



**The Institute of Electrical and
Electronics Engineers Inc.**

Hyderabad Section

NEWSLETTER

Vol. 3, No. 2, October 1989

Wishing you joy
at
DIWALI
and
Happiness all the Year

CONTENTS

	Page		Page
Chairman's Column	1	News Release	16
Technology Assessment	2	1989 Student Paper Competition (SPC) Rules	
Rare Event — IEEE President is visiting us	3	The Second International Symposium on Signal Processing and its Application	20
IEEE Video-Taped Seminar on Computer Integrated Manufacturing	4	Computer and Communication Systems — 1990 IEEE Region 10 Conference	21
A Message to Tag Readers	5	IEEE Sponsored and Co-sponsored Conference	22
Restructuring IEEE	6	Development of Compact, Multifunctional Oscilloscopes	25
Digital Electronics— Short Course	12	Super Conductivity for Power Application Lecture Notes	31
Computer Integrated Manufacturing— Video Conference	13		
Robotics : Research and Business Opportunities	14		
Designing Control Systems with GRAFCET	15		

* Address of the IEEE Hyderabad Section Office —

Room No. 644, 6th Floor
Alkarim Trade Centre
Ranigunj, Secunderabad-500 003

Indian wins prestigious US science award

India Abroad News Service
San Francisco: An Indian scientist has been honoured with the most prestigious award in the field of electronics science in the United States.

The medal of honour was given to Dr C Patel, widely known as the inventor of the carbon dioxide laser, by the institute of electric and electronic engineering (IEEE) at a specially held function here. Dr Patel is currently the executive director of the research, materials science of AT and T Bell laboratory in New Jersey. As a result of his invention, these lasers have now be-

come workhorses in industrial cutting, drilling and welding, scientific research such as spectroscopy, non-linear optics and pumping of far infra-red and X-ray lasers; laser surgery in the areas of otolaryngology, gynaecology and tumor removal, remote probing applications including pollution detection and ranging.

In 1978, Dr Patel had received the IEEE's 'Lamme medal'. He has also been honoured by the Optical Society of America and the Laser Institute of America. He is also a member of the

national academy of science and the national academy of engineering and is a fellow of the Indian National Science Academy. In 1985 he was elected an honorary member of the American society for laser medicine and surgery.

Out of two hundred fellows of IEEE, as many as 23 are of Indian origin. By receiving the prestigious award from IEEE, Dr Patel has joined the company of such giants like Charlie Townes, Ed Ginyton, John Pierce, Nico Bloembergen, John Whinnery and Cal Quate.

CHAIRMAN'S COLUMN

Without a continuous review and updating of their education, electrical engineers are prone to end up on technical scrap heap. Engineers represent a valuable resource which tends to depreciate rapidly unless they maintain and update their knowledge and skills. Life long learning and continuing education are the weapons for fighting the danger of obsolescence of the engineers.

Continuing education is the primary service of every section. Members join IEEE mainly for this opportunity to stay current in their fields. Universities and industries in our section do not offer flexible short courses to maintain/update the knowledge and skills of working electrical engineers. The IEEE's continuing educational products are beyond the reach of individual members in our section where incomes of members are 1/10th of the members in U.S.A. The IEEE Hyderabad section therefore desires to provide this basic service at an affordable cost and in a convenient way by innovative methods like section arranged video taped courses, library of video tapes, books, journals, ILPs, live presentation of short courses by experts. A Section level continuing education centre is being established to deliver this service. We have recently purchased a 532 sq.ft. hall in the centre of our city at a cost of Rs 1,44,000 (viz about \$ 9000) for this purpose. Our continuing education centre will be located here. We now intend to purchase chairs, tables, lights, fans, VCR and T.V. receiver, and procure video taped courses/tutorials from various sources.

During the visit of the then IEEE President Dr R E Larsen to Madras around 1981, a press report said that "a centre for continuing education for engineers is likely to be set up in Madras with the cooperation of the IEEE". This however did not materialise. Bruno weinschell 1986 IEEE present during visit to our section told that "it might be possible to make available the educational materials provided there was a permanent address for IEEE in India". The IEEE Hyderabad section is the first section in India and perhaps in Reg 10 to have its own hall for establishing a continuing education centre at the section level. The continuing education centre project needs/deserves the support of the IEEE Project Fund Committee and the IEEE Educational Activities Board and the various IEEE societies. The benefits of the project are summarised as :

1. Members can get more, affordable, flexible application oriented continuing education.
2. It will attract non members to become IEEE members and to retain the existing members.
3. It fulfils the objectives of the IEEE, its RAB, and its Hyderabad Section.
4. Most of our Section Executive Committee meetings can be held here.
5. It can act as a section level IEEE information centre.

C Satish
Section Chairman



THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.
HYDERABAD SECTION

is pleased to invite you to

A Lecture on
TECHNOLOGY ASSESSMENT

Integrated circuits in Historical perspective
by

Dr Emerson Pugh
1989 IEEE President

On Monday, November 27, 1989 at 5-00 p m
at Ritz Hotel, Hyderabad



- Name** : Emerson W Pugh
- Address** : IBM T J Watson Research Center
Yorktown Heights, New York 10598
- Biography** : Dr Pugh received his PhD in physics from Carnegie Mellon University where he served as assistant professor of Physics before joining IBM in 1957. He managed the development of the thin film memory array used in the top-of-the-line 360/95 computer and has held a number of research and development positions including Group Director of Operational Memory and Director of Technical Planning for the Research Division. He is an author of **Principles of Electricity and Magnetism**, Addison Wesley, 1960 and 1970; **Memories that shaped an Industry - Decisions leading to IBM System/360**, MIT Press, 1984; and **IBM's early Computers**, MIT Press 1986. Dr Pugh has served as President of the IEEE Magnetic Society, and 1989 President of the IEEE. He is a Fellow of IEEE. His Fellow citation is "for contributions to information storage technology for digital computers"
- Lecture / Abstract** : An account is given of the evolution and use of the "minimum-line width method" for assessing competing integrated circuit technologies, including its use in evaluating thin magnetic-film memory devices during the 1960s, semiconductor versus magnetic bubble devices during the 1970s, and semiconductor versus Josephson junction devices in the early 1980s. From this account, general rules are derived for conducting successful technology assessments. The account also illuminates significant trends in solid state computer technologies.

RARE EVENT - IEEE PRESIDENT IS VISITING US!

Dr Emerson W Pugh, 1989 IEEE President accompanied by Mrs Pugh will be in Hyderabad on Monday 27th November, 1989. His primary reason for coming to our Section is to learn from us about activities, interests and aspirations of the IEEE Members in the Hyderabad Section. An informal meeting of the members with the President is arranged in the evening at 7-00 p m on 27th November, 1989 at Ritz Hotel, Hyderabad.

It will be followed by dinner. I request every member to participate in this get-together. It is a rare opportunity for us to exchange views with the President. Don't plan any other engagement on 27th November, 1989 evening. Keep it for IEEE.

REMINDER

MEMBERS INVITED TO SPEAK AT COLLEGES

Student branches are asking Section Members to visit their colleges and give lectures to the students. To encourage the members, Section Executive Committee has decided to fund from 1989 the First Class Train or Bus Fare for the members who are willing and are invited by the student branches. The local hospitality expenses will also be reimbursed where it is not provided by the student branches. An amount is earmarked for this programme in this year's Section Budget. Members are urged to undertake these tours. Those who are willing may give the topics with abstracts in brief and number of hours of the lecture or seminar to the Section Secretary. The interaction between working engineers and students will be mutually beneficial. Also getting away from daily routine and the chance to see Lord Venkateswara, the incomparable temple art museum at Tirupati, visiting the grandeur of Ramappa temple sculpture near Warangal or the Alampur temple sculpture and the idyllic forest air and greenery around Mahanandi near Kur-nool or relaxing on the beautiful beaches of Vizag will give tranquillity and aesthetic pleasure to you.

A somewhat similar invitation was published in our April 1989 newsletter. Only 3 members responded. I request more members to come forward. Write to me or to the Section Secretary soon so that we can launch this program. Also I request the student branch Counsellors and Chairman to go through the Section Membership Directory and suggest names of those members whose background serves the student branch requirements. Student branches in our Section are located at Warangal, Tirupati, Cuddapah, and Vizag.

C Satish

IEEE VIDEO-TAPED SEMINAR ON COMPUTER INTEGRATED MANUFACTURING

The above program was presented by the Section on 15th September, 1989 from 6-00 pm at CMC Ltd., Secunderabad. About 12 persons viewed it with the help of the beautiful blown-up video projection system of CMC Ltd. We must thank our Section Secretary & CMC Ltd for that. The program lasting about 4 hours covered the theoretical foundation, architectural models and case studies from Westinghouse Elec. Corp's CIM system implementation Mr C S Snead of Westinghouse was asked to justify the heavy investments on CIM system. His answer was the alternative to avoiding the investment will be going out of business for any industry today. Members who missed the video program can see it as it is going to be repeated at IETE hall on 21-10-89. (see announcement on page 13).

We have another video-taped seminar on "New Technologies in Biomedical Engineering". We have just received the following video-taped seminars in PAL system -

1. VLSI - Its impact on your career
2. Fibre Optics - Technology & Applications
3. Applications of Artificial Intelligence
4. Data Communications Systems
5. Expert Systems and Prolog

We have video-taped tutorials in PAL system on -

1. Role of A.I. in manufacturing
2. Power System fault calculations

We have a package of Individual Learning Program on "Spread Spectrum Techniques". The 1987 IEEE Membership Directory containing names and address of IEEE members world wide is also available in our Section.

Section members are requested to inform the availability and sources of affordable video-taped courses. The prices of such tapes produced by U S Universities and Companies are beyond our reach.

VIDEO SEMINAR/TUTORIAL AT VIZAG

We are planning to present the following programs at Vizag. Members in Vizag can contact Prof G Madhusudan Rao, Dept of ECE, A V College of Engineering.

- | | |
|--|-------------------------------|
| 1. Data Communication Systems | Video Seminar
4 to 5 hours |
| 2. The Role of Artificial Intelligence
in Manufacturing | Video Tutorial
2 hours |

A MESSAGE TO TAG READERS



IEEE

TECHNICAL ACTIVITIES

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.
345 EAST 47TH STREET, NEW YORK, N.Y. 10017-2394, U.S.A. TELEX 236411

OFFICE OF THE STAFF DIRECTOR

(212) 705-7890

June 1989

Dear TAG Reader:

The international technology transfer equation is expected to change substantially as a result of the profound socio-economic changes which will occur in Europe in 1992. A unified European economic community will create new opportunities for our colleagues in Europe and new challenges for our colleagues worldwide.

A united Europe is a positive and welcome development. A divided Europe has in the past created frictions within the continent that had profound worldwide consequences. Both world wars started in Europe and expanded far beyond its borders. A unified Europe is one more step toward a unified world.

Electronics technology, particularly communications, is bringing people closer together. Thanks to electronics, people can increasingly follow events without the need to rely on parochial, and often distorted, interpretations. Therefore, it is becoming more difficult for politicians to control the educated among their peoples, as well as to survive without them. Thus, greater intellectual freedoms must be provided to technical scholars who play a strong role in the economic life of a community. As we approach 1992, industrial centers in Europe, Asia and the Americas must be ready for mutually beneficial and multilateral trade relations, or risk trade wars in the 21st Century as intense as the military conflicts of the 20th Century. These economic relationships must have strong technology transfer commitments to avoid such conflicts.

If we are to shrink the world further, through electronics technology, we must continue to strive for greater global understanding and cooperation. IEEE, as a transnational organization, should continue doing its part in promoting multilateral technology transfer and fair trade practices through its many conferences for the betterment of humankind.

Sincerely,

Irving Engelson
Technical Activities

RESTRUCTURING IEEE

IEEE defines its purposes as 1. "Scientific and Educational" and "Professional". Some members in U S A are seriously debating the second purpose. Some say IEEE is concentrating more on this purpose and diluting the first purpose. A restructuring of IEEE by IEEE concentrating on the first purpose and developing or reinforcing units like IEEE - U S A to concentrate on the second purpose is being considered. Units like IEEE - U S A will serve the professional interests of U S members with greater freedom. There is a fear that this could lead to drifting away from the transnational character of IEEE. Members like Feerst have been pleading that the IEEE must be a U S professional society. Major changes are being considered by IEEE Board of Directors in its November 89 meeting on these issues. The consequences of these changes are far reaching. The reasons for the changes and how these changes will bring the desired results are not spelled out. For instance IEEE is considering whether there should be a Vice President, International Activities without telling us how this is going to help. A few months back, an IEEE transnational office was set up in the headquarters. The scope of this office is very vague. Its program is not known. What will it do with the \$ 80,000 allotted to it this year? Whether it is a V P for International Activities or a Transnational office how will they serve their stated purpose of meeting the needs of overseas members. On August 21, 1989 IEEE Board of Directors considered major changes in the IEEE's voluntary organisation structure. The objectives is to strengthen the international focus to enable the IEEE to serve its global function better by giving up many of the functions relevant to U S members to the care of IEEE - U S A

The IEEE plans, and the BOD resolutions are reproduced below. The views of a few IEEE Educational Activities Board members are given on the following pages. I feel strongly that the issues merit your attention. I invite you to express your views through our Region 10, Director Mr M V Chauhan, Visram Motors, 3 Thiru-Vi-Ka Road, P. Box 725, Madras 600 006 so that he can influence the Board of Directors in its November 1989 meeting.

October 05, 1989

C Satish
Section Chairman

RECOMMENDATIONS OF THE AD HOC COMMITTEE ON RESTRUCTURING VOLUNTEER ORGANIZATION

The committee endorses and encourages expansion of the IEEE role in both its international and national character. Without a dissenting voice, the committee provides the following proposals:

1. In an effort to strengthen the international focus, the national activities presently associated with the Regional Activities Board, Educational Activities Board, United States Activities Board, and Standards Board would be transferred into an entity known as "IEEE-USA". This configuration enables the formation of other national entities. The ultimate authority still resides with the IEEE Board of Directors.
2. Headed by its own President, the IEEE-USA will have substantial fiscal autonomy and control and will be spokesman for all US National issues. Included in the functions of this body will be US standards, accreditation, and all professional func-

tions presently managed by the United States Activities Board. It is expected that the bylaws of the IEEE-USA would make provision for a Board of Directors composed of a VP Professional Activities, VP Accreditation Activities, VP Standards Activities, Secretary/Treasurer, the six US Regional Directors and an Executive Director; and chaired by the President of the IEEE-USA. Interface with the IEEE Board of Directors is through the bylaws and the representation by the US Regional Directors who sit on both the IEEE BoD and the IEEE-USA BoD. This new organization allows for significant independence of the national entity, as well as providing a template for establishing other entities of like nature in the future.

3. It is now feasible for the IEEE to attain a truly International stature without the stricture of national and professional activities. The IEEE Board of

Recommendations of The Ad Hoc Committee - continued

Directors would be composed of the President, President Elect, Past President, Secretary/Treasurer, VP Regional Activities, VP Technical Activities, Executive Director (all of whom would also be members of the Executive Committee), as well as the ten Regional Directors and ten Technical Directors. The President Elect would coordinate activities of the Publications Board, Educational Programs Board, and Awards Board, all of which have global impact on the membership. This also allows for the President Elect to become familiar with the broad range and complexities of IEEE activities before assuming the office of President. The experience and wisdom of the Past President would be retained in the role of chair for the Strategic Planning Committee.

4. Three Boards would be required to meet the various global needs of the membership in addition to Technical and Regional Activities. These are:

PUBLICATIONS BOARD

Needed to maintain the quality, availability and delivery of all published materials distributed worldwide.

EDUCATIONAL PROGRAMS BOARD

Needed to meet the education needs of our members worldwide. Educational programs for members of

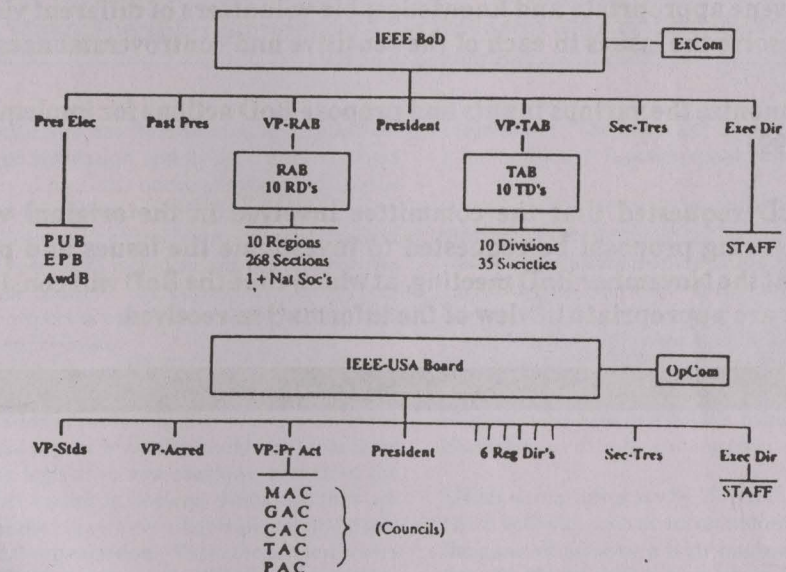
IEEE must remain an integral part of the global function; having a separate Board provides the vehicle for continuing education for all members worldwide.

AWARDS BOARD

Needed to recognize outstanding individuals without regard to national boundaries.

5. The committee reaffirms the proposal that accreditation is a national function. Recognizing that there may be questions regarding accreditation activities, the IEEE-USA Accreditation entity would act as a resource for inquiries from other national accreditation agencies.
6. All responsibility for maintaining the liaisons with other national and international standards organizations will be retained by the Standards Board under the aegis of IEEE-USA.
7. The committee believes that the suggested recommendations reinforce, and are consistent with, the internal changes being proposed within RAB and TAB.

Consistent with these recommendations, the following organizational charts for the revised IEEE Board of Directors and the new IEEE-USA Board are proposed.



IEEE Board of Directors, Resolution of August 21, 1989, Pittsburgh, PA.

Plans for Reorganization of the Volunteer Structure

The BoD, with the objective of increasing and strengthening international cooperation with sister organizations and promoting increased worldwide participation in the Institute, is considering organizational changes that would better achieve these objectives.

Thus, the BoD received the report of the Volunteer Restructuring Committee and approved the concept of creating, where desired, geographic area-specific entities within IEEE and restructuring the IEEE Board of Directors to strengthen its international character.

The intent is to:

- a. Immediately instigate communications through all of our media channels with IEEE members on the concept, objectives, benefits to be derived, and proposed schedules.
- b. Encourage discussions at all levels (Regions, Divisions, Societies, Committees, etc.) and invite comments from all interested parties and groups.
- c. Convene appropriate and knowledgeable volunteers of different viewpoints to resolve the issues in each of the sensitive and controversial areas:
- d. Harmonize the various inputs and propose BoD actions for implementation by 1991.

The BoD requested that the committee involved in the original volunteer restructuring proposal be requested to investigate the issues and provide a report at the November BoD meeting, at which time the BoD will consider what actions are appropriate in view of the information received.

The IEEE in a Global Economy

- Jerrier A. Haddad

The IEEE is the only existing international professional society. That is to say that it has full members from all over the world regardless of nationality or location. The overarching purpose of the IEEE is technical communication and the improvement of the technical knowledge and education of its members. Since progress in technology is ever faster as time progresses, and as it is becoming more and more necessary to understand the laws and cultures of our competitors and our foreign markets in this global economy, the international nature of the IEEE becomes ever more valuable. It is indeed laudable that the IEEE Board seeks to maximize the IEEE effectiveness in international affairs. We are to be envied by other engineering societies since we are much further down the road of internationalism than they are.

However, when we change things, we must take care that the objectives of that change are not inadvertently compromised. Any fundamental change in the structure of the IEEE should be tested and discussed in detail, with candor and completeness. There are some issues that I think could work against the objectives almost as likely as they might work for the objectives.

One example is that to the present, the IEEE operates on the basis of consensus rather than contention. My concern is that if we organize on the basis of national interest groups, it will be inevitable that the national interests of these groups will throw them into contention. This may or may not be bad. However, when there is contention, there should be a means of resolving

those contentions. At a minimum, there should be a way that will allow the technical activities and educational programs of the IEEE to be undisturbed by the contentions. The membership should discuss, debate, and consider whether or not we will become a confederation of national electrical engineering societies rather than a single international electrical engineering society.

I happen to believe that there are very few issues that affect electrical engineers that don't affect engineers in other disciplines. In fact, there are some, but few, issues that affect engineers in general that don't affect the general population. On the other hand there are many issues of difference between nations that are of a commercial or political nature that could breed animosity between IEEE units. We should not hide from these realities, but neither should the IEEE seek to remedy these issues at the price of endangering our technical mission and agenda.

While organizational structure is important, even more important is the style and thrust of the leadership of an institution. Without changing the structure, a new leadership can affect the manner in which an institution operates. The membership should consider whether the proposed new volunteer structure will achieve the stated goals or whether it may work against those very goals. It would be nice if we could design a test to ascertain this before anything irrevocable is done.

"Don't Make The IEEE Something That It Wa'sn't Meant, And Isn't Fit, To Be"

- Anthony Ephremides

The IEEE was founded and has flourished as a scientific organization. Its unique reputation and its appeal to members worldwide was achieved precisely because it was perceived as "the organization" that rose above national boundaries to foster the science and technology of electrosystems for the benefit of mankind. Its means have been technical and educational. As such, it developed publications and established conferences that have earned the respect of a vast world audience. Its reach stretches beyond its membership.

In the meantime, many of our US members have been experiencing the frustration of professional problems without the assistance of a national organization that could represent them effectively before the legislative and executive branch of the government and other bodies in Society. Naturally, they appealed to the IEEE as the organization that might fulfill the role of the lacking national organization. Thus, the United States Activities Board (USAB) was formed. Financed through assessments of the US members only, it has pursued the goals of professional representation that had been lacking in the USA (unlike other countries where strong national societies have existed with their primary goal being exactly this professional rep-

resentation). The history of USAB's performance shows that it has fulfilled its function quite well for US members.

At the time of debate about the formation of USAB, many members were opposed to it because they felt that its creation within IEEE would jeopardize the Institute's scientific/technical status and international character. They feared that this step was the first in a process of transforming the IEEE to a purely US, and mainly non-technical, organization. For several years now USAB has functioned successfully and in harmony with the remaining IEEE mission. Recently, however, the fears of those who saw in USAB's formation a threat to IEEE's character, seem to be coming true.

Under strong advocacy by USAB for the expansion into other IEEE activities such as accreditation and standards, and under the guise of creating a truly international umbrella organization, the Board of Directors of the IEEE has proceeded with unprecedented haste to approve the key feature of the committee report, i.e., the creation, where desired, of national entities. The committee recommendations are presented in full in this newsletter. The committee work was completed over the sum-

mer within a few weeks. I participated, of course, in the Board's deliberations and realized that many Board members approved the concept with serious reservations and with the earnest hope that any further action toward its implementation will take place only with the greatest caution and after considerable feedback from the various units of the Institute.

However, I am afraid that there is a need for vigilance. If the proposed concept of restructuring the IEEE is realized, the largest and, therefore, domineering National Society that will be formed will be the one in the United States; and it will not stop there. Already, USAB has stated that it won't be satisfied if under its National Society charter, nothing else other than professional activities is included. It wants all of what it calls "US-specific" activities. One wonders where the line is to be drawn. Is a conference taking place in Minneapolis a "US-specific" activity? Is a publication printed in New York a "US-specific" one? Isn't a corporation registered in the state of New York "US-specific"? You can see the problems!

Don't get me wrong! I do believe that there is a strong need for professional representation of the US engineer. There are a number of approaches possible to achieve this. One vehicle would be a strong and unambiguous Society outside of the IEEE. In the absence of such an organization, USAB has performed this task quite well within the IEEE. If USAB wishes more autonomy, it should have it. But if it wishes to take over the Institute and to weaken its scientific/technical and international character, it should not be allowed.

The proposal's language is mild and seems to be stating that its main goal is to strengthen IEEE's internationalism. But please expand your thoughts beyond the words. And also ponder the following questions: "Why is the proposed restructuring necessary?" If something "ain't broke", why "fix" it?

The Institute is doing very well; leave it in peace. Make your voice heard before IEEE becomes something that it wasn't meant, and isn't fit, to be.

Internationalism and The Proposed Reorganization of IEEE Volunteer Structure

- V. Thomas Rhyne

The reorganization plan, which was received and favorably considered by the IEEE Board of Directors in August, is intended, according to its authors, to strengthen the international nature of our society. In so doing, however, it creates a new, US-only sub-society, IEEE-USA. This is an interesting response to the stated concern for improved internationalism, not unlike the paradox of "fighting for peace." Further, the proposed reorganization removes two key IEEE activities, standards and education, from direct visibility at the Board of Directors level. Both of these actions are cause for concern by rank and file IEEE members.

If I assume that the new IEEE-USA is to be largely created from the current USAB, (now IEEE-US-Activities), as I believe is the proposal, then my concern is that the proposed reorganization may have negative impact on both standards and educational activities. First, however, I want to state that I am very satisfied with the work that the current USAB group has performed on behalf of the practicing electrical engineer. Their work on issues such as pensions, job security, and legislative reform has been of clear benefit to me and all other US electrical engineers. My concern over the reorganization, however, is centered around the basic incompatibility between these US-only professionalism emphases of USAB and the standardization and education activities proposed for incorporation under the new IEEE-USA. What is appropriate to USAB seems inappropriate to both the standards and educational activities of the IEEE.

For example, having been involved in IEEE and other standards activities for many years, I believe strongly that standardization is an international activity, and that effective standards creation often requires compromises that go beyond purely national interests. Nationalizing the IEEE's standards

activities will likely place a USA-only label on this key IEEE activity, significantly limiting the IEEE's role in international standards efforts where we are a recognized world-wide authority today. There is much to be lost here.

As to education, I note first that a recent IEEE member survey ranked the Institute's educational services among the most appreciated member benefits. I believe that the past effectiveness of these services is clear, and I am a strong subscriber to the philosophy that, "If it ain't broke, don't fix it!" By relegating education to below-Board-level, US-only status, it seems likely that the IEEE's strong educational presence will be diminished, both in the area of accreditation of electrical engineering and related programs for engineering students, and in continuing education for the IEEE's worldwide membership. I also believe that the interests of the practicing engineering professional, though well served by current USAB efforts, are in many ways quite different from the interests of the community of electrical engineers directly involved in the educational aspects of our profession. At present, volunteers are free to work in either (or both) areas of interest. If a merger is forced, however, which group's interests will dominate? As in the standards case, I can find no reason to shift the IEEE's educational activities away from visibility at the Board of Directors level and into a nationalized sub-society.

I hope that the Board of Directors will consider these and the many other concerns raised by knowledgeable IEEE volunteers before deciding whether or not to implement the proposed reorganization. I also hope that volunteers who read this will make their opinions (whether in agreement with me or not) known both to the IEEE Board of Directors and to me. This issue should be addressed by all IEEE members.

Dear Member,

I have been writing in the earlier newsletters that letters and articles from members are invited. You were urged to raise your concerns, points of view, share your knowledge, and experience. I wanted to know your suggestions about the directions you wish the newsletter, membership directory and the Section programs to take. There is no response from you to any of the above pleas. Needless to say active participation of members alone can sustain/strengthen the Section. A stronger personal commitment from each member can make the Section serve better.

Now that we have our own hall and are establishing a continuing education centre with a video library, we have to identify the topics/suppliers/experts and deliver the service.

We need several enthusiastic volunteers to share the work. Let me know your interests and needs.

C Satish
Section Chairman

NEW STUDENT BRANCHES

IEEE Regional Activities Board has given approval for the formation of 3 new student branches.

Student Branch at	Counsellor	Chairman
1. K S R M College of Engineering Cuddapah-516 003 (March 1989)	Mr G Ravindranath	Mr G Sudheer
2. Gandhi Institute of Technology & Management Vizag-530 040 (June 1989)	Dr M V Subba Rao	Srinivas Kaja
3. Andhra University College of Engineering Vizag-530 003 (September 1989)	Dr G Madhusudana Rao	Mr S Sudhakar

Welcome to these IEEE student branches.



THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS,
IEEE HYDERABAD SECTION

SHORT COURSE ON "DIGITAL ELECTRONICS"

Advances in the application of digital systems to instrumentation, industrial automation, communications, scientific research and consumer products created a critical demand for working engineers to have knowledge in these fields. The above subjects were not taught in the colleges to those engineers who were in College say before 1976. It is becoming important that such engineers become familiar with the basic principles of digital electronics to enable them to analyse, design, debug and maintain digital circuits or systems. The Institute of Electrical and Electronics Engineers Inc., and the Institution of Electronics & Telecommunication Engineers Hyderabad Sections are happy to provide an opportunity to them to acquire application oriented knowledge and skills in digital electronics.

Course Content

Logic Concepts, Electronic Logic, Boolean Algebra, Combinational Logic, Binary number operations, Sequential circuits, Flip-Flops, Counting, Shift registers, Timing and Synchronising circuits, IC Data Sheet interpretation signal conditioning for digital circuits, counter analysis and Design, Digital circuit fault analysis, circuit construction & manufacturing technique, Analog to Digital Conversion, Logic design using microprocessors.

Laboratory work to supplement the above.

- Course duration - 6-8.15 p m, 22 November 1989 to 22 December 1989
- Instructor (s) - 1. Mr T V S Rámamurthy, Deputy Director, Advanced Training Institute for Electronics, Hyderabad
2.
- Text books - 1. Digital Electronics - C E STRANGIO
Prentice - Hall — Rs 57
- Further information - Mr Narayana, Secretary, IETE, Behind O.U. Arts College, Hyderabad-500 007
Telephone No. 868025 / 850141
- Fees for Members of IEEE / IETE Rs 200
for Others Rs 250

Enrolment is Limited

DIGITAL ELECTRONICS

Name : Age :
Organisation : Designation :
Address : Telephone :

Qualifications

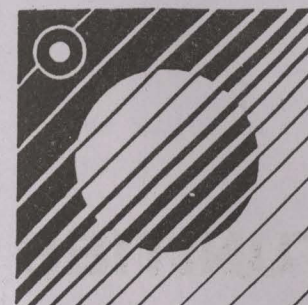
IEEE/IETE Membership No.

Register before 13 November, 1989. Make cheque payable to "IEEE Hyderabad Section" and send it to IEEE, Hyderabad Section, Mr Nagaraja, Engineer, N R S A, Balanaqar, Hyderabad-500 037.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, HYDERABAD SECTION

THE INSTITUTION OF ELECTRONICS AND TELECOMMUNICATION ENGINEERS, HYDERABAD CENTRE

PRESENT AN



IEEE VIDEOCONFERENCES
SEMINARS



IEEE Videoconference

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

COMPUTER INTEGRATED
MANUFACTURING:
Basic Architecture Models

INTENDED AUDIENCE:

The program will be of particular value to participants whose job functions span a rather broad range of responsibilities such as those of:

- Executives: CEO's, Administrative officers, Operations officers
- Managers: Engineering, manufacturing, information, production, CAD/CAM, CIM
- Engineers: Design, manufacturing, industrial, systems
- Analysts & Technicians: Systems, computer
- Academia: Engineering, technology, computer science, management information systems, business, quality assurance, marketing

KEY SEMINAR ELEMENTS:

- CIM Architecture Models
- CIM Information System
- CIM Impediments and Solutions
- CIM System Checklist

Computer Integrated Manufacturing (CIM) is gradually changing manufacturing from a practitioner's art to a highly specialized science. The change wrought by applying the philosophy, principles, and concepts of CIM is necessary, according to many experts, if our manufacturing companies are to survive. The change from conventional manufacturing to CIM is not easy and it is not inexpensive.

The presentation will introduce architectural framework models for CIM design and implementation. Views and case studies will be presented for large, medium, and small companies. A special CIM system checklist will be distributed for assisting developers and users to quickly and systematically define the requirements and conditions for their own CIM system.

PROGRAM OUTLINE:

- Dr. Dell K. Allen
- CIM BASIC ARCHITECTURE
- Theoretical foundation for CIM
Historical development
Basic premises
 - Architectural framework models
Industrial perspectives
CIM system model
CIM system test facility
 - CIM Challenge Matrix

- Robert J. Frank
- PATENTS AFFECTING CIM
- Coverage
 - Relevance
 - Implications

STRAIGHT TALK ABOUT CIM

Case studies and discussion of CIM challenges as they affect corporations in terms of motivation, know-how, tools and organization at the executive level, mid-manager and technical level, and craftsman-operator level.

Large Company Viewpoint:

Mr. Charles S. Snead
Westinghouse Electric Corp.

Medium Size Company Viewpoint:

Mr. Philip E. Whiteside
OTC Division of Sealed Power Corp.

Small Company Viewpoint:

Mr. Buford B. Wilson
Daniel Industries

TECHNICAL CONSULTANT:

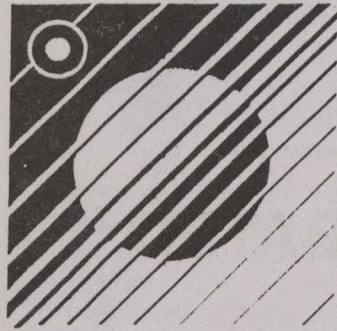
Dr. Dell K. Allen
Director, CAM Software Research Center, Brigham Young University

PRESENTERS:

Charles S. Snead Operations Manager Hunt Valley Works Westinghouse Electric Corp.	Philip E. Whiteside Manager, Manufacturing Engineering OTC Division Sealed Power Corporation
Buford B. Wilson Engineering Systems Analyst Daniel Industries	Robert J. Frank Attorney at Law Spencer & Frank

Date : October 21, 1989
Time : 1030 hrs to 1600 hrs
Venue : I E T E
near Arts College
Osmania University Campus
Hyderabad-500 007

Admission free - Prior intimation preferred.



IEEE VIDEOCONFERENCES SEMINARS

IEEE Hyderabad Section presents



IEEE VIDEOTAPE PROGRAM

ROBOTICS: RESEARCH AND BUSINESS OPPORTUNITIES

INTENDED AUDIENCE:

This program is intended for research, design and development engineers, computer hardware and software engineers, computer hardware and software engineers, control and systems engineers, manufacturing and production engineers and top-level engineering management.

RUNNING TIME:

About 5 hours

ADMISSION FREE -

Seats are limited prior registration preferred

If today can be called "The Computer Age," the next several decades will surely become known as "The Robotics Age." From today's "prosaic" applications—such as materials handling, welding and paint spraying—robots will someday be mining the sea beds, constructing buildings, manufacturing other robots to perform myriad tasks. Already, "smarter" robots are fabricating computer chips. The future is limited only by our imagination and the expansion of technologies now in existence.

PROGRAM OUTLINE :

PART-I

1. Introduction
2. Dr. Thomas Sheridan
History and Definitions
3. Dr. James Albus
Kinematics and Dynamics
Sensors and Sensory Processing
Control Systems
Internal Models and
Knowledge Representation
Programming Methods
Mobility
Interfacing
Socioeconomics
4. Dr. Thomas Sheridan
Accommodation and Touch
Impedance Control
Teleoperators
Supervisory Control
Social Impact of Robotics

5. Question and Answer Session

PART-II

6. Midpoint
"Robots VI: Tomorrow's Technology on Display"
Produced by the Society of Manufacturing Engineers
7. Mr. Maurice Dunne
Mr. Michael Radeke
Investment and Die Casting
Machine Loading
Resistance Spot Welding
Arc Welding
Materials Handling
Aerospace Drilling

Question and Answer Session Round Table Discussion

PRESENTERS:

James S. Albus
National Bureau of Standards

Maurice J. Dunne
Unimation, Inc.

Michael Radeke
Cincinnati Milacron

Thomas B. Sheridan
Massachusetts Institute of Technology

- When : Part I on 10th November 1989 6-00 pm to 8-30 pm
Part II on 17th November 1989 6-00 pm to 8-30 pm
- Where : CMC Limited, 6th Floor, Cheney Trade Centre
Park Lane, Secunderabad.

IEEE 2nd VIDEOCONFERENCE

IEEE Hyderabad Section presents

A TECHNICAL LECTURE

DESIGNING CONTROL SYSTEMS WITH GRAFCET

The Subject

GRAFCET is a recently developed technique for designing control systems for complex sequential and batch sequential processes. It combines the convenience of a graphical approach in a formally verifiable design. GRAFCET has been the result of a long collaborative study by the French industry and university research groups under the aegis of the French scientific body AFCET. It has recently been standardised by the International Electrotechnical Commission (IEC 848 - 1988). Many manufacturers now propose programmable controllers with GRAFCET support.

The Speaker

Dr S Parthasarathy, Systems Consultant at CMC's R & D, has been specialising in the design of real time systems for process control related applications. He has worked closely with the developers of GRAFCET during its initial stages of development and recently during his sabbatical visit to France. Dr Parthasarathy is a Senior Member of IEEE.

When :] will be intimated soon
Where :]



IEEE
MEMBERSHIP IS PART OF
BEING A PROFESSIONAL

Keep a step ahead IEEE programs help you :

- Adapt to a rapidly changing environment
- Add "how to" skills to a formal education
- Recognize technology advances early
- Understand new-technology applications
- Identify synergisms across technology boundaries
- Gain perspectives and measures for judging one's work
- Present and test ideas in the IEEE's many forums
- Follow or participate in standards development
- Develop educational guidelines and programs for today's needs
- Establish contacts in the profession
- Build professional recognition and prestige



NEWS RELEASE

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

FOR IMMEDIATE RELEASE

Contact: Theresa Kirby
(201) 562-5498

Announcing a New Individual Learning Program from Educational Activities Transducers and Sensors

The Educational Activities Board of the Institute of Electrical and Electronics Engineers, Inc. announces the publication of *Transducers and Sensors*, developed by John G. Webster. This package, designed in a self-study format, is the eighth volume in the Individual Learning Program Series of continuing education publications.

Transducers and Sensors provides a thorough understanding of the theory, design, and application of temperature, optical, position, and flow sensors and amplifier circuits for interfacing sensors to computers and other read-out devices. After completing the course, a student should be able to select the optimal sensor, design an amplifier to interface a sensor with other electronic systems, measure temperature, displacement, optical radiation, and flow to a given application.

Three videotapes, representing five hours of lecture, accompany the package. In addition to reinforcing the text and study guide material, the videos provide numerous examples of modern industrial sensors.

Divided into 13 units, the topics covered by the program include amplifiers, op-amp circuits, p-n junction thermometers, thermocouples, resistive temperature sensors, optical sources and filters, optical sensors, optical sensor systems, resistive strain gauges, linear variable differential transformers, piezoelectric sensors, thermal and mechanical flowmeters, electromagnetic and ultrasonic flowmeters. Each unit contains an introduction, learning objectives, a videotape, and a self-test.

In addition to the videotapes and study guide, the program includes a textbook, *Interfacing Sensors to the IBM PC*, edited by Willis J. Tompkins and John G. Webster, Prentice-Hall, 1988, and a 100-question final examination.

Transducers and Sensors is particularly valuable for applications, manufacturing, design, and research engineers and engineers working in instrumentation, aerospace, and the automotive industry.

-More-

NEW YORK, N.Y. • 345 EAST 47TH STREET, 10017
WASHINGTON, D.C. • 1111 NINETEENTH STREET, N.W. 20036

John G. Webster is a Professor of Electrical and Computer Engineering at the University of Wisconsin, Madison, where he teaches courses in medical instrumentation and sensors. In addition to teaching and research, Professor Webster has worked extensively in industry. He has coauthored, edited, and coedited nine books in the area of biomedical engineering and published numerous articles in technical journals. Professor Webster is a fellow of the IEEE and a fellow of the Instrument Society of America. He is a member of the NIH Surgery and Bioengineering Study Section.

The program was reviewed by two experts in the area of transducers and sensors, Robert A. Peura, Professor and Director of Biomedical Engineering, Worcester Polytechnic Institute, Worcester, MA, and Kenneth C. Mylrea, Professor and Director of Clinical Engineering, University of Arizona, Tucson.

The complete *Transducers and Sensors* ILP which includes three videotapes, study guide, textbook, and final exam (Order No. HL0411-9) is available for \$498 (\$249 for IEEE members).

The study guide and final exam may be purchased separately (Order No. HL0413-5) for \$90 (\$45 for IEEE members). The videotapes are also available outside the package (Order No. HL0414-3) for \$330 (\$165 for IEEE members).

The package and components may be ordered from the IEEE Service Center, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331. Make check payable to IEEE. Please add the following shipping and handling charges: for orders totaling \$1.00 to \$50.00, add \$4.00; \$50.01 to \$75.00, add \$5.00; \$75.01 to \$100.00, add \$6.00; \$100.01 to \$200.00, add \$8.00; over \$200.00, add \$15.00. Credit card orders (MasterCard, VISA, American Express, and Diners Club) are accepted. To place your credit card order, please call (201) 981-9535.



GREAT OPPORTUNITY FOR STUDENT MEMBERS

IEEE REGION 10 1989 STUDENT PAPER COMPETITION (SPC) RULES

The IEEE Region 10 conducts two student paper competitions every year, one for the Post graduate and the other for the Under graduate IEEE student members in the Region.

The papers for the competition will be selected from tiered competitions conducted by the IEEE Sections.

Competition 1 (PG SPC)

Open to IEEE student members with basic degree in Electrical, Electronics, Computer Science or any other field of interest of an IEEE society, and who are studying for a post graduate course. (Eligibility to be supported by a certificate from the Student Branch Counselor)

Competition 2 (UG SPC)

Open to IEEE student members undergoing an Under Graduate Course in Electrical, Electronics, Computer Science or allied subjects. (Eligibility to be supported by a certificate from the Student Branch Counselor).

1. General Rules

- * Open only to IEEE student members in the Region.
- * The papers may be on any Engineering Subject in the field of interest of IEEE.
- * The paper should be typewritten on one side only on A4 size and should not exceed 10 pages.
- * The number of authors for one paper is limited to 3.

Four Copies of the paper should be sent to the Student Activities Committee Chairman of your Section before November 15, 1989.

2. Format to be followed

2.1 Title page

This should provide the title, the author (s) name (s), IEEE membership number (s), address and about a 100 word abstract.

2.2 Eligibility certificate

A certificate from the Student Branch Counselor/faculty member who is a member of IEEE, in the following format should be enclosed with each paper.

"I certify that the author/authors.....
(name/names)is /are student members of IEEE and is/are eligible to enter the Region 10 Postgraduate / Undergraduate Student Paper Competition."

..... (Signature)

Place (Name)

IEEE Student Branch Counselor/faculty member

Date (Membership No.)

Contd ...2

2.3 Main Text

This should provide a well structured, clear and concise presentation of the subject matter including an introduction, the main body and the conclusion with supporting tables and figures. The headings and subheadings should be numbered as in the example below:

6. Simulation Results

6.1 Test Systems

2.4 Figures and Tables

These should be neat and tidy, consecutively numbered, captioned and contained within the text at the appropriate places.

2.5 Equations

The equations should be consecutively numbered with the number in parenthesis, opposite the equation.

2.6 References

References suitably numbered, should be provided at the end with their reference numbers given within square brackets at the appropriate places in the main text.

2.7 Appendices

Detailed mathematical proofs, development of equations etc. which are subordinate to the main argument in the body of the paper, should be given in the appendices, with reference in the main text.

3. Prizes

One prize for the PG SPC and two prizes for the UG SPC will be awarded.

<u>PG SPC</u>	<u>First Prize</u>	<u>US \$ 300.00</u>
<u>UG SPC</u>	<u>First Prize</u>	<u>US \$ 300.00</u>
	<u>Second Prize</u>	<u>US \$ 200.00</u>

The winners will also receive duly inscribed plaques, and their colleges, scrolls.

In case of co-authored papers, prize money shall be divided equally among the authors; however, the plaques will be given separately to each author.

Address of the Section
Student Activities
Committee Chairman
Mr Tenneti Eswar
2-2-1126/2, Nallakunta
Hyderabad-500 044

K Gomathi
SAC Chairman
IEEE Region 10



THE SECOND INTERNATIONAL SYMPOSIUM ON SIGNAL PROCESSING AND ITS APPLICATIONS

ISSPA 90

GOLD COAST, AUSTRALIA, 27th - 31st AUGUST, 1990.

SPONSORED BY THE INTERNATIONAL ASSOCIATION OF SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (IASTD) AND IEEE, IREE, IE (AUST)

THE SECOND INTERNATIONAL SYMPOSIUM ON SIGNAL PROCESSING AND ITS APPLICATIONS

ISSPA 90 is the second international Symposium held in Australia devoted exclusively to Signal Processing and its applications. The Symposium aims to provide a forum where industrialists, researchers, engineers, and technicians may discuss common and disparate objectives, and aspirations for the applications of Signal Processing.

AREAS OF INTEREST:

1. Digital Signal Processing
2. Digital Filters
3. Spectrum Estimation
4. Computational Techniques
5. Detection, Estimation and Identification
6. Adaptive Signal Processing
7. Seismic and Array Signal Processing
8. Array Signal Processing and Beamforming
9. Radar and Sonar Signal Processing
10. Speech Processing and Pattern Recognition
11. Image Processing, Recognition, Synthesis
12. VLSI Signal Processing
13. Optical Signal Processing
14. Biomedical Signal Processing
15. Communications Signal Processing
16. Applications of Signal Processing Techniques
17. Advances in Signal Theory

20

EXHIBITIONS

An exhibition of equipment and technical apparatus related to the subject will be held in conjunction with the conference. Prospective exhibitors are invited to contact the Conference Secretariat to make preliminary arrangements.

SUBMISSION OF PAPERS

Prospective authors are invited to submit

- (1) 400-500 word **summary** and
- (2) a short form description **selecting one of the areas of interest** and describing the importance and novelty of the submission, with relevant references of previous work. The Technical Program Committee will select the final program.

Submission of an abstract implies a commitment to present the paper.

(The non-observance of this format might prejudice the acceptance of the paper).

The time schedule is as follows:

- 4 copies of a 400-500 word abstract : January 15, 1990
- Notification of acceptance by mail : March 16, 1990
- Full papers in camera ready form : May 15, 1990

ENQUIRIES

All Correspondence must be addressed to

Conference Secretariat
ISSPA 90, UniQuest
University of Queensland
Brisbane Qld 4067
Australia



THE INSTITUTE OF
ELECTRICAL AND
ELECTRONICS
ENGINEERS, INC.
HONG KONG SECTION

International Advisory Committee

Prof I Aleksander, Imperial College, London
Prof Y Aitikouzel, Univ. of W. Australia, Perth
Prof S Chanow, Univ. of British Columbia, Vancouver
Prof F L Chu, Univ. of New South Wales, Sydney
Prof T Cole, Univ. of Sydney, Sydney
Prof G R Hellestrand, Univ. of New South Wales, Sydney
Prof H P Khuncha, Indian Institute of Science, Bangalore
Prof S Lam, Univ. of Texas, Austin
Prof K F Lee, Univ. of Toledo, Ohio
Prof L S Lee, National Taiwan Univ., Taipei
Prof R C T Lee, National Tsing Hua Univ., Taipei
Prof C M Leung, Univ. of British Columbia, Vancouver
Prof H F Li, Concordia Univ., Quebec
Prof V O K Li, Univ. of Southern California, Los Angeles
Dr Y C Lim, National Univ. of Singapore, Singapore
Prof H D Liu, Beijing Univ., Beijing
Dr H Murata, Furukawa Electric, Tokyo
Mr K R S Murthy, AT & T Bell Labs, New Jersey
Dr E Numbaum, Bellcore, New Jersey
Dr K Ono, KDD, Tokyo
Prof A Pal, Indian Institute of Technology, Kharagpur
Prof P V Rao, Tata Inst. of Fundamental Research, Bombay
Prof M Schwartz, Columbia Univ., New York
Dr S Shimada, NTT, Yokosuka
Prof R Steele, Univ. of Southampton, Southampton
Prof T Suetu, Osaka Univ., Osaka
Dr S Takuchi, Sumitomo Electric, Yokohama
Prof B C Tan, Univ. of Malaya, Kuala Lumpur
Prof T T Tjhung, National Univ. of Singapore, Singapore
Prof K U, KAIST, Seoul
Prof Dejung Wang, Beijing Univ. of Posts & Telecom, Beijing
Prof C H Wei, National Chiao Tung Univ., Hsin Chu
Prof E Wong, Univ. of California, Berkeley
Prof J W W Wong, Univ. of Waterloo, Waterloo
Prof Feida Ye, Beijing Univ. of Post & Telecom, Beijing
Prof F T S Yu, Pennsylvania State Univ., Pennsylvania

Honorary Advisers

Prof C Kao, Chinese Univ. of Hong Kong
Mr H Wai, Post Office, Hong Kong

General Chairman

Dr P S Chung
Department of Electronic Engineering
The Chinese University of Hong Kong
Shatin, N.T., Hong Kong
Telex: 50301 CUHK HX
Fax: (852) 6957358

Vice Chairmen

Dr P C Ching, Chinese Univ. of Hong Kong
Dr F C M Lau, Univ. of Hong Kong

Secretary

Mr C Y Ng, Cable & Wireless (HK) Ltd.

Treasurer

Dr K M Hong, Univ. of Hong Kong

Technical Program

Dr Y S Cheung (Co-Chairman)
University of Hong Kong
Dr W C Siu (Co-Chairman)
Hong Kong Polytechnic

Special Program

Mr Anthony Au (Chairman)
ABC Software, H.K.

Tutorial Program

Dr C K Chan (Chairman)
City Polytechnic of Hong Kong
Dr K T Ko, City Polytechnic of Hong Kong
Dr K L Ho, Univ. of Hong Kong
Dr K M Luk, Chinese Univ. of Hong Kong

Publication

Mr C B Leung (Chairman)
Royal HK Police
Mr Y W Liu, Royal HK Police

Local Arrangement

Mr C M Mak (Chairman)
China Light & Power Co. Ltd, H.K.
Dr K W Tse, Univ. of Hong Kong
Dr Y H Pun, Chinese Univ. of Hong Kong

Publicity

Mr N F Chin (Chairman)
GEC Alsthom Measurements, H.K.

Steering Committee

Prof T C Chen, Chinese Univ. of Hong Kong
Prof Y C Cheng, City Polytechnic of Hong Kong
Prof W S Leung, Univ. of Hong Kong
Mr H M Fung, Cable & Wireless (HK), Ltd.
Dr J S L Wong, Hong Kong Polytechnic

TENCON'90

24-27 September, 1990

1990 IEEE Region 10 Conference on Computer and Communication Systems

24-27 September, 1990
Hong Kong Convention and Exhibition Centre
Hong Kong

CALL FOR PAPERS

Topics include (but not limited to):

Computer systems, modeling and performance of computer systems, distributed computer systems, real-time systems, information systems, expert systems, human factors and interactive computer systems, multi-processor systems, neural networks, optical computing, multi-tasking and multi-programming systems.

Communication theory, transmission systems, cable TV, mobile radio, satellite communications, optical communications and integrated optics, optoelectronics, optical sensors, high definition TV and digital TV, audio and video technologies, computer and communication electronics, signal processing, speech and image processing, computer networking, ISDN and data communications.

Prospective authors are invited to submit four copies of extended summaries of about 2000 words, with illustrations if necessary, and an abstract of less than 100 words, to the Technical Program Co-Chairman:

Dr Y.S. Cheung
Department of Electrical & Electronic Engineering
University of Hong Kong
Pokfulam, Hong Kong
Telex: 71919 CEREB HX
Fax: (852) 5-598738
Email: hkucs!hkucce!cheung@uunet.uu.net

Authors' Schedule :

Deadline for extended summaries: 22 January, 1990
Notification of acceptance : 14 April, 1990
Submission of camera-ready papers : 30 June, 1990

CeNIT ASIA'90, the Asian version of CeBIT, will be held concurrently with TENCON'90

1989

IEEE Sponsored and Cosponsored Conferences

Date & Record	Conference/Location	IEEE Sponsor(s)	Other Sponsors	(1)Exhibits (2)Attendees	Information Contact
Nov. 6-10 Record 2090	IECON '89 - 15th Annual Conference of IEEE Industrial Electronics Adams Mark Hotel Philadelphia, PA	IE Phil Sec	SPIE	(1) (2)	Dr. Hubert Wo AT&T Bell Laboratories Room 2K-238 Crawford Corners Road Holmdel, NJ 07733 (201) 949-0490 (201) 949-0538 (FAX)
Nov. 8-11* 89CH2770-6 2000	1989 Engineering in Medicine and Biology Society 11th Annual Conference Seattle Sheraton Hotel Seattle, WA	EMB		(1)Yes (2)1,500	Francis A. Spelman Conference Chairman Primate Center Mail Stop SJ50 Center for Bioengineering University of Washington Seattle, WA 98195 (206) 543-0232
Nov. 14-16 Record 1436	WESCON '89 Moscone Center Brooks Hall/Civic Auditorium San Francisco, CA	Region 6 LA Council SFBAC	ERA	(1)Yes (2)70,000	Electronic Conventions Mgmt. 8110 Airport Blvd. Los Angeles, CA 90045 (213) 772-2965 (800) 421-6816 Outside CA (800) 262-4208 Inside CA
Nov. 14-17 Record 2243	1989 IEEE International Conference on Systems, Man, and Cybernetics The Hyatt Regency Hotel Cambridge, MA	SMC		(1) (2)400	Mr. Daniel Serfaty Conference Coordinator Alphatech, Inc. 111 Middlesex Tpk. Burlington, MA 01803 (617) 273-3388
Nov. 22-24* 89CH2766-4 1957	TENCON '89 - Information Technologies for the 90's Bombay, India	C COM IE Region 10 Bombay Sec AIC		(1)Yes (2)300	Kirit J. Sheth Hakotronics Pvt. Ltd. 20 Sussex Road Victoria Garden Bombay 400 027, India (872 2888) or Professor Thomas Kailath Stanford University Durand 117 Stanford, CA 94305-4055
Nov. 27-29 Record 2231	1989 IEEE Workshop on Interpretation of 3D Scenes Austin Marriott at the Capitol Austin, Texas	C		(1)No (2)65	IEEE Computer Society Conference Services 1730 Massachusetts Ave., NW Washington, DC 20036-1903 (202) 371-1013 (202) 728-9614 (FAX)
Nov. 27-30 Record 1610	GLOBECOM '89 - 1989 IEEE Global Communications Conference Loew's Anatole Hotel Dallas, TX	COM		(1)Yes (2)1,500	Dr. Harold Sobol Associate Dean of Engineering University of Texas, Arlington Box 19019 Arlington, TX 76019 (817) 794-5637

* Revised Listing
** New Listing

1989

IEEE Sponsored and Cosponsored Conferences

Date & Record	Conference/Location	IEEE Sponsor(s)	Other Sponsors	(1)Exhibits (2)Attendees	Information Contact
Nov. 28 Dec. 1* Record 1667	1989 34th IEEE Annual Conference on Magnetism and Magnetic Materials Sheraton Boston Hotel Boston, MA	MAG	AIP	(1)Yes (2)625	Courtesy Associates, Inc. 655 15th Street, N.W. Suite 300 Washington, D.C. 20005 (202) 639-5088 Telex: 440487 COURTESY
Dec. 3-6* 89CH2637-7 1472	1989 IEEE International Electron Devices Meeting Washington Hilton & Towers Washington, DC	ED		(1)No (2)1,600	Ms. Melissa Widerkehr c/o Courtesy Associates, Inc. Suite 3000 655 15th Street, NW Washington, DC 20005 (202) 347-5900
Dec. 3-6** Record 2397	1989 Winter Simulation Conference The Capital Hilton Washington, DC	C SMC	ACM	(1)Yes (2)430	IEEE Computer Society Conference Services 1730 Massachusetts Ave., NW Washington, DC 20036-1903 (202) 371-1013 (202) 728-9614 (FAX)
Dec. 5-7** Record 2333	1989 IEEE Real-Time Systems Symposium Loews Santa Monica Beach Hotel Santa Monica, CA	C		(1)No (2)100	IEEE Computer Society Conferences Services 1730 Massachusetts Ave., NW Washington, DC 20036-1903 (202) 371-1013 (202) 728-9614 (FAX)
Dec. 6-9 2211	1989 20th Annual IEEE Semiconductor Interfaces Specialist Conference Bonaventure Resort and Spa Ft. Lauderdale, FL	ED		(1)No (2)120	Mr. Zeev A. Weinberg IBM Research Box 218 (9-127) Yorktown Heights, NY 10598 (914) 945-1065
Dec. 13-15 Record 1873	1989 28th IEEE Conference on Decision & Control Hyatt Regency-Tampa Tampa, FL	CS		(1)Yes (2)750	Professor Leonard Shaw General Chairman Department of Electrical Engineering and Computer Science Polytechnic University 333 Jay Street Brooklyn, N.Y. 11201 (718) 260-3802
Dec. 16** Record 2109	1989 IEEE Workshop on Computer-Aided Control Systems Design - (CACSD) Hyatt Regency Hotel Tampa, FL	CS		(1)No (2)	Prof. J. Douglas Birdwell Dept. of Electrical Engrg. University of Tennessee Knoxville, TN 37996-2100 (615) 974-5468

* Revised Listing
** New Listing

OTHER CONFERENCES

- | | | |
|--|---|--|
| * <i>Electrama-90, Largest International Exhibition in Asia on Electrical, Electronics & Allied Products</i> | 20-28 January 1990
Bombay | I E E M A
ELEC RAMA-90
Camp Office
c/o E R D A
1st Floor (gate No 10)
Barbourne Stadium
Building, Churchgate
Bombay-400 020 |
| * <i>International Conference on India's Energy Consumption in the year 2000</i> | 9-10 November 1989,
Ashok Hotel
New Delhi | Mr S K Gupta
Petroleum Conservation, Research Association, 603, Barakamba Road
New Delhi-110 001 |

SECTION MEMBERSHIP DIRECTORY

In March 1989 we published our Section's Membership Directory. It was mailed to the members whose addresses were with us. The idea and get up were appreciated by the Director IEEE Region 10. Those members who wish to notify us any charges/corrections can write to B S Nagaraja Engineer Tech Division, N R S A, Balanagar, Hyderabad-500 037

We now intend to add a supplement containing those members whose names are not in the Directory. Such members may send the information in the following form to Mr B S Nagaraja before November 30, 1989.

Name :
Qualifications :
Designation :
Organisation :
Mailing Address :

Telephone No. :
IEEE Membership Grade & Number :
IEEE Society Membership :
Professional Interests :

DEVELOPMENT OF COMPACT, MULTIFUNCTIONAL OSCILLOSCOPES

Hirohisa Ishida and Toshihide Okada

*Measuring Instruments & Image Processing Systems Engineering Dept., Hitachi Denshi, Ltd.
32 Miyuki-cho, Kodaira-shi, Tokyo 187, Japan*

1. Introduction

Oscilloscopes are required to display electrical phenomena and measured values on a CRT. In conventional oscilloscopes, such values must be obtained manually by converting the visual display using the graticule on the CRT and the panel settings. This has not only been a burden to users in terms of time, accuracy and trouble, but also, is often associated with the problem that valuable data cannot be utilized because of misreading of set values, etc.

To make oscilloscopes more convenient to users, new oscilloscopes which display the results of measured parameters (voltage, time, delay time, panel setting conditions, etc.) and waveforms on the CRT have been brought onto the market. However, these oscilloscopes are so-called high grade oscilloscopes which ordinary users can hardly afford to buy

Considering this trend, we have decided to provide a CRT readout function, which has been favorably received by the market, on all our oscilloscopes by improving the technology to realize this function with fewer IC's. Using a multi-functional single-chip microprocessor (MPU) and our surface mounting technology, we planned to develop five models (40 to 100 MHz) of "Compact Series" multifunctional oscilloscopes. We have widely employed MPUs in our present oscilloscopes in order to provide the CRT readout function. The MPU sets the data to determine the selection control signals of integral capacitors and resistors in the sweep signal generator circuit, and the integral current through the D/A converter, and controls the slope of the sweep waveform. We planned to develop the following functions to perform digital control by employing the multi-

functional MPU:

- (1) Sweep control system which does not easily cause asynchronism
- (2) Automatic time-base calibration system to reduce number of adjusting points
- (3) Time-base autorange function to automatically count the frequency of the input signal by the counter built into the MPU, and then to set the sweep time automatically to display waveforms of approximately 1.6 to 4 cycles on the CRT.

Among the new functions utilizing the MPU, we describe below the sweep control system and the automatic time-base calibration system which were not found in the conventional technology.

2. Development of Multiple Sweep System

2.1 Problems in Conventional Dual Sweep System

(1) These days, users more often measure repetitive waveforms for which desirable trigger signals are hard to pick up only from the amplitude such as the pulse train of the MPU. Figure 1 shows an example of measurement of complicated signals by the conventional method. When measuring such waveforms, the waveforms become asynchronous on the CRT in most cases. Because of this, oscilloscopes have been provided with trigger holdoff to trigger waveforms. However, after being triggered, the waveforms become asynchronous again when the sweep range is changed, e.g. to measure details near the leading edge of the signal.

Figure 2 shows the block diagram of the conventional sweep control circuit of the dual time-base system. The input signal having voltage and time information be-

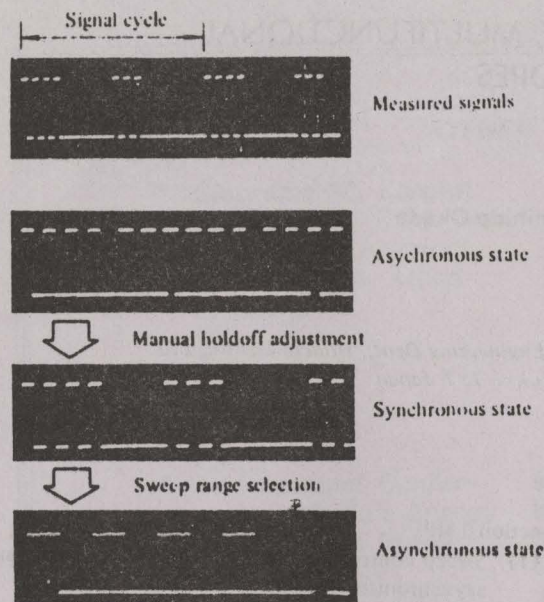


Fig. 1 Example of measurement of complicated signals by conventional method

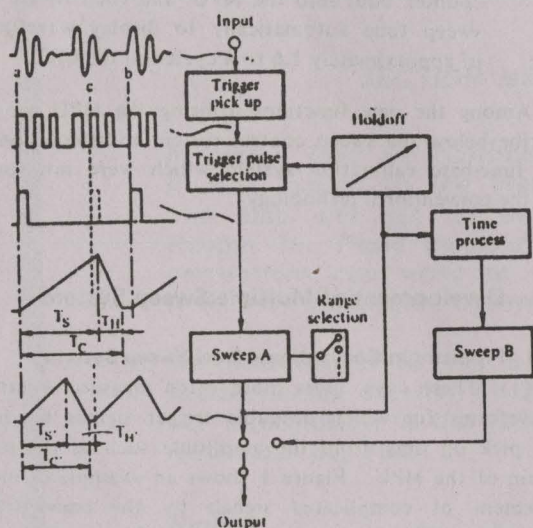


Fig. 2 Block diagram of conventional sweep control circuit of dual time-base system

comes the trigger pulse signal of a logic level containing only the time information necessary for sweep after passing through the trigger pick up circuit. The trigger pulse signal with only time information then enters the trigger pulse selection circuit which selects the pulse only to determine the cycle period of the sweep. This sweep cycle time (T_c) is determined by the sweep signal and the holdoff circuit, and the time is the sum of the sweep time (T_s) and the holdoff time (T_H). If the sweep range is changed even after the signals are triggered at point a and point b, therefore the sweep time (T_s') and

the holdoff time (T_H') are changed. The sweep cycle time (T_c'), the sum of T_s' and T_H' , also changes to displace the triggering point b to the point c, resulting in asynchronism.

(2) In case of delay sweep, the cycle period of the main sweep itself is determined as above. To determine the start time of the delay sweep, a sweep signal and a time process circuit which picks up the time information from the sweep signal are required. Because of this, two sweep signal generators i.e. a signal generator for the main sweep (sweep A) and signal generator for the delay sweep (sweep B), are required. This means that the signal generator for the main sweep must also operate even when only the delay sweep is displayed, and the circuit system is thus very inefficient.

(3) The start time of the delay sweep is actually determined by a comparison between the two voltages of the sweep signal and the DC level. The sweep signal itself includes noise caused by induction of the pattern of printed circuit board and variation of power voltage, so that jitters are generated. These are delay jitters which are obstacles to measurement. The abovementioned defects cannot be improved as long as the sweep signal is used as a reference signal.

2.2 Development of Multiple Sweep System

To improve the defects caused by the conventional methods, we have completely changed our way of thinking. Figure 3 shows the block diagram of our multiple sweep system. The trigger pulse selection output signal has been used only as a signal for the gate of the sweep signal generator, however, we provide a new time process circuit and treat the signal from the circuit as a reference signal to determine the cycle period of the sweep signal and the start time of the delayed sweep. As a result, in the multiple sweep system, the sweep cycle period is determined by the loop of the trigger

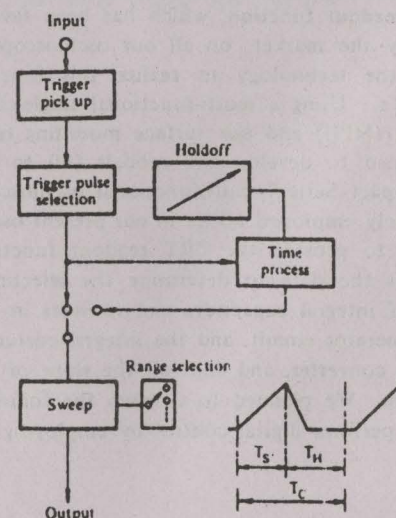


Fig. 3 Block diagram of multiple sweep system

pulse selection circuit, the time process circuit and the holdoff circuit which are provided before the sweep signal generator circuit, so that a stable trigger can be obtained regardless of the sweep range.

In addition, in conventional methods, a delayed sweep signal generator circuit is required separately from the main sweep signal circuit because the main sweep signal is a reference. However, in the new method, the time process circuit is a reference and the control signal for the delayed sweep signal can be obtained from part of the information of the time process circuit, so that only one sweep signal generator circuit is required. That is, in conventional methods, two signal generator circuits (called time base) for the reference of time operation and two circuits for the CRT output (called sweep) are required. However in the new system, one sweep circuit is sufficient. We therefore call the conventional method "Dual time-base and dual sweep circuit system" and the new system "Dual time-base multiple sweep circuit system."

3. Development of Automatic Time-base Calibration System

3.1 Conventional Sweep Circuit

Figure 4 shows a conventional sweep circuit block diagram. The sweep circuit generates sweep ramps triggered by the trigger pulses. The sweep circuit covers a wide range of 50 ns/div to 0.5 s/div with 22 ranges of 1, 2 and 5 sequences. The MPU sets the selection signals for integral capacitors and resistors in the sweep signal generator circuit, and the voltage E_D which determines the integral current I_D according to the 10-bit data using the D/A converter, and thus controls the ramp of the sweep signal.

Many high precision parts are used. Also calibration has to be carried out through adjustment of many variable components, because the ramp of the sweep signal varies according to combinations of components in the sweep waveform generator circuit and temperature

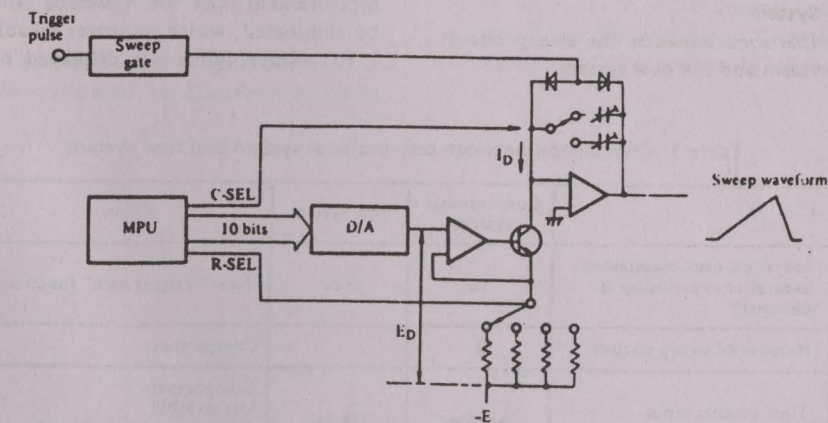


Fig. 4 Conventional sweep circuit block diagram of automatic time-base calibration

changes. Much adjustment time is needed, and further adjustment is needed, when servicing in order to calibrate the error caused after shipment.

3.2 Automatic Time Base Calibration System

In this system, the slope of the actual sweep waveform signal is measured with respect to the 10-bit data initially set by the MPU, errors are automatically processed, and the 10-bit data is reset. Automatic calibration is thus performed, the actual steps being as follows: The peak-to-peak voltage V_{p-p} of the sweep waveform signal is measured and the sweep time T is measured from the gate waveform; the ramp of the sweep waveform is then obtained according to the following expression.

$$\text{Ramp of sweep waveform} = \frac{V_{p-p}}{T} \quad (1)$$

Though an A/D converter for measuring the voltage V_{p-p} and a counter for measuring the time T are necessary, we found that both the A/D converter and the counter which are built into the multifunctional single chip MPU can be used for the purpose, and so we therefore decided to adopt this system.

Figure 5 shows the block diagram of automatic time-base calibration based on this system. We could not however obtain sufficient measuring accuracy for the voltage V_{p-p} in actual operation, because the resolution of the A/D converter built into the MPU is 8 bits. The system therefore measures ΔV several times with ΔT constant to obtain the average ΔV_{AVE} , as shown in Fig. 6.

$$\Delta V_{AVE} = \frac{\Delta V_1 + \Delta V_2 + \dots + \Delta V_n}{n}$$

From this value ΔV_{AVE} and the value T which is actually measured by the counter, the peak-to-peak voltage V_{p-p} is obtained according to the following expression (2).

$$V_{p-p} = \frac{\Delta V_{AVE}}{\Delta T} \times T \quad (2)$$

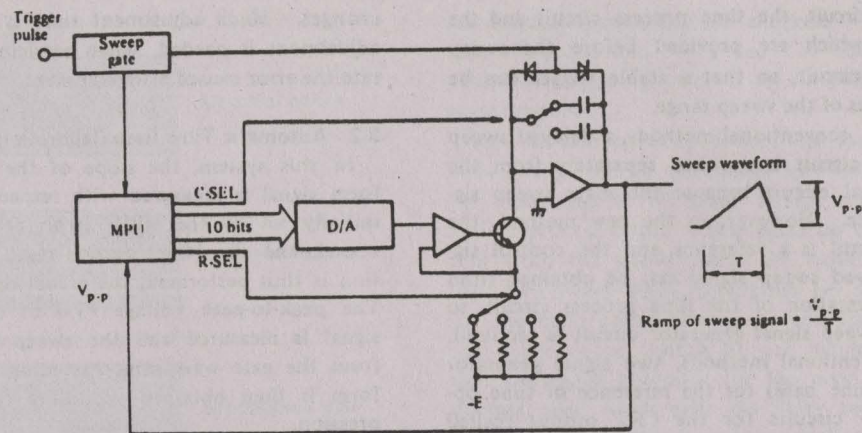


Fig. 5 Block diagram of automatic time-base calibration

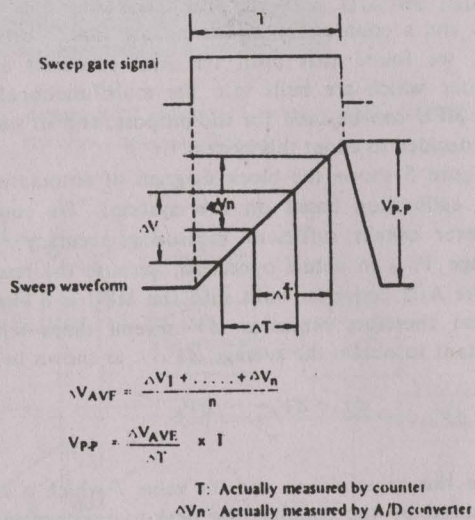


Fig. 6 Automatic time-base calibration system

4. Results and Interpretation

4.1 Multiple Sweep System

Table 1 gives comparisons between the sweep circuit of the conventional system and the new system:

	Conventional system	New system	Effect
Is synchronism maintained even after sweep range is changed?	No	Yes	New "Trigger lock" function
Number of sweep circuits	2	1	Compactness
Time process input information	Analog	Digital	Compactness Use of MPU (easy transition to digital delay)

(1) Thanks to the dual time-base multiple sweep circuit system, a new "Trigger lock function" which maintains the synchronous state even after change of sweep range has been realized.

(2) While two sweep signal generator circuits are necessary in the conventional system, one circuit is sufficient in this system. This contributes to making the instrument more compact, which is an objective of this development.

(3) Digitized input information to the time process circuit allows control by the MPU, and further facilitates transition to a digital delay which is one of the conventional themes.

4.2 Automatic Time-base Calibration

Table 2 shows the effect of the automatic time-base calibration compared to conventional oscilloscopes.

(1) The number of parts is reduced by 20%, and the number of adjusting points is reduced by 88%. In addition, the reliability of the hardware is improved by using highly reliable parts like the single chip MPU.

(2) Since calibration can be performed by the built-in MPU every time power is switched on, accuracy of measurement can be observed and misalignment can be eliminated, which improves reliability of measurement.

(3) Since faults are displayed on the CRT, reliability

Table 2 Effect of automatic time-base calibration

	Number of parts	Adjusting points	Calibration	Calibrating method	Measure against faults
Conventional system	Approx. 130	8	Upon user's request	Manual calibration and variable resistors	No measure
Automatic calibration system	Approx. 100	1	Every power-on	Built-in MPU	Display of faults on CRT

Reduction of number of components Highly reliable parts	Observation of accuracy and reduced misalignment	Detection of faults
Higher reliability		

ity of measurement is also improved as regards trouble detection.

In addition to the above high performance, the size and weight are reduced by 40% compared to conventional oscilloscopes. The smallest and lightest oscilloscope in the world among portable oscilloscopes using a 6-inch CRT has thus been realized.

5. Conclusion

We have developed five new models in series which are provided with the following new functions and features:

(1) A dual time-base multiple sweep circuit system and a "Trigger lock function" which retains the trigger state even after the sweep range is changed.

(2) An automatic time-base calibration system so that the number of adjustment points can be greatly reduced, and errors in accuracy due to the time lapse can be reduced.

(3) Reduction of the bulk and weight of the new oscilloscopes by 40% compared to conventional oscil-

loscopes.

References

- 1) H. Asano, et al., "Design for Low Cost Oscilloscopes (Popular Scope)," Hitachi Denshi R&D Report No. 147, May 1979.
- 2) M. Iwabushi, et al., "High Quality Oscilloscope Series (50 and 100 MHz)," Hitachi Denshi R&D Report No. 181, March 1981.
- 3) Y. Narukawa, et al., "Readout Type 100 MHz Oscilloscope," Hitachi Denshi R&D Report No. 230, May 1984.
- 4) T. Okada, et al., "Automatic Time-Base Calibration for Oscilloscopes," Paper No. 1427 of 1988 National Convention of Institute of Electrical Engineers of Japan, March 1988.
- 5) H. Ishida, et al., "Development of Compact and Multifunctional Oscilloscopes (Compact Series)," Hitachi Denshi R&D Report No. 257, September 1987.

IEEE
INDIVIDUAL
LEARNING
PROGRAM

Dear Member,

If sufficient engineers are interested we can organise a course on this subject with the material developed by Robert C Dixon etc., Additionally we can find a local professor who can clarify, supplement. Let me know if you, or your colleagues are interested.

C Satish
Section Chairman

* Membership strength of the Section
as on 31-8-1989



Members 140
Students 240

SPREAD SPECTRUM SIGNALS AND SYSTEMS

Introduces the concepts of spread spectrum signals and systems from basic techniques and theories to design and analysis of complex systems. Considers commercial and military applications and situations. Imparts the necessary technical knowledge and skills for designing and employing spectrum systems.

COMPONENTS

- Study Guide developed by Robert C. Dixon Associates
- Textbook: *Spread Spectrum Systems*, 2nd Edition, by Robert C. Dixon, John Wiley & Sons, 1984
- IEEE PRESS Book: *Spread Spectrum Communication*, edited by Charles E. Cook and Fred W. Ellersick, 1983
- Audio cassette prepared by Robert C. Dixon Associates
- Final examination

STUDY GUIDE CONTENT

- Spread Spectrum Systems
- Balance Modulation
- Maximal Sequences
- Initial Synchronization
- Direct Sequence Systems
- Remapping the Spread Spectrum
- Noise Figure and Cochannel Users
- Ranging Techniques
- Systems Application
- Future Design

Developed by
Robert C Dixon Associates

Reviewed by
Dr Fred Haber, University of Pennsylvania

Price for IEEE Members \$ 199.

THE INSTITUTION OF ENGINEERS (INDIA) A P STATE CENTRE

AND



THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS,
HYDERABAD SECTION

LECTURE NOTICE

SUPER CONDUCTIVITY FOR POWER APPLICATIONS

by

Mr K C LAHIRY, Executive Director
BHEL, R & D, Hyderabad

5-45 p m, Friday, November 3, 1989

at

The Institution of Engineers (India) Building
Visweswaraya Bhavan, Khairatabad
Hyderabad

Please inform your colleagues and friends that everyone is
welcome to attend the lecture.

C Satish
Section Chairman

REGION 10 MEETING - IMPRESSIONS

The Region 10 is made up of sections of IEEE in South-east Asia/Far East and is a significant area of growth as it has a blend of developed countries like Japan and developing countries like India. This year the meeting was at Bali, Indonesia.

The annual meeting is usually spread over 2-3 days, with business sessions throughout the day, and committee meetings in the late evenings. The final day is usually devoted to individual section reporting, culminating in presentation of reports by various Sub-committees like MDC, EAC, Planning, etc. The Tencon committee also presented the plans for the November Tencon '89 at Bombay.

The financial report was presented, as also the budget for the financial year 1989, by the Secretary, Hardianto Kamarga of Indonesia. Mr Emerson Pugh addressed the gathering and spoke of the introduction of CD Roms at IEEE Headquarters.

The organisers are to be commended for the hectic preparations and smooth functioning of the meeting. A group photo was also taken along with a sightseeing tour on the last evening.

R B Iyengar

LATE NEWS

1. The IEEE Hyderabad Section in Collaboration with JNT University, Hyderabad is planning short courses on
 1. Cogeneration
 2. Demand Side ManagementAWAIT FOR THE DETAILS.
2. Dr K R S Murthy, AT & T Bell Labs USA is likely to visit our Section in November 1989. He is the IEEE Computer Society's Area Chairman for Region 1 (Northeastern U S)

About the IEEE

The Institute of Electrical and Electronics Engineers, Inc. (IEEE) is a transnational organization with over a quarter million member in 137 countries. The world's largest engineering society, its objectives are technical, professional and societal.

The IEEE's technical objectives center on advancing the theory and practice of electrical, electronics, and computer engineering and computer science. To meet these objectives, it sponsors conferences and meetings, publishes a wide range of professional papers and provides educational programs. In addition, the Institute works to advance the professional standing of its members. It also has a mandate to enhance the quality of life for all people through the application of its technologies, and to promote a better understanding of the influence of these technologies on the public welfare.

Today, the IEEE is a leading authority in areas ranging from aerospace, computers and communications to biomedical technology, electric power and consumer electronics. When it began its second century in 1984, it rededicated itself to innovation, excellence, the exchange of information and the quest for improved education. In so doing, it underscores the initials IEEE.

IEEE Service Centre

445, Hoes Lane,
Piscataway, N. J. 08854-4150 USA
(201) 981-0060

IEEE Hyderabad Section's geographical jurisdiction covers the state of Andhra Pradesh. The Section Executive Committee :

C. Satish
Chairman
Tele : 260541 Ext. : 277

D. V. S. Raju
Vice Chairman
Tele : 228373

R. B. Iyengar
Secretary
Tele : 42471

B S. Nagaraja
Treasurer
Tele : 262572

R. S. Sivaswami
Member

N. S. S. Prasad
Member

Krishna Kumar
Member

Ch. Venkateswara Rao
Co-opted Member

Ch. Anantapadmanabha Sastry
Co-opted Member

Student Activities - Tenneti Eswar,
ECIL

Member Development - Major Rama Krishnan,
CMC Ltd.

Educational Activities - Dr. K. J. Sharma, CBIT

All correspondence on IEEE Hyderabad
Section business can be directed to :

R. B. IYENGAR
IEEE Hyderabad Section
CMC Ltd.
5th Floor, Posnett Bhavan
Tilak Road,
Hyderabad-500 001.