-2210	2	IIIGG	

C.4 SOLAR RADIO SPECTROGRAMS OF EVENTS

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	SWEEP FREQUENCY MHZ
WEISSENAU	47N	9										C	A	A	A	A	C	46-540
ONDREJOV	50N	15											B	B				50-210
CULGOORA	30S	147													B			8-222
CULGOORA	30S	147													C	C		8-2000
CULGOORA	30S	147											A	A				10-210
CULGOORA	30S	147														A	C	8-4000
SYDNEY	36S	151	B	A	A	A	A	A	A	A	A	A						10-250
BIG PINE	37N	241				C	B											450-1000
CLARK LAKE	33N	244														B	C	7-80
BOULDER HAO	40N	255			B	A	A	A	A	A	A	A	A	A	A	B	C	7-80
FT DAVIS	30N	257				B	A											2100-3900
FT DAVIS	30N	257	B	A	A	A	A	A	A	A	A	A	A	A	A	C		10-580
FT DAVIS	30N	257														B	C	10-2000
ANN ARBOR	42N	277		C	A	C	B											100-580
SAGAMORE HILL	42N	288												A	B	B		19-41
VILLA ELISA	34S	302										B	C					10-210

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COMPUTER FORMAT:

1. Radio events - Spectral (one card/event by observatory)
   AFCRL 1/1968 to date
   Boulder 1/1967 to date
   Culgoora 1/1967 to date
   Ft. Davis 1/1967 to date
   Weissenau 4/1968 to date

PUBLICATIONS:

1. Solar-Geophysical Data, NOAA. Western Hemisphere grouped reports 4/1966 - 12/1968
   Worldwide grouped reports 1/1969 to date
2. IAU Quarterly Bulletin on Solar Activity, Zurich, all data are published.

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
66-049A-18	OGO 3	4-2 MHz Solar Bursts	Haddock	06/07/66	0666-0868
67-031A-01	ATS 2	0.5-3 MHz Radio Astron	Stone	04/06/67	0467-1067

C.5

The data are listed by satellite with the reporting station or group responsible also indicated for data held at Boulder.

SOLAR X-RAYS MEASURED BY SATELLITE
SOLRAD 9-EXPLORER 37

NAVAL RESEARCH LABORATORY

X-RAY FLARES OBSERVED DURING JANUARY,1969

DAY	START TIME	0.5-3A FLUX XE-5	PEAK TIME	1-8A FLUX XE-4	PEAK TIME	8-20A FLUX XE-3	PEAK TIME	END TIME
1	1622	6,70	1626	37,00	1623	25,00	1627	1628
1	2027E	17,00	2034	78,00	2036	39,00	2046	2056
1	2109	4,50	2111	32,00	2112	27,00	2112	2113
2	1141	6,70D	1154E	73,00	1147	39,00	1206	1210
2	2119	6,70	2123	41,00	2124	29,00	2126	2127
3	0123	5,60D	0128E	67,00	0125	27,00	0124	0129
3	0433	130,00D	0454E	510,00	0453	140,00	0453	0548
3	1050	5,60	1353	37,00	1357	39,00	1357	1359
3	2337	13,00	2339	44,00	2338	27,00	2341	2343
4	0622D	34,00	0624	88,00	0626	39,00	0633	0636
4	0954	30,00	0955	69,00	0956	29,00D	0959D	1001
4	1112	10,00	1112	38,00	1114	25,00	1114	1117
4	1306	13,00D	1321E	54,00D	1321E	39,00D	1322E	1325
4	1408E	11,00	1410	38,00	1411	28,00	1416	1419
4	1546E	30,00	1548	74,00	1548	27,00	1551	1552
4	2041E	8,90	2043	36,00	2042	26,00	2044	2045
4	2055	130,00D	2124E	1300,00	2114	320,00	2118	2204D
5	0315E	12,00	0315	46,00	0[illegible]	24,00	0317	0319
5	1551	6,70	1555	38,00	1[illegible]	27,00	1558	1602
5	1825	10,00	1826	46,00	1[illegible]	25,00	1827	1829
5	1909	4,50	1914	37,00	1913	27,00	1920	1921
5	1923	19,00	1928	65,00	1929	28,00	1927	1932
6	0213	5,60	0216	38,00	0217	28,00	0216	0229
6	0306	29,00	0312	90,00	0313	39,00	0321	0326
6	0527	13,00	0529	46,00	0529	24,00	0530	0531
6	0806	34,00	0809	90,00	0810	39,00	0810	0813
6	0907	120,00D	0909D	390,00	0912	120,00	0912	0918
6	1147	18,00	1149	56,00	1153	29,00	1152	1204
6	2234	28,00	2236	74,00	2237	29,00	2240	2245
7	0105	4,50	0109	32,00	0107	25,00	0109	0110
7	0121	8,90	0137	54,00	0129	29,00	0140	0148
7	0318	8,90	0324	44,00	0325	26,00	0329	0334
7	0440	4,50D	0449D	34,00	0449	29,00	0449	0450
7	0452	2,20D	0505E	86,00	0458	39,00D	0459D	050[illegible]
7	0518	2,20	0519	33,00	0519	28,00	0521	052[illegible]
7	0550	130,00D	0558E	510,00	0556	120,00	0557	064[illegible]
7	0645E	12,00	0655	6,80	0651	40,00	0656	0738D
7	0738E	16,00	0740	8,00	0740	40,00	0740	0759
7	0917	6,70	0917	38,00	0917	28,00	0927	0928
7	1100	30,00	1104	87,00	1108	52,00	1109	1120
7	1313	7,80	1320	51,00	1319	39,00	1325	1338
7	1404	8,90	1405	46,00	1405	29,00	1404	1410
7	1419	10,00	1420	44,00	1421	28,00	1419	1426
7	1536	4,50	1537	38,00	1537	29,00	1536	1543
7	1704	38,00	1706	94,00	1706	39,00	1713	1717

C.5 SOLAR X-RAY OBSERVATIONS

AT BOULDER

SATELLITE	BAND	SOURCE	61	62	63	64	65	66	67	68	69	70	71
INJUN 1	0-20A	U OF IOWA	B	C									
INJUN 3	0-20A	U OF IOWA		C	B								
VELA 2		LASL									B		
VELA 3	0.5-4A	LASL			C						A	C	
VELA 4	0.5-4A	LASL			C						B		
VELA 5	.05-.5	LASL						C	C		B	C	
OGO-1	10-50KEV	U OF MINNESOTA					C	B					
OGO-3	10-50KEV	U OF MINNESOTA						B					
SOLRAD	0-8A	USNRL				A	A	A	A	A	A	A	C
SOLRAD	8-12A	USNRL				A	A	A	A	A	A	A	C
SOLRAD	44-60A	USNRL				A	A	A	A	A	A	C	
SOLRAD	0-8A	ABERDEEN S DAK					B	B	B	B			
SOLRAD	8-12A	ABERDEEN S DAK					B	B	B	B			
SOLRAD	44-60A	ABERDEEN S DAK					B	B	B	B			
SOLRAD	0-8A	ESSA BOULDER					C	A	B	B			
SOLRAD	8-12A	ESSA BOULDER					C	A	B				
SOLRAD	44-60A	ESSA BOULDER					C	A	B				
EXPLORER 33	2-12A	U OF IOWA						B	A	B	A	B	
EXPLORER 35	2-12A	U OF IOWA								B	A	B	
OSO-3	8-12A	MCMATH-HULBERT							B				
OSO-5	9.1-10.5A	LEIC/UC-LONDON									B	A	C

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

COMPUTER FORMAT:

1. X-ray Events (one card/event)
   USNRL - 11/1965 - 2/1966; 4/1966 - 6/1966; 2/1967 - 11/1968; 12/1968 - 10/1969
   Aberdeen, S. Dakota - 2/1967 - 10/1968.
2. X-ray Daily Averages (one card/day)
   USNRL (covers same period as above events)
   Aberdeen - 4/1967 - 10/1968.
3. Event log - Preliminary reports of flare-associated events in time sequence. Includes x-ray bursts, flares, radio emission bursts, SID. (listing only)

PUBLICATIONS:

1. Solar-Geophysical Data NOAA. Most of the data listed above have been published.

AT GREENBELT

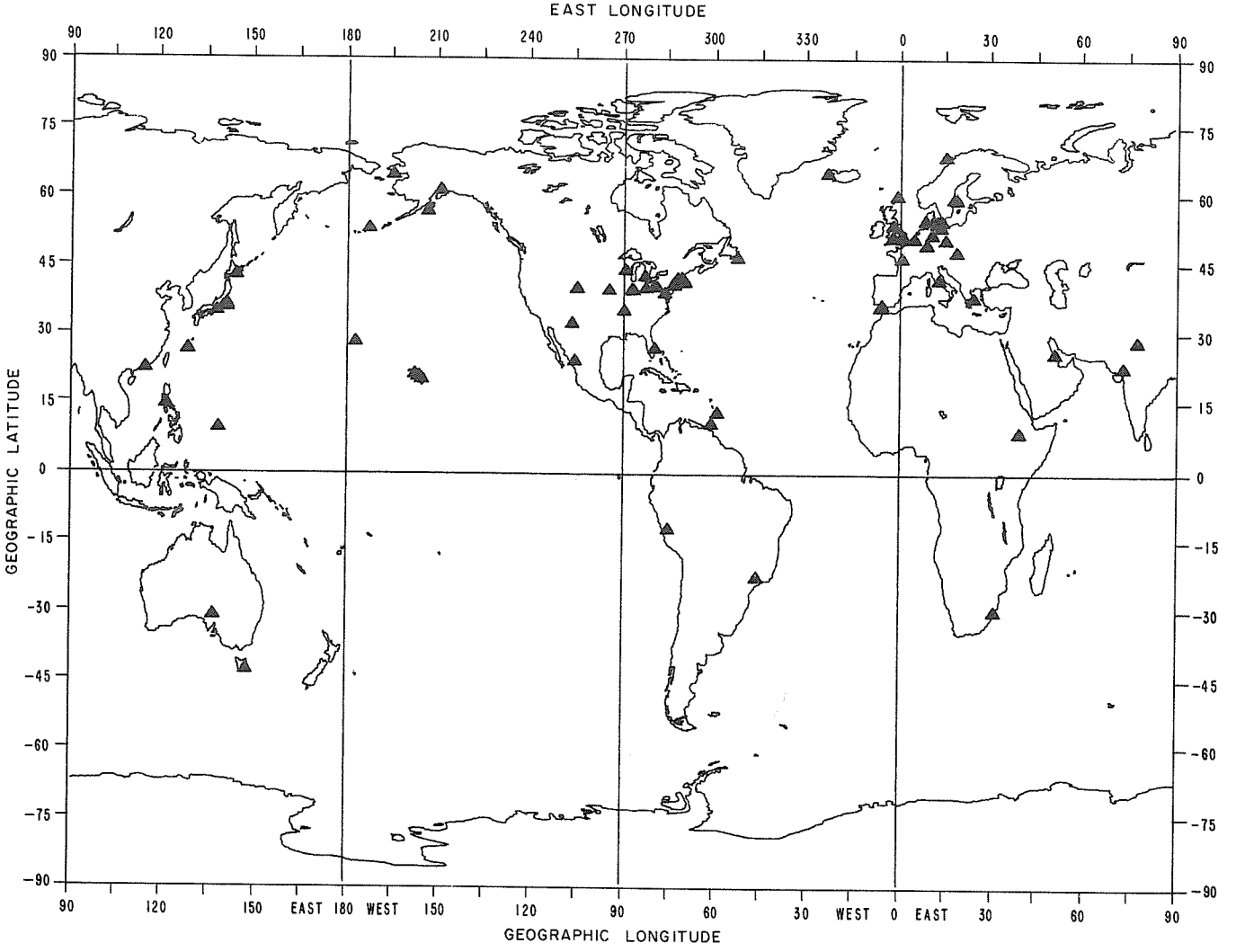
NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
60-007B-01	SOLRAD 1 (Greb 1)	X-rays and L-α Study	Friedman	03/11/60	0660-1160
61-015B-01	Injun 1	GM Counter (2-12A)	Frank	06/29/61	0661-0862
62-006A-01	OSO 1	Solar Spectrometer	Neupert	03/07/62	0362-0562
64-001D-01	SOLRAD 7A (Greb 5)	Solar X-rays (2-60A) and UV (1225-1350A) Flux	Kreplin	01/11/64	0164-0265
64-054A-20	OGO 1	Ionization Chamber	Winckler	09/05/64	0964-1267
65-007A-02	OSO 2	Solar X-ray Bursts	Chubb	02/03/65	0265-0365
65-058C-02	ERS 17	X-ray Detectors	Vette	07/20/65	0765-1165
65-093A-01	Explorer 30	Solar X-ray and Ultra-violet Monitor	Kreplin	11/18/65	1165-0867
66-058A-05	Explorer 33	Electron and Proton Detectors	Van Allen	07/01/66	0766-1268
67-070A-01	Explorer 35	Electron and Proton Detectors	Van Allen	07/19/67	0767-0570
67-100A-08	OSO 4	Solar X-ray Telescope	Giacconi	10/18/67	1067-0568

C.6

The data are listed by type of report: short-wave fadeout (SWF), sudden cosmic noise absorption (SCNA), sudden enhancement of atmospherics (SEA), sudden frequency deviations (SFD), sudden phase anomaly (SPA) and sudden enhancement of signal (SES).

The map shows currently reporting stations.

SUDDEN IONOSPHERIC DISTURBANCES - GROUND-BASED STATIONS 1971



AT BOULDER

C.6 SUDDEN IONOSPHERIC DISTURBANCES

GROUND BASED OBSERVATIONS

SWF

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
BRENTWOOD	51N	0				B	C	B	C			B	C				
POITIERS	46N	0												C	C		
TATSFIELD	51N	0	B	B	B	B	B	B	B	B	B	B					
NEDERHORST	52N	5	B	A	A	A	A	A	A	A	A	B					
DARMSTADT	49N	8												B	A	B	C
LINDAU	51N	10	B	A	A	A	B							C			
KUHLUNGSBORN	54N	11	B	A	A	A	A	A	A	A	B	A	C	B	B		
ROME	41N	12											B				
NEUSTRELITZ	53N	13				A	A	A	A	A	B	A	B	B	B	C	
PANSKA VES	50N	14									A	A	A	B	A	A	C
ENKOPING	59N	17				A	A	A	A	A	B	A	A	B	A	B	C
HURBANOVO	47N	18													B	C	
ATHENS	37N	23												B	A	B	C
DELHI	28N	77													B	C	C
COLUMBUS	39N	83												C			
SINGAPORE	01N	103				B											
HONGKONG	22N	114				B		C	C			C	B	B	C	C	
MANILA	14N	121							B	A	A	A	A	A	A	A	C
OKINAWA	26N	128	B	A	A	A	A	A	A	A	A	A	A	B	A	C	C
HIRAISO	36N	140	B	A	A	A	A	A	A	A	A	A	B	A	A	A	C
HOLLANDIA	02S	140				A	A	A	C								
CANBERRA	35S	149								C	C	C	A	A	C		
CHRISTCHURCH	43S	172				C	A	A	A	A	C		C				
GODLEY HEAD	43S	172						B	A	B	A	A	A	C	S		
ADAK	51N	184	B	A	A	A	A	A	A	A	A	S					
ANCHORAGE	61N	211	B	A	A	A	A	A	B	A	A	A	A	B	B	B	C
LOS ANGELES	34N	242		B	A	A	C										
WHITE SANDS	32N	253	B	A	A	A	B	A	A	A	A	A	A	A	A	A	C'
BOULDER	40N	255				B	A	A	B	A	A	B	A	A			
MCMATH-HULBERT	42N	277	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
CORNELL	42N	283	C	A													
FT BELVOIR	38N	283	B	A	A	A	A	A	A	A	A	A	A	C			
GREENBELT	39N	284										C	C	C	B	C	
HUANCAYO	12S	285	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
FT MONMOUTH	40N	286		C	A	A	A	A	A	A	A	B	C	S			
PUERTO RICO	18N	293	B	A	A	A	A	A	B	S							
TRINIDAD	10N	299								B	A	A	B	A	B	A	C
BARBADOS	13N	301				C		C				B	B	C	C	C	
PARAMARIBO	05N	305				A	A	A	A	A	A	C					
BEARLEY	52N	358											C	B	B	B	C
SOMERTON	51N	358				B	C	C	C			C	B	B	B	B	C

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C.6

SHORT WAVE FADEOUTS - SWF

MONTH February YEAR 1969 OBSERVING STATION Huancayo, Peru

CHART SPEED 3 inch hour

RECORDER TIME CONSTANT

DATE	START UT	END UT	MAX UT	TYPE	DEFI-NITE-NESS	M-POR-TANCE	TRANSMITTER LOCATION	TRANSMITTER CALL LETTERS	TRANSMITTER FREQ MC/S	REMARKS
01	2136	2157	2140U	S	5	1				
08	1750	1809U	1756	SL	4	1				
09	1431	1450U	1435U	SL	1	1-				
09	1603	1622	1607U	S	0	1-				
09	1724	1740	1727	S	5	1				
13	2012	2018	2014	S	0	1-				
24	2039	2050U	2041	S	0	1-				
25	1658U	1735U	1706U	SL	0	1				
25	1940	2015U	-	(S)	4	1				
27	1358	1520U	)-	(S)	4	2				
28	1947U	2028	1955	S	4	1				

Location
10 MHz WWV Washington D.C. U.S.A.
15 " " " "
20 " " " "

Power Failure

Date	From	To
06	1435	2125
13	1511	1655
16	1345	1950
20	1512	1940
28	1520	1735

SUDDEN COSMIC NOISE ABSORPTION - SCNA
SUDDEN ENHANCEMENTS OF ATMOSPHERICS - SEA
SUDDEN ENHANCEMENTS OF VLF SIGNALS - SES
SOLAR NOISE BURSTS AT SCNA FREQUENCY

MONTH October YEAR 1968 OBSERVING STATION AAVSO, Solar Division

	FREQUENCY	CHART SPEED	RECORDER TIME CONSTANT
SCNA	____ Mc/s		
SEA	27 kc/s		
SES	24 kc/s		
BURSTS	____ Mc/s		

DATE	START UT	END UT	MAX. UT	SCNA %ABS	SCNA IMPT	SEA IMPT	SES IMPT	BURST IMPT	DEFI-NITE-NESS	REMARKS
✓5	1430	1515	1436			2+			4	A-17, Durban, S. Africa
✓5	1431	1520	1437				1		2	A-1, Valley Cottage, N.Y.
✓12	0833	0920	0838			2+			5	A-17
✓12	1341	1420	1345			1			2	A-17

COMPUTER FORMAT:

1. All types of SIDs summarized 10/1955 to date, Single station reports - 8/1968 to date.
2. Event log - Preliminary reports of flare-associated events in time sequence: Includes SID, flares, radio emission bursts, x-ray bursts - July 1969 to date.

PUBLICATIONS:

1. Solar-Geophysical Data, NOAA, single line entries by type of SID until data for 12/1969 when combined into one line per SID event.
2. IGY Solar Activity Report Series No. 24, World Data Center A - SIDs from 7/1957 - 12/1959.

ORIGINAL RECORDINGS:

Selected SWF recordings are available. For the most part these are for the stations given in Section B9 of this catalogue.

MISCELLANY:

1. SPA and SES available from Boulder, Table Mountain site.
2. Sonograms of SFD available from Boulder.

C.6 SUDDEN IONOSPHERIC DISTURBANCES

AT BOULDER

SES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
SYLT	54N	8													B	B	C
ROME	41N	12										B	C				
PANSKA VES	50N	14												C	A	A	C
SOFIA	43N	23														C	
DURBAN	29S	30								C	C	B	C	C	C		
DELHI	28N	77								A	B	B	A		B	B	C
MAYFIELD VILLAGE	40N	82															C
MANILA	14N	121						C	C	C			B		C		
MARCUS	26N	128													B	A	
YAP	09N	138													C	B	C
HOKKAIDO	42N	143													B		
GESASHI	24N	154													C	B	
KURE	29N	182													C	B	C
ATTU	52N	186													B	B	C
PORT CLARENCE	64N	194													B	B	C
HAWAII	21N	202										B	C	C		C	
SITKINAK	56N	205													C	B	C
BEVERLY HILLS	34N	242						B	B	C							
BOULDER	40N	255										B	C	C			
LITTLETON	39N	255											C	B	B	B	C
ST JOSEPH	40N	265													B		
MEMPHIS	35N	270													C		
PITTSBURGH	40N	280						A	B		C						
LATROBE	40N	281												C	B	C	C
RAMSEY	41N	286			C	A		A	A	A	C	C		C			
VALLEY COTTAGE	41N	286							B	A	B	B	C	B	B	B	C
BENNINGTON	42N	287							C	C	C	C	C				
BROOKLYN	40N	287						C	B	B	C	B	B	B	B	C	
WEST NYACK	41N	287											C	B	B		
HADDAM	41N	288										C	C		C		
SCITUATE	42N	288									C	B	B	C			
NANTUCKET	42N	289													B	B	C
CAPE RACE	46N	306													B	C	
SAO PAULO	22S	314							C	C		B	B	A	B	B	C

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S

SUDDEN COSMIC NOISE ABSORPTION - SCNA
SUDDEN ENHANCEMENTS OF ATMOSPHERICS - SEA
SUDDEN ENHANCEMENTS OF VLF SIGNALS - SES
SOLAR NOISE BURSTS AT SCNA FREQUENCY

A

MONTH October YEAR 1968 OBSERVING STATION AAVSO, Solar Division

	FREQUENCY	CHART SPEED	RECORDER TIME CONSTANT
SCNA	____ Mc/s		
SEA	27 kc/s		
SES	24 kc/s		
BURSTS	____ Mc/s		

M

DATE	START UT	END UT	MAX. UT	SCNA %ABS	SCNA IMPT	SEA IMPT	SES IMPT	BURST IMPT	DEFINITENESS	REMARKS
✓5	1430	1515	1436			2+			4	A-17, Durban, S. Africa
✓5	1431	1520	1437				1	P	2	A-1, Valley Cottage, N.Y.
✓12	0833	0920	0838			2+			5	A-17
✓12	1341	1420	1345			1			2	A-17
✓12	2000	2040	2006			1+			4	A-6
✓12	2000	2045	2007			1+			4	A-1, Latrobe, Penna.
✓19	1852	1920	1857			1+			4	A-6 Oshkosh, Wisconsin
✓19	1852	1930	1900				1		2	A-1
✓21	1427	1520	1437			3			5	A-17
✓21	1427	1530	1440				3		5	A-1
✓21	1423	1520	1428			3			5	A-22, Wellesley, Mass.

L

E

AT BOULDER

SEA

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
HERSTMONCEUX	50N	0								B					C	B	C
POITIERS	46N	0												C	A	B	C
TORTOSA	40N	0						B	C	B	B						
UCCLE	50N	4								A	A	A	B	B	C	C	C
NEDERHORST	52N	5	B	A	A	A	A	A	A								
ARCETRI	34N	11								B	B	A	B	B			
KUHLUNGSBORN	54N	11	B	A	A	A	A	A	A	B	B	B	B	B	B	B	C
ROME	41N	12								A	B	A	A	B	B	B	
NEUSTRELITZ	53N	13	B	A	A	A	A	A	A	B	B	B	C	B			
ONDREJOV	49N	14								C	C	A	B				
PANSKA VES	50N	14		B	C						C	C	A	B	A	A	C
ATHENS	37N	23												B	B	C	
DURBAN	29S	30									B	B	B	B	B	B	C
ADDIS ABABA	09N	38				C	C										
KERGUELEN	49S	70												A			
DELHI	28N	77	C	B						A	B	B	A	C	C		
MANILA	14N	121				C	B	C	C	A	B	A	A	C	B	B	
TOYOKAWA	34N	137				C	A	B	C	A	A	B	A	A	B	C	
YAP	09N	138														B	C
HOLLANDIA	02S	140	C	A	A	A	A	A	A	S							
HOBART	42S	147					B	A	B	A	B	B	A	A	A	B	C
HAWAII	21N	202		C	A	A	A	A	B	B	B	A	C				
ANCHORAGE	61N	211										B	B	C	C		
OAKLAND	37N	238			C	B	B	B	C								
BEVERLY HILLS	34N	242						B	B								
CHINA LAKE	35N	243		C	B	C	B	C									
BOULDER	40N	255	B	A	A	A	A	A	A	A	B	A	C	B	A	A	C
LITTLETON	39N	255		B									C	C	S		
SACRAMENTO PK	32N	255	B	A	A	C	C										
ST JOSEPH	40N	265													B	C	C
MEMPHIS	35N	270													C		
NEW ORLEANS	29N	270					C	B									
OSHKOSH	44N	271		C	A	B	B					C	B	B	B	B	C
COLUMBUS	40N	273													C	C	C
LOUISVILLE	38N	274														C	C
MCMATH-HULBERT	42N	277	B	A	A	A	A	A	C	B	B	B	C		C		
PITTSBURG	40N	280		B	A	B	C	C			C	C	C		C	B	C
LATROBE	40N	281										C	C	C	B	B	C
DERWOOD	39N	283		B	C	S											
RAMSEY	41N	286		B	A	A	B	A	B	B	B	B		C			
BENNINGTON	42N	287							C	B	C	C					
BLAUVELT	41N	287				B	C	B	C	C	C						
BROOKLYN	40N	287		A	A	A	B	B	A	B	B	A	B	C	B	B	C
WEST NYACK	41N	287											C	C	C		
HADDAM	41N	288									C	C	C	C	B	B	C
SCITUATE	42N	288									C	B	C	C			
WELLESLEY	42N	289												B	B	B	C
LEXINGTON	42N	289														C	C
PARAMARIBO	05N	305	C	A	A	A	A	A	A								
SAO PAULO	22S	314							C	C		B	B	C	C	C	

KEY TO SYMBOLS

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MICROFILM:

Original recordings of SCNA-SEA from Rome, Manila, Hawaii, Boulder and McMath-Hulbert grouped on 35 mm microfilm. Monthly strips $3.00 per month.

ESSA RESEARCH LABORATORIES

ESSA FORM 6[illegible] SC
(10/68)

SUDDEN PHASE ANOMALIES - SPA

MONTH MARCH YEAR 1970

OBSERVING STATION #59 MANIMA OBSERVATORY
CHART SPEED 1.2 inches/hour
RECORDER TIME CONSTANT 1.0 second

DATE	START UT	END UT	MAX. UT	PHASE SHIFT AT MAX. DEGREES	TRANSMITTER LOCATION	TRANSMITTER CALL LETTERS	TRANSMITTER FREQ kc/s	REMARKS
01	0035	0050	0038	18	Jim Creek	NLK	18.6	
01	0207	0245	0218	30	Rugby, England	GBR	16.0	
01	0204	0246	0218	34	Jim Creek	NLK	18.6	
01	0250	0324	0301	29	Rugby	GBR	16	
01	0251	0310	0259	14	Jim Creek	NLK	18.6	
01	0421	0600	0437	90	Jim Creek	NLK	18.6	2nd Max at 0508Z /of 87°
01	0420	0501	0434	32	Cutler Maine	NAA	17.8	
01	0502	0530	0507	32	Rugby	GBR	16	
01	0502	0524	0507	18	Cutler Maine	NAA	17.8	
01	0808	0830	0815	32	Rugby	GBR	16	
01	0937	1052	0943	140	Rugby	GBR	16	End uncertain. Very /rough trace.
01	1402	1430	1408	30	Rugby	Slight	SES.	
01	1530	1555	1533	30	Rugby	GBR	16	SES
01	2100	2214	2114	198	Jim Creek	NLK	18.6	
01	2335	2407	2344	36	Jim Creek	NLK	18.6	
02	0013	0047D	0012	85	Jim Creek	NLK	2nd	SPA began on tail
02	0047	0146	0052	54	Jim Creek	NLK	Adv. projection	measured from of tail of previous SPA
02	0047	0117	0050	25	Rugby	GBR	16	
02	0437	0446	0441	18	Rugby	GBR	16	
02	0438	0452	0442	23	Cutler Maine	NAA	17.8	
02	0448	0529	0502	45	Rugby	GBR	16.0	
02	0448	0521	0500	22	Jim Creek	NLK	18.6	
02	0505	0542	0524	24	Cutler Maine	NAA	17.8	
03	0022	0108	0027	41	Rugby	GBR	16	
03	0022	0110	0029	65	Jim Creek	NLK	18.6	
03	0630	0717	0648	205	Rugby	GBR	16	
03	0630	0717	0644	51	Jim Creek	NLK	18.6	
03	0843	0930	0850	115	Rugby	GBR	16	
03	2034	2130	2040	108	Jim Creek	NLK	18.6	phase seems lost on /tail till 2130Z
03	2240	2350	2250	75	Jim Creek	NLK	18.6	
04	0055	0135	0108	36	Rugby	GBR	16	
04	0055	0200	0110	83	Jim Creek	NLK	18.6	
04	0056	0154	0110	88	Cutler Maine	NAA	17.8	
04	0230	0322	0243	48	Rugby	GBR	16	
04	0227	0325	0243	64	Jim Creek	NLK	18.6	
04	0607	0711	0618	93	Rugby	GBR	16	
04	0608	0631	0616	23	Jim Creek	NLK	18.6	
05	0419	0656	0453	134	Rugby	GBR	16	
05	0419	0642	0455	140	Jim Creek	NLK	18.6	
05	0418	0607	0458	142	Cutler Maine	NAA	17.8	
06	0934	1100	0944	101	Rugby	GBR	16	
07	0143	0243	0154	80	Rugby	GBR	16	
07	0143	0303	0200	97	Jim Creek	NLK	18.6	

C.6 SUDDEN IONOSPHERIC DISTURBANCES

AT BOULDER

SEA

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
DUNSINK	53N	354	B	A	A	A	A	A	A	A	B	S					
RABAT	34N	354	C	B	B												
EDINBURGH	55N	357	B	A	C	S											
PRESTON	43N	358	B	A	A	A	B	B	A	A	A	A	A	B	A	A	C

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C.6 SUDDEN IONOSPHERIC DISTURBANCES

AT BOULDER

SPA

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
SYLT	54N	8													B	B	C
KUHLUNGSBORN	54N	11								B	C	B	B			B	C
NEUSTRELITZ	53N	13								B	C	C					
STOCKHOLM	59N	18													A	C	
DEBRA ZEIT	08N	38												B	A	C	
DELHI	28N	77										C	C	C			
MANILA	14N	121									B	A	A	A	A	A	C
MARCUS	26N	128													B	A	
WOOMERA	31S	136												B	B	C	
KASUGAI	35N	137														A	C
YAP	09N	138													C	B	C
TOKYO	35N	139												C	C	C	
INUBO	35N	141													B	A	C
HOKKAIDO	42N	143													B		
GESASHI	24N	154													C	B	C
KURE	28N	182													C	B	C
ATTU	52N	186													B	B	C
FORESTPORT	43N	186														B	C
PORT CLARENCE	64N	194													B	B	C
HAWAII	21N	202										A	A	A	A	A	B
PYRAMID ROCK	21N	203														B	C
SITKINAK	56N	205													C	B	C
ANCHORAGE	61N	210										A	B	A	A	B	C
NELC	33N	243														B	C
BOULDER	40N	255				B	C	C	C	C		B	A	A	C		
HUANCAYO	12S	285										C	B				
NANTUCKET	42N	289													B	B	C
TRINIDAD	11N	299														B	C
CAPE RACE	46N	306													B	C	
SAO PAULO	23S	314										B	C	A	B	B	C
SAN FERNANDO	36N	354												B	C		
SLOUGH	51N	360								A	A	B	B	A	A	A	C

SUDDEN FREQUENCY DEVIATIONS – SFD

MONTH JANUARY YEAR 1969

TAPE NUMBER
OBSERVING STATION University of Hawaii
TIMING ACCURACY ± 1 minute

DATE	START UT	END UT	MAX. UT	FREQ. DEV., Hz	TRANSMITTER LOCATION	TRANSMITTER CALL LETTERS	TRANSMITTER FREQ MHz	REMARKS
4	2101	2102	2102	.9	Maui	WWVH	10	
	2057	2101	2059	.3			5	

SUDDEN COSMIC NOISE ABSORPTION – SCNA
SUDDEN ENHANCEMENTS OF ATMOSPHERICS – SEA
SUDDEN ENHANCEMENTS OF VLF SIGNALS – SES
SOLAR NOISE BURSTS AT SCNA FREQUENCY

MONTH OCTOBER YEAR 1968 OBSERVING STATION #59 MANILA OBSERVATORY

	FREQUENCY		CHART SPEED	RECORDER TIME CONSTANT
SCNA	18 & 30	Mc/s	1.2 inch/hour	1 second
SEA		kc/s		
SES		kc/s		
BURSTS		Mc/s		

DATE	START UT	END UT	MAX. UT	SCNA %ABS	SCNA IMPT	SEA IMPT	SES IMPT	BURST IMPT	DEFINITENESS	REMARKS
04	0035	0040	0037	8	1-				2	30 MHz
21	0603	0705	0613	70	1				5	18 MHz
21	0608	0618	0611	50	1				5	30 MHz
23	0357	0432	0446	30	1				5	18 MHz
23	0401	0435	0405	40	1				5	30 MHz

C.6 SUDDEN IONOSPHERIC DISTURBANCES

AT BOULDER

SFD

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
DELHI	28N	77										B	B	B	C	C	C
HAWAII	21N	202										C	B	A	B	A	C
BOULDER	40N	255				C	A	A	A	B	A	A	A	A	A	C	

C.6 SUDDEN IONOSPHERIC DISTURBANCES

AT BOULDER

SCNA

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
KUHLUNGSBORN	54N	11	B	A	A	A	A	A	A	B	B	A	B	C			
ROME	41N	12								A	B	B	B	A	B	A	C
NEUSTRELITZ	53N	13	B	A	A	A	A	A	A	B	B	A		C		A	C
ONDREJOV	49N	14								C	C						
PANSKA VES	50N	14									B	A	A	C			
DELHI	28N	77		C						A	B	B	B	C	B	B	C
MANILA	14N	121						B	B	A	B	A	A	A	A	B	C
HAWAII	21N	202		C	A	A	A	A	B	B	B	A	B				
ANCHORAGE	61N	211										A	B	B	A	C	C
BOULDER	40N	255	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
SACRAMENTO PK	32N	255	B	A	A	C	C	S									
MCMATH-HULBERT	42N	277	B	A	A	A	A	A	C	B	B	B	B	C	A	A	C
GRAFTON	42N	282	B	A	A	B	B	C									
EDINBURGH	55N	357	B	B													

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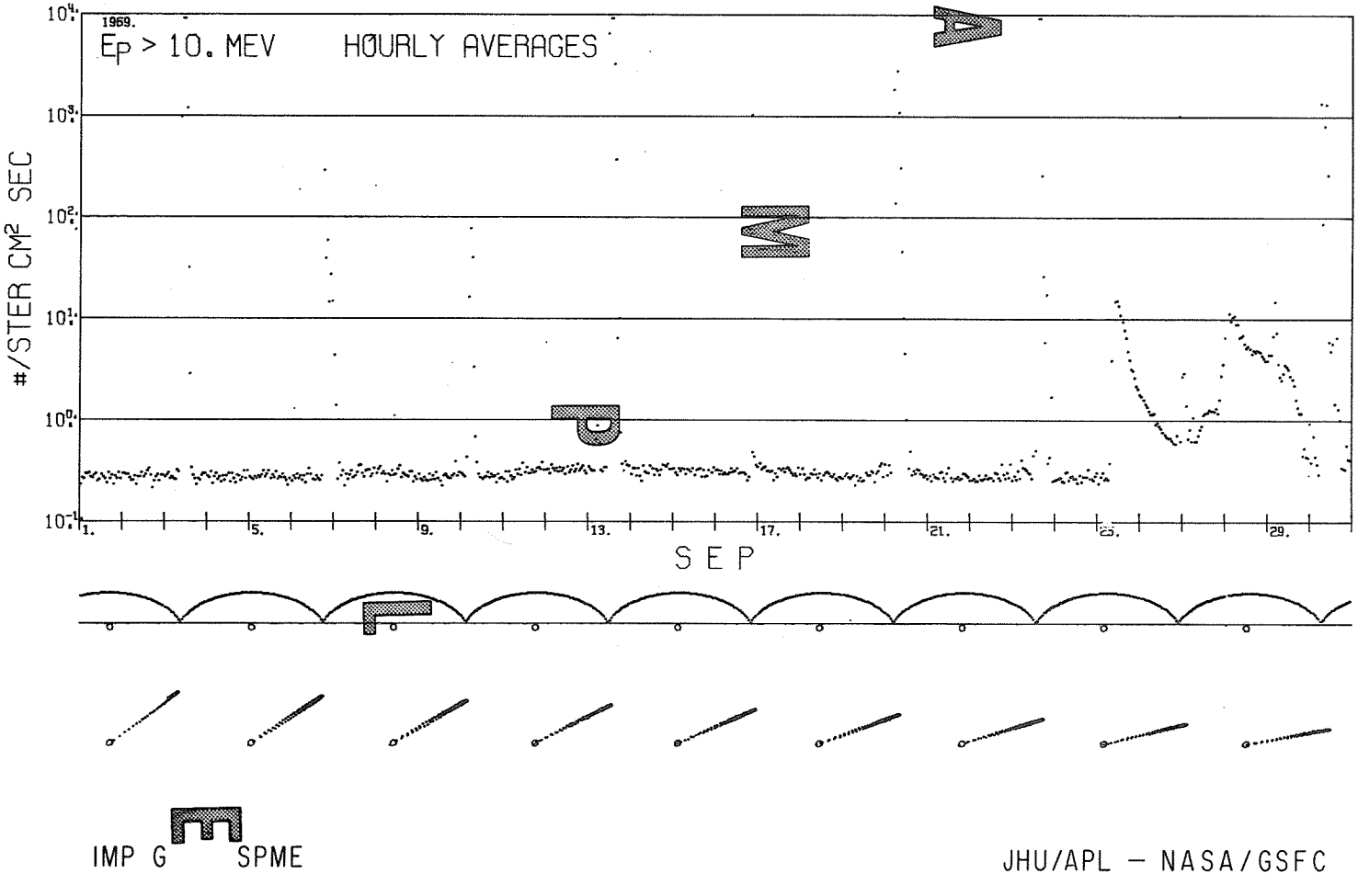
The graphs of the Explorer 41 data indicate outstanding events of more than one hour's duration.

SOLAR PROTONS BY SATELLITE
EXPLORER 41 (1969-53A)

SEPTEMBER 1969



C.7 SOLAR PROTONS AND ELECTRONS - DIRECT MEASUREMENT

AT BOULDER

SATELLITE	ENERGY RANGE	SOURCE	67	68	69	70	71
EXPLORER 34	10MEV	JHU/APL-GSFC	B	B	CS		
EXPLORER 34	30MEV	JHU/APL-GSFC	B	B	CS		
EXPLORER 34	60MEV	JHU/APL-GSFC	B	B	CS		
EXPLORER 41	10MEV	JHU/APL-GSFC			B	B	
EXPLORER 41	30MEV	JHU/APL-GSFC			B	B	
EXPLORER 41	60MEV	JHU/APL-GSFC			B	B	
ATS-1	5-21MEV	AEROSPACE				A	C
ATS-1	21-70MEV	AEROSPACE				A	C
PIONEER 8	64MEV	UNIV N HAMPSHIRE				A	C
PIONEER 9	40MEV	UNIV N HAMPSHIRE				A	C

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PUBLICATIONS:

1. Solar-Geophysical Data, NOAA Research Laboratories, Explorer 34, Explorer 41 and ATS-1 data published monthly.

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
59-009A-04	Explorer 6	Radiation & Solar Protons	Van Allen	08/07/59	1059-0261
60-001A-01	Pioneer 5	Proportional Counter Telescope	Simpson	03/11/60	0360-0560
61-020A-04	Explorer 12	C. R. Scintillation	McDonald	08/16/61	0861-1261
62-051A-04	Explorer 14	Cosmic Ray Scintillation	McDonald	10/02/62	1062-0863
63-046A-03	Explorer 18	Cosmic Ray Range vs. Energy Loss	Simpson	11/27/63	1163-0664
63-046A-04	Explorer 18	Cosmic Rays	McDonald	11/27/63	1163-0564
64-054A-12	OGO 1	Solar Cosmic Rays	Anderson	09/05/64	0965-0566
64-054A-18	OGO 1	C. R. Spectra and Fluxes	Simpson	09/05/64	0964-1167
64-060A-3	Explorer 21	Cosmic Ray Range vs. Energy Loss	Simpson	10/04/64	1064-0465
64-060A-05	Explorer 21	Ionization Chamber and GM Counters	Anderson	10/04/64	1064-0965
64-076B-04	Explorer 25	Solid State Detector	Van Allen	11/21/64	0265-0766
64-077A-04	Mariner 4	Cosmic Ray Telescope	Simpson	11/28/64	1164-1065
65-042A-03	Explorer 28	Cosmic Ray Range vs. Energy Loss	Simpson	05/29/65	0565-0567
65-042A-05	Explorer 28	Ionization Chamber and GM Counters	Anderson	05/29/65	0565-0167
65-081A-07	OGO 2	Low-energy Proton, Alpha Particle Measurement	Simpson	10/14/65	1065-1266
65-081A-08	OGO 2	Galactic & Solar Cosmic Ray	Webber	10/14/65	1065-1065
65-105A-03	Pioneer 6	Cosmic Ray Telescope	Fan	12/16/65	1265-0870
66-049A-01	OGO 3	Solar Cosmic Rays	Anderson	06/07/66	0666-0267
66-049A-03	OGO 3	Cosmic Ray Spectra & Fluxes	Simpson	06/07/66	0666-0868
66-058A-04	Explorer 33	Ionization Chamber and GM Counters	Anderson	07/01/66	0766-0667
66-075A-06	Pioneer 7	Cosmic Ray Telescope	Simpson	08/17/66	0866-0870
66-110A-03	ATS 1	Omni Directional Spectrometer	Paulikas	12/07/66	1266-0568
67-031A-05	ATS 2	Omni Directional Proton Electron Detectors	McIlwain	04/06/67	0467-1067
67-051A-03	Explorer 34	Cosmic Ray Proton	Simpson	05/24/67	0567-0569
67-051A-07	Explorer 34	Solar Proton Monitor	Bostrom	05/24/67	0567-0569
67-070A-01	Explorer 35	Electron and Proton Detectors	Van Allen	07/19/67	0767-0570
67-073A-09	OGO 4	Galactic &Solar Cosmic Ray	Webber	07/28/67	0767-0867

C.8

Suitably located riometers are capable of recording solar protons (at geomagnetic latitude $\geq 65°$).

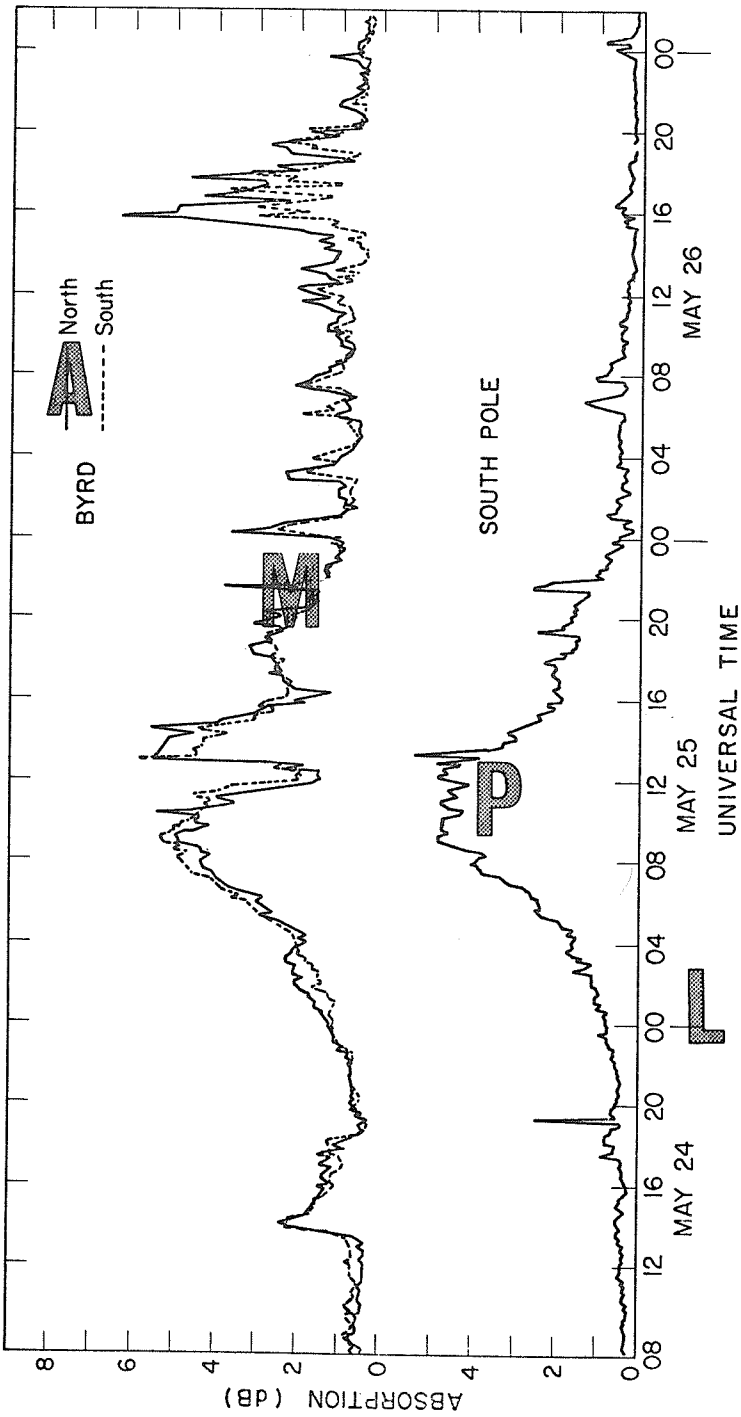

Fig. 1. Polar-cap absorption on 30 MHz at Byrd and South Pole, May 24-26, 1967.

C.8 SOLAR PROTONS - RIOMETER

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	INDICATOR
HEISS ISLAND	80N	58								A	A	S					BT
THULE	76N	292		B				Q	Q	A	B	Q	Q	B			TH
RESOLUTE BAY	74N	266			Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	RB
BARROW	71N	204		B	S												
BAR 1	69N	220											B	A	A		
GODHAVN	69N	307							Q	Q	Q	Q	Q	Q			GO
KIRUNA	67N	20		B	B	B	A	A	A	B	A	A	A	A			KI
FT YUKON	66N	215		C									A	A	A		
COLLEGE	64N	213	B	A	B	A	A	A	B	A	A	A	A	A	A	C	CO
CORAL HARBOR	64N	277			Q	Q	Q	Q	Q	Q	S						
LEIRVOGUR	64N	339										Q	Q	Q	Q		
REYKJAVIK	64N	339									B	A	A	A			RK
FROBISHER BAY	63N	292							B	A	C	S					FB
CHURCHILL	58N	266	B	A	A	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	CH
GREAT WHALE	55N	283							B	A	A	A	A	A			GW
CAPE JONES	54N	281			Q	Q	Q	Q	A	A	B	S					CJ
SYOWA BASE	69S	39											B	C			SW
CAPE HALLETT	72S	170				B	Q	Q	Q	S							HT
MCMURDO	77S	166						C	Q	Q	Q	Q	Q	Q	Q	Q	
VOSTOK	78S	106								C	A	A	A	A			VO
BYRD STATION	80S	240							A	A	A	A	A	A			BD
SOUTH POLE	90S	0							A	A	A	A	A	A	A		PO

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PUBLICATIONS:

1. Reid and Leinbach, "Polar Cap Absorption During the Solar Cosmic Ray Outbursts of July 1959", IUGG Proc. Symposium on the July 1959 Events and Associated Phenomena, Helsinki (1960).
2. Expedition Antarctique Belgo-Neerlandaise, Riometer events from Base Roi Baudouin from 2/1965 - 12/1965.

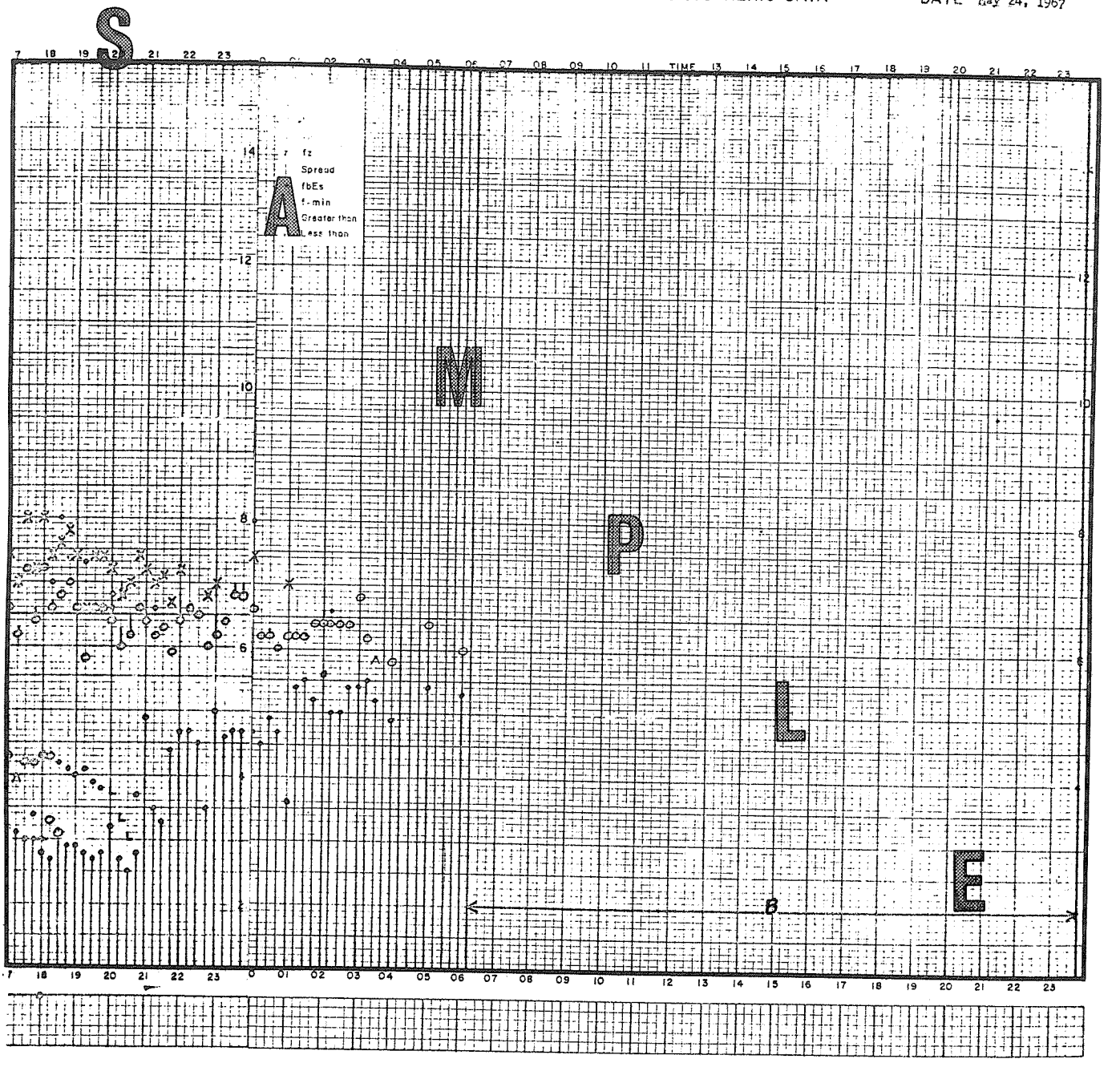
STRIP CHARTS

See Section B.8 for list of stations available.

C.9

The 15-minute f min scalings from polar cap stations can indicate solar protons as polar cap absorption events.

DATE May 23, 1967 STATION RESOLUTE BAY, N.W.T. f-PLOT OF IONOSPHERIC DATA DATE May 24, 1967



SCALED BY NA/DS/PKB

C.9 SOLAR PROTONS - IONOSPHERIC VERTICAL INCIDENCE SOUNDINGS

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	INDICATOR
ARCTICA (NP-6)	87N		B	A	B	S											XA
ALERT	82N	298	C	A	S												AL
FLETCHERS ICE	82N		B	A	S												XC
ARCTICA(NP-13)	81N									B	A	B					XG
ARCTICA (NP-8)	80N					B	B	S									XG
EUREKA	80N	275	C	A	C	S											EU
HEISS ISLAND	80N	58	B	A	B	A	A	A	A	A	A	A	P	P	P	P	BT
ARCTICA (NP-7)	79N		B	A	C	S											XG
ARCTICA(NP-11)	79N							C	S								XB
ARCTICA(NP-10)	78N							C	A	C							XG
THULE	76N	292	B	A	A	B	A	A	A	B	B	B	S				TH
RESOLUTE BAY	74N	266	B	A	A	A	A	A	A	A	A	A	A	A	B	C	RB
BARROW	71N	204	B	A	A	A	A	A	B	A	B	S					BW
CLYDE	70N	292	C	B	S												CR
GODHAVN	69N	307	B	A	B	B	A	A	B	A	A	A	A	A	B	Q	GO
TROMSO	69N	19	B	A	A	B	A	A	A	A	A	B	B	A	A	C	TR
KIRUNA	67N	20	B	A	A	A	A	A	A	A	A	A	A	A	A	Q	KI
BAKER LAKE	64N	264	B	A	C	S											BL
COLLEGE	64N	213	B	A	A	A	A	A	B	B	A	A	A	A	B	Q	CO
FORT NORMAN	64N	235	C	S													FN
REYKJAVIK	64N	339	B	A	A	A	A	A	A	A	S						RK
YELLOWKNIFE	62N	246	C	B	C	S											YE
NARSSARSSUAQ	61N	315	C	A	A	A	A	A	B	A	A	A	A	A	C	Q	NQ
CHURCHILL	58N	266	B	A	A	A	A	A	A	A	A	A	A	A	A	C	CH
FORT CHIMO	58N	292		C	S												FC
MIRNY	66S	93	B	A	A	A	A	A	A	A	A	A	P	P	P	P	MI
TERRE ADELIE	66S	140	B	A	A	A	A	A	A	A	A	A	B	Q	Q	Q	DU
WILKES	66S	110	B	B	A	A	A	A	C	A	A	A	A	A	C	Q	WL
MAWSON	67S	62		C	B	B	A	A	A	A	A	A	A	A	Q	Q	MW
SYOWA BASE	69S	39			B	A	B					B					SW
CAPE HALLETT	72S	170	B	A	A	A	A	A	A	C	S						HT
HALLEY BAY+	75S	334	B	A		B	A	A	A	B	A	C	P	P	P	P	HB
ELLSWORTH	77S	319	B	A	B	A	A	B							Q		EL
SCOTT BASE	77S	166	B	A	A	A	A	A	A	A	A	A	C	B	B	C	SB
LITTLE AMERICA	78S	198	B	A	S												LA
VOSTOK	78S	106		B	A	A	A			B	A	A	P	P	Q	Q	VO
BYRD STATION	80S	240	B	A	A	A	A	B	A	A	A	A	C	Q	Q	Q	BD
SOUTH POLE	90S		B	A	A	A	A	B	B	A	A	A	Q	Q	Q	Q	PO

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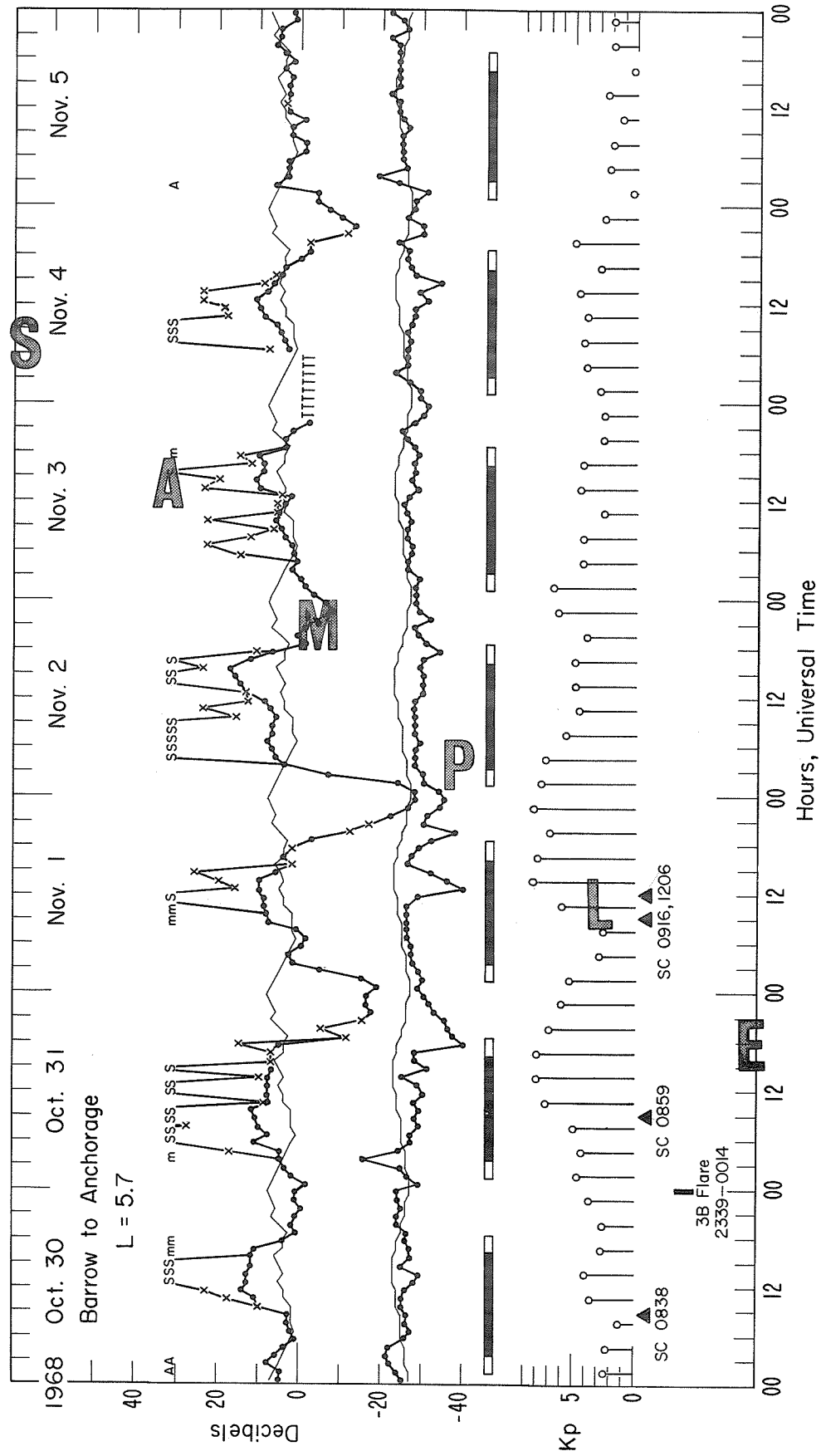
PUBLICATIONS:

1. Y. Hakura, Y. Takenashita and K. Matsuaka, Influence of Solar Activity on the Ionosphere Blackout Index, J. Radio Res. Labs. Japan, 1967, 14 No. 73. - defines Ip Indices.
2. Annals of IQSY, Vol. 2 pp. 286-294 contains Ip Indices for 1957-1965.
3. Solar-Geophysical Data, NOAA and STP Notes publish current Ip Indices in the Calendar Records.



Ionospheric forward-scatter observations from Alaska showing effects of solar protons and electron precipitation at L = 5.7.

C.10 SOLAR PROTONS AND ELECTRONS

VHF FORWARD SCATTER

AT BOULDER

RECEIVING STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	64	65	66	67	68	69	70	71	TRANSMITTER	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST
COLLEGE	64N	213	A	A	A	A	S				ANNETTE	55N	131W
ANCHORAGE	61N	211	B	A	A	B	Q	Q	Q	Q	BARROW	71N	204E
GREAT WHALE	55N	283	Q	Q							FROBISHER BAY	63N	292E
MCMURDO	77S	166	Q	Q							BYRD	80S	240E
VOSTOK	78S	106	Q	Q							MCMURDO	77S	166E
SOUTH POLE	90S	0	Q	Q							BYRD	80S	240E

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

PUBLICATIONS:

1. D. K. Bailey, Planetary and Space Science, 12, 495-541, 1964 - Comprehensive list of solar proton events by VHF Forward Scatter.

2. D. K. Bailey, et.al., Characteristics of Precipitated Electrons Inferred from Ionospheric Forward Scatter, J. Geophysical Research, 71, 5179-5182, 1966.

C.11

C.11 SOLAR PROTONS AND ELECTRONS - OTHER TYPES

AT BOULDER

"Blackout" of HF communications over polar circuits can sometimes be interpreted as polar cap absorption events, e.g. HF field strength recordings of Thule transmissions received at Anchorage and Tokyo are suitable for such analysis.

WDC-A holds some Thule-Anchorage data.

C.12

C.12 SOLAR, IONOSPHERIC OR AERONOMICAL ROCKETS

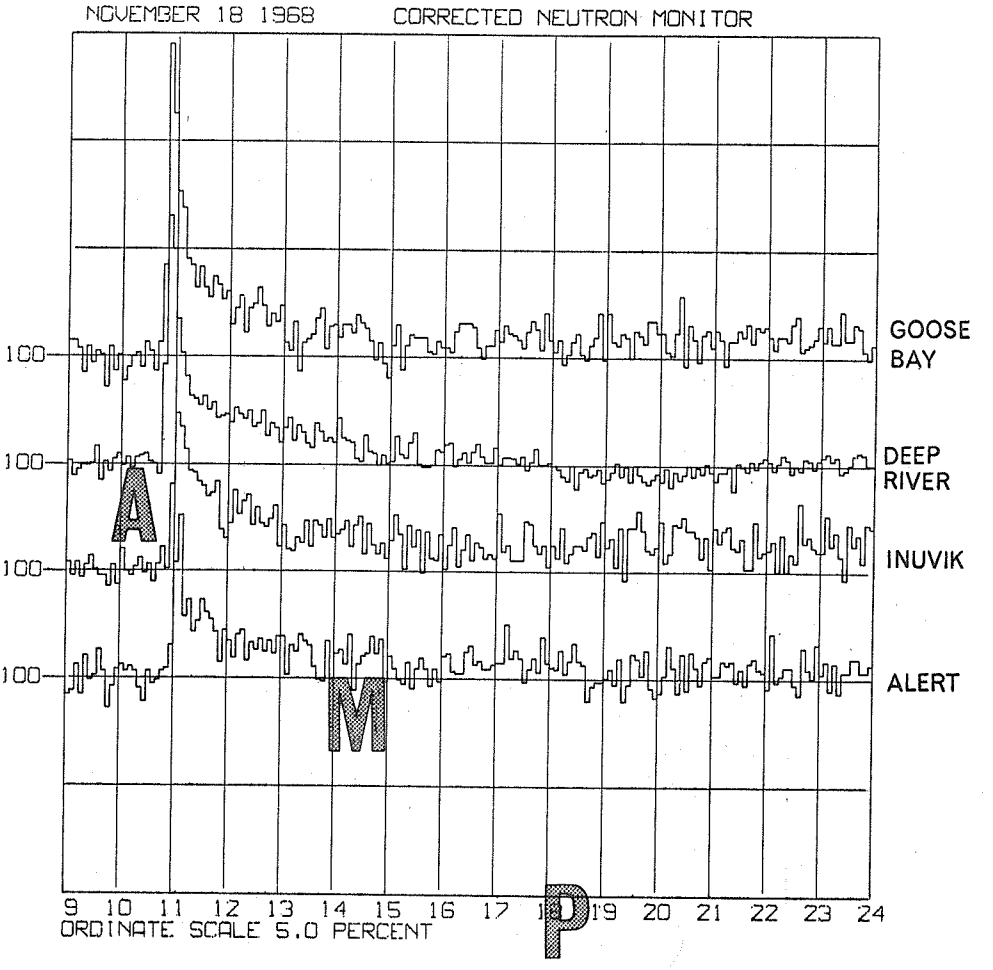
AT GREENBELT

To identify rockets launched during events, see summary listings in World Data Center A Rockets and Satellites Catalogue, NASA, Greenbelt, Maryland.

Rocket launching sites are listed in Section B.5.

C.13

Neutron or super neutron monitors record ground level increases occurring at the time of great solar proton events.



* ALERT * 82 30 N, 62 20 W, 57 M, CANADA

NEUTRON MONITOR 18-NM-64

REAL COUNTS 100 TIMES TABULATED COUNTS

FIVE-MINUTE BAROMETER CORRECTED HOURLY RATE

NOVEMBER 18, 1968

TIME U.T.	MINUTES AT END OF INTERVAL 05	10	15	20	25	30	35	40	45	60	AVERAGE
900 - 1000	* 6351	6364	6441	6351	6467	6396	6409	6487	6422	6428 *	6400
1000 - 1100	* 6441	6422	6435	6422	6370	6331	6422	6383	6396	6500 *	6414
1100 - 1200	* 6746	6888	6584	6636	6539	6571	6636	6597	6577	6545 *	6609
1200 - 1300	* 6513	6461	6532	6545	6455	6506	6487	6519	6481	6526 *	6501
1300 - 1400	* 6526	6410	6500	6481	6532	6513	6500	6436	6397	6397 *	6466
1400 - 1500	* 6474	6487	6442	6532	6365	6442	6468	6474	6525	6391 *	6466
1500 - 1600	* 6468	6430	6398	6385	6449	6372	6430	6462	6430	6391 *	6419
1600 - 1700	* 6468	6474	6423	6417	6417	6481	6500	6442	6455	6442 *	6448
1700 - 1800	* 6449	6449	6563	6461	6487	6461	6392	6430	6461	6449 *	6462

C.13 COSMIC RAY GROUND LEVEL INCREASES

See station lists in Sections F.1 and F.2 for stations recording at the time of the outstanding ground level increases.

OUTSTANDING GROUND LEVEL INCREASES

1942	Feb	28	1960	Nov	12
1946	July	25	1960	Nov	15
1949	Nov	19	1960	Nov	20
1956	Feb	23	1961	July	18
1956	Aug	31	1961	July	20
1959	July	16	*1967	Jan	28
1960	May	04	*1968	Nov	18
1960	Sept	03	*1969	Feb	25
			*1971	Jan	24-25

* WDC-A holds several graphs of the events marked by the asterisks.

P U B L I C A T I O N S:

1. World Data Center A - Upper Atmosphere Geophysics Report UAG-9 - Data on Cosmic Ray Event of Nov. 18, 1968 and Associated Phenomena.

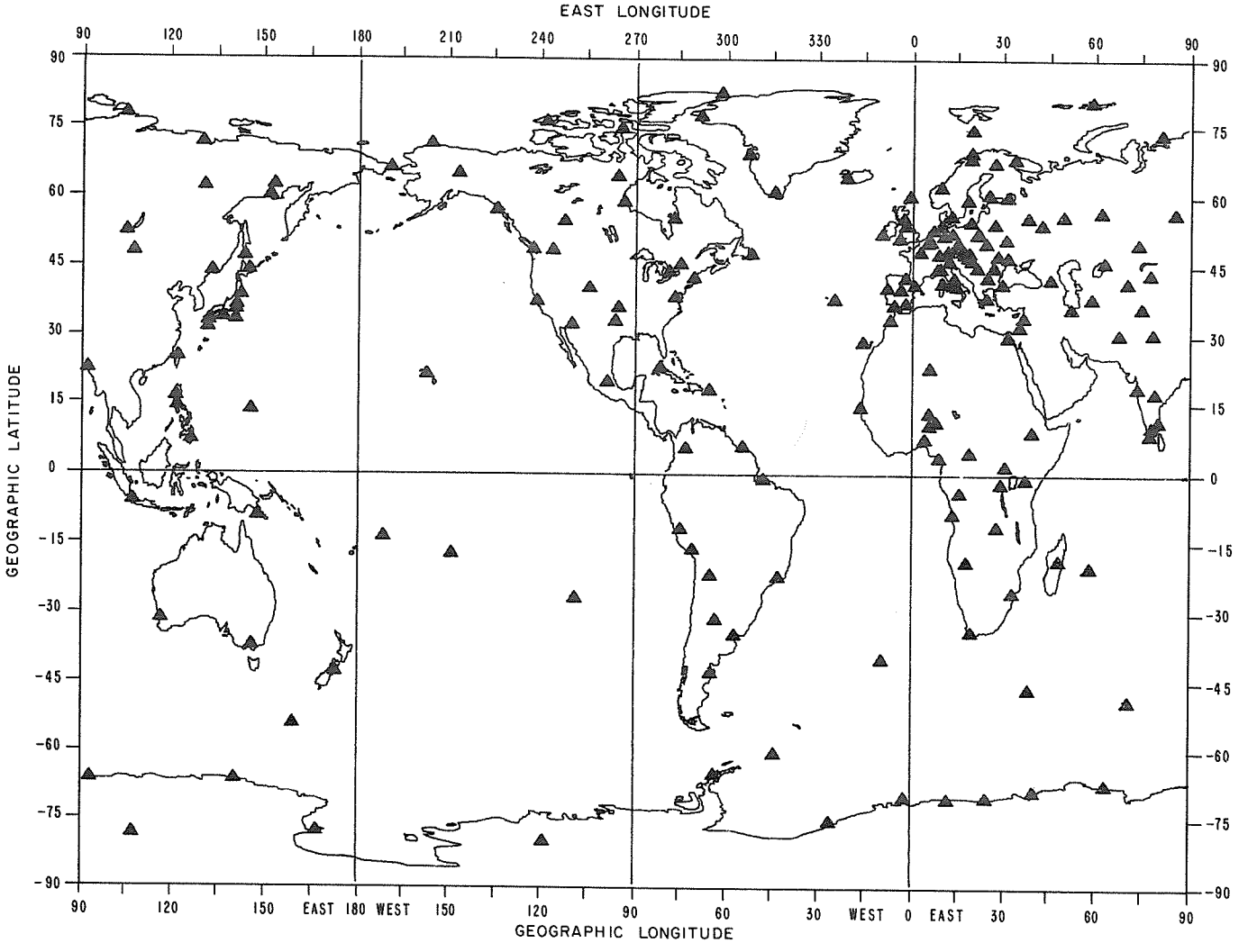
D. GEOMAGNETIC PHENOMENA

The map below shows all the observatories currently submitting geomagnetic data to the World Data Center A. The catalogue listings are arranged by geographic latitude from north to south. They are included alphabetically in the Master Station List pp. 6 to 30.

CONTENTS

		Page
D.1	STANDARD AND RAPID RUN MEASUREMENTS	181
D.2	MAGNETOSPHERIC MICROPULSATION PHENOMENA	208
D.3	SPACE MAGNETISM	212
D.4	MAGNETOSPHERIC PARTICLES	214
D.5	MEASUREMENT OF MAGNETOSPHERE BY WHISTLER AND VLF EMISSIONS.	216

GEOMAGNETIC OBSERVATORIES 1971



NORMAL MAGNETOGRAMS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
NORTH POLE 7	86N	297	B	A	C												
ALERT	83N	298						A	A	A	A	A	A	A	A	A	C
NORTH POLE 6	82N	9	B	A	B												
HEISS IS	81N	58		B	A	A	A	A	A	A	A	A	A				
NORTH POLE 13	81N	165								B	A						
ARCTIC ICE FLO	80N	195	B	B													
MURCHISON BAY	80N	18	C	A	B												
NORTH POLE 8	80N	165			B	A	A	C									
TIKHAYA BAY	80N	58	B	B													
NORTH POLE 12	79N	187							B	C							
CAPE CHELYUSKIN	78N	104	B	A	A	A	A	A	A	A	A	A	A	A			
NORTH POLE 10	78N	165					C	C									
THULE	77N	291	B	A	A	A	A	A	A	A	A	A	A	A	A	A	
MOULD BAY	76N	241						A	A	A	A	A	A	A	A	A	C
THULE AFB	76N	291										C	A	A	A	A	C
RESOLUTE BAY	75N	265	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
DIXON	74N	80	B	A	A	A	A	A	A	A	A	A	A	A		B	
BARROW	72N	204	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
TIXIE BAY	72N	129	B	A	A	A	A	A	A	A	A	A	B	C		B	
BARTER ISLAND	70N	216	C	A													
KAP TOBIN	70N	338	C	A	B												
TROMSO	70N	19								A	A	A	A	A	A		
GODHAVN	69N	306	B	A	A	A	A	A	A	A	A	A	A	A	A	A	
IVALO	69N	27	C	A	C												
MURMANSK	69N	33	B	A	A	A	A	A	A	A	A	A	A	A	B		
ABISKO	68N	19												A	A	A	C
KIRUNA	68N	21	B	A	C		C	A	A	A	A	A	A	A	A	A	C
FORT YUKON	67N	215	C	A													
KOTZEBUE	67N	198	C	A													
SODANKYLA	67N	27	B	B						A	A	A	A	A	A	A	C
CAPE WELLEN	66N	190	B	A	A	A	A	A	A	A	A	A	A	A		C	
COLLEGE	65N	212	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
SUKKERTOPPEN	65N	307								A	A						
BAKER LAKE	64N	264	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
BIG DELTA	64N	214	B	A	C												
EIELSON AFB	64N	213										C	A	A	A	A	C
HEALY	64N	211	B	A	C												
LEIRVOGUR	64N	338	C	A	A	A	A	A	A	A	A	A	A	A	A	A	C
NORTHWAY	63N	218	B	A													
DOMBAS	62N	9								A	A	A	A	A	A	B	
SREDNIKAN	62N	152	B	A	A	A	A	A	A	B							
YAKUTSK	62N	130	B	A	A	A	A	A	A	A	A	A	A	A	A	C	
YELLOWKNIFE	62N	246	B	B													
ANCHORAGE	61N	210	B	A													
JULIANEHAAB	61N	314	C	C						B	C						
NARSSARSSUAQ	61N	315												B	A	A	
NURMIJARVI	61N	25	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
LENINGRAD	60N	31	B	A	A	A	A	A	A	A	A	A	A	A	A	C	
LERWICK	60N	359	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
FORT CHURCHILL	59N	266	B	A					C	A	A	A	A	A	A	A	C

HOURLY VALUES

STATION	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
NORTH POLE 7	B	A	C												
ALERT					A	A	A	A	A	A	A	A	A		
NORTH POLE 6	B	A	B												
HEISS IS		B	A	A	A	A	A	A	A	A	A				
NORTH POLE 13								B	A						
ARCTIC ICE FLO															
MURCHISON BAY	C	A	B												
NORTH POLE 8			B	A	A	C									
TIKHAYA BAY	B	B													
NORTH POLE 12							B	C							
CAPE CHELYUSKIN	B	A	A	A	A	A	A	A	A	A	A	A			
NORTH POLE 10					C	C									
THULE	B	A	A	A	A	A		C	B						
MOULD BAY						A	A	A	A	A	A	A	A		
THULE AFB															
RESOLUTE BAY	B	A	A	A	A	A	A	A	A	A	A	A	A		
DIXON	B	A	A	A	A	A	A	A	A	A	A	A			
BARROW	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
TIXIE BAY	B	A	A	A	A	A	A	A	A						
BARTER ISLAND	C	A													
KAP TOBIN															
TROMSO	B	A	A	A	A	A	A	A			A	A			
GODHAVN	B	A	A	A	A	A	A	A	A	C	C	C	C		
IVALO															
MURMANSK		B	A	A	A	A	A	A	A	A	A	A	B		
ABISKO												B			
KIRUNA						C	B	C	A	B					
FORT YUKON	C	A													
KOTZEBUE	C	A													
SODANKYLA	B	A	A	A	A	A	A	A	A	A	A	B	A	A	C
CAPE WELLEN	B	A	A	A	A	A	A	A	A	A	A	A			
COLLEGE	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
SUKKERTOPPEN									C						
BAKER LAKE	B	A	A	A	A	A	A	A	A	A	A	A			
BIG DELTA	B	A													
EIELSON AFB															
HEALY	B	A													
LEIRVOGUR	C	A	A	A	A	A	A	A	A	A	A	A	A	A	C
NORTHWAY	B	A									A				
DOMBAS	B	A	A	A	A	A	A	A	A	A					
SREDNIKAN	B	A	A	A	A	A	A	B							
YAKUTSK	B	A	A	A	A	A	A	A	A	A	A	A	A	C	
YELLOWKNIFE	B	B													
ANCHORAGE	B	A													
JULIANEHAAB															
NARSSARSSUAQ												B	A	A	
NURMIJARVI	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
LENINGRAD	B	A	A	A	A	A	A	A	A	A	A	A	A	C	
LERWICK	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
FORT CHURCHILL	B	A					A	A	A	A	A	A	A		

KEY TO SYMBOLS

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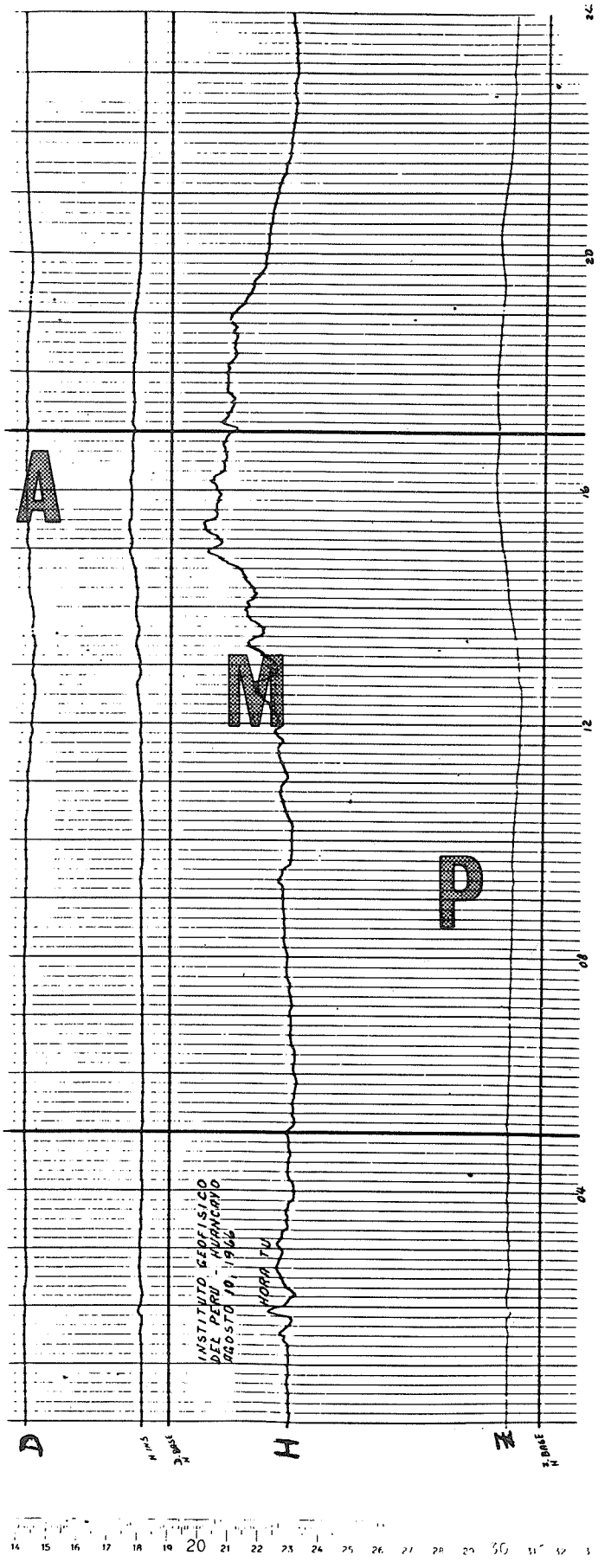
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

D.1



NORMAL MAGNETORGRAM

AT BOULDER-GEOMAGNETISM

NORMAL MAGNETOGRAMS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
LOVO	59N	18	B	A	A	A	C			A	A	A	A	A	A	B	
SITKA	57N	225	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
SVERDLOVSK	57N	61	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
KAZAN	56N	49	B	A	A	A	A	A	A	A	A	A	A	A			
ESKDALEMUIR	55N	357	B	A	A			A	A	A	A	A	A	A	A	B	
GREAT WHALE	55N	282									B	A	A	A	A	A	C
HEL	55N	19	B	A	A		A			A							
MEANOOK	55N	247	B	A					C	A	A	A	A	A	A	A	C
MOSCOW	55N	37	B	A	A	A	A	A	B	A	A	A	A	A	A	B	
RUDE SKOV	55N	12	B	A	A	A	A	A	A	A	A	A	A	A	A	A	
MINSK	54N	27					A	A	A	A	A	A	A	A	A	B	
STONYHURST	54N	358		B						A	A	A					
WINGST	54N	9			A	A	A		A	A	A	A	A	A	A		
MELVILLE AFB	53N	300										C	A	A	A	A	C
WITTEVEEN	53N	7	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
ADAK	52N	183								C	A	C					
BELSK	52N	21										A	A	A			
GOTTINGEN	52N	10	B	A													
IRKUTSK	52N	104	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
NIEMEGK	52N	13	B	A	A					A	A	A	A	B	A	B	
SWIDER	52N	21	B	A	A	A											
VALENTIA	52N	350	B	A	A	A	A	A	A	A	A	C					
HARTLAND	51N	356	B	A	A		B		B	A	A	A	A	A			
DOURBES	50N	5	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
KIEV	50N	31		B	A	A	A	A	A	A	A	A	A	A	A	C	
LVOV	50N	24	B	A	A	A	A	A	A	A	A	A	A	A	A	C	
MANHAY	50N	6	B	A													
PRUHONICE	50N	15	B	A	A					A							
VICTORIA	49N	237	B	A					C	A	A	A	A	A	A	A	C
CHAMBON-LA-FORET	48N	2	B	A	A	A	A	A	A	A	A						
FURSTENFELDBRUCK	48N	11								A	A	A	A	A	A	A	C
HURBANOVO	48N	18									C						
NAGYCENK	48N	17								A	A						
NEWPORT	48N	243										B	A	A	A	A	C
ST JOHNS	48N	307												B	A	A	C
ULAN BATOR	48N	106										A	A	A	C		
WIEN-KOBENZL	48N	16	B	A						A	A						
LORING AFB	47N	292										C	A	A	A	A	C
ODESSA	47N	31	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
TIHANY	47N	18	B	A	A	A											
YUZHNO SAKHALINSK	47N	143	B	A	A	A	A	A	A	A	A	B	A	A	A		
GROCKA	45N	21		A													
OTTAWA	45N	284												B	A	A	C
SURLARI	45N	26	B	A	A	A	A	A	A	A	A	A	A	A	B		
AGINCOURT	44N	281	B	A	A	A	A	A	A	A	A	A	A	A	BS		
CASTELLACCIO	44N	9	B	A	A	A	A	B									
MEMAMBETSU	44N	144	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
MONTE CAPELLINO	44N	9															
ROBURENT	44N	8															
CASPER	43N	254	B	A	C												

HOURLY VALUES

STATION	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
LOVO	B	A	A	A	A	A	A	A	A	A	A	A	A		
SITKA	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
SVERDLOVSK	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
KAZAN	B	A	A	A	A	A	A	A	A	A	A	A			
ESKDALEMUIR	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
GREAT WHALE								C	A	A	A	A	B	C	
HEL															
MEANOOK	B	A	A	A	A	A	A	A	A	A	A	A	A	C	
MOSCOW	B	A	A	A	A	A	B	A	A	A	A	A	B		
RUDE SKOV	B	A	A	A	A	A	A	A	A	A	A				
MINSK					A	A	A	A	A	A	A	B			
STONYHURST								A	A	A					
WINGST	B	A	A	A	A	A	A	A	A	A	A				
MELVILLE AFB															
WITTEVEEN	B	A	A	A	A	A	A	A	A	A	A	B			
ADAK															
BELSK									A	A	A		A		
GOTTINGEN															
IRKUTSK	B	A	A	A	A	A	A	A	A	A	A	B			
NIEMEGK	B	A	A	A	A	A	A	A	A	A	A	B			
SWIDER	B	A	A	A	A	A	A	A	A						
VALENTIA	B	A	A	A	A	A	A	A	A	A					
HARTLAND	B	A	A	A	A		B	A	A	A	A				
DOURBES	B	A	A	A	A	A	A	A	A	A	A	A	A	C	
KIEV		B	A	A	A	A	A	A	A	A	A	C			
LVOV	B	A	A	A	A	A	A	A	A	A	A	C			
MANHAY															
PRUHONICE	B	A	A	A	A	A	A	A		A					
VICTORIA	B	A	A	A	A	A	A	A	A	A	A	C			
CHAMBON-LA-FORET	B	A	A	A	A	A	A	A							
FURSTENFELDBRUCK	B	A	A	A	A	A	A	A	A	A	A	A	A	C	
HURBANOVO	B	A	A	A	A	A	A	A	A						
NAGYCENK															
NEWPORT									B	A	A	A	C	C	
ST JOHNS												C			
ULAN BATOR									A	A	A	C			
WIEN-KOBENZL	B	A	A	A	A	A	A	A	A	A	A	A			
LORING AFB															
ODESSA	B	A	A	A	A	A	A	A	A	A	A	A	B		
TIHANY	B	A	A	A	A	A	A								
YUZHNO SAKHALINSK	B	A	A	A	A	A	A	A	A	A	A	A			
GROCKA		B													
OTTAWA															
SURLARI	B	A	A	A	A	A	A	A	A	A	A	A	A	C	
AGINCOURT	B	A	A	A	A	A	A	A	A	A	A	C			
CASTELLACCIO	B	A	A	A	A	B									
MEMAMBETSU	B	A	A	A	A	A	A	A	A	A	A				
MONTE CAPELLINO	B	A	A	A	A	A									
ROBURENT								C	A	A	A	A	A	A	
CASPER	C	B													

KEY TO SYMBOLS

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P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability

S = Program STOPPED operations (see MASTER STATION LIST for actual date)

Ministry of Scientific Research

HELWAN OBSERVATORY Misallat

U A R

Horizontal Intensity

31000γ + Tabulated values in gammas

HOURLY VALUES

November 1967

Days of Month	Hours of Observation G. M. T. 1	2	3	4	5	6	7	8	9	10	11	Noon	13	14	15	16	17	18	19	20	21	22	23	Midn	Sum	Mean	Remarks
1	180	181	184	189	196	203	211	212	221	228	228	221	211	199	190	186	190	186	177	173	179	177	175	162	4659	194	
2	160	162	183	185	185	188	185	186	194	207	202	182	171	164	165	167	168	156	145	140	169	156	151	151	4122	172	
3	150	153	157	159	169	173	181	185	193	206	182	189	182	176	136	145	149	122	161	163	146	162	160	158	3957	165	
4	154	152	166	164	167	175	178	182	184	184	178	170	163	161	167	173	178	177	174	173	174	171	169	170	4106	171	
5	174	171	174	177	181	189	192	193	189	188	184	174	167	170	164	157	157	155	152	165	165	168	[illegible]	164	4128	172	
6	165	169	172	177	181	190	196	200	207	217	215	203	193	185	179	179	184	186	181	184	184	187	186	185	4505	188	
7	183	183	187	192	197	199	209	218	226	235	234	218	208	198	188	186	191	191	186	186	188	188	189	188	4768	199	
8	187	176	183	182	179	184	193	198	208	209	209	192	191	191	184	158	169	179	183	171	138	139	147	146	4296	179	
9	147	150	154	155	161	166	169	176	183	193	184	173	164	146	141	153	154	165	178	168	169	171	170	170	3960	165	
10	168	169	171	174	179	187	195	201	201	201	192	183	174	171	172	172	171	174	173	173	172	173	174	174	4294	179	
11	174	172	172	178	184	192	194	198	201	207	207	195	186	183	183	188	193	198	200	195	176	181	150	150	4457	186	
12	154	151	161	163	165	164	160	172	175	177	174	167	162	164	162	155	159	166	150	158	163	154	162	160	3896	162	
13	164	163	169	170	177	184	192	197	197	191	181	170	168	169	163	165	168	[illegible]	181	179	172	170	182	179	4221	176	
14	170	168	167	172	181	191	191	200	201	195	187	174	173	174	169	168	174	[illegible]	173	178	174	173	176	176	4267	178	
15	175	175	176	181	185	192	195	200	209	213	208	193	174	160	164	157	146	133	128	142	157	166	166	172	4167	174	
16	167	165	169	169	179	195	206	215	214	214	211	194	183	174	175	169	175	175	173	173	175	177	177	173	4397	183	
17	171	171	174	175	182	186	197	202	206	205	199	190	182	177	175	175	180	182	182	180	180	180	180	180	4411	184	
18	180	178	175	180	187	194	200	207	209	205	198	190	179	181	182	181	184	185	183	184	184	183	182	181	4492	187	
1	181	181	181	186	191	197	198	203	205	207	207	201	193	189	185	183	181	182	185	186	185	183	183	182	4555	190	
20	177	180	182	186	189	193	199	203	203	199	195	190	181	178	179	183	188	188	188	188	188	188	188	188	4521	188	
21	188	188	189	194	202	205	205	205	200	201	201	201	19[illegible]	[illegible]09	211	211	204	196	192	187	185	204	187	4756	198		
22	187	189	188	198	204	196	183	177	179	171	162	158	144	[illegible]65	176	179	182	179	174	179	182	181	179	4256	177		
23	179	180	185	192	204	204	206	204	197	185	182	177	166	156	158	167	174	175	184	186	183	180	179	184	4387	183	
24	181	177	184	183	186	184	184	179	172	173	149	148	146	147	155	153	147	136	132	138	150	155	155	159	3873	161	
25	165	162	162	162	165	171	176	180	185	181	170	151	137	135	136	130	132	137	142	148	148	149	158	162	3744	156	
26	163	173	170	170	174	178	180	177	172	169	168	166	164	157	152	158	160	162	160	160	165	172	175	173	4018	167	
27	170	175	177	178	182	190	191	199	200	196	190	184	181	181	178	175	170	165	154	151	162	164	167	170	4250	177	
28	168	172	178	177	182	177	173	172	165	163	158	151	147	144	144	143	139	150	149	136	134	135	139	155	3751	156	
29	171	161	165	167	174	187	197	203	[illegible]	[illegible]	185	185	170	166	165	163	158	159	166	168	173	177	177	179	4198	175	
30	179	178	179	183	191	203	200	193	[illegible]	187	187	182	177	178	157	158	166	173	172	165	156	159	154	163	4231	176	
31																											
Sum	5132	5125	5234	5318	5479	5637	5736	5837	5886	5890	5727	5472	5231	5115	5042	5034	5095	5082	5081	5072	5079	5102	5117	5120	127643		
Mean	171	171	174	177	183	188	191	195	196	196	191	182	174	170	168	168	170	169	169	169	169	170	171	171		177	
# Mean Q	178	179	180	184	189	194	201	207	210	210	207	198	189	185	182	182	185	186	185	185	185	184	184	184			
## M	167	164	17	171	175	178	182	186	189	191	177	173	170	169	160	155	158	154	161	162	154	156	161	160			
D	-6	-6	-3	0	+6	+11	+14	+18	+19	+19	+14	+5	-3	-7	-9	-9	-7	-8	-8	-8	-8	-7	-6	-6			

AT BOULDER-GEOMAGNETISM

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	NORMAL MAGNETOGRAMS YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	HOURLY VALUES YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
PANAGYURISHTE	43N	24	B	A	A	A				A	B	A	A	A	A	B		B	A	A	A	A	A	A	A	A	A	A			
VLADIVOSTOK	43N	132	B	A	A	A	A	A	A	A	B	A	A	A	A	B		B	A	A	A	A	A	A	A	B	A	A	A	A	B
LOGRONO	42N	358	B	A	A					A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	
L AQUILA	42N	13		B	A	A	A	C		A	A								C	C	A	A	A	A	A	A	A	A	A		
TBILISI	42N	45	B	A	A	A	A	A	A	A	A	A	A	A	A	C		B	A	A	A	A	A	A	A	A	A	A	A	A	C
WESTON	42N	289												A							C	A	A	A	A	A	A	A	A	B
CAPRI	41N	14		A	B		B			A	A							B	A	B		B	A	A	A						
EBRO	41N	0	B	A						A	A	A	A	A	A	A	C	B	A	A					A	A	A	A	A	C	
KANDILLI	41N	29								A	A							B	A	A											
TASHKENT	41N	69	B	A	A	A	A	A	A	A	A	A	A	A	A	B		B	A	A	A	A	A	A	A	A	A	A	A	A	B
BOULDER	40N	255							B	A	A	A	A	A	A	A	C							B	A	A	A	A	A	A	C
COIMBRA	40N	352																					A	A	A	A	A				
TOLEDO	40N	356	B	A	A					A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	
BELOIT	39N	262	B	A	C													B	A	C											
BURLINGTON	39N	258	B	A	C													B	A	C											
CARROLLTON	39N	267	B	A	C														A	C											
LEADVILLE	39N	254	B	A	C													B	B	C											
PRICE	39N	249	B	A	C													B	A	C											
ASHKHABAD	38N	58		C	A	A	A	A		A	A	A	A	A	A					A	A	A	A		A	A	A	A	A	A	
FREDERICKSBURG	38N	283	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	C
PENDELI	38N	24									C	A	C																		
SAN MIGUEL	38N	334								A	A										B	C				C					
ALMERIA	37N	358	B	A	A					A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A		
CASTLE ROCK	37N	248														B														B	
SEOUL	37N	127																							B						
ESPANOLA	36N	254	B	A	C													B	A	C											
KAKIOKA	36N	140	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	
SAN FERNANDO	36N	354	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	B	A	A	C
TEHRAN	36N	51	B	B	C	C					A	C													A	A	A				
TULSA	36N	264					B	A	A	A	A	A	A	A	B																
KANOZAN	35N	140													A												A				
KSARA	34N	36								A	A																				
MT WILSON	34N	242	B	A																											
SIMOSATO	34N	136	B	A														B	A	A	A	A	A	A	A	A					
ASO	33N	131	B	B	B					A	A							B	A	A											
DALLAS	33N	263								A	A	A	A	A	A	A	C								A	A	A	A	A	A	C
NITSANIM	32N	35																						A			A	A			
TUCSON	32N	249	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	C
KANOYA	31N	131		A	A	A	A	A	A	A	A	A	A	A	A	B			A	A	A	A	A	A	A	A	A	A	A		
HELWAN	30N	31																B	A	A											
MISALLAT	30N	31							A	A	A										B	A	A	A	A	A	A	A	A		
SABHAWALA	30N	78								A	A														A	A					
MIDWAY	28N	183								B	A	C																			
TENERIFE	28N	344								A	A	C					C					A	A	A	A	B	A	A	A		
LUNPING	25N	121									B		A	A	A											B	A	A			
CENTRO GEOFISICO	23N	278								C	A	A	A	A										C	A	A	A	A			
TAMANRASSET	23N	6	B	A	A																										
CHA-PA	22N	104	C	A	A													C	A	A											
HONOLULU	21N	202	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	C
TEOLOYUCAN	20N	261	B	A						B	A					C		B	A				A			A	A	A	A		

KEY TO SYMBOLS

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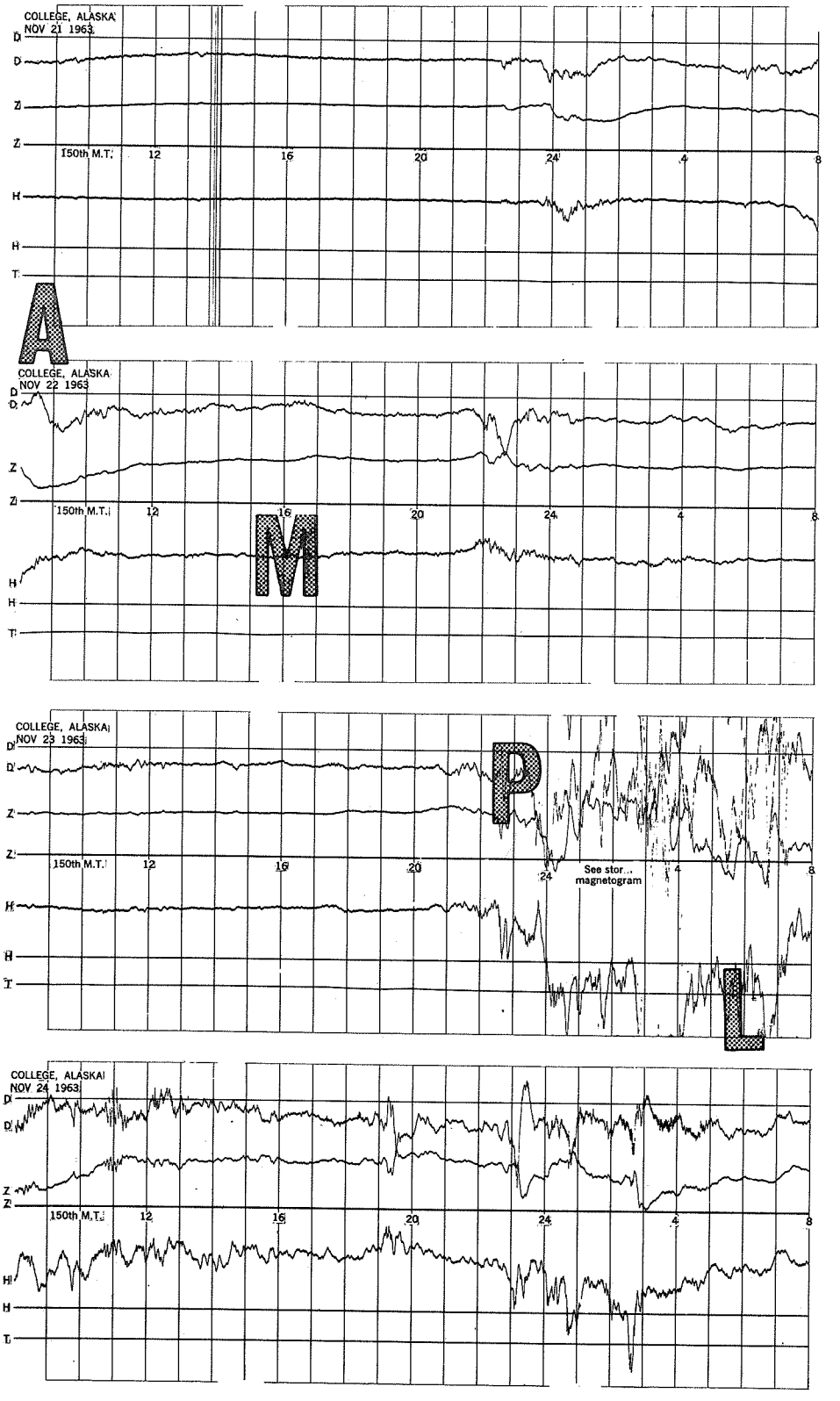
S = Program STOPPED operations (see MASTER STATION LIST for actual date)



NORMAL MAGNETOGRAMS

AT BOULDER-GEOMAGNETISM

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	NORMAL MAGNETOGRAMS YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	HOURLY VALUES YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
ALIBAG	19N	73	B	A	A				A	A	A	A	A	A	A			B	A	A		A	A	A	A	A	A	A				
SAN JUAN	18N	294	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
HYDERABAD	17N	79									B	A	A	A	A										B	A	A	A	A	C	
BAGUIO	16N	121								A	A	A	A	A	A	A											A	A	A	A	A	
GUAM	14N	145	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
MBOUR	14N	343	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A			
MUNTINLUPA	14N	121	B	A	A			A	A	A	A	A	A					B	A	A	A				A	A						
ZARIA	12N	352								A	A																					
ANNAMALAINGAR	11N	80	C	A	A				A	A	A	A	A	A	A			C	A	A		A	A	A	A	A	A	A				
CEBU	10N	124					B																									
KODAIKANAL	10N	77	B	A	A				A	A	A	A	A	A	A			B	A	A	A	A	B	A	B							
KONTAGORA	10N	5								C	A																					
ADDIS ABABA	09N	39		A	A	A	A	A	A	A	A				A	C			A	A	B				A	A				C		
TRIVANDRUM	09N	77	C	A	A				A	A	A	A	A	A	A			B	A	A		A	A	A	A	A	A	A				
FREETOWN	08N	347					B	A	A	A	A	A	C									B	A	A	A	B						
DAVAO	07N	126									B	A	A	A	A	A													A	A	A	
IBADAN	07N	4	B	A						C	A							B	A	A						C						
KOROR	07N	135	B	A						B	A	C						B	A						B	A						
MAJURO	07N	171								C	A	C																				
PALMYRA ISLAND	06N	198	C	B														C	B													
PARAMARIBO	06N	305	B	A	A	A	A	A	A	A	A	A	A	A	A	B			A	A	A	A	A	A	A	A	A	A	A	A	A	B	
BANGUI	05N	19	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	B	A	A	A	A	A	A	A	A	A	C	
FUQUENE	05N	286	B	A	A	A	A	A	A	A	A	A	A	A	B			B	A	A	A	A	A	A	A	A	A	A	A	A	B		
FANNING	04N	201	C	A														C	A													
MOCA	03N	9		C	A					A	A	A	A	A	A	A			C	A	A	A	A	A	A	A	A	A	A	A			
JARVIS ISLAND	00S	200	C	A														C	A	C												
NAIROBI	01S	37								B	A	C	C												B	A	C					
TATUOCA	01S	311	C	A						A	A							C	A	A	A	A	A		C	A						
LWIRO	02S	29								B	B								B	A	A	B		B	B	B	A	A				
HOLLANDIA	03S	141	B	A	A	A	A	B										B	A	A	A	A	B									
BINZA	04S	15										B																				
TALARA	05S	279	B	B	A	C												B	B	A	C											
KUYPER	06S	107	B	A	A	A	B											B	A	A	A	A	C									
TANGERANG	06S	107								B	A	C	B	A	A	A	C								A	A	A	B	A	A	C	
CHICLAYO	07S	280	C	A	A	C												C	A	A	C											
CHIMBOTE	09S	281	C	A	A	C												C	A	A	C											
LUANDA	09S	13																C	A				A	A	A	A	A	A	A			
PORT MORESBY	09S	147		B	A	A	A	A	A	A	A	A	A	A	A	A	C		B	A	A	A	A	A	A	A	A	A	A	A	A	A	
HUANCAYO	12S	285	B	A	A	A	A	A	A	A	A	A	A	A	A	A		B	A	A	A	A			A	A	A	C	C	C		
APIA	14S	188	B	A					A	A	A							B	A	A	A	A	A	A	A	A						
CUZCO	14S	288									C	C																				
AREQUIPA	16S	289								A	A	A		A	B	B									A	A	A					
YAUCA	16S	285	C	A	A	C												C	A	A												
TAHITI	18S	211		B	C							B		A	A	A	C		B	C												
TANANARIVE	19S	48	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
TSUMEB	19S	18																							C	A						
PLAISANCE	20S	58										A																				
LA QUIACA	22S	294							A	A	A	A	A					B	A					A	A		C					
VASSOURAS	22S	316	B	A	A					A								B	A	A	A	A	A									
EASTER ISLAND	27S	251		B		B	B	B	A	A				C										B								

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COLLEGE

HORIZONTAL INTENSITY = 12000 plus tabular values, in gammas

DECEMBER 1963

Tabular values are averages for successive hourly periods beginning at midnight, 150th West Meridian Time.

Quiet (Q) and stormy (S) days are based on Universal Time.

( ) Interpolated

[ ] Significant portion of hour interpolated.

□ No record; or no values available because of faulty record.

[ ] Scaling uncertain because of magnetic storm.

△ Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.

DAY \ HOUR	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN	SUM
1	0	827	829	826	808	821	771	820	831	824	829	831	831	827	82[illegible]	[illegible]	839	842	844	838	841	863	915	872	841	835	20029
2	1	835	837	820	797	456	578	760	795	800	830	837	839	840	843	841	842	829	854	891	852	858	813	840	874	807	19361
S 3	1	535	389	208	218	497	682	735	722	771	753	829	830	846	825	832	837	846	838	858	847	885	849	824	777	718	17233
S 4	1	733	642	483	628	702	593	658	667	830	830	807	775	788	882	936	855	847	872	836	838	869	871	828	662	768	18432
S 5	1	701	761	714	270	289	616	680	815	794	783	840	789	802	841	834	851	858	858	851	861	837	837	862	831	757	18175
S 6	1	841	697	299	597	567	794	787	792	756	774	811	823	827	845	836	833	833	856	853	857	850	861	815	662	769	18466
7	1	675	594	336	716	686	692	810	866	843	831	819	817	817	823	823	835	842	845	827	832	872	908	931	810	785	18850
8	1	735	719	431	633	730	684	765	831	828	836	829	822	830	836	836	835	839	836	836	822	828	803	823	597	774	18564
9	1	602	740	686	618	713	822	837	844	839	837	837	836	832	830	835	835	833	835	835	834	830	830	830	830	800	19200
Q 10	0	831	833	832	834	832	834	833	832	832	831	828	830	832	833	836	838	838	837	834	831	831	831	830	825	832	19978
Q 11	0	821	814	833	836	836	834	833	832	831	830	832	832	831	832	831	831	832	831	831	826	824	822	832	831	830	19918
12	0	830	830	832	829	826	830	830	831	833	[illegible]	833	839	840	824	820	837	843	838	849	854	865	864	843	834	837	20088
13	0	834	835	823	815	770	818	842	833	83[illegible]	[illegible]	822	823	830	832	831	835	834	829	835	839	842	854	886	887	834	20005
14	1	865	846	606	664	447	522	832	846	83[illegible]	[illegible]	837	840	850	836	837	836	838	829	833	839	855	847	848	861	794	19056
15	0	838	820	751	811	812	796	820	823	835	831	835	832	830	830	829	831	835	838	838	838	837	831	835	838	826	19814
16	0	834	828	817	821	824	821	839	824	818	827	831	830	828	819	825	837	837	837	837	838	836	829	827	827	829	19891
17	0	827	824	829	828	813	821	821	828	828	823	821	829	837	837	836	837	839	837	837	837	837	836	836	837	831	19935
Q 18	0	836	840	842	835	836	836	831	830	830	831	833	830	831	831	836	834	837	838	836	836	836	836	833	833	834	20027
19	0	833	834	836	838	836	840	829	827	830	828	834	835	805	805	835	836	843	850	843	857	913	901	892	828	842	20209
S 20	1	774	697	496	333	611	814	820	813	836	807	746	818	830	824	828	839	841	835	839	835	832	835	846	850	775	18599
21	1	832	826	783	599	751	801	827	818	820	826	826	830	814	809	833	838	836	840	833	834	870	869	841	793	815	19549
22	1	699	670	538	246	736	822	851	827	809	814	845	838	823	829	845	843	837	841	833	832	827	840	858	792	779	18695
23	1	837	826	819	827	830	812	742	710	818	830	844	830	825	816	826	821	835	833	834	833	832	830	828	826	819	19664
24	0	826	827	809	[illegible]	[illegible]	842	826	791	832	838	822	828	827	835	834	833	834	834	834	834	827	830	822	792	820	19677
Q 25	0	609	814	810	821	[illegible]	835	835	833	834	834	834	831	829	828	833	834	834	833	828	829	834	836	831	827	821	19700
26	0	819	817	822	821	815	800	830	836	835	832	829	827	821	821	825	834	839	830	835	836	832	836	835	835	828	19862
27	0	829	826	771	786	829	844	843	836	836	830	833	830	832	833	833	832	836	839	838	839	843	840	843	840	831	19941
28	0	838	834	833	829	804	811	827	834	836	841	820	832	836	837	841	840	841	844	850	846	847	837	851	841	835	20050
29	1	825	584	427	433	587	655	566	765	828	858	844	834	818	823	851	846	853	859	839	840	836	834	836	836	762	18277
30	0	836	824	826	811	749	772	836	829	829	830	829	827	824	819	834	844	842	839	841	835	833	835	833	847	826	19824
Q 31	0	832	829	826	813	836	834	829	829	829	829	829	829	829	829	834	836	840	842	842	837	835	842	840	839	833	19989
MEAN ALL DAYS		787	771	696	692	724	769	800	813	824	824	827	827	827	830	837	837	839	841	840	839	846	845	844	813	808	
MEAN 5 QUIET		786	826	829	828	835	835	832	831	831	831	831	830	830	831	834	837	837	836	836	834	832	832	830	826	830	
MEAN 5 STORMY DAYS (S)		717	637	440	409	533	700	736	762	797	789	807	807	819	843	853	844	845	854	856	851	872	854	849	794	761	
SUM ALL DAYS		(LAST FOUR DIGITS ONLY)																								GRAND SUM	
		4389	3886	1564	1441	2449	3826	4794	5190	5530	5539	5647	5636	5631	5731	5942	5954	6013	6071	6044	6009	6216	6202	6151	5203	601058	

AT BOULDER-GEOMAGNETISM

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	NORMAL MAGNETOGRAMS YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	HOURLY VALUES YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
GNANGARA	32S	116	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A		A
PILAR	32S	296				B	A	A	A	A	A	A	A	A	C			B	A		B	A	A	A	A	B	A	B	A			
WATHEROO	32S	116	B	A														B	A													
HERMANUS	34S	19	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A			
LAS ACACIAS	35S	302								A	B	B	A	A	C																	
TOOLANGI	38S	145	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
AMBERLEY	43S	173	B	A						A	A							B	A	A	A	A	A	A	A	B						
TRELEW	43S	295	C	A	A	A	A	A	A	A	A	A	A	A	B			C	A	A	A	A			C	A	A	C	C			
PORT AUX FRANCAIS	49S	70	C	A	B	B	A	A	A	A	A	A						C	A	B	B	A	A	A	A	A						
MACQUARIE ISLAND	55S	159	B	A	A	A	A	A	A	A	A	A	A	A					A			A	A	A	A	A	A	A				
ARGENTINE ISLAND	65S	296	B	A	A	A	A	A	A	A								B	A	A	A	A	A	A	A							
GONZALES VIDELA	65S	297					B															B										
OASIS	66S	101	B	B														B	B													
WILKES	66S	112	B	A	A	A	A	A	A	A	A	A	C					B	A						C	A	C					
DUMONT D URVILLE	67S	140	B	A	A	A		B	A	A	A							B	A	A	A		B	A	A	A						
MIRNY	67S	93	B	A	A	A	A	A	A	A	A	A	A					B	A	A	A	A	A	A	A	A	A	A				
MAWSON	68S	63	B	A	A	A	A	A	A	A	A	C						B	A						C	B	C					
CHARCOT	69S	139																B	A													
SYOWA BASE	69S	40			B	C						B	C																			
LAZAREV	70S	13				A	C														A	C										
PIONERSKAYA	70S	96	B	A														B	A													
ROI BAUDOUIN	70S	23								B	A	A													B	A	A					
SANAE STATION	70S	358																					B	A	A	A	A	A	A			
NORWAY STATION	71S	357																				A	C									
NOVOLAZAREVSKAYA	71S	12					B	A	A	A	A	A	A									B	A	A	A	A	A	A				
CAPE HALLETT	72S	170	B	A	A	A	A	A										B	A													
EIGHTS	75S	283							B	A	B													B	A	B						
HALLEY BAY	76S	333	B	A	A	A	A	A	A	A								B	A	A	A	A	A	A	A							
LITTLE AMERICA	78S	198	B	A														B	A													
SCOTT BASE	78S	167	B	A						A	A							B	A													
PLATEAU	79S	40										B	A	B													B	A	B			
VOSTOK	79S	107		A	A	A	A		B	A	A	A	A						A	A	A	A		B	A	A	A	A				
BYRD STATION	80S	240	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
SOUTH POLE	90S	0			A	B	A	A	A	B	A	A	A	A	A	A	C			B	B	A	A	A	B	A	A	A	A	A	A	C

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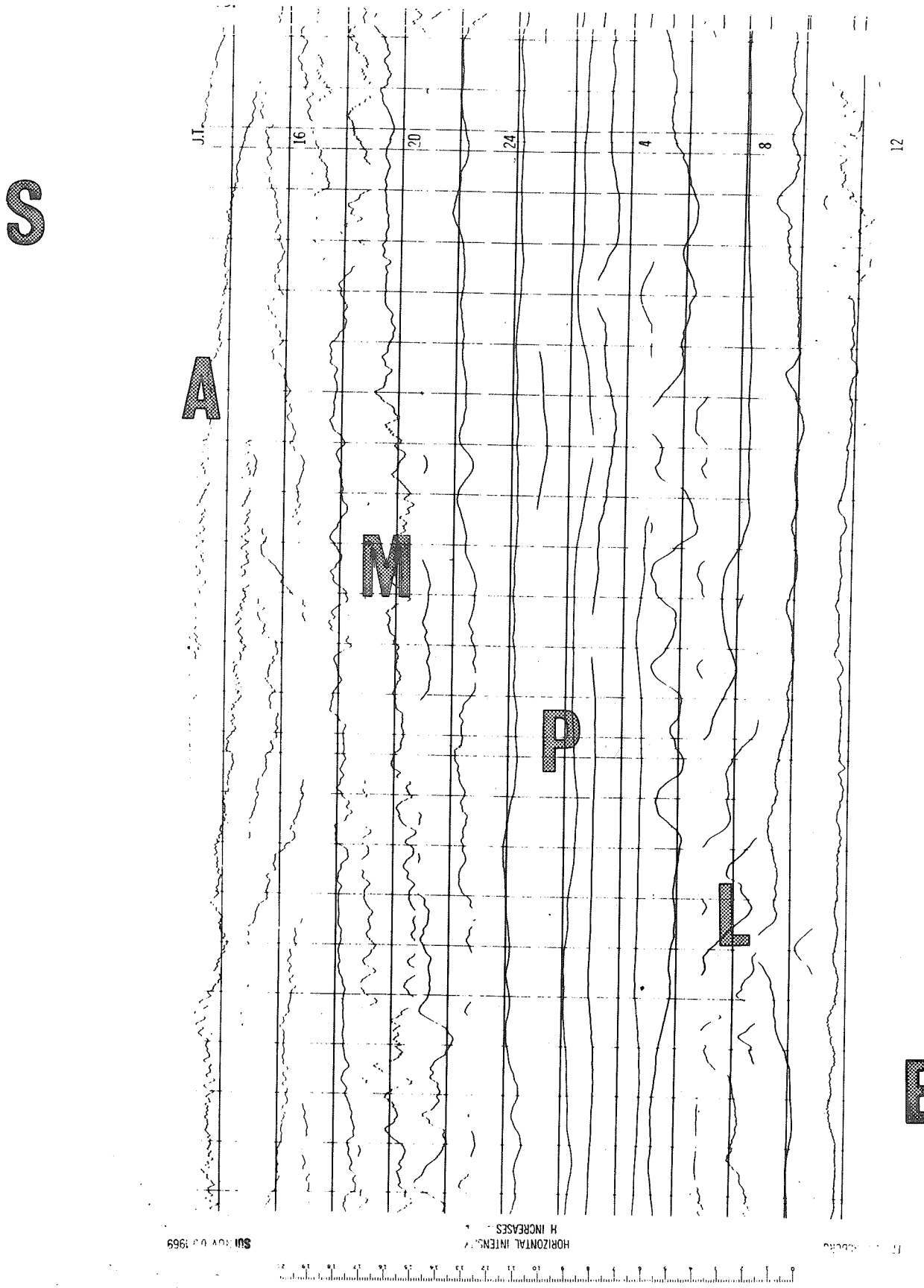
D.1



RAPID-RUN MAGNETOGRAM

AT BOULDER - GEOMAGNETISM

RAPID-RUN MAGNETOGRAMS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
MURCHISON BAY	80N	18	C	A													
THULE	77N	291	B														
BARROW	72N	204	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
GODHAVN	69N	306								A	A						
KIRUNA	68N	21	C						A	A	A	A	A	A	A	A	C
LOVOZERO	68N	35	C	A	A	A				A	A	B	A	A	A	B	
SODANKYLA	67N	27	B	B						A	A	A	A	A	A	A	C
COLLEGE	65N	212	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
SUKKERTOPPEN	65N	307								A	A						
BIG DELTA	64N	214	B	A	C												
HEALY	64N	211	B	A	C												
LEIRVOGUR	64N	338	C	A	A	A	A	A	A	A	B				C	B	C
YAKUTSK	62N	130			B												
JULIANEHAAB	61N	314								B	B						
NURMIJARVI	61N	25	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
LERWICK	60N	359								A	A						
LOVO	59N	18	B	A						A	A	A	A	A	A		
BOROK	58N	38	C	A	A	A	A	A	A	A	A	A					
SITKA	57N	225	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
ESKDALEMUIR	55N	357								A	A						
GREAT WHALE	55N	282									B	A	A	A	A	A	C
RUDE SKOV	55N	12								A	A						
WINGST	54N	9								A	A	A	A	A			
PETROPAVLOVSK	53N	158	C	A	A	A	A	A	A	B	C						
WITTEVEEN	53N	7	B	A	A					A	A	A	A	A	A	B	
DOURBES	50N	5	C	A	A					A	B						
KIEV	50N	31			B	A	A	A	A	A	A	A					
CHAMBON-LA-FORET	48N	2	B	A	A												
MEMAMBETSU	44N	144	B	A	A	A	A	A	A	A	A	A	A	A	A		
SIMFEROPOL	44N	34	B	A	A												
TBILISI	42N	45	B	B	A	C				A							
BOULDER	40N	255								B	A	A	A	A	A	A	C
TOLEDO	40N	356								A	A	B	C				
ASHKHABAD	38N	58			B	A	A	A	A	B		A	A	B	A		
FREDERICKSBURG	38N	283	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
ONAGAWA	38N	141	B	A													
KAKIOKA	36N	140	B	A													
SIMOSATO	34N	136	B	A													
TUCSON	32N	249	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
KANOYA	31N	131		A	A	A	A	A	A	A	A	A	A	A	A		
HONOLULU	21N	202	B	A	A	B	A	A	A	A	A	A	A	A	A	A	C
SAN JUAN	18N	294										C	A	A	A	A	C
GUAM	14N	145	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
KOROR	07N	135	B	A													
PARAMARIBO	06N	305	B	A						B							
MOCA	03N	9								A	A	B	C				
HOLLANDIA	03S	141	C	A													
PORT MORESBY	09S	147			C	A		A	A	A	A	A	A	A	A	A	C
APIA	14S	188	B	B						A	A						
WATHEROO	32S	116	B	A													
HERMANUS	34S	19	B	A	A												
MACQUARIE IS	55S	159							A	A	A	A	A	A			
WILKES	66S	112	B	A	A	A	A	A	A	A	A	A					
MIRNY	67S	93	C	A													
EIGHTS	75S	283								A	B						
LITTLE AMERICA	78S	198	B	A													
SCOTT BASE	78S	167	B	A													
PLATEAU	79S	40										B					
BYRD STATION	80S	240		A	A	A	A	A	A	A	A	A	A	A	A	A	C

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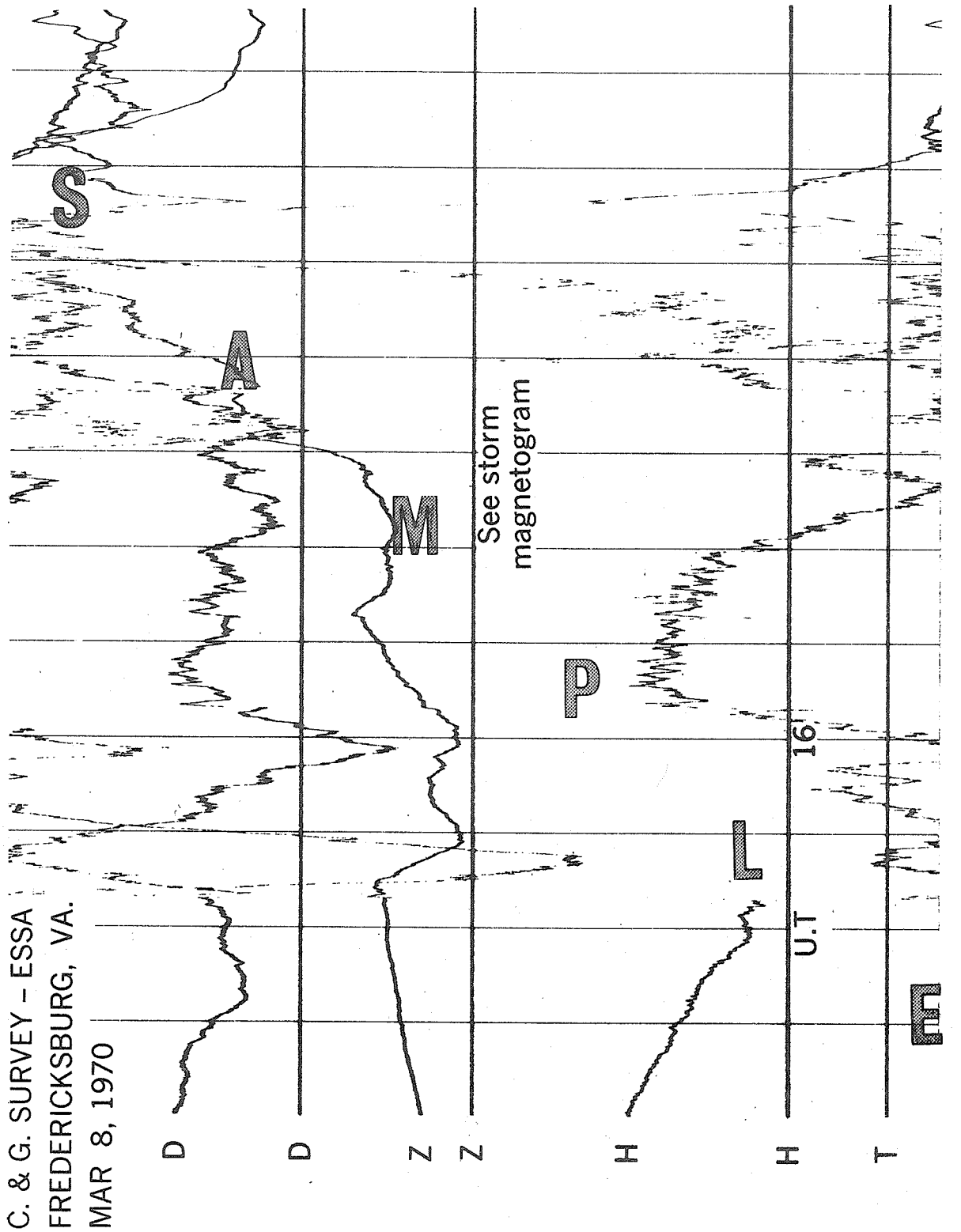
C. & G. SURVEY – ESSA
FREDERICKSBURG, VA.
MAR 8, 1970
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0.1 2.5 MINUTE DIGITIZATIONS OF MAGNETOGRAMS AT BOULDER - GEOMAGNETISM

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
ALERT	83N	298								C	A	A	B	B	C		
HEISS ISLAND	81N	58									C	B					
CAPE CHELYUSKIN	78N	104								C	A						
THULE	77N	291								C	A	C					
MOULD BAY	76N	241								C	A	A	C	B			
RESOLUTE BAY	75N	265								C	A	B					
DIXON	74N	80								C	A						
BARROW	72N	204								C	A	A	A	A	A	C	
TIXIE BAY	72N	129								C	A						
GODHAVN	69N	306								C	A	C	C	C	C		
MURMANSK	69N	33								C	A	A					
ABISKO	68N	19												B			
KIRUNA	68N	21						C	B	C	A	B				C	
SODANKYLA	67N	27										B	A	C			
CAPE WELLEN	66N	190								C	A	C					
COLLEGE	65N	212						C	B	B	A	A	A	A	A	C	
SUKKERTOPPEN	65N	307									C	C					
BAKER LAKE	64N	264								C	A	B	B	B			
LEIRVOGUR	64N	338						C	B	C	A	A	A	A			
YAKUTSK	62N	130								C	A	A	A	B			
NURMIJARVI	61N	25								C	A	A	B	B			
LENINGRAD	60N	31										C					
LERWICK	60N	359								C	A	C					
FORT CHURCHILL	59N	266								C	A	C					
LOVO	59N	18								C	A	C					
SITKA	57N	225								B	A	A	A	A	A	C	
SVERDLOVSK	57N	61								C	A	A	C	C	C		
GREAT WHALE	55N	282									C	A	A	B			
MEANOOK	55N	247								C	A	A	A	B			
RUDE SKOV	55N	12								C	A	B	C	C	C		
IRKUTSK	52N	104								C	A	B	B	B	C		
HARTLAND	51N	356								A	A	A	B				
VICTORIA	49N	237								A	A	C					
FURSTENFELDBRUCK	48N	11								C	A	A	B				
NEWPORT	48N	243										B	A	A	A	C	
ST JOHNS	48N	307													C		
ODESSA	47N	31									B	B	C	C	C		
YUZHNO SAKHALINSK	47N	143										C					
SURLARI	45N	26					C			C	C						
MEMAMBETSU	44N	144								C	A	B					
LOGRONO	42N	358										C					
TBILISI	42N	45											C	C			
EBRO	41N	0										B					
TASHKENT	41N	69								C	A	A	A	B			
BOULDER	40N	255								C			A	A	A	C	
TOLEDO	40N	356								C	A	C	C	C	C		
FREDERICKSBURG	38N	283					B		C	A	A	A	A	A	A	C	
SAN MIGUEL	38N	334									C						
ALMERIA	37N	358										C					
CASTLE ROCK	37N	248														B	

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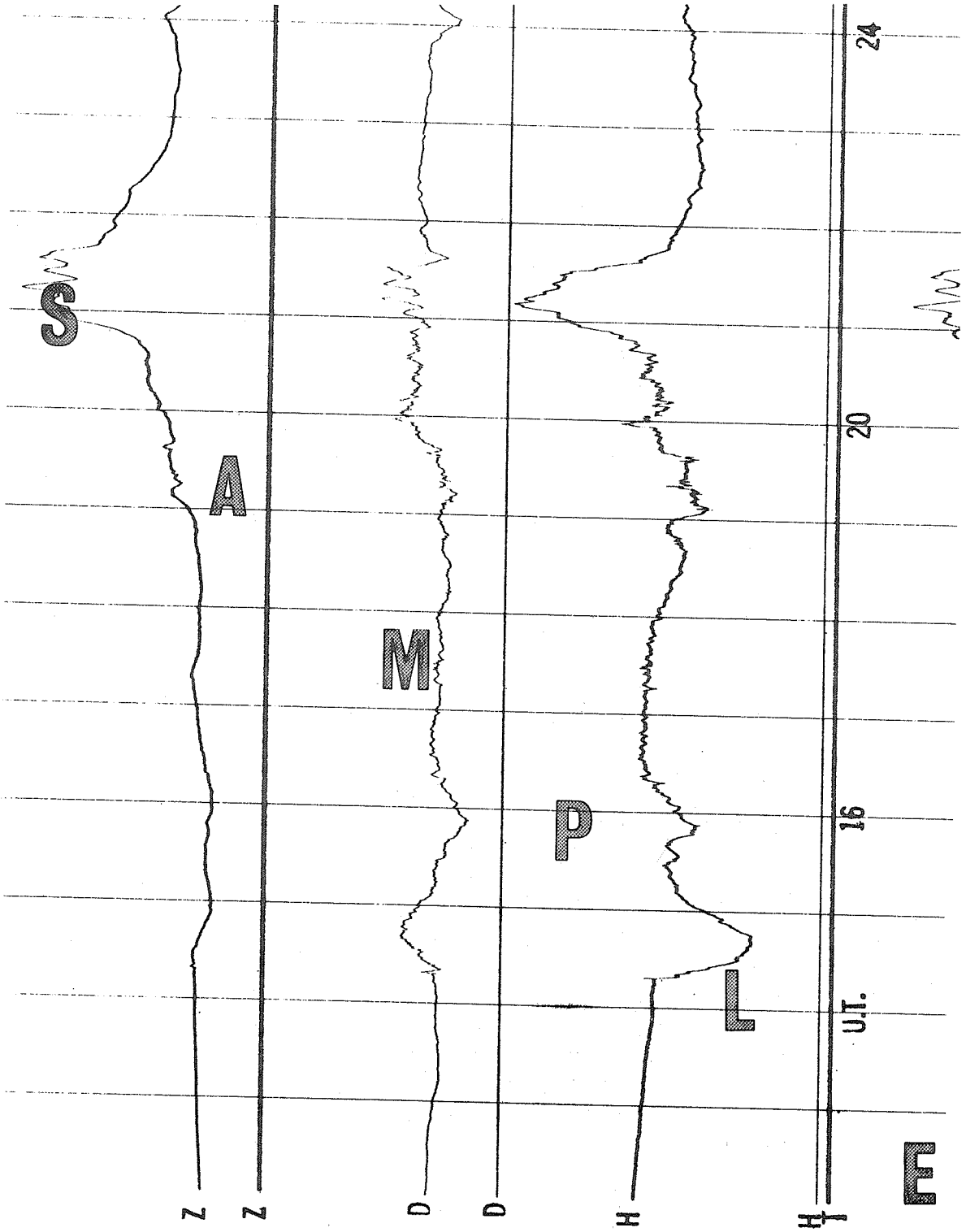

FREDERICKSBURG STORM MAGNETOGRAPH SUN MAR 08 1970

D.1 2.5 MINUTE DIGITIZATIONS OF MAGNETOGRAMS AT BOULDER - GEOMAGNETISM

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
KAKIOKA	36N	140					C			A	A	A	A	A	A		
SAN FERNANDO	36N	354										C					
TEHRAN	36N	51										C					
DALLAS	33N	263								C	A	C	A	A	A	A	
TUCSON	32N	249					C			A	A	A	A	A	A	C	
KANOYA	31N	131										C					
MISALLAT	30N	31								C	A						
TENERIFE	28N	344								C	B	C					
HAVANA	23N	278											C	C			
HONOLULU	21N	202					C		A	A	A	A	A	A	A	C	
ALIBAG	19N	73								B							
SAN JUAN	18N	294					C	C	A	A	A	A	A	A	A	C	
HYDERABAD	17N	79									A			C			
BAGUIO	16N	121										C		C	C		
GUAM	14N	145					C	C	B	A	A	A	A	B	A	C	
MBOUR	14N	343									C	A	A	A			
MUNTINLUPA	14N	121								C	A						
ADDIS ABABA	09N	39								C	A						
IBADAN	07N	4									C						
KOROR	07N	135								B	A	C					
PARAMARIBO	06N	305								C	A	B	C	C	C		
BANGUI	05N	19					C				C	C	B	C	C		
FUQUENE	05N	286					C			A	A	B	C	C	C		
MOCA	03N	9								A	A	B	C	C	C		
NAIROBI	01S	37								C	A	C	C				
TATUOCA	01S	311								C	A						
TANGERANG	06S	107										C	C				
PORT MORESBY	09S	147					C			C	A	A	C	C	C		
HUANCAYO	12S	285								A	A	A	C	C	C		
APIA	14S	188							A	B	A						
TANANARIVE	19S	48									B	A	C	C	C		
LA QUIACA	22S	294										C					
EASTER ISLAND	27S	251								C							
GNANGARA	32S	116					C			A	A	A	A	B	C		
PILAR	32S	296								C	B	A	B	B			
HERMANUS	34S	19							A	A	A	A	A	A			
TOOLANGI	38S	145					C			C	A	A	B	C	C		
AMBERLEY	43S	173								B	C						
TRELEW	43S	295								C	A	A	C	C			
KERGUELEN	49S	70									C	B					
MACQUARIE IS	55S	159						C	B	C	A	C					
WILKES	66S	112					C			C	A	C					
DUMONT D URVILLE	67S	140								C	A						
MIRNY	67S	93								C							
MAWSON	68S	63								C	B	C					
ROI BAUDOIN	70S	23										C					
EIGHTS	75S	283								C	B						
BYRD	80S	240							B	A	A						
SOUTH POLE	90S	0								B	A	A	A	A			

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COLLEGE

DECLINATION = (28° plus tabular values in tenth-minutes) East

APRIL 1963

Tabular values are averages for successive hourly periods beginning at midnight, 150 th West Meridian Time.

Quiet (Q) and stormy (S) days are based on Universal Time.

( ) Interpolated

⌊ ⌋ Significant portion of hour interpolated.

□ No record; or no values available because of faulty record.

[ ] Scaling uncertain because of magnetic storm.

△ Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.

DAY \ HOUR	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN	SUM
1	0	369	399	428	439	422	429	424	430	429	414	406	397	388	[illegible]		355	351	380	381	390	391	390	389	391	397	9529
2	0	395	399	404	404	411	420	419	432	391	400	390	385	370	361	355	358	369	362	375	389	399	369	391	423	390	9371
3	0	400	402	400	411	412	418	430	441	447	462	439	415	379	362	349	340	352	357	363	370	352	339	343	375	390	9358
S 4	1	389	407	409	538	563	529	449	489	463	414	359	367	348	341	270	253	351	313	474	501	378	353	438	389	408	9785
S 5	1	354	453	389	419	466	524	441	439	440	431	386	364	373	368	369	343	322	381	379	370	389	410	489	384	403	9683
S 6	1	346	244	401	422	398	369	409	425	447	422	425	379	368	372	357	367	368	340	366	357	424	609	410	461	395	9486
7	1	392	412	411	411	452	423	379	406	427	437	415	400	395	367	355	357	357	359	371	383	388	381	387	388	394	9453
8	1	426	404	426	371	390	417	431	430	459	458	429	399	370	360	350	352	357	352	418	397	389	410	395	397	399	9587
9	0	401	388	390	371	400	439	448	443	426	427	421	388	380	366	359	360	361	369	377	386	395	408	391	389	395	9483
Q 10	0	386	405	403	402	429	437	440	442	429	428	415	405	404	386	371	360	359	360	369	380	381	389	391	388	398	9559
Q 11	0	410	400	399	410	423	440	450	450	[illegible]	[illegible]	430	419	411	381	349	311	330	339	350	358	368	424	370	494	400	9610
12	0	416	431	400	409	453	431	453	464	457	[illegible]	371	342	377	369	349	331	330	348	359	363	378	372	360	319	388	9308
13	1	368	547	407	459	539	627	609	581	[illegible]	[illegible]	451	409	349	351	308	316	319	330	359	361	366	377	359	358	416	9976
S 14	1	374	421	628	607	805	809	662	399	[illegible]	[illegible]	440	414	401	365	350	304	339	318	256	332	386	259	371	371	437	10477
15	1	420	529	436	409	439	439	452	439	428	422	405	394	385	361	329	319	320	311	350	353	365	370	378	391	394	9444
16	0	399	391	410	397	410	422	465	447	439	468	427	413	393	359	329	312	339	345	360	342	349	361	370	379	389	9326
17	0	359	390	409	411	439	450	468	463	410	416	407	388	357	339	331	339	354	356	364	369	374	373	339	398	388	9303
18	1	390	397	469	470	449	479	510	488	427	422	345	353	322	340	340	350	350	323	289	407	341	263	331	390	385	9245
19	0	371	372	402	402	424	439	459	424	389	420	393	379	349	342	339	349	351	360	375	374	392	437	411	369	388	9322
20	1	401	380	451	502	516	529	489	443	432	411	384	360	337	339	338	347	357	370	389	384	383	382	389	381	404	9694
Q 21	0	385	393	412	421	411	441	460	441	410	400	391	378	350	349	322	346	360	372	373	385	389	384	375	370	388	9318
22	1	366	380	402	404	421	427	441	431	427	401	419	325	340	351	349	328	317	327	351	269	313	332	283	308	363	8712
23	0	371	379	439	[illegible]	[illegible]	453	458	449	425	401	389	377	359	342	340	349	360	380	390	390	384	383	381	388	396	9496
Q 24	0	389	389	399	[illegible]	[illegible]	453	452	451	432	421	409	383	360	359	341	339	346	356	371	397	392	368	377	377	392	9410
25	0	379	389	412	[illegible]	[illegible]	459	461	456	446	418	420	401	358	349	341	339	331	338	368	363	379	374	379	381	392	9399
26	0	390	389	391	402	421	439	454	471	473	451	448	376	319	311	279	285	281	281	256	309	316	341	347	371	367	8801
27	1	375	441	531	506	464	522	489	520	479	324	321	351	352	340	330	338	344	359	371	380	382	380	374	379	402	9652
Q 28	0	383	385	399	400	416	431	441	438	430	412	400	384	361	350	342	344	345	341	351	360	379	373	369	379	384	9213
29	0	390	392	404	413	432	461	472	470	449	431	412	389	370	355	340	338	341	350	365	376	369	363	368	397	394	9447
S 30	1	399	399	409	452	451	476	559	709	489	449	285	259	369	350	342	295	294	359	350	348	356	564	403	409	407	9775
MEAN ALL DAYS		386	404	422	432	453	468	466	460	437	422	401	380	366	355	339	334	342	348	362	371	375	385	379	386	395	
MEAN [illegible]		391	394	402	410	422	440	449	444	430	421	409	394	355 377	348 365	345	351	356	368	379	384	385	388	385	385	395	
MEAN 5 STORMY DAYS (S)		372	385	447	488	537	541	504	492	455	429	379	357	355 372	327 359	338	318	337	346	388	396	371	368	399	381	406	
SUM ALL DAYS		(LAST FOUR DIGITS ONLY)																								GRAND SUM	
		1593	2107	2670	2955	3579	4032	3974	3811	3121	2651	2032	1393	994	662	183	24	255	436	8701	1431	1247	1538	1358	1594		284222

D.1

AT BOULDER - GEOMAGNETISM

COMPUTER FORMAT:

1. The above data are available also as hourly values.
2. 2.5 minute AE, AU and AL values for 9/1964-12/1967.
3. Hourly AE values from 7/1957 - 12/1968.
4. Hourly Dst values from 7/1957 - 12/1958; 1/1961 - 12/1968.

PUBLICATIONS:

1. Hourly Values of the Auroral Electrojet Activity Index AE, UAG-R Series, Geophysical Institute, University of Alaska 7/1957 - 12/1964
2. Provisional Hourly Values of Equatorial Dst, NASA, 7/1957 - 12/1958; 1961 - 1963; 1968
3. Annals of IGY, Vol. 35, pp. 9-45 - Provisional Hourly Values of Equatorial DST, 7/1957 - 12/1958

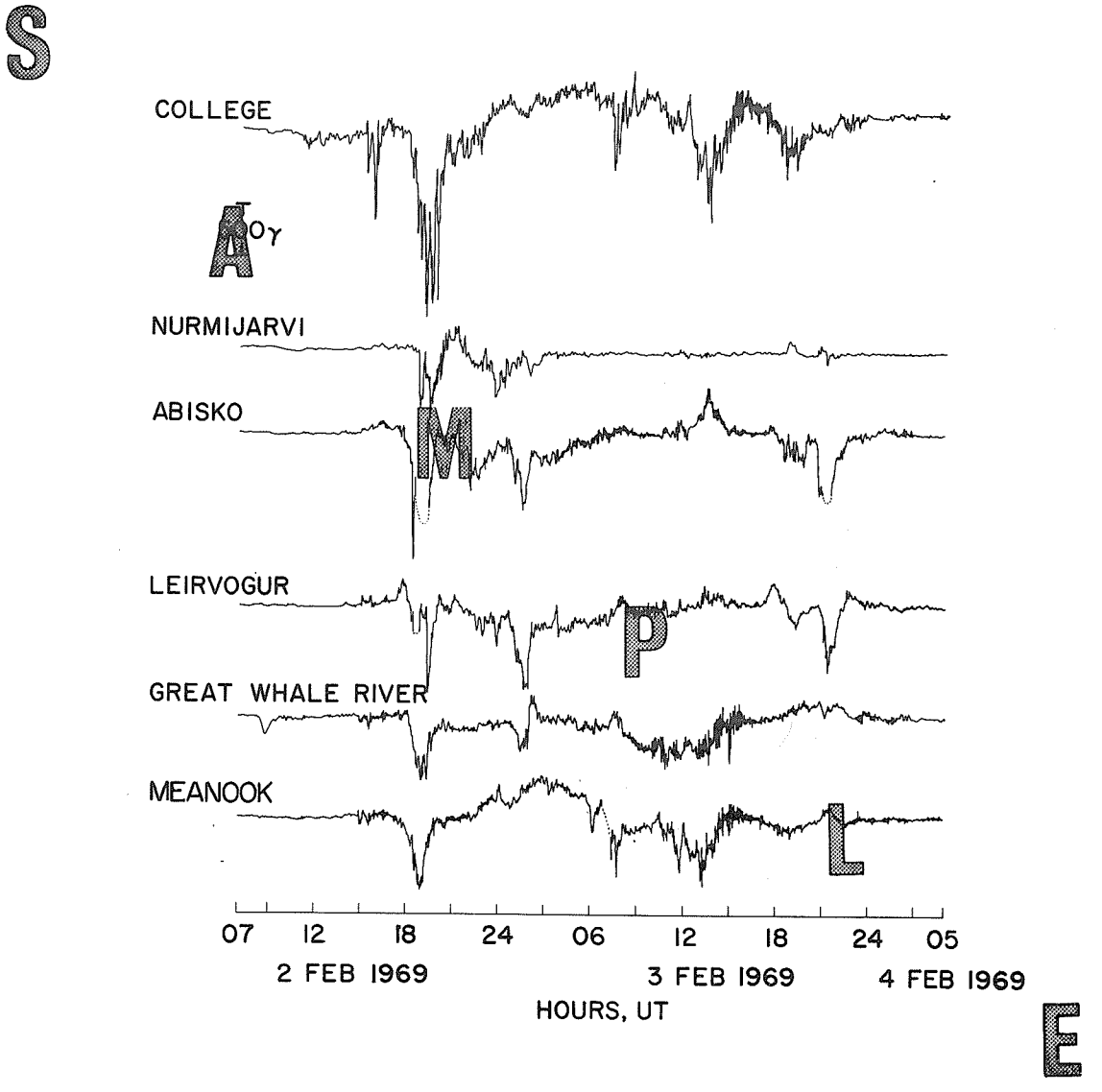
MICROFILM:

1. AE Hourly Values 7/1957 - 12/1964, 35 mm microfilm
2. AE 2.5 minute averages and plots 9/1964 - 12/1967, 35 mm microfilm

HOURLY VALUES ON MAGNETIC TAPE

ADDIS ABABA	1/58-12/59	HERMANUS	1/57-12/59	SAN FERNANDO	7/57-12/59
AGINCOURT	7/57-12/59	HOLLANDIA	7/57-12/59	SAN JUAN	1/31-12/34
ALIBAG	7/57-12/59	HONOLULU	1/39-12/47	SAN JUAN	1/46-12/47
ALMERIA	7/57-12/59	HONOLULU	1/57-12/64	SAN JUAN	1/51-12/64
AMBERLEY	7/57-12/59	HUANCAYO	7/57-12/59	SCOTT BASE	7/57-12/58
ANCHORAGE	7/57-12/58	HURBANOVO	7/57-12/59	SIMOSATO	7/57-12/59
APIA	7/57-12/59	IBADAN	7/57-12/59	SITKA	1/02-12/64
ASO	7/57-12/59	IRKUTSK	7/57-12/59	SODANKYLA	1/14-12/67
BAKER LAKE	7/57-12/59	JARVIS ISLAND	8/57-12/58	SOUTH POLE	1/59-12/62
BANGUI	7/57-12/59	KAKIOKA	7/57-12/59	SURLARI	7/57-12/59
BELOIT	7/57-12/58	KAZAN	7/57-12/59	SVERDLOVSK	7/57-12/59
BIG DELTA	7/57-12/58	KODAIKANAL	7/57-12/59	SWIDER	7/57-12/59
BYRD	8/57-12/60	KOROR	7/57-12/58	TALARA	7/58-12/59
BYRD	1/62-12/62	KUYPER	7/57-12/59	TANANARIVE	7/57-12/59
CAPE CHELYUSKIN	7/57-12/59	LENINGRAD	7/57-12/59	TASHKENT	7/57-12/59
CAPE WELLEN	7/57-12/59	LERWICK	7/57-12/59	TATUOCA	8/57-12/59
CASTELLACCIO	7/57-12/59	LITTLE AMERICA	7/57-12/58	TBILISI	7/57-12/59
CHA-PA	9/57-12/59	LOGRONO	7/57-12/59	THULE	7/57-12/59
CHELTENHAM	1/37-12/47	LOVO	7/57-12/59	TIHANY	7/57-12/59
CHELTENHAM	1/52-12/56	LUANDA	8/57-12/58	TIXIE BAY	7/57-12/59
COLLEGE	1/48-12/64	LVOV	7/57-12/59	TOLEDO	7/57-12/59
DALLAS	1/64-12/64	MACQUARIE ISLAND	1/58-12/58	TOOLANGI	7/57-12/58
DIXON ISLAND	7/57-12/59	M'BOUR	7/57-12/59	TRELEW	9/57-12/59
DOMBAS	7/57-12/59	MEANOOK	7/57-12/59	TRIVANDRUM	10/57-12/59
DOURBES	7/57-12/59	MEMAMBETSU	7/57-12/59	TROMSO	7/57-12/59
EBRO	7/57-12/59	MIRNY	7/57-12/59	TUCSON	1/39-12/47
ESKDALEMUIR	7/57-12/59	MONTE CAPELLINO	7/58-12/59	TUCSON	1/52-12/63
FANNING ISLAND	8/57-12/58	MOSCOW	5/57-12/59	VALENTIA	7/57-12/59
FORT CHURCHILL	7/57-12/58	MUNTINLUPA	7/57-12/59	VASSOURAS	7/57-12/59
FREDERICKSBURG	1/56-12/64	MURCHISON BAY	8/57-7/59	VICTORIA	7/57-12/59
FURSTENFELDBRUCK	7/57-12/59	MURMANSK	7/58-12/59	VLADIVOSTOK	7/57-12/59
GODHAVN	7/57-12/59	NIEMEGK	7/57-12/59	VOSTOK	1/58-12/59
GUAM	7/57-12/62	NURMIJARVI	1/53-12/68	WATHEROO	7/57-12/58
GUAM	1/64-12/64	OASIS	7/57-11/58	WIEN-KOBENZL	7/57-12/59
HARTLAND	7/57-12/59	ODESSA	7/57-12/59	WILKES	7/57-12/58
HEALY	7/57-12/58	PORT-AUX-FRANCAIS	1/62-12/65	WINGST	7/57-12/59
HEISS ISLAND	7/57-12/59	PRUHONICE	7/57-12/59	YAKUTSK	7/57-12/59
HELWAN	7/57-12/59	RESOLUTE BAY	7/57-12/59	YUZHNO-SAKHALINSK	7/57-12/59
		RUDE SKOV	7/57-12/59		

MAGNETOGRAMS



AT BOULDER - GEOMAGNETISM

P U B L I C A T I O N S:

Abinger	1957	Helwan	1957-1959	Pionerskaya	1957-1958
Addis Ababa	1958-1960	Hermanus	1957-1968	Port-Aux-Francais	1957-1962
Addis Ababa	1964	Hollandia	1957-1962	Pruhonice	1957-1964
Agincourt	1957-1968	Honolulu	1957-1963	Pruhonice	1966
Alert	1961-1962	Huancayo	1957-1961	Resolute Bay	1957-1962
Alert	1964-1968	Hurbanovo	1957-1966	Resolute Bay	1964-1968
Alibag	1957-1959	Hyderabad	1965-1970	Roburent	1964-1970
Alibag	1961-1966	Jarvis Island	1957-1958	Roi Baudouin	1964-1966
Almeria	1957-1967	Kakioka	1957-1968	Rude Skov	1957-1967
Amberley	1957-1964	Kandilli	1957	Sabhawala	1964-1965
Anchorage	1957-1958	Kanoya	1958-1968	Sanae	1962-1969
Annamalainagar	1957-1959	Kiev	1968	San Fernando	1957-1967
Annamalainagar	1961-1966	Kodaikanal	1957-1964	San Juan	1957-1962
Apia	1957-1963	Koror	1957-1958	Scott Base	1957-1958
Baker Lake	1957-1962	Kuyper	1957-1961	Simosato	1957-1965
Baker Lake	1964-1968	La Quiaca	1964	Sitka	1957-1963
Bangui	1957-1964	L'Aquila	1960-1968	Sodankyla	1957-1967
Beloit	1957-1958	Lazarev	1960	South Pole	1959-1961
Belsk	1966-1968	Leirvogur	1957-1967	Stonyhurst	1964-1966
Big Delta	1957-1958	Lerwick	1957-1967	Sulari	1963-1965
Byrd	1957-1961	Little America	1957-1958	Swider	1957-1966
Capri	1957-1959	Logrono	1957-1967	Tananarive	1957-1969
Capri	1961-1964	Lovo	1957-1967	Tangerang	1964-1969
Castellaccio	1957-1962	Luanda	1957-1958	Tatuoca	1957-1962
Chambon-la-Foret	1957-1964	Luanda	1961-1968	Tbilisi	1959
Cha-pa	1957-1959	Lunping	1965-1967	Tenerife	1961-1965
Charcot	1957-1958	Lvov	1968	Tenerife	1967
Coimbra	1962-1966	Lwiro	1958-1961	Teoloyucan	1965-1968
College	1957-1963	Lwiro	1963-1967	Thule	1957-1962
Dombas	1957-1967	M'Bour	1957-1961	Tihany	1957-1964
Dourbes	1957-1969	Meanook	1957-1968	Toledo	1957-1967
Dumont D'Urville	1957-1960	Memambetsu	1957-1968	Toolangi	1957-1958
Dumont D'Urville	1962-1965	Mirny	1957-1960	Trelew	1957-1961
Easter Island	1963	Moca	1958-1967	Trivandrum	1957-1959
Ebro	1957-1959	Monte Capellino	1957-1962	Trivandrum	1961-1966
Eskdalemuir	1957-1967	Mould Bay	1964-1968	Tromso	1957-1965
Fanning Island	1957-1958	Muntinlupa	1957-1960	Tromso	1968-1969
Fort Churchill	1957-1958	Niemegk	1957-1968	Tsumeb	1964-1965
Fort Churchill	1964-1968	Nitsanim	1967	Tucson	1957-1963
Fredericksburg	1957-1963	Norway Station	1961	Valentia	1957-1967
Furstenfeldbruck	1957-1959	Nurmijarvi	1957-1969	Victoria	1957-1968
Godhavn	1957-1964	Oasis	1957-1958	Vostok	1958-1960
Guam	1957-1962	Odessa	1968	Watheroo	1957-1958
Halley Bay	1957-1958	Panagyurishte	1961-1964	Wien-Kobenzl	1957-1969
Hartland	1957-1961	Panagyurishte	1967	Wilkes	1957-1958
Hartland	1965-1967	Paramaribo	1958-1965	Wingst	1957-1968
Healy	1957-1958	Pilar	1964	Witteveen	1957-1965
				Yellowknife	1957-1958

D.1

INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
INTERNATIONAL ASSOCIATION OF GEOMAGNETISM AND AERONOMY

INDICES OF GEOMAGNETIC ACTIVITY

OBSERVATORY L'Aquila
MONTH: February 1970
RANGE FOR K-9: 350 γ

SCALE-VALUES OF VARIOMETERS IN γ/MM
D 7.0 H 5.1 Z 2.7

GR DAY 19—	K-INDICES FOR THREE-HOUR INTERVAL										CHAR. 0, 1, 2
	00h-03h	03h-06h	06h-09h	09h-12h	12h-15h	15h-18h	18h-21h	21h-24h	SUM		FULL DAY
1	2	2	1	0	1	1	2	4	13		1
2	3	2	2	2	3	2	5	5	24		2
3	3	1	2	2	1	0	0	1	10		1
4	1	1	1	2	2	4	4	2	17		1
5	2	2	1	1	3	2	1	3	15		1
6	2	0	0	0	0	0	1	1	4		0
7	0	0	0	0	0	0	0	0	0		0
8	0	1	1	1	0	1	1	1	5		0
9	1	0	0	0	0	0	2	1	5		0
10	1	1	1	0	0	3	4	1	11		1
11	0	0	1	1	0	0	1	0	3		0
12	1	0	0	1	0	1	2	1	6		0
13	1	2	1	2	2	1	0	1	12		0
14	2	3	1	3	2	3	1	1	17		1
15	2	2	1	3	1	2	2	2	15		1
16	1	0	1	2	2	1	1	2	10		0
17	2	0	0	2	1	2	4	3	14		1
18	2	1	2	1	2	2	2	3	15		1
19	1	0	1	2	1	0	0	1	6		0
20	0	0	0	1	1	1	1	1	5		0
21	0	0	0	1	0	0	1	1	3		0
22	0	0	0	0	0	0	1	1	2		0
23	1	0	0	0	1	0	3	2	7		0
24	1	2	1	1	2	4	3	1	15		1
25	1	2	2	1	0	1	1	0	8		0
26	2	1	1	2	4	3	1	1	15		1
27	1	0	2	2	2	2	3	3	15		1
28	3	2	2	3	2	3	3	3	21		1
29											
30											
31											

AT BOULDER - GEOMAGNETISM

K - INDICES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST
AVERROES	33N	353
DALLAS	33N	263
TUCSON	32N	249
MISALLAT	30N	31
HONOLULU	21N	202
TEOLOYUCAN	20N	261
SAN JUAN	18N	294
GUAM	14N	145
BANGUI	05N	19
MOCA	03N	9
BINZA	04S	15
TANGERANG	06S	107
LUANDA	09S	13
PORT MORESBY	09S	147
HUANCAYO	12S	285
TANANARIVE	19S	48
LA QUIACA	22S	294
GNANGARA	32S	116
PILAR	32S	296
HERMANUS	34S	19
LAS ACACIAS	35S	302
SAN MIGUEL	35S	301
TOOLANGI	38S	145
AMBERLEY	43S	173
TRELEW	43S	295
MACQUARIE ISLAND	55S	159
DUMONT D URVILLE	67S	140
MIRNY	67S	93
MAWSON	68S	63
SYOWA BASE	69S	40
NOVOLAZAREVSKAYA	71S	12
SCOTT BASE	78S	167
VOSTOK	79S	107
BYRD	80S	240
SOUTH POLE	90S	0
HEISS ISLAND	81N	58
CAPE CHELYUSKIN	78N	104
DIXON ISLAND	74N	80
BARROW	72N	204
MURMANSK	69N	33
SODANKYLA	67N	27
CAPE WELLEN	66N	190
COLLEGE	65N	212
LEIRVOGUR	64N	338
YAKUTSK	62N	130
NURMIJARVI	61N	25
LENINGRAD	60N	31
MAGADAN	60N	151
SITKA	57N	225
SVERDLOVSK	57N	61
TOMSK	57N	85
KAZAN	56N	49
HEL	55N	19
MOSCOW	55N	37
MINSK	54N	27
WINGST	54N	9
WITTEVEEN	53N	7
BELSK	52N	21
IRKUTSK	52N	104
NIEMEGK	52N	13
SWIDER	52N	21
HARTLAND	51N	356
KIEV	50N	31
LVOV	50N	24
KARAGANDA	49N	73
HURBANOVO	48N	18
NEWPORT	48N	243
ULAN BATOR	48N	106
ODESSA	47N	31
YUZHNO-SAKHALINSK	47N	143
NOVOKAZALINSK	45N	62
SURLARI	45N	26
ALMA ATA	43N	77
VLADIVOSTOK	43N	132
L AQUILA	42N	13
TBILISI	42N	45
TASHKENT	41N	69
BOULDER	40N	255
COIMBRA	40N	352
TOLEDO	40N	356
ASHKHABAD	38N	58
FREDERICKSBURG	38N	283
PENDELI	38N	24
SAN FERNANDO	36N	354
KSARA	34N	36

The Geomagnetic Data Center receives the tables of K Indices on a current basis (within 6 months of the recording period) from the above list of observatories.

PUBLICATIONS:

1. IAGA Bulletin No. 12 Series, International Union of Geodesy and Geophysics - latest K-indices published are through 1968.

YEAR	MO	DAY	SUNROT	CYCLE	KP	SUM(KP)	3-H-AP								SUM(AP)	AP	CP	C9	SUNSPOT	FLUX	CODE
67	1	1	1825	23	2+ 2+ 2- 30 3+ 5+ 3+ 2+	24-	9	9	6	15	18	56	18	9	140	18	1.0	5	73	124.4	0
67	1	2	1825	24	2+ 3- 1+ 1+ 1+ 10 2+ 1+	14-	9	12	5	5	5	4	9	5	54	7	0.3	1	96	143.0	1
67	1	3	1825	25	1+ 2+ 1+ 3- 3+ 3+ 20 0+	17-	5	9	5	12	18	18	7	2	76	10	0.5	2	124	154.0	0
67	1	4	1825	26	00 0+ 0+ 00 1- 0+ 10 10	4-	0	2	2	0	3	2	4	4	17	[illegible]	0.0	0	148	160.7	0
67	1	5	1825	27	1+ 0+ 0+ 1- 1- 1- 0+ 1-	50	5	2	2	3	3	3	2	3	23	[illegible]	0.1	0	150	168.2	0
67	1	6	1826	1	0+ 10 3- 20 10 1+ 20 1-	110	2	4	12	7	4	5	7	3	44	6	0.2	1	148	160.5	0
67	1	7	1826	2	1- 0+ 3+ 4- 4+ 50 5- 5+	27+	3	2	18	22	32	48	39	56	220	28	1.2	6	134	153.6	0
67	1	8	1826	3	6+ 7- 6+ 60 40 50 3+ 2+	400	94	111	94	80	27	48	18	9	481	60	1.7	7	116	142.9	0
67	1	9	1826	4	2+ 40 2+ 20 3+ 30 2- 20	21-	9	27	9	7	18	15	6	7	98	12	0.7	3	111	144.7	0
67	1	10	1826	5	20 0+ 0+ 0+ 0+ 2- 20 20	90	7	2	2	2	2	6	7	7	35	4	0.2	1	111	145.6	0
67	1	11	1826	6	3+ 3- 30 20 3+ 40 30 30	24+	18	12	15	7	18	27	15	15	127	16	0.9	4	104	139.8	0
67	1	12	1826	7	10 00 0+ 0+ 0+ 00 1- 0+	30	4	0	2	2	2	0	3	2	15	2	0.0	0	97	139.1	0
67	1	13	1826	8	10 20 30 20 6- 3- 4+ 6-	26+	4	7	15	7	67	12	[illegible]	[illegible]	211	26	1.2	6	93	138.1	0
67	1	14	1826	9	7+ 8- 60 5+ 2- 1+ 10 10	31+	154	179	80	56	6	5	4	4	488	61	1.7	7	85	135.2	0
67	1	15	1826	10	30 1- 10 2+ 3- 2- 2+ 3-	16+	15	3	4	9	12	6	9	12	70	9	0.5	2	60	126.6	0
67	1	16	1826	11	3- 3- 3+ 20 20 1+ 2- 1+	170	12	12	18	7	7	5	6	5	72	9	0.5	2	56	120.2	0
67	1	17	1826	12	1+ 1+ 10 1+ 0+ 1+ 1- 10	8+	5	5	4	5	2	5	3	4	33	4	0.1	0	59	116.9	0
67	1	18	1826	13	1+ 1+ 0+ 1- 1+ 20 20 1+	10+	5	5	2	3	5	7	7	5	39	5	0.2	1	72	117.4	0
67	1	19	1826	14	20 1- 1- 10 0+ 10 2+ 1+	9+	7	3	3	4	2	4	9	5	37	5	0.2	1	82	116.4	0
67	1	20	1826	15	1+ 2+ 3+ 2+ 3- 40 3+ 2+	22-	5	9	18	[illegible]	12	27	18	9	107	13	0.8	4	92	127.0	0
67	1	21	1826	16	20 30 2+ 2+ 20 30 10 10	17-	7	15	9	[illegible]	7	15	4	4	70	9	0.5	2	125	138.2	0
67	1	22	1826	17	2+ 00 1+ 10 1- 1- 1+ 10	8+	9	0	5	[illegible]	3	3	5	4	33	4	0.1	0	140	139.9	0
67	1	23	1826	18	2+ 2- 20 2- 0+ 1- 10 1+	110	9	6	7	6	2	3	4	5	42	5	0.2	1	152	148.8	1
67	1	24	1826	19	10 0+ 00 00 0+ 0+ 0+ 1+	4-	4	2	0	0	2	2	2	5	17	2	0.0	0	122	146.8	0
67	1	25	1826	20	2- 1+ 10 2- 20 10 1- 1-	100	6	5	4	6	7	4	3	3	38	5	0.2	1	133	142.7	1
67	1	26	1826	21	1+ 10 1+ 20 2- 00 00 0+	8-	5	4	5	7	6	0	0	2	29	4	0.1	0	136	154.3	0
67	1	27	1826	22	0+ 0+ 1- 2- 1+ 10 1- 10	70	2	2	3	6	5	4	3	4	29	4	0.1	0	130	158.3	0
67	1	28	1826	23	20 4- 4- 3+ 10 1+ 3- 2-	19+	7	22	22	18	4	5	12	6	96	12	0.0	3	125	156.2	0
67	1	29	1826	24	2- 2- 2+ 10 1- 1- 10 00	90	[illegible]	6	9	4	3	3	4	0	35	4	0.2	1	122	158.2	1
67	1	30	1826	25	0+ 1- 10 1- 1- 0+ 1- 1-	50	[illegible]	3	4	3	3	2	3	3	23	3	0.1	0	132	159.0	0
67	1	31	1826	26	00 0+ 1- 0+ 0+ 10 1- 1-	40	0	2	3	2	2	4	3	3	19	2	0.0	0	110	156.4	0
67	2	1	1826	27	1+ 2- 20 2- 10 1- 00 0+	9-	5	6	7	6	4	3	0	2	33	4	0.1	0	93	151.6	0
67	2	2	1827	1	00 00 1- 1- 0+ 0+ 1+ 1-	40	0	0	3	3	2	2	5	3	18	2	0.0	0	88	143.5	0
67	2	3	1827	2	00 00 00 2- 0+ 00 10 10	40	0	0	0	6	2	0	4	4	16	2	0.0	0	92	138.7	0
67	2	4	1827	3	0+ 2+ 20 20 2+ 3[illegible]	40	190	2	9	7	7	9	18	12	27	91	11	0.7	3	100	137.3	1
67	2	5	1827	4	5- 30 2+ 20 3+ 4[illegible] 2- 10	22-	39	15	9	7	18	22	6	4	120	15	0.8	4	72	146.8	1
67	2	6	1827	5	10 2+ 20 1+ 2- 10 10 3+	14-	4	9	7	5	6	4	4	18	57	7	0.4	2	89	148.8	0
67	2	7	1827	6	2- 10 10 1+ 2- 5+ 6- 6+	240	6	4	4	5	6	56	67	94	242	30	1.3	6	138	162.5	0
67	2	8	1827	7	60 60 5- 5- 5- 4- 5- 40	38+	80	80	39	39	39	22	39	27	365	46	1.5	7	109	148.3	0
67	2	9	1827	8	3+ 2+ 3+ 1- 1- 0+ 1+ 1-	13-	18	9	18	3	3	2	5	3	61	8	0.4	2	112	145.9	0
67	2	10	1827	9	00 1+ 0+ 1- 1- 00 00 00	30	0	5	2	3	3	0	0	0	13	2	0.0	0	97	140.5	0
67	2	11	1827	10	10 4- 4- 30 2+ 10 2+ 2-	19-	4	22	22	15	9	4	9	6	91	11	0.7	3	96	133.7	0
67	2	12	1827	11	0+ 00 0+ 1- 1- 1- 0+ 1+	4+	2	0	2	3	3	3	2	5	20	2	0.0	0	79	132.9	0
67	2	13	1827	12	1-[illegible]+ 1- 0+ 20 2- 2-	7+	3	0	2	3	2	7	6	6	29	4	0.1	0	77	130.0	0
67	2	14	1827	13	2-10 10 1+ 1+ 00 1+ 1+	90	6	4	4	5	5	0	5	5	34	4	0.1	0	58	129.2	0
67	2	15	1827	14	1+ 10 0+ 00 00 00 1- 5-	80	5	4	2	0	0	0	3	39	53	7	0.3	1	58	126.4	0
67	2	16	1827	15	4- 3+ 50 80 70 40 5- 4-	39+	22	18	48	207	132	27	39	22	515	64	1.7	7	60	124.9	0
67	2	17	1827	16	3+ 40 2+ 30 30 30 20 3-	23+	18	27	9	15	15	7	12	118	15	0.8	4	60	122.2	1	
67	2	18	1827	17	2- 2+ 2+ 1+ 2- 00 0+ 00	10-	6	9	9	5	6	0	2	0	37	5	0.2	1	70	124.2	0
67	2	19	1827	18	00 00 1+ 2- 20 2+ 20 2-	110	0	0	5	6	7	9	7	6	40	5	0.2	1	67	121.0	0
67	2	20	1827	19	1- 2- 1+ 1+ 0+ 1+ 2- 2-	100	3	6	5	5	2	5	6	6	38	5	0.2	1	74	128.6	0
67	2	21	1827	20	1- 00 10 20 2+ 2+ 20 1+	12-	3	0	4	7	9	9	7	5	44	6	0.2	1	82	131.8	1

D.1 INDICES AND SPECIAL EVENTS

Listings of special events are available from many observatories. For information concerning the availability of these data for any particular observatory-month, please write to the Data Center. These listings are being received on a current basis from the following observatories.

AT BOULDER - GEOMAGNETISM
SPECIAL EVENTS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST
BARROW	72N	204	FREDERICKSBURG	38N	283
SODANKYLA	67N	27	PENDELI	38N	24
COLLEGE	65N	212	SAN FERNANDO	36N	354
NURMIJARVI	61N	25	TEHRAN	36N	51
SITKA	57N	225	DALLAS	33N	263
KAZAN	56N	49	TUCSON	32N	249
HEL	55N	19	HONOLULU	21N	202
MOSCOW	55N	37	TEOLOYACAN	20N	261
WINGST	54N	9	SAN JUAN	18N	294
BELSK	52N	21	GUAM	14N	145
IRKUTSK	52N	104	BANGUI	05N	19
NIEMEGK	52N	13	BINZA	04S	15
SWIDER	52N	21	TANGERANG	06S	107
KIEV	50N	31	LUANDA	09S	13
HURBANOVO	48N	18	PORT MORESBY	09S	147
NEWPORT	48N	243	HUANCAYO	12S	285
ULAN BATOR	48N	106	APIA	14S	188
ODESSA	47N	31	TANANRIVE	19S	48
L AQUILA	42N	13	LOURENCE MARQUEE	26S	32
TBILISI	42N	45	GNANGARA	32S	116
TASHKENT	41N	69	HERMANUS	34S	19
BOULDER	40N	255	LAS ACACIAS	35S	302
COIMBRA	40N	352	SAN MIGUEL	35S	301
TOLEDO	40N	356	TOOLANGI	38S	145
ASHKHABAD	38N	58	TRELEW	43S	295

COMPUTER FORMAT:

1. ESRO magnetic tape - Daily 3-hourly Kp indices 1932 to date; Cp and C9 indices 1951 to date. (tape also includes solar rotation number and day of cycle; sunspot number; Ottawa flux) see sample listing on opposite page.
2. Ap indices - one card/day 1/1943 to date.
   Ci indices - one card/day 1/1960 to date.
   K - Fredericksburg - one card/day 1/1966 to date.
3. Principal magnetic storms - one card/storm/observatory - 1/1966 to date.

PUBLICATIONS:

1. Solar-Geophysical Data, NOAA - monthly Kp, Ap, Cp, Ci, K_{FR} indices; monthly list of principal magnetic storms and magnetograms of storms selected by S. -I. Akasofu (all original records reduced to the same sensitivity and time scale.)

SODANKYLÄ GEOMAGNETIC INDICES Q NOVEMBER 1969

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0h	0000	2221	7654	1000	0111	0000	0000	2333	6433	0000	2111	3455	1000	0000	0000
	0000	2221	4332	0000	1100	0000	0012	3211	2111	0000	2000	5443	0010	0000	0000
	0000	0000	2211	0001	0000	0000	2100	1000	1121	0000	0101	2100	0000	0000	0000
	0000	0000	0100	2222	0000	0000	1112	0000	1122	1123	1000	0000	0000	0000	0000
	0000	1000	1100	1111	1000	0011	1111	1100	2334	3233	1000	0000	0000	1000	0000
	0000	0001	1222	0000	0000	0000	1000	0100	4323	4444	0111	0000	0100	0000	0000
6h	0000	0000	3322	0000	0000	0000	0000	1100	3444	2555	1111	0000	0000	0000	0000
	0000	0000	2111	0000	0000	0000	0000	0000	4433	3221	2121	0000	0000	0000	0000
	0000	0000	1010	0010	0000	0000	0111	0000	3343	1234	3102	0010	0000	0000	0000
	0000	0000	1101	0000	0000	0000	1100	0000	3333	2222	1100	0000	0000	0000	0000
	0000	0010	2101	0000	0000	0000	1112	0000	4543	2122	1100	0101	0000	0000	0000
	0000	0101	3010	0000	0100	0000	1001	0000	4333	2225	1111	1100	0000	0000	0000
12h	0000	0000	2100	0000	0000	0000	2321	0000	4555	5534	0000	0001	0110	0000	0000
	0000	0001	0101	0000	0000	0000	1121	1000	5444	4334	2221	1000	0000	0000	0000
	0000	1111	1112	0000	1110	0000	0000	2332	3567	5566	2212	0000	0000	0000	0000
	0000	1234	3332	0000	0023	0000	0001	1121	7555	4555	2343	0000	1001	0000	0000
	0000	4432	2111	0000	3100	0000	1000	1233	4433	5434	2011	0001	1111	0000	0000
	0000	2221	1000	0000	0000	0000	0001	3444	3333	4545	1222	3243	2222	0000	0000
18h	0000	1122	0000	0112	0000	0100	2111	4334	3454	5435	2332	2100	3332	0000	0000
	0000	2433	0001	1111	0000	0000	1103	4366	5544	6546	2434	0000	1000	0000	0000
	0000	2200	1247	1111	0000	0000	4333	6666	3333	6665	4431	0000	0000	0000	0000
	0000	0000	6642	1101	0000	0011	4444	6666	3222	5664	2100	0000	0000	0000	0000
	0010	0123	2211	0000	0000	1100	4443	6655	1110	2322	0000	0001	0133	0000	0000
	1111	3457	1111	1000	0000	0000	3222	6666	0000	2112	1002	1221	2100	0000	0000

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0h	0000	0000	0111	0000	3211	0000	0000	0000	0000	1100	3322	0001	5533	1101	4545
	0000	0000	1000	0000	1210	0000	0000	0000	0000	0000	2223	0101	3333	2122	5665
	0000	0000	0000	0000	0111	0000	0000	0000	0000	0000	4443	1111	3332	2111	4333
	0000	0000	0000	0000	1000	0000	2110	0000	0000	0000	2222	0011	1110	1000	3334
	0000	0000	0000	0000	0010	0000	0011	0000	0000	0000	2200	1012	0100	1000	3332
	0000	0000	0000	0000	0000	0000	1111	1000	0000	0000	0000	2333	0011	0011	2122
6h	0000	0000	0000	0000	0001	0000	0112	0000	0000	0000	0000	3322	0000	0000	2324
	0000	0000	0000	0000	0000	0000	1100	0000	0000	0000	0000	2222	1000	1222	4343
	0000	0000	0000	0000	0100	0000	0000	0101	0000	0000	0000	2222	0111	2110	2433
	0000	0000	0000	0100	0000	0000	0010	0000	0100	0001	1000	3322	2210	0111	3322
	0000	0000	0000	0000	0000	0000	0000	0000	1000	0000	0000	2244	1100	1100	2211
	0000	0000	0000	0010	0000	0000	0000	0000	0000	0000	0000	2211	0000	0000	1101
12h	0000	0000	0000	0000	0000	0000	1001	0000	0000	0000	0000	2354	0000	1000	1100
	0000	0000	0000	0000	0000	0000	1110	0000	0111	0011	0000	4223	0000	0122	1110
	0000	0000	0000	0000	0000	0000	0000	0000	1000	0000	0000	2344	0000	2223	0001
	0000	0000	0000	0000	0000	0111	0000	0011	0000	0011	0311	5555	0000	3323	1135
	0000	0001	0000	0112	0000	0000	0000	1100	0001	1211	2234	5333	0000	3343	4332
	0000	1111	0033	2221	0000	0000	0011	1123	2333	0001	5433	2344	0000	3443	3123
18h	1000	1000	3211	2221	0000	0000	2233	3332	2100	1222	3433	4444	0122	3466	4434
	0000	0000	1000	1122	0000	0000	3335	1133	0000	1100	2223	3333	2222	6544	3555
	0000	0000	0000	2355	0001	0000	5552	2222	1333	0000	4455	3555	2223	6666	4233
	0000	2100	0000	4333	1000	0000	2211	2222	3323	0222	5433	3332	3556	6665	2112
	0000	0000	0000	3344	1000	1100	1000	2332	3322	2323	3200	3454	6654	5433	2221
	0000	0001	0000	4432	0000	0000	0010	2100	2111	3333	0000	4556	2211	3444	2222

AT BOULDER - GEOMAGNETISM

Q-INDICES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
HEISS ISLAND	81N	58	B	A	C					A	A						
MURCHISON BAY	80N	18	B	A	C												
ARCTICA	79N	179				C											
CAPE CHELYUSKIN	78N	104	B	A	B					A	A						
THULE	77N	291	B	A													
RESOLUTE BAY	75N	265	B	A													
DIXON ISLAND	74N	80	B	A	B					A	A						
BARROW	72N	204	B	A													
TIXIE BAY	72N	129	B	A						A	A						
GODHAVN	69N	306	B	A													
KIRUNA	68N	21	B	A	A	A	A										
SODANKYLA	67N	27	B	A	A	A	A	A	A	A	A	A	A	A	A	A	C
CAPE WELLEN	66N	190	B	A	B					A	A						
COLLEGE	55N	212	C	C													
BAKER LAKE	64N	264	B	A													
YELLOWKNIFE	62N	246	B	B													
NURMIJARVI	61N	25					C										
LERWICK	60N	359	B	A													
ESKDALEMUIR	55N	357	B	A													
MACQUARIE ISLAND	55S	159	B	A													
MIRNY	67S	93	B	A	B					A	A						
MAWSON	68S	63	B	A													
NOVOLAZAREVSKAYA	71S	12								A	A						
HALLEY BAY	76S	333	B	A						A							
VOSTOK	79S	107								A	A						

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

AT BOULDER - GEOMAGNETISM

REPORTS OF SPECIAL PROJECTS

Aeromagnetic Survey in Japan by the Geographical Survey Institute and the Hydrographic Office (Japan) - Approximately 8500 values of magnetic declination, inclination, and horizontal, vertical, and total intensities obtained in flights made during the years 1961-1965.

Airborne Magnetic Survey by the Division of Geomagnetism, Dominion Observatory (Canada) - Approximately 11,000 values of magnetic declination, inclination and horizontal, vertical, and total field intensities obtained in flights made during the years 1953-1963.

Hermanus Magnetic Observatory, South African Antarctic Scientific Records, Measurements of Total Magnetic Intensity During Voyages of the "RSA", December 1964-April 1965, Geophysical Series 1, Report No. B4, approximately 300 values.

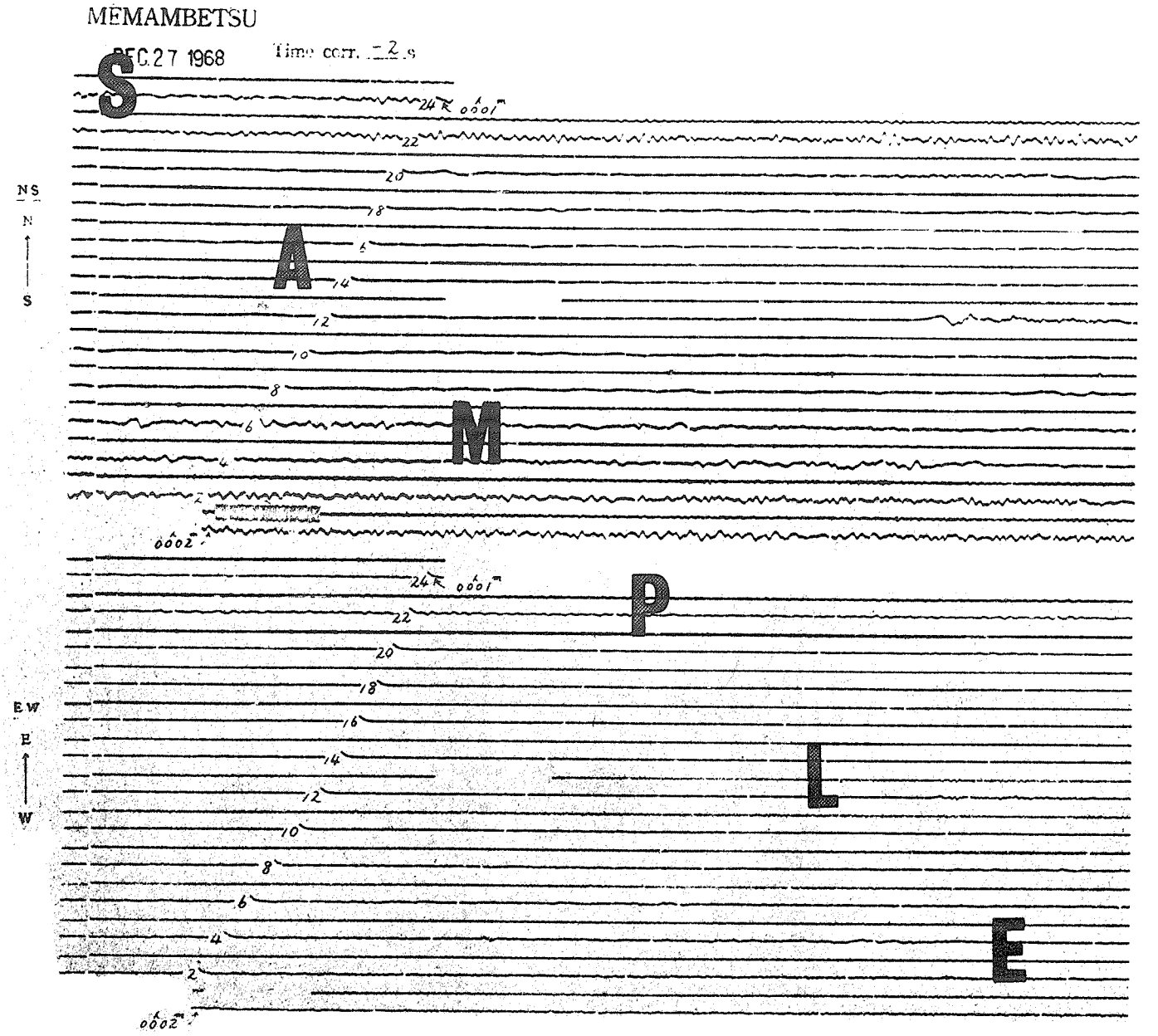
Hermanus Magnetic Observatory, South African Antarctic Scientific Records, Seaborne Magnetic Measurements, Cape Town-Sanse December 1965-January 1966, Geophysical Series 1, Report No. B.7, Approximately 250 values of total magnetic intensity.

Nagata, T., T. Oguti, and S. Kakinuma, Results of Geomagnetic Total Force Surveys over Southern Ocean, Indian Ocean, and South China Sea, National Antarctic Committee, Science Council of Japan, 75, 1961.

Project Magnet (Airborne Geomagnetic Data) - Approximately 40,000 values of magnetic declination, inclination, and horizontal, vertical, and total intensity obtained in flights made during the years 1953-1963 by the U.S. Naval Oceanographic Office. Special Publication No. 66 and Special Publication No. 66, Supplement No. 1, Airborne Magnetic Data, contain these data.

VEMA MAGNETIC DATA - Approximately 3600 geomagnetic total field intensity readings obtained on cruises of the R/V VEMA during the years 1959-1962 by the Lamont Geological Observatory.

ZARYA MAGNETIC DATA - Results of magnetic observations made on board the USSR Ship ZARYA by the Magnetic Survey Section, Leningrad Office, IZMIRAN on four expeditions during the years 1957-1967. Data consist of approximately 3400 values of declination and horizontal, vertical, and total intensities.



Rapid-run Tellurigram

AT BOULDER-GEOMAGNETISM

NORMAL TELLURIGRAMS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
TIXIE BAY	72N	129		C	A												
LOVOZERO	68N	35								A	A	B	A	A	A	B	
MINSK	54N	27								A	A	B	A	B	B	C	
SHATSK	54N	42	C	A	A	A											
IRKUTSK	52N	104								C	A	A	B	A			
NIEMEGK	52N	13								A	A	A	A	B	A	B	
KORETS	51N	27															
LVOV	50N	24															
BUDKOV	49N	14															
ODESSA	47N	31								A	B	A	A	A	B		
TIHANY	47N	18		B	A												
YUZHNO-SAKHALINSK	47N	143		C	A												
MEMAMBETSU	44N	144	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
ALMA ATA	43N	77	C	A	A												
TBILISI	42N	45	C	A	A					A	B						
EBRO	41N	0	B	A													
TOLEDO	40N	356	B	A	A												
ASHKHABAD	38N	58	B	A	B					A	A	B					
KAKIOKA	36N	140	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
KANOYA	31N	131	B	A	A	A	A	A	A	A	A	A	A	A	A	B	
LEGON	05N	0						B	A	C							
OASIS	66S	101	B														

HOURLY VALUES

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
TIXIE BAY	72N	129		C	A												
LOVOZERO	68N	35															
MINSK	54N	27													A		B
SHATSK	54N	42	C	B	C	A											
IRKUTSK	52N	104															
NIEMEGK	52N	13															
KORETS	51N	27															A
LVOV	50N	24															A
BUDKOV	49N	14		A			A		A	A		A					
ODESSA	47N	31													A		C
TIHANY	47N	18															
YUZHNO-SAKHALINSK	47N	143															
MEMAMBETSU	44N	144	B	A	A	A	A	A	A	A	A	A	A	A	A	A	
ALMA ATA	43N	77	C														
TBILISI	42N	45	C	A	A												
EBRO	41N	0	B	A	A												
TOLEDO	40N	356		A	A	A	A	A									
ASHKHABAD	38N	58	B	A	B										A	A	C
KAKIOKA	36N	140	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
KANOYA	31N	131	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
LEGON	05N	0															
OASIS	66S	101	B														

RAPID-RUN TELLURIGRAMS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
HEISS ISLAND	81N	58	C	A	A	B	B	B	B	A	A	A	A	B			
TIKHAYA BAY	80N	58	C	A													
BARENTSBURG	78N	16	C	A	B												
CAPE CHELYUSKIN	78N	104	C	A	B												
TIXIE BAY	72N	129		B	B	C											
LOVOZERO	68N	35	B	A	A	A	C			A	A	B	A	A	A	B	
BOROK	58N	39	B	A	A	A	A	A	A	A	A	A	A	A	B		
MINSK	54N	27							A	A	A	B	A	B	B	C	
SHATSK	54N	42	B	A	A	A											
VOLOZHIN	54N	27		B	A	C											
PETROPAVLOVSK	53N	158	B	A	A	A	B	B	A	A	C						
WITTEVEEN	53N	7	B	B	A	A				B		B					
IRKUTSK	52N	104	C	A	A					B	A	A	A	A			
LVOV	50N	24	C	A	C												
BUDKOV	49N	14		B													
YUZHNO-SAKHALINSK	47N	143		B	A												
ALOUSHTA	44N	34	B	A	A	A	B										
MEMAMBETSU	44N	144	B	A	A	A	A	A	A	A	A	A	A	A	A		
ALMA ATA	43N	77	B	A	A	A	B										
TBILISI	42N	45	B	A						A	B						
ASHKHABAD	38N	58	B	A	B					B	A	A					
KAKIOKA	36N	140	B	A													
KANOYA	31N	131	B	A	A	A	A	A	A	A	A	A	A	A	A		
SOROA	22N	277								B	B	C	B				
PARAMARIBO	06N	305	B	A													
HOLLANDIA	03S	141	C	A													
OASIS	66S	101	C	B													
MIRNY	67S	93	B	B	B	A	A	A	A	A	B	A	A				

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data

P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability

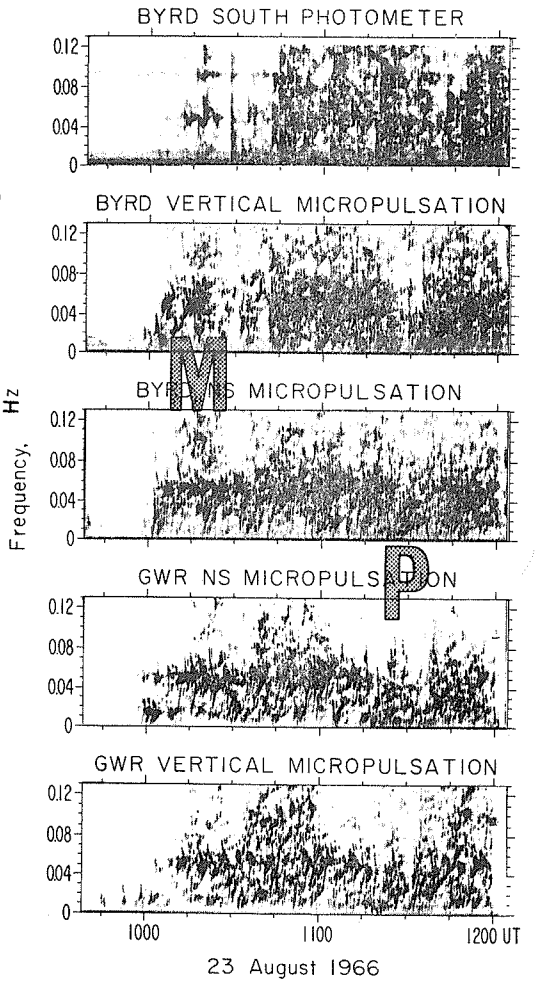
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

M I C R O F I L M:

1. Copies of magnetograms and hourly values for IGY-IGC period on 35 mm roll microfilm.

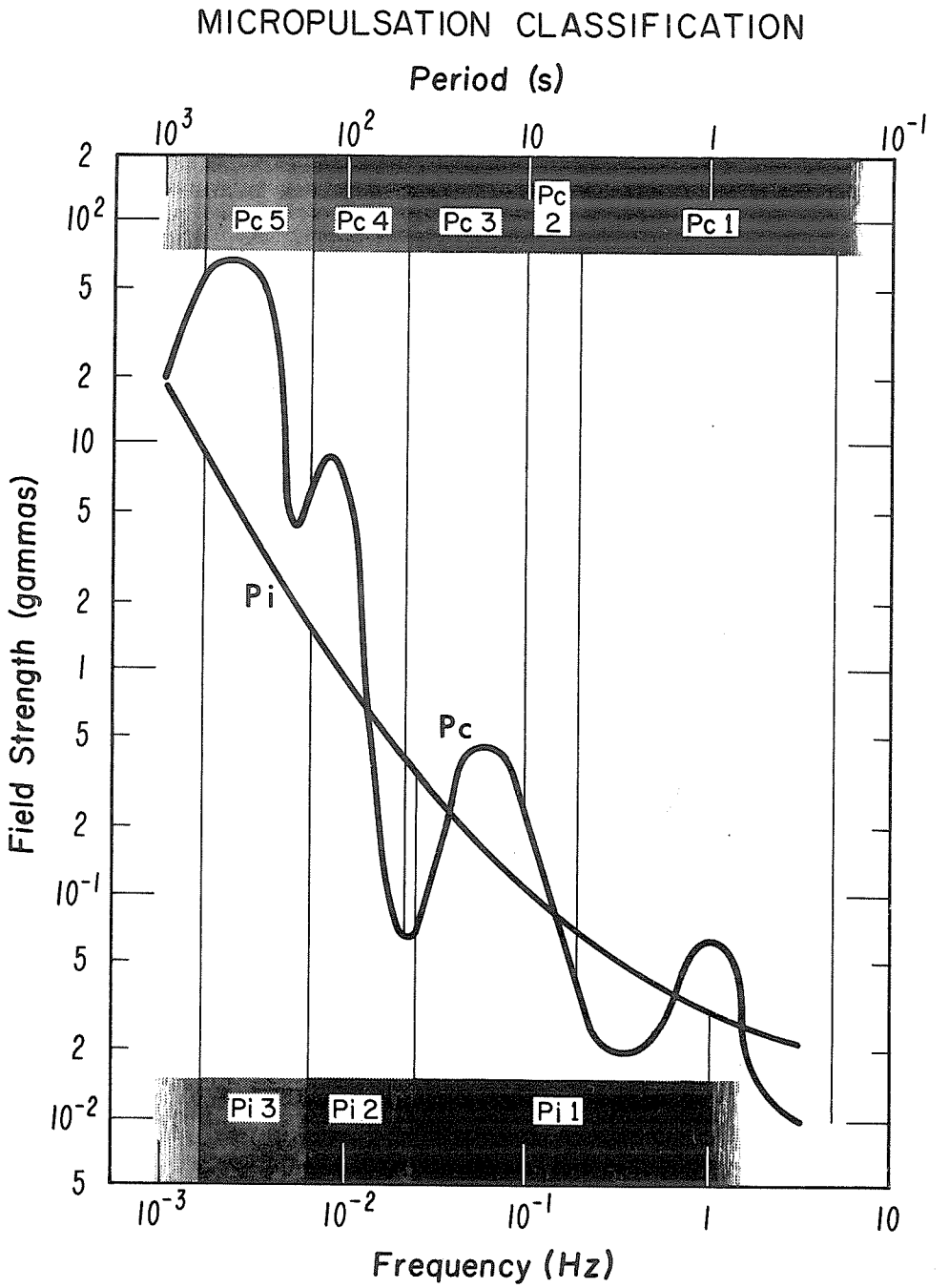
D.2

The stations listed on pages 209, 211 and 213 have reported their research programs at the request of Working Group 5 of Commission IV of the International Association of Geomagnetism and Aeronomy. Details are available in "Tabulation of Rapid-Run Geomagnetic Micropulsation Stations" by H. B. Liemohn. The report is available from WDC-A Upper Atmosphere Geophysics. Corrections or additions to its entries should be sent to WDC-A Upper Atmosphere Geophysics, NOAA, Boulder, Colorado, U.S.A. 80302.



D.2 MAGNETOSPHERIC MICROPULSATION PHENOMENA

STATION	GEOGRAPHIC LAT		GEOGRAPHIC LONG		GEOMAGNETIC LAT		GEOMAGNETIC LONG EAST
ADDIS ABABA	09.03	N	38.77	E	05.4	N	109.2
ALMA-ATA	43.25	N	76.92	E	33.4	N	150.7
ANCHORAGE	61.10	N	149.55	W	60.9	N	258.1
APIA	13.80	S	171.77	W	16.1	S	260.2
ASHKHABAD	37.95	N	58.10	E	30.3	N	133.0
ASHLAND	46.3	N	68.3	W	57.0	N	3.
ASO	32.53	N	131.01	E	22.0	N	198.1
AUCKLAND	36.51	S	174.45	E	42.7	S	253.6
AUSTIN	30.18	N	97.47	W	40.0	N	326.
BAGUIO	16.42	N	120.6	E	05.1	N	189.2
BAIE ST. PAUL	47.37	N	70.55	W	58.7	N	359.3
BAKER LAKE	64.33	N	96.03	W	73.8	N	315.2
BANDA	09.16	N	18.36	E			
BANGUI	04.43	N	18.57	E	04.8	N	88.5
BAR I	69.6	N	140.18	W	70.4	N	258.1
BARROW	71.30	N	156.75	W	68.5	N	241.1
BASE ROI BAUDOUIN	70.42	S	24.30	E			
BAURU	22.19	S	49.07	W			
BOROK	58.03	N	38.97	E	52.9	N	123.3
BORREGO	33.36	N	116.28	W			
BOULDER	40.14	N	105.24	W	48.9	N	43.1
BUDKOV	49.04	N	14.01	E	49.01	N	96.02
BYRD	79.98	S	120.02	W	70.4	S	336.
CALGARY	51.0	N	114.2	W	58.7	N	302.0
CAMBRIDGE BAY	69.1	N	105.	W	77.0	N	301.0
CAMP TORUGUERO	18.29	N	66.25	W	30.0	N	5.
CAPE CHELYUSKIN	77.72	N	104.28	E	65.9	N	177.5
CAPE WELLEN	66.17	N	169.83	W	61.8	N	237.1
CENTRO GEOFISICO	22.97	N	82.15	W	34.1	N	345.3
CHAMBON-LA-FORET	48.02	N	02.16	E	50.5	N	83.9
COLLEGE	64.87	N	147.83	W	64.6	N	256.5
COUGAR MT.	47.63	N	122.35	W	52.15	N	293.
DALLAS	32.98	N	96.75	W	43.0	N	327.7
DAVAO	10.33	N	123.9	E	0.0	N	189.
DILLINGHAM AFB	21.6	N	158.0	W	21.0	N	270.
DIXON	73.53	N	80.55	E	63.0	N	161.4
DOURBES	50.1	N	04.6	E	52.0	N	87.7
DUNEDIN	45.8	S	170.5	W	53.3	S	252.7
DURBAN	29.92	S	30.93	E	31.5	S	93.0
EDINBURGH	55.92	N	3.19	W	55.3	N	79.4
EIGHTS	75.23	S	77.17	W	63.9	S	355.3
ENKOPING	59.58	N	17.13	E	58.5	N	105.3
ESK	27.25	S	152.50	E	35.8	S	226.9
ESKDALEMUIR	55.32	N	03.20	W	58.5	N	82.9
FORT CHEPEWYAN	58.7	N	111.	W	67.0	N	303.
FORT MCMURRAY	56.7	N	111.3	W	65.	N	300.0
FORT SMITH	60.0	N	111.9	W	68.5	N	302.0
FREDERICKSBURG	38.2	N	77.38	W	49.6	N	349.8
FREETOWN	08.47	N	13.22	W	14.8	N	57.8
FT. RELIANCE	62.7	N	109.	W	71.4	N	300.
FT. YUKON	66.57	N	145.25	W			
FURSTENFELDBRUK	48.17	N	11.28	E	48.9	N	92.4
GARCHY	47.30	N	03.10	E	49.6	N	84.9
GODHAVN	69.23	N	53.52	W	79.9	N	32.5
GOTTINGEN	51.53	N	09.95	E	52.3	N	93.8
GREAT WHALE RIVER	55.33	N	77.83	W	66.6	N	14.4
GROCKA	44.63	N	20.77	E	43.6	N	100.9
GUAM	13.45	N	144.75	E	4.0	N	212.9



Amplitude levels of signals to be expected in the Micropulsation range. The period range for pc and pi classification is noted.

D.2 MAGNETOSPHERIC MICROPULSATION PHENOMENA

STATION	GEOGRAPHIC LAT		GEOGRAPHIC LONG		GEOMAGNETIC LAT		GEOMAGNETIC LONG EAST
HALLEY BAY	75.52	S	26.7	W	65.8	S	24.3
HARTLAND	51.00	N	04.48	W	54.6	N	79.0
HEISS IS.	80.62	N	58.05	E	74.3	N	144.1
HERMANUS	34.42	S	19.23	E	33.7	S	80.70
HOBART	42.87	S	147.33	E	52.0	S	223.
HUANCAYO	12.1	S	75.3	W	00.6	S	353.8
HUROQUE	43.92	N	0.35	W	47.0	N	79.4
IBADAN	07.43	N	03.9	E	10.7	N	74.6
INUVIK	68.	N	130.	W	72.	N	268.
INVERCARGILL	47.2	S	168.3	E			
IRKUTSK	52.47	N	104.03	E	44.4	N	218.2
JAKUTSK	62.02	N	129.67	E	56.4	N	199.1
JICAMARCA	11.95	S	76.87	W			
KAKIOKA	36.14	N	140.11	E	26.0	N	206.0
KANOYA	31.25	N	130.53	E	20.5	N	198.1
KAO-JUNG	24.55	N	121.08	E			
KIEV	50.72	N	30.30	E	47.6	N	112.2
KINGSTON	41.62	N	71.73	W			
KIRUNA	67.83	N	20.42	E	65.3	N	115.7
KOROR	07.27	N	134.53	E	3.3	S	203.5
KOTZEBUE	66.92	N	162.60	W	63.7	N	242.1
LA ROCHE GODON	37.83	S	77.57	E	46.70	S	140.6
LAE	6.07	S	146.9	E			
LAGRANDE	45.5	N	118.	W	50.0	N	297.
LAUNCESTON	41.25	S	147.07	E			
LEBANON, N.J.	39.63	N	74.5	W	50.0	N	
LEDUC	53.6	N	113.4	W	61.2	N	301.5
LEGON	05.63	N	00.18	W	03.0	S	
LEIRVOGUR	64.18	N	21.70	W	70.2	N	71.0
LERWICK	60.13	N	01.18	W	62.5	N	88.6
LOVOZERO	67.98	N	35.08	E	63.6	N	115.5
M≠BOUR	14.4	N	16.95	W	21.5	N	55.1
MACQUARIE	54.5	S	158.95	E	61.6	S	243.1
MAKERERE	00.5	N	32.5	E	12.6	S	
MANILA	14.7	N	121.1	E	06.0	N	182.
MAUI	20.71	N	156.26	W	21.1	N	266.5
MAWSON	67.58	S	62.9	E	73.1	S	103.4
MCMURDO	77.85	S	166.62	E			
MEANOOK	54.62	N	113.33	W	62.5	N	301.2
MEMAMBETSU	43.54	N	144.12	E	34.0	N	208.4
MIRNY	66.55	S	93.02	E	77.0	S	146.8
MOCA	03.35	N	58.10	E	05.7	N	78.6
MT. ST. HILAIRE	45.53	N	73.15	W	57.	N	355.
MUNDARING	31.90	S	116.15	E			
NAGYCENK	47.63	N	16.72	E	47.2	N	98.3
NEWCASTLE	32.75	S	151.5	E	42.0	S	226.
NEWPORT	48.26	N	117.12	W			
NIEMEGK	52.07	N	12.68	E	52.2	N	96.6
NOORD OOST POLDER	52.72	N	05.65	E	51.4	N	90.
NOVOLARZAREVSKAYA	74.77	S	11.82	E	66.2	S	53.6
NURMIJARVI	60.52	N	24.65	E	57.9	N	112.6
OAMARU	44.99	S	170.97	E	47.7	S	250.
ONAGAWA	38.26	N	141.28	E	28.3	N	206.8
OTTAWA	45.2	N	75.5	W	57.0	N	351.5
PAMATAI	17.57	S	149.57	W	15.35	S	77.23
PARAKOU	09.35	N	02.62	E	12.6	N	74.8
PARAMARIBO	05.82	N	55.22	W	16.9	N	15.3
PETROPAVLOVSK	53.1	N	158.63	E	44.7	N	218.2

SPACECRAFT NAME- MARINER 4 NSSDC ID 64-077A
OTHER NAMES- 1964 77A

LAUNCH DATE- 11/28/64 DATE LAST SCIENTIFIC DATA RECORDED- 12/20/67

AGENCY- NASA-JPL SPACECRAFT WEIGHT IN ORBIT- 262 KG

ORBIT TYPE- HELIOCENTRIC EPOCH- 07/15/65 ORBIT PERIOD- 567 DAYS
APOGEE- 1.58 AU RAD PERIGEE- 1.1 AU RAD INCLINATION- 0 DEGREES

SPACECRAFT BRIEF DESCRIPTION
MARINER 4 WAS THE FOURTH IN A SERIES OF SPACECRAFT USED FOR PLANETARY EXPLORATION IN THE FLYBY, OR NONLANDING, MODE. THE SPACECRAFT WAS ORIENTED BOTH TOWARD THE SUN AND THE STAR CANOPUS. IT WAS LAUNCHED ON NOVEMBER 28, 1964, AND PASSED WITHIN 9846 KM OF THE PLANET MARS ON JULY 15, 1965. IN ADDITION TO TELEVISING PICTURES OF THE MARTIAN SURFACE, THE SPACECRAFT INSTRUMENTS MEASURED THE MAGNETIC FIELDS, CHARGED PARTICLES, PLASMA, AND DUST IN INTERPLANETARY SPACE AND IN THE VICINITY OF MARS. THE MISSION IS CONSIDERED A SUCCESS.

EXPERIMENT NAME- HELIUM MAGNETOMETER
NSSDC ID 64-077A-02

ORIGINAL EXPERIMENT INSTITUTION- NASA-JPL

INVESTIGATORS- E.J. SMITH, NASA-JPL , PASADENA, CALIF.

DATE LAST USEFUL DATA RECORDED- 12/20/67

EXPERIMENT BRIEF DESCRIPTION
A VECTOR, LOW FIELD, HELIUM MAGNETOMETER, NOT TO BE CONFUSED WITH THE RUBIDIUM VAPOR OR HELIUM VAPOR MAGNETOMETER, WAS USED TO MEASURE THE INTERPLANETARY MAGNETIC FIELD. THE THREE COMPONENTS OF THE FIELD WERE MEASURED ESSENTIALLY SIMULTANEOUSLY, BUT LATER TRANSMITTED SEQUENTIALLY. EACH OBSERVATION REPRESENTED AN AVERAGE OVER APPROXIMATELY 1 SEC, I.E., THE RESPONSE DROPPED 3 DB FOR FREQUENCIES OF 1 HZ, AND HIGHER FREQUENCY INFORMATION WAS ESSENTIALLY LOST. IN EACH DATA FRAME, FOUR VECTOR MEASUREMENTS WERE MADE, SEPARATED BY INTERVALS OF 1.5, 0.9, AND 2.4 SEC. THE WHOLE FRAME WAS REPEATED EVERY 12.5 SEC. THERE WAS AN UNCERTAINTY OF PLUS OR MINUS 0.3 GAMMA PER COMPONENT. FIELDS WERE MEASURED AS HIGH AS 625 GAMMAS. THE EXPERIMENT OPERATED SUCCESSFULLY FOR THE OPERATIONAL LIFETIME OF THE SPACECRAFT.

DATA SET NAME- ORIGINAL VECTOR MAGNETIC FIELD DATA, 3-HR AVERAGES ON TAPE
NSSDC ID 64-077A-02A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME SPAN OF DATA- 11/28/64 TO 10/01/65

DATA SET BRIEF DESCRIPTION
THESE ANALYZED DATA CONSIST OF ONE 7-TRACK, BCD MAGNETIC TAPE AS SUPPLIED BY THE EXPERIMENTER. THE TAPE CONTAINS 3-HR AVERAGED VALUES OF THE VECTOR COMPONENTS OF THE MAGNETIC FIELD (IN A HELIOCENTRIC SOLAR POLAR COORDINATE SYSTEM), THE FIELD MAGNITUDE, THE RMS DEVIATION OF EACH OF THE AVERAGED VALUES, AND THE NUMBER OF DATA POINTS USED IN THE AVERAGE. THESE DATA COVER HELIOCENTRIC RADIAL DISTANCES FROM 1 TO 1.54 AU AND TIME PERIODS INCLUDING 11 SOLAR ROTATIONS.

D.2 MAGNETOSPHERIC MICROPULSATION PHENOMENA

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG EAST
PLATEAU	79.47 S	40.58 E		
PORT ALFRED	46.43 S	51.87 E	51.20S	109.3
PORT MORESBY	9.40 S	147.15 E	18.6 S	217.9
PORT-AUX-FRANCAIS	49.35 S	70.20 E	56.5 S	127.8
RED DEER	52.3 N	113.8 W	60.3 N	300.
RESOLUTE BAY	74.70 N	94.90 W	83.0 N	289.6
ROBURENT	44.3 N	07.88 E	45.8 N	88.5
RUDE SKOV	55.85 N	12.45 E	55.9 N	98.5
SAN JUAN	18.12 N	66.15 W		
SAO JOSE D CAMPOS	23.2 S	45.8 W	12.4 S	26.6
SIMOSATO	33.34 N	135.56 E	23.0 N	202.4
SITKA	57.07 N	135.33 W	60.0 N	275.3
SODANKYLA	67.37 N	26.63 E	63.8 N	120.0
SOGRA	62.8 N	46.25 E	57.9 N	122.1
SOUTH POLE	90.00 S	0.0		
STANFORD	37.26 N	122.10 W	43.5 N	299.0
STEPANOVKA	46.78 N	30.9 E	43.8 N	111.1
SUKKERTOPPEN	65.42 N	52.90 W	76.1 N	28.7
SYOWA BAY	69.0 S	39.35 E	69.7 S	77.7
TAMANRASSET	22.8 N	05.52 E	25.07N	80.1
TBILISI	42.08 N	44.70 E	36.7 N	122.1
TERRE ADELIE	66.67 S	140.0 E	75.6 S	230.9
THULE	76.61 N	68.65 W	88.9 N	357.8
TIXIE	71.58 N	129. E	65.6 N	195.2
TOLEDO	39.88 N	04.05 W	43.9 N	74.7
TOOLANGI	37.53 S	145.47 E	46.7 S	220.8
TOWNSVILLE	19.32 S	146.73 E	29.0 S	217.
TRINIDAD	10.42 N	61.38 W	21.0 N	9.
TROMSO	69.67 N	18.97 E	67.1 N	116.7
TUCSON	32.25 N	110.83 W	40.4 N	312.2
TULALIP	48.08 N	122.19 W	53.6 N	292.
TUNGSTEN	62.00 N	128.15 W		
ULAN BATOR	47.85 N	106.75 E	36.4 N	176.5
VICTORIA	48.5 N	123.42 W	54.2 N	293.
VOSTOK	78.45 S	106.87 E	89.2 S	92.6
WILKES	66.25 S	110.58 E	77.7 S	179.2
WINGST	53.73 N	09.07 E	54.5 N	94.00
WITTEVEEN	52.82 N	06.67 E	54.1 N	91.2
WOOMERA	31.11 S	136.54 E	41.8 S	209.
ZARIA	11.15 N	7.65 E	13.7 N	79.1

D.3 SPACE MAGNETISM

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
58-007A-02	Pioneer 1	Single Axis Search Coil Magnetometer	Sonett	10/11/58	1058-1058
59-004A-04	Explorer 6	Search Coil Magnetometer	Sonett	08/07/59	0859-0959
60-001A-02	Pioneer 5	Search Coil Magnetometer	Coleman	03/11/60	0360-0560
61-020A-02	Explorer 12	Fluxgate Magnetometers	Cahill	08/16/61	0861-1261
62-041A-03	Mariner 2	Fluxgate Magnetometers	Coleman	08/27/62	0862-1162
62-051A-02	Explorer 14	Fluxgate Magnetometers	Cahill	10/02/62	0163-0563
63-046A-02	Explorer 18	Fluxgate Magnetometers	Ness	11/27/63	1163-0564
64-060A-02	Explorer 21	Fluxgate Magnetometers	Ness	10/04/64	1064-0465
64-069A-01	Cosmos 49	Proton Precessional Magnetometer	Dolginov	10/24/64	1064-1164
64-077A-02	Mariner 4	Helium Magnetometer	Smith	11/28/64	1164-1065
64-083C-01	-	Rubidium Vapor Magnetometer	Zmuda	12/13/64	1264-0665
65-042A-02	Explorer 28	Fluxgate Magnetometer	Ness	05/29/65	0565-0567
65-081A-05	OGO 2	Rubidium Vapor Magnetometer	Cain	10/14/65	1065-1067
66-058A-01	Explorer 33	GSFC Magnetometer	Ness	07/01/66	0766-1068
66-058A-03	Explorer 33	Ames Magnetic Fields	Sonett	07/01/66	0666-0768
67-070A-03	Explorer 35	Ames Magnetic Fields	Sonett	07/19/67	0767-0768
68-014A-14	OGO 5	UCLA 3 Axis Fluxgate Magnetometer	Coleman	03/04/68	0368-0369

PUBLICATION:

1. Tabulation of Rapid-Run Geomagnetic Micropulsation Stations by H. B. Liemohn, Boeing Scientific Research Laboratories Document D1-82-1043, January 1971.

SPACECRAFT NAME- EXPLORER 34 NSSDC ID 67-051A
OTHER NAMES- IMP-F, IMP 4, 1967 51A

LAUNCH DATE- 05/24/67 DATE LAST SCIENTIFIC DATA RECORDED- 05/03/69

AGENCY- NASA-OSSA SPACECRAFT WEIGHT IN ORBIT- 75 KG

ORBIT TYPE- GEOCENTRIC EPOCH- 05/24/67 ORBIT PERIOD- 6225 MIN.
APOGEE-211112. KM ALT PERIGEE- 278. KM ALT INCLINATION- 67.4 DEGREES

SPACECRAFT BRIEF DESCRIPTION
THIS SPACECRAFT WAS PLACED INTO A HIGH-INCLINATION, HIGHLY ECCENTRIC EARTH ORBIT. THE APOGEE POINT LAY NEAR THE ECLIPTIC PLANE AND HAD AN INITIAL LOCAL TIME OF ABOUT 1900 HR. THE SPACECRAFT WAS SPIN STABILIZED, AND IT HAD AN INITIAL SPIN PERIOD OF 2.6 SEC. LIKE THE EARLIER IMP'S, THIS SPACECRAFT WAS INSTRUMENTED TO STUDY INTERPLANETARY MAGNETIC FIELDS, ENERGETIC PARTICLES, AND PLASMA. USEFUL DATA WERE ACQUIRED UNTIL JUST BEFORE SPACECRAFT REENTRY, WHICH OCCURRED ON MAY 3, 1969.

EXPERIMENT NAME- LOW-ENERGY ELECTRONS AND PROTONS NSSDC ID 67-051A-04

ORIGINAL EXPERIMENT INSTITUTION- U OF IOWA

INVESTIGATORS- J.A. VAN ALLEN, U OF IOWA, IOWA CITY, IOWA
L.A. FRANK, U OF IOWA, IOWA CITY, IOWA

DATE LAST USEFUL DATA RECORDED- 05/03/69

EXPERIMENT BRIEF DESCRIPTION
THIS EXPERIMENT WAS DESIGNED TO MEASURE, IN EIGHT CHANNELS, THE DIRECTIONAL LOW-ENERGY ELECTRON AND PROTON INTENSITIES IN THE RANGE 125 EV TO 52 KEV INSIDE THE EARTH'S MAGNETOSPHERE AND IN THE INTERPLANETARY REGIONS. THE INSTRUMENTATION CONSISTED OF TWO CURVED-PLATE CYLINDRICAL ELECTROSTATIC ANALYZERS (LEPEDEA DETECTORS), TWO BENDIX CONTINUOUS-CHANNEL MULTIPLIERS ("CHANNELTRONS"), AND AN ANTON 213 GM TUBE. THE GM TUBE WAS USED TO MEASURE ELECTRON INTENSITIES (E GREATER THAN 40 KEV) IN THE EARTH'S MAGNETOSPHERE. THE DETECTOR ACCUMULATORS WERE READ OUT FOUR TIMES EVERY 20.48 SEC. EACH ACCUMULATION WAS ABOUT 480 MSEC LONG (SPACECRAFT SPIN PERIOD WAS INITIALLY 2.6 SEC). THE INSTRUMENTS PERFORMED NORMALLY FROM LAUNCH UNTIL THE SATELLITE DECAYED FROM ORBIT ON MAY 3, 1969.

DATA SET NAME- LEPEDEA MOTION PICTURE SURVEY OF THE MAGNETOSPHERE NSSDC ID 67-051A-04A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME SPAN OF DATA- 06/30/67 TO 07/04/67

DATA SET BRIEF DESCRIPTION

D.4 MAGNETOSPHERIC PARTICLES

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
58-001A-01	Explorer 1	Cosmic Ray Detector	Van Allen	02/01/58	0258-0358
58-005A-01	Explorer 4	Charged Particle Detector	Van Allen	07/25/58	0758-0958
58-007A-01	Pioneer 1	Ion Chamber	Sonett	10/11/58	1058-1058
59-004A-01	Explorer 6	Proportional Counter Telescope	Simpson	08/07/59	0859-1059
59-004A-02	Explorer 6	Scintillation Counter	Sonett	08/07/59	0859-0959
59-004A-03	Explorer 6	Ion Chamber and GM Counter	Winckler	08/07/59	0859-1059
59-009A-04	Explorer 7	Radiation & Solar Protons	Van Allen	10/13/59	1059-0261
60-001A-03	Pioneer 5	Ion Chamber and GM Tube	Winckler	03/11/60	0360-0760
61-010A-02	Explorer 10	Plasma Probe	Bridge	03/25/61	0361-0361
61-013A-02	Explorer 11	Crystal Sandwich Cerenkov Counter	Garmire	04/27/61	0461-1161
61-015B-01	Injun 1	GM Counter	Frank	06/29/61	0661-0862
61-015B-02	Injun 1	Cadmium Sulfide Detector	Freeman	06/29/61	0661-0862
61-015B-03	Injun 1	Electron Differential Energy Spectrometer	Laughlin	06/29/61	0661-0862
61-015B-06	Injun 1	Solid State Proton Detector	Bostrom	06/29/61	0661-0862
61-020A-03	Explorer 12	Charged Particles	Van Allen	08/16/61	0861-1261
61-020A-04	Explorer 12	C. R. Scintillation	McDonald	08/16/61	0861-1261
61-020A-05	Explorer 12	0.1-10 Mev Proton & Electron Scintillation	Davis	08/16/61	0861-1261
62-006A-11	OSO 1	Proton Electron Analyser	Schrader	03/07/62	0362-0763
62-029A-01	Telstar 1	Proton & Electron Radiation	Brown	07/10/62	0762-0263
62-041A-06	Mariner 2	Solar Plasma Analyzer	Neugebauer	08/27/62	0862-1262
62-049A-02	Alouette 1	Cosmic Particle Detectors	McDiarmid	09/29/62	0962-0364
62-051A-03	Explorer 14	Trapped Particle Radiation	Van Allen	10/02/62	1062-0863
62-051A-04	Explorer 14	C. R. Scintillation	McDonald	10/02/62	1062-0863
62-059A-01	Explorer 15	Electron and Proton Solid State Detectors	Brown	10/27/62	1062-0163
62-059A-02	Explorer 15	Directional and Omnidirectional Energetic Protons and Electrons	McIlwain	10/27/62	1062-0163
62-067B-01	Injun 3	Geiger Tube Detectors	O'Brien	12/13/62	1262-1063
62-067B-02	Injun 3	Pulse Scintillator	O'Brien	12/13/62	1262-1063
62-067B-03	Injun 3	Magnetic Differential Electron Spectrometer	O'Brien	12/13/62	1262-1063
62-067B-04	Injun 3	Integral Magnetic Electron Spectrometer	O'Brien	12/13/62	1262-1063
62-067B-05	Injun 3	DC Scintillator	O'Brien	12/13/62	1262-1063
62-067B-06	Injun 3	Electron Multiplier	O'Brien	12/13/62	1262-1063
62-067B-07	Injun 3	Proton Spectrometer	O'Brien	12/13/62	1262-1063
62-068A-02	Relay 1	Solid State Ion Chamber Electron and Proton Detector	Brown	12/13/62	1262-0364
62-068A-03	Relay 1	Proton-Electron Detectors	McIlwain	12/13/62	1262-1064
63-013A-01	Telstar 2	Proton and Electron Radiation	Brown	05/07/63	0563-0565
63-038C-01	1963-38C	Energetic Electron and Proton Detectors	Bostrom	09/28/63	0963-1268
63-046A-05	Explorer 18	Ion Chamber and GM Counters	Anderson	11/27/63	1163-0365
63-046A-07	Explorer 18	Plasma, Faraday Cup	Bridge	11/27/63	1163-0165
64-003A-02	Relay 2	Solid State Ion Chamber Electron and Proton Detector	Brown	01/21/64	0164-1265
64-040C-01	ERS 13	Charged Particle Detectors	Vette	07/17/64	0764-1264
64-054A-12	OGO 1	Solar Cosmic Rays	Anderson	09/05/64	0965-0566
64-054A-16	OGO 1	Trapped Radiation Scintillation Counter	Konradi	09/05/64	0964-1165
64-054A-20	OGO 1	Ionization Chamber	Winckler	09/05/64	0964-1267
64-054A-21	OGO 1	Electron Spectrometer	Winckler	09/05/64	0964-0667
64-060A-01	Explorer 21	Retarding Potential Analyzer	Serbu	10/04/64	1064-0465
64-060A-05	Explorer 21	Ion Chamber & GM Counters	Anderson	10/04/64	1064-0965
64-060A-07	Explorer 21	MIT Faraday Cup	Bridge	10/04/64	1064-0965

EXPERIMENT NAME- PLASMA WAVE DETECTOR NSSDC ID 68-014A-24

ORIGINAL EXPERIMENT INSTITUTION- TRW SYSTEMS INC

INVESTIGATORS- G.M. CROOK, TRW SYSTEMS INC , REDONDO BEACH, CALIF.
F.L. SCARF, TRW SYSTEMS INC , REDONDO BEACH, CALIF.
R.W. FREDRICKS, TRW SYSTEMS INC , REDONDO BEACH, CALIF.

DATE LAST USEFUL DATA RECORDED- EXPERIMENT STILL OPERATIONAL

EXPERIMENT BRIEF DESCRIPTION
THE PLASMA WAVE DETECTOR INCLUDES FIVE ELECTRIC DIPOLES AND THREE ORTHOGONAL SEARCH-COIL MAGNETOMETERS MOUNTED ON A 2.2-FT BOOM. THE THREE 0.5-M-LONG ORTHOGONAL ELECTRIC DIPOLES ARE NORMAL TO THE PLANES OF THE MAGNETOMETERS. EACH OF THE ORTHOGONAL COMPONENTS OF THE DIPOLE AND MAGNETOMETER ARE SAMPLED SIMULTANEOUSLY FOR 9.2 SEC THROUGH 15 PERCENT BANDPASS FILTERS IN THE FOLLOWING SEQUENCE -- 0.56, 1.3, 3.0, 7.35, 14.5, 30.0, AND 70.0 KHZ FOR EACH DIPOLE CONCURRENT WITH 0.56, 0.56, 0.56, 0.56, 70.0, 70.0, AND 70.0 KHZ FOR EACH MAGNETOMETER. REPEAT TIME FOR THIS SEQUENCE IS 3.26 MIN. ONBOARD AUTOCORRELATION BETWEEN EACH E AND B MEASUREMENT IS PERFORMED. THE REMAINING TWO BOOM-MOUNTED DIPOLES ARE COLINEAR. DIFFERING ONLY IN DIPOLE LENGTH, EACH IS MONITORED THROUGH A 200-HZ 10 PERCENT FILTER FOR 2 SEC ONCE EVERY 9.2 SEC. IN ADDITION TO THESE DIGITAL DATA, 1- TO 22-KHZ ELECTRIC FIELD DATA TAKEN FROM ONE MAIN DIPOLE AND YIELDING POWER SPECTRUM INFORMATION FOR THAT AXIS ARE CONTINUOUSLY MONITORED BY A SPECIAL PURPOSE ANALOG TELEMETRY SYSTEM. THRESHOLD SENSITIVITY OF THESE MEASUREMENTS IS TELEMETERED WITH THE DIGITAL DATA. ALSO, INTENSE EMISSIONS BELOW 1 KHZ AND ABOVE 22 KHZ MAY STILL BE DETECTABLE. THE EXPERIMENT HAS OPERATED NORMALLY. HOWEVER, MUCH OF THE DATA AFTER APRIL 1968 IS OF POOR QUALITY AS A RESULT OF TRANSMITTER FAILURE.

DATA SET NAME- ORIGINAL ELECTRIC FIELD SONOGRAMS ON MICROFILM NSSDC ID 68-014A-24A

AVAILABILITY OF DATA SET- DATA AT NSSDC BEING PROCESSED

TIME SPAN OF DATA- 03/27/68 TO 09/15/68

DATA SET BRIEF DESCRIPTION
THIS DATA SET CONSISTS OF ELECTRIC FIELD SONOGRAMS GENERATED BY THE EXPERIMENTER FROM ANALOG DATA ON NINE ROLLS OF 35-MM MICROFILM. THE DATA COVER AN AVERAGE OF 3 HR PER DAY FOR 8 DAYS INTERSPERSED BETWEEN MARCH 27, 1968, AND SEPTEMBER 15, 1968. THE DATA WERE PROCESSED AT A RATE OF 16 SEC PER IN. THE FREQUENCY INTERVALS INCLUDED IN THE SET ARE 0 TO 2.5, 0 TO 5, 0 TO 10, 9 TO 10, 0 TO 20, AND 10 TO 30 KHZ, WITH THE 0- TO 5-, 0- TO 10-, AND 0- TO 20-KHZ INTERVALS PRESENTED MOST OFTEN. THE ANALOG DATA USED TO GENERATE THESE SONOGRAMS ARE FROM ONE AXIS OF THE THREE ORTHOGONAL DIPOLES

D.4 MAGNETOSPHERIC PARTICLES (Continued)

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
64-076B-03	Explorer 25	Geiger-Mueller Counter	Van Allen	11/21/64	0265-0766
64-076B-04	Explorer 25	Solid State Detector	Van Allen	11/21/64	0265-0766
64-076B-05	Explorer 25	Cadmium Sulfide Detectors	Van Allen	11/21/64	0265-0766
64-076B-06	Explorer 25	Plastic Scintillator Particle Detectors	Van Allen	11/21/64	0265-0766
64-086A-01	Explorer 26	Solid State Electron Detector	Brown	12/21/64	1264-0567
64-086A-02	Explorer 26	Omnidirectional and Unidirectional Electron and Proton Fluxes	McIlwain	12/21/64	1264-0567
65-042A-01	Explorer 28	Retarding Potential Analyzer	Serbu	05/29/65	0565-0567
65-042A-05	Explorer 28	Ion Chamber and GM Counters	Anderson	05/29/65	0565-0167
65-058C-01	ERS 17	Charged Particle Detectors	Vette	07/20/65	0765-1165
65-078A-02	OVI 2	Electron and Proton Detectors	Farley	10/05/65	1065-1265
65-081A-07	OGO 2	Low-energy Proton, Alpha Particle Measurement	Simpson	10/14/65	1065-1266
66-049A-01	OGO 3	Solar Cosmic Rays	Anderson	06/07/66	0666-0267
66-049A-08	OGO 3	Low-energy Electrons and Protons	Frank	06/07/66	0766-0766
66-049A-10	OGO 3	Trapped Radiation Scintillation Counter	Konradi	06/07/66	0666-0167
66-049A-22	OGO 3	Electron Spectrometer	Winckler	06/07/66	0666-0568
66-049A-23	OGO 3	Ionization Chamber	Winckler	06/07/66	0666-0868
66-110A-03	ATS 1	Omnidirectional Spectrometer	Paulikas	12/07/66	1266-1268
66-110A-05	ATS 1	Particle Telescope	Brown	12/07/66	1266-0367
67-031A-05	ATS 2	Omnidirectional Proton and Electron Detectors	McIlwain	04/06/67	0467-1067
67-051A-01	Explorer 34	Low Energy Solid State Telescope	Brown	05/24/67	0567-0569
67-051A-04	Explorer 34	Low-Energy Proton and Electron Differential Energy Analyzer	Van Allen	05/24/67	0667-0767

D.5 MEASUREMENT OF MAGNETOSPHERE BY WHISTLER AND VLF EMISSIONS

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
62-067B-09	Injun 3	VLF Receiver Signal Strength	Gurnett	12/13/62	1262-1063
64-045B-06	P11 AS	VLF Electric Field Detector	Scarf	08/14/64	0864-0964
64-054A-08	OGO 1	VLF Receivers, Wideband and Narrowband Step Frequency	Helliwell	09/05/64	0964-1265
65-081A-02	OGO 2	VLF Receivers, Wideband and Narrowband Step Frequency and Tunable	Helliwell	10/14/65	1065-0966
65-101A-01	FR 1	VLF Receiver	Storey	12/06/65	1265-0868
68-014A-24	OGO 5	Plasma Wave Detector	Crook	03/04/68	0368-0968

E. AURORA

All-sky camera photographs are the main type of auroral data, recorded on film (16 or 35 mm) in rolls approximately 100 feet in length. These cameras are located mainly in the northern and southern auroral regions; a few are in the sub-auroral belts. These data are supplemented by photographs of auroras taken by ordinary camera (not all-sky) and telescopes, and by sets of simultaneous photographs from groups of associated stations taken to determine the heights and location of auroras. Spectrographic (patrol spectrograph) data are available; however, though copies may be used for verifying the presence or absence of spectral lines and bands, they cannot be considered suitable for studies for which details are essential, e.g., microphotometry, since normal copying processes introduce uncertainties in spectral resolution and densities. Radar echo (auroral) data are recorded on 16 mm film. The tabulations are divided into northern and southern hemispheres, in north to south order. The symbol A represents data for substantially all of the winter months, while the symbol C represents data for less than all the winter months. To indicate the auroral seasons for northern hemisphere stations the symbol is placed between the calendar years, and for southern hemisphere stations the symbol is placed under the calendar year.

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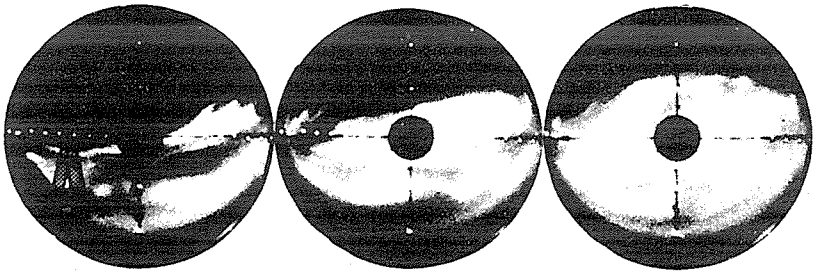
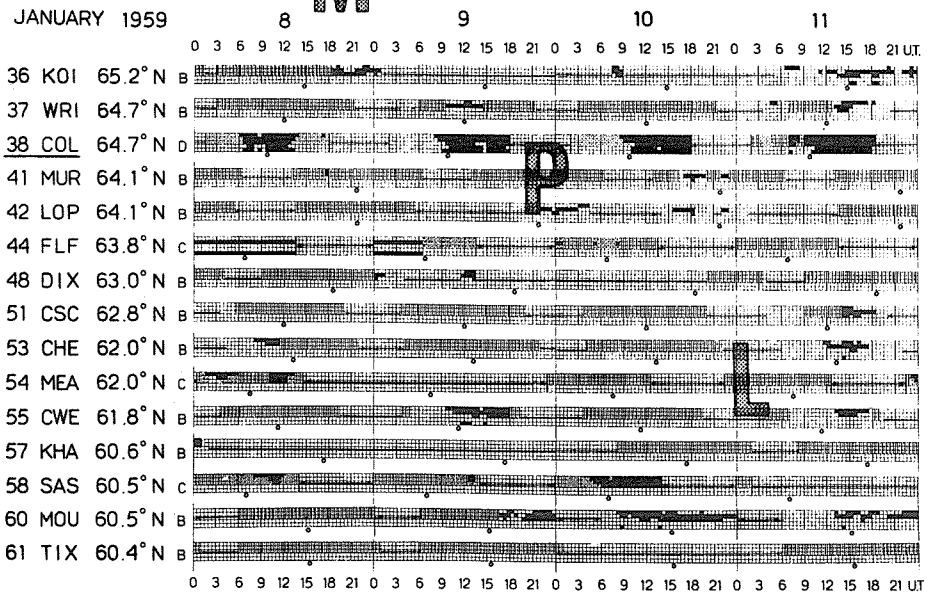
E.S

ALL SKY CAMERA



College: 0147-0152, 150° WMT, 10 January 1959.

MASCAPLOT



E

AT BOULDER

ALL-SKY CAMERA

STATIONS NORTHERN	GEOGRAPHIC LAT	LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
ALERT	82N	298	C	C	S												
ARCTICA 1	81N		A	A	S												
NORD	81N	344	Q	Q												Q	
ARCTIC ICE FLO	80N		A	S													
ARCTICA 11	80N		A	A	S												
ARLIS III	80N								C	S							
FLETCHER S ICS	80N		A	C	S												
HEISS ISLAND	80N	58	A						C	P	P	P	P	P	P		
MURCHISON BAY	80N	18	A	S													
T-3	80N									C	A	C	Q	S			
NY-ALESUND	79N	12														Q	
WIESE IS	79N	77	Q	Q	Q	S											
PYRAMIDA	78N	15	C	C	S												
CAPE CHELYUSKIN	77N	104	A	Q					C	P	P	P	P	P	P		
THULE	77N	291	C	A	A	A	A	A	Q	Q	Q	Q	Q	Q	Q		
UEDINENIE IS	77N	82	Q	Q	S												
CAPE ZHELANIA	76N	68	C	S													
KOTELNY IS	76N	137		Q	S												
MOULD BAY	76N	241									A	Q			Q	Q	
PREOBRAZHENIE	74N	112		C	S												
RESOLUTE BAY	74N	266	A	A					Q	Q	Q	S					
CAPE SHALAUROV	73N	143	C	Q	S												
DIXON ISLAND	73N	80	A	A					C	P					P		
SACHS HARBOUR	72N	235													Q	Q	
BARROW	71N	204	A	A	C	Q	C	Q	C	A	A	C	Q	S			
MUOSTAKH	71N	130	C	Q	Q	S											
TIXIE BAY	71N	129	C	C	Q				C	P	P	P	P	P	P		
WRANGEL ISLAND	71N	182	Q	Q	S												
CAP TOBIN	70N	338													Q		
CHETIREKHSTOLBOVOI	70N	162	Q	A	Q	S											
KAZACHIE	70N	136	C	A					C	P	P	P	P	Q	Q		
TROMSO	70N	18	A	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
BAR I	69N	220								A	A	Q	S				
GODHAVN	69N	307	Q	Q											P		
MURMANSK	69N	33	A	Q	Q	Q	P	P	A	P	P	P	P	P	P		
UTSJOKI	69N	27									Q	Q	Q	Q	Q	Q	
ABISKO	68N	18	A	A	S												
AKLAVIK	68N	225	C	C	S												
CAPE SCHMIDT	68N	181	A	Q					C	S							
INUVIK	68N	226													Q	Q	
OLENEK	68N	112	C	C					C	P	P	P	P	P	P		
IVALO	68N	27		Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
KIRUNA	67N	20	A	C									P	P	P		
NARYAN MAR	67N	53		Q							Q	Q	S				
SONDER STROMFJORD	67N	310													Q		
VERKHOYANSK	67N	133	Q	Q	S									P			
SODANKYLA	67N	27	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
ALLAKAKET	66N	207									A	Q	S				
BETTLES	66N	209	A	A	Q		C			C	Q	Q	Q	Q	S		
CAPE WELLEN	66N	191	C	Q	S												

KEY TO SYMBOLS

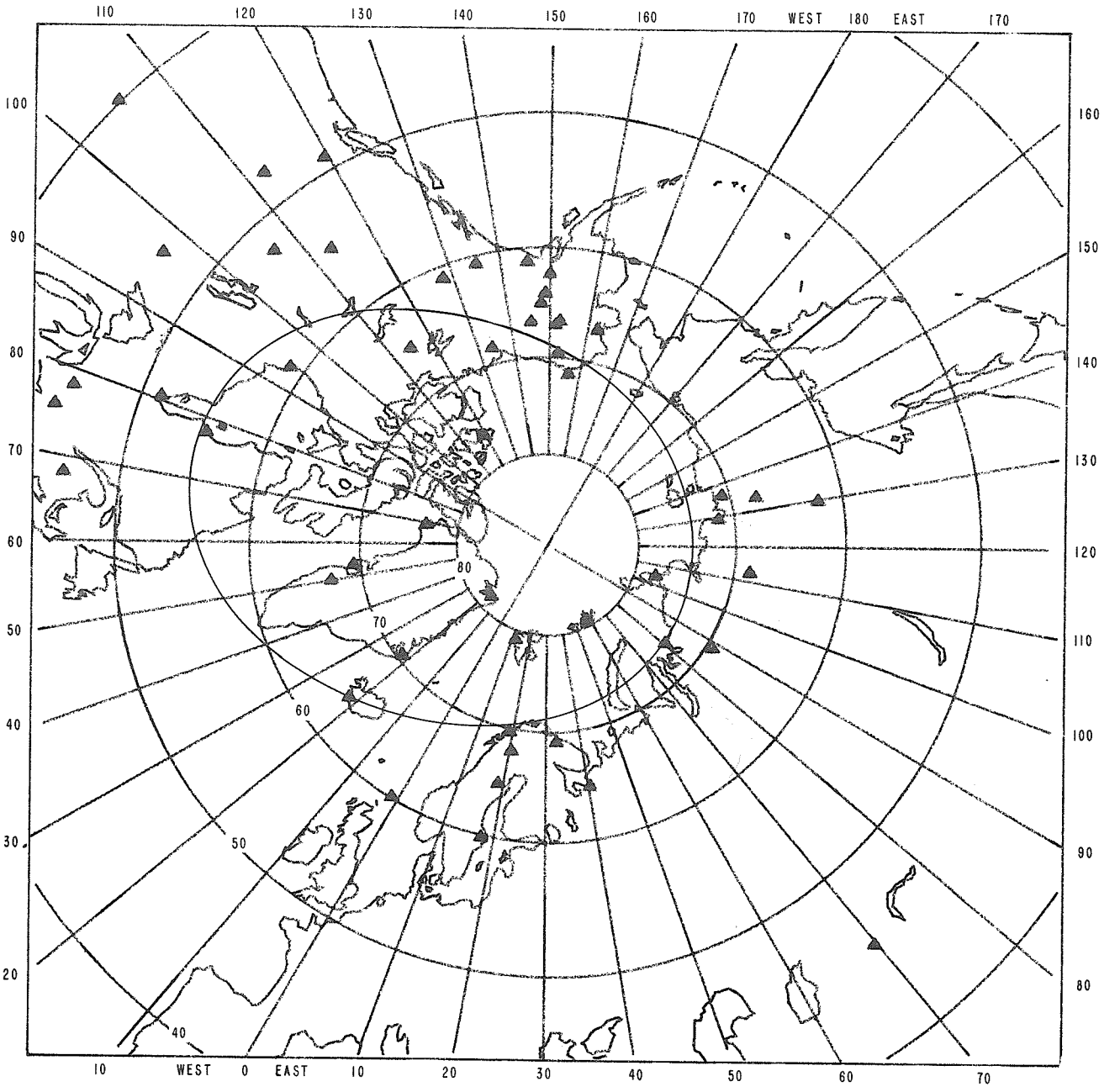
A = All Winter Months
C = Incomplete Winter Months

Q = Data exist but not held at WDC-A; QUERY WDC-A to assit in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

E.1

ALL-SKY CAMERA STATIONS 1971

NORTH



The approximate position of the Feldstein auroral oval at local geomagnetic midnight is indicated.

E.1 ALL-SKY CAMERAS AND OTHERS

AT BOULDER

ALL-SKY CAMERA

STATIONS NORTHERN	GEOGRAPHIC LAT	LONG EAST	YEAR 57-58	58-59	59-60	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70	70-71
FORT YUKON	66N	215	Q	Q	Q	Q	Q	Q		A		Q	Q	Q	Q	Q
KOTZEBUE	66N	198	Q	Q			Q	Q	Q	A	C	Q	Q	Q	Q	Q
SALEKHARD	66N	66	C	A	S											
EGILSSTADIR	65N	346									A	A	A	A	A	Q
KRISTINEBERG	65N	18	C	A	S											
OULU	65N	25												Q	Q	Q
ARKHANGELSK	64N	40	Q	A										Q	Q	
BAKER LAKE	64N	264	A	A	Q					Q	Q	S				
COLLEGE	64N	213	A	A	A	A	A	A	C	A	A	C	Q	Q	Q	Q
HEALY	64N	211	C	C	S											
LYCKSELE	64N	18	A	A											Q	
REYKJAVIK	64N	339	Q	C	C						A	A	A	A	A	Q
EAGLE	64N	219											Q	Q	S	
NORTHWAY	63N	218		C	S											
FAREWELL	62N	207	A	C	S											
TALKEETNA	62N	210								Q	Q	Q	S			
YAKUTSK	62N	129	Q	Q	Q	Q	Q	Q	C	Q	Q	Q	Q	Q	Q	Q
YELLOWKNIFE	62N	246	C	C	S											
ENNADAI LAKE	61N	260	A	C	S											
NARSSARSSUAQ	61N	318													Q	
SIKTIVKAR	61N	50	Q	Q					C	S						
TUNGSTEN	61N	232											Q	Q	Q	Q
JULIANEHAAB	60N	314	C	S												
LERWICK	60N	359								C	S					
ROSCHINO	60N	29	C	Q	S											
WHITE HORSE	60N	225										C	Q	S		
UPPSALA	59N	17	Q												Q	
ALDAN	58N	125	C	Q	S											
CHURCHILL	58N	267	A	A	Q				Q	Q	Q	Q	Q	Q	Q	Q
O DAY	57N	266	C	S												
BIRD	56N	266	A	C	S											
GREAT WHALE	55N	283								Q	Q	Q	Q	Q	Q	Q
ZVENIGOROD	55N	36	P	P	S											
FLIN FLON	54N	258	A	C	S											
KNOB LAKE	54N	294	C	C	C	Q	Q	Q	Q	Q	Q	C	S			
MEANOOK	54N	247	C	A	C				Q	Q	Q	Q	Q	S		
SASKATOON	52N	254	A	A	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
MOOSENEE	51N	279												Q	Q	Q
REGINA	50N	256	A	C	S											
MOUNT KOBAU	49N	119											Q	Q	Q	
VICTORIA	48N	237	C	C	S											
CHOTEAU	47N	248	A	A	Q	Q	Q	Q	Q		C	A	C	P	P	
FARGO	46N	264	A	A	A	Q	Q	Q	Q	A	A	P	P	P	P	
PRESQUE ISLE	46N	292								Q	A	S				
PULLMAN	46N	243	C	A	A	Q	Q	Q	Q	A	A	C	S			
SHINGLETON	46N	274	A	A	S											
LAKE TRAVERSE	45N	282										Q	Q	Q	Q	Q
OTTAWA	45N	285	A	A	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
RAPID CITY	44N	257	C	C	S											
REDMOND	44N	239	A	A	A	Q	Q	Q	S							

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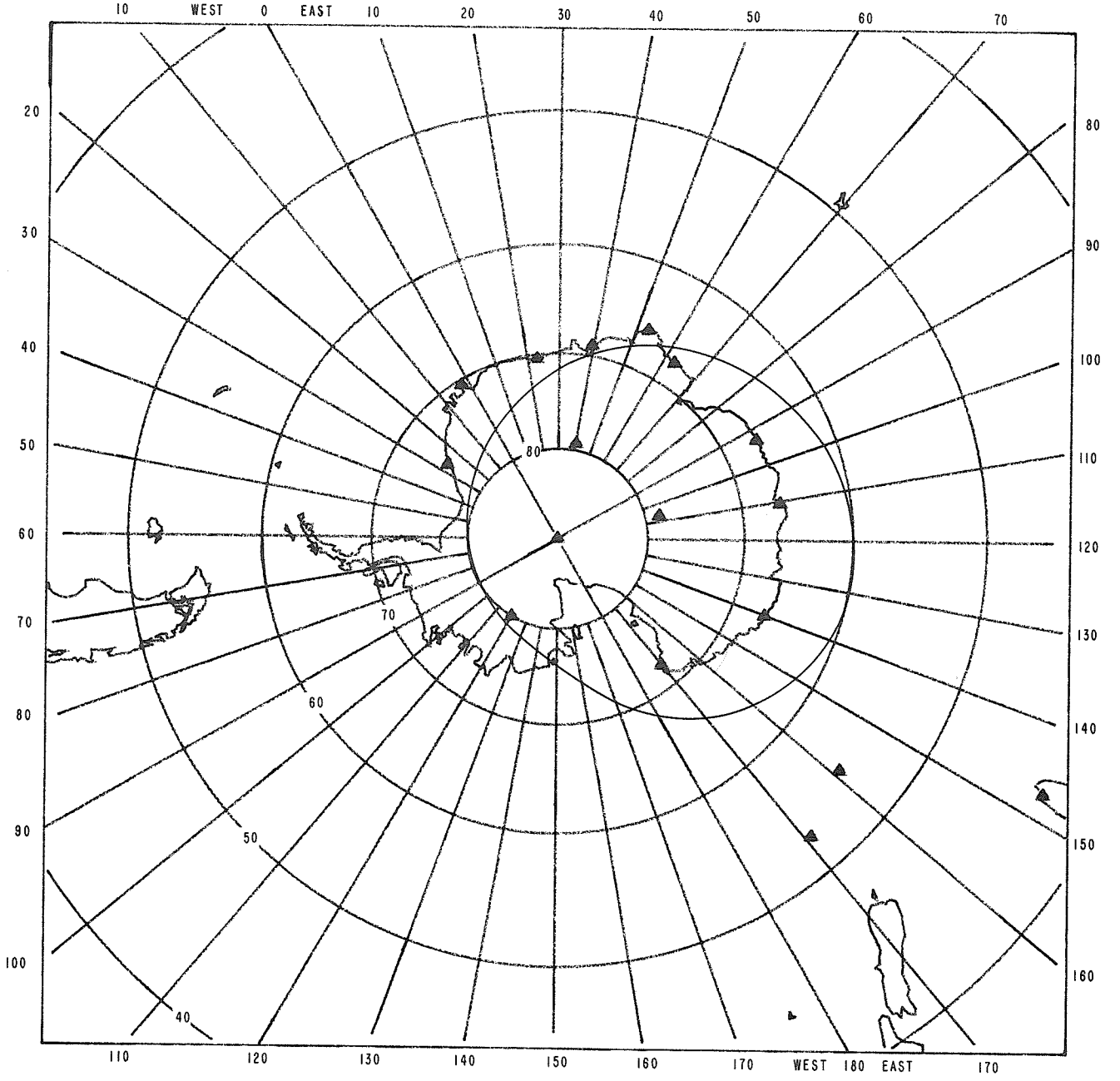
E.1

ALL-SKY CAMERA STATIONS 1971

SOUTH



The approximate position of the Feldstein auroral oval at local geomagnetic midnight is indicated.

E.1 ALL-SKY CAMERAS AND OTHERS

AT BOULDER

ALL-SKY CAMERA

STATIONS NORTHERN	GEOGRAPHIC LAT	LONG EAST	YEAR 57-58	58-59	59-60	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70	70-71
HANOVER	43N	288	C	A	Q	Q	Q	Q	Q	Q	A	C	S			
ITHACA	42N	284	A	A	A	C	C				C	C	S			
POCATELLO	42N	248	A	A	A	Q	Q	Q	Q	S						
VERMILLION	42N	264	A	A	Q	Q	Q	Q	S							
WILLIAMS BAY	42N	272	A	A	Q	Q	Q	S								
DELAWARE	40N	277	A	A	Q	Q	S									
FRITZ PEAK	39N	255	C	C						Q	Q	Q	Q	Q	Q	

E.1 ALL-SKY CAMERAS AND OTHERS

AT BOULDER

STATIONS SOUTHERN	GEOGRAPHIC LAT	LONG EAST	YEAR 57-58	58-59	59-60	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70	70-71
CAMDEN	34S	150	C	C	S											
MELBOURNE	37S	145	A	C	S											
HOBART	43S	147	C	C	S											
LAUDER	45S	169													P	
AWARUA	46S	168	A	A	S											
CAMPBELL IS	52S	169	C	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
MACQUARIE	54S	159		C				C	A	A	Q	Q	Q	Q		Q	Q
O HIGGINS	63S	303	A	C	S											
GONZALES VIDELA	64S	298	C	C	S											
CASEY	66S	111												Q	Q	Q
MIRNY	66S	93	A	C						Q	Q			P	P	
NOVOLAZAREVSKA	66S	53									Q				P	
OASIS	66S	100	A	Q	S											
WILKES	66S	110	A	A	A				A	Q	Q	A	Q	Q	S	
MAWSON	67S	62	A	A					A	Q	A	Q	Q	Q	Q	Q
DAVIS	68S	78	A	A						Q					Q	Q
SYOWA BASE	69S	39			A	A							Q	P	P	P
ROI BAUDOUIN	70S	23		Q		Q	S									
SANAE	70S	358													P	P
CAPE HALLETT	72S	170	C	A					A	S						
EIGHTS STATION	75S	283							A		A	S				
HALLEY BAY	75S	334	A	A	A	A				C	A	Q	Q	Q	Q	Q
ELLSWORTH	77S	319	A	A	C	C	A	S								
SCOTT BASE	77S	166	A	A	S											
BELGRANO	78S	322		A						A	A	A	S			
LITTLE AMERICA	78S	198	A	A	S											
VOSTOK	78S	106		A	A						Q				P	P
PLATEAU	79S	40										Q	Q	Q	Q	S
BYRD	80S	241	C	A	A	A	A	A	A	A	A	Q	Q	Q	Q	Q	Q
AMUNDSEN-SCOTT	90S		A	A	A	A	A	A	A	A	A	Q	Q	Q	Q	Q	Q

PUBLICATIONS:

1. Southernmost limits of outstanding aurora as reported by U.S. - Canada, Western Europe and USSR have been published as "Calendar Records" or "Abbreviated Calendar Records" in the following:

Annals of IGY, Vol. XVI, Parts I and III, Pergamon Press, 7/1957 - 12/1959
Annals of IQSY, MIT Press, Vol. 2, 1/1960 - 12/1965
IQSY Notes, IQSY Secretariat, London, 1/1964 - 12/1966
World Data Center A, UAG Report Series #4, 1/1966 - 12/1967
STP Notes, IUCSTP, NAS, Washington, D. C., 1/1967 - 11/1968
Solar-Geophysical Data, NOAA, 12/1968 to date

KEY TO SYMBOLS

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E.2 VISUAL OBSERVATIONS

The visual data held at Boulder were transferred from the center at Ithaca, New York, in July 1968. Currently there are no routine visual observations being received.

Visual data have been the main data obtained in the sub-auroral and min-auroral belts. The observers included members of the meteorological services.

Some of the data are on punched cards. All cards give a description of certain angular intervals of the north-south meridian. The intervals correspond to degrees of latitude for forms 100 km high. Each card from the Weather Bureau system contains six hourly reports of this type, while the volunteers (Canadian and United States) and Antarctic cards refer to a single time. Every card contains the latitude of the observer, the time of the observation, and information about color and motion, in addition to the description of the auroral forms and intensity in each angular interval of the meridian.

The punched cards are designed to facilitate listing auroral data by latitude of the aurora rather than that of the observer; geographic or geomagnetic latitude can be used. The Weather Bureau data are listed by longitude and latitude for every hour, while the other programs are listed by latitude and time.

The IGY, IGC, and IQSY auroral data from Canada and the United States are plotted on hourly maps, drawn to a scale of about 170 miles to the inch. Microfilm copies of the maps have been sent to WDCs B and C. The northern hemisphere data for the IGY and the IQSY have been collected into Northern Hemisphere Synoptic Auroral Maps and copies of these maps have been exchanged between the Data Centers. Some final maps for the IGY have been published in the Annals of the IGY and the IQSY final maps are available.

The above maps give two geographic coordinates at a given time, but there are many purposes for which it is more valuable to have latitude and time plotted as variables, for a given longitude. Such a plot is called a Visoplot; all three WDCs supplied them for publication in the IGY Annals. The Visoplots show the position of the aurora, or its inferred position, or its known absence. North American Visoplots also show the type of form present. Each Visoplot covers 45° of geomagnetic latitude and 24 hours of Universal Time, and applies to one of the two sectors of geomagnetic longitude which cover the western hemisphere.

The majority of the reports are on the special forms provided during the IGY-IGC programs. When these showed no aurora, they were not put on IBM cards, but are still available for the maps and for reference.

The Antarctic workers kept aurora log books, which are stored at WDC-A. These include, in some cases, summaries of the relevant data. Written observations by mariners are on file, mostly taken from the Monthly Notices of the Hydrographic Office.

The IQSY All-sky Camera data from many of the All-sky cameras run by College, Alaska, were put on special report forms and were used for inclusion in the synoptic maps.

The IBM cards have been analyzed for various projects, and written reports are on file in multilith form. These reports cover the South Pole observations, the Ellsworth observations, a tentative list of aurora sizes during the IGY, and statistical analyses of the Visoplot data. Most of them are available in IGY General Report No. 12 of WDC-A, or the Visual Aurora Series (in limited supply).

Digests of the above data are available. The main ones are:

1. IGY General Report #12, "Report on IGY Visual Aurora Observations"

2. Volumes 1 - 10 of the description and analysis of data at the Visual Aurora Subcenter while at University of Cornell are available. Volume 1 is a collection of data studies published previously as the experimental part of "The Origin and Morphology of the Aurora." Volume 2 and 7 are digests of auroral theories. Volume 8 includes a summary of studies on the auroral-radio effects conducted by the University of Cornell and a summary report on the Visual Aurora Newsletters. Volume 9 is a collection of data on the auroral zones and conjugate points.

3. "North American Visoplots," Canadian-US IGY data

4. IQSY Northern Hemisphere Synoptic Auroral Maps.

AREA	TYPE OF DATA	PERIOD COVERED
Central America		
Cuba	Reports on 09/23/57 and 02/11/58 aurora	
Mexico	Reports on 09/23/57 and 02/11/58 aurora	
North America		
Canada	IBM cards	IGY
	Visoplots for Annals	IGY
	Maps of aurora	01/64-03/68
United States		
Alaska	IBM cards for 14 USWB stations	07/57-12/65
	All-sky camera auroraplots	01/64-12/65
Continental U.S.	Graphic reports from volunteers	07/57-06/68
	IBM cards from USWB	07/57-12/65
	All-sky camera auroraplots	01/64-12/66
Ships	Reports from U.S. Naval Hydrographic Office	07/57-12/59
Antarctic	IBM cards and log books	
	Wilkes	IGY-IGC
	Ellsworth	IGY
	Little America	IGY
	Byrd	01/57-11/61, 1964-65
	Amundsen-Scott	01/57-11/62, 1964-65
	Eights	1965
South America		
Argentina	Reports from Antarctic and Argentine observers	IGY
	Visual observations from Ellsworth	01/60-12/63
	Visual observations from Base Sobral and Base Belgrano	01/64-12/65
Chile	Weather Bureau type cards for O'Higgins (Risopatron), and Gonzales Videla	IGY
Australasia		
Australia	Reports from Mawson, Antarctic, July 1957-October 1958, giving time of auroral sighting	07/57-10/58
	Preliminary reports of aurora seen from Australia (Date, time, duration, location of observer and number of reports)	IGY-IGC
New Zealand	Summary reports on date, time and type of aurora seen in New Zealand, parts of Australia, and Campbell Island	IGY
Antarctic	Hallett Station	
	IBM cards, 1957	IGY
	Daily and Monthly Logs	IGY
	Scott Base	
	Daily and Monthly Logs	IGY
Japan	Copies of all IGY publications dealing with the aurora, including auroral reports from the Antarctic and from Japan	07/57-10/67
Europe		
Belgium	Observations at Base Roi Baudouin	IGY
Czechoslovakia	Antarctic Data	03/65-09/65
Denmark	Danish Visual Observations	1957/1960
France	Kerguelen Islands Data	11/57-03/59, 01/64-12/65
German FR	List of reports from ships and volunteers	07/57-12/64
Hungary	Reports on the 02/11/58 aurora	
Rumania	Reports on the 09/29/57 and 07/09/58 auroras	
Sweden	Visual aurora index	IGC, 01/63-12/66
WDC-A Processed Data	IGY cards from volunteer reports	07/57-12/67
	15-hour summary of USWB reports	IGY-IGC
	Hourly data plot of USWB reports	07/57-12/65
	List of all Antarctic Data	IGY-1965
	Maps of all North American data	IGY-06/68
	First stage maps of Alaska and United States data	01/59-08/60, 01/64-12/65
	Microfilm of maps	IGY, 1964, 1965
	WDC-A Visoplots	IGY
	Greatest Southern Extent List	IGY-IGC 01/60-06/68
	Occurrence List	07/57-06/68
	Summary of color and motion	IGY
WDC-B	Catalogue for period 07/01/57-06/30/65	
	Greatest Southern Extent List sector C, D, E	IGY-IGC
	Visual Observations	07/57-11/57
	Visual Observations for selected days	12/57-12/58
	Microfilm of Visoplots	IGY
	Maps	01/64-12/65
WDC-C	Tabular plots for sector B	IGY
	Jodrell Bank Auroral Radar	07/57-10/57
	Greatest Southern Extent List sector B	IGY-IGC, 1960-1964
	South African Auroral Observations	09/29/57
	Halley Bay Report	IGY-IGC, 1960
	Visual Observations from Atlantic and Europe	IGY-IGC-IQSY
	British Antarctic Survey Report	1957-1965

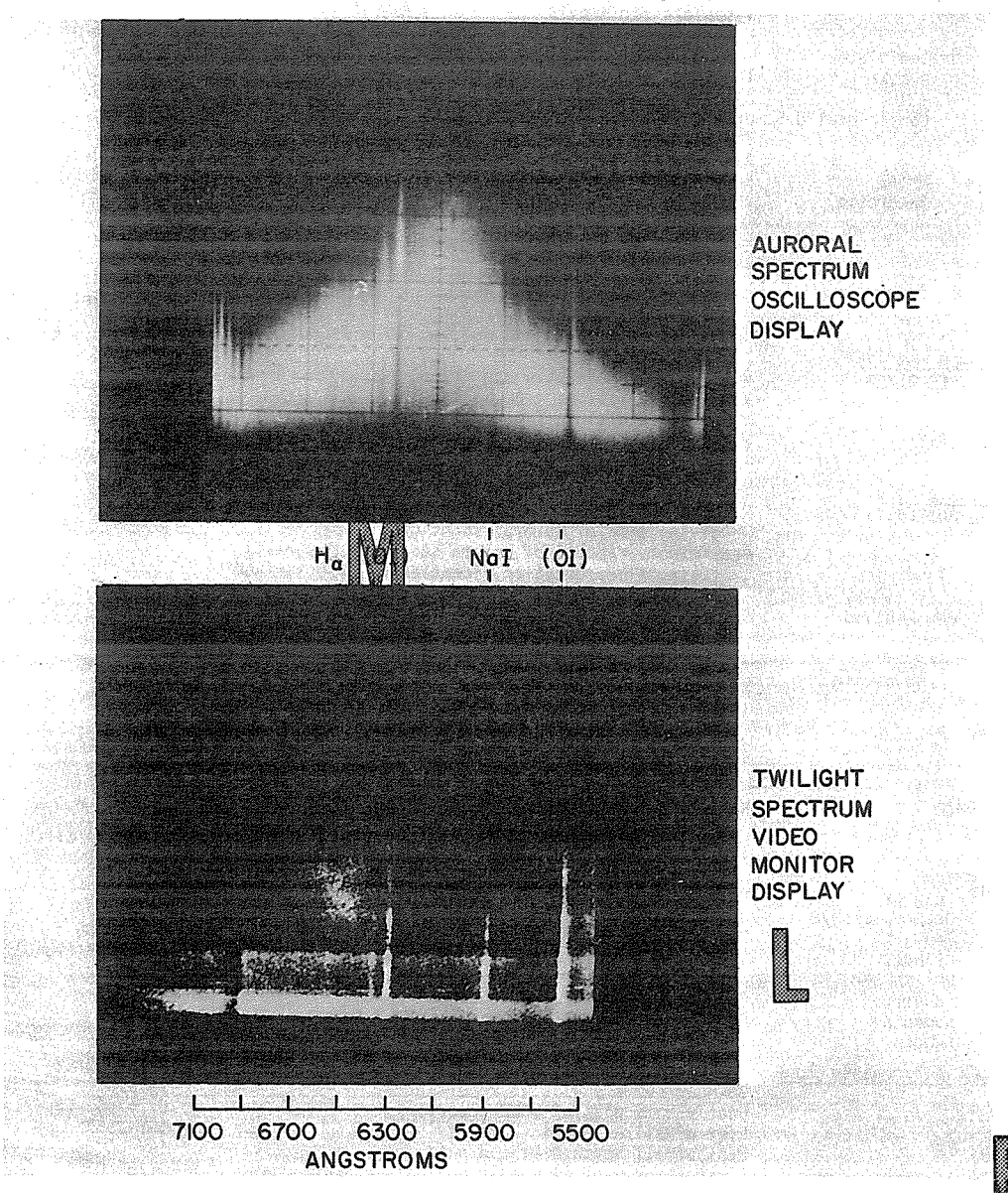

Fig. 4. Examples of two readout methods used with the TV spectrograph. The top spectrogram is an oscilloscope trace of the entire video signal. The bottom spectrogram is a twilight spectrum taken from the video monitor and including the wavelength region 5500 to 7500 A. The exposure is one second.

E.3 PATROL SPECTROGRAPH

AT BOULDER

STATIONS NORTHERN	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
ARCTIC ICE FLO	80N		C	S	S												
THULE	77N	291	A	A	C										Q	P	
RESOLUTE BAY	74N	266	C	C	S									S	Q	P	
BAKER LAKE	64N	264	C	S	S												
COLLEGE	64N	213	A	C	C										Q	P	
YAKUTSK	62N	130	E												P	P	
CHURCHILL	58N	267	C												Q	P	
MEANOOK	54N	247	C	C	S									S	Q	P	
SASKATOON	52N	106	C	C											Q	P	
SHINGLETON	46N	274	A	A	S										Q	P	
RAPID CITY	44N	257	C	S	S									S	Q	P	
ANDOVER	42N	289	C	S	S												
ITHACA	42N	284	C	C										S	Q	P	
WILLIAMS BAY	42N	272	C	C	C	S									Q	P	
FRITZ PEAK	39N	255	C	S	C										Q	P	
ALAMORGORDO	32N	255	C	C	S												

PATROL SPECTROGRAPH

AT BOULDER

STATIONS SOUTHERN	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
INVERCARGILL	46S	168	A	C	S	Q		Q	S							Q	
MIRNY	66S	93														Q	
WILKES	66S	110	A	A	A					Q	Q	Q	Q	S		Q	
CAPE HALLETT	72S	170	A	A	A					S						Q	
ELLSWORTH	77S	319	A	A		Q		Q	S							Q	
LITTLE AMERICA	78S	198	A	A	S	Q		Q	S							Q	
BYRD	80S	241	A	A	A											Q	
AMUNDSEN-SCOTT	90S		C	A	A											Q	

KEY TO SYMBOLS

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S = Program STOPPED operations (see MASTER STATION LIST for actual date)

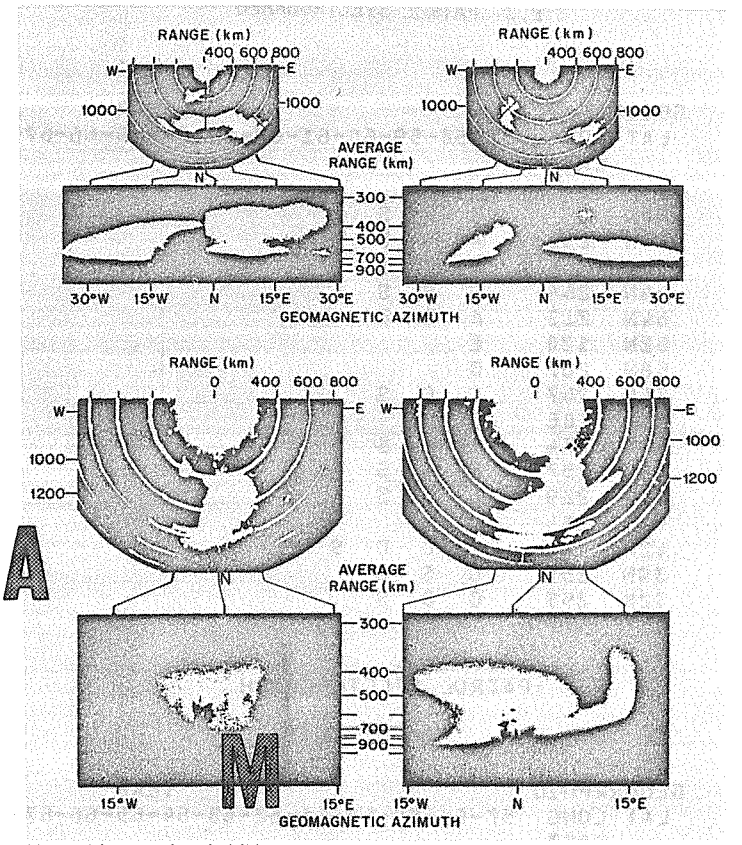
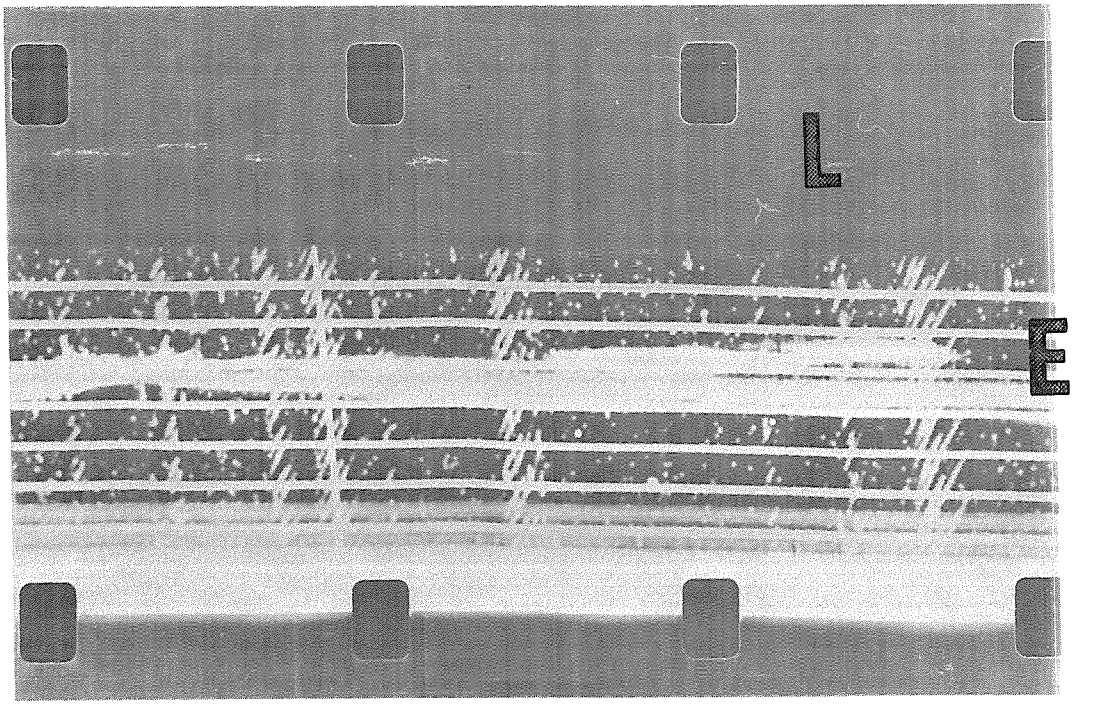


FIG. 5. Photographs of visible aurora compared with PPI presentations of 106-Mc/sec radar echoes taken simultaneously at College, Alaska.



E.4 AURORAL RADAR

AT BOULDER

STATIONS NORTHERN	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
TIXIE BAY	72N	129													Q	Q	
BARROW	71N	204	A	A	S												
MURMANSK	69N	33													Q	Q	
KOTZEBUE	66N	198	C												Q	Q	
COLLEGE	64N	213	A	A	A	A	C								Q	Q	
FAREWELL	62N	207	C	C	S												
YAKUTSK	62N	130													P		
CHURCHILL	58N	266												Q	Q	Q	
KING SALMON	58N	204		C	C	S											
GREAT WHALE	55N	283												Q	Q	Q	
THOMPSON	55N	263												Q	Q	Q	
KUHLUNGSBORN	54N	12														Q	
UNALASKA	53N	194		C	S												
OTTAWA	45N	284												Q	Q	Q	
RAPID CITY	44N	257		C	S												
ITHACA	42N	284	C	C									S				

AT BOULDER

STATIONS SOUTHERN	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
HOBART	43S	147													P		
MIRNY	66S	93													P		
SYOWA BASE	69S	40													P		

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E.5 SATELLITE MEASUREMENTS

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
62-049A-02	Alouette 1	Cosmic Particle Detectors	McDiarmid	09/29/62	0962-0364
62-067B-08	Injun 3	Aurora and Airglow Photometers	O'Brien	12/13/62	1262-1063

F. COSMIC RAYS

The data are taken from observations made with the following types of cosmic ray instruments:

Super Neutron Monitor	Underground Telescope
Neutron Monitor	Narrow Angle Telescope
Cubical Meson Telescope	Shower Apparatus (non-synoptic)
Ionization Chamber	

The cosmic ray stations are arranged in order of vertical cutoff rigidities, in Bv, calculated using the 6-degree quiescent magnetic field coefficients by Finch-Leaton for epoch 1955.0. Whether the data are both corrected and uncorrected data, pressure-corrected data only, or uncorrected data only, is indicated.

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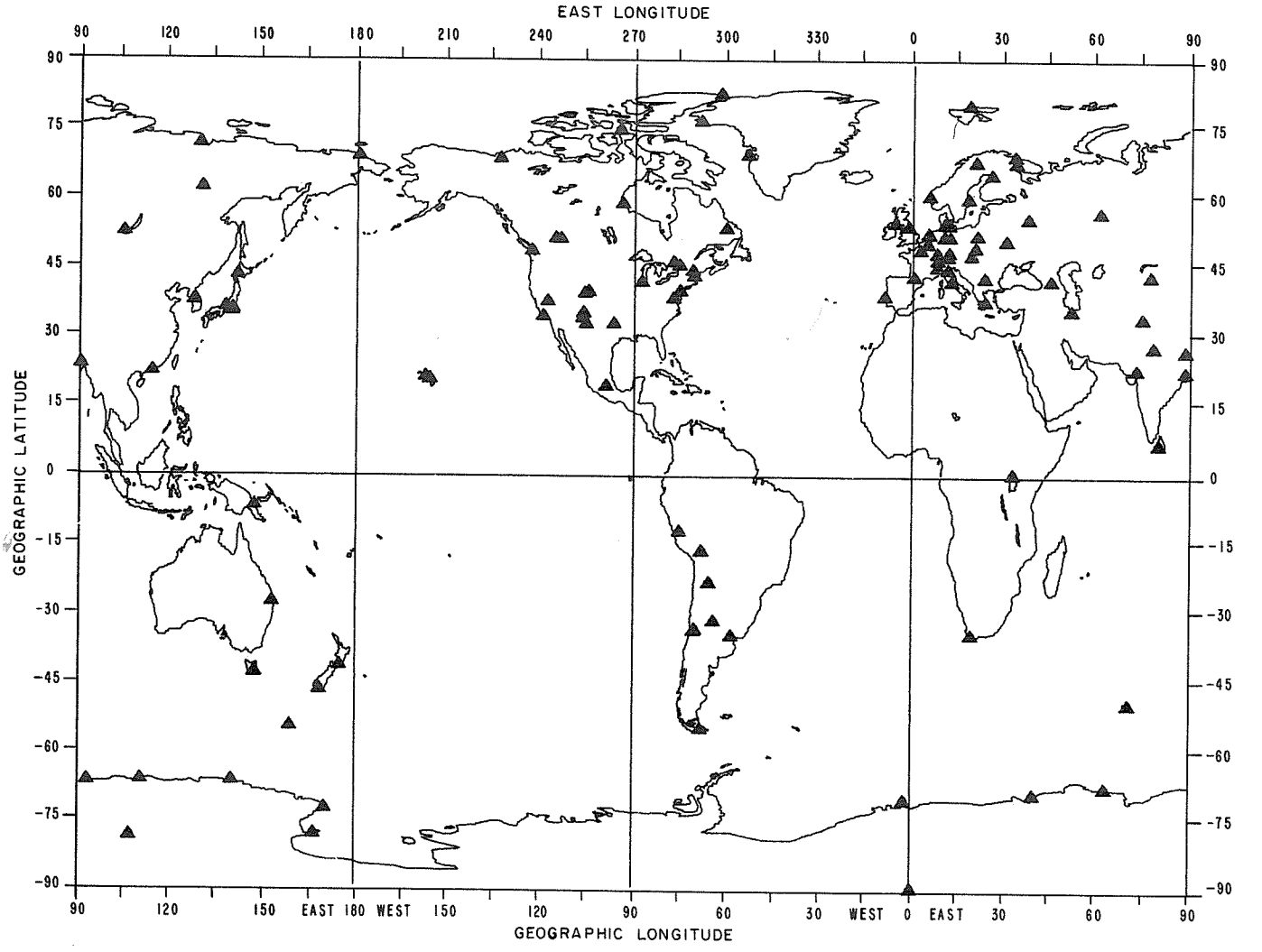
F.5	Aircraft and Ship Measurements	247
F.6	Satellite Measurements	248

NEUTRON MONITOR STATIONS 1971



AT BOULDER

F.1 NEUTRON MONITORS AND SUPERMONITORS

NEUTRON MONITOR DATA

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	CUT-OFF RIGIDITY
RESOLUTE	74N	265	B1	A1	A1	A1	A1	A1	A1	A1	B1	B1	S+					00.00
THULE	76N	292	C2	A2	A2	A2	A2	A2	A1	B1	S+							00.00
CASEY	66S	110													Q	Q		00.01
DUMONT D URVILLE	66S	140											C1	C1	S+			00.01
MCMURDO	77S	166				B1	A1	A1	A1	B1	S+							00.01
WILKES	66S	110						B2	A2	A1	A2	A1	A2	C2	S			00.01
CAPE HALLETT	72S	170					C2	A2	P	P	P	P	P	P	P	P		00.04
MIRNY	66S	93			A1	A1	A1	A1	A1	A1	A1	Q	Q	Q	Q	Q		00.04
MURCHISON BAY	80N	18	C1	A1	C2	S												00.06
HEISS IS	80N	57		B1	A3	A1	A1	A2	A2	A2	A1	A1		S				00.09
SOUTH POLE	90S	360								B1	A1	A1	A1	A1	Q	Q		00.11
CHURCHILL	58N	266	B1	A1	A1	A1	A1	A1	A1	A1	S+							00.21
MAWSON	67S	62	A1	A1	A1	A1	A2	A2	A2	A2	A2	A2	A2	B1	Q	Q		00.22
SYOWA BASE	69S	39				B2								S+				00.42
MURMANSK	68N	33		C2	A1	A3	A3	S										00.50
COLLEGE	64N	213	C1	B1	C1	B1	A1	A1	A1	A1	B1	A1	A1	C1	S			00.54
CAPE SCHMIDT	68N	180											C1	B2	Q	Q		00.60
APATITY	67N	33						B2	A2	A1	A2	A2	A2	A2	S+			00.65
ELLSWORTH	77S	319			B2			S										00.79
DEEP RIVER	46N	283	B1	A1	A1	A1	A1	A1	S+									01.02
OTTAWA	45N	285	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	B1			01.08
BERGEN	60N	5		Q	Q	Q	Q	Q	Q	Q	Q	Q	A2	A2	Q	Q		01.13
SULPHUR MT	51N	245	B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	B1			01.14
MT WASHINGTON	44N	289	B2	A2	A2	A1	A1	A1	A1	A1	A2	A1	A2	A2	B2			01.24
NORTHFIELD	44N	267		A1	S													01.43
UPPSALA	59N	17	A2	A1	A1	A1	A1	A1	A2	A2	Q	C2	Q	Q	Q	Q		01.43
YAKUTSK	62N	129	B1	A1	A1	A2	A2	A2	A2	A1	A2	A2	A1	A2	C2			01.70
CHICAGO	41N	273	B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			01.72
AWARUA	46S	168	C1	A1	A1	C1	S											01.86
HOBART	42S	147												B1	Q	Q		01.89
MT WELLINGTON	42S	147	A1	A1	A1	A1	A1	A2	A2	A2	A2	A2	C2	S				01.89
LEEDS	53N	359	B2	A2	A2	A2	A2	A2	A2	A2	C2	S+						02.20
LINCOLN	40N	264	B1	A1	A1	A3	A3	B3	S									02.22
KIEL	54N	10	B1	A1	A1	A1	A1	A1	A1	B1	S+							02.29
KUHLUNGSBORN	54N	11								A1	B1	A2	B2	P	P	P		02.43
MOSCOW	55N	37		B3	B3	B3	B2	A2	A2	A2	A1	C1	S+					02.46
LONDON	51N	360				C2	A2	A2	A2	A1	C1	S						02.73
NEDERHORSTDENBERG	52N	5		B1	A1	A1	A1	A1	B1	A1	B1	S	+					02.76
DENVER	39N	255								A1	A3	A3	Q	Q	Q	Q		02.91
HERSTMONCEUX	50N	0	B1	A1	A1	B2	S											02.92
GOTTINGEN	51N	9	B1	A1	C1	S												03.00
LINDAU	51N	10			B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	C1		03.00
CLIMAX	39N	254	B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			03.03
HALLE	51N	12					A1	A1	A1	A1	A1			A2	B2			03.07
DOURBES	50N	4													B2			03.24
WELLINGTON	41S	174	B1	B1							C1	P	P	P	P	P		03.42
PRAGUE	50N	14			B3	A3	B3	B3	S									03.53
IRKUTSK	52N	104		B1	B1	B3	B3	B3	A3	A2	A2	A2	S+					03.74
LOMNICKY STIT	49N	20		A1	B1	C3	S			B2	A2	A2	A2	B3	Q	Q		04.00
FREIBURG	48N	0	B2	A2	A2	A2												04.10

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months
+ = Continued with Super Neutron Monitor See Super NM listing.

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

1 = Both corrected and uncorrected data
2 = Pressure-corrected data only
3 = Uncorrected data only

COSMIC RAY DATA. PHYSICS DEPARTMENT, UNIVERSITY OF TASMANIA.

STATION: MAWSON, ANTARCTICA. (67° 36'S, 62° 53'E). Sea Level. OCTOBER, 1964.
RECORDER: TRIPLEX NEUTRON MONITOR. Exponential correction, attenuation length 138 gm/cm^2
TABULATED: Hourly count totals corrected to standard pressure of 990 millibars.
REAL COUNTS = 64 x tabulated counts.

Hour GMT.	Date. 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
01	589	608	604	593	597	595	602	604	593	607	605	598	599	599	607	591	602	598	600	590	598	597	599	596	597	597	595	602	603	600	595
02	607	601	599	588	590	595	602	605	598	605	599	603	601	606	601	608	607	605	599	599	590	597	605	604	599	596	591	607	602	604	593
03	595	603	602	591	590	596	587	600	587	609	600	597	599	596	599	589	606	595	598	591	592	597	594	605	599	598	602	600	604	601	599
04	589	603	599	589	598	588	596	591	591	599	594	593	596	601	593	599	606	589	595	590	598	602	596	603	598	597	600	595	601	601	604
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15	601	607	609	600	607	599	606	599	600	593	601	601	603	609	600	603	599	599	601	603	598	604	599	598	600	587	603	603	604	608	605
16	600	603	603	600	599	597	604	603	598	601	596	599	595	602	601	598	596	598	591	593	600	591	600	596	596	595	603	606	597	609	602
17	603	597	606	602	597	599	605	602	603	601	598	597	599	599	601	599	604	601	596	595	601	595	599	600	597	591	597	594	601	603	608
18	605	607	595	600	602	603	595	597	602	601	599	597	598	600	598	598	596	594	595	597	594	602	602	601	603	595	602	600	603	603	602
19	606	608	592	601	602	599	599	603	597	608	601	598	595	593	605	594	599	590	591	597	594	602	603	596	607	596	601	598	601	600	609
20	601	599	603	594	597	599	598	605	600	602	590	594	606	594	603	602	604	595	597	597	601	595	603	593	595	592	593	598	597	599	601
21	601	598	596	598	590	603	603	600	601	607	599	598	601	593	602	601	603	598	598	601	597	605	605	597	597	605	596	597	601	604	607
22	597	604	606	596	592	593	593	596	595	600	594	600	598	598	600	599	599	595	595	595	602	604	609	599	585	598	600	592	597	608	607
23	607	604	606	595	590	588	599	610	601	601	602	595	600	605	602	605	598	602	593	599	599	595	601	600	602	595	601	597	602	599	600
24	599	607	606	597	596	597	601	603	603	598	598	603	599	593	603	597	599	601	595	601	597	602	598	602	600	588	595	605	602	611	599
Σ	14393	14428	14323	14406	14329	14400	14405	14422	14436	14324	14325	14426	14357	14345	14414	14436															
M	599.7	601.2	596.8	600.3	597.0	600.0	600.2	600.9	601.5	596.8	596.9	601.1	598.2	597.7	600.6	601.5															
	14488	14324	14324	14427	14448	14371	14417	14386	14323	14291	14392	14378	14299	14372	14421															
	603.7	596.8	596.8	601.1	602.0	598.8	600.7	599.4	596.8	595.5	599.7	599.1	595.8	598.8	600.9															

Normalizing factor = 0·9966.

F.1 NEUTRON MONITORS AND SUPERMONITORS

AT BOULDER

NEUTRON MONITOR DATA

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	CUT-OFF RIGIDITY
MUNICH	48N	11			B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	S		04.14
WEISSENAU	47N	9	B1	A1	C1	S												04.16
ZUGSPITZE	47N	11	B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			04.24
JUNGFRAUJOCH	46N	8		C1	A2	A2	B2	B2	B2	A2	A1	A1	A1	A1	B1			04.48
WHITE MOUNTAIN	37N	242									C2	A2	A1	A1	B1			04.48
BERKELEY	37N	238	B2	A2	B2	S												04.54
SYDNEY	33S	151	A2	A2	A2	S												04.69
HERMANUS	34S	19	B1	A1	A1	A1	A2	B2	B2	C2	S+							04.90
PIC DU MIDI	42N	0	C1	B1	A1	A2	A2	A2	A2	Q	S+							05.36
SIMFEROPOL	44N	34					B2			B2	S							05.51
USHUAIA	54S	292	B1	B2	B2			B2	A2	A2	C2	B2	A2	A2	B2			05.68
ROME	41N	12	B1	A1	A1	A1	A1	A1	A1	A1	A1	A3	S+					06.32
TBILISI	42N	44					C2		B2	A2	A2	A2	B2	A2	C2			06.67
ALMA ATA	43N	76	B1	A1	A1	B3	A2	A2	A2	A2	A2	A2	A2	A2	C2			06.69
BRISBANE	27S	152												A1	A1	B1		07.21
MEXICO CITY	19N	261													B1			09.53
BUENOS AIRES	34S	302	B2	A2	A2	A2	A2	A2	B2	A2	C2	B2	S+					10.63
MT NORIKURA	36N	137	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	B2	S+			11.39
CORDOBA	31S	296								B1	A1	A1	A1	B1	Q	Q		11.45
RIO DE JANEIRO	22S	317	C1	A1	A1	A1	A2	A2	S									11.73
MINA AGUILAR	23S	295	B2	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	Q	Q		12.51
CHACALTAYA	16S	292							B1				S+					13.10
MAKAPUU PT	21N	203	B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	C1	P	P	P		13.23
HALEAKALA	20N	204	B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	B1	P	P		13.30
HUANCAYO	12S	285	A2	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			13.45
MAKERERE	00N	32	C1	A1	A1				B2	B2	B2	B1	P	P	P	P		14.98
LAE	06S	147	B1	A1	B1	B3		C3	B3	B3	A3	C3	Q	Q	Q	Q		15.52
AHMEDABAD	23N	73	B1	A1	B1	A3	B3	A3	A3	B1	S			+				15.94
DACCA	23N	90										C2	Q	Q	Q	Q		16.22
KODAIKANAL	10N	77	B1	A1	A1	A3	A3	A3	A3	B1	S							17.47
MOUSALLA	42N	23													A3			
VOSTOK	78S	106									B3	B3	A3	A3	A3			

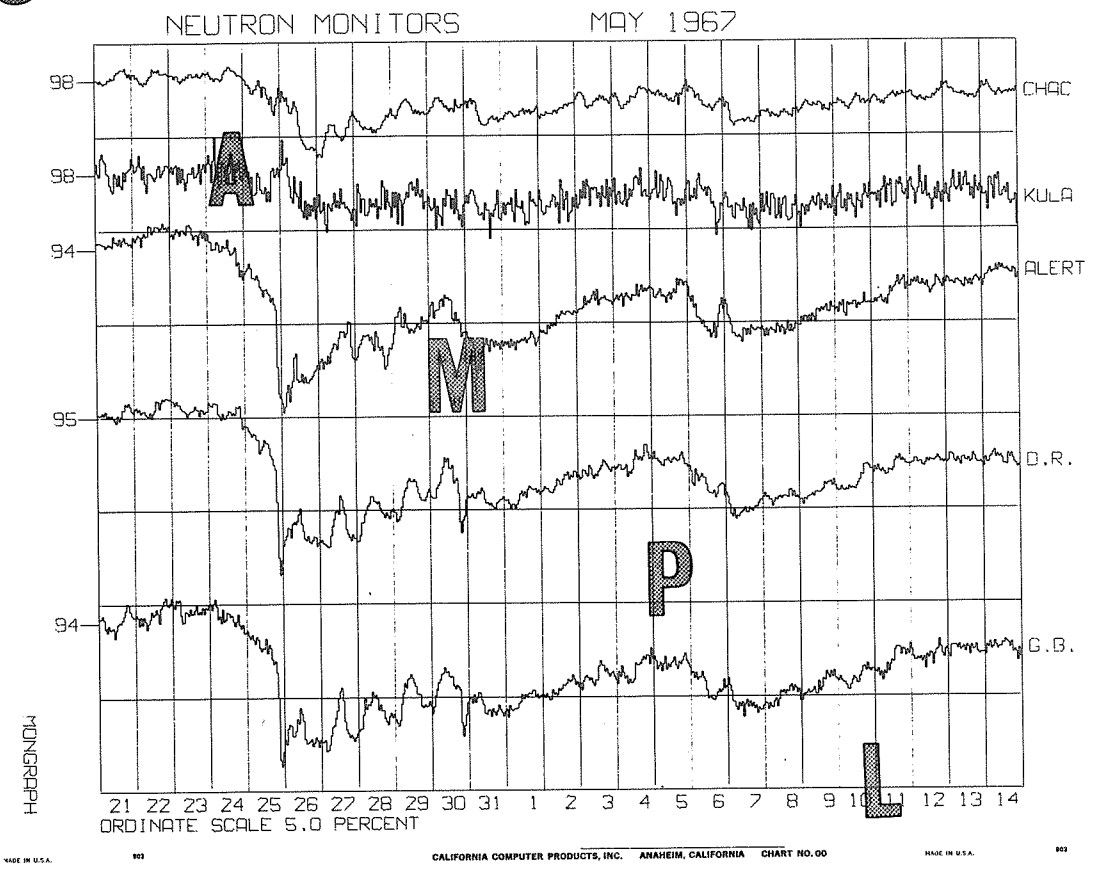
KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months
\+ = Continued with Super Neutron Monitor See Super NM listing.

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

1 = Both corrected and uncorrected data
2 = Pressure-corrected data only
3 = Uncorrected data only

F.1 S


NEUTRON MONITORS MAY 1967
98
98
94
95
94
CHAC
KULA
ALERT
D.R.
G.B.
MONSRPH
21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14
ORDINATE SCALE 5.0 PERCENT
MADE IN U.S.A.
903
CALIFORNIA COMPUTER PRODUCTS, INC. ANAHEIM, CALIFORNIA CHART NO. 00
MADE IN U.S.A.
902

A M P L E

F.1 NEUTRON MONITORS AND SUPERMONITORS

SUPER NEUTRON MONITOR DATA

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	CUT-OFF RIGIDITY
ALERT	82N	298									C1	A1	A1	A1	B1			00.00
RESOLUTE	74N	265										B1	A1	A1	B1			00.00
THULE	76N	292								C1	A1	A1	A1	A1	Q	Q		00.00
DUMONT D URVILLE	66S	140												B2	Q	Q		00.01
MCMURDO	77S	166								B1	A1	A1	A1	A1	Q	Q		00.01
INUVIK	68N	227								B1	A1	A1	A1	A1	B1			00.18
CHURCHILL	58N	266								B1	A1	A1	A1	A1	C1			00.21
SYOWA	69S	39											Q	Q	Q	Q		00.42
GOOSE BAY	53N	300								C1	A1	A1	A1	A1	B1			00.52
TIXIE BAY	71N	128										C1	A1	A2	B2			00.53
KIRUNA	69N	20														C2		00.54
APATITY	67N	33												C2	C2			00.65
OULU	65N	25								B1	A1	A1	A1	A1	B1			00.81
DEEP RIVER	46N	283						A2	A1	A1	A2	A1	A1	A1	A1	C2		01.02
SANAE BASE	70S	358								B1	A1	A1	A1	Q	Q	Q		01.02
CALGARY	51N	246								A2	A2	A2	A1	A1	B1			01.09
SULPHUR MT	51N	245								A2	A2	A1	A1	A1	A1			01.14
PORT AUX FRANCAIS	49S	70								A2	A2	A2	A2	A2	B2			01.19
DURHAM	43N	290								B2	A2	A2	A2	B2	B2			01.41
VICTORIA	48N	237								C1	A1	A1	A1	A2	B2			01.86
BELFAST	54N	355										Q	Q	Q	Q	Q		01.92
SWARTHMORE	39N	285								B1	A1	A1	A1	A1	Q	Q		01.92
LEEDS	53N	359									B1	A2	A2	A2	B2			02.20
KIEL	54N	10									C1	A1	A1	A1	A1	C1		02.29
MOSCOW	55N	121											B2	A2	B2	C2		02.46
UTRECHT	52N	4													B1	C1		02.69
NEDERHORSTDENBERG	52N	5											Q	Q	Q	Q		02.76
LINDAU	51N	10									A2	A2	A2	A2	B2			03.00
IRKUTSK	52N	104											B2	A2	Q	Q		03.74
DALLAS	32N	264								A1	A2	A1	A1	A1	C1			04.35
HERMANUS	34S	19								C1	A1	A1	A1	B1	C1			04.90
PIC DU MIDI	42N	0								A2	A2	A2	A2	A2	B2			05.36
ROME	41N	12										B3	B3	Q	Q	Q		06.32
ATHENS	38N	23													Q	Q		08.72
BUENOS AIRES	34S	302											Q	B2	B2			10.63
MT NORIKURA	36N	137												Q	Q	Q		11.39
EL INFIERNILLO	33S	289												Q	Q	Q		11.45
CHACALTAYA	16S	292										C1	A1	A1	Q	Q		13.10
KULA	20N	203										B1	A1	A1	B1			13.30
AHMEDABAD	23N	72												Q	Q	Q		15.94
DENVER	39N	255											A1	A1				
DOURBES	4N	40													A2	A2		
HAFELEKAR	47N	10												B2	A2	A1		
PREDIGTSTUHL	48N	13													A1	A1	C1	

KEY TO SYMBOLS

A = 12 Months
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3 = Uncorrected data only

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

PUBLICATIONS:

1. Solar-Geophysical Data, NOAA

Daily average counting rates per hour
- Climax - 9/1960 to date
- Deep River - 1/1960 to date
- Dallas - 1/1964 to date
- Churchill - 5/1964 to date

Graphical hourly rates
- Deep River - 1/1959 to date
- Alert - 7/1965 to date

2. World Data Center A - Upper Atmosphere Geophysics Report UAG-9, Data on Cosmic Ray Event of November 18, 1968 and Associated Phenomena, April 1970.

NEUTRON MONITORS AND SUPERMONITORS

MAGNETIC TAPE

Scientists transmitting computer-usable data to the World Data Center are asked to use the following procedure:

Data supplied on magnetic tape will be on standard 7 track, 1/2 inch width tape. Tape densities are optional at either 200 BPI, 556 BPI or 800 BPI. It is recommended that 556 BPI be used for tapes transmitted through the mails. The data will be written on the tape in Binary Coded Decimal (BCD) even parity with one card image comprising one logical and physical record on the tape. A physical record on the magnetic tape supplied to stations by World Data Center-A will consist of the 80 characters of the card image. However, tapes sent to World Data Center-A may have the 80 characters of the card image plus as many characters as are necessary to make one physical record (i.e., tapes from experimenters having IBM 700/7000 series equipment will have 80 plus 4 characters per physical record).

A logical file normally consists of a year's data. The first seven card images on every file will always contain alphabetic characters (header cards). The end of every file will be marked by seven blank (or zero) card images, the equivalent of one day's data, followed by an end of file mark. This will facilitate recognition of the beginning and ending of files.

The first file of any data tape (both tapes sent by the experimenter to the data center and those sent by the data center in answer to a specific request) will contain the seven header cards previously described, seven blank (or zero) card images (indicating an end of file) and an end of file mark. Thus, this first file contains a total of 14 card images. The second and succeeding data files will contain the seven data header cards followed by a year, or less, of data. One year's data is the maximum to be contained in one file, but it may be less. A file mark should be inserted whenever significant changes (i.e., scaling factor, barometric coefficient, monitor configuration) occur. The start of the next file will be another seven card header group reflecting these changes. It would be preferred that at least one month's data be contained in a data file, and that whenever possible the file mark occur at the end of a month. To indicate the end of data on a tape, the last seven cards (normally blank or zero cards to indicate an end of file) will contain a "blank-999" in the columns where pressure, uncorrected and corrected data would appear if these were a data set. The columns reserved for the identification number, year, day number and card number should still contain blanks or zeros.

Following a WDC-A Upper Atmosphere Geophysics Circular Letter to Cosmic Ray Scientists (No. 2 of April 5, 1968) many groups have supplied their data to WDC-A in the recommended standard format. The essentials of this format are repeated below for convenience of the user:

HEADER CARDS - Header information on seven cards in alphabetic form will appear at the beginning of each year of data and whenever a significant change (i.e., scaling factor, barometric coefficient, monitor configuration) occurs:

Card 1 - Station Identification (code name)	Columns 1-4
Station name	Columns 7-36
Station latitude	Columns 37-41
North or South latitude specifications	Columns 43-47
Station longitude	Columns 49-54
East or West longitude specifications	Columns 56-59
Station altitude	Columns 61-66
Units of altitude	Columns 67-78
Card 2 - Description of instrument	Columns 1-80
Card 3 - Scaling factor	Columns 13-18
(Explanatory text can appear anywhere else on the card except columns 13-18 which are reserved for the numbers.)	
Card 4 - Standard station pressure	Columns 61-66
(Explanatory text, including units, can appear anywhere else on the card except columns 61-66 which are reserved for the numbers.) The pressure may be given in any scientifically acceptable units; however, please specify the units.	
Card 5 - Barometric coefficients	Columns 13-18
(Explanatory text can appear anywhere else on the card except columns 13-18 which are reserved for the numbers.) Please give units.	
Card 6 - Credit statement (any text)	Columns 1-80
Card 7 - Period of data covered	
Starting month (up to 6 alphabetic characters)	Columns 7-12
Starting day of month	Columns 13-14
Ending month (up to 6 alphabetic characters)	Columns 19-24
Ending day of month	Columns 25-26
Year (4 digits)	Columns 29-32

F.1 NEUTRON MONITORS AND SUPERMONITORS

AT BOULDER

COMPUTER-USABLE DATA

STATION	COMPUTER CODE	PERIOD			FORMAT	FORM
AHMEDABAD	AHM1	7/1957	-	12/1959	IGY	PUNCHED CARDS
ALERT	ALE2	10/1965	-	6/1969	STD	MAGNETIC TAPE
ALMA ATA	ALM1	7/1957	-	12/1959	IGY	PUNCHED CARDS
AWARUA	AWA1	11/1957	-	12/1959	IGY	PUNCHED CARDS
BERKELEY	BER1	7/1957	-	8/1959	IGY	PUNCHED CARDS
BRISBANE	BRI1	1/1968	-	6/1970	STD	MAGENTIC TAPE
BUENOS AIRES	BUE1	7/1957	-	12/1959	IGY	PUNCHED CARDS
CHACALTAYA	CHA2	10/1966	-	6/1969	STD	MAGNETIC TAPE
CHICAGO	CHI1	7/1957	-	12/1959	IGY	PUNCHED CARDS
CHICAGO	CHI1	1/1966	-	12/1967	STD	PUNCHED CARDS
CHURCHILL	CHU1	7/1957	-	12/1959	IGY	PUNCHED CARDS
CHURCHILL	CHU2	1/1967	-	12/1967	STD	PUNCHED CARDS
CHURCHILL	CHU2	5/1968	-	9/1968	STD	PUNCHED CARDS
CLIMAX	CLI1	7/1957	-	12/1959	IGY	PUNCHED CARDS
COLLEGE	COL1	7/1957	-	8/1957	IGY	PUNCHED CARDS
COLLEGE	COL1	10/1957	-	11/1957	IGY	PUNCHED CARDS
COLLEGE	COL1	1/1958	-	7/1958	IGY	PUNCHED CARDS
COLLEGE	COL1	9/1958	-	12/1958	IGY	PUNCHED CARDS
COLLEGE	COL1	8/1962	-	11/1962	IGY	PUNCHED CARDS
COLLEGE	COL1	1/1964	-	12/1964	IGY	PUNCHED CARDS
COLLEGE	COL1	1/1967	-	12/1967	IGY	PUNCHED CARDS
DALLAS	DAL2	5/1968	-	9/1968	STD	PUNCHED CARDS
DEEP RIVER	DEE1	5/1957	-	12/1959	IGY	PUNCHED CARDS
DEEP RIVER	DEE2	4/1962	-	6/1969	STD	MAGNETIC TAPE
DENVER	DEN2	1/1967	-	12/1968	STD	MAGNETIC TAPE
DUMONT D URVILLE	DUM2	3/1968	-	1/1971	STD	PUNCHED CARDS
ELLSWORTH	ELL1	4/1959	-	12/1959	IGY	PUNCHED CARDS
FREIBURG	FRE1	7/1957	-	12/1959	IGY	PUNCHED CARDS
GOOSE BAY	GOO2	11/1964	-	6/1969	STD	MAGNETIC TAPE
GOTTINGEN	GOT1	7/1957	-	1/1959	IGY	PUNCHED CARDS
HALEAKALA	HAK1	7/1957	-	4/1967	STD	MAGNETIC TAPE
HEISS ISLAND	HEI1	4/1958	-	12/1959	IGY	PUNCHED CARDS
HERMANUS	HER1	7/1957	-	12/1959	IGY	PUNCHED CARDS
HERSTMONCEUX	HEX1	7/1957	-	12/1959	IGY	PUNCHED CARDS
HOBART	HOB1	1/1968	-	6/1968	STD	MAGNETIC TAPE
HUANCAYO	HUA1	7/1957	-	12/1959	IGY	PUNCHED CARDS
INUVIK	INU2	7/1964	-	6/1969	STD	MAGNETIC TAPE
IRKUTSK	IRK1	4/1958	-	12/1959	IGY	PUNCHED CARDS
JUNGFRAUJOCH	JUN1	10/1958	-	12/1959	IGY	PUNCHED CARDS
KIEL	KIE1	7/1957	-	12/1959	IGY	PUNCHED CARDS
KIEL	KIE2	1/1966	-	5/1967	STD	PUNCHED CARDS
KODAIKANAL	KOD1	7/1957	-	12/1959	IGY	PUNCHED CARDS
KULA	KUL2	7/1966	-	6/1969	STD	MAGNETIC TAPE
LAE	LAE1	7/1957	-	12/1959	IGY	PUNCHED CARDS
LEEDS	LEE1	7/1957	-	12/1959	IGY	PUNCHED CARDS
LINCOLN	LIL1	7/1957	-	12/1959	IGY	PUNCHED CARDS
LINDAU	LIN1	5/1959	-	12/1959	IGY	PUNCHED CARDS
LOMNICKY STIT	LOM1	7/1958	-	12/1959	IGY	PUNCHED CARDS
LONDON	LON1	7/1957	-	8/1957	IGY	PUNCHED CARDS
LONDON	LON1	10/1957	-	12/1957	IGY	PUNCHED CARDS
LONDON	LON1	1/1958	-	6/1959	IGY	PUNCHED CARDS
MAKAPUU POINT	MAK1	7/1957	-	4/1967	STD	MAGNETIC TAPE
MAKAPUU POINT	MAK1	7/1957	-	6/1959	IGY	PUNCHED CARDS
MAKERERE	MAR1	10/1957	-	12/1959	IGY	PUNCHED CARDS
MAKERERE	MAR1	10/1967	-	4/1968	STD	PUNCHED CARDS
MAWSON	MAW1	7/1957	-	12/1959	IGY	PUNCHED CARDS

COMPUTER-USABLE STANDARD FORMAT (CONT'D.)

DATA CARDS

Column Assignments: Data Cards 1-6

Station Identification (code name)	Columns 1-4
Year (last two digits)	Columns 5-6
Day of year (001-365 or 001-366)	Columns 7-9
Card number (1-6)	Column 10
Data Quality Tags	Columns 11-12
First Data Group Pressure (e.g., 01 UT)	Columns 13-17
Uncorrected Counting Rate	Columns 18-23
Corrected Counting Rate	Columns 24-29
Second Data Group (e.g., 02 UT)	
Pressure	Columns 30-34
Uncorrected Counting Rate	Columns 35-40
Corrected Counting Rate	Columns 41-46
Third Data Group (e.g., 03 UT)	
Pressure	Columns 47-51
Uncorrected Counting Rate	Columns 52-57
Corrected Counting Rate	Columns 58-63
Fourth Data Group (e.g., 04 UT)	
Pressure	Columns 64-68
Uncorrected Counting Rate	Columns 69-74
Corrected Counting Rate	Columns 75-80

NOTE: All numbers are right adjusted in their fields.

Column Assignments: Data Card 7

Station Identification (code name)	Columns 1-4
Year (last two digits)	Columns 5-6
Day of year (001-365 or 001-366)	Columns 7-9
Card number (7)	Column 10
Normalizing factor multiplied by 10,000 (integer format)	Columns 11-17
Optional special data factors	Columns 18-51
(no special column assignments, but it would be convenient if column assignments of the first six cards could be retained)	
Daily sum of the uncorrected counting rate	Columns 52-57
Daily sum of the corrected counting rate	Columns 58-63
Daily average pressure (for the hours corrected data are present)	Columns 64-68
The number of hours of data present	Columns 69-74
Daily average corrected counting rate	Columns 75-80

NOTE 1: All numbers are right adjusted in their fields.

NOTE 2: The only data on this card that the experimenters are required to supply is the normalizing factor and optional special data factors. The daily sums and averages can be calculated by the data center when the card is entered into the computer.

It should be mentioned that occasionally an experimenter's equipment will be inoperative for a day or two. In this case the data cards, with zero for the counting rate, should still be included in order to preserve the original sequence and so that the data center and potential data user will know that no data are available instead of questioning whether or not a day was accidentally missed in supplying the data.

F.1 NEUTRON MONITORS AND SUPERMONITORS

AT BOULDER

COMPUTER-USABLE DATA

STATION	COMPUTER CODE	PERIOD			FORMAT	FORM
MAWSON	MAW1	1/1966	-	12/1967	IGY	PUNCHED CARDS
MAWSON	MAW1	1/1968	-	6/1968	STD	MAGNETIC TAPE
MINA AGUILAR	MIN1	7/1957	-	12/1959	IGY	PUNCHED CARDS
MINA AGUILAR	MIN1	8/1962	-	11/1962	STD	PUNCHED CARDS
MINA AGUILAR	MIN1	1/1964	-	12/1964	STD	PUNCHED CARDS
MINA AGUILAR	MIN1	1/1967	-	12/1967	IGY	PUNCHED CARDS
MINA AGUILAR	MIN1	5/1968	-	7/1968	STD	PUNCHED CARDS
MIRNY	MIR1	1/1959	-	12/1959	IGY	PUNCHED CARDS
MOSCOW	MOS1	1/1958	-	9/1958	IGY	PUNCHED CARDS
MOSCOW	MOS1	1/1959	-	10/1959	IGY	PUNCHED CARDS
MOSCOW	MOS1	12/1959	-		IGY	PUNCHED CARDS
MT NORIKURA	MTN1	7/1957	-	12/1959	IGY	PUNCHED CARDS
MT WASHINGTON	MTW1	7/1957	-	12/1959	IGY	PUNCHED CARDS
MT WASHINGTON	MTW1	11/1955	-	12/1966	STD	MAGNETIC TAPE
MT WELLINGTON	MTZ1	7/1957	-	12/1959	STD	PUNCHED CARDS
MT WELLINGTON	MTZ1	1/1966	-	1/1967	IGY	PUNCHED CARDS
MUNICH	MUN1	4/1959	-	12/1959	IGY	PUNCHED CARDS
MURCHISON BAY	MUR1	8/1957	-	12/1959	IGY	PUNCHED CARDS
MURMANSK	MUS1	12/1958	-	12/1959	IGY	PUNCHED CARDS
NEDERHORSTDENBERG	NED1	7/1958	-	12/1959	IGY	PUNCHED CARDS
NORTHFIELD	NOR1	1/1958	-	12/1958	IGY	PUNCHED CARDS
OTTAWA	OTT1	7/1957	-	12/1959	IGY	PUNCHED CARDS
OTTAWA	OTT1	1/1968	-	12/1969	STD	MAGNETIC TAPE
PIC CU MIDI	PIC2	3/1969	-	1/1971	STD	PUNCHED CARDS
PIC DU MIDI	PIC1	8/1957	-	2/1958	IGY	PUNCHED CARDS
PIC DU MIDI	PIC1	8/1958	-	12/1958	IGY	PUNCHED CARDS
PORT AUX FRANCAIS	POR2	3/1969	-	1/1971	STD	PUNCHED CARDS
PRAGUE	PRA1	2/1959	-	12/1959	IGY	PUNCHED CARDS
PREDIGTSTUHL	PRE2	1/1969	-	3/1971	STD	PUNCHED CARDS
RESOLUTE BAY	RES1	7/1957	-	12/1959	IGY	PUNCHED CARDS
RESOLUTE BAY	RES2	2/1966	-	12/1968	STD	MAGNETIC TAPE
RIO DE JANEIRO	RIO1	12/1957	-	12/1959	IGY	PUNCHED CARDS
ROME	ROM1	7/1957	-	12/1959	IGY	PUNCHED CARDS
SOUTH POLE	SOU1	7/1957	-	12/1959	IGY	PUNCHED CARDS
SULPHUR MOUNTAIN	SUL1	7/1957	-	12/1959	IGY	PUNCHED CARDS
SWARTHMORE	SWA2	7/1964	-	3/1966	STD	PUNCHED CARDS
SYDNEY	SYD1	7/1957	-	12/1959	IGY	PUNCHED CARDS
THULE	THU1	8/1957	-	12/1959	IGY	PUNCHED CARDS
THULE	THU1	1/1964	-	9/1964	STD	PUNCHED CARDS
THULE	THU2	10/1964	-	12/1965	STD	PUNCHED CARDS
UPPSALA	UPP1	7/1957	-	12/1959	IGY	PUNCHED CARDS
USHUAIA	USH1	7/1957	-	10/1957	IGY	PUNCHED CARDS
USHUAIA	USH1	12/1957	-	8/1958	IGY	PUNCHED CARDS
USHUAIA	USH1	10/1958	-	12/1958	IGY	PUNCHED CARDS
USHUAIA	USH1	1/1959	-	3/1959	IGY	PUNCHED CARDS
USHUAIA	USH1	5/1959	-		IGY	PUNCHED CARDS
USHUAIA	USH1	8/1959	-	12/1959	IGY	PUNCHED CARDS
VICTORIA	VIC2	9/1964	-	7/1967	STD	PUNCHED CARDS
WEISSENAU	WEI1	7/1957	-	3/1959	IGY	PUNCHED CARDS
WELLINGTON NZ	WEL1	7/1957	-	6/1958	IGY	PUNCHED CARDS
WHITE MOUNTAIN	WHI1	8/1965	-	6/1969	STD	PUNCHED CARDS
WILKES	WIL1	1/1968	-	6/1968	STD	MAGNETIC TAPE
YAKUTSK	YAK1	7/1957	-	7/1959	IGY	PUNCHED CARDS
YAKUTSK	YAK1	9/1959	-	12/1959	IGY	PUNCHED CARDS
ZUGSPITZE	ZUG1	7/1957	-	12/1959	IGY	PUNCHED CARDS

Format "STD" refers to the internationally accepted format explained on pp. 214 and 216. Format "IGY" was used from 1957-1959 as explained in Annals of IGY, Vols. XXVI and XXVII.

Data can be furnished on magnetic tape, cards, or listings by month or days.

January, 1968

MONTHLY TABLE OF COSMIC RAY INTENSITIES

Bi-hourly values, corrected for the barometer effect

Instrument: Large Ionization Chamber with 10 cm Pb shielded
(about 160 lt Argon, 31 atms, at 20°C)

Location: Tokyo-Koenji. 35°42.4'N 139°38.7'E (Geomag. lat. 25°27'N)
H = 42 m

All values are in units of 0.1%. 4.0% should be subtracted from these tabulated values to obtain the difference from 100%.
i.e., 96.0 + *.**%

'Time ------ G.M.T.

TIME / DATE	1	3	5	7	9	11	13	15	17	19	21	23	sum	N	mean
1	87	83	86	83	86	80	82	85	85	85	87	90	1019	12	84.9
2	87	80	78	82	84	83	84	81	78	79	78	81	975	12	81.3
3	82	83	85	83	80	79	79	77	81	78	80	82	969	12	80.8
4	85	79	75	80	82	80	78	79	83	82	81	83	967	12	80.6
5	87	84	77	81	82	79	79	77	76	80	82	80	964	12	80.3
6	82	69	67	77	78	76	74	76	77	77	82	77	912	12	76.0
7	79	76	76	77	75	73	76	75	76	75	83	81	922	12	76.8
8	90	88	92	85	95	94	90	87	94	90	91	91	1078	12	89.8
9	95	93	91	88	88	85	85	84	86	86	84	85	1050	12	87.5
10	84	75	75	78	84	88	85	88	84	82	85	91	989	12	82.4
11	90	85	87	94	86	90	87	86	88	90	91	89	1063	12	88.6
12	90	85	85	80	84	82	77	80	80	78	80	83	984	12	82.0
13	77	74	79	81	74	80	76	78	85	82	81	87	954	12	79.5
14	92	86	89	88	87	85	88	93	90	88	92	94	1072	12	89.3
15	98	94	92	93	95	94	93	94	98	98	94	95	1134	12	94.5
16	91	92	94	90	86	87	84	86	87	87	86	83	1052	12	87.7
17	84	79	80	82	85	82	80	82	81	77	80	81	973	12	81.1
18	86	84	80	81	81	73	80	81	79	79	79	80	963	12	80.3
19	83	80	80	82	82	79	79	81	80	81	79	81	967	12	80.6
20	84	83	84	85	84	81	82	84	83	81	82	88	1001	12	83.4
21	86	82	82	87	84	81	76	80	80	85	88	86	997	12	83.1
22	87	89	91	92	91	89	88	86	89	83	85	88	1058	12	88.2
23	89	88	86	88	89	86	82	81	79	82	82	85	1017	12	84.8
24	83	76	75	76	84	79	79	80	83	81	81	84	961	12	80.1
25	84	87	83	83	82	84	83	83	83	81	84	86	1003	12	83.6
26	83	83	83	88	86	86	85	84	81	83.	84	86	1012	12	84.3
27	70	86	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf	156	2	78.0
28	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf		-	
29	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf		-	
30	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf		-	
31	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf	rf		-	

Meteorological Research Institute
4 - 35 - 8, Koenji Kita, Suginami
Tokyo, JAPAN
(CSAGI No. C 160)

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	CUT-OFF RIGIDITY
GODHAVN	69N	307	B2	A2	B2	P	P	P	P	P	P	P	P	P	P	P		00.03
MIRNY	66S	93	B2	C2	A2	B2	A2	B2	A2	A1	A1	P	S					00.04
SYOWA BASE	69S	39	B2	C2	S													00.42
TIXIE	71N	128	C2	A2	A3	A3	B3	B3	A2	A2	B2	A2	C3	C1	Q	Q		00.53
CAPE SCHMIDT	68N	180		C3	A3					B2	A2	A2	B3	Q	Q	Q		00.60
DEEP RIVER	46N	283	C2	A2	B2	S												01.02
YAKUTSK	62N	129	B2	A2	A1	A2	A2	A2	A2	A2	A1	A2	A1	C1	Q	Q		01.70
FREDRICKSBURG	38N	283	B2	A2	A2	C2	P	P	P	P	P	P	P	P	P	P		02.18
SVERDOLOVSK	56N	61	C2	A2	B1	A2	A2	A2	A2	A1	A2	A2	A1	B1	Q	Q		02.30
KUHLUNGSBORN	54N	11	B1	A1	A1	A2	A2	A2	A2	A1	B1	A2	B2	P	P	P		02.43
MOSCOW	55N	37	B2	B1	B2	A2	A2	A2	A2	A2	A2	B2	Q	Q	Q	Q		02.46
AMSTERDAM	52N	4	B2	A2	A2	A2	A2	B2	S									02.69
CHRISTCHURCH	43S	172	B3	A3	B2	B3	A3	P	P	P	P	P	P	P	P	P		02.71
HALLE	51N	12	B1	A1	A1	A1	A1	A1	A1	A1	A1	P	P	P	P	P		03.07
IRKUTSK	52N	104		B3	A3	B3	S											03.74
FREIBURG	48N	7	B1	A1	A3	P	P	P	P	P	P	P	P	P	P	P		04.10
HAFELEKAR	47N	11	B3	A3	A3	A3	A3	A3	A3	A3	A3	C3	P	P	P	P		04.37
TBILISI	42N	44	C2	B2	C2	A2	B2		B2	A2	B2	A2	B2	S				06.67
SAPPORO	43N	141	B1	A1	A1	P	P	P	P	P	P	P	P	P	P	P		08.22
CIUDAD UNIV	19N	261	B2	A2	S													09.53
MT NORIKURA	36N	137	B2	A2	B2	A2	A2	A2	A2	A2	A2	A2	B2	C2	Q	Q		11.39
TOKYO KOENJI	35N	139									A2	B2	A2	B2	B2			11.58
TOKYO ITABASHI	35N	139	B2	A2	B2	A2	A2	A2	B2	A2	A2	A2	A2	B2	Q	Q		11.61
TOKYO MABASHI	35N	139			B2	B2	C1	C2	A2	A2	P	P	P	P	P	P		11.61
HUANCAYO	12S	285	B2	A2	A2	A2	A2	A2	P	P	P	P	P	P	P	P		13.45
HOWRAH	22N	88	B2	A2	P	P	P	P	P	P	P	P	P	P	P	P		16.43
HONG KONG	22N	114														C2		

KEY TO SYMBOLS

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S = Program STOPPED operations (see MASTER STATION LIST for actual date)

F.3

3806-VII
т. 64

МЕЖДУНАРОДНЫЙ ГЕОФИЗИЧЕСКИЙ ГОД

Научно-исследовательский институт земного магнетизма, ионосферы и распространения радиоволн

S

Cubica / Meson T. СССР, Москва 17, по Ватутинки

Moscow

Космические лучи — кубический телескоп

Станция Кр. Пахра (Москва) Географическая широта 55,5° N Долгота 37,8° E Месяц, год Январь 1963 JAN

Геомагнитная широта _____ Пересчетный коэффициент 200 Высота над уровнем моря 200

Барометрический коэффициент -0.16 % / мб Введены поправки на давление.

Дни	Двухчасовые значения по мировому времени												Сумма
	0—2	2—4	4—6	6—8	8—10	10—12	12—14	14—16	16—18	18—20	20—22	22—24	
1	1051	1054	1052	1055	1057	1059	1054	1056	1052	1054	1054	1054	
2	1052	1050	1050	1056	1054	1050	1056	1058	1061	1053	1055	1064	
3	1048	1047	1047	[1048]	1047	1045	1044	1051	1040	1043	1041	1045	
4	1043	1043	1038	1041	1038	1042	1044	1041	1041	1043	1039	1028	
5	1029	1034	1030	1026	1028	1043	1044	1040	1038	1043	1041	1042	
6	1042	1044	1041	1041	[illegible]	1035	1039	1034	1041	1043	1041	1036	
7	1032	1037	1037	1027	[illegible]	1028	1029	1026	1031	1026	1020	1028	
8	1040	1037	1031	1031	[illegible]	1038	1039	1027	1038	1038	1035	1031	
9	1032	1033	1031	1026	1035	1030	1028	1038	1034	1032	1037	1034	
10	1031	1032	1037	1037	1037	1043	1031	1039	1034	1039	1038	1040	
11	1031	1043	1040	1046	1030	1039	1041	1041	1041	1042	1041	1039	
12	1037	1043	1032	1043	1051	1040	1044	1046	1040	1047	1047	1040	
13	1044	1043	1047	1043	1048	1044	1048	1038	1038	1038	1040	1044	
14	1036	1040	1043	1041	1027	1043	1044	1041	1041	1040	1040	1029	
15	1039	1042											
16							1037	1035	1044	1046	1050		
17	1034	1032	1032	1031	1027	1032	1038	1036	1038	1042	1042	1032	
18	1039	1037	1041	1039	1051	1044	1040	1047	1046	1033	1033	1035	
19	1034	1027	1030	1028	1028	1036	1028	1028	1025				
20	1031	1043	1043	1050	1053		1045	1052	1052	104[illegible]	1044	1048	
21	1044	1041	1046	1055	1049	1046	1043	1046	1046	104[illegible]	1046	1040	
22	1038	1042	1042	1050	1048	1045	1051	1044	1049	104[illegible]	1043	1046	
23	1044	1045	1045	046		1045	1044						
24					1049	1044	1050	1049	1048	1051	1040	1045	
25	1040	1035	1036	1037	1048	1054	1042	1048			1047	1036	
26	1037	1025	1032	1036	1034	1030	1032	1022	1026			1022	
27	1022	1018	1018	1016	1018	1030	1029	1028	1029	1031	1032	1029	
28	1022	1012	1021	1029	1025	1040	1031	1036		1030		1029	
29	1025	1021	1018					1029	1035	1028	1028	1025	
30	1022	1020	1026	1030	1025	1028	1008	1009	1024	1021	1020	1021	
31	1025	1025	1025	1026	1019	1024	1027	1021	1017	1019	1014		

A M P L E

Ответственное лицо: Я. Л. Блох

Гип. производственного комбината ВХО з-517

AT BOULDER

MESON TELESCOPE

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	CUT-OFF RIGIDITY
ALERT	82N	298									C2	A2	A2	A2	Q	Q		00.00
RESOLUTE	74N	265	B1	A1	A1	A1	A1	A1	A1	A1	B1	B1	S					00.00
THULE	76N	292		A2	B2	B2	B2	B2	Q	Q	Q	Q	Q	Q	Q	Q		00.00
MCMURDO	78S	167				Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q		00.01
WILKES	66S	110	C3	B1	P	P	P	P	P	P	P	P	P	P	P	P		00.01
MURCHISON BAY	80N	18	C3	A3	C3	S												00.06
HEISS IS	80N	57		B3	A3	A2	A2	A2	B1	A2	B1	A1	S					00.09
INUVIK	68N	226								B2	A2	A2	A2	A2	Q	Q		00.18
CHURCHILL	58N	266	B1	A1	A1	A1	B1	A1	A1	A2	S							00.21
MAWSON	67S	62	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	Q	Q	Q		00.22
GOOSE BAY	53N	300								C2	A2	A2	A2	A2	Q	Q		00.52
KIRUNA	67N	20	B3	A3	A3	A3	A3	A2	A2	A2	A2	A2	P	S				00.54
MACQUARIE IS	54S	159	B1	A1	C1	S												00.55
APATITY	67N	33									B2	B2	B2	B1	Q	Q		00.65
OULU	65N	25								B3	B3	C3		Q	Q	Q		00.81
DEEP RIVER	46N	283									A2	A2	A2	A2	Q	Q		01.02
OTTAWA	45N	285	B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	B1			01.08
BERGEN	60N	5	B3	A3	A3	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q		01.13
SULPHUR MT	51N	245	B1	A1	A1	A1	A1	A1	A1	B2				C2	B2			01.14
UPPSALA	59N	17	B3	A3	A3	A3	A3	A2	A2	A2	A2	S						01.43
AWARUA	46S	168		B3	P	P	P	P	P	P	P	P	P	P	P	P		01.86
HOBART	42S	147	B3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	Q	Q	Q		01.89
BELFAST	55N	354												Q	Q	Q		01.92
LINCOLN	40N	264	B3	A3	B3	A3	A3	B3	S									02.22
KIEL	54N	10	B1	A1	A1	B1	A1	A1	A1	A1	A1	A1	A1	A1	A1	C1		02.29
KUHLUNGSBORN	54N	11	B1	A1	A1	A2	A2	A2	A2	A1	A3	A2	B2	P	P	P		02.43
MOSCOW	55N	37	B3	A3	B1	A2	A2	B2	A2	A2	A2	B2	B2	Q	Q	Q		02.46
CHRISTCHURCH	43S	172	C3	B3	C2	P	P	P	P	P	P	P	P	P	P	P		02.71
LONDON	51N	360	B2	A2	S													02.73
DENVER	40N	255									Q	Q	Q	Q	Q	Q		02.91
HERSTMONCEUX	50N	0	B2	A1	A1	S												02.92
LINDAU	51N	10			B1	A1	A1	A1	A1	A1	A1	A1	B1	S				03.00
BELSK	52N	21										A1	A1	A1	Q	Q		03.18
DOURBES	50N	5													Q	Q		03.24
WELLINGTON	41S	174								C2	C1	P	P	P	P	P		03.42
PRAGUE	50N	14		A3	A3	A3	B3	S										03.53
IRKUTSK	52N	104	C3	A3	B3	B3	B3	B2	A2	A2	A2	B2	C2	B2	Q	Q		03.74
LOMNICKY STIT	49N	20		A3	A3	C3				B2	A2	A2	B2	C3	P	P		04.00
WEISSENAU	47N	9	B1	A1	C1	S												04.16
ZUGSPITZE	47N	11	B3	A3	A3	C3	P	P	P	P	P	P	P	P	P	P		04.24
EMBUDO	35N	254													Q	Q		04.36
HAFELEKAR	47N	11	C3	A3	A3	A3	A3	A3	A3	A3	A3	C3	P	P	P	P		04.37
BERKELEY	37N	238	B3	A3		S												04.54
SOCORRO	34N	253												Q	Q	Q		04.73
HERMANUS	34S	19	B1	A1	A1	A1	A1	C2	S									04.90
MONTE DEI CAPPUCCINI	45N	8											Q	Q	Q	Q		04.94
CAPETOWN	34S	18	C3	B3	S													04.96
BOLOGNA	44N	11	B3	A3	A3	A3	B2	A2	A2	A2	A2	A2	A2	A2	Q	Q		05.22
PIC DU MIDI	42N	0	C3	B3	A3	Q	Q	Q	Q	Q	Q	S						05.36
SIMFEROPOL	44N	34		B3	A3		B2			B2	S							05.51

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F.3

CUBICAL MUON MONITOR 4-MT-64 * GOOSE BAY * 53 16 N, 60 24 W, 46 M, CANADA

10000 EQUALS 658500 COUNTS PER HOUR

CORRECTED FOR TEMPERATURE BY MAEDA FORMULA

ROTATION NO. 1840

	DATE U.T.	DAY	01 UT 13	02 14	03 15	04 16	05 17	06 18	07 19	08 20	09 21	10 22	11 23	12 24	DAILY AVERAGE
1	JANUARY 19, 1968	19	9788	9781	9773	9762	9742	9746	9744	9758	9742	9752	9772	9763	
			9779	9767	9804	9812	9820	9812	9815	9824	9788	9789	9799	9784	9779.7
2	JANUARY 20, 1968	20	9755	9796	9788	9761	9758	9787	9753	9765	9763	9742	9763	9772	
			9759	9786	9794	9823	9810	9827	9836	9799	9836	9828	9803	9811	9788.1
3	JANUARY 21, 1968	21	9786	9783	9774	9785	9791	9770	9778	9774	9767	9781	9788	9779	
			9805	9820	9819	9852	9836	9849	9840	9843	9816	9781	9805	9817	9801.6
4	JANUARY 22, 1968	22	9812	9810	9806	9811	9786	9789	9797	9778	9774	9787	9774	9785	
			9790	9781	9786	9807	9803	9805	9826	9810	9820	9819	9801	9798	9798.1
5	JANUARY 23, 1968	23	9814	9790	9793	9814	9781	9806	9787	9764	9773	9775	9760	9780	
			9784	9768	9795	9791	9766	9794	9814	9832	9802	9800	9797	9772	9789.7
6	JANUARY 24, 1968	24	9798	9788	9795	9808	9777	9778	9764	9768	9757	9751	9750	9772	
			9752	9747	9743	9747	9759	9747	9727	9728	9743	9722	9736	9707	9756.8
7	JANUARY 25, 1968	25	9731	9749	9751	9778	9748	9763	9776	9743	9749	9731	9781	9804	
			9810	9822	9806	9834	9847	9813	9805	9805	9792	9788	9781	9775	9782.6
8	JANUARY 26, 1968	26	9776	9821	9781	9791	9805	9796	9744	9751	9780	9772	9747	9724	
			9704	9775	9786	9832	9847	9847	9828	9812	9788	9782	9715	9705	9779.5
9	JANUARY 27, 1968	27	9661	9583	9569	9598	9597	9629	9580	9566	9575	9577	9589	9611	
			9630	9659	9634	9666	9672	9662	9666	9646	9668	9638	9654	9631	9623.4
10	JANUARY 28, 1968	28	9639	9611	9643	9643	9666	9677	9656	9701	9689	9711	9679	9708	
			9706	9701	9743	9743	9712	9718	9736	9731	9751	9730	9754	9758	9698.2
11	JANUARY 29, 1968	29	9748	9764	9765	9765	9752	9760	9764	9753	9758	9743	9754	9750	
			9769	9798	9774	9774	9810	9787	9787	9754	9780	9764	9758	9750	9765.7
12	JANUARY 30, 1968	30	9737	9733	9735	9729	9722	9724	9706	9707	9687	9714	9714	9738	
			9760	9762	9773	9757	9752	9746	9777	9760	9773	9759	9750	9765	9740.8
13	JANUARY 31, 1968	31	9753	9770	9754	9767	9750	9753	9736	9756	9768	9754	9764	9756	
			9800	9775	9776	9794	9752	9753	9747	9741	9766	9799	9768	9788	9764.2
14	FEBRUARY 1, 1968	32	9776	9772	9760	9768	9763	9760	9766	9724	9771	9753	9764	9766	
			9772	9770	9775	9773	9775	9790	9762	9763	9762	9744	9730	9700	9760.8
15	FEBRUARY 2, 1968	33	9699	9687	9657	9646	9645	9623	9654	9663	9668	9679	9704	9703	
			9686	9695	9674	9682	9655	9671	9693	9685	9688	9699	9718	9736	9680.2
16	FEBRUARY 3, 1968	34	9749	9749	9780	9773	9773	9748	9770	9780	9770	9791	9779	9801	
			9748	9757	9735	9723	9728	9705	9727	9732	9727	9739	9740	9724	9751.9
17	FEBRUARY 4, 1968	35	9729	9760	9766	9763	9776	9795	9750	9764	9765	9727	9710	9702	
			9723	9719	9722	9691	9673	9693	9711	9725	9724	9708	9717	9678	9728.7
18	FEBRUARY 5, 1968	36	9679	9704	9687	9702	9699	9699	9701	9703	9699	9710	9716	9700	
			9698	9688	9657	9650	9668	9702	9724	9750	9764	9729	9731	9731	9703.8
19	FEBRUARY 6, 1968	37	9702	9691	9709	9730	9726	9727	9705	9705	9725	9711	9729	9692	
			9674	9669	9688	9630	9649	9708	9688	9701	9727	9722	9735	9749	9703.7
20	FEBRUARY 7, 1968	38	9719	9753	9765	9795	9773	9776	9777	9774	9767	9763	9734	9713	
			9687	9652	9724	9732	9754	9764	9777	9791	9799	9812	9802	9809	9758.9
21	FEBRUARY 8, 1968	39	9808	9800	9792	9789	9807	9811	9828	9824	9822	9812	9802	9806	
			9780	9792	9789	9794	9822	9831	9822	9816	9823	9812	9847	9822	9810.5
22	FEBRUARY 9, 1968	40	9829	9805	9861	9842	9851	9857	9872	9862	9863	9853	9854	9856	
			9842	9850	9860	9848	9839	9869	9869	9843	9828	9832	9812	9804	9845.9
23	FEBRUARY 10, 1968	41	9811	9800	9808	9811	9802	9823	9820	9820	9820	9836	9837	9843	
			9852	9878	9860	9882	9866	9874	9879	9853	9857	9851	9851	9845	9840.7
24	FEBRUARY 11, 1968	42	9843	9846	9838	9820	9831	9840	9836	9872	9876	9852	9840	9806	
			9822	9791	9797	9812	9830	9823	9869	9866	9843	9845	9837	9840	9836
25	FEBRUARY 12, 1968	43	9848	9836	9824	9815	9816	9816	9823	9849	9835	9829	9834	9828	
			9818	9770	9781	9769	9784	9791	9810	9815	9820	9825	9780	9784	9812
26	FEBRUARY 13, 1968	44	9775	9794	9775	9804	9780	9773	9781	9787	9763	9757	9724	9742	
			9775	9778	9780	9783	9791	9800	9797	9787	9783	9762	9780	9763	9776.3
27	FEBRUARY 14, 1968	45	9742	9743	9775	9751	9740	9760	9759	9750	9783	9758	9788	9787	
			9812	9794	9820	9804	9833	9811	9814	9801	9780	9791	9776	9758	9780.4
	27 DAY AVERAGES		97594	97600	97582	97637	97576	97628	97566	97580	97595	97563	97574	97588	
			97607	97616	97665	97705	97723	97777	97831	97782	97796	97728	97695	97631	9765.2

AT BOULDER

MESON TELESCOPE

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	CUT-OFF RIGIDITY
ROME	41N	12		A2	B2	A2	A2	A2	B2	B2	S							06.32
LISBON	38N	351	C3	A3	A3	P	P	P	P	P	P	P	P	P	P	P		06.65
TBILISI	42N	44				B3	B3		B2	B2	B2	B2	B2	C1	Q	Q		06.67
ALMA ATA	43N	76						B3		A3	A2	A1	A2	Q	Q	Q		06.69
BUENOS AIRES	34S	302	C3	P	P	P	P	P	P	P	P	P	P	P	P	P		10.63
SEOUL	37N	127								C3	B3	S						10.79
HAIFA	32N	35		B3	C3	S												10.96
MT NORIKURA	36N	138												Q	Q	Q		11.39
LOS CERRILLOS	34S	353											Q	Q	Q	Q		11.44
TOKYO ITABASHI	35N	139	B2	A2	B1	A2	A2	A2	A2	A2	A2	A2	C2	Q	Q	Q		11.61
TOKYO MABASHI	35N	139		B3	B3	P	P	P	P	P	P	P	P	P	P	P		11.61
GULMARG	34N	74		C3	P	P	P	P	P	P	P	P	P	P	P	P		11.91
CHACALTAYA	16S	292	C3	A3	C3	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q		13.10
MAKAPUU PT	21N	203	B3	A3	P	P	P	P	P	P	P	P	P	P	P	P		13.23
KULA	21N	204										B2	A2	A2	Q	Q		13.30
MAKERERE	00N	32	B1	A1	A1					B3	B3	B3			S			14.98
DARJEELING	27N	88	C2	P	P	P	P	P	P	P	P	P	P	P	P	P		15.35
LAE	06S	147	B3	A3	A3	B3		C3	A3	A3	A3	C3	P	P	P	P		15.52
AHMEDABAD	23N	73	B3	A3	A3	A3	A3	A3	S									15.94
MACAU	22N	113	B3	A3	A3	C3	P	P	P	P	P	P	P	P	P	P		16.28
COLOMBO	06N	79	B3	P	P	P	P	P	P	P	P	P	P	P	P	P		17.46
KODAIKANAL	10N	77	B3	A3	A3	A3	B3	A3	B3	S								17.47
UTRECHT	52N	5													B2			
YAKUTSK	62N	129														Q		

UNDERGROUND

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	CUT-OFF RIGIDITY
YAKUTSK	62N	129	B2	A2	A1	A2		A3	A2	B2	B1	B2	B1	C2	Q	Q		01.70
MOSCOW UNIV	55N	37		B2	A2	A2	A2	A2	A2	B2	B2	B2	Q	Q	Q	Q		02.46
BUDAPEST	47N	18		B3	A3	B3	B3	A3	B3	S		Q	Q	Q	Q	Q		04.44
MONTE DEI CAPPUCCINI	45N	8											C2	B2	Q	Q		04.94
TAKEYAMA	35N	139												Q	Q	Q		11.77

NARROW ANGLE

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	CUT-OFF RIGIDITY
HOBART	43S	147														Q		01.89
LINCOLN	40N	264	B3	A3	A3	A3	A3	B3	S									02.22
MOSCOW	55N	37	B3	B2	A2	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q		02.46
WELLINGTON	41S	174							C2	B2	P	P	P	P	P	P		03.42
SANTIAGO	33S	290		B3	A3	A3	A3	A3	A3	P	P	P	P	P	P	P		11.43
TOKYO MABASHI	35N	139		B3	B3	P	P	P	P	P	P	P	P	P	P	P		11.61
CHACALTAYA	16S	292		B3	C3	P	P	P	P	P	P	P	P	P	P	P		13.10
DACCA	24N	90										Q	Q	Q	Q	Q		16.22

KEY TO SYMBOLS

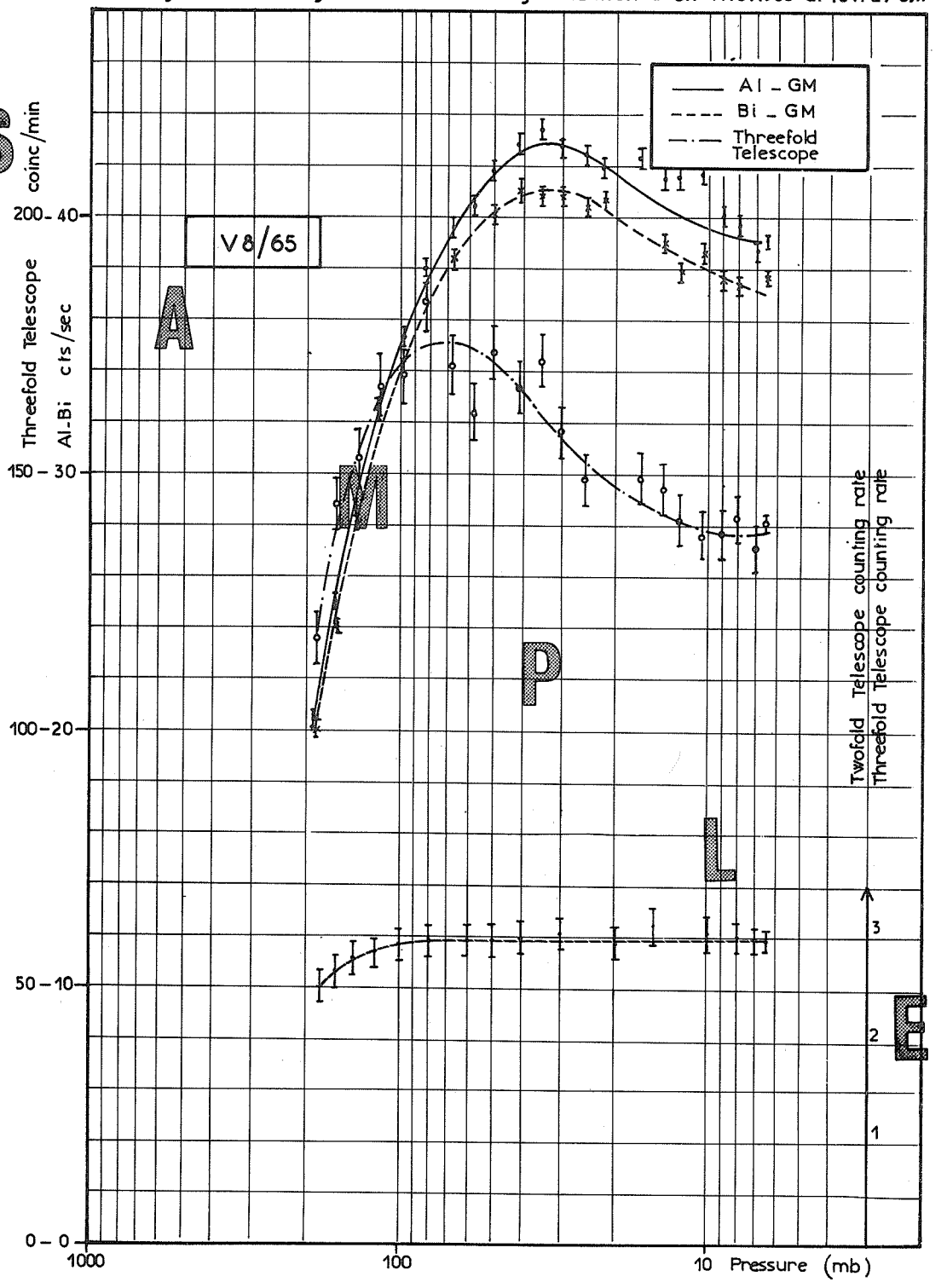
A = 12 Months
B = 6-11 Months
C = 1-5 Months

1 = Both corrected and uncorrected data
2 = Pressure-corrected data only
3 = Uncorrected data only

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED TO EXIST BUT NOT HELD AT WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

LABORATOIRE DE PHYSIQUE COSMIQUE
Station IVALO (FINLAND)

Counting rates during the SPARMO flight launched on 14.8.1965 at 15 h 27 U.T.



F.3 MESON TELESCOPE

AT BOULDER

SHOWER APPARATUS

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	CUT-OFF RIGIDITY
YAKUTSK	62N	129	B3	A3	B3	P	P	P	P	P	P	P	P	P	P	P		01.70
WELLINGTON	41S	174							C3	B2	C1	P	P	P	P	P		03.42
SANTA BARBARA	34N	241	C3	A3	A3	A3	C3	P	P	P	P	P	P	P	P	P		05.50
CHACALTAYA	16S	292	B3	B1	P	P	P	P	P	P	P	P	P	P	P	P		13.10

KEY TO SYMBOLS

A = 12 Months
B = 6-11 Months
C = 1-5 Months

1 = Both corrected and uncorrected data
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3 = Uncorrected data only

Q = Data exist but not held at WDC-A; QUERY WDC-A to assist in obtaining data
P = Data PRESUMED to exist but not held at WDC-A; WDC-A will attempt to ascertain availability
S = Program STOPPED operations (see MASTER STATION LIST for actual date)

F.4 BALLOON MEASUREMENTS

AT BOULDER

Results published in SPARMO Bulletins from

SPARMO launching stations:

Ivalo	68N	27E
Kiruna	67N	20E
Sodankyla	67N	20E
Lindau	51N	10E
Reykjavik	64N	21W
Aire/Adour	43N	00W
Dakar	14N	17W
Buenos Aires	34S	58W
Port Aux Francais	49S	70E
Utrecht	52N	05E
Potchefstroom	26S	27E
Roi Baudouin	70S	23E

Other known launching sites:

Churchill	58N	95W
College	64N	148W
Bombay	19N	13E

F.5 AIRCRAFT AND SHIP MEASUREMENTS

AT BOULDER

No data currently held, but institutions are asked to provide information as outlined in STP NOTES No. 6, p. 48.

SPACECRAFT NAME- OGO 2 NSSDC ID 65-081A
OTHER NAMES- OGO-C, POGO 1, S 5C, 1965 81A

LAUNCH DATE- 10/14/65 DATE LAST SCIENTIFIC DATA RECORDED- 10/--/67

AGENCY- NASA-OSSA SPACECRAFT WEIGHT IN ORBIT- 520 KG

ORBIT TYPE- GEOCENTRIC EPOCH- 10/15/65 ORBIT PERIOD- 104 MIN.
APOGEE- 1510. KM ALT PERIGEE- 414. KM ALT INCLINATION- 87.356 DEGREES

SPACECRAFT BRIEF DESCRIPTION
OGO 2 WAS A LARGE OBSERVATORY INSTRUMENTED WITH 20 EXPERIMENTS DESIGNED TO TAKE SIMULTANEOUS, CORRELATIVE OBSERVATIONS OF AURORA AND AIRGLOW EMISSIONS, ENERGETIC PARTICLES, MAGNETIC FIELD VARIATIONS, IONOSPHERIC PROPERTIES, ETC., ESPECIALLY OVER THE POLAR AREAS. THE MAIN BODY OF THE SPACECRAFT WAS ATTITUDE CONTROLLED BY MEANS OF HORIZON SCANNERS AND GAS JETS. ITS ORIENTATION WAS MAINTAINED CONSTANT BOTH WITH RESPECT TO THE EARTH AND WITH RESPECT TO THE DIRECTION OF THE SUN. THE SOLAR PANELS ROTATED ON A HORIZONTAL SHAFT EXTENDING TRANSVERSELY THROUGH THE MAIN BODY. THE ROTATION OF THE PANELS WAS ACTIVATED BY SUN SENSORS SO THAT THE PANELS RECEIVED MAXIMUM SUNLIGHT. FOUR EXPERIMENTS WERE MOUNTED ON THE SOLAR PADDLES. ANOTHER SHAFT ORIENTED VERTICALLY AND MOUNTED AT THE FRONT OF THE SPACECRAFT CARRIED FIVE EXPERIMENTS. NOMINALLY THESE SENSORS OPERATED LOOKING FORWARD IN THE ORBITAL PLANE OF THE SATELLITE. ROTATION OF OVER 90 DEG RELATIVE TO THE NOMINAL POSITION, AND OF OVER 90 DEG BETWEEN THE UPPER AND LOWER EXPERIMENT PACKAGES ON THIS AXIS, WAS POSSIBLE. NEWTON'S PARTICLE EXPERIMENT FAILED ON LAUNCH, AND KREPLIN'S SOLAR X-RAY EXPERIMENT SHORTLY THEREAFTER. SOON AFTER ACHIEVING ORBIT, DIFFICULTIES IN MAINTAINING EARTH LOCK WITH HORIZON SCANNERS CAUSED EXHAUSTION OF ATTITUDE CONTROL GAS BY OCTOBER 23, 10 DAYS AFTER LAUNCH. AT THIS TIME THE SPACECRAFT ENTERED A SPIN MODE (APPROX. 0.11 RPM) WITH A LARGE CONING ANGLE ABOUT THE PREVIOUSLY VERTICAL AXIS. FIVE EXPERIMENTS BECAME USELESS WHEN THE SATELLITE WENT INTO THIS SPIN MODE. SIX ADDITIONAL EXPERIMENTS WERE DEGRADED BY THIS LOSS OF ATTITUDE CONTROL. BY APRIL 1966, BOTH BATTERIES HAD FAILED SO THAT OBSERVATIONS WERE LIMITED TO SUNLIT PORTIONS OF THE ORBIT. BY DECEMBER 1966, ONLY EIGHT EXPERIMENTS WERE OPERATIONAL, NONE OF WHICH WERE NOT DEGRADED BY THE SPIN MODE OPERATION. BY APRIL 1967, THE TAPE RECORDERS HAD MALFUNCTIONED SO THAT ONLY ONE THIRD OF THE RECORDED DATA WAS PROCESSABLE. THE SPACECRAFT WAS SHUT DOWN IN OCTOBER 1967 WITH EIGHT EXPERIMENTS STILL OPERATIONAL.

EXPERIMENT NAME- GALACTIC AND SOLAR COSMIC RAY NSSDC ID 65-081A-08

ORIGINAL EXPERIMENT INSTITUTION- U OF MINNESOTA

INVESTIGATORS- W.R. WEBBER, U OF NEW HAMPSHIRE , DURHAM, N.H.

DATE LAST USEFUL DATA RECORDED- 10/24/65

EXPERIMENT BRIEF DESCRIPTION
THIS COSMIC-RAY TELESCOPE EXPERIMENT WAS DESIGNED TO MEASURE THE DIFFERENTIAL ENERGY SPECTRA OF PROTONS, HELIUM NUCLEI, AND HEAVIER NUCLEI UP TO Z = 10, WITHIN THE ENERGY RANGE OF 50 TO 2000 MEV PER NUCLEON. THE TELESCOPE HAD A MAXIMUM SAMPLING RATE OF ONE COUNT PER 288 MSEC. THE TELESCOPE CONSISTED OF TWO DETECTORS, A SCINTILLATOR WITH ITS ASSOCIATED PHOTOMULTIPLIER (PM) TUBE AND A SCINTILLATOR AND A CERENKOV ELEMENT SANDWICH WITH BOTH ELEMENTS OPTICALLY COUPLED TO THE SAME PM TUBE. A 70-NANOSEC COINCIDENCE CIRCUIT COUPLED THE TWO DETECTORS TO FORM THE TELESCOPE. PULSES FROM EACH DETECTOR WERE PULSE HEIGHT ANALYZED. SAMPLE PULSE HEIGHTS, THE COINCIDENCE COUNT RATE, AND THE COUNT RATE OF THE FIRST DETECTOR WERE TELEMETERED. THE NOISE LEVELS OF THE SPACECRAFT INCREASED TO SUFFICIENT AMPLITUDE TO RENDER THE SINGLES RATE DATA UNUSABLE EXCEPT DURING ECLIPSE PERIODS. ALL THE USEFUL DATA FROM THIS EXPERIMENT WERE OBTAINED BETWEEN OCTOBER 15 AND OCTOBER 24, 1965, AND ABOUT 17.4 PERCENT OF THE DATA OBTAINED DURING THIS PERIOD CONTAINS USEFUL INFORMATION.

F.6 SATELLITE MEASUREMENTS

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
58-001A-01	Explorer 1	Cosmic Ray Detector	Van Allen	02/01/58	0258-0358
59-009A-03	Explorer 7	Heavy Primary Cosmic Ray	Pomerantz	10/13/59	1059-0560
59-009A-04	Explorer 7	Radiation & Solar Protons	Van Allen	10/13/59	1059-0261
60-001A-01	Pioneer 5	Proportional Counter Telescope	Simpson	03/11/60	0360-0560
60-001A-03	Pioneer 5	Ion Chamber and GM Tube	Winckler	03/11/60	0360-0760
61-020A-03	Explorer 12	Charge Particles	Van Allen	08/16/61	0861-1261
61-020A-04	Explorer 12	Cosmic Rays	McDonald	08/16/61	0861-1261
62-006A-10	OSO 1	Proportional Counters	Hess	03/07/62	0362-0763
62-015A-03	Ariel 1	Cosmic-ray Detector	Elliot	04/26/62	0462-0762
63-046A-03	Explorer 18	Cosmic-ray Range vs. Energy Loss	Simpson	11/27/63	1163-0664
63-046A-04	Explorer 18	Cosmic Rays	McDonald	11/27/63	1163-0564
63-046A-05	Explorer 18	Ion Chamber and GM Counters	Anderson	11/27/63	1163-0365
64-054A-18	OGO 1	Cosmic Ray Spectra and Fluxes	Simpson	09/05/64	0964-1167
64-060A-03	Explorer 21	Cosmic Ray Range vs. Energy Loss	Simpson	10/04/64	1064-0465
64-076B-03	Explorer 25	Geiger-Mueller Counter	Van Allen	11/21/64	0265-0766
64-077A-04	Mariner 4	Cosmic Ray Telescope	Simpson	11/28/64	1164-1065
65-042A-03	Explorer 28	Cosmic Ray Range vs. Energy Loss	Simpson	05/29/65	0565-0567
65-042A-05	Explorer 28	Ion Chamber and GM Counters	Anderson	05/29/65	0565-0167
65-081A-07	OGO 2	Low-energy Proton, Alpha Particle Measurement	Simpson	10/14/65	1065-1266
65-081A-08	OGO 2	Galactic and Solar Cosmic Ray	Webber	10/14/65	1065-1065
65-105A-03	Pioneer 6	Cosmic Ray Telescope	Fan	12/16/65	1265-0870
66-049A-01	OGO 3	Solar Cosmic Rays	Anderson	06/07/66	0666-0267
66-049A-03	OGO 3	Cosmic Ray Spectra & Fluxes	Simpson	06/07/66	0666-0868
66-058A-04	Explorer 33	Ion Chamber and GM Counters	Anderson	07/01/66	0766-0667
66-058A-05	Explorer 33	Electron and Proton Detectors	Van Allen	07/01/66	0766-0968
66-075A-06	Pioneer 7	Cosmic Ray Telescope	Simpson	08/17/66	0866-0870
67-051A-03	Explorer 34	Cosmic Ray Proton	Simpson	05/24/67	0567-0569
67-070A-01	Explorer 35	Electron and Proton Detectors	Van Allen	07/19/67	0767-0570
67-073A-09	OGO 4	Galactic and Solar Cosmic Ray	Webber	07/28/67	0767-0867
67-123A-06	Pioneer 8	Cosmic Ray Gradient Detector	Webber	12/13/67	1267-0468

G. AIRGLOW

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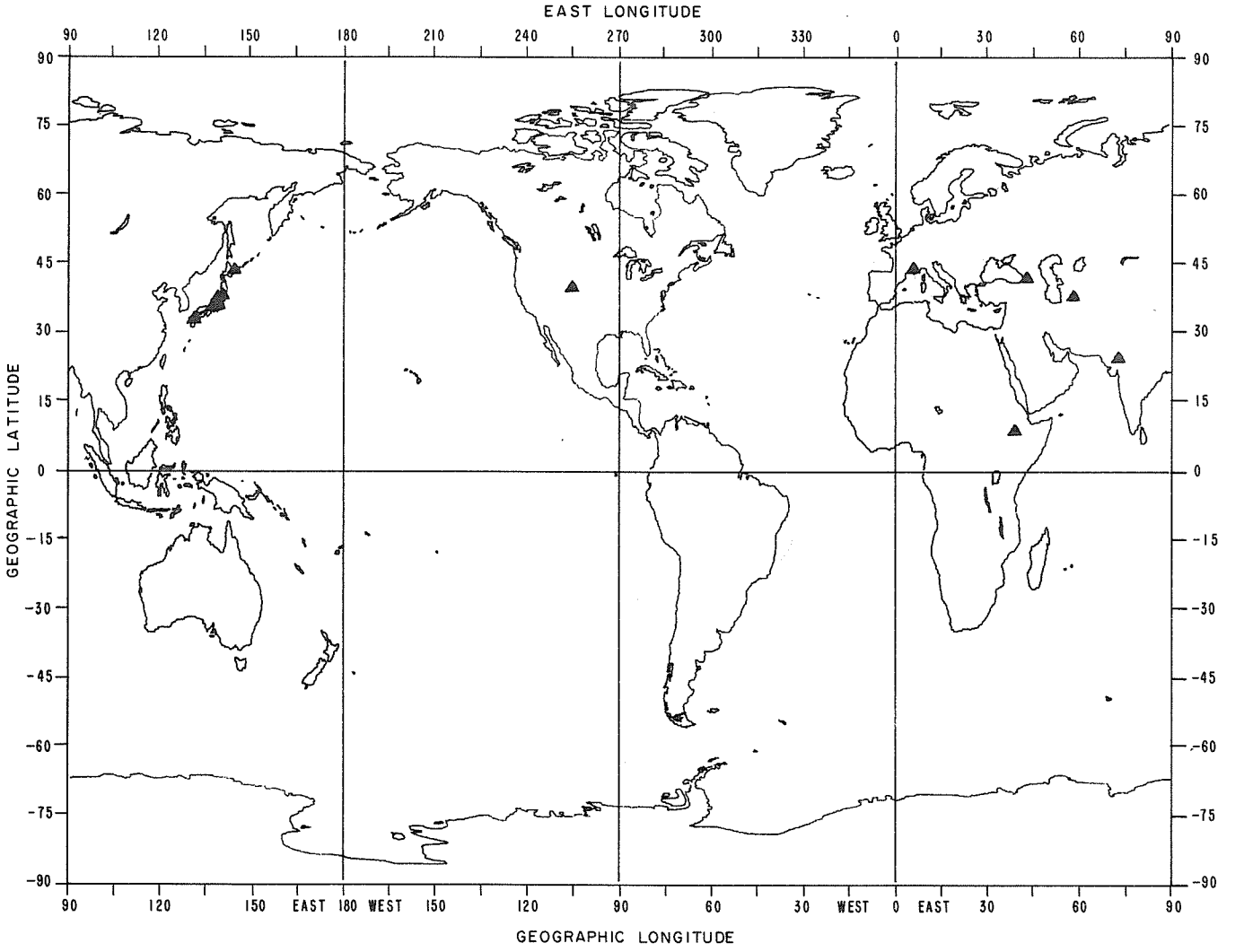
Airglow data listed are the results of photometric observations. The data in this catalogue are zenith intensities and ratio of intensities at equal angular distances north and south. The stations are by geographic latitude in descending order north to south with spectral wavelength in code.

AIRGLOW PHOTOMETER STATIONS 1971



AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	CODE	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	INDICATOR
THULE	76N	292	1		C	C	S												T
LOPARSKAYA	68N	33	1	C	A	C					C	C	S						MM
LOPARSKAYA	68N	33	2	C	C	C					C	C	S						MM
LOPARSKAYA	68N	33	3	C	C	C													MM
LOPARSKAYA	68N	33	4								C	S							MM
LOPARSKAYA	68N	33	5	C	C	C	S												MM
LOPARSKAYA	68N	33	6		C	C	S												MM
SHEPHERD BAY	68N	267	1							Q	Q	Q	Q	Q	Q	Q	Q		
SHEPHERD BAY	68N	267	6							Q	Q	Q	Q	Q	Q	Q	Q		
YAKUTSK	62N	129		Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
ZVENIGOROD	55N	36	1	C	B	B	S												
ZVENIGOROD	55N	36	2	C	B	B	S												
ZVENIGOROD	55N	36	3	C	B	B	S												
ZVENIGOROD	55N	36	7	C	B	B	S												
BIALKOW	51N	16	1		C	C	S												
BIALKOW	51N	16	3		C	C	S												
LOMNICKY STIT	49N	20	1	C	B	C	S												
LOMNICKY STIT	49N	20	2	C	A	B	S												
LOMNICKY STIT	49N	20	3	B	A	B	S												
ONDREJOV	49N	15	2	B	B	B	S												
ONDREJOV	49N	15	3	B	B	B	S												
RAPID CITY	44N	257	1	C	A	S													
RAPID CITY	44N	257	2	C	A	S													
RAPID CITY	44N	257	3		B	S													
SIMFEROPOL	44N	34	1	C	B	B	S												S
SIMFEROPOL	44N	34	2	C	B	B	S												S
SIMFEROPOL	44N	34	3	C	B	B	S												S
SIMFEROPOL	44N	34	5	C	B	B	S												S
HAUTE PROVENCE	43N	5	1	B	A	A					A	A	A	B	A	A	B		
HAUTE PROVENCE	43N	5	2	B	A	A					A	A	A	B	A	A	B		
HAUTE PROVENCE	43N	5	3	B	A	A													
HAUTE PROVENCE	43N	5	4	B	A	A					A	A	A	B	A	A	B		
HAUTE PROVENCE	43N	5	7	B	A	A					A	A	A	B	A	A	B		
MEMAMBETSU	43N	144	1	C	A	B	C	C			B	A	B	A					
MEMAMBETSU	43N	144	2		B	B						B	C						
MEMAMBETSU	43N	144	3		B	B													
MEMAMBETSU	43N	144	5	C	A	B													
ABASTUMANI	41N	42	1	C	B	B					B	A							
ABASTUMANI	41N	42	2	C	C	B					C	A							
ABASTUMANI	41N	42	3	C	B	B					B	A							
ABASTUMANI	41N	42	4	C	B	B													
ABASTUMANI	41N	42	7	C	B	B					B	A							
FRITZ PEAK	39N	255	1	B	B	B	A	A	A		B	B		Q	Q	Q	Q	Q	
FRITZ PEAK	39N	255	2	B	B	B	A	A	A		B	B							
FRITZ PEAK	39N	255	3			B	A	A	A		B	B							
FRITZ PEAK	39N	255	5						A					C	B				
SENDAI	39N	140	1	B	A	A	C	A	A	A	B	A	A	A					
SENDAI	39N	140	2								B	B	B						
SENDAI	39N	140	5	B	A	A	A				C	A	A						
ASHKHABAD	37N	58	1								B	B	C						AS

Code	Wavelength	Code	Wavelength
1	5577A	5	Cont. at ∿5300
2	6300/6364	6	3914/4278
3	5890/5896	7	Other
4	OH		

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МЕЖДУНАРОДНЫЙ ГОД СПОКОЙНОГО СОЛНЦА.

СВОДКА ДАННЫХ НАБЛЮДЕНИЙ НОЧНОГО НЕБА ЗА НОЯБРЬ 1965 ГОД.

СТАНЦИЯ ЛОПАРСКАЯ — ЭМИССИЯ 5577 Å

$\varphi = 68^{0}\ 15'$, $\lambda = 33^{0}\ 05'$ — ИНТЕНСИВНОСТЬ В РЕЛЕЯХ

ЗЕНИТ

S

дата \ время GMT	20 h	21 h	22 h	23 h	00 h
28–29	–	670	–	310	350

A

75^{0} N

дата \ время GMT	20 h	21 h	22 h	23 h	00 h
28–29	–	–	–	3700	2000

M

75^{0} S

дата \ время GMT	20 h	21 h	22 h	23 h	00 h
28–29	–	2000	–	1400	1200

P

L

REC'D. WDC-A 500.10 JUL 18 '68

СОСТАВИЛ : РОЛДУГИН В. К.

Ролдугин

6300A RAYLEIGHS

MT. ABU (INDIA) ZENITH INTENSITIES — TIME ZONE 5H EAST

E

YR.	MO.	DA.	18	19	20	21	22	23	00	01	02	03	04	05	06	MEAN	STD DEV
65	1	26			96	65	93	80	54	37	39	42				63	23
65	1	27			105	87	90	60	39	42	30	45				63	25
65	1	28			94	64	82	74	62	42	46	65	71			67	15
65	1	29			89	85	107	90	84	74	89	87	85	93		88	8
65	1	30				96	80	65	75	85	85	75	61	87		79	10
65	1	31				101	68	62	43	27	32	39	45	47		52	21
65	2	1			96	203	85	65	65	45	33	38	53	38		72	48
65	2	2			117	123	57	24	20	30	23		35	50		53	38
65	2	3			77	60	45	33	38	30	42	57	94			53	20
65	2	4			125	96	62	41	30	11	44	84	50	52		60	32
65	2	6						37	23	34	100	59	54	52		51	23
65	2	7							24	41	77	95	67	95		67	26
65	2	8									49	55	54	42		49	6
65	2	9									69	122	147	123		115	29
65	2	10										79	84	82		82	2
HR	AVG		OBS	AVG	100 66	95	76 STD	58 DEV	47 29	43	53	67	69	69			

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	CODE	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	INDICATOR
ASHKHABAD	37N	58	2								C								AS
ASHKHABAD	37N	58	5								B								AS
NIIGATA	37N	138	1	B	A	B	C	B	B	B	A	B	B	B	Q				
NIIGATA	37N	138	5	B	A	B													
DODAIRA	36N	139	1								B	B	B	B	C				
DODAIRA	36N	139	2								B	B	B						
DODAIRA	36N	139	4								C	A	B						
KAKIOKA	36N	140	1	B	A	A	S												
KAKIOKA	36N	140	4			B		B	B	B	C	S							
KAKIOKA	36N	140	5	B	A	A	S												
GIFU	35N	137	1	B	B	B	C	B	B	B	B	B	C						
GIFU	35N	137	2						B		B								
GIFU	35N	137	5	B	B	B													
MARUYAMA	35N	139	1	B	A	B	C	B	B	B	C	S							
MARUYAMA	35N	139	2		B	C	S												
MARUYAMA	35N	139	3		B	C	S												
MARUYAMA	35N	139	4	C	A	C	C	S											
MARUYAMA	35N	139	5	B	A	B	B	B	C	S									
SHODA JIMA	34N	134	4	C	A	C	S												
ASO	32N	131	1	C	A	B			B	C	B	C							
ASO	32N	131	2								C	C							
ASO	32N	131	5	C	A	B													
ASO	32N	131	7							C									
SACRAMENTO	32N	255	1	B	A	B	Q	Q	Q	Q	Q	S							
SACRAMENTO	32N	255	2	C	A	B	S												
SACRAMENTO	32N	255	3	B	A	B	S												
TUCSON	32N	250	1								B	B	S						
TUCSON	32N	250	2								B	B	S						
TUCSON	32N	250	3								B	B	S						
NAINITAL	29N	79	1									Q							
NAINITAL	29N	79	3									Q							
NAINITAL	29N	79	7									Q							
CANARY IS	28N	344	1														Q	Q	
CANARY IS	28N	344	2														Q	Q	
MT ABU	24N	72	1	C	B						C	B	B						
MT ABU	24N	72	2	C	B	B					C	B	B						
MT ABU	24N	72	3	C	B						C	B	B						
TAMANRASSET	22N	5	1	B	A	A	S												T
TAMANRASSET	22N	5	2	B	A	A	S												T
TAMANRASSET	22N	5	3	B	A	A	S												T
TAMANRASSET	22N	5	4	B	A	A	S												T
TAMANRASSET	22N	5	7	B	A	A	S												T
HALEAKALA	20N	204	1					Q	Q	Q	B	A	S						
HALEAKALA	20N	204	2					Q	Q	Q	B	A	S						
HALEAKALA	20N	204	3					Q	Q	Q	B	A	S						
HALEAKALA	20N	204	5					Q	Q	Q	B	A	S						
POONA	18N	73	1		B		C		C		C	S							
POONA	18N	73	2						C		C	S							
POONA	18N	73	3						C		C	S							
POONA	18N	73	5								C	S							

Code	Wavelength	Code	Wavelength
1	5577A	5	Cont. at ∿5300
2	6300/6364	6	3914/4278
3	5890/5896	7	Other
4	OH		

KEY TO SYMBOLS

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OH RAYLEIGHS

SAMPLE

HAUTE PROVENCE ZENITH INTENSITIES 6700A TIME ZONE 0 HOUR

YR.	MO.	DA.	18	19	20	21	22	23	00	01	02	03	04	05	06	MEAN	STD. DEV.
64	10	9						90	75							83	8
64	10	10									75	85				80	5
64	10	12					85	70	70	75	75	90				78	8
64	10	13									80	80				80	0
64	10	15								100	80	75				85	11
64	10	16									35	45				40	5
64	10	17										100				100	0
HR	AVG			110	49	47	50	46	55	75	66	64					
			OBS	AVG	56		STD	DEV	26								
64	10	25		115												115	0
64	10	26		65	95											80	15
64	10	29		145	125	130	125	135	130							132	7
64	10	30		170	160	160	135	125	110							143	22
64	10	31						105	125	95	115					110	11
64	11	1		100	100	80		115	130	130	105	80				103	18
64	11	2		155	155	140		145	130	135						142	9
64	11	4									150		140			145	5
64	11	5		190	145	130	130	110	110	115	110	105				127	25
64	11	7				95	80									88	8
64	11	8				110	100	90	85	75						92	12
64	11	9				150	130	100	90			90	105			111	22
64	11	10					130	145	130	110	110	115	105			121	13
64	11	11						170	105	105	105	115	135			123	24
64	11	12							90	110	100	95	90			97	7
64	11	14									140	115	110			122	13
64	11	15											175			175	0
HR	AVG			134	130	124	117	124	112	109	116	102	122				
			OBS	AVG	119		STD	DEV	25								
64	11	22	110													110	0
64	11	23	50	60												55	5
64	11	24	65	80	85											77	8
64	11	25	125	105	105	95	100									106	10
64	11	26	95	95	100	120										103	10
64	11	27	95	90	130	115	125		100							109	15
64	11	29	165	110	120	120	100	95	100	115	130					117	20
64	11	30	135	115	105	100	80	80	95	100	125	125				106	18
64	12	1	90	85	80	80	55	60	70	80	70	80	80			75	10
64	12	2	90	90	110	95	90	95	85	95	90	90	80	95		92	7
64	12	3				65	50	65	70	85	80		65			69	11
64	12	4	105	120	135	135	160	170	155	145	120	110	150	120		135	20
64	12	5	165	140	120	130	150	165	155	155	155	135	125	125		143	15

AT BOULDER

STATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG EAST	CODE	YEAR 57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	INDICATOR
POONA	18N	73	7								C	S							
DEBRE ZEIT	08N	38	1										C	C					
DEBRE ZEIT	08N	38	2										C	C					
DEBRE ZEIT	08N	38	3										C	C					
DEBRE ZEIT	08N	38	4										C	C					
ZAMBOANGA CITY	06N	122	1			C	S												
LWIRO	02S	28	1	C	A	C	S												LW
LWIRO	02S	28	2	C	A	C	S												LW
LWIRO	02S	28	3	C	A	S													LW
LWIRO	02S	28	4	C	A	C	S												LW
LWIRO	02S	28	5	C	A	C	S												LW
HUANCAYO	12S	285	1		B	B													HU
HUANCAYO	12S	285	2		B	B													HU
HUANCAYO	12S	285	3		B	B													HU
MAKATEA	16S	212	1							B	A	B							
MAKATEA	16S	212	2							B	A	B							
MAKATEA	16S	212	4							B	A	B							
MAKATEA	16S	212	7							B	A	B							
TOWNSVILLE	19S	146	2								C	S							
TSUMEB	19S	17	1									C	S						T
TSUMEB	19S	17	2									C	S						T
TSUMEB	19S	17	3									C	S						T
TSUMEB	19S	17	4									C	S						T
TSUMEB	19S	17	6									C	S						T
CAMDEN	34S	150	1	B	B	S													
CAMDEN	34S	150	2		B	S													
LAUDER	45S	169	7													Q	Q		
KERGUELEN	49S	70	1								B	A	B						KG
KERGUELEN	49S	70	2								B	A	B						KG
KERGUELEN	49S	70	3								B	A	B						KG
KERGUELEN	49S	70	4								B	A	B						KG
KERGUELEN	49S	70	7								B	A	B						KG
SOYA SHIP	60S		1	B	C	C	C	C	C	S									X
SOYA SHIP	60S		2			C	C	C	C	S									X
SOYA SHIP	60S		3			C	C	C	C	S									X
SOYA SHIP	60S		4			C	C	C	C	S									X
MIRNY	66S	92	1		B	S													M
MIRNY	66S	92	2		B	S													M
MIRNY	66S	92	3		B	S													M
SYOWA BASE	69S	39	1			B	C	B	C	S									S
SYOWA BASE	69S	39	2				C	B	C	S									S
SYOWA BASE	69S	39	3				C		C	S									S
SYOWA BASE	69S	39	4				C		C	S									S
SYOWA BASE	69S	39	6					B	S										S
SANAE	70S	357	1											C					
SANAE	70S	357	2											C					
SANAE	70S	357	6											C					
MCMURDO	77S	166	1												C				
MCMURDO	77S	166	6												C				

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S

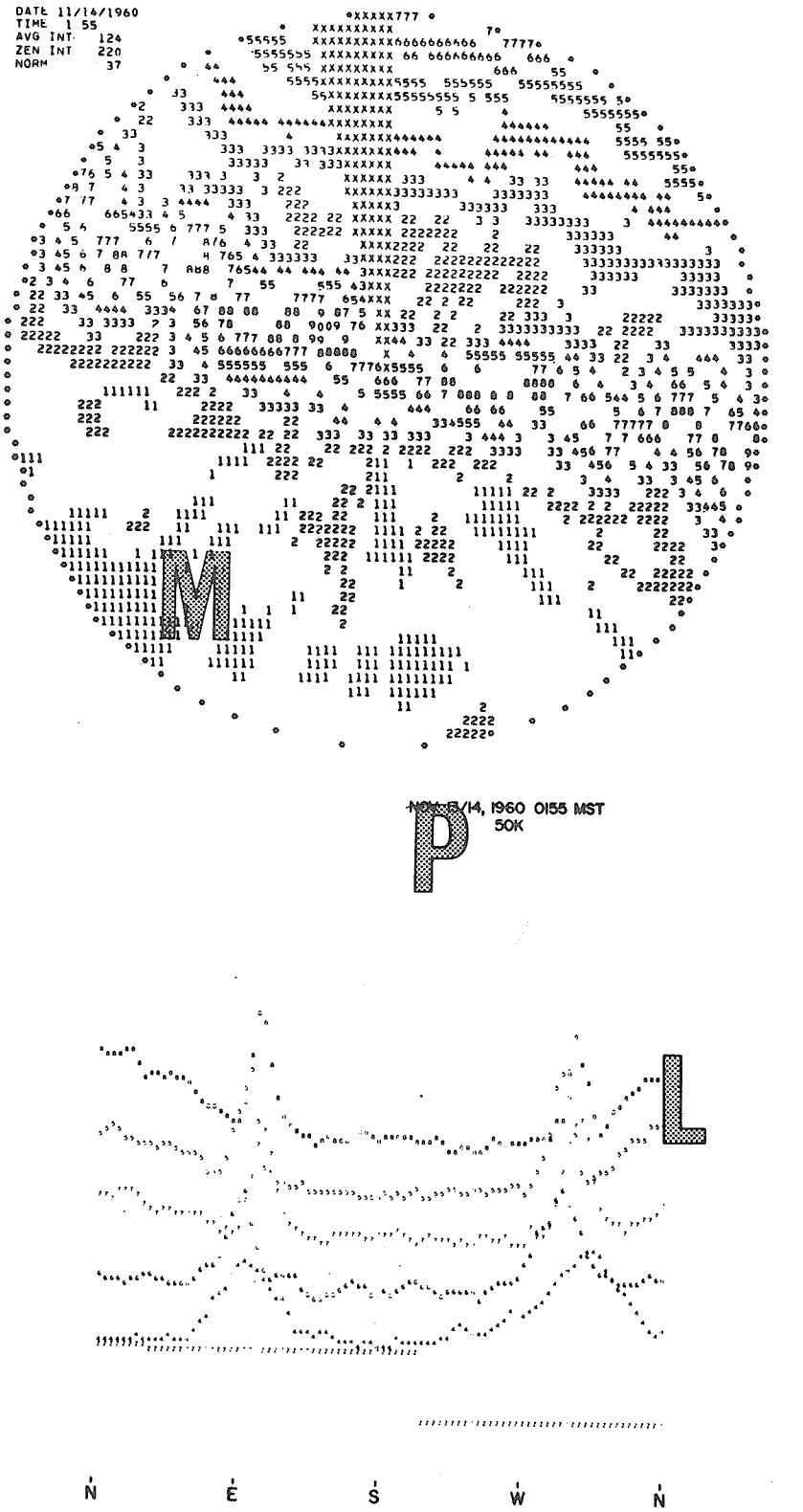
A

M

P

L

E


DATE 11/14/1960
TIME 1 55
AVG INT 124
ZEN INT 220
NORM 37
NOV 13/14, 1960 0155 MST
50K
N
E
S
W
N

G.1 AIRGLOW GROUND BASED

P U B L I C A T I O N S:

1. World Data Center A, Upper Atmosphere Geophysics Report Series UAG #1 - IQSY Night Airglow Data, July 1968. (Data in this publication also available on punched cards).

2. ESSA Technical Report, IER 16-ITSA-16 - "Fritz Peak Observations of Stable Auroral Red Arcs Summary 1955 - 1965", E. Marovich, December 1966.

G.2 SATELLITE MEASUREMENTS (PHOTOMETERS)

AT GREENBELT

NSSDC ID	POPULAR NAME	EXPERIMENT	PRINCIPAL INVESTIGATOR	LAUNCH DATE	DATA SET
62-067B-08	Injun 3	Aurora and Airglow Photometers	O'Brien	12/13/62	1262-1063
67-073A-13	OGO 4	Lα+UV Airglow Study	Mange	07/28/67	0767-0268

H. MISCELLANY

CONTENTS

		Page
H.1	NOCTILUCENT CLOUDS	259
H.2	METEOROLOGICAL ROCKETS	260
H.3	OZONE	262

These data are not the primary responsibility of the Solar-Terrestrial Physics disciplines, but because of close relationships to solar-terrestrial physics, are outlined here.

H.1 NOCTILUCENT CLOUDS

H.1 Responsibility for publication of noctilucent cloud data has been undertaken by the Meteorological Service of Canada.

For information on data available, contact:

Department of Transport
Meteorological Branch
Attn: Dr. A. D. Christie
315 Bloor Street West
Toronto 181, Canada

H.1 Observations were made at Mawson, Wilkes and Macquarie Island during February-April 1968 and 1969. Contact World Data Center-A, Boulder for information.

AT BOULDER

M I C R O F I L M:

1. IQSY (1964-1965) observations from the 202 stations of the Hydro-Meteorology Service of the USSR, the 7 stations of the All-Union Astronomical-Geodetical Society, and the station of the Institute of Physics and Astronomy of the Academy of Sciences, Estonian SSR, on 35 mm roll microfilm.

P U B L I C A T I O N S:

1. Geophysical Institute, University of Alaska, UAG-191, Summary of Noctilucent Cloud Data from Alaska, Canada, Greenland, Iceland and the Southern Hemisphere for the years 1885 - 1966.
2. Department of Transport, Meteorological Branch, Canada - Noctilucent Cloud Data for March - October, 1967; March - October, 1968 and March - October, 1969 from Alaska, Canada, Greenland, and Iceland.
3. IQSY Notes, IQSY Secretariat, London and STP Notes, National Academy of Sciences, Washington, D. C., Solar-Geophysical Data, NOAA - occurrences of noctilucent clouds over the N. Atlantic and western Europe in the abbreviated Calendar Records.
4. World Meteorological Organization, WMO-No. 250, TP. 138. "International Noctilucent Cloud Observation Manual"

METEOROLOGICAL ROCKET NETWORK SUMMARY

Page No.	Date GCT	Time GCT	Type Rocket	Wind Sensor	Temperature Sensor	Temp Track (10^4 M MSL)	Wind Track (10^4 M MSL)
AFETR, ANTIGUA AAFB, B.W.I.					Lat. 17° 09'N Long. 61° 47'W		
3	1 Mar 68	1429	Arcas	Chute	Arcasonde 1A	5608-2581	5775-2575
32	6 Mar 68	1700	Arcas	Chute	Arcasonde 1A	6264-2459	6150-2425
44	8 Mar 68	1503	Arcas	Chute	Arcasonde 1A	5900-2450	5900-2475
81	18 Mar 68	1550	Arcas	Chute	Arcasonde 1A	6100-2450	5975-2475
111	22 Mar 68	1445	Arcas	Chute	Arcasonde 1A	6100-2450	6000-2500
AFETR, ASCENSION ISLAND, AFB					Lat. 07° 59'S Long. 14° 25'W		
4	1 Mar 68	1445	Arcas	Chute	Arcasonde 1A	5800-2500	5875-2400
12	4 Mar 68	1445	Arcas	Chute	Arcasonde 1A	5950-2500	5975-2400
29	6 Mar 68	1445	Arcas	Chute	Arcasonde 1A	5200-2450	6275-2425
39	7 Mar 68	1445	Arcas	Chute	Arcasonde 1A	5825-2500	6325-2575
50	11 Mar 68	1455	Arcas	Chute	Arcasonde 1A	6350-2475	6100-2475

METEOROLOGICAL ROCKET SOUNDING DATA

RP	RP NAME + PLACE	DATE Y M D	TIME Z	TR	RT	WS	TS	RP	IJ	QQ	WHT	WHB	THT	THB	C
23039	WSMR, NEW MEXICO	66 10 20	1320 +03	01	02	12									3

ROCKET WND

FV	A MSL	COMP	WNDS
123	6800	+010	+026
152	6700	+020	+027
165	6600	+027	+032
170	6500	+030	+028
169	6400	+030	+021
163	6300	+022	+026
155	6200	+005	+031
146	6100	+000	+043
138	6000	+011	+049
128	5900	+016	+047
119	5800	+008	+034
111	5700	+007	+035
103	5600	+013	+028
097	5500	+005	+033
092	5400	+001	+036
087	5300	+007	+028
081	5200	-009	+033
077	5100	+005	+043
070	5000	-005	+032
066	4900	-009	+046
061	4800	+002	+044
053	4600	+006	+033
049	4500	-004	+026
046	4400	+006	+030
043	4300	-006	+028
040	4200	+004	+028
038	4100	-006	+027
035	4000	+008	+018
032	3900	+005	+024
030	3800	+002	+019
028	3700	+002	+009
026	3600	+000	+013
024	3500	+006	+002
022	3400	+002	+008
020	3300	+016	+003
019	3200	+001	-003
018	3100	+002	-004
016	3000	-001	+002
015	2900	+000	+002
014	2800	+004	+003

THERMODYNAMICS

A MSL	TDC	PMB	D	SOS
6370	-19.6	00.137	00.188	319
6102	-16.5	00.194	00.264	321
6066	-11.4	00.204	00.271	324
5403	-12.2	00.477	00.636	324
5261	-08.4	00.571	00.752	326
5077	-06.9	00.721	00.943	327
4634	-15.7	01.273	01.723	322
4539	-22.8	01.444	02.010	317
4345	-26.3	01.878	02.603	315
4276	-23.8	02.063	02.880	317
4201	-26.0	02.282	03.187	315
4041	-22.9	02.835	03.917	317
3977	-26.5	03.091	04.267	315
3911	-26.1	03.386	04.705	315
3863	-30.1	03.616	05.184	313
3738	-29.9	04.297	06.155	313
3638	-34.4	04.948	07.221	310
3590	-31.2	05.291	07.619	312
3544	-32.4	05.638	08.160	311
3492	-35.1	06.071	08.885	309
3406	-37.0	06.863	10.125	308
3373	-36.1	07.188	10.565	309
3326	-36.3	07.685	11.305	309
3285	-38.1	08.149	12.079	307
3212	-39.6	09.066	13.525	306
3181	-41.9	09.481	14.284	305
3139	-39.6	10.067	15.018	306
3109	-43.2	10.525	15.947	304
3047	-46.1	11.541	17.709	302
3018	-44.5	12.038	18.344	303
2951	-46.3	13.300	20.428	302
2892	-45.3	14.518	22.200	303
2838	-46.9	15.730	24.223	302
2787	-46.2	16.994	26.089	302
2710	-48.1	19.063	29.513	301
2660	-47.8	20.531	31.743	301
2642	-46.6	21.120	32.481	302
2589	-46.5	22.839	35.110	302
2532	-50.2	24.907	38.924	299
2467	-48.1	27.453	42.501	301

COMPOSITION

A MSL	O	ED	LAR

RAOB

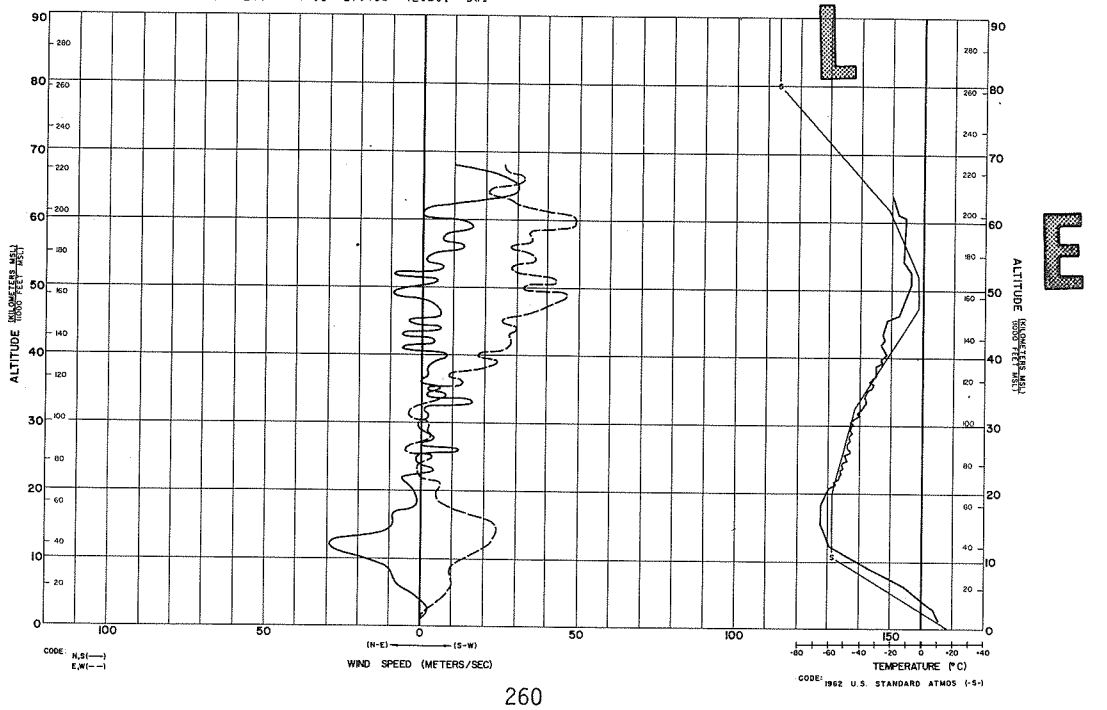
PMB	A MSL	COMP	WNDS	RH	TDC
0009.2	3200	+002	+002		-41.3
0011.5	3048	+001	-005		-42.7
0014.4	2896	-002	+000		-44.7
0018.0	2743	+001	+002		-46.3
0022.7	2591	+004	-003		-48.0
0028.6	2438	+001	-002		-50.7
0045.9	2134	-003	+003		-57.9
0074.7	1829	-001	+006		-65.6
0123.0	1524	-009	+023		-65.5
0201.9	1219	-029	+022		-59.3
0319.8	0914	-012	+010	24	-35.0
0484.3	0610	-008	+010	16	-10.8
0709.3	0305	+002	+003	10	+07.2
0884.6	0122	+000	+000	41	+11.0
0010.0	3127	+002	-002		-41.4
0050.0	2070	-004	+005		-59.2
0100.0	1646	-009	+016		-65.3
0500.0	0585	-007	+010	13	-08.8
0700.0	0316	+002	+003	10	+06.5

ROCKET C[illegible]NUED

FV	A MSL	CO	WNDS
013	2700	+000	-001
011	2600	+012	-005
011	2500	-002	+003
010	2400	-001	-001
010	2300	+004	-001
009	2200	-006	+000
008	2100	-004	+006

THERMODYNAMICS CONTINUED

A MSL	TDC	PMB	D	SOS
2451	-50.9	28.121	44.084	299
2409	-51.9	29.984	47.217	298
2369	-50.2	31.905	49.860	299
2333	-53.2	33.700	53.383	297
2284	-51.7	36.350	57.192	298
2263	-53.2	37.524	59.441	297
2196	-53.7	41.623	66.084	297
2153	-56.8	44.486	71.642	295
2136	-55.5	45.697	73.152	296
2075	-59.6	50.273	82.022	293



H.2 METEOROLOGICAL ROCKETS

The Meteorological Rocket Data Reports, issued monthly by World Data Center A for Meteorology, start with January 1964 data. Each report contains the wind and temperature measurements from all available meteorological sounding rocket firings for that particular month, along with computed values for pressure, density, and speed of sound. It also includes the local radiosonde observations nearest the time of firing. Release time of the radiosonde should be within ±6 hours of the time of firing. However, exceptions up to ±12 hours are made, particularly in tropical regions. Since only those firings which yield significant data are of interest here, the report does not include unsuccessful firings. Prior to January 1966, only data from stations cooperating in the current Meteorological Rocket Network (MRN) are available. Thus these first issues of the Meteorological Rocket Data Reports are essentially a reprint of the Data Report of the Meteorological Rocket Network Firings, IRIG Document 109-62, issued by the Meteorological Rocket Network Committee (MRNC). Other countries are encouraged to submit their observations to WDC-A for inclusion in this series. Meteorological Rocket Network Stations which have contributed data are listed in an addendum. Any data delayed and thus omitted from previous publications will appear in a second addendum.

The current Meteorological Rocket Network (MRN) combines the efforts of a number of meteorological organizations engaged in observations and studies of the upper atmosphere. The MRNC has played an active role in coordinating the planning, implementation, processing, and publication of the data acquired under the auspices of the MRN. Background information relative to the development of the MRN, the techniques employed, and the participants, is contained in IRIG Document 111-64, first published in February 1965. Familiarization with this document is urged as the details involved in the collection and reduction of MRN data are numerous and cannot be given in each data report. Additional information concerning computer techniques used in data reduction should be referred to the individual contributors.

Data gathered by the Meteorological Rocket Network prior to 1965 were uniformly reduced by United States Army Electronics Research and Development Activity, White Sands Missile Range, New Mexico, using graphical techniques. Beginning with the 1965 data, initial reduction is the responsibility of each contributing station. This change has been brought about primarily because the radar plots once used as a basis for all reduction are no longer available. Under this new reduction procedure, several of the MRN sites will be reducing wind data from digital radar position tapes using high-speed computers. The advantages in this method are obvious. The only change in the presentation of the data will be in the manner in which the position times are reported. Beginning with data for July 1965 fall rate is calculated for the user's convenience. Thus columns 16, 17, and 18 which formerly denoted time after firing in relation to altitude, now denote fall rate in whole meters per second.

A brief monthly summary has been initiated beginning with the 1965 data reports. This summary, found immediately before the addendum, is designed to compare the mean profile for the current month with long-term means for the same month. It is hoped that this summary will prove of value to the user and that its scope can be increased with time.

These World Data Center A Meteorology Data Reports "High Altitude Meteorological Data" (formerly Meteorological Rocket Network Firings) are published by the National Climatic Center, Asheville, North Carolina, U.S.A. 28801. The subscription price is $36.00 per year; $9.00 additional for foreign mailing; $3.00 single copy. Checks and money orders should be made payable to the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.

WMO/OMM MSC/SMC

VERTICAL DISTRIBUTION OF OZONE
DISTRIBUTION VERTICALE D'OZONE

Country/pays FRANCE

Station VAL-JOYEUX

Date 1er AVRIL 1966 Time/heure 9h00

λ SΩΩΩ ____ $(\Omega\Omega\Omega)_p$ 5 ~~(10mb)~~

Equipment/équipement

RADIOSONDE A. VASSY

PPPP	TT	$P_3P_3P_3$	fff	ddd
100	-56	245		
70	-55	200		
50	-54	37		
30	-50	100		
20	-47	25		
10	-35	100		
b 85	-55	262		
b 29	-50	100		
b 45	-54	32		
c 10	-35	100		

b MAXIMA ET MINIMA
c PRESSION MINIMALE

Form No. 0-3
MSC 63-9702

WMO/OMM MSC/SMC

VERTICAL DISTRIBUTION OF OZONE
DISTRIBUTION VERTICALE D'OZONE

Country/pays FRANCE

Station VAL-JOYEUX

Date 21 AVRIL 1966 Time/heure 9h00

λ SΩΩΩ 314 $(\Omega\Omega\Omega)_p$ 54 ~~(26 mb)~~

Equipment/équipement

RADIOSONDE A. VASSY

PPPP	TT	$P_3P_3P_3$	fff	ddd
100	-58	215		
70	-54	136		
50	-50	225		
30	-48	168		
b 90	-56	232		
b 49	-50	226		
b 65	-53	130		
c 23	-46	192		

b MAXIMA ET MINIMA
c PRESSION MINIMALE

Form No. 0-3
MSC 63-9702

H.2 METEOROLOGICAL ROCKETS

Reporting Points

AFETR, Antigua AAFB, B.W.I.
(Lat. 17° 09'N Long. 61° 47'W)

AFETR, Ascension Island, AFB
(Lat. 07° 59'S Long. 14° 25'W)

AFETR, Cape Kennedy, Florida
(Lat. 28° 27'N Long. 80° 32'W)

AFWTR, Eniwetok, Marshall Islands
(Lat. 11° 26'N Long. 162° 23'E)

AFWTR, Vandenberg AFB, California
(Lat. 34° 40'N Long. 120° 36'W)

Arenosillo, Spain
(Lat. 37° 06'N Long. 06° 44'W)

Eglin Air Force Base, Florida
(Lat. 30° 23'N Long. 86° 42'W)

Fort Churchill, Canada
(Lat. 58° 44'N Long. 93° 49'W)

Fort Greely, Alaska
(Lat. 64° 00'N Long. 145° 44'W)

Fort Sherman, Canal Zone
(Lat. 09° 20'N Long. 79° 59'W)

Green River, Utah
(Lat. 38° 56'N Long. 110° 04'W)

Harp, Seawell, West Indies
(Lat. 13° 06'N Long. 59° 37'W)

Heiss Island, USSR
(Lat. 80° 37'N Long. 58 03'E)

Highwater Test Range, Canada
(Lat. 45° 01'N Long. 72° 27'W)

Kindley Air Force Base, Bermuda
(Lat. 32° 21'N Long. 64° 39'W)

PMR, Barking Sands (Kauai), Hawaii
(Lat. 22° 02'N Long. 159° 47'W)

PMR, Point Mugu, California
(Lat. 34° 07'N Long. 119° 07'W)

Reporting Points

PMR, San Nicolas Island, California
(Lat. 33° 14'N Long. 119° 25'W)

Primrose Lake, Alberta, Canada
(Lat. 54° 45'N Long. 110° 03'W)

Tartagal, Argentina
(Lat. 22° 46'S Long. 63° 49'W)

Thule AB, Greenland
(Lat. 76° 33'N Long. 68° 49'W)

Thumba, India
(Lat. 08° 30'N Long. 76° 52'E)

Tonopah Range, Nevada
(Lat. 38° 00'N Long. 116° 30'W)

Uchinoura, Japan
(Lat. 31° 15'N Long. 131° 05'E)

USAMC, Kwajalein, Marshall Islands
(Lat. 08° 44'N Long. 167° 44'E)

Wallops Island, Virginia
(Lat. 37° 50'N Long. 75° 29'W)

West Geirinish, Scotland
(Lat. 57° 21'N Long. 07° 22'W)

White Sands Missile Range, New Mexico
(Lat. 32° 23'N Long. 106° 29'W)

Yuma Proving Ground, Arizona
(Lat. 32° 52'N Long. 114° 19'W)

ZURF, White Sands Missile Range, New Mexico
(Lat. 33° 46'N Long. 106° 36'W)

SHIPS:

Ship Sierra

List of Inactive Reporting Points	Date Inactive
AFMDC, Holloman AFB, New Mexico (Lat. 32° 51'N Long. 106° 06'W)	20 June 61
AFETR, Eleuthera Island AFB (Lat. 25° 16'N Long. 76° 19'W)	9 June 65
AFETR, Grand Turk Island AAFB (Lat. 21° 26'N Long. 71° 09'W)	2 Dec. 66
AFETR, San Salvador Island AAFB (Lat. 24° 07'N Long. 74° 27'W)	10 Dec. 64
McMurdo Sound, Antarctica (Lat. 77° 53'S Long. 166° 44'E)	3 Oct. 63
Point Barrow, Alaska (Lat. 71° 21'N Long. 156° 59'W)	3 Aug. 61

H.3 OZONE

The ozone data from observations at ground stations throughout the world are published by the Department of Transport, Meteorological Branch, of Canada in cooperation with the World Meteorological Organization. There is a "Catalogue of Published Data up to the End of 1966, Index No. 2" available from: Director, Meteorological Service of Canada, 315 Bloor Street West, Toronto 181, Ontario, Canada.

For information on ozone data including that available from ozonesondes contact World Data Center-A, Meteorology, National Weather Records Center, Asheville, North Carolina, U.S.A. 28801.

Publication Notice

WORLD DATA CENTER A - UPPER ATMOSPHERE GEOPHYSICS REPORT UAG
(Prepared by Environmental Research Laboratories, Boulder, Colorado)

These reports are for sale through the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402. Subscription price: $9.00 a year; $2.50 additional for foreign mailing; single copy price varies. These reports are issued on an irregular basis with 6 to 12 reports being issued each year. Therefore, in some years the single copy rate will be less than the subscription price, and in some years the single copy rate will be more than the subscription price. Checks and money orders should be made payable to the Superintendent of Documents.

Upper Atmosphere Geophysics Report UAG-1, "IQSY Night Airglow Data" by L. L. Smith, F. E. Roach and J. M. McKennan of Aeronomy Laboratory, ESSA Research Laboratories, July 1968, single copy price $1.75. [Catalog No. C52.16/2:1]

Upper Atmosphere Geophysics Report UAG-2, "A Reevaluation of Solar Flares, 1964-1966" by Helen W. Dodson and E. Ruth Hedeman of McMath-Hulbert Observatory, The University of Michigan, August 1968, single copy price 30 cents. [Catalog No. C52.16/2:2]

Upper Atmosphere Geophysics Report UAG-3, "Observations of Jupiter's Sporadic Radio Emission in the Range 7.6-41 MHz, 6 July 1966 through 8 September 1968" by James W. Warwick and George A. Dulk, Department of Astro-Geophysics, University of Colorado, October 1968, single copy price 30 cents. [Catalog No. C52.16/2:3]

Upper Atmosphere Geophysics Report UAG-4, "Abbreviated Calendar Record 1966-1967" by J. Virginia Lincoln, Hope I. Leighton and Dorothy K. Kropp, Aeronomy and Space Data Center, Space Disturbances Laboratory, ESSA Research Laboratories, January 1969, single copy price $1.25. [Catalog No. C52.16/2:4]

Upper Atmosphere Geophysics Report UAG-5, "Data on Solar Event of May 23, 1967 and its Geophysical Effects" compiled by J. Virginia Lincoln, World Data Center A, Upper Atmosphere Geophysics, ESSA, February 1969, single copy price 65 cents. [Catalog No. C52.16/2:5]

Upper Atmosphere Geophysics Report UAG-6, "International Geophysical Calendars 1957-1969" by A. H. Shapley and J. Virginia Lincoln, ESSA Research Laboratories, March 1969, single copy price 30 cents. [Catalog No. C52.16/2:6]

Upper Atmosphere Geophysics Report UAG-7, "Observations of the Solar Electron Corona: February 1964-January 1968" by Richard T. Hansen, High Altitude Observatory, Boulder, Colorado and Kamuela, Hawaii, October 1969, single copy price 15 cents. [Catalog No. C52.16/2:7]

Upper Atmosphere Geophysics Report UAG-8, "Data on Solar Geophysical Activity October 24-November 6, 1968", Parts 1 and 2, compiled by J. Virginia Lincoln, World Data Center A, Upper Atmosphere Geophysics, ESSA, March 1970, single copy price (includes Parts 1 and 2) $1.75. Part 1 [Catalog No. C52.16/2:8/1], Part 2 [Catalog No. C52.16/2:8/2]

Upper Atmosphere Geophysics Report UAG-9, "Data on Cosmic Ray Event of November 18, 1968 and Associated Phenomena" compiled by J. Virginia Lincoln, World Data Center A, Upper Atmosphere Geophysics, ESSA, April 1970, single copy price 55 cents. [Catalog No. C52.16/2:9]

Upper Atmosphere Geophysics Report UAG-10, "Atlas of Ionograms" edited by A. H. Shapley, ESSA Research Laboratories, May 1970, single copy price $1.50. [Catalog No. C52.16/2:10]

Upper Atmosphere Geophysics Report UAG-11, "Catalogue of Data on Solar-Terrestrial Physics", compiled by J. Virginia Lincoln and H. Patricia Smith, World Data Center A, Upper Atmosphere Geophysics, ESSA, June 1970, single copy price $1.50. [Catalog No. C52.16/2:11]

Upper Atmosphere Geophysics Report UAG-12, "Solar-Geophysical Activity Associated with the Major Geomagnetic Storm of March 8, 1970", Parts 1, 2 and 3, compiled by J. Virginia Lincoln and Dale B. Buckman, World Data Center A, Upper Atmosphere Geophysics, NOAA, April 1971, single copy price (includes Parts 1-3) $3.00. Part 1 [Catalog No. C52.16:12/1], Part 2 [Catalog No. C52.16:12/2], Part 3 [Catalog No. C52.16:12/3]

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Upper Atmosphere Geophysics Report UAG-13, "Data on the Solar Proton Event of November 2, 1969 through the Geomagnetic Storm of November 8-10, 1969," compiled by Dale B. Bucknam and J. Virginia Lincoln, World Data Center A, Upper Atmosphere Geophysics, NOAA, May 1971, single copy price 50 cents. [Catalog No. C52.16/2:13]

Upper Atmosphere Geophysics Report UAG-14, "An Experimental Comprehensive Flare Index and its Derivation or 'Major' Flares 1955-1969," by Helen W. Dodson and E. Ruth Hedeman, McMath-Holbert Observatory, University of Michigan, July 1971, single copy price 30 cents.