

Table des matières - Contents

	Pages
Microwave Communication.....	1
Electromagnetic Compatibility - 1978.....	1
Propagation in Non-ionized Media, F. Eklund and P. Misme.....	3
EUROCON '77, F.L. Stumpers.....	5
COSPAR Meeting: Tel Aviv.....	8
Electromagnetic Compatibility - 1977.....	10
Waves and Instabilities in Plasmas.....	12
Spectrum Management.....	13
Beacon Satellite Measurements of Plasmaspheric and Ionospheric Properties.....	13



## MICROWAVE COMMUNICATION

The 6th Colloquium on Microwave Communication will be held, under the Chairmanship of Acad. G. Bognar, in Budapest, Hungary, from 29 August to 1 September 1978.

The main subjects will be:

- I. Trends in communications
- II. Communication system theory
- III. Circuit theory and computer aided design
- IV. Electromagnetic theory, antennas and propagation
- V. Microwave circuits and devices
- VI. Semiconductor and magnetic materials for microwave applications.

Papers dealing with research or the state-of-the-art in these fields will be welcomed. Prospective authors are requested to submit four copies of the English language summaries of the papers not later than 15 January 1978 to:

Secretary, MICROCOLL,  
1525 Budapest, 114,  
POB 15, Hungary.

The International Organising Committee will select the papers for presentation and will notify the authors of their decision before 15 March 1978. The maximum permitted length of the selected papers is four sheets (including figures) of the special paper which will be sent to the authors. The deadline for the receipt of the final manuscripts is 15 April 1978.

The Proceedings will be published before the Colloquium.

+ + + + +

## ELECTROMAGNETIC COMPATIBILITY - 1978

A Symposium on Electromagnetic Compatibility (EMC) will be held at the Technical University, Wróclaw, Poland from 13 to 15 September 1978. The official languages will be English and Russian, with simultaneous translation.

For the purposes of this event, EMC is defined as the ability of a device to function satisfactorily in its electromagnetic environment, without introducing intolerable disturbance into that environment, or inter-

fering with the functioning of other devices.

The following specific topics will be subjects for papers:

- Social and economic impact of EMC;
- Electromagnetic pollution, control and enforcement;
- Spectrum economy and management;
- Systems planning;
- National and international cooperation;
- Propagation of interference and its suppression;
- Antenna patterns;
- EMC of power, transport and communication systems;
- Immunity of analogue and digital devices and systems;
- Medical electronics, biological effects;
- Interference statistics, etc.

A specialised exhibition relevant to the Symposium will be held at the same time. There will also be social events and excursions.

Papers are invited on all aspects of EMC and authors are requested to send 5 copies of a one-page summary (if possible in both English and Russian) not later than 30 October 1977 to:

Prof. R. Struzak,  
EMC Symposium,  
Box 2141,  
51-654 Wróclaw, Poland.

Authors will be notified about their papers, and will receive an author's kit by 31 December 1977. The full text of papers that have been accepted must be received (in English or in Russian) by 15 March 1978. These texts will be reproduced in the Symposium Record, copies of which will be available at the beginning of the Symposium.

Requests for further information should be addressed to the Secretary General:

Mr. W. Moron,  
EMC Symposium,  
Box 2141,  
51-654 Wróclaw, Poland.

+ + + + +

PROPAGATION IN NON-IONIZED MEDIA  
La Baule, 1977

At the General Assembly in Lima (1975), the URSI Council invited each of the scientific Commissions to consider organising an Open Symposium in the interval between two Assemblies. In accordance with this recommendation, Commission F organised an Open Symposium covering its whole field of interest. At the invitation of the URSI Member Committee in France, the Symposium was held at La Baule, from 28 April to 6 May 1977.

Scientific Activities

The Symposium was attended by 180 participants from 23 countries and 3 international organizations (ESA, CCIR, UER). It is worth noting that some of the participants came from countries which do not adhere to the Union and from countries which are but seldom represented at URSI meetings. This resulted in a very useful exchange of views at international level and it shows that URSI Commission F is able to attract the specialists of the world in its field for the discussion of highly specialised topics.

The terms of reference of Commission F cover a wide variety of subjects the limits of which are, on the one hand, the purely geophysical studies of non-ionized media and, on the other, the applications of radio wave propagation data to the development of telecommunications systems. Thanks to the effort and the ability of the Scientific Programme Committee, the 140 papers which were presented in the period of 7 working days were all relevant to the subject matter. In order to avoid restricting the time allocated to each speaker to less than 20 minutes, some sessions were held in parallel. In such cases the relation between the topics discussed in the simultaneous sessions was sufficiently loose to give the participants an easy choice.

The main subjects discussed in the various sessions are given below:

- Nature and structure of clear air: this included the characteristics of the atmospheric layers, absorption by gases, etc., and measurements made *in situ* or by remote sensing.
- Nature of rain from the viewpoint of applications to telecommunications: this did not relate to the

geophysical aspects, but to the form of the rain drops and the spectrum of their diameters for specific applications.

- Absorption, scattering and depolarisation due to rain: this covered a great number of studies relating to applications to both horizontal and oblique links.
- Utilisation of propagation techniques for acquiring knowledge on the nature of the surface and of underground structures: the discussions referred to the principles of the methods of measurement and analysis.
- Propagation effects which limit the performance of telecommunication systems: the papers presented dealt with techniques and models for describing propagation characteristics of ground-ground and ground-satellite transmission channels.

Independently of the Symposium, two international working parties of the CCIR held meetings at La Baule. A large number of participants in URSI activities are also active in the CCIR organisation and, in the domain of Commission F, the cooperation between URSI and CCIR was initiated many years ago.

#### Some Remarks following the Symposium

Commission F has been the first to act on the recommendation of the General Assembly of URSI in 1975 and it is worth considering the advantages and disadvantages of the La Baule Symposium.

#### Advantages:

- The wide range of countries represented;
- The relatively low age, on average, of the participants;
- Sufficient time was allocated to each speaker;
- The choice of a small town, which enabled the participants to maintain permanent contact with each other;
- The publication of the Proceedings which represent an important source of information.

#### Disadvantages:

- The Member Committees of URSI did not all respond to the call for circulation of information. In some countries, many potential participants were not aware of the event.
- Some of the participants attended only the sessions

relevant to their own immediate interest and, in consequence, it seems that the didactical aspect of the Symposium was not sufficiently emphasised.

- In future symposia, the number of papers submitted will increase. What solution should be adopted if the number of high-quality papers submitted reached 200?

#### Conclusion

The Symposium has shown that URSI can bring together a majority of scientists and specialists interested in the topics covered by URSI Commission F.

A large number of participants expressed the opinion that the Symposium was highly successful as a forum for the exchange of scientific information.

URSI Commission F will seriously consider the organisation of a similar Open Symposium in the period 1979-1981. A proposal to this effect will be submitted to the XIXth General Assembly of URSI.

28 June 1977

F. Eklund  
P. Misme

x x x

Some copies of the Proceedings of the URSI Commission F Open Symposium (La Baule, 28 April - 6 May 1977) are available at 150 French francs, including postal charges. Cheques should be made payable to "Misme - URSI" and sent to M. P. Misme, CNET, 38 rue du Général Leclerc, F - 92131 Issy-les-Moulineaux, France.

This volume ( x + 646 pages) contains extended summaries of the papers presented (4-5 pages per paper) including graphs and diagrams.

+ + + + +

EUROCON ' 77: VENICE, 3 - 6 MAY 1977

Directly over the lagoon from the Piazza San Marco lies the island of San Giorgio Maggiore, with the church of the same name and the convent, which is now used for scientific conferences by the Fondazione Cini. Eurocon used the large Sala Cerrelutti, to the left of the church, as its reception hall. There the participants registered and were handed the two large books with the full text of all the papers ( over 1,400 pages) in a plastic bag. They

could also sit down and talk to old friends or admire the photographic exhibition organised by the industries that supported the organisation. In the convent itself we had six meeting rooms, the largest of which could hold about 600 people, and other facilities.

At the Opening Ceremony on Tuesday, there were addresses of welcome from the Chairman of the Conference Steering Committee ( Prof. Gigli ) and other dignataries. This was followed by a lecture on "The evolution of communications" by Prof. Gagliardi and an invited paper by Mr. Reid on "The long-term demand for, and planning of, new telecommunication services". This speaker sketched the uncertainties caused by social, economic and even political changes, but also the inertia caused by the immense size of a national telecommunication system, and by its monopolistic character.

On Tuesday afternoon there were two parallel sessions on advances in systems techniques, and on the exploitation of these techniques. A special meeting was held by students and young engineers in order to allow them to define what the societies could do for them. Later on Tuesday many participants attended a folklore evening and dinner in the tavern "Ai Musicanti", interrupted by a gondola ride through the canals and past the palaces.

On Wednesday there were parallel sessions on 1) Communications in large power systems, 2) New developments in communications, 3) Computers and communications, and 4) Communications and signal processing in medicine. Topic No 2 had drawn such a large number of good papers that the Programme Committee agreed to arrange three sessions in parallel. Even so, only just over half the papers received could be presented.

The arrangements on Friday were similar to those on Wednesday. Satellite, waveguide and optical communications all received attention as did switching methods, data communications, and new services such as teletext and viewdata. Microprocessors received much attention under Topics 2 and 3.

On Wednesday evening the R.A.I. invited the participants to a classical concert by the Trio di Trieste in the beautiful Palazzo Libia. During the interval the guests could admire the beautiful architecture and the paintings in their mediaeval glory.

The programme on Thursday was especially devoted

to Communications in the developing countries. After a short introduction by Dr. Rao (India, Section Chairman) and Prof. Carassa (Chairman, Technical Programme Committee), Mr. Mili, Secretary General of the International Telecommunications Union, gave the inaugural address, stressing the work of the ITU and its subsidiaries for the developing countries. Mr. Kirby, Director of CCIR, and Prof. Voge, President of URSI, also pointed out the way in which their organisations helped, and could further help, the developing countries. The Deputy Director General of UNESCO, Mr. Fobes, had sent in a contribution (presented by one of his associates) mentioning the efforts of his organisation in using communications for educational purposes. A remarkable lecture was given by Mr. Clarke (Sri Lanka) who, when still in the British Army in 1945, published the first paper on the geostationary satellite. He later published science fiction, and made a film on telecommunications in 2076 which appeared on American television. He also advised the Indian Space Research Council on its satellite work. On Thursday afternoon this Section split into five parallel sessions. Among the speakers from developing countries Prof. Wellenius (Chile), Prof. Sesay (Sierra Leone), Mr. Wanas (Libya), Mr. Ali (Saudi-Arabia), Messrs Narayanan and Gupta (India) could be mentioned. We also noted, among Sub-committee members and Chairmen, Messrs Kresch and Alber-naz (Brazil), Mr. Okundi (Kenya), Prof. Al-Mashat (Iraq), Mr. Hagopian (Iran), Mr. Molnadir (Indonesia). Algeria was also very well represented. Several speakers from developed countries gave their ideas on how best to organise an industry in a developing country (Messrs van den Brink and Aria) and Mr. Gupta described his own experience in an Indian communications industry. In the evening, Mr. Kirby chaired a forum during which the ideas of the day were summed up. In the discussion we noted the Indonesian domestic satellite network, inaugurated last year, which permitted parts of this country to bypass the development of centuries elsewhere.

On Thursday evening there was a second meeting for students together with representatives of societies, at which Mr. Raby discussed a sociological study of the commitment of engineers to their employing organisations. Several students wanted more opportunities for international contacts.

On Friday morning, Mr. Mikulsky (London) spoke on The art of technological forecasting, and on Industrial

market research. In the afternoon, some practical applications were discussed by this author, a team of Italian specialists and the audience, with Mr. Russell in the Chair.

As part of the Ladies programme, Mrs Rossi gave a lecture on "Personal experience of a woman manager in the telephone service". Quite a few male guests were noted in the audience.

With about 700 participants the Symposium was considered to be quite successful. It was acknowledged with appreciation that URSI had contributed greatly, especially to the day devoted to the needs of the developing countries.

June 1977

F.L. Stumpers

+ + + + +

#### COSPAR MEETING: TEL AVIV JUNE 1977

The 20th COSPAR Meeting was held in Tel Aviv, Israel in June 1977 at the invitation of the Israeli Academy of Sciences and Humanities. Nearly 500 participants were present.

#### Symposia

Apart from the papers presented in the 8 COSPAR Working Group Sessions, specialised symposia were held on:

- A. New instrumentation for space astronomy;
- B. Travelling interplanetary phenomena;
- C. Viking (Mars) science;
- D. Contributions of space science to global food information systems.

Altogether over 400 papers were presented during the COSPAR Meeting.

#### Publications

The following publications are planned:

1. Proceedings of Symposium A; ed. van der Hucht and Vaiana (Pergamon Press Ltd).
2. Proceedings of Symposium D; ed. Godby and Otterman (Pergamon Press Ltd).

3. Proceedings of Symposium B; ed. Shea, Smart and Wu (D.Reidel Publishing House - invited papers; Air Force Geophysics Laboratory, Bedford, Mass., USA - contributed papers).
4. The 49 papers in Symposium C will appear in a special issue of J. Geophysical Research.
5. The key papers presented on physical sciences will appear in Space Research XVIII; ed. Rycroft (Pergamon Press Ltd).
6. Papers on the life sciences will appear in Life Sciences and Space Research XVI; ed. Holmquist (Pergamon Press Ltd).

Programme for 1978

The 21st COSPAR Meeting will be held in Innsbruck, Austria, from 29 May to 10 June 1978. URSI has been invited to cosponsor the following symposia:

- Conference on the Results of ASHAY;
- Solar-terrestrial Physics;
- Planetary Surfaces and Atmospheres.

URSI has also been invited to cosponsor a Laser Workshop to be held in Athens, Greece, from 24 to 27 May 1978.

COSPAR Panel

Prof. K. Rawer has been designated as Chairman of the Panel on Potentially Environmentally Detrimental Activities in Space (formerly Potential Harmful Activities in Space) created in 1976. The Panel will prepare a report for submission to the U.N.. URSI Commission J(Radioastronomy) has been asked to designate a representative on the Panel. Radioastronomers, or others interested, are invited to communicate with the Chairman:

Prof. K. Rawer,  
Institut für Physikalische Weltraumforschung,  
Heidenhofstrasse 8,  
D - 78 Freiburg im Breisgau, FR Germany.

COSPAR Secretariat

More detailed information on the activities of COSPAR is available from the Executive Secretary:

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

+ + + + +

### ELECTROMAGNETIC COMPATIBILITY - 1977

Note. The Secretary General gratefully acknowledges the reports prepared by Prof. F.L. Stumpers and Mr. G.H. Hagn which provided the basis for this brief summary.

The 2nd EMC Symposium and Exhibition was held in Montreux from 28 to 30 June 1977 and was attended by nearly 400 participants from 25 countries, including 7 non-European countries. The Chairman was Prof.Dr. F.E. Borgnis of the Elektrotechnische Hochschule who was ably assisted by Dipl. Ing. T. Dvorak also of the ETH in Zurich.

At the Opening Meeting, welcoming addresses were given by Prof. Borgnis, by the Mayor of Montreux, by Prof. Stumpers (Chairman of the Programme Committee) and by Dr. Minnis (Secretary General of URSI). The Symposium was officially opened by Mr. Locher (Director General of the Swiss PTT).

The keynote address was given by Mr. Kirby (Director of CCIR) who took as his theme: Electromagnetic Compatibility and Telecommunications, and the growth of the subject over the past decade. Mr. Kirby underlined the importance of spectrum management, especially for the Administrative Radio Conference of ITU, a field being studied by CCIR Commission 1. Apart from the complex engineering questions associated with EMC, Mr. Kirby drew attention to the need for the study of certain scientific matters such as the optimization of communication channels in the presence of noise and interference, the development of statistical mathematical models, and the effects of electromagnetic radiation on biological systems. He expected that, in future, EMC would increasingly provide a basis for ensuring the protection and operational efficiency of radiocommunication systems.

The technical sessions on noise and interference focused on high-voltage power lines, motor vehicles,

computers, the statistics of noise, and the effects of noise on system performance. Other sessions dealt with classical subjects such as shielding, immunity, specifications and measurements (including those defined by CISPR). Electromagnetic pulses and the control of transients were also discussed. The sessions on safety margins for flammable gas mixtures and the effects of fields on plants, birds and in animals illustrated the need to consider the side effects arising from the use of electromagnetic energy. The session on frequency management was particularly appropriate in view of the forthcoming World Administrative Radio Conference in 1979.

Four Workshops were organised by H.K. Mertel (USA) on

- EMC diagnostics;
- Applications of programmable calculators for EMI prediction and EMC design;
- Electromagnetic pulse effects;
- Shielding methods and materials.

The close cooperation of international organisations in planning the scientific sessions was illustrated by the fact that the EMC Group of IEEE and URSI Commission E were responsible for finding the speakers for certain sessions. It is worth recording that one of the speakers invited by Mr. Hagn (Vice-Chairman, URSI Commission E) shared the First Prize for the best paper presented, namely: A.D. Spaulding (Inst. for Telecommunications Sciences, Boulder, USA) who discussed Optimum reception in the presence of impulsive noise. The other paper which shared the Prize was presented by A.P. Kalmakov (Leningrad Radio Research Inst., USSR) and dealt with Analysis of the statistical characteristics of click voltages measured with a CISPR RFI measuring set.

Apart from the formal sessions of the Symposium, mention should be made of the after-dinner address given by Prof. Prinz (Munich) on High-voltage electricity - then and now, and the visit to the Swiss PTT Earth-satellite terminal station at Leuk.

The Montreux Congress Centre, where the Symposium was held, afforded sufficient space for 20 industrial firms to organise an interesting exhibition of instruments and products likely to be of interest to scientists and engineers concerned with EMC.

Copies of the excellent Proceedings: Electromagnetic Compatibility, Montreux 1977 ( x + 567 pages) edited by T. Dvorak are available from:

Dipl. Ing. T. Dvorak,  
ETH Zentrum HF,  
CH - 8092 Zurich, Switzerland.

The price is 95 Swiss francs.

Copies can also be obtained from:

IEEE,  
345 East 47th Street,  
New York N.Y.,

quoting Ref. No 77CH-1224-5EMC.

+ + + + +

#### WAVES AND INSTABILITIES IN PLASMAS

Two publications are available following the successful International Congress on Waves and Instabilities in Plasmas, which was held in Palaiseau in June-July 1977:

##### 1. Book of Abstracts

This contains 252 summaries of the papers presented. Copies can be obtained from:

Laboratoire PMI,  
Ecole Polytechnique,  
F - 91128 Palaiseau Cedex, France.

Price: 50 French francs plus postage.

##### 2. Book of Survey Lectures

The 16 invited papers will be published in the Journal de Physique-Colloque towards the end of 1977. Requests for information regarding this volume should be addressed to:

Journal de Physique,  
Z.I. Courtaboeuf,  
BP 112,  
F - 91402 Orsay, France.

+ + + + +

#### SPECTRUM MANAGEMENT

A special issue of Transactions of IEEE-EMC is due for publication in August 1977. The Guest Editor is Mr. G.H. Hagn, Vice-Chairman of URSI Commission E, who has written the editorial introduction entitled: "What is the radio frequency spectrum and what is spectrum management all about?".

In addition to a survey paper by W. Dean Jr. on "Reflections on the spectrum management process", the volume contains 29 papers under the following main headings:

- International spectrum management;
- National spectrum management;
- Spectrum definitions and metrics, occupancy, and efficiency of usage;
- Predicting compatibility and frequency assignment strategies;
- Economics and spectrum management.

+ + + + +

#### BEACON SATELLITE MEASUREMENTS OF PLASMASPERIC AND IONOSPHERIC PROPERTIES

COSPAR and URSI have agreed to organise a Symposium on the above topic, to be held in Florence, Italy, from 22-25 May 1978. The provisional topics to be covered include:

- Electron content measurements using the ATS-6 Satellite;
- Behaviour of the plasmasphere during magnetic storms;
- Night-time changes in the ionosphere;
- Morphology of scintillations; modelling of ionospheric electron content;
- Comparison of results obtained in Europe and America.

The Chairman of the Organizing Committee, from whom further information can be obtained, is:

Professor P.F. Checacci,  
Istituto di Ricerca sulle Onde Elettro-  
magnetiche,  
Via Panciatichi 56,  
I - 50127 Firenze, Italy.

