International Council of Scientific Unions

SPECIAL COMMITTEE
ON
SOLAR-TERRESTRIAL PHYSICS

76-12

President: Dr. Francis S. Johnson *Vice-President:* Dr. J. W. King *Secretary:* Dr. E. R. Dyer

INTERNATIONAL MAGNETOSPHERIC STUDY
J. G. Roederer, Chairman IMS Steering Committee
JOE H. ALLEN, HEAD, TEMPORARY IMS CENTRAL INFORMATION EXCHANGE OFFICE
WORLD DATA CENTER A FOR STP, D64 NOAA, BOULDER, COLORADO 80302, USA

IMS NEWSLETTER

The continuation of this IMS information office and these Newsletters for 1977 onwards is virtually assured. The conditions for continuance put by my parent organization, NOAA, was that the IMS community provide two visiting scientists to Boulder to complete the team needed to handle this growing work on a continuing basis. Arrangements are virtually complete for a Japanese scientist to come next March. There is another very active prospect from overseas for the second scientist. To fill the gap, Dr. Manka (US IMS Coordinator) has made arrangements with Dr. O.K. Garriott (NASA-Houston) for Dr. Andrei Konradi to come to Boulder to help in the IMSCIE Office during the first six months of 1977. I (my wife also) am very glad that help will be coming and look forward to changing TIMSCIE to IMSCIE.

---JHA Dec 1, 1976

TIMSCIE Office: Telex 45897 SOLTERWARN BDR
Telephone: 303-499-1000 x6501 (FTS 323-6501)
IMS SSC (Vette): Telex 89675 NASCOM GBLT
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Telephone: 027-75-30 et 75-70

SPECIAL IMS PERIODS

Dec 3, 0800 UT to Dec 3, 2000 UT	IMP-J, Vela 5B, Vela 6A, Vela 6B - Magnetopause
Dec 6, 0600 UT to Dec 8, 1800 UT	IMP-H, Vela 5B, Vela 6B - Neutral Sheet
Dec 30, 0200 UT to Dec 31, 1300 UT	Hawkeye 1 - Cusp; Vela 5B, Vela 6A - Neutral Sheet

Times of Satellite Conjunctions from SSC Report No 7, Oct 76, pg 15 (also in IMS NL 76-11, pg 3).

Jan 3, 1100 UT to Jan 5, 0200 UT	4 satel crossing magnetopause in 5hrs, 3 satel in tail 8hr
Jan 11, 1400 UT to Jan 14, 1000 UT	6 satel in magnetosheath for 10 hrs (only Moon not in)
Feb 2, 0700 UT to Feb 6, 0400 UT	5 boundary crossings in 5 hrs, mult satel in tail
Feb 7, 0800 UT to Feb 8, 0100 UT	7 satel in sheath 9 hrs, 4 boundary crossings in 2.5hr

At SSC suggestion, start and end times of "idealized" periods of interest have been extended by 6 hrs to allow for possible motion of the boundaries and cusp region or later adjustment of orbit parameters.

GBR Campaigns: (numbers refer to program details in IMS Bulletin No 2 or in references in these NLs)

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

--- to Dec 6; #0522; Truttse; Moscow Region; AIRCRAFT- Oxygen emissions, H-α, Nitrogen, other spectra
--- to Dec 10; #0531, et al; Lazutin, et al; Kiruna/ESRANGE; BALLOONS (15) - Rescheduled SAMBO-76
--- to Dec 16; #0474; Rees, et al; Andoya; ROCKETS (2)-Coordinated launches and ground, see note 76-11
--- to Dec 16; #0152; Bryant, et al; Andoya; ROCKETS (2) - Coordinated launches, see note in 76-11
--- to Dec 31; #0332; DeMendonca; Sao Paulo; BALLOONS (13) - X-rays, gamma rays, UV, joint program
Dec 1 to Mar 31; A-32; L.G. Smith (Univ Illinois); Wallops Isl; ROCKETS (2)- 80-200 Km study, see 76-11
Dec 12 to Dec 21; B-5; Egeland, Johnstone ("Harang Pair I"); Andoya; ROCKETS (2) - into Harang discont
Dec 25 to Jan 7; #0522; Truttse; Moscow Region; AIRCRAFT - Same program as above
Jan 1 to Jan 31; B-14; Whalen; Ft Churchill; ROCKETS(2) - Complex experiments, see note in NL 76-11
Jan 7 to Feb 14; #0131; Arnoldy, Cahill; Andoya; ROCKETS (2) - 18.1004UE, 18.1005UE Nike-Tomahawks
Jan 10 to Jan 31; #0064; Scherb, Lynch; Poker Flat; ROCKET - energetic 10 Kev Oxygen, Helium ions, note
Jan 11 to Mar 4; B-3; Bjorn (S-18 "D-Layer"); Kiruna/ESRANGE; ROCKET - Complex experiments see 76-11
Jan 11 to Mar 20; #0308; Theile ("Polar High Atmosphere"); Andoya; ROCKETS (4) - Complex exper, 76-11
Jan 12 to Mar 5; #0170; D. Evans; Poker Flat; ROCKET-29.003AE, resched Terrier-Malemute (A-7 in 76-1)
Jan 24 to Jan 27; #0400; Fitz ("SPIRE"); Poker Flat; ROCKET - optical earth-limb meas in quiet conditions
Feb 1 to Feb 28; B-9; Zipf; Ft Churchill; ROCKETS (3) - Nike-Hawks 31.001UA & 31.002UA, possibly coord
Feb 1 to Feb 28; B-10; Mentall; Ft Churchill; ROCKETS (2) - Nike-Tomahawk 18.1013GA & 18.1014GA, note
Feb 1 to Mar 31; A-19; Williams; S Uist; ROCKET - P112H, Winter Anomaly & Strat-Warms
Feb 1 to Mar 31; #0085; Dickinson; S Uist; ROCKETS (2) - P189H & P192H, Neutral O2 & e- concentrations
Feb 1 to Mar 31; A-18; Wooliscroft; S Uist; Rockets (2) - P139H & P140H, ion mass spectrometer
Feb 7 to Feb 25; #0164; Davis; Poker Flat; ROCKETS (2)- Nike-Tomahawk 18.1011UE & 18.1012UE
Feb 7 to Mar 27; B-1; Witt (S-22 "Aurora"); Kiruna/ESRANGE; ROCKET - Complex experiments see note 76-11
Feb 7 to Mar 27; B-2; Holmgren (S-21 "Trigger"); Kiruna/ESRANGE; ROCKETS(4)-Complex experiments, 76-11
Feb 8 to Feb 21; #0400; Fitz ("ICECAP"); Poker Flat; ROCKETS(3)-2 Nike-Hydac, auroral meas, Nike-Jav TMA
Feb 11 to Mar 16; B-8; Maehlum & Maynard ("Composition"); Andoya; ROCKET - over quiescent arc, note below
Feb 14 to Mar 31; B-7; Matthews; Andoya; ROCKET - 18.211UE/IE during dark of Moon, see note below
Feb 22 - Mar 12; #0400; Fitz ("Stress"); Egland; ROCKETS (10) - ΔNe/Ne distribution, see note below

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

--- to Dec 31; #0458; Charakchyan; Mirny, Murmansk, Moscow, Alma Ata; BALLOONS - daily, cosmic rays

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

--- to Dec 16; #0115; Smith; Skibotn, Norway; SURFACE - interferometer coord with UK High Lat Campaign
--- to Dec 31; B-13; Berkey, Parsons; Norway; SURFACE- ground campaigns supporting rocket & other camp
--- to May 31; #0304; Stuart; Multiple Sites; SURFACE- "Pulsations" program of magnetometers, see note
Feb 9 to Feb 22; #0205; A.V. Jones; Canada; SURFACE- meridian scanning photometers, note below, map pg 7
Feb 9 to Feb 22; #0454; Paulson; Canada; SURFACE - meridian scanning photometer, coord with #0205
Feb 9 to Feb 22; #0169; Eather & Mende; Canada; SURFACE - merid scan photom, coord with #0205

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marks new or changed information from NL 76-9

Program Planning Notes by Region, Dec 76 - Feb 77

SATELLITES

Refined Times of Special IMS Periods for Dec 1976. Start and end times of the periods listed above and in the SCOSTEP Special Announcement shift a few hours as a result of recomputations given in the IMS Satellite Situation Center Report No. 6 (pg 14) by Vette. Refined UT times are (changed times are underlined): Dec 3 0700 to Dec 3 2300; Dec 6 0600 to Dec 8 1400; Dec 30 0100 to Dec 31 1400 UT.

GROUND-BASED, BALLOON & ROCKET PROGRAM DETAILS

In IMS NL 76-11 detailed notes by region were given for many programs scheduled during Nov 76 - Jan 77. Programs still listed above in the one-line format for which TIMSCIE Office has not received changes will not have detailed descriptions repeated.

USSR

#0522; Truttse, NL 76-11 pg 2.

#0531; Lazutin, "SAMBO-76" (formerly called SAMBO 1B). This program is now in progress and is described in detail by the following telex message sent on 10 Nov by the Soviet IMS Committee. A series of joint balloon experiments according to SAMBO-76 Project (Simultaneous Auroral Multiple Balloon Observatories) will be realized in North Europe during November-December 1976 with a view to study near-space disturbances and their effects in the high-latitude atmosphere. In these experiments, attention will be directed to variations of auroral electron fluxes and energy spectrum as given by bremsstrahlung measurements, to the dynamics and fine structure of auroral particle precipitation in the high-latitude ionosphere, to variations of electric fields of ionospheric and magnetospheric origin (during magnetospheric disturbances).

These experiments are supposed to use high-altitude drifting balloons with scientific apparatus on board for measuring bremsstrahlung, auroral luminosity and electric field variations (balloon-borne geophysical observatory).

(continued on page 3)

(continued from page 2)

The balloons will be launched from Kiruna (north Sweden) and will drift, due to the winter wind regime, through Sweden, Finland, and the northern part of the USSR. The landing will take place at the longitude of the Urals. On USSR territory, the radiotelemetry information transmitted from on-board the balloon will be received in Apatity, Shoina, Naryan-Mar, and Amderma. Fifteen balloons are to be launched in five groups.

The complex of soviet scientific on-board equipment is comprised of: bremsstrahlung spectrometers for 20-200 Kev, a 3-component electric field meter based on double-probe method, an aurora photometer with 30 deg field of vision directed towards the zenith, and the necessary auxilliary apparatus. Radar means are used to trace the balloon drift for space-time matching of observations.

Simultaneously, observations will be carried out at a vast network of ground-based points (including, in particular, the chain of magnetic stations operated during "Geomagnetic Meridian" Project), and it is planned to realize flights of small balloons in Apatity and Tixi.

During SAMBO-76 campaign, it is also planned to use a ground-based VLF transmitter at subauroral latitudes to study the possibility of generating artificial distrubances (stimulated partical precipitation, variations of the ionosphere conductivity, electric field disturbances, geomagnetic micropulsations).

The following scientific groups participate in the campaign:

-IZMIRAN and Polar Geophysical Institute of the Soviet Union, represented by Dr. I. Zhulin and Dr. L. Lazutin

-Technische Universitat Graz (TUG) Austria, represented by Prof. W. Riedler

-Royal Institute of Technology - Dept of Plasma Physics (KTH), Sweden, represented by Prof. C.-G. Falthammar.

Within a month following project termination, it is planned to publish a report on the realized measurements with indication of the active periods. A meeting for discussion of preliminary results is to be held during April-May 1977 in Apatity.

All the participants of the program are now at ESRANGE, Kiruna, and the test flight is to be realized on November 10.

Further details can be obtained from Project Leader - Dr. I. Zhulin, IZMIRAN, Moscow Region, USSR 142092 (Telex: 7523 SOLTER SU).

KIRUNA

B-1; Witt, Dept of Met, Univ Stockholm, NL 76-11 S-22 "Aurora" rescheduled for two launch windows: Feb 7-25 and Mar 6-27.

B-2; Holmgren (UJO), S-21 "Trigger" rescheduled for 2 periods: Feb 7-25, Mar 6-27, same as "Aurora". 2 Super Arcas rockets added to original program.

B-3; L Bjorn, UJO, "S18 D-Layer" NL 76-11, has two launch window periods: Jan 11 to Feb 2 and Feb 7 to Mar 4.

ANDOYA

#0474; Rees, 1st UK High Latitude Campaign,NL 76-11 launch window now ends Dec 16. Observations to be coordinated with interferometer measurements from Kibotn by Smith, #0115 (exper # 3).

#0152; Bryant, NL 76-11, window now ends Dec 16.

B-5; Egeland, Johnstone (#0450) "Harang Pair I" is rescheduled to two periods in 1976: Nov 14 to 30 & Dec 12 to 21. Detailed program in NL 76-11, pg 3.

#0131; Arnoldy & Cahill, have 3 launch windows: Jan 7-15, Jan 23-31 and Feb 7-14, 1977.

#0308; Theile, new launch window dates, Jan 11 to Mar 20 for "Polar High Atmosphere" Program. Launch of "EUV-1 & 2" part of PHA Program.

B-8; Maehlum & Maynard (#0025), project "Ferdinand 46 - 'Composition'" to investigate chemical & dynam processes in high latitude F-region in conjunction with auroral arc. Co-participants and experiments are: Maynard, DC E-field; Egeland, AC E-field 0-100 kHz; Krankowsky, Mass Spectrometer for neutron & ion densities; Maehlum, e- spectrometer 0-12 KeV; Soraas, solid state e- & p+ detector for E>20 KeV; Stadsnes, X-rays; Troim, e- density & temperature; Riedler (#0028), Faraday rotation; and Jacobsen, ion temperatures. Launch over quiescent arc.

B-7; Matthews, Univ of Maryland, this launch will test payload and support equipment to be used at Siple, Antarctica when site reopened.

SCANDINAVIA

#0304; Stuart sends word that 3-component Rubidium magnetometers began operation Sep 20 at: Tromso, Kiruna, Nurmijarvi, Kvistaberg and Arendal to continue through May 77 with possibility that some sites may continue after GEOS in orbit on meridian. Part of UK Pulsation program for which routine mag sites were operational 1 Jan 76. St Anthony, Newfoundland, Halley Bay and S Georgia mag began 1 Jul to record 2.5-sec data at 800 bpi on cassette tape. For details on data exchange, collaborative project contact Dr W.F. Stuart, Geomagnetism Unit, IGS, W. Mains Road, Edinburgh EH9 3LA.

NORWAY

B-13; Berkey, Parsons (Univ Calgary, Canada) 76-11

SOUTH UIST

A-19; Williams, Petrel launch postponed from 1976, see IMS NL 76-8, pg 7. Similar postponed launches for #0085, Dickinson and A-18, Wooliscroft. UK rocket programs under general review.

SAO PAULO

#0332; De Mendonca, NL 76-11, pg 3.

WALLOPS ISLAND

A-32; L.G. Smith, Univ Illinois, NL 76-11

FORT CHURCHILL

B-14; Whalen (NRC, Canada), NL 76-11, pg 3.

B-9; Zipf, Univ Pittsburg, 2 Nike-Orion and 1 Nike-Apache (14.500UA). All prepared by NASA Wallops Flight Center. Other aeronomy rockets in preparation by NASA-WFC for B-10, Mentall & Gentieu are 2 Nike-Tomahawks for same launch period and may be coordinated. Further information as available.

CANADA

#0205; Vallance Jones "Proton Aurora" description, table of sites and map on pg 7, this NL. Cooperating with #0454, Paulson and #0169, Eather.

POKER FLAT

#0064; Scherb, Lynch - NL 76-11, pg 3.

#0170; Evans, NL 76-11, pg 3.

#0400; Fitz, "SPIRE" in NL 76-11. "ICECAP" to be 2 Nike-Hydac for auroral measurements and 1 Nike-Javelin for TMA release. "STRESS" to be 5 payloads releasing 48 Kg Barium each to artificially induce striations and scintillation phenomena. Six Nike-Hydac diagnostic probe rockets to monitor $\Delta Ne/Ne$.

News from the IMS Satellite Situation Center.

SSC Report No. 7

IMS/SSC Report No 7, "Daily Summary for IMS High-Altitude Satellites, Days 1-181 1977" has just been published. Tables and graphs of orbit positions are given for six artificial satellites (Vela 5B, IMP-H, IMP-J, Solrad 11A, Solrad 11B and Hawkeye 1) and the Moon (our satellite of opportunity) which may be of interest for IMS studies during 1977. Note --- Hawkeye 1 is not scheduled for data acquisition after the end of 1976 but has been included in Rpt No 7 "to determine when such data could be extremely valuable". The some 400 page volume covers only the first half of 1977 because of the large number of pages required and the satellite orbit uncertainties when projected beyond 6 months. Included are the dates of SSC-selected Special Periods for the first half of 1977 (Table 7, pg 15; see also IMS NL 76-11, pg 3), tables giving times of satellite passage across or through boundaries/regions of interest for IMS, samples of satellite orbit plots available from the SSC (NL 76-10, pgs 4-5), a list of satellite plots for the first half of 1977 available from the SSC on microfilm (see below) and daily bar charts for all 7 satellites. The bar charts are on facing pages for a single day and to the "standard" IMS paper reproduction scale of 1 cm = 1 hour. They are the most compact graphical representation of information about the location of all satellites at a given time and are explained in the SSC Rpt No 7 and IMS NL 76-10.

SSC Reports in Preparation

In the next two months the SSC is planning to issue three further reports. The first will contain orbit plots and bar charts for the Prognoz 4 satellite for the first three months of 1976 (see SSC Report No 7 and NL 76-10). The second report will be an IMS Satellite Directory giving brief descriptions of all IMS related spacecraft experiments acquiring data in 1976 and ISEE A and B and GEOS and giving names and addresses including telephone and telex numbers of all Principal Investigators on these satellites. The third report will contain definitive orbit bar charts for the first six months of 1976 for the following satellites: IMP-H,IMP-J,Prognoz 4,Solrad 11A,Solrad 11B,Hawkeye 1, Vela 5B,Vela 6A,Vela 6B,and the Moon. In addition to the normal information, the SSC intends to include on the bar chart an indication of the times for which data was acquired from a given satellite.

The SSC requests that any individual having information for the first half of 1976 concerning data acquisition from the high-altitude satellites listed above, communicate this to the SSC at the address given on the front page of this NL. The SSC would appreciate receiving such information as soon as possible as it hopes to have the report ready for presentation at the IMS Steering Committee meeting in January 1977.

Satellite Actuality -- PROGNOZ 5

Almost at IMS NL press-time, J. Vette called to share an anouncement the SSC received about the launch of USSR satellite PROGNOZ 5. Launch date was 25 November 1976 and the preliminary orbit parameters are: Apogee 199000 km; Perigee 510 km; Period 95 hr 13 min; Inclination 65 . The orbit is similar to that of Prognoz 4 and this satellite is one of a continuing series.

New Satellite Program -- ARCAD 3

The SSC has received from the French Coordinator the following information on the French experiments on the USSR-France magnetospheric satellite ARCAD3.

Spacecraft Name - ARCAD 3
Last Reported State - An Approved Mission
Launch Date - 2nd half 1979
Initial Orbit Parameters:
Orbit Type - Geocentric Periapsis - 400 km alt
Apoapsis - 1100 km alt Inclination 73 deg

Details on ARCAD 3 Experiments:

Experiment Name - DYCTION
Experiment Personnel -
PI J.J.Berthelier Lab de Geophysique externe, 94-Saint-Maur-des-Fosses, France

Experiment Brief Description -
The experiment is designed to study the effects of thermal plasma on the concentration and temperature of H+, N+, NO+, and O2+ ions. The scientific objectives are to study the dynamics of thermal ions (component of ion velocity along and across magnetic field), the heating of thermal plasma, large scale perturbations associated with substorms and the distribution function of suprathermal ions.

Experiment Name - ISOPROBE F
Experiment Personnel -
PI J.J.Berthelier. Address as above.

Experiment Brief Description -
The scientific objective of this experiment is to study electric fields in the range 0 to 500 Hz.

Experiment Name - ISOPROBE
Experiment Personnel -
PI C.Beghin, Cen de Rec en Phy de l'Environment (CRPE) 45-Orleans France

Experiment Brief Description -
The scientific objectives of this experiment are to measure electron density and temperature in the thermal plasma and field aligned currents in high latitude zones.

Experiment Name - Low Energy E- and P+
Experiment Personnel -
PIs H.Reme and J.M.Bosqued, Cen d'Etude Spatiale des Rayonnements (CESR) 31-Toulouse France

Experiment Brief Description -
The scientific objectives of this experiment are to measure the acceleration, precipitation and diffusion mechanisms affecting electrons and protons in the energy range 5ev to 30kev and to investigate the origin of magnetospheric and auroral Helium, Hydrogen and Oxygen ions.

Satellite Plots on Microfilm Available from SSC

The following information is taken from Table 9 (pg 17) of SSC Report No 7 and gives the film designation to request, the number of frames on each reel and the contents. NSDF SX-A1A (1086): 181 pairs of boundary plots and long/lat plots, each showing 1 day for the three satellites IMP-H, IMP-J, and the Moon; 181 pairs of the the same graphs for Hawkeye 1; and 181 pairs of the same graphs for Solrad 11A, 11B, and Vela 5B. NSDF SX-A1B (724): 181 pairs of neutral sheet plots and X-Y plots, each showing 1 day for IMP-H, IMP-J, and the Moon; 181 pairs of the same graphs for Solrad 11A, 11B, and Vela 5B. NSDF SX-A1C (289): 16 frames of GSE plots, each showing 12 days for IMP-H, IMP-J, and the Moon; 91 frames of GSE plots, each showing 2 days for Hawkeye 1; 91 frames of GSE plots, each showing 2 days for Solrad 11A, 11B, and Vela 5B; and 91 frames of SM plots, each showing 2 days for Hawkeye 1.

Information on GEOS - K. Knott, ESA, informs TIMSCIE Office that the scheduled GEOS launch is confirmed for Mid-April 1977. He also requests that we supplement information given on rapid selection of GEOS data (IMS NL 76-11, pg 7). Requirements for prompt selection of special intervals for GEOS data retention apply only to Experiment S-300, Field and Wave Phenomena, which is the "high speed data" experiment. Principal Investigator for S-300 is #0011, R.E. Gendrin, CNET, 3 Ave de la Republique, 92131 Issy-les-Moulineaux, France. All other data from GEOS, including particle, E- & B-field (DC & ULF) and some compressed wave data will be archived and distributed to experimenters without selection. For details on the 7 GEOS experiments, we refer to Knott's review article in "ESA Scientific & Technical Review", 1, (173-196), 1975.

All-sky cameras in routine operation -- Northern Hemisphere 1976-77. In IMS NL 76-11 we shared a map (pg 7) and brief comment about information on all-sky camera sites to be operational during the winter of 1976-77. This information was assembled by K. Lassen, Danish Met Inst, according to an understanding reached during the Grenoble meeting in 1975. Below are given the addresses of institutions responsible for each station group, nominal site coordinates and format of film product as announced.

Station coordinates are geographic with degrees N latitude and degrees E longitude given.

Scandinavian Sector

	Coord.		Format	Inst	Res
Finland					
Kevo	70	027	16 mm color	MIH	
Ivola	69	028	16 mm color	MIH	
Muomio	68	024	16 mm color	MIH	
Sodankyla	67	027	16 mm color	MIH	
"	"	"	35 mm	MPI	
Oulu	65	026	16 mm color	MIH	
Norway					
Ny-Alesund	79	012	16 mm	NOT/UJO	
Bjornoya	74	019	16 mm	UJO	
Tromso	70	019	16 mm	NOT	
Skibotn	69	020	35 mm	MPI	
Sweden					
Abisko	68	019	35 mm	MPI	
ESRANGE	68	021	35 mm	UJO	
Kiruna	68	020	16 mm	KGI	
Skaulo	67	021	35 mm	UJO	
Lycksele	65	019	16 mm	KGI	
Intermittent or on request:					
Uppsala	60	018	16 mm	UJO	

Addresses of responsible institutes:

KGI = Kiruna Geofysiska Institut
981 01 Kiruna 1
Sweden

MIH = Meteorologiska Institutet Helsingfors
Please address requests for data and information to:
Finnish Meteorological Institute
Vuorikatu 24, Box 503
00100 Helsinki 10, Finland

MPI = Max-Planck-Institut fur Aeronomie
Institut fur Ionospharenphysik
3411 Lindau/Harz
Federal Republic of Germany

NOT = Nordlysobservatoriet
Postbox 387
9001 Tromso
Norway

UJO = Uppsala Jonosfarobservatorium
S-755 90 Uppsala 1
Sweden

Soviet Union Sector

Loparskaya	68	033	C-180/35mm	PGI
Arkhangelsk	65	040	"	PGI
Heiss Island	81	056	"	PGI
Dixon Island	74	080	"	PGI
Cape Chelyuskin	78	104	"	PGI
Tixie Bay	72	129	"	PGI
Yakutsk	62	130	"	PGI
Cape Schmidt	69	180	"	PGI

PGI = Polar Geophysical Institute
USSR Academy of Sciences
184200 Apatity
Murmansk Region
USSR

As mentioned in IMS NL 76-6, the TIMSCIE Office reminds those interested in information about or data from Soviet IMS programs that requests will be expedited if they are addressed to Prof V.V. Migulin Chairman, Soviet IMS Committee, IZMIRAN, P/O Akademgorodok, Moscow Region, USSR, Telex 7523 SOLTER SU.

Greenland Sector

	Coord.		Format	Inst Res
Thule	78	291	16 mm	DMI
Danmarkshavn	77	341	16 mm	DMI
Upernavik	73	304	16 mm	DMI
Kap Tobin	70	338	16 mm	DMI
Godhavn	69	306	16 mm	DMI
Sondre Stromfjord	67	310	16 mm	DMI
Angmagssalik	66	322	16 mm	DMI
Narssarssuaq	61	315	16 mm	DMI

DMI = Danish Meteorological Institute
Geophysical Section II
Lyngbyvej 100
DK-2100 Copenhagen
Denmark

North American Sector

Canada				
Fort Churchill	59	266	35 mm	NRC
Moosonee	52	279	35 mm	NRC
Great Whale River	55	282	35 mm	NRC
Goose Bay	53	300	16 mm	AFGL
Alaskan Chain				
Arctic Village	68	214	16 mm	UAL
College	65	212	16 mm	UAL
Fort Yukon	67	215	16 mm*	UAL
Inuvik	68	226	16 mm	UAL
Poker Flat	65	212	16 mm*	UAL
Sachs Harbour	72	235	16 mm	UAL
Talkeetna	62	210	16 mm	UAL

All stations will use black & white film (4X/7224); also 35 mm cameras will be used intermittently at Chatanika (65.1 N, 212.6 E) and those marked as *.

NRC = National Research Council of Canada
Astrophysics Branch
Upper Atmosphere Research Section
Ottawa
Canada K1A 0R8

AFGL = Air Force Geophysical Laboratory
Ionospheric Dynamics Branch (LIB)
Hanscom AFB, Massachusetts 01731
USA

UAL = All-Sky Program Coordinator
Geophysical Institute
University of Alaska
Fairbanks, Alaska 99701
U.S.A.

GENERAL NEWS

Exchanges of IMS Digital Data - In May 1976, samples of geomagnetic and other data from WDC-A for STP were taken to WDC-B2 in Moscow. As often happens, the magnetic tapes were in a format incompatible with their local computers. However, similar sample tapes prepared on WDC-B2's computers have recently been received in Boulder and the tape prepared on the EC-1030 computer in 9-track, 800 bpi, EBCDIC format was directly compatible with our local computers. Also, the digital geomagnetic data from Minsk, USSR, could be read from the ASCII punched paper tapes into a local mini-computer. A sample magnetic tape in the EBCDIC format containing Canadian geomagnetic measurements from Ft Churchill has now been returned to the USSR and we hope routine exchange of digital magnetic tapes will soon develop from this effort. Digital tapes from Canadian magnetic observatories are now routinely deposited with WDC-A and we have received a test tape containing the first data from the 8-station Alberta Magnetometer Chain (see NL 76-9, pgs 3&4). We plan to prepare a proto-type IMS data publication for distribution to IMS NL recipients.

Intermittent Errata - After mailing NL 76-11, we discovered that some copies were without the Simon-style calendar on pg 8. Our assembly line for stuffing NLs into envelopes does not include the quality control step of checking each copy but we will be more careful with this issue and will encourage our printer to do the same.

Response Requested -- J. Roederer asked the TIMESCIE Office to remind IMS participants of the IMS Steering Committee meeting Jan 24 - 27 at ESTEC. A primary topic will be means for encouraging and improving the scientific output from the IMS. Anyone having suggestions about this topic is asked to send them to Dr. E.R. Dyer, SCOSTEP Secretariat, c/o National Academy of Sciences, 2101 Constitution Avenue, Washington, DC 20418 USA.

NEW PROGRAMS & UPDATES

Energy Budget Campaign, N Scandinavia, Winter 1979/80. Representatives of more than 20 scientific groups met at Bonn University (FRG) on October 6, 1976 to prepare an Energy Budget Campaign. They agreed on a scientific program to be performed at Kiruna and Andoya, probably during the winter 1979/80. Six model rocket payloads were defined. The contribution of ground-based facilities, balloon payloads and satellite experiments were specified. Everyone interested in participatiing in this campaign is invited to contact promptly (at least before the end of Dec 1976) Dr. D. Offermann, Project Scientist, Physikalisches Institut, Universitat Bonn, 53 Bonn 1, West Germany. Telex 8 869 693.

Availability of Experiment Announcements and Report on Completed Experiments in Western Europe. Due to space limitations in the IMS NL, information received from experimenters can only be published in abbreviated form. Scientists interested in a copy of the original announcement or report can contact the European IMS Information Office directly at Meudon.

IMS Programs in Brazil. Developing IMS magnetic field monitoring programs in Brazil are: 1- measurements at Eusebio ($\sim 4°$ S, $\sim 38°$ W) with a digital fluxgate magnetometer developed by the UCLA Space Science Center and part of their low latitude net of stations. Principal scientists: R.L. McPherron, N. Trivedi and J.M. da Costa. 2- Total geomagnetic field intensity measurement at Eusebio with a Rubidium vapor magnetometer. Principal scientists: N. Trivedi and J. M. da Costa. 3- Geomagnetic measurements at Cachoeira Paulista ($\sim$23° S, $\sim$45° W) with a Cesium vapor automatic magnetic observatory (ASMO). Principal scientists: J.M. da Costa and N. Trivedi.

North American Magnetometer Chains. NL 76-9 reported on the start-up of the Alberta Chain of magnetometers at 8 sites in W. Canada. Sugiura & Manka have begun to produce a series of IMS Magnetometer Network Notes to issue at irregular intervals. They will be devoted to information about the installation, operation and status of the magnetometer stations and provide a specialized forum for sharing other helpful information (such as how to best cope with Customs formalities). The IMS NL will abstract information of general interest. After the magnetometer network special session at the Fall AGU, Wednesday, Dec 8, 5-7 pm, we expect that the exact station locations will be known and will be announced in these NLs.

UK Magnetometers. A.N. Hunter (#0468) notifies us that a 3-component fluxgate magnetometer is installed on the Faroes and three more units will be operating in Iceland by early Oct 1976. Units record 3 components each 10 s on digital magnetic tape cassettes.

M. Gadsden (#0178) reports that a fluxgate magnetometer has been installed as of 20 Oct at the Aberdeen site. It is recording D-trace only at "450 gammas" and may run for an extended time.

Stuart's note on the Pulsation Programme is given with details under current campaigns.

Scandinavian IMS Magnetometer Array. An updated description has been submitted for IMS Program #0312, Untiedt with Kuppers and Baumjohann. Their array of 32 "post-hole" magnetometers is now completely installed as shown in the map published in IMS NL 76-8, pg 7. The complete array has been operational since Oct 1976, and will continue at least until summer 1978. Analog traces for interesting events will be manually digitized to permit cooperative study with digital data from the Kertz and Maurer (#0243) chain. N-S and E-W high-latitude ionospheric current structures will be analyzed down to periods of 1-min. Derived equivalent current systems or digitized data will be made available for special intervals. For other times direct copies of analog film images can be distributed. Contact Untiedt, Kuppers or Baumjohann for details: Inst fur Geophysik, Univ Munster, Gievenbecker Weg 61, D-4400 Munster, FRG. Telephone: (0251)4903591, Telex: 892 529 UNIMSD.

ACTUALITIES

SYOWA 1976 Rocket Launches

S-210JA-22; 2320 UT, 25 Jan; Precip e-, abundance of NO, number dens of e-, e- temp

S-310JA-1; 0945 UT, 13 Feb; natural plasma waves, precip e-, number dens of e-, e- temp

S-210JA-20; 2340 UT, 24 Jun; same obser as above

S-210JA-21; 0023 UT, 26 Jul; " " " "

S-210JA-24; 2354 UT, 16 Aug; E&B field, number dens of e-, e- temperature

S-210JA-25; 0001 UT, 1 Sept; same obser as above

S-210JA-23; 0431, 13 Sep; Precip e-, abundance of NO, number dens of e-, e- temp

#0162; Corcuff on the "1 every 5 min" schedule for Jun and Jul 76 at Kerguelen & Gen Belgrano, IPPDYP

A-28; Ullaland (NL 76-8, pg 2) completed summer balloon launches: type A from Karasjok 14 Jul 2300 to Egesminde 18 Jul 2240 UT; meas X-rays, E field and CNA (riometer). Types B and C1, C2, C3 were simul launch from Karasjok, 27 Jul 0245 to 30 Jul 1715; Sodankyla 27 Jul 0320 to 1 Aug 0325; Repvag 27 Jul 0330 to 29 Jul 1840; and Karasjok 27 Jul 0400 to 31 Jul 1500, respectively. Meas X-rays, VLF goniometer, atmos infrasonic waves, E&B fields on type B and X-rays on type C. All exper worked.

#0115; Smith, night time interferometric obser, exp no 3 in IMS Bulletin No 2. Observations at Collin Mt and Sidmouth from Jan to Sep 1976. Interferometer moved to Skibotn, Norway, see pg 2.

A-24; Goldberg, 21 Sept # 18.178GE at 1252 UT, only forward-looking experiments got data; 23 Sep good data; # 18.180GE, failed. See IMS NL 76-8 pg 2 for program details.

#0366; Walker is working on model programs to use in analyzing Churchill meridian magnetometer data. He reports that a computer code has been developed to simultaneously fit meridian chain magnetic observations and rocket or satellite based magnetic measurements to an electrojet and Birkeland current model. Rocket VB-33 (15 Jan 72) spin probe observations of Koehler & Sil were used with Churchill chain data to construct a detailed auroral current model. Intense, oppositely flowing electrojets were needed to fit the combined observations and meridian currents were linked by equally intense Birkeland field-aligned currents. Model cleft current systems were constructed for post-noon rocket events on 25 & 28 Nov 75 from E field and ionosphere observations. E fields were determined from electrostatic analyser data (Daly & Whalen) and Barium motions (Pongratz). Resulting electrojets were similar to auroral ones but higher and flowing in opposite directions. Birkeland currents calculated from divergent-free meridian currents flowed outward at the observed locations of several arcs. Also, a cooperative program with Potemra has resulted in satellite tracking facilities at Resolute for TRIAD. Passes are tracked over the polar cap, across the cleft and auroral zone to just below Churchill.

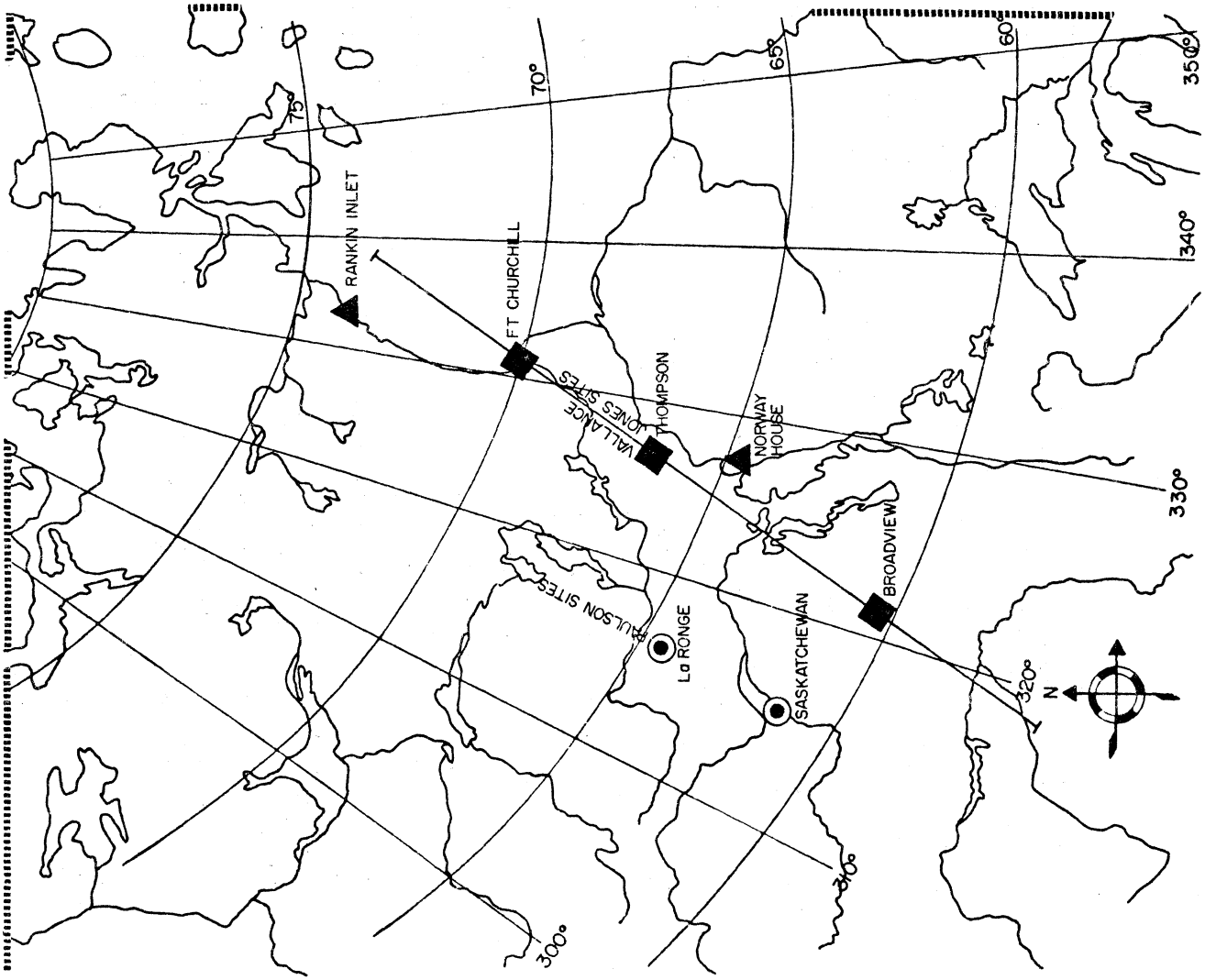
COORDINATED CANADIAN AURORAL PHOTOMETRY CAMPAIGN

A.V. Jones (#0205) updated his IMS "Proton Aurora" Program description with the table and map below. This program is also described in the Canadian Based IMS Activities Report (D-1, pg 16) prepared by B.W. Currie in April 1976. Dates for the first 1977 campaign are Feb 9 - 22, inclusive. Observations by Jones will be at the sites and with the instruments listed in the table and shown below. Simultaneous observations are planned by #0454, Paulson at La Ronge and Saskatoon (this experiment not described in IMS Bulletin No 2 but is program D-2 in Canadian Report). A similar concurrent study by #0169, Eather along the line Rankin Inlet - Norway House could result in relatively complete photometric coverage over a 15 x 15 area. Trials of the Jones meridian scanning photometers during 1976 resulted in data from Ft Churchill for Jan 20 - Feb 3, from Thompson for Feb 21 - Mar 4 and from Broadview for May 20 - 25. The photometers worked well during these trials and the data will be available. A similar campaign is planned for early 1978.

Station	Geograph. Coord.		Wavelengths Observed	Scan Rep. Period	Scan Az.	Full Field	ASC	Magnetometer	Timing	Primary Record
Ft. Churchill	58.76	266.00	λ4278, λ4392[a] λ4805, [a] λ4861 λ5075, [a] λ5275, λ5577, λ6235[a] λ6300, λ6670, λ7042	30 s[b]	36°T	4°	35 mm	From EMR Ft. Churchill	Quartz clock ±0.5 s	7-track dig. tape
Thompson	55.74	262.14	λ3914, λ4278, λ4861, [c] λ5577 λ6300, λ6700	15 s[d]	31°T	1°	70 mm 150° fll	EDA Fluxgate FM 100B. Results on Tape 1γ	Quartz clock ±0.5 s	9-track dig. tape
Broadview	50.38	257.42	λ4278, λ4805, [a] λ4861, λ5624 λ5577, λ6300	30 s[e]	26°T	4°	35 mm	EDA Fluxgate FM 100B. Chart ±500γ full scale	60 Hz line synch. clock checked 1 hr^{-1} WWV	7-track dig. tape

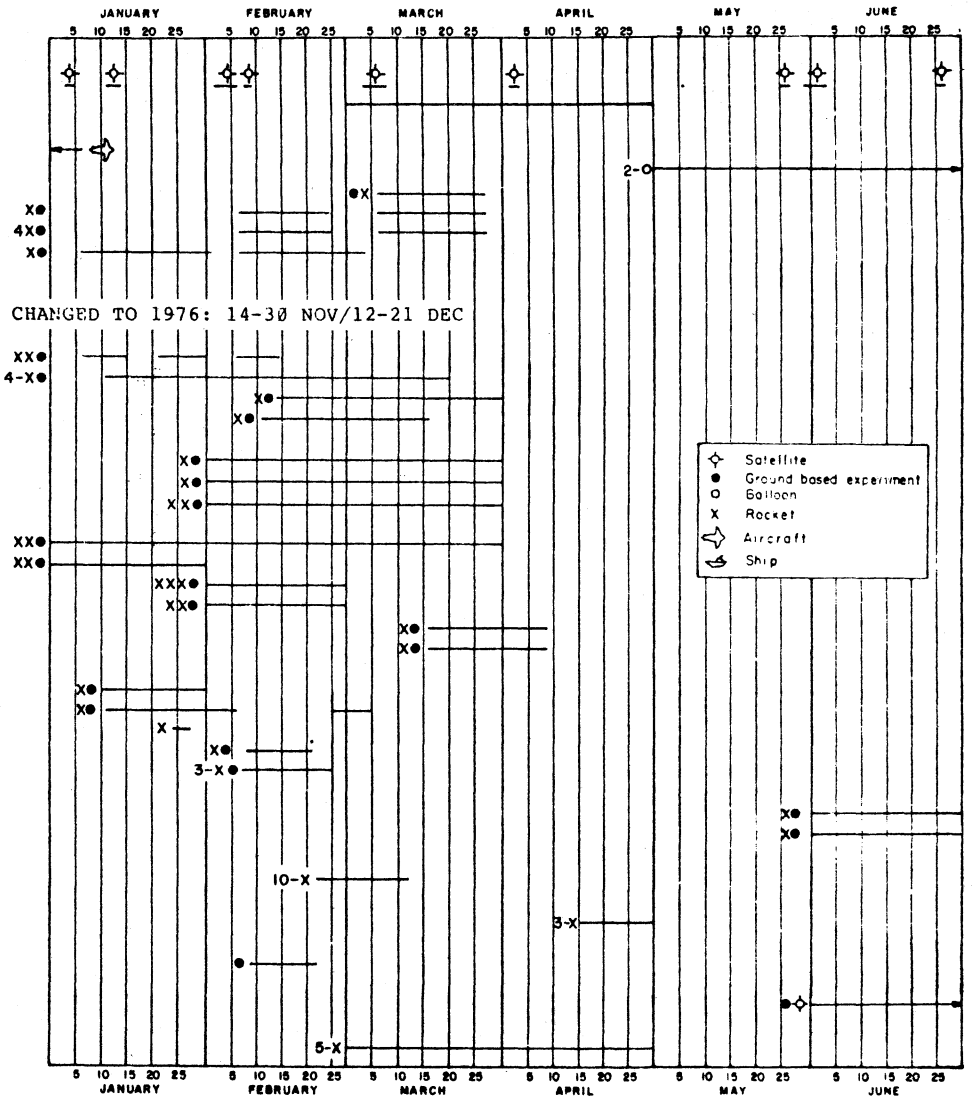
Background Asynchronous On half-integral minutes
Separate filter-filter photometer stepping 10-170° in 20 equal steps in 50 sec with 5° field
Generally (60/n) sec where n= 1, 2, 4, or 8; each scan a set of 5 (6/n)-sec scans at each wavelength

MERIDIAN SCANNING PHOTOMETER CAMPAIGN SITES



IMS CALENDAR OF GBR CAMPAIGNS JANUARY - JUNE 1977
(As of 31 November 1976)

WORLD-WIDE- -
Special SSC-selected Satellite Periods - - - - - - - - -
ASHAY (Radicella, et al)
MULTIPLE SITES- -
#0522 (Truttse) Moscow region, 50-79 deg N.
#0139 (Berthellier) Pretoria region
KIRUNA (ESRANGE) #0183 (Haerendel, "Porcupine") - - - - - - -
B-1 (Witt, et al; "Aurora")
B-2 (Holmgren, et al; "Trigger")
B-3 (Bjorn, et al; "D-Layer")
B-4 (? , Nagoya Univ.) Postponed to August 1977
ANDOYA (ANDENES)- -
B-5 (Egeland & Johnstone, et al; "Harang Pair I")
B-6 (? ; EUV - 1 & 2) Part of #0308 below
#0131 (Arnoldy, Cahill)
#0308 (Theile; "Polar High Atmosphere")
B-7 (Matthews; 18.211 UE/IE)
B-8 (Maehlum, Maynard, et al; "Composition")
SOUTH UIST- -
A-19 (Williams; P112H)
#0085 (Dickinson; P189H, P192H)
A-18 (Woolliscroft; P139, P140H)
WALLOPS ISLAND- -
A-32 (Smith; 14.533UE, 14.534UE)
FORT CHURCHILL B-14 (Whalen, et al) - - - - - - - - - - -
B-9 (Zipf; 31.001UA, 31.002UA)
B-10 (Mentall; 18.1013GA, 18.1014GA)
B-11 (Bernstein, et al; 21.035AE)
B-12 (Hays/Sharp; 13.132UE)
POKER FLAT- -
#0064 (Scherb; 29.004UE)
#0170 (Evans; 29.003AE)
#0400 (Fitz; "SPIRE")
#0400 (Fitz; "ICECAP")
#0164 (Davis; 18.1011UE, 18.1012UE)
WHITE SANDS -
B-10 (Mentall; 31.004GA)
#0356 (Sheldon; 23.009UE, 23.010UE)
EGLAND AFB- -
#0400 (Fitz; "STRESS")
KWAJALEIN -
#0400 (Fitz; "Equatorial Wideband")
CANADA- -
#0205 (A. Vallance Jones, et al)
CONJUGATE POINTS- -
#0011, 0429 (Perrault, Hirosawa)
HEISS ISLAND- -
B-15 (Beghin, et al; "IPOCAMP")



Σ=92