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## JANUSZ GROSZKOWSKI

1898 - 1984

It is with deep regret that we announce the death of Professor Janusz Groszkowski, Vice-President of URSI 1966-1972, on 3 August 1984.

Janusz Groszkowski was born in Warsaw, Poland on 21 March 1898. His academic career began in 1917 at the Technical University of Warsaw. In 1929 he was nominated as a Professor and Head of the Chair of Radio Engineering at the Technical University. At about the same time, he was the organizer and first Director of the Radio Research Institute. In the 1930's, this Institute performed significant research on frequency stability UHF techniques, television, ultrasonics, etc. Prof. Groszkowski himself published many excellent papers in those times, especially on the theory of oscillations. The so-called Groszkowski formula, relating the frequency of a nonlinear oscillator to the harmonic contents of its waveform, is connected with his name. Among numerous postwar achievements of Prof. Groszkowski, the new ideas and instruments for precise determination of extremely high vacuum received widespread appreciation.

Prof. Groszkowski was a member of the Polish Academy of Technical Sciences (1936), the Polish Academy of Knowledge (1945), the Warsaw Scientific Society (1949) and the Polish Academy of Sciences (1952). He was elected Vice-President of the Academy of Sciences in 1956 and was President from 1963 to 1972. He was a member of many foreign Academies. He was a Life Fellow of IEEE "for his contributions in the field of frequency stability and leadership in engineering education and research". He was a member of the Société des Amis de la TSF en France (1925) and a honorary member of the Société des Electriciens et des Electroniciens de France (1967). Prof. Groszkowski was President of the Polish URSI Committee from 1959 to 1972.

The rôle Professor Groszkowski played in Poland in the field of education and research, and even in human relations, was unique. He was the educator of many generations of prominent Polish engineers and scientists, the initiator of diversified research and the propagator of new ideas not only in

science and engineering, but also in a broad spectrum of human life and culture. Even as a retired Professor, Janusz Groszkowski was still active in the laboratory as well as in the scientific and social events until his last days.

Stefan Hahn

## RADAR: 50TH ANNIVERSARY

At an URSI General Assembly many years ago, E.V. Appleton made the remark that the ionosphere had to be invented before it could be discovered. He had in mind the fact that Balfour Stewart, and later Heaviside and Kennelly, had "invented" the ionosphere or, to be more precise, had postulated its existence, although for very different reasons. It was not until 1924 that Appleton, and Breit and Tuve, "discovered" that it actually did exist.

If an analogous remark were to be coined concerning the origins of radar, a possible version might be that the complex idea of an operationally acceptable radar system had to be conceived by someone before the design or the construction of a prototype could begin. In this context, the word 'radar' does not refer to the mere detection of radio waves reflected from a target, but rather to a fully integrated system capable of detecting the reflected radiation from a distant aircraft, of measuring the range of the aircraft, and the direction of arrival of the radiation in azimuth and angle of incidence, of converting the range and polar coordinates into a military map reference combined with the height of the aircraft, and finally of passing on all this information without delay to a distant user.

Such a system was conceived in the United Kingdom by R.A. Watson Watt (later Sir Robert Watson-Watt) in February 1935, and was described in his Memorandum on the detection of aircraft by radio methods. The Memorandum was examined by the members of the British Committee for the Scientific Survey of Air Defence, usually referred to as the Tizard Committee after the name of its Chairman. It is often forgotten that the ideas contained in this document were submitted on the initiative of Watson Watt himself, and not at the request of the Air Ministry or the Tizard Committee. Indeed the first contacts with Watson Watt were made by H.E. Wimperis (Director of Scientific Research at the Air Ministry) and were concerned not with radar, but with the possibility of making a 'death ray'. On the basis of calculations made by A.F. Wilkins, Watson Watt's response was that there was no such possibility, either for the pilot of an aircraft or even for a stationary target.

The proposals made in Watson Watt's Memorandum were intended to represent a possible alternative, but more realistic,

solution to the growing problem of defence against air attack. It must be admitted that the concept of a fully operational radar system was, 50 years ago, very much closer to science fiction than to reality. Nevertheless, the scientific members of the Tizard Committee were prepared to accept the validity of Watson Watt's proposals, which were supported by estimates of the field-strength of aircraft reflections that had been made by Wilkins. On the other hand, the officer representing the Royal Air Force found himself unable to do so immediately, and he asked whether it would be possible to arrange a demonstration of some kind designed to show that the strength of the radio waves reflected from an aircraft was, in fact, great enough to be detected.

The result was a simple experiment, hastily arranged by Wilkins, which took place on 26 February 1935 near the BBC 6 MHz broadcasting transmitter at Daventry. After the receiving antenna set up by Wilkins had been adjusted so that the direct signal from the BBC transmitter had been reduced to a low level, an aircraft was flown over the site several times. During these passes, beats were observed between the almost completely suppressed direct signal and the radiation reflected from the aircraft. Beats continued to be observed until the receding aircraft was at a distance estimated to be about 12 km, and the experiment was regarded as providing confirmation of the calculations made earlier by Wilkins.

Intensive research and development in a series of stages from mid-1935 onwards led to the completion, by mid-1937, of a prototype operational radar; this equipment was used soon afterwards for making the first experimental ground-controlled interceptions, over the North Sea, of an approaching 'bomber' by a 'fighter' aircraft based at Martlesham about 15 km inland from the radar on the Suffolk coast.

As the 50th Anniversary of Watson Watt's Memorandum on radar approaches, it seems worth recalling several aspects of the events of 1935-36, especially because Watson Watt and Wilkins both had associations with URSI. Watson Watt was Chairman of the Commission on Atmospheric Physics for many years in the late 1920's, and his well-known pioneering work on the location of thunderstorms using radio techniques was described by Appleton at the time as "most astounding". Wilkins was associated with the activities of the British URSI Committee and was Secretary of a Sub-Commission on ionospheric propagation during the URSI General Assembly in 1934.

A second reason for referring to the origins of radar in the *URSI Information Bulletin* is that remote sensing, whether from satellites or from the ground, is one of the more spectacular branches of radio science at present, and can be said to have its earliest roots in radar as conceived 50 years ago.

Mention has already been made of the fact that Watson Watt's conception of radar in February 1935 did not result from any request made to him; it emerged, apparently almost as an afterthought, following the negative advice he had given about the development of a death ray. Although nowadays the word 'radar' is immediately understood to refer to a complex synthesis of various ideas and techniques, this concept had not yet emerged clearly 50 years ago. On the other hand, it is important to note that Watson Watt's personal experience up to 1935 had already brought him into close contact with several aspects of radio science that were, at that time, almost unconnected but which, if brought together and properly integrated, would provide the basis for a radar system. The main features in his experience at the Radio Research Station at Slough were familiarity with the generation and handling of short radio pulses and the design of the associated wide-band receivers, with progress in current research on Adcock and other radio direction-finders, and with the measurement of the vertical angle of incidence of radio waves from distant transmitters. Finally, he was one of the first users of cathode-ray tubes, including those made in 1930 by von Ardenne in Germany, and he was joint author of a well-known book on cathode-ray tubes and their associated circuitry.

Thus it seems fair to say that Watson Watt's first major contribution to the development of radar was his ability to see that the synthesis of these almost unrelated techniques would, in principle, result in a radar system. It is important to underline the qualification 'in principle' because, given the progress made in radio science up to February 1935, there was no immediate possibility of constructing even the simplest viable radar. It was clear that an operationally useful radar would have to use much shorter and more powerful pulses, and would require receivers with much greater band-width. In order to ensure maximum sensitivity at high angles of incidence (for the detection of aircraft at great distances), the operating frequency and the height of the antennae would have to be as great as technically and economically possible. So far as direction-finding was concerned, the well-understood systems based on vertically polarised radiation would have to give way

to some new and untried system using horizontal polarisation. Finally, the measurement of angle of incidence would have to be effective up to angles as close as possible to  $90^\circ$ , and should preferably be independent of the azimuthal direction of arrival of the signals.

Thus it was evident that the parameters of an operational radar system would differ, in effect by orders of magnitude, from those that could actually be achieved in February 1935. It was obvious that a considerable amount of time for research and for the development of techniques would be required before such a system could become a reality. Watson Watt's second major contribution to radar was his ability to convince the Air Ministry that, in spite of the uncertainties ahead, the final outcome would be successful; this can only be attributed to his confidence in himself and in those who worked for him.

Experimental work on various elements of a future radar system began in mid-1935 in wooden huts on the windswept 'island' of Orfordness on the East Suffolk Coast. By the early months of 1936, the results of tentative tests of different kinds suggested that there were no foreseeable, insuperable obstacles to further progress. However, the spartan conditions under which the work was carried out on Orfordness were quite unsuitable for a longer-term programme. Fortunately, more appropriate accommodation was found, and it was with a considerable sense of relief that the six or eight members of the staff on Orfordness moved, in May 1936, to the much more civilised surroundings of Bawdsey Manor, 15 km south of Orfordness. There the development work continued without a break until the end of August 1939 when it was transferred to Dundee.

It would be misleading to suggest that no difficulties or problems were encountered during the different stages of development; when they arose, happily it was usually possible to overcome or to solve them in some way and, by mid-1937, the complete prototype radar mentioned earlier had become a reality. Looking backwards in time, it seems fortunate that, even before the completion of the prototype, the Air Ministry had sufficient confidence in Watson Watt's promises to authorise the construction of four additional radars designed to protect the Thames Estuary and London and, a little later, to approve plans for a chain of 20 radars extending from the Isle of Wight, along the south and east coasts of England, northwards to the Firth of Forth in Scotland. Thanks to the close cooperation between the scientists at Bawdsey and the Royal Air Force since early 1937, these stations were in continuous operation by



3 September 1939 and were manned and maintained by Service personnel.

Mention has already been made of the fact that work on the chain of radar stations had to begin earlier than anticipated, even though much remained to be done on the further development and improvement of the prototype. Although this situation naturally caused some misgivings at the time, in the light of subsequent events in 1939-40, it is not difficult to justify Watson Watt's dictum concerning the need for making improvements to the prototype: "The ideal result will probably never be found; the second best may come too late; we must be satisfied with the third best". The second best arrived only in 1942 but, as events were to prove in 1940, the 20-station chain of radars, in spite of some shortcomings, provided the vital protective umbrella under which new and more sophisticated types of radar and navigational aids were developed for other applications, not only for the RAF but also for the special needs of the Army and the Navy.

A reference was made earlier to the RAF officer who, in February 1935, had some understandable reservations about radar as a practical possibility. By a stroke of fate, he had, five years later, become Commander-in-Chief of RAF Fighter Command and, as Air Marshal Sir Hugh Dowding, was responsible for over-all control of the long series of air operations in September 1940, now known as the 'Battle of Britain'. The intelligent use by Dowding and his staff of the vital information flowing from the radar chain to the operations rooms was one of several deciding factors that favourably influenced the result of the Battle.

In conclusion, it should be mentioned that the radar system described in this article was referred to in Watson Watt's Memorandum as 'RDF I'. However, the Memorandum also described 'RDF II'; this referred to radar for use in the fighter aircraft themselves, the development of which began at Bawdsey in mid-1936. The technical difficulties involved in the use of very high frequencies, and in the installation of radar equipment in small fighter aircraft, meant that progress was slower than for RDF I. However, notwithstanding such problems, RDF II later became a reality and was successfully used in air operations, especially at night, from 1941-42 onwards, six years after its conception.

10 October 1984

C.M. MINNIS

## NEWS FROM MEMBER COMMITTEES

### ONE-DAY SYMPOSIUM ON RADIO SCIENCE IN IRELAND, Dublin 2 Oct 1984

The URSI Committee in Ireland joined URSI through the Royal Irish Academy in 1978 and was represented at the XXth General Assembly in Washington, D.C. in 1981 at which a booklet on "Radio Science in Ireland" was presented. The present Symposium was organised by the URSI Sub-Committee of the Academy National Committee for Engineering Sciences and was, in fact, the first public activity of the Sub-Committee.

The meeting was attended by some 30 engineers and scientists from the Institutes of Higher Education, Industry, Government Departments, Telecom Eireann, Radio Telefis Eireann and - very interestingly - the Irish Radio Transmitters Society. Following the opening lecture on the history of URSI and a summary of the recent XXIst General Assembly in Florence by Professor Sexton, who was the Representative of the Irish Committee in Florence, the following papers were presented and discussed:

- (1) Passive Sea-Surface Imaging using Broadcast VHF Television Signals, R. Scaife and J. Calderwood, Department of Electronic Engineering, University College, Galway.
- (2) Low Noise DBS T.V. Receiver Developments, P.J. Murphy, Department of Electrical Engineering and Microelectronics, University College, Cork.
- (3) Experiments in VHF Propagation for an Undergraduate Course, S. Swords, Department of Microelectronics and Electrical Engineering, Trinity College, Dublin.
- (4) R.T.E. Network Design and Development, J.C. Curley, Radio Telefis Eireann, Dublin.
- (5) Interaction of Radio Waves with Matter, J.K. Vij and Theoretical Problems Relating to Dielectric Materials, B.K. Scaife, Department of Microelectronics and Electrical Engineering, Trinity College, Dublin.
- (6) Emission from Solar Flares using a Radio Interferometer (SCOSTEP Programme) and the Irish EPONA experiment on the Giotto Mission to Comet Halley, Susan McKenna-Lawlor, Department of Experimental Physics, St. Patrick's College, Maynooth, Co. Kildare.

- (7) Auroral and E-Layer Propagation and VHF Propagation by means of Meteor Trails, P. Martin, Irish Radio Transmitters Society, Dublin.

Dublin, October 1984

M.C. SEXTON  
Royal Irish Academy.

ALL-UNION SYMPOSIUM ON EFFECTS ON ARTIFICIAL MODIFICATION OF  
EARTH'S IONOSPHERE BY RADIO EMISSION, Suzdal, September 1983

The all-Union Symposium on "Effects on Artificial Modification of the Earth's Ionosphere by Powerful Radio Emission", to which foreign scientists had been invited, was held in Suzdal at the end of September 1983.

It was organised by the Soviet URSI Committee, the Scientific Council for the complex problem of Radio Wave Propagation of the USSR Academy of Sciences, the Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation of the USSR Academy of Sciences (IZMIRAN).

More than 100 Soviet scientists participated in the Symposium, the programme of which included 14 review papers and 31 short presentations on the following topics:

- Modification of the upper (F-region) ionosphere,
- Modification of the atmosphere and the lower ionosphere,
- LF-emission effects in the upper ionosphere and the magnetosphere,
- Modulation of current jets and geophysical effects.

The Symposium was opened by Prof. V.V. Migulin, Corresponding Member of the USSR Academy of Sciences and President of the Soviet URSI Committee. V.L. Ginzburg and A.V. Gurevich presented a report on "The Perspectives of the investigation of non-linear phenomena".

During the Symposium, special emphasis was laid on the following results: 1) investigations carried out with the help of different diagnostic facilities, such as Doppler setting, in order to obtain new results on the modification of the ionosphere; 2) experimental and theoretical investigations of the effects connected with magnetospheric propagation of emission of high-latitude VLF transmitter; 3) investigations on the ionospheric plasma modification under the action of radio emission from satellite.

The next Symposium will be organised in 2 or 3 years time.

The Proceedings of the Symposium are available at IZMIRAN.

V.V. MIGULIN  
President, Soviet URSI  
Committee

## IUCAF AND THE VEGA MISSION

The forthcoming Vega missions to Venus and Halley's comet are to be flown using an improved version of the Soviet Venera spacecraft designed to drop off probes at Venus and then to continue on to Halley. The current schedule calls for launches toward Venus in late December 1984, Venus flybys and probe deliveries in June 1985, and interceptions of Halley on 6 and 9 March 1986.

Concern has been expressed because these missions will transmit radio signals at 1667.8 MHz, falling within the 1660-1670 MHz band where radio astronomy has a primary, world-wide allocation. The members of the Inter-Union Commission on the Allocation of Frequencies for Radio Astronomy and Space Science (IUCAF) have discussed these concerns within COSPAR, URSI and IAU. At the recent XXI General Assembly of URSI, IUCAF was asked to undertake the following tasks:

- (a) To obtain from the Vega project managers as much technical and operational information as possible on the planned transmissions on frequencies within bands allocated for passive use by the Radio Astronomy and Space Research Services.
- (b) To arrange for scientists to be informed, e.g., by publications in COSPAR, IAU, and URSI bulletins and by other means as needed, of possible cases where sensitive observations may be affected by these transmissions.<sup>+</sup>

IUCAF has accepted these tasks, and a document (IUCAF 328) has already been circulated to about 60 people. This paper, prepared by Professor J. Blamont of CNES, describes the mission up to the Venus encounter, and it also covers the pathfinder

<sup>+</sup> See Resolution U.17<sup>1</sup> of the URSI Council on page 34.

concept where Vega helps the ESA Giotto mission. IUCAF will continue to circulate further information as it becomes available. Requests for information should be addressed to:

John W. Findlay  
Chairman, IUCAF  
National Radio Astronomy Observatory  
Edgemont Road  
Charlottesville, VA 22903 USA.

## SYMPOSIUM ON WAVE BREAKING, TURBULENT MIXING AND RADIO PROBING OF THE OCEAN SURFACE

The Symposium on Wave Breaking, Turbulent Mixing and Radio Probing of the Ocean Surface, which was co-sponsored by URSI, was held successfully in the campus of the Faculty of Science, Tohoku University, Sendai, Japan, from 19 to 25 July 1984.

About 180 participants attended the Symposium, nearly 80 of them from overseas. Cancellation of papers was very few. In total 85 papers were presented (oral presentation 72, poster presentation 13), including special papers of 40 min. by Profs. M.S. Longuet-Higgins, O.M. Phillips, S.A. Kitaigorodskij, J.D. Woods and by Dr. G.R. Valenzuela.

The Proceedings of about 550 pages will be published as "The Ocean Surface: Wave Breaking, Turbulent Mixing and Radio Probing", Ed. Y.Toba and H. Mitsuyasu, Reidel Pub. Co., Dordrecht, Holland in the next Spring.

Yoshiaki Toba

## IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS

This Conference, which was held in Amsterdam, Netherlands, from 14 to 17 May 1984, had 48 sessions and was attended by more than 1200 participants. Without treating it in detail, we would like to refer to the session entitled "Science - The Basis of Telecommunications" which, according to the editors, Prof. de Wilde and Mr. May, was a key session with fundamental contributions. It will be clear from the programme of that session that a major rôle in it was given to URSI scientists:

- Trends in optical communications, H.G. Unger (FRG)
- Information theory, the Copernician system of communications, J.L. Massey (Switzerland)
- A contribution of radio propagation research to radio-communications development: prediction of attenuation due to rain, F. Fedi (Italy)
- Communication with outer-space radio astronomy, R. Wielebinski (FRG)
- The ionosphere and radio communications, P.A. Bradley (UK)
- Cryptography: How to attack, what to protect?, R. Govaerts, Y. Desmedt, J. Van de Walle (Belgium).

The session had an overflow audience and received favourable comments.

F.L.H.M. Stumpers

## ELECTROMAGNETIC COMPATIBILITY

WROCLAW 1984

The 7th International Wroclaw Symposium on Electromagnetic Compatibility was held from 18 to 20 June 1984. Organized by the Association of Polish Electrical Engineers, the Wroclaw Technical University, and the Institute of Telecommunications, it was co-sponsored by the national associations of engineers from 13 countries, as well as by URSI and 7 other international organizations. More than 200 scientists and engineers from 22 countries participated, representing Europe, North America, Africa and Asia.

Prof. A. Smolinski, Vice-President of URSI, and Prof. F.L. Stumpers, Vice-Chairman of URSI Commission E, chaired the Symposium Council and the Scientific Programme Committee respectively. Prof. R.G. Strużak, Vice-Chairman of CCIR Study Group 1, served again as the Symposium Chairman. The Symposium was opened by Mr. E. Janowski, Director General of the PTT, on behalf of the Polish Minister of the PTT. Among the telegrams received, there was one in which the Minister of the PTT of the USSR underlined the truly international character of this event and its rôle in scientific contacts between East and West, North and South.

From the contributions submitted, more than a hundred papers from 21 countries have been selected for printing in the Proceedings of the Symposium and for discussion at the conference. The core of the Symposium was constituted by seven special invited sessions organized by Prof. K. Bullough, UK (EM environment); Prof. H. Kikuchi, Japan (EMC active line models); Prof. H. Mikołajczyk, Poland (EMC and biology); Prof. L.E. Varakin, USSR (EMC in mobile radiocommunication); Prof. Ch. Ts. Tsydypov, USSR (Radio wave propagation); Dr. H. Lorke, GDR/CCITT (EMC and wire communications); Prof. S. Lundquist, Sweden/URSI and Prof. F.L. Stumpers, Netherlands/URSI (Lightning and EMC), and by four special Workshops on Automatic interference measurement software, on Computer-aided TV network analysis, on Radio-monitoring methods, and on RF field-strength measurements and instrumentation. Dr. David Middleton (USA) completed this core by his invited paper on Threshold signal detection for EMC in non-uniform non-gaussian EMI fields. He also represented officially the IEEE EMC Society, acting as a cooperating organization.

The 17 sessions of the Symposium covered the whole field of EMC. Prof. F.L. Stumpers, in his keynote address, drew special attention to the URSI studies, with which the programme of the Wrocław Symposium coincides in many points.

All the meetings took place in the historical premises of the Wrocław Technical University. There was the usual get-together cocktail party on Monday evening and the banquet on Tuesday night. On the last day there was a common meeting of the Symposium Council, the Programme Committee and the Organizing Committee with the participation of all session chairmen. Plans for better international cooperation and possible improvements of the Symposium were discussed. A general opinion was that the 7th Wrocław Symposium was the occasion for a good review of the activity in the field of electromagnetic

compatibility on the world scale.

Copies of the 1070-page Proceedings of the Symposium *Electromagnetic Compatibility 1984* are still available from

EMC Symposium  
Box 2141  
51-645 Wrocław 12, Poland.

The papers are printed in their original languages, English or Russian, with the summaries in the second language.

Prof. R.G. Strużak  
Symposium Chairman.

## CONFERENCE ON PRECISION ELECTROMAGNETIC MEASUREMENTS

The CPEM was held in Delft, Netherlands from 20 to 24 August 1984. It was organized jointly by the Van Swinden Laboratory of the National Metrology Service and the Delft University of Technology and sponsored by URSI, the Netherlands and US URSI Committees, the IEEE Instrumentation and Measurement Society, IEEE Region 8 and the IEEE Benelux Section. The Conference Chairman was Mr. Kaarls of the Van Swinden Laboratory. The formal opening session was chaired by Dr. Kamper (NBS) and the keynote address was given by Mr. Dr Kruffyf, Director of the Philips Department of Science and Industry, who stressed the importance of the work of Standards Laboratories for the manufacturers of measuring equipment.

There were four sessions on Time and frequency, three on RF measurements, three on DC and LF measurements, two on Absolute electrical measurements, and single sessions on Fundamental constants, Power and energy, AC-DC, Hall effect, Calibration, Dielectrics, Fiber optics and Cryoelectronics. 173 papers were contributed: USA 37, F.R. Germany 25, France 14, Japan 12, Canada 12, UK 11, Netherlands 10, Italy 7, China 5 and smaller numbers from 18 other countries.

Global positioning satellites were used to attain an accuracy better than 1 in  $10^{14}$  for time and frequency comparison between standards of USA, France, F.R. Germany and Japan. Austria and Italy used the OTS satellite for the same purpose. G.P.S. were also used for geodesy (baseline measuring accuracy



$10^{-8}$  or a few cm on 1000 Km).

Caesium frequency standards with instability of at best  $2.10^{-14}$  were discussed by standardization experts from USSR, Japan, F.R. Germany, France and Canada. There were new determinations of the Ampère (German D.R.), the Farad and the Ohm (F.R. Germany) and the Ohm (UK). Josephson effect based standard voltages were used in F.R. Germany and the USA. The velocity of light is 299,792,458 M/sec (NBS).

High precision power measurements were discussed by Belgian and Yugoslav experts. The hydrogen maser frequency standard was used in Sweden and the USA. Accurate standard cells were treated by French, Canadian, US and Netherlands experts. The quantum Hall effect resistance was used in the USA, F.R. Germany and Japan. Precise optical fibre measurements were contributed by USA and Japan.

A reception was given on the Monday evening by the Mayor of Delft in the Town Hall. On Wednesday the Morris Leeds Award was handed over to Mr. Leonard Cutler (Director, Physical Science Labs, Hewlett Packard) for "Outstanding contributions to the development of advanced line standards, in particular the Caesium beam standard".

The three-hundred page Conference book is available under IEEE Cat. No CH- 2057-8, ed. Postma and Harmans.

F.L.H.M. Stumpers

## 25TH PLENARY MEETING OF COSPAR AND ASSOCIATED ACTIVITIES

The 25th COSPAR Plenary Meeting and the Associated Activities were held, at the invitation of the Austrian Academy of Sciences, in Graz, Austria from 25 June to 7 July 1984. This jubilee COSPAR Meeting included the highest number of scientific events ever organized by the Committee: 9 symposia, 15 workshops, 21 topical meetings, and a number of special sessions. The highest record of participation was attained at the Graz Meeting: some 1170 participants and over 130 accompanying persons.

Two Symposia and one Workshop were co-sponsored by URSI:

- Symposium on Space Observations for Climate Studies;
- Symposium on the Physics of the Magnetosphere-Ionosphere Connection;
- Workshop on International Reference Ionosphere.

The first COSPAR Award for Outstanding Contribution to Space Science was allocated to Prof. James A. van Allen, and the first COSPAR International Cooperation Medal for Distinguished Contribution to Promotion of International Cooperation in Space Science, to Academician Roald Z. Sagdeev.

The 26th COSPAR Plenary Meeting and Associated Activities, including the International Solar-Terrestrial Physics Symposium, will take place in Toulouse, France, at the Centre National d'Etudes Spatiales, from 23 June to 5 July 1986. The Chairman of the General COSPAR Programme Committee for the 1986 Meeting is Dr. E. Grün (Max-Planck Institut für Kernphysik, FRG).

The following Decisions adopted by the COSPAR Plenary Meeting may be of some interest.

Decision No 1/84

COSPAR,

*recognizing* that some of the National Scientific Institutions beginning to take an interest in space research may face some difficulties in entering the existing categories of membership in COSPAR,

*hereby establishes* a category of Provisional Membership, P, with annual dues of about 50% those in category 1. Membership in this category is limited to a period of four years, after which time the Institution concerned should either enter another category or relinquish its membership. Membership in this category is open only to National Scientific Institutions which have not yet been members of COSPAR.

COSPAR *further resolves* that the Members in category P have the same rights in COSPAR as the other Members.

Decision No 4/84

COSPAR,

*recognizing* the need to disseminate among the scientific community at large the data and theories arising out of planetary and lunar space missions, and

*recognizing* the duty to assist the international scientific unions in more fully integrating into their objectives and

assemblies the advances in the knowledge of planets and other bodies of the solar system, and

*further recognizing* the need to facilitate the international interchange of plans for future solar system missions,

*recommends* that the successor body to the Coordinating Committee for the Moon and Planets (CCMP) should be a Task Group within COSPAR ISC B, and

*further recommends* that this Task Group have a Chairman, Vice-Chairman, Secretary, and representatives of such international unions as appropriate to the goals of this Task Group, and

*further recommends* that the officers of this Task Group be as follows: Prof. S.K. Runcorn (UK) - Chairman; Acad. R.Z. Sagdeev (USSR) - Vice-Chairman; and Dr. H. Masursky (USA) - Secretary.

Decision No 7/84

COSPAR,

*recognizing* the importance of maps of ionospheric F2 peak parameters to the URSI/COSPAR project "International Reference Ionosphere (IRI)", and

*noting* the fact that large amounts of data from sources other than ground-based ionosondes are now available which were not taken into account in the CCIR Report 340, currently used with the IRI,

*requests* URSI Commission G to initiate a new international cooperative effort in the field of ionospheric mapping in order to provide a more reliable representation of the ionospheric peak parameters than currently given in this report.

Decision No 11/84

COSPAR,

*recognizing* the variety of phenomena occurring in solar system plasmas, including interactions with dust, solid bodies, planetary magnetospheres, planetary ionospheres, and neutral gases, and

*noting* that the investigation of many of these phenomena are in their very early stages,

*urges* that national institutions seize every opportunity to explore these phenomena on their planetary and interplanetary platforms.

Decision No 12/84

COSPAR,

*recognizing* the importance of its scientific programme, and *noting* that invited speakers play an important role in the success of its scientific meetings,

*suggests* that invited speakers, as well as officers of COSPAR bodies, receive from their national organizations the highest priority for participation in their national delegations.

Decision No 15/84

COSPAR,

*recognizing* the need for encouragement of an increased participation of scientists from less developed countries (LDC's) in COSPAR scientific meetings;

*decides* that its exemption of 20 LDC scientists under the age of 35 from the registration fee will be continued in future and extended to some scientists over the age of 35.

## ANNOUNCEMENTS OF MEETINGS AND SYMPOSIA

### 1985 NORTH AMERICAN RADIO SCIENCE MEETING AND INTERNATIONAL IEEE/AP-S SYMPOSIUM

The 1985 North American Radio Science Meeting, sponsored by the US and Canadian URSI Committees and the International Symposium, sponsored by the IEEE Antennas and Propagation Society (AP-S), will be held jointly at the Conference Centre of the University of British Columbia, Vancouver, B.C., Canada, from 17 to 21 June 1985. The technical sessions for the North American Radio Science Meeting and International IEEE/AP-S Symposium will be coordinated to provide a comprehensive and well-balanced programme. Authors are invited to submit papers on all topics of interest to the AP-S and URSI membership. The topics listed below are intended as suggestions; consideration will be given to papers on other subjects.

Suggested topics for AP-S

Adaptive antennas; Aircraft and spacecraft antennas; Antenna systems; Antenna theory; Array analysis, design and synthesis; Conformal antennas; Electromagnetic theory; Environmental effects on waves; HF techniques; Lens and horn antennas; Measurement techniques; Microstrip antennas; Millimeter-wave antennas and propagation; Numerical techniques; Optical techniques; Phased arrays; Radomes; Reflector antennas and feeds; Remote sensing; Satellite antennas; Scattering and diffraction; Surface and underground antennas and waves; Transients; Wave propagation theory; Wideband antennas.

Suggested topics for URSI

Commission A: Telecommunication measurements and related studies; Frequency standards for radio astronomy (with J); Time domain metrology; Health and microwave frequencies; Antenna metrology; EM field measurements.

Commission B: Scattering and diffraction; High-frequency techniques; Transient fields; Numerical techniques; Propagation in random, inhomogeneous and non-linear media; Inverse scattering; Guided waves; Antenna theory.

Commission C: Information theory; Digital signal processing; Optical fibre systems; Modulation techniques including spread spectrum; Networks (satellites and synchronization).

Commission D: Microelectronics (Si); Microelectronics (GaAs, InP) including millimeter wave integrated circuits; Millimeter wave techniques; Optical techniques including lasers, fibres and waveguides; Surface acoustic waves; Opto-electronic and opto-acoustic devices; Superconducting devices.

Commission E: Natural and man-made noise; Characterization and modelling of noise and interference; Effects of noise on system performance (with C).

Commission F: Clear air properties; Multipath propagation; Attenuation of microwaves; Cross polarization effects; Radiometry; Remote sensing applications; Radar measurements and applications.

Commission G: Ionospheric modification and heating (with H); Ionospheric studies using radio waves; Modelling and dynamics of the ionosphere; High latitude ionosphere; HF propagation; Incoherent scatter.

Commission H: The Alouette-ISIS Programme (with G); Wave processes in the ionosphere (with G); Ionospheric studies using

the space shuttle (with G).

Commission J: Long wavelength arrays; Focal plane arrays; Wide bandwidth spectrometers; Very long baseline interferometry development.

All summaries and abstracts must be received before 4 January 1985. All papers must be written in English or French. For detailed instructions regarding the submission of papers, apply to:

Mr. K. Charbonneau (URSI or AP-S Programme)  
Conference Services  
National Research Council  
Montreal Road, M-58  
Ottawa, Ontario, Canada K1A 0R6.

Advance registration and accommodation information will be mailed with the Advance Programme.

#### 4TH INTERNATIONAL CONFERENCE ON ANTENNAS AND PROPAGATION

ICAP 85 will be held at the University of Warwick, Coventry, UK, from 16 to 19 April 1985. A feature of this 4th IEE International Conference on Antennas and Propagation is a continuing close association with URSI through cooperation with the British Committee for Radio Science. To identify this association, several additional topics have been included in the Call for Papers and it is expected that a number of sessions at ICAP 85 will be dedicated to radio science subjects.

ICAP 85 will promote interaction between those active in the fields of antenna theory and design and of electromagnetic wave propagation. The entire radiowave spectrum used for telecommunication, radar, navigation, remote sensing and radio-astronomical purposes will be considered. Contributions are particularly welcome on problems of current interest, such as adaptive arrays, spacecraft antennas, near-field antenna measurements, effects of local terrain on antenna performance, radio propagation in cities, the influence of rain scatter in terrestrial microwave interference and the problems of synthetic aperture remote sensing.

New technologies, such as the incorporation of microwave integrated circuits, very high performance signal processors in antenna elements and sub-systems, present new challenges and opportunities. Papers on practical progress and innovation and application of these techniques are particularly sought.

The deadline for the submission of abstracts was 20 August 1984. For further information, apply to:

ICAP 85 Secretariat  
Conference Services, IEE  
Savoy Place  
London WC2R OBL, United Kingdom.

## INTERNATIONAL REFERENCE IONOSPHERE

### I. Workshop at Stara Zagora

The construction of the International Reference Ionosphere (IRI) is the joint responsibility of URSI and COSPAR. The first IRI (IRI-78) was published in 1978 (1) and in revised form (IRI-79) in 1981 (2); it was the subject of critical discussion at meetings held in Budapest (1980) and Ottawa (1982) during COSPAR Assemblies, and finally at a Workshop held in Stara Zagora in late 1983. Discussion of IRI-78 and IRI-79 can now be regarded as closed, and the next stage is to be the construction of a new and improved IRI which will take into account the experience gained since 1978.

One of the objectives of the Workshop at Stara Zagora was to lay down the guidelines that will be required for the continuation of the work, and to make decisions on several specific questions. Complete agreement was reached on the use of Booker's skeleton method for obtaining a unique expression for the electron density profile, and also on electron temperature formulae which take into account the electron density. At least provisional agreement was reached on the use of new data sources on positive ion composition, and on the particular characteristics of the D region, including clusters and negative ions.

The 25 papers presented at Stara Zagora have been published in a volume entitled *Towards an Improved International Reference Ionosphere* (3); they include several useful reviews

by Ramanamurty and Kutiev, and a final summary and list of conclusions by Rawer.

- (1) K. Rawer, S. Ramakrishnan and D. Bilitza, *IRI 1978* (URSI, Brussels, 1978).
- (2) K. Rawer, J.V. Lincoln and R.O. Conkright (Eds), *IRI 1979*, Report UAG-82 (World Data Centre A, Boulder, Col., 1981).
- (3) K. Rawer, C.M. Minnis and K.B. Serafimov (Eds), *Towards an Improved International Reference Ionosphere*, Adv. Space Sci. 4(1), 1 - 171 (1984).

## II. Recommendation of URSI/COSPAR Working Group on IRI

The Working Group on the "International Reference Ionosphere" is asking for a world-wide set of bottomside ionospheric profiles for the following, carefully selected 24 days:

1976: Jan. 20-22, Apr.13-15, Jul.13-15, Oct.19-21

1980: Jan. 15-17, Apr.15-17, Jul. 8-10, Oct. 7-9.

Ionosonde stations are asked either to provide profiles for all even hours UT of these days (or, if this seems impossible, good copies of the original ionograms on film). They should forward these (directly or through their regional WDC) to WDC-B (S.T.P.), Molodezhnaja 3, Moscow B-296 (attn. Dr. T.L. Gulyaeva). The results of the analysis will be communicated to all participants.

## BOOKS PUBLISHED BY URSI PERSONALITIES

- F. DE COULON (Swiss Official Member for URSI Commission C)  
*Théorie et traitement des signaux*,  
Presses Polytechniques Romandes, 1984, 560 pages, 491 figures
- J. VAN BLADEL (Secretary General, URSI)  
*Relativity and Engineering*,  
Springer Verlag, Berlin, 1984, 402 pages, 203 figures.



## INTERNATIONAL GEOPHYSICAL CALENDAR 1985

The Operational Edition of the Calendar (see following pages) has been issued by the International Ursigram and World Days Service (IUWDS) and copies are available from

Dr. P. Simon  
Chairman, IUWDS  
Ursigrammes Observatoire  
F-92190 Meudon  
France

or

Miss H.E. Coffey  
IUWDS Secretary for World Days  
WDC-A for Solar-Terrestrial Physics  
NOAA, E/GC2  
325 Broadway  
Boulder, Colorado 80303  
USA.

On the back of the Calendar, there is a summary (not reproduced here) of the recommended observational programmes in various branches of atmospheric physics and in studies of certain interplanetary phenomena.

# International Geophysical Calendar for 1985

(See other side for information on use of this Calendar)

	S	M	T	W	T	F	S		S	M	T	W	T	F	S		
			1	2	3	4	5					1	2	3	4	5	6
	6	7	8	9	10	11	12		7	8	9	10	11	12	13		
JANUARY	13	14	15 <sup>+</sup>	16 <sup>+</sup>	17 <sup>+</sup>	18 <sup>f</sup>	19		14	15	16 <sup>*</sup>	17 <sup>*</sup>	18	19	20		JULY
	20	21	22	23	24	25	26		21	22	23	24	25	26	27		
	27	28	29	30	31	1	2		28	29	30	31	1	2	3		
	3	4	5	6	7	8	9		4	5	6	7	8	9	10		
FEBRUARY	10	11	12	13 <sup>*</sup>	14 <sup>*</sup>	15	16		11	12	13 <sup>+</sup>	14 <sup>+</sup>	15 <sup>*</sup>	16	17		AUGUST
	17	18	19	20	21	22	23		18	19	20	21	22	23	24		
	24	25	26	27	28	1	2		25	26	27	28	29	30	31		
	3	4	5	6	7	8	9		1	2	3	4	5	6	7		
MARCH	10	11	12	13	14	15	16		8	9	10 <sup>+</sup>	11 <sup>+</sup>	12	13	14		
	17	18	19 <sup>+</sup>	20 <sup>+</sup>	21 <sup>+</sup>	22 <sup>+</sup>	23		15	16	17 <sup>*</sup>	18 <sup>*</sup>	19	20	21		SEPTEMBER
	24	25	26	27	28	29	30		22	23	24	25	26	27	28		
	31	1	2	3	4	5	6		29	30	1	2	3	4	5		
	7	8	9	10	11	12	13		6	7	8	9	10	11	12		
APRIL	14	15	16	17 <sup>*</sup>	18 <sup>*</sup>	19	20		13	14	15 <sup>+</sup>	16 <sup>+</sup>	17 <sup>+</sup>	18 <sup>+</sup>	19		OCTOBER
	21	22	23 <sup>+</sup>	24 <sup>+</sup>	25	26	27		20	21	22	23	24	25	26		
	28	29	30	1	2	3	4		27	28	29	30	31	1	2		

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

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

NOVEMBER

DECEMBER

1986  
JANUARY

- 15 Regular World Day (RWD)
- 13 Priority Regular World Day (PRWD)
- 16 Quarterly World Day (QWD)  
also a PRWD and RWD
- 2 Regular Geophysical Day (RGD)
- 7 8 World Geophysical Interval (WG1)
- 15<sup>+</sup> Incoherent Scatter Coordinated  
Observation Day and Coordinated  
Tidal Observation Day

- 19 Day of Solar Eclipse
- 17 18 Airglow and Aurora Period
- 16\* Dark Moon Geophysical Day (DMGD)

**NOTES:**

1. Days with unusual meteor shower activity are: Northern Hemisphere Jan 3,4; Apr 21-23; May 3-5; Jun 8-12, 27-29; Jul 27-29; Aug 10-14; Oct 19-23; Nov 2-4, 16-18; Dec 12-16, 21-23, 1985. Southern Hemisphere May 3-5; Jun 8-12; Jul 26-30; Oct 19-23; Nov 2-4, 16-18; Dec 5-7, 12-16, 1985.
2. Middle Atmosphere Program (MAP) began 1 Jan 1982 and runs through 1985.
3. STIP Interval XV: the month of September 1985 (ISEE-3 fly-by of Comet Giacobini-Zinner).
4. Day intervals that IMP 8 satellite is in the solar wind (begin and end days are generally partial days):  
Jan 1-5, 10-18; 23-31; Feb 4-12, 17-25; Mar 2-10, 14-23, 27-4 Apr; Apr 8-16, 20-29; May 3-11, 16-24, 29-5 Jun; Jun 10-18, 23-1 Jul; Jul 5-13, 18-25, 30-7 Aug; Aug 12-19, 24-1 Sep; Sep 6-14, 19-26; Oct 2-9, 14-21, 27-3 Nov; Nov 9-15, 21-18; Dec 4-10, 16-23, 29-31, 1985.  
There will not be total IMP 8 data monitoring coverage during these intervals. (Information kindly provided by the U.S. National Space Science Data Center, Greenbelt, MD.)
5. + Incoherent Scatter programs start at 1200 UT on the first day of intervals indicated and end at 1200 UT on last day of intervals.

OPERATIONAL EDITION, September 1984

## XXI URSI GENERAL ASSEMBLY

The XXI General Assembly of URSI was held in Florence, Italy, from 28 August to 5 September 1984. A full account of the Opening and Closing Meetings, and of the business transacted by the URSI Council and the Commissions will appear in 1985 in *Proceedings of URSI General Assemblies*, Vol. XX. The present issue of the Bulletin contains the names of the newly elected officers of the Union and the Resolutions and Recommendations adopted by the Council and the Commissions.

### BOARD OF OFFICERS

President: Dr. A.P. Mitra (India)  
Past President: Prof. W.E. Gordon (USA)  
Vice-Presidents: Dr. H.J. Albrecht (F.R.G.) (Treasurer)  
Prof. A.L. Cullen (UK)  
Prof. S. Okamura (Japan)  
Prof. V. Zima (Czechoslovakia)  
Secretary General: Prof. J. Van Bladel (Belgium).

### CHAIRMEN AND VICE-CHAIRMEN OF COMMISSIONS

#### Commission A - Electromagnetic Metrology

Chairman: Prof. S. Hahn (Poland)  
Vice-Chairman: Prof. S. Leschiutta (Italy)

#### Commission B - Fields and Waves

Chairman: Prof. J. Bach Andersen (Denmark)  
Vice-Chairman: Prof. T.B.A. Senior (USA)

#### Commission C - Signals and Systems

Chairman: Prof. K. Géher (Hungary)  
Vice-Chairman: Prof. R. Saal (FRG)

#### Commission D - Electronic and Optical Devices and Applications

Chairman: Prof. W.A. Gambling (UK)  
Vice-Chairman: Prof. T. Okoshi (Japan)

#### Commission E - Electromagnetic Noise and Interference

Chairman: Prof. F.L.H.M. Stumpers (Netherlands)  
Vice-Chairman: Prof. R. Struzak (Poland)

Commission F - Wave Propagation and Remote Sensing

Chairman: Dr. F. Fedi (Italy)  
Vice-Chairman: Prof. R.K. Crane (USA)

Commission G - Ionospheric Radio and Propagation

Chairman: Dr. J. Aarons (USA)  
Vice-Chairman: Dr. H. Rishbeth (UK)

Commission H - Waves in Plasmas

Chairman: Prof. R.L. Dowden (New Zealand)  
Vice-Chairman: Dr. H. Matsumoto (Japan)

Commission J - Radio Astronomy

Chairman: Dr. R. Wielebinski (FRG)  
Vice-Chairman: Prof. R.H. Frater (Australia).

RESOLUTIONS AND RECOMMENDATIONS OF THE COUNCIL  
(voir texte français p.58)

U.1 Admission of Member Committees

The URSI Council,

*considering*

- (a) that the Post and Telegraph Department of Thailand has applied for membership of URSI in Category 1;
- (b) that the Chinese Institute of Electronics, Beijing, has applied for membership of URSI in Category 3;
- (c) that the conditions specified in Articles 2, 3 and 4 of the URSI Statutes are satisfied;

*resolves* to admit to membership of URSI, in Categories 1 and 3 respectively:

1. the Committee which will be formed under the auspices of the Post and Telegraph Department of Thailand;
2. the Committee which will be formed under the auspices of the Chinese Institute of Electronics, Beijing.

U.2 URSI Finances

The URSI Council,

*noting* the recommendations contained in the Report of the Standing Finance Committee, dated 3 September 1984;

*resolves*

1. to approve the audited accounts of URSI for the years ending 31 December 1981, 1982 and 1983;
2. to approve the Income and Expenditure Budgets given in Table I (model B modified) and Table II of this Report;
3. to adopt the unit contributions proposed in Table I of this Report, namely \$610 for each of the years 1985, 1986 and 1987;
4. to publish the Report of the Standing Finance Committee in the *Proceedings of URSI General Assemblies*, Volume XX;
5. in view of the fluctuations in the world economic situation, to authorize the Board of Officers to make annual budget corrections as appropriate.

U.3 Standing Finance Committee

The URSI Council

*resolves* to appoint the following as members of the Standing Finance Committee:

Dr. M. Petit (Chairman)  
Prof. A.L. Cullen  
Prof. F. Gardiol  
Prof. S. Radicella  
Prof. M.E. Zhabotinskij.

U.4 URSI Publications

The URSI Council,

*noting* the recommendations contained in the Report of the Publications Committee, dated 3 September 1984, regarding the future of the following publications of the Union:

- (a) *URSI Information Bulletin*,
- (b) *Proceedings of URSI General Assemblies*, Volume XX,
- (c) *URSI Brochure*,
- (d) *URSI Statutes*,
- (e) *Review of Radio Science*

- (f) *INAG Bulletin*,
- (g) *International Reference Ionosphere*;

*resolves*

1. to accept these recommendations;
2. to publish the Report of the Publications Committee in the *Proceedings of URSI General Assemblies*, Volume XX.

#### U.5 Proposed Union of Commissions G and H

The URSI Council,

*noting* the recommendations of the ad hoc Committee set up to consider the actions to be taken in pursuance of Resolution U.13 adopted at the XX General Assembly (Washington, D.C., 1981);

*resolves*

1. that Commissions G and H be not merged at this time;
2. that the excellent cooperation achieved during the past three years between the two Commissions be continued, and specifically that the Chairmen and Vice-Chairmen of Commissions G and H be instructed to cooperate on a continuing basis in:
  - (i) the planning of joint and separate symposia in the intervals between General Assemblies,
  - (ii) the planning of joint and separate scientific sessions of the two Commissions at General Assemblies,
  - (iii) the preparation of a joint report on results for inclusion in *Review of Radio Science*;
3. that, where Member Committees find it appropriate to identify a single individual to represent them in both Commissions, they should be encouraged to do so;
4. that, at each General Assembly, Commissions G and H should hold at least one joint business session. In addition, where possible, individual business sessions of Commissions G and H should be held at non-conflicting times.

#### U.6 Commendation of Chairmen of Commissions G and H, 1981-84

The URSI Council

*resolves* to commend Drs P. Bauer and M. Petit, Chairmen of Commissions G and H respectively during the triennium 1981-84, for the exemplary level of cooperation achieved during this

period between the two Commissions.

U.7 Title and Terms of Reference of Commission F

The URSI Council,

*noting* the recommendations submitted by Commission F;

*resolves*

1. to change the title of Commission F to "Commission F - Wave Propagation and Remote Sensing";
2. to approve the following terms of reference for the Commission:
  - 1) to study all aspects of wave propagation at all frequencies in a non-ionized environment:
    - (i) wave propagation over the Earth's surface,
    - (ii) wave propagation in, and interaction with, the neutral atmosphere,
    - (iii) wave interaction with the Earth's surface, oceans, land and ice,
    - (iv) wave propagation through, and scattering by, the sub-surface medium,
    - (v) characterization of the environment as it affects wave phenomena;
  - 2) to encourage the application of the results of these studies, particularly in the areas of remote sensing and communications;
  - 3) to develop the required cooperation with other URSI Commissions and other relevant organizations.

U.8 Role of Commission D

The URSI Council,

*considering* that the role of Commission D can be twofold:

- (a) that of a service Commission to other Commissions of URSI, bringing to them information on the state of the art in electronic and opto-electronic technologies, as well as providing a prospective view of the progress in these technologies;
- (b) that of a Commission playing an active part in the progress of its own field;



*resolves*

1. that the role of service to other Commissions, traditionally adopted by Commission D, should be continued, thereby improving its impact on other URSI Commissions;
2. that Commission D should develop energetically its second role, in order to increase its impact both inside and outside URSI, in particular by emphasizing its interest towards fundamental aspects, including the material aspects and physics of rapidly emerging technologies.

U.9 Committee on URSI Membership

The URSI Council,

*considering* that the efforts towards encouraging new Member Committees to join the Union should be pursued;

*resolves* to maintain the Committee on URSI Membership and to appoint the following as members:

Prof. S. Okamura (Chairman)  
Prof. J.A. Gledhill  
Prof. J. Oyinloye  
Prof. S. Radicella  
Prof. M. Rodriguez Vidal  
Prof. A. Smolinski.

U.10 Committee on Future General Assemblies

The URSI Council,

*considering* the importance of the task devolved on the Committee on Future General Assemblies in seeking invitations from the Member Committees for the organization of the General Assemblies of the Union;

*resolves* to maintain the Committee on Future General Assemblies and to appoint the following as members:

Prof. V. Zima (Chairman)  
Prof. R.L. Dowden  
Prof. V. Kose  
Prof. H. Tanaka.

U.11 URSI-CCIR-CCITT Liaison Committee

The URSI Council,

*noting* the recommendations made by the URSI-CCIR-CCITT Liaison Committee in order to further develop and improve the cooperation between URSI and the Consultative Committees of the International Telecommunication Union (ITU);

*resolves*

1. to accept these recommendations;
2. to express its appreciation to M. M. Thué, outgoing Chairman of the Committee, for his efficient leadership;
3. to maintain the URSI-CCIR-CCITT Liaison Committee and to appoint the following as members:

Chairman:	Mr. G. Hagn
Past Chairman:	M. M. Thué
Commission A:	Prof. S. Leschiutta
Commission B:	to be nominated by the Commission
Commission C:	Dr. J.G. Lucas
Commission E:	Prof. F.L. Stumpers Prof. A.D. Spaulding
Commission F:	Dr. F. Fedi Dr. A. Blomquist Dr. L. Boithias Dr. M. Hall
Commission G:	Dr. C. Rush
Commission J:	to be nominated by the Commission.

U.12 Cooperation with CCIR and CCITT

The URSI Council,

*considering*

- (a) that one of the objectives of URSI is "to stimulate and coordinate studies of the scientific aspects of telecommunications using electromagnetic waves, guided and unguided";
- (b) that many results presented during URSI General Assemblies or symposia, or other symposia sponsored by URSI, in particular in review papers, may be helpful for the progress of the work of the CCIR and CCITT Study Groups;

*invites* the Member Committees of the Union, on the occasion of their national or regional scientific meetings or of specialised symposia with which they are associated, to encourage the preparation of contributions for CCIR and CCITT Study Groups (in collaboration with the authorized CCI national organizations if any), to be sent to the relevant CCI Secretariat through the General Secretariat of URSI.

U.13 Committee on Developing Countries

The URSI Council,

*considering*

- (a) the fruitful activities developed by the Committee on Developing Countries since its creation in 1981;
- (b) the programme proposed by the Committee regarding the organization of workshops and the preparation of handbooks designed for radio scientists in developing countries;
- (c) the proposal to establish an International Radio Measurement Instruments Exchange System for developing countries;

*resolves*

1. to commend the Committee for its work during the past triennium;
2. to maintain the Committee on Developing Countries and to appoint the following as members:

Prof. S. Radicella (Chairman)  
Prof. S. Feng  
Prof. J. Oyinloye  
Dr. B.M. Reddy  
Dr. A. Sadik  
M. J. Voge.

U.14 XXII General Assembly 1987

The URSI Council,

*noting*

- (a) that in 1969, in 1972 and in 1975 the Israeli URSI Committee invited URSI to hold a future General Assembly in Israel;
- (b) that this invitation was renewed during the present Assembly with specific reference to the XXII General Assembly in 1987;

*resolves* to accept the invitation of the Israeli URSI Committee to hold the XXII General Assembly of URSI in Tel Aviv, Israel, during the period 24 August - 4 September 1987.

U.15 Invitations from India and New Zealand for XXII General Assembly

The URSI Council,

*noting* the invitations to hold the XXII General Assembly received from the URSI Member Committees in India and in New Zealand;

*resolves* to record its thanks to these Committees for their invitations.

U.16 Protection of Passive Radio Observations

The URSI Council,

*recognizing* the need for the protection of passive radio observations by the provision of interference-free bands;

*noting* that URSI, IAU and COSPAR have collaborated over many years in the Inter-Union Commission on the Allocation of Frequencies for Radio Astronomy and Space Science (IUCAF) in obtaining such bands by international agreement;

*noting further* with great regret that certain experiments have been planned in which transmissions will take place from space in one of these bands, and that these transmissions are likely, for example, to interfere with observations of OH emission from Halley's comet;

*resolves*, in view of the specific danger of interference to radio astronomy from space-based radio transmissions, to urge all those concerned in the design of experiments requiring radio transmissions from space to consult with IUCAF at the planning stage to ensure that the protection of sensitive passive radio observations which has been acquired through wide cooperation and with great effort is not jeopardised in the future.

U.17 The Vega Mission to Venus and Halley's Comet

The URSI Council,

*noting*

- (a) that the Vega mission is planned to use a transmitter emitting at about 1667.8 MHz, in the band 1660-1670 MHz allocated primarily to radio astronomy and space research

for passive use only;

- (b) that the comet encounter makes the mission time-critical and that it is now too late to alter this frequency;
- (c) that scientists around the world need to be kept informed about this project in order to reduce the probability of interference with their observations;

*resolves*

1. to ask the Inter-Union Commission on the Allocation of Frequencies for Radio Astronomy and Space Science (IUCAF) to undertake the following tasks:
  - (i) to obtain from the project managers as much technical and operational information as possible on the planned transmissions on frequencies within the bands allocated for passive use by the Radio Astronomy and Space Research Services;
  - (ii) to arrange for scientists to be informed, e.g. by publications in the COSPAR, IAU and URSI Bulletins and by other means as needed, of possible cases where sensitive observations may be affected by these transmissions;
2. to urge the Member Committees of COSPAR, IAU and URSI to work with IUCAF as a consultative body when planning any active radio frequency usage in future scientific missions which may cause interference to passive observations.

#### U.18 Designation of Honorary President

The URSI Council,

*considering* that, in accordance with Art. 47 of the URSI Statutes, it is authorized to confer the title of Honorary President on former members of the Board of Officers and Chairmen of Commissions who have made notable contributions to the achievement of the objects of the Union;

*resolves* to confer the title of Honorary President on Professor W.N. Christiansen in recognition of his major contributions to radio science and of his devoted services to URSI over many years.

U.19 Modification to URSI Statutes

The URSI Council,

*considering*

- (a) that the function of Secretary General of the Union is an honorary one;
- (b) that the work involved is too heavy for a scientist able to devote only part of his time to URSI;

*resolves*

1. to authorize the Board of Officers to designate an Assistant Secretary General, on nomination by the Secretary General;
2. to add to Article 37 of the Statutes the following sentences:  
"The Board is empowered to appoint, on nomination by the Secretary General, an Assistant Secretary General, who will serve from the date of his appointment until the end of the next ordinary General Assembly. The Secretary General may delegate some of his duties to the Assistant Secretary General".

U.20 Inter-Commission Coordinating Group on Remote Sensing

The URSI Council,

*noting* the recommendations of the Inter-Commission Coordinating Group on Remote Sensing regarding

- (i) the improvement of cooperation with IUGG, COSPAR, IEEE and other interested bodies;
- (ii) the dissemination of information on meetings in the field of remote sensing;
- (iii) the coordination of remote sensing activities within URSI;

*resolves* to maintain the Inter-Commission Coordinating Group on Remote Sensing and to appoint the following as members:

Chairman: Dr. J. Gower  
Vice-Chairman: Dr. D. Gjessing  
Secretary: to be nominated by Chairman  
Commission B: to be nominated by the Commission  
Commission C: Prof. F. Carassa  
Commission E: Dr. E.K. Smith  
Commission G: Dr. D.B. Jones  
Dr. C.L. Rino  
Commission H: Dr. R. Gendrin.

U.21 Inter-Commission Working Group on Effects of Human Activities on the Ionosphere and Magnetosphere and on Telecommunications

The URSI Council,

*noting* the recommendations made in the Report of the Inter-Commission Working Group on Effects of Human Activities on the Ionosphere and Magnetosphere, and on Telecommunications;

*resolves*

1. to dissolve this Inter-Commission Working Group;
2. to appoint Prof. K. Rawer to act as a liaison between URSI and CCIR regarding problems which were specified in the terms of reference of the former Working Group.

U.22 Inter-Commission Working Group on Coordination of URSI's Activities at Optical Wavelengths for Communication, Sensing and Processing

The URSI Council,

*noting* the recommendations made by Prof. W.A. Gambling, Chairman of the Inter-Commission Working Group on Coordination of URSI's Activities at Optical Wavelengths for Communication, Sensing and Processing, regarding the future activities of the Working Group;

*resolves* to maintain this Working Group for the following triennium and to confirm Prof. W.A. Gambling as Chairman of the Working Group.

U.23 Inter-Commission Working Group on Time Domain Waveform Measurements

The URSI Council,

*considering*

- (a) the very successful scientific meetings organized by the Inter-Commission Working Group on Time Domain Waveform Measurements during the present General Assembly;
- (b) the recommendations made by Dr. N.S. Nahman, Chairman of the Working Group, regarding the future activities of the Working Group;

*resolves* to maintain the Inter-Commission Working Group on Time Domain Waveform Measurements for the following triennium with Dr. N.S. Nahman as Chairman and the same membership.

U.24 Joint Working Groups of Commissions G and H

The URSI Council,

*noting* the recommendations of Commissions G and H,

*resolves* to approve the following joint Working Groups of the two Commissions:

1. Incoherent Scatter  
Chairman: Dr. V.B. Wickwar  
Vice-Chairman: Dr. K. Schlegel,
2. Active Experiments  
Chairman: Prof. R.L. Dowden,
3. Computer-aided Plasma Wave Analysis  
Co-Chairmen: Dr. M. Ashour-Abdalla  
Dr. H. Matsumoto.

U.25 Joint Working Group of Commissions C and H

The URSI Council,

*noting* the recommendations of Commissions C and H,

*resolves* to approve the following joint Working Group of the two Commissions:

- Wave Analysis  
Chairman: Dr. D. Jones.

U.26 Vote of Thanks to Chairman of INAG

The URSI Council,

*considering*

- (a) that Dr. W.R. Piggott has been active, as Chairman of the Ionospheric Network Advisory Group (INAG), in supporting the operation of the network of ionospheric stations for more than 25 years;
- (b) that he is now retiring from this office;

*expresses* its warmest thanks to Dr. W.R. Piggott for his extraordinary services in aiding and supporting ionospheric stations and operators and, in general, the international community of radio science.



U.27 Greetings to the Institute of Electrical and Electronics Engineers Inc.

The URSI Council,

*salutes* the Institute of Electrical and Electronics Engineers Inc. on a century of progress that has transformed the way man communicates, engages in business, interacts socially - literally the way man lives;

*expresses* its gratitude to IEEE for sixty-five years of fruitful collaboration with URSI, and

*looks forward* to continuing that experience in the exciting, rapidly changing world ahead.

U.28 Vote of Thanks to Italian URSI Committee

The URSI Council,

*noting*

- (a) the excellent facilities made available in Florence for the scientific and administrative sessions of the XXI General Assembly of URSI, and the Open Symposia associated with it;
- (b) the opportunities provided to the participants for visits to scientific institutions;
- (c) the programme of social events and visits to Museums arranged by the Organizing Committee for the participants and the accompanying persons;
- (d) the cordial hospitality shown to the participants and their families during the Assembly;

*resolves* to extend its warmest thanks and appreciation

1. to the Italian URSI Committee for the invitation to hold the XXI General Assembly in Florence and, in particular, to its President, Prof. C. Egidi;
2. to the members of the Organizing Committee for the successful completion of the detailed arrangements for the Assembly and, in particular, to Prof. V. Cappellini and to Prof. A.M. Scheggi, Chairman and Executive Secretary respectively of the Organizing Committee.

U.29 UNESCO Subventions

The URSI Council,

*considering*

- (a) that an important part of the activities of the Union consists of the organization of international scientific meetings, and the issue of scientific publications;
- (b) that the annual subventions received from UNESCO, via ICSU, are used to cover part of the cost of these activities;

*resolves* to convey to UNESCO the warm thanks and appreciation of the Union for the valuable support thus provided.

U.30 Young Scientists Programme

The URSI Council,

*considering* the importance of the Young Scientists Programme which enables young radio scientists from developing and developed countries to participate in the URSI General Assemblies by providing them with financial assistance;

*resolves* to record its thanks and appreciation to the following organizations which provided funds in support of the Young Scientists Programme:

- the United Nations Organization for Education, Science and Culture (UNESCO),
- the International Council of Scientific Unions (ICSU),
- the ICSU Committee on Science and Technology for Developing Countries (COSTED),
- the Italian URSI Committee,
- the Royal Society of London,
- the International Institute for Theoretical Physics in Trieste.

RESOLUTIONS AND RECOMMENDATIONS OF COMMISSIONS

Commission A - Electromagnetic Metrology

A.1 Transfer of TAI to BIPM

Commission A,

*considering*

- (a) that the present systems of International Atomic Time (TAI) and Coordinated Universal Time (UTC) have served well the needs of the scientific and technical community and the general public since 1972;
- (b) that UTC is based on astronomical and atomic time;
- (c) that it is foreseen that the coordination of the relevant astronomical observations and the generation of TAI will take place in separate locations;

*recommends*

1. that the responsibility for the maintenance of TAI be taken over completely by the Bureau International des Poids et Mesures (BIPM) within the framework of its present Committees;
2. that the function of announcing leap seconds and computation of DUT1 remain at the Bureau International de l'Heure (BIH);
3. that BIPM and BIH contribute to joint reports in order that publications such as "Circular D" and the BIH Reports maintain continuity.

A.2 Utility of Frequency-stabilized LF Emissions

Commission A,

*considering*

- (a) that frequency-stabilized LF emissions, such as the Loran-C chains, are available;
- (b) that these emissions provide a large number of users with convenient, precise, and inexpensive access to national and international time and frequency standards;
- (c) that the international time scale TAI is largely dependent upon comparisons made by means of Loran-C links;

*recommends* that serious consideration should be given to the needs of the large community of frequency and time users when changes in coverage or in system operation are being contemplated.

#### A.3 Improvement of Frequency Standards

Commission A,

*considering*

- (a) the new possibilities of improvement in the stability and the accuracy of atomic frequency standards offered by:
  - (i) the efficient application of optical pumping and detection methods to caesium devices,
  - (ii) the storage of hydrogen atoms at a very low temperature in bulbs lined with helium films,
  - (iii) the storage and cooling of ions in radio frequency and Penning traps,
  - (iv) the successful observation of a fine structure transition in a magnesium beam;
- (b) the need for improved frequency and time standards in scientific and technological applications such as time-keeping, navigation, radio astronomy, geodesy, and other branches of basic research;

*recommends* that fundamental and applied research on advanced frequency standards be actively pursued.

#### A.4 Working Group on Measurements Related to the Interaction of Electromagnetic Fields with Biological Systems

Commission A,

*considering* the Resolutions adopted at the XVIII, XIX and XX General Assemblies of URSI, which recognize the need for international cooperation between physical scientists, biological scientists and doctors to increase the knowledge of the interaction of electromagnetic fields with biological systems;

*recommends*

1. that the Working Group on Measurements related to the interaction of electromagnetic fields with biological systems be maintained;
2. that the Working Group be asked to continue its efforts towards

- (i) convening symposia that stress the role of physical measurements related to the interaction of electromagnetic fields and biological systems,
  - (ii) cooperating with other organizations in the planning and convening of such symposia, and
  - (iii) giving active support to international organizations that are concerned with matters of health and safety related to electromagnetic fields;
3. that the URSI Working Group be provided with appropriate financial support for the establishment of symposia jointly sponsored with other organizations, in particular during URSI General Assemblies.

#### A.5 URSI Register of National Standards Laboratories

Commission A,

*considering* that the URSI Register of National Standards Laboratories is a valuable source of information on standards and calibration facilities for electromagnetic quantities world-wide;

*recommends* that revised editions of the Register should be produced on a continuing basis every three years;

*instructs* the Working Group on National Standards Laboratories

1. to prepare a revised edition of the Register in 1987;
2. to investigate ways of giving maximum publicity to the existence of the Register, and
3. to explore the possibility of offering future editions of the Register for sale on a financially viable basis.

#### Commission B - Fields and Waves

##### B.1 Symposium on Electromagnetic Wave Theory

Commission B,

*considering*

- (a) that the URSI Symposia on Electromagnetic Wave Theory have been held at intervals of three years in a series beginning in 1953;

- (b) that these Symposia are major events which represent the main effort of Commission B between Assemblies;
- (c) that invitations to host the next Symposium in the series have been received from the Member Committees in Hungary and Israel;

*resolves*

1. that the next Symposium in this series be held in 1986;
2. that the invitation to hold the Symposium in Budapest, Hungary, be accepted;
3. that the Symposium be held during the same week as the 8th Colloquium on Microwave Communication (MICROCOLL), with one or two days overlapping.

B.2 Co-sponsorship of International Conferences

Commission B

*considering* that various forthcoming international conferences are of direct interest to the Commission;

*recommends* that URSI should co-sponsor the following conferences:

1. International Conference on Integrated Optics and Optical Communication, Venice, Italy (1-4 October 1985);
2. 8th Colloquium on Microwave Communication (MICROCOLL), Budapest, Hungary (1986);
3. European Microwave Conference, Paris, France (1985);
4. European Conference on Optical Communication, Spain (1986).

B.3 Activities in Remote Sensing

Commission B,

*considering* that it has a sustained interest in inverse scattering and its applications,

*recommends* that the Inter-Commission Coordinating Group on Remote Sensing continue its activities.

B.4 Inverse Scattering

Commission B,

*considering* the desire to give added focus and impetus to the work on inverse scattering within the Commission;

*resolves* to establish a Working Group on Inverse Scattering.

Commission C - Signals and Circuits

C.1 Remote Sensing

Commission C

*recommends* that the Inter-Commission Coordinating Group on Remote Sensing should be maintained for the next three years.

C.2 Co-sponsorship of Meetings

Commission C

*recommends* that URSI should co-sponsor the following meetings:

1. Workshop on Information Theory, USSR (1984);
2. E.C.C.T.D., Prague, Czechoslovakia (1985);
3. 8th Colloquium on Microwave Communication (MICROCOLL), Budapest, Hungary (1986);
4. IEEE International Symposium on Information Theory, UK (1985);
5. Joint Swedish/USSR Workshop on Information Theory, Sweden (1985);
6. Benelux Symposium on Information Theory, Netherlands (1985),
7. Conference on Digital Signal Processing, Florence, Italy (1987).

Commission D - Electronic and Optical Devices  
and Applications

D.1 Role of Commission D

Commission D,

*considering*

- (a) that the name and image of URSI, so far making no reference to electronics, does not attract a large number of leading

scientists in the field of Commission D;

- (b) that the role of Commission D can be
  - (i) either that of a service Commission to other Commissions of URSI (bringing to them information on the state of the art in electronic and opto-electronic technologies, as well as providing a prospective view on the progress in these technologies);
  - (ii) or that of a Commission trying to play an active part in the progress of its own field;
- (c) that the first role has been traditionally adopted by Commission D and should be continued, provided its impact on other Commissions can be improved;
- (d) that the development of the second role is crucial for increasing the impact of Commission D both inside and outside URSI, as well as in the general community involved in electron technology;
- (e) that this development necessitates a shift of Commission D interest towards the fundamental research (including the material aspects and physics of rapidly emerging technologies);

*recommends* that the following three series of actions be taken:

1. a change of the name of URSI to include a reference to electronics without changing the URSI logo (the name "International Union of Radio and Electronic Science" has been proposed and seems adequate);
2. the organization of symposia by Commission D (if possible with other URSI Commissions, such as C, and perhaps A or B) before the next General Assembly, the following subjects having been considered:
  - (i) devices for signal processing (in cooperation with Commission C, to be held in 1986, perhaps in France),
  - (ii) some fundamental aspects of optical guided circuits and/or related devices (perhaps to be held in 1985 or 1986 in the UK, in cooperation with the Royal Society),
  - (iii) computer-aided design of VLSI circuits,
  - (iv) fast electronics for optical and gigabit applications;
3. the taking of various steps concerning the programme of the General Assembly, viz.:
  - (i) to reduce the overlap between sessions dealing with



- different aspects of the same subject, especially in the following broad domains: optics, electro-optics and opto-electronics (Commissions A, B, C and D, and also Commission J for the use of optical fibres in large radio telescopes); microwave, millimetre and submillimetre domains (Commissions A, B, C, D and J); micro-electronics and gigabit electronics (Commissions C, D and J, the latter for III-V devices) and to ask the quoted Commissions to designate a corresponding member for each of these domains;
- (ii) to organize joint sessions with other Commissions in the domains referred to above;
  - (iii) to organize sessions of Commission D devoted to progress in the material aspects and physics of emerging technologies, as well as to related modelling and computer-aided design techniques;
  - (iv) to include a General Lecture on some topic of electron technology in the programme of the General Assembly;
  - (v) to organize an Open Symposium in the field of Commission D, perhaps on compound semi-conductor (specially III-V) devices, which could be co-sponsored by another international organization or by a local scientific or engineering society.

#### Commission E - Electromagnetic Noise and Interference

##### E.1 Symposia on Electromagnetic Compatibility

Commission E,

*noting* the positive results of the cooperation between the Commission and the organizers of several Symposia on Electromagnetic Compatibility, in the form of URSI sessions and workshops organized during these Symposia;

*recommends* that URSI continue with its modest support for the Symposia in the Zurich and the Wroclaw series.

##### E.2 Working Groups

Commission E

*resolves* to maintain its Working Groups, as follows, for the next triennium:

1. Man-made noise (Chairman: A.D. Spaulding),

2. Natural noise (Chairman: J. Hamelin),
3. Damaging effects of transients on equipment (Chairman: V. Scuka),
4. Scientific basis of noise and interference control (Chairman: C. Baum).

Commission F - Remote Sensing and Wave Propagation  
Neutral Atmosphere, Oceans,  
Land, Ice

F.1 Title of Commission F

Commission F,

*having considered* the Report of the Working Group composed of R.K. Crane and P. Delogne (co-Chairmen), D. Croom and F. Fedi, in which the present title of Commission F "Remote Sensing and Wave Propagation: Neutral Atmosphere, Oceans, Land, Ice", decided by the Council at the XX General Assembly (Washington, D.C., 1981) is felt to be cumbersome;

*recommends* the adoption of the new title "Wave Propagation, Remote Sensing and Communications"; this reflects the fact that Commission F, as part of URSI, is basically concerned with wave propagation, but recognizes that the two principal applications of Commission F studies lie in the field of remote sensing and communications.

*Note: See Resolution U.7 of the URSI Council.*

F.2 Scientific Activities in the next Triennium

Commission F,

*considering*

- (a) the success of the Symposia held in the past triennium;
- (b) the leading role of the Commission in dealing with the study of wave propagation in non-ionized media, with particular emphasis on remote sensing and communications applications;

*recommends* that the following Symposia be held during the next triennium:

1. Wave propagation: remote sensing and communications, 1986 (Organizers: R.K. Crane, P. Delogne and F. Fedi);
2. Microwave signatures in remote sensing, 1986 or early 1987 (Organizers: F. Eklund and A. Blomquist).

### F.3 Inter-Commission Coordinating Group on Remote Sensing

Commission F,

*having considered* the Report of the Inter-Commission Coordinating Group on Remote Sensing (ICCGRS) submitted by its Chairman, Dr. J. Gower;

*recommends*

1. that the Inter-Commission Coordinating Group on Remote Sensing (ICCGRS) be maintained for the next triennium;
2. that Dr. D. Gjessing (Norway) and Dr. J. Gower (Canada) be included in the ICCGRS as representatives of Commission F;
3. that the Chairman of the ICCGRS be one of the two representatives of Commission F;
4. that a maximum of two representatives be designated by each of the interested Commissions;
5. that regular consultations be arranged between the Chairmen and the Vice-Chairmen of Commission F and of the ICCGRS.

### F.4 URSI-CCIR-CCITT Liaison Committee

Commission F,

*considering* that it is desirable to maintain and develop further the cooperation between URSI and the Consultative Committees of the International Telecommunication Union (CCIR and CCITT);

*recommends*

1. that the following be designated as representatives of Commission F: A. Blomquist, L. Boithias, F. Fedi and M.P. Hall;
2. that representatives be designated by the other URSI Commissions whose activities are relevant to the work of CCIR and CCITT.

F.5 URSI Representative on SCOR

Commission F

*recommends* that Dr. G. Valenzuela be designated as URSI Representative on the Scientific Committee on Oceanic Research (SCOR).

F.6 Review of Radio Science

Commission F

*resolves*

1. to appoint Dr. R.K. Crane, incoming Vice-Chairman of the Commission, as Commission F Editor for the next issue of *Review of Radio Science*;
2. to ask the new Editor to circulate, within the Commission, the complete list of references provided by the various members for the 1984 edition of *Review of Radio Science*.

Commission G - Ionospheric Radio and Propagation

G.1 INAG Bulletin and Meetings

Commission G,

*recognizing*

- (a) that it is difficult for the officers and members of the Ionospheric Network Advisory Group (INAG) to obtain sufficient support to attend INAG Meetings;
- (b) that the costs of preparing the *INAG Bulletin* are too high to be met by the individual organizations concerned, and that several other organizations have expressed their willingness to contribute to these costs;

*recommends*

1. that URSI Member Committees and other institutions should be urged to provide all possible assistance to overcome these difficulties;
2. that URSI should establish an international fund to finance the operation of INAG, under the control of the Chairman of INAG, and should invite the interested groups to contribute to this fund.

## G.2 New Ionosondes

Commission G,

*considering* that many new ionosondes have been set up, which are not yet known to the World Data Centres;

*recommends* that the responsible Administrations should provide the appropriate World Data Centre with the details of the new stations, and inform the Ionospheric Network Advisory Group (INAG) of their existence.

## G.3 Ionosonde Network and World Data Centres

Commission G,

*noting* that, in spite of an increase in the number of ionosonde stations during the last decade, the volume of data received by the World Data Centres has considerably decreased;

*urges* the ionosonde stations and the Administrations running such stations to ensure that the established interchange rules be respected and, in particular, that the monthly data reports be delivered regularly to the appropriate World Data Centres in the standardized format.

## G.4 Ionosonde Station at Huancayo

Commission G,

*recognizing* that the ionosonde station at Huancayo, Peru, has, for more than 47 years, played a highly significant role in the understanding of the ionized atmosphere at equatorial latitudes and its relationship to other geophysical phenomena;

*noting* that this station has ceased regular operation;

*urges* that a routine programme of soundings be re-established, and that the data be made available to the international community through the World Data Centres.

## G.5 Ebro Observatory at Roquetes

Commission G,

*noting* that the Ebro Observatory at Roquetes has provided geomagnetic data continuously for the past 80 years, and ionosonde data for the past 30 years, thereby contributing significantly to the understanding of ionospheric processes;

*urges* the responsible Administration to maintain this Observatory in operation.

G.6 Combined Catalogue of Ionosphere Vertical Soundings Data

Commission G,

*noting*

- (a) that the *Combined Catalogue of Ionosphere Vertical Soundings Data* is about to be published by the World Data Centres for Solar Terrestrial Physics;
- (b) that this Catalogue will be of great value to the scientific community;

*encourages* all stations and Administrations to examine the Catalogue closely and to bring any additions and corrections to the attention of the World Data Centre A in Boulder, USA.

G.7 Data Base for Incoherent Scatter Radar Data

Commission G,

*noting* that a data base for incoherent scatter radar data has been established at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado, USA;

*recommends* that, in the interests of facilitating the interchange and exploitation of such data, the responsible Administrations should adopt a common format and provide the Data base with their data in a timely fashion.

G.8 Space Measurements

Commission G,

*noting* that, in order to interpret the new data being acquired at high latitude with a variety of radio and other techniques, it is essential to know the parameters of the interplanetary magnetic field;

*urges* that every effort be made by governments and governmental agencies involved in space measurements to ensure that the relevant parameters be acquired and made available in a timely fashion.

G.9 Draft Standard Nomenclature for Parameters Determined from Digital Ionosondes

Commission G,

*noting* that its Working Group G.10, the International Digital Ionosonde Group, has developed a draft standard nomenclature for parameters determined from digital ionosondes (*INAG Bulletin*

No 40/41, 1983);

*recommends* that the scientific community should adopt this nomenclature as standard in documents and scientific publications.

#### G.10 Working Groups

Commission G,

*having considered* the reports submitted by its various Working Groups;

*resolves*

1. to merge Working Group G.1 "Ionosonde Network Advisory Group (INAG)" and Working Group G.10 "International Digital Ionosonde Group (IDIG)", and to give the new Group the title of "Ionosonde Network Advisory Group (INAG)",

Chairman: Prof. J.A. Gledhill (South Africa)  
Executive Secretary: Dr. R. Haggard (South Africa)  
Publications Secretary: Dr. R. Conkright (USA)

(see Annex I for Terms of Reference);

2. to dissolve Working Group G.6 "Ionospheric Knowledge Needed to Improve Radiocommunication";
3. to maintain Working Group G.3 "Southern Hemisphere Atmospheric Studies Group (SHAGS)",  
Chairman: Prof. S. Radicella (Argentina);
4. to maintain Working Group G.4 "International Reference Ionosphere (IRI)"(joint with COSPAR),  
Chairman: Prof. L. Bossy (Belgium)  
Vice-Chairman: Dr. T.L. Gulyaeva (USSR);

5. to maintain Working Group G.12 "Studies of the Ionosphere Using Beacon Satellites",

Chairman: Dr. R. Leitinger (Austria)  
Vice-Chairmen: Dr. A. Wernik (Poland)  
Dr. J.A. Klobuchar (USA)

6. to constitute a new Working Group on "Mapping of Characteristics at the Peak of the F2 Layer",  
Chairman: Dr. K. Davies (USA)

Members: Dr. P. Bradley (UK), Dr. N. Danilkin (USSR), Dr. N. Matuura (Japan), Dr. L. McNamara (Australia), Prof. K. Rower (FRG), Dr. C.M. Rush (USA).

(see Annex II for Terms of Reference).

Annex I - Terms of Reference of Ionosonde Network Advisory Group (INAG)

The Ionosonde Network Advisory Group (INAG) is established by Commission G to pursue the following objectives through the publication of a Bulletin, and by the organization of meetings in various locations:

1. to monitor, maintain and improve the standards of data produced by ionosondes and the ionosonde network;
2. to promote the interchange of data through the World Data Centres or by direct contact between stations and users, and the storing of, such data;
3. to revise the list of the parameters to be reported and associated rules to match the needs of the users;
4. to evaluate, and make recommendations on, the international importance of proposed and existing stations as required;
5. to encourage the development of improved ionosonde methods and to inform the community about them;
6. to encourage the staff at ionosonde stations by informing them of the use made of their data and allied matters;
7. to promote the use of ionosondes in research campaigns;
8. to encourage theoretical studies as an aid to the acquisition and interpretation of ionosonde data.

Annex II - Terms of Reference of Working Group on Mapping of Characteristics at the Peak of F2 Layer

The Working Group on Mapping of Characteristics at the Peak of the F2 Layer is established by Commission G to make improvements in the present CCIR Maps of F2-layer characteristics through theory and observation and, in particular, to investigate the possibility of incorporating space data.



G.11 Symposia during Next Triennium

Commission G

*recommends* the organization of the following symposia to be sponsored and financially supported by URSI:

1. Global, including theoretical, studies of the upper atmosphere using incoherent scatter radars, alone and in combination with other techniques, Spring or Summer 1986 (Local organization: Dr. A. Richmond, NCAR, Boulder, CO, USA);
2. Ionospheric studies using satellite radio beacons, Summer or Fall 1986 (Local organization: Prof. A. Tauriainen, University of Oulu, Oulu, Finland);
3. International Conference on Artificial Modification of the Ionosphere by Heating.

G.12 Representatives on Inter-Commission Coordinating Group on Remote Sensing

Commission G

*recommends* that the following be designated as representatives of the Commission on the Inter-Commission Coordinating Group on Remote Sensing (ICCGRS):

- Dr. C.L. Rino (USA) for synthetic aperture radar;
- Dr. Tudor Jones (UK) for HF remote sensing aspects.

G.13 Representative on URSI-CCIR-CCITT Liaison Committee

Commission G

*recommends* that Dr. C.M. Rush (USA) be designated as the representative of the Commission on the URSI-CCIR-CCITT Liaison Committee.

G.14 Editor for *Review of Radio Science* 1984-1986

Commission G

*resolves* to appoint Dr. Ken Davies (USA) as Editor for the joint Commission G and H triennial report to be included in the 1987 edition of *Review of Radio Science*.

Commission H - Waves in Plasmas

H.1 Terms of Reference

Commission H

*considering* that the terms of reference of the Commission, as specified at the Lima General Assembly in 1975 and published in *URSI Information Bulletin* No 195 (Sept.1975) are fully appropriate;

*decides* to confirm these terms of reference.

H.2 Sponsorship of Symposia and Meeting

Commission H

*recommends* the co-sponsorship by URSI of the following meetings:

1. 2nd International School for Space Simulations, Kapaa, Kauai, Hawaii, 4-15 February 1985 (Conference Secretary: Dr. D.A. Dutton, USA);
2. 17th International Conference on Phenomena in Ionized Gases, Budapest, Hungary, 1985;
3. Symposium on Wave Particle Interactions and Associated Phenomena, Dunedin, New Zealand, late January 1986 (jointly organized by Drs U. Inan, USA; H. Matsumoto, Japan; R.L. Dowden, New Zealand);
4. Symposium on Ionospheric Modification Induced by High Power Radio Waves, USSR, to be held before the XXII General Assembly (jointly organized by Prof. W.E. Gordon, USA, and Prof. V.V. Migulin, USSR).

H.3 URSI/IAGA Working Groups

Commission H

*resolves* to maintain the URSI/IAGA Working Groups as follows:

URSI/IAGA.1 Passive Electromagnetic Probing of the Magnetosphere

Co-Chairman for Commission H: Dr. U. Inan (USA);

URSI/IAGA.2 Wave Instabilities in Plasma

Co-Chairman for Commission H: Dr. T. Sato (Japan).

H.4 Inter-Commission Coordinating Group on Remote Sensing

Commission H

*recommends*

1. that the Inter-Commission Coordinating Group on Remote Sensing (ICGRS) be continued, and
2. that Dr. R. Gendrin (France) be designated as representative of the Commission on ICGRS.

H.5 Inter-Commission Working Group on Time Domain Waveform Measurements

Commission H

*recommends*

1. that the Inter-Commission Working Group on Time Domain Waveform Measurements be continued, and
2. that Dr. F. Lefeuvre (France) be designated as representative of the Commission on this Working Group.

RESOLUTIONS ET RECOMMANDATIONS DU CONSEIL

U.1 Admission de nouveaux Comités Membres

Le Conseil de l'URSI,

*considérant*

- (a) qu'une demande d'admission en Catégorie 1 a été soumise par le Département des Poste et Télégraphe de Thaïlande;
- (b) qu'une demande d'admission en Catégorie 3 a été soumise par l'Institut Chinois d'Electronique, Beijing;
- (c) que les conditions spécifiées aux Articles 2, 3 et 4 des Statuts de l'URSI sont satisfaites,

*décide* d'admettre comme membres de l'Union, en Catégories 1 et 3 respectivement:

1. Le Comité qui sera formé sous les auspices du Département des Poste et Télégraphe de Thaïlande;
2. Le Comité qui sera formé sous les auspices de l'Institut Chinois d'Electronique, Beijing.

U.2 Finances de l'URSI

Le Conseil de l'URSI,

*notant* les recommandations formulées dans le Rapport du Comité permanent des finances, en date du 3 septembre 1984,

*décide*

1. d'approuver les comptes de l'Union apurés pour les années prenant fin au 31 décembre 1981, 1982 et 1983;
2. d'approuver les prévisions budgétaires figurant dans le tableau I (modèle B révisé) et le tableau II de ce Rapport;
3. d'adopter pour l'unité de contribution annuelle le montant proposé dans le tableau I de ce Rapport, à savoir: 610 dollars pour chacune des années 1985, 1986 et 1987;
4. de publier le Rapport du Comité permanent des finances dans le Volume XX des *Comptes Rendus des Assemblées générales de l'URSI*;
5. en raison des fluctuations liées à la situation économique mondiale, d'autoriser le Bureau à apporter des modifications annuelles aux prévisions budgétaires, s'il le juge approprié.

### U.3 Comité permanent des finances

Le Conseil de l'URSI

*décide* de désigner les personnalités suivantes comme membres du Comité permanent des finances:

Dr. M. Petit (Président)  
Prof. A.L. Cullen  
Prof. F. Gardiol  
Prof. S. Radicella  
Prof. M.E. Zhabotinskij.

### U.4 Publications de l'URSI

Le Conseil de l'URSI,

*ayant pris connaissance* des recommandations formulées dans le Rapport du Comité des publications, en date du 3 septembre 1984, concernant l'avenir des publications suivantes de l'Union:

- (a) *Bulletin d'Information de l'URSI,*
- (b) *Comptes Rendus des Assemblées générales de l'URSI,*
- (c) *Brochure de l'URSI,*
- (d) *Statuts de l'URSI,*
- (e) *Review of Radio Science*
- (f) *INAG Bulletin,*
- (g) *International Reference Ionosphere,*

*décide*

1. d'accepter ces recommandations;
2. de publier le Rapport du Comité des publications dans le Volume XX des *Comptes Rendus des Assemblées générales de l'URSI.*

### U.5 Projet d'union des Commissions G et H

Le Conseil de l'URSI,

*ayant pris connaissance* des recommandations formulées par le Comité ad hoc chargé d'étudier les mesures à prendre en application de la Résolution U.13 adoptée à la XXe Assemblée générale (Washington, D.C., 1981),

*décide*

1. que les Commissions G et H ne soient pas fusionnées pour le moment;
2. que l'excellente collaboration réalisée au cours des trois

dernières années par les deux Commissions soit poursuivie et, en particulier, qu'il soit mandé aux Présidents et aux Vice-Présidents des Commissions G et H de poursuivre une collaboration permanente dans les domaines suivants:

- (i) la programmation de colloques communs et séparés dans la période qui sépare les Assemblées générales;
  - (ii) la programmation de séances scientifiques communes et séparées des deux Commissions au cours des Assemblées générales;
  - (iii) la préparation d'un rapport commun pour inclusion à la *Review of Radio Science*;
3. que, dans les cas où cela leur semble approprié, les Comités Membres soient encouragés à désigner une seule personne pour les représenter au sein des deux Commissions;
4. qu'au cours de chaque Assemblée générale, les Commissions G et H organisent au moins une séance administrative commune ainsi que, si possible et selon un horaire approprié, des séances administratives séparées.

#### U.6 Eloge des Présidents des Commissions G et H 1981-84

Le Conseil de l'URSI

*décide* d'adresser ses félicitations au Dr. P. Bauer et au Dr. M. Petit, respectivement Présidents des Commissions G et H pendant la période 1981-1984, pour le degré de collaboration exemplaire réalisé entre les deux Commissions au cours des trois années écoulées.

#### U.7 Titre et Mandat de la Commission F

Le Conseil de l'URSI,

*notant* les recommandations soumises par la Commission F,

*décide*

1. de modifier comme suit le titre de cette Commission: "Propagation des ondes et télédétection";
2. d'approuver le mandat suivant pour la Commission:
  - 1) étudier tous les aspects de la propagation des ondes à toutes les fréquences dans un environnement ionisé:
    - (i) propagation des ondes au-dessus de la surface de la Terre,

- (ii) propagation des ondes dans l'atmosphère neutre et interaction des ondes avec l'atmosphère neutre,
  - (iii) interaction des ondes avec la surface de la Terre: océans, sol et glace,
  - (iv) propagation et diffraction des ondes dans le milieu souterrain,
  - (v) caractérisation de l'environnement en ce qu'il affecte les phénomènes ondulatoires;
2. encourager l'application des résultats de ces études, en particulier dans les domaines de la télédétection et des communications;
  3. développer une collaboration appropriée avec les autres Commissions de l'URSI et les organisations concernées.

#### U.8 Rôle de la Commission D

Le Conseil de l'URSI,

*considérant* que la mission de la Commission D peut être double:

- (a) celle d'une Commission au service des autres Commissions de l'URSI, leur fournissant toutes informations sur les derniers résultats obtenus dans le domaine des technologies électronique et optoélectronique ainsi que sur les perspectives qui s'offrent dans ce domaine;
- (b) celle d'une Commission prenant une part active dans le développement des connaissances de son propre domaine,

*décide*

1. que la mission de service, traditionnellement assurée par la Commission D, soit maintenue et que l'interaction avec les autres Commissions de l'URSI soit intensifiée;
2. que la Commission D prenne des mesures énergiques pour remplir l'autre volet de sa mission, afin d'accroître son rayonnement aussi bien qu'en sein de l'URSI qu'en dehors, en particulier en se consacrant davantage à la recherche fondamentale, y compris les problèmes de physique et des matériaux des technologies en évolution rapide.

#### U.9 Comité pour l'adhésion à l'URSI

Le Conseil de l'URSI,

*considérant* qu'il est souhaitable de poursuivre les efforts en vue d'encourager l'adhésion de nouveaux Comités Membres à l'Union,

*décide* de maintenir le Comité pour l'adhésion à l'URSI et de désigner les personnalités suivantes comme membres:

Prof. S. Okamura (Président)  
Prof. J.A. Gledhill  
Prof. J. Oyinloye  
Prof. S. Radicella  
Prof. M. Rodriguez Vidal  
Prof. A. Smolinski.

U.10 Comité pour les Assemblées générales de l'URSI

Le Conseil de l'URSI,

*considérant* l'importance de la tâche dévolue au Comité pour les Assemblées générales de l'URSI, laquelle consiste à solliciter auprès des Comités Membres des invitations pour l'organisation des Assemblées générales futures de l'Union,

*décide* de maintenir le Comité pour les Assemblées générales de l'URSI et de désigner les personnalités suivantes comme membres:

Prof. V. Zima (Président)  
Prof. R.L. Dowden  
Prof. V. Kose  
Prof. H. Tanaka.

U.11 Comité de liaison URSI-CCIR-CCITT

Le Conseil de l'URSI,

*ayant pris connaissance* des recommandations formulées par le Comité de liaison URSI-CCIR-CCITT afin de développer et de renforcer la collaboration de l'URSI avec les Comités consultatifs de l'Union Internationale des Télécommunications (UIT),

*décide*

1. d'accepter ces recommandations;
2. d'exprimer ses remerciements à Monsieur M. Thué, Président sortant du Comité, pour la façon efficace dont il en a dirigé les travaux;
3. de maintenir le Comité de liaison URSI-CCIR-CCITT et de désigner les personnalités suivantes comme membres:

Président: M. G. Hagn  
Président sortant: M. M. Thué  
Commission A: Prof. S. Leschiutta  
Commission B: à désigner par la Commission



Commission C: Dr. J.G. Lucas  
Commission E: Prof. F.L. Stumpers  
Prof. A.D. Spaulding  
Commission F: Dr. F. Fedi  
Dr. A. Blomquist  
Dr. L. Boithias  
Dr. M.P. Hall  
Commission G: Dr. C. Rush  
Commission J: à désigner par la Commission.

U.12 Collaboration avec le CCIR et le CCITT

Le Conseil de l'URSI,

*considérant*

- (a) que l'un des buts de l'URSI est "de stimuler et de coordonner les études des aspects scientifiques des télécommunications utilisant les ondes électromagnétiques guidées et non guidées";
- (b) que bon nombre des résultats scientifiques présentés aux Assemblées générales et aux colloques de l'URSI, ou bien à des colloques copatronnés par l'URSI et, en particulier, dans des exposés de synthèse, sont susceptibles de contribuer à l'avancement des travaux des Commissions d'études du CCIR et du CCITT,

*invite* les Comités Membres de l'Union, à l'occasion de leurs réunions scientifiques nationales ou régionales, ou bien de colloques spécialisés auxquels ils sont associés, à encourager la préparation (en liaison avec les organisations nationales compétentes s'il en existe) de contributions pour les Commissions d'études du CCIR et du CCITT; celles-ci seront transmises au Secrétariat du Comité consultatif intéressé par l'intermédiaire du Secrétariat général de l'URSI.

U.13 Comité pour les pays en développement

Le Conseil de l'URSI,

*considérant*

- (a) l'efficacité de l'activité déployée par le Comité pour les pays en développement depuis sa création en 1981;
- (b) le programme proposé par le Comité concernant l'organisation d'ateliers de travail et la préparation de manuels à l'intention des scientifiques radioélectriciens des pays en développement;

(c) la proposition d'établir un Système international d'échange d'instruments de mesures radioélectriques pour les pays en développement,

*décide*

1. d'adresser ses félicitations au Comité pour le travail accompli au cours des trois années écoulées;
2. de maintenir le Comité pour les pays en développement et de désigner les personnalités suivantes comme membres:

Prof. S. Radicella (Président)  
Prof. S. Feng  
Prof. J. Oyinloye  
Dr. B.M. Reddy  
Dr. A. Sadik  
M. J. Voge.

U.14 XXIIe Assemblée générale 1987

Le Conseil de l'URSI,

*notant*

- (a) qu'en 1969, en 1972 et en 1975 le Comité israélien de l'URSI a invité l'Union à tenir une de ses futures Assemblées générales en Israël;
- (b) que cette invitation a été renouvelée au cours de l'actuelle Assemblée en vue spécifiquement de la XXIIe Assemblée générale en 1987,

*décide* d'accepter l'invitation du Comité israélien de l'URSI de tenir la XXIIe Assemblée générale à Tel Aviv, Israël, la période projetée allant du 24 août au 4 septembre 1987.

U.15 Invitations des Comités Membres indien et néo-zélandais

Le Conseil de l'URSI,

*notant* que des invitations pour la XXIIe Assemblée générale ont été reçues des Comités Membres indien et néo-zélandais,

*décide* d'exprimer sa gratitude à ces deux Comités.

U.16 Protection des observations radioélectriques passives

Le Conseil de l'URSI,

*reconnaissant* le besoin de protéger les observations radioélectriques passives par l'attribution de bandes exemptes de brouillages;

*notant* que l'URSI, l'IAU et le COSPAR ont collaboré pendant de nombreuses années au sein de la Commission inter-Unions pour l'attribution de fréquences à la radioastronomie et à la science spatiale (IUCAF) pour obtenir ces bandes en vertu d'un accord international;

*constatant* avec grand regret que des expériences en cours d'élaboration feront appel à l'une de ces bandes pour des émissions à partir de l'espace et que ces émissions sont susceptibles de brouiller notamment les observations de l'émission OH de la comète de Halley,

*décide*, compte tenu du danger spécifique de brouillage que des émissions radioélectriques à partir de l'espace présentent pour la radioastronomie, de prier instamment tous les responsables de la programmation d'expériences comportant de telles émissions de consulter l'IUCAF dès la phase de programmation initiale de manière à ne plus compromettre à l'avenir la protection, acquise grâce à une large collaboration et à de grands efforts, des délicates observations radioélectriques passives.

#### U.17 La Mission Vega vers Vénus et la comète de Halley

Le Conseil de l'URSI,

*notant*

- (a) que la mission Vega prévoit l'utilisation d'un émetteur fonctionnant à environ 1667.8 MHz, dans la bande des 1660-1670 MHz attribuée à titre primaire à la radioastronomie et à la recherche spatiale pour observations passives uniquement;
- (b) que le rendez-vous avec la comète rend critique le facteur temps de la mission et qu'il est désormais trop tard pour changer cette fréquence;
- (c) que les scientifiques du monde entier doivent être tenus au courant de ce projet pour leur permettre de réduire la probabilité de brouillage de leurs observations,

*décide*

1. de demander à la Commission inter-Unions pour l'attribution de fréquences à la radioastronomie et à la science spatiale (IUCAF) de se charger des tâches suivantes:
  - (i) obtenir des responsables du projet le plus grand nombre possible de renseignements d'ordre technique et opérationnel sur les émissions projetées aux fréquences des

bandes attribuées aux services de radioastronomie et de recherche spatiale pour les observations passives;

- (ii) prendre les mesures nécessaires pour informer les scientifiques, par exemple au moyen d'articles dans les bulletins du COSPAR, de l'IAU et de l'URSI ainsi que par tous autres moyens appropriés, des cas possibles où ces émissions pourraient affecter les observations de haute sensibilité;
2. de prier instamment les Comités Membres du COSPAR, de l'IAU et de l'URSI de coopérer avec l'IUCAF, en tant qu'organe consultatif, lorsqu'ils envisageront pour leurs missions scientifiques futures l'utilisation active de fréquences radioélectriques susceptibles de brouiller les observations passives.

#### U.18 Présidence d'honneur de l'URSI

Le Conseil de l'URSI,

*considérant* que, en vertu de l'Article 47 des Statuts de l'URSI, il est autorisé à conférer le titre de Président d'honneur à d'anciens membres du Bureau ou à des Présidents de Commission qui ont contribué de façon exceptionnelle à la réalisation des buts de l'Union,

*décide* de conférer le titre de Président d'honneur au Prof. W.N. Christiansen pour les contributions majeures qu'il a apportées à la radioélectricité scientifique et pour les services qu'il a rendus à l'URSI pendant de nombreuses années.

#### U.19 Modification aux Statuts de l'URSI

Le Conseil de l'URSI,

*considérant*

- (a) que la fonction de Secrétaire général de l'Union a un caractère bénévole;
- (b) que le travail attaché à cette fonction est trop lourd pour un scientifique ne pouvant consacrer qu'une partie de son temps aux affaires de l'URSI,

*décide*

1. d'autoriser le Bureau à désigner un Secrétaire général adjoint, sur proposition du Secrétaire général;
2. d'ajouter à l'Article 37 des Statuts les phrases suivantes:

"Le Bureau a pouvoir de désigner, sur proposition du Secrétaire général, un Secrétaire général adjoint qui restera en fonction de la date de sa nomination jusqu'à la fin de l'Assemblée générale ordinaire suivante. Le Secrétaire général peut déléguer certaines des tâches qui lui incombent au Secrétaire général adjoint".

U.20 Groupe de coordination inter-Commissions sur la télé-détection

Le Conseil de l'URSI,

*ayant pris connaissance* des recommandations du Groupe de coordination inter-Commissions sur la télé-détection pour ce qui concerne

- (i) l'amélioration de la collaboration avec l'UGGI, le COSPAR, l'IEEE et les autres organismes intéressés,
- (ii) la diffusion d'informations sur les réunions dans le domaine de la télé-détection,
- (iii) la coordination des activités de télé-détection au sein de l'URSI,

*décide* de maintenir le Groupe de coordination inter-Commissions sur la télé-détection et de désigner les personnalités suivantes comme membres:

Président: Dr. J. Gower (Commission F)  
Vice-Président: Dr. D. Gjessing (Commission F)  
Secrétaire: à désigner par le Président  
Commission B: à désigner par la Commission  
Commission C: Prof. F. Carassa  
Commission E: Dr. E.K. Smith  
Commission G: Dr. D.B. Jones  
                  Dr. C.L. Rino  
Commission H: Dr. R. Gendrin.

U.21 Groupe de travail inter-Commissions sur les effets des activités de l'homme sur l'ionosphère, la magnétosphère et les télécommunications

Le Conseil de l'URSI,

*considérant* les recommandations formulées dans le Rapport du Groupe de travail inter-Commissions sur les effets des activités de l'homme sur l'ionosphère, la magnétosphère et les télécommunications,

*décide*

1. de dissoudre ce Groupe de travail inter-Commissions;
2. de désigner le Prof. K. Rawer pour assurer la liaison entre l'URSI et le CCIR pour ce qui concerne les problèmes qui figuraient au mandat du Groupe.

U.22 Groupe de travail inter-Commissions pour la coordination des activités de l'URSI pour les communications, la détection et le traitement des données dans la gamme optique

Le Conseil de l'URSI,

*ayant pris connaissance* des recommandations formulées par le Prof. W.A. Gambling, Président du Groupe de travail inter-Commissions pour la coordination des activités de l'URSI pour les communications, la détection et le traitement des données dans la gamme optique, concernant les activités futures de ce Groupe de travail,

*décide* de maintenir ce Groupe de travail pendant les trois années à venir et de confirmer le Prof. W.A. Gambling dans ses fonctions de Président du Groupe de travail.

U.23 Groupe de travail inter-Commissions sur la mesure des formes d'onde dans le domaine temporel

Le Conseil de l'URSI,

*considérant*

- (a) le succès des séances scientifiques organisées au cours de la présente Assemblée par le Groupe de travail inter-Commissions sur la mesure des formes d'onde dans le domaine temporel;
- (b) les recommandations formulées par le Dr. N.S. Nahman, Président du Groupe de travail, concernant les activités futures du Groupe de travail,

*décide* de maintenir le Groupe de travail inter-Commissions sur la mesure des formes d'onde dans le domaine temporel pendant les trois années à venir avec, comme Président, le Dr. N.S. Nahman et les mêmes membres.

U.24 Groupes de travail communs des Commissions G et H

Le Conseil de l'URSI,

*notant* les recommandations des Commissions G et H,

*décide* d'approuver les Groupes de travail communs suivants des deux Commissions:

1. Diffusion incohérente  
Président: Dr. V.B. Wickwar  
Vice-Président: Dr. K. Schlegel,
2. Expériences actives  
Président: Prof. R.L. Dowden,
3. Analyse des ondes de plasma par ordinateur  
Co-présidents: Dr. M. Ashour-Abdalla  
Dr. H. Matsumoto.

U.25 Groupe de travail commun des Commissions C et H

Le Conseil de l'URSI,

*notant* les recommandations des Commissions C et H,

*décide* d'approuver le Groupe de travail commun suivant des deux Commissions:

- Analyse des ondes  
Président: Dr. D. Jones.

U.26 Remerciements au Président de l'INAG

Le Conseil de l'URSI,

*notant*

- (a) que le Dr. W.R. Piggott, en tant que Président du Groupe Conseil du réseau ionosphérique (INAG), n'a pas cessé, pendant plus de 25 ans, de consacrer ses efforts au bon fonctionnement du réseau des stations ionosphériques;

- (b) qu'il quitte la présidence de ce Groupe,

*exprime* sa plus vive reconnaissance au Dr. W.R. Piggott pour les services exceptionnels qu'il a rendus en prodiguant aide et encouragements aux stations ionosphériques et aux opérateurs de ces stations et, de manière générale, à la communauté internationale des scientifiques radioélectriciens.

U.27 Message à l'Institute of Electrical and Electronics Engineers Inc.

Le Conseil de l'URSI

*adresse* à l'Institute of Electrical and Electronics Engineers Inc. ses vives félicitations pour les progrès réalisés au cours d'un siècle d'existence, pendant lequel s'est littéralement transformée toute la façon de vivre de l'homme - sa façon de communiquer, sa façon de traiter les affaires, son rôle social;

*exprime* sa gratitude à l'IEEE pour la féconde collaboration qui a pu se développer avec l'URSI au cours des 65 années écoulées, et

*émet le vœu* que cette collaboration se poursuive dans le monde à venir, plein de promesses et en rapide évolution.

U.28 Remerciements au Comité italien de l'URSI

Le Conseil de l'URSI,

*notant*

- (a) l'excellente organisation matérielle mise en place à Florence pour les séances scientifiques et administratives de la XXIIe Assemblée générale et les colloques ouverts;
- (b) le programme des visites scientifiques organisé pour les participants;
- (c) le programme des réceptions et visites aux musées mis au point par le Comité organisateur italien pour les participants et les personnes accompagnantes;
- (d) l'accueil cordial réservé aux participants et à leurs familles pendant l'Assemblée,

*décide* d'exprimer ses plus vifs remerciements:

1. au Comité italien de l'URSI pour l'invitation de tenir la XXIIe Assemblée générale à Florence et, en particulier, à son Président, le Professeur C. Egidi;
2. aux membres du Comité organisateur italien pour leurs méticuleux travaux préparatoires qui ont assuré le succès de l'Assemblée et, en particulier, au Professeur V. Cappellini et au Professeur A.M. Scheggi, respectivement Président et Secrétaire exécutif du Comité organisateur italien.



U.29 Subventions de l'UNESCO

Le Conseil de l'URSI,

*considérant*

- (a) qu'une grande partie des activités de l'Union consiste dans l'organisation de conférences scientifiques internationales et l'impression de publications scientifiques;
- (b) que les subventions annuelles accordées par l'UNESCO à l'URSI, par l'intermédiaire du CIUS, permettent de couvrir une partie du coût de ces activités,

*décide* d'exprimer à l'UNESCO la vive gratitude de l'Union pour l'appui considérable qui lui est ainsi fourni.

U.30 Programme des jeunes scientifiques

Le Conseil de l'URSI,

*considérant* l'importance du Programme des jeunes scientifiques qui, mettant à la disposition de jeunes scientifiques de pays développés et en développement une assistance financière, leur permet de participer aux travaux des Assemblées générales de l'Union,

*décide* d'exprimer sa vive gratitude aux organisations suivantes:

- l'Organisation des Nations Unies pour l'Education, la Culture et la Science (UNESCO),
- le Conseil International des Unions Scientifiques (CIUS),
- le Comité du CIUS pour la science et la technologie dans les pays en développement (COSTED),
- le Comité italien de l'URSI,
- la Royal Society de Londres,
- l'Institut international de physique théorique à Trieste.

RESOLUTIONS ET RECOMMANDATIONS DES COMMISSIONS

Commission A - Métrologie électromagnétique

A.1 Transfert au BIPM du maintien du TAI

La Commission A,

*considérant*

- (a) que les systèmes actuels du Temps Atomique International (TAI) et du Temps Universel Coordonné (TUC) ont répondu depuis 1972 de manière satisfaisante aux besoins de la communauté scientifique et technique, et à ceux des utilisateurs en général;
- (b) que le TUC est basé sur le temps astronomique et le temps atomique;
- (c) qu'il est prévu que la coordination des observations astronomiques, d'une part, et la réalisation du TAI, de l'autre, s'effectueront en des endroits séparés,

*recommande*

1. que le Bureau International des Poids et des Mesures (BIPM), dans le cadre de ses Comités actuels, prenne l'entière responsabilité pour le maintien du TAI;
2. que le Bureau International de l'Heure (BIH) continue d'assumer la tâche d'annoncer les secondes intercalaires et de calculer le DUT1;
3. que le BIPM et le BIH collaborent pour la mise au point de rapports communs afin de maintenir la continuité des publications telles que la "Circulaire D" et les Rapports annuels du BIH.

A.2 Utilité des émissions en ondes kilométriques stabilisées en fréquence

La Commission A,

*considérant*

- (a) que des émissions en ondes kilométriques stabilisées en fréquence, telles que les réseaux Loran C, sont disponibles;
- (b) que, grâce à ces émissions, un grand nombre d'utilisateurs ont un accès facile, précis et peu onéreux aux étalons de temps et de fréquence nationaux et internationaux;

(c) que l'échelle de temps internationale TAI dépend dans une grande mesure de comparaisons effectuées au moyen des réseaux Loran C,

*recommande* qu'il soit sérieusement tenu compte des besoins de l'importante communauté des utilisateurs des étalons de temps et de fréquence lorsque des changements dans la couverture ou dans le mode de fonctionnement des réseaux seront envisagés.

### A.3 Perfectionnement des étalons de fréquence

La Commission A,

*considérant*

(a) les nouvelles possibilités d'amélioration de la stabilité et de la précision des étalons de fréquence atomiques offertes par:

- (i) l'application efficace des méthodes de pompage et de détection optiques aux dispositifs à jet de césium,
- (ii) le stockage d'atomes d'hydrogène à très basse fréquence dans des cellules revêtues de films d'hélium,
- (iii) le stockage et le refroidissement d'ions dans des trappes radio-fréquence et des trappes Penning,
- (iv) l'observation réussie d'une transition de structure fine dans un jet de magnésium;

(b) le besoin d'améliorer les étalons de fréquence et de temps pour des applications scientifiques et techniques telles que la conservation du temps, la navigation, la radio-astronomie, la géodésie et d'autres branches de la recherche fondamentale,

*recommande* que les recherches fondamentales et appliquées soient activement poursuivies en vue du perfectionnement des étalons de fréquence.

### A.4 Groupe de travail sur la métrologie dans le domaine des interactions entre champs électromagnétiques et systèmes biologiques

La Commission A,

*considérant* les Résolutions adoptées au cours des XVIIIe, XIXe et XXe Assemblées générales de l'URSI, qui soulignent la nécessité de la collaboration internationale des physiciens, des biologistes et des médecins pour améliorer la connaissance des interactions entre systèmes biologiques et champs électromagnétiques,

*recommande*

1. de maintenir le Groupe de travail sur la métrologie dans le domaine des interactions des champs électromagnétiques avec les systèmes biologiques;
2. d'inviter ce Groupe de travail à poursuivre ses efforts
  - (i) en prenant l'initiative de l'organisation de colloques sur le rôle des mesures physiques relatives à l'interaction des champs électromagnétiques et des systèmes biologiques,
  - (ii) en collaborant avec d'autres organismes dans la planification et l'organisation de ces colloques,
  - (iii) en fournissant un appui actif aux organisations internationales qui s'occupent des influences des champs électromagnétiques sur la santé et des problèmes de sécurité qui s'y rattachent;
3. d'assurer à ce Groupe de travail de l'URSI un appui financier qui lui permette de prendre l'initiative de l'organisation de colloques patronnés en commun avec d'autres organisations, en particulier pendant les Assemblées générales de l'Union.

#### A.4 Registre de l'URSI des Laboratoires nationaux d'étalons

La Commission A,

*considérant* que le Registre de l'URSI des Laboratoires nationaux d'étalons constitue une importante source d'informations sur les établissements qui, dans le monde entier, s'occupent d'étalons et de systèmes d'étalonnage des quantités électromagnétiques,

*recommande* qu'une édition révisée du Registre soit publiée de façon régulière tous les trois ans,

*charge* le Groupe de travail sur les Laboratoires nationaux d'étalons

1. de préparer une édition révisée du Registre pour 1987,
2. d'étudier les moyens de donner le maximum de publicité à ce Registre,
3. d'explorer les possibilités de vente des futures éditions du Registre sur une base financière raisonnable.

Commission B - Ondes et champs

B.1 Symposium sur la Théorie des ondes électromagnétiques

La Commission B,

*considérant*

- (a) que les symposia de l'URSI sur la Théorie des ondes électromagnétiques se sont succédé à intervalles de trois ans depuis 1953;
- (b) que ces symposia revêtent une importance majeure et représentent l'essentiel des activités de la Commission B entre les Assemblées;
- (c) que des invitations pour organiser le prochain symposium ont été reçues des Comités Membres de l'URSI en Hongrie et en Israël,

*décide*

- 1. d'organiser le prochain symposium de cette série en 1986;
- 2. d'accepter l'invitation du Comité Membre hongrois de l'URSI de tenir le symposium à Budapest, Hongrie;
- 3. de fixer les dates du Symposium pendant la même semaine que le 8e Colloque sur les Communications en hyperfréquences (MICROCOLL), avec un recouvrement d'un ou deux jours.

B.2 Copatronage de conférences internationales

La Commission B,

*considérant* que certaines conférences internationales à venir présentent un intérêt direct pour la Commission,

*recommande* que l'URSI accorde son copatronage aux conférences suivantes:

- 1. Conférence internationale d'optique intégrée et de communications optiques, Venise, Italie (1-4 octobre 1985);
- 2. 8e Colloque sur les communications en hyperfréquences (MICROCOLL), Budapest, Hongrie (1986);
- 3. Conférence européenne sur les hyperfréquences, Paris, France (1985);
- 4. Conférence européenne sur les communications optiques, Espagne (1986).

### B.3 Activités dans le domaine de la télédétection

La Commission B,

*considérant* que les méthodes inverses appliquées à la diffusion et leurs utilisations présentent un intérêt continu pour la Commission,

*recommande* le maintien du Groupe de coordination inter-Commissions sur la télédétection.

### B.4 Méthodes inverses appliquées à la diffusion

La Commission B

*considérant* qu'il est souhaitable de consacrer une attention accrue aux méthodes inverses appliquées à la diffusion et de stimuler les travaux dans ce domaine au sein de la Commission,

*décide* d'établir un Groupe de travail sur les méthodes inverses appliquées à la diffusion.

## Commission C - Signaux et systèmes

### C.1 Télédétection

La Commission C

*recommande* le maintien du Groupe de coordination inter-Commissions sur la télédétection pendant les trois années à venir.

### C.2 Copatronage de conférences

La Commission C

*recommande* le copatronage par l'URSI des conférences suivantes:

1. Atelier de travail sur la théorie de l'information, URSS (1984);
2. E.C.C.T.D., Prague, Tchécoslovaquie (1985);
3. 8e Colloque sur les communications aux hyperfréquences (MICROCOLL), Budapest, Hongrie (1986);
4. Symposium international sur la théorie de l'information de l'IEEE, Royaume-Uni (1985);
5. Atelier de travail suédo-soviétique sur la théorie de

- l'information, Suède (1985);
6. Symposium sur la théorie de l'information du Benelux, Pays-Bas (1985);
  7. Conférence sur le traitement numérique des signaux, Florence, Italie (1987).

Commission D - Dispositifs électroniques et  
optiques et applications

D.1 Rôle de la Commission D

La Commission D,

*considérant*

- (a) que, ne faisant pas référence à l'électronique, le titre de l'URSI et l'image qu'on s'en fait n'attirent qu'un nombre restreint des scientifiques les plus éminents dans le domaine de la Commission D;
- (b) que la Commission D peut jouer un double rôle:
  - (i) celui d'une Commission au service des autres Commissions de l'URSI (leur fournissant toutes informations sur les derniers résultats obtenus dans le domaine des technologies électronique et optoélectronique ainsi que sur les perspectives qui s'offrent dans ce domaine);
  - (ii) celui d'une Commission prenant une part active dans le développement des connaissances de son propre domaine;
- (c) que la Commission D a traditionnellement rempli le premier de ces rôles, lequel devrait être maintenu à condition d'augmenter l'interaction de la Commission avec les autres Commissions de l'Union;
- (d) qu'il est essentiel de développer le deuxième de ces rôles pour accroître le rayonnement de la Commission D aussi bien au sein de l'URSI qu'en dehors de celle-ci et, d'une manière générale, au sein de la communauté des spécialistes de la technologie électronique;
- (e) que, pour ce faire, la Commission D devrait accentuer son intérêt pour la recherche fondamentale, y compris les

problèmes de physique et des matériaux des technologies en évolution rapide,

*recommande* que soient prises les trois séries de mesures suivantes:

1. modifier le titre de l'URSI de manière à insérer une référence à l'électronique, sans pour autant changer le sigle (le titre proposé de "Union Radio-Scientifique et Electronique Internationale" semblerait approprié);
2. organiser, avant la prochaine Assemblée générale, des colloques de la Commission D (si possible en commun avec d'autres Commissions de l'URSI telles que la Commission C et, peut-être, les Commissions A et B) qui pourraient traiter les sujets suivants:
  - (i) les dispositifs pour le traitement du signal (en collaboration avec la Commission C, en 1986, peut-être en France),
  - (ii) les aspects fondamentaux des guides d'ondes optiques et/ou des dispositifs qui leur sont associés (peut-être en 1985 ou en 1986 au Royaume-Uni, en collaboration avec la Royal Society),
  - (iii) la conception assistée par ordinateur de circuits intégrés à très grande échelle,
  - (iv) l'électronique rapide et ses applications optiques dans les systèmes numériques à large bande (gigabits);
3. prendre des mesures appropriées concernant le programme de l'Assemblée générale, à savoir:
  - (i) réduire le recouvrement de séances consacrées aux différents aspects d'un même sujet, en particulier dans les domaines suivants, pris au sens large: optique, électro-optique et opto-électronique (Commissions A, B, C et D, mais aussi Commission J pour l'utilisation de fibres optiques dans les grands radiotélescopes), hyperfréquences, domaines des ondes millimétriques et sous-millimétriques (Commissions A, B, C, D et J), microélectronique et électronique rapide (Commissions C et D, ainsi que Commission J pour les dispositifs III-V), et demander aux Commissions mentionnées de désigner un membre correspondant pour chacun de ces domaines;
  - (ii) organiser des séances communes avec les autres Commissions dans les domaines cités en (i);



- (iii) organiser des séances de la Commission D consacrées au progrès dans les problèmes de physique et des matériaux des technologies de pointe, ainsi que dans la modélisation et la conception assistée par ordinateur;
- (iv) inclure au programme de l'Assemblée une Conférence générale sur un sujet de technologie électronique;
- (v) organiser un Colloque ouvert consacré à un sujet du domaine de la Commission D: les dispositifs semi-conducteurs composés par exemple (en particulier les dispositifs III-V) qui pourrait être copatronné par une autre organisation internationale ou bien par une association scientifique ou d'ingénierie nationale.

## Commission E - Bruits et brouillages électromagnétiques

### E.1 Colloques sur la compatibilité électromagnétique

La Commission E,

*notant* les résultats positifs de la collaboration entre la Commission et les responsables de plusieurs colloques sur la compatibilité électromagnétique, résultats qui se sont traduits par l'organisation de plusieurs séances et ateliers de travail URSI dans le cadre de ces colloques,

*recommande* que l'URSI continue d'accorder un modeste appui financier aux colloques des séries de Zurich et de Wrocław.

### E.2 Groupes de travail

La Commission E

*décide* de maintenir, pendant les trois années à venir, les Groupes de travail suivants:

1. Bruits artificiels (Président: A.D. Spaulding);
2. Bruits naturels (Président: J. Hamelin);
3. Effets nocifs des phénomènes transitoires sur les équipements (Président: V. Scuka);
4. Fondement scientifique de la maîtrise des bruits et des brouillages (Président: C. Baum).

Commission F - Télédétection et propagation des ondes -  
atmosphère neutre, océans, terre, glace

F.1 Titre de la Commission F

La Commission F,

*ayant pris connaissance* du rapport du Groupe de travail composé de R.K. Crane et P. Delogne (co-présidents), D. Croom et F. Fedi, qui estime peu pratique le titre actuel de la Commission, "Télédétection et propagation des ondes - atmosphère neutre, océans, terre, glace" adopté par le Conseil à la XXe Assemblée générale (Washington D.C., 1981),

*recommande* que soit adopté le nouveau titre: "Propagation des ondes: télédétection et communications" qui reflète le fait que la Commission F, en tant que partie intégrante de l'URSI, est essentiellement concernée par la propagation des ondes, mais qui reconnaît en même temps que les deux principaux champs d'application des études de la Commission sont la télédétection et les communications.

*Note: Voir la Résolution U.7 du Conseil de l'URSI.*

F.2 Activités scientifiques 1985-1987

La Commission F,

*considérant*

- (a) le succès obtenu par les colloques organisés au cours des trois dernières années;
- (b) le rôle prépondérant de la Commission dans l'étude de la propagation des ondes dans les milieux non ionisés, et plus particulièrement des applications dans les domaines de la télédétection et des communications,

*recommande* l'organisation des colloques suivants au cours des trois années à venir:

1. Propagation des ondes: télédétection et communications, 1986 (organisateur: R.K. Crane, P. Delogne et F. Fedi);
2. Problèmes de signatures en télédétection, 1986 ou début 1987 (organisateur: F. Eklund et A. Blomquist).

F.3 Groupe de coordination inter-Commissions sur la télé-détection

La Commission F,

*ayant pris connaissance* du rapport du Groupe de coordination inter-Commissions sur la télé-détection, présenté par le Dr. J. Gower, Président du Groupe,

*recommande*

1. que le Groupe de coordination inter-Commissions sur la télé-détection soit maintenu pendant les trois années à venir;
2. que le Dr. D. Gjessing (Norvège) et le Dr. J. Gower (Canada) soient inclus à ce Groupe en qualité de représentants de la Commission F;
3. que le Groupe de coordination soit présidé par l'un des deux représentants de la Commission F;
4. que chacune des Commissions de l'URSI intéressées désigne deux représentants au maximum au sein du Groupe de coordination;
5. que des consultations régulières aient lieu entre les Présidents et les Vice-présidents de la Commission F et du Groupe de coordination inter-Commissions sur la télé-détection.

F.4 Comité de Liaison URSI-CCIR-CCITT

La Commission F,

*considérant* qu'il est souhaitable de maintenir et de développer davantage la collaboration entre l'URSI et les Comités consultatifs de l'Union internationale des télécommunications (CCIR et CCITT),

*recommande*

1. que les personnalités suivantes soient désignées comme représentants de la Commission au sein du Comité de Liaison URSI-CCIR-CCITT: A. Blomquist (Suède), L. Boithias (France), F. Fedi (Italie), M.P. Hall (Royaume-Uni);
2. que les autres Commissions de l'URSI dont les études concernent les travaux du CCIR et du CCITT désignent des représentants au sein de ce Comité.

F.5 Représentant de l'URSI au SCOR

La Commission F

*recommande* que le Dr. G. Valenzuela (EUA) soit désigné en tant que représentant de l'URSI au Comité scientifique des recherches océaniques.

F.6 Review of Radio Science

La Commission F

*décide*

1. de désigner le Dr. R.K. Crane, nouveau Vice-président de la Commission, comme rédacteur de la Commission F pour la prochaine édition de *Review of Radio Science*;
2. de demander au nouveau rédacteur de diffuser, au sein de la Commission, la liste complète des références fournies par les différents membres pour l'édition 1984 de *Review of Radio Science*.

Commission G - Radioélectricité ionosphérique  
et propagation

G.1 Bulletin et réunions de l'INAG

La Commission G,

*reconnaissant*

- (a) qu'il est difficile pour les responsables et les membres du Groupe Conseil du réseau ionosphérique (INAG) d'obtenir des fonds suffisants pour assister aux réunions de l'INAG;
- (b) que le coût de la préparation du bulletin de l'INAG est trop élevé pour être supporté par les quelques organisations concernées;
- (c) que plusieurs autres organisations se sont déclarées prêtes à apporter une contribution financière,

*recommande*

1. que les Comités Membres de l'URSI et les institutions intéressées soient instamment invités à fournir toute l'aide possible pour surmonter ces difficultés;

2. que l'URSI établisse un Fonds international destiné à financer le fonctionnement de l'INAG, sous le contrôle du Président de l'INAG, et qu'elle invite les groupements intéressés à fournir des contributions à ce Fonds.

#### G.2 Nouvelles ionosondes

La Commission G,

*considérant* que, dans de nombreux cas, les Centres mondiaux de données n'ont pas été informés de l'installation de nouvelles ionosondes,

*recommande* aux Administrations dont elles dépendent de fournir aux Centres mondiaux appropriés les détails concernant les nouvelles stations et d'informer le Groupe Conseil du réseau ionosphérique (INAG) de leur existence.

#### G.3 Réseau d'ionosondes et Centres mondiaux de données

La Commission G,

*notant* qu'en dépit de l'accroissement du nombre des stations ionosphériques au cours des dix années écoulées, le volume des données reçues par les Centres mondiaux de données a diminué considérablement,

*invite instamment* les stations ionosphériques et les Administrations dont dépendent ces stations à faire en sorte que les règles d'échange établies soient respectées et, en particulier, que les rapports mensuels soient régulièrement communiqués, sous le format normalisé, aux Centres mondiaux appropriés.

#### G.4 Station ionosphérique d'Huancayo

La Commission G,

*reconnaissant* qu'au cours de plus de 47 années, la station ionosphérique d'Huancayo a joué un rôle extrêmement important dans la compréhension de la physique de l'atmosphère ionisée des latitudes équatoriales et de ses relations avec les autres phénomènes géophysiques,

*notant* que cette station ne fonctionne plus régulièrement,

*recommande instamment* qu'un programme de sondages de routine soit réétabli et que les données soient mises à la disposition de la communauté internationale par l'intermédiaire des Centres mondiaux de données.

#### G.5 Observatoire de l'Ebre à Roquetes

La Commission G,

*notant* que l'Observatoire de l'Ebre à Roquetes a produit une série continue de données géomagnétiques au cours des 80 années écoulées, ainsi qu'une série de données ionosphériques au cours des 30 années écoulées, apportant ainsi une remarquable contribution à la connaissance des processus dans l'ionosphère,

*demande instamment* à l'Administration dont il dépend d'en maintenir le fonctionnement continu.

#### G.6 Combined Catalogue of Ionosphere Vertical Soundings Data

La Commission G,

*notant*

(a) la très prochaine publication, par les Centres mondiaux de données pour la physique solaire-terrestre, du *Combined Catalogue of Ionosphere Vertical Soundings Data*;

(b) la grande valeur que ce catalogue représentera pour la communauté scientifique,

*encourage* toutes les stations et Administrations concernées à examiner ce catalogue avec soin et à porter toutes additions et corrections qu'elles jugeraient nécessaires à l'attention du Centre mondial de données A à Boulder, Etats-Unis.

#### G.7 Base de données obtenues au moyen de radars à diffusion incohérente

La Commission G,

*notant* qu'une base de données obtenues au moyen de radars à diffusion incohérente a été établie au Centre National de Recherches Atmosphériques (NCAR) à Boulder, Colorado, Etats-Unis, *recommande* aux Administrations responsables d'adopter un format commun pour leurs données et de communiquer celles-ci en temps opportun au Centre de données afin de faciliter l'échange et l'exploitation de ces données.

#### G.8 Mesures dans l'espace

La Commission G,

*considérant* que, pour pouvoir interpréter les nouvelles données acquises aux hautes latitudes au moyen de diverses techniques radioélectriques et autres, il est essentiel de connaître les

paramètres du champ magnétique interplanétaire,

*demande instamment* aux gouvernements et aux agences gouvernementales s'occupant de mesures dans l'espace de faire tout leur possible pour assurer l'acquisition et la diffusion de ces paramètres en temps opportun.

G.9 Projet de nomenclature normalisée des paramètres obtenus à l'aide d'ionosondes numériques

La Commission G,

*notant* que le Groupe de travail G.10, Groupe de travail international sur les ionosondes numériques, a préparé un projet de nomenclature normalisée pour les paramètres obtenus à l'aide des ionosondes numériques (*INAG Bulletin* No 40/41, 1983),

*recommande* que la communauté scientifique adopte cette nomenclature pour tous les documents et publications scientifiques.

G.10 Groupes de travail

La Commission G,

*ayant pris connaissance* des rapports présentés par ses différents Groupes de travail,

*décide*

1. de fusionner le Groupe de travail G.1 "Groupe conseil du réseau ionosphérique (INAG)" avec le Groupe de travail G.10 "Groupe international sur les ionosondes numériques (IDIG)" et de donner au Groupe ainsi formé le titre de "Groupe conseil du réseau d'ionosondes (INAG)",

Président: Prof. J.A. Gledhill (Afrique du Sud)  
Secrétaire exécutif: Dr. R. Haggard (Afrique du Sud)  
Secrétaire aux publications: Dr. R. Conkright (EUA)

(voir Annexe I pour le mandat du Groupe);

2. de dissoudre le Groupe de travail G.6 "Connaissance des caractéristiques ionosphériques nécessaires pour l'amélioration des systèmes de propagation radioélectrique";
3. de maintenir le Groupe de travail G.3 "Groupe d'études de l'atmosphère de l'hémisphère austral (SHAGS)",

Président: Prof. S. Radicella (Argentine);

4. de maintenir le Groupe de travail G.4 "Ionosphère de référence internationale (IRI)" (commun avec le COSPAR),

Président: Prof. L. Bossy (Belgique)  
Vice-président: Dr. T.L. Gulyaeva (URSS);

5. de maintenir le Groupe de travail G.12 "Utilisation des émissions des satellites à balise",

Président: Dr. R. Leitinger (Autriche)  
Vice-présidents: Dr. A. Wernik (Pologne)  
Dr. J.A. Klobuchar (EUA);

6. de former un nouveau Groupe de travail "Cartographie des caractéristiques du sommet de la couche F2",

Président: Dr. K. Davies (EUA)  
Membres: Dr. P. Bradley (Royaume-Uni), Dr. N. Danilkin (URSS)  
Dr. N. Mattura (Japon), Dr. L. McNamara (Australie),  
Prof. K. Rawer (RFA), Dr. C.M. Rush (EUA).

(voir Annexe II pour le mandat du Groupe).

Annexe I - Mandat du Groupe conseil du réseau d'ionosondes (INAG)

Le Groupe conseil du réseau d'ionosondes (INAG) est établi par la Commission G, avec mission de poursuivre les buts suivants au moyen de la publication d'un bulletin et de l'organisation de réunions:

1. surveiller, maintenir et améliorer la qualité des données fournies par les ionosondes et le réseau d'ionosondes;
2. promouvoir l'échange de données par l'intermédiaire des Centres mondiaux de données ou bien par des contacts directs entre les stations et les utilisateurs, ainsi que le stockage de ces données;
3. réviser la liste des paramètres et les règles en usage pour les adapter aux besoins des utilisateurs;
4. évaluer l'importance internationale des stations existantes et de celles qu'il serait proposé d'établir, et formuler des recommandations appropriées;
5. encourager la mise au point de méthodes améliorées pour l'utilisation des ionosondes et faire connaître ces méthodes à la communauté;
6. prodiguer des encouragements au personnel des stations ionosphériques en les tenant au courant de l'utilisation faite des données et de toutes questions susceptibles de l'intéresser;
7. promouvoir l'utilisation des ionosondes dans les campagnes



de recherches;

8. stimuler les études théoriques pour améliorer l'acquisition et l'interprétation des données.

Annexe II - Mandat du Groupe de travail sur la cartographie des caractéristiques du sommet de la couche F2

Le Groupe de travail sur la cartographie des caractéristiques du sommet de la couche F2 est établi par la Commission G pour contribuer à l'amélioration des Cartes du CCIR donnant les caractéristiques de la couche F2, par des études théoriques et des observations. En particulier, la possibilité d'incorporer à ces études les données acquises à partir de l'espace sera envisagée.

G.11 Colloques 1984-1987

La Commission G

*recommande* l'organisation des colloques suivants, qui seraient patronnés et financièrement supportés par l'URSI:

1. Etude globale, théorie y compris, de la haute atmosphère au moyen de radars à diffusion incohérente, utilisés seuls ou en relation avec d'autres techniques, printemps ou été 1986 (organisation locale: Dr. A. Richmond, NCAR, Boulder, Colorado, EUA);
2. Etudes ionosphériques au moyen de satellites à balises, été ou automne 1986 (organisation locale: Prof. A. Tauriainen, Université d'Oulu, Oulu, Finlande);
3. Conférence internationale sur la modification artificielle de l'ionosphère par échauffement.

G.12 Représentants au Groupe de coordination inter-Commissions sur la télédétection

La Commission G

*recommande* que les personnalités suivantes soient désignées comme représentants de la Commission au sein du Groupe de coordination inter-Commissions sur la télédétection:

- Dr. C.L. Rino (EUA) pour les radars à synthèse d'ouverture,
- Dr. Tudor Jones (Royaume-Uni) pour les aspects de la télédétection aux hautes fréquences.

G.13 Représentant au Comité de liaison URSI-CCIR-CCITT

La Commission G

*recommande* que le Dr. C.M. Rush (EUA) soit désigné comme représentant de la Commission au sein du Comité de Liaison URSI-CCIR-CCITT.

G.14 Review of Radio Science 1984-1986

La Commission G

*décide* de désigner le Dr. Ken Davies (EUA) comme rédacteur du rapport triennal commun des Commissions G et H qui sera inclus à l'édition 1987 de la *Review of Radio Science*.

Commission H - Ondes dans les plasmas

H.1 Mandat de la Commission H

La Commission H,

*considérant* que le mandat de la Commission, tel qu'il a été défini lors de l'Assemblée générale de Lima (1975) et publié au *Bulletin d'Information de l'URSI* No 195 (septembre 1975), est parfaitement approprié,

*décide* de confirmer les termes de ce mandat.

H.2 Patronage de colloques et de réunions

La Commission H

*recommande* que l'URSI accorde son copatronage aux réunions suivantes:

1. 2e Ecole internationale pour les simulations dans l'espace, Kapaa, Kauai, Hawaii, 4-15 février 1985 (secrétaire de la conférence: Dr. D.A. Dutton, EUA);
2. 17e Conférence internationale sur les phénomènes dans les gaz ionisés, Budapest, Hongrie, 1985;
3. Colloque sur les interactions entre les ondes et les particules, et phénomènes associés, Dunedin, Nouvelle Zélande, fin janvier 1986 (organisé en commun par les Drs U. Inan, EUA, H. Matsumoto, Japon, et R.L. Dowden, Nouvelle Zélande);

4. Colloque sur les modifications de l'ionosphère provoquées par des ondes radioélectriques de haute puissance, URSS, avant la XXIIe Assemblée générale (organisé conjointement par les Professeurs W.E. Gordon, EUA, et V.V. Migulin, URSS).

H.3 Groupes de travail URSI/IAGA

La Commission H

*décide* de maintenir les Groupes de travail URSI/IAGA comme suit:

URSI/IAGA.1 Sondage électromagnétique passif de la magnétosphère

Co-président pour la Commission H: Dr. U. Inan (EUA);

URSI/IAGA.2 Instabilités des ondes dans les plasmas

Co-président pour la Commission H: Dr. T. Sato (Japon).

H.4 Groupe de coordination inter-Commissions sur la télédétection

La Commission H

*recommande*

1. que le Groupe de coordination inter-Commissions sur la télédétection soit maintenu;
2. que le Dr. H. Gendrin (France) soit désigné comme représentant de la Commission au sein de ce Groupe.

H.5 Groupe de travail inter-Commissions sur la mesure des formes d'ondes dans le domaine temporel

La Commission H

*recommande*

1. que le Groupe de travail inter-Commissions sur la mesure des formes d'ondes dans le domaine temporel soit maintenu;
2. que le Dr. F. Lefeuvre (France) soit désigné comme représentant de la Commission au sein de ce Groupe.

