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SCIENTIFIC COMMITTEE
ON
SOLAR-TERRESTRIAL PHYSICS

79-4

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IMS NEWSLETTER

This issue is the last with Toyohisa Kamei on the letterhead. He has returned to Kyoto after some two years work at the IMSCIE Office (and on his thesis and other research) made notable by improved computerization of our information files, keeping up the IMS calendar, and improving coverage of Japanese and other IMS programs. Also, another IMSCIE Associate is preparing to leave. Peter Davies will soon return to Australia after a year in IMSCIE. While here, Peter was the "voice" of the IMS NL during extended absences and times of preoccupation by the rest of our staff. Maurizio and I will miss these friends, especially at month's end when IMS NL time comes round.

J.H.A. 79/04/04

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PROGRAM PLANS FOR APRIL 1979 - JUNE 1979

SPECIAL IMS HIGH-ALTITUDE SATELLITE PERIODS - 1979

Special IMS High-Altitude Satellite Intervals for Apr - Jun 1979 are given below. Page 5 of NL 79-3 has a detailed listing of all the SSC - selected Special Satellite intervals for January - June 1979 and the satellite configurations that were the basis for selection of these periods. As was done for such earlier intervals, start and end times were extended from the model calculations to allow for boundary fluctuations during disturbances. Details for the latter half of 1978 were published in NL 78-8, pg 4.

#4	8 Apr	98/1900 UT	to	10 Apr	100/0900 UT
#5	27 Apr	117/2200 UT	to	29 Apr	119/1600 UT
#6	27 May	147/2300 UT	to	29 May	149/2400 UT
#7	6 Jun	157/0200 UT	to	8 Jun	159/0500 UT

SPECIAL LOW-ALTITUDE SATELLITE CONJUNCTIONS

The IMS Satellite Situation Center prepares a weekly forecast of times of satellite magnetic field line conjunctions for the principal high-altitude IMS satellites (ISEE-1&2, GEOS-2 and SCATHA), selected low-altitude satellites and selected ground arrays. This information is telexed by the IMSCIE Office, upon request, to some 20 locations for use by project scientists, satellite tracking controllers and administrators. Those interested in addition of other satellites or ground based experiments to these forecasts should contact J. Vette, IMS SSC (see NL letterhead for address) and anyone wishing to receive the weekly telexes should contact the SSC or the IMSCIE Office.

Because of the introduction of SCATHA, the number of conjunctions has become so vast to suggest a change of format. Time intervals of special significance are now selected. These, numbered sequentially, include all conjunctions between target satellites (ISEE, GEOS-2, SCATHA) and those conjunctions between target satellites and low altitude satellite or ground based station which fall in the selected interval. These periods are called " special periods of magnetic conjunction ". In addition to these times two tables are given; the first shows additional information about conjunctions between target satellites, including altitudes, geomagnetic separation and separation along the magnetic flux tube; the second shows the total number of conjunctions between each target satellite and the other satellites and ground stations. Additional information about these conjunctions is available directly from the SSC.

GROUND-BASED, BALLOON AND ROCKET CAMPAIGNS:

----------Phenomena-related Campaigns----------

Mar -- to Apr --; S.I. Avdyushine, C. Renard; "IPOCAMP 3"; Heiss Is; ROCKET - see NL 79-2 pg 3
Mar 13 to Apr 4; G. Holmgren; "Ba-GEOS S-29"; ESRANGE; ROCKET - Nike Black Brant VC - see NL 79-1 pg 2
Mar 15 to Apr 6; G. Haerendel; "Porcupine III & IV"; ESRANGE; Rockets (2) - Aries - see NL 78-9 pg 3
Mar 16 to Apr 3; E.M. Wescott "12.1003, 12.1004"; Poker Flat; ROCKETS - 12.1003, 12.1004-plasma physics
Apr 13 to Apr 30; J.P. Heppner; "18.217-8GEX, 29.011-2GEX"; Poker Flat; ROCKETS (4) - see NL 79-1 pg 3
Apr ----------; G. Rottman; "27.028US"; White Sands; ROCKET - see NL 78-12 pg 3
Apr 23 to May 4; E.R. Williams; "P201H"; South Uist; ROCKET - Petrel - see NL 79-2 pg 3
Jun 1 to Jul 13; S. Ullaland; "SBARMO 79"; N. Scandinavia; BALLOONS (36) - see NL 79-4 pg 2
Jun 1 to Jul 13; J. Wygand; Manitoba, Canada; BALLOONS (5) - See NL 79-4 pg 3

------Quasi-synoptic Observations involving Balloons, Rockets, Aircraft, Selected Surface Campaigns------

Mar 15 to Jun 20; Siebert, Wedeken, Krenzien; "GEOMAGNETIC PULSATIONS"; N. Scandinavia;
Monthly; Wright & Hilsenrath; "OZONESONDE"; Various Sites; ROCKETS - See Actualities, NL 77-10, pg 3

REGIONAL IMS SAT/GBR PROGRAM DETAILS, APRIL - JUNE 1979

Program details for many brief listings given above appeared, as indicated, in earlier IMS NLs.

GROUND BASED

USSR (SIBERIA)

SIBERIA-IMS-79 --- I. A. Zhulin has sent the IMSCIE office details of SIBERIA-IMS-79. SIBIZMIR and IKFIA continue their work on expedition SIBERIA-IMS-79, on two chains of stations along the Norilsk (88 degrees) and Yakutsk (130 degrees) meridians. Provisional observation stations will be set up along the Norilsk meridian at the following points; Golomenny Island (geographic latitude 73.3 degrees), Isachenko Island (70.8 degrees), Cape Sterlingov (69.3 degrees), Ust-Tareya (67.7 degrees), Kresty (65.6 degrees), Norilsk (64.2 degrees), Snezhnogorsk (63.2 degrees), Turukansk (61.1 degrees). The active period of observations is from January 20 through March 30, 1979.

The main scientific objective of the expedition is the study of formation and dynamics of magnetosphere - ionosphere structures, in particular auroral electrojet, the zone of enhanced intensity of electron and proton precipitations, generation regions of different type short-period pulsations and radioauroras.

Observation points will be equipped with magnetic variometers, fluxmeters, zenith and scanning photometers, all-sky cameras (Golomenny, Cape Sterlingov and Norilsk). The whole geophysical complex in Norilsk will be under operation. In Turukhansk, it is planned to install VLF instrumentation to locate the plasmapause by whistler mode registrations.

BALLOONS

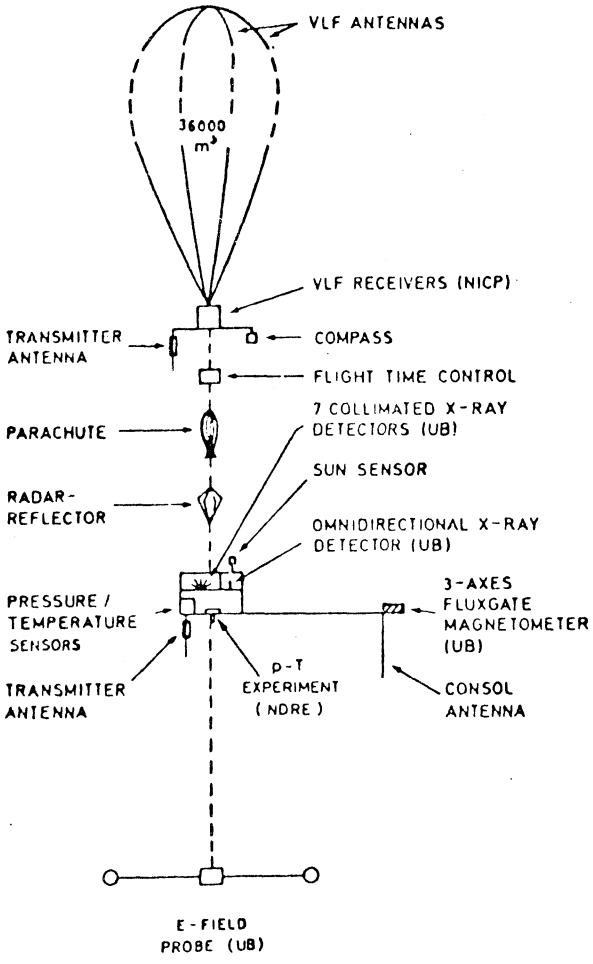
N. SCANDINAVIA

"SBARMO 79" --- Project scientist for this auroral zone balloon program is S. Ullaland, University of Bergen. Thirty six balloons will be launched from Honningsvag, Karasjok (Norway), Sodankyla, Oulu (Finland) in the period June 1 to July 13, 1979. The balloons will be flown near the geomagnetic conjugate areas of GEOS-2 and later drift westward. The instruments will measure auroral X-rays, magnetic and electric fields, VLF emissions and atmospheric infrasonic waves. Continuous telemetry of the balloons will be performed from degrees 25E to 55W.

The SBARMO-78 campaign aims at a further understanding of dynamical processes in the magnetosphere. The coupling of phenomena in the outer magnetosphere with those in the auroral zone ionosphere is of special interest. Examples of phenomena to be investigated are the processes preceding the break-up phase of magnetospheric substorms, the break-up phase itself and the redistribution of particles and fields following

the substorm. It is not yet known how substorms are triggered and how the trigger is loaded. Furthermore, substorms abrubtly change the conditions for particle propagation in the outer magnetosphere. Radial and pitch-angle diffusion can drastically change the particle distribution. Other phenomena of interest are related to the occurrence of ssc's. It will be possible to investigate in detail their implications on the particle flux variations and their relationship to substorms. In the case of solar particle events the influence that magnetospheric processes have on the propagation of solar particles can be studied.

Experiments, principal investigators/institutes are;- Directional X-ray detectors, - Kremser MPAE, Stadsnes U. Bergen; Omnidirectional X-ray detectors (energy spectrometer), Kremser MPAE, Riedler Tech U. Graz, Bronstad U. Bergen, Tanskanen U. Oulu; DC E-field probe - Bronstad, UB, Fahleson Royal Ins. Tech. Stockholm, Riedler TUG; DC B-field probe - Bjordal U. Bergen; VLF goniometer - Egeland Norwegian Inst. of Cosmic Physics, Blindern; Infrasonic wave probe - Thrane NDRE;



Sketch of the configuration of the multi-experiment payload (MEP)

The most important parameters to to be measured during the balloon flights are auroral X-rays and electric fields. The corresponding experiments on the GEOS satellites are the medium (S-321) and low energy particle (S310) experiments and magnetic and electric field experiments (S-300, S-331). It is also intended to coordinate the balloon flights with the program of the ISEE satellites and other balloon campaigns (University of Berkeley, USA; University of Calgary, Canada; Danish Space Research Institute, Denmark). In addition ground based observations will be carried out in Scandinavia by several groups. Further details on ground based observations may be obtained from the CCOG hanbook.

Three different kinds of payloads will be used: a multi-experiment payload, a special aurora X-ray payload, and a payload for the combined measurement of omnidirectional X-ray fluxes and electric fields.

Multi-experiment payload MEP - this payload contains experiments to measure auroral X-ray fluxes (directional and omnidirectional), electric and magnetic fields, VLF emissions and atmospheric infrasonic waves. A sketch of the payload appears above.

Auroral X-ray fluxes are measured by a six channel omnidirectional X-ray spectrometer and an array of seven collimated detectors. The detectors consist of cylindrical NaI(Tl) crystals (5.08 cm diameter, 2.54 cm height) mounted on photomultipliers. Electric fields are measured by one pair of electric field probes, the magnetic field by a three axis fluxgate magnetometer.

Two orthogonal loop antennas are used to record VLF emissions. Acoustic waves are detected via the associated temperature variations. Five or six multi-experiment payloads will be flown.

Special auroral X-ray payload (SAP) - this payload was designed for an optimum recording of temporal and spatial variations of the auroral X-ray flux and its energy spectrum. It contains a multichannel omnidirectional X-ray spectrometer and an array of four collimated detectors. All detectors consist of cylindrical NaI(Tl) crystals (2.54 cm height and diameter) and two pairs of electric field probes in a configuration that enables the recording of three electric field components. Twenty one combined payloads will be flown.

Payload for the combined measurement of omnidirectional X-ray fluxes and electric fields (CEP) - this payload contains one uncollimated X-ray detector (cylindrical NaI(Tl) crystal, 2.54 cm height and diameter) and two pairs of electric field probes in a configuration that enables the recording of three electric field components. Twenty one combined payloads will be flown.

THOMSON, MANITOBA

U.C. Berkeley will launch 3 to 5 balloons at Thomson, Manitoba in conjunction with SBARMO-79. The balloons will fly at an altitude of 30,000 km and will make E-field measurements. Launch dates will be between June 1 and July 13. Project scientist is J. Wygand, Space Sciences Laboratory, U. C. Berkeley.

SATELLITES

GEOS-2 --- A. Pedersen has supplied the following information about the current GEOS-2 operation plans. The satellite attitude will be changed for a short period. The spin axis will be tilted by 90 degrees, to lie close to the earth equatorial plane for the benefit of the ion spectrometer experiment, which will be looking along the magnetic field lines, and not orthogonal to them as for the usual position. This position will be held for the period April 26 to 30, 1979. Acquisition of telemetry will be possible only for short periods (roughly one hour), around noon and midnight, because of the orientation of the antenna. The period May 1 to 23, 1979, immediately following the previous, will see a switch over of the ground facilities from GEOS-2 real time operations to the analysis of GEOS-1 data collected during the reactivation. The GEOS-2 data will therefore not be available for this period.

ROCKETS

POKER FLAT

18.217-8GEX, 29.011-2GEX --- Note that the new launch date for these rockets is Apr 13 to Apr 30.

MEETINGS and CONFERENCES

Symposium on IMS Results, Melbourne --- Further details on the arrangements for this Symposium have been issued in Bulletin II.

Financial Assistance: The local organising committee is able to provide assistance by way of registration fees and/or local living expenses to a limited number of scientists who may experience difficulties in getting to the Symposium otherwise. Please write confidential enquiries immediately to Mr. R. Tuttleby, Secretary, Local Organising Committee, IMS Symposium, La Trobe University, Bundoora, Victoria, Australia 3083. Not all applications for assistance will be able to be met and preference will be given to scientists presenting a paper and with special financial difficulties.

Air Fares: Overseas prospective attendees should note that recently reduced air fares on a prepayment basis from many parts of the world to Australia have been introduced. Enquire at your international airline for details. Participants should note that November/December is a busy period for travel to and from Australia and earlier bookings are advised.

Accommodation: The recommended accommodation at the Symposium is on the campus at La Trobe University. The university colleges provide very good accommodation and bed and breakfast costs $13.50 per day. For lunch and dinner the costs are between $3.00 to $4.00 and $4.50 to $5.50 respectively, while snacks can be purchased at various food bars on campus for as little as 80c.

There are two small motels near the campus but there is plenty motel and hotel accommodation more than 10 km from the campus, but in this case participants would need to provide their own transport.

Social Programme: The social programme will include a welcome on campus, a dinner on campus, and a reception at the Parliament House of Victoria.

Transport: Many international flights come to Melbourne. Some terminate in Sydney. For transport of participants from Melbourne after the IMS Symposium to Canberra for IAGA meetings, Trans Australia Airlines are making special flight arrangements for December 2 and 3, 1979.

Chapman Conference on Waves and Instabilities in Space Plasma, August 7-9, 1979 --- AGU and the University of Denver will sponsor a Chapman Conference on Waves and Insabilities in Space Plasma, which will cover wave generation mechanisms and plasma instabilities in the areas of planetary magnetosphere, interplanetary, and solar physics. The conference will be held August 7-9, 1979, on the campus of the University of Denver, Denver, Colorado.

The purpose of the conference is to bring together plasma physicists who are working on diverse but complementary problems in laboratory and space plasmas. The emphasis is on the applications of recent plasma theory to space physics problems. The role of inhomogeneities and nonlinear effects in the plasma instabilities will be of special interest at the conference. Relevant space plasma observations by recent spacecraft experiments and their interpretation in terms of plasma instabilities also will be appropriate topics of the conference.

The conference format provides tutorial and review lectures on plasma instability theories, the general status of observations and theory of space plasmas, and problems and limitations in future space experiments.

Contributed papers relevant to the conference topics are solicited. Suggestions for the names of speakers to give reviews and tutorial lectures are welcome and may be transmitted to the convenors or program committee members. Convenors are V. L. Patel, Dept. of Physics, University of Denver, and B. Coppi, Dept. of Physics, Massachusetts Institute of Technology. Those interested in attending the conference should send their name, title, address, and phone number to the American Geophysical Union Registration information will be sent to correspondents in June 1979. Pertinent information will appear in EOS.

Conference Planning. Six sessions of three hours each are planned. The first two sessions will be on magnetospheric plasma: Low frequency waves, cyclotron, hybrid waves, drift instabilities due to inhomogeneities, mode coupling, non-linear effects, multi-component modes. Third session - Instabilities in the cusp region: Double layers, and associated instabilities problems. Fourth session - Interplanetary and Solar plasma: Wave-instabilities near the sector boundaries, bow-shock, and near-solar region, large amplitude waves. Fifth session - Astrophysics problems: Application of concepts tested in the near-earth plasma to the stellar physics. Sixth session- Panel discussion: Requirements on the experimental observations (time resolution, scale lengths etc.) for comparison with theory, trends in theory. Panel will consist of experimentalists, theorists and data analysis experts.

COSPAR 1979 Plenary Meeting --- The 22nd Plenary Meeting of COSPAR convenes in Bangalore, India, May 29 - June 9, 1979. In addition to the COSPAR meetings, four symposia and a workshop will be held during the same period. They are:- A) Vikram Sarabhai Symposium on Space Development B) Symposium on Gamma-Rays, C) Symposium on Low Latitude Aeronomical Processes, D) Symposium on the Contribution of Space Research to Water Resources Studies and the Management of these Resources, and E) Workshop on Remote Sensing and Mineral Exploration.

Advance registration forms and details may be obtained from the Organizing Committee, XXII COSPAR-79, c/o Assistant Scientific Secretary, Indian Space Research Organisation (Headquarters), Cauvery Bhavan, District Office Road, Bangalore 560009, INDIA.

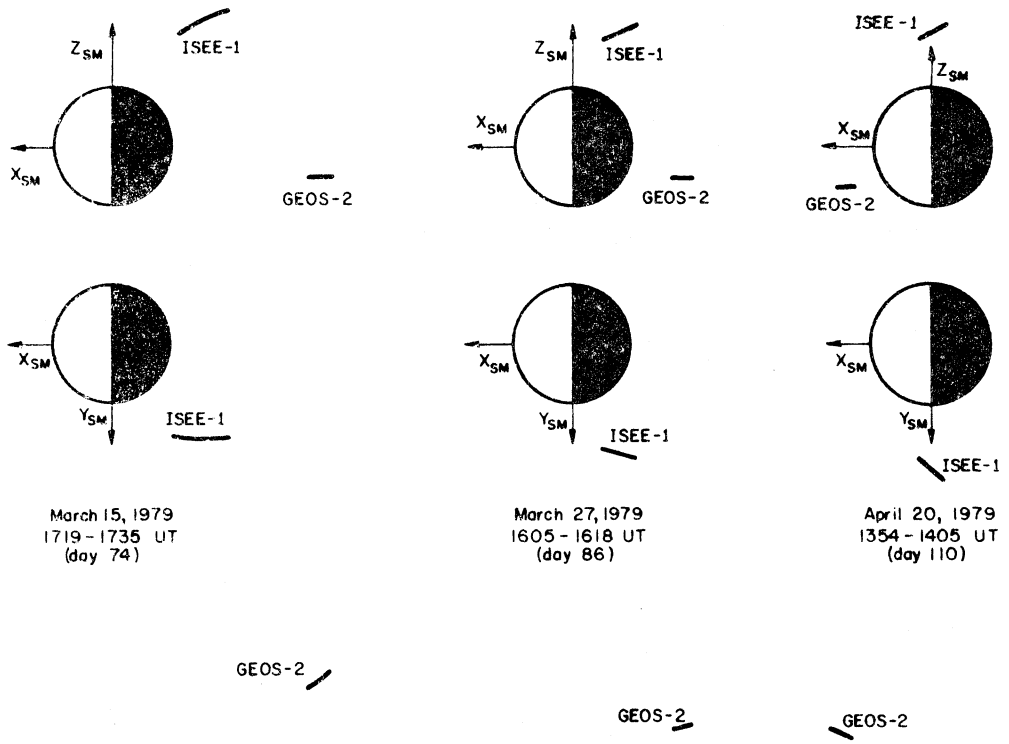
AGU 1979 Spring Meeting --- A special session of the 1979 AGU Spring Meeting has been announced for May 29, 1979, 8 to 11 p.m. Its title: Solar Terrestrial Physics in the 1980's. The session will be held in the Cotillon Room of the Sheraton Park Hotel and will be chaired by Dr. H. Glaser from NASA. The speakers, who will deal with the programs in physical research about the solar system, the sun, the interplanetary and magnetospheric media, and the atmosphere and ionosphere of the Earth, will be respectively Drs. Kennel, Newkirk, Williams and Seals.

CDAW 2 on the July 29, 1977 substorms --- The planning committee for the workshop on the July 29, 1977 substorms is proceeding to prepare for it to be held in early fall 1979. This workshop is being sponsored by NASA, ESA and NOAA and support from NSF is anticipated. Some of the final details are jet to be arranged.

Time and location : the workshop will be held during the last week of September or in early October at the IMS SSC at NASA Goddard Space Flight Center, using the CDAW 1 facilities (Coordinated Data Analysis Workshop 1). All the experimenters and modelers involved thus far in the analysis of this event are invited to participate in a subgroup, and it is hoped that all participants can be accommodated in the overall workshop; however because of size limitations in the computer facility there may be some constraints on attendance. A strong interaction through the subgroups is encouraged.

Time of data submission : scientists should prepare now, if they have not already done so, to send their data to the SSC. Guidelines for data

(continued on pg 5)



ISEE/GEOS-2 SOLAR MAGNETOSPHERIC COORDINATE PLOTS FOR PREDICTED CONJUNCTION TIMES
The upper and lower panel show respectively the XZ and XY orthogonal projections for the positions of the satellites during the conjunction

As described on pag.2 of this newsletter, under the title "SPECIAL LOW ALTITUDE SATELLITE CONJUNCTIONS", the Satellite Situation Center at Goddard produces routinely a two week advance computation of magnetic conjunction times between high altitude "target" satellites and low altitude satellites or ground stations. A longer term prediction would not be accurate because of the variability of the low altitude satellite orbits. The high altitude satellites however have stable orbits and the magnetic conjunctions between them can be predicted much further in the future. Following a request by C. Russell, the SSC started computing three months advance times for conjunctions between ISEE and GEOS-2; under further request by the IMSCIE Office they supplied a listing of SM coordinates for the two satellites during the conjunction times for the period March 15 - May 15, 1979. The table at the end of this paragraph gives the times, altitudes and separations of the satellites for the magnetic conjunctions predicted for this period; the plots at the top of this page give the positions of the three satellites (GEOS-2 and the ISEE pair) for the real conjunctions, which last several minutes, as opposed to the shorter "crosses".

	DAY/H.H (UT)	ESA-GEOS 2 ALT(KM)	ISEE 1 ALT(KM)	G.SEP. (RE)	F.SEP. (RE)
START	74/17.3	35800	10300	5.3	1.2
STOP	74/17.6	35800	14500		
START	86/16.1	35800	9580	5.4	4.3
STOP	86/16.3	35800	12800		
CROSSES	96/ 4.7	35800	4630	5.6	6.5
CROSSES	98/15.0	35800	9410	5.4	2.8
CROSSES	108/ 3.5	35800	5320	5.5	6.5
START	110/13.9	35800	9340	5.4	4.4
STOP	110/14.1	35800	12500		
CROSSES	120/ 2.4	35800	5430	5.5	6.4
CROSSES	132/ 1.3	35800	6200	5.5	6.2

(continued from pg 4)

submission will be mailed in mid-April to those scientists who have already been involved in the analysis of this event. It will be desirable for scientists to submit data in the latter part of April and in May. Furthermore, exchange of data and analysis within the subgroups is strongly encouraged.

Data period to be studied : this study focuses on the sudden commencement and the four substorms of July 29, 1977. A large interplanetary shock compressed the magnetosphere at 0030 UT on July 29, followed by at least four substorms with peak electojet currents at 0430, 0630, 0900 and a very large substorm peaking at 1230 UT. From midlatitude magnetograms, the ring current showed a maximum at about 0600 UT and a second major perturbation at about 1230 UT corresponding to the last substorm. The overall data interval is likely to include :

1200 UT 28 July to 2000 UT 29 July 1977

Within this time period there will be periods to emphasize including about two hours around 1200 UT 28 July as a prestorm quiet reference. Depending on requests from the scientists involved some periods on July 30 will also be included but the major emphasis will be on the period 0000 UT to 2000 UT on July 29.

(continued on pg 9)

UPDATED APRIL 78

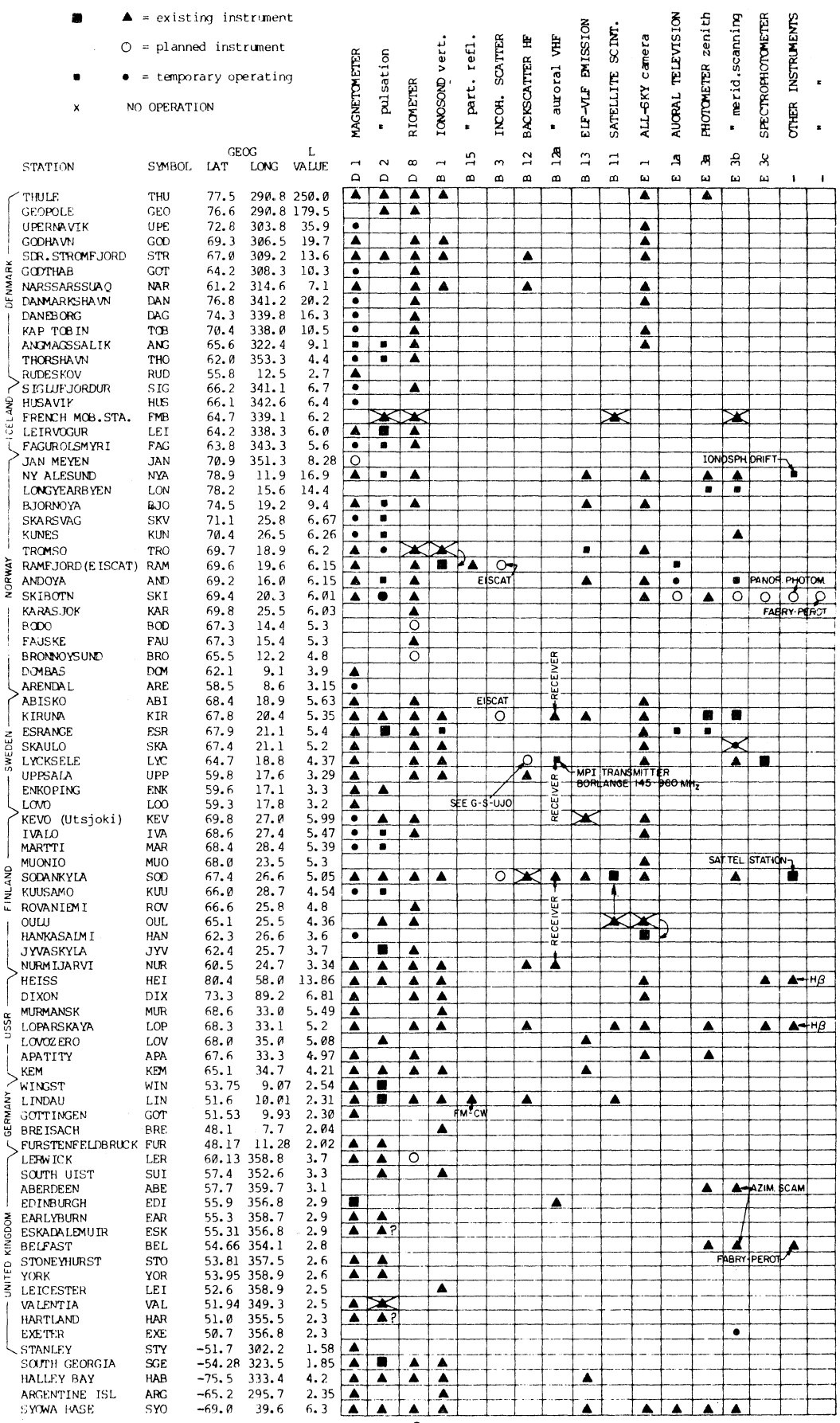
INSTRUMENTS IN OPERATION DURING THE IMS-GEOS PERIOD

■ ▲ = existing instrument

○ = planned instrument

■ ● = temporary operating

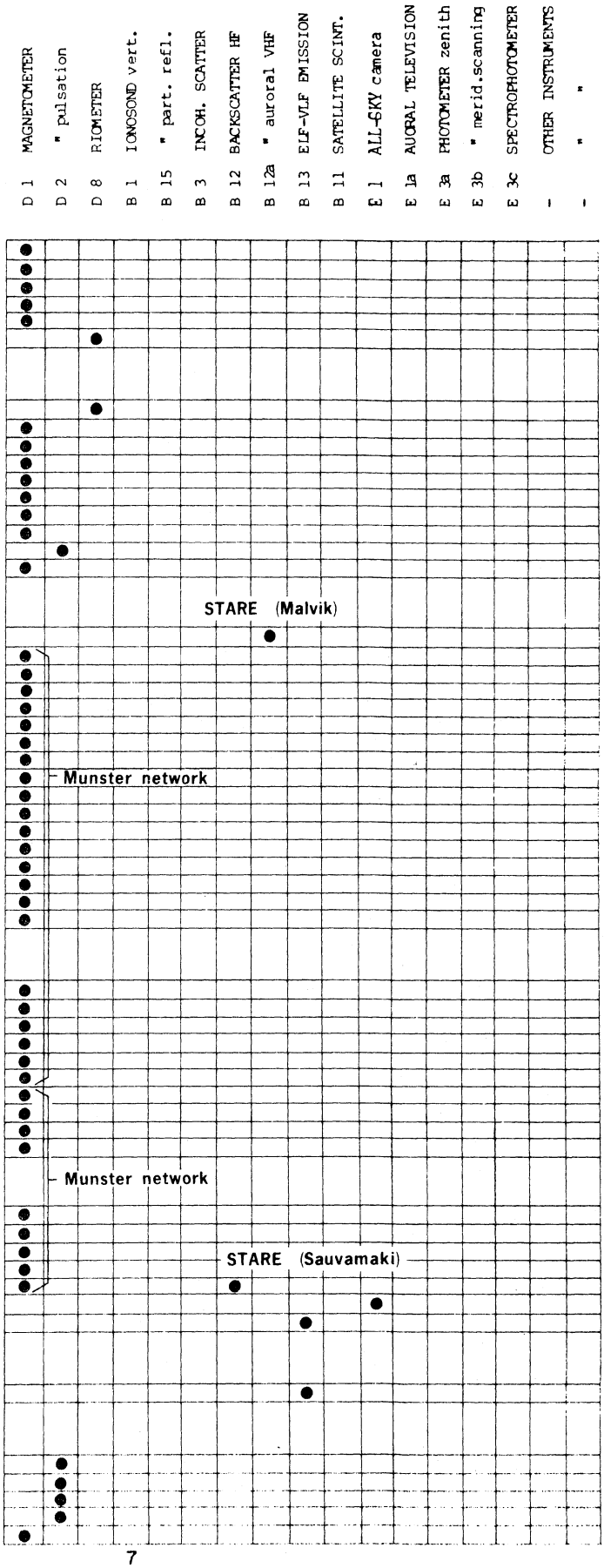
x NO OPERATION



	STATION	SYMBOL	GEOG LAT	GEOG LONG	L VALUE
DENMARK	THULE	THU	77.5	290.8	250.0
	GEOPOLE	GEO	76.6	290.8	179.5
	UPERNAVIK	UPE	72.8	303.8	35.9
	GODHAVN	GOD	69.3	306.5	19.7
	SDR.STROMFJORD	STR	67.0	309.2	13.6
	GODTHAB	GOT	64.2	308.3	10.3
	NARSSARSSUAQ	NAR	61.2	314.6	7.1
	DANMARKSHAVN	DAN	76.8	341.2	20.2
	DANEBORG	DAG	74.3	339.8	16.3
	KAP TOBIN	TOB	70.4	338.0	10.5
	ANGMAGSSALIK	ANG	65.6	322.4	9.1
	THORSHAVN	THO	62.0	353.3	4.4
ICELAND	RUDESKOV	RUD	55.8	12.5	2.7
	SIGLUFJORDUR	SIG	66.2	341.1	6.7
	HUSAVIK	HUS	66.1	342.6	6.4
	FRENCH MOB.STA.	FMB	64.7	339.1	6.2
	LEIRVOGUR	LEI	64.2	338.3	6.0
	FAGUROLSMYRI	FAG	63.8	343.3	5.6
NORWAY	JAN MEYEN	JAN	70.9	351.3	8.28
	NY ALESUND	NYA	78.9	11.9	16.9
	LONGYEARBYEN	LON	78.2	15.6	14.4
	BJORNOYA	BJO	74.5	19.2	9.4
	SKARSVAG	SKV	71.1	25.8	6.67
	KUNES	KUN	70.4	26.5	6.26
	TROMSO	TRO	69.7	18.9	6.2
	RAMFJORD (EISCAT)	RAM	69.6	19.6	6.15
	ANDOYA	AND	69.2	16.0	6.15
	SKIBOTN	SKI	69.4	20.3	6.01
	KARASJOK	KAR	69.8	25.5	6.03
	BODO	BOD	67.3	14.4	5.3
	FAUSKE	FAU	67.3	15.4	5.3
	BRONNOYSUND	BRO	65.5	12.2	4.8
	DOMBAS	DOM	62.1	9.1	3.9
	ARENDAL	ARE	58.5	8.6	3.15
SWEDEN	ABISKO	ABI	68.4	18.9	5.63
	KIRUNA	KIR	67.8	20.4	5.35
	ESRANGE	ESR	67.9	21.1	5.4
	SKAULO	SKA	67.4	21.1	5.2
	LYCKSELE	LYC	64.7	18.8	4.37
	UPPSALA	UPP	59.8	17.6	3.29
	ENKOPING	ENK	59.6	17.1	3.3
	LOVO	LOO	59.3	17.8	3.2
FINLAND	KEVO (Utsjoki)	KEV	69.8	27.0	5.99
	IVALO	IVA	68.6	27.4	5.47
	MARTTI	MAR	68.4	28.4	5.39
	MUONIO	MUO	68.0	23.5	5.3
	SODANKYLA	SOD	67.4	26.6	5.05
	KUUSAMO	KUU	66.0	28.7	4.54
	ROVANIEMI	ROV	66.6	25.8	4.8
	OULU	OUL	65.1	25.5	4.36
	HANKASALMI	HAN	62.3	26.6	3.6
	JYVASKYLA	JYV	62.4	25.7	3.7
	NURMIJARVI	NUR	60.5	24.7	3.34
USSR	HEISS	HEI	80.4	58.0	13.86
	DIXON	DIX	73.3	89.2	6.81
	MURMANSK	MUR	68.6	33.0	5.49
	LOPARSKAYA	LOP	68.3	33.1	5.2
	LOVOZERO	LOV	68.0	35.0	5.08
	APATITY	APA	67.6	33.3	4.97
	KEM	KEM	65.1	34.7	4.21
GERMANY	WINGST	WIN	53.75	9.07	2.54
	LINDAU	LIN	51.6	10.01	2.31
	GOTTINGEN	GOT	51.53	9.93	2.30
	BREISACH	BRE	48.1	7.7	2.04
	FURSTENFELDBRUCK	FUR	48.17	11.28	2.02
UNITED KINGDOM	LERWICK	LER	60.13	358.8	3.7
	SOUTH UIST	SUI	57.4	352.6	3.3
	ABERDEEN	ABE	57.7	359.7	3.1
	EDINBURGH	EDI	55.9	356.8	2.9
	EARLYBURN	EAR	55.3	358.7	2.9
	ESKDALEMUIR	ESK	55.31	356.8	2.9
	BELFAST	BEL	54.66	354.1	2.8
	STONEYHURST	STO	53.81	357.5	2.6
	YORK	YOR	53.95	358.9	2.6
	LEICESTER	LEI	52.6	358.9	2.5
	VALENTIA	VAL	51.94	349.3	2.5
	HARTLAND	HAR	51.0	355.5	2.3
	EXETER	EXE	50.7	356.8	2.3
	STANLEY	STY	-51.7	302.2	1.58
	SOUTH GEORGIA	SGE	-54.28	323.5	1.85
	HALLEY BAY	HAB	-75.5	333.4	4.2
	ARGENTINE ISL	ARG	-65.2	295.7	2.35
	SYOWA BASE	SYO	-69.0	39.6	6.3

ADDITIONAL STATIONS IN OPERATION DURING IMS

STATION	SYMBOL	LAT	LONG
DENMARK			
SAVIGSIVIK	SAV	76.0	294.9
KUVFLORSSUAQ	KUV	74.6	302.8
UMANAQ	UMA	70.7	307.9
FREDRIKSHAB	FRE	62.0	310.3
NORD	NOR	81.6	343.3
ST.SIRIUS NORD	SIR	81.6	343.3
ICELAND			
TJORNES	TJO	66.2	342.9
ISAFJORDUR	ISA	66.1	336.9
REYKJASKOLI	REY	65.3	338.9
SIGLUFJORDUR	SIG	66.2	341.1
PORSHOFN	POR	66.2	344.7
FAGURHOLSMYRI	FAG	63.9	343.3
HVERAVELLIR	HVE	64.9	340.0
EIDAR	EID	65.4	345.6
THINGEYRI	THI	63.9	343.4
BORDEYRI	BOR	65.3	338.8
NORWAY			
TRONDHEIM	TRO	63.5	11.0
NAMSOS	NAM	64.5	11.1
MALOY	MAL	62.2	5.1
HELLVIK	HEL	58.5	5.8
FREDVANG	FRE	68.1	13.2
GLOMFJORD	GLO	66.9	13.6
OKSTINDAN	OKS	65.9	14.3
ANDENES	AND	69.2	16.0
EVENES	EVE	68.5	16.8
MIKKELVIK	MIK	70.1	19.0
ROSTADALEN	ROS	68.9	19.7
SOROYA	SOR	70.6	22.2
MATTISDALEN	MAT	69.8	22.9
MIERON	MIE	69.1	23.3
BERLEVAG	BER	70.9	29.1
VADSO	VAD	70.1	29.1
SKOGSFOSS	SKO	69.4	29.4
SWEDEN			
ARVIKA	ARV	59.6	12.6
RISEDA	RIS	64.5	15.1
HASSELA	HAS	62.1	16.5
RITSEMJOKK	RIT	67.7	17.5
KVIKKJOKK	KVI	66.9	17.9
STORAVAN	STO	65.8	18.2
LYCKSELE	LYC	64.6	18.8
KIRUNA	KIR	67.8	20.4
NATTAVARA	NAT	66.8	21.0
PITEA	PIT	65.2	21.6
FINLAND			
MUONIO	MUO	68.0	23.6
PELLO	PEL	66.9	24.7
OULU	OUL	65.1	25.5
JOKIKYLA	JOK	63.8	26.1
SAUVAMAKI	SAU	62.3	26.6
KILPISJARVI	KIL	69.1	20.8
KAAMANEN	KAA	69.1	27.2
GERMANY, FRG			
HUSUM	HUS	54.6	8.8
UNITED KINGDOM			
CAPE WRATH	CAW	58.6	355.3
DURNESS	DUR	58.6	355.2
LOCH LAGGAN	LOL	57.0	355.6
CAMBRIDGE	CAM	52.2	0.0
GREENWICH	GRE	51.5	0.0



ACTUALITIES

SATELLITES

ISEE-C --- On page 1 of NL 78-9 reference was made to a possible "transient coronal hole" that may have been the cause of a disappearing filament near the sun's central meridian on 22 August 1978. This may have resulted in a geomagnetic disturbance beginning with a sudden commencement at 0247UT 27 August. R. J. Hynds, Imperial College of Science and Technology, London, project scientist for the Low Energy Particle Experiment, reports that a particle increase was observed starting around 1400UT on 25 Aug. and lasted until late 27 Aug.

ISIS --- A memorandum from T. R. Hartz, Chairman, ISIS Working Group, dated 2 Jan. 1979, states that a substantial reduction must be made on expenditures for the program, and that all operations will likely be terminated sometime in late 1979. More precise information about a termination date will be provided by Dr. Hartz as the date approaches.

GROUND BASED

N. SCANDINAVIA

Auroral Observations in N. Scandinavia --- From the Canadian IMS Newsletter comes this report by G. G. Shepherd, on sabbatical leave from York University and at the Royal Institute of Technology, Stockholm. "I have taken advantage of the GEOS-2 spacecraft, which for this winter has its footprint somewhere north of Kiruna, depending on the activity label. One of J. Miller's two channel rocket photometers has been installed with a 6300A filter at Kilpisjarvi in Finland, just at the boundary of Norway/Sweden/Finland, and just north of Kiruna. This was done in collaboration with the Uppsala Ionospheric Observatory and the Finnish Meteorological Institute. I received the first data tape today (22 Dec 1978) and everything seems to be working well at -30 C. R. Koehler just returned to Canada after a two week visit during which he installed our four-channel scanning photometer at the Kiruna Geophysical Institute. They provided a scanning mirror, and the data are going in real time into the EISCAT computer. This is not all yet integrated and functional but we expect to get a few months of data from these two stations while GEOS is in this location. Data intercomparisons will be done with GEOS investigators at Kiruna, at the Royal Institute of Technology, and Mullard Space Science Laboratories."

Photometric Studies, Dayside Cleft, Spitzbergen --- D. McEwen reports that these studies are proceeding at Longyerbyen as planned. A six channel meridian scanning photometer was operated by J. Gilmer from Dec. 5, 1978 to Jan. 2, 1979. He was replaced on that date by C. Duncan who will continue measurements through to Jan. 30, 1979. Gilmer on his return to Saskatoon reported everything had gone smoothly, the equipment was operating well and both Norwegian and Alaskan scientists were most helpful and cooperative. During December, data were taken on nine clear days, eight of which spanned periods both before and after magnetic noon. This included five consecutive clear days (Dec. 24 thru 28) which appeared to have a broad range of day and night- time auroral activity. A quick look at the December data indicates both hard and soft electron precipitation during the day with the cleft appearing to the north most of the time, moving overhead sometimes, and far south only once. See NLs 78-9 pg 3 and 78-12 pg 3 for details of the Norwegian Alaskan Spitzbergen Expedition.

CANADA

All-Sky Auroral Imager --- The U. of Calgary All-Sky Auroral Imager is now fully operational, having undergone further refinements to its optics and extensive tests at Cold Lake, Alberta. It operated successfully at La Ronge during the last week of February. An improved version is already under development, using a 100 x 100 CCD array for improved sensitivity and resolution.

ROCKETS

RED LAKE (CANADA)

ECLIPSE 1979 --- Rockets launched during the 1979 total eclipse at Red Lake in Canada were successful. E. C. Zipf, University of Pittsburgh, reports that the launch of Taurus-Orion 33.003UA was a success. L. C. Smith, University of Illinois, reported the successful launch of three Nike-Tomahawks, 18.102Ø-22UE. The first was launched on 24 February, prior to the eclipse, during an absorption event. The other two were launched during totality. High particle ionization was observed during the launches. Solar activity in the days prior to the eclipse had been high. L. C. Hale, Penn State University, reported on the firing of two Astrobee D rockets, 23.009-10UE. One was fired during totality, (parachute did not operate), and the second was fired the following night. There was much auroral activity during the eclipse period which affected the loss-rate measurements. Electric field measurements worked well. M. Kelley, Cornell University, had 100% success with the launching of Taurus-Orion 33.004UE. See NL 78-12 pgs 2 and 3 for details.

Some more eclipse news was included in the Canadian IMS Newsletter. The visibility was excellent along most of the path of totality in Southern Saskatchewan and Manitoba. Data obtained with a Black Brant V rocket launched during totality at Red Lake, Ontario, may be of interest to some IMS participants. This was the first rocket fired in Canada with an altitude control "pointing" system, - accuracy within one tenth of a degree in pointing at the sun. A major objective was to record the vacuum ultraviolet spectrum of the solar corona, Dr. R. Nicholls and colleagues, CRESS , York University, designing the spectroscope and the experiment. Two other experiments were on the same rocket. One was by A. McNamara, Herzberg Institute of Astrophysics, National Research Council, Ottawa, consisted of plasma probes to provide data on the ionosphere during the eclipse. The other was by E. Llewellyn, Institute of Space and Atmospheric Studies, University of Saskatchewan, recording spectra of the ozone and the infrared airglow. The data from all three experiments are still to be analyzed.

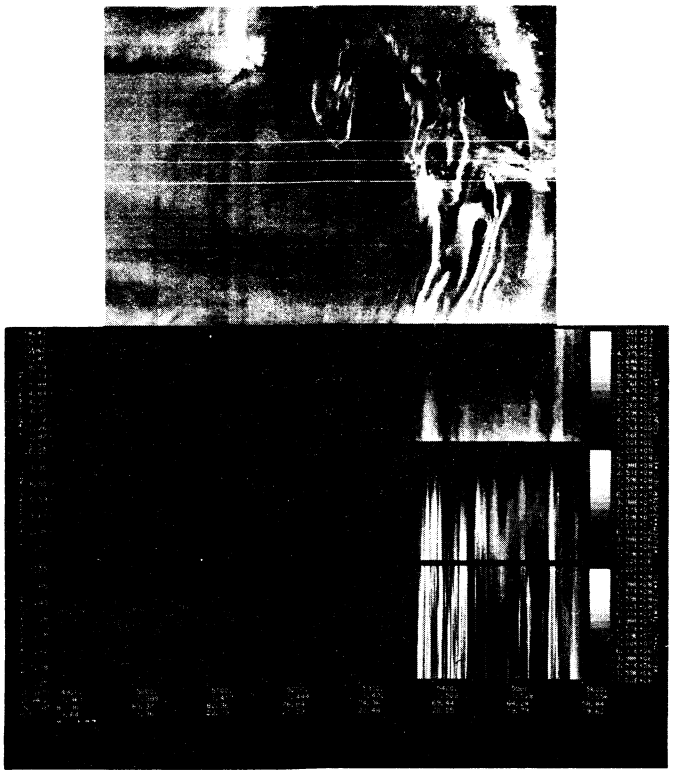
CHILCA, PERU

Artificial Spread-F --- We have news of two Castor rockets which were launched from Chilca, Peru on March 21 and 22. This was a joint effort by the Max Planck Institut (G. Haerendel), Argentine Space Board (A. Valenzuela), and CONIDA, Peru (C. Calderon). The second stage failed on one of the rockets. In this Artificial Spread-F experiment, two barium clouds were to be released from each rocket. Good data was obtained from the Jicamarca radar and from the AFGL observation aircraft.

BALLOONS

ESRANGE

SAMBO II --- P. Simon reported by telex that the SAMBO II campaign has now been completed. A total of 25 balloons were launched since 23 January. Preliminary information was received from Treilhou (Toulouse) and Sjoeholm (ESRANGE). No times were available for the IZMIRAN, Graz and Apatiti flights. For the period Feb. 12 to Mar. 6, Date/Agency/Experiments/Time are as follows: Feb. 12 IZMIRAN/ Balloon #11/ E-fields, photometer, Mar. 2 CESR Toulouse/ #12/ X-ray, photometer/ 20.55UT for 20 mins. Mar 4 CESR/ #13/ X Spectrometer, E-fields/ 16.28UT for 14 hrs, CESR/ #14/ X Spectrometer, E-fields/ 17.47UT for 14 hrs. Mar. 5 CESR/ #18/ X spectrometer, X-ray camera/ 18.47UT for 16 hrs, #19/ Spectrometer, X-Tetraphotometer (6300A, 5577A, 4862A, 4278A)/ 20.20UT for 16 hrs #20/ IDEM/ 22.04UT, IZMIRAN/ #15/ VLF, #21, E-Fields, photometer, Apatiti/ #15/ VLF, #17/ Spectrometer, five direction/ Graz/ #16/ E-Fields,Mar. 6 IZMIRAN/ #23/ E-Fields, photometer, #25/ VLF, E-Fields, photometer, Apatiti/ #22/ photometer, #24/ spectrometer, five direction.



Above are two figures from "Correlated Observations of Auroral Arcs, Electrons and X-Rays from a DMSP Satellite", by Mizera, Luhmann, Kolasinski and Blake, Space Sciences Laboratory, The Aerospace Corporation.

Top figure. Midnight and evening auroral arcs, in the wavelength band between 475 to 750 nm, recorded by the DMSP visible scanner, are shown. The center line represents the ground track of the satellite and the cross-track field-of-view of the x-ray sensor is shown as the strip along the middle of the photograph. Five arc systems, identified for analysis at times near 5373, 5393, 5425 and 5538 seconds UT, are located between geographic latitudes of 49 N and 58 N deg. at 85 W deg. longitude.

Bottom figure. An energy-time spectrogram is shown of upcoming bremsstrahlung x-rays and downgoing electrons as a function of time along the satellite ground track shown in the upper figure. Magnetic coordinates, invariant latitude and local time, are calculated and shown every 100 seconds. The vertical energy scales are logarithmic. The gray scale intensities are in units of differential energy flux for electrons and proportional to differential number flux for x-rays. Approximately 5 levels per decade are used to distinguish the intensity variations

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(continued from pg 5)

Further information will be carried in next newsletter, and those scientists who have already actively participated in the study of this event will receive some detailed information directly. Any scientist not directly receiving a detailed memo, and who has a contribution, should contact the appropriate subgroup leader.

It is expected that data will be available from the sources listed hereafter.
Geosynchronous spacecrafts : GEOS-1, ATS-6, SMS/GOES, 1976-059A, 1977-007A
High and low altitude spacecrafts : IMP-7, IMP-8, S3-3, Triad, AE-C
Ground based arrays : Alberta magnetometer chain, Fort Churchill magnetometer chain, Munster magnetometer network, Braunschweig magnetometer network, NGSDC-A, STARE radar, Alaskan magnetometer/pulsation network.
Models expected to be available will be : Disturbed magnetic field, Substorm model, Energetic particle drift.
The tentative subgroups titles, with the respective leaders, follow.
Solar Wind parameters (J. King)
Current Systems and Magnetic Field (T. Potemra, spacecraft; S-I-Akasofu, North American ground based; W. Baumjohann, European ground based)
Electric Fields (K. Knott)
Cold Plasmas (D. Young)
Hot Plasmas (R. Johnson)
Energetic Particles (T. Fritz, B. Wilken)
Waves (R. Gendrin)
Theory/Modeling (W. Olson)

On pgs 6 and 7 are tables of instruments in operation at European ground stations during the IMS-GEOS period, updated April 1978, extracted from the Supplement to the CCOG-Handbook for the IMS-GEOS (Period 1976-79).

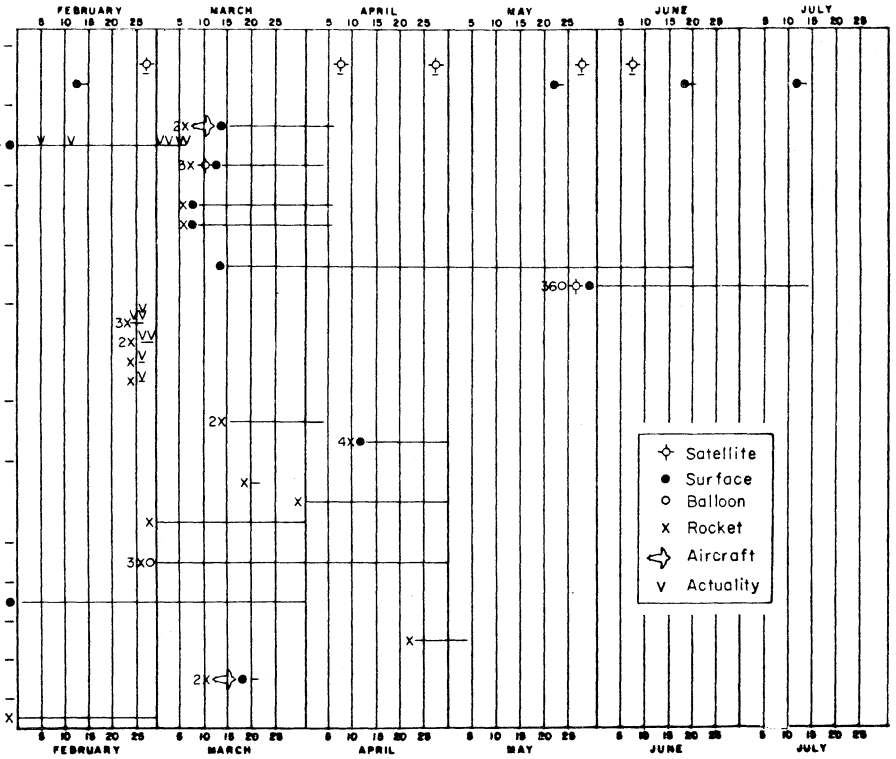
Preliminary Listing of Solar Flares

Solar Flare Data --- The table below contains a listing of X-ray flares, class M1 and higher, for the period 19 Feb. 1979 - 25 Mar. 1979 extracted from "Preliminary Report and Forecast of Solar Geophysical Data", published by SESC Boulder (see IMS NL78-5).

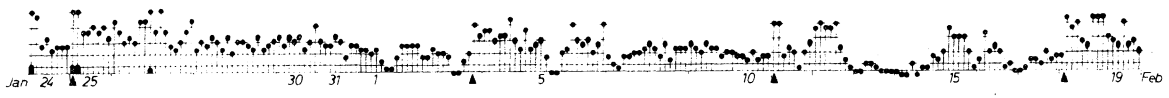
Date	Begin	Max	End	Location	Imp	Reg	Cl
Feb19	0435	0440	0446	Unknown	--	----	M1
	1030	1035	1046	Unknown	--	----	M1
	1525	1527	1649	N19 W25	1B	1568	M3
	1755	1814	1854	N15 E02	1B	1574	M8
20	0449		A0450	N17 E03	1F	1574	M1
	1349	1416	1500	N20 W39	1B	1569	M2
	1604	1649	1714	N16 W10	1B	1574	M2
	B1805	1815	A2017	N20 W30	2B	1574	M3
	2156	2210	2301	N18 W47	-B	1568	M5
	B2333	2338	2400	N18 W25	-B	1574	M2
21	0041	0045	0056	Unknown	--	----	M1
	0930	0937	0943	Unknown	--	----	M2
	1106	1133	1143	Unknown	--	----	M1
	B1418	1421	1436	N17 W28	1B	1574	X1
	B1555	1557	1613	N17 W32	-B	1574	M2
	1939	1953	2129	N15 W31	-B	1574	M4
22	0043	0046	0050	Unknown	--	----	M4
	0505	0510	0527	N17 W36	1B	1574	M9
	0915	0917	0921	N16 W40	-N	1574	M2
	1151	1151	1221	N16 W40	-N	1574	M1
	1253	1255	1324	N15 W40	1B	1574	M2
	1808	1810	1847	N15 W43	-B	1574	M2
	1857	1859	1923	N15 W43	1B	1574	M5
	B2225		2251	N17 W48	-N	1574	M1
23	0425	0439	0458	Unknown	--	----	M2
	1452	1453	1502	N17 W53	1B	1574	M1
24	1547	1547	1558	N16 W60	-B	1574	M1
25	0011	0021	0047	Unknown	--	----	M1
	0641	0704	0730	S20 E58	1N	1591	M1
	0840	0847	0900	Unknown	--	----	M1
26	1838	1843	1853	Unknown	--	----	M3
Mar 1	0955	1015	1135	S24 E58	3N	1599	X1
2	0333	0338	0353	S18 E90	-N	1605	M3
3	1813	1823	1830	S24 E04	1B	1595	M1
5	1405	1415	A1517	N11 E38	1B	1616	M1
9	0942	1032	1138	N15 E77	LPS	1620	M9
11	B0700	0708	0732	N19 E76	-N	1625	M1
15	B0706	0745	A0803	N19 W04	1N	1620	M1
16	1411	1428	1507	N18 E27	1B	1630	M1
18	1418	1424	A1425	N06 E32	1B	1638	M1
19	1654	1657	A1745	N07 E15	1B	1638	M7
20	1234	1253	1311	Unknown	--	----	M1
	2256	2312	2316	Unknown	--	----	M1
21	1258	1308	1326	Unknown	--	----	M2
22	0324	0326	0400	N07 W19	2N	1638	M3
	B1349	1400	1546	N07 W21	2N	1638	M1
	1818	1821	1935	N08 E70	-B	1649	M1
23	0644	0647	0703	N08 E65	2B	1649	M2
	1904	1020	2015	N08 W43	1B	1638	M2
	2044	2047	2105	N08 W44	-B	1638	M1
24	1442	1456	1528	N09 W57	-B	1638	M4
25	0030	0040	A0058	N09 W60	-B	1638	M2
	B0655	0700	0730	N07 W63	-F	1638	M1
	1633	1650	1723	N09 W71	-B	1638	M2
	1802	1815	1903	N10 W77	1B	1638	X1

IMS CALENDAR OF GBR CAMPAIGNS FEBRUARY 79 - JULY 79
(As of 2 APRIL 1979)

WORLD-WIDE- -
Special SSC-selected satellite periods
IISN (Bauer et al)
KIRUNA (ESRANGE)- -
Haerendel; "Porcupine"
Zhulin; "SAMBO II"
Holmgren; "S-29 Ba GEOS"
ANDOYA (ANDENES)- -
Woolliscroft; "F6"
Woolliscroft; "VLF"
N. SCANDINAVIA- -
Siebert, Wedeken, Krenzien; "Geomagnetic Pulsations"
Ullaland; "SBARMO 79"
CANADA (RED LAKE) -
Smith; "18.1020UE, 18.1021UE, 18.1022UE"
Hale; "23.009UE, 23.010UE"
Kelley; "33.003UE"
Zipf; "33.003UE"
POKER FLAT- -
Wescott; "12.1003UE, 12.1004UE"
Heppner; "18.217-8GEX, 29.011-2GEX"
WHITE SANDS -
MacQueen; "27.033AS/US"
Rottman; "27.028US"
Moore; "27.038UEX"
USSR (HEISS IS.)- -
Avdyushine; "IPOCAMP 3"
USSR (SIBERIA)- -
SiBIZMIR,IKFIA; SIBERIA-IMS-79
UK (SOUTH UIST) -
Williams; "P201H"
CHILCA (PERU) -
Calderon, Valenzuela, Haerendel; Artificial Spread F
INDIA (THUMBA)- -
Reddy; Rocket



SOLAR AND GEOMAGNETIC ACTIVITY JANUARY 24 - MARCH 18



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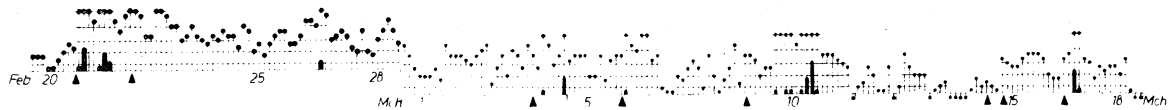
ROTATION #1989

2800 MHZ
FLUX OTTAWA 214 215 199 209 215 218 203 200 190 190 195 193 203 212 209 215 204 204 210 199 202 229 216 214 215 376* 243

*FLARE ENHANCED

SS NO. BOULDER 304 356 348 285 280 250 221 197 128 190 200 227 171 264 297 241 187 179 255 257 219 236 232 183 316 292 309



KP

ROTATION #1990

2800 MHZ
FLUX OTTAWA 238 230 230 201 186 170 171 166 167 172 174 176 184 200 187 190 181 184 183 195 191 189 189 183 188 177 196

SS NO. BOULDER 241 250 219 223 157 158 171 152 143 202 224 241 201 204 182 184 228 271 266 270 290 290 257 314 293 290 273