

# Engineering Management



NEWSLETTER

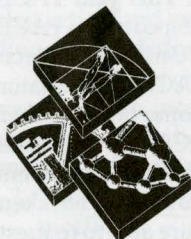
The IEEE Engineering Management Society Newsletter

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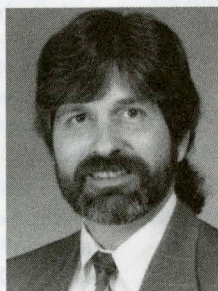
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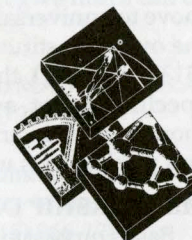
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**Y**our volunteer EMS officers are always waiting to serve you, our members. If you have an idea for a conference or meeting location, contact K.R.S. Murthy with your proposals. Want to recognize the outstanding job done by an EMS volunteer in your Chapter, or nominate an IEEE Fellow? Give Bill Burke a call. Interested in educational activities, seminars and tutorials? Wade Shaw is at your service. By the way, you can be sure that Gus Gaynor wants your inputs on what you want to see in your EMS publications, from the Transactions, to the Review, to this Newsletter, and what you need from them to make your job easier.

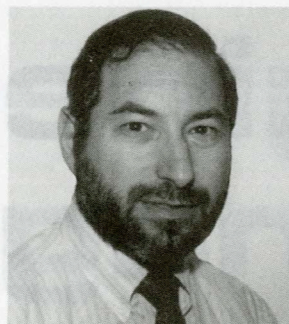
## Your EMS Member Services Team Coordinators



**Membership  
Development Coordinator:**  
David Kemp



**Chapter Coordinator:**  
Cinda Voegtli



**PACE Coordinator:**  
Charles Rubenstein



**Student Activities  
Coordinator:**  
Cecelia Jankowski

### MEMBERSHIP

Reflecting computer conversion difficulties at headquarters, current membership statistics are not available. The last report is 07/31/94. When HQ recovers from this continuing computer conversion problem, continuity and comparison with prior statistics to detect trends will likely no longer be valid. Trending to the past will be further inhibited by the move to anniversary style billing. I am advised that although the overall Institute membership is down approximately 1% (313K vs. 316K), the societies trend, and EMS information in specific, is not available. All members, including those thought to be in arrears, will continue to receive full services and publications until the HQ conversion is completed.

### MEMBERSHIP DEVELOPMENT and TIP PROFILES

Based on past experience and the advise of my predecessor (VP-Membership 1995 - Bill Burke), I do not propose to undertake mailings to either new members (welcome letter) nor to members in arrears. These have been tried in the past with limited results relative to costs and benefits. I do propose to do a solicitation to potential new members based on the technical interest profile (TIP) codes of the IEEE mailing list. Headquarters recommends this be done just after the new year, at a time when membership can be had for half-price. The technical interest profiles have not been updated for years. HQ is requesting Societies review these and report revisions so that they can be incorporated into the annual renewals process. A copy of the EMS current TIP options was reviewed at the April BoG meeting.

### Newly Elected EMS Senior Members

Dennis M. Darcy	Dracut, MA	(Region 1)
Christopher G. Walker	Coraoplois PA	(Region 2)
Syed Ahmed Ali	Chamblee, GA	(Region 3)
Ronald P. Layne	Birmingham, AL	(Region 3)
Henry J. Fulford	Austin, TX	(Region 5)

*Congratulations from your Board of Governors to you all.*

Are YOU qualified? Call or write IEEE for a Senior Member application and see YOUR name in this column. Special thanks to IEEE staff member Diana Pladdys, IEEE Society General Activities, who compiles this information for your newsletter.

### FAMILY ADDITION

We welcome the Alabama EMS Chapter to our network of local entities serving members. Commendations to the organizers for their initiative and leadership.

### PACE ACTIVITIES

For the most part, your EMS Society PACE activities have not been too visible in the past few years. This year PACE activity has been seen as an increase in the exposure to PACE programs like the Career Conference and the Online Job Search files. In the next Newsletter, your Society PACE Coordinator will overview the 1995 PACE Conference, some ongoing and futuristic PACE ideas and some of the PACE opportunities available for EMS members in the USA. Non-USA members should take note: many of these same programs be undertaken in your Sections as well. (Only USA Sections are able to request financial support for IEEE-USA programs.) Try a school visitation or Engineers Week program or create a local Consultants or Employment Assistance Network in your Section. (See a related article on Page 6.)

### STUDENT ACTIVITIES

After a grand start beginning to address some of the problems of Student Activities at the Society level, we are at once delighted and disappointed to learn that our new EMS Student Activities Coordinator will be resigning at the end of the year to become the Managing Director for IEEE Regional Activities! If you or someone you know is a student activist, please contact Dave Kemp, your EMS Vice-president for Member Relations for further information on how you can help your EMS help the engineering managers of the future. Dave can be reached by phone (voice and fax) at (204) 992-2494 or via the Internet by E-Mail to: d.kemp@ieee.org

### Any Questions?

#### Get your answers by Contacting:

**U.S. Toll-Free IEEE Member Service Questions:**  
1-(800) 678-IEEE for general membership questions

**U.S. Toll-Free EMS Member Service Hotline:**  
1-(800) 742-0432 for EMS-specific questions  
or E-Mail to: c.rubenstein@ieee.org

## EMS Chapter Coordinator's Corner

By Cinda Voegtli

As you know, the chapter coordinator role exists because of the belief that communication between the Board of Governors and Chapters, and among the Chapters themselves, is that 1) communication is important to the health and vitality of the EMS as a whole, 2) communication can contribute to the quality and success of local EMS opportunities for professional development, and 3) communication can improve the efficiency with which our dedicated EMS volunteers can provide those local benefits.

Many interesting things are going on at the local level in the engineering management community! I hope to use this column to help promote this communication and let you know what is going on out there where the EMS members live and work. Specifically, I will use this column to raise specific requests for information or comments from our chapters and our members, to tell you about specific Chapter Coordination activities, and to tell you about new chapter formation efforts.

### Chapter Coordination activities

I have written to each new chapter chairman and immediate past chairman this summer to try and re-establish communications and work on the goals mentioned in my article in the last newsletter. But as always, we would like as much feedback as possible from individual members. Please feel free to re-read that article and respond to me with any comments.

### Request for Information

A number of chapters are planning their programs for next year and are interested in knowing what techniques other chapters use to be successful in their programs. Please comment with your insights on the following questions!

1. How has your chapter been able to increase attendance at meetings?
2. How do you determine what programs to put on?
3. Do you have any special techniques for getting potential speakers to say Yes, or is that not a problem?

In the Puerto Rico/Caribbean chapter, Carlos Rivera-

Abrams is working on the slate of upcoming programs and is interested in knowing what programs have proven successful for other chapters with large numbers of attendees. I have replied to him that for Santa Clara Valley, the ones of most interest have been Venture Capital and starting businesses; and project management and related subjects. Please send any information from your chapter's successful activities to Carlos, and copy me so that I can compile a list to be available to all chapters. Carlos can be reached at (809) 793-3950, or by email at 70511.1335@compuserve.com.

### New Chapters in progress:

Several individuals have decided to establish new chapters in their areas. Give them a call to help get some local EMS activity going!

#### Southeast Michigan Section EMS Chapter

Prakash Shrivastava, (GM Corp., Detroit, Michigan)  
Work: (810) 280-7988

#### Austin Texas Section EMS Chapter

Darius Samani, (University of Texas, Austin, Texas)  
Work: (512) 795-6176; Home: (512) 250-0811  
email: samani@uts.cc.utexas.edu

### Other chapter notes:

In Boston, Harry Heflin is working to get the local Boston area programs in full swing again. Why not give him a call or drop him a line:

Harry Heflin  
INTERSYS, 685 Depot Road, Boxboro MA 01719, U.S.A.  
Daytime EST U.S.A. telephone: (508) 266-1800.  
email: h.heflin@ieee.org

And remember, I can only help you coordinate what you tell me about that needs coordination! Here's how to reach me:

Work phone: (415) 966-1650; Fax: (415) 966-1238  
Email: cvoegtli@infoserv.com

I look forward to your comments, opinions, and questions. Let us know what EMS, your Board of Governors and your Chapter Coordinator can do for you.

## Management Ideas Part 7 of 8 INTERVIEWS

By Robert Bishop, Secretary  
EMS Board of Governors

The two articles in this issue of Engineering Management Newsletter complete the 8 parts of this management series. Your EMS hopes that these new ideas for both our personal and organizational lives were helpful to you and welcome your comments. As noted earlier, the information for this series of eight articles was taken from recent management articles and from Bob's actual experiences. Since Bob is an engineer, he presented the material and ideas that work (or at least that worked for him), without spending a lot of time on theory.

Let's continue the personal themes to help you manage your career. Here are some questions to help achieve effective information-gathering interviews.

First ask yourself, "Why?" Why go to the trouble of meeting someone face-to-face? For starters, you'll get the most recent examples of what's going on in that subject area. Second, you won't be looking at year-old data, as most published reports tend to be, by definition. It just takes time to get into print. Third, you'll learn things that would never be in a published report.

So these are the questions to ask to collect information.

1. What brought you to this organization? This will tell you a lot about the organization. Most people like to open up and talk about themselves. It can lead to a very insightful discussion.
2. What interesting projects are you working on? Again, people like to talk about their projects, and often express real pride in describing what they've accomplished.
3. Who else do you know, also working on exciting projects? (Don't be surprised if someone picks up the phone and introduces you to other people.)

Courtesy is vital: Be on time, don't overstay your welcome, and send a Thank You note that very night. (Very few people do.)

Richard Bolles has written about the late John Crystal's ideas and techniques for meeting with people. The best seller, titled "What Color Is Your Parachute?", is published by Ten Speed Press.

Bob Bishop is a member of the Board of governors and Secretary of the EMS. This is the seventh in a series of eight short articles on his Management Ideas. Bob can be reached at (903) 482-5320 or via E-Mail at r.bishop@ieee.org.

## Leaders or Cheerleaders

By Gerard H. (Gus) Gaynor  
EMS VP-Publications

Leadership is surrounded by many false perceptions. The most destructive asserts that leadership resides at the top of the organizational pyramid and is the source of initiative, creativity, innovation, and wisdom. If organizations depended solely on this type of top-down leadership, Wall Street would vanish.

Do these leaders at the top of the hierarchy propose new ideas and concepts, develop new technologies, play a major role in innovation related to new products and processes, create the strategies, and fulfil the operational requirements to sustain the business? In most cases, the answer is a definite, no.

Top level management too often succumbs to a semi-state of retirement: too reluctant to change; too cautious to experiment with management processes; too limited by convention; too intimidated by new thinking; too reliant upon inputs that are not challenged or validated; too fearful to take the giant step; too willing to play it safe. Consensus and group-think take precedence over integration of group intelligence. Non-performance is tolerated. Negative feedback is rejected. Play the game of "catch-up" dominates decision processes. Such actions are the antithesis of leadership.

Most leadership, what I call the "invisible leadership," takes place in the depths of the organization. It is this "invisible leadership" that determines the organization's success or failure. The invisible leadership:

- Generates the ideas and concepts, dedicates its energy in pursuing them, and in the process meets the purposes and objectives of the organization.

- Creates change, implements the transitions, and pursues specific objectives.
- Translates wish lists related to all aspects of technology, products, and markets to reality.
- Promotes and supports creativity, ingenuity, and innovation from all the participants.

This "invisible leadership" is demonstrated by engineers, scientists, marketers, and other participants throughout the organization every day. Management's challenge is to allow that "invisible leadership" to surface and leverage its contribution to business performance.

Leader need followers. However, those followers must be willing to question the actions, decisions, and wisdom of the leader, and in that process, expand their own horizons and actively participate in the leadership process. Competent followers challenge the leader's thinking and do not follow as sheep going to slaughter. They use their insight and communicate. Leaders cannot lead in an antiseptic environment. Effective leadership occurs in an environment where followers challenge the designated leader. In this sense the followers take on their own leadership role.

The assumptions and foundations on which past leadership models were built — command and control or the people oriented, often referred to as "touchy-feely" approach, no longer apply. Both are dead or should be dead. Bringing everyone down to the lowest denominator has failed to provide organizations with the needed stimulus for leadership in managing technology, products, markets, the business, and activities that people engage in.

Industry needs a new leadership model; one that returns

## Santa Clara Valley Chapter Hosts Panel Discussion

On June 28 the SCV chapter hosted a panel discussion on "Issues and Progress in Defense to Commercial Conversion".



The picture above shows prestigious panel members (from the left) James Horner, General Manager, Communications Components Division, Hewlett-Packard; Albert E. Smith, President of Lockheed-Martin Space Systems Division; Dr. W. Keith Kennedy, CEO of Watkins-Johnson Company; and Robert J. Kohler, Executive Vice President and General Manager Avionics and Surveillance Group, TRW Inc. (Not shown

are EMS Chapter Coordinator Cinda Voegtli and EMS SCV Chapter Program Chair Roland K. Soohoo, Project Leader - Santa Clara Microwave Products, Hewlett-Packard.)

The idea for the panel discussion originated from a members' first hand experiences with the conversion process at Hewlett-Packard, in the Communications Components Division, which was previously a separate company called Avantek. Acknowledging that a key trend in the nation's changing political and economic outlook is the migration away from defense-related development and the increasing importance of the commercial marketplace to historically defense-oriented companies, the chapter decided to form a panel to inform members about these efforts in several prominent Bay-area companies. The group especially wanted to hear about the potentially profound implications of the conversion process on these companies' approaches to management, technology, and the product development process.

The meeting format allowed each executive to discuss his company's conversion progress and "lessons learned" for 15 minutes; then the panel took questions from the audience. A number of interesting excerpts from the meeting:

At one company, change was resisted initially by the upper management and lower ranks; but when time came to implement, the middle managers suddenly stopped supporting the change once they realized the real impact on their careers.

to the basics of management practice and reintroduces and revitalizes executives, managers, and professionals to take a proactive stance and meet their responsibilities to the stakeholders. Management and professionals at all levels must:

- View the enterprise as an integral system
- Emphasize system rather than functional performance
- Pursue activities that add value - quantitatively and qualitatively
- Leverage the resources and the business infrastructure
- Manage the business process - with substance, outputs, and feedback
- Foster organizational vitality, resourcefulness, and creativity
- Develop participants with breadth - too much overspecialization is destructive
- Educate or replace those functionally illiterate in business and technology
- Create a challenging environment - freedom with business discipline
- Raise expectations at all levels and in all disciplines
- Improve effectiveness, efficiency, and economic use of resources
- Influence, guide, coach, participate, and "do"
- Understand the dynamics of the internal and external environment
- Infuse proactive leading rather than accept reactive managing
- Insist on participation - it is not a choice but a requirement
- Encourage non-solicited proposals from every participant
- Build a sense of urgency
- Challenge the total organization
- Live with reality - eliminate egocentric rationalization
- Manage technology as an integrated activity - product and process
- Balance change with stability
- Rock the boat - but know how far
- Demand competence at all levels
- Eliminate the gimmicks, fads, single-issue management, slogans

If by chance you consider this model for leadership as utopian, idealistic, or perhaps even managerial nonsense, try

building an effective organization by preceding every verb in the previous list with the negative "do not." As an example: do not view the enterprise as a system; do not leverage resources; do not foster organizational vitality; do not raise expectations; do not build a sense of urgency; do not demand competency at all levels. Leadership does not mean installing the latest single-issue fad or bringing in the current leading guru. Leadership is practicing the basics of management practice.

Such a model demands dedicated and competent proactive leaders and followers. Management cannot sit on the sidelines cheerleading, and not making a personal contribution. Managers need to set both feet firmly in the business: one foot cannot be in the business while the other pursues some personal or ancillary and non-value-adding activity.

There is no doubt that some cheerleading and encouragement are essential, but not as a substitute for leading. Leadership is not about charisma, but about integrity and credibility, about creativity and innovation, about making a personal contribution, about systems thinking and acting, and about passionately pursuing the vision, the purposes, and objectives of the organization. One end of the leadership continuum involves seeing the total picture and not losing sight of the pieces, and the other end, seeing the pieces and not losing sight of the complete picture.

Gus Gaynor is your Engineering Management Society Vice-president for Publications and a member of your Board of Governors. He is Editor of the Handbook of Technology Management and can be reached at G. H. Gaynor Associates, Inc., 1300 Nicollet Mall Suite 5168, Minneapolis MN, 55403. His phone number is (612) 332-8822, FAX (612) 343-3299, and E-mail at g.gaynor@ieee.org. Gus welcomes comments and discussion from the membership on his ideas and looks forward to our publishing YOUR views in our Newsletter.

Across the board, the panel mentioned the challenge in shifting to a market-driven mentality, and the difficulties in forming a new balance among the parameters of schedule, cost, and product performance, learning to compromise reasonably on product performance ("good enough" for the market) to meet the cost targets for the product and its development.

One panelist mentioned the need for engineers to understand the potential "liability" side of a project: the cost to the company if the product does not succeed. Engineers also need to understand how to do a business case and marketing research. The panelists also agreed that in general they are making a shift from the highest emphasis on "management" skills (i.e., emphasis on control), to an emphasis on leadership skills. This is one area where they are using training to accomplish a shift.

When asked about what other training they see a need for to help with the conversions, they agreed that some marketing training can be done, but they were having to bring in some people from outside in key areas such as marketing to get the right skills and mindset.

James Horner mentioned that at the former Avantek, the greatest challenge was to teach the new HP employees about "the HP way", the important aspects of the HP culture and way of doing business.

One panelist mentioned their adjustments to aspects of team responsibilities and project staffing. For example, the systems engineering group is no longer involved front to

back; they must get the requirements generated quickly and move on. The company has also moved to "pay for performance", including an emphasis on team performance.

One panelist mentioned that a critical need was to learn to turn around RFPs quickly: instead of months to respond, now some customers want 24-hour turnaround. They have set up a system to allow teams to bid using a template, with no outside signatures required, on projects of up to 70 million dollars. When asked about potential loss of quality due to less "process", panelists replied that they believe process is actually more effective in commercial sector.

In the defense arena, there is more of an audit/control mentality, inspecting problems out at the end; in the commercial arena, there is a more emphasis on financial justification of the steps in the process: The process is intended to lower costs by eliminating or discovering mistakes; therefore the process is tuned so that the organization ends up with only the process that is effective and therefore can be financially justified. One panel member made the point that it is important to remember that there are opportunities to diversify within your current core business, such as finding new products to develop for the DoD.

Overall the meeting was quite interesting and the audience received in-depth answers to their personal questions. One attendee was so engaged by the information that it inspired him to rejoin EMS and volunteer to help the local chapter. An excellent ending to an excellent evening.

## Engineering Consulting as an Option

by Robert H. Gauger, Vice-Chairman,  
IEEE-USA Alliance of IEEE Consultants' Networks

Broadly speaking, an engineering consultant is an engineer who offers his or her special skills to the public for a fee. This type of self employment has become particularly attractive in recent years following the layoffs and instability in the military and aerospace fields and down-sizing and right-sizing in the industrial and commercial fields. Companies have laid off many of their specialized, experienced (and more highly paid) employees skills that the company continues to need, but only on a part-time basis. From the company's viewpoint, it has made an immediate dollar savings. From the consultant's viewpoint, this is an opportunity.

The field of engineering consulting has responded rapidly to this new employment picture. The cut-backs provide an ideal market for the consultant with saleable skills, a high risk tolerance, and the special mix of personal characteristics that are needed for self employment. Perhaps it is reverse age discrimination, but it is these abilities are most likely to have been acquired by the more experienced engineer. On the other hand, the demand for competitive computer skills means that there is a lucrative market for younger consultants and engineers. As a result, consulting is one of the fastest growing engineering careers of the 90's.

For a consultant-to-be, the first evaluation should be whether consulting is the right option. Bob Krause, a successful consultant from Fort Worth, summarized nine characteristics of a consultant at a June 1995 workshop of the Alliance of IEEE Consultants Networks (AICN) in Anaheim, California:

1. Risk taker - consulting is typically a matter of feast or famine.
2. Disciplined - Working at home has many distractions.
3. Problem Solver - Problems you have never seen before.
4. Ability to Work Hard - Multiple clients will often establish coincident due dates. There are 70-hour weeks.
5. High Ethical Standards - The client must trust you.
6. Ability to Work with People - This is #1 people are your business.
7. Ability to Control Time - You have multiple deadlines and you have to decide how to allocate your time.
8. Ability to Switch Gears - Or how to work for more than one client in the same day and keep them all happy.
9. Ability to Market Constantly - When you're committed to client's deadlines, there's no time to market. Yet, if you don't, you'll be without work.

### Getting Started

Ideally, you are still employed, but you see the writing on the wall, or you have that irresistible urge to be self employed. Good. Join a consultants network, read several of the books on the AICN recommended reading list, and learn all you can about consulting. Start by taking on several small part-time consulting assignments, something you can handle during your vacation or by moonlighting. If you like what you are doing, plan your transition into self employment.

To find your nearest consultant networks, contact Bill Anderson at the IEEE-USA office [202/785-0017 (O), w.anderson@ieee.org]. Ask for the start-up package for new consultants, including the list of recommended books on consulting. Several of these books, particularly a 92-page book from Professional Publication, Getting Started as a Con-

sulting Engineer, should help you. If you don't find a consultants' network in your area, ask Anderson how to form one. IEEE can provide you with start-up information and AICN will assist you in getting a network going.

Next consider your financial resources. Consulting requires a much smaller initial outlay than most areas of self employment. Three thousand dollars are probably adequate to set up a basic office including a computer, printer, and fax. Additional funds will be required if your business needs a laboratory, test equipment, or specialized software. These costs, however, can often be deferred.

Much more important are living and marketing expenses for the first six months, or until the first contract is obtained and the invoice paid. Be aware when entering a new field and/or working in a field with few contacts, it may be several years before the new consulting practice is providing an income comparable to your previous salary.

Question: do you need a PE (a professional engineer's license) in order to become a consultant? Usually you do not, but it may be desirable, especially if you are involved in the design and construction of facilities, telecommunication, generation, or areas of high risk and hazards, such as pollution control. Whether or not a PE is specifically required, it should be considered, it will add credibility to your practice.

Another major question is "Do you need professional liability (errors and omissions) insurance?" Though very desirable, the cost of this insurance is so high that less than 15% of all AICN members carry it. Currently, the IEEE is trying to get us a more affordable policy. Until then, most of us will operate "bare."

IEEE Consultant Networks are funded in part by IEEE-USA as a PACE activity. This article was extracted from the IEEE-USA Employment Assistance FRONTLINE Report Volume 2, Number 4; July-August 1995. Further information on these activities is available from IEEE-USA Employment Assistance Committee Chairman, Jean M. Eason [817/923-1032 (O), j.eason@ieee.org]. The IEEE-USA PACE World Wide Web Page is reachable from the IEEE's Home Page at <http://www.ieee.org>.

### The IEEE-USA National Job-Listing Service

To browse through current job listings, send an e-mail message to any of the following Internet addresses (no subject line or text message is needed, and request files will automatically return to your e-mail address):

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# CALL FOR PAPERS IEMC'96

The IEEE Engineering Management Society  
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ENGINEERING & TECHNOLOGY MANAGEMENT

Aug. 18 - 20, 1996 in Vancouver, B.C., Canada



## Managing Virtual Enterprises: A Convergence of Communications, Computing and Energy Technologies

The "Virtual Enterprise" is emerging by integrating business components in multiple locations. Combining its own products and services with those from external sources, virtual enterprise is developing a new organizational culture, a new way of doing business. Co-location of organizational groups is no longer important; permanent location of corporate workforce is no longer relevant. Scanning, faxing, e-mail and WWW are replacing the traditional communication modes. The backbone of the virtual enterprise is the triumvirate of communications, computers, and energy technologies. IEMC'96 addresses the management of technology in such enterprises.

**Areas of Emphasis include but are not limited to:**

- Managing people, organizations and resources in the virtual enterprise
- Managing virtual projects, programs and products
- Managing innovation, creativity and quality
- Managing technologies, including video conferencing, electronic communication and software standardization
- Managing strategic, legal, ethical, and policy issues

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Use a separate form for each paper or session. Include full name, address, phone, fax, and e-mail information for all authors and organizers in the 150-word summary. Clearly indicate your topic and that you would like to organize either a) a paper session, b) a panel discussion, c) a half-day workshop, or that you are submitting a paper.

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### Newsletter Deadlines

Month of Issue	Quarter	Deadlines
Oct 1995	Fourth	31 October
Jan 1996	First	18 December
Apr 1996	Second	11 March
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