Bulletin nº 141 Novembre-Décembre 1963

U. R. S. I.

TABLE DES MATIERES — CONTENTS

OBITUARY

Dr. Takeo Hatanaka

Takeo Hatanaka passed away at his home in Tokyo, Japan on November 10, 1963, after an active career in astronomy.

He was born in Wakayama Prefecture, Japan, in 1914. After graduated from Tokyo Imperial University with a B. S. degree in 1937, he worked at the Tokyo Astronomical Observatory. About that time he was interested in solar physics and published a few papers. Subsequently he started a research in planetary nebulae, in which he interpreted the emission mechanism of the nebulae as an optical interaction rather than fluorescence and succeeded in quantitative explanations of the mechanism. By this study he received his Ph. D. degree in 1945.

Dr. Hatanaka has conducted researches in radio astronomy which were started at the Tokyo Astronomical Observatory in 1949. He was one of the pioneering and leading radio astronomers in the world : he first pointed out the importance of observations of linear polarizations, which have been carried out by himself and subsequently by many other radio astronomers. Further he examined the possibility of receiving radar echoes from the sun.

In 1955 Dr. Hatanaka was appointed a professor in the University of Tokyo and has been in charge of the theoretical astronomy in the Department of Astronomy, Faculty of Science, and also has been in charge of the sections of Radio Astronomy and Spectroscopy in the Tokyo Astronomical Observatory.

He was an excellent organizer and leader of various research groups in astronomy and related fields in Japan.

Dr. Hatanaka was a member of U.R.S.I. Commission V and as such he played a very active and efficient role during the Tokyo General Assembly, when he was elected Vice-President of this Commission.

He was a member of Committees 34, 40 and 44 of the I.A.U., and of Working Group I of COSPAR. He was also a member of the Science Council of Japan and many other scientific committees in Japan.

U. R. S. I. NEWS

We have the pleasure to inform our readers that our President, Prof. I. Koga, was awarded the Order of Culture, the highest Japanese Academic Decoration. He was granted this award by the Prime Minister in a ceremony attended by the Emperor on November 3rd, the « Cultural Day » of Japan.

We do not doubt that all our readers will join us in presenting Prof. I. Koga with our warmest congratulations.

XIVe ASSEMBLÉE GÉNÉRALE

Commission VI

RAPPORT DU COMITÉ NATIONAL DES ÉTATS-UNIS

Ce rapport dont le contenu, à cause de son importance, ne sera pas reproduit dans le Compte Rendu de l'Assemblée Générale, peut être obtenu en s'adressant au Secrétariat Général de l'U.R.S.I. ou au Secrétariat du Comité National des Etats-Unis (U.S.C.N./U.R.S.I., National Research Council, 2101 Constitution Avenue, Washington 25, D. C.).

Chacune des parties dont le contenu est donné ci-dessous peut être obtenue séparément :

XIVth GENERAL ASSEMBLY

Commission VI

REPORT OF THE U. S. NATIONAL COMMITTEE

This report which due to its importance will not be published in the Proceedings of the General Assembly is available at the General Secretariat of U.R.S.I. or at the Secretariat of the U. S. National Committee (U.S.C.N./U.R.S.I., National Research Council, 2101 Constitution Avenue, Washington 25, D. C.).

Each part of which the contents is given below is available separately :

Part I — Electromagnetics.

Introduction.

1. Antennas.

Progress in Antennas 1960-62, V. H. Rumsey, R. C. Hansen, A. Ksienski.

2. Statistical problems in electromagnetics.
   Rough surfaces, W. S. AMENT.
   Electromagnetic wave propagation in a random medium, W. C. HOFFMAN.
   Coherence theory, F. J. ZUCKER.
3. Radiation.
   Electromagnetic fields in lossy media, J. R. WAIT.
   Antennas in lossy media, C. T. TAI.
   Guided waves, R. E. COLLIN and A. A. OLINER.
   Radiation from plasmas, L. B. FELSEN.
   Electromagnetic wave propagation in inhomogeneous plasmas and/or magnetoplasmas, W. C. HOFFMAN.
4. Classical diffraction and scattering.
   Diffraction and scattering, L. B. FELSEN and V. H. WESTON.
   On scattering of waves by many bodies, J. E. BURKE and V. TWERSKY.
   Passive communications satellites, Review 1960-62, J. RUSSELL BURKE.
   Passive and active reflectors, J. KAISER and I. KAY.

Part II — Information theory.

Introduction.

1. Foundations of information theory, A. J. THOMASIAN.
2. Coding theory, W. W. PETERSON and J. MASSEY.
3. Signal theory and noise theory, D. SLEPIAN.
4. Time-variant communication channels, T. KAILATH.
5. Prediction and filtering, A. V. BALAKRISHNAN.
6. Communication and radar.
   A. General — R. PRICE and G. L. TURIN.
   B. Radar waveform selection — R. M. LERNER.
7. Artificial intelligence, E. A. FEIGENBAUM.
8. Human information processing, M. EDEN.
9. Pattern recognition and machine learning, N. ABRAMSON, D. BRAVERMAN and G. SEBESTYEN.
10. Space communication, G. E. MULLER.

Part III — Network theory.

Introduction, L. WEINBERG.

1. Passive circuit theory, M. E. VAN VALKENBURG.
2. Time-varying and active network theory, J. B. CRUZ, Jr.
3. Microwave filters, L. YOUNG.
4. Adaptive control processes, R. BALLMAN.
5. Linear graphs, L. WEINBERG.
6. Communication networks, R. T. CHIEN, R. E. GOMORY and T. C. HU.
7. Switching functions, E. J. MCCLUSKEY.
8. Sequential circuits.
   A. Structural properties, D. B. ARMSTRONG.
   B. Behavioral properties, R. MCNAUGHTON.

NATIONAL COMMITTEES

List of Presidents and Secretaries of U.R.S.I. National Committees

(f) *French speaking.*
(e) *English speaking.*

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Ghana

c/o Dr. D. G. OSBORNE, Department of Physics, University of Ghana, Legon, Accra (e).

Greece

c/o Mr. S. NICOLIS, Direction Générale des Télécommunications, Ministère des Communications, 4 rue Voulis, Athènes (f).

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Secretary-Treasurer, South African Council for Scientific Research, POB 395, Pretoria, Tvl. (e).

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Commission VI : Ing. Juan M. Barcala, 71 - N° 385, La Plata (B.A.).

Italie

NOMINATION D'UN NOUVEAU SECRÉTAIRE

Le Dr. Ing. Riccardo V. Ceccherini s'est démis, pour raisons de santé, de ses fonctions de Secrétaire du Comité National Italien de l'U.R.S.I.

C'est le Dr. Ing. A. Guidoboni qui assurera dorénavant ces fonctions, dans lesquelles il sera appuyé, pour les relations entre le Comité National Italien et l'U.R.S.I., par le Prof. Fanny Veglianti d'Emilio.

U. S. A.

CONFERENCE ON PRECISION ELECTROMAGNETIC MEASUREMENTS

June 23, 24, and 25, 1964
Boulder, Colorado — United States of America

Sponsored by :

National Bureau of Standards, Radio Standards Laboratory.

Institute of Electrical and Electronics Engineers, Professional Technical Group on Instrumentation and Measurement.

International Scientific Radio Union, U. S. Commission I, Radio Measurement Methods and Standards.

The 1964 Conference on Precision Electromagnetic Measurements will be held June 23, 24, and 25 at the Boulder Laboratories

of the National Bureau of Standards, Boulder, Colorado. (Notice that these new dates are a week later than the dates originally announced.) This Conference is an outgrowth and continuation of previous conferences which have been held since 1958 under slightly different names.

The aim of the Conference is the advancement of measurement, throughout the coherent frequency spectrum, at levels of precision and accuracy appropriate to the national standards laboratories of the world. The scope of the Conference ranges from measurement studies in the traditional fields of low frequency, high frequency, and microwaves, to physical studies which may have application to future precision measurements or which may require new measurement standards. Traditionally, the conference program also includes survey articles prepared by leading men in the field. These articles are designed to encourage a close relationship between the persons in the standards laboratories and the physicists who are making the discoveries upon which further accuracy and precision are founded. By stimulating unity among these areas the sponsors hope to shorten the interval between discovery and application in the field of precision measurement.

Since the 1962 conference there have been two changes in the sponsorship of the conference. Two traditional sponsors—The Instrumentation Division of the American Institute of Electrical Engineers, and the Professional Group on Instrumentation and Measurement of the Institute of Radio Engineers—have combined to form the Professional Technical Group on Instrumentation and Measurement of the Institute of Electrical and Electronics Engineers (I.E.E.E.). At the same time conference sponsorship has been expanded to include the U. S. Commission 1, Radio Measurement Methods and Standards, of the International Scientific Radio Union.

As in the past, the Conference wishes to encourage international participation. There are few, if any, other conferences with the same objectives ; yet there is a need to exchange such knowledge on a global basis and also to actively support and advance international standardization in the electromagnetic area.

Call for papers

Original papers in the following areas will be considered for presentation : (1) atomic frequency and time, (2) determination of

conductivity and complex (tensor) electric and magnetic susceptibilities, (3) direct current and low frequency measurements, (4) radio frequency, microwave, and millimeter wave measurements, (5) quantum electronics in precision radio and optical measurements, (6) electromagnetic measurements for space navigation and exploration, and (7) statistical methods automation, and data reduction in precision measurements.

As before, it is planned to publish a conference record by including the conference papers in one issue of the I.E.E.E. Transactions on Instrumentation and Measurement.

Papers should be submitted to : Charles F. Hempstead, Bell Telephone Laboratories, Inc., Murray Hill, New Jersey.

These should be in the form of 200-word abstracts.

The deadline for submission of summaries is March 15, 1964, but prospective authors are encouraged to express their intention to submit a paper as early as possible.

Notifications of acceptance or rejections will be mailed by March 30, 1964. (This late deadline was chosen to allow presentation of the most recent work.) The full technical program will be announced about April 15, 1964.

General questions concerning the Conference should be addressed to : James F. Brockman, National Bureau of Standards, Boulder, Colorado.

BIBLIOGRAPHY

N.B.S. Central Radio Propagation Laboratories

PUBLICATIONS LISTING

A Publications Listing (including author index) for the period July 1954 to March 1963 has been issued by the Boulder Laboratories.

COMMISSIONS AND COMMITTEES

Commission III

CO-OPERATION WITH C.C.I.R.

Commission III has appointed the following Working Group :

B. H. BRIGGS, *Chairman* (Australia) : Irregularities.

G. L. GRISDALE (U. K.) : H. F. fading.

F. KIFT (U. K.) : Ionospheric Modes.

C. G. McCUE (Australia) : Ionospheric Modes.

S. A. McINNES (Australia) : Backscatter Fading and Ionospheric Modes.

M. NAKAGAMI (Japan) : Fading Statistics.

E. S. WARREN (Canada) : Ionospheric Modes.

W. UTLAUT (U. S.) : H. F. Fading and Ionospheric Modes.

1. to consider C.C.I.R. Opinion n° 10 — Fading of signal propagated by the ionosphere ;

2. to study the following areas before the next General Assembly :

— Types of statistics most useful to specify fading properties.

— Theory of short-period fading at vertical and oblique incidence.

— Correlation of long period fading with geophysical phenomena.

— Spatial autocorrelation functions of fading signals and their variation with frequency.

— Focusing and defocusing effects for long hop low modes.

U.R.S.I.-C.I.G. Committee

REVISED MEMBERSHIP (SEPTEMBER 1963)

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Dr. F. DENISSE
Prof. W. DIEMINGER
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Ex officio : President of U.R.S.I., Secretary-General of U.R.S.I.

Space Radio Research Committee

TOKYO, SEPTEMBER 1963

1. — Meetings of the Committee were held at Tokyo on 13 and 19 September 1963 during the XIVth General Assembly.

2. — *Membership.*

At the request of the Executive Committee of U.R.S.I. the terms of reference and membership of the Committee were reviewed. No changes in terms of reference were proposed. The following revised membership was agreed.

(i) The Chairmen of the seven U.R.S.I. Commissions :

Dr. L. Essen (Commission I).

Dr. Y. Voge (Commission II).

Mr. J. A. Ratcliffe (Commission III).

Dr. H. G. Booker (Commission IV).

Prof. W. N. Christiansen (Commission V).

Dr. F. L. S. Stumpers (Commission VI).

Prof. P. A. Grivet (Commission VII).

(ii) The following additional members : Drs. Agno, Beynon, Clarck (N.A.S.A.), Dieminger, Friedman, Gringauz, Hagen, Hatanaka, K. Maeda, A. P. Mitra, Pushkov, Ranzi, Shapley, Siforov, Silver, Vitkevitch.

3. — *Officers* :

(*a*) *Chairman* : Prof. S. Silver.

(*b*) *Secretary* : Prof. W. J. G. Beynon.

(*c*) *Representative on C.O.S.P.A.R.* : Prof. S. Silver with Prof. Beynon as alternate.

(*d*) *C.C.I.R.* — It was agreed that close association with C.C.I.R. could be maintained through Dr. I. Ranzi (Chairman C.C.I.R. Study Group IV) and that in addition Dr. Voge should act as S.R.R.C. Correspondent on the U.R.S.I.-C.C.I.R. Committee.

4. — *Report on activities since* 1960 *General Assembly.*

Professor Beynon reported on a successful Symposium on Space Radio Communication which had been organized in Paris in September 1961. A total of 116 delegates from 12 countries, some 50 observers and representatives of national and international organizations participated in the Symposium. The meeting had the full support and collaboration of C.O.S.P.A.R. The proceedings of the Symposium had been published as an U.R.S.I. Monograph.

At the last Assembly it had also been decided to organize a second Symposium on the transmission of information and design of space experiments. For various reasons it had not yet been possible to organize this meeting but it was considered very desirable that this topic shall be discussed in the near future. It

was agreed that a more appropriate title for this topic would be « Optimization of instrumental design and data processing in space experiments ».

In view of the numerous Symposia now being organised it was resolved to attempt the preparation by selected experts of a comprehensive report on this topic, the main body of the work being accomplished by correspondence together with a committee type meeting of those concerned. It was agreed that a Working Group consisting of Drs. Friedman, Gringauz, Golomb together with the Chairman should analyse the problem and prepare a list of topics. Experts with experience of data processing would then be invited to prepare draft sections of the report and this material could form the basis of a discussion meeting. Professor Silver agreed to initiate a preliminary exchange of views along these lines.

5. — *C.O.S.P.A.R. activities and symposium topics.*

Professor Beynon briefly reported on proceedings at C.O.S.P.A.R. Meetings in Florence (1961), Washington (1962) and at Paris (1962). The interest and importance of space research activities to U.R.S.I. was now clearly recognized by C.O.S.P.A.R. and he felt that in the future very close cooperation between U.R.S.I. and C.O.S.P.A.R. could be expected.

Professor Silver represented U.R.S.I. at the June 1963 C.O.S.P.A.R. Meeting in Warsaw, and reported that at the administrative meetings of the C.O.S.P.A.R. Executive Council due consideration was always given to the interests of U.R.S.I.

He summarized plans which C.O.S.P.A.R. has drafted for future scientific symposia and stated that it is the intention of C.O.S.P.A.R. that the symposia will be held jointly with the Unions directly engaged in the given area of research. At least 8 of the topics proposed by C.O.S.P.A.R. are of direct interest to U.R.S.I.

Dr. Friedman stated that the titles selected by C.O.S.P.A.R. for Symposia in 1964, 1965 and 1966 were respectively « Interaction of corpuscular radiation with the atmosphre », « The physical and chemical structure of the high atmosphere » and « The interaction of the sun with the atmosphere under minimum solar activity conditions ». He added that if any Scientific Union had a major interest in any one topic in the list then C.O.S.P.A.R. would welcome the organization of that symposium by the Union concerned.

Dr. Hagen stated that in addition to those mentioned by Dr. Friedman the following three topics in the C.O.S.P.A.R. list were of primary interest to U.R.S.I. « Ionosphere currents and drifts », « Solar wind and boundary of the magnetosphere » and « Basic relations between space experiment design and telemetry and reduction requirements ».

Dr. Essen referred to satellite experiments of direct interest to Commission I which could be considered. Satellites provided opportunities for investigating the effect of the gravitational field on certain standard measurements.

In the general discussion which followed it was agreed to invite each U.R.S.I. Commission to consider possible topics for space research symposia. These can then be considered together with the C.O.S.P.A.R. list and an attempt made to draw up a long term calendar of such symposia. The possibility of holding these symposia in conjunction with other international meetings already arranged, should always be considered.

It was agreed that U.R.S.I. should, in consultation with C.O.S.P.A.R., offer to organize a symposium on « Solar wind and the boundary of the magnetosphere ».

It was further agreed that a small sub-group consisting of the Chairmen of Commissions III and IV, together with Dr. Friedman, should be invited to discuss with C.O.S.P.A.R. the cooperation which U.R.S.I. can give in arranging the programme at the 1964 C.O.S.P.A.R. Symposium on « The interaction of corpuscular radiation with the atmosphere ».

It was agreed that the cooperation between U.R.S.I. and C.O.S.P.A.R. should be further developed and that to this end it was desirable that U.R.S.I. should be represented on each C.O.S.P.A.R. Working Group. It was resolved that Dr. Friedman and the Chairman should discuss this matter and in particular suggest an U.R.S.I. nomination to the new C.O.S.P.A.R. Working Group VI (« Physics and Chemistry of near space »).

6. — *Resolution on monitoring of solar radiation.*

The Executive Committee of U.R.S.I. has referred to the Space Research Committee a resolution from the Inter-Union Committee on the Ionosphere on the monitoring of solar radiation. Dr. Friedman stated that wavelengths in the solar spectrum which were of special importance as far as the ionosphere was concerned were

now known and a statement on the point could be added to the resolution.

After some discussion the Committee strongly endorsed the resolution and statement (given in Appendix I).

The question of arrangements for publishing and disseminating the data on solar spectrum monitoring was raised and the following recommendation adopted.

« The U.R.S.I. Space Radio Research Committee notes that it is generally anticipated that within the next triennium great progress will be made in efforts to obtain nearly continuous monitoring from satellites of solar variations on X-ray and UV wavelengths and that these data will be of very great interest to many scientists studying variations in the ionosphere and magnetosphere. The Committee therefore urges that these data, in terms of suitable flux indices and lists of outstanding events, be made available to interested scientists with as little delay as possible. It is suggested that preliminary data be provided to the World Days organization and WDCs, eventually on a regular schedule, and that final data be made available to the editors of the various regular publications of solar and geophysical data. »

7. — *Frequencies for Space Research.*

Dr. J. P. Hagen reported on the activities of the Inter-Union Committee on Frequency Allocation (I.U.C.A.F.) and outlined the proposals which I.U.C.A.F. will put forward at the forthcoming Extraordinary Administrative Radio Conference. It was resolved : « that the Committee on Space Radio Research should invite the Executive Committee of U.R.S.I. to endorse strongly the proposals on frequencies for Space Research which I.U.C.A.F. will submit to the forthcoming Extraordinary Administrative Radio Conference ».

Dr. Hagen also referred to the work of C.C.I.R. Study Group IV on the problem of frequency allocation. It was agreed that there should be closer cooperation between the U.R.S.I. Space Radio Research Committee and C.C.I.R. Study Group IV and that this cooperation should be effected through Dr. Ranzi and Dr. Voge (see para. 3 (*d*)).

W. J. G. BEYNON,
Secretary.

22 October, 1963.

Appendix I

Resolution of Inter-Union Committee on the Ionosphere.

Recognizing the great value of measurements of solar X-ray and extreme ultra-violet ionizing radiation flux for understanding and interpreting the ionosphere, it is recommended that continuous recordings on certain wavelengths (1) be given high priority in artificial satellite instrumentation. Emphasis should be placed on a coordinated sequence of relatively simple measurements, and on the continuity. It is of especial importance to cover the period of the I.Q.S.Y.

The behaviour of the ionosphere is controlled by the flux of solar ultra-violet and X-radiation. In each ionospheric region, certain wavelengths are of primary importance. Under quiet conditions, Lyman-α (1216A) is the major source of D-region ionization. When the sun is active, ionization by X-ray from 1-10A increases in proportion to solar activity. At E-region heights (100-150 km) ionization is produced by the broad band of X-ray from 10-100A ; the ultraviolet Lyman-β (1025.7A) may shape the base of E-region and CIII (977A) and the Lyman continuum (910-800A) are important sources of ionization in higher portions of E-region. The major input to F-region is a band of ultraviolet from 175A to 400A including the resonance line of HeII (304A).

A solar monitoring programme should measure absolute fluxes of the major sources of ionization continuously. At the present time it is possible to prescribe absolute photometers for the wavelength intervals 1-10A, 44-60A, 175-400A and Lyman-α. The detectors may be photocells or ionization chambers combined with appropriate filters. With data storage it should be possible to monitor continuously. The response times of photometers currently in use is about 500 milliseconds. If carried on a solar pointed platform, the monitors may approach continuity to the limit of response time. On a spin stabilized satellite continuity is limited by the spin period, usually about one second.

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(1) The spectral regions concerned are specified in the following paragraphs.

DOCUMENTATION

L'attention est attirée sur les articles ci-après publiés dans le *Journal des Télécommunications*, vol. 30, nº 11 (novembre 1963) :

— Ouverture de la Conférence des Radiocommunications spatiales, pp. 334-336.

— Les télécommunications par satellites stationnaires — Problèmes à résoudre et possibilités ouvertes, G. D. WALLENSTEIN, pp. 342-346.

BIBLIOGRAPHY

Attention is called to the following papers published in *Telecommunication Journal*, Vol. 30, nº 11 (November 1963) :

— Opening of the Conference on Space Communications, pp. 334-336.

— Problems and Promise of Stationary Satellite Communications, G. D. WALLENSTEIN, pp. 342-346.

INTER-UNION COMMITTEES

Inter-Union Committee on Radio Meteorology

FIRST ANNOUNCEMENT

1964 World Conference on Radio Meteorology

Covering all aspects of Radio-Meteorology, and incorporating the eleventh Weather Radar Conference, a symposium will be held at Boulder, Colorado in the period September 14-18, 1964. Emphasis will be on discussion, and on establishing through discussion a broader community of interest among various specialities, all involving interaction between radio waves and the troposphere.

This conference is being organized by the Inter-Union Committee on Radio-Meteorology (of U.R.S.I. and U.G.G.I.) in conjunction with the American Meteorological Society (sponsor of the regular series of Weather Radar Conferences) and the Central Radio Propagation Laboratories of the National Bureau of Standards, who will be the hosts to the Conference in the Laboratories at Boulder, Colorado, U. S. A.

The organizing committee would like to hear now from all those interested in attending and participating in the conference. Those intending to present papers should submit proposed titles immediately. In addition, any specific suggestions for the conduct of the meeting are welcome. All those intending to attend, whether submitting a paper or not, should respond to this announcement *since all further information about the conference will be directed only to those responding.*

TOPICS COVERED at the Conference will include all the interactions of radio with the troposphere, with emphasis on their meteorological relevance. These include :

(i) The scientifically-relevant aspects of microwave propagation in or through the troposphere, notably scatter-propagation,

ducting and general bending, and attenuation by precipitation, cloud, vapours and gases.

(ii) Radar observations of precipitation, cloud, lightning and dielectric inhomogeneities of the air.

(iii) Radiations from lightning. Interactions of these radiations with the ionosphere and the field beyond are not included, unless through relevance to other items. Changes in the electric field of the thunderstorm would seem to offer a valid topic.

(iv) Microwave radiometry, closely related to the attenuation of item (i).

(v) The meteorological processes giving rise to phenomena, the observation of which is included in preceding items. Topics under this head will be judged by their likely interest to the participants, and such judgement is bound to be somewhat arbitrary.

(vi) Interactions like those above, but involving light waves, especially if the light when generated is coherent or in a coherent pulse.

(vii) Other topics adjudged to be of interest to the various radio-meteorological specialists who will be conferring.

CONTRIBUTED PAPERS will be reproduced and distributed a month or more before the conference, to allow the necessary thorough reading by all participants. By so doing, the committee seeks to encourage the free presentation of ideas, and the effective communication of those ideas, toward truly constructive discussion. There will be ample discussion time in which to raise any significant point in any paper. There will be no spoken presentation of the contributed papers as such. Some invited speakers will review topics in need of such review. Others will introduce discussion of new developments as represented by the contributed papers. These presentations will provide leads to extensive discussion, in which points from contributed papers can be aired. These General Sessions will be planned toward their being intelligible and appropriate to the whole spectrum of participants. The various specialities have enough in common that the total sharing of these sessions should enhance them for the specialist, rather than constituting an expurgated version.

SPECIALIZED SESSIONS will occupy an equal amount of time and will not be run in parallel.

It is important that the earliest possible registration be made, even if tentative, since the success of this meeting will depend largely on the early distributions of the advance proceedings to all participants. The following schedule will be observed :

Tentative titles and suggestions — immediately.

Contributions (ready for photo-reproduction) — 1 June 1964.

Distribution of advanced proceedings — 15 July 1964.

Conference — September 14-18, 1964.

Please write to : Mr. J. W. Herbstreit, Program Committee, 1964 World Conference on Radio Meteorology, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colorado.

I. U. C. A. F.

DOCUMENTATION

L'attention est attirée sur les articles ci-après publiés dans le *Journal des Télécommunications*, vol. 30, n° 11 (novembre 1963) :

— Ouverture de la Conférence des Radiocommunications Spatiales, pp. 334-336.

— Les océanographes à la recherche d'une longueur d'ondes, p. 339.

BIBLIOGRAPHY

Attention is called to the following papers published in the *Telecommunications Journal*, Vol. 30, n° 11 (November 1963) :

— Oceanographers in search of a wavelength, p. 339.

— Opening of the Conference on Space Communications, pp. 334-336.

I. Q. S. Y.

Trial Forecasts of Solar Activity

To : Members of Advisory Groups for I.Q.S.Y. Disciplines and others.

At the IInd C.I.G.-I.Q.S.Y. Assembly, Rome, March 1963, the I.Q.S.Y. Working Groups for Aeronomy and for Space Research submitted to the Solar Activity Working Group the requirements of rocket experimenters for forecasts or solar activity. The Solar Activity Working Group in turn requested three experts to be responsible for furnishing the World Warning Agency with weekly forecasts for three to four weeks in advance. See I.Q.S.Y. NOTES No. 3, pages 47 (Resolution 14) and 65.

These Solar Activity Forecasts are issued weekly. They are being started now since the I.Q.S.Y. World Days programme was put into effect as of October 1, 1963. The months of October, November and December are considered a trial in anticipation of the formal start of I.Q.S.Y. on January 1, 1964 (I.Q.S.Y. NOTES No. 3, p. 85).

It should be emphasized that the designated specialists are effectively pioneering a new field of study and geophysicists are « eavesdropping » on their current pure research. There is as yet no single « best » technique for forecasting solar activity or « best » way of expressing the forecasts. For the next few months, at least, we will quote in these circulars the forecast statements received from one or more of the specialists.

We are now sending these forecasts of solar activity to members of the advisory groups of the other I.Q.S.Y. disciplines (I.Q.S.Y. NOTES No. 1, pp. 9-10) as well as to those concerned with Aeronomy and Space Research (p. 11), so that you would be aware that this activity has been started in accord with the C.I.G.-I.Q.S.Y. recommendations. We will be glad to continue to send the forecasts to you each week, or to any other scientists you may

suggest. However, we would like to have word from you that the forecasts are wanted. If we have not heard by December 15, we will consider that you have no further need to receive a copy personally.

A. H. SHAPLEY,
I.Q.S.Y. Reporter for World Days.

November, 1963.

INTERNATIONAL YEARS OF THE QUIET SUN
I.Q.S.Y. 1964-1965

Trial Forecasts of Solar Activity

A. From Dr. Helen Dodson Prince (in association with Miss Ruth Hedeman), McMath-Hulbert Observatory, U. S. A. :

1. *Definitions* : « Relatively Active » : By this we mean (*a*) the occurrence of flares or subflares, (*b*) the existence on the visible hemisphere of the sun of a calcium plage (with or without a spot, with or without flares) of area >1000 millionths of the hemisphere with intensity $\geqslant 2.5$ on our scale, (*c*) a plage of any size with a spot that lasts more than two days, (*d*) systems of surges or loop-type prominences at limb. « Relatively Quiet » : By this we mean the absence of the features described under « Relatively Active ».

2. *Forecast* for November 23 to December 2 :

Nov. 23-Dec. 2 : relatively active.

Dec. 3-Dec. 10 : relatively quiet.

Dec. 11-Dec. 20 : relatively active.

3. Comments : During the November 23-December 2 interval the sun is expected to be relatively active because region 7013 which formed on the disk October 28 has returned with spots as region 7044. During December 3-10 only small ephemeral plages and remnants of old plages are expected to be present on the disk.

B. From Dr. R. Michard (in association with Mrs. Martres), Meudon Observatory, France :

1. *Definitions* : « Completely Quiet » : No spot ; no plage larger than 1000 millionths of hemisphere ; no active prominence ; no

green line activity ; no known active region within 1-2 days of limb transit ; 10 cm flux < 65. « Active » : Either large and bright plage (> 1000 millionths) or plage with spots present on disk, or active region at limb with green line condensation ; flares and active prominence region possible ; 10 cm flux > 75. « Relatively Quiet » : Intermediate between above cases.

2. *Forecast* for November 22 to December 22 :

Nov. 22-Dec. 22 : active.

C. C. I. R.

Xe Assemblée Plénière

GENÈVE 1963

Les volumes ci-après de la série des documents de la Xe Assemblée Plénière viennent de sortir de presse.

Volume II — Propagation, contenant :

— Avis de la Sous-section G.1 — Propagation de l'onde de sol et propagation troposphérique.

— Rapports de la Sous-section G.1 — Propagation de l'onde de sol et propagation troposphérique.

— Questions et Programmes d'études attribués à la Commission d'études V (Propagation à la surface de la terre et dans les régions non-ionisées de l'atmosphère) ; Vœux et Résolutions intéressant cette Commission.

— Liste des Documents de la Xe Assemblée plénière relatifs à la Commission d'études V.

— Avis de la Sous-section G.2 — Propagation ionosphérique.

— Rapports de la Sous-section G.2 — Propagation ionosphérique.

— Questions et Programmes d'études attribués à la Commission d'études VI (Propagation ionosphérique) ; Vœux et Résolutions intéressant cette Commission.

— Liste des Documents de la Xe Assemblée plénière relatifs à la Commission d'études VI.

Volume V — Radiodiffusion, Télévision, contenant :

— Avis de la Sous-Section E.1 : Basse fréquence et enregistrement.

— Avis de la Sous-section E.2 : Fréquences radioélectriques.

— Avis de la Sous-section E.3 : Radiodiffusion tropicale.

— Avis de la Sous-section E.4 : Télévision.

— Rapports de la Sous-section E.1 : Basse fréquence et enregistrement.

— Rapports de la Sous-section E.2 : Fréquences radioélectriques.

— Rapports de la Sous-section E.3 : Radiodiffusion tropicale.

— Rapports de la Sous-section E.4 : Télévision.

— Questions et Programmes d'études attribués à la Commission d'études X (Radiodiffusion) ; Vœux et Résolutions intéressant cette Commission ; Liste des Documents de la Xe Assemblée plénière relatifs à la Commission d'études X.

— Questions et Programmes d'études attribués à la Commission d'études XI (Télévision) ; Vœux et Résolutions intéressant cette Commission ; Liste des Documents de la Xe Assemblée plénière relatifs à la Commission d'études XI.

— Questions et Programmes d'études attribués à la Commission d'études XII (Radiodiffusion tropicale) ; Vœux et Résolutions intéressant cette Commission ; Liste des Documents de la Xe Assemblée plénière relatifs à la Commission d'études XII.

— Questions et Programmes d'études attribués à la C.M.T.T. (Commission mixte C.C.I.R./C.C.I.T.T. pour les transmission télévisuelles) ; Vœux et Résolutions intéressant cette Commission ; Liste des Documents de la Xe Assemblée Plénière relatifs à la C.M.T.T.

C. C. I. R.

Xth Plenary Assembly

GENEVA 1963

The following volumes of the series of documents of the Xth Plenary Assembly have just been issued.

Volume II — Propagation, containing :

— Recommendations of Sub-section G.1 — Propagation over the surface of the earth and through the non-ionized regions of the atmosphere.

— Reports of Sub-section G.1 — Propagation over the surface of the earth and through the non-ionized regions of the atmosphere.

— Questions and Study Programmes allocated to Study Group V (Propagation over the surface of the earth and through the non-ionized regions of the atmosphere) ; Opinions and Resolutions of interest to this Study Group.

— List of documents of the Xth Plenary Assembly concerning Study Group V.

— Recommendations of Sub-section G.2 — Ionospheric propagation.

— Reports of Sub-section G.2 — Ionospheric propagation.

— Questions and Study Programmes allocated to Study Group VI (Ionospheric propagation) ; Opinions and Resolutions of interest to this Study Group.

— List of documents of the Xth Plenary Assembly concerning Study Group VI.

Volume V — Sound broadcasting television, containing :

— Recommendations of Sub-section E.1 — Audio-frequency and recording.

— Recommendations of Sub-section E.2 : Radio-frequency.

— Recommendations of Sub-section E.3 : Tropical broadcasting.

— Recommendations of Sub-section E.4 : Television.

— Reports of Sub-section E.1 : Audio-frequency and recording.

— Reports of Sub-section E.2 : Radio-frequency.

— Reports of Sub-section E.3 : Tropical broadcasting.

— Reports of Sub-section E.4 : Television.

— Questions and Study Programmes allocated to Study Group X (Broadcasting) ; Opinions and Resolutions of interest to this Study Group, List of documents of the Xth Plenary Assembly concerning Study Group X.

— Questions and Study Programmes allocated to Study Group XI (Television) ; Opinions and Resolutions of interest to this Study Group ; List of documents of the Xth Plenary Assembly concerning Study Group XI.

— Questions and Study Programmes allocated to Study Group XII (Tropical broadcasting) ; Opinions and Resolutions of interest to this Study Group ; List of documents of the Xth Plenary Assembly concerning Study Group XII.

— Questions and Study Programmes allocated to the C.M.T.T. (C.C.I.R./C.C.I.T.T. Joint Commission for television transmissions) ; Opinions and Resolutions of interest to this Commission ; List of documents of the Xth Plenary Assembly concerning the C.M.T.T.

I. C. S. U.

The I.C.S.U. Abstracting Board

The I.C.S.U. Abstracting Board was established in 1952 for the purpose of improving communication between scientists throughout the world by assisting in the development of more effective abstracting services. Its goal was to insure that, within each of the major disciplines, clearly written abstracts covering essentially the world periodical literature for the discipline involved would be produced and distributed with maximum speed and economy.

In accomplishing its objectives, the Board recognized early that greater progress could be made by encouraging and assisting existing national abstracting journals than by setting up a competing international abstracting journal printed in several languages. The discipline of physics appeared to offer the most favorable climate for initial cooperative effort and the first journals expressing interest in cooperating were « Physics Abstracts », in the English language, « Bulletin Signalétique du C.N.R.S. », in the French, « Physikalische Berichte », in the German, and somewhat later the physics section of « Referativniy Zhurnal », representing the Russian language. The success of the I.C.S.U. A.B. in the discipline of physics attracted the interest of scientists in other disciplines. Its work was extended to chemistry in 1955 and in 1962 to biology. These new disciplines brought with them new problems, but ones for which the I.C.S.U. A.B. was uniquely able to offer assistance.

To insure that the interest of users of abstracts be well met, the Abstracting Board included as users three members appointed by I.C.S.U., as well as one representative from each of the international unions involved. The remaining members of the Board represented producers and were nominated by the managements of the cooperating abstracting journals. Actually the distinction between users and producers is not as sharp as these words imply, since the scientists appointed were often former or part-time

editors and the editors of abstracting journals were generally former working scientists. The abstracting Board was given independent legal entity in order that it be able to accept grants and respond quickly to needs.

An important function that annual meetings of the Board has fulfilled is that of bringing the editors of abstracting journals in different languages and different disciplines together to compare practices and to initiate cooperation. More specifically the meetings of the scientists and the editors have clarified the problems which must be solved in meeting the objectives mentioned above. To assist the journals and to help in solving these problems, a central secretariat has been set up in Paris. Among the principal tasks undertaken over the years to improve abstracts are the following :

1. — Related to improving clarity.

Standardized guides for the use of authors in the preparation of abstracts have been adopted and widely circulated. Editors and referees have been urged successfully to take increased responsibility in insuring greater clarity and precision in the author abstracts in their publications. Every possible influence has been brought to bear upon those publications not publishing author abstracts for them to do so in the interest of better world-wide documentation.

2. — Related to coverage.

I.C.S.U. A.B. is assisting materially in helping abstracting services to obtain out-of-the-way journals and non-periodical reports. To assist the secretariat in this work, scientists-correspondents are presently employed in the U. S. A., Great Britain, Germany, Scandinavian countries, South American countries and Japan. Yearly lists of new journals and non-periodic publications in each country are prepared and distributed to editors.

3. — Related to speed.

An exchange service has been set up by the secretariat whereby page proofs of primary publications are sent automatically by air mail to the various member journals. This procedure often saves several weeks in the receipt of primary scientific literature. During 1962 more than 70 000 pages were exchanged in this manner at no small cost for proofs and air mail postage.

4. — Related to economy.

The Board has been successful in setting up exchanges and obtaining journals at reduced rates for its member abstracting journals. Studies of costs and methods of financing have been made to suggest means whereby costs may be reduced. It is expected that through cooperation, undesirable duplication may be avoided and thus reduce costs.

5. — Related to improved documentation generally.

Studies are continually being made by the I.C.S.U. A.B. Secretariat for consideration and decision at annual meetings of the editors or the Executive Committee on such topics as standarization of abbreviations, transliteration of cyrillic characters, classification and indexing and, recently, on the use of computers in abstracting and other areas of scientific documentation. Joint studies with U.N.E.S.C.O., E.C.O.S.O.C., F.I.D., I.S.O. and I.F.L.A. have been carried out from time to time.

With the appointment of a full-time professional General Secretary, an extremely active program is now under way. A new dimension of the regular services has been added by the inclusion of biology. New statistical studies are planned to assist in obtaining an overall view of primary literature and of the gaps in coverage in various fields. New aids to indexing which are being tried in one country are being called to the attention of editors in other countries and extensions of them are contemplated on a worldwide basis. Through its various services, the I.C.S.U. A.B. has become a significant factor in the improvement of scientific documentation.

In view of the extensive nature of the I.C.S.U. A.B. services, the maintenance of a central secretariat and the holding of annual meetings, the expenses have been remarkedly low, amounting to about $ 20 000 per year. This has been made up principally by annual subventions from I.C.S.U., U.N.E.S.C.O. and the N.S.F. Additional sources of support are being sought on an active basis. The I.C.S.U. subvention has amounted to $ 5000 annually. Without this subvention, the work would be badly crippled and an urgent appeal is hereby made for the continuation of the annual $ 5000 subvention for at least the next three years.

FÉDÉRATION INTERNATIONALE D'ASTRONAUTIQUE

XVe Congrès International

Le XV[e] Congrès International d'Astronautique aura lieu à Varsovie, Pologne, du 7 au 13 septembre 1964.

INTERNATIONAL ASTRONAUTICAL FEDERATION

XVth International Congress

The XVth International Astronautical Congress will take place in Warsaw, Poland, from the 7 to the 13 September, 1964.

U. R. S. I. PUBLICATIONS

Radio Waves and Circuits. — Proceedings of Commission VI on Radio Waves and Circuits during the XIIIth General Assembly, London, September 1960, edited by S. Silver, has been issued.

It is a volume of 378 pages and 101 illustrations containing the following parts :

I. Boundary value and scattering problems (4 papers).
II. Surface waves (4 papers).
III. Coding problems (3 papers).
IV. Information theory of randomly varying channels (5 papers).
V. Propagation of electromagnetic waves in statistically inhomogeneous media (4 papers).
VI. Aerials and data processing (2 papers).
VII. Solid state circuits (4 papers).

Copies may be ordered at the U.R.S.I. General Secretariat or at Elsevier Publishing Company, 110-112 Spuistraat, Amsterdam, Netherlands.

PUBLICATIONS DE L'U.R.S.I.
U. R. S. I. PUBLICATIONS

Catalogue

Des exemplaires des publications de l'U.R.S.I. figurant dans la liste ci-dessous sont en vente au Secrétariat Général. Les prix indiqués comprennent les frais d'envoi.

Copies of U.R.S.I. publications mentioned in the following list are on sale at the General Secretariat. Prices include postage.

Publications	F. belges	£	U.S. $
Bulletin d'Information — Information Bulletin :			
Abonnement annuel — Yearly subscription	300	2.4.0	6.00
Un numéro — One number	50	0.7.6	1.00
Comptes Rendus des Assemblées Générales — General Assembly Proceedings :			
IV. — Copenhagen 1931, vol. III.....	75	0.10.6	1.50
V. — London 1934, vol. IV	75	0.10.6	1.50
VI. — Venise 1938, vol. V.....	125	0.18.0	2.50
VII. — Paris 1946, vol. VI	125	0.18.0	2.50
VIII. — Stockholm 1948, vol. VII	225	1.12.0	4.50
IX. — Zurich 1950, vol. VIII :			
Part 1 (Gener.-Administration) .	250	1.16.0	5.00
Part 2 (Scientif.)	300	2.2.6	6.00
Les deux parties — The two parts	500	3.12.0	10.00
X. — Sydney 1952, vol. IX :			
Administration	70	0.10.0	1.40
Commission I	50	0.7.6	1.00
Commission II	60	0.8.9	1.20
Commission III	75	0.10.6	1.50
Commission IV	40	0.5.6	0.80
Commission V	75	0.10.6	1.50
Commission VI	60	0.8.9	1.20
Commission VII	50	0.7.6	1.00
La série des 8 fascicules — The series of 8 parts	400	2.17.6	8.00
XI. — The Hague 1954, vol. X [1] :			
Commission I	50	0.7.6	1.00
Commission II	80	0.14.4	1.60
Commission III	175	1.5.6	3.50
Commission IV	50	0.7.6	1.00
Commission V	100	0.15.0	2.00
Commission VI	125	0.18.0	2.50
Commission VII	125	0.18.0	2.50
Administration	75	0.10.6	1.50
La série des 8 fascicules — The series of 8 parts	700	5.0.0	14.00
XII. — Boulder, Co. 1957, vol. XI			
Commission I	80	0.14.4	1.60
Commission II	150	1.2.6	3.00
Commission III	200	1.10.0	4.00
Commission IV	125	0.18.0	2.50

[1] English version out of print.

Publications	F. belges	£	U.S. $
Commission V	175	1.5.6	3.50
Commission VI	250	1.17.6	5.00
Commission VII			
Administration et Divers — Administration and Miscellaneous ..	175	1.5.6	3.50
La série des 8 fascicules — The series of 8 parts	1050	7.10.0	21.00
XIII. — London 1960, vol. XII :			
Commission I	150	1.2.6	3.00
Commission II	225	1.13.0	4.50
Commission III	350	2.12.0	7.00
Commission IV	150	1.2.6	3.00
Commission V	350	2.12.0	7.00
Commission VI	700	5.0.0	14.00
Commission VI*bis*	200	1.10.0	4.00
Commission VII	300	2.5.0	6.00
Administration et Comités — Administration and Committees	150	1.2.6	3.00
La série des 8 fascicules — The series of 8 parts	2300	16.10.0	46.00
Manuel des Stations Ionosphériques — Ionospheric Station Manual (Bilingue-Bilingual)	700	5.0.0	14.00
Manuel des Codes des Ursigrammes — Manual of Ursigrammes Codes	400	2.17.0	8.00
Goldschmidt Memorial Lecture-1960	40	0.5.9	0.80
Conférence à la Mémoire de R. Goldschmidt-1960	40	0.5.9	0.80
Golden Jubilee Memorial	200	1.10.0	4.00

Publications en vente chez Elsevier Publishing Company Amsterdam et New York

Publications on sale at Elsevier Publishing Company, Amsterdam and New York

Some Ionospheric Results Obtained during the International Geophysical Year — Proceedings of a symposium organised by the U.R.S.I.-A.G.I. Committee, Brussels, September 1959, edited by W. J. G. Beynon.

U.R.S.I. Handbook of Ionogram Interpretation and Reduction of the World Wide Soundings Committee, edited by W. R. Piggott and K. Rawer.

Monographie sur les mesures et étalons radio-électriques, rédigée par B. Decaux.

Radio Observation of the Aurora, U.R.S.I. Special Report N° 6.

The Measurement of characteristics of Terrestrial Radio Noise — U.R.S.I. special Report N° 7.

Monograph on Radio Noise of Terrestrial Origin (XIIIth General Assembly, London 1960) edited by F. Horner.

Ionospheric Radio (XIIIth General Assembly, London 1960) edited by W. J. G. Beynon.

Radio Wave Propagation in the Troposphere (XIIIth General Assembly, London 1960) edited by J. A. Saxton.

Space Radio Communication — Proceedings of a symposium held under the auspices of U.R.S.I., Paris, September 1961.

Radio Waves and Circuits (XIIIth General Assembly, London 1960) edited by S. Silver.

BIBLIOGRAPHIE

Commission Electrotechnique Internationale (C.E.I.)

132-2. — Commutateurs rotatifs (à faible intensité nominale). Deuxième partie : Commutateurs rotatifs à fixation centrale.

132-3. — Troisième partie — Commutateurs rotatifs à deux trous de fixation.

165. — Règles pour les essais de véhicules moteurs de traction électrique après achèvement et avant mise en service.

160. — Conditions atmosphériques normales pour les essais et les mesures.

143. — Condensateurs série destinés à être installés sur des réseaux.

79-3. — Matériel électrique pour atmosphères explosives. Troisième partie : Essais du matériel à sécurité intrinsèque.

56-7. — Règles pour les disjoncteurs à courant alternatif. Guide pour l'essai des disjoncteurs en ce qui concerne la mise en et hors circuit des batteries de condensateurs en dérivation.

147-1A. — Complément à la Publication 147-1. — Valeurs limites et caractéristiques essentielles des dispositifs à semi-conducteurs et principes généraux des méthodes de mesure. Première partie : Valeurs limites et caractéristiques essentielles.

163-1. — Interrupteurs sensibles. Première partie : Terminologie.

Union Internationale des Télécommunications

L'U.I.T. vient de publier *la Nomenclature des stations fixes qui assurent des liaisons internationales*, 2e *édition* 1963.

Ce document contient les états signalétiques des stations fixes qui assurent des liaisons internationales et dont les assignations de fréquence figurent dans la Liste internationale des fréquences. Ces états signalétiques sont publiés dans la forme prévue à l'appendice 9 au Règlement des radiocommunications de Genève (1959).

Cette Nomenclature a fait l'objet d'une édition trilingue (française, anglaise et espagnole). Le prix de vente, pour un volume d'environ 480 pages, a été fixé à 21,50 *francs suisses* ; ce prix comprend les frais de port pour envoi par la poste ordinaire dans le monde entier, l'emballage et l'abonnement aux suppléments récapitulatifs trimestriels qui paraîtront jusqu'à la prochaine édition.

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L'U.I.T. a également publié la 2e édition de la *Nomenclature des stations de radiorepérage et des stations effectuant des services spéciaux.*

Cette Nomenclature est un document de service de l'Union internationale des télécommunications, publié conformément aux dispositions de l'Article 20 du Règlement des radiocommunications (Genève, 1959). Cette publication groupe, comme la première édition, les renseignements contenus auparavant dans la Nomenclature des stations de radiorepérage (à l'exception des renseignements relatifs aux stations de radionavigation aéronautique, aux stations de détection électromagnétique et aux stations Loran) et ceux contenus dans la Nomenclature des stations effectuant des services spéciaux.

Elle comprend les 11 sections suivantes, dans lesquelles les stations sont rangées par pays :

1. Stations radiogoniométriques du service de navigation maritime.
2. Stations de radiophare du service de navigation maritime, y compris les radiophares du service de radionavigation aéronautique susceptibles d'être utiles pour la navigation maritime.
3. Navires — stations océaniques.
4. Stations émettant des signaux pour l'étalonnage des goniomètres.
5. Stations émettant des signaux horaires.
6. Stations émettant des fréquences étalon.
7. Stations émettant des bulletins météorologiques réguliers.
8. Stations émettant des avis aux navigateurs.
9. Stations émettant des avis médicaux.
10. Stations émettant des bulletins épidémiologiques.
11. Stations émettant des ursigrammes.

La 2e édition de la Nomenclature des stations de radiorepérage et des stations effectuant des services spéciaux est publiée en éditions séparées française et anglaise. Le prix de vente d'un exemplaire de cette publication d'environ 620 pages a été fixé à 15 *francs suisses* pour l'édition française et 10 *francs suisses* pour l'édition anglaise ; ce prix comprend l'emballage, les frais de port par poste ordinaire et l'abonnement aux suppléments semestriels qui paraîtront jusqu'à la prochaine édition.

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132-2. — Rotary wafer switches (low current rating). Part 2 — Rotary wafer switches with central mounting.

132-3. — Part 3 — Rotary wafer switches with two-hole mounting.

165. — Rules for the testing of electric rolling stock on completion of construction and before entry into service.

160. — Standard atmospheric conditions for test purposes.

143. — Series condensators for power systems.

79-3. — Electrical apparatus for explosive gas atmospheres. Part 3 : Testing of intrinsically safe apparatus.

56-7. — Specification for alternating current circuit-breakers — Guide to the testing of circuit-breakers with respect to the switching of shunt capacitor banks.

147-1A. — Supplement to Publication 147-1 — Essential ratings and characteristics of semiconductor devices and general principles of measuring methods. Part 1 : Essential ratings and characteristics.

163-1. — Sensitive switches. Part 1 : Terminology.

International Telecommunication Union

The I.T.U. has just published the *List of Fixed Stations Operating International Circuits, 2nd edition* 1963.

This list contains particulars of the fixed stations operating international circuits, whose frequency assignments appear in the International Frequency List. The particulars are published in the form prescribed in Appendix 9 to the Radio Regulations (Geneva, 1959).

This document is published in a three-language edition (French, English and Spanish). The price for a volume of about 480 pages is 21.50 *Swiss francs,* which includes packing and postage by ordinary mail to anywhere in the world and a subscription to the quarterly recapitulatory supplements which will be appearing until publication of the next edition.

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The I.T.U. has also published the 2nd edition of the *List of Radiodetermination and Special Service Stations.*

This List is a service document of the International Telecommunication Union and is published in accordance with Article 20 of the Radio Regulations (Geneva, 1959). Like the first edition, it gives the information formerly contained in the List of Radiolocation Stations (except for the particulars relating to aeronautical radionavigation stations, radar stations and Loran stations) and in the List of Special Service Stations.

The document consists of 11 sections, in which the stations are listed by country, namely :

1. Direction-finding stations in the maritime navigation service.
2. Radiobeacon stations in the maritime navigation service, including radiobeacons in the aeronautical radionavigation service which may be used for maritime navigation.
3. Ocean-station vessels.

4. Direction-finder calibration stations.
5. Stations transmitting time signals.
6. Stations transmitting standard frequencies.
7. Stations transmitting regular meteorological bulletins.
8. Stations transmitting notice to navigators.
9. Stations transmitting medical advice.
10. Stations transmitting epidemiological bulletins.
11. Stations transmitting ursigrams.

The 2nd edition of the List of Radiodetermination and Special Service Stations is available in separate English and French versions. The price of one copy, comprising about 620 pages, is 10 *Swiss francs* for the English edition and 15 *Swiss francs* for the French ; this price includes carriage by ordinary mail and subscription to half-yearly supplements issued prior to the next edition.