International Council of Scientific Unions

SPECIAL COMMITTEE
ON
SOLAR-TERRESTRIAL PHYSICS

76-7

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
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IMS NEWSLETTER

CONTENTS

This issue of the IMS NL contains many items picked up at major international meetings held since the previous issue: the open meetings of the IMS Steering Committee at the SCOSTEP General Meeting in Boulder (p. 3) and the Geomagnetic Meridian Project symposium and planning meetings in Leningrad (p. 7). TIMSCIE was participating in and listening at each, as well as at the Int'l Symposium on STP which followed the SCOSTEP sessions. The total attendance at all these sessions probably amounted to 700 scientists including many who have been on the other end of Telex connections with us. Enthusiasm for IMS is obviously high. We appreciate the kind words said about these NLs and the steps being taken to remove the T from TIMSCIE (item 7, p 3). --- JHA

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PROGRAM PLANS FOR JULY 1976

SPECIAL IMS PERIODS

Jul 7 0700 UT to Jul 8 1900 UT IMP-J,IMP-H - Neutral Sheet; IMP-J,VELA 5B,VELA 6A - Magnetopause

Jul 9 2000 UT to Jul 10 0800 UT IMP-H, HAWKEYE 1 - Magnetopause

Jul 22 0600 UT to Jul 22 1800 UT IMP-H, VELA 6A, VELA 5B - Magnetopause

Jul 31 2000 UT to Aug 3 0400 UT IMP-J, VELA 5B, VELA 6A - Neutral Sheet

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

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

Jul 1 to Jul 31; #0005; Bland; Fort Churchill; Balloon - cosmic rays and particles, cosmic ray telescope
Jul 1 to Jul 31; A-18; Woolliscroft; South Uist; Rocket - +ion mass spectrometer
Jul 1 to Jul 31; A-19; Williams; South Uist; Rocket - Lyman , e-density
Jul 1 to Jul 31; #0085; Dickinson; South Uist; Rocket - neutral oxygen & e-concentrations
Jul 1 to Dec 31; #0019; Jakimiec; USSR; Rocket - solar X-ray exper, cooperative with Interkosmos program
Jul 12 to Aug 3; A-26; Ullaland; Karasjok (Norway); Balloons (5)- two flights, types A and B, see note

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

--- to Aug 15; A-20; Koons, et al; New Zealand area and N. conjugate; Surface- VLF exper, satel, note
Jul 1...31; #0458; Charakchyan; Mirny, Murmansk, Moscow, Alma Ata; Balloons - daily launch, cosmic rays
Jul 7, 14, 21, 28; #0162; Y. Corcuff; Gen Belgrano, Halley Bay; Surface; weekly VLF obser see May note
Jul 13 to Jul 15; #0004; Bauer; IISN; Surface - thermal tides in 100-130 km altitude region, see NL 76-3

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

--- to Sep 30; #0115; R.W. Smith; Jordanstown; Surface - airglow interferom, intermittant operation
(we have not received full information on Surface campaigns)

Notes on Program Plans for July 1976

Addendum on Special IMS periods for July. The start and end times and the satellite conjunctions listed above are those given in the December Special Announcement by SCOSTEP (see NL 76-1 p4). Later computations by Vette in IMS Satellite Situation Center Report No. 6 (pg 14) give the refined times as (changes underlined): July 7 0800 to Jul 8 2000; Jul 9 2100 to Jul 10 1000; Jul 22 0600 to Jul 22 2000, Jul 31 2300 to Aug 3 0400. For the July 7-8 and 9-10 Special IMS Periods supplementary information on the times of bowshock and magnetopause crossing by high altitude satellites of opportunity have been given by the SSC.

Magnetopause		
July	UT	Satellite
7	15.0	IMP-H
7	17.5	SOLRAD 11A
8	7.5	SOLRAD 11B
8	9.0	Hawkeye 1
8	10.5	Vela 5B
8	12.0	IMP-J
10	7.5	SOLRAD 11B

Bowshock		
July	UT	Satellite
7	16.0	SOLRAD 11B
7	20.0	Vela 5B
8	5.0	SOLRAD 11A
10	6.0	SOLRAD 11A

A-26; Ullaland balloons to measure: A- X-rays, E-field, cosmic noise absorption; B- X-rays with spatial resolution, VLF-goniometer, atmospheric infrasonic waves, B-fields. 2 A flights and 2 A + 1 B drift into conjugate area of ATS 6.

PROGRAM PLANS FOR AUGUST 1976

SPECIAL IMS PERIODS

- - - - - - - to Aug 3 0400 UT IMP-J, VELA 5B, VELA 6A - Neutral Sheet

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

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

--- 1 to Dec 31; #0019; Jakimiec; USSR; Rocket - solar X-ray exper, cooperative with Interkosmos program
Aug 1 to Aug 31; #0311; Ungstrup; Andoya; Balloons (4) - E-fields, X-rays, riometers, see note below
Aug 1 to Aug 31; #0263,0311; Olesen, Ungstrup; Sdr Stromfjord; Rockets (2) - Complex exper, note below

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

--- to Aug 15; A-20; Koons; et al; New Zealand area & N. conjugate; Surface- VLF exp, satel; NL-4 p3
Jul 7, 14, 21, 28, #0162; Y. Corcuff; Gen Belgrano, Halley Bay; Surface; weekly VLF obser, see NL-5 p2

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

--- to Sep 30; #0115; R.W. Smith; Jordanstown; Surface - airglow interferom, intermittant operation
(we have not received full information on Surface campaigns)

Notes on Program Plans for August 1976

#0311; Ungstrup, postponed from June, 4 balloons to launch at Andoya, drifting N. of Iceland and across Greenland. Experiments to measure E-field X-rays and riometers. Telemetry to Andoya, Iceland and W. coast of Greenland.

#0263, 0311; Olesen and Ungstrup, also postponed from June, 2 rockets from Sdr Stromfjord, Greenland to measure E-field, ELF/VLF waves, ionospheric currents, particle precipitation, plasma density and temperature. Daughter payload will measure part precip & plasma density. Launch to be when cleft (cusp) near and N. of Sdr Stromfjord, strong ionospheric current above there and Godhavn with backscatter echoes on 12 MHz & slant sporadic E traces indicating ionosphere instability of Farley & Buneman.

Submitting IMS Campaign Announcements

P. Simon, European IMS Information Office, is using a standard card form to collect announcements of IMS campaign plans. Emphasis is given to reporting individual experiments and also the overall campaign or vehicle (rocket, balloon) to minimize confusion.

PROGRAM PLANS FOR SEPTEMBER 1976

No Special Satellite Periods were selected for September 1976. Consult the 1976 International Geophysical Calendar for other special observational intervals. Attention is called to programs in Sept shown on pg 8.

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

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

Sep 19 to Oct 2; A-24; Goldberg; Poker Flat; Rockets (3) - High altitude launches, complex program
Sep 19 to Oct 2; A-25; Hilsenrath; Poker Flat; Rockets (3) - Low alt, coordinated with A-24 above
Sep 19 to Oct 2; #0337; Heath; Poker Flat; Rockets (3) - Coordinated with A-24 above, see notes
Sep 19 to Oct 2; A-26? Barcus; Poker Flat; Balloons - Coordinated with A-24 above

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

Sep 1...30; #0458; Charakchyan: Mirny, Murmansk, Moscow, Alma Ata; Balloons - daily launch, cosmic rays

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

--- to Sep 30; #0115; R.W. Smith; Jordanstown; Surface - airglow interferom, intermittant operation
(we have not received full information on Surface campaigns)

Notes on Program Plans for September 1976

A-24; Goldberg announces a complex program of 9 or 10 rocket launches (see calendar on pg 8) coord with balloons and ground observations at or near Poker Flat launch facility. Other participants are: A-25 Hilsenrath, #0337 Heath, A-26? Barcus, Kruger, Williamson, Hale, Szuszczewicz and Jones. High-alt rockets too carry GM counters, X-ray, NRL ion temp and density probe, exper to measure ozone, temp, pressure and wind velocity. Low-alt simultaneous launches will measure conductivity below 75 km. Balloons to monitor cosmic rays and X-rays at 40 km. Objective to monitor bremstrahllung X-rays as possible energy transfer mechanism from high altitude down to stratosphere and lower mesosphere. Auroral zone launches are similar to Antarqui program of May 1975 in Peru.

IMS Highlights of Boulder SCOSTEP Meetings

by E.R. Dyer, SCOSTEP Secretary

SCOSTEP held a General Meeting with National Representatives at the World Data Center A for STP Boulder, 2-5 June 1976, including meetings of all four Steering Committees. Fifty-seven persons participated, some in more than one capacity (several as alternates) including 21 National Representatives, 12 of the 15 Discipline Representatives, 7 Members of the Bureau and 18 stated members of Steering Committees. The Opening Plenary Session on 2 June heard status reports and was presented with questions for which the participants were asked to seek satisfactory solutions for adoption at the Closing Plenary on 5 June, the two intervening days being devoted to Steering Committee Meetings. The Meeting adopted a resolution of thanks to their host, A.H. Shapley, and to the members of his staff (led by D.B. Bucknam) who handled local arrangements, which were flawless. The rest of these notes will be limited to action items of concern to the IMS.

1. Because of unavoidable delays in bringing into operation the observational systems designed for the IMS (especially certain key spacecraft and special ground-based nets), because these delays will have the effect of making 1978-1979 the most productive years for the IMS, and because it would be unthinkable not to take full advantage of observational systems established for the IMS (at considerable cost) by dismantling the IMS during this productive interval, it was agreed to place a request through Union and national channels to the International Council of Scientific Unions (i) to recognize an extension of the IMS observational interval to the end of 1979, (ii) to extend SCOSTEP through 1980 to provide time to finish unfinished business, etc., (iii) and to review the situation in 1978 to see whether any adjustment to the schedule proposed above is needed, either for the IMS or any of the other coordinated STP programs.

2. The IMS Steering Committee recognized three categories of observational intervals for the IMS: (A) Special Spacecraft Periods based on spacecraft configurations relative to features of the magnetosphere and to each other, like those already announced for 1976; (B) intervals based on the scheduling of major rocket, balloon, and/or ground-based campaigns, which will be announced and updated in this Newsletter, and for which correlative spacecraft and other data will be arranged to the extent possible; and (C) intervals based on naturally occurring solar or geophysical events for which alerts will be issued, which will be designated retroactively, and in which the WDCs will assist as far as possible by compiling data collections, etc.

3. After August 1976, when the SOLRAD spacecraft pair 11/A,B are settled in final orbits, the Satellite Situation Center will look for intervals of spacecraft configurations involving the SOLRADs for October-December 1976 and into 1977. The SSC will also provide positions for the SOLRADs and for PROGNOZ 4 for the late 1976 Special Spacecraft Periods already announced. The PROGNOZ 4 positions will be based on orbital data provided by the Soviet IMS Committee.

4. The IMS-SSC presented a preliminary list of about 100 potential Special Spacecraft Periods for 1977. About twenty of the best of these will be selected in the autumn of 1976 and published in this Newsletter for use in 1977. The number must be kept relatively small to minimize demands for spacecraft telemetry, especially for those spacecraft that are operated only intermittently.

5. IMPORTANT! Tracking and telemetry for the University of Iowa satellite Hawkeye-1, which is one of the principal spacecraft now incorporated in IMS schedules, is now scheduled to be discontinued on 31 December 1976. Those participants who have made use of Hawkeye-1 data or who will do so within the next several months, who feel that Hawkeye-1 data are important for their researchs, and who can make a case for continuing telemetry after 1976 should write to Dr. R.H. Manka, U.S. Coordinator for the IMS, National Science Foundation 1800 G Street, N.W., Washington, D.C. 20550, USA.

6. The IMS-SSC reported that the ISEE A and B spacecraft pair, if launched as planned in mid-October 1977, will make numerous passes through the magnetotail and neutral sheet in April-June 1978 during the early Antarctic winter. SCOSTEP and its IMS Steering Committee will therefore recommend to the ICSU Scientific Committee on Antarctic Research (SCAR) and national organizations involved that an intensified IMS-related observational campaign, especially auroral studies, be undertaken in the Antarctic during that iNterval (subject to adjustment for a launch date different from mid-October 1977).

7. It was orginally agreed in December 1975 that the TIMSCIE Office at WDC for STP, NOAA, Boulder,

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would operate for one year to meet the extremely pressing need for a means of frequently disseminating updated information to IMS participants, especially on campaigns, status of observational programs and projects, etc. The TIMSCIE Office at NOAA cannot continue past December 1976 with existing resources, especially manpower. The IMS Steering Committee has evolved a plan to seek help from outside NOAA which is being set in motion.

8. IMPORTANT! In order to provide documentary evidence to administrators responsible for such operations as specially requested spacecraft telemetry, or the Satellite Situation Center, the TIMSCIE Office, the WDCs, etc., about the usefulness of these services and to avoid cutting back or discontinuing these services, it is vitally important that: (i) IMS participants promptly and regularly report to the TIMSCIE Office, NOAA, Boulder, the outcome of their own observational efforts. The reports, which can be very brief, should contain, to the extent possible, such essential facts as the degree of success of the observations, scientific results (if available), the participants' use of IMS-related services noted above in planning and carrying out of their programs, etc. (ii) Authors of scientific papers who make use of any services such as those just noted should acknowledge that fact in their papers whether presented at meetings or published in journals. In other words, it is necessary to make known to the sources of support for the IMS and to the world scientific community as represented in ICSU that the IMS is a scientifically lively and useful enterprise, even at this early stage.

9. The IMS Steering Committee will meet in early 1977 in order to: (i) Review the positive scientific results from the first year of the IMS. This review will also help the Committee to assess and improve the effectiveness of the various types of coordination being tried out in 1976, particularly the Special Spacecraft Periods. (ii) Look for ways in which the scientific results of the IMS can be quickly developed and brought out. For instance, a workshop on the results of selected Special Spacecraft Periods and other workshops are contemplated. (iii) Confirm plans for coordination for 1977 and into 1978, with special attention to GEOS and ISEE A/B.

Participants in SCOSTEP/IMS General Meeting - There is not space in the NL to give the full details on the attendees so we will merely list the 21 countries and the last names of the 57 attendees and leave the matching to the reader. Argentina, Australia, Belgium, Canada, Czechoslavakia, Federal Republic of Germany, Finland, France, India, Israel, Italy, Japan, Mexico, Netherlands, South Africa, Spain, Sweden, Switzerland, United Kingdom, United States of America, and Union of Soviet Socialist Republics. Allen, Belmont, Beynon, Bowhill, Cardus, Cauffman, Chasson, Cole, Cuperman, Currie, Dryer, Dyer, Fomin, Gall, Gendrin, Gledhill, Gregory, Heikkila, Hilberg, Hultqvist, Johnson, Kaiser, King, Lemaire, Lincoln, Manka, Migulin, Mustel, Nagata, Ne'eman, Obayashi, Page, Pellinen, Pfotzer, Pick, Radicella, Roederer, Rostoker, Scarf, Sechrist, Shapley, Shea, Simon, Singh, Smart, Svestka, Tagliaferri, Teague, Tinsley, Triska, Troitskaya, Vette, Waldmeier, Wilhelm, Williams, Zhulin, Zolotukhin.

Information from Satellite Situation Center

ATS-6 Shift Plan: Satellite ATS-6 is currently in geostationary orbit nominally on longitude 35 deg E. It is scheduled for relocation to 135 deg W with drift beginning on 1 Aug. At about 1.3 deg per day it will be on station by 1 Dec. Status of ATS-6 experiments is: McIlwain, particles and fields partially operational, 0 - 80 kev N-S only, no rotation on E-W and intermittant; Winckler, particles and fields, only e-spectrometer working; Masley, cosmic rays, working well; Paulikas, spectrometer, working well; Coleman, magnetometer, X and Y elements working well; Fritz, low-energy p+ working well; Davies, radio beacon working well (will continue transmitting during relocation). See July 1975 Supplement to Dec 1974 Space Investigations Documentation System (SIDS) Report, pages 1008 and 1009 (Supplement to "Active and Planned").

SOLRAD 11 A&B - A more detailed description of SOLRAD orbits, experiments, and availability of data will appear in a future IMS NL. R.H. Manka, US IMS Coordinator sends the following information from R. Kreplin, Naval Research Laboratory (#0096): (i) Phasing is nearly completed; the two satellites are to be 180 deg apart in high altitude circular orbit. (ii) All experiments are working well except the X-ray background experiment. (iii) Data tracked at Blossom Point, Maryland, will soon be available in near real-time through the NOAA SELDADS system. (iv) Tracking of the SOLRAD satellites is also planned by Osservatorio Astrofisico, Arcetri, Florence, Italy and by the Physical Research Laboratory at Ahmedabad, India.

Tagliaferri (#0074) reported to SCOSTEP and TIMSCIE Office that the Osservatorio Astrofisico at Arcetri has arranged with the Naval Research Laboratory to provide tracking of both SOLRAD 11 A and SOLRAD 11 B when they are over the meridian of Arcetri(11°E). Other tracking windows are possible for requested intervals. Interested participants are invited to correspond.

Spacewarn Bulletin - WDC A for Rockets and Satellites regularly publishes this information source for the IUWDS. It contains monthly updates of satellite launching announcements, lists of spacecraft particularly suited for international cooperative studies (especially radio beacons), and details of experiments. Spacewarn Bulletin is distributed to COSPAR National Contacts for satellite information, to Satellite Regional Warning Centers, and to various leaders and participants in COSPAR activities. Requests for further information should be directed to Dr. J. Vette, IMS SSC Code 601, Goddard Space Flight Center, Greenbelt, Maryland, USA 20771.

SSC Products and Services - Programs are now operational on the new SSC computer system to produce plots for 1977 satellite conjunctions on request from participants. For high altitude satellite IMP H and J, Vela 5B, and SOLRAD 11 A/B there are 4-day GSE plots (orbits projected in the solar ecliptic plane), daily plots of distance from magnetopause and boundary, latitude and longitude plots, and distance from the neutral sheet. For Hawkeye and the predicted ISEE A&B there are GSE and boundary distance plots available.

By mid-September these plots will be on 35 mm microfilm and bar-chart graphs of satellite positions in interesting regions will be available in hard copy format along with tabular orbital information. It is estimated that this package of information will be available by mid-October for distribution to IMS satellite participants and interested institutes (about 300 sets of the hard copies) to assist in picking the Special Spacecraft Periods for 1977. Films and hard copy will be sent to satellite Principal Investigators.

Additional items on SSC appear in IMS Highlights of Boulder SCOSTEP Meetings, pp 3-4 of this NL.

The Wideband Propagation Experiment satellite was launched into polar orbit on 22 May 1976. The orbit is highly stable, sun synchronous between 990 and 1062 km with equatorial crossings about 1117 (northward) and 2317 (southward) local time. Orbital elements on 25 May were: semimajor axis 7396.280 km, eccentricity 0.0049093, inclination 99.6823 deg, ft. ascen. node 52.4513 deg (+0.9920 deg/day change), arg. of perigee 146.1401 deg (-2.5154 deg/day change), and time of perigee 0949:29.477 UT.

At about 0430 UT on 25 May the radio beacon was
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turned on for continuous phase-coherent transmissions, right-hand circular polarization, on the following frequencies: VHF 137.6748 MHz; UHF 378.6057, 390.0786, 401.5515, 413.0244, 424.4973, 435.9702, 447.4431 MHz; L Band 1239.073 MHz; S Band 2891.171 MHz.

Members of the international satellite beacon community are invited to observe these signals and anyone needing element updates or other information should contact E.J. Fremouw, SRI, Menlo Park, California 94025, USA.

ISIS II satellite - Experimenters and others interested in this polar orbiting satellite met in Boulder during the International Symposium on Solar-Terrestrial Physics. More details on this program will appear in these NLs because of the importance of ISIS II (and potentially of ISIS I) to the IMS. The experiments are described by (#0031) Shepard, et al (Planet Space Sci 21, 819, 1973), are in the Canadian IMS program description distributed by Currie at the SCOSTEP Meetings, in a Communications Research Centre report by F. Daniels, CRC, Shirley Bay, Ottawa, Canada, and on pages 49-51 of the NSSDC Report on Satellite Experiments Active and Planned, Dec 1974. This information on the satellite's status was conveyed by J.D.R. Boulding. The satellite is operational although some telemetry and command systems are rated partial. Topside sounder, radio noise, and VLF experiments are fully operational; energetic particle detector partially operational; cylindrical electrostatic probe, retarding potential analyzer, red-line photometer, and auroral scanning photometer also fully operational; beacon experiment operational but switched off; ion mass spectrometer operational but with low mass channel at decreased sensitivity since early 1974; soft particle spectrometer not operational as of Jan 1976.

Data acquisition now is primarily from the southern polar cap. Planned rotation in Sept will permit viewing the equator and further rotation for northern winter will be performed. Specific intervals of data acquisition and processing are based on a system of "ISIS Studies" arranged cooperatively through the ISIS experimenters. Names and addresses are given below. Spacecraft schedules are prepared 2-3 weeks ahead so requests should be initiated 4-6 weeks in advance of earliest need. IMS participants are invited to suggest special ISIS Studies by contacting the appropriate experimenter.

L.H. Brace and E.J. Maier, NASA Goddard Space Flight Center, Greenbelt, Maryland 20771, USA, e- and ion temperatures and e- density; (#0196) J.H. Hoffman, Space Science Division, Univ of Texas at Dallas, Richardson, Texas 75080, USA, ion composition; (#0128) C.D. Anger, Physics Dept, Univ of Calgary, Calgary, Alberta T2N 1N4, Canada, auroral scanning photometer; (#0031)G.G. Shepherd, CRESS, York Univ, Downsview, Ontario M3J 1P3, Canada, red line photometer; J.H. Whitteker, CRC, Shirley Bay, Ottawa, Ontario K2H 8S2, topside sounder, VLF; J.R. Burrows, Herzberg Inst of Astrophysics, NRC, Ottawa, Ontario K1A 0R6, Canada, energetic particles.

Corrigenda

Oops! The sun should shine longer than it would appear from NL 76-6, page 3. My "less experienced colleagues" reprinted a misprint in the IMS review article by K. Knott. He writes that his first paragraph should have said the sun "still has an expected lifetime of 10^9 years".

Finnish All-Sky Camera Network and Selected Nights for Correlative Auroral Studies from Oct 1975-Apr 1976. Digitally controlled all-sky cameras as described by Hypponen et al (see #0174, Sucksdorff) in Technical Report No 9, Finnish Meteorological Inst, Dec 1974, are operating at 5 sites in Finland: Kevo (70N,27E), Ivalo (69N,27E), Muonio (68N,24E), Sodankyla (67N,27E), and Oulu (65N,25E). These sites are part of a comprehensive Geocosmophysical Recording Station network operating in Finland during the IMS and fit into the overall Scandinavian complex of IMS sites

Coloured film images of auroral activity from these stations are visually checked and and quantitative measures descriptive of the events are coded onto standard forms for computer entry. Tables of quick-look values are produced on the computer and distributed to interested experimenters and to the World Data Centers. Intervals of special interest can be quickly checked for level of auroral activity and quality of recording for the stations listed above. Finer time resolution data or additional information may be obtained upon request from R.J. Pellinen, Div. of Geomagnetism, Finnish Meteorological Inst, Postbox 503, SF-00101 Helsinki 10, Finland.

Data obtained during the N-MAC (Noon-Midnight Auroral Correlation) periods and other intervals of auroral activity led to the selection of the following list of nights which will be studied in some detail: 1975, Oct 29, 30, Nov 2, 7, 9, 10, Dec 8, 26, 28; 1976, Jan 3, 5, 6, 31, Feb 2, 8, Mar 30, Apr 1, 2. All interested IMS participants are invited to correspond with Pellinen or check details in the published quick-look tables. Similar N-MAC intervals for intensified observations for the coming winter of 1976-77 are given in the International Geophysical Calendar.

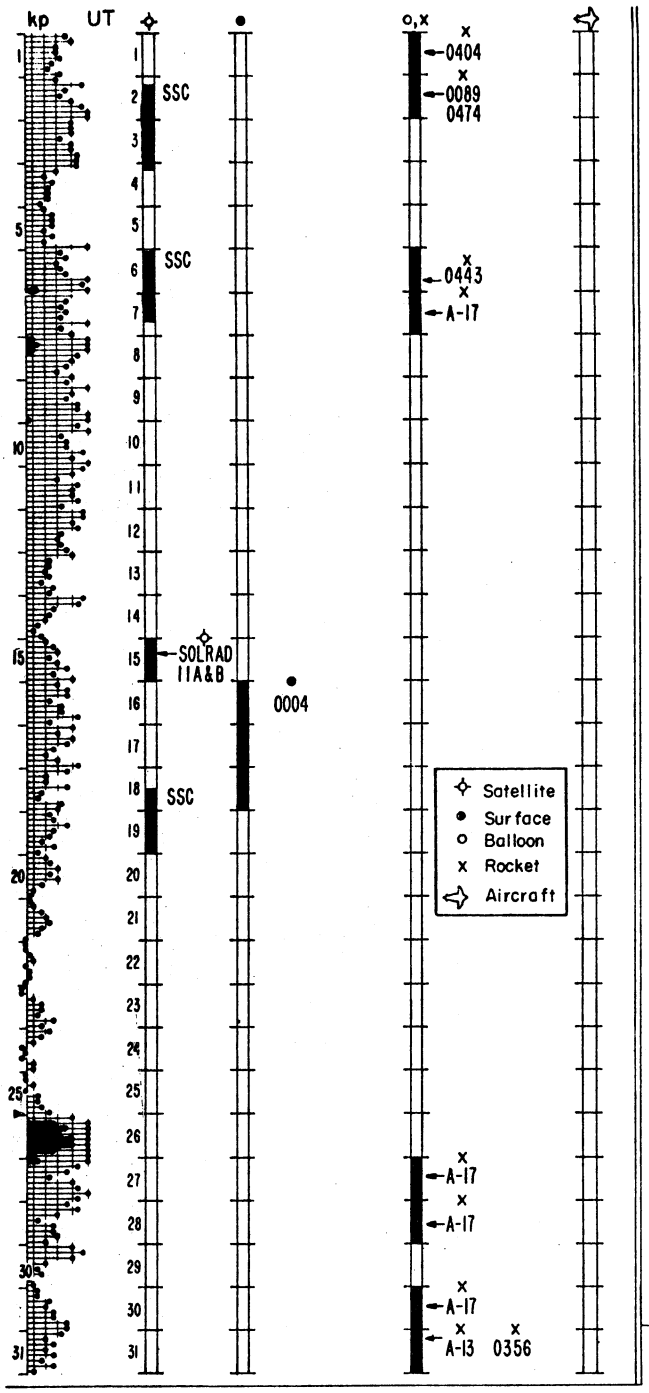
ISSTP Boulder - The International Symposium on Solar-Terrestrial Physics was held in Boulder from June 7-18. Since this is the home of the TIMSCIE Office, the many meetings convened before, during, and after the ISSTP provided opportunities for contact with attending Regional and National IMS Representatives and with the many scientists having IMS programs already in operation or soon to begin. Results from these contacts are evident throughout this NL and will continue to appear into the future. G.W. Adams (US Natl Sci Fdn) chaired a meeting of IMS experimenters who will be operating arrays of ground-based photometers (meridian scanning, all-sky, etc.) during IMS. These devices usually generate massive digital data collections which are difficult to summarize in a quick-look publication or otherwise distribute inexpensively to experimenters. Eather (#0169) and Mende have produced "KEOGRAMS" as optical summarizations on 35 mm film frames of the data from their digital meridian scanning photometers. Samples of such photometric data will be distributed to the IMS community to assess their utility and whether routine preparation and distribution are warranted.

NOAA's Space Environment Laboratory and the US Geological Survey combined to present a demonstration of the magnetometer/interface controller/radio relay systems which will form the instrumental nucleus of the N. American magnetometer chains. Variations recorded by these instruments will be transmitted to SEL via the GOES satellites and available to users in near-real-time through the SELDADS. Cumulative results will be transferred monthly to the World Data Center A for Solar Terrestrial Physics in Boulder for rapid publication and distribution. Instrument site preparation is in progress and the first data transfer via GOES will begin in January 1977 if schedules are met. A paper by Lanzerotti (#0226), et al, in the June 1976 EOS reviews the role of magnetometer chains in the IMS and describes in detail the US-sponsored network.

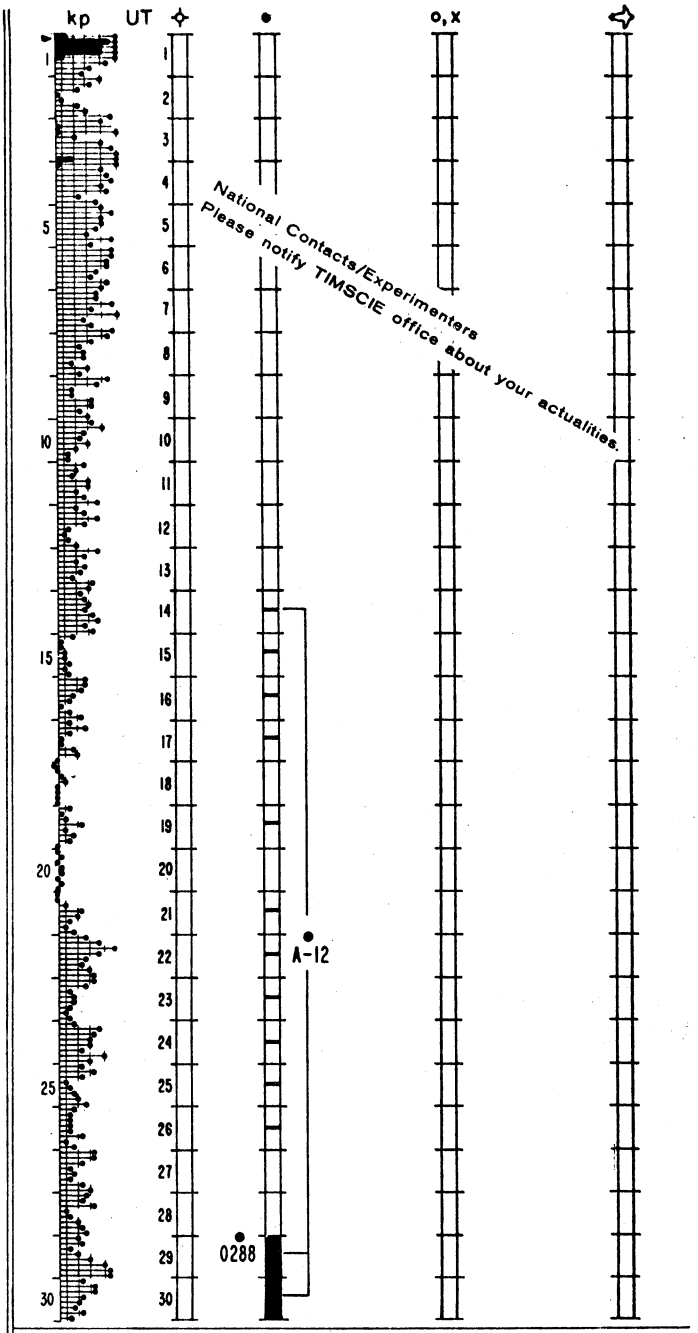
M.J.A. Chivers (Univ Calif San Diego) demonstrated his compact riometer system that will operate at each of the IMS magnetometer sites and will also relay data back via satellite channels.

Late Actualities. Chanin (#0159) reports neutral temperature measurements made by laser technique at Heiss Island: (local Moscow Time) Feb 28, 0355, 165km; Feb 28, 1722, 130-140km; Feb 29, 0415, 130-140km; Mar 3, 0310, 165-170km, Mar 4 0301, 165km; Mar 7 0248, 130-140km; Mar 8 0232, 140km; Mar 9 0155, 160-165km. Data reduction in progress.

MARCH 1976 CAMPAIGN ACTUALITIES
(Preliminary)



APRIL 1976 CAMPAIGN ACTUALITIES
(Preliminary)



NOTES ON ACTUALITIES

Confirmed IMS campaign actualities for Mar-Apr 1976 shown above are listed here. Earlier campaigns for which information was received after publication of the last IMS NL and recently completed programs for which preliminary information is in hand are also described. We encourage IMS participants to continue providing details on actualities at the earliest possible opportunity.

#0207; Jones and Spracklen began operation of HF Doppler Sounder system on Antarctic peninsula continuing from 1 Jan 1976 through 31 Dec 1978. System has 6 transmitters and 2 receivers with analog records resulting which can be digitized on request for special intervals.

#0443; Hultqvist, launches from Esrange at 1850UT Jan 22 and 2100UT March 6. E-field, particles, e-and ion density in mother/daughter payload. All seemed to work well except E-field daughter for Jan launch.

#0404; Cloutier, 2 launches at Poker Flat: 0705 UT Feb 18 and 1045 UT Mar 1; E&B-fields, particles. Supported by Chatanika incoherent scatter radar.

#0089, 0474; Holmgren, Rees, launch at Kiruna on 2 Mar at 2349 UT. TNT-Cesium and Tri-methyl-aluminium release. Injection-Trigger project: E-fields and neutral winds at 100-160 km.

#0096; Kreplin, launch of SOLRAD 11 A and B at 0238 UT on 15 March. See SSC Report on Active and Planned Spacecraft and Experiments, and detailed information in IMS Bulletin No 2 (0096).

#0004; IISN Program, Bauer reports that from March 16 0300 UT to March 18 1900 UT gravity wave observations at medium scale were performed with good results at Nancay, Mende and Monpazier.

A-17; Hepner launched 4 Nike Tomahawks each carried 4 cannisters of Barium for sequential release to

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(Continued from page 6)

monitor E-fields & neutral winds between 220-310 km and a trail generator for lower altitude neu-winds from 180-80 km. Poker Flat launches were: 7 March 0643 UT; 27 March 1250 UT; 28 March 1300 UT; and 30 March 1230 UT, all payloads worked.

A-13; Heikkila, Ft. Churchill, successful launch at 0639UT March 31 into a series of multiple quiescent arcs. Carried multinational complex of 12 experiments by 8 experimenters from 4 institutions. See NL-3, p2, for further details. Also coordinated ground-based TV aurora obs. by T. Berkey, U. Calgary, during exp and 2 weeks prior. See also #0356 below. Only partially usable data on suprathermal ion composition, swept frequency admittance probe and low energy electron spectrometer. Other exp. seem good. Auroral event may prove to be rather complicated for analysis.

#0356; Sheldon, Ft. Churchill, successful launch at 0638UT March 31 in conjunction with A-13 above, x-ray bremmstrahlung and E-fields.

A-12; Crochet, coherent ground-based radar at Addis Ababa; observations 1000-1900UT on April 14,15,16,17,19,21,22,23,24,25,26,29,30,May 1,2.

#0288; Rycroft, at S. Uist, Cape Wrath and Ardnamurchan operated ELF/VLF goniometers from April 29 through June 5. Supported several rockets.

A-19; Williams, S. Uist, rocket launched at 1222 UT on 6 May to measure Lyman- and e-density. Coordinated with separate launch at 1144 UT by K. Norman (MSSL). This mass spectrometer experiment had not been previously reported in IMS NL.

#0149; Bullough, at S. Uist 2 rockets launched. Both carried experiments measuring AC/DC E-field. First launch at 0440 UT on 4 June suffered partial data loss. Simultaneous rocket and ground record of emissions and whistlers. Second at 0456 UT into morning emissions event also measured B-fields. Good joint rocket/ground data.

#0400; Fitz (Fremouw), satellite P76-5 launched from California at 0742 UT on 22 May. Carries multifrequency, coherent radio beacon. See note on page 4 for details. International cooperation in observations is invited.

TIMSCIE Office Visit in USSR

Soviet IMS Commission - The following items from discussions with the Soviet IMS Commission relate to IMS: (1) First steps have been taken to develop a capability for exchange of IMS digital data on magnetic tapes. Sample tapes of 1-min geomagnetic measurements and computer programs were carried from WDC-A for STP to WDC-B. The USSR is now transmitting digital magnetic measurements from 3 sites to the ATS-6 satellite for relay to the Univ of California at Los Angeles as part of a cooperative experiment that may contribute to the rapid availability of magnetic variations data during IMS. The sites are: Archangelsk, Minsk, and Odessa. After ATS-6 is shifted away, the new digital magnetometers will possibly be relocated but will continue in operation. Special efforts are to be made to secure magnetogram copies from remote Arctic magnetic observatories so that Auroral Electrojet (AE) indices can be derived on a month-to-month basis during much of IMS. Interest was expressed in the selection of intervals of special interest during IMS for the collection of comprehensive data sets and the special digitization of analog data during those times. The Soviet IMS Commission is responsible for coordinating IMS planning in the USSR, for collecting information on actualities, and for reviewing and analysis of results. They will supply TIMSCIE Office with regular updates of program plans and results for publication in these NLs. Questions about USSR IMS programs are welcomed and may come either through the TIMSCIE Office or directly to the Chm of the Soviet IMS Commission, V.V. Migulin via the telex 7523 SOLTER SU. Opportunities for international IMS cooperation exist, such as the real-time telex net established between Kiruna (ESRANGE) and points in the USSR for the PORCUPINE rocket launch. There is interest in coordinated simultaneous rocket launches from USSR and North American sites. The SAMBO balloon program is being rescheduled for early 1978 with details to be announced. Magnetograms from regular observatories and from the 11 temporary sites on the 145 deg geomagnetic meridian are routinely deposited with the World Data Centers.

Geomagnetic Meridian Project Symposium

This international symposium, in Leningrad from May 24-28, was a preeminent success. Results from the analysis of geomagnetic data of many meridian chains were presented and numerous examples shown of the importance of this type of data in correlative studies. The 105 deg geomag and 145 deg geomag meridian chains are providing abundant data for study. Other chains also discussed at these meetings are in the Irkutsk region, a dense network in N. Scandinavia, and the N. American chains in Canada and Alaska. Maps of station locations were collected from several participants and lists of these temporary sites (most scheduled to last through the IMS) will be distributed along with maps in some appropriate format. The Geomagnetic Meridian Project has attained its goals of promoting the creation of nets of well-distributed auroral zone observatories and of creating an environment for international cooperative studies.

W. Baumjohann (Univ Munster, FRG) reported on preliminary results from digitizing variations records of the 14 established sites of Untiedt (0312), Kuppers, and Baumjohann in N. Scandinavia. This network will be expanded to include 30 temporary recording sites located among the numerous observatories and launch sites in that region.

Kamide showed how effectively the Alaska meridian magnetometer chain data could be compared with satellite field measurements and incoherent scatter radar data to derive a comprehensive model of the location and intensity of field-aligned and ionospheric currents in the auroral zone.

Questions about details of the GMP Symposium or results of the GMP Working Group may be addressed to its Chm, A.N. Zaitzev, Soviet Geophysical Commission, Molodezhnaya 3, Moscow 117296, USSR.

GEOS and ISEE A/B and ISEE C Status Report - Page (#0267) and Knott report that the April 1977 launch date for GEOS still looks accurate. The Qualification model passed all tests and the Flight Model was assembled May 19.

Present plans for GEOS are that it will be launched in April and measurements from experiments will begin in May 1977. Its initial position will be about 0 deg longitude (magnetically conjugate to Iceland and Syowa Base). It will begin shifting by August toward a longitude of 35 deg East (aligned with Scandinavia). The shift will coordinate with the Aires rocket campaign and GEOS should achieve its position in Sep-Oct. A return to the Iceland longitude is expected for Spring/Summer 1978.

ISEE B is being constructed by the European Space Agency and will be launched atop ISEE A. These are the "Mother/Daughter" pair of IMS satellites. There are the usual testing worries about potential "vibration" problems and "radiation" problems but these are typical. The planned launch date in October 1977 seems possible.

ISEE C prospects for July 1978 launch still look good. A request from European experimenters for near-real-time data from ISEE C has been discussed and prospects for some data availability are favorable.

Japanese Satellite Descriptions - Obayashi (#0258) brought copies of brochures describing (in English) the satellites JISS, CS (launch Nov 77), ETS (Feb 77), BSE (Mar 78) and ECS (Feb 79). Copies may be obtained by writing to MINISTRY OF POSTS AND TELECOMMUNICATIONS, Radio Regulatory Bureau, 3-2, Kasumigaseki 1-chome, Chiyoda-ku, Tokyo 100 Japan.

IMS CALENDAR OF GBR CAMPAIGNS JULY - DECEMBER 1976

(As of 30 June 1976)