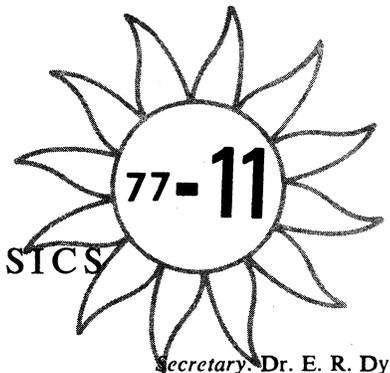


International Council of Scientific Unions
SPECIAL COMMITTEE
ON
SOLAR-TERRESTRIAL PHYSICS



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WORLD DATA CENTER-A FOR STP, D64, NOAA, BOULDER, COLORADO, 80302, USA

IMS NEWSLETTER

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The past nearly two weeks have been an extremely active time for everyone associated with the IMS and attempting to keep up with the latest news about the ISEE-A&B satellites just launched. Although there has not been the frantic effort we knew in the attempt to salvage a useful orbit for GEOS, the pressing matters of orbit determination, map plotting, telefaxing tables and diagrams, etc. is uncommonly demanding. The IMSCIE Office staff believe that the increasing quantity of Actualities, exclusive of ISEE, points to the effectiveness of all efforts to promote active cooperation and sharing of data.

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Telephone: 303-499-1000 x6501 (FTS 323-6501)

IMS SSC (Vette): Telex 89675 NASCOM GBLT
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European Information (P. Simon): Telex 200590 CNET OBS B MEUDO
Telephone: 027-75-30 et 75-70

USSR Coordination/Information Office (I. Zhulin): Telex 7523 SOLTER SU

SPECIAL IMS SATELLITE PERIODS

Tables giving details about satellite conjunctions for the second half of 1977 were given in NL's 77-6 (pg 3), 77-7 (pg 5) and 77-9 (pg 5). These periods will probably be important for the forthcoming IMS Workshops because of the more comprehensive satellite data acquisition during these times. Also note a number of remaining special conjunctions associated with the STIP-IV/IMS Special Observational Period (events 11-18, IMS NL 77-10, pg 5) and shown in the diagram on page 8 of this NL.

October 31, 1400 UT to November 2, 1300 UT	November 9, 1200 UT to November 10, 2300 UT
November 15, 1600 UT to November 17, 0800 UT	December 10, 1100 UT to December 12, 0700 UT
December 27, 0800 UT to December 29, 0200 UT	

GBR Campaigns:

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

----- Ulwick; "SPIRE I"; Poker Flat; ROCKET - launched 28 September 1977, no recovery
 ----- Rees; "2ND HIGH LATITUDE CAMPAIGN"; Andoya; ROCKET - F3 launched 16 October 1977
 ----- Sheldon; White Sands; ROCKET (2) - 23.009UE and 23.010UE postponed to April 1978
 ----- to Nov 15; Jorgensen, Kelley; Sondre Stromfjord; ROCKET (2) - 18.1015UE & 18.1016UE
 ----- to Nov 19; Johnstone; "2ND HIGH LATITUDE CAMPAIGN"; Andoya; ROCKET - SL1421, see Actualities
 ----- to Nov 19; Bryant; "2ND HIGH LATITUDE CAMPAIGN"; Andoya; ROCKET - F1
 Nov 1 to Nov 30; Sharp; "MAP-2"; Wallops Island; ROCKET - 26.xxxUE, no details
 Nov 3 to Nov 21; Baron; "WIDEBAND"; Poker Flat; ROCKET (2) - scint. meas. with Wideband
 Nov 3 to Nov 21; Ulwick; "WIDEBAND MULTI"; Poker Flat; ROCKET - Wideband, e-dens., energ. particles
 Nov 3 to Nov 21; Ulwick; "FIELD WIDENED INTERFEROMETER"; Poker Flat; ROCKET - IR during aurora
 ----- to Dec 6; Woolliscroft; "2ND HIGH LATITUDE CAMPAIGN"; Andoya; ROCKET (3) - SL1424, F4 & F6
 ----- to Dec 6; Wilhelm; "SUBSTORM CAMPAIGN"; Andoya; ROCKET (3) - T/NL2-4, see Actualities
 ----- to Feb 28; Lundin; "S23-SUBSTORM GEOS"; ESRANGE; ROCKET (3) - note below
 Dec 1 to Dec 31; Shepherd; "... CLEFT"; Cape Parry; ROCKET (2) - Details in 77-10, pg 2
 Dec 1 to Dec 31; Forsyth; "... CUSP IONOSPHERE"; Cape Parry; ROCKET (3) - Details in 77-10, pg 2
 Jan 4 to Feb 2; Matthews; Andoya; ROCKET - multi-national cooperation, see note below
 Jan 1 to Jan 31; Scherb; Poker Flat; ROCKET - 29.009UE to measure particles and fields
 Jan 1 to Jan 31; Heppner; Poker Flat; ROCKET (4) - Ba 18.196 - 199, note below
 Jan 1 to Mar 31; Zhulin; "SAMBO-II"; ESRANGE; BALLOONS (25) - details below
 Jan 1 to Mar 31; Venkatesan; "AURORAL X-RAYS"; Ft. Churchill; ROCKET (3) - note below
 Jan 1 to Mar 31; Whalen; "ENERGETIC PARTICLE DETECTOR"; Ft. Churchill; ROCKET - note below

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

Nov 15-17; Dec 6-8; Bauer, Evans; IISN; Global Network; SURFACE incoherent scatter radar net
 Monthly; Wright & Hilsenrath; "OZONESONDE"; Various Sites; ROCKET (3) - see Actualities, NL 77-10, pg 3

-----Observing Plans for Temporary Surface Stations-----

----- to Dec 31; Rycroft; "VLF"; N. Scandinavia; SURFACE - see current Actualities, pg 6
 ----- to Apr 30; Eather; "Meridian Scanning Photometers"; Churchill Chain; SURFACE - note below

Regional IMS GBR Program Details, Nov 77 - Jan 78

Program details for some of the brief listings given above have appeared in earlier IMD NIs. These will only be repeated below if there is new information.

CANADA

Churchill Photometer Chain --- R.H. Eather and S.B. Mende will operate a 3-station network of meridian scanning photometers located at Rankin Inlet, Fort Churchill and Island Lake. Observations will be taken from October 77 through April 78 except for 4 days before and after full moon. The photometers are 4-channel recorders. Data from all 3 stations will be merged and processed for presentation in the form of Keograms (grey scale representation of intensity on a latitude-time grid). Coordination will be with Canadian groups operating photometers, magnetometers and ionosondes along the Churchill meridian. The AFGL laboratory instrumented aircraft will overfly the chain on several missions with an all sky monochromatic imaging system and a digital ionosonde system. Simultaneous observations of dayside aurora from Cambridge Bay will also be compared and observations will be coordinated with data acquisition from satellites ISIS and TRIAD. For reference on meridian scanning photometer data and results see JGR, 81, 2805 1976.

ANDOYA

NASA Nike-Tomahawk 18.211UE/IE --- Matthews will launch this rocket as a prototype of a series to be launched from Siple, Antarctica next year. Experimenters are: Matthews - electrons, pitch-angle and energy, 50 eV-700 KeV; Kelley and Holtet - VLF electric field on 3 axes and plasma density fluctuation; and Rycroft - VLF magnetic

field on 3 axes. Launch will be pre-midnight with riometer absorption.

ESRANGE

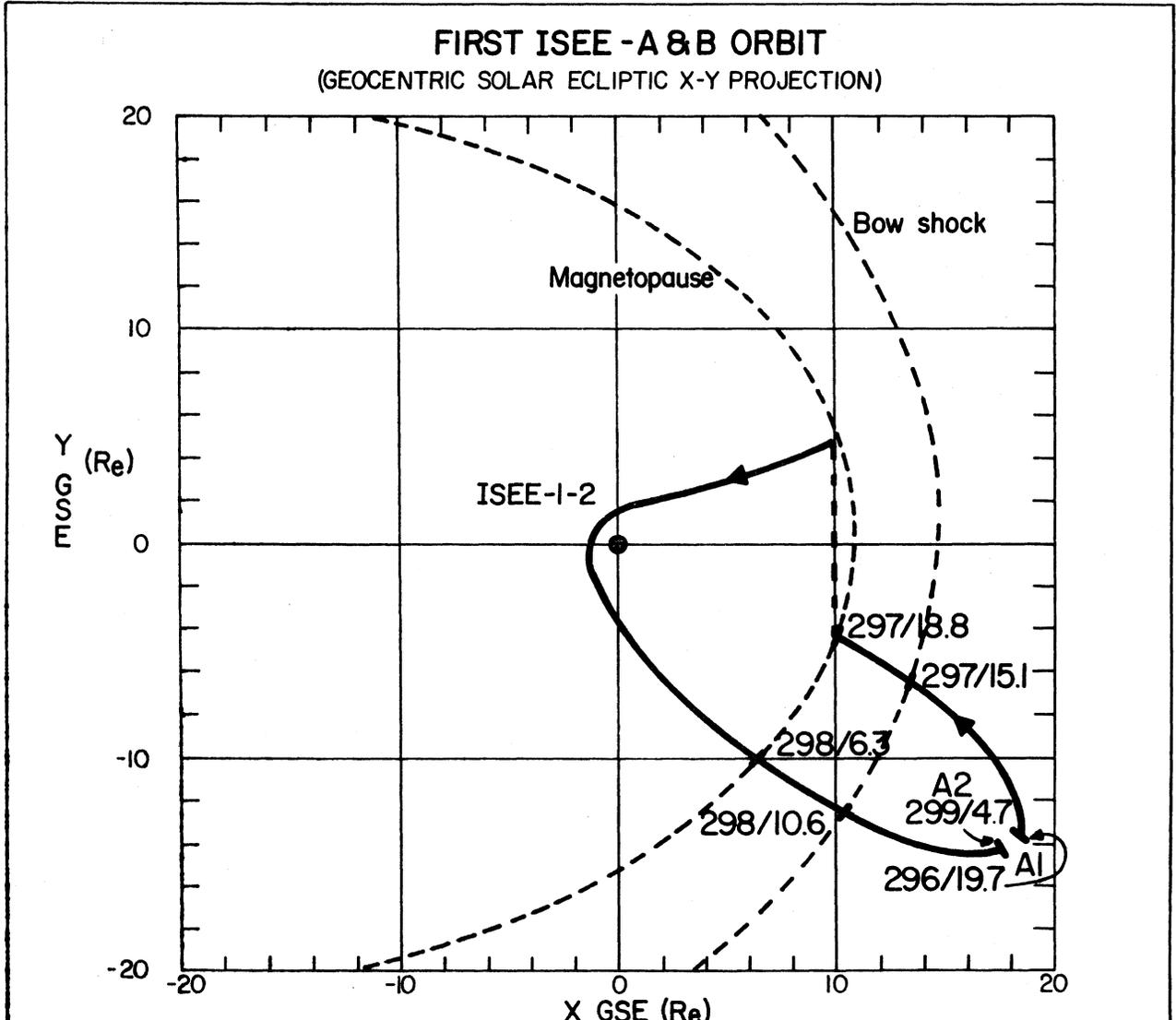
"S23-Substorm GEOS" --- R. Lundin will launch 3 rockets from Kiruna: two Black Brant VC's to 250 km and one Nike-BBVC to 400 km altitude. The Nike will launch sometime in the interval 17 Oct - 31 Dec 1977, while the others are to be launched in Jan - Feb 78. The scientific objective is to measure particles and fields on and close to the GEOS field-line during an auroral substorm. Experimenters are: O. Storey - high and middle frequency e- currents; E. Ungstrup - AC E-field and B-field; F. Primdahl - DC magnetic field; U. Fahlsson - DC electric field; R. Lundin - low and medium energy charged particles, 0.05-200 KeV and positive ions with mass-resolution 1-16 KeV, 1 to about 20 Amu; B. Holback - DC and AC plasma density measurements; and G. Witt - Grating polychromator. Launch will be into clear sky during an auroral substorm. Coordination is planned with satellites GEOS, S302, S303, S310 and S321.

"SAMBO-II" --- I.A. Zhulin is project scientist for this international program of multiple balloon launches from Kiruna/ESRANGE. Launch window is from 15 Jan to 1 March 1978; however, because of the failure of GEOS-1 to achieve geostationary orbit the date of SAMBO-II may be delayed up to Jan/Feb 1979. Potential exists for coordination with other satellites including GEOS-II or MAGIK or with the EISCAT incoherent radar now under construction. Co-investigator for this program is J.P. Treilhou. Scientific objective of the balloons is to study auroral disturbance effects at 33-35 km altitude by measuring X-rays (30 KeV - 160 (Continued on pg 10)

ACTUALITIES

SATELLITES

ISEE-A&B --- Two of the main IMS satellites were launched successfully Saturday morning, 22 October 1977. After several postponements due to the succession of impaired launches or launch failures from NASA's Eastern Test Range, the ISEE-A&B satellites were boosted together into a nominal (scheduled) orbit by a "picture book" launch. From Boulder's NOAA/SEL Communications Center, IMSCIE staff monitored the prelaunch preparations, launch, successful orbit attainment and the beginning of boom deployment with the help of telephone calls from the ISEE-B European Space Agency office at Canaveral. Arne Pedersen, following meetings at JPL and a quick visit to the IMSCIE Office in Boulder, monitored the launch with other ISEE experimenters from a link in Berkeley, California. The IMS Satellite Situation Center at Goddard was manned in preparation to receive orbit parameters soon after launch and quickly produce a table of projected boundary crossing times for use in monitoring experiment turn-on and interpretation of the satellites' vital signals. Below we give the SSC-produced map of the first ISEE-A&B (now "1&2") orbit with nominal boundary crossing times. Also given are the first telexes sent about the launch and experiment status.



ISEE Telexes --- To: selected satellite experimenters on IMSCIE prompt notification list, IMS officials, Regional and National IMS Contacts. From IMSCIE Office, J.H. Allen. Sent 77/10/22 @ 1655 UT:

"By telephone call from the Eastern Test Range, Dr. A. Durney, ISEE-B Project Scientist, has notified IMSCIE Office of the successful launch of satellites ISEE-A&B ('Mother & Daughter'). All systems operated nominally through the various stages for a 'picture book' launch. As of 1535 UT, 22 October 1977, the satellites are in orbit and beginning boom deployment. Durney will supply information on experiment status as of Tuesday, 25 October for inclusion in IMS Newsletter 77-11 which will be distributed on 1 November. This NL will include orbit plots for ISEE-A&B and other current information from the IMS Satellite Situation Center."

To IMSCIE Office. From A. Durney/K.W. Ogilvie (Project Scientists for ISEE B & A, respectively). Sent 77/10/26 @ 1600 UT:

"ISEE-A/B Report, second orbit. Operations so far have been near nominal. Apogee is 22.64 earth radii instead of the planned 23.0, possibly due to a slightly low third stage performance; however, this is well within the dispersion and gives us no problem. At the present time all spacecraft booms and the 'A' S-band antenna have been successfully deployed. Most of the experiments have been switched on. The exceptions are the instruments which use high voltages, and experiments which require the long wire antenna. The aperture shutters from Bame's instrument and the covers for Mozer's spheres have been removed. The long wire antennas have yet to be deployed. Everything seems to be working very well indeed. The retro-maneuver to take off the effect of the separation springs went smoothly, so we know we have a working maneuver system. Separation time at present is 7 minutes. We are hoping to bring the flyby which is the start of the scientific phase forward from November 10 to November 6. We have two healthy spacecraft, a good orbit and everything is set for a successful mission."

ISEE-A&B Orbit Elements --- The following orbit elements were provided by J. Vette, IMS Satellite Situation Center. They are given to rounded values rather than with the full accuracy used for calculating exact positions. Epoch = 22 Oct 1977, day 295 15h 15m 12s. Semi-major axis $a=75571.6$ km; eccentricity $e=0.91191$; inclination $i=28.7$ deg; argument of perigee $\omega=309.9$ deg; right ascension of ascending node $\Omega=58.5$ deg; and mean anomaly $M=2.8$ deg. From these classical elements can be determined the following information: perigee height = 279 km; apogee height = 138108 km; latitude of apogee = 21.6 deg; local time of first apogee = 10.9h; and period = 57.43 hours.

ISEE Boundary Crossings --- The ISEE orbit map for the first revolution is shown on page 3 with nominal times given for the crossings of the magnetopause boundary and bow shock. Tables of the outward and inward boundary crossing times are given for ISEE-A&B on page 11 for the period Oct 22 through Dec 31, 1977. These times correspond to the special IMS SSC intervals and the STIP IV Period (NL 77-10, pgs. 4&5). On the basis of these boundary crossing times, the position of the ISEE satellites relative to the magnetosphere has been used to include these satellites with the others listed on page 9 of this NL for the STIP-IV/IMS Special Observational Interval, 15 Oct - 31 Dec 77.

GEOS --- K. Knott, GEOS Project Scientist, sends the following telex message. "Urgent! Received list of data acquisition periods for ISIS-1&2 from Boulding and S3-3 from Mozer. Be advised that GEOS experimenters selected periods 13-14 July, 29-30 July and 20-21 September for concentrated data analysis. They also selected 12 July as reference day to establish particle spectrum over eV to MeV range at 13:00 and 15:00 composed by results from 5 different experiments."

"Please inform U.S. and Canadian experimenters to request processing of their data for these periods."

"HS-GEOS data collected during Jim Creek passes in June are now available. Will advise soon on results and possibility to repeat exercise in near future."

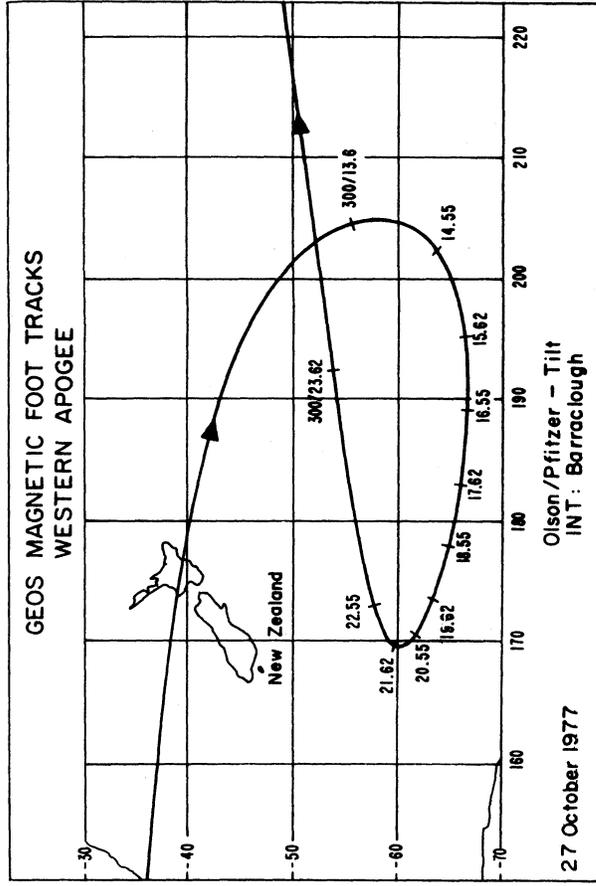
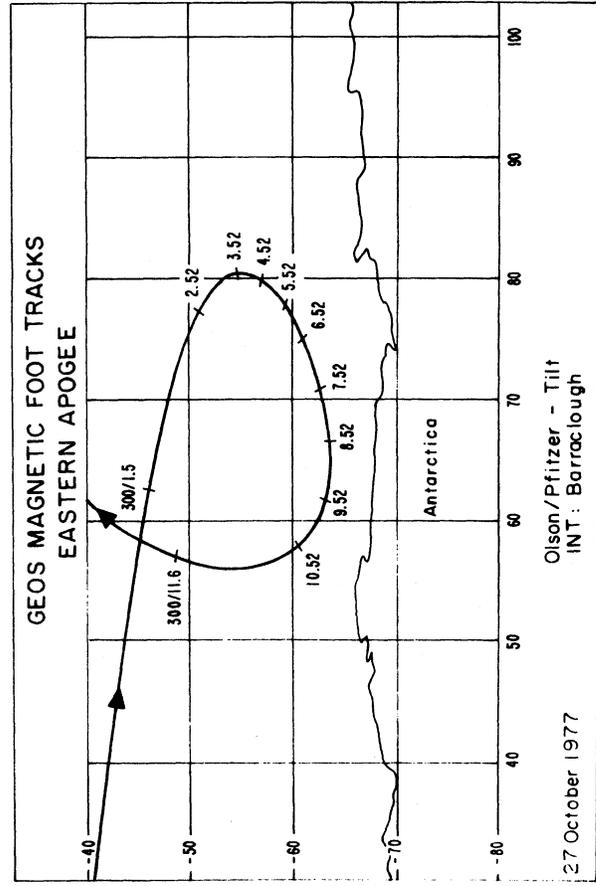
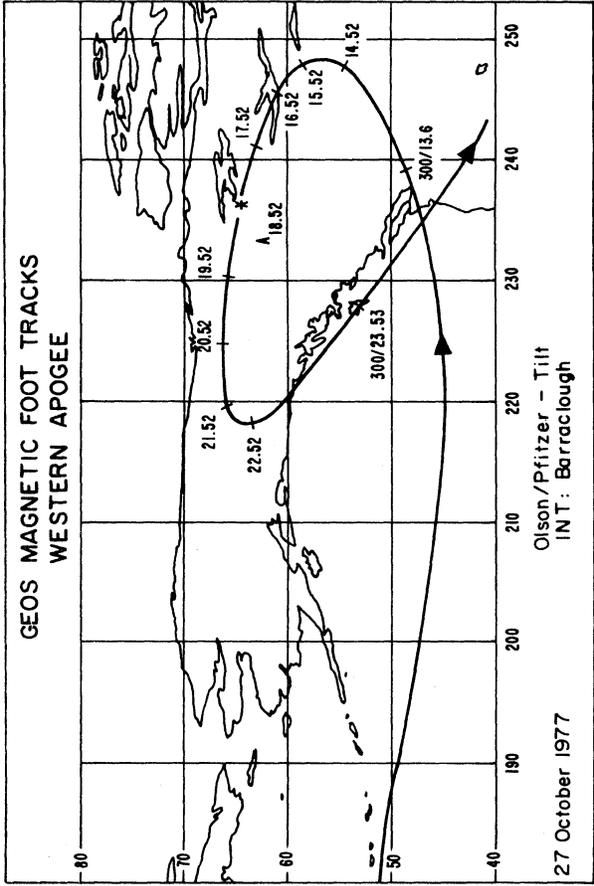
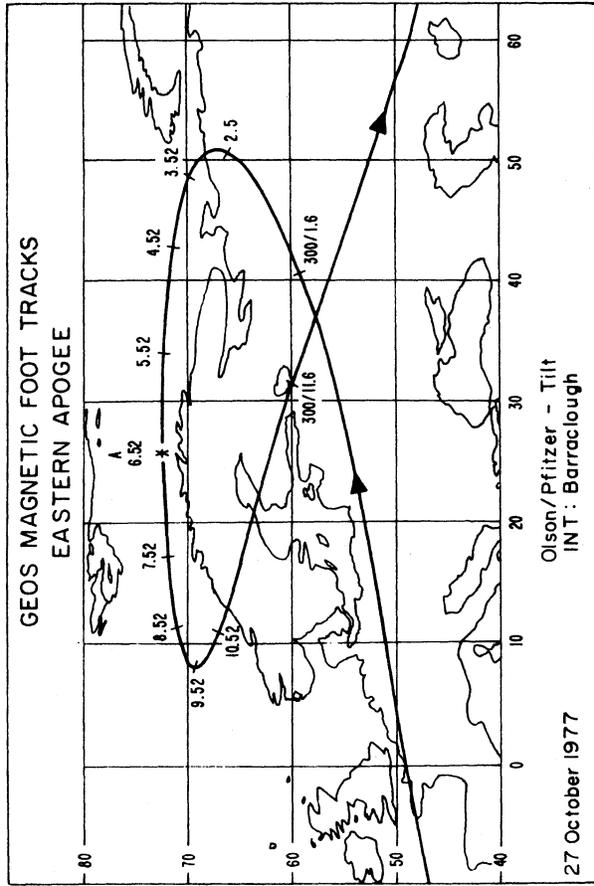
The IMSCIE Office has also received from Boulding lists of the data acquisition intervals for ISIS-1&2 during times when those satellites were near the GEOS magnetic field line. Most recently we received this information for the month of September 1977 and an earlier transmission covered the period 15 June - 31 August. In general, data acquired during these conjunctions will only be processed upon special request (see note in IMS NL 77 10, pg 3 "ISIS-1&2"). Anyone interested in this data may obtain copies of the acquisition intervals from: J.D.R. Boulding, ISIS Satellite Controller, Communications Research Center, Shirley Bay, P.O. Box 11490, Station "H", Ottawa, Ontario, K2H 8S2, Canada, from the IMS Satellite Situation Center or from the IMSCIE Office. Lists of scientists responsible for the various experiments on ISIS have been published in IMS/SSC Report No. 9, "IMS Directory of Spacecraft and Experiment Scientific Contacts", Jan 1977 (updated periodically).

A. Pedersen confirmed during his recent visit to the IMSCIE Office that the GEOS experiments received the Jim Creek radio signals clearly and with an amplitude almost saturating the receiver. These results (also referred to in the Knott telex above) suggest the practicality of some further cooperative Jim Creek/GEOS program as discussed by R.A. Hellwell (IMS NL 77-7, pg 8 "IMS Science"). Further, Arne mentioned that there was now discussion about the utility of a similar transmitter located in Scandinavia for future studies during the GEOS-1 Eastern Apogee passes and for use in conjunction with GEOS-2 if that satellite is launched.

GEOS ORBIT MAPS --- On facing page 5 are four maps showing the GEOS satellite magnetic foot tracks for both northern and southern hemisphere on 27 Oct 1977. The time ticks marked on each path are approximately for hours before, at and after apogee and may be related to the position of GEOS during the tracking intervals, priority periods and satellite or ground conjunctions identified by the IMS SSC and circulated weekly by telex to those requesting this service from the IMSCIE Office.

GEOS Special Intervals --- Because data from GEOS passes over the Western Apogee (N. America) can only be acquired at the highest rates for selected intervals, the IMS SSC has generated lists of GEOS magnetic flux tube conjunctions with selected surface experiments and low-altitude or geostationary satellites. These lists have provided input to the European Space Agency from which they could select intervals to be tracked by NASA (See IMS NL 77-7, pgs 8&9, and subsequent NL's for details). Later, this capability to alert GEOS experimenters and others to potentially opportune times for cooperative observations was extended to include passes over the Eastern Apogee. For these GEOS passes, ESOC was recording data at the full high-data-rate except for times of satellite maneuvers or signal/equipment problems. During interval G9 (0030-0630 UT with high-speed data acquisition "priority period" from 0100-0130 UT), experimenters for satellite S3-3 report observing upwelling ions and they are interested in related observations near geosynchronous altitude. Also, F. Scarf reports that the Voyager-1&2 satellites recorded effects of the solar activity of 19 September (covered by intervals 102/G102 and subsequent times). These are additions to the list of intervals/interesting events discussed at IAGA in Seattle and reported in NL 77-9, pgs 3&4.

LATEST GEOS/ISEE INFORMATION --- Just at press time IMSCIE Office received news of a unique conjunction for these space craft. See [pg. 8] for details & map plus news on GEOS Daily Summary plots and meeting.



More Actualities:

ROCKETS

"Equatorial Wideband" --- This program of rocket launches coordinated with satellite passages and ground experiments has been partially successful but with several changes from information given in earlier NL's. M. Baron informs IMSCIE that John Clark, DNA, has succeeded Carl Fitz as director of the Wideband Equatorial program and he is currently responsible for this campaign. The Kwajalein Wideband Equatorial program took place from 12-26 August 1977. Participating with ground-based instrumentation were: Baron (SRI)/Wideband satellite experiment, Biondi (U. Pittsburgh)/Fabry Perot Interferometer, Reinisch (U. Lowell)/Digital Ionosonde, Towle (MIT/LL) and Tsunoda (SRI)/Altair radar and Fulks (MRC)/ISIS station. Rocket experimenters were: Szuszczewicz (NRL)/Pulsed Plasma Probe, Baker (Utah State U.)/Capacitance Probe, Plasma Frequency Probe, DC Probe, Photometers, Kelley (Cornell)/Electric Field Probes and Ulwick (AFGL)/Mass Spectrometer. A rocket was launched at about 1200 UT on 23 Aug but because of a malfunction the payload achieved an apogee of less than 200 km rather than the planned 900 km. No further rocket launches were attempted. However, a great deal of interesting coordinated ground-based measurements were obtained. Plans are being formulated to launch the remaining two rockets from Kwajalein in the spring of 1978 in conjunction with a second Wideband Equatorial program (details on the Wideband radio beacon satellite are in IMS NL 76-7, pg 4). Following Fremouw's departure from SRI, M. Baron is now responsible for the Wideband satellite program and associated rockets to be launched from Poker Flat.

ANTARCTICA --- T. Hirasawa launched rocket "S-210JA-29" and I. Kimura launched "S-310JA-3" from Syowa at 1615 UT on 12 July and at 1535 UT on 26 July 1977, respectively, in coordination with the GEOS and ISIS satellites on disturbed days. At these times ISIS was passing overhead near Syowa and the magnetic foot track of the westward-shifted GEOS was located near Syowa. Details on these rocket programs are given in IMS NL 77-7, pg 2.

Since the start of IMS, 12 rockets have been launched from Syowa in coordination with satellite experiments and ground based observations. Scientific objectives were: study of wave-particle interaction mechanisms, study of relationship between electric and magnetic fields in auroras and study of ionization processes in the high-latitude ionosphere. All of these launches have been reported in these NL's. Detailed information on the individual rockets and the overall IMS program of Japan at Syowa Station is given in two papers given to us in Seattle: (1) "Sounding Rocket Campaign at Syowa Station, Antarctica" by T. Nagata, H. Fukunishi, I. Kimura and T. Tohmatsu and (2) "Multipoint Ground Observations around Syowa Station, Antarctica by Means of Manned and Unmanned Observatories" by T. Nagata, T. Hirasawa, M. Ayukawa and H. Fukunishi.

ANDOYA --- "2ND HIGH-LATITUDE CAMPAIGN" Rocket SL 1423, A. Johnstone, was launched on 13 Oct 1977. NL 77-8, pg 2, has details of this extensive program with experiment descriptions and lists of participants. Rees launched rockets "F3" and "P207A" on 16 Oct as part of this campaign. Wilhelm launched rocket "T/NL 1" of the "Substorm Phenomena" campaign on 13 Oct. The close coordination of these two programs is described in 77-8.

GROUND-BASED

Iceland --- M.J. Rycroft sends news that his group from U. Southampton was making VLF observations in Iceland during August and September 1977 and they are observing in Northern Scandinavia from Oct to Dec. He has requested information of GEOS and ISIS-1&2 data acquisition during these times and complete information on the STIP-IV interval (see pg 8&9 of this NL).

GLOBAL NETWORK MAP --- C.R. Argent (U.K.) sends following information about the Institute Geological Sciences Rubidium magnetometer network deployed for the IMS. The map on the next page shows the locations of IGS rubidium magnetometers established for the IMS (some in place since 1975). Data at these sites are recorded digitally with 2.5-sec time resolution. Enquiries for copies of data or proposals for cooperative research projects using the data from this array should be addressed to: Dr W.F. Stuart, Geomagnetism Unit, IGS Murchison House, West Mains Road, Edinburgh, EH9 3LA. Recordings at Loch Laggan ended in 1976 and terminated at four other sites (Valentia, Hartland, Arendal and Kvistaberg) during 1977. At the other locations recordings are scheduled to continue into 1979 (except possibly at Eidar).

CANADA --- E-W Magnetometer Network: Dr. J.S. Kim reports that the IMS magnetometers with satellite telemetry relay have been installed in a longitudinal chain at Norman Wells, Fort Simpson and Lynn Lake during September and they are fully operational. Norman Wells was a substitute location for the proposed instrumentation that was to have been placed at Tungsten (see IMS NL 77-1, pg 6, "IV. EAST-WEST CHAIN"). High mountains around Tungsten blocked transmission from the ground magnetometer site to the SMS/GOES satellites that relay the data to the Space Environment Laboratory Data Acquisition and Display System (SELDADS) in NOAA at Boulder.

Alberta Chain --- Dr. G. Rostoker reports that the Alberta Chain is operating well at all sites except Ft. Reliance. The instrument there has been disconnected and it may be installed at Lethbridge.

Alaska Chain --- Dr. G. Romick reports successful installation of IMS systems at Eureka and Isachsen. The system at Johnson Point will probably be restarted when those at Sachs Harbour and Cape Parry are installed. See US Coordinator's report.

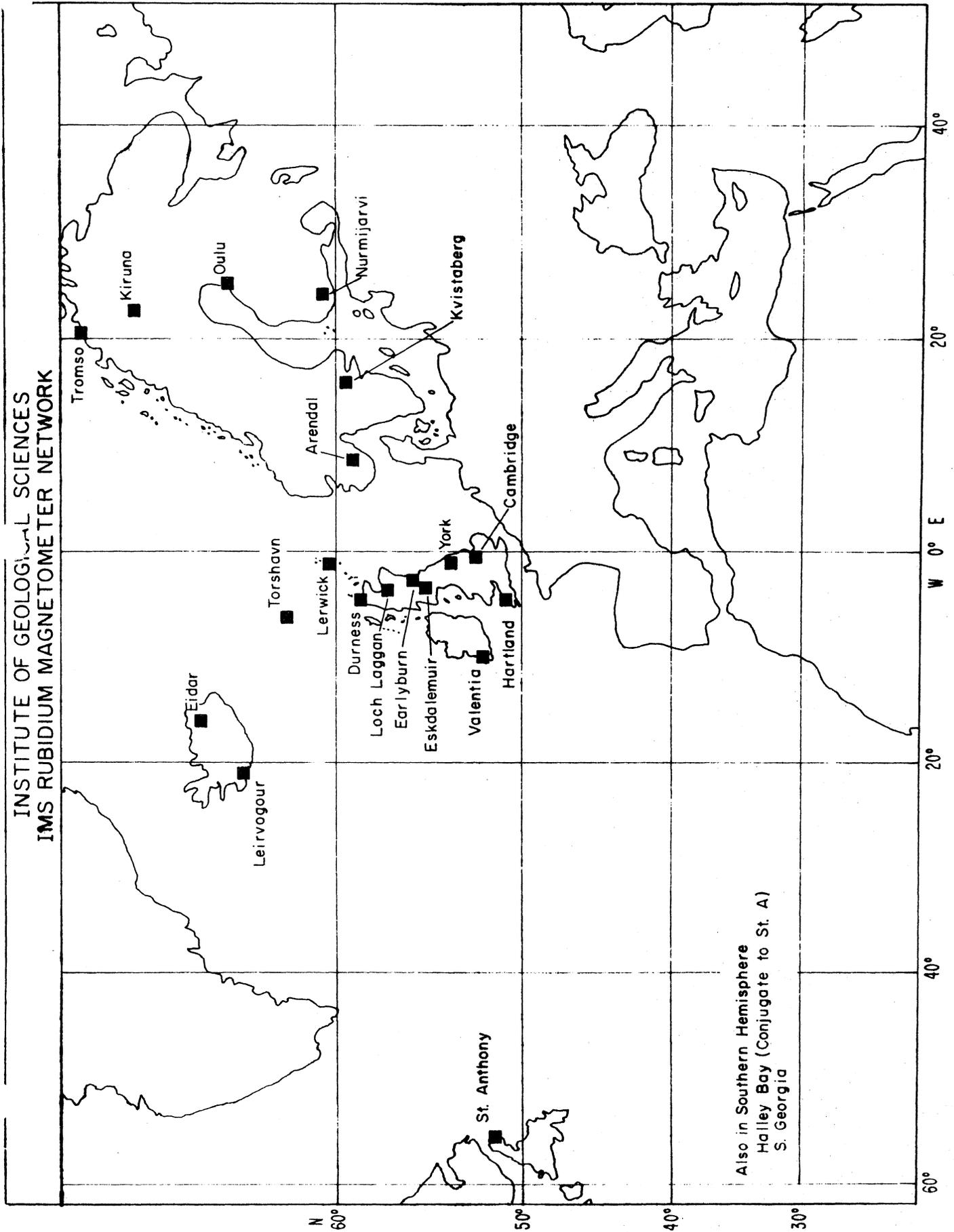
Permanent Canadian Magnetic Observatories --- All the standard Canadian magnetic observatories except Mould Bay now have digitally recording system (AMOS). X, Y and Z components and F are recorded on magnetic tape at each location. Back-up Ruska photographic recordings were discontinued at Ft Churchill (77/03/31); at Baker Lake (77/06/23); and at Great Whale River (77/06/30). They are still recorded at Mould Bay, Victoria, Meanook and Ottawa. At all other locations the only analogue recording is by strip-chart or on microfilm prepared from computer plots of 1-min data.

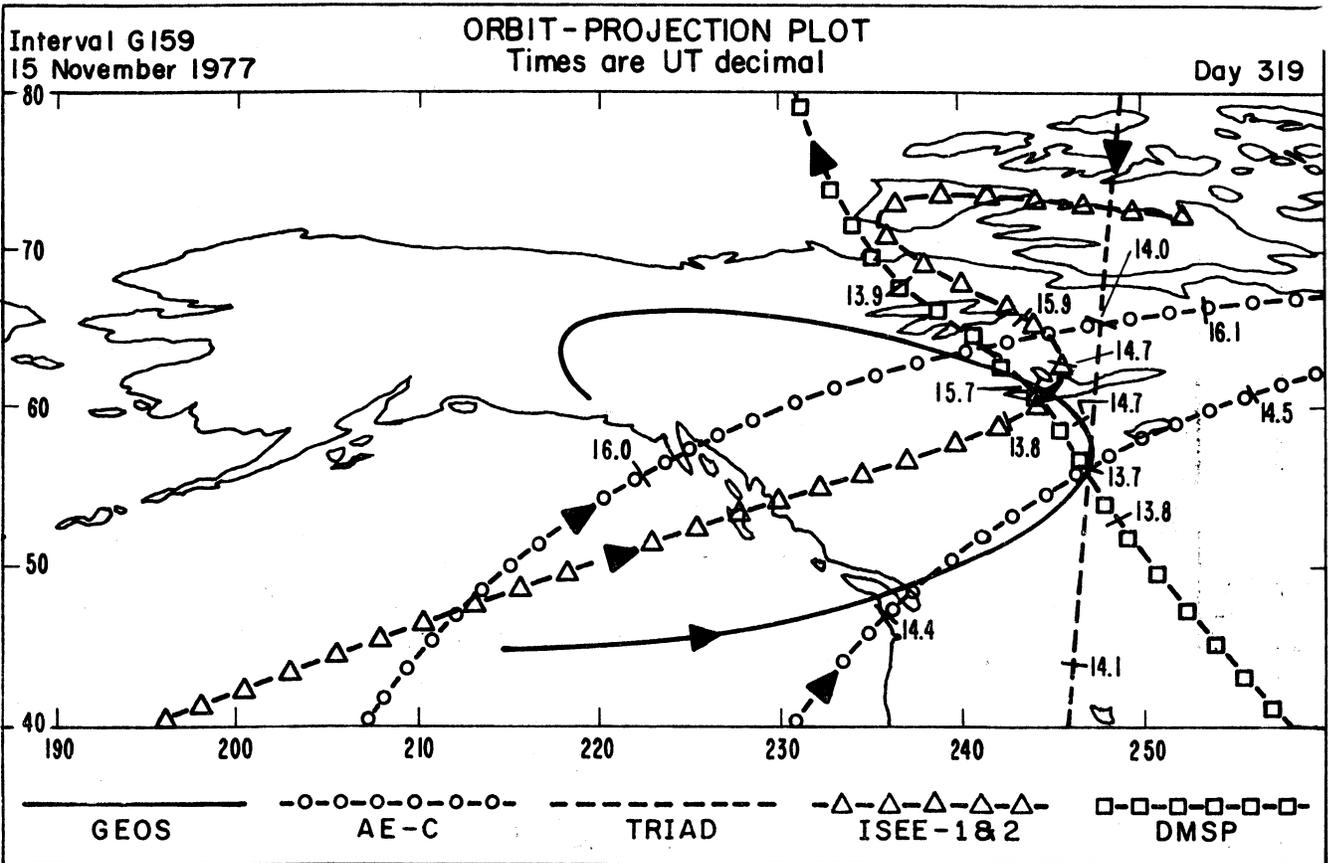
Geomagnetic and Auroral Pulsations --- Dr J.C. Gupta reports that Pc 1,2 recordings at Ottawa will continue at least until the end of 1977. Problems at Resolute Bay have stopped recording there.

Dr's T. Watanabe and T. Oguti have completed their campaign for Aug-Sept recordings in Manitoba using a network of induction magnetometers. Results were excellent. Persistent cloud cover over the Canadian prairies during much of Aug and all Sept greatly limited the amount of complementary auroral photographic recordings using TV imaging systems or other photometric means. They are considering adding LaRonge and Rankin sites for 1978 campaigns.

Dr's N.R. Parsons and F.T. Berkey report observations at Primrose Lake, Alberta with two image-intensifier based systems capable of detecting sub-visual auroral luminosities. These are on a sporadic operation basis during the winter season. Campaigns in 1977 included dates 15-20 Feb, 16-24 March and 7-17 Oct. A program during 5-15 December is tentatively planned. Principal scientific interests are pulsating auroras, diffuse aurora and substorm onsets. Coordinated studies of bremsstrahlung X-ray precipitation and auroral luminosity are to be undertaken in Oct 77 with Prof Venkatesan. Cooperation with Prof Watanabe at Primrose Lake is also scheduled for Oct also using an observation-activated fluxgate magnetometer and a fast-response riometer.

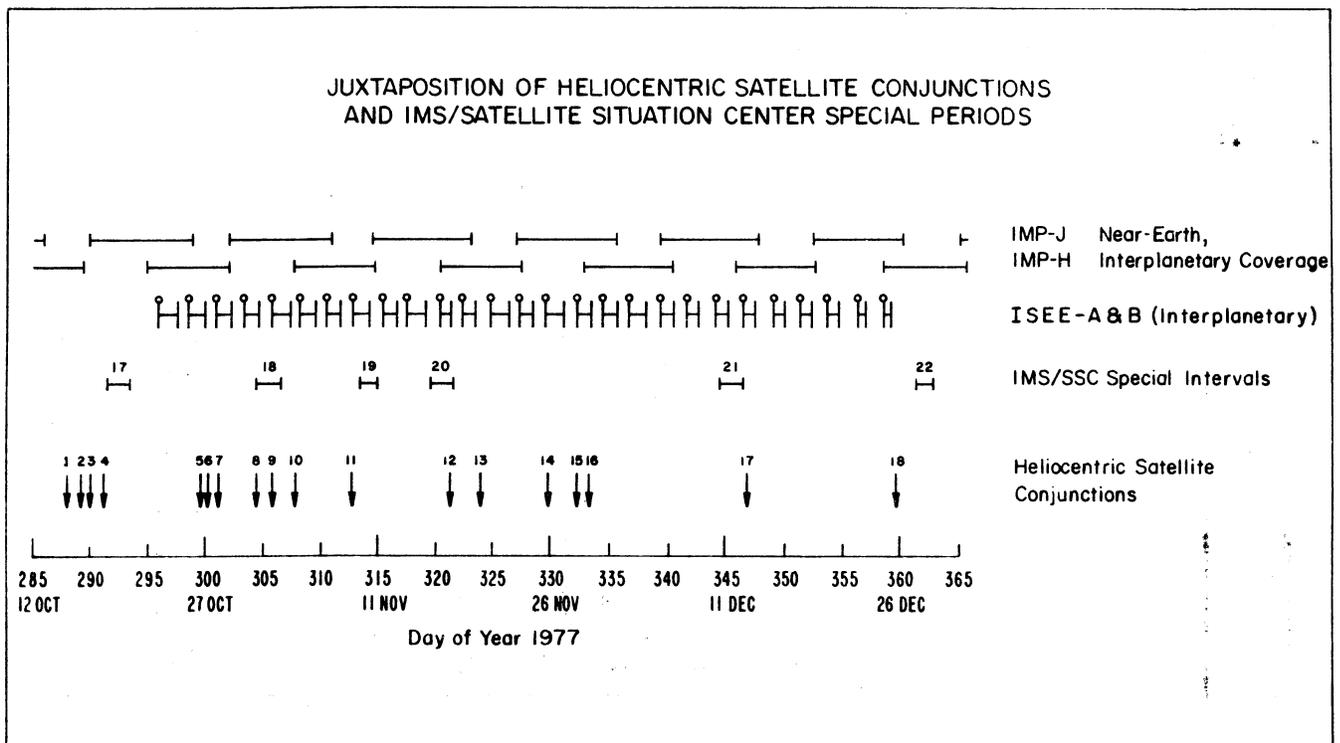
INSTITUTE OF GEOLOGICAL SCIENCES
 IMS RUBIDIUM MAGNETOMETER NETWORK





GEOS-ISEE CONJUNCTION --- The crowded map above displays orbit magnetic foot tracks for the five listed satellites during a period of prolonged (2-hour) conjunction between ISEE-1&2 and GEOS on Nov 15 around the W. Apogee. This configuration is not expected to recur during the GEOS lifetime. An enlargement of the conjunction region is being made at the SSC for circulation to the experimenters and may appear in a later NL. Time ticks along each foot track mark conjunctions, not orbit crossings.

STIP-IV/IMS Observational Interval --- NL's 77-9&10 described the radial alignment period that combines with IMS periods to offer unusual opportunities for coordinated multi-satellite and GRB observations. The diagram below and table on the next page show heliocentric and geocentric satellite positions at times previously designated by the SSC as Special IMS Satellite intervals. These are updated from a recent letter circulated by Dr. R.H. Manka. See NL 77-10, pg 5 for details of events 1-18 and a map.



SSC INTERVALS DURING STIP IV INTERVAL

SSC Int. #	Date/Hour	Region: S/C	S/C/Position							
		IMS S/C	Heliocentric S/C							
17	291/16-293/10 Oct 18/16-Oct 20/10	INP: J,11B	P6	P9	P11	H1	H2	V1	V2	
		P,S: 5A,5B	$\Delta\phi$: 27W	14W	110W	130E	130E	7W	10W	
		SHE: 6A,6B, 11B	R: 1.0	1.0	5.9	0.3	0.3	1.2	1.2	
		TAL: 5B,6A,H	τ : 1.9	1.0	2.6	13	13	1.4	1.7	
18	304/14-306/16 Oct 31/14-Nov 2/16	INP: A/B,J	$\Delta\phi$: 27W	13W	98W	70E	55E	5W	7W	
		P,S: 5B,6B, A/B	R: 1.0	1.0	6.0	0.4	0.3	1.3	1.3	
		SHE: 5A,5B, 6A,6B,11B,A/B	τ : 2.0	1.0	2.0	-8	-7	1.8	2.0	
		TAL: 5B,6A, 6B,11B,H								
19	313/12-314/23 Nov 9/12-Nov 10/23	INP: 11B,A/B, H	$\Delta\phi$: 26W	13W	90W	50E	32E	3W	5W	
		P,S: 5A,6A, 11B,A/B,H,J	R: 1.0	1.0	6.0	0.5	0.4	1.4	1.4	
		SHE: 5B,6A,5A,A/B	τ : 2.0	0.9	1.6	-6	-5	2.0	2.1	
20	319/16-321/8 Nov 15/16-Nov 17/8	INP: A/B,H, J	$\Delta\phi$: 26W	12W	85W	45E	15E	0	1W	
		P,S: 5B,6A, 6B,11B,A/B,H	R: 1.0	1.0	6.1	0.6	0.5	1.5	1.5	
		SHE: 5A,6B,11B, H,A/B	τ : 1.9	0.9	1.2	-5	-3	2.0	2.2	
		TAL: 5B,6A,11B								
21	344/11-346/7 Dec 8/11-Dec 12/7	INP: 11B,J	$\Delta\phi$: 25W	11W	60W	35E	2E	22E	11E	
		P,S: 6A, H	R: 1.0	1.0	6.2	0.8	0.8	1.9	1.7	
		SHE: 5A,6B,11B, A/B,H	τ : 1.8	0.7	0.1	-3	-1	2.3	2.3	
		TAL: 5A,5B								
22	361/7-363/2 Dec 27/7-Dec 29/2	INP: H	$\Delta\phi$: 24W	11W	42W	38E	4E	22E	21E	
		P,S: 6A,6B,J	R: 1.0	0.9	6.3	0.9	0.9	1.9	1.9	
		SHE: 5A,5B, 6A,6B,11B, A/B,J	τ : 1.7	0.6	-0.7	-3	-0.6	2.3	2.2	
		TAL: 5B,6A, 6B,11B,J								

Symbols

INP=Interplanetary
P,S=Magnetopause, Bow Shock
SHE=Magnetosheath
TAL=Magnetotail
5A=Vela 5A
5B=Vela 5B
6A=Vela 6A
6B=Vela 6B
11B=Solrad 11B
A/B=ISEE-A/B

H=IMP-H
J=IMP-J
 $\Delta\phi$ =ecliptic longitude-earth
R=radial distance in AU
E=corotation delay in days
P6=Pioneer 6
P9=Pioneer 9
P11=Pioneer 11
H1=Helios 1
H2=Helios 2
V1=Voyager 1
V2=Voyager 2

Still More Actualities

ALASKA --- "Chatanika Radar" is about to become operational again. M. Baron writes that vendor delays set back reactivation of the Chatanika radar into the first week of November. Weather and roads permitting, the 10-ton power supply transformer has now been transported by truck, barge and truck to the site. Reinstallation will take a few days and operations may begin on 8 Nov. First support will be for the delayed rocket programs of Ulwick and Baron (see page 2 of this NL). The radar will also operate during the World-Wide IISN intervals shown on the IMS calendar.

NORTH AMERICA --- R.H. Manka, C. Hornback and R. Kuberry send the following brief status report on the N. American IMS Magnetometer Network. "During the past month, a significant advance in the status of the testing and deployment of the network has occurred. At the present time, six stations are in operation at their intended sites (four transmitting through the satellite and two recording data on magnetic tape). Four more stations are currently being tested through the satellite at the various investigators' laboratories. The status of the chains is: Alaska Chain - Eureka and Isachsen operational with local recording on magnetic tape; Johnson Point not operation because stand-alone power supply out; Sachs Harbour and Inuvik systems being tested at College; College operation with good data that compares well with standard observatory magnetograms from that site. Fort Churchill Chain - Pelly Bay system being tested in Ottawa with good transmission. E-W Chain all successfully operating with some noise in the X-component of Lynn Lake (see Canadian Actualities). and Mid-Latitude Chain has the Eusebio system testing in Los Angeles with good transmissions."

The monthly IMS Platform Status Report letters from C. Hornback, SEL, provide a fascinating record of the multitude of problems that can afflict a complex electronic system such as the IMS magnetometer/riometer networks with satellite data relay. His latest correspondence is encouraging in that several systems are working well with data coming through the complete circuit so that the comment can be made that "... if a platform is running well, there will be little trouble in acquiring better than 95% of the data." SEL has attempted to furnish data listings, printer image magnetic tapes and data plots to the Principal Investigators for each chain to permit evaluation of the quality of received data from SELDADS. 1-min and "raw values" data tapes should soon be processed, together with 35mm microfilm stack plots, for transmittal to the WDC-A for STP (Boulder) and relay to participating scientists and the IMS community. Laboratory studies continue to achieve shielding and isolation that will permit operation of the riometers with the magnetometer systems, as originally planned. Al Gray, SEL, has compared data transmitted from College against magnetograms from the observatory at that location. He finds the data agree within a few gammas.

The adjacent figure is reproduced from Charley Hornback's recent report. It is a station-day stacked plot of 5-min average variations in the magnetic field at College as transmitted through the SMS/GOES and SELDADS system. Breaks in the traces are due to data loss.

GEOS SUMMARY DATA PLOTS

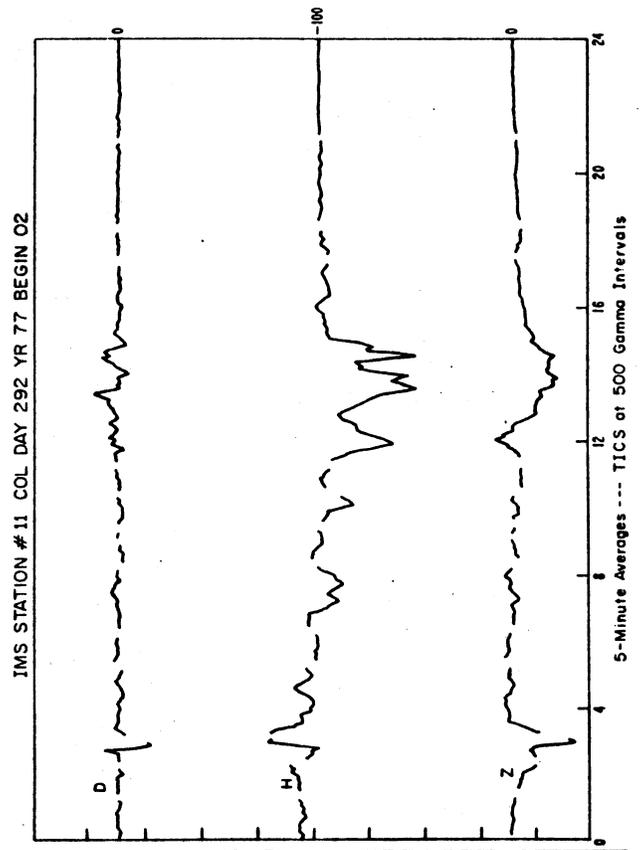
IMSCIE Office received the first Daily Summaries of GEOS data. They span the dates from 18 August to 13 September 1977. In a cover letter, K. Knott describes the data plots in detail but we will have to include this information in a later NL. Karl mentions that data acquired by NASA during the W. Apogee passes has not yet been routinely converted to the daily plots. However, he expects that beginning in November the data plots for passage through both apogees will be processed and promptly available. Presently, passes over Odenwald have resulted in an 80% or better data acquisition rate.

(Continued from pg 2)

KeV, 13 channels), electric field and photometric emissions (6300, 5577, 5200 and 4278 A). Experimenters participating in SAMBO-II are: I.A. Zhulin, L. Lazutin, W. Riedler, J.P. Treilhou, C. Barat and M. Fehrenbach. Coordination will be sought with ground magnetometer data collection, auroral and riometric observations, ionosondes, etc. and with GEOS.

Ft Churchill --- D. Venkatesan plans to launch 3 Black Brant VI rockets in early 1978 to measure auroral X-rays during special events such as auroral break-up and pulsating aurora. The payloads will consist of his X-ray detector. Launching conditions are during moderate to fair auroral display and riometer absorption and there is a possibility of launch into the same event as "AAF-IVB" (Whalen).

Whalen will also launch one payload from Ft Churchill in early 1978. It will be a Black Brant IVB to 700 km altitude. The scientific objective is to measure energy spectrum, pitch angle distribution and mass distribution of electrons and ions in the energy range from 1 eV to 100 KeV. Experimenters are: B.A. Whalen - energetic particle detector; A.G. McNamara - plasma probes; and J.A. Koehler - ram sensor probes. Launching conditions will be into an auroral substorm and there is a possibility of coordination with the Venkatesan launch "AKF-VI-14/15/16".



PROCEDURE FOR ENTRY OF US EQUIPMENT INTO CANADA

The US IMS Coordinator, R.H. Manka, has forwarded a description of the procedure for the entry of U.S. IMS equipment into Canada, which has been developed by the National Research Council of Canada and the US IMS Coordination Office. We will reproduce this note and the complete procedure in our next NL. However, anyone desiring details within the next month might obtain a copy from the US Coordinator's Office, from the Canadian IMS Coordinator or from IMSCIE. The principal time constraint of the procedure is a minimum six-weeks advance application for permission.

ISEE-1&2 Boundary Encounters

The table below relates to the passage times of ISEE-1&2 through the bow shock and the magnetopause as calculated from the early orbit information provided to the SSC. Some of this information is also displayed in other formats by the first-orbit map on page 3 and the diagram and table of pages 8 & 9, in this NL. The table begins with the first

outbound passage through the magnetopause on 22 Oct 1977, 295/21.42 (21h 25m UT), out across the bow shock some 3.64 hours later, back inbound across the bow shock on 297/15.06 and through the magnetopause on 297/18.76 (see diagram explanation on page 8 for further details). At the end of 1977, ISEE stays inside the magnetopause or magnetosheath and does not enter the interplanetary region; hence, no bow crossings in the table.

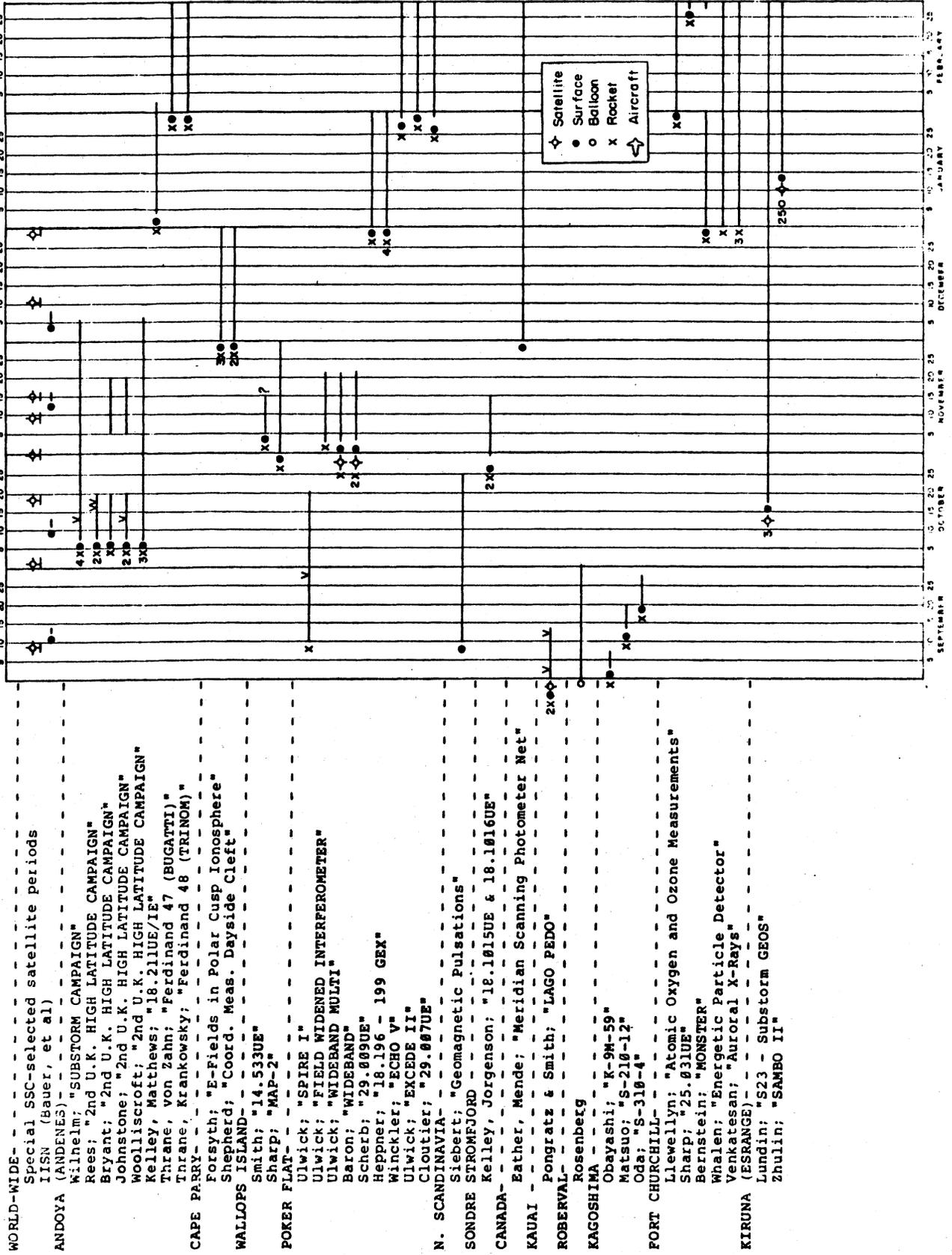
ISEE 1&2			MAGNETOPAUSE ENCOUNTER			BOW SHOCK CROSSING			BOW SHOCK CROSSING			MAGNETOPAUSE ENCOUNTER		
DATE	Day/Hr UT	Dir	DATE	Day/Hr UT	Dir	DATE	Day/Hr UT	Dir	DATE	Day/Hr UT	Dir	DATE	Day/Hr UT	Dir
Oct 22	295/21.42	Out	Oct 23	296/ 1.06	Out	Oct 24	297/15.06	In	Oct 24	297/18.76	In			
25	298/ 6.29		25	298/10.63		27	300/ 0.44		27	300/ 4.14				
27	300/15.77		27	300/20.22		29	302/ 9.78		29	302/13.52				
30	303/ 1.25		30	303/ 5.81		31	304/19.09		31	304/22.86				
Nov 1	305/10.72	Out	Nov 1	305/15.4	Out	Nov 3	307/ 4.4	In	Nov 3	307/ 8.2	In			
3	307/20.17		4	308/ 0.98		5	309/13.71		5	309/17.55				
6	310/ 5.64		6	310/10.59		7	311/23.07		8	312/ 2.96				
8	312/15.16		8	312/20.27		10	314/ 8.41		10	314/12.35				
Nov 11	315/ 0.74	Out	Nov 11	315/ 6.02	Out	Nov 12	316/17.66	In	Nov 12	316/21.66	In			
13	317/10.25		13	317/15.73		15	319/ 2.89		15	319/ 6.98				
15	319/19.74		16	320/ 1.42		17	321/12.14		17	321/16.32				
18	322/ 5.27		18	322/11.16		19	323/21.4		20	324/ 1.68				
Nov 20	324/14.83	Out	Nov 20	324/20.47	Out	Nov 22	326/ 6.64	In	Nov 22	326/11.03	In			
23	327/ 0.41		23	327/ 6.83		24	328/15.84		24	328/20.36				
25	329/10.02		25	329/16.72		27	331/ 1.00		27	331/ 5.67				
27	331/19.61		28	332/ 2.66		29	333/10.11		29	333/19.95				
Nov 30	334/ 3.19	Out	Nov 30	334/12.62	Out	Dec 1	335/19.2	In	Dec 2	336/ 0.23	In			
Dec 2	336/14.78	Out	Dec 2	336/22.6	Out	Dec 4	338/ 4.3	In	Dec 4	338/ 9.56	In			
5	339/ 0.41		5	339/ 8.7		6	340/13.41		6	340/18.91				
7	341/10.14		7	341/18.92		8	342/22.39		9	343/ 4.19				
9	343/19.86		10	344/ 5.27		11	345/ 7.25		11	345/13.42				
Dec 12	346/ 5.53	Out	Dec 12	346/15.64	Out	Dec 13	347/16.06	In	Dec 13	347/22.67	In			
14	348/15.23		15	349/ 2.12		16	350/ 0.81		16	350/ 7.92				
17	351/ 0.98		17	351/12.8		18	352/ 9.45		18	352/17.19				
19	353/10.78		19	353/23.75		20	354/17.89		21	355/ 2.44				
Dec 21	355/20.02	Out	Dec 22	356/11.06	Out	Dec 23	357/ 1.98	In	Dec 23	357/11.64	In			
24	358/ 6.5		24	358/23.11		25	359/ 9.39		25	359/20.81				
26	360/16.39								28	362/ 5.94				
29	363/ 2.3								30	364/15.08				
Dec 31	365/12.23	Out												

during the intervals of special interest. Measurement intervals selected in Seattle by an ad-hoc group of experimenters were June 11-27 (special periods G1-G17); July 12-21 (magnetic activity); and July 25 - Aug 2 (substorm on 29 July). GEOS experimenters have selected some seven days from July and September and several conjunctions during G1-G17 for special emphasis, they are: 13-14 July, 29-30 July, 20-21 Sept (storm following the solar flare of 19 Sept) and 12 July as a reference day for particle spectra (at 1300 & 1500 UT). Any scientist having data related to these events/intervals or theoretical interests in them is invited to attend the discussion.

GEOS/N. American Data Discussion in San Francisco

The US IMS Coordinator has scheduled an informal meeting at the Fall AGU to discuss data collected by GEOS and by N. American satellites and ground arrays during GEOS conjunctions over the W. Apogee. Comparisons of preliminary data are encouraged. The meeting is scheduled for 2-5 pm Wed, 7 Dec in the Pacific Heights-Presidio room at the Jack Tar Hotel. It will be for N. American and European scientists having data from these conjunctions

I.M.S. CALENDAR OF GRR CAMPAIGNS SEPTEMBER 77 - FEBRUARY 78
(As of 31 October 1977)



WORLD-WIDE - Special SSC-selected satellite periods
 IISN (Bauer, et al)
 ANDOYA (ANDENES) -
 Wilhelm; "SUBSTORM CAMPAIGN"
 Rees; "2nd U.K. HIGH LATITUDE CAMPAIGN"
 Bryant; "2nd U.K. HIGH LATITUDE CAMPAIGN"
 Johnstone; "2nd U.K. HIGH LATITUDE CAMPAIGN"
 Woolliscroft; "2nd U.K. HIGH LATITUDE CAMPAIGN"
 Kelley, Matthews; "18.211UE/IE"
 Thrane, von Zahn; "Ferdinand 47 (BUGATTI)"
 Thrane, Krankowsky; "Ferdinand 48 (TRINOM)"
 CAPE PARRY -
 Forsyth; "E-Fields in Polar Cusp Ionosphere"
 Shepherd; "Coord. Meas. Dayside Cleft"
 WALLOPS ISLAND -
 Smith; "14.533UE"
 Sharp; "MAP-2"
 POKER FLAT -
 Ulwick; "SPIRE I"
 Ulwick; "FIELD WIDENED INTERFEROMETER"
 Ulwick; "WIDEBAND MULTI"
 Baron; "WIDEBAND"
 Scherb; "29.009UE"
 Heppner; "18.196 - 199 GEX"
 Winckler; "ECHO V"
 Ulwick; "EXCEDE II"
 Cloutier; "29.007UE"
 N. N. SCANDINAVIA -
 Siebert; "Geomagnetic Pulsations"
 SONDRE STROMFJORD -
 Kelley, Jorgenson; "18.1015UE & 18.1016UE"
 CANADA -
 Eather, Mende; "Meridian Scanning Photometer Net"
 KAUAI -
 Pongratz & Smith; "LAGO PEDO"
 ROBERVAL -
 Rosenberg
 KAGOSHIMA -
 Obayashi; "K-9M-59"
 Matsuo; "S-210-12"
 Oda; "S-310-4"
 PORT CHURCHILL -
 Llewellyn; "Atomic Oxygen and Ozone Measurements"
 Sharp; "25.031UE"
 Bernstein; "MONSTER"
 Whalen; "Energetic Particle Detector"
 Venkatesan; "Auroral X-Rays"
 KIRUNA (ESRRANGE) -
 Lundin; "S23 - Substorm GEOS"
 Zhulin; "SAMBO II"