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SOLAR TERRESTRIAL PHYSICS DATA EXCHANGE.(U)

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SOLAR TERRESTRIAL PHYSICS DATA EXCHANGE

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Solar-terrestrial physics is a multi-disciplinary area of science comprising studies of the sun, the interplanetary medium and solar effects on the terrestrial environment, particularly the earth's outer atmosphere. The current international and inter-disciplinary manner of research in solar-terrestrial physics really began with comprehensive systematic world-wide studies during the International Geophysical Year (IGY) in 1957 and 1958.

Although past emphasis in solar-terrestrial physics has been largely on research for understanding the processes in the upper atmosphere and the physical mechanisms of the effect of a solar-interplanetary phenomena on this atmosphere, there has been a phase of the work directed toward more practical applications. For example, ionospheric measurements have been and continue to be utilized for the purpose of improving the planning and operation of radio telecommunications using the high frequency band where long distance point-to-point communication is made possible by radio wave reflections from the ionosphere. Interruptions to such telecommunication circuits caused by ionospheric disturbances can often be traced to specific solar phenomena such as the emission of solar x-rays. Other types of ionospheric disturbances associated with geomagnetic storms can be forecast in some cases and prompt warnings of the onset of these storms enable telecommunication services to take action to minimize the effect of the disruptions.

In the last few years, as our measurement techniques became more sophisticated and our technology more advanced, we found additional areas of solar-terrestrial physics which have direct application to ordinary daily activities. As it became known that the occurrence of a major solar flare on the sun had both immediate and delayed effects on communication systems, scientists had a need to acquire enough data of these phenomena to describe, model and predict the disturbances to our environment that could be expected after a solar flare was visually observed. In the past few years there has been increasing evidence accumulated that many of the climatic changes over the decades may be related to solar activity although neither direct nor indirect relationships are clearly evident from the data. Certainly economic benefits could be derived from being able to predict long-term changes in the weather patterns in specific areas of the world from the observations of solar activity.

One of the necessary requirements for the study of correlative phenomena such as these is the availability of an adequate data base. To accumulate such a base, contributions must be made from a world-wide network of ground-based observatories and from monitoring observations from satellites in the magnetosphere and the interplanetary medium. In many cases these observations need to extend through several solar cycles in order to delineate and understand the complex time variations.

The world data centres were established to acquire, archive and disseminate data throughout the scientific community. In doing this, these centres have developed an enormous data infor-

TABLE I

World Data Centre System
(Solar and Geophysical Data)

Auspices:	International Council of Scientific Unions (non-govermental). Referred to in many uni- and bilateral governmental documents
Started:	International Geophysical Year, 1957-1958
Mechanism:	ICSU Guide for International Data Exchange
Participation:	Voluntary
Locations:	Multiple centres for core collection (for safety and convenience) World Data Centre A in the USA World Data Centre B in the USSR World Data Centre C in Europe and Japan
Funding:	From national sources

TABLE II

Location of the World Data Centres for Solar-Terrestrial Physics

Discipline	WDC-A	WDC-B	WDC-C
Solar and Interplanetary Phenomena	Boulder, USA	Crimea, USSR Kiev, USSR Moscow, USSR	Arcetri, Italy Freiburg, FRG Meudon, France Munich, FRG Pic-du-Midi, France Rome, Italy Tokyo, Japan Toyokawa, Japan Zurich, Switzerland
Ionospheric Phenomena	Boulder, USA	Moscow, USSR	Slough, England Tokyo, Japan
Flare-Associated Events	Boulder, USA	Moscow, USSR	Itabashi, Japan Meudon, France Ondrejov, Czechoslovakia Slough, England Toyokawa, Japan Umea, Sweden
Geomagnetic Variations	Boulder, USA	Moscow, USSR	Bombay, India Charlottenlund, Denmark Hailsham, England Kyoto, Japan Tokyo, Japan
Aurora	Boulder, USA	Moscow, USSR	Edinburgh, UK Kiruna, Sweden
Cosmic Rays	Boulder, USA	Moscow, USSR	Itabashi, Japan Tokyo, Japan Umea, Sweden
Airglow	Boulder, USA	Moscow, USSR	Mitaka, Japan Paris, France

mation system that can be utilized by anyone throughout the world. Each of the world data centres is responsible for:

1. endeavoring to collect a complete set of data in the field or discipline for which it is responsible,

2. the safekeeping of the incoming data, the correct typing, copying and reproduction of the data and the maintenance of adequate standards of clarity and durability,

3. supplying copies of the data in their data centre to other data centres so that there will be duplicate records in case of loss,

4. the preparation of catalogues of data under its cognizance and

5. making data in the data centre available to the scientific community.

In addition to these responsibilities, countries in which each centre is located also provide investigators with the opportunity of working personally with the material stored in the data centre. A scientist who wishes to visit a data centre for this purpose will be provided with a desk and possibly other facilities to examine data of specific interest. For example, during 1976 two French visitors spent one month visiting World Data Centre A in Boulder, Colorado, USA where they examined 260,000 ionograms in search for a specific phenomenon. In addition to the availability of the data centre archives, visitors such as these have the opportunity of exchanging ideas with data centre personnel on various aspects of data acquisition, utilization and expected scientific achievements. Such an exchange of ideas and suggestions can often result in an improvement of data centre services to the entire scientific community.

Table I illustrates how the world data centre system functions. The data centres as we know them today were organized during the IGY and are now operated under the auspices of the International Council of Scientific Unions (ICSU). Participation in the world data centre program is voluntary. According to the operating policies described in the ICSU Guide for International Data Exchange, all contributors to the data centres may be given, upon request and without charge, a similar amount of data from the data archives. For safety and convenience there are multiple centres of data collection; World Data Centre A located in the United States, World Data Centre B located in the Soviet Union and World Data Centres C, which are discipline-oriented, located in Europe and Japan. In all cases, funding comes from national sources. The location of each of the World Data Centres for Solar-Terrestrial Physics is listed in Table II.

For convenience the broad area of "solar-terrestrial physics" is divided into eight categories as follows:

1. solar and interplanetary phenomena
2. ionospheric phenomena
3. flare-associated events
4. geomagnetic and magnetospheric phenomena
5. aurora
6. cosmic rays
7. airglow
8. miscellaneous

Each of these categories is subdivided into specific types of measurements or measurement techniques.

Scientific data may be submitted to the world data centres in many forms such as photographic film, strip charts, punched cards, magnetic tapes, microfilm or data tabulations. Once the receipt of data is logged into the data centre, the data will either be deposited in the archives directly or be further processed for compatibility with other similar data sets. At the present time World Data Centre A for Solar-Terrestrial Physics is systematically digitizing magnetograms for convenience to the user. A complete record of all data in the archives, filed by both station and discipline, is continuously updated so that requests for data can be promptly filled. Data requested from the data centres are transmitted, as much as possible, in the form that the requestor desires; i.e., on microfilm, strip charts, data tabulations, punched tape, magnetic tape, etc. The only charge for these data is for reproduction costs. As mentioned, previously contributors to the data centre may receive an equal amount of data free of charge in whatever discipline they request.

Each of the World Data Centres for Solar-Terrestrial Physics has some form of publishing selected data sets. Solar Geophysical Data, published monthly in two parts (prompt reports and comprehensive reports) by World Data Centre A for Solar-Terrestrial Physics, contains current data tabulations and information on the most commonly used solar-terrestrial physics data such as solar flares, solar x-ray measurements, solar radio noise bursts, solar particle measurements, sunspot numbers, the solar wind and interplanetary magnetic field measurements, ionospheric and radio wave propagation characteristics, geomagnetic indices and neutron monitor counting rates. A summary of the table of contents of Solar Geophysical Data (listed by discipline) is given in Table III. Other publications such as the Upper Atmosphere Geophysics (UAG) series include data collections for time

TABLE III
Table of Contents of "Solar Geophysical Data"

A.	*Solar and Interplanetary Phenomena*	From	To
A.1	Sunspot Drawings	1/67	- present
A.1	Sunspot Data (see A05a)	7/57	- present
A.2	Zürich Provisional Relative Sunspot numbers, R_Z	7/57	- present
A.2	Zürich Final Sunspot numbers, R_Z	7/57	- present
A.2	American Relative Sunspot numbers, R'_A	7/57	- present
A.2	27-day Plot of Relative Sunspot numbers (see D.1c)	7/57	- present
A.2	Sunspot Cycle (smoothed numbers) Graphs-in each issue	7/57	- present
A.2	Table of Observed and Predicted Smoothed Sunspot numbers - in each issue since IER-FB-294, updated each month, for period	10/64	- present
A.3	Mt. Wilson Magnetograms	9/66	- present
A.3	Mt. Wilson Sunspot Magnetic Field Classifications	1/62	- present
A.3	Kitt Peak Magnetograms	7/74	- present
A.4	H α Spectroheliograms	1/67	- present

TABLE III (cont'd)
Table of Contents of "Solar Geophysical Data"

A. *Solar and Interplanetary Phenomena* (continued)		From	To
A.5	Calcium Plage Drawings - McMath (or Catania)	1/67	- present
A.5	Calcium Plage (McMath) and Sunspot Regions	7/57	- present
A.5	Daily Calcium Plage Index	12/70	- present
A.6	Hα Synoptic Charts	6/73	- present
A.7	Coronal Line Emission Indices (Provisional)	7/57	- 5/66
A.7	Coronal Line Emission Indices (Final)	1/60	- 6/74
A.7	White Light Corona (NRL OSO-7, 1971-083A)	2/72	- present
A.7	Solar EUV Spectroheliograms FeXV 284 Å (GSFC OSO-7, 1971-083A)	5/72	- 3/74
A.7	Solar XUV Coronagrams (NRL OSO-7, 1971-083A)	10/72	- 12/73
A.8	2800 MHz (ARO-Ottawa) Daily Observed Values of Solar Flux	7/57	- present
A.8	2800 MHz (Ottawa) Final - Daily Observed Values of Solar Flux	1/62	- 12/66
A.8	2800 MHz (ARO-Ottawa) Daily Values Solar Flux Adjusted to 1 A.U.	1/64	- present
A.8	2800 MHz (Ottawa) Final - Daily Values of Solar Flux Adjusted to 1 A.U.	1/64	- 12/66
A.8	470 MHz (Boulder) Daily 3-hourly Averages	7/57	- 3/58
A.8	167 MHz (Boulder) Daily 3-hourly Averages	7/57	- 12/58
A.8	200 MHz (Cornell) Daily 3-hourly Averages	7/57	- 12/58
A.8	9530 MHz (USNRL) Daily Averages	2/58	- 4/59
A.8	3200 MHz (USNRL) Daily Averages	2/58	- 4/59
A.8	15400, 8800, 4995, 2695, 1415, 606, 410, 245 MHz (AFCRL) Solar Flux Adjusted to 1 A.U. (15400 MHz began 11/67 and 245 MHz began 1/70)	1/67	- present
A.9	9.1 cm (Stanford) Radio Maps of the Sun	4/60	- 8/73
A.9	9.1 cm Spectroheliogram Data - included in A.5a since 1/69		
A.9	21 cm (Fleurs) Radio Maps of the Sun	12/64	- 12/73
A.9	8.6 mm (Prospect Hill) Radio Maps of the Sun	4/70	- 2/74
A.9	8.6 mm (NELC) Radio Maps of the Sun	11/74	- present
A.9	2 cm (NELC) Radio Maps of the Sun	6/74	- present
A.10	169 MHz (Nançay) Interferometric Observations	7/57	- present
A.10	408 MHz (Nançay) Interferometric Observations	11/65	- 8/71
A.10	21 cm (Fleurs) East-West Solar Scans	10/65	- present
A.10	43 cm (Fleurs) East-West Solar Scans	4/66	- present
A.10	10.7 cm (Ottawa-ARO) East-West Solar Scans	6/68	- present
A.11	Solar X-ray Background Levels (NRL) (satellites, see below)	1/64	- 4/74
A.11	Solar X-ray Background Levels (NRL Graphs) (satellites, see below)	3/65	- 4/74
A.11	Solar X-ray Background Levels (Boulder) (satellites, see below)	12/65	- 11/68
A.11	Solar X-ray Background Levels (France) (satellites, see below)	4/66	- 5/66
A.11	Solar X-ray Background Levels (Aberdeen, S. D.)	1/66	- 11/68
	Popular Name — Satellite Designation		
	SOLRAD 7A — 1964-1D	1/64	- 10/64
	SOLRAD 7B — 1965-16D	3/65	- 12/65
	SOLRAD 8 (Explorer 30) — 1965-93A	1/66	- 12/67
	OGO-4 — 1967-73A		
	OSO-4 — 1967-100A	1/68	- 3/68
	SOLRAD 9 — 1968-17A	3/68	- 7/72
	(Explorer 37)	6/73	- 4/74
	(Beginning 12/68 daily/hourly averages presented)		
	SOLRAD-10 — 1971-58A	8/72	- 6/73
	(Explorer 44)		
A.11	Solar X-ray Background Levels, 0-20Å Injun 1/SOLRAD-3, 1961-02	6/61	- 12/61
A.11	Solar X-ray Background Levels (Vela 1,2; 1963-39A,C)	(10/63)	
A.11	Solar X-ray Background Levels (McMath) (OSO-3; 1967-20A), 8-12A	3/67	- 8/67
A.11	Solar X-ray (OSO-5; 1969-6A) Spectroheliograms	7/69	- 11/72
	(University College London, Leicester Univ.)	7/74	- 6/75
A.11	Solar X-ray (GSFC OSO-7, 1971-083A) Spectroheliograms	12/72	- 7/74
A.11	Solar X-ray Background Levels (SMS-1/GOES, 1974-033A); (SMS-2/GOES, 1975-011A)	11/74	- present
A.11	Solar X-ray	8/75	- present
A.12	Solar Protons, Daily-hourly Values, JPL/GSFC (satellites, see below)	5/67	- 5/73

TABLE III (cont'd)
Table of Contents of "Solar Geophysical Data"

A. *Solar and Interplanetary Phenomena* (continued)		From	To
A.12	Solar Protons, Graphs, JPL/GSFC (satellites, see below)	5/67	5/73
	Popular Name — Satellite Designation		
	Explorer 34 — 1967-51A, Ep > 10, > 30, > 60 Mev	5/67	5/69
	Explorer 41 — 1969-53A, Ep > 10, > 30, > 60 Mev	6/69	12/72
	Explorer 43 — 1971-19A, Ep > 10, > 30, > 60 Mev	11/71	5/73
A.12	Cosmic Ray Protons, Ep 0.6-13, 13-175, > 175 Mev, Univ. of Chicago (Pioneer 6; 1965-105A and Pioneer 7; 1966-75A)	3/69	present
A.12	Cosmic Ray Protons, Ep > 13.9, > 64 or > 40 Mev, Univ. of New Hampshire (Pioneer 8; 1967-123A and Pioneer 9; 1968-100A)	12/69	present
A.12	Cosmic Ray Protons, Ep 5-21, 21-70 Mev, Aerospace (ATS-1; 1966-110A)	1/70	8/72
A.12	Low Energy Protons (NOAA satellites 1972-082A, 1973-086A, 1974-089A)	7/74	present
A.13	Solar Wind (Pioneer 6, 1965-105A; and Pioneer 7, 1966-75A) NASA Ames	12/65	present
A.13	Solar Wind, M.I.T.		
	Pioneer 6, 1965-105A	3/69	2/70
		12/73	present
	Pioneer 7, 1966-75A	6/69	12/69
A.13	Solar Wind (Vela 3, 1964-40A; Vela 5, 1965-58A)	1/69	6/72
A.13	Solar Wind from IPS Measurements (UCSD)	1/75	present
A.17	Interplanetary Magnetic Field		
	Pioneer 8, 1967-123A	10/72	present
	Pioneer 9, 1968-100A	4/72	present
A.17	Inferred Interplanetary Magnetic Field	12/71	present
A.18	Interplanetary Electric Field		
	Pioneer 8, 1967-123A	5/72	present
	Pioneer 9, 1968-100A	4/72	present
B.	***Ionospheric (and Radio Wave Propagation) Phenomena***		
B.10	Radar Meteor Indices, perpetual, based upon 1958-1962 *data for N45 latitude — see issues 246, 251*		
B.51	NARWS Quality Figures and Forecasts (NBS/ESSA)	7/57	12/65
B.51	NARWS Comparison Graphs (NBS/ESSA)	7/57	12/65
B.51	NPRWS Quality Figures and Forecasts (NBS)	7/57	12/65
B.51	NPRWS Comparison Graphs (NBS)	7/57	10/64
B.51	High Latitude Quality Figures and Forecasts (ESSA/OT)	11/64	present
B.51	High Latitude Comparison Graphs (ESSA/OT)	11/64	11/73
B.52	North Atlantic Graphs of Useful Frequency Ranges (German PTT)	7/57	present
B.53	Quality Figures Based Upon Frequency Ranges (German PTT)	1/70	present
C.	***Flare-Associated Events***		
C.1	H-α Solar Flares (Preliminary)	7/57	present
C.1	H-α Solar Flares (including Standardized Data) (Divided into Confirmed and Unconfirmed Flares as of 1/68)	9/66	present
C.1	H-α Subflares	7/57	present
C.1	H-α Flare Patrol (the most recent issue listed for a month contains the comprehensive flare patrol.)	7/57	present
C.1	H-α Flare Index (daily)	9/69	present
C.1	H-α Flare Index (by region)	9/70	present
C.1	Frequency of Occurrence of Confirmed Solar Flares	1/68	6/68
C.3	2800 MHz (Ottawa) Outstanding Occurrences	7/57	present
C.3	2800 MHz (Ottawa) Hours of Observation	7/57	present
C.3	470 MHz (Boulder) Outstanding Occurrences	7/57	3/58
C.3	167 MHz (Boulder) Outstanding Occurrences	7/57	10/60
C.3	167 MHz (Boulder) Hours of Observation	1/59	12/59
C.3	200 MHz (Cornell) Outstanding Occurrences	7/57	12/58
C.3	9530 MHz (USNRL) Outstanding Occurrences	2/58	4/59
C.3	3200 MHz (USNRL) Outstanding Occurrences	2/58	4/59
C.3	200 MHz (Hawaii) Outstanding Occurrences	6/59	8/59
C.3	108 MHz (Boulder) Outstanding Occurrences	1/60	6/66
C.3	108 MHz (Boulder) Hours of Observation	1/60	6/66

TABLE III (cont'd)
Table of Contents of "Solar Geophysical Data"

C. *Flare-Associated Events* (continued)		From	To
C.3	221 MHz (Boeing-Seattle) Outstanding Occurrences (Interferometric) — Changed to 223 MHz in May 1963	4/62 -	7/63
		5/65 -	11/65
C.3	107 MHz (Haleakala) Outstanding Occurrences	6/65 -	3/66
C.3	10700, 2700, 960 MHz (Pennsylvania State Univ.) Outstanding Occurrences	7/64 -	present
C.3	486 MHz (Washington State Univ.) Outstanding Occurrences	7/66 -	4/69
C.3	18 MHz Bursts (Boulder) (reported in C.6 1/63 - 11/66, C.6ab prior to 1/63)	11/67 -	present
C.3	35000, 15400, 8800, 4995, 2695, 1415, 606, 410, 245 MHz (AFCRL - Sagamore Hill) Outstanding Occurrences (15400 MHz began 11/67, 35000 and 245 MHz began early 1969, 410 MHz began 1971)	1/66 -	present
C.3	184 MHz (Boulder) Outstanding Occurrences	3/67 -	7/72
C.3	7000 MHz (Sao Paulo) Outstanding Occurrences	11/67 -	present
C.3	408 MHz (San Miguel) Outstanding Occurrences	10/67 -	4/72
C.3	18 MHz (McMath-Hulbert) Bursts	1/68 -	present
C.3	43.25, 80 and 160"MHz (Culgoora) Selected Bursts	12/72 -	present

Note: Beginning with the data for April 1966, in CRPL-FB-261, the C.3 entries on Solar Radio Outstanding Occurrences for the western hemisphere observatories and frequencies were combined into a single table "Solar Radio Emission Outstanding Occurrences, C.3." Beginning with June 1969 data, the table was expanded to worlwide coverage and the various observatories are no longer indexed separately.

		From	To
C.4	Solar Radio Spectrograms of Events (Fort Davis)	7/57 -	12/58
	100 - 580 MHz	7/57 -	12/58
	25 - 580 MHz	1/59 -	12/62
	50 - 320 MHz	1/63 -	3/65
	25 - 320 MHz	4/65 -	12/66
	10 - 580 MHz	1/67 -	2/70
	10 - 1000 MHz	3/70 -	4/70
	10 - 2000 MHz	5/70 -	5/73
	20 - 4000 MHz	5/73 -	3/74
	25 - 320 MHz	4/74 -	present
C.4	2100-3900 MHz Solar Radio Spectrograms of Events (Fort Davis)	1/60 -	12/61
C.4	Solar Radio Spectrograms of Events (Boulder)		
	7.6 - 41 MHz	3/61 -	8/68
	7.6 - 80 MHz/	9/68 -	present
C.4	450-1000 MHz Solar Radio Spectrograms of Events (Owens Valley)	11/60 -	10/61
C.4	Solar Radio Spectrograms of Events (Culgoora)		
	10 - 210 MHz	1/67 -	7/69
	8 - 2000 MHz	8/69 -	2/70
	8 - 4000 MHz	3/70 -	10/70
	8 - 8000 MHz	11/70 -	present
C.4	30-1000 MHz Solar Radio Spectrograms of Events (Weissenau, GFR)	3/68 -	present
C.4	Solar Radio Spectrograms of Events (AFCRL — Sagamore Hill)		
	19 - 41 MHz	1/68 -	7/70
	24 - 48 MHz	7/70 -	8/75
	25 - 75 MHz	8/75 -	present
C.4	20-60 MHz Solar Radio Spectrograms of Events (Clark Lake)	4/70 -	9/70
C.4	160-320 MHz Solar Radio Spectrograms of Events (Dwingeloo)	1/74 -	present
C.4	100-1000 MHz Solar Radio Spectrograms of Events (Dürnten)	1/74 -	present
C.4	24-48 MHz Solar Radio Spectrograms of Events (Manila)	4/74 -	present
C.5	Solar X-ray Events (Vela 1,2; 1963-39A,C)	(10/63)	
C.5	Solar X-ray Events (Univ. of Iowa)		
	Explorer 33; 1966-58A (2-12Å)	7/66 -	10/71
	Explorer 35; 1967-70A (2-12Å)	12/67 -	7/72
C.5	Solar X-ray Events (NRL Tabulation)	1/64 -	10/64
	(See A.11ab for NRL Graphs and list of Satellites)	and 3/65 -	present
C.5	Solar X-ray Events (McMath-Hulbert) OSO-3; 1967-20A (8-12Å)	3/67 -	8/67
C.5	Solar X-ray Events (SMS-1/GOES; 1974-033A; SMS-2, 1975-011A)	11/74 -	present
C.6	Sudden Ionospheric Disturbances (SID)	1/63 -	present
C.6	Sudden Ionospheric Disturbances (SWF)	7/57 -	included in C.6 after 12/62

TABLE III (cont'd)
Table of Contents of "Solar Geophysical Data"

		From	To
C. *Flare-Associated Events* (continued)			
C.6	Sudden Ionospheric Disturbances (SCNA, SEA, bursts)	1/58 -	included in C.6 after 12/62
C.6	Sudden Ionospheric Disturbances (SPA)	6/61 -	included in C.6 after 12/62
C.7	Solar Proton Events — Direct Measurement — same as A.12	5/67 -	present
C.8	Solar Proton Events — Riometer Confirmed Polar Cap Absorption Events (ESSA)	1/67 -	6/67
C.8	Solar Protons, 26 MHz Riometer Events (South Pole) Provisional	9/63 -	11/67
C.8	Solar Protons, 30 MHz Riometer Events (Frobisher Bay)	1/65 -	5/65
C.8	Solar Protons, 30 MHz Riometer Events (Great Whale River)	6/65 -	2/67
D. *Geomagnetic and Magnetospheric Phenomena*			
D.1	Geomagnetic Indices Ci, Cp, Kp, Ap, aa, Selected Days (aa first published 1/74)	7/57 -	present
D.1	27-day Chart of Kp for Year	7/57 -	present
D.1	27-day Chart of Kp Indices	7/57 -	present
D.1	27-day Chart of C9 for Year	7/57 -	present
D.1	Principal Magnetic Storms	7/66 -	present
D.1	Reduced Magnetograms	1/67 -	present
D.1	Sudden Commencements and Solar Flare Effects	1/66 -	present
D.1	Equatorial Indices Dst	5/73 -	present
F. *Cosmic Rays*			
F.1	Cosmic Ray Daily Averages Neutron Monitors (Deep River — graph of hourly values, daily averages begin 11/65)	1/59 -	present
•F.1	Cosmic Ray Daily Averages Neutron Monitors (Climax)	9/60 -	3/72
	Daily averages and graph of hourly values	12/74 -	present
F.1	Cosmic Ray Daily Averages Neutron Monitors (Dallas)	1/64 -	3/74
F.1	Cosmic Ray Daily Averages Neutron Monitors (Churchill)	5/64 -	6/72
F.1	Cosmic Ray Daily Averages Neutron Monitors (Alert) Graph of hourly values (Alert)	7/66 -	present
F.1	Cosmic Ray Daily Averages Neutron Monitors (Calgary — also graph of hourly values)	1/71 -	present
F.1	Cosmic Ray Daily Averages Neutron Monitors (Sulphur Mountain — also graph of hourly values)	1/71 -	present
F.1	Cosmic Ray Daily Averages Neutron Monitors (Thule — also graph of hourly values)	4/73 -	present
F.1	Cosmic Ray Daily Averages Neutron Monitors (Tokyo — also graph of hourly values)	12/73 -	present
F.1	Cosmic Ray Daily Averages Neutron Monitors (Kiel — also graph of hourly values)	12/73 -	present
H. *Miscellaneous*			
H.60	Alert and Special World Interval Decisions (IUWDS Geophysical Alerts)	7/57 -	present
H.61	International Geophysical Calendar	1/62 -	12/62
H.62	Abbreviated Calendar Record	12/68 -	present
H.63	Retrospective World Intervals	1/66 -	12/67

periods of special interest, as shown in Table IV, or other specialized data collections or indices. Examples of publications and services available from World Data Centre A for Solar-Terrestrial Physics are given in the information booklet entitled Solar-Terrestrial Physics Services and Publications which is available from World Data Centre A for STP, NOAA, Boulder, Colorado, 80302, USA.

Fig. 1 is a map of the western hemisphere illustrating locations where solar-terrestrial physics observations are being conducted. During the past year data acquired at many of these stations have been sent to scientists in all parts of the world. For example, in the period July 1975 to July 1976, World Data Centre A for STP received 34 individual requests for ionospheric vertical sounding data acquired in South America. These 34 requests represented 899 station-months of data. Sixty-six separate requests were made for geomagnetic data from South American locations representing a total of 1535 station-months of data.

During the next three years requests for data are expected to increase markedly as scientists participate in the International Magnetospheric Study project in an attempt to gain a better understanding of the earth's magnetosphere, the interplanetary medium and the interaction between the two. The exchange of scientific data through the world data centre system for projects such as the International Magnetospheric Study should prove

TABLE IV

UAG Report on Selected Solar-Terrestrial Events

UAG-5:	"Data on Solar Event of May 23, 1967 and its Geophysical Effects", compiled by J. Virginia Lincoln, World Data Centre A, Upper Atmosphere Geophysics, ESSA, February 1969.
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most fruitful, not only for the scientists participating in these programs, but also for the increased understanding of the environment in which we live and the subsequent benefit for mankind.

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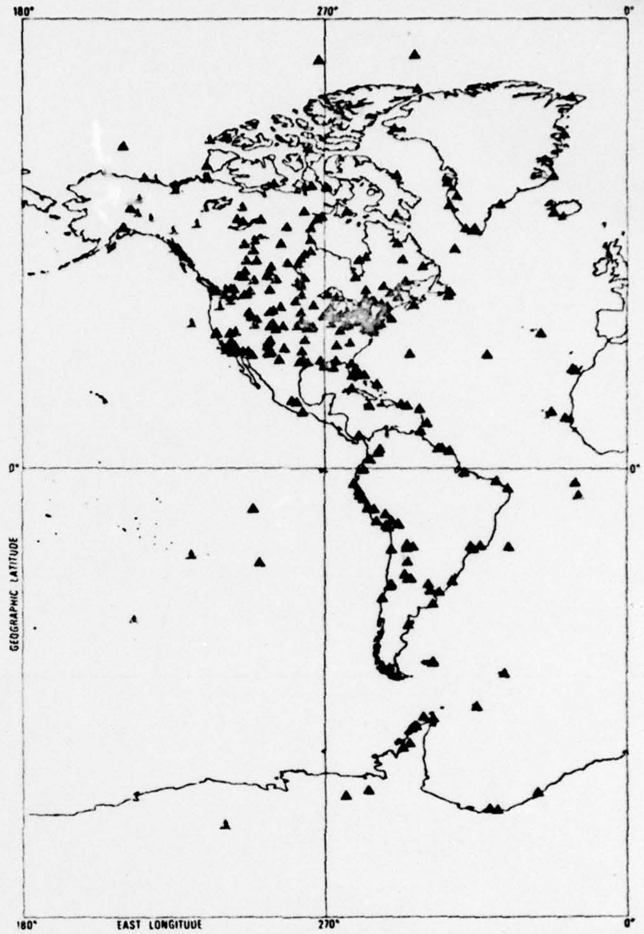

Figure 1. A map of the western hemisphere where the triangles denote locations at which solar-terrestrial physics observations are being conducted. (Courtesy of World Data Centre A for Solar-Terrestrial Physics.)

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A description of the solar-terrestrial physics scientific data exchange and information systems operated by the World Data Centers is presented. This includes a brief history of the data center system, a listing of the various types of data archived and disseminated and a summary of relevant publications of World Data Center A for Solar-Terrestrial Physics.

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