IAGA News

NOVEMBER 1974 NO. 13

INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS

ASSOCIATION OF GEOMAGNETISM AND AERONOMY

President: Dr. V. A. Troitskaya
Soviet IGC Committee
Molodezhnaya 3
Moscow B-296, USSR

Vice Presidents: Dr. G. M. Weill
Dr. J. G. Roederer

General Secretary and Editor of IAGA News:

Dr. Leroy R. Alldredge
USGS, c/o NOAA, R10
Boulder, Colorado 80302, USA

CONTENTS

One of the Important Buildings at the University of Grenoble

GENERAL INFORMATION

THE NEXT ASSEMBLY

The big event on the horizon for IAGA is the IUGG General Assembly to be held at Grenoble, France, 25 August - 6 September 1975. Plans are well advanced for this event. A separate section of this News is devoted to this topic. Your attention is directed to the abstract deadline of 20 February 1975. Originals, in the proper format, must be received by the General Secretary and copies must be received by the proper conveners by that date.

Your IAGA general program committee consisting of G.M. Weill, chairman, J.G. Roederer, and L.R. Alldredge spent three days in Grenoble in early August of this year to plan the general program and to check up on the facilities. The facilities which will be made available to IAGA are located in the Ecole Nationale Supérieme d'Electrotechnique et de Genie Physique which is a part of the Domaine Universitaire de St. Martin d'Heres, et de Gieres, Grenoble, France. A picture of the large auditorium at the university is shown on the frontispiece.

REORGANIZATION

IAGA was reorganized at the Kyoto Assembly. The decision was made then that the new organization would become effective 1 January 1974. Since the Kyoto Assembly, the newly appointed division chairmen have been very busy completing their organization and getting ready for the Grenoble Assembly. The new organization as far as it has been completed to date is shown later in this News.

The Executive Committee takes this opportunity to thank all the officials who manned the old IAGA Commission structure. That organization structure served well for a little over a decade.

IN MEMORY

Prof. Neil Brice died tragically in a plane crash in Samoa on 30 January 1974. He was enroute back to the United States from a sabbatical leave in Australia, which he took after the IAGA Assembly in Kyoto. We in IAGA will always remember him as a professional colleague of great

wisdom and wit, as a hard-working commission member, and as a most loyal friend.

Dr. A. J. Zmuda passed away July 14, 1974 of a heart attack, in Washington, D. C. Al until his death was very active in field aligned current research and related areas. He was the Reporter for the Working Group on "Analysis of Geomagnetic Fields"of Commission II until the re-organization in Kyoto. He is perhaps best known as the editor of the World Magnetic Survey 1957-1969. Dr. Zmuda was very active in managing the discussions which finally specified the first International Geomagnetic Reference Field in Washington, D. C. in 1968.

Mr. James Paton died suddenly on 26 August 1973 in his seventieth year on the verge of retirement from the University of Edinburgh.

Known to his colleagues and friends throughout the world as Director of the World Data Centre for Visual Aurora at Edinburgh and as a member for several years of the IAGA Commission for Aurora and Airglow. James Paton spent the major part of his working life in studies of the aurora and of noctilucent clouds. In the early 1950s, he built up a large volunteer corps of observers on land, on ships, and in aircraft to cover large areas of the Atlantic sector of the northern hemisphere. The collection, collation and analysis of these visual auroral data formed the principal work of the Data Centre but he also undertook to produce synoptic auroral maps for Antarctica during the IQSY.

Father Ernesto Gherzi, who was 87 years old, died on 6 December 1973 at Saint-Jérôme, near Montreal. He has been stationed at the Geophysical Observatory of Collège Jean-de-Brébenf for the past 18 years. Father Gherzi spent almost 30 years at the Zikawei Observatory in Shanghai. His more recent research has involved mainly solar radiation, radio wave, propagation, ionosphere, atmospheric electricity and microseismicity.

MINUTES OF THE IAGA EXECUTIVE COMMITTEE MEETING HELD 12-16 AUGUST IN THE SOVIET UNION

The Executive Committee held a meeting in the Soviet Union on 12-16 August 1974 under very unusual conditions. President V.A. Troitskaya arranged through the Soviet Geophysical Committee for the Executive Committee members to be the guests of the Soviet Academy of Sciences during the above period. The first session was held in the morning of 12 August in the office of the Soviet Geophysical Committee in Moscow. The Committee members then took a bus to Dubna where they boarded a boat on the Volga river for a trip to Borok, arriving on August 13. On the way the historical town of Uglich was visited. In Borok several biological laboratories and Geophysical Observatory were visited. Back in Moscow, the Committee was treated to a concert on 16 August. Executive Committee sessions were held on the boat and in Borok. The entire event was delightful and memorable and members of the Committee express their thanks to President Troitskaya, to the Soviet Geophysical Committee, and to the Soviet Academy of Sciences for this opportunity.

The Minutes reported here are given without identifying the session where the discussions took place.

Those present were:

V.A. Troitskaya, president
G.M. Weill, vice-president
J.G. Roederer, vice-president
T. Nagata, member
O. Schneider, member
A.J. Dessler, member
R. Turajlic, member
M. Ackerman, observer for M. Nicolet
L.R. Alldredge, general secretary
N. Fukushima, adjoint secretary

J.W. Dungey did not attend, but he did send comments on the Agenda items.

After greetings from the host, President V.A. Troitskaya, J.G. Roederer raised the question of the status of M. Ackerman. It was agreed that he should be participating as an observer for M. Nicolet. N. Fukushima expressed his thanks for being included in the meeting as the Adjoint Secretary

GRENOBLE ASSEMBLY

G.M. Weill reported on the work of the IAGA Grenoble Program Committee, consisting of himself (chairman), J.G. Roederer and L.R. Alldredge. The Committee had met in Grenoble on 9-10 August where they reviewed the facilities that will be made available to IAGA for the Assembly, and worked up a program schedule starting with input provided by the Union, and by the division chairmen. An attempt will be made to publish the program of Symposia and Scientific Sessions with the names of conveners and IAGA representatives in the Second Circular for the Grenoble Assembly due in September, as well as in the IAGA News due in October or November.

The general schedule calls for regular sessions from 9.00 to 12.00 in the morning, 14.00 to 17.00 in the afternoon and for working group meetings in the evening from 17.30 to 19.00. It is hoped that the IUGG special lectures which are planned for five different days will be scheduled from 8.30 to 9.30. On these days the regular sessions should be 10.00 to 13.00, 14.30 to 17.30 and 17.45 to 19.15. It was decided to recommend the following topics and speakers to IUGG as candidates for Union Special Lectures:

Planetary Plasmas and Fields	- J.G. Roederer
Geomagnetic Reversals	- A.V. Cox
Solar Activity Effects on the Weather- Fact or Fiction?	- C.O. Hines
Planetary Neutral Atmospheres	- Soviet scientist to be named later.

V.A. Troitskaya pointed out that there were very few working group reporters and representatives on the program committees from the USSR. She agreed to look for a possible list of Soviet scientists who can be contacted to help with the programs.

It was agreed to dispense with the verbal presentation of symposia highlights at the final Plenary Session in Grenoble. It was stressed, however, that conveners should prepare well written highlights for publication in the Transactions. A decision was made to strongly recommend to conveners and division chairmen that if a person is not present to give his own paper it should be read by title only. Exceptions to this rule should be permitted only if another specialist in the field is available who is intimately acquainted with the author's work, has the author's slides, and is prepared to answer questions. When exceptions are granted, the substitute speaker should not just "read" the paper but should be fully prepared to explain the impact of the paper in less time than was originally reserved for the author on the program.

Division chairmen will be invited to arrive in Grenoble a day or two in advance of the start of the Assembly to have ample time to make last minute preparations and to meet with the Executive Committee.

A written proposal by B.A. Tinsley to hold a meeting of division chairmen in Europe after the abstracts for Grenoble have been received to help allocate papers to the proper sessions was not approved. This action was taken because conveners have been appointed for each symposium and scientific session with authority to accept or reject papers. The cost of having such a meeting for all the conveners would be prohibitive. Most of this work must be done by correspondence.

The Local Program Committee was asked to try to arrange a separate small room for use by each division chairman at Grenoble.

The desirability of IAGA participation in Symposium 31 on "High Atmosphere and Space Problems in Atmospheric Electricity" was questioned by several members. The consensus was that IAGA's interest in electric fields is already covered in many other symposia and scientific sessions being planned.

G.M. Weill explained that IAGA may petition IUGG to change the number of sessions scheduled for certain interdisciplinary symposia. Notably among these is no. 24 on "Tidal Interactions" O. Schneider, the convener, needs another session. The Executive Committee agreed to support his request.

R. Gendrin had written to V.A. Troitskaya earlier asking IAGA to stop Symposium no. 9 "Analysis, Processing and Interpretation of Geophysical Data" because of a similar one he was organizing for URSI in Peru in 1975. After reviewing Gendrin's request and his plans it was agreed that the two could proceed without much interference provided each convener knew of the others symposium main set of topics. Letters are to be directed to the conveners explaining the situation.

The question of what to do with contributed papers lead to the conclusion that most of the acceptable papers will fit one of the planned symposia or scientific sessions, but that a few additional rooms should be reserved for 4 and 5 September to accommodate additional sessions if necessary. This will provide a little flexibility for division chairmen and conveners.

The originals of all abstracts for the interdisciplinary symposia and the IAGA scientific sessions must reach the General Secretary by 20 February 1975. Copies of the abstracts should be sent simultaneously by the authors to the proper convener. All abstracts must conform to the format that will be specified in the Second Circular for the Assembly scheduled for distribution in September 1974.

The Executive Committee asked the Secretary to correspond with the following scientists to determine their willingness to serve IAGA during the Grenoble Assembly in the positions

indicated:

Finance Committee

C.O. Cardus	- chairman	(Spain
C.G. Sucksdorff	-	(Finland)
K.L. Svendson	-	(USA)

Resolutions Committee

A.J. Dessler	- chairman	(USA)
P.N. Mayaud	-	(France)
B.R. Leaton	-	(U.K.)
N. Fukushima	-	(Japan)
A. Zaitzev	-	(USSR)

Nominations Committee

T. Nagata	- chairman	(Japan)
F.S. Johnson	-	(USA)
N.P. Benkova	-	(USSR)
R. Gendrin	-	(France)
B.M. Bhargava	-	(India)

In a few cases alternates were suggested.

The Secretary was asked to write to IAGA National Committees requesting the name of their chief delegate for Grenoble. The letter should explain that although the designation of the chief delegate may be difficult at this early time, if proper credentials were not presented in the first days of the Assembly, the Executive Committee would have to proceed according to its own interpretation of the meaning of paragraph V-18 of the Statutes in case questions regarding votes on finances or alteration of the Statutes should arise.

The Secretary is to write to all working group and division chairmen explaining that only very specific, meaningful, resolutions will be accepted by the Executive Committee at the Grenoble Assembly. In the past some have been too general. Resolutions must be submitted to the Resolutions Committee not later than August 30, 1975.

J.G. Roederer described the minutes of an open IMS meeting held in São Paulo, Brazil, in June 1974, at the time of the

COSPAR meeting. There an attempt was made to plan the IMS workshop to be held during the Grenoble Assembly. The main idea developed was to have theoreticians identify what is missing in the experimental plans as contained in the next IMS Bulletin to verify or test critical theoretical ideas, and then to have ad hoc working parties identify possible deficiencies in the experimental program and determine what can be done to optimize the observational plans.

G.M. Weill was asked to contact Prof. L. Néel, of solid state magnetic theory fame, who is at the University of Grenoble, to see if he could be presuaded to give one of the IUGG Special Lectures during the Assembly.

President Troitskaya asked the Committee members to make suggests about what they would like her to include in her Grenoble President's Plenary Session talk.

SCIENTIFIC MEETING IN 1977

Extracts from a meeting of the United States IUGG National Committee regarding very tentative plans for 1977 Joint Scientific Assembly of IAGA and IAMAP in the United States were reviewed. The Secretary was instructed to write a letter urging the United States IUGG National Committee to arrange for charter flights from the east coast to Seattle if the meeting is finally scheduled to take place there.

FINANCES

The finances of IAGA were reviewed by the Secretary. At the present time IAGA has approximately $24,000 available as compared to $17,000 in January of 1973. The Secretary was instructed not to be so penurious since the hoarding of funds made it difficult to obtain a larger allocation. The latest proposal from the IUGG Executive Committee, which will likely be adopted by the Finance Committee is to allocate IUGG funds to Associations in a way proportional to the following weights:

IAG	IASPEI	IAMAP	IAGA	IAPSO	IAVCEI	IASH
0.217	0.145	0.145	0.145	0.116	0.116	0.116

This should give IAGA just a little more than the $12,000 now allocated per year.

Some needs for added finances which were discussed are:

1. Need to pay travel expenses for Division Chairmen to IAGA and IUGG Assemblies if they lack private support.
2. Support for special planning meetings and workshops proposed by the Divisions.
3. The convenience of organizing and for sponsoring tutorial summer studies or specific subjects of interest to IAGA.

Possible new sources of money which were discussed are the following:

1. UNESCO, for support of specific projects.
2. IUGG, to support the IAGA contribution to Joint IAGA/URSI activities.
3. Seek funds outside the ICSU framework.
4. Geodynamics program.
5. Pan American Institute of Geography and History

Most Executive Committee members were very pessimistic about obtaining the needed money as long as IAGA remains within the IUGG structure. It was decided to ask division chairmen to report to the Exectuive Committee what needs they foresee in the next four to eight years to operate their Divisions, including the cost of organizing special meetings, travel, etc., as well as to ask them for suggestions about how to raise additional funds.

FAGS

The Secretary reviewed the annual report of the International Service of Geomagnetic Indices written by D. van Sabben, dated 28 March 1974. It has already been decided by the Serivce to discontinue the Three-Monthly Bulletin on

pulsations because of lack of interest among scientists consulted. This will save approximately $300 per year, so that if the subvention from FAGS remains the same as for 1973, the expected deficit will be approximately $200. The Executive Committee authorized the Secretary to cover this deficit if necessary. During 1973 there was no deficit.

J.G. Roederer reported that SBARMO, when first organized, did provide a useful monitoring service, but that it is his impression that its primary activity now is the coordination of experiments involving only a few individual groups. There now seems to be less reason for them to remain in FAGS than before. He will very soon send a report to IUGG on the recent SBARMO Council meeting in Buenos Aires.

INTERNAL ORGANIZATION

The progress made by each division and other internal units was reviewed with the following results:

Division I

Chairman J.C. Cain distributed 1100 inquires of interest and had received only 172 replies as of 2 August 1974. The policy of the division is not to list a person as a division member without some indication that they wish to participate. The working group titles have been modified a little from those authorized in Kyoto, without any objection from the Executive Committee. They are, however, not yet complete nor have the working group chairmanship and membership been finalized. The Division Chairman wants to collect more returns from his questionnaire before finalizing the working group structure.

The Chairman has indicated that he has not received adequate returns from the USSR. President Troitskaya made it clear that to improve the input from Soviet scientists, it is necessary to send a letter to the Director of the Institute where the scientist works, explaining what services are wanted from which scientists. Blind copies of such requests should

also be sent simultaneously to the scientists involved, and to the President of the Soviet Geophysical Committee. Questionnaires should be handled in the same way. In this case the opinions within an Institute may be obtained by sending all copies of the questionnaire to the Institute Director. Division Chairmen will be informed on this recommended procedure.

J.C. Cain has listed two chairmen (or reporters) for each of the six working groups (or topics). A decision regarding the question of whether the units will be called working group or topics awaits the return of additonal questionnaires.

The Executive Committee encourages Division I to continue to make informal arrangements to cooperate with the People's Republic of China as they have tried to do, but to remember that formal negotiations must be left to the IUGG. The Secretary was instructed to send copies of IAGA Transactions and IAGA News to the People's Republic of China.

The Secretary was asked to follow through on Kyoto Resolution No. 5 to determine whether the IUGS will establish a Joint Working Group with IAGA on magnetic stratigraphy. If it is accepted, suitable publicity should be given to it.

The Executive Committee commends Division I for its desire to develop closer ties with other Associations interested in tectonophysics, but advises the Division that formal interassociation groups are not to be set up without prior approval of the Executive Committee. After planning is complete, a definite proposal should be presented to this Committee. This applies to the chairman's suggestion of such an interassociation group on the stress and thermal changes of magnetization.

The Executive Committee agrees that Division I should pursue the extension of all of its internal magnetic field studies to the moon, other planets, and their satellites.

Division II

The Memorandum of Agreement on "Joint IUGG-URSI activity with respect to the Upper Atmospehre"dated 24 June 1974, which was signed at São Paulo, Brazil, by five IAGA officials, five URSI officials, one SCOSTEP official, and one IAMAP official calling for three IAGA/URSI Joint Working Groups, was ratified by the Executive Committee.

The Executive Committee did not approve the proposed change in the name of the topic number one for Division II because it omitted "Structure" and anything below the ionosphere. The Executive Committee expressed strong reasons why IAGA should remain in a strong position to work on the aeronomy of the stratosphere. A. Dessler and M. Ackerman will talk to the Division Chairman very soon on this topic.

It was noted that since IAMAP has not agreed to approve the ad hoc Joint IAGA/IAMAP Working Group established in Melbourne, in January 1974, such action must wait until the Grenoble Assembly. In the meantime it will continue to function as an ad hoc Committee. In the interim President Troitskaya will try to have further informal talks with IAMAP officials on this topic.

As to Chairman Tinsley's request for the Executive Committee to carefully define the dividing line between Division II and III, the Executive Committee commented that this line must of necessity be one that fluctuates with time as the science develops, and requests that the two Division Chairmen discuss the proper division of effort each time a problem arises. The same answer is given to the query regarding the participation of Division II and III in the work of the Joint Working Group on "The Auroral Oval and its Extension into Space" and "Physics of the Plasmapause". These working groups were worked out before the reorganization in Kyoto, but clearly both Divisions II and III should participate.

The Executive Committee sees no reason why topics 1, 2, and 6 in Division II need to correspond exactly to the title of the corresponding IAGA/URSI Working Groups, and further suggests that all of the officials under these topics be listed as reporters or co-reporters. When the IAGA componenets meet as a part of a Joint Working Group with URSI, the officials could then use different titles appropriate to the Joint Working Group.

Division III

The topics, reporters, working groups, and corresponding chairmen submitted by Chairman C.-G. Falthämmar were reviewed and approved. One reporter for each topic has been designated, but more may be added later.

The proposal by A. Hasagawa to create an interdivisional body on theoretical plasma physics was thoroughly discussed. The consensus seemed to be that it would not be wise to separate the theoreticians from the experimental scientisits by setting up such an interdividisonal body. It was agreed however that an attempt should be made to attract some well-known theoretical plasma physicists to Grenoble to discuss problems dealing with laboratory plasma problems. President Troitskaya was not convinced that the Hasagawa proposal should be turned down, and requested the question be put on the Grenoble agenda.

A letter from R. Gendrin, dated 11 July 1974, objecting to the formation of the three new Joint IAGA/URSI Working Groups (see item under Division II) was discussed at length. Letters defending the action from S.A. Bowhill, dated 29 July 1974, and from B.A. Tinsley, dated 1 August 1974, were also reviewed. There seems to be a misunderstanding of motives involved in this question on the part of Dr. Gendrin and G.M. Weill was requested to talk to him on this topic to clarify the function of these working groups.

Division IV

This Division has started to move, but is still in the "questionnaire" stage. The Secretary was requested to write to Chairman Geiss (and the cochairmen) giving a deadline of 1 October for final information on Division organization, including the names of all officials so that the entire IAGA organization can appear in IAGA News No. 13 scheduled for publication in late October or early November 1974.

Division V

The report from Chairman Serson appeared to be very complete, with only two exceptions. The Executive Committee raised the question about whether or not the subject of auroral observations was adequately covered, and whether or not IAU has officially recognized the Joint Working Group with IAGA (Division V) on "Radar Observations of Meteor Flux, Radiants and Anomalies at the Base of the Thermosphere". The Secretary was asked to see that Division V is prepared to discuss the first of these items at the Grenoble Assembly and to determine from Division V and IAU if the second one has been accomplished.

Interdivisional Commission on History

This Commission is planning a rather extensive program for Grenoble. The internal organization of the Commission is fairly well accomplished. Reporters have been appointed for all basic topics that have been proposed.

Interdivisional Commission on Antarctic Research

The Chairman, T. Nagata, pointed out that the complete organization is given on p. 115 of the Transactions of the Kyoto Assembly.

Interdivisional Working Group on Relations between External and Internal Magnetic Variations

In view of the absence of any report from Chairman A. A. Ashour, the Secretary was asked to correspond with him to determine his plans for the Grenoble Assembly.

RELATIONS WITH OTHER ORGANIZATIONS

The following were recognized as representatives to other organizations in which IAGA has a primary interest:

COSPAR - - - - M. Nicolet - - - IUGG(IAGA) representative
SCAR - - - - T. Nagata - - - IUGG(IAGA) representative
SBARMO - - - - J.G. Roederer - IUGG(IAGA) representative
FAGS - - - - J. Veldkamp - - IUGG(IAGA) representative
SCOSTEP - - - J.G. Roederer - IUGG(IAGA) representative
IMS - Steering Committee - - J.G. Roederer(chairman) and G. Rostocker
SSC - - - - - M. Sugiura, chairman of ad hoc Advisory Group to the SSC

Dr. Roederer has been invited to report on the IMS at the SCAR meeting to be held in Jackson Hole, Wyoming, USA, in September 1974.

L.R. Alldredge is to write formal letters to COSPAR, URSI, and IAU inviting them to send official representatives to Grenoble.

The recent expansion of CODATA, with the apparent overlap of some of the task groups with other existing organizations, such as the World Data Centers, was noted. Members were urged to study the consequences of this expansion as they may relate to IAGA.

Many COSPAR resolutions, recommendations, and future meeting plans coming from the São Paulo 1974 meeting relate directly to IAGA. These will be published in IAGA News No. 13.

PUBLICATIONS

The Secretary noted the completion and distribution of IAGA Bulletin No. 35, the Transactions of the Kyoto Assembly. He also pointed out that the results of several of the Kyoto symposia have been or are being published as units in standard scientific journals. He also reviewed the inventory of publications in Paris and Tortosa and their rate of sales. The Executive Committee noted that the prices being charged for

some of the old publications are excessive and that the sales rate is low, and requested that the Secretary explore with Mr. Laclavere the possibilities of:

1. Greatly reducing our inventory by making a big reduction in prices charged for the old publications (in effect to have a sale).
2. Having an IAGA publications display in Grenoble where the reduction in prices are clearly shown with an agent present to take orders.
3. Selling IAGA publications in the USSR for roubles. This could build up a IAGA rouble fund in the USSR which could be used for IAGA expenses within the USSR, such as Aeroflot tickets for USSR-IAGA officers travelling to official meetings.
4. Advertizing in scientific journals, in the IAGA News and in the IUGG Chronicle.

MISCELLANEOUS ITEMS

The Geomagnetic Meridian Project under the chairmanship of A.N. Zaitzev plans to hold a meeting mainly on ground based observations in the USSR in 1976. This proposal will be considered further at the Grenoble Assembly.

President Troitskaya will appoint an IAGA official to attend the URSI meeting and represent IAGA in Lima, Peru, following our Grenoble Assembly in 1975.

O. Schneider will write to P. Melchior to make sure the item promoting an Interassociation Committee on Tidal Interactions is placed on the agenda for the IUGG Executive Meeting in Grenoble. The IAGA Executive Committee will give further help to him in this activity if needed.

At the end of the last session all members joined in thanking President Troitskaya and the Soviet Geophysical Committee for providing such a pleasant and interesting setting for this very profitable meeting.

PLANS FOR THE GRENOBLE ASSEMBLY

GENERAL COMMENTS

The next IUGG General Assembly, at which IAGA will have a full scientific and administrative program, will be held at Grenoble, France, 25 August - 6 September 1975.

The abstract deadline for papers is 20 February 1975. Originals, in the proper format, must be received by the General Secreaty and copies must be received by the appropriate conveners by that date.

A standard format will be required for all abstracts for the Grenoble assembly. It is understood that the format will be explained in the Second Circular for the assembly which has been printed but not widely distributed yet because of the mail strike in France. Attempts to get details of the abstract format for inclusion in this News have also failed because of the mail strike. If it can be obtained prior to mailing the News it will be included as an insert.

A few of the symposia discussed in subsequent papers call for abstract deadlines a little earlier than the 20 February 1975 date given above. Please watch carefully for these differences. Note for example that the deadline for the IS 24 symposium on "Tidal Interactions" is 31 December 1974.

In so far as possible, divisions should formulate resolutions before the assembly starts by correspondence. Each resolution must be submitted to the Resolutions Committee by a division chairman on behalf of his division. That is, resolutions submitted by working groups or national committees, etc., will no longer be considered. All resolutions must be submitted to the Resolutions Committee by noon of the Saturday of the first week of the assembly, in a format similar to those already published (see earlier Transactions of Assemblies or copies of IAGA News).

Resolutions that are not in reasonable conformance with these sample formats will be rejected.

Division Chairmen should try to provide both English and French translations of each resolution. For normal IAGA resolutions only the English is required. Resolutions published quickly in IAGA News may be only in English, but the final publication in the transactions of the meeting will contain both French and English. If the Commission intends that the resolution be elevated to an IUGG resolution the French translation as well as the English is required.

The only exception to the above deadline is for late resolutions which arise out of scientific items revealed at scientific sessions during the second week of the assembly. Such "emergency" resolutions to be adopted must have the unanimous support of the Division Leadership, the Resolution Committee, the Executive Committee and the Plenary Session.

Resolutions will be considered by the Resolutions Committee and the Executive Committee very quickly after they are received for proper format and duplication or conflicting ideas, so that the surviving resolutions can be duplicated and distributed to all delegates at least one day before the final Plenary Session.

At the final Plenary Session, each resolution will be voted on after a short time is allowed for discussion. The formal reading of the resolution can be dispensed with (except in possible "emergency" resolutions) since they will have been made available in writing ahead of time. During discussion only "minor" amendments will be admitted. "Major" "new" resolutions will not be allowed; except under the "emergency" procedure described above.

A program and abstract book will be published and will be available to participants at the Grenoble meeting.

The General Secretary has the responsibility of preparing a Transactions of the Assembly. It is obvious that he cannot do it alone. To obtain a worthwhile Transactions it is absolutely necessary for the Division Chairmen to assume a big responsibility in reporting to the General Secretary all newsworthy items under his jurisdiction. To accomplish this it is requested that Division Chairmen with the aid of his reporters and other special reporters he may select report to the General Secretary in writing before he leaves Grenoble the following information:

1. Results of all working group business meetings in his division.
2. Results of all division business meetings.
3. Scientific summaries giving the highlights of the division scientific meetings. These should include special symposia designated as coming under his area of responsibility.

SCHEDULE OF MEETINGS

The IAGA Program Committee with the help of Division Chairmen have designed a rather detailed schedule of meetings for IAGA at the assembly. This schedule is given below along with a description of the meaning of the short hand symbols used in an attempt to save space. This schedule has been tested quite thoroughly and should be considered as final. Any real hardship cases should be directed to Dr. G.M. Weill, who is chairman of the program committee.

U1	IUGG		Plenary Session
U2	Union		Special Lectures
U3	Official Welcome Reception		
A1	Association Plenary Session		
EX	IAGA Executive Committee		

	Room	First Sponsor	Number of Sessions	Title of Symposia	IAGA Convener (C) or Representative (R)
IS4	D1	IASPEI	2	Geophysical Phenomena Preceding, Accompanying and Following Earthquakes	F.D. Stacey (R)
IS6	D10	IAGA	2	Magnetic Properties of Basalts and their Relation to Magnetic Anomalies	J.M. Ade Hall (C)
IS7	A1	IAGA	2	Tectonomagnetism and Tectonoelectricity	T. Rikitake (C)
IS8	A022	GEOCH	3	Planetary Atmosphere Evolution	M.Y. Marov (R) and D.M. Hunter (R)
IS9	AW	IAGA	3	Processing and Interpretation of Geophysical Data	R. Langel (C)
IS10	AW	IASPEI	3	Mid-Ocean Ridges, Oceanic Trenches and Geodynamics	T. Atwater (R)
IS11	AW	IAGA	1	Ancient Plate Margins	J. Briden (C)
IS14	A2	IAVCEI	1	Deep Structure of Volcanoes	R.L. Wilson (R)
IS19	A1	IAMAP	4	GARP Second Objective: Climatic Change	J.C.G. Walker (R) (to be confirmed)
IS21	AW	IAMAP	2	Atmospheric Pollution	R.D. Hudson (R)
IS22	D2	IAMAP	3	Stratosphere Mesosphere Relations.	M. Ackerman (R)
IS23	A010	IAGA	3	Optical Sensing and Probing of the Atmosphere	G. Weill (C)
IS24	AW	IAGA	4	Tidal Interactions (including Earth Tides), (4th Session requested)	O. Schneider (C)
IS25	D1	IAGA	4	Global Effects of the Interplanetary Medium-Magnetosphere-Lower Atmosphere Interactions	W.O. Roberts (C)
IS31	A022	IAMAP	2	High Atmosphere and Space Problems in Atmospheric Electricity	F. Mozer (R)
SM1	C06	V	2	New Techniques of Magnetic and Electric Measurements in Geophysical Phenomena	W.F. Stuart (C)
SM2	B148	V	1	Airglow and Aurora Calibration	R. Pastiels (C)
SM3	C05	I	2	Chemical and Physical Problems in Paleomagnetic Field Intensity Determinations (Earth and Moon)	C.M. Carmichael (C)
SM4	C05	I	1	Fine Structure of Geomagnetic Reversal History	V. Bucha (C)
SM5	C05	I	2	Theory of Planetary Fields	S.I. Braginsky (C) and D. Winch (C)
SM6	C06	I	1	Recent Secular Change	B.R. Leaton (C)
SM7	C05	I	1	Fluctuations of the Field During Times of Constant Polarity	K.M. Creer (C)

	Room	First Sponsor	Number of Sessions	Title of Symposia	IAGA Convener (C) or Representative (R)
SM8	A022	II	2	Laboratory Experiments of Aeronomic Interest	H.I. Schiff (C) and D.C. Cartwright (C)
SM9	A022	II	2	Atmospheric Quantal Emissions	M.H. Rees (C) and J.C. Gerard (C)
SM10	B101	IAG	1	Relations Between Internal and External Magnetic Variations	A.A. Ashour (C)
SM11	C06	II, URSI III	2	Solar Fluxes and Photochemistry	L. Thomas (C)
SM12	A010	II, URSI, COSPAR	4	Transport Phenomena in the Thermosphere and Exosphere	H. Risbeth (C) A. Nagy (C) & M. Roemer(C)
SM13	B101	II	1	Ionospheric Irregularities, Middle and Low Latitudes	P.L. Dyson (C)
SM14	A022	II, III, URSI COSPAR	3	High Latitude Phenomena	B. Hultqvist (C)
SM15	A022	II, III, URSI IV	3*	Physics of the Plasmapause	T. Kaiser (C)
SM16	A022	III	3*	Plasma Instabilities in Magnetosphere	R. Thorne (C)
SM17	A010	III	2	Division III Reporter Review Session	C.G. Falthämmar (C)
SM18	A2	IV, III, COSPAR	4	Solar Wind Interaction with Bodies Other than the Earth	K. Schindler (C)
SM19	B101	ICAR	2	Substorm Observations in Antarctica with Special Emphasis on Unmanned Observatories	T. Nagata (C)
SM20	B101	ICH	2	History of Geomagnetism and Aeronomy	E.J. Chernosky (C)
SM21	C05	IV	2	Division IV Reporter Review Session	J. Geiss (C)
SM22	C06	IV	2	Interplanetary Medium Between 0.3 and 5 A.U. and Beyond	P. Hedgecock (C) and L.F. Burlaga (C)
SM23	A022	II	1*	Ionospheric Irregularities, Auroral Zone and High Latitudes	R.S. Unwin (C)
W1	A010	II, III, IV, V	4	IMS Workshop	J.G. Roederer (C)
W2	A010	II, V, URSI, III	1	Workshop "International Cooperative Tidal Experiment"	J.E. Salah (C) and R. Roper (C)
BM1	C05		1	Business Meeting Division I	J.C. Cain (C)
BMII	C05		1	Business Meeting Division II	B. A. Tinsley (C)
BMIII	C05		1	Business Meeting Division III	C.G. Falthämmar (C)
BMIV	A010		1	Business Meeting Division IV	J. Geiss (C)
BMV	C05		1	Business Meeting Division V	P.H. Serson (C)
JWG1	B148	II, URSI III	1	Joint Working Group IAGA/URSI Structure and Dynamics of Thermosphere, Ionosphere and Exosphere	
JWG2	B148	II, URSI III	1	Joint Working Group IAGA/URSI Neutral and Ion Chemistry and Solar Fluxes	

* One Joint Session

	Room	First Sponsor	Number of Sessions	Title of Symposia	IAGA Convener (C) or Representative (R)
JW3	B148	II, URSI III	1	Joint Working Group IAGA/URSI Stratosphere, Mesosphere, Ionosphere Interactions	
DWG	B354 C010 C011 C012			Division Working Group	

CODES (Roman numerals refer to IAGA Divisions)

A	Association Plenary Session (IAGA)	ICH	Interdivisional Commission on History
BM	Business Meeting (IAGA Divisions)	IS	Interdisciplinary Symposia (IUGG)
DWG	Division Working Groups	IWG	Interdivisional Working Group
EX	Executive Committee	SM	Scientific Meetings
JWG	Joint Working Group (IAGA/URSI)	U	Union Activity
ICAR	Interdivisional Commission on Antarctic Research	W	Workshop

GRENOBLE IAGA PROGRAMME 1975

as per September 20, 1974

	MONDAY Aug. 25	TUESDAY Aug. 26	WEDNESDAY Aug. 27	THURSDAY Aug. 28	FRIDAY Aug. 29	SATURDAY Aug. 30
MORNING		U2		U2		U2
			IS22			
		IS22		IS14		IS6
			SM5		SM2	
		SM1		IS23	SM4 + BMI	IS24
	U1				SM12	
		SM3		IS24		IS31
			SM14		SM15	
		SM17		SM11	SM22	SM12
			DWGV5,6,11	SM14		
		SM19		SM21		SM18
LUNCH						
AFTERNOON		IS22	IS23	IS23	IS6	IS24
		SM1	SM5	IS24	SM12	IS31
		SM3	SM11	SM6	SM15 + 16	SM7
	A1		SM13			
		SM17	SM14	SM15	SM22	SM12
		SM19	SM20	SM20	BMV	SM18
				SM21+BMIV		
EVENING	DWGV 1,2,10	JWG1	JWG2	JWG3	BMII	
		DWGV3,4	DWGV7	BMIII		
		DWG1,2,3,		DWGV9		
				DWG15,6		

Footnote No. 1. An IUGG Social Event is tentatively planned for the evening of 28 August. If this is confirmed the IAGA evening programs shown for the 28th and 29th will be shifted forward by one day except for BMII which will remain on Friday evening and JWG3 which will be moved to noon on Thursday the 28th.

	MONDAY Sept. 1	TUESDAY Sept. 2	WEDNESDAY Sept. 3	THURSDAY Sept. 4	FRIDAY Sept. 5	SATURDAY Sept. 6
MORNING	U2		U2			
		IS4		IS11	IS7	
	IS8		IS10			
		IS8		IS25	IS21	
	IS9		IS25			U1
	SM16 + 23	IS9		SM8	IS25	
	IS19		SM9			
		IS19				
	SM18		SM10			
		WI	WI			
			WI			
LUNCH	EX					
AFTERNOON	IS8	IS4	IS10		IS7	
	IS9	IS10	IS25		IS21	
	IS19	IS19	SM8	AI		
	SM16	SM9	WI			
	SM18	W1				
EVENING	DWGI 1a		EX	EX		
	W2					

Footnote No. 2. Normally the morning sessions will be from 9:00a.m. to 12:00 noon, afternoon sessions from 2:00p.m. to 5:00p.m., and evening sessions from 5:30p.m. to 7:00p.m. These may, however, vary somewhat to a accommodate the special IUGG talks U2 and to accommodate the inter-disciplinary symposia if other Associations have different hours.

DESCRIPTION OF SYMPOSIA, SCIENTIFIC MEETINGS AND WORKSHOPS

Information has been received from most conveners of scientific sessions for which IAGA is responsible. In a few instances for symposia IAGA is cosponsoring but not convening no information is yet available. In such cases interested scientists should correspond with the IAGA representatives. Addresses can be found in the back of this News. Acceptance or rejection of contributed papers (where they are invited) is of course left up to the convener and program committee of each event.

IS 4 - Geophysical Phenomena Preceding, Accompanying and Following Earthquakes.

IASPEI - First sponsor (with IAGA, IAG, & IAVCEI)

F.D. Stacey, IAGA representative

IS 6 - Magnetic Properties of Basalts and Their Relation to Magnetic Anomalies

IAGA - First sponsor (with IAVCEI)

J.M. Ade-Hall, convener

Each session will consist of an introductory review paper followed by a series of shorter submitted papers.

During 1974 two legs of the Deep Sea Drilling Project had oceanic basement drilling as prime objectives. These legs, in the Pacific and the Atlantic, have shown that basaltic Layer 2 of the oceanic crust is more complex lithologically and magnetically than was previously assumed. While this discoverey will hardly surprise the volcanologist and paleomagnetist used to working in subaerial volcanic complexes, it does raise the important question of the compatibility of Layer 2 as observed, and the frequently clear two dimensional magnetic anomaly patterns measured by surface ships. For example, we must consider what the effect will be on the associated magnetic anomaly patterns of superimposed Normal and Reverse polarity zones in Layer 2, as found near to the ridge crest in the Atlantic.

Nearly a kilometer of oceanic basement volcanic rock has been recovered during the Deep Sea Drilling Project, and large collections of dredgehaul material exist at many institutions. With the first phase of the International Program of Ocean Drilling assigned to further basement studies it is timely to consider the collected paleomagnetic, rock magnetic and magnetic survey data in order to focus on major outstanding problems. The symposium will bring together people involved in tracing the anomaly patterns and laboratory workers in the field of the magnetic properties of oceanic basement rocks. It is hoped that geochemists and crustal geophysicists will also attend to put realistic restraints on new models of the sources of the magnetic anomaly patters.

Participant are invited to submit abstracts of papers to J.M. Ade-Hall, Department of Geology, Dalhousie University, Halifax, Nova Scotia, Canada. Each paper will be assigned a 10 minute interval, followed by 5 minutes for discussion. An informal discussion meeting will be arranged for the evening of Friday, August 29th.

IS 7 - Symposium on Tectonomagnetism and Tectonoelectricity (Sym. 7)

IAGA - First sponsor (with IASPEI & IAG)

T. Rikitake, convener

M.J.S. Johnston, co-covener

This is a 2 half-day symposium on topics on magnetism and electricity related to tectonic processes within the earth; i.e. piezomagnetism, seismomagnetic effect, secular change of local anomaly, stress-induced change in electric resistivity, etc.

Several invited papers will be presented. In addition to these, a number of contributed papers can be accepted. The time for presentation is expected to be 10-15 minutes for the latter papers.

The abstracts will be reviewed by the convener and co-covener with consultation with specialists in the field. Acceptance will be notified some time later.

A symposium on "Geophysical phenomena preceding, accompanying and following earthquakes" (Sym. 4) will be closely related with Sym. 7. Because of limited time, however, it is anticipated that most of electric and magnetic papers will come to Sym. 7. In view of current interest in earthquake prediction study, papers on precursory and coseismic phenomena will be highly welcomed.

IS 8 - Planetary Atmosphere Evolution

Geochemistry - First sponsor (with IAGA, IASPEI, IAMAP & IAVCEI)

E. Martell, convenor

M.V. Marov and D.M. Hunten, IAGA representatives

IS 9 - Processing and Interpretation of Geophysical Data

IAGA - First sponsor (all Associations are participating)

R.A. Langel, convener

The tentative symposium organization is in three sessions:

1. Assimilation/compression, quality evaluation, and representation or display of large amounts of data. (Emphasis on computer techniques.)
2. Techniques of spectral analysis, filtering/smoothing, and correlation.
3. Data inversion. Application of mathematical/computer techniques to physical problems.

Authors should indicate for which session their paper is intended. Papers may utilize specific data sets but must emphasize the reduction/analysis techniques. It is to be emphasized that papers should deal with real and noisy data.

For work dealing with radio signals and certain aspects of nonstationary signal analysis authors should consider the Symposium on "Nonstationary Signal Analysis" to be held at the URSI General Assembly, 11-19 August 1975, in Lima, Peru.

IS 10 - Mid-Ocean Ridges, Oceanic Trenches and Geodynamics

IASPEI - First sponsor (with IAGA & IAVCEI)

S. Uyeda, convener

T. Atwater, IAGA representative

IS 11 - Anciet Plate Margins

IAGA - First sponsor (with IASPEI & IAVCEI)

J.C. Briden, convenor

The characteristics of existing plate margins and their evolution will be reviewed as necessary to complement IS 10 listed above to form a basis for exploring the older geological record.

Discussion may extend over the whole range of geological and geophysical evidence for identifying ancient plate margins, and may assess whether examples of former constructive, conservative and consuming margins exist. Structural aspects and paleomagnetic evidence will relate to identification and possible modes of evolution of margins. Possible kinematic constraints on plate motion, and causes of plate break-up and movement could be debated.

The symposium will consist of only one half-day session, Thursday afternoon, September 4th.

There will be an invited introduction plus short contributions (no more than 20 minutes including discussion). The program committee will notify authors direct of the acceptance, or other course, of contributed abstracts.

IS 14 - Deep Structure of Volcanoes

IAVCEI - First sponsor (with IASPEI & IAGA)

D. Shimozuru, convener

R.L. Wilson, IAGA representative

Magnetic measurements may be used to examine the structure of volcanoes in several ways. Aeromagnetic and marine magnetic maps have frequently been used to indicate the

existence of plugs beneath volcanic piles with complex natural magnetizations (Malahoff 1969). Transient and longer-term magnetic changes have been associated with volcanic activity (Johnson and Stacey, 1969a; 1969b, Yokoyama 1969). Natural secular variation patterns are thought to be associated with certain types of deep-seated volcanic activity in Kamchatka (Pudovkin and Tanichev 1972). Artifically generated source fields have been used to investigate the conductivity (and hence temperature) structure beneath Kilauea volcano, Hawaii (Jackson and Keller, 1972). One might also consider earth-current observations at the surface of the pile to be within the scope of this symposium, in which we hope to bring together the most recent results from these and any other relevant techniques.

References

Jackson, D.B., and Keller, G.V., An electromagnetic sounding survey of the summit of Kilauea volcano, Hawaii. J.Geophy. Res., 77, 26, pp 4957-65, 1972.

Johnson, M.J.S., and Stacey, F.D., Transient magnetic anomalies accompanying volcanic eruptions in New Zealand. Nature, 224, pp 1289-1290, 1969a.

Johnson, M.J.S., and Stacey, F.D., Volcano-magnetic effect observed on Mt. Ruapehu, New Zealand, J. Geophys. Res., 74, pp 6541-6544, 1969b.

Malahoff, Alexander, Magnetic studies over volcanoes, in the earth's crust and upper mantle. Amer. Geophys. Union. Geophys. Mon. 13, pp 436-446, 1969.

Pudovkin, I. M., and Tanichev, A.A., Anomalies of secular geomagnetic field variations on Kamchatka in 1965-1967. Geomag. and Aeron. (USA) 12, p 273-6, 1972; (USSR) 12, 2, p 311-15, 1972.

Yokoyama, Izumi. Anomalous changes in geomagnetic field on Oosima Volcano related with its activities in the decade of 1950. J. Physics Earth, 17, pp 69-76, 1969.

IS 19 - GARP Second Objective: Climate Change

IAMAP - First sponsor (with IAPSO, IAGA & IAHS)

B.R. Bohn, convener

J.C.G. Walker, IAGA representative

IS 21 - Atmospheric Pollution

IAMAP - First sponsor (with IAPSO & IAGA)

C.E. JUNGE, convener

R. Hudson, IAGA representative

IS 22 - Stratosphere Mesosphere Relations

IAMAP - First sponsor (with IAGA)

J.B. Gregory, convener

M. Ackerman, IAGA representative

Contributions are solicited, but the number that can be accepted is limited. Abstracts should be sent to Dr. A.D. Belmont, Research Division, Control Data Corp., P. O. Box 1249, Minneapolis, Minnesota 55440, USA. and must be submitted to Dr. Belmont by January 15, 1975.

The folowing topics will be covered:

Topic 1. Observations of physical structure and circulation, including variations of temperature and winds.

Topic 2. Observations and simple models of chemical and ionic composition.

Topic 3. Dynamical models, including those incorporating dynamical-chemical, ionic linkages and interations between stratosphere and mesosphere

IS 23 - Optical Sensing and Probing of the Atmosphere

IAGA - First sponsor (with IAMAP)

G.M. Weill, convener

IS 24 - Tidal Interactions (including Earth Tides)

IAGA - First Sponsor (all Associations are participating)

O. Schneider, convener

Scope: Stress will be laid on the interdisciplinary character of the Grenoble Symposia. Contributions bearing merely on some unidisciplinary aspect or tidal phenomenon will be included only if they can be expected to have a stimulating effect on tidal studies in neighboring areas or interdisciplinary work. As will become clear from the tentative list of topics given below. The concept of "tides", though always supposed of gravitational origin, is taken here as also including phenomena affected by other periodically varying solar and lunar causes (e.g. thermal and ionizing solar radiation in atmospheric, ionospheric and geomagnetic tides). By "interaction", in turn, we understand true tide-tide interactions (as is the case with ocean tides interacting with geomagnetic tides, or earth tides with atmospheric tides), as well as one-sided tidal effects on general geophysical processes, e.g. the earth's rotation.

Type of contributions:

1. Invited papers (35 minutes duration, plus 10 minutes for discussion).
2. A limited number of contributed communications (15 minutes, plus 5 minutes for discussion).

Tentative list of topics (not in order of preference):

1. Electrical and magnetic tidal effects in the atmosphere, the ocean, and the solid earth (including geomagnetic tides; ocean and solid earth effects on geomagnetic tides; dynamo effects in general).
2. Tides in the Earth's far environment (magnetosphere; ring current).
3. Transfer and dissipation of energy; tidal friction in the earth's body, surface waters, and atmosphere.
4. Tidal interaction inthe solar system.
5. Tidal potential.
6. Effect of earth, air and ocean tides on satellite orbits.
7. (Cancelled; incorporated in 9).
8. Tidal control or triggering of events in the atmosphere, hydrosphere and lithosphere (including underground waters, geysers, volcanic

events, glacier calving, earthquakes and others).

9. Tidal interaction between the solid earth, hydropshere and atmosphere, including loading effects.
10. Atmospheric tides, a common ground between Meteorology and Aeronomy.
11. Numerical models for the global ocean tides.
12. Open sea tidal measuring techniques and philosophy of their deployment.
13. Dynamic effect of the liquid core on tides and nutations.
14. Methods of analysis and data processing (bearing of signal-to-noise ratio on global planning of tide research in the different branches of Geophysics and Geodesy).

Screening: Association representatives will participate in the screening of contributed communications. To this end, proposed titles along with a draft abstract should be submitted to one of the following colleagues, with a simultaneous copy to the convener. (For addresses see below.)

Referee:		D.E. Cartwright	J.T. Kuo	R. Lecolazet	R.S. Lindzen	O. Schneider
Representing:		IAPSO	IASPEI	IAG	IAMAP	IAGA
Topics:	1					x
	2					x
	3	x	x	x	x	
	4			x		
	5	x		x		
	6			x		
	8		x		x	x
	9	x	x	x	x	
	10				x	
	11	x				
	12	x				
	13		x	x		
	14	x	x	x	x	x
	15					x

Appointment of IAHS and IAVCEI representatives is pending; in the meantime, for subjects associated with these two disciplines, contact the convenor.

Deadlines

i) Invited papers: Prospective invited speakers are kindly requested to communicate there acceptance (with title), or else, when first contacted.

ii) Titles and draft abstracts of contributed communications: Should be in the hands of the referee not later than December 31, 1974 (with copy to the convenor); earlier presentation will facilitate the planning.

iii) Final abstracts of both invited and contributed papers: Must be in the hands of the convenor before February 20, 1975. (The original of the abstract must go to the IAGA General Secretary before this date).

Referee's and Convenor's addresses:

Dr. David E. Cartwright, Instituto of Oceanographic Sciences, Bidston Observatory, Birkenhead, Cheshire L43 7RA, Great Britain.

Dr. John T. Kuo, Professor of Mining (Geophysics) Columbia University in the City of New York, Henry Krumb School of Mines, Seeley W. Mudd Building, New York, N.Y. 10027, USA.

M.le Professeur R. Lecolazet, Institut de Physicque du Globe, 5, rue René Descartes, 67084 Strasbourg Cedex, France.

Professor Richard S. Lindzen, Division of Engineering and Applied Physics, Pierce Hall, Harvard University, Cambridge, Massachusetts 02138, USA.

Dr. Otto Schneider, Profesor de Geomagnetismo, Observatorio Astronómico, Paseo del Bosque, La Plata, Argentina.

IS 25 - Global Effects of the Interplanetary Medium - Magnetosphere-Lower Atmosphere Interactions

IAGA - First sponsor (with IAMAP, IAU & COSPAR)

W.O. Roberts, convener

For the two days planned for this program, twelve review papers are to be prepared concerning mechanisms, critical tests, and observations. Approximately twenty contributed papers are solicited from the scientific community to complete this symposium.

The symposium topic is to include (but not be limited to) such subjects as: 1) The influence of variable solar activity upon weather and climate; 2) contribution of solar activity to ozonospheric heating; 3) the 22-yr solar magnetic cycle effects in the upper atmosphere; 4) the

solar sector effects seen at the earth's surface, and 5) the influence of solar activity upon atmospheric electricity.

Abstracts must be relevant to the topic and contain sufficient detail to permit an evaluation of the importance of the contribution so that an appropriate delivery time (5 to 20 min.) may be assigned by the session chairmen.

As in the past the author is expected to comply with his own country's National Committee regulations for submission of the paper. For authors within the U. S. we will transmit the collected papers to the U. S. National Committee for approval. We will arrange for the submission of the approved special symposium group of papers to the IAGA General Secretary.

If you wish to contribute a paper, mail the original to the General Secretary and three copies of the abstract to W.H. Campbell by 20 February 1975. Please include a note identifying the sender, the symposium to which the paper is submitted, and any special slide projection requirements.

We look forward to your participation in this program. Please contact one of us for further details, if you have any questions regarding the symposium.

W.H. Campbell, U.S. Geological Survey, c/o ERL/NOAA, Boulder, Colorado 80302, USA.

W.O. Roberts, University Corporation for Atmospheric Research, P.O. Box 3000, Boulder, Colorado 80303, USA.

S. Matsushita, High Altitude Observatory of NCAR, Boulder, Colorado 80303, USA.

E.R. Mustel, Astronomical Council, USSR Academy of Sciences, Vavilova Street 34, Moscow V312, USSR.

J.M. Wilcox, Institute for Plasma Research, Stanford University, Stanford, California 94305, USA.

J.W. King, Appleton Laboratory, Ditton Park, Slough SL3 9JX, England

Ralph Shapiro, Air Force Cambridge Laboratory, L.C. Hanscomb Field, Bedford, Massachusetts 01730, USA.

IS 31 - High Atmosphere and Space Problems in Atmospheric Electricity

IAMAP - First sponsor (with IAGA)

H. Dolezalek, convener

F. Mozer, IAGA representative.

There will be no invited papers. Contributed papers are called for covering the following topics:

(A) Magnetosphere-ionosphere-troposphere electric coupling - including SQ, L, Sq^p, DP1, DP2, dynamo effects and their consequences for the lower atmosphere; mapping of electric field up and down; other influences from tropospheric processes to the higher layers.

(B) Solar-terrestrial relationships using or acting on atmospheric electric parameters.

(C) Global electric circuits in general and under special consideration of distribution of ionospheric potential; parameters of sources and sinks; total resistance of the whole atmosphere; extension of global circuits.

(D) Electric processes in the atmospheres of moons and other planets.

(E) VLF, SLF, ULF, ELF (up to 40 kHz) sources in atmospehre and space, especially considering penetration from one domain into the other.

(F) Ions - composition, distribution-, mobility, conductivity; especially comparisons and relations of the situations in mesosphere, stratosphere and troposphere.

The original of the abstract should be sent by 20 February 1975 to Dr. Warren L. Godson, Secretary, IAMAP, Atmospheric Environment Service, 4905 Dufferin Street, Downsview, Ontario, M3H, 5T4, Canada, and one copy is to be mailed at the same time to International Commission on Atmospheric Electricity, 1812 Drury Lane, Alexandria, Virginia 22307 USA.

The decision on acceptance or rejection will be made before the end of March and the authors will be notified immediately thereafter.

SM 1 - New Techniques of Magnetic and Electric Measurements

Division V - Sponsor

W.F. Stuart, convener

It is intended that the session will provide a forum for instrumentalists in all branches of geophysics to exchange information about recent developments in measuring techniques and technology. One session will be allocated to magnetic and one to electric measurements. It is hoped that each session will include invited and contributed papers and that time will be available for discussion.

Contributions will be welcomed from all aspects of electric and magnetic field measurements, including: Sensing methods, New applications of established instruments; Ground instrumentation; Marine instrumentation; Satellite measurements; Data retrieval systems; State of the art of instrument design, with special reference to low power consumption.

The emphasis of the Scientific Session is on the technical aspects of the subject however it is important that the geophysical applicability of any development should be made clear.

Any suggestions for reviews of special interest, particularly in electric field measurements, would be welcomed. These should be made to Dr. Stuart as early as possible.

SM 2 - Airglow and Aurora Calibration

Divison V - Sponsor

R. Pastiels, convener

G.G. Shepherd, program committee member

Only one session has been allocated to the meeting.

Invited papers will be given and contributed papers are requested.

Titles and abstracts of contributed papers should be mailed to reach the address of R. Pastiels not later than 1 February 1975. Immediately after examination, notification is done of acceptance or

rejection, directly to the author.

Papers will be of reasonable length, a few pages, for expected publication.

This scientific session is intented to cover the description and analysis of the actual state in absolute calibration of photometers, spectrophotometers, imaging devices, lidars, used for all airglow and aurora measurements. From the analysis, a procedure which could result in a complete intercalibration of all airglow and aurora standard sources in observatories, shall be proposed and debated.

SM 3 - Chemical and Physical Problems in Paleomagnetism

Division I - Sponsor

C.M. Carmichael, convener

The sympsoium will concentrate on the physical and chemical changes that take place in rocks during paleomagnetic intensity determination procedures. These changes make measurements of ancient field intensity much more difficult than measurements of field direction. It is hoped that out of the symposium will come a better understanding of how the changes can be detected if they occur, how their effects can be minimized and how valid and comparable measures of intensity can be obtained by different methods using different rock types.

While the symposium will concentrate on measuring procedures, measurements of the intensity of the earth's field and also of that of the moon and meteorites will form an important part. It is hoped that the symposium will produce the best available history of magnetic field intensity that is possible at the present time. This should make an important contribution to studies of the development of the earth's core and perhaps of fields in interplanetary space in the past. Publication of the proceedings of the conference is planned. Those wishing to contribute papers to the symposium should contact Dr. Carmichael at the Geophysics Department, University of Western Ontario, London, Canada.

Contributions in the USSR and eastern countries may send copies of their abstracts to Madam G. Petrova (original to the IAGA General Secretary).

It is estimated that the length of contributed papers will be 15 to 20 minutes depending on the number of contributers. Notification of acceptance or rejection will be sent to each contributor by the convener.

SM 4 - Fine Structure of Geomagnetic Reversal History

Division I - Sponsor

V. Bucha, convener

SM 5 - Theory of Planetary Fields

Division I - Sponsor

S.I. Braginsky and D. Winch, conveners (For description see p. 74.)

SM 6 - Recent Secular Change

Division I - Sponsor

B.R. Leaton, convener

Contributions to this meeting are welcome. Fifteen minutes will be allocated to each accepted speaker. The convener will directly notify contributors of acceptance or rejection.

The main topics to be considered are: Secular change in historic times, Westerly drift, Indications of core motions and dynamo action, Length of day variations, Short wavelength anomaly changes, Regional changes, Short Period fluctions and their tectonic implications.

SM 7 - Fluctuations of the Field During Times of Constant Polarity

Division I - Sponsor

K.M. Creer, convener

Contributed papers will be considered in addition to invited contributions.

Papers should be planned to be read in 15 minutes and authors prepared to present additional information during discussion in response to questions.

Contributors will be notified of acceptance or rejection within one month of closing date for submission.

Areas to be covered:

(i) Observations and analysis of palaeosecular variations of field direction during glacial and post-glacial time at particular geographic regions.

(ii) Observations of field direction during intervals of instability of the main dipole and consideration of whether such events can be regarded as unsuccessful attempts at polarity reversal.

(iii) Investigations of possibility of developing studies of cyclic variations of the field as a method of dating.

(iv) Correlation of magnetic observations with stratigraphy, palaeoclimates, pollen diagrams, radiocarbon measurements.

(v) Studies of detailed variations of field over similarly short time intervals (less than 10^5 yr.) observed in preglacial deposits.

(vi) Detailed observations of the reversal process as deduced from proven reversals.

SM 8 - Laboratory Experiments of Aeronomic Interest

Division II - Sponsor

H.I. Shift and D.C. Cartwright, conveners

It is intended that this symposium will consist of both invited and contributed papers. Although not yet finalized, it is hoped that there will be three invited talks dealing with the following subjects:

1. Electron impact excitation of electronic states (N_2, O_2, CO_2, N_2O, etc.)
2. Dissociative excitation by electron impact (production of N, O, etc.)
3. Electron-Impact processes involving negative ions.

Ten minutes will be allowed for the presentation of each contributed paper and as many contributed papers will be accepted as the session time allows. A copy of the abstract and a summary of the paper's content should be sent by February 20, 1975 to David C. Cartwright, T-Division (Mail Stop 228), P.O. Box 1663, Los Alamos, New Mexico 87544. Notification of acceptance or rejection of each contributed paper will be made by mail. The information discussed in this symposium will be related to subjects covered in the symposia on Atmospheric Quantal Emissions, Optical Sensing and Probing, and Neutral and Ion Chemistry.

SM 9 - Atmospheric Quantal Emissions

Division II - Sponsor

M.H. Rees and J.C. Gerard, conveners

This scientific meeting will focus on airglow and auroral radiations that have been studied only recently, owing to the development of sensitive detectors with adequate resolution. For example, the aeronomy of nitric oxide still remains an outstanding problem, and the auroral O_2 $^1\Delta_g$ radiation is a controversial subject. Ultra-violet radiations in the airglow and the aurora account for an appreciable fraction of the nocturnal energy budget and ionization. U.V. radiations provide the most promising source of information on these topics. Weak allowed lines of atomic oxygen and nitrogen are proving to be useful sources for studying excitation mechanisms in the airglow and aurora. Other symposia and scientific sessions will cover related topics: The Symposium on High Latitude Phenomena, Optical Sensing and Probing of the Atmosphere, Solar Fluxes and Photochemistry, Thermospheric Transport, and Laboratory Experiments of Aeronomic Interest.

There will be several invited papers of about 30 to 40 minutes duration, and as many contributed papers as time will permit during the two sessions devoted to the topic. The contributed papers will be about 15 minutes duration. Duplicate abstracts should be sent to the General Secretary and to the conveners of the session, M.H. Rees and J.C. Gerard at the Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Colorado 80302, USA, by 20 February 1975. Notifications of acceptance of contributed papers will be sent by the conveners of the session by 15 March 1975.

SM 10 - Relations Between Internal and External Magnetic Variations

Interdivisional Working Group on Relations between Internal and External Magnetic Variations - Sponsor

A.A. Ashour, convener

SM 11 - Solar Fluxes and Photochemistry

Division II and URSI Commission III - Cosponors

L. Thomas, convener

It will take place on the afternoon of 27 August and the morning of 28 August.

In addition to reviews and other invited papers, contributed papers

will be considered.

Copies of abstracts should be sent by 6 January 1975 to the convener of the symposium, Dr. L. Thomas, S.R.C. Appleton Laboratory, Ditton Park, Slough SL3 9JX, Berks, England.

The contributed papers will be allocated 15 minutes, this including time for questions and discussion.

Those people who have submitted contributed papers will be notified of their acceptance or rejection by the Convener of the symposium on behalf of the Programme Committee.

The symposium is to cover direct measurements of solar fluxes at wavelengths less than about 3000 Å; the aeronomical implications of these measurements; estimates of solar fluxes from aeronomical studies; photochemical models of the neutral and ionized atmosphere at heights above about 10 km; the results of recent measurements of atmospheric constituents and ion composition. Papers on laboratory measurements, atmospheric emmissions, and other related areas will be included in other special symposia to be held as part of the Assembly.

SM 12 - Transport Phenomena in the Thermosphere and Exosphere

Division II, URSI, and COSPAR - Sponsors

H. Rishbeth, A. Nagy and M. Roemer, conveners

A limited number of short contributed papers (10 minutes or less) will be accepted. Notification of acceptance or rejection will be sent by mail, before 15 April 1975

SM 13 - Ionospheric Irregularities, Middle and Low Latitudes

Division II - Sponsor

P.L. Dyson, convener

Contributed papers as well as invited papers will be considered.

Papers should be 15 minutes in length.

Convener will notify authors of acceptance or rejection of papers by approximately the end of March 1975.

Areas to be covered are the equatorial electrojet, sporadic E, F region irregularities including spread F.

SM 14 - High Latitude Phenomena

Divisions II and III, URSI and COSPAR - Sponsors

B. Hultqvist, convener

The three half-day sessions on High Latitude phenomena at the Grenoble General Assembly on August 27 and 28, 1975 will deal with two different sets of subjects. The forenoon and afternoon sessions on August 27 will be devoted to "Birkeland Currents and Magnetic Field Aligned Electric Fields". The half-day session on the 28th will be on "Satellite Auroral Photography". The sessions on "Birkeland Currents and Magnetic Field Aligned Electric Fields"are dedicated to the late J. Armstrong and A.J. Zmuda.

All sessions will contain both invited and contributed papers. Contributed papers will in general be given 20 minutes for preparation but exceptions may be accepted. All those who submit abstracts will be notified about acceptance or rejection before the end of May 1975.

SM 15 - Physics of the Plasmapause

Divisions II, III, & IV, and URSI Commission IV - Cosponsors

T. Kaiser, convener

Of the three sessions proposed, one will be held jointly with the Symposium on Plasma Instabilities in Magnetospheres (Convener: R.M. Thorne). In addition to invited papers, short contributions will be accepted. Abstract should be sent to the General Secretary of IAGA by February 20, 1975, with a copy to the convener. The program will cover aspects of the magnetosphere and ionosphere related to the plasmapause. It is anticipated that these will include Magnetospheric Electric Particles and Waves, Ground-based, Rocket and Satellite Experiments, Theoretical Studies, Future Experimental Programs (especially in relation to the IMS). Authors will receive notification directly from the convenor as to acceptance or their contribution with an indication of the time available for presentation. The convener will welcome any suggestions for additional topics.

SM 16 - Plasma Instabilities in Magnetosphere

Division III - Sponsor

R.M. Thorne, convener

The Symposium will last for three one half day sessions. One session will be held jointly with the final session on the "Physics of the Plasmapause". Topics will include the mechanisms leading to the formation of detached plasma regions and wave-particle interactions in such regions and at the plasmapause. A second session held jointly with Division II, Symposium on "Ionospheric Irregularities at High Latitudes" will include such topics as electrojet instabilities, F region and topside irregularities, auroral structures and anomalous resistivity. The final session will cover instabilities in the Jovian radiation belts and fundamental instabilities relevant to the Earth's magnetosphere which have not been included above.

Presentation time will be equally divided between invited reviews (30 min.) and brief invited/contributed research papers (10-15 min.).

Notification of acceptance of contributed papers only will be sent by March 30, 1975.

SM 17 - Division III Reporter Review Session

Division III - Sponsor

C.-G. Falthämmar, convener

Reporter sessions will consist of oral presentations by each of the nine reporters highlighting developments in their fields of responsibility since the last IAGA meeting.

SM 18 - Solar Wind Interaction with Bodies other than the Earth

Divisions III and IV, and COSPAR - Cosponsors

K. Schindler, convener

This meeting will include both invited and contributed papers. The list of invited speakers is almost complete.

About 30 minutes will be allocated to invited papers and 10-15 minutes to contributed papers.

The convener together with a board made up of Drs. J. Geiss, N. Ness, and K.I, Gringaus will make decisions regarding the acceptance or rejection of contributed papers.

Emphasis will be placed on the interaction between the body considered and the solar wind. Papers that predominantly deal with solar wind structures should be given elsewhere (e.g. at the Varna meeting "Study of travelling interplanetary phenomena: , convened by Dr. Dryer). Equally, papers that stress particular planetary aspects for which the solar wind is not essential should be reserved for a planetary session. Solar-terrestrial effects of course are exluded as belonging to the appropriate session of Division III. Comets are included.

SM 19 - Substorm Observations in Antarctica with Special Emphasis on Unmanned Observatories

Interdivisional Commission on Antarctic Research - Sponsor

T. Nagata, convener

This meeting on Antarctic Research has two half day sessions, particularly on "unmanned observatories". One session will be entirely devoted to the presentation of invited papers, but the other session is open to contributing papers on relevant topics.

A copy of invited and contributed papers must be sent to the convener: Prof. Takesi Nagata, National Institute of Polar Research, 9-10, Kaga, 1-chome Itabashi-ku, Tokyo, 173, Japan.

All invited papers will be published in a volume of the Proceedings of this session. Therefore, the authors of very long papers may be requested to reduce their length for the publication.

The convener will notify the contributing paper submitters whether or not their papers are accepted.

Coverage of the subject.

(a) Ground-based unmanned observatories

(b) Telemetric receiving observatories in Antarctica for Satellite measurement data.

(c) Synthetic studies on substorm phenomena obtained by combining satellite data and ground-based, balloon and rocket data in Antarctica.

List of invited papers

Item (a) W.J. Heikkila (USA), D.L. Carpenter (USA), a Soviet scientist

(invited through USSR Academy of Science).

tem (b) R. Gendrin (France), a Soviet scientist (invited through USSR Academy of Science).

tem (c) R. Gendrin (or some French Scientist), T. Nagata (Japan)

M 20 - History of Geomagnetism and Aeronomy

Interdivisional Commission on History - Sponsor

E.J. Chernosky, convener

A provisional list of papers as provided by G. Fanselau, chairman f the working group on the European-African area is given below:

. S.R. Malin, "Measurements of the geomagnetic field direction in London" (since c 1576 to the present). In this paper the
.5213 author is more concerned with the observers, including e.g. Hooke, Halley, Cavendish, etc., than their data.

. A.M. van Wijk, "History of Geomagnetism in South Africa".

. R.W. Vice, "History of Ionospheric Research in South Africa".

Remarks to 2. and 3.: The two authors have already given papers to IAGA Commission IX at the Helsinki IUGG Assembly 1960. The papers for Grenoble are the continuation to the present and are joint to the Helsinki papers.

. G.N. Petrova, "The development of Paleomagnetism and rock magnetism in the USSR".

. J. Bouska, P. Ochabová, "History of Geomagnetism in the CSSR".

. At the end of this year will be published a special issue of the "Journal of Atmospheric and Terrestrial Physics"on the occasion of the 50th Anniversary of the discovery of the ionosphere
94035 by Appleton. This issue will contain contributions of different authors, e.g. by W. Dieminger, "Ionospheric research in Germany until 1945". I think we must present at our meeting in Grenoble reprints of all the papers in this JATP special issue referring to Europe and Africa.

G. Fanselau, "Determination of the absolute and relative level of the geomagnetic variations at the observatory Potsdam-Seddin-Niemegk 1890 -1969".

02138

8. G. Fanselau, "Determination of the absolute and relative level of absolute and relative level of the geomagnetic elements at the observatory Potsdam-Seddin-Niemegk 1890 - 1969".
9. G. Fanselau, "The Development of the Geomagnetic Depth Sounding at the Observatory Potsdam-Seddin-Niemegk 1890 - 1969".
10. K. Lengning, "The development of the current earth observations at Potsdam-Niemegk 1890 -1969".
11. W. Zander, "The unification of the data series 1890 - 1969 of the geomagnetic observations at Potsdam-Seddin-Niemegk".
12. Collected papers to commenorate the 60th Anniversary of the Sodankylä Observatory. Edited by J. Keränen and C. Sucksdorff. Veröffentlichungen des Geophysikalischen Observatoriums der Finnischen Akademie der Wissenschaften, Helsinki 1973.
    This volume contains six papers by following authors: J. Keränen, E. Kataja, W. Dieminger, J.C. Gupta, S. Koivumaa, H. Ranta and A. Kataja.

This list of papers will be continued as soon as further promises exist.

C. Stewart Gillmor, who is a professional science historian, and is chairman of the working group on Development of Research of this Interdivisional Commission, urges historians of science who have appropriate research interests to affiliate with the commission by writing to him at Dept. of History, Wesleyan University, Middletown, Connecticut 06457.

SM 21 - Division IV Review Session

Division IV - Sponsor

J. Geiss, convener

This meeting will consist of oral presentations by the reporters of Division IV highlighting developments in their fields of responsibility since the last IAGA meeting.

SM 22 - Interplanetary Medium between 0.3 and 5 AU and Beyond

Division IV - Sponsor

P. Hedgecock and L.F. Burlaga, conveners

Most of the papers will be invited. A limited number of contributed

papers will be considered; these must contain very significant and new results relating directly to the subject of variations of the interplanetary plasma and magnetic field with distance from the sun.

copies of abstracts should be sent to both conveners (the original to the General Secretary by 20 February 1975).

Approximately 15 minutes to 30 minutes will be allowed for each invited paper and approximately 15 minutes will be allowed for contributed papers.

Authors will be notified of acceptance or rejection by mail.

This meeting will concern the deep space probe observations and theories of the interplanetary plasma, magnetic field, and neutral particles in the region between 0.3 and 5 AU and beyond. Energetic particles, the interaction with the planets, and the interaction with the earth will not be discussed. A very limited number of papers on properties of the solar wind near 1 AU which relate directly to the distant solar wind will be considered.

SM 23 - Ionospheric Irregularities, Auroral Zone and High Latitude

Division II - Sponsor

R.S. Unwin, convener

The session on this topic will be held jointly with one of the sessions of SM 16 (see that report for additional information).

BM I, II, III, IV and V - Business Meeting

Each Division - Sponsor

Division Chairmen, conveners

Each division will hold a business meeting at which resolutions will be formalized, problems of organization will be discussed including methods of optimizing the good the division can do for the advancement of its scientific area.

W1 - IMS Workshop

Divisions II, III, IV and V - Cosponsors

J.G. Roederer, convener

The main purpose of this workshop is to critically appraise the proposed scientific progams for the IMS, to analyze their potential value

to the theoretical understanding of magnetospheric processes, and to propose last minute realistic implementation where necessary.

W2 - International Cooperative Tidal Experiment-Workshop

Divisions II and V and URSI Commission III - Cosponsors

R. Roper and J.E. Salah, conveners

During the period 10-15 August 1974 the International Cooperative Tidal Experiment was conducted in which six incoherent scatter radars and 11 meteor wind radars simultaneously gathered measurements of wind temperature and density in the lower thermosphere (80-130 km).

It is desirable for the experimenters to present and discuss collectively the results of this experiment.

IAGA INTERNAL ORGANIZATION

Since the reorganization at the Kyoto Assembly the selected leaderships for Divisions, Interdivisional Commissions and Working Groups have been very busy organizing their units. Some leaders have completed this work and others are not quite finished. We are reluctant to publish names until they have fully agreed to serve the organization. The new organization is given below as far as it is known at this time.

DIVISION I
INTERNAL MAGNETIC FIELDS

Chairman: J.C. Cain (USA)

Cochairmen: K.M. Creer (U.K.)
W.D. Parkinson (Australia)
T. Yukutake (Japan)

Working Group I-1, Analysis of the Main Field and Secular Variations

Cochairmen: B.R. Leaton (U.K.)
A.N. Pushkov (USSR)

Working Group I-2, Theory of Planetary Magnetic Fields and Geomagnetic Secular Variation

Cochairmen: S.I. Braginsky (USSR)
D.E. Winch (Australia)

Working Group I-3, Electromagnetic Induction and Electrical Conductivity (earth and moon)

Cochairman: D.I. Gough (Canada)
U. Schmucker (FRG)

Working Group I-4, Magnetic Anomalies (land and sea)

Cochairmen: A. Hahn (FRG)
J. LeMouel (France)

Working Group I-5, Paleomagnetism

Cochairmen: J. Briden (U.K.)
V. Bucha (Czech.)

Working Group I-6, Rock Magnetism

Cochairmen: H. Carmichael (Canada)
G.N. Petrova (USSR

The membership of each working group will be specified later.

DIVISION II

AERONOMIC PHENOMENA

(MESOSPHERES, IONOSPHERES, THERMOSPHERES, EXOSPHERES)

Chairman: B.A. Tinsley (USA)

Cochairmen: M. Ackerman (Belgium)
H. Rishbeth (U.K.)
A. Vallance-Jones (Canada)

Topic II-1, Structure and Dynamics of the Thermosphere, Ionosphere and Exosphere

Reporters: G. Knockarts (Belgium)
H. Kohl (German Fed. Rep.)
H. Rishbeth (England)

Topic II-2, Neutral and Ion Chemistry and Solar Fluxes

Reporters: A.D. Danilov (USSR)
L. Thomas (England)
T. Tohmatsu (Japan)

Topic II-3, Atmospheric Quantal Emissions, Including Auroral Processes and Airglow

Reporters: J.C. Gerard (USA)
M. Rees (USA)
G.G. Shepherd (Canada)

Topic II-4, Ionospheric Irregularities, Including Small Scale Auroral Structures

Reporters: T.N. Davis (USA)
P. Dyson (Australia)
R. Unwin (New Zealand)

Topic II-5, Ionsphere-Magnetosphere Interactions, Including Large Scale Auroral Structures

Reporters: L. Block (Sweden)
R.J. Hoch (USA)
A.F. Nagy (USA)

Topic II-6, Stratosphere - Mesosphere - Ionosphere Interactions

Reporters: M. Ackerman (Belgium)
J.B. Gregory (Canada)
C.F. Sechrist (USA)

Topic II-7, Aeronomy of Other Planetary Atmospheres

Reporters: D.M. Hunten (USA)
M.Yu. Marov (USSR)
G.E. Thomas (USA)

Topic II-8, Laboratory Experiments of Aeronomical Interest

Reporters: D.C. Cartwright (USA)
H.I. Schiff (Canada)
B.A. Thrush (England)

DIVISION III
MAGNETOSPHERIC PHENOMENA

Chairman: C.-G. Falthammer (Sweden)

Cochairmen: R. Gendrin (France)
T. Obayashi (Japan)
D.J. Williams (USA)

Topic III-1, Magnetic Field, Electric Fields and Current Systems Including Ground Observations

Reporter: G. Roster (Canada)

Topic III-2, Magnetosheath, Magnetospheric Boundary and Plasma Penetration

Reporter: W.J. Heikkila (USA)

Topic III-3, Distribution and Properties of Magnetospheric Plasmas

Reporter: V.M. Vasyliunas (USA)

Topic III-4, Energetic Particle Populations Including Cosmic Ray Entry

Reporter: L.J. Lanzerotti (USA)

Topic III-5, Magnetic Oscillations, Waves and Wave-Particle Interactions

Reporter: R. Gendrin (France)

Topic III-6, Magnetic Storms and Substorms, Including Aurora-Magnetospheric Relations

Reporter: S.-I. Akasofu (USA)

Topic III-7, Magnetosphere-Ionosphere Interactions

Reporter: R. Bostrom (Sweden)

Topic III-8, Magnetospheres of Other Planets

Reporter: F.V. Coroniti (USA)

Topic III-9, Laboratory Experiments of Magnetospheric Interest

Reporter: N. Kawashima (Japan)

Working Group III-1, Magnetic Pulsations

Chairman: R. McPherron (USA)

Working Group III-2, Magnetic Meridian Project

Chairman: A.N. Zaitsev (USSR)

Members: R. Bostrom (Sweden)
P. Coleman, Jr. (USA)
O. Holt (Norway)
B. Bhargava (India)
V.P. Golovkov (USSR)
M.I. Pudovkin (USSR)
O.M. Raspopov (USSR)
I.I. Rokitynsky (USSR)
V.N. Pogrebnoy (USSR)

DIVISON IV

SOLAR WIND AND INTERPLANETARY MAGNETIC FIELD

Chairman: J. Geiss (Switzerland)

Cochairman: K.I. Gringauz (USSR)
P.C. Hedgecock (U.K.)
N.F. Ness (USA)

Topic IV-1, Large Scale Characteristics of the Interplanetary Medium

Reporter:

Topic IV-2, Waves, Discontinuities and Shocks in the Interplanetary Plasma

Reporter:

Topic IV-3, Solar Wind Interaction with Unmagnetized or Weakly Magnetized Bodies

Reporter:

Topic IV-4, Solar Activity, Interplanetary Dynamics and Terrestrial Disburbances

Reporter:

Topic IV-5, Evolution of the Sun and Solar System as Deduced from Solar Wind Observations.

Reporter:

Note: Reporters for the above topics will be chosen soon.

DIVISION V

OBSERVATORIES, INSTRUMENTS, INDICES, AND DATA

Chairman: P.H. Serson (Canada)

Cochairmen: P.N. Mayaud (France)
R. Pastiels (Belgium)
M. Sugiura (USA)

Working Group V-1, Mangetic Observatories

Chairman: C. Sucksdorff (Finland)

Cochairman: K.L. Svendsen(USA)

Members:
B.N. Bhargava (India)
F. Eleman, (Sweden)
P.L. Gouin (Ethiopia)
A.W. Green (USA)
M.P. Ivchenko (USSR)
E.I. Loomer (Canada)
C.E.F. Oni (Nigeria)
H. Schmidt (GDR)
O. Schneider (Argentina)
R. Turajlic (Yugoslavia)
K.A. Wienert (FRG)
K. Yanagihara (Japan)

Working Group V-2, Meteor Observatories

Chairman: R.G. Roper (USA)

Cochairman: T.R. Kaiser (U.K.)

Members:
P.B. Babadjanov (USSR)
W.J. Baggaley (New Zealand)
Z. Ceplecha (Czech.)
W.G. Elford (Australia)
V.V. Fedynsky (USSR)
A.D. Frost (USA)
M. Glass (France)
V.M. Lebedinets (USSR)
P.M. Millman (Canada)
J.E. Salah (USA)
F. Verniani (Italy)

Working Group V-3, Geomagnetic Instruments and Standards

Chairman:	W.F. Stuart (U.K.)	
Cochairman:	A.P. DeVuyst (Belgium)	
Members:	V.N. Bobrov (USSR)	J. Mosnier (France)
	M. Casaverde (Peru)	T. Ogawa (Japan)
	G. Fischer (Switzerland)	W.D. Partinson (Australia)
	P.J. Hood (Canada)	G.L.M. Scheepers (So. Africa)
	R.W. Kuberry	J. Verö (Hungary)
	E.K. Lauridsen (Denmark)	D. Voppel (GFR)

Working Group V-4, Optical Calibration Standards

Chairman:	R.A. Pastiels (Belgium)	
Cochairman:	G.G. Shepherd (Canada)	
Members:	E.B. Armstrong (Australia)	P.V. Kulkarni (India)
	A.L. Broadfoot (USA)	J. Noxon (USA)
	J. Christophe (France)	M. Torr (So. Africa)
	O. Harang (Norway)	Y.L. Truttse (USSR)
	M. Huruhata (Japan)	R.S. Unwin (New Zealand)

Working Group V-5, Magnetic Surveys and Charts

Chairman:	E.B. Fabiano (USA)	
Cochairman:	P.M. McGregor (Australia)	
Members:	D.R. Barraclough (U.K.)	W.W. Mundt (GDR)
	H.G. Barsczus (Senegal)	A.N. Pushkov (USSR)
	E. Dawson (Canada)	H.P. Stockard (USA)
	F. Eleman (Sweden)	S. Utashiro (Japan)
	J. Le Mouël (France)	

Working Group V-6, Geophysical Indices

Chairman:	J.V. Lincoln (USA)	
Cochairman:	P.N. Mayaud (France)	
Members:	J.H. Allen (USA)	A. Romaña (Spain)
	M. Dryer (USA)	G. Rostoker (Canada)
	E. Essex (Australia)	M. Siebert (GFR)
	Ya.I. Feldstein (USSR)	M. Sugiura (USA)
	N. Fukushima (Japan)	D. van Sabben (Netherlands)

Working Group V-7, Collection and Dissemination of Data

Chairman: V.P. Golovkov (USSR)

Cochairman: H. Maeda

Members:

A.P. Casaverde (Peru)	H. Schmidt (GDR)
A. Egeland (Norway)	P.G. Simon (France)
G. Fiocco (Italy)	N.J. Skinner (Kenya)
R.H.F. Lust (GRF)	G.V. Starkov (USA)
S.R.C. Malin (U.K.)	K.L. Svendson (USA)
H. Rishbeth (U.K.)	J.I. Vette (USA)

Working Group V-8, (Ad Hoc) Coordination of IMS Ground-Based Balloon and Rocket Experiments

Chairman: M. Sugiura (USA)

Cochairman: R. Rostoker (Canada)

Members:

T.N. Davis (USA)	L.J. Lanzerotti (USA)
Sh.Sh.Dolginov (USSR)	D.B. Rai (Brazil)
M. Fukushima (Japan)	O.M. Raspopov (USSR)
R.E. Gendrin (France)	W. Stoffregen (Sweden)
J.W. King (U.K.)	C.U. Wagner (GDR)
G. Lange-Hesse (GFR)	A.N. Zaitzev (USSR)

Working Group V-9, (Ad Hoc) Joint Working Group with Commission 22 of IAU "Ad Hoc Committee on Radar Observations of Meteor Flux, Radiants and Anomalies at the Base of the Thermosphere."

Chairman: T.R. Kaiser (U.K.)

Members: W.J. Baggaley (New Zealand) R.G. Roper (USA)

Topic V-1, Geophysical Alerts and Forecasts

Reporter: D.J. Williams (USA)

Topic V-2, International Geomagnetic Survey by Satellite

Reporter: R. Langel (USA)

Coreporter: Sh.Sh. Dolginov (USSR)

INTERDIVISIONAL COMMISSION ON HISTORY

Chairman: E.J. Chernosky (USA)

Cochairman: N.V. Pushkov (USSR)

Working Group No. 1, American Area

Chairman: D.G. Knapp (USA)

Working Group No. 2, Pacific - Asian Area

Chairman: N. Fukushima (Japan)

Members:
- F.H. Hibberd (Australia)
- D.E. Winch (Australia)
- G.O. Walker (Hong Kong)
- B.N. Bhargava (India)
- R. Susanto (Indonesia)
- M. Ota (Japan)
- A. Kimpara (Japan)
- R.S. Unwin (New Zealand)
- S.R. de Guia (Philippines)
- J.O. Cardus (Spain)

Working Group No. 3, European-African Area

Chairman: G. Fanselau (GDR)

Members:
- J. Bouska (CSSR)
- W. Dieminger (GFR)
- M. Fahim (Egypt)
- S.R. Malin (U.K.)
- P.N. Mayaud (France)
- C.A. Onwumechili (Nigeria)
- G.N. Petrova (USSR)
- N.V. Pushkov (USSR)
- W. Schröder (GFR)
- C. Sucksdorf (Finland)
- K. Wienert (GFR)
- M. Van Wijk (So. Africa)

Working Group No. 4, Development of Research

Chairman: C. Stewart Gillmor (USA)

INTERDIVISIONAL COMMISSION ON ANTARCTIC RESEARCH

Chairman: T. Nagata (Japan)

Working Group No. 1, Geomagnetic Variation and ULF

Chairman: V.A. Troitskaya (USSR)

Working Group No. 2, Radar and Optical Auroras

Chairman: T.N. Davis (USA)

Working Group No. 3, VLF and Whistlers

Chairman: D.L. Carpenter (USA)

Working Group No. 4, Ionosphere and CNA

Chairman: J.W. King

Working Group No. 5, Rockets

Chairman: T. Oguti (Japan)

Working Group No. 6, Balloons

Chairman: J.J. Rosenberg

INTERDIVISIONAL WORKING GROUP ON RELATIONS BETWEEN EXTERNAL AND INTERNAL MAGNETIC VARIATIONS

Chairman: A.A. Ashour (Egypt)

Cochairman: C.A. Onwumechili (Nigeria)

Members:

J. Cain (USA)
G. Fanselau (GDR)
D.I. Gough (Canada)
V.R.S. Hutton (U.K.)
S.R. Malin (U.K.)
S. Matsushita (USA)
P. Morat (France)
E. Oni (Nigeria)
M. Siebert (GRF)
D.J. Stone (U.K.)

JOINT WORKING GROUPS BETWEEN IAGA AND URSI

The rules governing the joint working groups between IAGA and URSI have not yet been formally adopted by URSI and IUGG(IAGA). Draft rules have been drawn up and they will be submitted to IUGG and URSI at their 1975 Assemblies. The tentative organizations are given below.

Working Group No. 1, The Auroral Oval and Its Extension into Space

Chairman: B. Hultqvist (Sweden)

Vice Chairman: C.I. Russell (USA)

Working Group No. 2, Physics of the Plasmapause

Chairman: D. J. Williams (USA)

Vice Chairman: T.R. Kaiser (U.K.)

The above two Working Groups involve IAGA Division II and III, and URSI.)

Working Group No. 3, Structure and Dynamics of the Thermosphere, Ionosphere, and Exosphere

IAGA Division II, Topic II-1 will be combined with URSI Commission 3, Working Group 3.2 to form this new Working Group.

Chairman: H. Rishbeth (U.K.)

Vice Chairmen: G. Kockarts (Belgium) and H. Kohl (FGR)

SCOSTEP Rep: J.W. King (U.K.)

Working Group No. 4, Neutral and Ion Chemistry and Solar Fluxes

IAGA Division II, Topic II-2, will be combined with URSI Commission 3, Working Group 3.5 to form this new Working Group.

Chairman: L. Thomas (U.K.)

Vice Chairmen: A.D. Danilov (USSR) and T. Tohmatsu (Japan)

SCOSTEP Rep.: S.A. Bowhill (USA)

Working Group No. 5, Stratosphere-Mesosphere-Ionosphere Interactions

IAGA Divsion II, Topic II-6, will be combined with URSI Commission 6, Working Group 3.3 to form this new Working Group.

Chairman: J.B. Gregory (Canada)

Vice Chairmen: M. Ackerman (Belgium) and C.F. Sechrist (USA)

AD HOC JOINT IAGA/IAMAP WORKING GROUP ON STRATOSPHERIC AND MESOSPHERIC PROCESSES

Although this Working Group has not yet been formally approved by either Association in final form, it has held two meetings in Melbourne, Australia, in January 1974. Since it has not yet been approved it must retain its ad hoc category at least until the Grenoble Assembly.

A tentative list of the members of this ad hoc working group are:

IAMAP	IAGA
J.B. Gregory (canada)	B.A. Tinsley (USA)
A.D. Belmont (USA)	M. Ackerman (Belgium)
R.E. Dickinson (USA)	J. Barat (France)
H.U. Dutsch (Switzerland)	R.G. Roper (USA)
R.J. Murgatroyd (England)	C.F. Sechrist (USA)

IUGS/IAGA INTERUNION SUB-COMMISSION ON THE MAGNETIC POLARITY TIME SCLAE

At the Kyoto Assembly, Resolution 5 noted the existence of the sub-commission on magnetic stratigraphy within the IUGS and requested that the IUGS establish a joint working group with IAGA on this topic. At the present time the exact official status of negotiations to effect such a working group is not clear. In any case the unit is functioning unofficially with the members of the IUGS sub-commission which are affiliated with

IAGA, representing IAGA's interests. These members are:

IAGA Correspondent: K.M. Creer (U.K.)
A. Khranov (USSR)
N.D. Opdyke (USA)
M.W. McElhinny (Australia)
C.E. Helsley (USA)
D.M. Perchevsky
E. Irving (Canada)
N.D. Watkins (USA)

This group will be closely associated with Division I.

IAGA REPRESENTATIVES TO OTHER ORGANIZATIONS

COSPAR - M. Nicolet, IUGG(IAGA) representative

SCAR - T. Nagata, IUGG(IAGA) representative

SBARMO - J.G. Roederer, IUGG(IAGA) representative

FAGS - J. Veldkamp, IAGA representative

SCOSTEP- J.G. Roederer, IUGG representative

IMS - J.G. Roederer, chairman

IMS Steering Committee - G. Rostoker

SSC - M. Sugiura, chairman of ad hoc advisory group to SSC

IAC on Mathematical Geophysics - J.A. Jacobs, IAGA representative and D.P. Zidarov, IAGA representative

SELECTED ITEMS OF INTEREST

INTERNATIONAL SERVICE OF GEOMAGNETIC INDICES (ISGI)

The annual report of the ISGI for 1973 as sent by the Director, D. van Sabben, to FAGS follows:

In the series IAGA Bulletin No. 32, the second volume (IAGA Bulletin No. 32b, Geomagnetic Data 1972) was prepared in 1972 and published in February 1973. The third volume, No. 32c, Geomagnetic Data 1972 was prepared in 1973. It appeared just before the end of the year. These bulletins contain planetary and semi-planetary magnetic indices, international quiet and disturbed days, rapid variation data and surveys of data on selected special intervals, including magnetograms of about 16 observatories and K-indices of about 60 observatories for these intervals. K-indices were received regularly from 116 observatories. The k-indices of 1972 were punched and transferred to magnetic tape. In September 1973, this magnetic tape was sent to the World Digital Data Center in England, were copies are made for the other WDDC's.

Except for the monthly tables and diagrams of the Kp, Ap and Cp indices, which are issued by the Institut für Geophysik in Göttingen, all publications of the ISGI are prepared for printing at the former "C + K center", the Geophysical Division of the Meteorological Institute, De Bilt, Netherlands. These publications are: The Monthly Bulletins (containing Ci-indices, international quiet and disturbed days and preliminary data on rapid magnetic variations of the types ssc, si, bay, pg, sfe), the Threemonthly

Bulletins (containing data on pulsations: pil, pi2, and pcl,...pc5), the Yearly Supplement of the Threemonthly Bulletin (late reports on pi and pc) and the yearly IAGA Bulletin No. 32, mentioned above. The data published in these bulletins, are based on the reports of more than 100 magnetic observatories. The rapid variations reports are compiled and elaborated at the Observatorio del Ebro, Roquetas, Spain.

Other institutes which contributed to the IAGA Bulletins No. 32b and No. 32c are: Institut fur Geophysik, Göttingen, DGR (Kp, etc.), Institut de Physique du Globe, Paris, France (Kn, Ks, etc.), NASA-Goddard Space Flight Center, Greenbelt, USA (Dst), World Data Center A on Solar Terrestrial Physics, NOAA, Boulder, USA (magnetic storm data) and the Geophysical Institute, College, Alaska, USA (magnetograms). The reduction of the magnetograms to standard time and intensity scales has been partly performed at NOAA, Boulder, USA.

A special IAGA Bulletin No. 33 was printed in October 1973. This Bulletin has been compiled by Dr. P.N. Mayaud and contains a hundred years' series of magnetic indices aa and a list of sudden commencements of magnetic storms, 1868-1967. It provides a relatively homogeneous series of indices, going back in history as far as possible, for correlation studies with other phenomena. The funds for this special issue were obtained through the intermediary of IAGA.

Dr. van Sabben also submitted a financial report for 1973 and a report of expected expenses for 1974. He points out in his report that if the

FAGS subvention remains the same in 1974 as in 1973 the 1974 expenses will surpass the income by roughly Dfl 3100. Since the report was issued and following a survey investigation, it has been decided to discontinue the publication of the Threemonthly Bulletins on pulsation. This action will save approximately Dfl 1000 per year.

OFFICERS OF IAGA

Mr. E. J. Chernosky, chairman of the Interdivisional Commission on History, has supplied the following interesting historical information on IAGA Officers.

Date	President		Secretary		Meeting
1919-22	A. Tanakadate	Japan	L.A. Bauer	USA	Brussels
1922-24	C. Chree	U.K.	L.A. Bauer	USA	Rome
1924-27	C. Chree	U.K.	L.A. Bauer	USA	Madrid
1927-30	L.A. Bauer	USA	Ch. Maurain	France	Prague
1930-33	J.A. Fleming	USA	Ch. Maurain	France	Stockholm
1933-36	J.A. Fleming	USA	M.D. LaCour	Denmark	Lisbon
1936-39	J.A. Fleming	USA	A.H.R. Goldie	U.K.	Edinburgh
1939-48	J.A. Fleming	USA	J.W. Joyce (Acting)	USA	Washington
1948-51	S. Chapman	U.K.	J.W. Joyce	USA	Oslo
1951-54	J. Coulomb	France	V. Laursen	Denmark	Brussels
1954-57	J. Bartels	Germany	V. Laursen	Denmark	Rome
1957-60	J. Kaplan	USA	J.O. Cardus	Spain	Toronto
1960-63	V. Laursen	Denmark	J.O. Cardus	Spain	Helsinki
1963-67	M. Nicolet	France	L.R. Alldredge	USA	Berkeley
1967-71	T. Nagata	Japan	L.R. Alldredge	USA	(St. Gall) Zurich
1971-75	V.A. Troitskaya	USSR	L.R. Alldredge	USA	Moscow

1919-33 Section of Terrestrial Magnetism and Electricity of IUGG

1933-54 Association of Terrestiral Magnetism and Electricity of IUGG

1954--- Association of Geomagnetism and Aeronomy of IUGG

[Editor's note: Two Scientific General Assemblies were held by IAGA: 1969, Madrid and 1973, Kyoto].

INTERNATIONAL MAGNETOSPHERE STUDY (IMS)

The following letter was received from Prof. V.V. Beloussov, president of the Soviet Geophysical Committee:

"Dear Sirs,

We take this opportunity to inform you that the Academy of Sciences of the USSR has organised the Soviet Commission on the International Magnetospheric Studies Project within the Soviet Geophysical Committee. The tasks of the Soviet IMS Commission shall be the compilation of the program of the IMS researches in the USSR and its coordination with international programs, worked out by the IUGG and other participating international bodies, interested in the Project.

"Professor V.V. Migulin, Member-Correspondent of the Acad. of Sc. of the USSR, is nominated Chairman of the Soviet IMS Commission; Professors G.S. Narimanov, N.V. Pushkov and V.A. Troitskaya are Vice-Chairmen; Dr. K.Yu. Zybin is the Scientific Secretary. The Members of the Commission are: Dr. S.I. Avdiushin, Akademician A.A. Blagonravov, Dr. S.G. Korneiev, Prof. M.Ya. Marov, Dr. A.D. Powsner, Prof. B.A. Tverskoy, Dr. V.S. Vereschetin, Dr. I.I. Zhulin.

"The mailing address of the Soviet IMS Commission is as follows:

Soviet IMS Commission
Molodezhnaya 3
Moscow B-296, U.S.S.R.
Cable address: Moscow MGG

Sincerely yours,"

TAKESI NAGATA CONFERENCE

A scientific conference on Magnetic Fields - Past and Present was held at the Department of Earth and Planetary Sciences, University of Pittsburgh on 3 and 4 June 1974. The conference was cosponsored by the Lunar Science Institute, Houston, Texas. The conference was organized to honor Professor Takesi Nagata on his retirement as Director of the Geophysical Institute at the University of Tokyo.

The University of Pittsburgh took the lead in organizing this conference because Prof. Nagata has been a visiting professor there since 1961 where he has carried out research on rock magnetism in the Department of Earth and Planetary Sciences.

The program highlighted the following invited talks:

Rock Magnetism-Basis of the Paleomagnetic Record	D. Dunlop
Generation of Magnetic Fields in the Cosmos	E. Levi
Present Field of the Earth and Its Secular Variation	J. Cain
Paleomagnetic Record of the Earth's Magnetic Field	A. Cox
Models of the Earth's Magnetic Field Generation	T. Rikitake
Magnetism of Continental Crust	I. Zietz
Search for Seismomagnetic Effects	M. Johnson
Magnetics of the Sea Floor and Plate Tectonics	T. Atwater
Deep Tow Results and the Reversal Time Scale	J. Mudie
Long Term Variations in the Field and Tectonics	E. Irving
Magnetic Fields in the Solar System	C. Sonnett
Magnetism of Meteorites	P. Wasilewski
Geomagnetism 1938-1974	T. Nagata

These were supplemented by numerous short contributed papers.

At a banquet in the evening Dr. J.G. Roederer extolled the accomplishments of Dr. Nagata. At the end all wished him well in his retirement from the University.

[Editor's note: Dr. Nagata says he is now busier than ever with his Antarctic responsibilities.]

RESOLUTION ON THE SI

Dr. Wm. Markowitz has sent the following draft resolution to the General Secretary Paul J. Melchior for consideration at Grenoble:

1. Explanation. Numerous systems of units were formed, resulting in confusion and imprecision. With the increase in international scientific cooperation and in the interaction of different fields the need became felt for a single system of units for use in all sciences. In response to a request from the International Union of Pure and Applied Physics (IUPAP), the General Conference of Weights and Measures (CGPM) directed a study on this matter. After a long and thorough study the CGPM established the International System of Units (SI), in 1960, to fill this need.

The SI has been adopted since then by international scientific unions whose fields underlie the activities of the IUGG, namely, the IUPAP, the Union of Pure and Applied Chemistry, the International Astronomical Union, and the International Electrotechnical Commission. In view of the involvement of the IUGG in programs of broad scientific cooperation it is desirable that it also should adopt the recommendation on units of the General Conference of Weights and Measures. The following resolution has been prepared, to this end, for consideration by the IUGG at Grenoble in 1975.

2. Resolution. The IUGG recommends the use of the International System of Units (SI).

3. Comments on the Resolution. It is recognized that views differ concerning the use of the SI. Some prefer to use other units with which they are familiar. For this reason the resolution was cast in the form of a "recommendation". It does not force anyone to use the SI. Nor does it require

that publications must use the SI. The purpose of the resolution is to bring about a gradually increasing use of the SI, and not a sudden conversion to that system.

COSTED TRAVEL FELLOWSHIPS

A following announcement was issued in June 1974 by the ICSU Committee on Science and Technology in Developing Countries.

Objectives.

(i) The travel fellowships are intended to enable scientists from developing countries to attend scientific conferences. Only those conferences where specific symposia are held will be considered for these awards. Attendance at General Assemblies will not be encouraged.

(ii) The fellowships will also be available for scientists from developing countries to visit laboratories/institutions/industries for specialised training or project work or workshops.

Availability.

(i) The funds under this scheme will be available to support round-trip international travel by economy class. The fare will be paid to the authorised travel agent.

(ii) The fellowship does not include allowances for maintenance in the host country or break of journey en route.

(iii) There will be no restriction as to the country to be visited by the fellow.

(iv) The fellowships will be available only for candidates from developing countries.

(v) Fellowships will not be available for participation in programmes within the same country (e.g.: Indians will not be eligible for a workshop in India).

(vi) The fellowships will not be available for any programme which is of more than 3 months duration.

Applications.

(i) Only candidates below the age of 35 years will be eligible for these fellowships.

(ii) Candidates should have a good academic background or industrial experience. These details should be included in the biodata attached to the applications.

(iii) Candidates should normally be employed, and should return to the position in the home country after the training.

(iv) Candidates should establish availability of other sources of support for covering expenses during the stay abroad.

(v) Candidates should have been accepted in the Conference/Project Workshop (this partly transfers the responsibility of judging the quality of the candidates to the sponsors).

(vi) Two letters of assessment of the candidates should be directly sent to the COSTED Secretariat--one from a senior person in the field within the home country and the other, if possible, from the Director or Convener of the Conference/Project/Workshop.

(vii) Applications should contain a statement (one page) of the likely benefits to the candidate in developing potential for future work in the home country.

(viii) Applications should reach the COSTED Secretariat with supporting documents at least 3 months before the starting date of the programme.

(ix) Applications should be addressed to the Scientific Secretary, COSTED Secretariat, Indian Institute of Science, Bangalore 560012, India.

Selection.

Candidates selected for the awards will be informed by the COSTED Secretariat.

IUGS/IAGA INTERUNION SUBCOMMISSION ON THE MAGNETIC POLARITY TIME SCALE

At the 24th International Geological Congress (Aug. 72) a group of geologists and geophysicists interested in the application of the geomagnetic polarity time scale to stratigraphic correlation met to discuss the requirement of the problems involved in setting up a nomenclature system which does not conflict with present stratographic terminology and usage. Two meetings were held and the outcome was the setting up of a formal membership which was subsequently recognized as a subcommission

(on the magnetic polarity time scale) of the International Commission on Stratigraphy of the International Union of Geological Sciences (IUGS). Because of the concern that any nomenclature system decided upon should be consistent with geomagnetic theory and otherwise acceptable to geomagnetists, the view was expressed that the subcommission should be formally recognized by IAGA. It is accepted that those affiliated with IAGA among the present membership should represent its interests for the time being. The next meeting of the subcommission is scheduled for Nov. 15-16, 1974 at Miami, Florida immediately preceeding the annual meeting of GSA. IAGA input to this meeting should be routed through Professor K.M. Creer, Department of Geophysics, 6 South Oswald Road, Edinburgh EH92HX. Initial membership was: Dr. R.N. Carter (NZ); Prof. H.B.S. Cooke (Canada), vice chairman; Prof. K.H. Creer (UK); Prof. T. Einnarsson (Iceland); Prof. J. D. Hays (USA); Prof. C.E. Helsley (USA); Prof. E. Irving (Canada); Dr. A. Khramov (USSR); Dr. V. Kukla (Czech.); Dr. I. McDougall (Australia); Dr. M.W. McElhinny (Australia); Dr. H. Nakagawa (Japan); Dr. N.O. Opdyke (USA); Dr. D.M. Pechersky (USSR), and Prof. N.D. Watkins (USA), chairman.

International Geophysical Calendar for 1975

JANUARY

S	M	T	W	T	F	S
			1	2	[3	[4
5	6	7	8	9	10	11
12	13	(14)*	(15)*	(16)	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

FEBRUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	(11)*	◇12◇*	(13)	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

MARCH

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	(11)*	(12)*	(13)	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

APRIL

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9*	10*	11	12
13	14	(15)	(16)	(17)	18	19
20	21	[22	[23	24	25	26
27	28	29	30			

MAY

S	M	T	W	T	F	S
				1	2	3
4	[5]	[6]	7	8	9	10
[11]	12	(13)*	◇14◇*	(15)	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUNE

S	M	T	W	T	F	S
1	2	3	4	5	6	[7
[8]	[9]	[10]	[11]*	[12]	13	14
15	16	17	18	19	20	21
22	[23]	[24]	25	26	27	28
29	30					

JULY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8*	9*	10	11	12
13	14	(15)	(16)	(17)	18	19
20	21	22	23	24	25	26
27]	[28]	[29]	[30]	31]		

AUGUST

S	M	T	W	T	F	S
					1]	2
3	4	5	6*	7*	8	9
10	[11	[(12)	[◇13◇	(14)	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

SEPTEMBER

S	M	T	W	T	F	S
	1	2	3*	4*	5	6
7	8	9	10	11	12	13
14	15	(16)	(17)	(18)	19	20
21	22	23	24	25	26	27
28	29	30				

OCTOBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7*	8*	9	10	11
12	13	(14)	(15)	(16)	17	18
19	20	[21]	[22]	23	24	25
26	27	28	29	30	31	

NOVEMBER

S	M	T	W	T	F	S
						1
2	[3]	4*	5*	6	7	8
9	10	(11)	◇12◇	(13)	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
[30]						

DECEMBER

S	M	T	W	T	F	S
	1	2	3*	4*	5]	6]
7]	8	9	10	11	12	[13]
[14]	[15]	(16)	(17)	(18)	19	20
21	[22	[23	24	25	26	27
28	29	30	31*			

JANUARY 1976

S	M	T	W	T	F	S
				1*	2	[3
[4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	(20)	(21)	(22)	23	24
25	26	27	28*	29*	30	31

(14) Regular World Day (RWD)

(15) Priority Regular World Day (PRWD)

◇12◇ Quarterly World Day (QWD) also a PRWD and RGD

8 Regular Geophysical Day (RGD)

[11] Day of Solar Eclipse

14* Dark Moon Geophysical Day (DMGD)

[5 6] World Geophysical Interval (WGI)

[3 Day with unusual meteor shower activity, Northern Hemisphere

5] Day with unusual meteor shower activity, Southern Hemisphere

[10 11] Airglow and Aurora Period

NOTE: For the Antarctic and Southern Hemisphere Aeronomy Year (ASHAY) there are plans to coordinate experiments within the 18 months September 1975 through March 1977. Contact is S. Radicella (Argentina).

EXPLANATIONS OF GEOPHYSICAL CALENDAR

This Calendar continues the series begun for the IGY years 1957-58, and is issued annually to recommend dates for solar and geophysical observations which cannot be carried out continuously. Thus, the amount of observational data in existence tends to be larger on Calendar days. The recommendations on data reduction and expecially the flow of data to World Data Centers (WDCs) in many instances emphasize Calendar days. The Calendar is prepared by the International Ursigram and World Days Service (IUWDS) with the advice of spokesmen for the various scientific disciplines. For greater detail concerning explanations or recommendations your attention is called to information published periodically in STP Notes, IAGA News, IUGG Chronicle, URSI Information Bulletin or other scientific journals.

The definitions of the designated days remain as described on previous Calendars. Universal Time (UT) is the standard of time for all world days. Regular Geophysical Days (RGD) are each Wednesday. Regular World Days (RWD) are three consecutive days each month, always Tuesday, Wednesday and Thursday near the middle of the month. Priority Regular Word Days (PRWD) are the RWD which fall on Wednesdays. Quarterly World Days (QWD) are one day each quarter and are the PRWD which fall in the World Geophysical Intervals (WGI). The WGI are fourteen consecutive days in each season, beginning on a Monday, of the selected month, and normally shift from year to year. In 1975 the WGI will be in February, May, August and November and include the Solar Eclipses.

The Solar Eclipses are May 11 (partial) maximum beginning in Northwest Africa crossing southern tip of Greenland, northern coast of Canada, northern tip of Alaska ending in Pacific Ocean east of Japan, and November 3 (partial) maximum beginning in Pacific Ocean west of South America crossing Wilkes Land, Antarctica, ending in southern Indian Ocean. Geophysical stations in the eclipse zones and their conjugate areas treat these days as world days and undertake special programs to study eclipse effects on the earth's atmosphere.

Meteor Showers (selected by P.M. Millman, Ottawa) include important visual showers and also unusual showers observable mainly by radio and radar techniques. The dates are coded to indicate whether the shower is

observable in the northern or southern hemisphere.

The occurrence of unusual solar or geophysical conditions is announced or forecast by the IUWDS through various types of geophysical "Alerts" which are widely distributed by telegram and radio broadcast on a current schedule. Stratospheric warmings (STRATWARM) are also designated. The meteorological telecommunications network coordinated by WMO carries these worldwide Alerts once daily soon after 0400 UT. For definitions of Alerts see IUWDS "Synoptic Codes for Solar and Geophysical Data, Third Revised Edition 1973" and its amendments. Retrospective World Intervals are selected and announced in STP Notes and elsewhere to provide additional analyzed data for particular events studied in the ICSU Special Committee on Solar-Terrestrial Physics (SCOSTEP) programs.

THE HISTORY OF WORDS FOR IAGA AREAS OF INTEREST

The history of the word aeronomy is described by Sydney Chapman in the 1973 Encyclopedia Brittanica as follows: Aeronomy is an Anglicized Greek word meaning the science of the air; more precisely, the science of 'that part of the upper atmosphere where dissociation and ionization are important'." The flyleaf of the 1954 Rome IAGA Transactions carries the following statement: "Aeronomy is the science of the upper atmospheric regions where dissociation and ionization are important." --S. Chapman.

Retiring president J. Coulomb announced at the final plenary session of the IUGG on 25 September 1974: "La dixième Assemblée de notre Union restera marquée pour les géomagnéticiens par la mort de l'Association Internationale de Magnétisme et Electricité Terrestres et par sa resurrection sous le nom d'Association Internationale de Géomagnetisms et d' Aeronomie." Thus, the Section of Terrestrial Magnetism and Electricity of the International Union of Geodesy and Geophysics, as it was known from the time of its inception (formation) in 1919 at Brussels, was renamed, at Lisbon in 1933, the International Association of Terrestrial Magnetism and Electricity. Its name was ultimately changed in 1954 to the International Association of Geomagnetism and Aeronomy.

According to the Chapman article in the Encyclopedia and the verbal information it appears the word aeronomy was originally proposed in 1945 to replace the word meteorology (or an alternate word aerology) but was not accepted by the meteorologists. A paper entitled "Upper Atmosphere Nomenclature" by Sydney Chapman in the December 1950 issue of the Journal of Geophysical Research offered a detailed proposal for description and definition of the regions of the upper atmosphere. His abstract reads as follows:

> "It is proposed that stratosphere shall signify solely the nearly isothermal region above the troposphere; that the layer between the stratosphere and the deep temperature minimum somewhat below 100 km be called the mesosphere; that the layer of rising temperature above this minimum be called the thermosphere. On the basis of composition, it is proposed to divide the atmosphere into the homosphere (of substantially uniform composition from the ground upwards) and the heterosphere (of different composition), the region wherein turbulence overcomes diffusion being the turbosphere. On the basis of electron density, a correlative to ionosphere is proposed, the neutrosphere. Using pause to signify upper boundary, the stratopause, mesopause, homopause, turbopause, and neutropause are defined. Peak is suggested as the name for a for a level of maximum; e.g., mesopeak, ozone peak E or F peak. Incline and decline are names suggested for the parts of a peaked layer below and above the peak; e.g., mesoincline (for the layer of rising temperature just above the stratosphere), mesodecline, E or F incline or decline. A "dip" in a peaked layer is called a syncline."

Chapman also noted that airglow, proposed by O. Struve and supported by C. T. Elvey in his paper in the astrophysical Journal or March, 1950, was to signify the light emitted by the atmosphere other than the aurora (and lightning).

In an earlier note in the September 1938 issue of the Journal of Terrestrial Magnetism and Electricity, Chapman expressed his concern for appropriate terminology which is of current interest to us in IAGA. To quote again:

> "I am not enough of a historian to know when the title terrestrial magnetism became general, or why it ever gained vogue, when the old words geography and geology already offered analogies for the word geomagnetism. But apart from the stylist literary objection to the combination of a Latin adjective terrestrial with a noun originally Greek -- an argument which to many scientists may not have much appeal -- the use of the Greek earth-prefix geo with the main noun magnetism, in line with the nomenclature for geography, geodesy, geophysics and geology, has the great advantage of convenience, brevity, and ease of speech. The adjectival form of the word, geomagnetic, has a still greater convenience over the adjectival phrase terrestrial magnetic, in which the second adjective is qualified by the separate subadjective terrestrial."

The origin of ionosphere sometimes credited to Watson-Watt in 1932, was first used by J. N. Plendl in a paper in volume 38 of Jahrbuch der drahtlosen Telegraphie in 1931. To quote it: "Bei der Ausbreitund der drahtlosen Wellen spielt die ionisierte obere Atmosphäre (Ionosphëre) neben dem Erdboden eine bedeutende Rolle." It was once translated as ionization sphere. Sir Edward Appleton verified this origin by Plendl some years later.

In September 1959, T. Gold in the Journal of Geophysical Research stated: "It has now become possible to investigate the region above the ionosphere in which the magnetic field of the earth has a dominant control over the motions of gas and fast charged particles. This region extends out to a distance of the order of 10 earth radii; it may appropriately be called the magnetosphere."

The streamlined deformation of the magnetosphere that provided a tail (the embrynoic magnetotail of subsequent interest) was proposed by F. A. Johnson in an October 1960 paper in the Journal of Geophysical Research.

The term solar wind to describe the properties of the moving solar gas appeared in a May 1958 paper by E. N. Parkes in Physics of Fluids.

Leads to some of this information requested by the IAGA Executive Committee was offered by B. A. Tinsley , J. M. Plendl (son), and J.N. Howard and is gratefully acknowledged.

Edwin J. Chernosky, Chairman, IAGA Interdivisional
Commission on History

DYNAMO THEORIES OF PLANETARY MAGNETIC FIELDS

The Earth's main magnetic field is now widely considered to arise from electrical currents created by a self-excited dynamo process in the Earth's liquid core. The mathematical theories used to describe the process are known as dynamo theories, and such theories have been developed for stellar, planetary and galactic magnetic fields.

The dynamo theory in its simplest form is known as the kinematic dynamo, and employs only Maxwell's equations with Ohm's law for moving conductors. A fluid flow is assigned and one seeks to establish whether or not the body of conducting fluid within a closed volume can amplify or maintain a magnetic field against ohmic and thermal dissipation for an indefinite time. By further permitting the fluid flow and the magnetic field to have both microscale and macroscale components, a new effect known as the α-effect has been demonstrated. The microscale motion can be either turbulent or smooth, arising from small perturbations of the macroscale component. A further type of development for fluids of high electrical conductivity or flows with high Reynolds number is now known as the Braginsky dynamo. The strong toroidal fields required by this dynamo have lead to the interpretation of geomagnetic secular variation in terms of MAC waves, in which Magnetic, Archimedean (buoyancy) and Coriolis forces are in balance.

The complete dynamo problem, or the magnetohydrodynamic problem, consists of the linear induction equation for the kinematic dynamo together with the Navier-Stokes equations of motion for an electrically conducting rotating fluid. Convective motions driven by thermal gradients or gravitational instabilities give rise to fluid flows which may be sufficiently asymmetrical to be of importance in the context of the geomagnetic dynamo.

The above information was submitted by D. E. Winch in support of SM5. It arrived too late to be put in the section on the Grenoble Assemmbly (see p. 38).

RELATIONS WITH OTHER ORGANIZATIONS

IUGG

Excerpts from the IUGG Executive Committee meeting held in London, October 3, 1973 are given below.

"Dr. Constantinescu raised the question of membership in Associations, a problem which had been discussed at the IASPEI Assembly in Lima. Dr. de Bremaecker explained the IASPEI proposal, that countries be asked to affirm, 6 months in advance of an Assembly, that they are members of an Association; this was for the purpose of establishing the number of members in order to apply the IASPEI statue defining a quorum. The President stated that he felt that all members of the Union must be considered members of all Associations, and that it would be better for IASPEI to change its statutes.

"Mr. Laclavère reported on arrangements for the 1975 General Assembly to open on Monday, August 25, 1975. It would be held at the new University of Grenoble, which offered excellent facilities. Each Association could have a separate building. There was only one very large theatre (capacity 3500) but there were 23 theatres seating from 200 to 1000 persons. Residences would be available at 15-20 francs per night, and meals at 10-15 francs, wine included. A registration fee of 150 francs was foreseen. Tours to areas of glaciological interest and to extinct volcanoes were planned.

There was considerable discussion of the registration fee. Dr. Troitskaya pointed out that it would be difficult for many people, and asked if there were services, such as simultaneous translation, which could be eliminated. The arrangement of a discount for advance payment was mentioned. However, the President noted that the fee was within the limit proposed by ICSU, and no action was taken. Mr. Laclavère noted that 4000 - 5000 participants, including families, were expected.

"The President reviewed the situation since the adoption of new statutes in 1967; some Associations had held Assemblies away from the General Assembly, others had not. The sentiment had been expressed that, if the emphasis on programme at General Assemblies were entirely

interdisciplinary, many matters of central importance to one Association might be neglected.

"Dr. Alldredge noted that IAGA foresaw 3 types of activity at General Assemblies: inter-Association programme; meetings with other ICSU bodies, and IAGA's own work. Dr. Fritz recalled that the statutes had been modified because of logistics; he queried if the size of General Assemblies was still a problem. There was general agreement that it was desirable for Associations to have their own programmes, scientific and administrative, as well as participating in joint activities. The President summarized by indicating that the Executive Committee would first set the time of inter-Association meetings; Associations would be free to arrange scientific and administrative activities in the time remaining.

"Dr. Alldredge queried the size of the Union reserves. This was reported to be approximately $100,000 or about the requirements of 9 months of operation. He noted that IAGA had examined the allocations to different Associations over recent years, and had concluded that it received too small a share.

"The President noted that the Executive Committee could only make recommendations to the Finance Committee; he also queried the size of IAGA's reserve. Dr. Allredge reported that while there was a reserve, it would be entirely spent in two years, with the new activities of IAGA, if the income were not increased.

"Dr. Kukkamaki spoke as a former member of the Finance Committee; he noted the difficulty of determining allocations, and also reported that IAG has no other source of income.

"There was general agreement that a submission to the Finance Committee be made before the General Assembly, in which the relative allocations to Associations would be proposed. The difficulty was in reaching agreement on the criteria by which to judge the different needs.

"It was agreed that the President, with the assistance of the Treasurer and Secretary General, would prepare and circulate a paper, proposing the criteria to use and also a weight for each Association. Associations would respond, and these responses would be considered by the Executive Committee (in Grenoble) before the recommendation went to

the Finance Committee.

"There was also agreement that the Finance Committee be asked to examine the size of the Union's reserve, and its rate of growth.

"Dr. Troitskaya and Prof. Ashour reported on the IAGA Assembly in Kyoto. Six hundred participants had been present, and 766 papers given. The most important result had been the reorganization of IAGA, following a great deal of work by Dr. Roederer; five Divisions now replace the former Commission structure.

"Dr. Troitskaya drew attention to two resolutions of IAGA that could be of interest to other Associations: One urged National Committees to take responsibility for the replacement of officers or speakers at meetings, in cases where a person could not attend. The second urged that certain frequency bands, of scientific importance, be kept free of man-made electromagnetic noise.

"Dr. Fritz observed that, while he had been prepared to accept the new IAGA structure on the basis of the preliminary proposal, he was concerned about the final Division titles and responsiblities, in particular Division II, "Aeronomic Studies". He felt that the Division topics could include much of atmospheric physics. Dr. Roederer felt that the question was one of semantics, rather than intentional overlap. The Presidents of IAGA and IAMAP agreed to set up a joint group, of 3 representatives each, to work on this problem as quickly as possible. Dr. Troitskaya urged that the Union provide support for this temporary working group.

"Dr. Minnis, speaking for URSI, said that URSI looked forward to working with IAGA, through the proposed joint working groups. He hoped that these would be constituted to deal with very specific problems.

"The President asked Dr. Minnis to review FAGS activities. Dr. Minnis noted the financing problems. He reported that the Council had met 2 days previously, and had decided upon the final allocations for 1973.

"Dr. Godson asked why more Services were not self-supporting. Prof. Melchior explained that this was not possible, giving as an example BIH, a service doing indispensable scientific work, but with no hope of

intergovernmental support.

"He noted, however, that there were some problems inside FAGS, and urged the Unions involved to take a critical look at the Services for which they were responsible.

"Dr. Garland noted the importance of Associations ensuring that the Directing Boards of Services gave scientific leadership.

"Dr. Roederer reported on the reorganization of IUCSTP into a Special Committee.

"The new statutes permitted 2 representatives from IUGG, to be appointed on the nominations of IAMAP and IAGA. The Committee thanked Dr. Roederer for his report, and for his service as sole representative to the former IUCSTP.

"Prof. Melchior spoke on CODATA, and expressed much concern on the proposed activities of that organization. Melchior represented our Union at two meetings of CODATA and strongly emphazised that most of the CODATA program had been undertaken by the geodesists and geophysicists many years ago. It seems that CODATA committees have no idea of the enormous amount of time and location dependent parameters they wish to consider as a part of their activity. But, on the other hand, CODATA has an important annual budget (130.000 US $ in 1973) which should not be used exclusively for physics and chemistry as ICSU and CODATA have decided that geodesy and geophysics are also within CODATA field. (Just after the London meeting, Melchior was informed that he has been elected member of the CODATA Executive Committee...).

"The President agreed to express to ICSU the concern of IUGG on the direction that CODATA activities appeared to be taking, and on its financial requirements relative to other activities of ICSU."

IAMAP

At Kyoto the IAGA Executive Committee approved the creation of a joint IAGA-IAMAP working group on "Stratospheric and Mesospheric Processes." This group met at the IAMAP Scientific Assembly in Melbourne, Australia, in January 1974. At this meeting terms of reference for the joint committee were formulated as indicated.

The Ad Hoc Group on IAGA-IAMAP arrangements wishes to inform your Associations that we have met on five occasions during the Melbourne Assembly. We recommend as follows:

(1) A joint body of IAGA and IAMAP be formed, to be concerned with common fields of interest to the two Associations; for example, phenomena of the stratosphere and mesosphere.

(2) A combined meeting of IAMAP and IAGA be held in 1977.

(3) For future joint meetings of IAGA and IAMAP the joint body be assigned the duty of recommending titles of joint symposia and names of conveners.

In the case of the Grenoble Meeting where some recommendations have already been made, the joint body be consulted on these, and asked to take responsibility for those not already made.

For IUGG assemblies the recommendations of the joint body be transmitted to the Associations and directly to the Executive Committee of IUGG for deliberation under by-law No. 8 of IUGG; for other assemblies, after approval or amendment by the Associations, the proposals be referred back to the joint body for any necessary action.

(4) The joint body for IAGA-IAMAP arrangements be formed by each of the Associations appointing not more than five persons to serve on the joint body.

Appointments to the joint body be for four years, beginning and ending at the last meeting of the body held at the time of IUGG Assemblies. For the period preceding the next IUGG assembly (Grenoble) further appointments be made by the Associations to bring the total number of representatives of each Association in this ad hoc committee to five, and this committee act as the joint body until the Grenoble meeting.

The joint body appoint its own chairman at its first meeting; the chairman to hold office for not more than four years.

(5) The joint body through its chairman cooperate fully with the Atmospheric Physics program of SCOSTEP, particularly with the SESAME project.

We note that discussion is taking place in IAMAP concerning internal structure, and have accordingly left open the form of the joint body e.g. working group or committee. IAGA has already made provision for a working group for the above purposes.

This document has not yet been finally approved by either IAMAP or IAGA. Changes are still being proposed. Final action is likely to take place at Grenoble.

SCAR

Prof. Takesi Nagata, the IUGG delegate to SCAR, made the following report to SCAR at its 13th meeting.

IAGA/IUGG has established IAGA Committee on Antarctic Research in IAGA at its General Assembly held in August 1971 at Moscow with the agreement of SCAR (SCAR Bulletin No. 40, p. 830). The main task of this IAGA Committee should be scientific and technical research and discussions to prepare the most valuable scientific research programmes of Antarctic upper atmosphere physics, in particular during the period of Internation Magnetospheric Study (IMS), 1976-78. The results of the work by this Committee should be submitted, in forms of recommendations or/and proposals, to SCAR for its studies to examine practical possibilities of their implementations.

The IAGA Committee on Antarctic Research met at the occasion of IAGA General Scientific Assembly held in September 1973 at Kyoto to scientifically review recent progress in Antarctic upper atmosphere physics research and prepare the most important scientific research programmes in this scientific field in the future. The substance of results of this meeting will be reported in a separate IAGA report. IUGG is very happy to be able to cooperate with SCAR in this way to promote geophysical research in Antarctica.

As for solid earth geophysics, we are informed that the SCAR working group on Solid Earth Geophysics is considering a meeting at the General Assembly of IUGG which will be held in August 1975 at Grenoble. As IUGG is greatly interested in the development of solid earth geophysics in Antarctica, we are happy to cooperate with SCAR in any possible way to promote Antarctic solid earth geophysics on SCAR's request.

URSI

IAGA and URSI now have five joint working groups. Two of these, "The Auroral Oval and its Extension into Space" and "Physics of the Plasma Pause" were approved by IAGA at Kyoto. At the time of the COSPAR meeting in São Paulo, Brazil, a Memorandum of Agreement on "Joint IUGG-URSI Activity with Respect to the Upper Atmosphere" dated 24 June 1974 was signed by five IAGA officials, five URSI officials, one SCOSTEP offical, and one IAMAP official. This memorandum which is copied below was approved by the IAGA Executive Committee at its recent meeting in the Soviet Union.

MEMORANDUM OF AGREEMENT ON JOINT IUGG-URSI ACTIVITY WITH RESPECT TO THE UPPER ATMOSPHERE

June 24, 1974

São Paulo, Brazil

1. IUGG and URSI have already agreed to the formation of joint IAGA/URSI Joint Working Groups on areas of common interest. This memorandum sets out the nature of the agreements reached to date with respect to the upper atmosphere. The effective date of these actions will be August 15, 1974.
2. IAGA Division 2, Topic 1 on "Structure, composition and dynamical processes of neutral and ionized constituents" will be combined with URSI Commission 3 , Working Group 3.2, on "E and F region dynamics--observations and theories" to form a new Joint IAGA/URSI Working Group on the "Structure and Dynamics of the Thermosphere, Ionosphere and Exosphere." URSI Subgroups 3.2.1 on "Drift observations" and 3.2.2 on "Travelling ionosphere disturbances" will continue as Subgroups of the new Joint Working Group.
3. IAGA Division 2, Topic 2 on "Solar fluxes and photochemistry of ionized and neutral constituents, including excited species" will be combined with URSI Commission 3, Working Group 3.5 on "Production and loss of ionization (including flare effects)" to form a new Joint IAGA-URSI Working Group on "Neutral and Ion Chemistry and Solar Fluxes."

4. IAGA Division 2, Topic 6 on "Upper atmosphere--lower atmosphere interactions" will be combined with URSI Commission 3, Working Group 3.3 on "Ionosphere-mesosphere studies involving absorption and other radio techniques" to form a new Joint IAGA/URSI Working Group on "Stratosphere-Mesosphere-Ionosphere Interactions." URSI Subgroup 3.3.1 on "Absorption measurements" will continue as a Subgroup of the new Joint Working Group.
5. The new IAGA/URSI Joint Working Groups described above will replace the corresponding Working Groups in the URSI Commission 3 list of Working Groups (in Commission 3 Report No. 74-1) and their titles will replace those of the corresponding topics in the IAGA Division 2 "List of Topics and Reporters."
6. The officers of the new Joint IAGA/URSI Working Groups will be comprised of essentially equal representation from IAGA and URSI scientists. A list of officers prepared by the Chairmen of IAGA Division 2 and URSI Commission 3 is attached and will become effective on acceptance of the individuals nominated.
7. Since IAGA and IAMAP are now establishing an "IAGA/IAMAP Joint Committee", IAMAP is invited to participate in the IAGA/URSI Working Groups referred to in Articles 3 and 4.
8. SCOSTEP agrees to assign responsibility to its program on "Energetics, dynamics and structure of the thermosphere" to the new IAGA/URSI Working Group on "Structure and Dynamics of the Thermosphere, Ionosphere and Exosphere."
9. SCOSTEP agrees to assign responsibility for its program on "Neutral and ion chemistry" to the new IAGA/URSI Joint Working Group on "Neutral and Ion Chemistry and Solar Fluxes."
10. SCOSTEP agrees that the officers of the Joint IAGA/URSI Working Groups referred to in Articles 8 and 9 are appointed members ex officio of the Atmospheric Physics Programmes Steering Committee of SCOSTEP.

/s/ V. Troitskaya* President, IAGA	/s/S.A. Bowhill+ Chairman, URSI Com. 3 Chairman, APP Steering Committee SCOSTEP	/s/ F.S. Johnson President, SCOSTEP	/s/ J.B. Gregory For President. IAMAP
/s/ J. Roederer* Vice Pres., IAGA	/s/ J.W. King+ Vice Chairman, URSI Com. 3		

/s/ B.A. Tinsley Chairman, IAGA Div. 2	/s/ H. Kohl Chairman, URSI W.G. 3.2
/s/ G. Kockarts Reporter, IAGA Div. 2	/s/ C.F. Sechrist Chairman, URSI W.G. 3.3
/s/ T. Tohmatsu Reporter, IAGA Div. 2	/s/ L. Thomas Chairman, URSI W.G. 3.5

* Subject to ratification by IAGA Executive Committee in August 1974. Signatories will be notified only if ratification is withheld.

+ Subject to ratification by URSI Board of Officers in July 1974. Signatories will be notified only if ratification is withheld.

Although there are now five IAGA-URSI Working Groups in being, the rules governing each working group have not yet been formally adopted. Draft rules have been drawn up however and they will be submitted to IUGG and URSI General Assemblies in 1975 for action. A copy of the draft rules is reproduced below:

RULES FOR INTER-UNION WORKING GROUPS FORMED BY IUGG(IAGA) AND URSI

In these Rules, the term Working Group refers to an Inter-Union Working Group of IUGG(IAGA) and URSI.

1. Proposals

1.1 The Chairman of an URSI Commission submits a proposal for a Working Group to the Secretary General of URSI who will then ask the URSI Board of Officers and the Secretary of IAGA for their comments on, or approval of, the proposal.

1.2 The Chairman of an IAGA Division submits a proposal for a Working Group to the Secretary of IAGA who will then ask the Executive Committee of IAGA and the Secretary General of URSI for their comments on, or approval of, the proposal.

2. Membership

2.1 When the formation of a Working Group has been approved by the URSI Board of Officers and the IAGA Executive Committee, the Chairmen of the URSI Commission and of the IAGA Division concerned will jointly agree on the membership of the Working Group, in consultation with the Chairman of the Working Group whom they will designate jointly.

2.2 The members will not be appointed by, or regarded as representatives of, URSI or IAGA. In order to minimize the cost of maintaining effective contacts between the members, and also to make it easier to arrange meetings, the membership of a Working Group shall normally be limited to 6-8 persons.

3. Activities

3.1 Working Groups shall normally work by correspondence. Meetings may be convened, if this can be arranged at minimal cost, during meetings of other bodies at which some or all of the members are expected to be present. At the discretion of the Chairman, a meeting may be opened to non-members who wish to attend.

3.2 The Chairman of a Working Group must prepare Progress Reports for submission to the General Assembly of URSI and the Scientific Assembly of IAGA. Either Assembly may recommend the withdrawal of its support for a Working Group or the termination of a Working Group, after consultataion with the other Union.

3.3 The Chairman of a Working Group must maintain contact, as necessary, with the Chairmen of the appropriate USRI Commission and IAGA Division.

3.4 The Secretary of IAGA will keep the Secretary General of IUGG fully informed about proposals for the formation of Working Groups, the memberships of the Groups and the progress made in attaining their objectives.

4. Finances

Expenses incurred by a Working Group shall be shared equally by URSI and IAGA. Expenditure shall be limited either to items approved in ad-

vance by both URSI and IAGA, or to the amount of any grant provided jointly by those two bodies and designed to cover all expenditure during a stated period of time.

Following the establishment of the five IAGA/URSI Working Groups discussed above, there has been a fairly lively coorespondence in which a few scientists have expressed opposition to so many joint working groups. It is gratifying to note that in every case where this has occurred, URSI officials have stoutly defended the need for such working groups. I quote below from one such letter from Henry G. Booker to W.J.G. Benynon, president of URSI:

"...the post-sputnik era has created a new situation. Whereas international leadership in ionospheric and magnetospheric physics had previously been largely exercised de facto by URSI, during the post-sputnik era three or four international organizations have been trying to do so, and this has led to undesirable overlapping of activities and to inexcusable duplication of meetings. Suggestions were made at an early stage for dealing with this situation, but only limited success has been achieved.

"Although the consequent confusion affected only a minority of URSI, nevertheless the Union as an organization became deeply involved in the jurisdicitional dispute. According to my understanding, the majority of URSI is now tired of seeing its Union sidetracked by these arguments, and intends to ensure that URSI rededicates itself to the telecommunications and remote sensing science that is its prime responsibility.

"URSI is interested in all aspects of electromagnetic theory, electromagnetic measurements and electromagnetic observations. In particular, URSI is interested in electromagnetic wave phenomena in ionized media anywhere in the universe. The Earth's ionized environment is, of course, particularly important in practice. URSI needs to understand relevant properties of the Earth's ionized environment without denying IAGA's responsibility for the geophysics of the ionosphere and magnetosphere. In association with remote sensing techniques, URSI has contributions to make to the geophysics of the ionosphere and magnetosphere, and should

make them without denying IAGA's responsibility for the geophysics of the upper atmosphere. Conversely, IAGA should recognize that URSI has a prime responsibility to handle electromagnetic wave phenomena everywhere, and is the international scientific organization charged with so doing.

"Contact between URSI and IAGA is required for three reasons:

(a) URSI needs to keep abreast of all relevant developments in the geophysics of the upper atmosphere.

(b) Via remote sensing techniques, URSI has contributions to make to the geophysics of the upper atmosphere.

(c) There are upper atmospheric geophysicists in URSI who have so far had little contact with IAGA and who need to be brought into the IAGA orbit.

"The current approach to contact between URSI and IAGA is through the novel mechanism of Inter-Union Working Groups. Why this is superior to the traditional approach of the Inter-Union Commission is unclear. We seem to be reinventing in a clumsy way a version of the Mixed Commission on the Ionosphere that was abolished about a decade ago. Nevertheless if the new concept of Inter-Union Working Groups serves a legimate purpose, let it do so. But let it not be used in any way to prolong confusion about the respective responsibilities of URSI and IAGA."

COSPAR

The XVIIth COSPAR Meeting and related events were held in São Paulo, Brazil, in June-July 1974. Some excerpts from a report received from A. Niemirowicz, executive secretary of COSPAR, are given below:

"The total number of scientific papers presented during the Open Meetings of COSPAR Working Groups and the specialized activities was about 230.

Publication of Proceedings

"Four volumes will be published containing the results of the XVIIth Meeting of COSPAR and related activities:

- A separate volume with the Proceedings of the Seminar on Space Applications of Direct Interest to Developing Countries; this will be

combined with a resumé of the Workshop on the same subject. The volume is to appear by the end of August - beginning of September 1974; it will be published for COSPAR by the Brazilian Space Research Institute (INPE).

- A separate column with Proceedings of the Symposium on Satellite Dynamics, to be published by Springer-Verlag, Berlin, FRG; scientific editor is Prof. G.E.O. Giacaglia (Brazil); it should appear in late fall 1974.
- Space Research XV including papers presented at Open Meetings of COSPAR Working Groups on Physical Sciences; the scientific editor is Dr. M.J. Rycroft (U.K.).
- Life Sciences and Space Research XIII with papers presented at the Open Meetings of COSPAR Working Group 5 on Space Biology; scientific Editor is Dr. P.H.A. Sneath (U.K.).

"The latter two volumes will once again be published by Akademie-Verlag, Berlin, GDR; they should appear about mid-1975. The Executive Editor for the above volumes is Dr. A.C. Strickland (U.K.)."

International Symposium on Solar Terrestrial Physics

"During the week of 17-22 June, the International Solar-Terrestrial Physics Symposium, sponsored by COSPAR, IAU, IUGG, IUPAP, URSI and SCOSTEP was held in the Anhembi Palace. The main topics of interest in the Symposium Program were: Atmospheric Physics; Interplanetary Medium; Solar Topics; Magnetosphere; Quiet Magnetosphere; Flare Build-up Study, and CINOF."

Location of 1975, 1976, and 1977 COSPAR Meetings

"In 1973, the invitation from the Israeli Academy of Sciences and Humanities to hold the XVIIIth COSPAR Meeting in Israel was accepted. During the 1974 Meeting, with the agreement of this Academy and the approval of the Plenary, the locations of the 1975 and 1977 Meetings were interchanged, i.e. the 1975 Meeting of COSPAR will take place in Golden Sands, near Varna, Bulgaria, and the 1977 Meeting will be held in Israel.

"In regard to the location of the 1976 Meeting, three invitations were submitted: from India, USA and Canada. By secret ballot, the Plenary chose the USA as the location of the 1976 COSPAR Meeting."

Scientific Program for the 1975 COSPAR Meeting

"The provisional schedule for the 1975 program, in conjunction with the Meeting in Bulgaria (29 May - 7 June 1975) is the following:

Symposia, Colloquia, Workshop

- COSPAR/IAU Symposium on Fast Transients in X- and Gamma-Rays, Golden Sands, Bulgaria.
- COSPAR Symposium on Results from Coordinated Upper Atmosphere Measurements Programs, to be followed by a one-day Workshop for discussing plans for future programs of this type, Golden Sands, Bulgaria.
- COSPAR/WMO/IAMAP Symposium on Meteorological Satellites and Meteorological Observations from Space, Golden Sands, Bulgaria, or Vienna, Austria, immediately before the 1975 COSPAR Meeting.

- SCOSTEP/COSPAR Colloquium on the Study of Travelling Interplanetary Phenomena, Golden Sands, Bulgaria. (Tentatively approved, pending official proposal from SCOSTEP).
- COSPAR/IUPS Symposium on Gravitational Biology, Golden Sands, Bulgaria.
- XVIIIth Plenary Meeting of COSPAR, including Open Meetings of Working Groups and Panels on the following proposed topics:
  - Working Group 1 on Tracking, Telemetry and Dynamics of Satellites
    --Satellite Altimetry Techniques and Applications to Oceanography (joint with W.G. 6)
    --Upper Atmosphere Research using Satellite Tracking and Drag Observations (joint with W.G. 4)
    --New Satellites Useful for Geodynamics (such as Timation III, Starlette, GEOS-C, Castor, Lageos).
  - Working Group 2 on the Experiments in Interplanetary Space and in the Magnetosphere
    --Active Experiments (possibly joint with Panels 4.B and 4.C)
    --Latest Significant Results.
  - Working Group 3 on Space Techniques as Applied to Astrophysical Problems
    --Latest Significant Results of Astrophysical Measurements

--Particle Storage and Propagation in the Solar Corona
--Flare Forecasting
--Inter-relations of the Sun and Solar Dust
--Latest Results on Cosmic Dust

- Working Group 4 on Experiments in the Upper Atmosphere
--Minor Constituents in the Stratosphere and Thermosphere
--Latest Significant Results

- Working Group 5 on Space Biology
--Flight Experiments
--HZE Particles
--Heavy Ion Dosimetry and Geological Effects and Biological Effects
--Prebiotic Chemistry and Molecular Evolution

--Simulation Experiments
--Biology of Extreme Conditions
--Quarantine Sterilization, Contamination and Containment

- Working Group 6 on Application of Space Research to Meteorology and Earth Surveys
--Utilization of Rocket and Satellite Data for Stratospheric and Mesospheric Research
--Latest Results in Meteorology and Earth Surveys

- Working Group 7 on Space-Related Studies of the Moon and Planets
--Analysis of Lunar and Planetary Missions (Pioneers 10 and 11, Mars 5 and 6, Luna 22, Mariner 10)
--Invited Review on Recent Results on the Chemistry and Physics of the Moon."

Resolutions and Recommendations

"Decision No. 4 proposed by the Executive Council on a proposal from Working Group 3

COSPAR,

noting that for the coming years of solar maximum several initiatives have been made for coordinated observations of solar activity, and

recognizing the importance of the flare build-up processes on the Sun and the substantial contribution for the study of them which can be derived from space observations,
encourages responsible agencies to provide solar maximum spacecraft with experiments that can significantly contribute to the study of energy accumulation processes on the Sun.

Decision No. 5 proposed by the Executive Council on a proposal from Working Group 4
COSPAR,
noting the importance of coordinated upper atmosphere measurement progams in providing simultaneous data on all atmospheric properties which are necessary for a complete undertanding of the structure of the neutral and ionized atmosphere,

calls the attention of SCOSTEP, IAGA, URSI, and national bodies involved in planning space activities to the importance of continuing such comprehensive measurement programs.

Decision No. 6 proposed by the Executive Council on a proposal from Working Group 4
COSPAR,
noting the apparent asymmetry between the northern and southern hemispheres in the statosphere, mesosphere, thermosphere, and exosphere,
recommends that SCAR, SCOSTEP, IAGA, URSI, and national bodies involved in planning space activities develop comprehensive measurement programs to define the differences and the reasons for them.

Decision No. 7 proposed by the Executive Council on a proposal from Working Group 4
COSPAR,
noting the lack of data on ion composition at altitudes of 100-200 km at solar zenith angles less than 50°and during nighttime quiet conditions and
noting the difficulty that results for the creation of empirical models such as the International Reference Ionosphere and the understanding of

photochemistry and nighttime ionization,
recommends a concentrated effort by rocket research groups to make the appropriate measurements in the next two years.

Decision No. 8 proposed by the Executive Council on a proposal from Wroking Group 4
COSPAR,
noting that the reorganization of IAGA has taken place in September 1973* and
noting the Memorandum of Agreement signed by representatives of IAGA, URSI, and SCOSTEP on June 24, 1974, on "Joint IUGG/URSI Activity with Respect to the Upper Atmosphere",
supports the three new Joint IAGA-URSI Working Groups described in the Memorandum and

* Decision No. 4 of the 1973 COSPAR Meeting

expresses the interest of COSPAR in having representation on these Joint Working Groups.

Decision No. 9 proposed by the Executive Council on a combined proposal from Working Group 4 and the Advisory Committee on Data Problems and Publications
COSPAR,
noting that many papers scheduled for the 1974 open meetings were not presented, and
noting the disruption of the scientific program which resulted,
determines that in the future only those papers (both invited and contributed) will be accepted for presentation which have been submitted through and approved by the National Committees,
urges all national committees to make every effort to ensure the presence of the author or an immediate colleague at the COSPAR meeting to present and discuss his paper, and

* For details, see Annex.

instructs the Secretariat to compile statistics on the papers accepted and presented and to transmit these to the national committees.

Decision No. 10 proposed by the Executive Council on a proposal from Working Group 6

COSPAR,

recognizing the importance of stratospheric warmings during northern winters, and

noting the importance of combining data from many sources for reliable large-scale observations, including satellites which provide high-resolution vertical temperature profiles of the stratosphere,

recommends the establishment of an internationally coordinated intensive data-gathering campaign for the period December 1974 to 14 February 1975** and

requests the WMO to attempt to obtain stratospheric altitudes for balloon soundings, and to coordinate these with the rocket launchings.

Decision No. 11 proposed by the Executive Council on a proposal from the Chairman of the Ad Hoc Advisory Party on Developing Countries

COSPAR

accepts the recommendations of the Advisory Party on matters pertaining to space research applications in developing countries, and

decides to undertake, through the appropriate Working Group, the preparation of manuals and/or informative material on the possibilities of development through space technology, and to distribute this material to the appropriate bodies in developing countries, including non-members of COSPAR, and further

decides that in the future, Workshops, Seminars and meetings on space application for development will be organized primarily on a regional basis, and that the respective Organizing Committees will include two representatives of the appropriate Working Group and four representatives from developing countries, and

recommends that international training centers on different aspects of space technology applications be established on the basis of already existing facilities.

Annex to Decision No. 10

During this period, nations launching rocket sondes should do so as usual until a warming begins; then, efforts should be made to launch three, or more if possible, rockets per week - Wednesday should continue to be the prime launch day with Mondays and Fridays in addition. For those nations not scheduling regular network operations, the recommended period December 1974 - February 1975 should be considered as a prime experimental period, with at least one sounding a week on Wednesdays. After a warming, the effort should be increased to three, if possible.

SCOSTEP

As a result of the election concluded in June 1974, the following were installed as new President and Vice President of SCOSTEP at a meeting of SCOSTEP in São Paulo, Brazil, 19 June 1974.

President:	Dr. Francis S. Johnson Executive Director Center for Advanced Studies University of Texas at Dallas P.O. Box 688 Richardson, Texas 75080 USA
Vice President:	Dr. Joseph W. King Appleton Laboratory Ditton Park Slough, Bucks., SL3 9JX England

They will serve for a term of three years (until mid 1977), subject to extension or reelection.

Members of the component parts of SCOSTEP are given below:

1. Bureau

President:	F. S. Johnson (USA)
Vice President:	J. W. King (U.K.)
Union Representatives:	W.J.G. Beynon (URSI) (U.K.)
	J. G. Roederer (IUGG) (USA)
	R. J. Murgatroyd (IUGG) (U.K.)
	Z. Svestka(IAU) (FRG)
	B. Peters (IUPAP) (Denmark)
	N. V. Pushkov (COSPAR) (USSR)

Scientific Secretary: E. R. Dyer (USA)

2. Scientific Discipline Representatives (designated by the SCOSTEP Bureau in consultation with the Unions and COSPAR)

S.A. Bowhill (USA)	T. Obayashi (Japan)
M. Dryer (USA)	B.A. Tinsley (USA)
H. Friedman (USA)	V.A. Troitskaya (USSR)
R. Gendrin (France)	J.P. Wild (Australia)
J.B. Gregory (Canada)	*K.D. Cole (Australia)
B. Hultqvist (Sweden)	*F.L. Scarf (USA)
C. de Jager (Netherlands)	*D.J. Williams (USA)
E.R. Mustel (USSR)	

* Have been nominated to fill the three vacancies which exist.

3. Data Centre Representatives

WDC-A:	A.H. Shapley	(USA)
WDC-B:		
WDC-C:	T. Nagata	(Japan)

4. Representatives of International Organizations

SCAR:	T. Nagata	(Japan)
IUWDS:	P. Simon	(France)
SBARMO	H. Trefell	(Norway)
WMO:	W.L. Godson	(Canada)

5. Administrative Members

	D.C. Martin	(U. K.)
	H. Odishaw	(USA)

Steering Committees

The International Magnetospheric Study (IMS)

Chairman:	J.G. Roederer (SCOSTEP) (USA)
Members:	J. Ortner (COSPAR) (France)
	Ch.-U. Wagner (COSPAR) (GDR)
	I.A. Zhulin (COSPAR) (USSR)
	J.M. Wilcox (IAU) (USA)

	J.W. King (URSI) (U.K.)
	J.J. Quenby (IUPAP) (U.K.)
	G. Rostoker (IUGG) (Canada)
Ex-Officio:	M. Sugiura (Satellite Situation Center)(USA)
Liaison Representatives of	
Space Research Organizations:	G. Haerendel (Max-Planck-Inst.) (FRG)
	T. Obayashi (Science Council of Japan)(Japan)
	D.E. Page (ESRO) (Netherlands)
	E.R. Schmerling (NASA) (USA)
	(to be appointed)(IKI/Intercosmos) (USSR)
	(Other appointments have been invited)
Scientific Consultants:	R. Gendrin (France)
(Members of SCOSTEP)	B. Hultqvist (Sweden)
	V.A. Troitskaya (USSR)

Solar and Interplanetary Programs (SIP)

Chairman:	*C. de Jager (COSTEP/IAU/COSPAR) (Netherlands)
	*Z. Svestka (SCOSTEP/IAU/COSPAR) (FRG)
	*M. Dryer (IAU/IAGA) (USA)
	*T. Obayashi (IAGA/COSPAR) (Japan)
	M. Pick (IAU) (France)
	U.R. Rao (IAU) (India)
	*P. Simon (IAU/IUWDS) (France)
	*J.M. Wilcox (IAU) (USA)
	J.P. Wild (IAU) (Australia)

* Study or Project leaders

Atmospheric Physics Programs (APP)

Chairman:	*S.A. Bowhill (SCOSTEP/URSI/COSPAR)(USA)
Members:	L.A. Alendrov (COSPAR) (USSR)
	P. Bauer (URSI)(France)
	J.B. Gregrory (IAGA/IAMAP) (Canada)
	H. Kohl (URSI((FRG)
	M. Tepper (COSPAR)(USA)

	L. Thomas (URSI)(U.K.)
	T. Tohmatsu (IAGA) (JAPAN)
Ex-Officio:	*E.R. Mustel (SCOSTEP)USSR)
	*S.M. Radicella (SHISG)(Argentina)
Scientific Consultants: (Members of SCOSTEP)	B. Hultqvist (Sweden)
	B.A. Tinsley (USA)

* Study or Project leaders.

Monitoring the Sun-Earth Environment (MONSEE)

Members appointed by each ICSU body.

Chairman:	A.H. Shapley (SCOSTEP) (USA)
Vice Chairman:	*N.V. Pushkov (SCOSTEP) (USSR)
Secretary:	*M.A. Shea (IUPAP) (USA)
Members:	F.W. Jäger (IAU-optical)(GDR)
	W.R. Piggott (URSI)(U.K.)
	P. Simon (IUWDS) (France)
	H. Tanaka (IAU-radio)(Japan)
	D. van Sabben (IUGG/IAGA)(Netherlands)
	J.I. Vette (COSPAR)(USA)
Ex-Officio:	A.H. Shapley (WDC-A)(USA)
	(to be appointed)(WDC-B)(USSR)
	T. Nagata (WDC-C)(Japan)

* Conveners of Panels under MONSEE

IAGA MAILING LIST

J AARONS
AFCRL
L G HANSCOM FIELD
BEDFORD MA 07130

M ABDALLA ASHOUR
CNET GRI
92131 ISSY LES MOULINEAUX
FRANCE

W G ABEL
THE MITRE CORPORATION
P O BOX 208
BEDFORD MA 01730

W C ACKERMANN
P O BOX 232
URBANA IL 61801

A ADAM
GEOPHYS RES LAB OF HUNGARIA
P O BOX 9
SOPRON HUNGARY

R ADLER
DEPT OF SURVEYS
MINISTRY OF LABOUR
P O BOX 14171
TEL AVIA ISRAEL

H K AFSHAR
INST OF GEOPHYSICS
TEHRAN UNIV
AMIRABAD TEHRAN
IRAN

P C AGAWAL
TATA INST FUNDAMENTAL RES
COLABA BOMBAY 5
INDIA

C AGUIRRE
INST DE INVEST FISICAS
UNI MAYOR DE SAN ANDRES
LA PAZ BOLIVA

H S AHLUWALIA
DEPT OF PHYSICS AND AERO
UNI OF NEW MEXICO
ALBUQUERQUE N MEX 87232

K AIKYO
RADIO RES LABS
KOGANEI TOKYO 184
JAPAN

S I AKASOFU
GEOPHYSICAL INSTITUTE
UNIV OF ALASKA
COLLEGE AK 99735

W N ABBOTT
MICHALACOPOYLOU ILISIA
42 LEOPHOROS A
ATHENS 612 GREECE

M A ABDU
INST DE PESQUISAS ESPACIAIS
SAO JOSE DOS CAMPOS
BRAZIL

M ACKERMAN
INST FOR AERONOMY
3 AVE CIRCULAIRE
2280 BRUSSELS BELGIUM

S ADACHI
ELEC ENGINEERING
TOHOKU UNIVERSITY
SENDAI 980 JAPAN

J M ADE HALL
DEPT OF GEOLOGY
DALHOUSIE UNI
HALIFAX NOVA SCOTIA

E AERTS
INST FOR AERONOMY
3 AVENUE CIRCULAIRE
2280 BRUSSELS BELGIUM

V AGASHE
PHYSICS DEPT
UNIVERSITY OF POONA
POONA 7 INDIA

T L AGGSON
NASA
GSFC CODE 645
GREENBELT MD 20770

P AH HEE
OBS DE TANANARIVE
BP 3843
MALAGASY REPUBLIC
TANANARIVE

A C AIKEN
GODDARD SPACE FLIGHT CTR
GREENBELT MD 20772

M J AITKEN
ARCHAEOLOGICAL LAB
OXFORD UNIVERSITY
OXFORD LONDON ENGLAND

D ALCAYDE
CESR BP 4057
31 TOULOUSE FRANCE

L T ALDRICH
5241 BROAD BRANCH RD NW
WASHINGTON D C 20015

H ALFVEN
ROYAL INST OF TECH
STOCKHOLM SWEDEN

C W ALLEN
UNIV LONDON OBSERVATORY
LONDON NW7
ENGLAND

R R ALLEN
SPACE DEPT R A E
FARNBOROUGH HANTS
ENGLAND

G M ALLCOCK
PHYSICS + ENGR LAB
PRIVATE BAG LOWER HUTT
NEW ZEALAND

L R ALLDREDGE
USGS NOAA R10
BOULDER CO 80302

J H ALLEN
NOAA EDS D64
BOULDER CO 80302

O C ALLKOFER
UNIVERSITAT KIEL
OLSHAUSENSTRASSE 40 60
FED REP OF GERMANY

C W ANDERSON
BELL LABORATOREIS
ROOM 2C 234
WHIPPANY N J 07981

H R ANDERSON
RICE UNIVERSITY
P O BOX 1892
HOUSTON TX 77006

J G ANDERSON
UNIV OF PITTSBURGH
205 SRRC BLVD
PITTSBURGH PA 15260

K ANDERSON
METEOROLOGISK INSTITUT
GAMLEHAVE ALLE 22
CHARLOTTENLUND DENMARK

K A ANDERSON
DEPT OF PHYSICS
UNI OF CALIF AT BERKELEY
BERKELEY CA 94720

M K ANDREWS
PHYSICS AND ENG LAB
PRIVATE BAG LOWER HUTT
NEW ZEALAND

G ANGENHEISTER
UNIVERSITAT MUCHEN
RICHARD WAGNER STRASSE 10
9 MUCHEN 2
GERMANY (FD)

D C ANGER
PHYSICS DEPT
UNIVERSITY OF CALGARY
CALGARY ALBERTA CANADA

A E ANTONOVA
INST OF NUCLEAR PHYSICS
MOSCOW STATE UNIVERSITY
MOSCOW USSR

S SANZ ARANGUEZ
LAGASCA 26
MADRID L SPAIN

C R ARGENT
6 CORNWALL TERRACE
REGENTS PARK
LONDON N 88 1 ENGLAND

J C ARMSTRONG
JOHNS HOPKINS UNIV
APL
SILVER SPING MD 20910

T P ARMSTRONG
DEPT OF PHYSICS
UNIVERSITY OF KANSAS
LAWRENCE KA 66044

R L ARNOLDY
SPACE SCINECE CENTER
UNI OF NEW HAMPSHIRE
DURHAM N H 03824

A A ASHOUR
FACULTY OF SCIENCE
CAIRO UNIVERSITY
CAIRO EGYPT

T ASO
IONOSPHERE RES LAB
KYOTO UNIVERSITY
UJI 622 KYOTO JAPAN

K ASTROM
DIV OF GEOCOSMIC PHYSICS
UNIV OF UPPSALA BOX 516
S 75120 UPPSALA SWEDEN

R N ATHAVALE
TAT INST OF FUNDAMENTAL RES
CALABA BOMBAY 5
INDIA

G ATKINSON
COMM RES CTR SHIRLEY BAY
P O BOX 490 STATION A
OTTAWA ONTARIO
K1N 8T5 CANADA

7 AUBERT
CNES
129 RUE DE LUNIVERSITE
75007 PARIS FRANCE

W I AXFORD
MAX PLANCK INST AERONOMIE
D3411 LINDAU HARZ
GERMAN FED REP

P B BABDJANOV
MOLODEZHNAYA 3
MOSCOW 8-296 USSR

M P BACHYNSKI
DEPT OF APP PHYSICS
INFORMATION SCIENCES
UNI OF CALIF SAN DIEGO
LA JOLLA CA 92037

DR W.J. BAGGALEY
DEPT OF PHYSICS
UNIV. OF CANTERBURY
CHRISTCHURCH 1, NEW ZEALAND

DR BAGGE
INST REINE + ANGEWANDTE
KERNPHY CHRISTIAN ALBRECHTS UNIV
OLSHAUSENSTR 40/60
D 23 KIEL GERMAN FED REP

D K BAILEY
ITSA/NOAA
BOULDER CO 80302

D J BAKER
RCA RESEARCH LABS
STE ANNE DE BELLEVUE
P G CANADA

D J BAKER
CTR FOR RES IN AERONOMY
UTAH STATE UNIVERSITY
LOGAN UTAH 84322

V N BALABANOVA
HYDROMETEOROL SERVICE
12 PAVLIK MOROZOV ST
MOSCOW USSR

K G BALMAIN
DEPT OF ELECTRICAL ENGR
UNIV OF TORONTO
TORONTO 5
ONTARIO CANADA

H BALSIGER
PHYSIKALISCHES INSTITUT
SIDLERSTRASSE 5
2013 BERN SWITZERLAND

B BALSLEY
ESSA RESEARCH LABORATORIES
BOULDER CO 80302

S J BAME
SPACE PHYSICS GROUP
LOS ALAMOS SCIENTIFIC LAB
LOS ALAMOS N M 87544

S K BANERJEE
DEPT OF GEOL AND GEOPHY
UNIV OF MINNESOTA
MINNEAPOLIS MN 55455

P M BANKS
UNI OF CALIF SAN DIEGO
LA JOLLA CA 92037

R J BANKS
DEPT OF ENVIRON SCS
BAILRIGG LANCASTER
ENGLAND

J BARAT
SERV D≠AERONOMIE 91370
VERRIERES LEBUISSON
FRANCE

M BARBETTI
DEPT OF GEOPHYS + GEOCHEM
AUSTRALIAN NATIONAL UNI
P O BOX 4
CANBERRA A C T AUSTRALIA

J BARCUS
UNIV OF DENVER
DENVER CO 80210

J N BARFIELD
NOAA CODE D64
BOULDER CO 80302

AARON BARNES
AMES RESEARCH CENTER
MAIL STOP N203 9
MOFFETT FIELD CA 94035

D R BARRACLOUGH
INST OF GEOLOGICAL SCS
HERSTMONCEUX CASTLE
HALISHAM SUSSEX
UNITED KINGDOM

R E BARRINGTON
COMM RES CENTRE
P O BOX 490STATION A
OTTAWA ONTARIO
K1N 8T5 CANADA

M J BARON
STANFORD RES INST
MENLO PARK CA 94025

C H BARROW
DEPT OF PHYSICS
UNIV OF THE WEST INDIES
KINGSTON 7
JAMAICA WEST INDIES

H G BARSCZUS
CENTRE DE GEOPHYSIQUE
DE M BOUR
B P 50 M BOUR
REPUBLIQUE DU SENEGAL

G BARTA
INSTITUTE GEOPHYSIQUE
EOTVOS LORAND
DAMJANICH U 28 B
BUDAPEST HUNGARY

C A BARTH
SPACE SCIENCE BUILDING
UNIVERSITY OF COLORADO
BOULDER CO 80

S BASU
UNI OF CALCUTTA
CALCUTTA 700009 INDIA

H F BATES
UNIV OF ALASKA
P O BOX 938
COLLEGE AK 99701

P BAUER
CNET RSR
3 AVE DE LA REPUBLIQUE
92131 ISSY LES MOULINEAUX
FRANCE

S J BAUER
NASA GSFC
CODE 620
GREENBELT MD 20

D B BEARD
DEPT OF PHYS AND ASTRO
UNI OF KANSAA
LAWRENCE KA 66345

FRIEDRICH BEGEMANN
MAX PLANCK INST FUR CHEMIE
SAARSTRASSE 23
6500 MAINZ GERMAN FED REP

K W BEHANNON
GSFC
CODE 692
GREENBELT MD 20771

J C BEHRENDT
USGS
OFFICE OF MARINE GEOLOGY
WOODS HOLE MA 02543

DR. ART BELMONT
RES DIV
CONTROL DATA CORP
P O BOX 1249
MINNEAPOLIS MINN 55440

A E BELON
GEOPHYSICAL INST
UNIV OF ALASKA
COLLEGE AK 99701

V V BELOUSSOV
SOVIET GEOPHYS COMMITTEE
MOLODEZHNAYA 3
MOSCOW B 296 USSR

J S BELROSE
COMM RES CENTRE
P O BX 490 STATION A
OTTAWA ONTARIO
KIN 8T5 CANADA

E A BENEDIKTOV
RADIOPHYSICAL RES INST
GORKI USSR

W BENESCH
INST OF MOL PHYSICS
UNI OF MARYLAND
COLLEGE PARK MD 20742

N P BENKOVA
IZMIRAN
VATUTENKI MOSCOW
USSR

M BERCOVITCH
NATIONAL RESEARCH COUNCIL
100 SUSSEX DRIVE
OTTAWA ONTARIO
CANADA KA OR6

M N BERDITSHEVSKY
V N II GEOFIZIKA LENINGRADSKII
UNIVERSITET UM JDANOVA
LENINGRAD USSR

T BERKEY
THE AURORAL OBSERVATORY
TROMOSO NORWAY

W W BERNING
DEFENCE NUCLEAR AGENCY
WASHINGTON D C 20305

J J BERTHELIER
GRI
4 AVE DE NEPTUNE
94100 ST MAUR FRANCE

W J G BEYNON C B E
DEPARTMENT OF PHYSICS
UNIVERSITY COLLEGE OF WALES
ABERYSTWYTH WALES

R V BHONSLE
PHYSICAL RES LAB
AHMEDABAD 38009
INDIA

F BIONDI
DEPT OF PHYSICS
UNIVERSITY OF PITTSBURGH
PITTSBURGH PA 15213

D E BLACKWELL
DEPT OF ASTROPHYSICS
UNIVERSITY OBSERVATORY
OXFORD ENGLAND

J E BLAMONT
CNES
129 RUE DE L UNIVERSITE
75007 PARIS8 FRANCE

B C BLEVIS
DEPT OF COMMUNICATIONS
P O BOX 490 STATION A
OTTAWA ONTARIO
K1N 8T5 CANADA

L P BLOCK
ROYAL INST OF TECH
S1004.4
STOCKHOLM SWEDEN

B R BOHN
INST OF METEROLOGY
BOX 19111 S 10432
STOCKHOLM 19 SWEDEN

F R BOND
ANTARCTIC DIVISION
568 ST KELDA ROAD
MELBOURNE 3000H
VIC AUSTRALIA

R K BERGGREN
METEOROL ANDHYDROGLOG INST
BOX 12108
STOCKHOLM SWEDEN

P BERNARD
INST DE PHYSIQUE DU GLOBE
TOUR 14 9 QUAI
ST BERNARD PARIS 5 FRANCE

J L BERTAUX
SERVICE D AERONOMIE 91730
VERRIERES LE BUISSON
FRANCE

P BERTHIER
SNIA ETAB DE COURBEVOIE
55 RUE VICTOR HUGO
92 COURBEVOIE FRANCE

B N BHARGAVA
COLABA + ALIBAG OBS
COLABA BOMBAY 5
INDIA

L BIERMANN
MAX PLANCK INST PHYSIK + ASTROPHYS
FOHRINGER RING 6
8 MUCHEN 23
GERMAN FED REP

S BISWAS
TATA INST FUNDAMENTAL RES
COLABA BOMBAY5
INDIA

J B BLAKE
AEROSPACE CORP
P O BOX 92957
LOS ANGELES CA 90009

C J BLAND
UNI OF CALGARY
CALGARY ALBERTA
CANADA

D F BLIEL
U S NAVAL ORD LAB
SILVER SPRING MD 20910

V N BOBROV
P/O VATUTENKI
MOSCOVSKAYA OBLAST
MOSCOW USSR

A S BOLJSHAKOV
INST OF PHYSICS OF THE EARTH
GRUZINSKAYA 10
MOSCOW USSR

ALBERTO BONETTI
UNIVERSITA DI FIRENZE
CATTEDRA DI FISICA DELLO SPAZIO
OFFICINE GALILEO VIA CARLO BINI
FLORENCE ITALY

W E BONINI
DEPT OF GEOLO + GEOPHYS SCS
PRINCETON UNIVERSITY
PRINCETON N J 06540

M H P BOTT
DEPT OF EOLOGICAL SCS
UNIVERSITYOF DURHAM
DURHAM ENGLAND

J R BOOKER
UNI OF WASHINGTON
GEOPHYSICS PROGRAM
SEATTLE WA 98105

M BOSSOLASCO
UNI OF GENOVA
P O BOX 3145
16100 GENOVA ITALY

L G A BOSSY
INST ROYAL METEOROLOGIQUE
B 1180 BRUSSELS
BELGIUM

C O BOSTROM
JOHNS HOPKINS UNIVERSITY
8621 GEORGIA AVENUE
SILVER SPRING MD 20

R BOSTROM
INST F PLASMAFYSIK
KUNGL TEKN HOGSKOLAN
STOCKHOLM 70 SWEDEN

S M BOURLATSKAYA
MOSCOW RUTUSOW
USSR

J BOUSKA
CZECH ACA OF SCI
PHARA 4-SPORILOV
BOCNI II/1401 CZECHOSLOVAKIA

S A BOWHILL
DEPT OF ELECT ENGR
UNIVERSITY OF ILLINOIS
URBANA IL 61

K L BOWLES
UNI OF CLAIF AT SAN DIEGO
LA JOLLA CA 92037

R L F BOYD
UNIV COLLEGE OF LONDON
GOWER STREET
LONDON W C 1 ENGLAND

R BOYKOV
BD ANTON IVANOV 1 4
UNIVERSITY OF SOFIA
SOFIA BULGARIA

L G BRACE
CODE 6 21
NASA GSFC
GREENBELT MD 20771

J BRADBURY
LOCKHEED PALO ALTO RES LAB
3 251 HANOVER STREET
PALO ALTO CA 94304

S I BRAGINSKY
INST OF PHYSICS OF THE EARTH
ACADEMY OF SCIENCES
MOSCOW USSR

J C BRANDT
CODE 680
NASA / GSFC
GREENBELT MD 20771

L M BRANSCOMB
JILA
UNIVERSITY OF COLORADO
BOULDER CO 80

G P BRASSEUR
INST D AERONOMIE SPATIALE
1180 BRUSELLS BELGIUM

S BRAVO FLORES
OF METEOROLO DE CHILE
CASILLA 717
SANTIAGO CHILE

A BREKKE
AURORAL OBSERVATORY
P O BOX 953
9001 TROMOSO
NORWAY

A W BREWER
DEPT OF PHYSICS
UNI OF TORONTO
TORONTO 5 CANADA

J BRICARD
UNI DE PARIS
9 QUAI ST BERNARD
PARIS FRANCE

J C BRIDEN
DEPT OF EARTH SCIENCES
LEEDS UNIVERSITY
LEEDS LS 3 9JT
UNITED KINGDOM

HERBERT S BRIDGE
LABORATORY FOR NUCLEAR SCIENCE
DEPT OF PHYSICS
MIT 26/563
CAMBRIDGE MA 02139

R T BRINKMANN
PHYSICS DEPT
UNI SOUTHERN CALIF
LOS ANGELES CA 90007

A L BROADFOOT
KITT PEAK NAT L OBS
950 N CHERRY AVENUE
TUCSON AZ 85719

G M BROWN
UNI COLLEGE OF WALES
PENGLAIS ABERYSTWYTH
WALES

N B BROWN
GEOPHYSICAL INST
UNIV OF ALASKA
FAIRBANKS AK 99701

R R BROWN
PHYSICS DEPT
UNIV OF CALIFORNIA
BERKELEY8 CA 97420

B E BRUNELLI
ACADEMY OF SCS OF USSR
APATITY MURMANSK REGION
184200 USSR

P BRUSTON
LPSP
B P N 10
92 VERRIERES LE BUISSON
FRANCE

D A BRYANT
APPLETON LAB DITTON PARK
SLOUGH SL 3 93X
BUCKS8 ENGLAND

V BUCHA
GEOPHYSICAL INSTITUT
BOCNI II PRAHA 4-SPORILOV
PRAGUE CZECHOSLOVAKIA

H A BUCKMASTER
UNI OF ALBERTA
CALGARY ALBERTA
CANADA

E BUDZINSKI
NATIONAL RESEARCH COUNCIL
OTTAWA ONTARIO
K1A OR6 CANADA

R BUKATA
GRADUATE RES CTR SOUTHWEST
DALLAS TX 75230

H T BULL
UNIVERSITY OF CAMBRIDGE
FREE SCHOOL LANE
CAMBRIDGE ENGLAND

E C BULLARD
MADINGLEY RISE
MADINGLEY ROAD
CAMBRIDGE LONDON ENGLAND

W BULLERWELL
GEOLOGICAL SURVEY OF G B
EXHIBITION ROAD
LONDON S W 7 ENGLAND

K BULLOUGH
THE UNIVERSITY
SHEFFIELD S102 TN
YORKSHIRE ENGLAND

S BUNKHROB
ROYAL THAI SURVEY DEPT
SUPREME DOMMAND HDGTRS
BANGKOK 2 THAILAND

J L BURCH
CODE 646
NASA GSFC
GREENBELT MD 20771

O M BURKARD
METEOROLOGY INST UNIV
GRAZ AUSTRIA

R BURKE
ESRI
VIA GALILEO GALILEI
C0044 FRASCATI ITALY

L F BURLAGA
CODE 69 2
NASA GSFC
GREENBELT MD 20771

S P BURLATSKAYA
ACADEMY OF SCIS USSR
MOSCOW USSR

D S BURNETT
DIVISION OF GEOLOGICAL SCIENCES
CALIFORNIA INST OF TECHNOLOGY
PASADENA CA 91109

D K BURROWS
RADIO AND SPACE RES STATION
DITTON PARK
SLOUGH BUCKS ENGLAND

T BURTSEV
ISMIRAN
LENINSKI
MOSCOW USSR

J BYRNE
NAT COMM GEODESY + GEOPHYS
44 UPPER O CONNEL STREET
DUBLIN IRELAND

L J CAHILL JR
SPACE SCIENCE CENTER
MINNEAPOLIS MN 554

J C CAIN
NASA GSFC
CODE 900
GREENBELT MD 20771

F CAMBOU
CENTRE SPATIALE
118 RT DE NARBONNE
TOULOUSE 31 FRANCE

F CAMBOU
UNIVERSITE PAUL SABATIER
B P 4057
30029 TOULOUSE CEDEX
FRANCE

W H CAMPBELL
USGS NOAA
BOULDER CO 80302

C CANON
INST DE GEOFISICA
TORRE DE CIENCIAS
3ER PISO CIUDAD UNIV
MEXICO 20 D F

J O CARDUS
OBSERVATORIO DEL EBRO
APDO 9
TORTOSA SPAIN

N P CARLETON
HARVARD UNIVERSITY
CAMBRIDGE MA 02140

C M CARMICHAEL
UNI OF WESTERN ONTARIO
LONDON ONTARIO
CANADA

H CARMICHAEL
ATOMIC ENERGY OF CANADA
CHALK RIVER LABS
CHALK RIVER CANADA

R L CAROVILLANO
BOSTON COLLEGE
140 COMMONWEALTH AVENUE
BOSTON MA 021

H C CARLSON JR
UNIV TEXAS AT DALLAS
P O BOX 688
RICHARDSON TX 75080

E H CARMAN
UNI OF PAPUA
P O BOX 4820
UNI P O PORT MORESBY
PAPUA NEW GUINEA

D L CARPENTER
RADIOSCIENCE LAB
STANFORD UNIVERSITY
STANFORD CA 94305

A CARRIGAN
AFCRL PHS
L G HANSCOM FIELD
BEDFORD MA 02730

DAVID C CARTWRIGHT
THEORETICAL DIV
MAIL STOP 228
LOS ALAMOS
N MEX 87544

M CASAVERDE
INST GEOFISICO DEL PERU
APDO 3747
LIMA PERU S A

A W CASTLEMAN
BROCKHAVEN NATL LAB
UPTON L I
NEW YORK 11973

M CATALAN
TENIENTE DE NAVIO
INST Y OBS DE MARINE
SAN FERNANDO CADIZ
SPAIN

D P CAUFFMAN
AEROSPACE CORP
P O BOX 92957
LOS ANGELES CA 90009

Z CEPLECHA
ASTROMONICAL OBS
ONDREJOV-U-PRAHY
CZECHOSLOVAKIA

J W CHAMBERLAIN
R CHABBAL
LAB AIME CONTON
CNRS ORDAY
FRANCE

F H CHAMALAUN
FINDERS UNIVERSITY SA
BEDFORD PARK
5042 SOUTH AUSTRALIA

J W CHAMBERLAIN
LUNAR CSC INSTITUTE
3303 NASA ROAD 1
HOUSTON TX 77058

K S W CHAMPION
6 ROLFE ROAD
LEXINGTON MA 02173

S H CHAN
DEPT OF GEOLOGY
UNIVERSITY OF MALAYA
KUALE LUMPUR 2211
MALAYA

S CHANDRA
GSFC
GREENBELT MD 20771

M L CHANIN
SER D≠AERONOMIE DU CNRS
B P NO 4
91370 VERRIERES LE BUISSON
FRANCE

G CHANIN
CNRS
91 VERRIERES LE BUISSON
FRANCE

J W CHAPMAN
RM 1111 BERGER BLDG
100 METCALFE STREET
OTTAWA ONTARIO K1A OC8

H CHARNOCK
NATIONAL INST OCEANOGRAPHY
WORMLEY GODALMING
SURREY ENGLAND

R L CHASSON
DEPT OF PHYSICS+ ASTRONOMY
UNIV OF DENVER
DENVER CO 80218

E J CHERNOSKY
AFCRL
48 BERKELEY STREET
WALTHAM MA 02154

S A CHERNOUS
POLAR GEOPHYSICAL INST
APATITY USSR

B CHING
SPACE PHYSICS LAB
AEROSPACE CORP PO 95085
LOS ANGELES CA 93345

M W CHIPLONKAR
DEPT OF PHYSICS
PONNA UNIVERSITY
PONNA INDIA

Y T CHIU
AEROSPACE CORP
BOX 95085
LOS ANGELES CA 90045

H J A CHIVERS
UNIV OF CALIF SAN DIEGO
P O BOX 109
LA JOLLA CA 92037

K C CHO
YONSEI UNIVERSITY
134 SHINCHON DON
CHONGRO KU SEOUL
KOREA

K J CHO
GEOL + MINERAL INST
219 5 KALIBONG DONG
YONGDUNGPO KU
SEOUL KOREA

S T CHOH
DEPT OF PHYSICS
31 DONGSOONG DONG
CHONGRO KU
SEOUL KOREA

A B CHRISTENSEN
UNIV OF TEXAS DALLAS
P O BOX 688
RICHARDSON TX 75080

J CHRISTOPHE
INST D ASTROPHYSIQUE
98 BIS BOVD ARAGO
75 PARIS 14 E FRANCE

DAVID R CRISWELL
LUNAR SCIENCE INSTITUTE
3303 NASA ROAD
HOUSTON TX 77058

E V CHUBARINA
MAIN GEOPHYS OBS
KARBYSHEVA 7
LENINGRAD USSR

T A CHUBB
NAVAL RESEARCH LAB
WASHINGTON D C

C H CHUMMACH
GEOPHYSICAL OBSERVATORY
DSIR P O BOX 2111
CHRISTCHURCH NEW ZEALAND

D H CHUNG
4 ANGIER ROAD
LEXINGTON MA 02173

E L CHUPP
DEPT OF PHYSICS
UNI OF NEW HAMPSHIRE
DURHAM NH 03824

A A CICCHINI
CABILDO 15
BUENOS AIRES ARGENTINA

J CHRISTOPHE-GLAUME
INSTITUT D ATROPHYSIQUE
98 BIS BLVD
ARAGO PARIS 14 FR

J B CLADIS
LOCKHEED PALO ALTO RES LAB
3 251 HANNOVER STREET
PALO ALTO CA 94304

C CLARK
UTAH STATE UNIV
LOGAN UTAH 84321

T A CLARK
PHYSICS DEPT
UNIV OF CLAGARY
CALGARY ALTA
CANADA

G G CLOUTIER
HYDRO QUEBEC INST OF RES
75 DORCHESTER BLVD WEST
MONTREAL 1
QUEBEC CANADA

L L COGGER
PHYSICS DEPT
UNIV OF CLAGRAY
CALGRAY
CANADA

J P COLEMAN JR
INST OF GEOPHYS + PLANET PHYS
UCLA
LOS ANGELES CA 90024

G W COLLINSON
PHYSICS DEPARTMENT
THE UNIV OF NEWCASTLE UPON TY
ENGLAND

P CONNES
CENTER N R S
BELLVUE FRANCE

Y CORCUFF
UNIVERSITE DE POITIERS
40 AVE DU RECTEUR PINEAU
86022 POITIERS FRANCE

J COULOMB
CHOIRE DE PHYS DU GLOBE
9 QUAI ST BERNARD
PARIS 5 FRANCE

A V COX
DEPT OF GEOPHYSICS
STANFORD UNIVERSITY
STANFORD CA 94305

S CIESLKI
OASB
3 AVE CIRCULAIRE
1183 BURSSELS BELGIUM

E V CHUBARINA
CENTRAL GEOPHYSICAL OBS
7 MALAYA SPASSKAYA
LENINGRAD K-18 USSR

N D CLARENCE
UNI OF NATAL
KING GEORGE AVENUE
DURBAN SOUTH AFRICA

K C CLARK
UNIVERSITY OF WASHINGTON
SEATTLE WA 98

K L CLOSS
DEPT OF PHYSICS
UNIV OF OTAGO
DUNEDIN
NEW ZEALAND

W E COBB
NOAA RES LAB R31
BOULDER CO 80302

K D COLE
LA TROBLE UNIVERSITY
BUNDOORA VIC
AUSTRALIA 3083

C COLLINS
COMM RES CENTRE
P O BOX 490 STATION A
OTTAWA ONTARIO
K1N 8T5 CANADA

C COMSTOCK
DPT OF MATHEMATICS
NAVAL POSTGRADUATE SCHOOL
MONTEREY CA 93940

G E COOK
ROYAL AIRCRAFT ESTAB
FRANBOROUGH ENGLAND

F V CORONITTI
SPACE SCIENCE LAB
UNI OF CALIFORNIA
BERKELEY CA 94720

M L COURVILLE
ESOLE POLYTECHNIQUE
UNIVERSITE DE MONTREAL
MONTREAL PQ CANADA

C S COX
SCRIPPS INST OF OCEANOGRAPHY
LA JOLLA CA 92

K M CREER
UNI OF EDINBURGH
6 SO OSWALD ROAD
EDINBURGH EH9
2HX U K

T A CROFT
CENTER FOR RADAR ASTRONOMY
STANFORD UNIVERSITY
STANFORD CA 94305

D CUMMING
ELECTRONICS DIV DREV
P O BOX 880
COURCELETTE PQ CANADA

S CUPERMAN
DEPT OF PHYSICS + ASTRONOMY
TEL AVIV UNICERSITY
RAMAT AVIV
ISRAEL

R J CVETANOVIC
NATIONAL RES COUNCIL
OTTAWA ONTARIO
K1A OR9 CANADA

J DACHS
ASTRONOMISCHES INSTITUT
RUHR UNIVERSITAT
D 463 DOCHUM
GENMANY FD

A DALGARNO
HARVARD COLLEGE OBS
CAMBRIDGE MA 02138

R R DANIEL
TATA INST FUNDAMENTAL RESEARCH
COLABA BOMBAY 5
INDIA

A D DANILOV
UNST APPLIED PHYSICS
HYDROMETEOROLOGICAL SERVICE
MOSCOW USSR

K DAVIES
NOAA EERL SEL
BOULDER 80302

L DAVIS
NASA GSFC
GREENBELT MD 20771

T N DAVIS
GEOPHYSICAL INSTITUTE
UNIV OF ALASKA
FAIRBANKS AK 89701

CREUTZBERG
ASTROPHYSICS BRANCH
NATIONAL RES COUNCIL
OTTAWA CANADA K 2A OR8

PAUL J CRUTZEN
NCAR
P O BOX 1470
BOULDER CO 80302

D M CUNNOLD
DEPT OF METEOROLOGY
MIT
CAMBRIDGE MA 02139

R G CURRIE
MAGNETIC OBS OF CSIR
P O BOX 32
HERMANUS REP OF SO AFRICA

P CZECHOWSKY
MAX-PLANCK INST FOR IONOSPHER
3411 LINDAU/HARX
WEST GERMANY

O DAHLMAN
RES INST OF NATINAL DEFENSE
104 50 STOCKHOLM 80
SWEDEN

P E DAMON
GEOLOGY BLDG 23 2B
UNIV OF ARIZONA
TUCSON ARIZONA 85721

V DANIELE
INST DE ELETTRNICAE
TEL POLITECNICO
TORINO ITALY

F J DAVEY
GEOPHYSICS DIVISION
DSIR BOX 8005
WELLINGTON
NEW ZEALAND

D D DAVIS
CHEMISTRY DEPT
UNIV OF MARYLAND
COLLEGE PARK MARYLAND 20742

LEVERETT DAVIS JR
405 47 CALTECH
CALIFORNIA INST OF TECHNOLOGY
PASADENA CA 91109

E DAWSON
GEOMAGNETIC DIVISION
DOMINION OBSERVATORY
OTTAWA CANADA

J DEEBLE
AUSTRALIAN ACADEMY OF SCI
GORDON STREET
CANBERRA A C T
AUSTRALIA

C S DEEHR
GEOPHYSICAL INSTITUTE
UNIV OF ALASKA
COLLEGE AK 99731

S E DEFOREST
DEPT OF PHYSICS
UNIV OF CALIF SA DIEGO
LA JOLLA CA 92037

S R DE GUIA
BUREAU OF C+GS
421 BARRACA STREET
SAN NICOLAS BINONDO
MANILA PILIPPPINES

C DE JAGER
ASTRONOMICAL INST
BENELUXLAAN 21
UTRECHT NETHERLANDS

G DE JARDIN
UNIVERSITE DE LYON
69 VILLEURBANNE
FRANCE

J DELANNOY
OBS DE BORDEAUX
33 FLOIRAC
FRANCE

L G DEL CASTILLO
IDRRE DE CEINCIAS 3ER PISO
UNIVERSITARIA
MEXICO 20 D F

J H DE LEEUW
INST OF AEROSPACE STUDIES
UNIVERSITY OF TORONOT
TORONTO 5 CANADA

F DE MENDONCA
GENERAL DIRECTOR INPE
C P 515
12.200 SAO JOSE DOS CAMPOS SP
BRAZIL

S DEL POZO
INST INVESTIGACIONES FISICAS
UNIV LMAYOR SAN ANDRES
LA PAZ BOLIVA

L DE MIGUEL
INST GEOG Y CATASTRAL
APARTADO 3007
MADRID SPAIN

W B DEMORE
JET PROPULSION LAB
4800 OAK GROVE DRIVE
PASADENA CA 91103

H DERBLOM
UPPSALA IONOSPHERIC OBS
S 75590 UPPSALA 1
SWEDEN

A J DESSLER
SPACE SCIENCE DEPT
RICE UNIVERSITY
HOUSTON TX 77001

E R DEUTSCH
PHYSICS DEPT
MEMORIAL UNIV OF NEWFOUNDLAND
ST JOHNS NEWFOUNDLAND
CANADA

J F DEVANE
WESTON OBSERVATIORU
WESTON MA 02193

A DEVUYST
CENTRE DE PHYS DU GLOBE
NISMES-PROV DE NAMUR
BELGIUM

K A DICK
KITT PEAK NAT OBS
P O BOX 4130
TUCSON ARIZONA

P H D DICKINSON
APPLETON LABORATORY
SLOUGH SK39JX
BUCKS ENGLAND

R E DICKINSON
NCAR
BOX 1470
BOULDER CO 80302

W E DIEMINGER
P O BOX 20
3411 LINDAU UBER NORTHEIM
HANNOVER GERMANY

C DILWORTH OCCHIALINI
UNIVERSITA DI MILANO
VIA CELORIA 16 MILANO
ITALY

A L DINIS
SERVICO METEORO DE ANGOLA
CAIXA POSTAL 1228
LUANDA ANGOLA

KAREL DOBES
ACADEMY OF SCS
VOCNI II SPORILOV
14131 PRAGUE
CZECHOSLOVAKIA

J DODGE
UNIV OF COLORADO
ASTRO GEOPHYSICS
BOULDER CO 80302

R H DOHERTY
OT ITS
NATIONAL BUREAU OF STANDRADS
BOULDER CO 80302

H DOLEZALEK
1812 DRUARY LANE
ALEXANDRIA VA 2230

S DOLGINOV
IZMIRAN P/O VATUTENKI
MOSCOVSKAYA OBSALT
MOSCOW USSR

H DOMEN
INST OF PHYSICAL SCIENCES
YAMAGUCHI UNIV
YANAGUCHI 753
JAPAN

V DOMINGO
ESTEC
SPACE SCIENCE DEPT
NOORDWIJK
THE NETHERLANDS

T M DONAHUE
SPACE RES LAB
UNIV OF MICHIGAN
ANN ARBOR MI 48105

J C DOOLEY
P O BOX 378
CANBERRA CITY
ACT 2601 AUSTRALIA

R L DOWDEN
PHYSICS DEPT
UNIV OF OTAGEO
DUNEDIN NEW ZEALAND

V M DRIATSKY
ARCTIC + ANTARCTIC RES INST
LENINGRAD USSR

MURRAY DRYER
NOAA SEL
BOULDER CO 80302

A DUBA
L 437 LAWRENCE LIVERMORE LABS
LIVERMORE CA 94550

MME M L DUBOIN
9 RUE DUNOIS
PARIS 13E FRANCE

R L DUBOIS
UNIV OF OKLAHOMA
NORMAN OK 73067

F DUCASTEL
CNET
3 AVE DE LA REPUBLIQUE
ISSY-LES-MOULINEAUX
(SEINE) FRANCE

M DUFAY
LAB DE PHYS DE L ATMOS
43 BOUL DU 11 NOVEMBER 1918
J69 VILLEURBANNE
FRANCE

H J DUFFUS
PHYSICS DPT CSCRR
DEPT OF NATIONAL DENFENCE
VICTORIA B C
CANADA

N M DULLER
PHYSICS DEPT
TEXAS A + M UNIV
COLLEGE STATION TX 77843

MR DUNKELMAN
NASA GSFC
GREENBELT MD 20771

J W DUNGEY
IMPERIAL COLLEGE
SOUTH KENSINGTON
LONDON S W 7 ENGLAND

D.J. DUNLOP
DEPART OF GEOPHYS
UNIVERSITY OF TORONTO
TORONTO 5,ONTARIO

H U DUTSCH
LAB FOR ATMOSPHERIC PHYS
ETH
11 KANB STREET
8044 ZURICH
SWITZERLAND

P DYAL
M S 245 6
NASA AMES RES CTR
MOFFETT FIELD CA 94035

E R DYER JR
NATIONAL ACADEMY OF SCS
2101 CONSTITUTION AVE N W
WASHINGTON DC 20418

P L DYSON
L TROBE UNIV
BUNDOORA VICTORIA
AUSTRALIA 3083

R H EATHER
PHYSICS DEPARTMENT
BOSTON COLLEGE
CHESTNUT HILL MA 02167

A EBEL
INST FOR GEOPHYS + METEOROL
UNIV VOLOGNE D 5000 COLOGNE 41
ALBERTUS MAGNUS PLATZ
WEST GERMANY

P EBERHARDT
PHYSIKALISCHES INSTITUT
SIDLERSTRASSE 5
3012 BERN SWITZERLAND

ECCLES
RSRS
DITTON PARK SLOUGH
UNITEDKINGDOM

P J EDWARDS
PHYSICS DEPT BOX 56
UNIV OF OTAGO
DUNEDIN
NEW ZEALAND

A EGELAND
INST OF COS PHYS
P O BOX 1048
BLINDER OSLO 3
NORWAY

A EGIDI
CONSIGLIO NAZIONALE DELLE RICERCHE
ISTITUTO DI FISICA
UNIVERSITA DI ROMA
ROME ITALY

DR EGLINTON
UNIVERSITY OF BRISTOL
BRISTOL ENGLAND

D H EHHALT
NCAR
BOULDER CO 80302

F ELEMAN
SWEDISH BD OF SHIPPING + NAV
STOCKHOLM 27 SWEDEN

W G ELFORD
DEPT OF PHYSICS
THE UNIV OF ADELAIDE
ADELAIDE SO AUSTRALIA 5001

H ELLIOT F R S
EPTARTMENT OF PHYSICS
IMPERIAL COLLEGE
LONDON SW7 ENGLAND

C C ELLYETT
THE UNIV OF NEWCASTLE
NEWCASTLE 2N N S W
AUSTRALIA

J ENGELMANN
CENTRE DE ETUDES NUCL DE SACLAY
BOITE POSTALE NO 2
91190 GIF SUR YVETTE
FRANCE

S EPSTEIN
CALIF INSTITUTE OF TECHNOLOGY
PASADENA CA 91109

W ESCOBAR
UNIVERSIDAD JAVERIANA
CARRERA 7 NO 40 62
BOGOTA D E COLOMBIA

E A ESSEX
LA TROBE UNIV
BUNDOORA VIC 3083
AUSTRALIA

J M ETCHETO
CNET
9 2130 ISSY LES MOULINEAUS
PARIS FRANCE

D S EVANS
NASA
CODE 611
GREENBELT MD 20711

J E EVANS
LOCKHEED MISS + SPCAE CO
RES LEABS DEPT 52 14
BLDG 22
PALO ALTO CA 94304

J V EVANS
LINCOLN LAB MIT
P O BOX 73
LEXINGTON MA 02137

J W EVANS
SACRAMENTO PEAK OBSERVATORY
SUNSPOT NM 88349

W F J EVANS
ATMOS ENVIROMENT SERV
4905 DUFFERIN STREET
DOWNSVIEW
ONTARIO CANADA

A EVIATAR
INST OF SPACE SCIENCE
TEL-AVIV UNIVERSITY
TEL-AVIV ISRAEL

E B FABIANO
USGS/NOAA
BOULDER CO 80302

M FAHIM
HELWAN OBSERVATORY
HELWAN EGYPT

U FAHLESON
DEPT OF PLASMA PHYSICS
ROYAL INST OF TECHNOLOGY
S 100 44 STOCKHOLM 70
SWEDEN

H J FAHR
INST ASTROPHY + EXTRATERR
FORSCHUNG UNIVERSITAT BONN
POPPELSDORFER ALLEE 49
53 BONN GERMAN FED REP

D H FAIRFELD
CODE 692
FSFC
GREENBELT MD 2077 2

C -G FALTHAMMER
THE ROYAL INST OF TECH
DIV OF PLASMA PHYSICS
STOCKHOLM 70 SWEDEN

C F FAMBITAKOYE
CENTRE ORSTOM DE BANGUI
B P 793
BANGUI CENTRAL AFRICA

CHANG YUN FAN
DEPT OF PHYSICS
UNIV OF ARIZONA
TUCSON AR 857 21

G FANSELAU
GEOMAG INST
TELEGRAPHENBERG 1
15 POTSDAM GERMANY (DR)

D T FARLEY
CORNELL UNIVERSITY
ITHACA NY 1485(

C B FARMER
JET PROPULSION LAB
4800 OAK GROVE DRIVE
PASADENA CA 91103

D T FARLEY
PHILLIPS HALL
CORNELL UNIVERSITY
ITHACA N Y 14850

W G FASTIE
JOHNS HOPKINS UNIVERSITY
204 ROWLAND HALL
BALTIMORE MD 20771

N I FEDOROVA
USSR ACADEMYOF SCS
PROFOOYZNAYA MOSCOW 117810
GSP 312 USSR

V I FEDOSSEV
COLA BR POLAR GEOPHYS INST
USSR ACADEMY OF SCIENCE
APATITY USSR

V V FEDYNSKY
ACADEMY OF SCIENCES
BOL GRUZINSKAYA 10
MOSCOW USSR

M FEHRENBACH
OBS DE HAUTE PROVENCE
OBS 04300 FORCALQUIER
FRANCE

J A FEJER
DEPT OF APPLIED EL PHYS
P O BOX 109
L. JOLLA CA 92307

P D FELDMAN
DEPT OF PHYSICS
JOHN HOPKINS UNI
BALTIMORE MD 21218

Y I FELOST'IN
INST OF PHYS OF THE ATMOS
ACADEMY OF SCIENCES
MOSCOW USSR

K G FENTON
UNIVERSITY OF TASMANIA
HOBART TASMANIA
AUSTRALIA 7001

E E FERGUSON
NOAA ERL AL
BOULDER CO 80302

H I S FERGUSON
DEPT OF PHYSICS
UNIV OF WESTERN ONTARIO
LONDON ONTARIO
CANADA

C E FICHTEL
NASA
CODE 662
GREENBELT MD

R W FILLIUS
UNI OF CALIF AT SAN DIEGO
LA JOLLA CA 92307

J H FILLOUX
SCRIPPS INST OF OCEANOGRAPHY
P O BOX 1529
LA JOLLA CA 9 2037

F D FINDLAY
ELECTRNICS DIV
DREV VALCARTIER
COURCELETTE PQ CANADA

G FIOCCO
UNIV OF FLORENCE
LARGO E FERMI Z
FLORENCE ITALY

JOHN W FIROR
HIGH ALTITUDE OBSERVATORY
P O BOX 1558
BOULDER CO 80302

STANISLAV FISCHER
ASTRO INST
BUDECSKA 6
120 23 PRAGUE 2
CZECHOSLOVAKIA

L M FISHKOVA
ABASTUMANI ATROPHYS OBS
ACAD OF SCS OF GEORGIAN SSR
USSR

E A FLINN
ALEXANDRIA LABS
TELEDYNE GEOTECH
BOX 334
ALEXANDRIA VA 22313

E G FONTHEIM
UNIV OF MICHIGAN
SPACE RESERACH BLDG
2455 HAYWARD
ANN ARBOR MI 48105

V FORMISANO
CONSIGLIO NAZIONALE DELLE RICI
INSTITUTO DI FISICA
UNIVERSITA DI ROMA
ROME ITALY

P A FORSYTH
8 LINKSGATE ROAD
LONDON ONTARIO
CANADA

P F FOUGERE
AFCRL/CRFG
BEDFORD MA

P H FOWLER F R X
H H WILLS PHYSICS LABORATORY
UNIVERSITY OF BRISTOL
BRISTOL 8 ENGLAND

L A FRANK
DEPT OF PHYS + ASTRNOMY
UNIV OF IOWA
IOWA CITY IA 5 2242

B J FRASER
DEPT OF PHYSICS
UNIV OF NEWCASTLE
N S W 2308 AUSTRALIA

C J FRASER
PHYSICS DEPT
UNIV OF CANTERBURY
CHRISTCHURCH
NEW ZEALAND

R A FRAZER
SPACE DEVELOP DEPT CODE SCC
JOHNS HOPKINS UNIV
8621 GEORGIA AVE
SILVER SPRING MD 20910

A C FRASER SMITH
RADIOSCIENCE LAB
STANFORD UNIVERSITY
STANFORD CA 94305

R A FRAZER
SPACE DEVELOP DEPT CODE SCC
JOHNS HOPKINS UNIV
8621 GEORGIA AVENUE
SILVER SPRING MD 20910

J W FREEMAN
SP SCI DEPT
RICE UNIVERSITY
HOUSTON TX

H FRIEDMAN
U S NAVAL RES LABS
CODE 7100
WASHINGTON D C 20390

M FRIDMAN
UNIV DE LIEGE
AVE DE COINTE
4200 OUGREE
BELGIUM

E FRIIS CHRISTENSEN
METOROLOGICAL INST
LYNGBYVEJ 100
DK 2100 COPENHAGEN 0
DENMARK

A FRITZ
NOAA ERL SEL
BOULDER CO 80302

SIGMUND FRITZ
NOAA NESS
FEDERAL BLDG 4
SUITLAND MD 20232

F FROLICH
GEOMAGNETISHES INST
TELEGRAFENBERG
15 POTSDAM
GERMANY (DR)

K FUJITAKE
GEOPHYSICS RES LAB
UNIV OF TOKYO
TOKYO 113 JAPAN

S FUKAO
DEPT OF ELECT ENG
KYOTO UNIVERSITY
KYOTO 606 JAPAN

H FUKUNISHI
BELL LABORATOREIS
MURRAY HILL N J 07974

N FUKUSHIMA
GEOPHYSICAL INST
UNIV OF TOKYO
BUNKYO-KU TOKYO JAPAN

N FUKUYAMA
GEOPHYSICAL INSTITUTE
KYOTO UNIVERSITY
KYOTO 606
JAPAN

MICHAEL FULLER
GEOLOGICAL SCS
UNIV OF CALIFORNIA
SANTA BARBARA CA 93107

P GACII
KENYATTA UNIV COLLEGE
P O BOX 43844
NAIROBI KENYA
EAST AFRICA

M GADSDEN
DEPT NAT PHIL
ABERDEEN UNI
ABERDEEN SCOTLAND

R GALL
INST DE GEOFISICA
CIUDAD UNIVERSITATIA MEXICO
MEXICO 20 D F

Y I GALPERIN
IFA ACADEMY OF SCS
GRUZINSKAYA 10
MOSCOW G 242 USSR

L I GAMA
OBSERVATORIO NACTIONAL
RIO DE JANEIRO
BRAZIL S A

G D GARLAND
GEOPHYSICAL LAB
UNIV OF TORONTO
TORONTO 5 CANADA

G J GASSMANN
33 WHIPPLE ROAD
LEXINGTON MA 02173

R L GATTINGER
NATIONAL RES COUNCIL
OTTAWA CANADA K1A OR8

J GEISS
UNIVERSITAT BERN
SIDLERSTRASSE5
3012 BERNE SWITZERLAND

M A GELLER
UNIV OF ILLINOIS
URBANA IL 61801

R F GELLER JR
DMA INTER AMERICANGEO SURVEY
FORT CLAYTON
CANAL ZONE

R GENDRIN
GRI CNET
3 AVE DE LA REPUBLIQUE
92131 ISSY LES MONLINEAUX
FRANCE

WOLFGANG GENTER
MAX PLACK INST FUR ASTROPHYSIK
SAUPFERCHECKWEG 1
HEIDELBERG
GERMAN FED REP

A GERANIOS
NUCLEAR PHYSICS LAB
SOLONOS 104
ATHENS 144 GREECE

J C GERARD
UNIV OF COLORADO
LASP
BOULDER CO 80302

H GHIELMETTI
CENTRO NAC DE RAD COSMICA
RIVADAVIA 1917
BUENOS AIRES ARGENTINA

E GJOEN
GEOPHYSICAL INST
BERGEN UNIVERSITY
ALLEGT 10
NORWAY

I L GIBSON
BEDFORD COLLEGE
LONDON N W 1
UNITED KINGDOM

F R GILMORE
341 LAS CASAS AVENUE
PACIFIC PALSADES CA 9027 2

C S GILLMOR
DEPT OF HISTORY
WESLAYAN UNIV
MIDDLETOWN CT 06457

V L GINZBURG
P N LEBEDEV PHYS INST
LENINSKY PROSPECT 53
MOSCOW B 312 USSR

M GIORIG
CONSIGLIO NAZIONALE DELLE RIC
PIAZZALE LUIGI STURZO 31
00144 ROMA ITALY

G GIOVANNI
VIALE A DORIA
CITTA UNIVERSITARIA
CANTANIA ITALY

A GIRARD
ONERA
25 39 AVE DE LA DIV LECLERC
CHATILLON SOUS BAGNEUX
SEINE FRANCE

DR R W GIRDLER
SCHOOL OF PHYSICS
THE UNIVERSITY
NEWCASTLE UPON TYNE NE1 7RU
UNITED KINGDOM

R GIRET
AIRBORNE SURVEYS OFFICE
108 RUE MONTMARTE
PARIS FRANCE

L GIUGLIETTI
INST INDROGRAFICO DELLA MARINA
PASSO OSSERVATORIO 4
16100 GENOA ITALY

F GLANGEAUD
CEPHAD
B P NO 15
38040 GRENOBLE CEDEX
FRANCE

I I GLASS
UNIV OF TORONTO
TORONTO ONTARIO
CANADA

M GLASS
CNET
3 AVE DE LA REPUBLIQUE
9 2131 ISSY LES MOULINEAUS
PARIS FRANCE

J A GLEDHILL
RHODES UNIVERSITY
GRAHAMSTOWN SO AFRICA

L J GLEESON
MONASH UNIVERSITY
CLAYTON VICTORIA 3168
AUSTRALIA

F N GLOVER
ATENEO DE MANILA UNIV
P O BOX 154
MANILA PHILLIPINES

M N GNEVYSHEV
BOX 1
35774 KISLOVODSK
USSR

D W GODSON
DEPT OF THE ENVIRONMENT
4905 DUFFERIN STREET
DOWNSVIEW ONTARIO
CANADA

P GOECIL
PHYSICS DEPARTMENT
UNIVERSITY COLLEGE
NAIROBI KENYA

A D GOEDEKE
EARTH RES + ENVIRON APP
5301 AVE BOLSA BLDG 28
HUNTINGTON BEACH CA 9 2647

N GOLSHAN
C/O MAHTASH ESFANDIARI
COLLEGE OF EDUCATION
KENNEDY AVENUE
TEHERAN IRAN

E V GORCHAKOV
MOSCOW STATE UNIV
INST OF NUCLEAR PHYS
MOSCOW 117234 USSR

P L GOUIN
GEOPHYSICAL OBS
HAILE SELASSIE I UNIV
BON 1176
ADDIS ABABA ETHIOPIA

AES GREEN
DEPT OF PHYS + ASTRONOMY
UNIV OF FLORIDA
GAINESVILLE FL 32601

E W GREENSTADT
TRW SYSTEMS BLDG R 1
2 SPACE PARK
REDONDO BEACH CA 90278

G P GREGORI
I F A
P L STURZO 31
0144 ROME ITALY

K I GRINGAUZ
INST OF APPLIED GEOPHYSICS
ACADEMY OF SCIENCES
10 B GRUZINSKAYA MOSCOW USSR

A J GROBECKER
INST DEFENSE ANALYSES
400 ARMY-NAVY DR
ARLINGTON VA 22202

G V GROVES
DEPARTMENT OF PHYSICS
UNIVERSITY COLLEGE
LONDON WC2 ENGLAND

A V GUL ELMI
BORCK OBSERVATORY
I F Z
MOSCOW USSR

J C GUPTA
(DOMINION OBS)
ENERGY MINES + RESOURCES
OTTAWA 4 ONTARIO CANADA

T GOLD
212 CLARK HALL
CORNELL UNIVERSITY
ITHACA NY 14850

J GOSLING
HIGH ALTITUDE OBSERVATORY
+ P O 1588
BOULDER CO 80302

D I GOUGH
UNIV OF ALBERTA
EDMONTON ALBERTA
CANADA T6G 2E1

MR GRARD
ESTEC
NOORDWIJK
THE NETHERLANDS

A W GREEN JR
USGS NOAA R10X3
BOULDER CO 80302

R G H GREER
QUEENS UNIV
BELFAST BT7 1NN
NORTHERN IRELAND

J B GREGORY
UNIVERSITY OF SASKATCHEWAN
SASKATOON SASKATCHEWAN
CANADA

A GRISCOM
USGS
345 MIDDLEFIELD RD
MENLO PARK CA 95025

C S GROMME
U S GEOLOGICAL SURVEY
345 MIDDLEFIELD ROAD
MENLO PARK CA 9420

S GRZEDZIELSKI
WARSAW UNIV
00 478 UJAZDOWSKIE 4
POLAND

D GUEBINS
MIT
DEPT OF MATHEMATICS
CAMBRIDGE MA 01239

D A GURNETT
6 DURHAM CT
IOWA CITY IA 52240

H GUSH
UNIV OF BRITISH COLUMBIA
VANCOUVER B9 C
CANADA

G GUSTAFSSON
THE ROYAL SWEDISH ACA OF SCS
KIRUNA GEOPHYS OBS
KIRUNA C SWEDEN

G HAERENDEL
MAX PLANCK INST
8046 GARCHING O MUNICH
GERMANY GFR

A HAHN
3 HANNOVER-BUCHHOLZ
POSTFACH 54
GERMANY

K HAKAMADA
FACULTY OF ENG
CHUBU INST OF TECH
KASUGAI AICHI 487 JAPAN

Y HAKURA
RADIO RES LABS
KOGANEI SHI TOKYO 184 JAPAN

D H HALL
UNI OF MANITOBA
WINNIPED MANITOBA
R3T 2N 2 CANADA

J E HALL
RADIC + SPACE RES STA
DITTON PARK SLOUGH
BUCKS ENGLAND

C J HALTON
PHYSICS DEPARTMENT
LEEDS UNIVERSITY
LEEDS ENGLAND

JOHN HAMPSON
ENTRE POUR LA RECHERCHE
SUR LES ATOMES ET MOLECULES
QUEBEC P Z CANADA

W B HANSON
UNIV OF TEXAS AT DALLAS
P O BOX 688
RICHARDSON TX 75080

Y HARADA
MINISTRY OF CONSTRUCTION
1000 7-CHOME KAMINEGURO
MEGURO-KU TOKYO JAPAN

O HARANGE
NORWEGIAN INST OF COSMIC PHYS
BLINDERN OSLO
NORWAY

R B HARGRAVES
PRINCETON UNIVERSITY
PRINCETON NJ 08541

J K HARGREAVES
ENVIRONMENTAL SCS DEPT
UNIVERSITY LANCASTER
ENGLAND

F R HARRIS
ASTROPHYSICS BRANCHH
NATIONAL RES COUNCIL
OTTAWA CANADA K1A OR8

A W HARRISON
DEPT OF PHYS
UNIV OF CALGARY
CALGARY 44 ALBERTA
CANADA

C G A HARRISON
INST OF MARINE SCS
10 RIKENBACK CAUSEWAY
MIAMI FL 3314[illegible]

P HART
NATIONAL ACADEMY OF SCS
2101 CONSTITUTION AVE N W
WASHINGTON DC 20418

T R HARTZ
DEFENCE RES TELECOM ESTAB
OTTAWA 4 CANADA

A HASEGAWA
BELL LABORATORIES
RM 1E433
MURRAY HILL NJ 07974

R HAUGJ
FAKULTAT FUR PHYSIK
UNIV OF REIBURGH
78 FREIBURG GERMANY

B HAURWITZ
NCAR
BOX 1470
BOULDER CO 80302

M HAYAKAWA
RES INST OF ATMOS
NAGOYA UNIV
TOYOKAWA AICHI 44 2 JAPAN

S HAYKAWA
DEPT OF PHYS
NAGOYA UNIV
CHIKUSA KU NAGOYA JAPAN

R R HEACOCK
GEOPHYSICAL INSTITUTE
UNIV OF ALASKA
FAIRBANKS AK 99701

P C HEDGECOCK
IMPERIAL COLLEGE
SOUTH KENSINGTON
LONDON SW 7 ENGLAND

J T HEIMERL
BALLISTIC RES LABS
ABERDEEN PROVING GROUNDS
MARYLAND 21005

R A HELLIWELL
STANFORD UNIVERSITY
STANFORD CA 94305

J J HENNESSEY
MANILA OBS
P O BOX 1231
MANILA D 404
PHILIPPINES

J P HEPPNER
NASA CODE 611.4
GREENBELT MD 20771

L HERMAN
DRP FACULTE DES SCS
TOUR 22 9 QUAI ST BERNARD
75 PARIS 5 FRANCE

G J HERNANDEZ
NOAA ERL AL
BOULDER 8030 2

V P HESSLER
USGS NOAA R60X1
BOULDER CO 80302

F T HEURING
GEONAUTICS INC
803 BROAD STREET W
FALLS CHURCH VA 22046

R C HEWSON BROWNE
UNIV OF SHEFFIELD
SHEFFIELD
S10 2TN ENGLAND

F H HIBBERD
UNIV OF NEW ENGLAND
ARMIDALE N S W 2351
AUSTRALIA

R HIDE
METEOROLOGICAL OFF (M O 21)
LONDON ROAD BRACKNELL
BERKS ENGLAND

W J HEIKKILA
UNIV OF TEXAS AT DALLAS
P O BOX 688
RICHARDSON TX 75080

J R HEIRTZLER
DEPT OF GEOL + GEOPHYS
WOODS HOLE OCEANOGRAPHIC INST
WOODS HOLE MA 02543

C E HELSLEY
UNIV TEXAS AT DALLAS
P O BOX 688
RICHARDSON TX 75080

KJELL HENRIKSEN
AURORAL OBSERVATORY
9006 TROMSO
NORWAY

PROF HERLOVSON
ROYAL INST OF TECHNOLOGY
S 10044 STOCKHOLM
SWEDEN

J F HERMANCE
EPT OF GEOLOGICAL SCS
BROWN UNIVERSITY
PROVIDENCE RI 02912

W N HESS
NOAA ERL R
BOULDER CO 80302

E C HESSTVEDT
ASTROFYSISK INSTITUT
OSLO UNIVERSITAT
BLINDER NORWAY

A HEWISH F R S
CAVENDISH LABORATORY
UNIVERSITY OF CAMBRIDGE
CAMBRIDGE ENGLAND

DIETER HEYMANN
DEPT OF GEOLOGY
RICK UNIVERSITY
HOUSTON TX 77001

G T HICKS
NAVAL RES LAB
WASHINGTON D C 20235

DR HIEBLOT
GROUPE RECHERCHES IONOSP LAB
DE PARCH ST MAUR 4 AVE NEPTUNE
94 ST MAUR DES FOSSEES
FRANCE

Y HIGUCHI
DEPT OF ELEC ENG
YAMAGATA UNIV
YONEZAWA JAPAN

R H HILBERG
GSFC
CODE 601.12
GREENBELT MD 20771

O HILLEBRAND
INST FUR GEOPHYSIK
D 34 GOTTINGEN
HERZBERGER LANDSTR 180
FED REP OF GERMANY

V E HILOEBRAND
DIV CODE 2200
NAVAL ELEC LAB CTR
SAN DIEGO CA 92029

C O HINES
UNIV OF TORONTO
TORONTO 5
ONTARIO CANADA

H HINTENBERGER
MAX PLANCK INST CHEMIE
D 8046 GARCHING B MUCHEN
GERMAN FED REP

H E HINTEREGGER
140 NEWTONVILLE AVE
NEWTON MA 02160

K HIRAO
RADIO RES LAB
KOKUBUNJI
TOKYO JAPAN

T HIRAYAMA
TOKYO ASTRO OBS
UNIV OF TOKYO
MITAKA TOKYO JAPAN

M HIRONO
DEPT PHYSICS
KYUSHU UNIV
HAKOZAKI FUKUOKA 81 2 JAPAN

K HIRROKA
FUKUI UNIV
GEOLOGICAL LAB
FUKUI JAPAN

J HIRSHBERG
HAO
BOULDER CO 80302

R J HOCH
BATTELLE NORTHWEST
RICHLAND WA 99352

J C HODGES
BLDG 44 RADIO PHYS LABS
STANFORD RES INST
MENLO PARK CA 94025

F R HODGES
UNIV TEXAS AT DALLAS
P O BOX 688 MAIL STOP 2
RICHARDSON TX 75080

J P HODYCH
PHYS DEPT
MEMORIAL UNIVERSITY
ST JOHNS NEWFOUNDLAND

C J HOFMANN
DEPT OF PHYSICS
UNIV OF WYOMING
LARAMIE WYO 8 2070

J H HOFFMAN
UNIV OF TEXAS AT DALLAS
P O BOX 688
RICHARDSON TX 75080

J HOFSTEE
PHYS DEPT
LAURENTIAN UNIV
SUDBURY ONTARIO CANADA

E A HOGGE
U S NAVY MINE DEFENSE LAB
PANAMA CITY FL 32401

D H HOHN
MESSTELLE SCHOOSS KRESSBACH
74 TUEBINGEN
KRESSBACHERSTRASSE W GERMANY

H HOJO
RADIO RES LABS
KOGANEI SHI
TOKYO 184 JAPAN

O HOLT
UNIV OF TROMOSO
P O BOX 387
N 90001 TROMOSO NORWAY

J A HOLTET
NORWEGIAN IST OF COSMIC PHYS
P O BOX 9038
FLINDERN OSLO 3
NORWAY

T HOLZER
HAO
P O BOX 1470
BOULDER CO 80302

T HONZAWA
FACULTY OF ENGLAND
UTSUNOMIYA UNIV
UTSUNOMIYA 321 31
JAPAN

R E HORITA
UNIV OF VICTORIA
VICTORIA B C
CANADA

J T HORNG
TELECOMM LABS
CHUNGI LI BOX 71
TAIWAN CHINA

J T HOUGHTON
UNIV OF OXFORD
CLARENDON LABS
OXFORD OX1 3PU
ENGLAND

J HOWARD
AFCRL CA
HANSCOM FIELD
BEDFORD MA 01730

C HUANG
DEPT OF ELEC ENGR
NATIONAL TAWAN UNIV
TAIPEI TAIWAN
CHINA

B HULTQVIST
KIRUNA GEOPHYSICAL LAB
KIRUNA SWEDEN

A J HUNDAUSEN
HAO
BOULDER CO 80302

D HUNTEN
KITT PEAK NATL OBS
950 N CHERRY AVENUE
TUCSON AZ 85717

A N HUNTER
THE ROYAL COLLEGE
P O BOX 30197
NAIROBI KENYA

E W HONES JR
LOS ALAMOS SCIENTIFIC LAB
LOS ALAMOS NM 8754

P J HOOD
GEOL SURVEY OF CANADA
601 BOOTH ST RM 573
OTTAWA CANADA

T HORICUCHI
IONOS RES LAB
KYOTO UNIV
KYOTO 606 JAPAN

C W HORTON
DEPT OF PHYSICS
UNIV OF TEXAS
AUSTIN TX 7870

D HOVESTADT
MAX PLACK INST FUR PHYSIK
8046 GARCHING
GERMANY GFR

A HRUSKA
NATIONAL RES COUNCIL
OTTAWA K1A OR6
CANADA

R D HUDSON
NASA JOHNSON SPACE ETR
HOUSTON TX 77058

J E HUMBLE
UNIV OF TASMANIA
BOX 252C GPO
HOBART TASMANIA
AUSTRALIA 7001

B G HUNT
JCOMMONWALTH MET RES CTR
P O BOX 8059AA
MELBOURNE
AUSTRALIA 3001

A N HUNTER
DEPT OF ENVIRON. SCI.
UNIV. OF LANCASTER
BAILRIGG
LANCASTER,ENGLAND

M HURUHATA
TOKYO ASTRO OBS
MITAKA
TOKYO JAPAN

V R S HUTTON
UNI OF EDINBURGH
6 SOUTH OSWALD ROAD
EDINBURGH 9 SCOTLAND

J J HYUN
SEOUL NATIONAL UNIV
31 DONGSOONG DONG
CHONGRO KU
SEOUL KOREA

V M IGNATYEV
INST OF COSMOPHYS RES + AERO
LENIN AVE 61
SIBERIAN DEPT
MOSCOW USSR

YU D ILJICHEV
JHYDROMETEOROL SERVICE
12 PAVLIK MOROZOV ST
MOSCOW USSR

D S INTRILIGATOR
UNIV OF SOUTHERN CALIF
LOS ANGELES CA 90007

D E IRVING
DOMINION OBSERVATORY
OTTAWA CANADA

I A ISAKSEN
INST FOR GEOFYSIKK
P B 1022 BLINDERN
OSLO 3 NORWAY

H ISHIKAWA
RES INST OF ATMOSPHERICS
NAGOYA UNIV
TOYOKAWA JAPAN

V G ISTOMIN
INST OF APPLIED SCS
B GURZINSKAYA 10
MOSCOW USSR

K G IVANOV
IZMIRAN
AKADEMGORODOK
MOSCOW REGION USSR

G S IVANOV-KHOLODNY
INST OF APPLIED GEOPHYSICS
ACADEMY OF SCS
MOSCOW USSR

L I IZMAILOV
NE CINST
FEC ACAD OF SCI
MOSCOW USSR

R J HYNES
PHYS DEPT
IMPERIAL COLLEGE
LONDON SW 7
ENGLAND

T ICHINOSE
DEPT OF ELECT
DOSHISHA UNIV
KYOTO 602
JAPAN

T IIJIMA
GEOPHYS RES LAB
UNIV OF TOKYO
TOKYO 113 JAPAN

Y INOVE
SRCC
UNI OF PITTSBURGH
PITTSBURGH

L V IOANE
APIA MAGNETIC OBS
P O BOX 52
APIA WESTERN SAMOA

S I ISAEV
VLADIMIROVSKAYA 17
MURMANSK 10 USSR

M ISHERWOOD
QUEENS UNIV
BELFAST BT7 1NN
NORTHERN IRELAND

T ITOK
INST OF SPACE + AERO SC
UNIV OF TOKYO
KOMABA TOYKYO 153
JAPAN

E IUFER
NASA ARC (N-244-6)
MOFFETT FIELD

M M IVANOV
LO ISMIRAN
2 LINIJA 23 V O
LENINGRAD V-53 USSR

Y IWASAKA
WATER RES INST
NAGOYA 464
JAPAN

L F JACCHIA
ASTROPHYSICAL OBS
SMITHSONIAN INSTITUTION
CAMBRIDGE

F JACKA
MAWSON INST FOR ANTARCTIC RES
UNI OF ADELAIDE BOX 498
GPO ADELAIDE S AUSTRALIA 5001

J A JACOBS
MADINGLEY RISE
MADINGLEY ROAD
CAMBRIDGE CB3 OEZ
UNITED KINGDOM

R J JADY
UNIV OF EXETER
NORTH PARK RD
EXETER EX4 4QE
ENGLAND

J JANKOWSKI
GOPHYS INST
CAD OF SCI
PASTEURA 3
WARSAW POLAND

A H JARRETT
DEPT OF APPLIED MATH
QUEENS UNIV
BELFAST NORTHERN IRELAND

J T JEFFERIES
HAWAII INST OF GEOPHYSICS
UNIV OS HAWAII RM 436
2525 CORREA ROAD
HONOLULU HAWAII 96822

D H JELLY
DEPT OF COMMUNICATIONS
P O BOX 490 STATION A
OTTAWA ONTARIO
K1N 8T5 CANADA

R C JOATTON
4 BIS RUE GUSTAVE ZEDE
37 BLVD MONTMORENCY
75016 PARIS FRANCE

B D JOHNSON
51 MAXHOLM RD
STREETLY SUTTON COLDFIELD
WARWICKSHIRE
ENGLAND

C Y JOHNSON
CODE 7127
U S NAVAL RES LAB
WASHINGTON DC 20

F S JOHNSON
UNIV OF TEXAS AT DALLAS
P O BOX 688
RICHARDSON TX 75080

R G JOHNSON
LOCKHEED PALO ALTO RES LAB
3 251 HANOVER ST 52 12235
PALO ALTO CA 94303

H S JOHNSTON
DEPT OF CHEM
UNIV OF CALIF
BERKELEY CA 947 20

J R JOKIPII
UNIVERSITY OF ARIZONA
TUCSON AR 85721

D JONES
SPACE SCI DEPT
ESTEC
NOORDWIJK
THE NETHERLANDS

D L JONES
PHYS DEPT
KINGS COLLEGE
LONDON WC 2R
ENGLAND

F W JONES
DPET OF PHYS
UNIV OF ALBERTA
EDMONTON 7
ALBERTA CANADA

T B JONES
PHYSICS DEPT
THE UNIVERSITY
LEICESTER ENGLAND

J H JOSEPH
DEPT OF ENVIROMENTAL SCS
TEL AVIV UNIVERSITY
TEL AVIV ISRAEL

J E KABY
PHYSICS ANNEXE
UNIV OF MELBOURNE
PARKVILE VIC 3052
AUSTRALIA

A B KAHLE
RAND CORPORATION
1700 MAIN STREET
SANTA MONICA CA 90401

T R KAISER
PHYSICS DEPT
UNIVERSITY SHEFFIELD 10
ENGLAND

Y D KALININ
INST OF PHYSICS
KARL MARX STREET
42 KRASNOYARSK USSR

K KALLIOMAKI
FINNISH METEOR OFFICE
-RUCHOLAHDENKATU 8
HELSINKI 10
FINLAND

TETSUO KAMADE
RES INST OF ATMOS
NAGOYA UNIVERSITY
TOYOKAWA AICHI
JAPAN

H KAMIYANA
GEOPHYSICAL INSTITUTE
TOHOKU UNIV
SENDAI JAPAN

J A KANE
CODE 6 25
NASA GSFC
GREENBELT MD 20771

M F KANE
USGE
BLDG 25 DENVER FED CENTER
DENVER CO 80 225

R P KANE
PHYS RES LAB
AHMEDABAD 9
INDIA

E KANEDA
GEOPHYSICAL INSTITUTE
UNIV OF TOKYO
TOKYO JAPAN

Y KANEKO
DEPT OF PHYS
TOKYO 158
JAPAN

J KANGAS
DEPT OF PHYS
UNIV OF OULU
SF 90100 OULU
FINLAND

T KANNO
DEPT OF PHYS
FUKUSHIMA UNIV
FUKUSHIMA 960 JAPAN

J KAPLAN
DEPT OF PHYSICS
UCLA
LOS ANGELES CA 90

E T KARLSON
DEPT OF PLASMA PHYS
RADIO INST OF TECH
10044 STOCKHOLM 70
SWEDEN

V I KARPMAN
IZMIRAN
MOSCOW REGION 142092
USSR

B L KASHCHEEV
KHARKOV POLYTECH INST
KHARKOV USSR

E I KATAJA
GEO OBS SODANKYLA
SF 99600 SODANKYLA
FINLAND

Y K KATO
GEOPHYSICAL INSTITUTE
TOHOKU UNIVERSITY
SENDAI JAPAN

S KATO
IONOSPHERE RES LAB
KYOTO UNIV
KYOTO JAPAN

L KATZ
ENERGETIC PARTICLES BR
AFCRL PHE
L G HANSCOM FEELD
BEDFORD MA 01730

F KAUFMAN
UNI OF PITTSBURGH
205 SRCC BLDG
PITTSBURGH PA 15

R L KAUFMANN
UNH PHYSICS
DEMERITT
DURHAM N H 038 24

E KAUSEL
UNIV DE CHILE
CASILLA 2777
SANTIAGO CHILE

H KAUTZLEBEN
ZENTRAL INST PHYS DER ERDE
15 POTSDAM TELEGRAPHENBURG
DDR GERMANY

A D KAVADAS
UNI OF SASKATCHEWAN
SASKATOON SASKATCHEWAN
CANADA

L D KAVANAGH JR
CODE SG
NASA HDQTRS
WASHINGTON D C 20546

N KAWAI
OSAKA UNIVERSITY
TOYONAKA
OSAKA JAPAN

M KAWAMURA
KAKIOKA YASATO MACHI
IBARAKI KEN 315 01
JAPAN

K KAWASAKI
CIRES
BOULDER CO 8030 2

K KAWAHIRA
GEOPHYS INST
KYOTO UNIVERSITY
KYOTO 606 JAPAN

NAOTO KAWAK
DEPT OF PHYSICS
OSAKA UNIVERSITY
OSAKA TOYONAKA
JAPAN

M KAWANO
NAGOYA UNIV
FURO-CHO CHIKUSA-KU
NAGOYA JAPAN

N KAWAHIMA
INST OF SPACE + AERO SCS
UNIV OF TOKYO
KOMABA TOKYO 153
JAPAN

E S KAZIMIROVSKY
SIB DEPT ACAD SCI
P O BOX CS
IRKUTSK 3 USSR

S A A KAZMI
GEOPHYSICAL CENTRE
P O BOX 2
QUETTA PAKISTAN

G M KEATING
NASA
LANGLEY RES CENTER
HAMPTON VA

W H KEE
DIRECTOR RADIO RES LAB
80 HOGAE DONG ANYANG SHI
KYONGGI DO KOREA

R KELLEHER
UNIVERSITY COLLEGE
P O BOX 30197
NAIROBI KENYA

PAUL KELLOGG
PHYSICS DEPARTMENT
UNIVERSITY OF MINNESOTA
MINNEAPOLIS MN 55455

P C KENDALL
DEPT OF APPLIED MATH
UNI OF SHEFFIELD
SHEFFIELD ENGLAND

C F KENNEL
C/O CENTRE DE PHYS THORIQUE
ECOLE POLYTECHNIQUE
17 RUE DESCORKS
PARIS V FRANCE

J F KENNY
BOEING SCI RES LAB
BOX 3981
SEATTLE WA 98124

E KEPPLER
INST FUR STRATOS PHYSK
3411 LINDAU UB NORTHEIM
GERMANY GFR
HANOVER

J KERANEN
KILLEKUJA 4 E 53
HELSINKI F 1 FINLAND

J W KERN
DEPT OF PHYSICS
UNIV OF HOUSTON
HOUSTON TX 77004

W G KERTZ
INST GEOPHYS METEOROL
TECHNICAL UNIVERSITY
33 BRAUNSCHWEIG GERMANY

J G KEYES
PEL AURORAL STATION
PRIVATE BAG OMAKAU
NEW ZEALAND

S P KHARE
INDIAN INST OF TECH
POWAI BOMBAY-76
INDIA

G M KHOCHOLAVA
INST OF GEOPHYS
ACA OF SCI GEORGIAN SSR
USSR

A N KHRAMOV
LITEINY 39
LENINGRAD USSR

W J KIM
GEO + MIN INST OF KOREA
2195 KALIBONG DONG
YONGDUNGPO KU
SEOUL KOREA

I KIMURA
INST ELECTRONICS
KYOTO UNIVERSITY
KYOTO JAPAN

J H KING
CODE 601
NASA GSFC
GREENBELT MD 20771

D G KING-HELE
ROYAL AIRCRAFT ESTAB
FARNBOROUGH HANTS
ENGLAND

T KIRSTEN
MAX PLANCK INST KERNPHYSIK
SAUPFERCHECKWEG
69 HEIDELBERG 1
GERMAN FED REP

T I KITAMURA
DEPT OF PHYSICS
KYUSHU UNIVERSITY
FUKUOKA 812
JAPAN

H KLEMSDAL
NORDLY OBS
TROMSO NORWAY

A KLIORE
JET PROPULSATION LAB
4800 OAK GROVE DRIVE
PASADENA CA 91103

D G KNAPP
USGS NOAA R10
BOULDER CO 80302

F B KNOX
PHYS + ENGR LAB
DSIR PRIVATE BAG
LOWER HUTT NEW ZEALAND

J S KIM
DEPT OF ATMOS SCIJ
DEPT OF ATMOS SCI
STATE UNIV OF NEW YORK
ALBANY N Y

A KIMPARA
CHUBU INST OF TECH
MATSUMOTO-CHO KASUGAI-SHI
AICHI-KEN JAPAN

CHI YU KING
EARTHQUAKE RES CENTER
P O BOX 58937
TAIPEI TAIWAN
CHINA

J W KING
APPLETON LAB
DITTON PARK
SLOUGH SL3 9JX
ENGLAND

S P KINGSLEY
DEPT OF PHYS
UNIV OF SHEFFIELD
SHEFFIELD ENGLAND

M KITAMURA
METEOROL RES INST
MABASHI SUGINAMI-KU
TOKYO JAPAN

N G KLEIMENOVA
IFZ BOLSHAJA
GRUNZENSKAJA 10
MOSCOW 123 242 USSR

N N KLIMOV
ACADEMY OF SCS
P O BOX 65
IRKUTSK 3 USSR

J S KLOSTERMEYER
MA PLANCK INST FUR AERO
3411 LINDAU
GERMANY GRF

K KNOTT
ESTEC/ESRO
DOMEINWEG NORDWIJK
NETHERLANDS

R KNUTH
OBS FUR IONOSPHAREN MITSCHURI
KUHLUNGSBORN GERMANY (DR)

K KOBAYASHI
OCEAN RES INST
UNIVERSITY OF TOKYO
TOKYO JAPAN

LUDIE KOCH
CENTRE D≠ETUDES NUCL DE SACLAY
B P 2
92 GIF SUR YVETTE
FRANCE

G E KOCHAROV
IOFFE PHYS TECH INST
USSR ACADEMY OF SCIENCES
194021 LENINGRAD K 21
USSR

G KOCKARTS
3 AVENUE CIRCULAIRE
BRUSSELS 18 BELGIUM

J A KOEHLER
UNIV OF SASKATCHEWAN
SASKATOON
SASKATCHEWAN CANADA

L KOENIGSFELD
RUE ETATS TIERS 17
B 4000 LIEGE
BELGIUM

H KOHL
MAX PLANCK INST D≠AERONOMIE
03411 LINDAU HARZ
GERMAN FED REP

S KOKUBUN
GEOPHYSICS RES LAB
UNIV OF TOKYO
TOKYO JAPAN

P H KONG
CHUNG LI
P O BOX 71
TAIWAN REP OF CHINA

H L KONIG
ELEKTROPHYS INST
TECH HOCHSCHULE MUCHEN
ARCIS STRASSE 21
D 8000 MUCHEN 2 GERMANY

M V KONIUKOV
P N LEBEDEV INST OF PHYS
MOSCOW USSR

A KONRADI
CODE TN 2
NASA JOHNSON SPACE ETR
HOUSTON TX 77058

S A KORFF
NEW YORK UNIV
4 WASHINGTON PLACE
NEW YORK NY 10003

A KORSCHUNOW
GEOPHYSIKALISCHES OBS
D 8080 FURSTENFELDBRUCK
LUDWIGSHOEHE 8
FR GERMANY

J R KOSTER
DEPT OF PHYSICS
UNIV OF GHANA
LEGON GHANA

K KOSTOV
GEOPHYS INST
BULGARIAN ACADEMY OF SCS
6 MOSKOVSKA ST
SOFIA BULGARIA

K M KOTADIA
DEPT OF PHYS
GUJARAT UNIV
AHMEDABAD 380009
INDIA

R L KOVACH
DEPT OF GEOPHYSICS
STANFORD UNIV
STANFORD CA 94305

J V KOVALEVSKIY
IZMIRAN
ACADEMGORODOK
MOSCOW REGION
USSR

A KOZLOV
P O VATUTENKI LENINSKI RAION
MOSCOVSKAYA OBLAST
MOSCOW USSR

V I KRASSOVSKY
ACADEMY OF SCS
PYZHEVSKY 3
MOSCOW ZH-17 USSR

V I KRASSOVSKY
INST OF PHYS ATMOS
BOX 919
ACADEMY OF SCS
MOSCOW K9 USSR

F KRAUSE
INST FUR MEGETOHYDRO-
JENNA FROBELSTIEG 3
GERMANY DDR 69

G KREMSER
DEPT OF COMM + WAVE PROP
TECH UNIV OF GRAF
TUFFELDGASSE 12 A 8010 GRAF
AUSTRIA

S M KRIMIGIS
APPLIED PHYSICS LAB
JOHNS HOPKINS UNIVERSITY
SILVER SPRING MD 20910

I A KRINBERG
SIB DEPT ACAD OF SCI
P O BOX 65
IRKUTSK 3 USSR

L KRIVSKY
ASTRONO INST
CZECH ACAD SCI
OB ONDREJOV
CZECHOSLOVIA

E P KROPACHEV
VASILIEVSKII OBSTRO
2 LINIA
23 LININGRAD B 53
USSR

M KRS
PODBELOHORSKA SILNICE 47
250 00 PRAGUE 5
SMICHEV CZECHOSLOVAKIA

H KUATZLEBEN
ZENTRAL PHYSIK DER ERDE
TELEGRAPHENBERG DDR
15 POTSDAM GERMANY

R W KUBERRY
U S GEOLOGICAL SURVEY
BR THEO + APP GEOPHYS
DENVER FED CENTER
DENVER CO 80225

A F KUCKES
CLARK HALL 206
CORNELL UNIV
ITHACA N Y

G J KUHN
MAGNETIC OBSERVATORY
P O BOX 32
HERMANUS SO AFRICA

GEORGE KULA
LAMONT GEOLOGOCAL OBS
PALISADES N Y 10964

P V KULKARNI
PHYS RES LAB
AHMEDABAD 9
INDIA

R N KULKARNI
DIV OS ATMOS PHYS
STATION STREET
ASPENDALE VIC
AUSTRALIA 3195

S KUME
INST OF GEOLOG SCI
OSAKA UNIV
TOYONAKA OSAKA 560
JAPAN

V A KURILOV
C P 796 NORTH
NORIL≠SK W 4566
USSR

M A KUTIMSKAYA
IRKUTSK STATE UNIV
IRKUTSK
USSR

G I KVIFTE
DEPT OF PHYSICS
AGRI COLLEGE OF NORWAY
1432AAS NLH NORWAY

G J KVIFTE
NORD OBSERVATORY
TROMSO NORWAY

N D KWON
SEOUL NATINAL UNIV
31 DONGSOONG DONG
CHONGRO KU
SEOUL KOREA

JACQUES LABEYRIE
CENTRE D≠ETUDES NUCL DE SACLAY
B P 2
91 GIF SUR YVETTE
FRANCE

J E LABY
PHYSICS ANNEXE
UNIV OF MELBOURNE
PARKVILLE VIC 3052
AUSTRALIA

J L LACOUME
B P 15
38040 GRENOBLE CEDEX
FRANCE

M J LAIRD
DEPT OF PURE + APPL MATH
KING≠S COLLEGE
LONDON WC 2 ENGLAND

R LANCEL
CODE 645
NASA GSFC
GREENBELT MD 20771

B LANDMARK
NDRE KJELLER PR
LILLESTROEM NORWAY

G LANGE-HESSE
3411 LINDAU P O 20
UBER NORTHEIM (HANN)
WEST GERMANY

L J LANZERATTI
BELL TELPHONE LAB
MURRAY HILL NJ 07971

J C LARSEN
NOAA
2525 CORREA ROAD
HONOLULU HI 96822

H LAUCHE
MPL FUR AERONOMIE
3411 LINDAU HARZ
POSTFACH 20
GERMANY

V LAURSEN
METEOROLOGISK INSTITUT
GAMLEHAVEALLE 22
CHARLOTTENLUND DENMARK

L K LAW
VICTORIA GEOPHYS OBS 5071
WEST SAANICH RD RR 7
VICTORIA B C
CANADA

P L LAWRENCE
MOBIL OIL CORPORATION
221 NASSAU ST
PRINCETON N J 08540

L L LAZUTIN
POLAR GEOPHYS INT
ACAD OF SCS
APATITY
MURMANSK REGION 184200
USSR

R L LEADABRAND
STANFORD RES INST
RADIO PHYS LAB
MENLO PARK CA 94025

B R LEATON
ROYAL GREENWICH OBS
HERSTMONCEUX CASTLE
HAILSHAM (SUSSEX)
GREAT BRITAIN

B LANDMAR
NORWEGIAN DEF RES EST
LILLESTROM NORWAY
KJELLER

D R LANE-SMITH
DEPT OF PHYSICS
UNI OF WESTERN ONTARIO
LONDON ONTARIO CANADA

R A LANGEL
NASA GSFC
GREENBELT MD 20771

A A LAPOUILLE
OUTRE MER ORSTOM BP A5
NOUMEA CEDEX
NEW CALEDONIA

K LASSEN
METEOROLOGISKE INSTITUT
KLOVERVAENGET 6
BIRKEROD DENMARK

E K LAURIDSEN
RUDE SKOV MAGNETIC OBS
BIRKEROED DENMARK

E A LAUTER
OBS FUR IONOSPHAREN
DDR 2565
KUHLUNGSBORN GERMANY

S M LAWLOR
ROOSKE ROAD
DUNBOYNE CO
MEATH IRELAND

A LAZARUS
MIT 37 691
CAMBRIDGE MA 02139

J F LEACH
BRITISH AIRCRAFT CORP
FILTON HOUSE
FILTON BRISTOL
ENGLAND

F A LEAL
SERVICO METEOROL DE MOCAMBIQUE
CAIXA POSTAL 256
LOURENCE MARQUES
MOZAMBIQUE

A LEBEAU
CENTRE NAT D*ETUDES SPATIALES
B P NO 4
91 BRETIGNY SUR ORGE
FRANCE

V N LEBEDINETS
ASTRO COUNCIL
ACAD OF SCS
VAVILOVA 34
MOSCOW B 312 USSR

A I LEBEDINSKY
SOVIET IGC COMMITTEE
MOLODEZHNAYA 3
MOSCOW B-296 USSR

E LEBORGNE
INST DE PHYSIQUE DU GLOBE
191 RUE ST JACQUES
75-PARIS (5E) FRANCE

B G LEDLEY
CODE 645
NASA GSFC
GREENBELT MD 20771

L LE DONCHE
INST DE METEOR + PHYS DU GLOVE
UNIV D≠ALGER
B P 1137
ALGIERS ALGERIA

J P LEGRAND
SPARMO
4,AVENUE DE NEPTUNE
94-SAINT-MAUR-DES-FOSSES

B LEHNERT
PLASMA PHYS + FUSION RES
ROYAL INST OF TECH
S10044 STOCKHOLM 70
SWEDEN

J LEMAIRE
INST FOR AERONOMY
3 AVE CIRCULAIRE
1180 BRUSSELS
BELGIUM

J LEMOUEL
OBSERVATORE DE GEOPHYSIQUE
45-CHAMBON LA FORET FRANCE

A C LEVASSEUR
SER D≠AERONOMIE DU CNRS
BP 3 91370 VERRIERES LE BUI
FRANCE

J LHERUREUX
DPET OF PHYSICS
UNIV OF ARIZONA
TUCSON AR 85721

W B LIATSKY
POLAR GEOPHYS INST
APATITY
MURMANSK REGION
USSR

H B LIEMOHN
BOEING SC RES LABS
BOX 3981
SEATTLE WA 98124

F E M LILLEY
AUST NATIONAL UNIV
BOX 4 P O
CANBERRA A C T
AUSTRALIA 2600

J V LICOLN
ESSA RESEARCH LABS
BOULDER CO 80302

R P LIN
SPACE SCIENCE LAB
UNIV OF CALIFORNIA
BERKELEY CA 94720

S T LINDGREN
UNIV OF UMEA
SPACE PHYSICS
90187 UMEA
SWEDEN

R LINDZEN
NCAR
P O BOX 1470
BOULDER CO 80302

F LINK
CNRS
INSTITUT D≠ASTRO
98 BIS BOUL ARAGO
PARIS 14
FRANCE

L M LINSON
SCI APPLICATINS INC
P O BOX 2351
LA JOLLA CA 92037

E E LLEWELLYN
UNI OF SASKATCHEWAN
SASKATOON SASKATCHEWAN
CANADA

J LONDON
DEPT OF ASTRO GEOPHYS
UNIV OF COLORADO
BOULDER CO 80302

E I LOOMER
EARTH PHYSICS BRANCH
DEPT ENERGY MINES + RES
OTTAWA KIA OE4
CANADA

F J LOWES
PHYSICS DEPT
UNIVERSITY OF NEWCASTLE
UPON TYNE 1 ENGLAND

WILLIAM LOWRIE
INST FUR GEOPHYSIK
ETH HONGGERBWRG
P O 266
CH 8049 ZURICH
SWITZERLAND

V N LUGOVENKO
P O VATUTENKI
LENINSKI RAION
MOSCOVSKAYA OBLAST
MOSCOW USSR

R LUST
MAX-PLANCHK-INST FUR PHYSIK
UND ASTROPHYS
D 8046 GARCHING B MUCHEN
GFR GERMANY

A J LYON
PHYSICS DEPARTMENT
UNIVERSITYOF HONG KONG
HONG KONG

L R LYONS
NOAA SEL
BOULDER CO 80302

K C MACLURE
CDRS L CFPO 5051
VIA BELLEVILLE
ONTARIO CANADA

K MAEDA
INST ELECTRONICS
KYOTO UNIVERSITY
KYOTO JAPAN

B M MAEHLUM
NORWEGIAN DEF RES ESTB
P O BOX 25
KJELLER NORWAY

J S MAINSTONE
PHYSICS DEPT
UNIV OF QUEENSLAND
BRISBANE AUSTRALIA

M A E LORAND
GEOFIZIKAI INTEZET
PF 35
BUDAPEST 70
HUNGARY

R LOWE
PHYS DEPT
UNIV OF WESTERN ONTARIO
LONDON 72
ONTARIO CANADA

E A LUBIMOVA
ACADEMY OF SCIENCES
B GRUZINSKAJA 10
MOSCOW G-242 USSR

A LUNDBAK
METEOROLO INST
GEOPHYSICAL SEC I
LYNGBYVEJ 100
DK 2100 COPENHAGEN
DENMARK

RHEA LUST
MAX PLANCK INST PHYS + ASTROPHY
FOHRINGER RING 6
8 MUCHEN 23
GERMAN FED REP

G F LYON
UNI OF WESTERN ONTARIO
LONDON ONTARIO
CANADA

E A LYTLE
ELEC DIV
P O BOX 880
COURCELETTE
P Q CANADA

H MAEDA
KOYTO UNIV
GEOPHYSICAL INST
KOYTO JAPAN

R MAEDA
HIRAISO BRANCH
RADIO RES LAB
NAKAMINATO IBARAKI
311 12 JAPAN

R J MAIN
GEOLOGICAL SURVEY
USGS/NOAA/R10
BOULDER CO 80302

Y MAKINO
DEPT OF PHYS
KYUKHU UNIV HAKOZAKI
FUKUOKA 812
JAPAN

S R MALIN
ROYAL GREENWICH OBS
HERSTMONCEAUX CASTLE
HAILSHAM SUSSEX
ENGLAND

W V R MALKUS
INST OF GEOPHYSICS
UCLA
LOS ANGELES CA 90024

N F MALTSEVA
INST OF PHYS OFTHE EARTH
ACAD OF SCIENCE
MOSCOW USSR

R H MANKA
ATMOS SCI SECTION
NATIONAL SCI FOUNDATION
WASHINGTON D C 20550

A H MANSON
DEPT OF PHYSICS
UNIV OF SASKATCHEWAN
SASKATOON SASK
CANADA

F MARIANI
INSTITUTO DI FISICA
UNIVERSITA DI ROMA
ROME ITALY

Y M MAROV
INST FOR APPLIED MATH
ACADEMY OF SCS OF USSR
MINSSKAYA SQUARE 4
MOSCOW USSR

E A MARTELL
NCAR LAB OF ATMOS SCI
P O 1470
BOULDER CO 80302

W MARTENSEN
NORD OBSERVATORY
TROMSO
NORWAY

DAVID MARTIN
ROYAL SOCIETY
6 CARLTON HOUSE TERRACE
LONDON SW1 ENGLAND

A J MASLEY
A-830=JNIT 52 DOUGLAS
3000 OCEAN PARK BLVD
SANTA MONICA CA 90406

L MASTEL
DEPT OF MATHEMATICS
UNIVERSITY OF MANCHESTER
MANCHESTER ENGLAND

Y MAKINO
DEPT OF PHYSICS
KYUKHU UNIVERSITY
HAKOZAKI
FUKUOKA 812 JAPAN

N MALTSEVA
INST OF THE PHYS OF THEEARTH
J10 BOLCHAIA
GRUZINSKALA
MOSCOW USSR

P W MANGE
CODE 7101
US NAVAL RES LAB
WASHINGTON DC 20390

O P MANLEY
12 NICKERSON ROAD
LEXINGTON MA 02173

S M MANSUROV
IZMIRAN P/O VATUTENKI
LENINSKI RAION
MOSCOVSKAYA OBS
MOSCOW USSR

H N MARKOV
P N LEBEDEV PHYS INST
LENINSKY PROSPECT 53
MOSCOW USSR

E MAROVICH
ESSA RESEARCH LABS
BOULDER CO 80302

G E G MARTELLI
UNIV OF SUSSEX
SUSSEX
ENGLAND

K MARTI
UNIV CALIFORNIA SAN DIEGO
DEPT OF CHEMISTRY
P O BOX 109
LA JOLLA CA 92037

G M MARTYNKEVICH
HYDROMETEOR SERV
12 PAVLIK MOROZOV ST
MOSCOW USSR

R G MASON
IMPERIAL COLLEGE
PRINCE CONSORT ROAD
LONDON S W 7 ENGLAND

K B MATHER
GEOPHYS INST
UNIV OF ALASKA
COLLEGE AK 99701

H MATSUMOTO
FACULTY OF ENGR
KYOTO UNIVERSITY
KYOTO 606 JAPAN

S MATSUSHITA
HIGH ALTITUDE OBS
BOULDER CO 8030

G MATTERN
D 6 241 KLEINER FELDBERG
TANNUS OBSERVATORIUM
FED REP GERMANY

D H MATTHEWS
UNI OF CAMBRIDGE
MADINGLEY RISE
MADINGLEY ROAD
CAMBRIDGE ENGLAND

T MATTHEWS
DEPARTMENT OF PHYSICS
UNIVERSITY OF CALGARY
CALGARY ALBERTA
CANADA

M MATUURA
RADIO RES LAB
KOKUBUNJ
TOKYO JAPAN

M MAURETTE
LABORATORIE DE CHIMIE PHYS DE
FACULTE DES SCIENCE
L≠UNIVERSITE DE PARIS
ORSAY FRANCE

P N MAYAUD
INST DE PHYSIQUE DU GLOBE
191 RUE ST JACQUES
PARIS (5E) FRANCE

E B MAYFIELD
AEROSPACE CORP
P O BOX 92957
LOS ANAGELS CA 90009

L A MAYNARD
DEPT OF COMMUNICATION
P O BOX 490 STATION A
OTTAWA ONTARIO
K1N 8T5 CANADA

H G MAYR
NASA GSFC
GREENBELT MD 20771

J P MCCLURE
UNI TEXAS AT DALLAS
P O BOX 688
RICHARDSON TX 75080

B M MCCORMAC
DEPT 52 14 BLDG 20 2
DEPT 5 2 14 BLDG 201
LOCKHEED 3 251 HANOVER ST
PALO ALTO CA 94304

K G MCCRACKEN
CSIRO
BOX 124 GPO
PORT MELBOURNE
VICTORIA 3207 AUSTRALIA

C G MCCUE
IONOS PRED SERVICE
P O BOX 702
DARLINGHURST N S W
2010 AUSTRALIA

D R MCDIARMID
NATIONAL RES COUNCIL
ASTROPHYSICS 3R
OTTAWA
CANADA K1A 0R8

I B MCDIARMID
NATIONAL RESEARCH COUNCIL
OTTAWA CANADA

M J MCEWAN
DEPT OF CHEMISTRY
UNIV OF CANTERBURY
CHRISTCHURCH NEW ZEALAND

M W MCELHINNY
DEPT OF GEOPHYSICS
AUSTRALIAN NATL UNIV
CAMBERRA ACT AUSTRALIA

M B MCELROY
PIERCE HALL
HARVARD UNIVERSITY
CAMBRIDGE MA 01238

D J MCEWWN
PHYSICS DEPT
UNIV SASKATACHEWAY
SASKATOON SAS
CANADA

P M MCGREGOR
BUR OF MINERAL RESOURCES
BOX 378 CANBERRA CITY
A C T 2601 AUSTRALIA

B A MCINTOSH
ASTRO BRANCH
NATIONAL RES COUNCIL
P O XOX 880
COURCELETTE P Q
CANADA

G MCK ALLCOCK
PHYSICS + ENGR LAB
DSIR
PRIVATE BAG
LOWER HUTT NEW ZEALAND

A G MCNAMARA
NATIONAL RESEARCH COUNCIL
OTTAWA ONTARIO CANADA

R L MCPHERRON
INST OF GEOPHYS + PLAN PHYS
UNIV OF CALIFORNIA
LOS ANGELES
CALIF 90024

G MEAD
GEOPHYS BRANCH
NASA GSFC CODE 927
GREENBELT MD 20771

L R MEGILL
CTR FOR RES IN ASTRO
UTAH STATE UNIV
LOGAN UTAH 84321

R R MEIR
NAVAL RES LABS
CODE 7121
WASHINGTON D C 20375

P MELCHIOR
OBS ROYAL DE BELGIUM
3 AVENUE CIRCULAIRE
BRUSSELS 18 BELGIUM

A S MENDES
INSTITU GEOFISICO
RUA ESCOLA POLITECNICA
LISBOA PORTUGAL

C I MENG
SPACE SCI LABS
UNIV OF CALIF
BERKELEY CA 94720

C E MCILWAIN
DEPT OF PHYSICS
UNIV OF CALIFORNIA SAN DIEGO
LA JOLLA CA 92037

D H MCINTOSH
EDINBURGH UNIVERSITY
12 ABERCORN TERRACE
EDINBURGH 15 SCOTLAND

D MCKINNON
ELECTRNICS WING
DRE VALCARTIER
P O BOX 880
COURCELETTE
P Q CANADA

R W E MCNICOL
PHYSICS DEPARTMENT
UNIV OF QUEENSLAND
ST LUCIA BRISBANE AUSTRALIA

J MCWILLIAMS
VALENTIA OBS
COUNTY KERRY
CAHIRCIVEEN IRELAND

W J MEGAW
YORK UNIV
4700 KEELE STREET
DOWNSVIEW 463
ONTARIO CANADA

G MEIRA
INPRE CP 515
SAO JOSE DOS CAMPOS
S P BRAZIL

A B MEINEL
UNIV OF ARIZONA
TUCSON AR 85721

S B MENDE
LOCKHEED PALO ALTO LAB
3251 HANOVER
PALO ALTO CA 94304

R B MENDELL
NEW YORK UNIV
4 WASHINGTON PLACE
NEW YORK N Y 10003

M G K MENON
TATA INST FUNDAMENTAL RESEARCH
COLABA BOMBAY 5 INDIA

J W MERIWETHER
GEOPHYS INST
UNIV OF ALASKA
COLLEGE AK 99701

I MESTERMAN
AV LABERATORDOR 321
VICENTE LOPEZ (B A)
ARGENTINA

PETER MEYER
ENRICO FERMI INSTITUTE
UNIVERSITY OF CHICAGE
CHICAGO IL 60637

F C MICHEL
DEPT OF SPACE PHYS AND ASTRO
RICE UNIV
HOUSTON TX 77001

M MIGEOTTE
UNIV DE LIEGE
B 4200 COINTE OUGREE
BELGIUM

W W MIKHNEVICH
HYDROMET SERV
12 PAVLIK MOROZOV ST
MOSCOW USSR

P M MILLMAN
NATIONAL RESEARCH COUNCIL
OTTAWA ONTARIO
CANADA

V M MISHIN
SIBIZMIR
IRKUTSIC 3 BOX 65
SIBERIA USSR

A P MITRA
NATIONAL PHYS LAB
NEW DELHI INDIA

S MIYATAKE
DEPT OF ELEC
KYOTO UNIV
OYOTO JAPAN

O A MOLCHANOV
P O AKADEMOGRODOK
IZMIRAN
MOSCOW REGION
USSR

F MOLINA
INST DI GEOFISICA
CIRTA UNIVERSITARIA
ROME ITALY

H MESSEL
SCHOOL OF PHYSICS
UNIVERSITY OF SYNONEY
NEW SOUTH WALES
AUSTRALIA

J MEUNIER
FACULTE DE SCS
CHAIRE DE PHYSIQUE DU GLOBE
PARIS FRANCE

R O MEYER
DEUTSCHES HYDROL INST
BERHNARD-NOCHT STRASSE 78
2000 HAMBURG 4 GERMANY (DR)

S MICHNOWSKI
ZAKLAD GEOFIZYKI
POLSKA ADADEMIA NAUK
PASTEURA 3 WARSZAWA
POLAND

J O MIHALOV
NASA AMES RES CTR
245 11
MOFFETT FLD CA 94035

O E MILLER
MET OFFICE MET O 19
LONDON RD RACKNELL
BERKS ENGLAND

C M MINNIS
URSI
7 PLACE EMILE DANCO
BRUSSELS 18 BELGIUM

V A MISYURA
RADIO PHYS FACULTY
STATE UNIV
KHARKOV 77 USSR

J MIYAKOSHI
TOTTORI UNIV
INST OF EARTH SCI
KOYAMA TOTTORI 680
JAPAN

O MOHLMANN
INST FUR SOLAR TERR PHY
TELEGRAFENBERG A50
DDR 15 POTSDAM
GERMAN DEM REP

A MOLDOVANU
CENTRE OF TECH + PHYS RES
ALEEA GRIGORE GHICA VODA
NO 41 A IASI
RUMANIA

A G MOLFILLS
17 CHEMIN MACORS
4040 TILFF
BELGIUM

M D MONTGOMERY
LOS ALAMOS SCIENTIFIC LAB
LOS ALAMOS NM 87544

A MONFILS
OBSERV ROY
AV CIRCULAIRE 3
B 1180 BRUSSELS
BELGIUM

L E MONTBRIAND
BOX 490 STATION A
OTTAWA ONTARIO
K1N8T5 CANADA

G MOREELS
SERVICE D AERONOMIE
CNR REDUITDE VERRIERES
91 VERRUERES DE BUISSON
FRANCE

G MORENO
LAB PLASMA SPAZIO
CONSIGLIO NAZIONALE RICERCHE
UNIVERSITA DI ROMA
ROME ITALY

M G MORGAN
RAGIOPHYS LAB
DARTMOUTH COLLEGE
HANOVER N H 03755

V I MOROV
STERNBERG ASTRON INST
MOSCOW USSR

X D MOUSSAS
NUCLEAR PHYS LAB (CHIMION)
SOLONES 104
ATHENS 144 GREECE

R MUHLEISEN
INST DER UNIVERSITAT
WISSENAU DREIS
TUBINGEN 7981 GERMANY

W MUNDT
GEOMAGNETISCHES INSTITUT
TELEGRAFENBERG
POTSDAM DDR GERMANY

O MULLER
MAX PLANCK INST FUR KENPHYSIK
SAUPFERCHECKWEG
69 HEIDELBERG
GERMAN FED REP

T MURAYAMA
NAGOYA UNIVERSITY
CHIKUSA-KU
NAGOYA JAPAN

A MONFILS
INST D ASTRO
AV DE COMTE 5
COINTE OUGREE
BELGIUM

R MONTALBETTI
PHYSICS DEPT
UNIV OF SASKATOON
SASKATOON ASAK
CANADA

D R MOORCROFT
UNIV OF WESTERN ONTARIO
LONDON 72 ONTARIO
CANADA

CARLO MORELLI
VIALE GESSI 4
OBSERVATORIO GEOFISICO
TRIESTE ITALY

K MORGAN
DEPT OF MATHEMATICS
UNIV OFEXETER
DEVON ENGLAND

Y MORI
MIYAGI UNIV OF ED
AOBA ARMAKI
SENDAI 980 JAPAN

FRED A MORSE
THE AEROSPACE CORP
PO BOX 92957
LOS ANGELES CA 90009

F MOZER
DEPT OF PHYS
UNIV OF CALIF AT BERKELEY
BERKELEY CA 94720

J W MUNCH
MAX PLACK INST FUR AERO
3411 LINDAU/HARZ
GERMAN FED REP

H G MULLER
UNIV OF SHEFFIELD
DEPT OF PHYSICS
SHEFFIELD ENGLAND

R E MUNN
METEOROLOGICAL SERV OF CANADA
315 BLOOR ST W
TORONTO 5 CANADA

D MURCRAY
DEPT OF PHYSICS
UNIV OF DENVER
DENVER CO 80210

W B MURCRAY
GEOPHYS INST
UNIV OF ALASKA
COLLEGE AK 99701

R E MURPHY
AFCRL
BEDFORD MA 01730

R J MURGATORYD
METEOR OFFICE
BRACKNELL BERSKSHIRE
ENGLAND

E R MUSTEL
ASTRONOMICAL COUNCIL USSR
ACADEMY OF SCS
U1 VAVILOVA 34
MOSCOW V-312 USSR

A NADOUBOVITCH JR
ACADEMY OF SCIENCES
MALODEZHNAYA 3
MOSCOW B-296 USSR

K NAGASHIMA
DEPT OF PHYSICS
NAGOYA UNIVERSITY
CHIKUSA KU
NAGOYA JAPAN

T NAGATA
NATION INST OF POLAR RES
1 9 10 KAGA
ITABASHI JU
TOYKO 173 JAPAN

A F NAGY
SPACE PHYS RES LAB
UNIV OF MICH
2455 HAYWARD
ANN ARBOR MI 48103

K NAJITA
2540 DOLE STREET
UNIVERSITYOF HAWAII
HONOLULU HAWAII 96822

Y NAJUBI
KYUKHU UNIV
HAKOZAKI FUKUOKA 812
JAPAN

M O NAKADA
NASA GSFC
CODE 641
GREENBELT MD 20771

Y NAKAGAWA
HAO/NCAR
BOULDER CO 80302

J NAKAMURA
UNIV OF TOKYO
KOMABA 3 8 1
TOYKO 153 JAPAN

M NAKAMURA
TOKYO UNIV OF ED
OOTSUKA 3 BUNKYO
TOKYO JAPAN

T NAKAMURA
TOKYO ASTRONOM OBS
MITAKA TOKYO JAPAN

Y NAKAGAWA
HAO/NCAR
BOULDER CO 80302

Y NAKATA
RADIO RES LAB
TOKYO 183 JAPAN

V NALIVAJKO
IZMIRAN
P/O VATUTENKI
LENINSKI RAION
MOSCOW USSR

D S NARAYAN
TATA INST FUNDAMENTAL RESEARCH
COLABA BOMBAY 5 INDIA

R NARCISI
AERONOMY LAB
AFCRL
BEDFORD MA 01730

T NEATHERY
P O DRAWER O
UNIV OF ALABAMA
TUSCALOOSA
ALABAMA 35486

N F NESS
NASA/GSFC
CODE 690
GREENBELT MD 2(

V P NESTEROV
HYDRO SERV
12 PAVLIK MOROZOV ST
MOSCOW USSR

M NEUGEBAUER
183 401 JET PROP LAB
4800 OAK GROVE DR
PASADENA CA 91103

R E NEWELL
DEPT OF METEOR
MIT
CAMBRIDGE MA 01239

G NEWKIRK
HAO/NCAR
BOULDER CO 80302

M NGUYEN DOAN
OBSERVATOIRE DE LYON
69 SAINT GENIS LAVAL
FRANCE

E R NIBLETT
DIV OF GEOMAGNETISM
DOMINION OBS
OTTAWA 3 ONTARIO CANADA

R W NICHOLLS
DEPT OF PHYSICS
YORK UNIVERSITY
TORONTO ONTARIO CANADA

M NICOLET
IRM-CRNE
3 AVENUE CIRCULAIRE
BRUSSELS BELGIUM

H C S NIELSEN
GEOPHYSICAL INST
UNIV OF ALSAKA
FAIRBANKS AK 99701

Z NIEMIROWICZ
COSPAR SECRETRIAT
55 BOULEVARD MALESHERBES
PARIS 8E FRANCE

H NIKI
SCI RES LAB
FORD MOTOR COMPANY
DEARBORN MI

A NISHIDA
INST FOR SPACE + AERO SCI
UNIV OF TOKYO
TOKYO 153 JAPAN

J NISHIMURA
UNIV OF TOKYO
KOMABA MEGURO
TOKYO 153 JAPAN

E NKANGA
DIR DE LA METEOROL
MIN DES TRANS ET COMM
KINSHASA
ZAIRE REPUBLIC

J NOXON
PIERCE HALL
HARVARD UNIVERSITY
CAMERIDGE MA 02138

F S NOZER
PHYSICS DEPT + SPACE SCI LAB
UNIVERSITY OF CALIFORNIA
BERKELEY CA 94720

H OBAYASHI
INST OF PLASMA PHYS
NAGOYA UNIV
NAGOYA 464 JAPAN

T OBAYASHI
UNIV OF TOKYO
KOMABA MEGURO
TOKYO JAPAN

B J O≠BRIEN
DEPT OF ENVIRONMENTAL PROT
BERTH
AUSTRALIA

B J O≠BRIEN
INST OF NUCLEAR SCIENCE
PRIVATE BAY LOWER HUTT
NEW ZEALAND

B T O≠BRIEN
BOX 52
N WOODSTOCK CT 06257

P OCHABOVA
GEOPHYS INST
SLOVAK ACAD OF SCS
HURBANOVO OKR
KOMARNO CZECH

T OGAWA
RADIO RES LABS
KOGANEI
TOKYO 184
JAPAN

T OGAWA
NOAA/ERL/R44
BOULDER CO 80302

T OGAWA
GEOPHYSICS RES LAB
THE UNIV OF TOKYO
HONGO BUNKYO KU
TOKYO JAPAN

T OGAWA
GEOPHYSICAL INST
KYOTO UNIVERSITY
KITASHIRAKAMA SAKYO KU
KYOTO JAPAN

TORU OGAWA
IONOSPHERIC RES LAB
KYOTO UNIVERSITY
KYOTO JAPAN

K W OGILVIE
NASA/GSFC
CODE 692
GREENBELT MD

T OGUTI
GEOPHYSICAL INST
UNIV OF TOKYO
TOKYO JAPAN

J OKSMAN
UNIV OF OULU
SF 90100
OULU 10
FINLAND

M OKUDA
DEPT OF NAT SCI
HIROSAKI UNIV
HIROSAKI 036
JAPAN

T OKUZAWA
DEPT OF APPL ELEC ENGR
UNIV OF ELECTRO COMM
CHOFU SHI
TOKYO 182
JAPAN

S OLBERT
PHYSICS DPT
MIT RM 26 443
77 MASSACHUSETTS AVE
CAMBRIDGE MA 02139

J K OLESEN
IONOS LAB METE INST
TECH UNIV
2800 LYNGBY
DENMARK

W P OLSON
MCDONN DOUGLAS ASTRO CO
5301 BOLSA BLVD
HUNTINGTON BEACH CA 92647

A OMHOLT
INST OF PHYS
P O BOX 1048
BLINDERN OSLO 3
NORWAY

T ONODA
RADIO RES LAB
NUKUIKITAMACHI
KOGANEISHI
TOKYO 184
JAPAN

T ONHOD
RADIO RES LAB
KOGANEI
TOKYO 184 JAPAN

M B O≠NEILL
INST DE GEOFISICA
25 DE MAY 659
CAPITAL FED ARGENTINA

R R O≠NEILL
AFCRL
BEDFORD MA 01730

C E F ONI
DEPT OF PHYSICS
UNIVERSITY OF IBADAN
IBADAD NIGERIA

C A ONWUMCHELI
DEPT OF PHYSICA
UNIV OF NIGERIA
NSUKKA NIGERIA

N D OPDYKE
LAMONT GEOLOGICAL OBS
PALISADES N Y 10964

W O≠REILLY
DEPT OF GEPHYS + PLANETARY PHY
THE UNIVERSITY
NEWCASTLE UPON TYNE
UNITED KINGDOM

D ORR
UNIV OF YORK
HESLINGTON YORK ENGLAND

J ORTNER
EUROPEAN SPACE RES ORG
114 AVE DE NEIULLY 92
NEUILLY-SUR-SEINE FRANCE

F J F OSBORNE
RESEARCH LABS
RCA LIMITED
P O BOX 800
STE ANNE DE BELLEVUE
P Q CANADA

N A OSTENSO
2871 AUDOBON TERRACE NW
WASHINGTON D C 20008

T OWEN
ASTRO SCIENCE CENTER
ITT RES INST
10 W 35TH STREET
CHICAGO IL 60616

M OZIMA
GEOPHYSICAL INST OF TOKYO
BUNKYO-KU
TOKYO JAPAN

M W PACKARD
VARIAN ASSOCIATES
611 HANSEN WAY
PALO ALTO CA 94303

H K PAETZOLD
INST GEOPHYS A METOROLO
UNIV COLOGNE
ALBERTUS MAGNUS PL
COLOGNE
WEST GERMANY

E PAGE
ESTEC/ESRO
SPACE SCI DEPT
DOMEINWEG NORDWIJK
NETHERLANDS

R L PAINE
TOOLANGI GEOPHYS OBS
P O BOX 2831AA
FPO MELBOURNE 3001
VICTORIA AUSTRALIA

Y PAL
SHRI SAHAJANAND
COLLEGE BUILDING
AHMEDABAD 380015
INDIA

H C PALMER
DEPT OF GEOPHYSICS
UNIV OF WESTERN ONTARIO
LONDON ONTARIO CANADA

A PALUMBO
INST DI FISICA TERR DELL*
UNIV DI NAPOLI
VIA LUIGI MERCANTINE
PARCO DELLA FONTANA 5
80125 NAPOLI ITALY

D PARDY
SRDE
CHRISTCHURCH HANTS
ENGLAND

I OZDOGAN
FEN FACULTASI
GEOFIZIK ENSTITUSU
ISTANBUL TURKEY

SWASDI PACHIMKUL
ROYAL TAI SURVEYDEPT
SUPREME COMMAND HDQTRS
BANGKOK 2
THAILAND

M PADYA
METEOROLOGICAL SER HDQTRS
VACOAS
MAURITIUS

D EDGAR PAGE
COSMIC RAY DIVISION
ESRTC
DOMEINWEG NOORDWIJK
NETHERLANDS

I PAGHIS
COMM RES CENTER
DEPT OF COMM
P O BOX 490 STATION A
OTTAWA ONTARIO
K1N 8T5 CANADA

BYUNG SO PAK
COSMIC RAY GROUP
SOGANG UNIVERSITY
MAPO KU SEOUL
KOREA

MANFRED PALANDT
D 3400 GOTTINGEN
INST FUR GEOPHYSIK
HERZBERGER LANDSTR 180
FEDREP GERMANY

G W PALTRIDGE
DIV OF METEOROL PHYSICS
CSIRO STATION STREET
ASPENDALE VIC 3195 AUSTRALIA

M D PAPAGIANNIS
DEPT OF ASTRONOMY
BOSTON UNIVERSITY
BOSTON MA 02215

G G PARFITT
PHYSICS DEPT
AHMADU BELLO UNIV
ZARIA NIGERIA

CHUNG G PARK
RADIOSCIENCE LAB
STANFORD UNIV
STANFORD CA 94305

E N PARKER
ENRICO FERMI INSTITUTE
NUCLEAR STUDIES
UNIVERSITY OF CHICAGO
CHICAGO IL 60637

CURTIS W PARKIN
NASA AMES RES CENTER 235 6
MOFFETT FIELD CA 94035

W D PARKINSON
UNIVERSITY OF TASMANIA
BOX 252 C G P O HOBART
TASMANIA AUSTRALIA

GEORGE K PARKS
GEOPHYSICS AK 50
UNIV OF WASHINGTON
SEATTLE WA 98195

N R PARSONS
DEPT OF PHYSICS
UNI OF CALGARY
CALGARY 44 CANADA

N R PARSONS
UNIVERSITY OF TASMANIA
HOBART TASMANIA
AUSTRALIA 7001

R PARTHASARATHY
GEOPHYSICAL INSTITUTE
UNIV OF ALASKA
FAIRBANKS AL 99701

DR PASCHMANN
MAX PLANCK INST PHYS + ASTROPHYSIK
INST EXTRATERRESTR PHYSIK
D 8046 GRACHING B. MUCHEN
GERMAN FED REP

R PASTIELS
INST ROYAL METEOROL
UCCLE
3 AVENUE CIRCULAIRE
BRUSSELS 18 BELGIUM

V L PATEL
UNIV OF DENVER
P O BOX 10127
DENVER CO 80310

G A PAULIKAS
AEROSPACECORP
P O BOX 92957
LOS ANGELES CA 900009

K V PAULSEN
PHYSICS DEPT
UNIV OF SASKATCHEWAN
SASKATOON SASKATCHEWAN
CANADA

N W PEDDIE
USGS/NOAA DF62
BOULDER CO 80302

ANDRE PEDERSEN
SPACE SCI DEPT
ESTEL
NOOROWIJK
NETHERLANDS

C L PEKERIS
WEIZMAN INST
DEPT OF APPLIED MATH
REHOVATH
ISRAEL

P PELLAS
MUSEUM NATIONAL D≠HISTOIRE
NATURELLE
61 RE DE BUFFON
PARIS 5E FRANCE

W R PENDLETON JR
CTR FOR RES IN AERONOMY
UTAH STATE UNIV
LOGAN UT 84322

R PEPIN
LUNAR SCINCE INSTITUTE
3303 NASA RAOD
HOUSTON TX 77058

GIOVANNI E PEROAN
INST DI ELET E TELECOMM
POLITECNICO DI TORINO
TORNINO ITALY

S M M PERRAUT
CNET/GRI
3 AVE DE LA REPUBLIQUE
92131 ISSY LES MOULINEAUX
PARIS FRANCE

B PETERS
DANISH SPACE RES INST
LUDTOFLEVEJ 100 BD 348
LYNGBY DENMARK

A M PETERSON
STANFORD RES INST
ELECTO + RADIO DIV
MENLO PARK CA 94025

N PETERSEN
GEOGENSTRA 63 RGB
8 MUNCHEN 13
WEST GERMANY

V L PETERSON
DEPT OF PHYSICS
UTAH STATE UNIV.
LOGAN UTAH 84321

MICHAEL PETIT
CNET/RST
38 RUE DE JENERAL
6ECLERC 92131
ISSY LES MOULINELAUX
FRANCE

L PETRIE
D R T E
SHIRLEY BAY
OTTAWA ONTARIO
CANADA

G N PETROVA
GEOPHYSICAL INST OF AC OF SCS
B GRUZINSKAYA 10
MOSCOW G-242 MOSCOW

W PFISTER
IONOSPHERIC PHYS LAB
AFCRL
BEDFORD MA 01730

G PFOTZER
MAX-PLANCK INST
POSTFACH 60
D 3411 LINDAU HARZ
WEST GERMANY

PHAM
CTR DE RECHERCHES GEOPHYS
UNIVERSITY PARIS VI
TOUR 15
9 AUAI ST BERNARD
75 PARIS 5 EME FRANCE

A V PHELPS
JILA
UNIV OF COLORADO
BOULDER CO 80302

LEON PHILLIPS
DEPT OF CHEMISTRY
UNIV OF CANTERBURY
CHRISTCHURCH
NEW ZEALAND

MONIQUE PICK
MEUDON OBSERVATORY
SOLAR DEPARTMENT
MEUDON 92190
FRANCE

J H PIDDINGTON
COMM SCIENTIFIC + IND RES ORG
SYDNEY AUSTRALIA

L PIERI
INST DI TOPOGRAFIA
FACOLTA DI IGENGNERIA
VIALE RISORGIMENTO 2
40136 BOLOGNA ITALY

W R PIGGOTT
RADIO RES STATION
SLOUGH
BUCKINGHAMSHIRE ENGLAND

I N PIKUS
L9507
GENERAL ELECT CO
BOX 8555
PHILADELPHIA PA 19101

G M PILLET
GRI-CNET
3 AVENUE DE LA REPUBLIQUE
92 ISSY-LES-MOULINEAUX
SEINE FRANCE

STEPHAN PINTER
GEOPHYS INST OF THE SOLVAK ACA
947 01 HURBANOVO
CZECHOSLOVAKIA

F PINTO COELHO
INST GEOFISICO
UNIV DE COIMBRA
ALTO DO BALEIA
COIMBRA PORTUGAL

P R PISHAROTY
COLABA AND ALIBAG OBS
BOMBAY 5 INDIA

G PIZZELLA
UNIVERSITA PER GLI STJDII
PIAZZALE DELLE SCIENZE 5
ROME ITALY

A A POKHUNKOV
HYDORMETEOROL SERVICE
12 PAVLIK
MOROZOV STREET
MOSCOW USSR

J C POLANYI
DEPT OF CHEMISTRY
UNIV OF TORONTO
TORONTO 5 ONTARIO
CANADA

M A POMERANTZ
BARTOL RESEARCH FOUNDATION
SWARTHMORE PA 19081

E A PONOMAREV
CRAS
P LENINA 61
YAKUTSK USSR

V N PONOMAREV
INST OF SPACE RES
PROFSOYZNAYA 88
MOSCOW 117810 GSP 312
USSR

E G POPOV
HYDROMETEOROLOGICAL RES CENTRE
13 BOLSHEVISTSKAYA
MOSCOW D-376 USSR

G PORSTENDORFER
92 FREIBERG/SA
GUSTAV-ZEUNER GERMANY (GDR)

T A POTEMRA
APPLIED PHYSICS LAB
JOHNS HOPKINS UNIV
SILVER SPRING MD 20910

ANDREW E POTTER
NASA MANNED SPACECRAFT CTR
CODE TY 3
HOUSTON TX 77058

K A POUNDS
DEPT OF PHYSICS
UNIV OF LEICESTER
LEICESTER ENGLAND

A D POWSNER
SOVIET GEOPHYSICAL COMMITTEE
ACADEMY OF SCIENCES
MALODEXHNAYA 3
MOSCOW B-296 USSR

J P POZZI
LAB DE GEOMAGNETISM
4 AVE DE NEPTUNE
94 ST MAUR-DES-FOSSES FRANCE

S PRAKASH
PHYSICAL RES LAB
AHMEDABAD-9 INDIA

RAM Y PRASAD
DEPT OF PHYS + ELECT
BANARAS HINDU UNIV
VARANASI 5
INDIA

O PRAUSS
ACADEMY OF SCIENCES
BOCNI II PRAGUE 4
SPORILOV CZECHOSLOVAKIA

S A PRENTICE
UNI OF QUEENSLAND
ST LUCIA
BRISBANE AUSTRALIA

M PREVOT
LAB OF GEOMAGNETISM
4 AVE DE NEPTUNE
94 ST MAUR-DES-FOSSES FRANCE

A T PRICE
23 BUTLERS COURT RD
BEACONSFIELD BUCKS
ENGLAND

W PRIESTER
STERNWARTE DER UNIV
POPPELSDORFER ALEE
49 BONN GERMANY GFR

C H B PRIESTLEY
STATION STREET
ASPENDALE VICTORIA 3915
AUSTRALIA

FRIZ PRIMDAHL
METEORO INST
GEOPHYS SECTION 11
LYNGBYVEJ 100
DK 2100 COPENHAGEN DENMARK

HELEN D PRINCE
MCMATH HULBERT OBS
895 LAKE ANGELUS ROAD N
PONTIAC MI 40855

L S PRIOR
BUREAU OF MINERAL RESOURCES
P O BOX 378
CANBERRA A C T AUSTRALIA

M I PUDOVKIN
LENINGRAD STATE UNI
LENINGRAD B 164 USSR

M PURANEN
GEOLOGINEN TUTKIMUSLAITOS
HELSINKI OTANIEMI
FINLAND

M PURUCKER
DUV IF GEIK + PLAN SCS
CALIF INST OF TECH
PASADENA CA 91109

A K PYATSI
USSR ACAD OF SCS
VLADIMIRSKAYA 17
MURMANSK 10
USSR

J QUINTERO
INST GEOG
CARRERA 30 NOV 48 51
CIUDAD UNIV
BOGOTA
COLOMBIA

C RADHARKRISHNAMURTY
TATA INS OF FUNDAMENTAL RES
HOMI BHABHA ROAD
COLABA BOMBAY 5 INDIA

R RAGHAVARAO
PHYSICAL RESEARCH LAB
AHMEDABAD-9 INDIA

M RAHMATULLAH
SUPARCO
P O BOX 3125
KARACHI 29 PAKISTAN

R R RAO
PHYSICAL RES LAB
NAVRANGPURA
AHMEDABAD 380009
INDIA

K R RAMANATHAN
PHYSICAL RES LAB
NAVRANGPURA
AHMEDABAD-9 INDIA

R G RASTOGI
PHYSICAL RES LAB
NAVRANGPURA
AHMEDABAD-9 INDIA

P A J RATNASIRI
CEYLON INST
SC AND IND RES
P O BOX 787
COLOMBO SRI LANKA
CEYLON

K M RAYNER
5 TENNYSON CRESCENT
FORREST CANBERRA ACT
AUSTRALIA 2603

C A REBER
NASA/GSFC
CODE 621
GREENBELT MD 20771

N PUSHKOV
IZMIRAN VATUTENKI
P/O ADADEMGORODOK
MOSCOW USSR

J J QUENBY
IMPERIAL COLLEGE
PRINCE CONSORT ROAD
LONDON S W 7 ENGLAND

E RACHIDI
NATIONAL RES CENTER
SHARYA EL TAHRIR
DOKKI CAIRO
UAR

H RAETHJEN
2308 PREETZ/HOLSTEIN
ALSENER WEG 2
FED REP GERMANY

M S RAHMAN
BANGLADESH METEO DEPT
CHITTAGONG
BANGLADESH

K S RAJA RAO
METEOROL OFFICE
LODI ROAD
NEW DELHI 3 INDIA

V R RAO
PHYSICAL RESEARCH LAB
AHMEDABAD 9
INDIA

O M RASPOPOV
IZMIRAN P/O VATUTENKI
LENINSKI RAION
MOSCOVSKAYA OBL MOSCOW USSR

J A RATCLIFFE
193 HUNTINGTON ROAD
CAMBRIDGE CB36DL
ENGLAND

K RAWER
ARB GR PH
WELTRAUMFSCHG D78
KRONENSTR 13
FREIBURG GERMANY (FR)

T S RAZMADZE
INST GEOPHYS ACA OF SCS
COSMIC RAY STATION
TBILISI GEORGIA
USSR

D REES
UNIV COLLEGE
GOWER STREET
LONDON WC2E 6BT
ENGLAND

M H REES
SPACE SCIENCE BLDG
UNI OF COLORADO
BOULDER CO 80302

G C REID
ESSA RES LABS
BOULDER CO 803

J S REID
ANTARCTIC DIV
568 STREET KILDA ROAD
MELBOURNE 3004
AUSTRALIA

W I REILLY
GEOPHYS DIV DSIR
P O BOX 8005
WELLINGTON
NEW ZEALAND

R REITER
PHYS-BIOKLIMATISCHE
SKISTADION WESTTOR
D8100 GARMISCH GERMANY

H REME
UNIV OF TOULOUSE
BP 4057 31029
TOULOUSE CEDEX
FRANCE

R REMIOT
SER SCS CENTRAUS
ORSTOM
73 71 ROUTE D≠AULNAY
BONDY FRANCE

J L REMO
PHYSICAL SCIENCE DEPT
NASSAU COMMUNITY COLLEGE
GARDEN CITY NY 11530

J H REYNOLDS
DEPT OF PHYSICS
UNIVERSITY OF CALIFORNIA
BERKELEY CA 94720
P
W RIEDLER

DEPT OF COMM + WAVE PROP
37 KRENNGAASE
A8010 GRAZ AUSTRIA

J A RIEKER
STATION AEROLOGIQUE
CH 1530 PAYERNE
SWITZERLAND

T RIKITAKE
CIRES NOAA
BOULDER CO 80302

J RING
IMPERIAL COLLEGE
DEPT OF PHYSICS
10 PRINCE≠S GARDENS
LONDON S W 7
ENGLAND

K RINNERT
MAX-PLANCK-INST FUR AERONOMIE
3411 LINDAU UBER
NORTHEIM GERMANY

H RISHBETH
APPLETON LABJ
DITTON PARK
SLOUGH S13 9JX
ENGLAND

P H ROBERTS
SCHOOL OF MATHEMATICS
THE UNIVERSITY
NEWCASTLE UPON TYNE
NE2 7 RU ENGLAND

W O ROBERTS
1829 BLUEBELL AVE
BOULDER CO 80302

R ROBLEY
OBS DE PIC DU MIDI
9 ALLEE FR VERDIER
31000 TOULOUS FRANCE

A RODRIGUEZ
INST GEOFISICO
UNIV NAT DE SAN AGUSTIN
CASILLA 23
AREQUIPA PERU

J G ROEDERER
UNI OF DENVER
P O 10127
DENVER CO 8031

H ROEMER
ASTRO INST
UNIV BOON 5300 BONN
AUF DEM HUGEL 71
FED REP OF GEDMANY

H A ROESER
FEDERAL GEOLOGICAL SURVEY
3 HANNOVER 23
GERMANY FED REP

E H ROGERS
THE AEROSPACE CORP
P O BOX 92957
LOS ANGELES CA 90009

J W ROGERS
AFCRL
BEDFORD MA 01730

I I ROKITIANSKY
INST OF GEOPHYS
MOSCOW USSR

G ROLAND
INST D'ASTROPHYSIQUE
UNIV DE LIEGE
B 4200 COINTE OUGREE
BELGIUM

S J ROMANA
OBS DEL EBRO
APTDO 9
TORTOSA SPAIN

A ROMANOVSKY
IPG ACA OF SCS
MOSCOW USSR

G J ROMICK
GEOPHYSICAL INST
UNI OF ALASKA
COLLEGE AK 99735

R G ROPER
SCHOOL OF AEROSPACE ENGR
GEORGIA TECH
ATLANTA GA 30332

D C ROSE
NATIONAL RESEARCH COUNCIL
100 SUSSEX DRIVE
OTTAWA ONTARIO
CANADA

H ROSENBAUER
MAX PLANCK INST PHYS + ASTROPHY
INST EXTRATERRESTR PHYSIK
D 8046 GARCHING B. MUCHEN
GERMAN FED REP

T J ROSENBERG
UNIV OF MARYLAND
COLLEGE PARK MD 20742

L ROSSBERG
MAX PLANCK INST
POSTFACH 60
D 3411 LINDAU/HARZ
FED REP GERMANY

D G V ROSSER
DEPT OF EXETER
EXETER DEVON
ENGLAND

B ROSSI
MIT
ROOM 37 667
CAMBRIDGE8 MA 02139

G ROSTOKER
DEPT OF PHYS
UNIV OF ALBERTA
EDMONTON CANADA

LADISLAV ROTH
MS 183 701
NASA JET PROPULSION LAB
PASADENA CA 91103

J P ROTHE
38 BOULEVARD D ANVERS
STRASBOURG FRANCE

E J ROTHMULLER
U S NAVY ELEC LAB CTR
CODE 2200
271 CATALINA BLVD
SAN DIEGO CA 92152

P ROTHWELL
UNI OF SOUTHAMPTON
SOUTHAMPTON ENGLAND

JURGEN ROTTGER
MAX PLANCK INST FUR AERONOMIE
D3411 LINDAU HARZ
WEST GERMANY

A ROUX
CNET/GRI
3 AVE DE LA REPUBLIQUE
92131 ISSYLES MOULINEAUX
FRANCE

L N RUBCOV
ASTRO INST
SVIRIDENKO 4
DUSHANBE USSR

A J RUDMAN
1008 2ND STREET
BLOOMINGTON IN 47401

S K RUNCORN
SCHOOL OF PHYSICS
UNI OF NEWCASTLE
UPON TYNE ENGLAND

H N RUNDLE
UNI OF SASKETCHEWAN
SASKATOON SASKATCHEWAN
CANADA

C T RUSSELL
UCLA SPACE SCI CTR
LOSANGELES CA 90024

R O RUSTER
MAX PLACK INST AERO
3411 6INDAU/HARZ
GERMANY D F

T SAEMUNDSSON
SCIENCE INSTITUTE
UNIV OF ICELAND
DUNHAGA
REYKJAVIK
ICELAND

C SAGAN
CIR RADIPHY + SAPCE RES
CORNELL UNIV
ITHACA NY 14850

B I SAITO
NIIGATA UNIVERSITY
NIIGATA 950 21
JAPAN

T SAITO
ONAGAWA MAGNETIC OBS
GEOPHYSICAL INST
TOHOKU UNIVERSITY
SENDAI JAPAN

T SAKURI
GEOPHYS INST
TOHOKU UNIV
SENDAI 980
JAPAN

R SALGJEIRO
INST PANAMERICAN GEO + HIST
CASILLA 4722
LA PAZ BOLIVIA

V P SAMSONOV
INST OF COSMORES + AERO
LENIN AVDNUE 61
YAKUTSK USSR

B P SANDFORD
AFCRL (CROR)
L G HANSCOM FLD
BEDFORD MA 01730

A M RUSSELL
DEPT OF PHYSICS
HOBART + WILLIAM SMITH COL
GENEVA N Y 14456

R D RUSSELL
DEPT OF GEOPHYS P ASTRO
UNIV OF BRITISH COLUMBIA
VANCOUVER 8 B C
CANADA

M J RYCROFT
DEPT OF PHYS
UNIV OF SOUTHAMPTON
SOUTHAMPTON
SO9 5NH ENGLAND

R C SAGALYN
AFCRC
HANSCOM FIELD
BEDFORD MA 0173

Y SAHAI
INST DE PESQUISAS ESPACIAIS
CX POSTAL 515
12200 SAO JOSE DOS CAMPOS
S P BRAZIL

M SAITO
GEOPHYS INST
UNIV OF TOKYO
HONGO TOKYO
JAPAN

K SAKURAI
NASA/GSFC
CODE 693
GREENBELT MD 20771

J E SALAH
MIT LINCOLN LAB
P O BOX 73
LEXINGTON MA 02173

M N SAMOKHIM
RADIOTECH INST
ACADEMYOF SCIENCES
MOSCOW A 83
USSR

S SANATANI
UNIV OF TEXASAT DALLAS
P O BOX 30365
DALLAS TX 75230

P V SANKER NARAYAN
NATIONAL GEOPHYS RES INST
HYDRABAD 7
(A P) INDIA

C M SANTOS
BUREAU OF C + G SURVEY
421 BARRACA SAN NICOLAS
MANILA D 405
PHILLIPPINES

D G SARMA
GEOLOGICAL SURVEY OF INDIA
27 CHOWRINGER ROAD
CALCUTTA 13 INDIA

V N SARMA
DEPT OF PHYS
GOV≠T TAZA POST
GRADUATE COLLEGE
RAMPUR (UP) INDIA

Y S SARMA
NATIONAL GEOPHYS RES INST
HYDERABAD 500007 INDIA

J D SARTOR
NCAR
BOULDER CO 80302

TERUO SATO
HYOGO COLLEGE OF MEDICINE
1 1 MUKOGAWA CHO
NISHINOMIYA
HYOGO 663 JAPAN

T SATO
DEPT OF PHYSICS
KYOTO UNIVERSITY
KYOTO JAPAN

R SAWADA
FACULTY OF SCS
KYUSHU UNIV
FUKUOKA 812
JAPAN

C SAWYER
NOAA/ERL/R43
BOULDER CO 80302

F L SCARF
ONE SPACE PARK
BLDG R 5 RM 1280
REDONDO BEACH CA 90278

K H SCHATTEN
PHYSICS DEPT
VICTORIA UNIVERSITY
WELLINGTON
NEW ZEALAND

G SCHEEPERS
MAGNETIC OBS
P O BOX 32
HERMANUS SO AFRICA

P V SCHEGLOV
ST ASTRON INST IM PK STERNBER
MOSCOW STATE UNIV
MOSCOW USSR

F SCHERB
PHYSICS DEPT
UNIV OF WISCONSIN
MADISON WI 53706

M G R SCHERER
3 AVENUE CIRCULAIRE
INST FOR AERO
1180 BRUSSELS BELGIUM

H I SCHIFF
YORK UNIVERSITY
TORONTO 12 ONT CANADA

K SCHINDLER
INST FUR THEORE PHYS
RUHR UNIV
D463 BOCHUM
GERMANY (DF)

D M SCHLAPP
UNI OF EXETER
EXETER DEVON ENGLAND

R SCHLICH
INST DE PHYSIQUE DE GLOBE
OBS GEOPHYSIQUEDE
PARC ST-MARU 4 AVE DE NEPTUNE
ST MAR-DES FOSSES SEINE FR

J C SCHLOBOHM
BLDG 44 RADIO PHYS LAB
STANDORD RES INST
MENLO PARK CA 94025

E R SCHMERLING
SG/NASA HDQTRS
WASHINGTON D C 20546

C E C SCHMIDT
UNIV FREIBURG
HERMANN HERDERSTR 3
78 FREIBURG
GERMANY (FD)

H SCHMIDT
GEOMAG INST + OBS
NIEMEGKLBELZIO
POTSDAM GERMANY (GDR)

U SCHMUCKER
MELIA REISEBURO
GROSSE BACKENHEIMER ST 54
6 FRANKFURT 1 GERMANY

O SCHNEIDER
OBSERVATARIO ASTRONOMICO
PASEO DEL BASQUE
LA PLATA,ARGENTINA

W SCHRODER
GEOPHYSICAL STATION
282 BREMEN-ROENNEBECK
HECHELSTRASSE 8 GERMANY FDR

A SCHULT
UNIVERSITAT MUCHEN
2 RICHARD-WAGNER STR 10
8000 MUCHEN GERMANY

E T SCHWARZ
GEOLOGICAL SURVEY OF CANADA
601 BOOTH STREET
OTTAWA ONT CANADA

H SCHWENTEK
MP 1 FUR AERONOMIE
D 3411 LINDAU
WEST GERMANY

D W SCIAMA
UNIVERSITY OBSERVATORY
ST PARKS ROAD
OXFORD OX1 3RQ
ENGLAND

M J SEATON
UNIVERSITY COLLEGE
GOWER ST
LONDON W C 1 ENGLAND

C F SECHRIST JR
AERONOMY LAB
DEPT OF ELECTRICAL ENGR
UNIV OF ILLINOIS
URBANA IL 61801

L I SEDOV
MGU LENINSKIE GORY
MOSCOW B 234 ZONA H KV84
USSR

M J SELBY
IMPERIAL COL OF SCI TECH
PRINCE CONSORT ROAD
LONDON ENGLAND

E SELZER
UNIVERSITE PARIS VI
4 PLACE JUSSIEU
75230 PARIS CEDEX05
FRANCE

P H SERSON
DOMINION OBS
DEPT OF MINES + TECH SURVEYS
OTTAWA ONT CANADA

V P SHABANSKY
MOSCOW STATE UNIV
INST OFNUCLEAR PHYS
MOSCOW V 234
USSR

V A SHAFTAN
CRAA
P LENINA 61
YAKUTSK USSR

M V SHAGAEV
INST OF PHYS OF ATMOS
ACADEMY OF SCS
MOSCOS USSR

J A SHAND
DREP
CANADIAN FORCES BASE
ESQUIMALT B C
CANADA

M M SHAPIRO
CODE 7020
NAVAL RESEARCH LABORATORY
WASHINGTON D C 20390

V A SHAPIRO
INST OF GEOPHYS
URAI SCI CENT
SVERDLOVSK K66
USSR

A H SHAPLEY
NOAA/ERL/EDS
BOULDER CO 80302

V N SHARMA
DEPT OF PHYSICS
GOVET RAZA POST
GRADUATE COLLEGE
RAMPUR (U P)
INDIA

R SHARP
LOCKHEED PAL ALTO RES LAB
DEPT 52 12 BLDG 205
PALO ALTO CA 94304

L K SHATASHVILI
INST OF GEOPHYS
ZOYA RUKHADZESTR 1
GEORGIAN SSR
THILISI USSR

M A SHEA
AFCRL (PHE)
BEDFORD MA 01730

N N SHEFOV
ACADEMY OF SCS
MOSCOW ZH 17 PYSHEVSKY 3
MOSCOW USSR

W R SHELDON
PHYSICS DEPT
UNIV OF HOUSTON
HOUSTON TX 77004

D SHEMANSKY
DEPT OF PHYS
UNIV OF PITTSBURGH
PITTSBURGH PA 15213

G G SHEPHERD
YORK UNIVERSITY
4700 K-ELE STREET
DOWNSVIEW TORONTO CANADA

A D SHEVNIN
IZMIRAN
P/O AKDEMOGRODOK
MOSCOW REGION
USSR

T SHIMAZAKI
AMES RESEARCH CENTER
NASA MOFFETT FIELD
CA 94035

M SHIMIZU
ISAS UNIV OF TOKYO
KOMABA TOKYO 153
JAPAN

P SIGNER
INST KRISTALLOGRAPHIE+ PETROG DER ETH
SONNEGGSTR 5
8006 ZURICH
SWITZERLAND

J A SIMPSON
ENRICO FERMI INSTITUTE
UNIVERSITY OF CHICAGO
CHICAGO IL 60637

A K SINHA
COMPUTER SCIENCE CORP
8728 COLESVILLE RD
SILVER SPRING MD 20910

N SHRESTHA
TRIBHUBAN UNIV NEPAL GANK
VIA RUPAIDIHA
BAHRAICH DIST
(UP) INDIA

N M SHUTTE
SPACE RES INST
ACADEMYOF SCS
MOSCOW USSR

M SIEBERT
GEOPHYSIKALISCHES INST
HERZBERGER LANDSTR 180
GOTTINGEN 34 GERMANY

R SIKSNA
INST F HOGSPANNINGSFORSKINING
KUNGL UNIVERSITET
UPPSALA SWEDEN

S M SILVERMAN
AFCRL (LKA)
BEDFORD MA 01830

P G SIMON
OBSERVATORE
92190 MEUDON
FRANCE

T N SIMONENKO
LO IZMIRAN
WASSILIEVSKY OSTROV
2 LINNIE
23 LENINGRAD BO 53 USSR

S F SINGER
DEPT OF INTERIOR
WASHINGTON DC 20242

R N SINGH
APPLIED PHYSICS
I T B H U
VARANASI 5
INDIA

A K SINHA
8631 GREENBELT RACD 101
GREENBELT MD 20770

W M SINTON
UNI OF HAWAII
2525 CORREA ROAD
HONOLULU HI 96822

G L SISCOE
DEPT OF METEOROLOGY
U C L A
LOS ANGELES CA 94034

L D SIVTSEVA
INST OF SOSM RES + AERO
LENIN AVENUE 61
YAUKUTSK USSR

G A SKURDIN
ACADEMY OF SCS
BOLSHAYA GRUZENSKAYA 10
MOSCOW G-242 USSR

S F SMERD
CSIRO DIV OF RADIO PHYS
P O BOX 76
EPPING NSW 2121
AUSTRALIA

E J SMITH
JET PROPULSION LAB
4800 OAK GROVE DR
PASADENA CA 91104

P J SMITH
THE OPEN UNIVERSITY
WALTON BLETCHLEY
ENGLAND

R A SMITH
DEPT OF PHYSICS
UNIV OF NEW ENGLAND
ARMIDALE NSW 2351
AUSTRALIA

D R SNELLING
ELEC WING
ORE VALCARTIER
P O BOX 880
COURCELETTE P Q
CANADA

H SOFFEL
INST FJR ANGEWANDTE GEOPHYSIK
UNIV OF MUNICH
THERESIENSTRASSE 41
MUNICH 2
GERMANY (DR)

J E SOLHEIM
NORDLYSOBERVATORIET
TROMSO NORWAY

F SORAAS
PHYSICS DEPT
UNIV OF BERGEN
BERGEN NORWAY

G G SIVJEE
UNIV OF SASKATCHEWAN
PHYSICS DEPT
SASKATOON SASKATCHEWAN
CANADA

N J SKINNER
DEPT OF PHYSICS
UNIVERSITY OF NAIROBI
P O BOX 30197
NAIROBI KENYA

R J SLUTZ
NOAA
BOULDER CO 80

D F SMITH
HAO/NCAR
P O BOX 1470
BOULDER CO 80302

L G SMITH
GCA TECH DIV
GCA CORP
BEDFORD MA 01730

R SMITH
ULSTER COLLEGE
JORDANSTOWN NEWTOWN ABBEY
CO. ANTRIM
N IRELAND

S D SNITH
PHYS DEPT
UNIV OF READING
READING ENGLAND

A SOARE
COMITETUL STAT AL GEOL
INST GEOFOIZICA APLICATA
SOS KISELEFF 55
BUCHAREST 63
RUMANINA

G J SOFKO
DEPT OF PHYSCIS
UNIV SASKATCHEWAY
SASKATOON SAKATCHEWAN
CANADA

A J SOMOGYI
RES INST OF PHYSICS
P O B 49 H 1525
BUDAPEST 114
HUNGARY

E N SOSNOVETS
INST OF NUCLEAR PHYS
MOSCOW STATE UNIV
MOSCOW 117234
USSR

M W J SOURFIELD
PHYSICS DEPT
UNIV OF NATAL
KING GERGE V ANENUE
DURBAN SOUTH AFRICA

S F SOUSK
AMERICAN GEOPHYS UNION
SUITE 435
1707 L STREET NW
WASHINGTON D C 20036

D J SOJTHWOOD
PHYSICS DEPT
IMPERIAL COLLEGE
LONDON S W 7 2AZ
ENGLAND

R SOUTHWORTH
HARVARD COLLEGE OBS
60 GARDEN STREET
CAMBRIDGE MA 02138

T W SPEISER
DEPT OF ASTRO GEOPHYS
UNIV OF COLORADO
BOULDER COLORADO 80302

N SPENCER
CODE 620
NASA GSFC
GREENBELT MD 20771

A F SPILHAUS JR
AGU 1737 L ST N W
WASHINGTON D C 20036

A L SPITZ
1233 W MCKINLEY AVENUE
APT 4
SUNNYVALE8 CA 99086

A SPIZZICHINO
CNET
OSSY LES MOULINEAUX
FRANCE

A SPOSITO
INST ASTR NAU NAV + MAG N
INST UNIV NAVALE
VIA AMMIRAGLIO ACTON 38
80200 NAPLES
ITALY

K R SPREILER
DEPT OFAPPLIED MECHANICS
520 DURAND BLDG
STANFORD UNIVERSITY
STANFORD CA 94305

J R SPREITER
DEPT OFAPPL MECH
BLDG 250
STANFORD UNIVERSITY
STANFORD CA 94305

K SPRENGER
OBS FUR IONOSPHAREN
DDR 2565
KUHLUNGSBORN GERMANY GDR

A N SRIVASTAVA
DEPT OF APP PHYS + TECH
UNIV OF ALLAHABAD
ALLAHABAD
INDIA

R D SRIVASTAVA
PHYSICS DEPT
UNIV OF ALLAHABAD
ALLAHABAD
INDIA

S P SRIVASTAVA
BEDFORD INST OF OCEANOGRAPHY
P O BOX 1006
DARTMOUTH N S CANADA

F D STACEY
PHYSICS DEPT
UNI OF QUEENSLAND
BRISBANE AUSTRALIA

J M STAGG
33 CARLTON ROAD
SEAFORD SUSSEX
UNITED KINGDOM

P STAHL
INST SCS CHERIFIEN
SER DE PHYS DU GLOBE
AV MOULAY CHERIF
RABAT
MOROCCO

A T STAIR JR
OPTICAL PHYSICS LAB
ACRL HANSCOM FLEILD
BEDFORD MA 01730

P STANIMIROVIC
DEPT OF SCIENCE
568 ST KILDA RD
MELBOURNE VIC 3004
AUSTRALIA

G V STARKOV
POLAR GEOPHYS INST
KOLA BRANCH ACA OF SCS
APATITY
MURMANSK REGION 184200
USSR

A STAVROU
NAT INST OF GEOL + MIN RES
34 VERANZEROU ST
ATHENS 102
GREECE

W R STEIGER
DEPT OF PHYSICS
UNI OF HAWAII
HONOLULU HI 8

F STEINHAUSER
ZENTRA FUR METEO + GEO
HOHE WARTE 38
VIENNA AUSTRIA

H C STENBAEK NIELSEN
GEOPHYS INST
UNIV OF ALASKA
FAIRBANKS AL 99701

O P STERN
NASA/GSFC
CODE 641
GREENBELT MD 20771

R W H STEVENSON
UNIV OF RHODSIA
P O BOX MP 167
SALISBURY RHODESIA

R W STEWART
PACIFIC REG ENVIRON CTR
1230 GOVERNMENT ST
VICTORIA B C
CANADA

H P STOCKARD
MAGNETICS DIVISION
U S NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON D C 20390

T STOCKFLET JORGENSEN
METEOR INST
LYNGBYVEJ 100 2100
COPENHAGEN DENMARK

W STOFFREGEN
UPSALA IONOSPHERIC OBS
UPSALA 10 SWEDEN

P H STOKER
DEPT OF PHYSICS
UNI OF PATCHEFSTROOM FOR CHE
PATCHEFSTROOM SO AFRICA

J D STOLARIK
NASA/GSFC
CODE 645
GREENBELT MD 20771

R S STOLARSKI
CODE TC
NASA/JOHNSON SPACE CTR
HOUSTON TX 77058

H L STOLOV
THE CITY COLLEGE
CONVENT AVE AT 138 ST
NEW YORK NY 10031

V P STOLPOVSKY
INST NUCLEAR PHYS
MOSCOW STATE UNIV
MOSCOW 117234
USSR

D J STONE
UNI OF EXETER
EXETER DEVON
ENGLAND

E C STONE
CALIF INST OF TECH
DOWNS LAB OF PHYS 220 47
PASADENA CA 91123

P H STONE
MIT RM 54 6420
CAMBRIDGE MA 02139

K STORELVEDT
UNIV OF BERGEN
GEOPHY INST
ALLEGT 70
5000 BERGEN NORWAY

J R STOREY
UNI OF AUCKLAND
PRIVATE BAG AUCKLAND
NEW ZEALAND

L R O STOREY
4 AVENUE DE NEPTUNE
4 ST MAUR-DES-FOSSES FRANCE

D W STRANGEWAY
GEOPHYSICS LABS
UNI OF TORONTO
TORONTO 181 ONT CANADA

D J STRICKLAND
FAB FOR ATMOS + SP PHYS
SPACE SCIENCE BLDG
UNIV OF COLORADO
BOULDER CO 80302

D F STROBEL
CODE 7750 HULBERT CTR
NAVAL RES LAB
WASHINGTON D C 20375

G E STJART
PHYSICS + ENGR LAB
PRIVATE BAG LOWER HUTT
NEW ZEALAND

W STUART
INST OF GEOLOGICAL SCS
EDINBURGH SCOTLAND

WOLFGANG STUDEMANN
MAX PLANCK INST FUR AERO
INST F STRATOSPHAREN PHYSIK
3411 LINDAU/HARZ
FED REP OF GERMANY

PETER STURROCK
INST FOR PLASMA RESEARCH
STANFORD UNIVERSITY
STANFORD CA 94105

C G SUCKSDORFF
FINISH METEOROL OFFICE
RUCHOLAHDENKATU 8
P O BOX 10503
HELSINKI 10 FINLAND

K SUGIURA
SURVEYING DIV HYDROGRAPHIC DEPT
MARITIME SAFETY AGENCY
5 CHOME TSUKIJI CHUO KU
TOKUO 104 JAPAN

M SUGIURA
NASA GSFC
CODE 612
GREENBELT MD 20771

T SUGIYAMA
DEPT OF PHYSICS
KYOTO UNIVERSITY
KYOTO JAPAN

HARRY M SULLIVAN
DEPART OF PHYSICS
UNIV OF VICTORIA
VICTORIA BRITISH COLUMBIA
CANADA

R SUSANTO
METORO + GEOPHYS INST
J1 JALAN ARIEF FAKHAMN
HAKIM NO 3
JAKARTA INDONESIA

A SUSSTRUNK
RUTISTR 13
CH 5400 BADEN
SWITZERLAND

K L SVENDSEN
NOAA ERL EDS
BOULDER CO 80302

YU L SVERDLOV
POLAR GEOPHYSICAL INST
KOLA FILIAL
ACADEMY OF SCIENCES
MOSCOW USSR

P A SWEET
DEPT OF ASTRONOMY
UNIVERSITY OF GLASGOW
GLASGOW SCOTLAND

ZDENEK SVESTKA
FRAUNHOFER INST
SCHONECKSTRASSE 6
78 FREIBURG (BREISGAV)
FR GERMANY

W SWARTZ
SCHOOL OF ELECT ENGR
CORNELL UNIVERSITY
ITHACA NY 14850

W SWIDER
CRUB AFCRL
L G HANSCOM FIELD
BEDFORD MA 01731

P SWINGS
INST D ASTROPHYS DE LIEGE
COINTE-SCLESSIN
LIEGE BELGIUM

C SYNDER
JET PROPULSION LAB
PASADENA CA 91103

PAUL SZEMEREDY
GEOPHYS DEPT OF EOTVOS UNIV
1083 KUN BELA TER 2
BUDAPEST HUNGARY

H TAKAHASHI
FACULTY OF EDUCATION
IWATE UNIVERSITY
18 33 UEDA 3 MORIOKA
IWATE 020 JAPAN

HISAO TAKAHASHI
INST PESQUESAS ESPACIAIS CP 515
SAO JOSE DOS CAMPOS
EST DE SAO PAULO
BRAZIL

K TAKAYANAGI
UNI OF TOKYO
KOMABA MEGURO-KU
TOKYO JAPAN

A TAKECHI
TOKYO ASTRONOMICAL OBS
MITAKA TOKYO 181
JAPAN

SHIGEO TAKEI
GEOPHYSICAL INSTITUTE
TOHOKU UNIVERSITY
SENDAI 980 JAPAN

T TAMAO
GEOPHYS. RES. LAB.
FACULTY OF SCIENCE
THE UNIV. OF TOKYO
BUNKYO-KU,TOKYO,113 JAPAN

HARUO TANAKA
RES INST OF ATMOSPHERICS
NAGOY UNIVERSITY
TOYOKAWA 442
JAPAN

YOSHIHITO TANKA
RES INST OF ATMOSPHERICS
NAGOYA UNIVERSTITY
TOYKAWA 442
JAPAN

YOSHIKAZU TANAKA
VOLCANOLOGICAL OBS
KYOTO UNIVERSITY
CHOYO SON ASO
KUMANOTO JAPAN

R P TANESELL
OBS METEROLO DELL INST
CAVANIS 30123
VENICE ITALY

PEKKA TANSKANEN
DEPT OF PHYSICS
UNIV OF OULU
SF 90100 OULU 10
FINLAND

O G TARANOVA
STERNBERG ASTRON INST
UNI PROSPEKT
13 MOSCOW B-234 USSR

T M TARASOVA
POLAR GEOPHYSICAL INST
APATITY USSR

A TARCXY-HORNOCH
P O BOX 9
SOPRON HUNGARY

H A TAYLOR JR
NASA/GSFC
7303 LOIS LANE
LANHAM MD 20801

H E TAYLOR
NAMS
STOCKTON STATE COLLEGE
POMONA N J 08240

H TEITELBAUM
SERIVE D≠AERO DU CNRS
91 VERRIERES LE BIUSSON
FRANCE

N R TEIXEIRA
INST OF PESQUISAS ESPEACIAIS
SAO JOSE DOS CAMPOS
SP BRAZIL

G M TEPTIN
KAZAN UNIVERSITY
USSR

YOSHINOUKE TERASHIMA
INST OF PLASA PHYS
NAGOYA UNIVERSITY
NAGOYA JAPAN

BURKHARD THEILE
INST FOR GEOPHYS + METEOROL
D 33 BRAUNSCHWEIG
MENDELSSOHNSTR 1
GERMAN FED REP

E THELLIER
4 AVENUE DE NEPTUNE
94 ST MAUR-DES-FOSSES FRANCE

GARY E THOMAS
LASP SP SCI BLDG D135
UNIVERSITY OF COLORADO
BOULDER CO 80302

I L THOMAS
PEL AURORAL STATION
PRIVATE BAG
OMAKAU NEW ZEALAND

L THOMAS
RADIO + SPACE RES STATION
DITTON PARK
SLOUGH BUCKS
ENGLAND

R M THORNE
JDEPT OF METEOROROLOGY
UCLA
LOS ANGELES CA 90024

B A THRUST
PHYS CHEMISTRY DEPT
LENSFIELD ROAD
CAMBRIDGE ENGLAND

B A TINSLEY
UNIV OF TEXAS AT DALLAS
P O BOX 30365
DALLAS TX 75230

J E TITHERIDGE
RADIO RES CENTER
UNIV OF AUCKLAND
PRIVATE BAG
AUCKLAND NEW ZEALAND

MARITI TIURI
HELSINKI UNIV OF TECH
OTANIEMI
FINLAND

T M TMIANITOV
MAIN GEOPHYS OBS
KARBYSHEVA 7
LENINGRAD K 18 USSR

T TOHMATSU
GEOPHYSICAL INST
1 MOTOFUJI-CHO
BUNKYO-KU
TOKYO JAPAN

T TOICHI
INST OF ENERGY ECON
NO 10 MORI BLDG 28 SHIBA
NISHIKUBO SAKAPUGAWA CHO
MINATO KU
TOKYO JAPAN

D G TORR
NAT INST FOR TELCOM RES
P O BOX 3718
JOHANNESBURG
SOUTH AFRICA

DOUGLAS G TORR
DEPT OF GEOLOG + GEOPHYS
YALE UNIVERSITY
NEW HAVEN CT 06520

M R TORR
DEPT OF GEOL + GEOPHYS
YALE UNIVERSITY
NEW HAVEN CT 06520

D C TOZER
THE UNIVERSITY OF NEWCASTLE
UPON TYNE 1 ENGLAND

H TREFELL
INSTITUTE OF PHYSICS
UNIVERSITY OF BERGEN
BERGEN NORWAY

E TRENDELENBURG
SPACE SCIENCE DEPT
ESTEC/ESRO
DOMEINWEG NORDWIJK
NETHERLANDS

V A TROITSKAYA
SOVIET IGC COMMITTEE
MOLODEZHNAYA 3
MOSCOW B-296 USSR

YU L TRUTTSE
INSTITUTE OF ATMOSPHERIC PHYS
ACADEMY OF SCS
PYZHEVSKY 3
MOSCOW ZH 17 USSR

R T TSUNODA
STANFORD RES INST
MENLO PARK CA 94025

M TSUTSUI
IONOSPHERE RES LAB
KYOTO UNIVERISTY
UJI KYOTO 611
JAPAN

T F TUAN
DEPT OF PHYSICS
UNIV OF CINCINNATI
CINCINNATI OH 45221

V F TULINOV
HYDROMETEROL SERVICE
12 PAVLIK
MOROZOV STREET
MOSCOW USSR

E H TULL
PHYSICS DEPT
NORTHWESTERN MICH COLLEGE
TRAVERSE CITY MI 49684

J TURNER
IONOS PREDICTION SERVICE DIV
BUREAU OF METEOROLOGY
SYDNEY 2000
AUSTRALIA

L V TVERSKAYA
INST OF NUCLEAR PHYS
MOSCOW STATE UNIV
MOSCOW 117234
USSR

J C ULWICK
CRUB AFCRL
L G HANSCOM FIELD
BEDFORD MA 01731

J UNTIEDT
INST FJR GEOPHYSIK
44 MUNSTER
STEINFURTER STR 107
WEST GERMANY

S UTASHIRO
MARITIME SAFETY ACADEMY
WAKABACHO 1 1
KURE CITY
HIROSHIMA PREFECTURE
JAPAN

SEIYA UYEDA
EARTHQUAKE RESEARCH INST
UNIV OF TOKYO
BUNKYO KU
TOKYO JAPAN

O VAISBERG
INST FOR SPACE RES
PROFSOJUZNAFA 88
MOSCOW B-687 USSR

BORIS VALNICEK
ASTRONOMICAL INST
25165 ONDREJOV
CZECHOSOLOVAKIA

DR VAN DE HULST
UNIVERSITY OBSERVATORY
LEIDEN HOLLAND

D VAN SABBEN
METEOROL INST OF NETHERLANDS
DEBILT NETHERLANDS

T E VAN ZANDT
NOAA/ ERL R445
BOULDER COLORADO 80802

R TURAJLIC
GEOMAGNETIC INSTITUTE
GROCKA YUGOSLAVIA

T E TURUNEN
IONO STATION GEOPHYS OBS
SF 99600 SODANKYLA
FINLAND

B A TVERSKOY
INST OF NUCLEAR PHYS
MOSCOW STATE UNIV
MOSCOW 117234
USSR

E UNGSTRUP
DANISH SPACE RES INST
LUNDLOFTEVEJ 7
2800 LYNGBY DENMARK

R S UNWIN
GEOPHYSICAL OBSERV.
P.O. BOX 2111
CHRISTCHURCH, NEW ZEALAND

O UYAR
MAGNETIC SERVICE
ISTANBUL KANDILLI OBS
GENGELKOY
ISTANBUL
TURKEY

V VACQUIER
SCRIPPS INST OF OCEANOGRAPHY
LA JOLLA CA 920

A VALLANCE-JONES
DIV OF RADIO + ELEC ENGR
NATIONAL RES COUNCIL
OTTAWA 7 ONTARIO CANADA

J A VAN ALLEN
DEPT OF PHYSICS AND ASTRONOMY
UNIVERSITY OF IOWA
IOWA CITY IA 52240

O A VAN DER WESTHUYSEN
SAC SIR
BOX 398
PRETORIA SOUTH AFRICA

A M VAN WIJK
MAGNETIC OBS
BOX 32
HERMANUS C P SOUTH AFRICA

A VASSY
UNIVERSITY PARIS VI
TOUR 14 PLACE JUSSIEU
75230 PARIS CEDEX 05
FRANCE

V M VASYLIUNAS
LAB FOR NUCLEAR SCS
MIT
CAMBRIDGE MA 02139

J VELDKAMP
STENER CAMER 38
DEBILT NETHERLANDS

VERCHEVAL JR
UNST FOR AERONOMY
3 AVENUE CIRCULAIRE
1180 BRUSSELS BELGIUM

J VERO
GEO + GEOPHY RES INST
HUNGARIAN ACAD OF SCS
POB 5
H 9401 SOPRON
HUNGARY

F J VESECKY
DEPARTMENT OF ASTRONOMY
UNIVERSITY OF LEICESTER
LEICESTER ENGLAND

A VIDAL MADJAR
LPSP BP 10
REDUIT DE VERRIERES LE BUSSON
91 FRANCE

P VILA
CRI/GNET
3 AVENUE DE LA REPUBLIQUE
92-ISSY-LES-MOULINEAUX
SEINE FRANCE

+P A VINOGRADOV
IRKUTSK 33
POST BOX 4
SIBIZMIR
USSR

M N VLASOV
HYDROMETEOROL SERVICE
12 PAVLIK
MOROZOV
MOSCOW USSR

E L VOGAN
PHYSICS
UNI OF WESTERN ONTARIO
LONDON 72
ONTARIO CANADA

H J VOLK
MAX PLANCK INST FUR KERNPHYSIK
SAUPFERCHECKWEG
69 HEIDELBERG U
GERMAN FED REP

M VATSIA
NIGHT VISION LAB
FORT BELVOIR VA 22060

D VENKATESAN
PHYSICS DEPT
UNI OF CALGARY
CALGARY ALBERTA
12N 1N4 CANADA

D VERKATESAN
PHYSICS DEPARTMENT
UNIVERSITY OF CALGARY
CALGARY ALBERTA
CANADA

K L VEROSUB
AMHERST COLLEGE
AMHERST MA 01002

J I VETTE
12502 WHITE DRIVE
SILVER SPRING MD 2090

DOMINQUE VIGLA
CENTER FOR NUCLEAR STDS
FONTENAY AUX ROSES
FRANCE

S A VINCENZ
ST LOUIS UNIV
P O BOX 8020 COLLEGE STA
ST LOUIS MO 6315

G VISCONTI
INST DI FISICA
UNIVERSITA
L≠AGUILA ITALY

H VOELKER
INST FUR GEOPHYSICS
UNIV GOTTINGEN
HERZBERGER LANSTR 180
GOTTINGEN W GERMANY

K G VOHRA
BHABHA ATOMIC RES CENTRE
BOMBAY-74 (AS) INDIA

HANS VOLLAND
RADIO ASTRON INST
AUF DEM HUGEL 71
53 BONN
FED REP OF GERMANY

D VOPPEL
DEUTSCHES HYDROGRAPH INST
BERNHARD NOCHSTRASSE 78
D 2000 HAMBURG 4
GERMANY (DR)

M WADA
INST OF PHYS + CHEM RES
KAGA 1-7 ITABASHI
TOKYO JAPAN

C U WAGNER
GEOMAGNETISCHES INST DER.DAW
POTSDAM 15 GERMANY (DR)

J R WAIT
NOAA/ERL
BOULDER CO 80302

N WAKAI
RADIO RES LAB
KOKUBUNJI
TOKYO JAPAN

P WALDTEUFEL
CTR NAT D≠ETUDES DESTELECOM
3 RUE DU GL LECLERC
92 ISSY LES MOLLINEAUX
FRANCE

A D M WALKER
UNIV OF NATAL
KING GEORGE V AVENUE
DURBAN SO AFRICA

G O WALKER
PHYSICS DEPT
UNIV OF HONG KONG
HONG KONG

J C G WALKER
YALE UNIVERSITY
NEW HAVEN CT 06520

J K WALKER
OBS BRANCH
DEPT ENERGY MINES + RES
OTTAWA 3 CANADA

L WALLACE
KITT PEAK NATL OBS
950 N CHERRY AVENUE
TUCSON AZ 85717

M K WALLIS
MATHEMATICAL INST
24 ST GILES
OXFORD ENGLAND

MARTIN WALT
LOCKHEED PALO ALTO RES LAB
52 10 BLD 201
3251 HANOVER ST
PALO ALTO CA 94304

T NIE CHIN WANG
RADIO PHYS LAB
STANFORD RESEARCH INST
MENLO PARK CA 94025

S H WARD
UNIV OF UTAH
SALT LAKE CITY UT 84112

D W WARK
U S WEATHER BUREAU
WASHINGTON D C

E S WARREN
DEPT OF COMM
P O B 490 STA A
OTTAWA ONTARIO
K2N 8T5 CANADA

JAMES WARWICK
HIGH ALTITUDE OBSERVATORY
UNIVERSITY OF COLORADO
BOULDER CO 80302

HARUICHI WASHIMI
RES INST OF ATMOS
NAGOYA UNIV
TOYOKAWA AICHI 442
JAPAN

T WATANABE
INST OF EARTH SCIENCE
UNIV OF BRITISH COLUMBIA
VANCOUVER 8 B C CANADA

B J WATKINS
GEOPHYSICAL INST
UNIV OFALASKA
FAIRBANKS AK 99701

C D WATKINS
RAYAL RADAR ESTAB
LIEGH SINTON RD
MALVERN
WORCH ENGLAND

N D WATKINS
UNIV OF RHODE ISLAND
KINGSTON RI 02882

T M WATT
RADIOPHYS LAB
MENLO PARK CA 94025

R P WAYNE
PHYSICAL CHEM LAB
SOUTH PARKS RD
OXFORD OX1 3ZQ
ENGLAND

W L WEBB
PHYSICS DEPT
UNIV OF TEXAS AT EL PASO
EL PASO TX 79968

T WEDDE
NORVEGIAN DEF RES ESTAB
POB 25
KJELLER NORWAY

G M WEILL
INST D ASTROPHYSIQUE
98 BIS BLVD ARAGO
PARIS 14E FRANCE

K H WELGE
CRESS YORK UNIV
TORONTO ONTARIO
CANADA

H I WEST
UNIV OF CLAIF
LAWRENCE LIVERMORE LAB
LIVERMORE CA 94550

Y C WHANG
DEPT AEROSPACE AND ATOMS SCI
CATHOLIC UNIV OF AMERICA
WASHINGTON D C 20017

R S WHITE
INST OF GEOPHYS + PLAN PHYS
UNIV OF CALIFORNIA
RIVERSIDE CA 92502

K WHITHAM
DIV OF GEOMAGNETISM
DOMINION OBS
CARLING AVENUE
OTTAWA 3 ONT CANADA

R WHITWORTH
DEPT OF NAT DEV
BUR OF MINES RES
MELBOURNE
AUSTRALIA

K A WIENERT
GEOPHYSIKALISCHES OBS
808 FURSTENFELD-BRUCK
GERMANY

H WIESE
GEOMAGNETIC OBS
1824 NIEMEGK
KREIS BELZIG GERMANY (DDR)

J T WEAVER
DEPT OF PHYS
UNIV OF VICTORIA
VICTORIA B C
CANADA

H C WEBSTER
QUEENSLAND CLBU
BOX 4 GPO BRISBANCE
QUEENSLAND 4001
AUSTRALIA

N WEHRLIN
CNET/GRI
3 AVENUE DE LA REP
92131 ISSY LES MOULINEAUX
FRANCE

J L WEINBERG
DUDLEY OBS
100 FULLER ROAD
ALBANY NY 12205

K P WENZEL
ESRTC SPACE SCI DEPT
NOORDWIJK
THE NETHERLANDS

B A WHALEN
NATIONAL RES COUNCIL
OTTAWA ONATRIO
R1A OR 6 CANADA

E C WHIPPLE
NOAA RES LABS
BOULDER CO 80302

J D WHITEHEAD
DEPT OF PHYSICS
UNIV OF QUEENSLAND
ST LUCIA BRISBANCE 4067
AUSTRALIA

R C WHITTEN
NASA AMES RES CTR
MAIL STOP 245 3
MOFFETT FIELD CA 94035

G WIBBERENZ
INST REINE + ANGEWANDTE
KERNPHYSIK CHRISTIAN ALBERCHTS UNIV
OLSHAUSENSTR 40/60
D 23 KIEL GERMAN FED REP

R WIENS
UNIV OF CALGARY
CALGARY ALBERTA
CANADA

J M WILCOX
INST FOR PLAMA RES
STANFORD UNIV
STANFAORD CA 94305

J WILHJELM
METEOR INST GEOPHYS SEC
LYGBYVEJ 100 DK 2100
COPENHAGEN
DENMARK

I WILKINSON
DEPT OF PHYSICS
THE UNIVERSITY OF NEWCASTLE
UPON TYNE 1 ENGLAND

CAROL A WILLIAMS
ERINDALE COLLEGE
UNIV OF TORONTO
3359 MISSASSAUGA RD
CLARKSON ONTARIO
CANADA

D J WILLIAMS
NOAA/ERL
BOULDER COLO 80302

A P WILLMORE
MULLARD SPACE ACI LAB
HOLMBURY ST MARY
DORKING SURREY
ENGLAND

D M WILLIS
APPLETON LAB
DITTON PARK
SLOUGH SL3 9JX
ENGLAND

B G WILSON
SIMON FRANSER UNIV
BURNABY 2 B C
CANADA

B G WILSON
UNIVERSITY OF CALGARY
CALGARY ALBERTA
CANADA

C R WILSON
GEOPHYSICAL INSTITUTE
UNIV OF ALASKA
FAIRBANKS AK 99702

R L WILSON
LIVERPOOL UNIV
LIVERSPPL L69 03BX
ENGLAND

D WINCH
DEPT OF APPLIED MATH
UNIV OF SYDNEY
SYDNEY N S W AUSTRALIA

J R WINCKLER
SHCOOL OF PHYS + ASTRO
UNIV OF MINNEAPOLIS
MINNEAPOLIS MN 55435

J D WINNINGHAM
UNIV OF TEXAS AT DALLAS
BOX 30365
DALLAS TX 75230

D WITT
UNIV OF STOCKHOLM
TULEGATEN 41 S604 32
STOCKHOLM 19 SWEDEN

J H WOLFE
NASA AMES RESEARCH CENTER
MOFFET FIELD CA 94035

H C WOOD
INST METEOROLOGY
UNI STOCKHOLM
STOCKHOLM
SWEDEN

R F WOODMAN
INST GEOL DEL PERU
APARTADO 3747
LIMA PERU S A

R A WOLF
DEPT OF SPACE PHYS + ASTRO
RICE UNIVERSITY
HOUSTON TX 77001

J E WORTHY
SCIENCE OBS
STONYHURST COLLEGE
WHALLEY VIA BLACKBURN
LANCASTER ENGLAND

G L WRENN
UNIV COLLEGE LONDON
HOLMBURG ST
MARY DORKING SURREY
ENGLAND

J A WRIGHT
MEMORIAL UNIV OF NEWFOUNDLAND
ST JOHN≠S
NEWFOUNDLAND
CANADA

J W WRIGHT
NOAA/ERL/SFL
BOULDER CO 80302

R WRIGHT
FACULTY OF SCS
UNIV OF BENIN
BENIN CITY NIGERIA

S T WU
BOX 1247
UNIV OF ALABAMA
HUNTSVILLE AL 35807

T YABUZAKI
IONOS RES LAB
KYOTO UNIVERSITY
UJI KYOTO 611
JAPAN

R S YADAV
DEPT OF PHYSICS
ALIGARH MUSLIM UNIV
ALIGARH (UP)
INDIA

G YAMAMOTO
GEOPHYS INST
TOHOKU UNIV
KATAHIRA 2 GHOME
SENDAI JAPAN

K YANAGIHARA
KAKIOKA MAGNETIC OBS
595 KAKIOKA
YASATO IBARAHI JAPAN

T YONEZAWA
NUKUI KILAMACHI 4 2 1
KOGANEI SHI
184 JAPAN

G A YOUNG
1301 DELWARE AVE SW APT9 204
WASHINGTON D C 20024

P C YUEN
COLLEGE OF ENGR
UNIV OF HAWAII AT MANOA
2540 DOLE STREET
HONOLULU HI 96822

V A ZAGULIAEVA
IZMIRAN
VATUTENKI
MOSCOW V 17
USSR

S A ZAITZEVA
PHYSICAL INST
LENINGRAD STATE UNIV
LENINGRAD USSR

C S WU
IFDAM
UNIV OF MARYLAND
COLLEGE PARK MD 20742

C L WYATT
UTAH STATE UNIV
LOGAN UTAH

T YABUZAKI
DEPT OF PHYSICS
ALIGARH MULSIN UNIV
ALIGARH U P
INDIA

K M YAKUBAULUK
KIRENSKI INS OF PHYSICS
USSR

YOSHIO YAMAZAKI
EARTHQUAKE RES INST
UNIV OF TOKYO
TOKYO JAPAN

L S YEVLASIN
POLAR GEOPHYS INST
APATITY
MURMANSK 10
USSR

T YOSHIMATSU
KAKOKA MAGNETIC OBS
KAKIOKA IBARAKI-KEN
JAPAN

O YUAR
MAGNETIC SERIVCE
ISTANBUL KANDILLI OBS
CENGELKOY ISTANBUL
TURKEY

TAKESI YUKUTAKE
RB 103 116 KOZIMATYO
TYOHU (CHOFU)
TOKYO 182 JAPAN

A N ZAITZEV
IZMIRAN
P O AKADEMGORODOK
1420902 MOSWOC REGION
USSR

K S ZALPURI
RADIO SCI DIV
NAT PHYS LAB
NEW DELHI INDIA

R J ZANDER
UNIV OF LEIGE
5 AVE DE COINTE
B4200 COINTE OUGREE
BELGIUM

A ZATOPEK
INST OF GEOPHYSICS
CHARLES UNIV
KE KARLOVU 3
PRAHA 2
CZECHOSLOVAKIA

A J ZEHIL
GROUPE DE RECH GEOPHYS
CONSEIL NATIONAL DE LA RECH SCS
P O BOX 8281
BIRUT LEBANAN

A D ZHLOOD≠KO
HYDROMETEOROL SER9
12 PAVLIK MOROZOV ST
MOSCOW USSR

I A ZHULIN
IZMIRAN
P/O AKADEMGORODOK
MOSCOW REGION USSR

S ZIAUDDIN
DEPT OF PHYSCIS
LAURENTIAN UNIVERSITY
SUDBURY ONATARIO
CANADA

D P ZIDAROV
GEOPHYSICAL INSTITUTE
SOFIA BULGARIA

I ZIETZ
U S GEOLOGICAL SURVEY
ROOM 415 BLAIR BLDG
SILVER SPRING MD 2091

IAGA PUBLICATIONS

On sale at the IUGG Publication Office
39 ter, Rue Gay-Lussac, 75005 Paris, France

All prices in U. S. Dollars
(Prices were revised downward
on 7 September 1974.)

REPORTS OF IAGA MEETINGS $8.00 each

N°3	Transactions of the Rome Meeting, 1922
N°5	Transactions of the Madrid Meeting, 1924
N°8	Comptes-rendes de l'Assemblée de Stockholm 1930
N°14	Transactions of the Brussels Meeting, 1951
N°16	Transactions of the Toronto Meeting, 1957
N°19	Transactions of the Helsinki and Berkeley Meetings, 1960 - 1963
N°24	Program and Abstracts of the St Gall Meeting, 1967
N°25	Transactions of the St Gall Meeting, 1967
N°26	Program and Abstracts of the General Scientific Assembly, Madrid, 1969
N°27	Transactions of the General Scientific Assembly, Madrid 1969
N°31	Transactions of the XV General Assembly, Moscow 1971
N°34	Program and Abstracts fro the Second General Scientific Assembly, Kyoto, 1973
N°35	Transactions of the Second General Scientific Assembly, Kyoto, 1973

GEOMAGNETIC INDICES AND GEOMAGNETIC DATA

N°12c	Geomagnetic Indices, K and C, 1949	$ 3.60
N°12d	Geomagnetic K-indices, International Polar Year August 1932 to 1933	3.60
N°12e	Geomagnetic Indices, K and C, 1950	3.60
N°12g	Geomagnetic Indices, K and C, 1952	3.60
N°12h	Geomagnetic Indices, K and C, 1953	3.60
N°12i	Geomagnetic Indices, K and C, 1954	3.60
N°12j	Geomagnetic Indices, K and C, 1955	3.60
N°12 m1	Geomagnetic Data, 1958, Indices K and C	3.60
N°12 m2	Geomagnetic Data, 1958, Rapid Variations	3.60
N°12 n1	Geomagnetic Data, 1959, Indices K and C	3.60
N°12 n2	Geomagnetic Data, 1959, Rapid Variations	3.60
N°12 o1	Geomagnetic Data, 1960, Indices K and C	3.60
N°12 o2	Geomagnetic Data, 1960, Rapid Variations	3.60
N°12 p1	Geomagnetic Data, 1961, Indices K and C	3.60
N°12 p2	Geomagnetic Data, 1961, Rapid Variations	3.60
N°12 q1	Geomagnetic Data, 1962, Indices K and C	3.60
N°12 q2	Geomagnetic Data, 1962, Rapid Variations	3.60
N°12 r1	Geomagnetic Data, 1963, Indices K and C	3.60
N°12 r2	Geomagnetic Data, 1963, Rapid Variations	3.60
N°12 s1	Geomagnetic Data, 1964, Indices K and C	3.60
N°12 s2	Geomangetic Data, 1964, Rapid Variations	3.60

N°12 t1	Geomagnetic Data, 1965, Indices K and C	$ 3.60
N°12 t2	Geomagnetic Data, 1965, Rapid Variations	3.60
N°12 u1	Geomagnetic Data, 1966, Indices K and C	3.60
N°12 u2	Geomagnetic Data, 1966, Rapid Variations	3.60
N°12 v1	Geomagnetic Data, 1967, Indices K and C	3.60
N°12 v2	Geomagnetic Data, 1967, Rapid Variations	3.60
N°12 w1	Geomagnetic Data, 1968, Indices K and C	3.60
N°12 w2	Geomagnetic Data, 1968, Rapid Variations	3.60
N°12 x1	Geomagnetic Data, 1969, Indices K and C	3.60
N°12 x2	Geomagnetic Data, 1969, Rapid Variations	3.60
N°18	Geomagnetic Planetary Indices Kp, Ap and Cp, 1932 to 1961	5.60
N°21	Atlas of Indices K, 1, Text - 2, Figures	8.00
N°32a	Geomagnetic Data, 1970, Indices, Rapid Variations Magnetic Storms	3.60
N°32b	Geomagnetic Data, 1971, Indices, Rapid Variations Special Intervals	3.60
N°32c	Geomagnetic Data, 1972, Indices, Rapid Variations Special Intervals	3.60
N°33	A hundred year series of Geomagnetic Data 1868-1967	8.00

PROCEEDINGS OF IAGA SYMPOSIA $8.00 each

IAGA Symposium N°2, Communications présentées à la Réunion de Berkeley, 1963
IAGA Symposium N°3, Symposium on Magnetism of the Earth's Interior, Pittsburgh, 1964
IAGA Symposium N°4, Communications présentées à la Réunion de Chambridge (Mass.), 1965
IAGA Symposium N°5, Communications présentées à la Réunion de Sao José dos Campos (Brésil), 1966
IAGA Symposium N°6, Symposium on Aurora and Magnetic Storms, Brikeland, 1967
IAGA Symposium N°7, Symposium on Upper Atmospheric Winds, Waves and Ionospheric Drifts, St Gall, 1967
IAGA Symposium N°8, Symposium on Laboratory Measurements of Aeronomic Interest, Toronto, 1963
IAGA Symposium N°9, Symposium on Multidisciplinary Studies of Unusual Regions of the Upper Mantle, Madrid, 1969

MISCELLANEOUS

N°28	The World Magnetic Survey, 1957 - 1969	10.00
N°29	Grid Values for the IGRF 1965	3.00