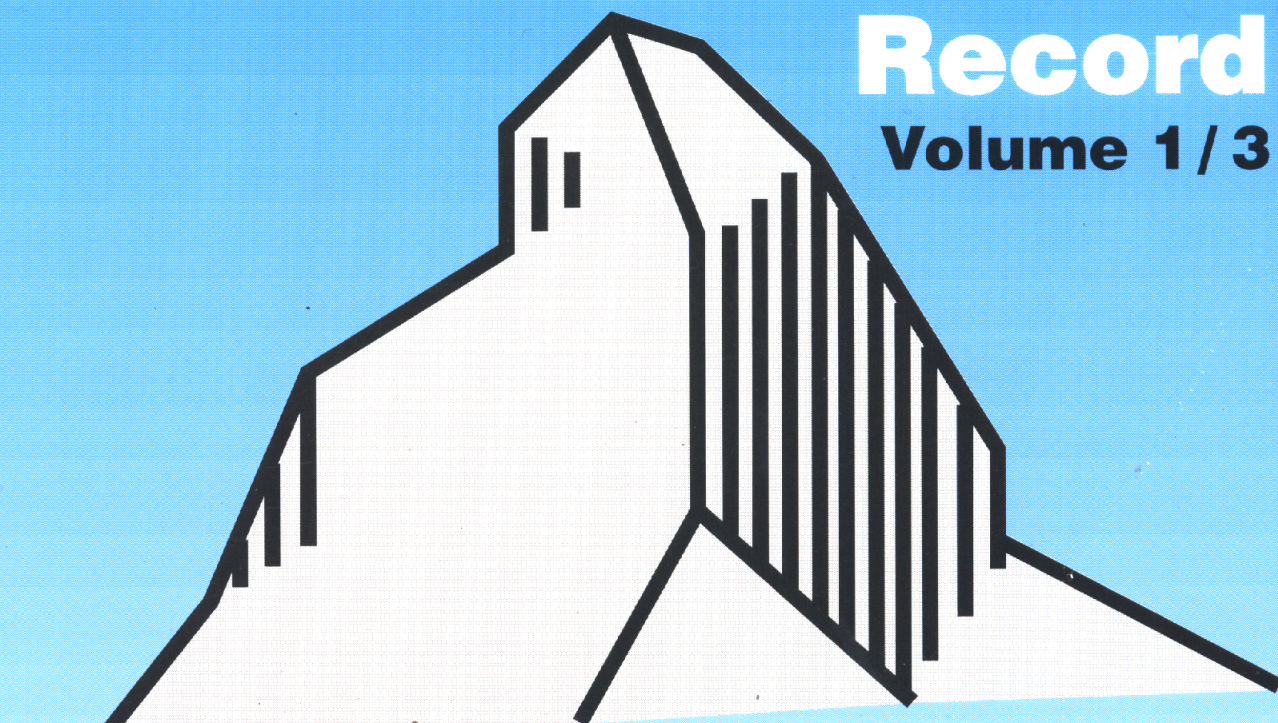


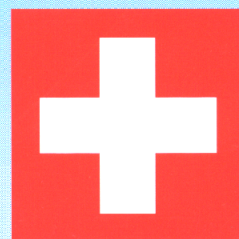
**Communications –
Technology that Unites Nations**

Conference Record

Volume 1 / 3



ICC'93



GENEVA

**IEEE International Conference
on Communications ICC '93
Geneva, Switzerland
May 23-26, 1993**



IST2579/1

ICC'93 GENEVA

IEEE International Conference on Communications '93

May 23-26, 1993, Geneva, Switzerland

Technical Program, Conference Record, Volume 1/3

Volume	Day	Sessions	Pages
1	Monday	11-29	1-615
2	Tuesday	31-49	616-1289
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IEEE COMMUNICATIONS SOCIETY



1993 IEEE International Conference on Communications ICC '93

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IEEE COMMUNICATIONS SOCIETY

General Chairman's Message

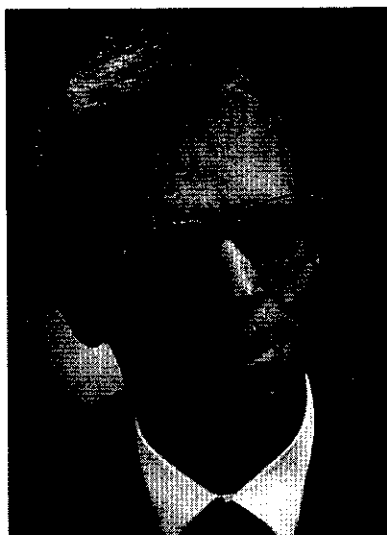
It is my honor to officially welcome you to ICC '93, in Geneva, Switzerland. The conference theme "Communications – Technology that Unites Nations" corresponds very well with the activities of many international organizations located in Geneva, including several UN agencies, the International Red Cross, the International Telecommunication Union (ITU), and the European Nuclear Research Center (CERN). The IEEE Switzerland Section is delighted to host this meeting that is being held for only the second time in Europe after ICC '84 in Amsterdam.

ICC '93 offers a superb opportunity for strengthening existing bonds between European communication engineers and their colleagues from abroad. It also presents a unique chance to establish new contacts, especially for participants from eastern European countries, who will profit from the short distance to Geneva. The ICC '93 exhibition areas, in the immediate vicinity of the session rooms in both the Geneva International Conference Center and the neighboring ITU building, provide a convenient location for these person-to-person exchanges of information.

The ICC '93 Technical Program Committee has assembled an outstanding selection from the more than 800 contributions that it received from leading communication researchers and designers. In the tradition of the ICC, the 54 technical sessions, which will take place from Monday, May 24, through Wednesday, May 26, will cover the whole spectrum of modern communications. A series of 11 tutorials and three workshops on subjects of great current interest will follow on Thursday, May 27, an arrangement that avoids any conflicts with the technical sessions.

An attractive social program has also been planned for ICC '93. Enjoy the Welcome Reception on Sunday evening, May 23, which is open to all participants and their families and is the perfect occasion for renewing old friendships and making new ones. Guided tours to either the International Red Cross Organization or the

United Nations European Center will be available on Monday afternoon. In no case will you want to miss the Monday evening boat cruise on the lovely Lake of Geneva; a delicious "Buffet Campagnard" will be served on board. Excursions to the famous Chillon Castle near Montreux on the edge of the Lake of Geneva and to Zermatt with its spectacular mountain scenery (including the Matterhorn of the ICC '93 logo) will be offered on Tuesday and Wednesday, respectively. The traditional Awards Luncheon on Monday and Conference Banquet on Tuesday evening round out the social program.



Prof. Dr. Peter E. Leuthold

Experience the appeal of Geneva, the international city in the heart of Europe. Since May is a beautiful season here in Switzerland, I encourage you to spend some days with your family, either before or after ICC '93, exploring the beauties of the Swiss Alps and the cultural highlights of our country. On behalf of the ICC '93 Executive Committee, I cordially welcome you to ICC '93 in Geneva.

Peter E. Leuthold
General Chairman ICC '93

Technical Program Chairman's Message

There are good reasons to believe that the technical program for ICC '93 will set a new standard for the ever excellent GLOBECOM/ICC series. The primary reason for this is the wealth of submissions from which the Technical Program Committee (TPC) had to choose. We received 820 submissions of full-length papers. Another reason is that the TPC treated all papers, whether solicited or submitted in response to the open call, on the same basis. The aim was to select the best papers for presentation and to group them by their subject matter into appropriate sessions.

One innovation for ICC '93 was the creation of a Review Board as a part of the TPC. This Review Board consisted of 27 telecommunications experts, all chosen from Europe to facilitate holding of a Review Board meeting in Zurich on Nov. 30, 1992, where a preliminary selection of papers and session assignments was made. This advance work greatly assisted the full TPC at its meeting in Orlando on Dec. 8, 1992, in making the final selection of papers and session assignments. To establish uniformity in the standards for judging the papers, each of the submitted papers was assigned to a Review Board member for evaluation. The Review Board members responded conscientiously to this daunting task. The representatives on the TPC of the sixteen Technical Committees of the IEEE Communications Society did a superb job in soliciting at least two further reviews for each paper assigned to their area of specialization, as also did the session organizers to whom the responsibility for obtaining these reviews was often delegated.

Another innovation was the use of an on-line electronic data base, established and maintained by the able TPC secretary, Thomas Mittelholzer, that allowed TPC members on three continents instantly to check the status of papers under their care or to catch papers inappropriately assigned to another Technical Committee. A final innovation in the ICC '93 technical program was the assignment of all Tutorials and Workshops to a separate day, following the three days of regular technical sessions, to minimize conflicts for ICC '93 attendees.

It seems to me that all of the above augurs well for the success of the ICC '93 technical program, but you, the participant, will be the final judge of that. What I can say for sure is that the credit for any such success will be due to an able and very hard-working Technical Program Committee.



Prof. Dr. James L. Massey



James L. Massey
ICC '93 TPC Chair

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Technical Program Committee

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<i>Communication Systems Engineering:</i>	Yeheskel Bar-Ness, NJ Inst. Tech., & Thomas J. Plevyak, Bell Atlantic
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<i>Network Operations and Management:</i>	Salah Aidarous, Bell-Northern Res.
<i>Optical Communications:</i>	Chinlon Lin, Bellcore
<i>Quality Assurance Management:</i>	David B. Waechter, Bellcore
<i>Radio Communications:</i>	Ashok Ranade, Bellcore
<i>Satellite and Space Communications:</i>	Satchandi N. Verma, GE Aerospace, & Christoph E. Mahle, COMSAT
<i>Signal Processing and Communication Electronics:</i>	Zoran Kostic, AT&T Bell Labs.
<i>Signal Processing for Recording:</i>	François B. Dolivo, IBM Res. Lab. Zurich
<i>Transmission Systems:</i>	Colleen Mitchell, US West, & Mike Kincaid, MSK & Assoc.

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Program Schedule Overview

Sunday, May 23

2:00-5:30 pm - Registration

6:00-9:00 pm - Welcome Reception and Dinner
Ball Room

Monday, May 24

8:30 am - 9:00 am

OPENING PLENARY SESSION

Keynote Address:

«Mobile Satellites and the Shrinking Planet»
Room C1CG I

9:15 am - 12:00 noon

- 11 Telecommunication Network Management
Room C1CG II
- 12 High-Speed Network Interconnections
Room ITU A
- 13 Broadband Switching Systems Architecture for the 1990's
Room C1CG I
- 14 Bandwidth-Efficient Modulation
Room ITU C1
- 15 Spread-Spectrum Multiple Access
Room ITU B2
- 16 Protocols for Multimedia Packet and Cell-Based Networks
Room ITU C2
- 17 Signal Processing Techniques and VLSI Architectures
Room C1CG III
- 18 Management and Architectures for Survivable Networks
Room C1CG IV
- 19A Multiple-Accessing for Personal Communications
Room ITU B1
- 19B Digital Radio Systems and Technologies for Trunk Access Applications
Room ITU B1

2:15 pm - 5:30 pm

- 21 Communications Software: Object-Oriented and Distributed Techniques and Applications
Room ITU A
- 22 Traffic Control in ATM Switching with Priority Diversity
Room C1CG I
- 23 Speech and Video Compression
Room ITU C2
- 24 Coding and Equalization
Room ITU C1
- 25 Spread Spectrum Communication Systems
Room ITU B2
- 26 Modulation and Synchronization Schemes
Room C1CG II
- 27 Coding and Data Representation in Multimedia Applications
Room C1CG III
- 28 Optical Networks
Room C1CG IV
- 29 Sharing Methodologies to Improve Spectrum Utilization
Room ITU B1

Tuesday, May 25

9:00 am - 12:30 pm

- 31A Software Quality and Productivity Improvements
Room ITU A
- 31B New Risks to Network Integrity
Room ITU A
- 32 Network Routing, Control and Management
Room C1CG IV
- 33 Switching for Broadband ISDN
Room C1CG I
- 34 Modulation, Coding and Detection
Room ITU C1
- 35 Multicarrier, Multitone Communications
Room ITU B2
- 36 Synchronization
Room ITU C2
- 37 Multimedia Systems and Applications
Room C1CG III
- 38 SONET-SDH Networks
Room C1CG II
- 39 Radio Resource Management for PCS
Room ITU B1

2:00 pm - 5:30 pm

- 41 Quality Management and Control of Advanced Telecommunication Services and Networks
Room ITU A
- 42 Communications Protocols for Wireless and Multiple Access
Room C1CG II
- 43 ATM Network Issues
Room C1CG I
- 44 Advanced Modulation and Coding
Room ITU C1
- 45 Advanced Space Communication Systems
Room C1CG III
- 46 Adaptive Blind Equalization
Room C1CG IV
- 47A User Interfaces for Multimedia Communications
Room ITU C2
- 47B Programmable Platforms for Network and Service Management
Room ITU C2
- 48 Wavelength-Division Multiplexing Optical Networks
Room ITU B2
- 49 Personal Communications Architectures, Network and Control
Room ITU B1

8:00 am - 12:00 pm
12:30 pm - 2:00 pm
Ball Room
2:30 - 5:30 pm - Registration and Reception
Museum (Room C1CG I)
6:30 - 10:30 pm - Dinner and Entertainment
Geneva, with dinner (Room C1CG I)

8:00 am - 12:00 pm
12:30 pm - 2:00 pm
Ball Room
2:30 - 5:30 pm - Registration and Reception
Museum (Room C1CG I)
6:30 - 10:30 pm - Dinner and Entertainment
Geneva, with dinner (Room C1CG I)

Wednesday, May 26

Thursday, May 27

Tutorials and Workshops

9:00 am - 12:30 pm	2:00 pm - 5:30 pm
51 B-ISDN Architectures, Management and Control <i>Room CIGG II</i>	61 OSI Applications: Experiences and Outlook <i>Room CIGG I</i>
52 Management/Protocols for High Speed Networks <i>Room CIGG III</i>	62 Performance Evaluation of High-Speed Networks <i>Room CIGG III</i>
53 Traffic Considerations in ATM <i>Room CIGG I</i>	63 Satellite Transmission, Modulation and Coding <i>Room ITU C1</i>
54 Trellis-Coded Modulation <i>Room ITU B2</i>	64 Signal Processing in Wireless Communication Systems <i>Room ITU C2</i>
55 Space Transmission Techniques <i>Room CIGG IV</i>	65 Advances in High-Speed Communications over Copper Loops <i>Room ITU B2</i>
56 Advances in Data Communications <i>Room ITU C1</i>	66 Topics in Networking <i>Room CIGG IV</i>
57 New Approaches to IN-Service Development and Network Control <i>Room ITU C2</i>	67A Knowledge-Based Technologies for Next Generation Networks and Services <i>Room ITU A</i>
58 Video Distribution and Optical Transmission Techniques <i>Room ITU A</i>	67B Interference Cancellation in Spread Spectrum Systems <i>Room ITU A</i>
59A Propagation Measurements and Modeling of Portable and Mobile Radio Environments <i>Room ITU B1</i>	68 Fiber-in-the-Loop Evolution Strategies <i>Room CIGG II</i>
59B Personal Mobile Communications <i>Room ITU B1</i>	69 Modeling and Simulation of PCS Radio Systems <i>Room ITU B1</i>

9:00 am - 12:30 pm	2:00 pm - 5:30 pm
Tutorial 1 ITU Standards: Processes for Standards Approvals <i>Room ITU B1</i>	Workshop 1 Error Performance Specifications for Digital Transmission Systems <i>Room ITU B1</i>
Workshop 2 All-Optical Networks: Challenges <i>Room CIGG I</i>	Workshop 2 (Continuation)
Workshop 3 Advances in Satellite and Space Communication Technologies <i>Room CIGG II</i>	Workshop 3 (Continuation)
Tutorial 2 ATM Technology: Compatibility for Local and Wide Area Metropolitan Networks <i>Room ITU B2</i>	Tutorial 2 (Continuation)
Tutorial 3 Modeling and Simulation of Wireless Communications <i>Room ITU C1</i>	Tutorial 4 Radiowave Propagation Measurements and Modeling for Personal Communications <i>Room ITU C1</i>
Tutorial 5 Global System for Mobile Communications (GSM) <i>Room CIGG III</i>	Tutorial 5 (Continuation)
Tutorial 6 Telecommunications Management Network (TMN) and Sub-network Management <i>Room ITU A</i>	Tutorial 7 Intelligent and Integrated Management of Messaging Networks <i>Room ITU A</i>
Tutorial 8 Fiber to the Home <i>Room CIGG IV</i>	Tutorial 9 High-Speed Data Communications over the Local Cable Network <i>Room CIGG IV</i>
Tutorial 10 Adaptive Antennas and Equalization in Wireless Systems <i>Room ITU C2</i>	Tutorial 11 Intelligent Networks <i>Room ITU C2</i>

Tutorials

Thursday, May 27, 1993
Morning or/and afternoon

TUTORIAL 1 Room ITU B1

9 am - 12:30 pm

ITU Standards: Processes for Standards Approvals

Dr. T. Irmer, ITU Telecommunication Standardization Bureau

This timely tutorial will introduce the participant to the process by which the International Telecommunication Union (ITU) sets telecommunication standards to which both suppliers and users of equipment agree to adhere. It will provide both the novice and the experienced engineer with vital insights into the standard setting process.

TUTORIAL 4 Room ITU C1

2 pm - 5:30 pm

Radiowave Propagation Measurements & Modeling for Personal Communications

Dr. D. Devasirvatham, Bellcore
Prof. T.S. Rappaport, Va. Polytech

Radiowave propagation profoundly affects the architecture and performance of personal and mobile radio communication systems. This tutorial will cover the measurement and modeling of time dispersion, short-term variability, path loss, spatial inhomogeneity, angle of arrival, and frequency dependence.

TUTORIAL 2 Room ITU B2

9 am - 5:30 pm

ATM Technology: Compatibility for Local and Wide Area Metropolitan Networks

Dr. J.F. Mollenauer, Technical Strategy Associates

This tutorial will cover applications, standards, and technology for Asynchronous Transfer Mode (ATM) networks. The application of ATM to wide-area networks in the Broadband Integrated Services Digital Network (B-ISDN) will also be discussed. Implementation issues will be addressed, both from the technical and from the marketing viewpoint.

TUTORIAL 5 Room C1CG III

9 am - 5:30 pm

Global System for Mobile Communications (GSM)

Prof. A.K. Kakaes, George Washington Univ.

The pan-European system for digital cellular communications, GSM, is currently being put into operation, capping a decade-long development of the GSM standard. This tutorial will explain the fundamental aspects of GSM in a manner to make the "big picture" clear and enable the participant later to read and understand the necessary details.

TUTORIAL 3 Room ITU C1

9 am - 12:30 pm

Modeling and Simulation of Wireless Communications

Prof. K. Shanmugan, Univ. Kansas
Dr. P. Balaban, AT&T Bell Labs
Prof. T.S. Rappaport, Va. Polytech

Radio is emerging as a prime media for inhouse communications as well as for mobile communications. This tutorial will provide a systematic treatment of the modeling and simulation of such wireless communication systems.

TUTORIAL 6 Room ITU A

9 am - 12:30 pm

Telecommunications Management Network (TMN) and Subnetwork Management

Dr. V. Sahin, NEC America
Dr. S. Aidarous, Bell North. Res.

The Telecommunications Management Network (TMN) provides a framework for interconnecting various components in a telecommunications environment via a common architecture and standardized protocols and interfaces. This tutorial will explain interworking strategies for TMN networks that allow network providers to deploy network elements and operations systems in a multi-vendor environment.

TUTORIAL 7 Room ITU A

2 pm - 5:30 pm

Intelligent and Integrated Management of Messaging Networks

Dr. R. Ananthanpillai, AT&T Bell Labs

This tutorial will address management issues for a globally distributed electronic messaging network with emphasis on management of the processing nodes. The integrated and intelligent managing of the message application and its processing node within a complex system of network elements will be addressed.

TUTORIAL 8 Room C1CG IV

9 am - 12:30 pm

Fiber to the Home

Dr. P.W. Shumate, Jr., Bellcore

This tutorial examines the key issues (including architectures, costs, powering, video alternatives, and evolution strategies) involved in residential "fiber-in-the-loop" as part of the development of the future fiber loop infrastructure for B-ISDN. Because of falling costs attributable to new and unconventional architectures, fiber has become competitive with copper for narrowband telephony and/or cable television.

TUTORIAL 9 Room C1CG IV

2 pm - 5:30 pm

High-Speed Data Communications over the Local Cable Network

Dr. N.A. Zervos, AT&T Bell Labs

Bandwidth-efficient digital signaling and submicron VLSI technology enable very high speed (1.5 Mb/s) data transmission over local subscriber loops. This tutorial will cover the transmission, reception, and coding techniques that are currently being introduced worldwide in the HDSL and asymmetric DSL (ADSL) systems for local-loop data communications.

TUTORIAL 10 Room ITU C2

9 am - 12:30 pm

Adaptive Antennas and Equalization in Wireless Systems

**Dr. J.H. Winters, AT&T Bell Labs
Dr. J. Salz, AT&T Bell Labs**

This tutorial will explain how antenna diversity and equalization can be used to overcome multipath fading, dispersion due to frequency-selective fading, and inter-user interference. Practical implementation of these techniques in systems such as IS-54, GSM and PCS will be stressed.

TUTORIAL 11 Room ITU C2

2 pm - 5:30 pm

Intelligent Networks

Prof. B. Jabbari, George Mason Univ.

This tutorial will examine the key issues in Intelligent Networks (INs) and explain the rationale behind various IN architectures. IN functional components will be reviewed in the context of different releases of the AIN and CCITT CS together with hardware and software realizations. Implementation plans for a number of telecommunication IN networks throughout the world will be presented.

Workshops

Thursday, May 27, 1993

All day or afternoon

WORKSHOP 1 Room ITU B1

2 pm - 5:30 pm

Error Performance Specifications for Digital Transmission Systems

CCITT Draft Recommendation G.82x, "Error performance parameters and objectives for international, constant bit rate digital paths at or above the primary rate" (1544 or 2048 kbit/s) is expected to be adopted in June 1993 and will apply to all line and radio transmission media. G.82x supplements existing CCITT Recommendation G.821 that applies to the basic rate (64 kbit/s) but introduces a new set of performance criteria and more stringent objectives.

This workshop will provide a forum for presentation of this important new standard and for discussion of the various application issues that arise in connection with G.82x.

Organizer:

Dr. Ferdo Ivanek, Communications Research

Speakers:

F. Ivanek
F. Coening, Wandel & Goltermann
M. Bonnifait, France Telecom
Dr. H.-J. Thaler, Siemens
Dr. M. Stojkovic, Intelsat

WORKSHOP 2 Room C1C6 I

9 am - 5:30 pm

All-Optical Networks: Challenges

Recent advances in such optical technologies as wavelength-division multiplexing, optical frequency-division multiplexing, and optical switches, have made all-optical, very high-speed networks attractive and feasible.

This workshop will review progress in Europe, the USA and Japan, and will describe the challenges that lie ahead in the development and implementation of all-optical networks.

Organizers:

Dr. P. Chidgey, British Telecom Labs.
Dr. C. Lin, Bellcore
Prof. M. O'Mahony, Univ. Essex
Dr. K. Nosu, Nippon T & T

Speakers:

P. Barnsley, British Telecom Labs
C. Bungarzeanu, EPFL
P. Chidgey
A. Elrefaie, Bellcore
E. LeCoquil, CNET
M. O'Mahony
J. McEachern, BNR
T. Takasaki, Hitachi
M. Sotom, Alcatel
L. Thylen, Royal Inst. Tech., Stockholm
M. Takahara, Yamanashi Univ.

WORKSHOP 3 Room C1C6 II

9 am - 5:30 pm

Advances in Satellite and Space Communication Technologies

This workshop will focus on the issues, designs, interfaces and techniques for advanced space and satellite (fixed/mobile/personal) communication systems.

Experts will describe system architectures, transmission techniques, services, field-trial experiences, interface and global interoperability standards.

Organizers:

Dr. S.N. Verma, GE Aerospace
Dr. C.E. Mahle, COMSAT Labs.
Prof. M. Bousquet, ENSAE Toulouse
Dr. H. Aghvami, King's College, London

Speakers:

Dr. F. Ananasso, Telespazio SPA
Dr. S. Ohmori, Min. Posts & Telecom, Japan
Dr. W.H. Tranter, Univ. Missouri
Dr. W. Ebel, Mississippi State Univ.
Dr. Y. Suzuki, Nat. Space Dev. Agency, Japan
Dr. S. Verma, GE Aerospace
Mr. R. Viola, ESTEC ESA
Dr. R. Leopold, Motorola
Prof. M. Bousquet, ENSAE Toulouse
Dr. K.M.S. Murty, Telesat Canada
Dr. H. Aghvami, King's College, London
Dr. S. Kato, NTT Radio Comm. Sys.

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ORGANIZER: D.N. Zuckerman, AT&T Bell Labs, USA
CHAIRPERSON: D.N. Zuckerman
SPONSOR: Network Operations and Management

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