

Table des matières - Contents

	pages
XXI General Assembly of URSI:Scientific Programme.....	1
News from Member Committees:	
Israel: Activities 1982-1983.....	7
Finland: XI Finnish National Convention on Radio Science.....	8
5th Symposium and Technical Exhibition on Electromagne- tic Compatibility 1983.....	8
Techniques in Studies of Biological Effects of Low Level Millimeter Waves.....	10
Symposium on Measurement and Processing for Indirect Imaging.....	11
Symposium on Information Theory 1983.....	12
International Reference Ionosphere (IRI).....	13
Announcements of Meetings and Symposia:	
XXXIX Scientific Session of Popov Society.....	17
URSI Symposium on the Frontiers of Remote Sensing of the Oceans and Troposphere from Air and Space Platforms.....	18
Annual Meeting of the European Geophysical Society URSI Symposium on Millimeter and Submillimeter Astronomy.....	19
14th European Microwave Conference.....	20
1984 International Symposium on EMC.....	20
EMC Symposium and Technical Exhibition 1985.....	21
Microwaves and Thermoregulation.....	22
International Geophysical Calendar 1984.....	23
List of Future Symposia and Meetings.....	26
Names and Addresses of URSI Officers:	
Honorary Officers.....	33
Board of Officers.....	33
Standing Committees.....	33
Commissions and Working Groups.....	34
Inter-Commission Working Groups.....	46
URSI Representatives on other Organizations.....	47
Member Committees.....	48
Alphabetical Index and Addresses.....	51

XXI GENERAL ASSEMBLY OF URSI SCIENTIFIC PROGRAMME

The Scientific Programme of the XXI General Assembly of URSI will run from Wednesday 29 August to Wednesday 5 September 1984. It will consist of the following main parts.

1. SCIENTIFIC SESSIONS OF THE COMMISSIONS

The speakers in the sessions will be those who have been invited, through the organizers of the sessions, by the Commission Chairmen to make contributions. The titles of the sessions, and the names of the organizers are given below:

Commission A - Electromagnetic Metrology

A1	Time transfer metrology	C.C. Costain, J. McA. Steele
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Commission B - Fields and Waves

B1	Inverse scattering	J.C. Bolomey
B2	Reflector antenna pattern synthesis	P.J.B. Clarricoats
B3	Radiation and scattering - analytical techniques	P.M. van den Berg
B4	Transients and identification	D.G. Dudley
B5	Microwave guides for planar and integrated circuits	K. Schuneman
B6	Recent advances in solution methods in e.m. theory	D.C. Chang
B7	Radiation and scattering - numerical techniques	R.F. Harrington

Commission C - Signals and Systems

C1	Coding theory	J.P.M. Schalkwijk
C2	Networks	M. Reiser
C3	Multi-access communications	J.L. Massey
C4	Information theory	E. van der Meulen
C5	Bandwidth efficient modulation	C.E. Sundberg
C6	Digital filters	G. Moschytz
C7	Communications reliability	J.K. Skwirzynski
C8	Stochastic processes	B. Picinbono

Commission D - Electronic and Optical Devices and Applications

D1	Monomode fibres and related devices	T. Okoshi
D2	Optical bistability	S.D. Smith
D3	Microelectronics 1	J. Henaff
D4	Microelectronics 2 (GaAs technology)	J. Henaff
D5	Mm wave sources, detectors and receivers	K.J. Button
D6	Optical techniques, applications for communication and radio science	W.A. Gambling
D7	Mm wave guiding structures, antennas and integrated circuits	A.A. Oliner

Commission E - Electromagnetic Noise and Interference

E1	Satellites and planetary noise environment	E. Smith
E2	Scientific principles of noise and interference control	C. Baum
E3	Natural noise environment (a) measurements (b) phenomena	P. Krider G. Dubro
E4	Man-made noise statistics	F.L. Stumpers
E5	Modelling of noise environment	G. Hagn
E6	Communication through noise	A.A. Giordano
E7	Lasting effects of transients	V. Scuka

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

F1 to F4	Highlights and new contributions based on discussions at Commission F Inter-Assembly Symposia 1982-1984	
F1	Multiparameter radar measurements of precipitation, UK, 1982	M.P.M. Hall
F2	Wave propagation and remote sensing, Belgium, 1983	A. Guissard
F3	Microwave signatures in remote sensing, France 1984	R.K. Moore, E. Schanda
F4	Frontiers of remote sensing of the oceans and troposphere, Israel, 1984	J. Goldhirsch

F5 Clear air effects on wideband
transmission systems J.P. Mon

Commission G - Ionospheric Radio and Propagation

G1 Modelling of the ionosphere:
application to radio systems C. Rush, K. Rawer,
A. Danilov

Commission H - Waves in Plasmas

H1 ULF and VLF waves J.W. Hughes, A. Roux

Commission J - Radio Astronomy

J1 Radio astronomy at metre and
decametre wavelengths W.C. Erickson,
A. Boischot
J2 Radio science studies of comets W. Irvine
J3 Problems affecting radioastrono-
mical measurements at low
frequencies T. Hagfors, J.R. Fisher
J4 Recent advances at various
observatories V. Radhakrishnan,
R.J. Wielebinski
J(T) Tutorial session on 'Quasi-
optical techniques at mm and
sub-mm wavelengths' P.F. Goldsmith

Joint Scientific Sessions of Commissions

JS1 Time-domain wave-form measure-
ments N.S. Nahman, S.J. Halme
JS2 Optical fibre measurements A.E. Karbowskiak
JS3 Cryogenic low noise detection P.L. Richards
JS4 Microwave and mm wave metrology
in guided systems H. Bayer
JS5 Standards for free field and
antenna gain R.C. Baird
JS6 Submillimetre and laser
metrology T. Nemoto
JS7 Satellite communications - signal
transmission impairment - their
modelling and amelioration G. Hyde, A. Viterbi
JS8 Plasma instabilities in magneto-
spheres F.C. Michel, H. Oya
JS9 Ionospheric plasma phenomena
(a) Plasma instabilities in the
ionosphere, (b.) Equatorial
irregularities, (c) Basic

- phenomena of ionosphere-
magnetosphere coupling at
high latitudes M. Baron, D.T. Farley
- JS10 Active and passive radio tech-
niques as diagnostic tool in the
magnetosphere and ionosphere -
latest developments R. Leitinger
- JS11 Computer modelling of plasma M. Abdalla, H. Matsumoto,
and radio phenomena T. Sato
- JS12 Ionospheric fluctuations
affecting radio astronomy
- JS13 Propagation in random media A. Ishimaru, F. Eklund
- JS14 Scattering and radiation by Butler, P. Degauque,
objects near media inter-faces J. Wait

Tutorial Lectures

Commission A

- Frequency standards M.C. Audouin
Automatic network analyzers and
six-port systems C.A. Hoer

Commission J

- Quasi-optical techniques at mm
and sub-mm wavelengths P.F. Goldsmith

2. OPEN SYMPOSIA

These Symposia are organized on the basis of a Call for Papers. Their titles and organizers are given below.

OS.1 Biological Effects and Electromagnetic Waves
Wednesday 29 and Thursday 30 August

The Conveners are:

- | | |
|------------------------------|-------------------------------|
| Prof. M. Grandolfo | Prof. S. Rosenthal |
| Laboratorio delle Radiazioni | Microwave Research Institute |
| Istituto Superiore di Sanita | Polytechnic Institute of |
| Viale Regina Elena 299 | New York, Route 110 |
| I-00161 Roma, Italy. | Farmingdale, N.Y. 11735, USA. |

This Symposium is held in conjunction with the Bio-electromagnetics Society (BEMS) meeting, which is organized in Florence on 27 and 28 August 1984.

OS.2 Active Experiments in Space Plasmas

Thursday 30 and Friday 31 August

Topics include:

- Ionospheric modification by powerful HF waves
- VLF wave injection from the ground
- Wave injection from space vehicles
- Beam injection
- Neutral gas and plasma releases
- Rocket exhaust effects
- Unintentional man-made modification effects.

Authors interested in presenting papers at the Symposium should submit abstracts in the standard form to one or more of the conveners as listed below. Papers may be presented in either oral or poster form.

Prof. R.L. Dowden
Department of Physics
University of Otago
Dunedin, New Zealand.

Dr. P. Stubbe
Max-Planck-Institut für
Aeronomie
D-3411 Katlenburg-Lindau 3, FRG.

Dr. J. Fejer
Arecibo Observatory
Cornell University
P.O.Box 995, Arecibo
Puerto Rico 00612, USA.

OS.3 Radio Techniques in Planetary Exploration

Monday 3 September

The objective of the Symposium will be to review current and future developments in radio techniques for ground-based and spacecraft planetary exploration. The programme will consist of invited and contributed papers, together with poster presentations. Authors wishing to contribute are invited to write to one of the following:

Prof. K. Runcorn
Chairman, CCMP
School of Physics
The University
Newcastle upon Tyne NE1 7RU
United Kingdom.

Sir Granville Beynon
URSI
Department of Physics
University College of Wales
Aberystwyth SY23 3BZ
United Kingdom.

OS.4 Data, Signal and Image Processing

Tuesday 4 and Wednesday 5 September

Topics include:

1. Measurements with Sensor Array(s)
 - (i) Modelling of wave propagation in 3 dimensions

- (ii) Determination of energy flux, polarisation, principal components, etc.
- (iii) 2-dimensional and 3-dimensional imaging
- (iv) Tomography-type measurements and other indirect imaging methods.

2. Methods of Analysis of Multi-sensor Data

- (i) Space-time resolution
- (ii) Non-stationary signal analysis
- (iii) N-dimensional analysis
- (iv) Maximum entropy and other inversion techniques
- (v) Signal and pattern recognition.

The deadline for the receipt of abstracts is 31 January 1984. These should be sent to one of the three conveners listed below.

Prof. J.-L. Lacoume
CEPHAG ENSIEG
Domaine Universitaire
BP 46, 38402
St-Martin-d'Hères, Grenoble
France.

Dr. Dyfrig Jones
Space Plasma Physics Section
British Antarctic Survey
Madingley Road
Cambridge CB3 0ET
United Kingdom.

Dr. K. Tsuruda
The Institute of Space and Astronautical
Science
6-1, Komaba 4-chome, Meguro-ku
Tokyo 153, Japan.

3. GENERAL LECTURES

The titles and the names of the speakers will be published later.

More detailed information, such as registration fees, etc. will appear in the Second Announcement of the General Assembly available through the URSI Member Committees, or by writing to

Prof. V. Cappellini
I.R.O.E.
National Research Council
Via Panciatichi 64
I - 50127 Florence, Italy.

NEWS FROM MEMBER COMMITTEES

ISRAEL: ACTIVITIES 1982-1983

The Israeli URSI Committee has intensified its activities substantially since 1981, to keep abreast with the academic and industrial developments in the country. Involvement of the community in URSI activity was achieved by a series of seminars and symposia, a list of which follows.

Commission F: Seminar on Remote Sensing, Tel Aviv University, 12 January 1982.

Commissions B and G: Seminar on Special Topics in Electromagnetic Theory, Technion, Haifa, 5 July 1982.

Commission E: Seminar on Noise and Interference, Tel Aviv, 7 September 1982.

Commission A: Seminar on the Interaction of EM Radiation with Live Tissues, Sheba Medical Center, Tel Hashomer, 21 March 1983.

Commission A: Seminar on EM Metrology, Technion, Haifa, 13 February 1983.

Commission C: Seminar on Computer Communication, Tel Aviv University, 19 May 1983.

Commission B: Workshop on Wave Propagation and Radiating Systems, Ben Gurion University, Beer Sheva, 27 June 1983.

Future Activities:

Commission C: Workshop on Knowledge Based Signal Processing and Expert Systems, 1-3 April 1984.

Commission F: International Symposium and Workshop on Frontiers of Remote Sensing of the Oceans and Troposphere from Air and Space Platforms, 14-23 May 1984.

Commission C: Workshop on Information Theory, July 1984.

FINLAND: XI FINNISH NATIONAL CONVENTION ON RADIO SCIENCE

This Convention represents a traditional review of work done in Finland in the broad range of Radio Science. The number of papers has been increasing over the years and some change in the conventional two-day meeting is soon bound to take place. A trend to extend the Convention towards an international or internordic direction also exists and the main reason for not inviting foreign speakers to this Convention was the lack of time for preparation. Since more than one half of the papers in the Proceedings of the Convention (held from 19-20 October 1983) are written in English, it is hoped, however, that some knowledge of the research on Radio Science in Finland will reach an audience well beyond the boundaries of the country.

Otaniemi, 31 August 1983

Ismo V. Lindell
Chairman, Organizing Committee

During the Convention, papers were presented in the following areas:

- Remote Sensing and Radio Measurements
- Radio Astronomy
- Measurement Techniques
- Circuit Design
- Ionosphere
- Electromagnetic Waves
- Optoelectronics
- Semiconductor Techniques
- Microwave Techniques
- Medical Electronics
- Telecommunications

5TH SYMPOSIUM AND TECHNICAL EXHIBITION ON
ELECTROMAGNETIC COMPATIBILITY

Zurich, 8-10 March 1983

Increasing interest in EMC technology is confirmed by steadily growing participation in West European EMC Symposia (1975 and 1977 Montreux, 1979 Rotterdam, 1981 and 1983 Zurich). The 1983 Symposium in Zurich was attended by 650 participants.

The Symposium was held under the auspices of Mr. R. Trachsel, Director-General of the Swiss PTT. It was sponsored by

the Swiss Electrotechnical Association (SEV/ASE), and co-sponsored by URSI. The President of the Symposium was Dr. P. Leuthold (Zurich), the Organizing Chairman Dr. T. Dvorak (Zurich) and the Technical Programme Chairman Prof. R.M. Showers (USA).

The technical programme featured 18 sessions, 5 workshops, 3 technical excursions and a technical exhibition.

96 papers from 18 countries were given in 18 sessions entitled: "Environment", "Interference models", "Propagation and wave coupling", "Nuclear EMP", "Biological effects of exposure to RF radiation", "Power electronics", "NEMP simulation", "Immunity", "Suppression techniques", "Non-homogeneous fields", "Shielding and grounding", "EMC standards", "Transmission line coupling", "Measurements", "EMC computer programmes", "EMI in microelectronics", "EMC analysis and design", "Spectrum management".

The following outstanding papers received certificates of honour and monetary awards totalling 5,000 Swiss francs:

- J.J. Goedbloed, K. Riemens, A.J. Stienstra: "Increasing the RF immunity of amplifiers with negative feedback";
- T.G. Dalby: "Linear antenna near-field decoupling using a radial transmission line";
- B. Demoulin, P. Duvinage, P. Cornic, P. Degauque: "Penetration through an interruption of the shield of a coaxial cable";
- K. Bullough, A. Cotterill: "Ariel 4 observations of the power line harmonic radiation over North America and its effects on the magnetosphere";
- L.E. Varakin: "Electromagnetic compatibility of cellular mobile communication systems with pseudo-noise signals";
- J.J. Max, A.V. Shah: "Distributed lowpass filters for EMI filtering".

The workshops, organized by H.K. Mertel (USA) had a tutorial character and were devoted to: "Lasting effects of transients" (Special workshop offered by the URSI Commission E), "Systems EMC", "Design and test for RFI regulations of USA and CISPR", "EMP simulation", "Predicting radiation emissions from computing devices and controls".

29 exhibitors used the opportunity to introduce their products and to discuss technological, measurement and educational problems with their customers.

The conference proceedings: "Electromagnetic Compatibility 1983" (103 papers, 565 pages) are available at a net price of SF 100, including mailing costs, from:

Dr. T. Dvorak
ETH Zentrum-IKT
CH-8092 Zurich
Switzerland.

TECHNIQUES IN STUDIES OF BIOLOGICAL EFFECTS OF LOW LEVEL MILLIMETER WAVES

Under the sponsorship of URSI, an International Symposium on Techniques in Studies of Biological Effects of Low Level Millimeter Waves was held in Herrsching (FRG), from 4 to 6 September 1983. Thirty-nine invited scientists participated, from eight countries.

The aim of the meeting could be perfectly met, i.e. to provide a platform to discuss in detail the pertaining experimental procedures. Lively discussions throughout the sessions and the laboratory visit helped to bring together the biological and the radio physicists' viewpoints. This will certainly deepen future cooperation. Probably more laboratories will take up to work on resonant millimeter wave effects on yeast, since this system seemed to provide the most extensively documented effect. Reproducing this effect in other laboratories will then set the stage for two important research goals: what is the basic mechanism and how generally does a nonthermal microwave sensitivity occur in biology.

A special success seems worth noting: for the first time it was possible to have a delegate member of N.D. Devyatkov's group (at the Academy of Sciences USSR, Moscow) participating at a pertaining meeting in a western country. This group has pioneered pertaining experimental work 10 years ago. We attribute this success to the international nature of URSI.

8 September 1983

F. Keilmann

SYMPOSIUM ON MEASUREMENT AND PROCESSING FOR INDIRECT IMAGING

The Symposium, sponsored by URSI and co-sponsored by the IAU, was held in Sydney, Australia from 30 August to 2 September 1983. The Symposium was attended by 115 delegates from 11 countries.

Forty-four papers were presented in sessions dealing with:

- radio mapping
- CLEAN
- maximum entropy
- optical mapping
- processing
- medical mapping
- specialized hardware.

The Symposium was followed by a day of workshops on maximum entropy, software tools, correlators and array configurations. These sessions proved extremely valuable by allowing for a much greater degree of interaction than is possible in the formal presentations of papers.

In his summing up of the Symposium, John Baldwin (UK) reflected on developments in the five-year period between the Imaging Symposium held in Groningen in 1978 and the present meeting. He noted that during that five-year period most of the problems in making good images seemed less pressing today because of the effective solutions provided by the new and very powerful but very simple techniques. Also impressive is the enormous range of new instrumentation which is either just finished or is being built or is at the stage of definite plans. These developments have outweighed the new advances in image analysis itself.

In closing on a philosophical note and confining his remarks to astronomical imaging, John posed the question: "Are our instruments already too good?". It would seem that the major mis-match is now between the very high quality of our instruments and the very poor astronomical intuition scientists possess for interpreting the very beautiful pictures that are made. "We have engineered things on the ground extremely well, but we now have to look at the interface to ourselves to see how to get the best out of the instruments that we have made. If we ask that question sharply enough, quite new types of instruments may assume importance".

The Proceedings of the Symposium, edited by Dr. J.A. Roberts of the CSIRO Division of Radiophysics, will be published by Cambridge University Press for release late in 1983. Enquiries for further copies should be sent to Dr. Simon Mitton, Science Editorial Director, Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, United Kingdom.

September 1983

R.H. Frater

SYMPOSIUM ON INFORMATION THEORY 1983

The 1983 IEEE International Symposium on Information Theory was held in the Laurentian mountain range at Gray Rocks Inn, Ste. Jovite, Quebec, 25-30 September. Approximately 360 people registered. There were 271 papers in 35 sessions, with authors coming from 27 countries. The technical programme was highlighted by the Shannon Lecture, entitled "Multiple-Access Channels and Protocols", given by Prof. R.G. Gallager of MIT. The five plenary lectures were: "Trees" by George Nagy, "Algebraic Models of Discrete Communications" by Robin Milner, "Digital Data Communication over Microwave Radio Channels" by Jack Salz, "Isometric Embeddings of Graphs" by Ronald Graham and "About Lattice Codes and their Reliability above and below Critical Rate" by Rudi de Buda. Invited sessions were organized on Computational Geometry, Bandwidth Efficient Coding, Cryptography and Spectrum Estimation. Two recent results sessions were also organized for the Wednesday evening.

The social programme included trips to Ottawa and Montreal as well as local excursions to view the foliage and visit artisan workshops. Entertainment included an opening cocktail party, a Soirée Québécoise on the Monday night with a traditional meal followed by a local choral group, and a chamber music concert on the Tuesday night by Le Trio Renoir, a young Montreal trio, with flutist Mario Deschenes.

The pleasant weather and environment and the high quality of the technical presentations made for an enjoyable Symposium.

November 1983

Ian F. Blake

INTERNATIONAL REFERENCE IONOSPHERE

The URSI/COSPAR Workshop on the International Reference Ionosphere was held at Stara Zagora, Bulgaria, from 30 August to 3 September 1983.

The main aim of the meeting was to specify guidelines for future work on IRI and to care for the work to be done during the next few years. To this end the following reporters have been designated:

1. Electron density profile
 - 1.1 Lower ionosphere: Y.V. Ramanamurthy (India)
 - 1.2 Middle ionosphere: T.L. Gulyaeva (USSR)
 - 1.3 Topside: D. Bilitza (FRG)
2. Temperature profiles: D. Bilitza (to cooperate with R.L. Brace during a stay in 1984 at Goddard in the USA).
3. Ion composition profiles: I. Kutiev (Bulgaria).

The reporters, aided by interested colleagues in the different countries, will make a serious effort to provide a 'refurbished' IRI in agreement with the Conclusions accepted at the meeting. These Conclusions are reproduced below.

1. Electron density profile

The full profile is to be represented by one analytical function using Booker's (1977) proposal of a "skeleton function" for the logarithmic derivative, however independently in (at least) three altitude ranges (see below); the final density profile will be built up with "filter functions" by Rawer's (1982) method. The most important physical condition can easily be enforced when using Rawer's (1983) function LAY for describing the logarithmic profile; the major peak is thus automatically produced by suitable choice of the linear term. Some more conditions may easily be fulfilled by resolving a linear system of equations determining the amplitudes of the individual "Epstein transitions". As for the characteristic scales and heights of these latter, empirical relations with the relevant geophysical parameters have yet to be established.

1.1 The topside, described in IRI 1979 by a two-member skeleton function derived from Bent's (1970) model needs extension to altitudes above 1000 km by at least one more

member. Recent topside sounder satellites (ISS-b, InterKosmos 19) together with other techniques (beacons) may provide a better data base. The linear dependence of the parameters on solar activity needs reshaping and an allowance for saturation for very high activity.

1.2 The middle ionosphere (between the E- and F2-peaks), actually described with a complicated sub-layer system, needs at least four members in the skeleton description. Thus, apart from two conditions enforcing the E-peak, two more may be applied for enforcing particularities of the profile, e.g. a valley or turning points (Gulyaeva, 1982). It was felt that such features, determining shape and thickness, might be more important than an accurate identification of the F1-feature (the F-region thickness is not always satisfactorily reproduced by the present IRI).

1.3 The lower ionosphere needs at least three members in the description in order to identify the D-turning-point (DTP) around 80 km. Since the slope at that altitude is of major importance, all three amplitudes might be determined from the behaviour at this point, the E-peak being enforced by the LAY function. More members would be needed to produce a C-layer, but experimental evidence might as yet be too scarce for a numerical description. Apart from well-established in situ rocket observations, conclusions obtained by comparison with multifrequency reflection and absorption measurements should also be taken into account. In particular, the fixed night-time value of NmD in the present IRI is not in agreement with the latter data (Singer and Taubenheim, 1983); a solar zenith angle dependence should not a priori be excluded at night. Reconsideration in the light of these data is also recommended for the seasonal variation. Together with observations made at low latitude (e.g. India) it might be feasible to establish an average latitudinal variation of the DTP-slope. The actually used solar cycle variation being far from satisfactory, it is proposed to make the solar-cycle factor strongly dependent on altitude. Aeronomical considerations about the main ionization sources (Taubenheim, 1983) seem to justify the large factor of 2.3 at 95 km claimed by Mechtly and Bowhill, but a lower one of 1.6 at 80 km (Singer and Taubenheim, 1983) and one even less than unity (i.e. a decrease with increasing activity) below about 65 km (Serafimov, 1983).

2. Temperature profiles

In order to be consistent with CIRA (the COSPAR neutral atmosphere model), the present IRI at 120 km fits electron and ion temperatures, T_e , T_i , with that of the neutrals, T_n , and does not allow T_i to fall below T_n . It is expected to get an outline of the new CIRA plans soon in order to refurbish the descriptive formula actually applied for T_n . The actually used skeleton function description of the height derivatives of T_i and T_e will in principle be preserved but with considerable improvements. The large data base due to recent satellites should allow a more detailed description of the latitudinal effect in T_e (in particular at heights above 400 km and for magnetic dip inferior to 35°). Also, the diurnal variation and the solar activity effect could be much better described now (Brace, 1983). Though an (inverse) dependence of T_e upon the electron density, N_e , is well established in the daytime F-region (bottom and top), it is not recommended to introduce such dependence for average data. These should be described along the lines presently used. However, in order to take care of individual conditions (e.g. with measured F2-peak data) a correction function will be established which gives the change of T_e as a function of the deviation of N_e from its average value.

3. Ion composition

The data base of the present IRI being rather sparse, it is recommended to reconsider all the presently used profile descriptions. Satellite data should be taken as a primary source at altitudes above 150 km, and reliable rocket data below. Where inconsistency is found with incoherent scatter results (secondary source), consistency with probe data at high altitudes might be a good agreement. Relative (percentage) densities of the main ion species are needed for IRI, since absolute values without indication of the total density are not usable. A determination of transition heights would, however, be extremely helpful.

3.1 In the topside ionosphere, the light ion profiles are to be modelled with suitable skeleton functions. Since the disturbance influence appears to be large, the standard description should be made valid for K_p around 2 (Philbrick, 1982). The diurnal variation (depending on solar zenith angle or not?) and that with latitude need reconsideration, especially during the night and at low latitudes. Whether certain plasma characteristics, in particular T_e , should additionally be introduced as influencing variables should also be studied.

3.2 In the middle ionosphere, satellite data should be given more weight wherever they are available. The transition to the height range covered by rockets should be made continuous. Conclusions deduced from incoherent scatter measurements should be considered with due caution when in situ measurements are at hand. A new latitudinal variation function for the lower altitudes and latitudes might be established using data obtained in India and South America. Height profiles which differ from the present IRI skeleton function will be established for the molecular ions, using O^+ for filling up to 100% (Philbrick, 1982). In view of large fluctuations, data from auroral latitudes appear to be insufficient for numerical modelling at present time.

3.3 In the lower ionosphere, apart from molecular ions, cluster-ions (with positive and negative charges) appear below certain transition heights. An overall description in terms of such heights and scales must now be introduced into the IRI computer programme. Wave propagation measurements may be used to establish diurnal variations. From the normal winter anomaly of absorption, a more realistic description of the mid-latitude seasonal variation should be obtainable. Even the anomalous anomaly phenomenon might be descriptively assessed by a (rather small) decrease in the cluster transition height.

4. Mapping

Though this is not in the terms of reference of the Sub-commission (Task Group) on IRI, the success of IRI depends on that of the CCIR numerical maps. A list of desiderata was established and will be given to URSI Commission G and the URSI Secretariat which might inform CCIR.

5. Some additional parameters of interest to IRI users have been identified. The future IRI should present written contributions by relevant authors.

5.1 A global description of drift results will be written by Kazimirovsky.

5.2 Friedrich and Torkar will very briefly introduce their formula for the electron collision frequency depending on neutral pressure (to be taken from the new CIRA) and electron temperature.

5.3 In case the future CIRA should preserve the present system, which takes the exospheric temperature as a kind of solar activity index, IRI should, as an option, ~~make~~ make it possible

to start with this parameter instead of R (Zürich) or F (10.7). This is for the convenience of users who may wish to apply IRI and CIRA simultaneously.

September 1983

K. Rawer

ANNOUNCEMENTS OF MEETINGS AND SYMPOSIA

XXXIX All-Union Scientific Session Dedicated to Radio Day

This Scientific Session is being organized by the A.S. Popov Scientific-Technical Society for Radio Technology, Electronics and Electrocommunications. It will be held from 15 to 17 May 1984 in Moscow.

The main subjects of the Session are as follows:

1. Automation and mechanization of production
2. Antenna devices
3. Waveguide devices
4. Quantum radiooptics
5. Microelectronics and semiconductor devices
6. Reliability and quality control of production
7. The use of radio electronics in biology and medicine
8. Measurement in radiotechnique and electronics
9. Radio transmitting devices
10. Radio receiving devices and amplifiers
11. Radio technology
12. Radio propagation
13. Information theory
14. Technology of production of radio apparatus
15. Economics of radio industry and electronics and telecommunication branches
16. Electronic microscopy
17. Electronics.

The working language will be Russian. All persons interested in participating in the Scientific Session are invited to make arrangements through one of Intourist accredited travel agency.

For further information, please contact:

Central Administration
The A.S. Popov Society
Kuznetskii Most 20
103897 Moscow Center, USSR.

International URSI Commission F Symposium on the Frontiers of
Remote Sensing of the Oceans and Troposphere from
Air and Space Platforms

This meeting will be held in Israel from 14 to 23 May 1984. It is by invitation only. The meeting will encompass 8 working days. During the first 5 days (Monday through Friday), technical papers will be presented. The next three days of the following week (Monday through Wednesday) will cover a workshop period. It will be the aim of the workshop to summarize the salient results of the paper session, to define the areas of remote sensing research that require further attention, and to define the most promising direction from major advances.

Papers will describe new concepts dealing with emerging technology, theory, and applications associated with remote sensing from space and air platforms of the oceans and interacting lower troposphere. Emphasis will be placed on how evolving ideas will impact the future in providing new and better information about the physical state of the medium being probed with the focus on electromagnetic methods.

Remote active and passive sensing at frequencies extending from RF to the optical will be considered. Approaches will be explored for making types of measurements that provide new or more accurate determination of physical parameters, and for devising novel methods for synthesizing the data into geophysical models.

For further information, contact:

Dr. J. Goldhirsh, Chairman
Applied Physics Laboratory
John Hopkins University
John Hopkins Road
Laurel, Maryland 20707, USA.

(301) 953-7100 x 5042

Prof. J. Shapira
Technion, Israel Institute of
Technology
Faculty of Electrical Eng.
Technion City, Haifa 32000,
Israel.

04-225-111 x 318

Annual Meeting of the European Geophysical Society

The 10th Annual Meeting of the European Geophysical Society will be held at Louvain-la-Neuve, Belgium, from 30 July to 3 August 1984.

Some of the symposia and workshops organized by Section 3 (External Geophysics) as part of this meeting might be of interest to the URSI community. These are listed below.

- Solar Geophysical Indices Revisited
- First Results from European Geophysics and Solar Experiments on Spacelab
- Thermosphere/Ionosphere Coupling at High Latitudes and Possible Solar Wind/Magnetosphere Influence
- Future Planetary Missions
- Magnetospheric Effects of Seismic Activity.

The deadline for submission of abstracts is 15 April 1984.

For further information, contact:

Dr. J. Lemaire
Chairman of Section 3
Institut d'Aéronomie Spatiale
3 avenue Circulaire
B - 1180 Brussels, Belgium.

URSI Symposium on Millimeter and Submillimeter Astronomy

This Symposium is being organized by URSI Commission J and will be held in Granada, Spain, from 11 to 14 September 1984, in the week following the XXI General Assembly of URSI in Florence, Italy.

The Co-chairmen of the Scientific Programme Committee are Drs E.J. Blum and D. Downes. Its membership includes the following: Dr. S. Drapatz, Dr. J. Gomez-Gonzalez, Dr. N. Kaifu, Dr. N. Kardashev, Dr. E. Kollberg, Dr. T.G. Phillips, Dr. J.W. Welch, Dr. R.W. Wilson and Dr. G. Wrixon.

A more detailed announcement will be published in the March issue of the *URSI Information Bulletin*.

For further information, please contact the Chairman of the Local Organizing Committee:

Dr. J. Gomez-Gonzalez
I.R.A.M.
Avenida Divina Pastora 79
Granada, Spain.

14th European Microwave Conference

This Conference will be held in Liège, Belgium, from 10 to 14 September 1984.

Recent advances in Microwaves will be highlighted, especially high frequency, high speed and power, low noise and consumption, as well as the trend towards advanced signal processing in microwave systems.

The emphasis will be placed not only on the presentation of original microwave developments but also on novel aspects in the use of known devices and techniques, including related technologies.

Special emphasis will also be placed on computer aided design and computer aided measurements in the field of microwaves. Informal lectures will be organized on this subject, as well as regular sessions. It is also planned to have this as the theme for a workshop. The subject will be covered from a hardware and software point of view and present to the microwave engineer what is currently available and the future trends.

Further information can be obtained from:

Prof. A. Vander Vorst, Conference Chairman,
Laboratoire de Télécommunications et d'Hyperfréquences,
Université Catholique de Louvain,
Bâtiment Maxwell,
B - 1348 Louvain-la-Neuve, Belgium.

1984 International Symposium on Electromagnetic Compatibility

This Symposium, the first EMC Symposium to be held in Japan, will take place in Tokyo from 16 to 18 October 1984. It is sponsored by the EMC Technical Group of the Institute of Electronics and Communication Engineers of Japan and the Institute of Electrical Engineers of Japan, and by the EMC Society of the IEEE. It is supported by many organizations

and institutions among which URSI Commission E.

The Chairman of the Steering Committee is Dr. R. Sato and the Secretary is Dr. T. Takagi, both from Tohoku University. URSI Commission E is represented by Dr. G.H. Hagn, Dr. F. Horner, Dr. Ya.I. Likhter, Prof. S. Lundquist and Prof. F.L. Stumpers.

The technical areas to be covered by the Symposium include all the traditional aspects of EMC in communication systems, and also in fields such as biological effects, lightning surges, etc.

For more information, please contact:

EMC '84/Tokyo,
c/o Prof. Takagi,
Tohoku University Dept. of Comm.,
Sendai, Japan 980.

EMC Symposium and Technical Exhibition Zurich 1985

After the success of the 1983 Conference, the 6th EMC Symposium is planned for 5-7 March 1985 in Zurich. Conference facilities are again provided by the Federal Institute of Technology in Zurich. Members of the Organizing Committee are Prof. P. Leuthold (President), Dr. T. Dvorak (Chairman), Prof. R.M. Showers (Programme Chairman). The sponsoring organization is the Swiss Electrotechnical Association.

Prospective authors are invited to submit 10 copies of an abstract and summary not exceeding 5 pages before 15 March 1984 to the Technical Programme Committee EMC 1983, ETH-Zentrum-IKT, 8092 Zurich, Switzerland. Summaries should clearly describe the work done, including results and conclusions and should preferably be accompanied by graphs and other pictorial material. Only original papers not published or submitted elsewhere will be considered. To ease up the reviewing procedure, the names of the authors, addresses, telephone and telex numbers should be quoted on a separate sheet.

Authors will be notified by 18 June 1984. Photo-ready manuscripts will be due by 31 October 1984.

For best papers five awards will be available with monetary prizes of Swiss francs 2,500, 1,500 and 1,000.

A rich technical and social programme with workshops and

technical excursions is again foreseen.

For further information, contact:

Dr. T. Dvorak,
ETH Zentrum-IKT,
8092 Zurich, Switzerland.
Phone (4..411) 256-2790
Telex 53 178 ethbi ch.

MICROWAVES AND THERMOREGULATION

The proceedings of a Symposium entitled "Microwaves and Thermoregulation" held at Yale University have been published⁺.

The book presents reviews and tutorials on the deposition of nonionizing radiation in biological systems and the resultant thermal, physiological, and behavioural effects.

Major topics include: biophysics of electromagnetic heating; fundamentals of thermal physiology, behavioural changes in the presence of microwave fields; acclimation to microwave radiation; sensations arising from microwaves exposure; heating by infrared radiation in comparison to microwave heating; microwave heating for cancer therapy.

Throughout the book detailed knowledge of the responses of humans exposed to infrared radiation, as well as their reactions to the body heat generated during exercise, are used to predict and evaluate the responses that may occur in the presence of microwave fields. Much of the experimental evidence is derived from animal models, but the focus is on the assessment of human thermoregulatory responses to specific radiant environments. Concluding chapters cover work stoppage produced by high intensity radiofrequency fields, subtle consequences of exposure to weak fields, drug/radiation interactions, complications of circadian rhythmicity, and the potential for life prolongation in animals exposed to weak microwave fields.

⁺ *Microwaves and Thermoregulation* (Ed. Eleanor R. Adair) 1983, 490 pp., Academic Press. ISBN:0-12-044020-2. Price: \$45.00.

INTERNATIONAL GEOPHYSICAL CALENDAR 1984

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,
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 1984

(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	6	7		1	2	3	4	5	6	7	
	8	9	10*	11*	12	13	14		8	9	10	11	12	13	14	
JANUARY	15	16	17 ⁺	18 ⁺	19 ⁺	20	21		15	16	17	18	19	20	21	JULY
	22	23	24	25	26	27	28		22	23	24	25**+	26*	27	28	
	29	30	31	1	2	3	4		29	30	31	1	2	3	4	
	5	6	7*	8**+	9	10	11		5	6	7	8	9	10	11	
FEBRUARY	12	13	14	15	16	17	18		12	13	14	15	16	17	18	AUGUST
	19	20	21	22	23	24	25		19	20	21	22**+	23*	24	25	
	26	27	28	29	1	2	3		26	27	28	29	30	31	1	
	4	5	6*	7**+	8	9	10		2	3	4	5	6	7	8	
MARCH	11	12	13	14	15	16	17		9	10	11	12	13	14	15	
	18	19	20	21	22	23	24		16	17	18	19**+	20*	21	22	SEPTEMBER
	25	26	27	28	29	30	31		23	24	25	26	27	28	29	
	1	2	3*	4**+	5	6	7		30	1	2	3	4	5	6	
	8	9	10	11	12	13	14		7	8	9	10	11	12	13	

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

11	12	13	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	12	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	15 ⁺	16 ^{*+}	17 ^{*+}	18	19
20	21	22	23	24	25	26
27	28	29	30	31		
S	M	T	W	T	F	S

NOVEMBER

DECEMBER

1985
JANUARY

- 17 Regular World Day (RWD)
- 18 Priority Regular World Day (PRWD)
- 15 Quarterly World Day (QWD)
also a PRWD and RWD
- 4 Regular Geophysical Day (RGD)
- 6 7 World Geophysical Interval (WGI)
- 17⁺ Incoherent Scatter Coordinated
Observation Day and Coordinated
Tidal Observation Day

- 30 Day of Solar Eclipse
- 4 5 Airglow and Aurora Period
- 10^{*} Dark Moon Geophysical Day (DMGD)

NOTES:

1. Days with unusual meteor shower activity are: Northern Hemisphere Jan. 3, 4; Apr 21, 22; May 2-5; Jun 8-12, 27-29; Jul 27-29; Aug 10-13; Oct 19-22; Nov 2, 3, 17; Dec 12-15, 21, 22, 1984. Southern Hemisphere May 2-5; Jun 8-12, 20, 21; Jul 26-30; Oct 19-22; Nov 2, 3, 17; Dec 5-7, 12-15, 1984.

2. Middle Atmosphere Program (MAP) began 1 Jan 1982 and runs through 1985.

OPERATIONAL EDITION, September 1983

LIST OF FUTURE SYMPOSIA AND MEETINGS

Note: Events marked by an asterisk are sponsored or co-sponsored by URSI.

Symposium on Microwave Signatures in Remote Sensing⁺
Toulouse, France, 16-20 January 1984.

Contact Addresses:

Dr. E. Schanda	or	Prof. R.K. Moore
Institute of Applied Physics,		Remote Sensing Laboratory,
University of Berne,		The University of Kansas,
Sidlerstrasse 5,		2291 Irving Hill Drive,
CH-3012 Berne,		C. West,
Switzerland.		Lawrence, Kansas 66045, USA.

International Seminar on Digital Communications⁺
Zurich, Switzerland, 6-8 March 1984.

Contact Address: Mrs. R. Agotai,
ETZ F88,
ETH Zentrum,
CH-8092 Zurich,
Switzerland.

Symposium on Equatorial Aeronomy⁺
Hong Kong, 17-24 March 1984.

Contact Address: Dr. S. Matsushita,
National Center for Atmospheric Research,
High Altitude Observatory,
P.O. Box 3000,
Boulder, Colorado 80307, USA.

Conference on Video and Data Recording
Southampton, England, 2-6 April 1984.

Contact Address: Conference Secretariat,
Institute of Electronic and Radio Engineers,
99 Gower Street,
London WC1E 6AZ,
England.

XXXIX All-Union Scientific Session Dedicated to Radio Day
Moscow, USSR, 15-17 May 1984.

Contact Address: Central Administration,
The A.S. Popov Society,
Kuznetskij Most 20,
103897 Moscow Center, USSR.

Symposium on the Frontiers of Remote Sensing of the Oceans and
Troposphere from Air and Space Platforms⁺
Israel, 14-23 May 1984.

Contact Addresses:

Dr. J. Goldhirsh,	or	Prof. J. Shapira,
Applied Physics Lab.,		Technion,
John Hopkins University,		Faculty of Electrical Eng.,
John Hopkins Road,		Technion City,
Laurel, Maryland 20707, USA.		Haifa 32000, Israel.

4th International Conference on Reliability and Maintainability
Perros-Guirec, France, 21-25 May 1984.

Contact Address: M.R. Goarin,
Centre de Fiabilité,
CNET-LAB/ICM,
B.P. 40,
F-22301 Lannion Cedex, France.

Solar-Terrestrial Prediction Workshop⁺
Meudon, France, 18-22 June 1984.

Contact Address: Dr. P. Simon,
DASOP,
Observatoire,
F-92195 Meudon Principal Cedex,
France.

7th International Wroclaw Symposium on Electromagnetic
Compatibility⁺
Wroclaw, Poland, 26-28 June 1984.

Contact Address: EMC Symposium,
Box 2141,
51645 Wroclaw 12,
Poland.

Second International Conference on Applied Fibre Optics
London, England, 26-28 June 1984.

Contact Address: The Conference Secretariat,
I.E.R.E.,
99 Gower Street,
London WC1E 6AZ,
England.

XXV Plenary Meeting of COSPAR and Associated Activities
Graz, Austria, 25 June - 7 July 1984.

Contact Address: Mr. Z. Niemirowicz,
Executive Secretary, COSPAR,
51 boulevard de Montmorency,
F-75016 Paris, France.

Symposium on the Achievements of the IMS⁺
(during the COSPAR Meeting) 26-28 June 1984.

Contact Address: Prof. J.G. Roederer,
Geophysical Institute,
University of Alaska,
Fairbanks, Alaska 99701, USA.

Symposium on Space Observations for Climate Studies⁺
(during the COSPAR Meeting) 25-29 June 1984.

Contact Addresses:

Prof. H.J. Bolle,	or	Prof. G. Ohring,
Universität Innsbruck,		NOAA/NEDSIS/LSB-E/RA12,
Institut für Meteorologie		Suitland Professional Center,
und Geophysik,		5001 Silver Hill Road,
Schöpfstrasse 41,		Washington, D.C. 20233,
A-6020 Innsbruck, Austria.		USA.

Symposium on the Physics of the Magnetosphere-Ionosphere
Connection⁺
(during the COSPAR Meeting) 2-5 July 1984.

Contact Address: Dr. E.R. Schmerling,
STARLAB,
231 Durand,
Stanford University,
Stanford, CA 94305,
USA.

Workshop on the International Reference Ionosphere (IRI)⁺
(during the COSPAR Meeting) 3 July 1984.

Contact Address: Prof. K. Rawer,
Herrenstrasse 53,
D-7801 March-Hugstetten,
Federal Republic of Germany.

IEEE Workshop on Information Theory⁺
Caesarea, Israel, July 1984.

Contact Address: Mr. J. Ziv,
Ministry of Communications,
Migdal Shalom,
Tel Aviv, Israel.

Symposium on Wave Breaking, Turbulent Mixing and Radio
Probing of the Ocean Surface⁺
Sendai, Japan, 19-25 July 1984.

Contact Address: Prof. Y. Toba,
Department of Geophysics,
Faculty of Science,
Tohoku University,
Sendai 980, Japan.

Annual Meeting of the European Geophysical Society
Louvain-la-Neuve, Belgium, 30 July - 3 August 1984.

Contact Address: Dr. J. Lemaire,
Institut d'Aéronomie Spatiale,
3 avenue Circulaire,
B-1180 Bruxelles, Belgium.

Conference on Precision Electromagnetic Measurements (CPEM)⁺
Delft, Netherlands, 20-24 August 1984.

Contact Address: Mrs Ij. Smits,
Department of Electrical Engineering,
Delft University of Technology,
P.O.B. 5031,
2600 GA Delft,
Netherlands.

XXI General Assembly of URSI⁺
Florence, Italy, 28 August - 5 September 1984.

Contact Address: URSI Secretariat,
Avenue A. Lancaster 32,
B-1180 Bruxelles, Belgium.

International Conference on Digital Signal Processing
Florence, Italy, 5-8 September 1984.

Contact Address: The Organizing Secretariat,
I.C.D.S.P.,
c/o ENIC,
via S. Caterina d'Alessandria 12,
I - 50129 Florence, Italy.

14th European Microwave Conference⁺
Liège, Belgium, 10-14 September 1984.

Contact Address: Prof. A. Vander Vorst,
Laboratoire de Télécommunications et
d'Hyperfréquences,
U.C.L., Bâtiment Maxwell,
B-1348 Louvain-la-Neuve, Belgium.

URSI Symposium on Millimeter and Submillimeter Astronomy⁺
Granada, Spain, 11-14 September 1984.

Contact Address: Dr. J. Gomez-Gonzalez,
I.R.A.M.,
Avenida Divina Pastora 79,
Granada, Spain.

Symposium on Irregularities of the High Latitude Ionosphere⁺
Lindau, F.R. of Germany, 10-12 September 1984.

Contact Address: Dr. K. Schlegel,
Max-Planck-Institut für Aeronomie,
Postfach 20,
D-3411 Katlenburg-Lindau,
Federal Republic of Germany.

20th General Assembly of ICSU
Ottawa, Canada, 24-26 September 1984.
(to be preceded by a multidisciplinary Symposium on 1) Global
Change, 2) Biotechnology, 3) The Teaching of Science.

Contact Address: ICSU Secretariat,
51 boulevard de Montmorency,
F-75016 Paris, France.

1984 International Symposium on Electromagnetic Compatibility⁺
Tokyo, Japan, 16-18 October 1984.

Contact Address: EMC '84/Tokyo,
c/o Prof. Takagi,
Tohoku University,
Sendai, Japan 980.

9th International Conference on Infrared and Millimeter Waves⁺
Osaka, Japan, 22-26 October 1984.

Contact Address: Prof. A. Mitsuishi,
Department of Applied Physics,
Osaka University,
Yamada-Oka, Suita,
Osaka 565, Japan.

International MAP Symposium⁺
Kyoto, Japan, 26-30 November 1984.

Contact Address: Prof. S. Kato,
Radio Atmospheric Science Center,
Kyoto University,
Gokanosho, Uji,
Kyoto 611, Japan.

EMC Symposium and Technical Exhibition Zurich 1985⁺
Zurich, Switzerland, 5-7 March 1985.

Contact Address: Dr. T. Dvorak,
ETH Zentrum-IKT,
CH-8092 Zurich, Switzerland.

North American Radio Science Meeting and IEEE Antennas and
Propagation Society Symposium
Vancouver, Canada, 16-21 June 1985.

Contact Address: Dr. E.V. Jull,
Department of Electrical Engineering,
University of British Columbia,
Vancouver, B.C. V6T 1W5,
Canada.

10th World Congress of the International Measurement Confede-
ration
Prague, Czechoslovakia, 22-26 August 1985.

Contact Address: IMEKO Secretariat,
P.O.B. 457,
H-1371 Budapest, Hungary.

ICSU Committee on the Teaching of Science: Conference on
Science and Technology Education and Future Human Needs
Bangalore, India, August 1985.

Contact Address: ICSU Secretariat,
51 boulevard de Montmorency,
F - 75016 Paris, France.

XIXth General Assembly of the International Astronomical
Union
New Delhi, India, November 1985.

Contact Address: IAU Secretariat,
61 avenue de l'Observatoire,
F - 75014 Paris, France.

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Note: An alphabetical index of names, with addresses and page references, is reproduced at the back of this Bulletin.

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United Kingdom: Prof. P.J.B. Clarricoats

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Yugoslavia:

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New Zealand: Prof. R.H.T. Bates
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Poland: Prof. J. Seidler
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South Africa: Prof. H.C. Viljoen
Spain: Dr. J.E. de Salamanca
Sweden: Dr. H. Schefte
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Note: The figures in parenthesis at the end of the entries indicate the pages on which references to individuals will be found.

- ARONS, Dr. J., Department of Astronomy, 725 Commonwealth Ave., Boston, MA 02215, USA (41).
- ABDULLA, Dr. Shaker A., Astronomy and Space Research Center, P.O.Box 255 Jadiryah, Baghdad, Iraq (41,44).
- AJAYI, Dr. G.O., Department of Electronic and Electrical Engineering, University of Ife, Ife, Nigeria (50).
- AKSENOV, Dr. V.I., Institute of Radioengineering and Electronics, Ac. Sci., Prospekt Marksa 18, 103907 Moskva K-9, USSR (44).
- AL-ARAJI, Dr. Saleh R., Department of Electrical Engineering, College of Engineering, Baghdad University, Baghdad, Iraq (37, 38).
- ALBRECHT, Dr. Ing. H.J., Postfach 21 01 43, D-5300 Bonn 2, FR of Germany (33, 49).
- ALTMAN, Prof. C., Department of Physics, Technion, Haifa 32000, Israel (42).
- ALTSCHULER, Dr. H.M., 2250 Bluebell Ave., Boulder, CO 80302, USA (35).
- ANDREU, Dr. A.M., CORCA, Av. Libertador 327, Vicente Lopez (BA), Argentina (48).
- ANGERAMI, Prof. J.J., Escola Politecnica, Universidad de Sao Paulo, Departamento de Electricidade, C.P. 61548, 01000 Sao Paulo S.P., Brazil (39).
- APEL, Dr. J.P., Applied Physics Laboratory, The John Hopkins University, John Hopkins Road, Laurel, MD 20707, USA (48).
- ARMAND, Dr. N.A., Institute of Radioengineering and Electronics Ac. Sci., Prospekt Marksa 18, 103907 Moskva K-9, USSR(41).
- ASHOUR-ABDALLA, Dr. M., USA (44).
- AUDOUIN, M. C., Laboratoire de l'horloge atomique, Université de Paris-Sud, F-91405 Orsay, France (34).

- AUTH, Prof. Dr. J., Humboldt-Universität zu Berlin, Sektion Physik, Hessischestr.2, DDR-104 Berlin, GDR (38).
- AZNAR, Dr. Enrique Used, Centro de Investigacion y Estudios, Compania Telefonica Nacional de Espana, Avda. de José Antonio num. 32, Madrid 13, Spain (39).
- BAARS, Dr. J.W.M., Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, D-5300 Bonn, FR of Germany (47).
- BACH ANDERSEN, Prof. J., Institute of Electronic Systems, Aalborg University Center, P.O.Box 159, DK-9100 Aalborg, Denmark (36, 47, 49).
- BAGGALEY, Dr. W.J., Physics Department, University of Canterbury, Christchurch, New Zealand (45).
- BAILEY, Mr. A.E., Foxgloves, New Valley Road, Milford-on-Sea, Lymington, Hampshire SO4 0SA, United Kingdom (35).
- BAJAJA, Dr. E., Instituto Argentino de Radioastronomia, Casilla de Correo No 5, 1894 Villa Elisa, Prov.DE B.A., Argentina (45).
- BAKHRAKH, Prof. L.D., Institute of Radioengineering and Electronics, Ac. Sci., Prospekt Marksa 18, 103907 Moskva K-9, USSR (37).
- BARON, Dr. M.J., Radio Physics Laboratory, SRI International, Menlo Park, CA 94025, USA (43).
- BARR, Dr. R., Physics and Engineering Laboratory, Geophysical Observatory, P.O.Box 2111, Christchurch, New Zealand(39).
- BATES, Prof. R.H.T., Department of Electrical Engineering, University of Canterbury, Private Bag, Christchurch, New Zealand (37).
- BAUER, Dr. P., CNET/PAB/RPE, 38 rue du Général Leclerc, F-92131 Issy-les Moulinaux, France. Phone: 638 4979. Telex: CNET ION 20 570 (41).
- BAUER, Prof. S.J., Institute für Meteorologie und Geophysik, Universität Graz, Halbärthgasse 1, A-8010 Graz, Austria (43, 48).

- BAUM, Dr. C., Air Force Weapons Laboratory, Kirtland Air Force Base, New Mexico 87117, USA (40, 47).
- BECKER, Prof. Dr. K.-D., Universität des Saarlandes, Fachrichtung 12.2, Elektrotechnik, D-6600 Saarbrücken, FR of Germany (40).
- BEM, Prof. D., ul. Bacciarellego 24 m.12, 51-649 Wrocław, Poland (36).
- BENDA, Prof. Dr. O., Slovak Technical University, Vazozova 5, 880-19 Bratislava, Czechoslovakia (36).
- BENSON, Dr. R.F., Code 621, Goddard Space Flight Center, Greenbelt, MD 20771, USA (44).
- BERTEAUD, Dr. A.J., Groupe du CNRS, 2 rue Henry Dunant, F-94320 Thiais, France (35).
- BEYNON, Sir Granville, Department of Physics, University College of Wales, Penglais, Aberystwyth SY23 3BZ, United Kingdom (33).
- BHONSLE, Prof. R.V., Physical Research Laboratory, Navrangpura, Ahmedabad 380009, India (44).
- BIBL, Dr. K., University of Lowell, Center for Atmospheric Research, 450 Aiken Street, Lowell, Mass.01854, USA (43).
- BITTENCOURT, Dr. J.A., INPE, S.P. 515, 12200 Sao Jose dos Campos - SP, Brazil (43).
- BLANC, Dr. M., CNET/PAB/RPE, 38 rue du Général Leclerc, F-92131 Issy-les-Moulineaux, France (43).
- BLOMQUIST, Mr. Å., Research Institute of National Defence, Dept. 3, Box 1165, S-581 11 Linköping (41).
- BLØTEKJAER, Prof. K., Institutt for Fysikalsk Elektronikk, Universitetet i Trondheim, N-7034 Trondheim NTH, Norway (38).
- BOGNAR, Academician Dr. G., Münnich Ferenc utca 7, H-1051 Budapest, Hungary (49).
- BOITE, Prof. R., Faculté Polytechnique de Mons, Département Electricité, rue de Houdain, B-7000 Mons, Belgium (37).
- BOLOMEY, Prof. J.C., Laboratoire de signaux et systèmes du CNRS, Ecole Supérieure d'Electricité, F-91190 Gif-sur-Yvette, France (36).

- BOOKER, Prof. H.G., Applied Physics and Information Science
Department, University of California, Code 014, La Jolla,
CA 92093, USA (33).
- BOSSY, Prof. L., Institut Royal Météorologique, av. Circulaire
3, B-1180 Bruxelles, Belgium (41, 43).
- BOTTREAU, Prof. A.M., Université de Bordeaux I, Laboratoire de
Spectronomie Temporelle et Fréquentielle, 40 rue Lamar-
tine, F-35400 Talence, France (46).
- BUTLER, Prof. Ch.M., Department of Electrical Engineering,
University of Mississippi, University, MS 38677, USA (37).
- BUTTON, Dr. K.J., Massachusetts Institute of Technology,
Francis Bitter National Magnet Laboratory, 170 Albany
Street, Cambridge, MA 02139, USA (39).
- CAETANO, M. Armino Custodio Mendonça, Lisbon Astronomical
Observatory, Lisbon, Portugal (35).
- CALLA, Prof. O.P.N., Space Applications Centre, SAC PO, Jodhpur
Tekra, Ahmedabad 380053, India (39).
- CAMPBELL, Dr. C.K., Department of Electrical Engineering,
McMaster University, Hamilton, Ontario L8S 4L7, Canada
(38).
- CAMPBELL, Dr. W., USGS MS 964, Box 25046, Denver, CO 80225,
USA (47).
- CARASSA, Prof. F., Istituto Elettrotecnico del Politecnico,
Piazzale L. da Vinci 32, I-20133 Milano, Italy (46).
- CARLEIAL, Dr. A.B., INPE, C.P. 515, 122000 Sao Jose dos Campos
- SP, Brazil (37).
- CEDERBAUM, Prof. I., Department of Electrical Engineering,
Technion, Haifa 32000, Israel (37).
- CENZOR, Dr. D., Department of Electrical Engineering and
Computer Science, Ben Gurion University in the Negev,
Beer Sheva 84120, Israel (36).
- CHANDRA, Dr. K., Deputy Director, National Physical Laboratory,
Illside Road, New Delhi 110012, India (35).

- CHEN, Prof. Chun-Hsiung, Department of Electrical Engineering, National Taiwan University, Taipei, Taiwan (36).
- CHEN, Prof. K.M., Department of Electrical Engineering, Michigan State University, East Lansing, Michigan, USA (35).
- CHMURNY, Prof. J., Slovak Technical University, Vazozova 5, 880-19 Bratislava, Czechoslovakia (37).
- CHRISTIANSEN, Prof. W.N., c/o Mount Stromlo Observatory, Private Bag, Canberra ACT 2606, Australia. Phone (062)881111. Cables: canopus. Telex: AA 62270 (33).
- CLARRICOATS, Prof. P.J.B., Department of Electronic and Electrical Engineering, Queen Mary College, Mile End Road, London E1 4NS, United Kingdom (36).
- COLE, Dr. D.G., Ionospheric Prediction Service, P.O.Box 702, Darlinghurst N.S.W. 2010, Australia (41, 42, 48).
- CORNEY, Mr. A.C. Physics and Engineering Laboratory, DSIR, Private Bag, Lower Hutt, New Zealand (35).
- COX, Dr. D.C., Bell Laboratories, Box 400, Holmdel, New Jersey 07733, USA (47).
- COYNE, Dr. T.N.R., Communications Research Centre, Dept. of Communications, P.O.Box 11490, Station H, Ottawa, Ontario K2H 8S2, Canada (39).
- CRANE, Dr. R.K., Thayer School of Engineering, Dartmouth College, Hanover, NH 03755, USA (41).
- CRAWFORD, Prof. F.W., Vice-Chancellor, University of Aston, Gosta Green, Birmingham B4 7ET, United Kingdom (44).
- CROCHET, Dr. M., Université de Toulon, La Giponne, boulevard des Armaris, F-83100 Toulon, France (42, 46).
- CROOM, Dr. D.L., Rutherford and Appleton Laboratory, Chilton, Didcot, Oxfordshire OX11 0QX, United Kingdom (41, 46).
- CULLEN, Prof. A.L., Department of Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, United Kingdom (33, 50).

- DAMBOLDT, Dr. Th., FI 34, Forschungsinstitut der DBP beim FTZ, Postfach 5000, D-6100 Darmstadt, FR of Germany (49).
- DANILOV, Dr. A.D., Institute of Applied Geophysics, Hydrometeorological Service of the USSR, 6 Pavlik Morozov St., Moscow, USSR (43).
- D'AURIA, Dr. G., Istituto di Elettronica, Facolta d'Ingegneria, Via Eudossiana 18, I-00184 Roma, Italy (41).
- DAVIES, Dr. K., NOAA Environmental Research Laboratory, 325 Broadway, Boulder, CO 80303, USA (42).
- DE COULON, Prof. Dr. F., Chemin du Couchant 18, CH-1007 Lausanne, Switzerland (37).
- DEGAUQUE, M.P., Université des Sciences et Techniques de Lille 1 (UER Informatique-Electronique-Electrotechnique-Automatique), BP 36, F-59650 Villeneuve d'Ascq, France (39).
- DE HOOP, Prof. Dr. A.T., Technische Hogeschool Delft, Afdeling Elektrotechniek, Delft, Netherlands (36).
- DE JONG, Mr. A., Dr. Neher Laboratorium, St. Paulusstraat 4, Leidschendam, Netherlands (39).
- DELOGNE, Prof. P., Laboratoire de Télécommunications, Bâtiment Maxwell, B-1348 Louvain-la-Neuve, Belgium (40, 41, 48).
- DE MAGALHAES, Eng. Antonio Amandio Sanches, Astronomical Observatory, University of Porto, Porto, Portugal (46).
- DEN, Prof. Chi-Fu, Dean, College of Engineering, National Tiao Chiao Tung University, Hsin-Chu, Taiwan (37).
- DEPRINS, Prof. J., avenue Stanley 7, B-1980 Tervuren, Belgium (34).
- DE SALAMANCA, Dr. J.E., Standard Electrica, S.A. José Ortega y Gasset num. 22, Madrid 6, Spain (37).
- DEWAM, Hofrat Dipl. Ing. W., Bundesamt für Eich- und Vermessungswesen, Abt. E3, Arltgasse 35, A-1160 Wien, Austria (34).
- DIEMINGER, Prof. Dr. W., Berlinerstrasse 14, D-3412 Nörten-Hardenberg, FR of Germany (33).
- DOHERTY, Dr. L.H., Herzberg Institute of Astrophysics, National Research Council, Sussex Drive, Room 2037-A, Ottawa, Ontario K1A 0R6, Canada (48).

- DOWDEN, Prof. R.L., Physics Department, University of Otago, Dunedin, New Zealand (33, 43, 44, 49).
- DUDENEY, Dr. J.R., British Antarctic Survey, Madingley Road, Cambridge CB3 0ET, United Kingdom (43).
- DUTTA ROY, Prof. S.C., Dept. of Electrical Engineering, Indian Institute of Technology, Hauz Khas, New Delhi 110016, India (37).
- DVORAK, Dr. T., Im Wiesengrund 24, CH-8907 Wettswil, Switzerland (40).
-
- EGIDI, Prof. C., Istituto Galileo Ferraris, Corso Massimo d'Azeglio 42, I-10125 Torino, Italy (35, 49).
- EKLUND, Mr. F., Research Institute of National Defence, Dept.3, S-104 50 Stockholm 80, Sweden (46).
- ELGARØY, Dosent Ø., Astrofysisk Institutt, Universitetet i Oslo, Postboks 1029, Blindern, Oslo 3, Norway (46).
- ENOME, Prof. S., Research Institute of Atmospherics, Nagoya University, 3-13 Honohara, Toyokawa-shi 442, Japan (45).
-
- ..
- FALTHAMMAR, Prof. C.-G., Royal Institute of Technology, S-100 44 Stockholm 70, Sweden (44).
- FANTI, Dr. R., Istituto di Fisica, Università di Bologna, v. Innerio 46, I-40126 Bologna, Italy (45).
- FEDI, Dr. F., Fondazione Bordini, Viale Trastevere, I-108 Roma, Italy (34, 40, 41).
- FIALA, Dr. V., Geophysical Institute, Czechoslovak Academy of Sciences, Bocni II-1a, 141 31 Praha 4, Czechoslovakia(43).
- FINDLAY, Dr. J.W., National Radio Astronomy Observatory, Edgemont Road, Charlottesville, VA 22901, USA (47).

- FIOCCO, Dr. G. Istituto di Fisica, Universita di Roma, P.le delle Scienze 5, I-00185 Roma, Italy (38).
- FISHER, Dr. J.R., National Radio Astronomy Observatory, Post Office Box 2, Green Bank, West Virginia 24944, USA (47).
- FRATER, Prof. R.H., CSIRO Division of Radiophysics, P.O.Box 76, Epping, N.S.W. 2121, Australia (48).
- FREMOUW, Dr. E.J., Physical Dynamics, Inc., P.O.B.3027, Bellevue, WA 98009, USA (45).
- FRUHAUF, Prof. Dr. Ing. H., Technische Universität Dresden, Helmholtzstrasse 18, DDR-8027 Dresden, GDR (49).
-
- GALDON MATEO, Rvdo. P.E., Observatorio del Ebro, Roquetas-Tortosa (Tarragona), Spain (42).
- GAMBLING, Prof. W.A., Department of Electronics, The University, Southampton SO9 5NH, United Kingdom (38, 39, 46).
- GARDIOL, Prof. Dr. F., Chemin des Graminées 11, CH-1012 Pully, Switzerland (36, 50).
- GEHER, Prof. K., Technical University of Budapest, Stoczek u.2, H-1111 Budapest, Hungary (33, 35, 36, 37, 38, 39, 41, 42, 44, 45, 49).
- GENDRIN, Dr. R., CNET/PAB/RPE, 38 rue du Général Leclerc, F-92131 Issy-les-Moulineaux, France (47).
- GEROSA, Dr. G., Istituto di Elettronica, Facolta d'Ingegneria, Via Eudossiana 18, I- 00184 Roma, Italy (36).
- GEWILLIG, Mr. M., Directeur-Generaal, Technische Diensten van de BRT, Reyerslaan 52, B-1040 Brussel, Belgium (48).
- GIORDANO, GTE Products Corporation, Sylvania Systems Group, Communication System Division, 77 A Street, Needham Heights, Mass. 02194, USA (40, 47).
- GJESSING, Dr. D., NTN/PFM, Postboks 25, N-2007 Kjeller, Norway (40, 41, 50).
- GLEDHILL, Prof. J.A., Department of Physics, Rhodes University, P.O. Box 94, Grahamstown 6140, South Africa (42, 43).
- GONZALEZ, Dr. Jesus Gomez, Observatorio Astronomico Nacional, Yebes (Guadalajara), Spain (46).

- GONZE, Prof. R., Observatoire Royal de Belgique, avenue Circulaire 3, B-1180 Bruxelles, Belgium (39, 45).
- GORDON, Prof. M.A., National Radio Astronomy Observatory, Suite 100, 2010 North Forbes Blvd, Tucson, AZ 85705, USA (46).
- GORDON, Prof. W.E., Rice University, P.O. Box 1892, Houston, Texas 77251, USA. Phone: (713) 527 4031 (33, 34, 47).
- GORGOLEWSKI, Prof. S., Instytut Radioastronomii, Uniwersytet im. M. Kopernika, ul. Chopina 12/18, 87 100 Toruń, Poland (46).
- GOSSARD, Dr. E.E., NOAA, 325 Broadway, Boulder, CO 80303, USA (41).
- GOSSEL, Dr.-Ing. D., c/o Philips GmbH Forschungslaboratorium Hamburg, Postfach 540840, D-2000 Hamburg, FR of Germany (35).
- GOWER, Dr. J.F.R., Institute of Ocean Sciences, Patricia Bay, POB 6000, Sidney BS V8L 4B2, Canada (46).
- GRAHL, Dr. B.H., Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, D-5300 Bonn 1, FR of Germany (45).
- GRINGAUZ, Dr. K.I., Institute of Space Research, Ac.Sci., 88 Profsoyusnaya ul., Moskva V-485, USSR (42).
- GUBANKOV, Dr. V.N., Institute of Radioengineering and Electronics, Ac. Sci., Prospekt Marksa 18, 103907 Moskva K-9, USSR (50).
- GUDMANDSEN, Prof. P., Electromagnetics Institute, Bldg 348, Technical University of Denmark, DK-2800 Lyngby, Denmark (40).
- GULDBRANDSEN, Dr. T., Physics Lab. III, Technical University of Denmark, DK-2800 Lyngby, Denmark (34).
- GUY, Prof. A.W., Department of Rehabilitation Medicine, RJ-30, University Hospital, Seattle, Washington 98195, USA (35).

- HADAD, Dr. Safa A., Department of Electrical Engineering, University of Technology, P.O.Box 745 Tel-Mohamed, Baghdad, Iraq (35, 42).
- HAGN, Mr. G.H., Stanford Research Institute, SRI-Washington, 1611 North Kent Street, Arlington, Virginia 22209, USA (34).
- HAHN, Prof. S., Instytut Radioelektroniki, Politechnika Warszawska, Nowowiejska 15/19, 00-665 Warszawa, Poland (34, 35).
- HAIKONEN, Dr. T., Administration of Posts and Telegraphs, Radio Department, P.O.Box 511, SF-00101 Helsinki 10, Finland (40).
- HAKURA, Dr. J., Radio Research Laboratories, 4-2-1 Nukui-Kitamachi, Koganei-shi, Tokyo 184, Japan (42).
- HALLIKAINEN, Dipl. Eng. M., Helsinki University of Technology, E.E. Department, Otakaari 5A, SF-02150 Espoo 15, Finland (49).
- HALME, Prof. S.J., Helsinki University of Technology, E.E. Department, Otakaari 5A, SF-02150 Espoo 15, Finland (37, 46).
- HAMAKER, Mr. J.P., Radiosterrewacht Dwingeloo, Dwingeloo, Netherlands (45).
- HARTAL, Mr. O., POB 2250, Haifa 31021, Israel (39).
- HELLWIG, Dr. H., Frequency and Time Systems Inc., 34 Tozer Road, Beverly, MA 01915, USA (35).
- HOEGGER, Dr. B., Route des Charbonnières 13, CH-1723 Marly, Switzerland (42, 44).
- HOGLUND, Prof. B., Chalmers Institute of Technology, S-402 20 Göteborg 5, Sweden (46).
- HOLT, Prof. O., Nordlysobservatoriet, Universitetet i Tromsø, N-9000 Tromsø, Norway (42).
- HONDA, Mr. T., Electrotechnical Laboratory, 1-1-14 Umezono, Sakura-mura, Niihari-gun, Ibaraki, Japan (46).
- HORITA, Dr. R., Department of Physics, University of Victoria, Victoria B.C., V8W 2Y2, Canada (42).
- HORNER, Dr. F., 10 Clarence Drive, Egham Sy TW20 ONL, United Kingdom (40).

HORVAT, Prof. R., Elektrotejnicki Fakultet, Bulevar Revolucije
73, 11000 Beograd, Yugoslavia (50).

HUANG, Prof. Chun-Ming, Department of Electrical Engineering,
National Taiwan University, Taipei, Taiwan (40).

HUANG, Dr. Yinn-Nien, Chief, Department of Planning and Pro-
gramming, Telecommunication Labs, P.O.Box 71, Chung-Li,
Taiwan (42).

HULTQVIST, Dr. B., Kiruna Geophysical Institute, Box 704,
S-981 27 Kiruna, Sweden (42).

HUMINER, Dr. Z., Radio Observatory, P.O.Box 4655, Haifa,
Israel (45, 49).

HYDE, Dr. G., COMSAT Labs., Rm 2146, P.O.Box 115, Clarksburg,
MD 20734, USA (41).

IGBO, Dr. L.A.B., Department of Electronic and Electrical
Engineering, University of Ife, Ile-Ife, Nigeria (35).

IRELAND, Mr. W., Physics and Engineering Laboratory, Dept. of
Scientific and Industrial Research, Private Bag, Lower
Hutt, New Zealand (49).

ISHIKAWA, Prof. H., 5-2 Hatchodori, Toyohashi-shi 440, Japan
(39).

IWAINSKY, Dr. A., Akademie der Wissenschaften, Zentralinstitut
für Kybernetik und Informationsprozesse, Kurstrasse 33,
DDR-1080 Berlin (49).

JACOBSON, Dr. D.H., Vice-President, CSIR, P.O.Box 395, Pretoria
0001, South Africa (50).

JAMES, Dr. H.G., Communications Research Centre, P.O.B.490,
Station H, Ottawa, Ontario K2H 8S2, Canada (43).

- JEUKEN, Dr. M.E.J., Technische Hogeschool Eindhoven, Afdeling Elektrotechniek, Eindhoven, Netherlands (38).
- JONES, Dr. D., British Antarctic Survey, Madingley Road, Cambridge CB3 0ET, United Kingdom (44).
- JORDAN, Dr. A.K., Naval Research Laboratory, 4555 Overlook Ave., S.W., Washington D.C. 20375, USA (46).
- JØRGENSEN, Dr. T.S., Geophysics Department, Danish Meteorological Institute, Lyngbyvej 100, DK-2100 Copenhagen Ø, Denmark (43).
- JOSS, Dr. J., Motto, CH-6655 Ubtragna, Switzerland (41).
- JULL, Dr. E.V., University of British Columbia, 2356 Main Mall, Vancouver, B.C. V6T 1W5, Canada (48).
-
- KAARLS, Mr. R., Van Swinden Laboratorium, Alphons Diepenbrockhof 2, ' Gravenhage, Netherlands (35).
- KAFTAN, Dr. May, Council for Scientific Research, Director ASRC, P.O.Box 255, Baghdad, Iraq (33, 34).
- KALLIOMAKI, Prof. K., University of Oulu, SF-90100 Oulu 10, Finland (34).
- KANGAS, Dr. J. University of Oulu, SF-90100 Oulu 10, Finland (43).
- KANTOR, Dr. I.J., INPE, C.P. 515, 12200 Sao José dos Campos, SP, Brazil (41).
- KAPAHI, Dr. V.K., TIFR Centre, Post Box 1234, Bangalore 560012, India (45).
- KARBOWIAK, Prof. A.E., Department of Electrical Engineering, University of New South Wales, Box 1, Kensington 2033, N.S.W., Australia (36).
- KARTASCHOFF, Dr. P., La Pistoule 28, CH-2036 Cormondrèche, Switzerland (50).
- KAUFMANN, Prof. P., INPE, C.P.515, 12200 Sao José dos Campos, SP, Brazil (45, 48).

- KEAY, Dr. R.W.J., The Royal Society, 6 Carlton House Terrace, London SW1Y 5AG, United Kingdom (50).
- KERSLEY, Dr. L., United Kingdom (43).
- KIMURA, Prof. I., Faculty of Engineering, Kyoto University, Yoshida-Honcho, Sakyo-ku, Kyoto-shi, Kyoto 606, Japan (44, 47).
- KING, Dr. J.W., SERC Rutherford and Appleton Laboratory, Chilton, Didcot, Oxon, OX11 0QX, United Kingdom (42).
- KLEIN, Prof. Dr. Ing. J.W., Ruhruniversität, Postfach 102148, D-4630 Bochum (38).
- KLOBUCHAR, Dr. J., Cunant Road, Lincoln, Mass.01773,USA (43).
- KNEPPO, Dr. I., Electrotechnical Institute, Slovak Academy of Sciences, Dubravska Cesta 4a, 809-32 Bratislava, Czechoslovakia (38).
- KNOCH, Prof. L., Instytut Radiokomunikacji, Politechnika Gdanska, ul. Majakowskiego 11/12, 80-952 Gdańsk-Wrzeszcz, Poland (41).
- KNUDSEN, Prof. H.L., Electromagnetics Institute, Technical University of Denmark, DK-2800 Lyngby, Denmark (36).
- KORNIEWICZ, Dr. R.H., Zakład Fizyki Doświadczalnej, CIOP, Plac Konstytucji 2, 00 552 Warszawa, Poland (35).
- KOSE, Prof. Dr. V., Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-3300 Braunschweig, FR of Germany. Phone: 0531/592 2240. Telex: 9-52 822 (ptd d) (34,35,48).
- KOSIŹO, Dr.T., Instytut Radioelektroniki, Politechnika Warszawska, ul. Nowowiejska 15/19, 00-665 Warszawa, Poland (50).
- KOVACEVIC, Prof. B., Pariske Komune 23, Novi Beograd, Yugoslavia (35).
- KRATENA, Dr. L., Institute of Radioengineering and Electronics, Czechoslovak Academy of Sciences, Lumumbova 1, Praha 8 - Kobylisy, Czechoslovakia (48).
- ..
- KRUGER, Dr. A. Zentralinstitut für Solar-terrestrische Physik, Rudower Chaussee 5, DDR-1199 Berlin-Adlershof, GDR (45).
- KRUL, Prof. L., Technische Hogeschool Delft, Afdeling Elektrotechniek, Delft, Netherlands (41).
- ..
- KUHN, Dr. U., Rundfunk- und Fernsehtechnische Zentralamt, DDR-1601 Kolberg Krs. Königs-Wusterhausen, GDR (40).

- KULSHRETHA, Dr. S.M., Dep. Director General, India Meteorological Dept., Lodi Road, New Delhi 110003, India (41).
- KUMMER, Prof. Dr.-Ing. M., Technische Hochschule Ilmenau, DDR-63 Ilmenau, GDR (36).
- LACOUME, Prof. J.-L., CEPHAG, Domaine Universitaire, B.P. 46, F-38402 St-Martin-d'Hères, France (37, 44).
- LANDMARK, Dr. B., NTN/R, Gaustadalléen 30D, Postboks 309, Blindern, Oslo 3, Norway (35).
- LANGENBERG, Dr. K.J., Theoretische Elektrotechnik, Universität des Saarlandes, D-6600 Saarbrücken, FR of Germany (46).
- LASTOVICKA, Dr. J., Geophysical Institute, Czechoslovak Academy of Sciences, Bocni II-1a, 141-31 Praha 4, Czechoslovakia (42).
- LEDINEGG, Univ. Prof. Dr. E., Institut für Theoretische Physik, Technische Universität, Kopernikusgasse 24, A-8010 Graz, Austria (36).
- LEFEUVRE, Dr. F., LPCE/CNRS, av. de la Recherche Scientifique, F-45045 Orléans Cedex, France (43, 47).
- LEITINGER, Dr. F., Karl-Franzens-Universität Graz, Institut für Meteorologie und Geophysik, Halbärthgasse 1, A-8010 Graz, Austria (43).
- LE MEZEC, M. J., CNET, Route de Trégastel, F-22301 Lannion, France (38).
- LIANG, Mr. Kang-Ping, Directorate General of Telecommunications, Ministry of Communications, P.O.Box 84, Taipei, Taiwan (34, 50).
- LIKHTER, Dr. Ya. I., IZMIRAN, Akademgorodok, Moscow Region, USSR (40).
- LINDELL, Prof. I.V., Helsinki University of Technology, E.E. Department, Otakaari 5A, SF-02150 Espoo 15, Finland (36).
- LITTLE, Assoc. Prof. A.G., School of Physics, Univ. of Sydney, Sydney 2006, NSW, Australia (45).

- LOCKE, Dr. J.L., Herzberg Institute of Astrophysics, National Research Council of Canada, Ottawa K1A 0R6, Canada (34).
- LOMBARD, M. D., CNET/PAB/ETR, 38 rue du Général Leclerc, F-92131 Issy-les-Moulineaux, France (49).
- LUCAS, Dr. J.G., Department of Electrical Engineering, University of Sydney, NSW 2006, Australia (37).
- LUCK, Dr. J. McK., Division of National Mapping, P.O.Box 31, Belconnen ACT 2616, Australia (34).
- LUNDBOM, Mr. P.O., Chief Engineer, Research Institute of National Defence, Dept. 3, S-104 50 Stockholm 80, Sweden (35).
- LUNDQUIST, Prof. S., Institute of High Tension Research, S-755 70 Uppsala, Sweden. Phone: 018/130830 (34,39,40,50).
- LYONS, Dr. L.R., Space Environmental Laboratory, NOAA, R43, 325 Broadway, Boulder, CO 80303 (45).
-
- MACPHIE, Dr. R.H., Department of Electrical Engineering, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada (36).
- MAEHLUM, Dr. B., FFI/E, Postboks 25, N-2007 Kjeller, Norway (44).
- MAGUN, Dr. A., Halen 66, CH-3037 Stuckishaus, Switzerland (46).
- MALHERBE, Dr. J.A.G., Faculty of Engineering, University of Stellenbosch, Stellenbosch 7600, South Africa (36).
- MALHERBE, Dr. P. le R., Head, International Relations, Information and Research Services, CSIR, P.O.Box 395, 0001 Pretoria, South Africa (50).
- MANDOUR, Prof. I., 6 Hoda Street, Loran Alexandria, Egypt (34).
- MARTIN, Prof. D.H., Department of Physics, Queen Mary College, Mile End Road, London E1 4NS, United Kingdom (46).
- MARTINEZ, Prof. Roberto Rivas, Comision de Pesas y Medidas, General Ibanez de Ibero num.3, Madrid 3, Spain (35).

- MASS, Dr. J. Radio Observatory, P.O.B.911, Haifa 31008, Israel (41).
- MATSUMOTO, Dr. H. Kyoto University, Ionosphere Research Lab., Uji 611, Kyoto, Japan (44).
- MATTHEWS, Prof. P.A., Department of Electrical and Electronic Engineering, The University, Leeds, LS2 9JT, United Kingdom (38).
- MATZLER, Dr. Ch., Staffelweg 30, CH-3302 Moosseedorf, Switzerland (41).
- McGEE, Dr. W.F., Bell Northern Research, P.O.Box 3511, Station C, Ottawa, Ontario K1Y 4L7, Canada (37).
- MEKHANNIKOV, Dr. A.I., Institute of Radioengineering and Electronics, Ac. Sci., Prospekt Marksa 18, 103907 Moskva K-9, USSR,(35).
- MELCHIOR, Prof. Dr. H., Freudenbergstr. 101/F-1, CH-8044 Zurich, Switzerland (39).
- MELROSE, Prof. D.B., Department of Theoretical Physics, University of Sydney, Sydney NSW 2006, Australia (43).
- MENDILLO, Prof. M., Department of Astronomy, Boston University, Boston, Mass. 02215, USA (47).
- MERINO, Prof. D. Elias Munoz, ETS de Ingenieros de Telecomunicacion, Ciudad Universitaria, Madrid 3, Spain (38).
- MIGULIN, Prof.V.V., IZMIRAN, Akademgorodok, Moscow Region, USSR (33, 50).
- MINNIS, Dr. C.M., c/o URSI Secretariat, av. A. Lancaster 32, B-1180 Bruxelles, Belgium (33, 47).
- MITRA, Dr. A.P., Jawaharlal Nehru Fellow, Radio Science Division, National Physical Laboratory, Hillside Road, New Delhi 110012, India. Phone: 585298. Cables:Natphylab New Delhi. Telex: 3726 RSD, NPL (33, 34, 47, 48, 49).
- MOBIUS, Dr. K., Amt für Standardisierung, Messwesen und Warenprüfung, Bereich Messwesen, Wallstr. 16, DDR-102 Berlin GDR (35).
- MOLSKI, Dr. J., ul. Sady Zoliborskie 11, m.1,01-772 Warszawa, Poland (42).
- MOORE, Prof. R.K., Remote Sensing Laboratory, 2291 Irving Hill Road, Lawrence, Kansas 66045, USA (46).

- NISSEN, Mr. H.G., Danish Research Centre for Applied Electronics, Venlighedsvej 4, DK-2970 Hørsholm, Denmark (39).
- NUNES, Prof. Dr. Rogerio Silva Sousa, Astronomical Observatory, University of Porto, Porto, Portugal (38).
- O'DONNELL, Mr. M., c/o Royal Irish Academy, 19 Dawson Street, Dublin 2, Republic of Ireland (49).
- OGUCHI, Dr. T., Radio Research Laboratories, 4-2-1 Nukui-Kitamachi, Koganei-shi, Tokyo 184, Japan (41).
- OHMAN, Dr. B., Swedish Telecommunication Administration, S-123 86 Farsta, Sweden (50).
- OKAMURA, Prof. S., Japan Society for Promotion of Science, Yamato Building, 5-3-1 Kojimachi, Chiyoda-ku, Tokyo 100, Japan. Phone: 03-263-1721 (33, 35).
- OKOSHI, Prof. T., Department of Electronic Engineering, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113, Japan (38).
- OKOYE, Dr., Department of Physics, University of Nigeria, Nsukka, Nigeria (46).
- OKSMAN, Prof. J., University of Oulu, E.E. Department, SF-901000 Oulu 10, Finland (42).
- OLINER, Prof. A.A., Polytechnic Institute of New York, 333 Jay Street, Brooklyn, N.Y. 11201, USA (39).
- ONI, Dr. C.E., Department of Physics, University of Ibadan, Ibadan, Nigeria (44).
- OSSAKOW, Dr. S.L., Code 7750, Naval Research Laboratory, Washington D.C. 20375, USA (45).
- OWOLABI, Prof. I.E., University of Ilorin, Department of Electrical Engineering, Ilorin, Nigeria (41).
- OYINLOYE, Dr. O. Department of Physics, University of Ilorin, Ilorin, Nigeria (33, 34, 42, 50).

- PADULA-PINTOS, Prof. V.H., CAERCEM, Julian Alvarez 1218, 1414 Buenos Aires, Argentina (34, 39, 48).
- PAI, Prof. Kwang-Hong, Department of Electrical Engineering, National Taiwan University, Taipei, Taiwan (44).
- PARADA, Dr. Nelson de Jesus, Director INPE, C.P.515, Sao José dos Campos, SP, Brazil (48).
- PATRICIO, Mr. Joaquim Fernandes, Director das Radiocomunicações dos CTT, Rua do Conde Redondo, 79-1º, 1189 Lisboa, Codex, Portugal (50).
- PEDRO, M. Belmiro José, Meteorological and Geophysical Service, Macao (42).
- PEEK, Dr. ir. J.B.H., Philips Research Laboratories, Eindhoven, Netherlands (49).
- PERONA, Dr. G., Politecnico di Torino, Corso Duca degli Abruzzi 24, I-10124 Torino, Italy (44).
- PETIT, Dr. M., Institut National d'Astronomie et de Géophysique, 77 avenue Denfert-Rochereau, F-75014 Paris, France (33, 43).
- PFLEIDERER, Prof. J., Institut für Astronomie, Universität Innsbruck, Universitätstrasse 4, A-6020 Innsbruck, Austria (45).
- PIEFKE, Prof. Dr. G., Institut für Theoretische Elektrotechnik, Technische Hochschule, Schlossgartenstrasse 8, D-6100 Darmstadt, FR of Germany (36).
- PIGGOTT, Dr. W.R., 21 Hillingdon Road, Uxbridge, Middlesex UB10 0AD, United Kingdom (42).
- PILLER, Dr. O., Aeckerlo, CH-1715 Alterswil, Switzerland (35).
- PILLET, Dr. G., CNET/DICET, 38 rue du Général Leclerc, F-92131 Issy-les-Moulineaux, France (48, 49).
- PIRJOLA, Lic. Ph.R., Administration of Posts and Telegraphs, Telegraph Department, P.O.Box 526, SF-00101 Helsinki 10, Finland (39).
- POPOVIĆ, Prof. Dr. B., Electrotechnical Faculty of Belgrade, P.O.Box 816, Beograd, Yugoslavia (50).

PORTELA, Prof. A., Instituto de Investigaciones Biofisicas, Consejo Nacional de Investigaciones Cientificas y Técnicas, 1023 Buenos Aires, Argentina (35).

PROKOP, Dr. J., Faculty of Engineering, Technical University of Prague, Suchbatarova 4, 166-27 Praha 6, Czechoslovakia (40).

RADHAKRISHNAN, Dr. V., Director, Raman Research Institute, Bangalore 560 006, India. Phone:30522. Telex:845 671. Cables: RAMAINST BANGALORE (45).

RADICELLA, Prof. S., PRONARP, Arenales 1446, 6°"C", 1061 Buenos Aires, Argentina (33, 34, 42).

RAO, Prof. P.B., Dept. of Physics, Kerala University, Kariavattom, Trivandrum 695581, India (42).

RANVAUD, Dr. R.D.P.K.C., INPE, C.P. 515, Sao José dos Campos, SP, Brazil (38).

RATCLIFFE, Mr. J.A., Huntingdon Road 193, Cambridge CB3 0DL, United Kingdom (33).

RAWER, Prof. K., Herrenstrasse 43, D-7801 March-Hugstetten, FR of Germany (43, 47).

REDDY, Dr. B.M., USA (43).

REIZ, Prof. A., Astronomical Observatory, Øster Voldgade 3, DK-1350 Copenhagen K, Denmark (45).

RIBES, Dr. J.C., Institut National d'Astronomie et de Géophysique, 77 avenue Denfert-Rochereau, F-75014 Paris, France (45, 47).

RIEDLER, Univ. Prof. W., Institut für Nachrichtentechnik und Wellenausbreitung, Technische Universität, Infeldgasse 12, A-8010 Graz, Austria (40, 41).

RIGBY, Prof. G.A., School of Electrical Engineering, P.O.Box 1, Kensington NSW 2033, Australia (38).

ROBINSON, Dr. B.J., CSIRO, Division of Radiophysics, P.O.Box 76, Epping NSW, 2121 Australia (47).

- RODRIGUEZ VIDAL, Prof. D.M., Facultad de Ciencias Fisicas,
Universidad Complutense, Madrid 3, Spain (33, 36, 50).
- RØDSRUD, Ms.E., NTN/PFM, Postboks 25, N-2007 Kjeller,
Norway (50).
- ROMERO-SIERRA, Dr. C., Department of Anatomy, Queen's Univer-
sity, Kingston, Ontario, Canada (35).
- ROSENTHAL, Prof. S., Microwave Research Institute, Polytechnic
Institute of New York, Route 110, Farmingdale, N.Y.11735,
USA (35).
- ROWE, Dr. H., Bell Laboratories, Crawford Hill, Holmdel, New
Jersey 07733, USA (46).
- RUSH, Dr. C.M., Air Force Geophys. Lab., L.G. Hanscom AFB,
MA 01731, USA (34, 43).
- RUSHIN, Dr. Sh., Department of Engineering, Tel Aviv Univer-
sity, Ramat-Aviv, Tel Aviv, Israel (38).
-
- SAAL, Prof. Dr. Ing. R., Technische Universität München, Lehr-
stuhl für Netzwerktheorie und Schaltungstechnik, Arcis-
strasse 21, D-8000 München 2, FR of Germany (37).
- SABURI, Dr. Y., Radio Research Laboratories, 4-2-1 Nukui-Kita-
machi, Koganei-shi, Tokyo 184, Japan (35).
- SADIK, Dr. Aziz R., Astronomy and Space Research Center, P.O.B.
255 Jadiryah, Baghdad, Iraq (45, 49).
- SAKURAI, Prof. K., Chief, Radio and Opto-Electronic Div.,
Electrotechnical Laboratory, Ministry of International
Trade and Industry, Tanashi, Tokyo, Japan (35).
- SALEM, Dr. I.A.M., c/o Academy of Scientific Research and Tech-
nology, Dept. of Scientific Societies and International
Scientific Unions, 101 Kasr El-Einy Street, Cairo,
Egypt (49).
- SANYAL, Prof. G.S., Radar and Communication Centre, Indian
Institute of Technology, Kharagpur 721302, India (36).

- SARKAR, Dr. T., Electrical Engineering Department, Rochester Institute of Technology, Rochester, N.Y.14623, USA (46)!
- SATO, Dr. T., Theoretical Research Center for Nuclear Fusion, Hiroshima University, Hiroshima 730, Japan (45).
- SAUZADE, M.M., Institut d'électronique fondamentale, Université de Paris-Sud, F-91405 Orsay, France (38).
- SCAVENNEC, M.A., CNET, Groupement PEC - 196, rue de Paris, F-92 220 Bagneux, France (47).
- SCHALWIJK, Prof. Dr. J.P.M., Technische Hogeschool Eindhoven, Afdeling Elektrotechniek, Eindhoven, Netherlands (37).
- SCHANING, Observatorium für Ionosphärenforschung, Mitschurinstrasse 4/6, DDR-2565 Kühlungsborn, GDR (39).
- SCHEFTE, Dr. H., Telefon AB LM Ericsson, DtF, S-126 25 Stockholm, Sweden (36, 37).
- SCHLEGEL, Dr. K., Max-Planck-Institut für Aeronomie, Postfach 80, D-3411 Katlenburg Lindau 3, FR of Germany (42).
- SCHON, Dr. K., Physikalisch-Technische Bundesanstalt, Postfach 3345, D-3300 Braunschweig, FR of Germany (46).
- SEBASTIAN, Dr. D.L.J., Facultad de Ciencias Fisicas, Universidad Complutense, Madrid 3, Spain (50).
- SEIDLER, Prof. J., Instytut Telekomunikacji, Politechnika Gdańska, Majakowskiego 11/12, 80-952 Gdańsk-Wrzeszcz, Poland (37).
- SEKIGUCHI, Prof. T., Faculty of Engineering, Tokyo Institute of Technology, 2-12-1 Ookayama, Meguro-ku, Tokyo 152, Japan (36).
- SENIOR, Prof. T.B.A., Radiation Laboratory, Electrical and Computer Engineering Dept., The University of Michigan, Ann Arbor, MI 48109, USA (50).
- SENISE, Prof. J.T., President, Instituto Maua de Tecnologia, Sociedade Brasileira de Micro Ondas, Estrada das Lagrimas, 2035, 09500 Sao Caetano do Sul, Brazil (36).
- SERAFIMOV, Prof. K., Bld Ruski 1, Sofia 1000, Bulgaria (48).
- SHABAN, Mr. Ali M.A., Telecommunications General Establishments, Al-Jumhuriya St., Baghdad, Iraq (36, 39).
- SHAPIRA, Dr. J., Department of Electrical Engineering, Technion Haifa 32000, Israel (49).

- SHEARMAN, Prof. E.D.R., Department of Electronic and Electrical Engineering, The University, P.O.Box 363, Edgbaston, Birmingham B15 2TT, United Kingdom (41).
- SHEEHY, Mr. M., c/o Royal Irish Academy, 19 Dawson Street, Dublin 2, Ireland (49).
- SIFOROV, Prof. V.I., Institute of Information and Transmission Problems, Ac. Sci., 8a Aviamotornaya ul. Moskva E-24, USSR (38).
- SITA RAM, Prof. R.V.S., Chief Executive, SMPU, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400005, India (38).
- SMITH, A.J., British Antarctic Research, Madingley Road, Cambridge CB3 0EZ, United Kingdom (45).
- SMITH, Prof. R.B., Postgraduate School of Studies in Electrical and Electronic Engineering, University of Bradford, Bradford, Yorkshire BD7 1DP, United Kingdom (35).
- SMOLINSKI, Prof. A., Instytut Podstaw Elektoniki, Politechnika Warszawska, ul. Nowowiejska 15/19, 00-665 Warszawa, Poland. Phone: 25 37 68. Telex: 813 507 itel pl (33, 34, 50).
- SOARES ASSIS, Prof. Mauro, Embratel, Depto de Treinamento, Rua Senador Pompeu 27, 20080 Rio de Janeiro, R.J., Brazil (40).
- SPASOV, Dr. A., bld Lenina 72, Sofia 1113, Bulgaria (48).
- SPAULDING, Dr. A.D., Radio Spectrum Occupancy Group, US Dept. of Commerce, Office of Telecommunications, Boulder, CO 80302, USA (40).
- SPRENGER, Prof. Dr. K., Observatorium für Ionosphärenforschung Mitschurinstrasse 4/6, DDR-2565 Kühlungsborn, GDR (42).
- STEELE, Mr. J. McA., National Physical Laboratory, Teddington, TW11 0LW, United Kingdom (35, 47).
- STETTE, Prof. G., Institutt for teleteknikk, Universitetet i Trondheim, N-7034 Trondheim, Norway (37).
- STOKKE, Mr. K.N., Teledirektoratet, Radiotransmijonskontoret, Postboks 6701, N - Oslo 1, Norway (39).
- STONE, Prof. R., 1446 Vista Claridad, La Jolla, CA 02937, USA (46).

- STRACCA, Dr. G.B., Istituto Elettrot. e Elettr., Politecnico di Milano, P.le Leonardo da Vinci 32, I-20100 Milano, Italy (37).
- STRANSKY, Prof. Dr. J., Faculty of Electrical Engineering, Technical University of Prague, Suchbatarova 4, Praha 6 - Dejvice, Czechoslovakia (48).
- STUBB, Prof. T., Helsinki University of Technology, E.E. Department, Otakaari 5A, SF-02150 Espoo 15, Finland (38).
- STUBBE, Dr. P., Max-Planck-Institut für Ionosphärenforschung, D-3411 Katlenburg Lindau, FR of Germany (47).
- STUBKJAER, Dr. K., Electromagnetics Institute, Bldg 348, Technical University of Denmark, DK-2800 Lyngby, Denmark (38).
- STUMPERS, Prof. F.L.H.M., Elzentlaan 11, Eindhoven 561 1LG, Netherlands. Phone: (40) 115512 (34, 39, 49).
- SUCHY, Prof. K., Institut für Theoretische Physik (II) der Universität Düsseldorf, Universitätsstrasse 1, D-4000 Düsseldorf 1, FR of Germany (44).
-
- TANAKA, Prof. Haruo, School of Electricity, Faculty of Engineering, Toyo University, Kawaga-shi 350, Japan (49).
- TENG, Mr. Yuan-Cheng, Chief, Radio Science Laboratory, Telecommunication Laboratories, DGT, MOC, P.O.Box 71, Chung-Li, Taipei, Taiwan (35).
- THOMPSON, Dr. D.C., NZ Meteorological Service, P.O.Box 722, Wellington, New Zealand (41).
- THRANE, Dr. E., NDRE, N-2007 Kjeller, Norway (43).
- THUE, M. M., CNET/DICET, 38 rue du Général Leclerc, F-92131 Issy-les-Moulineaux, France (34).
- TITHERIDGE, Dr. J.E., Dept. of Physics, Auckland University, Private Bag, Auckland, New Zealand (42).
- TIURI, Prof. M., Helsinki University of Technology, E.E. Department, Otakaari 5A, SF-02150 Espoo 15, Finland (45, 49).

- TLAMICHA, Dr. A., Astronomical Institute, Czechoslovak Academy of Sciences, 251-65 Ondrejov u Prahy, Czechoslovakia (45).
- TOLMAN, Dr. J., Institute of Radioengineering and Electronics, Czechoslovak Academy of Sciences, Lumumbova 1, 180-88 Praha 8, Czechoslovakia (34).
- TONNING, Prof. A., Institutt for Fysikalsk elektronikk, Universitetet i Trondheim, N-7034 Trondheim, Norway (36).
- TROITSKIJ, Prof. V.S., Institute of Radioengineering and Electronics, Ac. Sci., Prospekt Marksa 18, 103907 Moskva K-9, USSR (46).
- TSURUDA, Dr. K., Institute of Space and Astronautical Science, Komaba 4-6-1, Tokyo 153, Japan (45).
- TURNER, Mr. R., National Physical Research Laboratory, CSIR, P.O.Box 395, Pretoria 0001, South Africa (35).
- TURSKI, Dr. A., Instytut Podstawowych Problemow Techniki PAN, ul. Święto krzyńska 21, 00-049 Warszawa, Poland (44).
- UNGER, Prof. Dr. Ing. H.-G., Institut für Hochfrequenztechnik, Technische Universität Braunschweig, Postfach 3329, D-3300 Braunschweig, FR of Germany. Phone: (0531)3912422. Telex: (TU) 952526 tubsw. (35, 36).
- UNGSTRUP, Dr. E., Danish Space Research Institute, Lundtoftevej 7, DK-2800 Lyngby, Denmark (42).
- VAN BILJON, Prof. L., Department of Electrical Engineering, University of Pretoria, Hillcrest, Pretoria 0083, South Africa (38).
- VAN BLADEL, Prof. J., Lab. voor Electromagnetisme en Acustica, Rijksuniversiteit Gent, St-Pietersnieuwstraat 41, B-9000 Gent, Belgium. Phone: (91) 233821 ext.2435 (33).

- VANDER VORST, Prof. A.S., Laboratoire de Télécommunications et d'Hyperfréquences, UCL, Bâtiment Maxwell, B-1348 Louvain-la-Neuve, Belgium (36).
- VAN ECK, Prof. J.L., Faculté des Sciences Appliquées, Université Libre de Bruxelles, av. F.D. Roosevelt, 1050 Bruxelles, Belgium (38).
- VANIER, Dr. J., Dépt. de Génie Electrique, Université Laval, Cité Universitaire, Québec, P.Q., G1K 7P4, Canada (34).
- VAN ZANDT, Dr. Th.E., NOAA/ERL/R445, 325 Broadway, Boulder, CO 80303, USA (50).
- VESSEUR, Mr. H.J.A., Koninklijk Nederlands Meteorologisch Instituut, de Bildt, Netherlands (42).
- VICE, Mr. R.W., Director, National Institute for Telecommunications Research, P.O.Box 3718, Johannesburg 2000, South Africa (39, 41).
- VILJOEN, Prof. H.C., Faculty of Engineering, University of Stellenbosch, Stellenbosch 7600, South Africa (34).
- VITERBI, Dr. A.J., Linkabit Corp., 10453 Roselle St., San Diego, CA 92121, USA (38).
- VOGE, M.J., Direction des Affaires Internationales, Immeuble PERISUD (pièce 7410), 7 boulevard Romain Rolland, F-92128 Montrouge, France (34).
- VOSS, Prof. W.E., Division of Biomedical Engineering and Applied Sciences, Rm 247 Civil/Electrical Bldg, University of Alberta, Edmonton, Alberta T6G 2G7, Canada (36).
- WAGNER, Dr. Chr.-U., Zentralinstitut für Solar-terrestrische Physik, Bereich Physik der Sonne und Magnetosphäre, Telegrafenberg, DDR-15 Potsdam, GDR (44).
- WALKER, Prof. A.D.M., Department of Physics, University of Natal, King George V Avenue, Durban 4001, South Africa (44).
- WALDTEUFEL, Dr. Ph., Météorologie nationale, 73-75 rue de Sèvres, F-92106 Boulogne, France (40).

- WANG, Prof. Mei-Hwa, Engineering Dept., Directorate General of Telecommunications, P.O.Box 84, Taipei, Taiwan (41,50)
- WEBSTER, Dr. A.R., Faculty of Engineering Science, University of Western Ontario, London, Ontario, Canada (40).
- WEENINK, Prof., Technische Hogeschool Eindhoven, Afdeling Elektrotechniek, Eindhoven, Netherlands (44).
- WEISSGLASS, Dr. P., Chief, Solid State Division, Microwave Institute, Royal Institute of Technology, S-100 44 Stockholm 70, Sweden (36).
- WIEGMANN, Prof. Dr.-Ing. F., Technische Universität Dresden, Sektion Informationstechnik, Mommsenstr. 13, DDR-8027 Dresden, GDR (37).
- WIELEBINSKI, Prof. R., Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, D-5300 Bonn, FR of Germany (45).
- WILLIAMSON, Dr. A.G., Department of Electrical and Electronic Engineering, University of Auckland, Private Bag, Auckland, New Zealand (36).
- WILLIAMSON, Dr. W.J., Ass.Dir. of Research, Telecommunication Research Laboratories, 762-772 Blackburn Road, Clayton North, VIC 3168, Australia (40).
- WOJNAR, Prof. A., ul. Sady Zoliborskie 17, m.24, 01-772 Warszawa, Poland (39).
- WOLF, Prof. J.R., Department of Electrical and Computer Engineering, University of Massachusetts, Amherst, Mass. 01003, USA. Phone: (413) 545-0723 (office); (413) 545 2441 (messages) (37).
- WOODMAN, Dr. R., Instituto Geofisico del Peru, Apartado 3747, Lima 100, Peru (48, 50).
- WRIGHT, Dr. J.W., NOAA/ERL/R43, 325 Broadway, Boulder, CO 80303, USA (43).
- WU, Prof. Tien-Shou, Research Institute of Electrical Engineering, National Cheng Kung University, Taiwan (39).

YEN, Dr. J.L., Dept. of Electrical Engineering, University of Toronto, Toronto M5S 1A4, Canada (45).

ZAMIR, Prof. U., Geophysics Department, Tel Aviv University, Ramat-Aviv 69978, Israel (44).

ZHABOTINSKIJ, Prof. M.E., Institute of Radioengineering and Electronics, Ac. Sci., Prospekt Marksa 18, 103907 Moskva K-9, USSR (39).

ZIMA, Prof. V., Institute of Radioengineering and Electronics, Czechoslovak Academy of Sciences, Lumumbova 1, 180-88 Praha 8, Czechoslovakia (33).

ZIV, Mr. J., Ministry of Communications, Migdal Shalom, Tel Aviv, Israel (35).