



# THE INSTITUTION OF ELECTRONICS AND TELECOMMUNICATION ENGINEERS

1953-1993

**40**  
years

## Newsletter

Vol. 2, No. 1

January-February 1993

### FROM PRESIDENT'S

Our members would have noticed a visible change in our Directory of Corporate Members issued in January 1993, viz, the yellow pages. These pages have been deliberately introduced in the Directory to provide a classified listing of our members who have offered to serve as consultants. This is our first attempt to present the expertise/experience of our members in this compact form. We hope this information will be of wide use. However, we seek your comments/suggestions to make this Directory of Consultants more informative and useful nationally and internationally.

Our Council has been discussing for past some time on the current technical interest profile of our members. This is particularly important because the fields in which our members work are rapidly advancing and the time scale of change is shrinking year by year. Moreover, we are keen to offer membership services, ie, publications/technical programmes/tutorials etc, matching with the needs of our members.

A proforma seeking the technical interest profile has also been included in the Directory of Corporate Member (just before the yellow pages). May I urge you to fill in this proforma and return to the IETE HQ soon? This will greatly help us to serve you better.

As indicated to you through this column earlier, we are now in the 40th year of the IETE. Our status, image and visibility have yet to improve commensurate with our age. I look forward to your suggestions/action plans to make our Institution truly dynamic and responsive to the needs and aspirations of our members.

Bangalore

B.S. Sonde  
President

### NEWS FROM HQs

- *Call for Nominations* for Council Election 1993-96 and Directory of Corporate Members and Consultants (Jan 93) has been issued to members who have paid their subscriptions.

- *Ministry of Railways* (Railway Board) vide their Memo. No. E(G)83 FEI-4 dated 29 Apr 1988, has included IETE as one of the Indian Professional Institutions for reimbursement of membership subscriptions paid by their technical officers against Membership of IETE.

### List of Govt. and other Agencies where IETE is represented

#### Name of the Organisation/Member Representative

- Bureau of Indian Standards (BIS) — President/Brig SVS Chowdhry
- LTDC of BIS — Brig S V S Chowdhry/Cdr (Dr) H S Sharma/Secretary
- Basic Standards on Electronics and Telecommunication Engineering Sectional Committee-BIS — Dr P B Parikh/Secretary
- Electromagnetic Compatibility Sectional Committee, BIS — Prof V Sinha/Secretary
- Radio Communication Sectional Committee, BIS — Maj Gen J C Ahluwalia/Secretary
- Reliability of Electronic and Electrical Components & Equipment Sectional Committee, LTDC 3 — Shri A K Srivastava/Secretary
- AICTE Working Group to lay down criteria for recognising Private Institutions imparting training in Computers — Shri Y P Singh/Prof Ali Akbar Shamim
- Working Group on financial assistance to voluntary organisations, DOE — Shri P P Malhotra/Secretary
- Governing Council, Delhi Institute of Technology, Delhi University — Brig S V S Chowdhry/Secretary



- Governing Council - Motilal Nehru Regional Engineering College, Allahabad — Prof S C Dutta Roy
- Council of the Indian National Academy of Engineering — Shri B K Rai
- Monitoring Committee for Standards and Quality Systems, Delhi Administration — Maj Gen J C Ahluwalia
- All India Council for Technical Education — President
- All India Board of Undergraduate Studies in Engineering and Technology, Dept of Education — Prof P V Indiresan
- Task Force on 'Electronics in Health Care', DOE — Prof P V Indiresan
- Study Team on Manpower Development for 8th Five Year Plan, DOE — Secretary
- Data Communication Sectional Committee Ltd-31 — Secretary
- Indian Society of Technical Education — Secretary
- Governing Board 'SQ Scheme' STQC (DOE) — Brig S V S Chowdhry
- Institute of Applied Manpower Research — Prof R K Arora/ Secretary
- Govt of WB Apprenticeship Training — Prof AN Daw

## CURRENT ISSUES

### IETE Workshop on ISO 9000

A half day workshop on "Introduction to ISO 9000" was held at Delton Hall, IETE, New Delhi on 6 Feb '93. The workshop was conducted in 3 technical sessions by Shri A K Srivastava, FIETE, Chief Executive Quality Assurance, ITI Bangalore.

The Technical Session-I was devoted to the background and principles of ISO

9000. It highlighted 7 principles as:—

- i) Manufacturing and non-manufacturing process.
- ii) "Non-conformities" identification
- iii) "Non-conformities" prevention.
- iv) Documented procedure for each activity.
- v) Procedure implementation.
- vi) Procedure review.
- vii) Third party verifiability.

These principles have been developed to drive home the salient points for understanding ISO 9000.

Technical Session-II covered the overview of ISO 9000 in which factors like management responsibility, quality system, design control, document control, process control, product identification and traceability, inspection and testing, control of non conformities, handling, storage, packing and delivery, internal quality audits, training and servicing were examined with the help of examples.

Technical Session-III dealt with the implementation of ISO 9000. Highlight of this session was a 3-tier implementation model which harnesses the organisational learning and is best on the creative involvement of organisational members. Implementation can be achieved in three phases.

The first phase, which is the most important phase, consists of the following:—

- a) Study of the relevant clauses of ISO 9001 and 9004.
- b) Study of applicable auditors questionnaire.
- c) Recollection of personal success/failure experiences.
- d) Identification of new activities and amendment of old activities to achieve the best results.
- e) Integration of the outcome of the above 4 points.

The second phase is a follow-up of the first phase. It basically consists of

- i) Preparation of new documents for quality manual, procedure, work instruction and formats.

- ii) Adequacy audit for new documentation.

The final phase is a natural outcome from the first two phases and consists of the following:—

- a) Pilot implementation of the new system.
- b) Internal audit of implementation.
- c) Application for ISO 9001 accreditation.

Earlier in his keynote address, Lt Gen H Lal, Advisor FICCI noted that quality experts are unable to sell 'quality' as a marketable product despite growing awareness of ISO 9000 in the industry. The Indian mentality accepts 'quality' as a desirable trait but assign it a lower priority when constraints like finances or materials pose a problem. The plant and equipment of electronic industry though at par with the best in the world, fail to take the goods to the global markets and this has to do with unsystematic improvisation on methods and materials that is telling on quality of the end product.

On ISO certification procedure, he talked of India's endeavour to bring about a single international accreditation body whose stamp will be accepted by one and all for trade purposes. ISO 9000 is the way for continuous quality improvement by its inherent property of removal of non-conformities.

Prof Sonde President IETE summing-up the workshop dwelt on the possible role IETE could play in promoting ISO 9000 awareness in the electronic industry. With so many quality experts, eminent engineers etc on its panel, IETE could prepare a list of quality assurance people, hold training programs and through them offer consultation services so as to uplift the Indian electronic industry to a pioneering role.

## NEWS FROM LOCAL CENTRES

### Bangalore

Workshop and Symposium on 'Test Technology for Computers and Telecommunications' was



held on 05 Dec 92. It was inaugurated by Shri SK Khanna, Director, ITI, Rae Bareilly.

- Technical Lecture on 'Technology for High Speed Mainframe Computers' was delivered by Dr S Saineeck, Gp Leader, Computer Division, Siemens AG Munich, Germany on 22 Dec 92. Shri AK Srivastav, Chairman, IETE Bangalore Centre presided on the occasion.

#### Bombay

- A two-day Seminar on 'Impact of Liberalisation in Telecommunication and Broadcasting' was held on 28-29 Jan 93.

#### Pune

- A Lecture on 'Problems of Public Call Officers (PCO)' was delivered on 27 Nov 92 by Dr KR Phadke, Director, APLAB, Pune.

#### Trivandrum

- A two day National Seminar on 'Modern Trends in Communication Technology & Exhibition (COMMUTECX 93)' was held on 22-23 Jan 93.

### PERSONALIA



Shri N Vittal was born on 31st January, 1938 in Trivandrum. He had his early education in Tiruchirapalli and Madras. Graduated with

BSc Hons (Chemistry) degree from Loyola College, Madras—1958.

After a short time as lecturer in Jamal Mohamed College, Tiruchirapalli, he joined the IAS on 16th May, 1960 and was allotted to the Gujarat Cadre.

In his career of more than 32 years, Shri Vittal has held a number of assignments at the State Government, Central Government as well as in a joint sector enterprise. Currently he is Secretary, Deptt of Electronics Govt of India.

His experience covers a wide spectrum with the focus on industrial administration, administration of the departments connected with science and technology as well as security. The major achievements during his career has been: (i) revival of Kandla Free Trade Zone; (ii) opening of the Dahej Port in Gujarat; (iii) Emergence of the Gujarat Narmada Valley Fertilizer company not only as an efficient business enterprise, but, as a model for what a public sector unit can do for the development of a backward area especially in the field education, health and culture as well as environment management. Gujarat Narmada Valley Fertilizer Company was a zero pollution plant; (iv) Setting up of the Narmada College of Science, Technology and Commerce, Bharuch, the first English medium college in South Gujarat, teaching electronics, computer science and chemistry; (v) Setting up of the Rs 20 crore Gujarat Narmada Auto Limited factory in Valia in the backward district of Bharuch in 144 days; (vi) Setting up of new organisations, eg as Industries Commissioner in the Gujarat, responsible for Gujarat becoming the first State in the country which was fully covered with District Industries Centres; setting up of the single window service for industry and promotion (Indext Bureau) which was adopted later by other States; setting up the Entrepreneurship Development Centre; as Secretary, Civil Supplies Department, set up Gujarat State Civil Supplies Corporation; as Additional Chief Secretary Home, initiated the proposal for setting up of the Gujarat Police Housing Corporation.

Widely travelled, Shri Vittal is also interested in application of management principles in organisations in the public and private sectors. He has written more than 125 articles on various subjects relating to management, public relations, human resource development in journals and magazines including Economic & Political Weekly, Economic Times, Times of India, Financial Express, Business India, Journals of IIMA, Lal Bahadur Shastri National Academy of Administration, HCPS, RIPA, IIFT etc.

He has received various honours including Hon Fellowship of Computer Society of India (CSI) and a citation of gratitude from Electronic Component Industries Association (ELCINA).

He is interested in reading, writing and long walks.

### NEWS

#### National R&D Award for Bharat Electronics

Bharat Electronics has bagged the prestigious "National Award for R&D Efforts in Industry - 1992".

Mr DV Gupta, Executive Director (Northern Units) of Bharat Electronics received the award from Mr PR Kumaramangalam, Union Minister of State for Science and Technology at a function in New Delhi on 26.11.92.

Bharat Electronics has won this award for successful productionisation of the INDRA-I Radars which was developed by Electronics and Radar Development Establishment (LRDE), Bangalore, a Defence R&D Laboratory.

This award has been instituted by the Department of Scientific and Industrial Research, Ministry of Science and Technology for successful commercialisation of Public Funded R&D.

#### Visit of Japanese Delegation from CICC

A delegation consisting of M/s Yoshida Shoichi and Yoshicki Kanai from the Centres of the International Cooperation for Computerization (CICC) of Japan visited IETE on 9.2.93. The CICC Foundation is implementing cooperation activities for promoting computerization in the developing countries. Their main activities are in the areas of:

- Education & Training in Computerisation.
- Development & Guidance for Computerisation in developing countries.
- Study of Computerisation in Developing countries.



- Giving Information & Materials about Computerisation.
- Promoting International Exchanges for Cooperation in Computerization.
- Holding Conference to improve the relationship between related organisation in Japan to promote cooperation in Computerisation in developing countries.

The printed materials available/issued by CICC are:

- CICC News (English)
- Continuing Progress of Computerisation in Japan (English)
- Computerization Projects in Japan (English)
- News — Standardisation of International Technology (English)

There are 24 organisations which have CICC Library Centres as on Jan 1, 1993 in various countries including one with the Computer Society of India at Bombay.

The delegation was received at the IETE HQs by Brig SVS Chowdhry, Vice President of IETE. The Secretary IETE gave a talk and informed the delegation of the various activities of IETE including the Computer Courses run by the Institution. The delegation was also taken round the Microprocessor Laboratory of the IETE.

### ACADEMIC NEWS

AMIETE, DIPIETE & DOEACC 'C' Level December Examination were conducted from 16th to 23rd 1992 all over India and Abroad. Due to reasons beyond our control examinations could not be conducted at 2 Centres Aligarh and Kanpur and for the first 2 days at Jabalpur. Few students from these Centres who came to Delhi were permitted to appear for the examination at the Delhi Examination Centre. For those students who could not appear from the above Centres their examination fees paid for the December 1992 Examinations are being adjusted from June

1993 Examinations.

2. The next AMIETE, DIPIETE & DOEACC 'C' Level Examinations are scheduled to be conducted from 16th to 23rd June 1993. The first DOEACC 'B' Level Examinations will be conducted in December 1993.

3. The Institution launched a massive campaign in April 1992 to get AMIETE recognised by all the Universities/Institutions in India. Since then Universities, Andhra University, Hemwati Nandan Bahuguna Garhwal University Srinagar (Garhwal), University of Roorkee, Gulbarga University, Visva-Bharti University, Shanti Niketan, Mother Taresa Women's University, Madras and Kurushetra University have recognised AMIETE.

### TECHNICAL NEWS

#### ANTRIX Corporation

ISRO's new venture, Antrix Corporation, is all set to launch India into the global space technology market. Nothing quite captures the imagination like a rocket launch. A cylinder of gleaming metal rising majestically on a column of flame, with an ear-splitting roar, into the heavens above. The less glamorous aspect of the launch, indeed its rationale, lies hidden in the rocket's nose. India designs and fabricates satellites, but has depended on others like the former Soviet Union, the US or the European Space Agency to place them in orbit. But now, India bids entry into this exclusive and highly lucrative launch vehicle market.

The Indian Space Research Organisation has formed a separate organisation called Antrix Corporation Ltd for this purpose. This marks the beginning of a new commercial venture for ISRO. The company has an authorised capital of Rs 5 crore, contributed by the government, and has M/s Rattan Tata, Jamshedji Godrej, Ravindra Reddy, managing partner, MTAR and UR Rao Chairman, ISRO, on its board.

#### Electronics for Rural Development

The DoE Advisory Board for NGO's (Non Governmental Organisations) invol-

vement in Electronics for rural development met on 21.12.92 for deliberations and the following points emerged for consideration.

- i) DoE should find ways and means to provide 14" B/W TV to the rural population within Rs 1000/- which could also serve as a low cost PC monitor and data communication receiver.
- ii) Telecommunication/rural connectivity at least between each village and its Block HQ to be realised by 1997.
- iii) Field trials for various electronic products developed for rural applications be conducted through NGOs.
- iv) Equipments underutilized by various R&D organisations of DoE to be relocated to NGOs/other agencies for proper use.
- v) DoE's Inter Ministry Electronics Co-ordination Committee to achieve better coordination between its multiple department programmes such as Dept of Rural Development (DRD), Dept of Non-Conventional Energy Sources (DNES), Council for People's Action & Rural Technology (CAPART) .... etc.
- vi) Subsidies given by DNES for solar powered lighting programme be not restricted to only those villages which officially declare themselves as "Urja Grams" but to be made available to any and all individuals.

### INTERNATIONAL NEWS

#### ITU Plenipotentiaries agree on a new ITU to face the challenges of tomorrow

The Additional Plenipotentiary Conference of the International Telecommunication Union (ITU) has drawn a new Constitution and a new Convention of the Union after two weeks of work (7-22 December 1992).



The Conference was attended by more than 800 delegates from 140 countries and by observers from 16 international and regional organizations as well as liberation movements.

The work of the Conference was conducted under the chairmanship of Ambassador B de Riedmatten, Permanent Observer of Switzerland to the United Nations Office and Permanent Representative to the other international organizations in Geneva.

ITU's new structure is organized into three sectors: development, standardization and radiocommunication.

The standards-setting activities of the CCITT and CCIR have been consolidated into a telecommunications Standardization Sector. The rest of the CCIR activities — essentially those tasks related to the efficient management of the radio-frequency spectrum in terrestrial and space radiocommunications — have been integrated into a new Radiocommunication Sector along with the activities of the IFRB.

Although the role and functions have been redefined, the structure of the Development Sector remains essentially unchanged given the restructuring of the ITU development machinery in 1990. An assessment of its structure and operational

effectiveness will be made when sufficient time has elapsed to provide the type of feedback required. The Conference however has given the Development Sector its first ever elected Director. He is Mr A Ph Djiwatampu of Indonesia.

#### Reform of the Union

The Conference recognized the need to adapt the Union's structure, management practices and working methods to the changes in the world of telecommunications and to the increasing demands placed upon it to keep pace with the ever-accelerating progress in telecommunications. It overhauled ITU's main areas of activity: development, standardization and radiocommunication in the light of the recommendations made by the High-Level Committee and on the basis of proposals by ITU's membership.

The Union now comprises: a plenipotentiary conference which is the supreme authority of the Union, the Council which acts on behalf of the Plenipotentiary Conference, world conferences on international telecommunications, the Radiocommunication Sector (including world and regional radiocommunication conferences, radiocommunications assemblies and a Radio Regulations Board), a Telecommunication Standardization Sector (including world telecommunication

standardization conferences), a Telecommunications Development Sector (including world and regional telecommunication development conferences) and a General Secretariat.

#### OBITUARY



*Dr DS Kothari*, an Honorary Fellow of the Institution passed away on 4 Feb'93. He was born on 6 July,

1906 at Udaipur (Rajasthan). He obtained MSc degree in Physics from University of Allahabad and PhD from Cavendish Laboratory, Cambridge in 1933. He taught Physics at Delhi University and made the School of Physics into a vibrant academic centre. He was an eminent educationist and a renowned astrophysicist. He was former Chancellor of Jawahar Lal Nehru University, Scientific Advisor to the Defence Minister and Chairman University Grants Commission. He was a Fellow of the Indian National Science Academy (INSA) and a recipient of Padma Vibhushan.

#### BIBLIO FILE

##### Books added in the IETE HQ Library during Nov-Dec 92

Biomedical Instrumentation and Measurements

Fibre optics in Telecommunication

Principles of Optical Circuit Engineering

Object Orientation Concepts Languages

Stripline-Like Transmission Lines for Microwave Integrated Circuits

Principles of Measurement and Instrumentation

Operational Amplifiers and Linear Integrated Circuits

Semi Conductor Materials and Devices

Digital and Analog Communication Systems

Leslie Cromwell

BP Pal

MA Mentzer

S Khosafian

Bharathi Bhat

AS Morris

RF Coughlin

MS Tyagi

KS Shanyugam



Principles of Electronics

Electromagnetic Fields and Waves

Design of Magnetic Components for Switched Mode Power Converters

Introduction to System Design Using Integrated Circuits

Solid State Electronic Engineering Materials

Linear Integrated Circuits

Principles of Digital Communication

### Computer

Build your own Expert System

First Book of 'C' Fundamentals of 'C' Programming

Oracle 6.0 the Basics

Programming in ANSI 'C'

ANSI 'C' with Microsoft C 5.1 and Quick C 2.0

PASCAL: An Introduction Methodical Programming

Digital Computer's Memory Technology

Introduction to Computer Science

Multimedia Computer and Communication

BVN Rao

VV Sarwate

L Umanand

BS Sonde

SO Pillai

DR Choudhury

J Das

C Naylor

GJ Brownson

V Mukhi

Balagurusamy\

Balasubramanian

W Findley

Dutta Majumdar & J Das

S Govindraju

N Seshagiri & A Akopov

### FORUM

IETE has the proud privilege of presenting the First Issue of the Second Year of the News Letter. Since publications are the medium for the members to contribute and assist the institution in discharging its social and technological obligations to the society, we would endeavour to present the best to our members.

Electronics, telecommunications coupled with computers have become the main stay of technological growth in the society. Therefore, every country is endeavouring to put their best resources for the growth of electronics and telecommunication. With changing economic scenario like all other countries in the world, India also has to relook at the allocation of resources. This has demanded better coordination and utilisation of existing resources by every sector of the industry, R&D and institutions. While the Department of Electronics is redefining the future course, it is the institution like IETE

who can act as catalyst in accelerating the process of coordination and growth.

We would, therefore, like our experts to come out with their innovative ideas and proposals and as far as possible, act to organise local and regional seminars, workshops, group discussions to increase the awareness of the use of science and technology in general and electronics, telecommunications and computers in particular for achieving better social harmony and growth.

It would not be out of place to note that 'energy' is at the core of the origin of whole universe and hence, all the human beings. But all radiations are electromagnetic in nature, therefore, Electromagnetics also provides the basis for all socio-religious activities in the universe. It is for the institutions like IETE to propagate the values of science and technology to educate and enlighten the people so that they

understand the very basis of creation and existence and use science and technology for resolving day to day problems.

Electromagnetics, which is the heart of electronics, telecommunications and computers, is at the core of all existence and, therefore, it provides electronics and telecommunication engineers, a privileged position to take lead in perpetuating the scientific value in our society.

We would request our readers and members to kindly consider these propositions and come out with suggestions on how to propagate scientific values and use electronics, telecommunications and computers for better socio-economic growth of the country in future. We look forward to the views and suggestions in Forum.

— Cdr (Dr) H. S. Sharma (Retd)  
*Hony Editor*



## ANNOUNCEMENT

24th Mid Term Symposium, Ahmedabad  
10-11 April 1993

### HIGHLIGHTS

1. Theme "Space Electronics and Communications"
2. 20th Vikram Sarabhai Memorial Lecture Dr N Seshagiri
3. 8th Lal C Verman Award Lecture Shri J S Raju, DG, STQC
4. Eminent experts in the field of Space Electronics will chair the Technical Sessions and present papers at the Symposia. The Technical sessions will be as follows: Space Electronics in Rockets, Satellites, Defence Communications and Remote Sensing.
5. Panel Discussions & Validictory function

6. Registration

*Delegate Fee*

1. Sponsored Delegates	Rs. 800/-
2. Sustaining Donor Member	Rs. 600/-
3. Individual Corporate Member	Rs. 200/-
4. Student Member	Rs. 100/-
5. Council Members/Dist Fellow and Corporate Members above 65 years of age.	As Honoured Guest

7. Advertisement in souvenir

*Advertisement Rates*

(Page size 28cm x 22cm) Demy Quarto Printed area 24cm x 18cm

1. Back Cover	Rs. 6000/-*
2. 2nd & 3rd Cover	Rs. 4000/-*
3. Full page	Rs. 3000/-*
4. Half page	Rs. 1500/-
5. Quarter page	Rs. 800/-

\* For Colour Advertisement Rs 1000/- per colour in addition.

For more details, please write to IETE, HQ and/or to

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|---|---|---|
| <p>1. Shri O P N Calla, Convenor<br/>24th Mid Term Symposium, IETE<br/>Dy Director, Satellite Communication Area,<br/>Space Application Centre (ISRO)<br/>Ahmedabad - 380 053<br/>Phone: 0272-44180<br/>Telex: 0121-6321 &amp; 6239<br/>Gram: Space &amp; Antarix</p> | <p>2. Brig K Balasubramaniam<br/>Co-Convenor, 24th Mid Term Symposium<br/>Managing Director, Tata Telecom Ltd,<br/>E1/1 GIDC, Electronics Estate,<br/>Gandhi Nagar - 382 028<br/>Phone(s): (02712) 21773, 21774, 23345<br/>Telex: 01203-231/240 TTLG IN;<br/>Fax: (02712)- 24897.</p> | <p>3. Shri Madhukant Patel, Hony Secretary<br/>IETE Ahmedabad Centre<br/>206 Umia Shopping Centre,<br/>Satellite Road<br/>Ahmedabad - 380 053</p> |
|---|---|---|

## OPPORTUNITIES

To promote the cause of Electronics Industry, CEERI have promoted a scheme Technology Business Incubator (TBI) with the support of Department of Scientific & Industrial Research, Ministry of Science & Technology, Govt. of India, for entrepreneurs to make use of CEERI infrastructure. This provides an opportunity to the entrepreneurs to develop his own products with expertise and capabilities available at CEERI at one place.

The major activities of TBI are:

Joint development programmes and R&D services in (1) indigenising the processes; (2) optimising each process; (3) Absorption & Adaptation of technology; (4) upgradation of existing technology; (5) induction of new technology; (6) human resource development; and (7) software development.

Assistance & Guidance for: Selection of sources and choice over technology indigenous/imported; sources & selection of plant & machinery; sources & selection of raw materials; and trouble shooting.

For further details write to:

Dr Atul Kumar Agarwal, Manager, Technology Business Incubator, CEERI, Pilani 333 031



## CALENDER OF EVENTS

Subjects	Dates	Venue	Contact
AES 94th Convention	16-19 Mar'93	Berlin	Prof Ernest-Jo Voelke, Institut fuer Akustik und Bauphysik, Kiesweg 22, D-6370, Oberursel 6, Germany
Seminar on 'Integrated Electronics'	20-21 Mar'93	Roorkee	Prof R P Agarwal, Convenor, SIE-93 Deptt of Electronics & Comp Engg, Univ of Roorkee, Roorkee 247 667
CeBIT'93 Trade Fair on Computers & Telecommunication	24-31 Mar'93	Hanover Germany	ORBIT, 1127, Midway Apts, AS Marathe Marg, Opp Lucas TVS, Prabhadevi, Bombay 400 025
IETE 24th Mid-Term Symposium on 'Space Electronics & Communications	10-11 Aprl'93	Ahmedabad	Shri OPN Calla, Dy Director, Satellite Communication Area, SAC, Ahmedabad 380 053
National Seminar on Computer Processing of Hindi Language (COMPHIL-93)	10-11 Apr'93	Allahabad	Dr Gulab Singh, Convenor COMPHIL-93 The Instn of Engineers (India), Allahabad Local Centre, Teliarganj, Allahabad 211 004
Supercomm'93 Intl Conf & Exhibition on Telecommunications Path to the 21st Century	19-22 Apr'93	Atlanta Georgia	Telecommunications Industry Association, Suite 800, 2001 Pennsylvani Ave, NW Washington DC, USA 20006-1813
Asia Telcom 93	7-22 May'93	Singapore	Ms Suzan Hee-Sook Lee, Project Manager, Asia Telecom 93, ITU, Place des Nations, CH-1211 Geneva 20 Switzerland
IETE 36th Annual Technical Convention 'Personal Communication Systems'	30 Sep, 1-2 Oct'93	Hyderabad	Secretary, IETE HQs 2, Institutional Area, Lodi Road, New Delhi 110 003 or The Chairman, IETE Hyderabad Local Centre, Near Jama-i-Osmania Post Office, Osmania University Campus, Hyderabad 500 007
System Control Fair'93 (SCF'93)	05-08 Oct'93	Osaka Japan	System Control Fair, Executive Committee JEMA Bldg, 2-4-15 Nagatacho, Chiyoda-Ku, Tokyo 100, Japan
Korea Electronics Show'93	09-14 Oct'93	Seoul Korea	Electronic Industries, Association of Korea (EIAK) 648 Yeongsam-Dong, Kangnam-Ku, Seoul, 135-080, Korea
Computer Graphics'93 Annual Conf & Exhibition	13-15 Oct'93	Bangalore	Mr Tara S Ganguli, Director, Technology & Research Associates, 5, Lindsay Street, Calcutta 700 087
Indian Wind Energy Annual Conference	17-19 Nov'93	New Delhi	Mr Tara S Ganguli, Director, Technology & Research Associates, 5, Lindsay Street, Calcutta 700 087
National Symp on Ocean Electronics 1993 (Sympol-93)	15-17 Dec'93	Cochin	Dr PRS Pillai, Coordinator, SYMPOL-93 Dept of Electronics, CUSAT, Cochin-682 022, India
4th Intl Symp on Recent Advances in Microwave Technology (ISRAMT '93)	15-18 Dec'93	New Delhi & Agra	Prof Banmali Rawat, Dept of EE, University of Nevada, Reno, Nevada 89557-0153, USA; or Prof Bharathi Bhat, CARE, Indian Institute of Technology, New Delhi 110 016
Conference on 'Solar Energy'	Dec'93	Jaipur	Mr Tara S Ganguli, Director, Technology & Research Association, 5, Lindsay Street, Calcutta 700 087
Conference on 'Automation & Robotics'	Jan'94	Madras	Mr Tara S Ganguli, Director, Technology & Research Association, 5, Lindsay Street, Calcutta 700 087
Conference on 'Waste Management'	Feb'94	Calcutta	Mr Tara S Ganguli, Director, Technology & Research Association, 5, Lindsay Street, Calcutta 700 087
Conference on 'Tech Transfair'	Mar'94	Bombay	Mr Tara S Ganguli, Director, Technology & Research Association, 5, Lindsay Street, Calcutta 700 087

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