International Council of Scientific Unions

SPECIAL COMMITTEE
ON
SOLAR-TERRESTRIAL PHYSICS

78-1

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

IMS NEWSLETTER

С новым годом! С этим номером, IMS NL 78-1, начинается вторая половина наблюдательной фазы IMS. В данном номере, мы представляем обычную информацию о последних программных планах и о недавних действительных событиях. Кроме этого, доклады теперь читаются на профессиональных собраниях, IMS-ого "цехы" проводенные в нескольких странах и еще другие собираемые на этот новый год, 1978 г. . Первый два ISEE сателлита успешно выходят на орбиту и GEOS-1 уменьшается, планы запуска GEOS-в вовремя такое, чтобы играть наблюдательную роль в IMS , развываются. Контора IMSCIE уже стал многонациональным усилием в Болдере и с большим интересом мы ожидаем остатка IMS .

(Translation into English, for those needing it, will appear next month)

IMSCIE Office: Telex 45897 SOLTERWARN BDR
Telephone: 303-499-1000 x6501 (FTS 323-6501)
IMS Satellite Situation Center (J. Vette): Telex 89675 NASCOM GBLT
Telephone: 301-982-2354
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

PROGRAM PLANS FOR JANUARY 1978 - MARCH 1978

SPECIAL IMS HIGH-ALTITUDE SATELLITE PERIODS - 1978

Special IMS Satellite Intervals have been selected for the first half of 1978 by the IMS Satellite Situation Center. Based on interesting configurations of high altitude satellites, 10 special intervals have been selected by staff of the SSC. Tables showing the regions in which each of the high-altitude satellites are located during these periods will be published in IMS NL 78-2. At present, we are able to list only the dates and durations of these periods. Given are the date, day number/hour for each.

1 Jan	1/1600 UT to	3 Jan 3/0100 UT	3 Feb	34/0400 UT to	4 Feb 35/0200 UT
12 Feb	43/1300 UT to	13 Feb 44/2300 UT	22 Feb	53/0800 UT to	23 Feb 54/0400 UT
20 Mar	79/0200 UT to	21 Mar 80/2200 UT	1 Apr	91/0200 UT to	3 Apr 93/0100 UT
9 May	129/0100 UT to	10 May 130/1700 UT	22 May	142/1200 UT to	23 May 143/1600 UT
31 May	151/1400 UT to	3 Jun 154/0500 UT	28 Jun	179/0600 UT to	29 Jun 180/0300 UT

SPECIAL LOW-ALTITUDE SATELLITE CONJUNCTIONS

Magnetic flux tube conjunction times forecast by the IMS SSC for GEOS and selected low-altitude satellites have been distributed weekly by the IMSCIE Office. Beginning with the telex sent on 16 Dec 1977, these forecasts include flux tube conjunctions between ISEE-1&2 and selected satellites (including the moon as a satellite of opportunity). Details of these "potential" special low-altitude satellite intervals are given in this NL under the IMS Satellite Status Report (pg 5).

SATELLITE LAUNCHES:

Feb 1 to Feb 28; K. Hirao; "EXOS-A"; Uchinoura; SATELLITE - details in NL 77-12, pg 2
Feb 11 to Feb 27; K. Tao; "ISS-B"; Tanegashima; SATELLITE - details in NL 77-12, update below

GROUND-BASED, BALLOON AND ROCKET CAMPAIGNS:

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

Jan 1 to Jan 31; E.R. Williams; "P112H"; South Uist; ROCKET - winter anomaly and stratwarms
Jan 1 to Jan 31; E.R. Williams; "P197H"; South Uist; ROCKET - Lyman α and electron density
Jan 1 to Jan 31; L.J.C. Woolliscroft; "P139H & P140H"; South Uist; ROCKET-Positive ion mass spectrometer
Jan 1 to Mar 31; D. Venkatesan; "AURORAL X-RAYS"; Ft Churchill; ROCKETS (3) - note in 77-11, pg 10
Jan 1 to Mar 31; B.A. Whalen; "ENERGETIC PARTICLE DETECTOR"; Ft. Churchill; ROCKET- note in 77-11, pg 10
Jan 4 to Feb 2; D.L. Matthews; Andoya; ROCKET - multi-national cooperation, note 77-11, pg 2
Jan 7 to Jan 31; K. Wilhelm; "SUBSTORM CAMPAIGN"; Andoya; ROCKETS (2) - T/NL3&4, note in NL 77-12, pg 3
Jan 21; K. Hirao; "K-9M-62"; Uchinoura; ROCKET - see note below
Jan 26; N. Kawashima; "K-9M-61"; Uchinoura; ROCKET - see note below
Jan 28 to Feb 12; P. Cloutier, H. Anderson; "29.007UE"; Poker Flat; ROCKET - Auroral particles & fields
Jan 28 to Feb 14; F. Scherb; Poker Flat; ROCKET - 29.008UE to measure particles and fields
Jan 28 to Feb 27; J.C. Ulwick; "WIDEBAND-MULTI"; Poker Flat; ROCKET - rescheduled from Nov 1977
Feb 1 to Mar 31; E. Llewellyn; "ATOMIC OXYGEN AND OZONE"; Ft. Churchill; ROCKET - note NL 77-12, pg 4
Feb 3 to Feb 26; L.J.C. Woolliscroft; "2ND HIGH LATITUDE CAMPAIGN"; Andoya; ROCKETS (2) - SL1424 & F6
xxxxxxxxxxxxxxx; Lundin; "S23-SUBSTORM GEOS"; ESRANGE; ROCKETS (3) - Now scheduled Jan-Mar 1979
Feb 27 to Mar 10; W. Sharp; "25.031UE"; Ft. Churchill; ROCKET - auroral studies, refly of 25.005UE
Feb 27 to Mar 17; E. Thrane, U. von Zahn; "Ferdinand 47-BUGATTI"; Andoya; ROCKET-note NL 77-12, pg 3
Feb 27 to Mar 17; E. Thrane, D. Krankowsky; "Ferdinand 48-TRINOM"; Andoya; ROCKET - with BUGATTI
Feb 27 to Mar 20; M. Baron; "WIDEBAND"; Poker Flat; ROCKET - see note below
Feb 27 to Mar 20; J. Ulwick; "EXCEDE II-SPECTRAL"; Poker Flat; ROCKET - electron gun, like EXCEDE I
Feb 27 to Mar 20; J. Ulwick; "TMA"; Poker Flat; ROCKET - Nike-Javelin IC606.35-1, release
Feb 27 to Mar 20; J. Ulwick; "LWIR"; Poker Flat; ROCKETS (2) - Nike-Hydac IC607.15-1 & -2, infrared meas
Feb 27 to Mar 20; T.S. Jorgensen & M. Kelley; "18.1015UE & 18.1016UE"; Poker Flat; ROCKETS (2)- see below
Feb 27 to Mar 20; T.N. Davis & E. Wescott; "18.1017UE & 18.1018UE"; Poker Flat; ROCKETS (2)- Ba release
Mar 1 to Mar 11; J.R. Winckler; "ECHO-V"; Poker Flat; ROCKET - continuing annual series
Mar 1 to Mar 31; L.C. Hale; "15.170UE & 15.171UE"; Poker Flat; ROCKETS (2) - Super Arcas, plasma physics
Mar 5 to Mar 13; W. Bernstein; "E PARALLEL B"; Ft. Churchill; ROCKET - 27.010AE
Mar 21 to Mar 31; R.A. Goldberg; "AUROROZONE"; Poker Flat; ROCKETS (8) - see note below

------Quasi-synoptic Observing Involving Balloons, Rockets, Aircraft, Selected Surface Campaigns------

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

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

------ to Jan 31; Wilhelm; "SUBSTORM"; Andenes; SURFACE - cooperative with rocket program, see below
------ to Feb 25; Rycroft; "VLF"; N. Scandinavia; SURFACE - cooperative with rocket program, see below
------ to Apr 30, Eather; "MERIDIAN SCANNING PHOTOMETERS"; Churchill Chain; SURFACE - note below
Feb 27 to Mar 13; W. Heikkila, R. Pellinen; "AURORAL BREAKUP"; N. Europe; SURFACE - NL 77-12, pg 3
Mar 1 to Sep 30; M. Siebert; "GEOMAGNETIC PULSATIONS"; N. Scandinavia; SURFACE - note below

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Regional IMS SAT/GBR Program Details, Nov 77-Jan 78

Program details for some of the brief listings given above have appeared in earlier IMS NLs.

SPACE

ISS-B --- Dr. N. Matuura, RRL, has corrected our earlier notice about the satellite ISS-B (IMS NL 77-12, pg 2). Project Scientist is Dr. N. Wakai, Radio Research Labs (RRL), 2-1 Nukui-Kitamachi 4 Chome, Koganei-shi, Tokyo 184, Japan; Telephone: 0423-21-1211; Telex: 2832611 DEMPA J. Launch will be from the National Space Development Agency (NASDA) facility at Tanegashima Space Center. Launch window is 11-28 February 1978. The orbit will be circular at 1000 km altitude, period 105 min, and inclination 70 deg. Experiments and principal experimenters are: (1) Sweep frequency topside sounder, 0.5-15MHz, Dr. N. Matuura and Dr. R. Maeda; (2) Radio noise receiver near 2.5, 5, 10, & 25 MHz, Mr. M. Kotaki; (3) Retarding potential trap, Mr. H. Mori; and (4) Ion mass spectrometer, Bennett type, Mr. I. Iwamoto. All principal experimenters are from RRL.

UCHINOURA

K-9M-62 --- K. Hirao will launch this rocket on 21 Jan 1978. It will reach peak altitude at about 347 km. Launch will be from the Univ of Tokyo range at Uchinoura (Kagoshima Prefecture). Seven experiments carried are: electron density, electron temperature, thermal electron spectrum, electron density fluctuations, magnetic field, solar UV, and electric field.

K-9M-61 --- N. Kawashima will launch this rocket on 26 Jan 1978, from Uchinoura. Peak altitude will be 320 km. Four experiments carried are: Plasma waves, electron density, electron beam experiment, and low energy electrons.

POKER FLAT

18.1015UE & 18.1016UE --- Nike-Tomahawk rockets of Jorgensen and Kelley will be launched from Poker Flat, Alaska instead of Sondre Stromfjord, Greenland, as announced earlier.

AUROROZONE --- R. Goldberg and J.R. Barcus will launch combined rockets to study the energetics of high latitude phenomena associated with changes in the stratosphere and correlated with rocket observations of bremstrahllung X-rays. Two Nike-Tomahawks, 18.214 & 18.215GM, will carry X-ray detectors, scintillation counter (15-20 deg directionality), electron detector, Geiger tube for >15, >25, >40, and >100 KeV (looking down, up, and sideways). Observations will be coordinated with the Chatanika radar which is again operational and with Alaskan Chain all-sky cameras. Launch will be around midnight when the radar indicates aurora. Also part of the program are six Super Arcas rockets, 15.164 - 15.169.

FT. CHURCHILL

E Parallel B --- W. Berstein will launch a Nike-Black Brant from Ft. Churchill, Canada in March 1978. Co-experimenters are K. Wilhelm, and D. Evans. The payload carries 2 ejectable probes, an electron accelerator on the main payload, instruments to measure E-fields parallel to the B-field by fast echos, 4-direction energetic electron monitor for 1.9, 4, and 10 KeV e-, and 2 other probes. We apologize for having used the unbecoming nickname "Monster" for this rocket in past NL's (and in the calendar on pg 14 which had already gone to the printer).

ANDENES

SUBSTORM - In conjunction with the substorm sounding rocket campaign of Wilhelm, a geomagnetic pulsation magnetometer station is being operated at Andenes, Norway. Pulsations in the range 1 - 500 sec are recorded with a resolution of 0.02 nT. Data are recorded on paper chart and digital magnetic tape. The station began operating 25 Sep 1977, and will continue until the end of the rocket campaign.

N. SCANDINAVIA

VLF --- M.J. Rycroft sends word that he is participating with D.L. Matthews in January of 1978 and with the 2ND UK HIGH LATITUDE CAMPAIGN during February by continuing his VLF observations at several sites in N. Scandinavia.

Note from Chairman, IMS Steering Committee

Two years have passed since the beginning of the International Magnetospheric Study. A great deal has happened during this period of time, amply documented in the IMS Newsletter. It all can be summed up in one sentence: the data-gathering phase of the IMS is in full operation.

The effort and time dedicated by many scientists from all over the world to planning and assembling the IMS networks and spacecraft will pay off well. Indeed, the data base that is being acquired no doubt will be a key to the better understanding of near-earth space and its subtle and manifold interactions with our immediate environment.

Due recognition should be given to those scientists who have spent much of their time participating actively in international committees or carrying out duties at the Satellite Situation Center, the IMSCIE Office, the Data Centers and the IMS Secretariat. They have rendered and are rendering a superb service to the entire IMS community.

Two tasks are next in line in terms of international cooperation in magnetospheric research: (i) to provide for suitable mechanisms and forums for IMS data analysis and interpretation, and (ii) to provide for a rational and realistic transition of magnetospheric research into the post-IMS era. Both tasks require that we continue working together as in the past -- as colleagues and friends across boundaries of any kind.

Juan G. Roederer
Chairman
IMS Steering Committee

ACTUALITIES

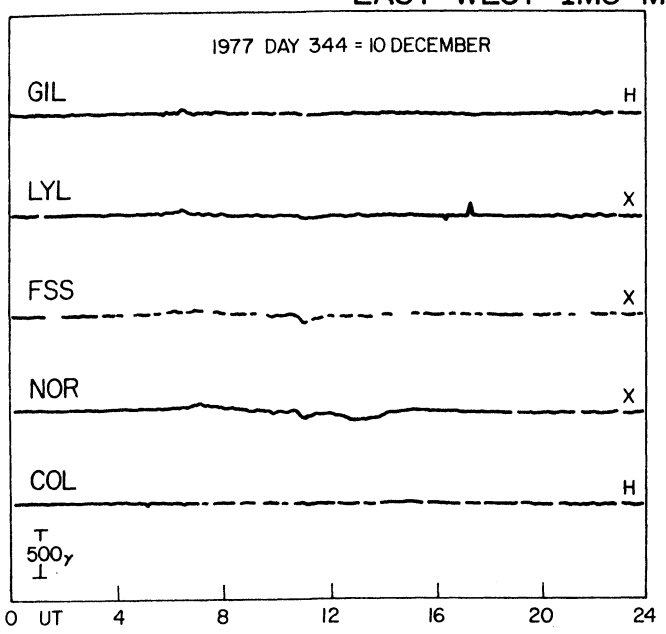
SATELLITES

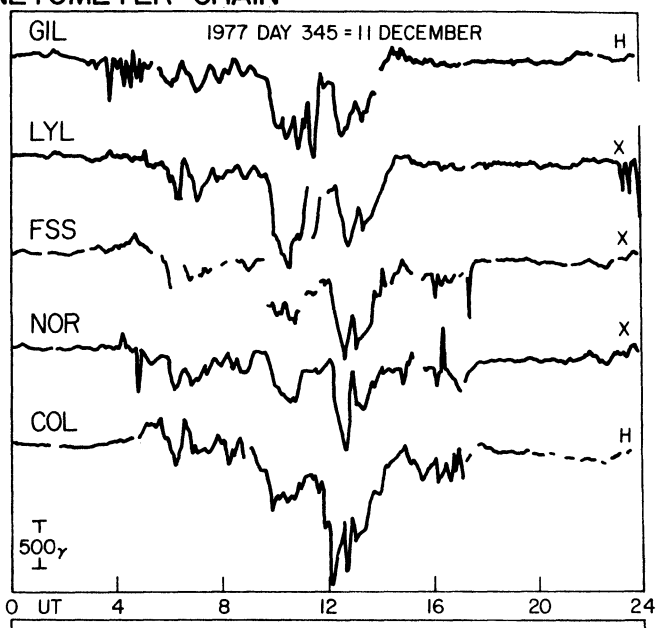
GEOS - K. Knott announced the end of GEOS data acquisition by NASA for ESA during the W. Apogee passes, last data taken was for 15 Dec 1977. Tracking time has been reduced for the E. Apogee passes and some time-sharing of experiments has become necessary because of the reduced power available during the satellite's solar eclipse period. Probably time sharing will continue to be necessary after end of the eclipse in Feb because of progressive decline of power supply. Experiment ON-OFF times are available in an ESOC report for times up to 11 Nov. In general ESA is able to obtain about 35% data recovery from the tapes prepared by NASA. Daily summary data plots from GEOS E. Apogee passes are available at the IMSCIE Office, IMS SSC, WDC-s, and with experimenters for the period 77/08/17 (17 August 1977) through 77/12/15 (15 December 1977). At the San Francisco meeting of AGU, K. Knott showed samples of daily summary data plots prepared from some of the NASA-collected data. At that time these were not available as a routine data product and there was discussion that perhaps only selected special interest intervals with reasonable data quality might be reproduced. Probably data acquisition for even the E. Apogee passes will end when GEOS enters a new eclipse season in June 1978. GEOS Project Scientist K. Knott should be contacted for detailed information about the satellite. Also, see information about the GEOS - N. American Experimenters' meeting on pg _ of this NL and the associated notes about interesting data observed by GEOS and other coordinated programs.

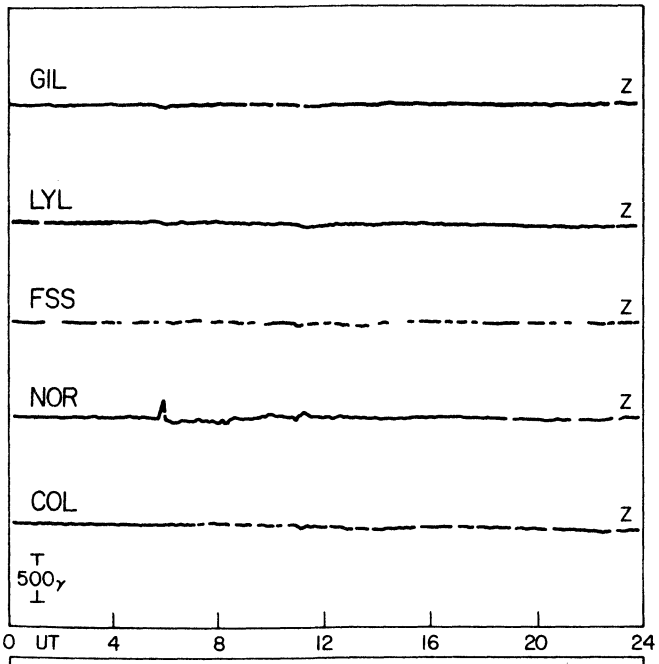
Mme S. Perraut, scientist responsible for the GEOS S-300 ULF magnetic field experiment comments on the ULF data displayed in the GEOS Daily Summaries as follows: "Until November 3 the two curves are not correctly labelled. What is given as B (parallel) should be B (perpendicular) and vice versa. The B (parallel) component occasionally exhibits strong discontinuities at the beginning and end of passes. This is due to the switching on or off of the despin unit of the experiment. The zero calibration for the two curves is different. For B (perpendicular), zero db corresponds to 0.025 gamma square; for B (parallel), this level corresponds to 0.0125 gamma square."

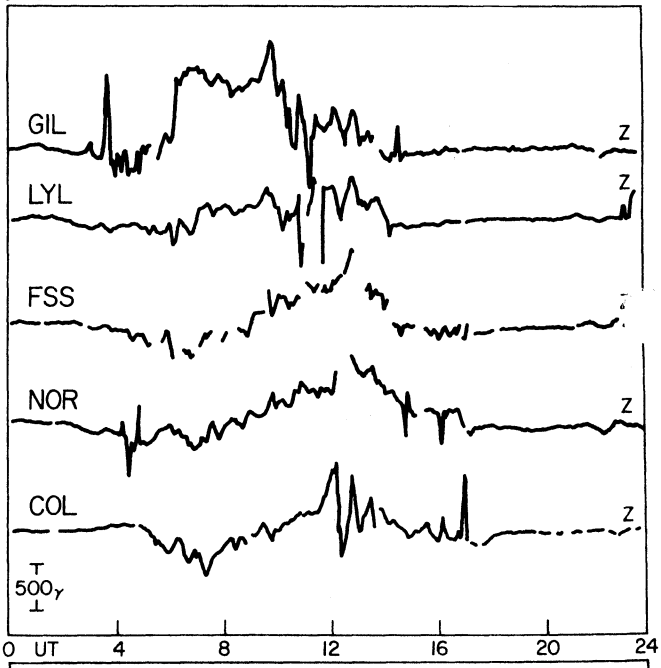
(Continued on pg 8)

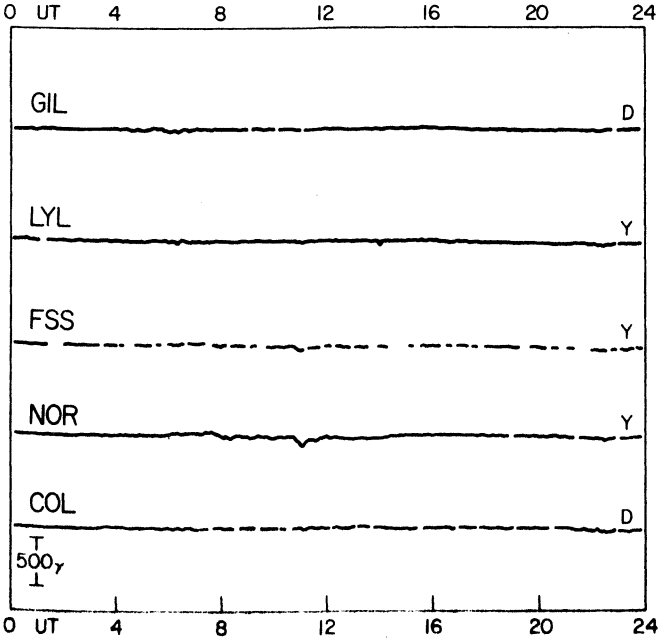
EAST-WEST IMS MAGNETOMETER CHAIN

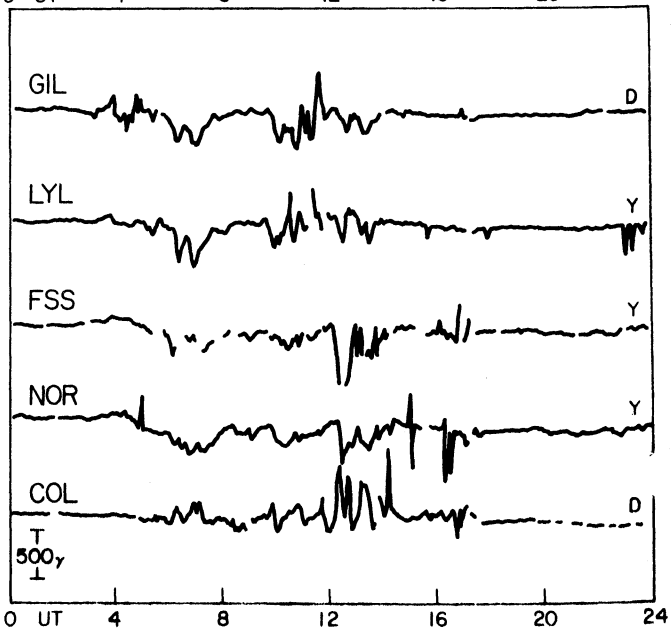












GEOS-N. AMERICAN DATA DISCUSSION AT FALL AGU

SELECTION OF PRIORITY INTERVALS FOR ANALYSIS

Priorities for data analysis from GEOS, N. American satellites, and ground based arrays were established at the December AGU meeting in San Francisco. Experimenters were requested to scan their data for the intervals listed below and communicate information about interesting observations to Dr's. Knott (Europe) and Manka (N. America). Depending on interest in what is seen in the data from these intervals, a data analysis workshop is under consideration and would be held during two days just prior to the Spring AGU. A number of very interesting events have already been noted (see text below).

US IMS Coordinator, R. Manka working with K. Knott, A. Pedersen, R. Johnson, T. Fritz and J. Vette, scheduled an informal meeting to discuss data collected by GEOS and N. American satellites and ground arrays. The discussion was held during the December AGU meeting in San Francisco. Among the some 40 scientists attending were those representing GEOS, the several N. American satellites listed below, numerous ground based programs, and several theoretical groups.

Several intervals in June, July and September 1977 previously had been identified by GEOS and N. American scientists (NL 77-11, pg 11 and 77-9, pg 4). At the San Francisco meeting, the following six intervals or groups of intervals were identified on the basis of interesting events observed or the possibility of interesting data having been taken during magnetic conjunctions between GEOS and other satellites or ground based arrays. These are given in the priority order discussed at the meeting and it is hoped experimenters will subject their data to intensive analysis for these times.

1. 29-30 July 1977 Substorm, magnetospheric activity
2. 13-14 July 1977 Some magnetic activity
3. 20-21 Sept 1977 Magnetic storm following solar proton flare of 19 Sept
4. 12 July 1977 Quiet reference day
5. Six Magnetic Conjunction Intervals from G1-G17 (11-27 June 1977)

   G9 -- 19 June 1007-1925 UT ATS-6 Cesium beam, ISIS-2, AE-C and AS3-3
   G10 -- 19-20 June 1004-1922 UT ATS-6 Cesium beam, TRIAD, ISIS-2, AE-C
   G14 -- 24 June 0949-1907 UT ISIS-1&2
   G6 -- 16 June 1018-1936 UT TRIAD, ATS-6 Cesium beam, AE-C and ISIS-1
   G1 -- 11 June 1036-1954 UT Chatanika, S3-3 and Jim Creek
   G17 -- 26-27 June 0938-1856 UT ATS-6 Cesium beam, ISIS-2
6. Other designated intervals if of interest, beginning with G15 -- 24-25 June xxxx-xxxx UT
7. Other times when interesting events occurred

The meeting was completed by brief reports from experimenters who were responsible for satellite or ground-based data suitable for comparison with GEOS data. Discussion covered: magnetospheric models, Chatanika radar, Sep 22 X-ray phenomena, ATS-6 electron data which is generally available, solar data, S3-2&3 with ion precipitation data for 20 Sep, DMSP has good auroral images during Sep, Triad, AE-C, IMP-7, IMP-8, S3-3 reported field aligned current in G2-conjunction with TRIAD,

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INTERESTING EVENTS

14 July -- A. Lazarus saw high density solar wind on IMP-8 (50/cm)

29 July -- R. Heacock saw SSC outstanding at 0027 UT at College, good ELF and induction magnetometer signals obtained

29 July -- Arnoldy saw drifting energetic ions from an injection around midnight at 0100 UT

29 July -- Lazarus measured high density solar wind density solar wind (shock) at 0030 UT

29 July -- J. Fennell saw down streaming ions at S3-3 at 1546-1550 UT when it was at 65 deg invariant latitude North, 7800 km altitude and 0300 local time

21 Sept -- R. Johnson notes large flux of Oxygen ions 0.5-16 KeV in ring current

21 Sept -- R. Arnoldy saw interesting features in electron and ion fluxes at 20 KeV

IMS NL "SERMON"

Each month we try to finish the task of NL preparation by writing a few appropriate words on the cover. Early in our efforts, A.H. Shapley named this short item our "sermon". For NL 77-12, we thought it appropriate to ask our IMSCIE Associate from Japan, Toyo Kamei, to write something. We ran out of room; hence the carry-over to next month for a translation. For the cover of NL 78-1, our summer employee Jerry Kisslinger wrote our Russian text. With Maurizio Candidi here as ESA's representative on the IMSCIE staff, perhaps our next venture will be in Italian. Unfortunately, we haven't anyone on our staff with the ability to write the text in proper King's (or Queen's?) English so we would welcome a volunteer for this or another of the many languages spanned by the IMS.

From pg 1, IMS NL 77-12 --- "This is the last issue in the second year of the IMS, 1977. This has been an epoch making year for the IMSCIE Office. Besides the many ground, rocket and balloon observations that were conducted, GEOS and ISEE-1&2 were launched. We had an assiciate from NASA for a first half of the year, from Japan since April, and from Italy since September; also, we have received much information from all over the world. We hope we will have continued such good cooperation in the coming year. Have a Merry Christmas and a Happy, Fruitful New Year. Joe H. Allen, T. Kamei, Maurizio Candidi"

1-15 DECEMBER 1977: SPECIAL IMS PERIOD

G. Rostoker reminds all IMS participants of the plan to select sub-intervals of the 1-15 Dec time for preparation of data to compare at the IMS Working Conference in Innsbruck. The magnetogram stacked plots shown on page 4, facing, are from this time. As discussed in 78-1 ACTUALITIES under SELDADS (pg 9), SMS-GOES relay of magnetic variations data from several ground stations is in progress. Present graphics from the system display station magnetograms for each day based on 5-min data averages. These have been cut apart and combined to form stacked plots of common scale magnetograms. Shown here are the "E-W Chain" (NL 77-1) as it now exists and supplemented with other stations. The days shown are 10-11 Dec 1977, a very quiet and relatively disturbed day. Records from 5-15 Dec are now complete and efforts are being made to get earlier days (particularly 2 Dec because of the activity seen on GEOS Daily Summary plots). The positive spike in Z at Gillam (GIL) is probably spurious as is the abrupt positive increase in Z of over 500 seen around 0600 UT. Quality control and processing programs are still being developed.

IMS Satellite Status (see ACTUALITIES)

Tentative ISEE/Low-Altitude Satellite conjunctions for 11-16 Jan 1978: (day/UT conjunction time) 11/AC-17.7, 22.2; S3-18.8, 19.7; D1-19.1, 22.7; 12/T-1.5; 14/D2-1.2; D1-1.4; S3-3.0; AC-4.1; S2-7.5; I1-8.7; T-8.9; 16/T-10.3, 17.9, 18.5; S3-13.3; AC-14.3, 17.2; S2-17.2; D2-17.0.

	Object	Observer	1976	1977	1978 (planned)
I	ULF waves	T. Saito			
	ULF waves	T. Kitamura			
	ULF waves	M. Kawamura			
	ULF, VLF & aurora	T. Oguti	(Listed separately)		
	Whistler propagation	T. Okada			
	Whistler propagation[A]	M. Hayakawa			
	VLF emission[B]	Y. Tanaka			
	ELF-VLF emission	J. Ohtsu			
	Ionospheric E and F	T. Yonezawa			
	Electron density	A. Iwai			
	Polar ionosphere	T. Kamada			
	Ionosph. irregularities[C]	A. Iwata			
	F-region drift[D]	T. Okuzawa			
	Low ionosph. disturbance[E]	T. Sato			
	Whistler mode VLF	T. Araki			
	Velocity ionosph.	T. Ogawa			
	Minor constituents	M. Hirono			
	Ionospheric wind[F]	S. Kato			
	Auroral temperature	H. Kamiyama			
	Ionospheric Drift	T. Ishimine			
	Ionosphere vertical s.	RRL[G]			
	Lower ionosphere (SID)	C. Ouchi			
	Whistler[H]	Y. Ishikawa			
	VLF emission (ISIS)	T. Ondoh			
	HF field strength[I]	A. Sakurazawa			
	Topside sounder (ISIS)	N. Matuura			
III	Geocoronal H, He[J]	K. Suzuki			
	Magnetospheric glow	M. Nakamura			
	Airglow	B. Saito			
	Dayglow[K]	B. Saito			
	Airglow[L]	M. Okuda			
	Doppler temperature[M] (subtropical arc)	H. Kamiyama			

Japanese IMS Ground-Based Observations 1976-78

The tables on page 7 (facing page) and above give information about past Japanese ground-based IMS observations and a schedule for the first half of 1978. Numeral II is missing because it covers "Auroral Flare" observations at Mizuho and Syowa stations in the Antarctic. These will be reported separately in a later NL. Information on methods of observation, locations of observing sites and affiliation of experimenters was given in IMS NLs 76-8 (pg 5), 76-9 (pg 4) and 76-11 (pg 6), except for additional or updated information give below the table on page 7.
I = Plasmasphere, II = Auroral Flare, III = Geocorona, IV = Heliosphere, and V = Solar Active Region

	Object	Observer	1976	1977	1978
IV	Solar wind velocity	T. Kakinuma			
	Jovian decameter wave	H. Oya			
	Distant solar wind	A. Hattori	(Listed separately)		
	"	K. Tomita			
	Cosmic ray modulation	K. Nagashima			
	"	S. Mori			
	"	T. Kanno			
	"	H. Takahashi			
V	Solar active region (N)	F. Moriyama			
	" (O)	H. Tanaka			
	Solar flare monitor	T. Kamada			
	Solar radio emission	A. Sakurazawa			
	"	K. Kai			

Site	Time	Aug.-Sep. 1976	Feb. 1977	Sep. 1977
Churchill	(70,327)	A V U	A V U	U
Gillam	(68,325)	U		
Thompson	(67,322)	A V U		U
Island Lake	(66,327)	U		U
Riverton	(62,324)			A V U
Star Lake	(61,326)	U		U

A: Aurora
V: VLF
U: ULF

ULF, VLF and aurora observations in northern Canada
(T. Oguti)

Comet	Interval
West	Mar. - June 76
Schwassmann-Wachmann	Oct. 76 - Jan. 77
Grigg	Apr. 77
Schwassmann-Wachmann	Sept. 77 - Mar. 78
Kohler	Sept. 77 - Mar. 78

Distant solar wind, by comet observations
(A. Hattori)

Tables of Japanese Ground-Based IMS Programs

Notations in the tables refer to the following information (numbers give nominal geomagnetic coordinates): (A) Direction finders at Sakushima (24, 203), Kagoshima (21, 198) and Okinawa (15, 196). (B) Direction finders at Brorfelde (56, 98) and Chambon-la-Foret (50, 85). (C) Sakushima was misspelled in IMS NL 76-8, pg 5. (D) Additional sites: Inubo (26, 207) and Shimizu (24, 204). (E) GBR signal monitored also. Reception of NLK and NWC signals has been terminated. (F) By meteor trail radar at Shigaraki (25, 204) by S. Kato. (G) Radio Research Lab stations: Wakkanai (35, 206), Akita (30, 207), Kokubunji (26, 206), and Yamagawa (20, 198). Also, Okinawa (15, 197) resumed operation in March 1977. (H) At Okinawa. (I) At Hiraiso (26, 206) by Sakurazawa. (J) At Kakioka (26, 205) only. (K) Spectrometric observations of 6300 A dayglow at Niigata (28, 205). One week a month. (L) Observing site changed to Iriomote (13, 192). (M) At Miyakojima (14, 194). (N) Observing site moved to Mitaka (26, 207). (O) 3 cm radioheliograph added in late 1977. All coordinates are N geomag lat, E geomag long.

It is with regret that we share the following announcement provided by Dr. A. Nishida.

T. Tohmatsu (1932 - 1977) Professor Takao Tohmatsu of the University of Tokyo died unexpectedly on 19 November 1977. Death was due to a blood clot in the brain. In his short life he made significant contributions, both experimental and theoretical, to the physics of the earth's upper atmosphere. Among his particularly well known works are those on the dynamical effects on airglow emission, on the maintenance and dynamics of the nighttime F layer, and on the mesospheric - thermospheric minor constituents such as O3 and NO. He was a scientist with an active mind, a teacher with understanding, and a friend with a good sense of humor. In his last years he actively promoted organization of the MAP project and his death is a severe blow to both Japanese and international space science. He is survived by his wife and two children.

(Continued from pg 3)

IMSCIE Office has received lists for October and November of times, distances, etc. when ISIS-I&II were near the magnetic field line passing through GEOS. Tape numbers and length of recording time should make it possible to request ISIS data for periods of interest. Source of this information is D. Boulding, CRC SATCON, Ottawa, Canada; telex 0534157 CRC SATCON. We remind those interested that ISIS data is not routinely processed but will be looked at upon request.

R. Gendrin sends notice that the CONJUGATE POINTS program linking observations at Iceland, Syowa, and GEOS continued until 22 Sep 1977.

Chatanika Incoherent Scatter Radar operations during GEOS orbits (W. Apogee tracking intervals) G1 (77/06/11), G6 (77/06/16), and G7 (77/06/17), by R.R. Vondrak, Radio Physics Lab, Stanford Research Institute, Menlo Park, CA 94025, is available in a draft preliminary data report form. Electron density profiles and ionospheric electric field maps are shown with magnetograms from nearby College observatory. Parameters that could also be derived from the radar data for these times are electrojet current density, E-region neutral winds, electron and ion temperatures, joule energy deposition, particle energy deposition, and the differential energy spectra of primary electrons.

ISEE-1&2 --- K. Ogilvie, Project Scientist for ISEE-1, informs us that the first week of ISEE data tapes should be in shipment by the time this NL arrives. For those not familiar with the ISEE program, we suggest the article "International Sun-Earth Explorer: A Three-Spacecraft Program" by K.W. Ogilvie, T. von Rosenvinge, and A.C. Durney, in Science, 198, (131-138), 14 Oct 1977. A summary of information about ISEE-1&2 was in IMS NL 77-8, pgs 8&9.

Data acquisition from the ISEE spacecraft may be in either a "High" or "Low" rate mode (16 384 or 4 096 information bits/sec for ISEE-1 and 8 192 or 2 048 inf bits/sec for ISEE-2, respectively). The high bit orbits have been: 7 - 5 Nov 2301 to 8 Nov 0823 UT; 10 - 13 Nov 0307 to 15 Nov 1229 UT; 11 - 15 Nov 1229 to 17 Nov 2151 UT; 15 - 25 Nov 0157 to 27 Nov 1119 UT; 20 - 7 Dec 0047 to 9 Dec 1009 UT; 22 - 11 Dec 1931 to 14 Dec 0453 UT; and 30 - 30 Dec 2227 to 2 Jan 0749 UT. Start and stop times given are for perigee. Only 1 orbit in 5 can be at the high rate because of the quantity of data acquired. Unless schedules are changed, the high data rate orbits will be every fifth orbit: 35, 40, etc. The even orbits (10, 20, 30, etc.) are fixed high data rate orbits but the others may be rescheduled as when two high data rate orbits (20 and 22) were scheduled to fall within the special IMS observational interval 1-15 December 1977.

In its main operational mode, F.S. Mozer's electric field experiment causes problems for the rest of the ISEE-1 experiments. For this reason, it will only be operated in this mode for 1 orbit out of 8. His experiment was active from apogee # 29 at 1400 UT to apogee # 30 (1 Jan) at 0300 UT.

At this time ISEE-1&2 are drifting slowly apart and are expected to continue until ISEE-2 orbit shift sometime in spring 1978.

ROCKETS & BALLOONS

UCHINOURA

L-3H-9 --- This rocket program and the three following were described in IMS NL 77-9, pg 2. Rocket L-3H-9 was launched 16 Aug 1977, with the second stage apogee at 302 km and third stage at 1294 km.

Objectives and/or preliminary results obtained were: measured altitude dependence and spatial distribution of UV airglow; precipitating and trapped particles (experiment failed due to high voltage breakdown); height dependence of H+/O+ ratio; modulation of plasma density and temperature and emission of wave and light, natural waves and light emissions were measured because electron beam did not emit due to malfunction of heater circuit; height dependence and emission mechanism of O2(1Δg) and OH layer; distribution and budget of H and He with grating spectrometer for He 584 A and H 1216 A in airglow, sequential operation was successful but counting rates of both channels were very low; height dependence of e- temperature up to 302 km; test of EXOS-A low-energy e- spectrum sensor measuring range from 2 to 600 eV; observation of galactic and planetary radio waves and instrument calibration, natural waves received above ionosphere; profile of e- density; wave excitation by high power HF, thermal e-, and DC bias voltage detected; natural plasma waves observed on upleg, frequency spectrum in range 0.3-10 kHz and 0.8-10 MHz, parametric wave excitation by injected 6 MHz/4 MHz wave on downleg, disturbed time sequence prevented injection of sufficient power, antenna impedance in plasma was measured; e- density profile obtained.

K-9M-59 --- Launched 3 Sep 77, to apogee of 376 km. Observed: e- fine structure; data on height dependence and emission mechanism for O+ airglow partially obtained; altitude distribution of ozone between 20-80 km and stratospheric aerosols measured; energetics of night time lower ionosphere; O2 height dependence and HL intensity in the upper atmosphere, results showed the absolute irradiance of solar hydrogen Lyman-alpha is 3.5x 10exp 11 photons per cm sq per sec (5.7 ergs/cm sq/sec); chemistry of R component in thermosphere.

S-210-12 --- Launched 15 Sep 77, to apogee 114 km. Observed: e- fine structure; estimate of ozone density at 70-90 km; and altitude distribution of stratospheric and mesospheric ozone and stratospheric aerosol.

S-310-4 --- Launched 21 Sep 77, to apogee 188 km. Observed: e- density and field intensity of HF standard frequency signals; estimated low e- density at 60-90 km during descent; thermal ion temperature and onboard potential measurement but most data doubtful because of nose cone trouble; e- temperature profile; and energy distribution of thermal electrons.

B15-35 --- Launched 30 Aug 77, with quadrupole mass spectrometer to measure stratospheric amtospheric composition. Investigators: T. Itoh, Y. Nakamura, T. Iguchi, and H. Honda, Univ of Tokyo. Measured SO2 and other minor constituents.

B5-82 --- Launched 3 Oct 77, to measure electric fields. Investigators: T. Ogawa, A. Hujita, and M. Yasuhara, Kyoto Univ. Measured dynamo electric field and Schumann resonances.

The above balloon programs were not previously announced in the IMS NL.

IMSCIE Office has received a 404-page report containing papers presented at a Japanese IMS Symposium held in July 1977. Although most of the papers are written in Japanese, many of the diagrams and photographs have captions in other languages. Dr. A. Nishida was our source.

POKER FLAT

FIELD WIDENED INTERFEROMETER --- J.C. Ulwick, AFGL, launched rocket IC730.09-1 at 085500 UT on 13 Nov 1977. Payload was recovered.

WIDEBAND --- M. Baron, SRI, launched WS710.51-1 at 103340 UT on 15 Nov 1977.

ANDOYA

2ND UK HIGH-LATITUDE CAMPAIGN --- Woolliscroft launched a Fulmar rocket F4 from Andenes, Norway on 5 December 1977. For details on the extension of this program and the coordinated SUBSTORM PHENOMENA campaign (K. Wilhelm), see pg 2 of this NL and IMS

NL 77-8, pgs 2 & 3. Launches have been supported by continuing supplementary ground programs VLF and GEOMAGNETIC PULSATIONS (pg 2).

SURFACE

MALYE KARMAKULY, USSR

GEOMAGNETIC MERIDIAN PROJECT --- I. Zhulin, USSR IMS Coordination/Information Office, sent a telex in early Dec to notify IMSCIE Office that V. Papetashvily (IZMIRAN) opened a new auroral zone magnetic observatory within the framework of the Geomagnetic Meridian Project. It is MALYE KARMAKULY (MKM), located at (NPD 17.62, E. Long 52.73). NPD is "North Polar Distance" as used in the station identification code for digital magnetic data on tape (WDC-A for STP data exchange format, see IMS NL 77-10, pg 6). This observatory will provide records for use in AE index calculations. It began regular work on 1 June 1977. Magnetograms are collected in IZMIRAN and WDC-B2 in Moscow.

At NL press time, WDC-A for STP in Boulder received full-scale copies of the H-component variations from Malye Karmakuly for the months of June and July 1977. These records will be integrated into the AE index derivation as soon as our digitizing program can cope with the backlog of unprocessed analog and digital magnetometer data. We are eager to see the contribution made by this new observatory located centrally between Dixon Island and Abisko which are regularly used for AE index derivation.

VARANASI, INDIA

Prof. R.N. Singh, INAS-IUCSTP, sends the following information. Whistlers were recorded at Varanasi (geomagnetic latitude 15.1 deg N). This recording confirms that there exists no low-latitude cut-off for whistlers activity although a decrease in the frequency of whistlers activity was observed. Whistlers observed at Varanasi have been classified into five catagories: (1) Normal short whistlers; (ii) Banded; (iii) Twin; (iv) Multiflash; and (v) Whistlers with large dispersion, about 25 sec*. From the study made so far it is found that dispersion lies in the range from 8 to 12 sec*. The whistlers activity at Varanasi showed highest occurrence rate during the months of Feb-Apr and generally occurred in the post midnight hours. The "hook-whistlers" similar to VLF "hook" have been recorded, for the first time, at Varanasi. The analysis and data reduction is carried out to study tne physics of the inner magnetosphere.

EUSEBIO, BRAZIL

In early December, R. Snare and C.R. Claur (UCLA) set up an IMS ground magnetometer platform at this site a little south of Fortaleza. The facility is operated by the Instituto de Pesquisas Espaciais (INPE) and support was also provided by the Observatorio Nacional. The fluxgate magnetometer system will provide 3-component variations records via the SMS/GOES data relay link to the NOAA SELDADS system (see IMS NL 77-1, pgs 5-7). An absolute observations pier was set up about 10 m from the IMS instrument pier and absolute field measurement were made. The IMS pier has the following values: D = 21.204 deg West of True North, I = -3.503 deg (up looking North), and B = 26,925 from a proton magnetometer observation. The change in I is about -0.438 deg per year.

SOUTH POLE, ANTARCTICA

Dr. A.N. Zaitzev, USSR Exchange Scientist, writes from S. Pole that his tour is almost finished. The first plane arrived on 3 Nov 1977. The summer season at the pole is very busy but he now has a complete set of IMS NLs to look over. Included with his letter is "Antarctic Research and Data Analysis Scientific Report: Preliminary notes about the dynamics of magnetospheric substorms as recorded at the South Pole in 1977" by S. Harris and A. Zaitzev. Included are some 14 pages of stacked plots of simultaneous magnetic variations, riometer and photometer recordings.

BOULDER, USA

SELDADS --- C. Hornback has circulated a large status report on the IMS Magnetometer Chains (see Eusebio report above). As of 19 Dec 1977, some 17 ground sites were operational, relaying magnetic variations (and riometer/photometer data from some sites) vis the SMS-GOES satellites. The report includes plots of 5-min averages of D, H, and Z variations from the 17 operating sites for day 345, 11 Dec 1977. Comparisons between College Observatory recordings and the IMS magnetometer data relayed from the same site were performed by Dr. G. Romick, Univ Alaska. He plotted the 10-sec IMS data to the same scale as the standard magnetogram and reports that they matched perfectly. Comparisons in Boulder of H, D, and Z scalings from College, the NOAA Anchorage magnetometer, and the College IMS system showed very good agreement when the values were shifted to account for baseline differences. However, the systematically wide scatter at times between the Anchorage and IMS data in D and Z has resulted in corrections to the Anchorage system. System debugging and processing program development are still in progress and no data has been turned over to the WDC-A yet. However, test tapes have been exchanged between the SELDADS and network scientists. A special effort has been made to obtain network data for the period 1-15 Dec 1977. See the sample on pg 4 of this NL. for days in July and August 1977. The data plots are very sharp and may be easily compared.

DATA INVENTORIES

WDC-A for STP has received, via the IMSCIE Office, several listings of data sets collected at research institutions. Some of the data may be archived and available at the World Data Centers. Those interested should check current catalogs or make specific enquiries either to the principal scientists involved or to the WDCs.

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1. Dr's. S.-I. Akasofu and G.J. Romick, Univ. of Alaska, sent a report UAG R-216, "Magnetic Records from a Meridian Chain of Observatories in the Alaskan Sector", Feb 1971, and the University of Alaska's Geophysical Institute Data Archives Inventory of Geophysical Data. The report describes operation of a mid-Alaska latitude chain of magnetic observatories and all-sky cameras from Sep 1969 to April 1970. Copies of all magnetograms collected are reproduced in this report. The Data Inventory gives source, location, instrument, and interval covered for all data collected in the geophysical archives of the Institute. For further information, contact WDC-A for STP, the IMSCIE Office or the Univ. of Alaska.

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2. W. Baumjohann, Univ. of Munster, sent copies of bar charts showing the availability of data from their Scandinavian chain of Gough-Reitzel magnetometers. The figures show station service times, when data exists and intervals of poor quality data. They cover each month from August 1974 through September 1976, giving one-day or better resolution. Five stations are given for one month on each page and as the network increased the number of pages to present the record grew rather large. IMSCIE Office/WDC-A for STP will try to share this information with anyone interested but the package is too large for reproduction here.

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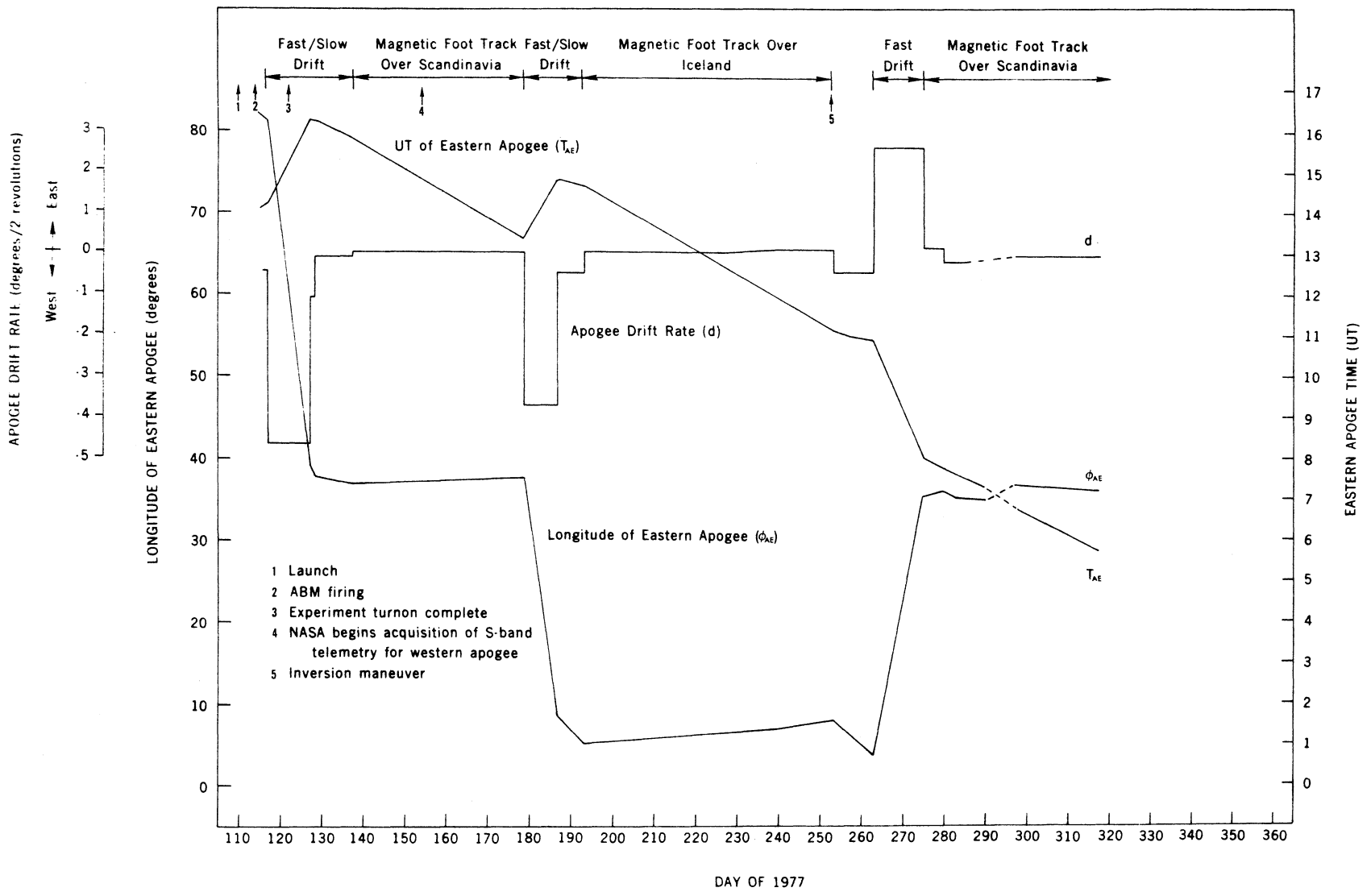
3. Dr. G. Rostoker, Univ. Alberta, sent a collection of bar plots for his magnetometer data covering the period 1969-1975. Keys are provided to magnetic tapes and for some intervals "event tapes" contain all the data from the network for that specific time. Low density tapes are now being recopied to reduce the number of archived reels. Not all the data has been "processed" and the expense to do so is prohibitive. However, requests for specific "small chunks" of data will be met and they will provide advise on necessary documentation.

MORPHOLOGY OF THE ESA-GEOS ORBIT

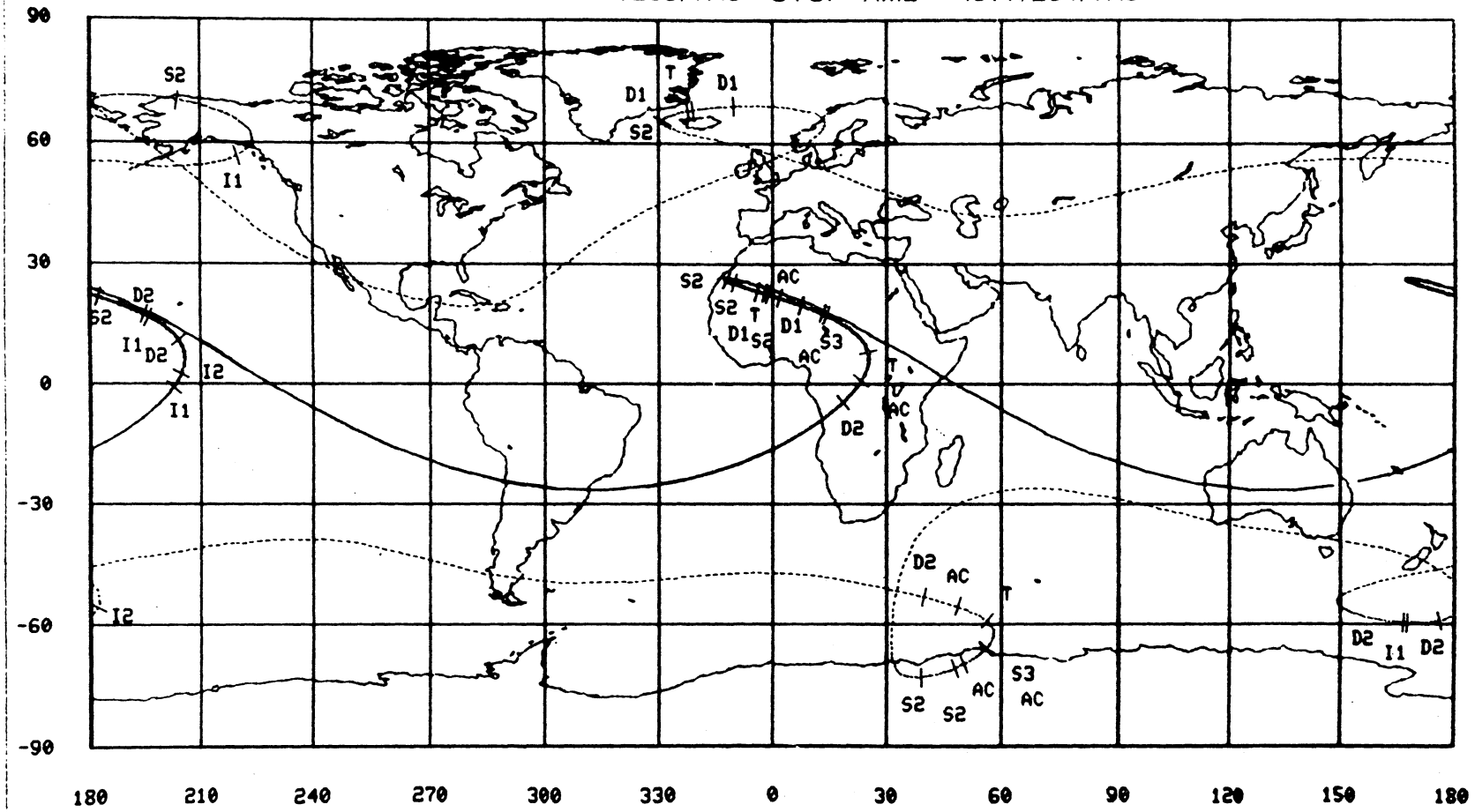


September 20-21, 1977

ORBIT-PROJECTION PLOT

Special Periods G103 and 103

START TIME = 1977/263/17.0 STOP TIME = 1977/264/17.0

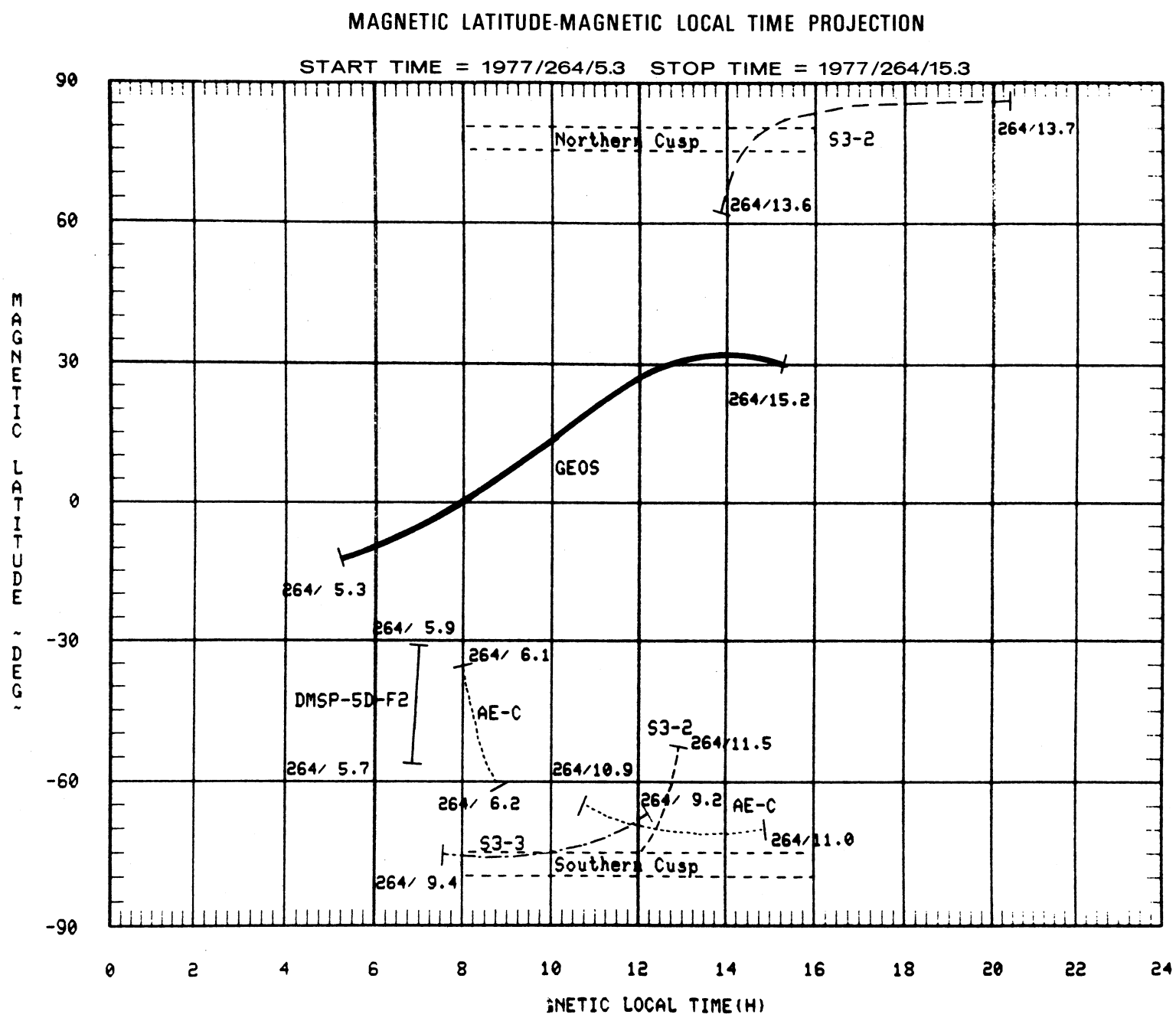


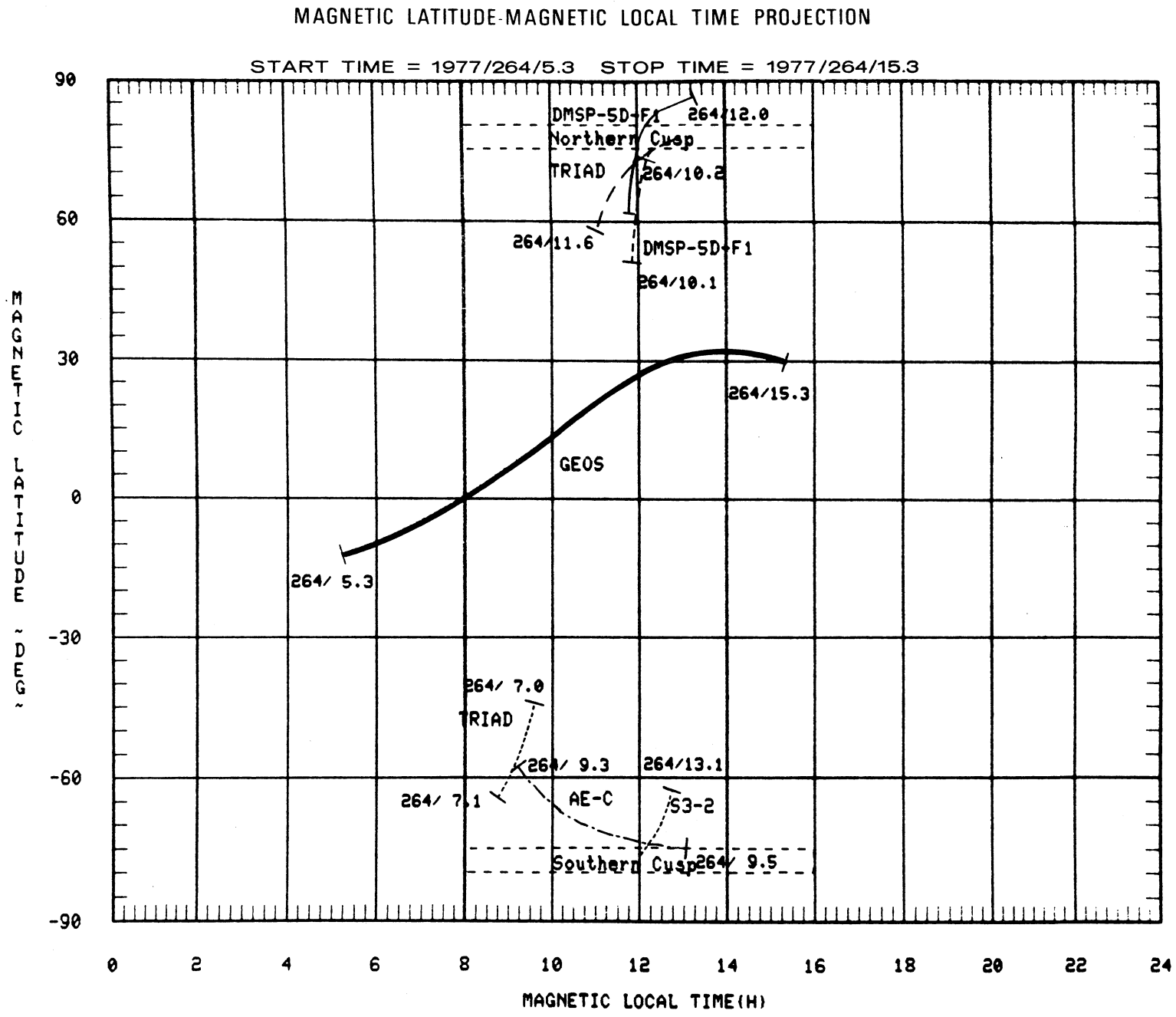
GEOS
SUBSATELLITE POINT

WESTERN APOGEE 22.72 H.
EASTERN APOGEE 10.70 H.

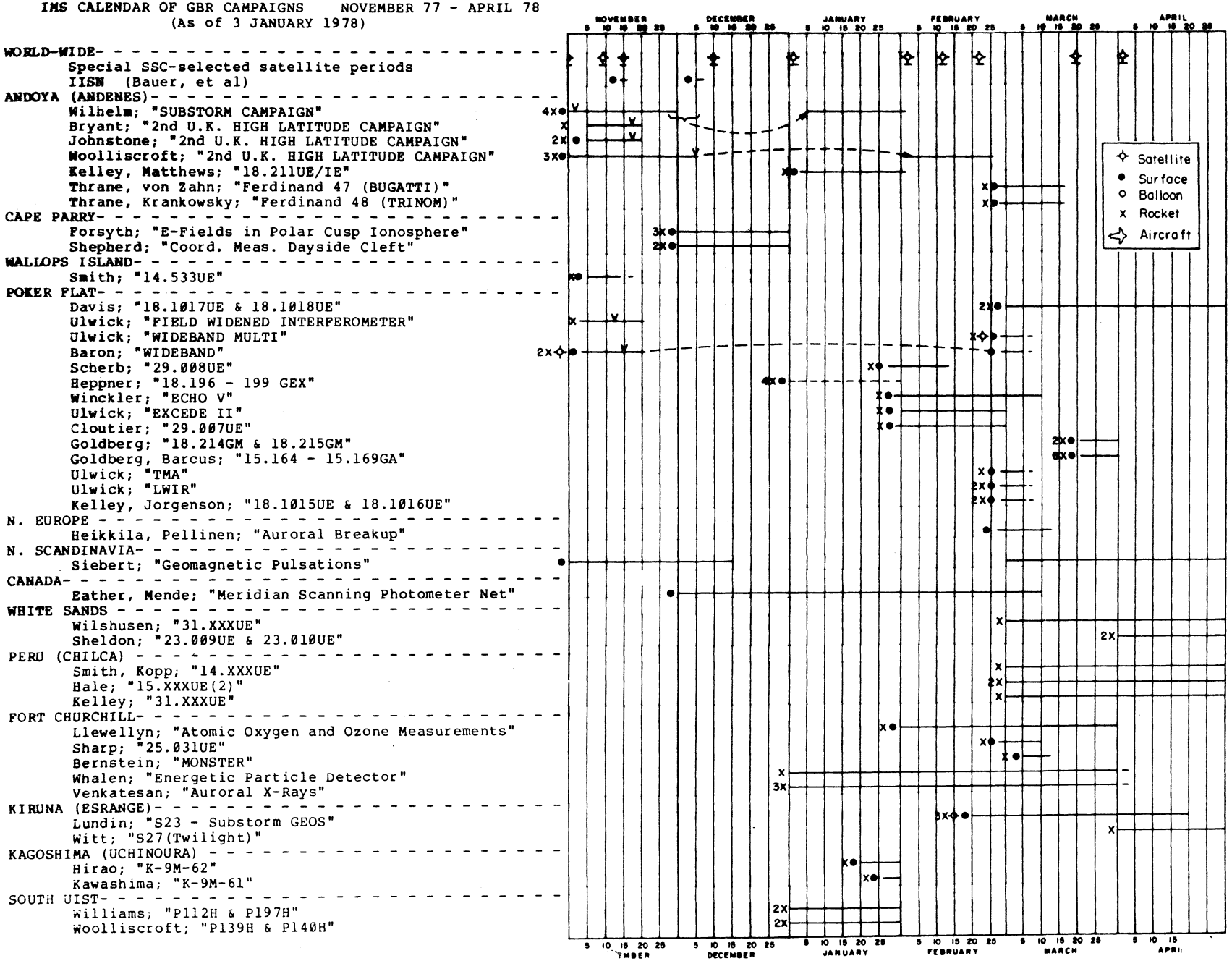
GEOS
OLSON/PFITZER-TILT
INT: BARRACLOUGH

DRAWN 77-12-1/16:45


MAGNETIC LATITUDE-MAGNETIC LOCAL TIME PROJECTION
START TIME = 1977/264/5.3 STOP TIME = 1977/264/15.3
90
60
30
0
-30
-60
-90
MAGNETIC LATITUDE (DEG)
0
2
4
6
8
10
12
14
16
18
20
22
24
MAGNETIC LOCAL TIME(H)
Northern Cusp
S3-2
264/13.7
264/13.6
264/15.2
GEOS
264/ 5.3
264/ 5.9
264/ 6.1
DMSP-5D-F2
AE-C
264/ 5.7
264/10.9
S3-2
264/11.5
264/ 6.2
264/ 9.2
AE-C
S3-3
264/11.0
Southern Cusp
264/ 9.4


MAGNETIC LATITUDE-MAGNETIC LOCAL TIME PROJECTION
START TIME = 1977/264/5.3 STOP TIME = 1977/264/15.3
DMSP-5D-F1
264/12.0
Northern Cusp
TRIAD
264/10.2
264/11.6
DMSP-5D-F1
264/10.1
264/15.3
GEOS
264/ 5.3
264/ 7.0
TRIAD
264/ 9.3
264/13.1
264/ 7.1
AE-C
S3-2
Southern Cusp
264/ 9.5
MAGNETIC LATITUDE - DEG
90
60
30
0
-30
-60
-90
0
2
4
6
8
10
12
14
16
18
20
22
24
MAGNETIC LOCAL TIME(H)

IMS CALENDAR OF GBR CAMPAIGNS NOVEMBER 77 - APRIL 78
(As of 3 JANUARY 1978)



WORLD-WIDE
- Special SSC-selected satellite periods
- IISN (Bauer, et al)

ANDOYA (ANDENES)
- Wilhelm; "SUBSTORM 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"

POKER FLAT
- Davis; "18.1017UE & 18.1018UE"
- Ulwick; "FIELD WIDENED INTERFEROMETER"
- Ulwick; "WIDEBAND MULTI"
- Baron; "WIDEBAND"
- Scherb; "29.008UE"
- Heppner; "18.196 - 199 GEX"
- Winckler; "ECHO V"
- Ulwick; "EXCEDE II"
- Cloutier; "29.007UE"
- Goldberg; "18.214GM & 18.215GM"
- Goldberg, Barcus; "15.164 - 15.169GA"
- Ulwick; "TMA"
- Ulwick; "LWIR"
- Kelley, Jorgenson; "18.1015UE & 18.1016UE"

N. EUROPE
- Heikkila, Pellinen; "Auroral Breakup"

N. SCANDINAVIA
- Siebert; "Geomagnetic Pulsations"

CANADA
- Eather, Mende; "Meridian Scanning Photometer Net"

WHITE SANDS
- Wilshusen; "31.XXXUE"
- Sheldon; "23.009UE & 23.010UE"

PERU (CHILCA)
- Smith, Kopp; "14.XXXUE"
- Hale; "15.XXXUE(2)"
- Kelley; "31.XXXUE"

FORT CHURCHILL
- Llewellyn; "Atomic Oxygen and Ozone Measurements"
- Sharp; "25.031UE"
- Bernstein; "MONSTER"
- Whalen; "Energetic Particle Detector"
- Venkatesan; "Auroral X-Rays"

KIRUNA (ESRANGE)
- Lundin; "S23 - Substorm GEOS"
- Witt; "S27(Twilight)"

KAGOSHIMA (UCHINOURA)
- Hirao; "K-9M-62"
- Kawashima; "K-9M-61"

SOUTH UIST
- Williams; "P112H & P197H"
- Woolliscroft; "P139H & P140H"