ELECTROMAGNETIC COMPATIBILITY SOCIETY

NEWSLETTER

ISSUE NO. 98 SUMMER 1978 EDITOR: ROBERT D. GOLDBLUM

IEEE ENERGY COMMITTEE

Last year the Electromagnetic Compatibility Society was invited to select an "appointed member" to participate in the work of the IEEE Energy Committee. This committee is a technical committee under the IEEE Technical Activities Board (TAB) with primary financial support provided by the IEEE United States Activities Board (USAB). Each IEEE Group and Society, the IEEE TAB Technology Committee, the TAB Council, each Geographic Region, and the IEEE USAB may appoint an official "appointed member" of the Energy Committee. (There are various other categories of memberships,all controlled by the "appointed members").

The President of the EMC Society has appointed Mr. A.H.Sullivan, Jr. as the "appointed member" of the Society to the Energy Committee. The text of his report on the meeting of 7 March 1978 is reproduced below:

The purpose of this letter is to report to you and the EMC Society ADCOM on my initial activity as EMC Society representative to the IEEE Energy Committee. You designated me as the EMC Society representative in your letter of 2 February 1978 to Hilton U. Brown, Chairman of the Energy Committee. I attended my first meeting of the Committee on 7 March at the O'Hare Hilton Hotel in Chicago, IL. inois.

Prior to attending the meeting I met with the Committee Secretary, Mr. Ralph Clark, in Washington, D.C. on 21 February. We discussed the objectives of the Committee and its plans and accomplishments. The following points summarize the Committee activity to date:

A. A primary objective of the Committee is the preparation and issuance of IEEE position papers on various aspects of the energy situation. These papers, of which four have been issued and several more are in process, are provided to Congressional committees and various government agencies as well as consumer groups, as required, to state the position of IEEE on critical energy problems.

B. A secondary objective is to provide briefings and presentations on fact- t ual aspects of energy matters, e.g. the breeder reactor.

I will not attempt to report in detail on the 7 March meeting except to note that the Committee discussed, at considerable length, projects now under way and planned and tried to establish priorities. Of specific interest to the EMC Society at this time is the rather urgent matter of the environmental impact of extra-high voltage electric power transmission lines. You may have already noted the considerable amount of attention given to this matter in the newspapers. It has been reported, for example, that farmers have attempted to physically block power line construction because of alleged effects of power line emanations on people, animals and crops.

As you know, the field strength of emanations from power lines is not difficult to determine. The matter, then, reduces to the problem of determining the biological study which may or may not be within the purview of the EMC Society.

IEEE ELECTROMAGNETIC COMPATIBILITY SOCIETY NEWSLETTER is published quarterly by the EMC Group of the Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, NY 10017. Sent automatically and without additional cost to each member of the EMC Group.

Second class postage paid at New York, N.Y., and additional mailing offices.

I decided not to volunteer to assist in this problem until the EMC Society ADCOM has an opportunity to determine whether the EMC Society had the desire and capability to participate in this study. Therefore, I suggest that the matter be discussed at the next ADCOM meeting.

Apart from the problem of transmission lines, there will probably be other Energy Committee projects to which the EMC Society can make contributions. I propose the establishment of a panel of EMC Society members who may have an interest in the energy situation.

As you are fully aware, I am sure, energy problems are a major concern of government, industry and consumers generally. Our way of life, and perhaps our survival, will be dependent on solving these problems. Perhaps, the EMC Society can assist in these solutions.

I would like to obtain the names of people familiar with energy EMC problems generally and power line problems in particular (if ADCOM decides to assist in the power line study). I would appreciate hearing directly from EMC Society members who are interested in making a contribution

EMC Society energy panel. My address and phone number are: A.H. Sullivan, Jr., 7121 Wolftree Lane, Rockville, MD 20852; Phone: (301) 881-4036

EDUCATION COMMITTEE NEWS

No short courses were produced for the Symposium this year. This idea was supported by the EMC-S Administration Committee and the Symposium Steering Committee. Three organizations were interested, but none could schedule a course. We will be pursuing this again for the Symposium next year and would like to hear your feelings on the idea. Get in touch with me in the near future -- if scheduling is a problem, we cannot start too early.

At the March meeting, the Administration Committee asked Dick Schulz and me to find a subject and papers for an IEEE press (reprint) book. We settled on a general area which Dick describes best as "Radio Noise Characteristics." The subject is to cover man-made and natural sources. So far, we have papers from the EMC Transactions back to 1969. If you have alternate ideas, please let us know. If you have published papers you feel should be included, please send us a copy or title and reference so we can find the paper.

Work is continuing on a college level EMC course. Several candidate papers have been submitted. These should illustrate basic EMC principles. If any of you have material, please send titles or a copy to Tom Herring, Route 2, Box 71, Burton, WA 98013. Thank you for any help you can send.

Several EMC courses are to be presented in the next period. George Washington Univ. will present "Electromagnetic Compatibility" in November, 1978. The Center for Advanced Professional Development is planning a course for the fall. Don White has courses scheduled in several areas and with several subjects. The IEEE Industrial EMC course is scheduled to be complete and ready for presentation this fall. For specifics, get in touch with the sponsors or call me at 612-574-4970.

Ken Entwistle
Chairman
Education Committee

In view of the statement of the Chairman of the Energy Committee at the March 7th meeting that "energy is a most important issue and the Committee should grow into a major activity of the Institute," the EMC Society should give some in-depth consideration to possible contributions to the Energy Committee. The EMC Society Administrative Committee has requested Mr. Sullivan to take appropriate action to study this "important issue" and coordinate among the EMC Society members, as necessary. Names of individuals for membership on an EMC Society Energy Panel should be sent to Mr. Sullvian at the address shown in the above letter.

NEWSLETTER STAFF

EDITOR: Robert D. Goldblum
R & B Enterprises
P. O. Box 328
Plymouth Meeting, PA 19462

ASSOCIATE EDITOR: (Chapter Chatter)
Charles F. W. Anderson
1716 Reppard Rd.
Orlando, FL 32803

ASSOCIATE EDITOR: (Book Reviews)
James S. Hill
6706 Deland Drive
Springfield, VA 22150

ASSOCIATE EDITOR: (EMC Personality Profiles)
William G. Duff
Atlantic Research Corp.
8601 Greeley Blvd.
Springfield, VA 22150

ASSOCIATE EDITOR: (Sequency Union)
Dr. G. Robert Redinbo
Electrical & Systems Engrg. Dept.
Rensselaer Polytechnic Institute

ASSOCIATE EDITOR: (Abstracts)
Edwin L. Bronaugh
Southwest Research Institute
P. O. Drawer 28510
San Antonio, TX 78284

ASSOCIATE EDITOR: (Photographer)
Fred J. Nichols
LMI, Inc.
6056 W. Jefferson Blvd.
Los Angeles, CA 90016

NEW NEWSLETTER LOGO CONTEST

Now that we are a Society, it is fitting that we have a new masthead for our Newsletter to fit our new image. Members are invited to participate in a contest and to submit ideas and sketches of a new masthead to the Editor. He will select up to six finalists and print the sketches in the next issue of the Newsletter. The total membership then will have the opportunity to vote, and the winner will receive a cash reward of $10.00.

Here are the rules:

1. The masthead shall be printed clearly or drawn and fit an 8" X 2½" space.
2. The IEEE logo and the words "ELECTROMAGNETIC COMPATIBILITY SOCIETY NEWSLETTER" must be used. The use of additional logos and words are acceptable.
3. All entries must be submitted to the Editor no later than September 15, 1978.
4. All material submitted shall become the property and copyright of the IEEE EMC Society and cannot be returned.
5. Entries shall be submitted to: Robert D. Goldblum, Editor, S-EMC Newsletter, R & B Enterprises, P. O. Box 328, Plymouth Meeting, PA 19462.

IEEE PRESS WELCOMES PROPOSALS FOR NEW BOOKS

With 49 titles in print, the IEEE PRESS has attained the stature of an established book publisher. PRESS books, which for the most part are carefully edited collections of reprinted papers, have been well received, particularly by the IEEE membership.

The PRESS Editor and his Editorial Board are constantly on the lookout for new books, especially on subjects that are of wide interest to the profession. Book proposals, either from individuals or from Groups or Societies, are always welcome. Such proposals should be submitted on a standardized form, copies of which are available from the Managing Editor, IEEE PRESS, 345 E. 47th St., NY, NY 10017.

Each proposal for a new book is reviewed carefully by the PRESS Editorial Board and by others to determine the need and marketability for the book and to ascertain its likely quality. Books on must subjects require the endorsement and sponsorship of the appropriate IEEE Group or Society, so a proposal normally should be submitted to the proposed sponsor before or at the same time it is submitted to the IEEE PRESS.

Any reader wishing a copy of a brochure describing the books published so far sho should request one from the Managing Editor of the IEEE PRESS at the address shown above.

IEEE ISSUES BOOKLET ON AGE DISCRIMINATION PRACTICES

The United States Activities Board of the IEEE has just published a new booklet, "You and Age Discrimination." The purpose of the Age Discrimination in Employment Act is "to promote employment of older persons based on their ability rather than age, to prohibit age discrimination in employment, to help employers and workers find ways of meeting problems arising from the impact of age on employment." The author is Michael D. Batten, senior staff associate of the National Manpower Institute in Washington.

Senator Harrison A. Williams, Jr., Chairman of the Senate Committee on Human Resources, says in the foreword that "Discrimination in employment on the basis of age is a critical problem for middle-aged and older American workers." Hans C. Cherney, Chairman of the IEEE Task Force on Age Discrimination, writes: "Creating an environment conducive to a lifetime career in engineering has long been a major concern of the Institute of Electrical and Electronics Engineers. Throughout its history, the primary thrust of the Institute has been to keep its members abreast of the latest technological advancements and to renew the skills that would enable them to maintain a continued and successful career. However, in recent times, it has become apparent to the Institute that this kind of effort may not be enough. Age discrimination has had a definite impact on a growing number of members. According to the 1977 U.S. Member Opinion Survey, almost 20% of the U.S. membership believed that age discimination prevents them from advancing in their careers. Nearly 60% of the respondents to the same survey favored IEEE efforts supporting government initiatives to promote affirmative action for engineers over 40.

The booklet covers pertinent provisions of the Age Discrimination in Employment Act of 1967 with its 1978 amendments, issues "red flag" warning signals on detection and assessment of age discrimination, and offers guidelines for action. An appendix provides a list of offices to contact in suspected cases.

FAA SEEKING HIGH ALTITUDE OZONE DATA

The Federal Aviation Administration is asking for suggestions on how to solve the ozone irritation problem that has been encountered on some high-altitude flights.

The request came in the form of an Advance Notice of Proposed Rule Making in which FAA said it is considering possible regulatory action to deal with the situation and wants to determine the extent of the problem and what solutions might be available.

BILL TO MANDATE FILTERS AGAINST CB INTERFERENCE IN TROUBLE

There is little strong support for legislation by Sen. Barry Goldwater (R., AZ) to require manufacturers of electronic equipment, including TV and stereo sets, to modify their equipment to filter out interference, mainly from CB radios.

Even the Federal Communications Commission is lukewarm, with Chairman Charles Ferris conceding that the interference problem has multiplied to consumer annoyance, but suggesting that "If the problem grows, I expect that manufacturers will become far more conscious of the interference susceptibility of their equipment." Mr. Ferris felt that merely airing the interference problem, as was done by a Senate Commerce Subcommittee on Communications, should have a "constructive impact."

He suggested that the FCC is assessing alternative regulatory approaches which might improve consumer equipment performance, but first must determine what is technically feasible before it can estimate costs. Even should the cost impact on each device be only a few dollars, Mr. Ferris added, the cumulative impact on the electronics industry - and its competitive position in domestic and world commerce - could be substantial.

Sen. Goldwater said he was "not wedded" to the wording of his legislation; that he would "much prefer to see the manufacturers do this on their own without the federal government offering any regulations at all." But, he added, the end result is the thing: reduction of interference, whether by requiring manufacturers to use protective components or by authorizing standards to reduce interference.

Mr. Goldwater said the main point is that many Americans are annoyed by CB interference, or even amateur frequency interference, with their TV, stereos, or both. He cited an FCC staff prediction that in fiscal 1979 up to 21 million people will be bothered by TV interference from these same sources. The Senator said that if all TV sets used a high-pass filter, about 40 per cent of the CB and other interference problems would be solved and another 30 per cent greatly improved, according to the FCC. He emphasized that the legislation would not allow the FCC to write regs so strict they could impede manufacturers of topline high-fidelity components. "So long as any manufacturer can solve the problem in his own way," Sen. Goldwater explained, "my bill is not intended to allow the FCC to require him to use any particular filter or circuitry."

Electronic products manufacturers weighed in against enacting federal legislation to deal with radio frequency interference (RFI). J. Edward Day, Counsel for the Electronic Industries Association's Consumer Electronics Group, testified that the manufacturers are "responding positively" to the problem.

Calling S. 864 "definitely not appropriate," the EIA counsel reported that product manufacturers have compelling economic incentives, without additional regulation or legislation, to do whatever is feasible to attack the interference problem. "Interference complaints and poor performance hurt sales," said Mr. Day, a former Postmaster General. "Competition provides a powerful incentive to minimize the susceptibility of audio devices to RFI."

The EIA position, too, is that filters are not a panacea and that requiring all electronic products to include them when they might be needed only in a limited number of cases would end with the consumer footing the bill "of any such grandiose scheme." Mr. Day added that manufacturers are using additional filters and most already take steps to cope with RFI complaints from product owners, providing technical assitance and even no-cost product modification at the factory where the problem is brought to their attention.

The Association of Maximum Service Telecasters, represented by Paul Berman, felt the proposed legislation was neither necessary nor desirable. It suggested that regulation of TV receiver standards could not eliminate CB harmonic interference at all and added that the FCC already has enough authority to eliminate virtually all CB interference to TV.

On the other side of the fence, the American Radio Relay League, represented by Harry Dannals, testified it was "extremely disturbed" by the FCC's inability to come forward with a comprehensive proposal. The Radio Relay League told the Senate subcommittee that jawboning won't work: "The home entertainment and consumer electronics market is so price-competitve that most manufacturers simply will not spend the additional few cents necessary to produce interference-free equipment. Nor will an educational campaign produce more than superficial results."

Mr. Dannals said manufacturers know the FCC lacks the power to compel the use of good engineering practices in equipment that does not emit radio frequency energy sufficient in degree to cause harmful interference to radio communications. "The commission, or some other agency, must be given the authority to require that receivers and other electronic devices be designed and constructed to reject interfering signals and energy," it was added.

(From the June 19, 1978 issue of "Electronics News.")

EMC PERSONALITY PROFILES

by William G. Duff

DONALD N. HEIRMAN

Don Heirman, a member of the technical staff at Bell Laboratories in Holmdel, NJ, received his BSEE and MSEE in Electrical Engineering from Purdue Univ. in 1962 and 1963, respectively. From 1963 to 1965, he was on military leave from Bell Labs serving as a Lieutenant in the Radio Wave Propagation Branch of the Navy Radio Frequency Spectrum Activity in Washington, D.C. After returning to Bell Labs, he worked in areas of predicting interference levels, harmonic content, and time variability of power-induced, audio frequency noise on telephone lines.

For the past 5 years, he has worked on statistically describing the electromagnetic interference environment near telephone equipment. His present work includes the determination of standards and measurement techniques for susceptibility and emission testing of telephone residential and business terminals. He also is in charge of a susceptibility/emission test facility. He also teaches a Bell Labs course on telephone equipment in an EMI environment which covers the environment, EMI reduction techniques, susceptibility/emission measurements/instrumentation, and test strategies as they relate to the telephone design engineer.

Don joined the IEEE and the EMC Society in 1974. His local New Jersey Coast Chapter activities include:

1. Chapter Newsletter Editor from 1974 to the present; over 30 editions have been published with a circulation of 175 chapter members, sponsors, national AdCom members, and other chapter chairmen
2. Chapter Vice Chairman, 1975-76
3. Chapter Chairman, 1976-78

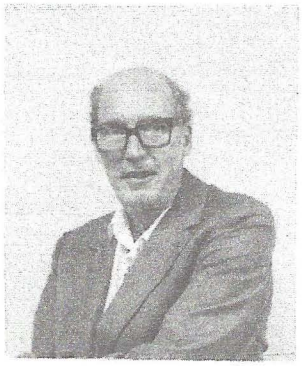
In the past two years, he has organized two seminars; one on Spectrum Engineering which was taught by D.M. Jansky, Office of Telecommunications, and one on EMC/EMI Measurements conducted by M.L. Crawford, NBS. He also organized the newly-formed joint EMC/Vehicular Technology Chapter and became its first chairman in March of this year. During his chairmanship, the Chapter was awarded the Chapter-of-the-Year Award for 1977 which was presented in Atlanta in June 1978.

Don's national EMC activities include:

1. Chairing and organizing the AdCom Intersociety Relations Committee starting in 1976. Since then, he has served as the S-EMC representative on 8 technical program committees and has accounted for 12 EMC-oriented technical sessions at national and international conferences, other than those of the S-EMC.
2. Elected to the national Administrative Committee in November 1976 for a 3-year period ending 31 December 1979
3. Elected national AdCom Vice President for 1978
4. Member of the S-EMC Technical Committee on EM Environments and EM Measurements
5. Guest co-editor of a planned special EMC Transactions on EMC equipment design as it relates to commercial electronic equipment
6. Coordinating the updating and expanded scope of the S-EMC Constitution and ByLaws

Don has presented several technical papers at IEEE conferences since 1973. He has authored or co-authored a paper both in the IEEE EMC and Communications Societies Transactions. He teaches part of an intensive "EMC Engineering" course at the Center for Professional Advancement in New Brunswick, N.J. He is a member of Tau Beta Pi, Eta Kappa Nu, and Omicron Delta Kappa. He also is a Commander (Selectee) in the U.S. Navy Research Reserves under the sponsorship of the Office of Naval Research. At the 1977 EMC Symposium in Seattle, Don was awarded a Certificate of Appreciation for his service to the EMC Society.

CHAPTER CHATTER



by Charles F. W. Anderson

Central New England

John Clarke sent in a fine report on the Chapter's activities for the period ending in May. On March 1st, they sponsored a meeting which featured R. J. Berkovits of G.E. and C. G. Wierman of ESD-Hanscom AFB. The topic was the "Intrasystem Electromagnetic Compatibility Analysis Program (IEMCAP)."

With the Power Engineering Society Chapter, they co-sponsored a meeting on March 30th. R. M. Avery of Electrack, Inc. spoke on "The Northeast Corridor Railroad Electrification Systems." He covered some aspects of the history of the electrification plan, and then discussed major technical factors and interrelationships, particularly with regard to coordination with telephone companies on potential EMI to adjacent telephone lines. There were 28 attendees.

The same two Chapters co-sponsored another meeting on May 10th. The topic was: "Interaction Between Lightning and Buried Cables." G. E. Briggs and A. W. Murphy of GTE-Sylvania were the speakers. They described the types of damage which lightning currents cause in cables, exhibiting some samples of damaged cable sections. They also presented information on a realistic lightning specification and discussed analytical means for estimation of lightning-induced cable currents.

Chapter officers for '78-'79 will be: Chairman, John Clarke (D OT/TSC); Vice Chairman, C. L. Smith (GTE-Sylvania); Secretary, Arthur C. Haskins (Raytheon). John indicated that special thanks were due to out-going Vice Chairman Dale Samuelson and to Bob Berkovits for their contributions and support. Planning for the '78-'79 activities is under way.

Annapolis/Baltimore

Carl Allen (Honeywell), Past Chairman of the Chapter reports that Program Chairman Jackie Janoski came up with a somewhat different approach for their '77-'78 meetings. Instead of formal paper presentations, the Chapter moved its meetings through the area EMC community with both tours and technical presentations. The first meeting was on October 18, 1977 at the Westinghouse Defense and Electronics Systems Center at Baltimore-Washington International Airport. Al Roberts acted as host. An overview of Westinghouse products and services was presented, with a tour of their EMC Laboratory and shielded enclosures.

On December 13th, Carl himself acted as host at Honeywell's Annapolis facility. James Hall presented a paper on "Fielding a 900 MHz Communication System in the High Arctic." William Tate also presented a paper, "A New Generation of EMI Test Instrumentation." There were 24 attendees.

The third meeting was held on February 15th at the ARINC Annapolis facility. David Hartell and Phil Walcoff were hosts, and presented papers titled "An Overview of ARINC Companies" and "Private-Line Airline Network Project." Twenty were in attendance. The fourth meeting was held jointly with the Washington Chapter on April 19th. This meeting involved a tour of the FCC Laurel, MD Laboratories, for which Michael Toia was the host. Carl reported "over 80" in attendance, but Bernie Keiser's report (see below) has the total higher than that! Chapter officers for '78-'79 are: William D. Stuart, Chairman; Dr. Hugh C. Maddocks, Vice Chairman; and William E. Tate, Secretary/Treasurer. Program Committee Chairman is R. W. McKeeby.

Atlanta

Busy though they must have been with pre-Symposium activities, the Chapter held a luncheon meeting on April 18th. The speaker, Don Clark of the Georgia Tech Engineering Experimental Station, presented a paper on "Factors in Electromagnetic Methodology." Candidates for Chapter offices were also the subject of discussion.

New Jersey Coast

Congratulations to the "Chapter-of-the-Year" winners! Also, many thanks to Chairman/Editor Don Heirman who keeps us posted via copies of their Newsletter. (At this time, only NJC and Atlanta Chapters seem to have such a publication.)

The Chapter's Tenth Anniversary Dinner was a great success! There were 65 in attendance, including Chapter organizer John O'Neil, Jackie Janoski, and Dr. Emberson, the IEEE General Manager and Executive Director. Six of the ten charter members of the Chapter were present to receive Certificates of Appreciation for their activities in connection with its formation. (Workloads and family occasions prevented my getting there, but Don was kind enough to send me my certificate.) Each of those attending also was presented with a Souvenir Memory Booklet. This included many items relating to highlights of the Chapter's history from its inception to the present. One feature of the festivities was a "See who you can identify in these pictures" contest. Eleven photos of past Chapter events were exhibited. Ron Fitch (one of the Chapter old-timers) and Mrs. Max Brown, wife of one of the charter members were winners of the awards for this competition.

Chapter officers for '78-'79 are: Chairman, Margaretta Stone; Vice Chairman, William Chriss; Secretary/Treasurer - indicated as "available."

On May 5th, there were 65 in attendance at the Chapter-sponsored EMC/EMI Measurements Seminar at USAECOM's Hexagon facility. Mike Crawford of NBS spoke on existing and proposed new techniques. Of special interest was his discussion of the NBS R&D programs on TEM susceptibility test cells and on measurement probes. Representative of many organizations were present, including FCC, CORADCOM, AVRADCOM, ERADCOM, USACSA, BELL LABS, Scientific Atlanta, Breeze-Illinois, American Electronic Labs and Honeywell. The success of this seminar has led to the Chapter's considering holding an in-depth workshop on TEM cell and probe technology later this year or in early '79. NOTE: If you are interested, please contact Don Heirman at 201-949-5535.

On May 11th, the Chapter and Section had a tour of the Ford Assembly Plant in Mahwah, N.J. Seventy attended this function, which featured a technical presentation by Fred Bauer of Ford's Dearborn facility. (There were 30 "stand-bys" for this event who could not be accommodated.)

The May 18th luncheon meeting included a showing of USAECOM's new film, "General EMC Design Considerations" and photos and slides of the Tenth Anniversary Dinner.

The June luncheon meeting was addressed by S. W. Segner of the Communications Research and Development Command at Ft. Monmouth, N.J. His topic was "U.S. Army Spectrum Management/Electromagnetic Compatibility Program."

Washington

First, an apology to the Chapter and to Bernie Keiser - I misplaced his reports of the January and March meetings, which should have gone into the Spring issue.

On January 19th, the Chapter held a meeting with 30 attendees. Tom Doeppner and Bernie presented a joint talk on "A Concept for a Spectrum Figure of Merit," dealing with a way to rate applicants for spectrum space in order to use that resource efficiently.

At the March 9th meeting, Sidney Metzger, Assistant Vice President and Chief Scientist of Communications Satellite Corp., was the speaker. His topic was "Communications Satellites." He described the growth of the industry from Early Bird (1965) with 60 channels, to the present world-wide coverage with numerous satellites and some 200 antenna installations in 86 countries for both domestic and international telecommunications. There were 22 in attendance.

The April meeting, as mentioned above, was the joint one with the Annapolis/Baltimore Chapter. Bernie reports that a total of 113 members, guests and friends were on hand for the FCC Laurel Lab tour! That's certainly a mark for other Chapters to shoot at! (Might even have beaten the "100+" we reported for the joint NJC/NYC Chapters' meeting at the Playboy Club in New York in March 1970.)

Special Plea from Your Chapter Chatter Editor:

It would simplify things considerably for me in socring for the "Chapter-of-the-Year" award if you followed Bernie Keiser's lead in giving his Chapter's scores with each report to me. (Chapter Chairmen and Secretaries: Refer to the scoring guide in this Newsletter.)

Had hoped to meet and talk with lots of people at Atlanta, but EMC/EMI "panics" developed on a couple of projects at the last minute and prevented my attending the "union meeting" there. See you all at San Diego in "79 - I hope!

NOTES FROM SEQUENCY UNION

Professor Harmuth has kindly responsed to my solicitation for an article on the current trends in the direct radiation of nonsinusoidal waves. He is widely recognized as an expert in both the theory and practice of radiating pulse type waveforms and is the author of the definitive text, Sequency Theory, Foundations and Applications.

BY
G. ROBERT REDINBO

Nonsinusoidal Electromagnetic Waves-When to Use Them

Electromagnetic waves used for radio transmission have had a sinusoidal time variation since the beginning of radio transmission around 1900. The most important reason for the use of sinusoidal functions in the early days was that circuits could be built with coils and capacitors that resonated with sinusoidal functions. Marconi received a much disputed US patent to use resonance for the selective reception of signals from different transmitters. Our current assignment of frequency bands for the prevention of mutual interference between transmitters goes back to this discovery of the use of resonating electric circuits.

A pure sinusoidal wave transmits information at the rate zero. If electric circuits would resonate only with pure sinusoidal waves, the discovery of resonating circuits would have been of little help for the transmission of information. Fortunately, a resonating circuit operates over a certain bandwidth Δf, which depends on the attenuation of the circuit. The usable bandwidth increases with the attenuation, but the resonance effect is reduced at the same time. Practically, the bandwidth Δf is in the order of 1% or less of the center frequency f_c of a resonating circuit, and one says that the relative bandwidth $\Delta f/f_c$ of the circuit must be small compared with 1. A radio signal with absolute bandwidth Δf being located on both sides of a carrier with frequency f_c will be selectively received by such a filter, and this implies that the relative bandwidth $\Delta f/f_c$ of the radio signal must be small too. The physical meaning of a small relative bandwidth is, that a signal looks more and more like a sinusoidal function as the relative bandwidth decreases.

Our current technology developed around this principle of a small relative bandwidth $\Delta f/f_c$ of radio signals. Not surprisingly, resonant antennas were developed, that would only radiate signals with a small relative bandwidth, but the influence of the small relative bandwidth goes beyond resonating circuits and structures. Amplitude and frequency modulation, as currently used, also require a small relative bandwidth of the produced radio signal. Obviously, there was no need to develop amplitude and frequency modulation for signals with large relative bandwidth, as long as there was no way to receive them selectively.

Those who still remember their basic mathematic courses in college, may recall that the term "resonance" came up in connection with differential equations, and that one always needed some inspiration to solve a differential equation with a term in resonance. Resonance in mathematics was not restricted to sinusoidal functions, but it could occur for Bessel functions, Legendre functions, or any other function you have ever heard about. There was only one important difference: Marconi and the other pioneers of early radio transmission could build resonating circuits for sinusoidal functions by means of coils and capacitors, but they could not do so for other functions.

One needs a cheap, reliable and fast time-variable circuit component to build resonating circuits for nonsinusoidal functions. This component arrived 50 years after radio communications had been put on its sinusoidal track. The new component was the switch, implemented by semiconductor technology. With the help of switches we can build selective receiver circuits that do <u>not</u> require sinusoidal waves or signals with a small relative bandwidth $\Delta f/f_c$.

When and why should we want to transmit radio signals that do not have a small relative bandwidth? Let us first observe that the information transmittable with a radio signal increases proportionate to its absolute bandwidth Δf. In order to make the relative bandwidth $\Delta f/f_c$ small, we need to operate at very high frequencies if the absolute bandwidth Δf is very large. That this creates a problem was not recognized until very high resolution all-weather radar and spread spectrum communications with very large bandwidth came into demand.

Let us explain this for the case of radar. Consider a radar using pulses of 1 μs duration, which yield a range resolution of about 150 m. The pulses occupy the approximate band $0 \leq f \leq 1$ MHz. We would need immense antenna structures to radiate them without a sinusoidal carrier. In order to turn the absolute bandwidth Δf - which for these pulses would be 2 MHz because of the doubling of the bandwidth by amplitude modulation - into a small relative bandwidth $\Delta f/f_c \leq 0.01$, we need a carrier frequency f_c=200 MHz or more. However, the size of the antenna is still large at 200 MHz and the external noise temperature is still high. From the standpoint of antenna size and noise we would much rather use a carrier frequency between 500 MHz and 10 GHz.

Hence, the requirement for a small relative bandwidth, imposed by the resonating filters, is overshadowed by the requirement for a still smaller relative bandwidth to operate at frequencies where the radar dish has a manageable size and the noise is lowest.

Let us now consider a radar that operates with pulses of a duration between about 1 ns and 0.1 ns, which implies a range resolution between 15 cm and 1.5 cm. The bandwidth of the pulses is between 1 GHz and 10 GHz. A relative bandwidth $\Delta f/f_c$=0.01 now calls for a carrier frequency between 100 and 1000 GHz. An all-weather radar cannot operate at such high frequencies, since the attenuation by rain and fog makes it mandatory not to exceed about 10 GHz. Even a fair-weather radar will not work well at such high frequencies, because of the high noise temperature and the absorption by molecular resonances (e.g., 22.2 GHz for H_2O and 60 GHz for O_2).

The upper frequency limit of about 10 GHz for an all-weather line-of-sight radar forces us to use a technology that does not require a small relative bandwidth. The usable absolute bandwidth is about 10 GHz, while an all-weather radar constraint by the requirement for a small relative bandwidth can use only about 1% of this bandwidth, or about 100 MHz, which implies that it can obtain only 1% of the information about the target that a radar with large relative bandwidth can obtain. This information consists inherently of accurate time measurements, but they can be translated into range resolution, Doppler resolution, angular resolution, good ambiguity functions, target signature, etc.

The frequency limit of about 10 GHz for an all-weather line-of-sight radar is one of three instances where a small relative bandwidth becomes a hindrance. The two other instances are the frequency limit of about 30 MHz for an over-the-horizon radar, and the frequency limit of some 10 Hz for radio communications with deeply submerged submarines. The first two instances of attenuation sharply increasing with frequency also apply to spread spectrum communications, when the bandwidth exceeds 100 MHz for line-of-sight and 300 kHz for short wave communications.

A series of papers on the use of nonsinusoidal electromagnetic waves in radar is currently being published by the IEEE Trans. EMC, starting with the February 1978 issue. The interested reader will find these papers much more detailed and scientific, and also much less understandable.

Henning F. Harmuth
Catholic University
Washington, DC 20064

EDWIN (ED) L. BRONUAGH

EMCABS

In this issue we are publishing 36 abstracts. In a future issue, we hope to publish a large number of abstracts, many of which are on Bonding and Grounding. These are still in the review process at this time.

If any of you have ideas or suggestions for improvement of the EMCABS, please contact one of the below listed EMCABS Committee Members. We are particularly interested in further suggestions that we can pass along to our readers on retrieval of abstracted articles.

The EMCABS Committee is listed below:

L. F. Babcock
J. S. Hill
J. R. Janoski
D. R. Kerns
R. B. Schulz
E. L. Bronaugh
R. N. Hokkanen
M. Kant
G. R. Redinbo
R. M. Showers

1978 IEEE STANDARDS CATALOG NOW AVAILABLE

The 1978 edition of the IEEE Standards Catalog is now available free of charge. The new 32 page catalog lists each of the over 300 electrical and electronics standards publications under one or more of the 167 subject headings. The catalog also provides a handy numerical sequence listing of every standard. The many American National Standards published by IEEE are included in the catalog in their categories as well as in a separate numerical listing.

Standards developed within the IEEE cover test methods, practices for electrical installations, units, definitions, graphic symbols, and applications methods. The 1978 catalog lists important new and newly revised publications, including: the 1977 edition of the National Electrical Safety Code, The IEEE Standard Dictionary of Electrical and Electronics Terms, IEEE Std 500-1977, the IEEE Nuclear Reliability Data Manual and the just published National Electrical Safety Code Interpretations, 1961-1977.

Engineers in such widely varied fields as antenna design, communications, power generation and distribution, microwave measurement, industrial applications, electromagnetic compatibility, and rotating machinery will find many authoritative documents that have received recognition both nationally and throughout the world.

Single copies of the 1978 IEEE Standards Catalog may be obtained free from the IEEE Standards office, 345 East 47th Street, New York, NY 10017

INTERFERENCE

During the past year and a half, the most visable and pervasive aspect of mobile radio regulation, has been the FCC's focus on inter-service interference. The word itself would probably qualify for the noun-of-the-year award. Much has been written on this, and in addition to numerous trade and press articles, a number of booklets and reports have been published to assist the industry in dealing with various types of interference problems. The most prominent of these are listed below for your reference.

FCC - How to Identify and Resolve Radio-TV Interference Problems, May 1977 GPO No. 004-000-00345-4

The Extent and Nature of Television Reception Difficulties Associated with CB Radio Transmissions, July 1977 - FCC/FOB/PD&E 77-02

Interference to Audio Devices and Receivers from Signals Near 27, 220, and 900 MHz., November 1977 FCC/OCE RS 77-03

Electronics Industries Association/ Consumer Electronics Group
Consumer Electronics Service Technician Interference Handbooks
Unit 1: Television Interference
Unit 2: Audio Rectification

Hi-Fi News and Record Review
Audio Radio Frequency Interference: Its Cause and Cure, March 1974, Harry Leeming

MEETINGS & EVENTS

ADVANCE CALL FOR PAPERS
1979 IEEE INTERNATIONAL SYMPOSIUM ON ELECTROMAGNETIC COMPATIBILITY

October 9-11, 1979 - San Diego, CA

As we enter the decade of the 1980's, EMC technology will have a greater effect than in any preceding decade on new products, new developments, and new techniques. Authors are invited to submit papers on the current state of the EMC technology and related disciplines. Original, unpublished papers will be considered in the following areas. Papers in other EMC areas also may be considered.

EMC PRODUCT AREAS	EMC TECHNOLOGICAL AREAS
Aerospace	Analysis
Automobiles	Design Techniques
Bio-Medical	Fiber Optics
Communication Systems	Hazards
Computers	Instrumentation
Consumer Products	Lightning
Defense Programs	Materials
Power Systems	Spectrum Management
Transportation Systems	Standards

Prospective authors should submit both a 35-50 word abstract and a 500-750 word summary (up to six illustrations) that clearly explain their contribution, its originality, and its relevance to the EMC discipline. For anonymity of review, please identify author(s) only on the cover sheet.

Upon acceptance, authors will receive forms and instructions for preparing materials to be printed in the Symposium Record.

Authors' Schedule

Abstract and Summary (3 copies required). . .Deadline: 2-1-79

Notification of Acceptance . . . . . .By: 4-1-79

Full Phot-Ready Manuscript . . . . . .Deadline: 6-1-79

Submit Abstracts/Summaries to:
J. Fischer, Technical Papers Chairman
P. O. Box 17510, San Diego, CA 92117
Tel.: 213-679-4511

For more information, contact:
F. Nichols, General Chairman
P. O. Box 17510, San Diego, CA 92117
Tel.: 213-870-9383

EMC SYMPOSIUM ROTTERDAM 1979
CALL FOR PAPERS

After two successful conferences at Montreux in 1975 and 1977, the third biennial Electromagnetic Compatibility (EMC) Symposium and Exhibition is planned for May 1-3, 1979 at Rotterdam, Holland. The Symposium is sponsored by the Dutch Electrotechnical Committee and will be held in liaison with the CISPR meetings at The Hague.

Topics of the Symposium include: Social and economical impact of EMC; Electromagnetic pollution, control and enforcement; Spectrum economy and management; Immunity of receptors and electronic systems; Compatibility of electric power, automotion and communications; EMC hazards; Biological effects of R.F. energy; Interference propagation; Nuclear electromagnetic pulse; Measuring methods and instrumentation; Lightning, static electricity, space charge effects; Sequency functions; Compatibility of new techniques: spread spectrum, optical communications, etc.

Prospective authors are invited to send English summaries of up to 500 words in 3 copies with full address and telephone number to Professor F. L. Stumpers, Elzentlaan 11, Eindhoven, Netherlands; Tel.: 040/115512. Send not later than September 15, 1978. Authors will be notified by October 1, 1978. Full text of papers will be made available in a Symposium Record. Best papers will be awarded monetary prizes.

Parallel to the sessions, workshops, round table discussions and a technical exhibition will be organized. Social events and excursions will round off the program. Contact person: T. Dvorak, ETH Zentrum-HF, 8092 Zurich, Switzerland; Tel.: 01/326211, Ext. 2790.

EM POLLUTION WORKSHOP

A major workshop for decision makers in industry and government on the causes, effects and regulation of electromagnetic pollution will be held at the National Bureau of Standards, Gaithersburg, MD on November 2-3, 1978. Impact areas include: transportation, communications, medical, industrial and consumer products.

For additional information, contact Dee Belsher, Workshop Coordinator, Program Information Office, National Bureau of Standards, Boulder, CO 80303; Te.: 303-499-1000, Ext. 3981.

ICC '79 CALL FOR PAPERS

Original papers in the field of communications research, technology and operations are invited for possible inclusion in the ICC '79 technical program. The theme of the conference is COMMUNICATIONS CHANGING THE WORLD and, where appropriate, papers should be keyed to this theme. The conference also will have a strong international flavor and papers are being sought at the leading edge of communication technology.

ICC '79 is co-sponsored by the Communications Society, the Aerospace and Electronics Systems Society and the Geoscience Electronics Group. The following subcommittees are among those that will be involved in the organization of technical sessions for ICC '79:

- Aerospace and Electronic Systems
- Communication Electronics
- Communication Switching
- Computer Communication
- Data Communication Systems
- Electromagnetic Compatibility
- Oceanic Engineering
- Radio Communication
- Social Implications of Technology
- Space Communication
- Transmission Systems

Where appropriate, authors should indicate on their manuscripts which particular subcommittee(s) they feel should review their contributions. Complete papers (including a one-page abstract for review) must be received by the November 15th deadline to ensure adequate consideration. The one-page abstract should clearly STATE WHY THE CONTRIBUTION IS IMPORTANT in addition to summarizing the manuscript.

Author's Schedule

Five copies of Abstract and Manuscript by . . . November 15, 1978

Notification of Acceptance Received by . . . February 1, 1979

Camera-ready copy (5 page maximum) mailed by . . . March 1, 1979

Authors are requested to send five double-spaced copies (in English) of the one-page abstract and manuscript (not to exceed 3000 words), plus illustrations to:

Dr. John Logan
Chairman, ICC '79 Technical Program
Bell Telephone Laboratories
1600 Osgood St.
North Andover, MA 01845
Telephone: 617-681-6306

If you intend to submit a paper, contact Dr. Logan at the above address before September 30, 1978.

RTCA APPOINTS TEST EQUIPMENT COMMITTEES

The Radio Technical Commission for Aeronautics has appointed two Committees to look into the field of Electronic Test Equipments and Procedures.

Special Committee 134 (SC-134) - "General Purpose Electronic Test Equipment," SC-134 will be under the Chairmanship of John M. Fluke, Chairman and Chief Executive, John Fluke Manufacturing Company, Inc., of Mountlake, Washington. SC-134 will continue some aspects of the work of the Electronic Test Equipment Task Force originally appointed to advise the Department of defense (DOD) on the use of privately developed and commercially available off-the-shelf Test Equipment. The goal of this Task Force was to achieve economy and reliability benefits for the Armed Services and to recommend policies and procedures to maximize benefits. With the establishment of SC-134 the objectives were broadened to achieve these benefits for all, civil and military, users of Electronic Test Equipment.

Special Committee 135 (SC-135) "Environmental Conditions and Test Procedures for Airborne Electronic/Electrical Equipment and instruments," has been asked to coordinate their efforts with the European Organization for Civil Aviation Electronics (EUROCAE) to ensure that the updated RTCA/EUROCAE companion Documents are in agreement or, as a minimum, compatible. SC-135 will be chaired by David W. Stratton, President, Aero Dynamics, Inc., of Buena Park, California.

CBEMA - ESC/SC-5 EMI COMMITTEE

The Computer Business Equipment Manufacturers Association (CBEMA) is a trade organization and is comprised of many industry firms whose business includes the manufacture and sale of Electronic Data Processing and Office Equipment. Like most trade organizations, CBEMA addresses a variety of topics and concerns through the activities of its various committees and subcommittees. ESC/SC-5 is an EMI subcommittee reporting to CBEMA's Environment and Safety Committee.

ESC/SC-5 also has been active in establishing and maintaining liaison with other organizations such as ANSI 63, ECMA, CSA, and CISPR. The present U.S. delegate to the CISPR-Working Group on Data Processing Equipment also is a member of SC-5.

Firms providing active representation on ESC-5 include: Burroughs Corp., Control Data Corp., Digital Equipment Corp., Eastman Kodak, Hewlett-Packard Co., Honeywell Information Systems, Inc., IBM Corp., NCR Corp., Sanders Associates, Sperry-UNIVAC, and Xerox Corp.

EMS COMMITTEE REPORTS

AWARDS AND FELLOWS COMMITTEE

The Committee has processed ten Fellow nominations. Altogether, twelve nominations will be reviewed by the EMC Society Fellow Evaluation Committee under the chairmanship of Dr. Carl L. Frederick, Sr. Nominations for the Society awards were solicited from AdCom by memo of March 31, 1978. Many replies were received. The results of this nomination solicitation procedure were reported to the AdCom President and the following list of awardees was drawn up:

Certificate of Appreciation . .
- Jim C. Toler
- Eugene D. Knowles

Certificate of Achievement . . .
- Robert B. Cowdell
- Gerald P. Rothhammer

Certificate of Acknowledgement . . .
- Jim C. Toler
- George H. Hagn
- Edward F. Vance
- Nasir Ahmed
- Dwayne R. Awerkamp
- Herbert M. Bartman
- Fred Haber
- Donald A. Miller

Certificate of Recognition . . .
- Don Bowen

Chapter-of-the-Year Award . . .
- New Jersey Coast Chapter

Transactions Prize Paper . . . .
- Henning R. Harmuth
- David Middleton

The committee has drawn up guidelines for the Awards Program. It is suggested that AdCom review and approve these guidelines.

Following this report are the descriptions of two new awards named in honor of two outstanding members of the society and now deceased.

The Richard R. Stoddart Award for Outstanding Performance would replace the present Citation Award. The Laurence G. Cumming Award for Outstanding Service would recognize the long-term service to the Society by one of its members.

One extremely important activity of a professional society is the recognition of distinguished achievement and service. The EMC Society awards serve several purposes: (1) They are an expression of recognition for outstanding contributions to the art and science of EMC. (2) They are an incentive to youth to emulate excellence. (3) They are a personalized presentation to the public of the achievements of the profession and its members. (4) They are the identification of the EMC Society with these achievements. The committee recommends approval of these awards.

James S. Hill
Chairman

THE RICHARD B. STODDART AWARD FOR OUTSTANDING PERFORMANCE

This award is established to recognize the outstanding performance of a member in contributing to the advancement of EMC technology or in contributing to the solution of a socio-technological problem.

Richard B. Stoddart was born in New York City on December 1, 1900. In his early years, he served as a shipboard operator and later became an engineer at the NBC New York Studios. In 1937, he served as radio operator and aviation assistant to Howard Hughes on his famous around-the-world flight. He became the first chief engineer of Hughes Electronics Co. Later, he became Vice President of Lear Radio and then organized his own company, Stoddart Aircraft Radio Company.

Dick was recognized for his development and manufacturing of aircraft for the aircraft ferry command during WW-2. His contribution to the EMC technology was in the development of a series of interference and field strength measuring instruments over a range of 20 Hz to 18 GHz. He delivered many papers before IRE/IEEE conferences, symposia, and meetings and was an avid supporter of the EMC Society.

He was made a Fellow of the Institute in 1958 with the citation "for his development of instrumentation for the measurement of radio interference." In 1969, he retired from the Stoddart Aircraft Radio Co. to indulge in his hobbies of avocado grower and fisherman. He passed away in 1973 and the EMC Society lost a distinguished member.

The Stoddart Award will consist of a certificate and One Hundred Dollars.

THE LAURENCE G. CUMMING AWARD FOR OUTSTANDING SERVICE

This award is established to recognize the outstanding service of a member of the Society in contributing to the administration and overall success of the Society. The award will be in the form of a bronze plaque.

Laurence G. Cumming retired from the U.S. Navy and joined the IRE (predecessor society of the IEEE) as Technical Secretary in 1946. In 1960, his title was changed to Professional Group's Secretary. He first was concerned with the administrative duties of 25 Technical Committees and comparatively few meetings in New York and in the field. This responsibility shortly grew to include 32 professional groups and required attendance at technical and executive meetings of these groups. The success of the technical professional group organization of IEEE is in a large part due to the dedicated service of Larry Cumming in assisting in the organization of each group and in taking a concerned interest in the continuing success of the group.

As a member of the EMC Society with a personal interest in EMC, Larry Cumming gave invaluable service to the EMC Society both as an advisor and as a member of the Administrative Committee.

Larry Cumming was made a Fellow of the IEEE in 1966 "for contributions to the engineering profession through leadership in organizing and stimulating the growth of Groups and Technical Committees of the IEEE." He became a Life Fellow in 1967 and retired from the IEEE in 1972. His passing in 1973 was a loss to the Society.

EMC SOCIETY AWARD GUIDELINES

1. Nominations for awards will be solicited by the committee 180 days prior to the awards presentation. An invitation to nominate will be sent to each member of AdCom.
2. AdCom members will be advised of qualifications for each award and a list of previous award recipients will be furnished.
3. The Transactions Prize Paper award recipient will be selected by the Editor of the Transactions.
4. The Chapter-of-the-Year award recipient will be named by the EMCS Newsletter Chapter Chatter Associate Editor on the basis of the standard scoring for chapters reporting activities to the Chapter Chatter Associate Editor.
5. The committee will advise the President of the results of the call for nominations and with the President's approval the committee will make up a list of recipients of awards. Certificates will be ordered from IEEE Headquarters.
6. The Awards Committee will assist the Symposium Committee in their prize paper award and in obtaining certificates for Symposium activities.
7. Eligibility: Eligibility for an award should be based on contribution to advancing the purposes and objectives of EMC.

   Typical methods of contribution can be by a technical or managerial paper in the EMCS transactions, or by the presentation of a paper at one of the EMCS or EMCS sponsored symposiums.

   Publications in other IEEE sponsored symposiums should also be considered.

   There should be no requirements for many of the awards based on membership of the EMC community or even the IEEE.
8. EMCS eligibility: There should be a number of awards that require membership in EMCS. These could be "name" awards.
9. Honorary Awards: These would be given as a token of appreciation to key guest speakers, members of EMCS sponsored committees, etc.
10. The Certificate of Appreciation, the Certificate of Achievement, the Certificate of Acknowledgement, and the Honorary Life Member awards will be reserved for members of EMCS.
11. The Certificate of Recognition and the EMCS Citation may be awarded to members or non-members of EMCS.

INTERNATIONAL AFFAIRS COMMITTEE

The Committee has had discussions with representatives of the organizing committee of the Rotterdam EMC Symposium sponsored by the Dutch Electro-technical Committee and scheduled for May 1-3, 1979. EMC Society co-sponsorship of this symposium will be a topic of discussion with the Rotterdam Symposium representatives, Dr. Borgnis and Mr. Dvorak who plan to attend the AdCom meeting.

Discussions also are underway with the British IERE regarding EMC Society co-sponsorship or cooperation in their next Symposium tentatively set for the Spring of 1980. Their recent Conference in April 1978 at Surrey had an attendance of 245. They will assume full financial burden, but would be interested in our support in the technical program and in attendance. They expect to have an organizing meeting in October and would ask us to send a representative.

We still are offering to organize a group to attend the Wroclaw Symposium in September 1978. No queries have as yet been received. At this time, plans should be made for the 1981 European Symposium. The Rotterdam Symposium Committee is suggesting the Swiss Association of Electrical Engineers may sponsor an EMC Symposium in Zurich.

It would be well to make our plans and decisions now on the support of future European symposia.

James S. Hill
Chairman

TREASURER'S REPORT

June 19, 1978

The latest financial information available from IEEE Headquarters is for the period ending April 30, 1978. As of that date, we had an uncommitted balance of $44,500.

The major financial actions, that I am aware of, since April 30th are: (1) a check from the '77 Symposium Committee for $6,508.10 (return of $1,500 loan and most of their surplus); and (2), a bill of $898.50 for the Spring Newsletter.

In April, I submitted to Headquarters an 1979 Estimated Budget. This does not include all budget items; it reflects those finance items that AdCom can control to a large degree.

Total membership, as of 4-30-78, was 1481 active and 270 in arrears.

Warren A. Kesselman
Treasurer

1979 EMC INTERNATIONAL SYMPOSIUM PROGRESS REPORT

Plans and progress on the 1979 EMC International Symposium are running very smoothly, and are timely. The following progress has been made to date:

1. The date is Oct.9-11, 1979, at the Town and Country Hotel, San Diego, CA.
2. A bank account has been established in San Diego and signatures have been authorized wherein two signatures from committeemen in San Diego and/or Los Angeles can sign checks. All checks will be issued by the Treasurer, Duane Mealey.
3. The Symposium Committee has tentatively approved that there will be two lunches and a reception, but no banquet. Final decisions on this will be based on budgetary consideration. Present plans are for a "welcome luncheon" on the initial day, Tuesday, of the Symposium, an awards luncheon on Wednesday, and the reception on Wednesday on the order of 6:00 - 8:00 P.M. and, tentatively, at poolside/patio.
4. The technical program will be arranged to have a common recess period so that all attendees will know what papers are being presented at a given time. The recess will be such as to allow for slight over runs and, thus, a catch-up period.
5. The technical committee will be geared for near equal importance of DoD and Commercial aspects of EMC.
6. Publications are being considered for Call for Papers, advance programs, and the Symposium Record. Plans are tentative for 800-900 copies of the Symposium Record.
7. It is planned that there will be a generous mixture of invited papers as compared to the result of the Call for Papers. The number of concurrent sessions has not been determined.
8. All hotel arrangements have been completed. We can obtain a block of 300-400 rooms.
9. Arrangements will be made for workshops. There is a good supply of meeting rooms available for workshops and various committees. Use of these rooms must be approved by the Chairman and the Arrangements Committee.
10. Meetings have been held bi-monthly since last September, and after the summer months, meetings will resume in September and will be on a monthly basis.
11. Based on IEEE and other Symposium guidelines, all matters seem to be well under control and on schedule, or ahead of schedule.
12. The Chairman wishes to express appreciation to Jim Toler, Len Carlson, and Aaron Sullivan, past Symposium Chairmen, for their advice and assistance.

Fred J. Nichols
Chairman

SUPREME COURT DENIAL OPENS UP FCC'S PART 68 REGISTRATION PROGRAM

The Supreme Court has denied review of the decision of the 4th Circuit Court of Appeals that dealt with FCC's Part 68 registration program. The effect of this decision is to permit the FCC to proceed with the registration of PBX systems, key telephone systems, and main station and extension telephones for use on single-party lines. The FCC will proceed with its implementation of registration once it receives a copy of the mandate from the Appeals Court.

FELLOWSHIP IN ELECTRICAL HISTORY AWARDED TO JOHNS HOPKINS STUDENT

(New York, NY) -- The first IEEE Fellowship in Electrical History is to be awarded to Terry Kay Rockefeller, a student in the Department of History at Johns Hopkins University. The fellowship carries a stipend of $8500 for full-time graduate study and research during the 1978-79 academic year.

Ms. Rockefeller, who received her AB degree in government from Radcliffe College in 1972, was awarded an MA degree in American History by Johns Hopkins in 1977. As an IEEE History Fellow, she will undertake research on the political and social impacts of electric light and power in the state of New York between the two World Wars. She expects this research to lead to a doctorate in American history in 1979.

Ms. Rockefeller states that her dissertation will examine the history of the impact of electricity and planning for electric power during a period that to date has been only superficially explored by scholars. "It will," she says, "focus on the interaction between technology and values...By studying a specifically defined geographical area, I hope to show that the application of technology -- both hardware and organization -- did not occur in a vacuum, sealed off from its particular political and economic setting. Rather, that setting and its social values determined how technology was used."

Ms. Rockefeller hopes to avoid the mistakes of many social and political historians who have glossed over the hard details of technical development and thus have been led to simplistic or incorrect conclusions about the role of technology in the historical process.

1977 CHAPTER-OF-THE-YEAR AWARD TO NEW JERSEY COAST CHAPTER

When Charlie Anderson finished his scoring for the 1977 Chapter-of-the-Year, the New Jersey Coast Chapter came out on top. Presentation of the certificate was made at the IEEE International EMC Symposium in Atlanta at the Awards Luncheon on June 20, 1978. The presentation was made by Society President Janoski to Don Heirman, Chapter Chairman during the full year. Assisting him during the first half of 1977 were Joseph Chislow, Vice Chairman, and Herbert Bennett, Secretary-Treasurer. His support for the last half of 1977 was William Chriss, Vice Chairman, and Margaretta Stone, Secretary-Treasurer.

Competition for the Chapter-of-the-Year Award is open to all EMC Society Chapters. Scoring is automatic as chapter activities are reported to Charlie Anderson, Chapter Activities Editor of the Newsletter. The method of scoring these activities is explained in the following scoring schedule. Please call this to the attention of your chapter officers who are taking office on July 1st.

CHAPTER-OF-THE-YEAR AWARD

A Chapter-of-the-Year Award has been established by the AdCom to recognize outstanding performance by a Chapter organization in serving its members and in establishing good will for the Group. One award will be made each year at the G-EMC Symposium for the one year period ending on December 31st. The Award will be in the form of a suitable certificate, in multiple, to be presented to each elected officer of the Chapter. Reporting of the chapter activities for scoring purposes will be coordinated with chapter reporting to the EMC Group Newsletter. The scoring report will be accepted only in written form with a 50 point bonus for reports received on or before the established due dates.

The new scoring schedule is presented below.

1. Chapter Meetings and Technical Activities

   Credit 100 points multiplied by the percentage of listed chapter members in attendance.

   Credit 100 points multiplied by the ratio of non-members in attendance to listed chapter members up to a one-to-one ratio. Listed chapter members are the members of record according to the IEEE Headquarter's reports issued during the award period. Dinner, luncheon, field trip and lecture series meetings shall be counted.

2. Special Events

   Credit 100 points for the sponsorship of a G-EMC Symposium and 50 points for joint sponsorship of a technical symposium.

   Credit 25 points for a social meeting.

   Credit 25 points for joint sponsorship of a meeting.

3. Chapter Newsletter

   Credit 25 points for each issue.

4. G-EMC Newsletter Report

   Credit 50 points for each report filed before the deadline. This report will include Chapter-of-the-Year point scoring information.

5. Awards Program

   Credit 25 points for an awards program to recognize outstanding service at a chapter level.

   Credit 25 points for participation in the G-EMC awards program. This is credit for national awards nominations made to the G-EMC Awards Committee.

6. Membership

   Credit 200 points multiplied by the percentage of increase or decrease in membership of the Chapter for the calendar year. This may be a negative value.

7. Advance Planning

   Credit 25 points when a complete annual program is issued to each chapter member before the first meeting is held.

The final scoring will be made by the Awards Committee on the basis of written reports received by the G-EMC Newsletter chapter news editor before established deadlines. Consideration may be given to unusual circumstances or activities of the chapters. The judgement of the Awards Committee will be considered final.

NEW JERSEY COAST CHAPTER NEWSLETTER

From time to time, different EMC Chapters of the IEEE undertake the publication of a Chapter Newsletter. This task has been a tradition with the New Jersey Coast Chapter. Since the disbribution of a Chapter Newsletter usually is limited to members of the Chapter, we have decided to publish the latest issue in total for all of the EMC Society members to see.

The New Jersey Coast Chapter has had a succession of notable editors, including Warren Thiers and Charlie Anderson (our Chapter Chatter editor). The current editor, Don Heirman, has been the editor over the past few years and is also their dedicated Chapter Chairman.

The Newsletter can play an important role in keeping a chapter together and everyone aware of current, past, and future activities. The New Jersey Coast Chapter officers should be congratulated for their continued efforts and the start-up of other chapter newsletters within the EMC Society is certainly encouraged.

The INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

NEW JERSEY COAST
EMC/VT SOCIETIES

Vol. 8, No. 7
Donald Heirman, Chairman

June 1978
Donald Heirman, Editor

NEWSLETTER

MEETING
"US Army Spectrum Management/Electromagnetic Compatibility Program"
Thursday, 15 June 1978
Gibbs Hall (Officers Club)
Fort Monmouth, NJ
For Reservations, Call Paul Major at (201) 544-4605
Before 4:00 P.M., 13 June 1978
Details Inside

OUR CHAPTER SELECTED 1977 CHAPTER-OF-THE-YEAR

Our Chapter has just been selected as the 1977 Chapter-of-the-Year!!!! The award will be presented to our Chapter chairman, Don Heirman, at the awards luncheon for the 1978 EMC Symposium in Atlanta on Tuesday, 20 June 1978.

The award is for the calendar year 1977 which spans two chapter administrations since our technical year starts on 1 July. The officers for each half year were:

	1 Jan.-30 June 1977	1 July- 31 December 1977
Chairman:	Don Heirman	Don Heirman
Vice-Chairman	Joe Chislow	Bill Chriss
Secretary/Treasurer	Herb Bennett	Marge Stone

The award will reflect the above names. Each will receive a separate copy of the scroll.

Over that period we held 8 technical meetings and our special Spectrum Engineering Seminar. We also published 8 Chapter Newsletters sponsored by 16 institutional listings. We want to thank you-our members and friends-for the interest and enthusiasm for our technical program which was a prime ingredient in receiving this award. Our special thanks go to our fine technical speakers, many of whom traveled from distant locations to give their presentations. We especially want to thank Don Jansky, our Spectrum Engineering Seminar principal instructor, for his key efforts in bringing to our Chapter an outstanding seminar. Of course, our slates of officers are also to be congratulated for their constant efforts to provide our chapter with a quality technical program. Finally, we want to thank the S-EMC national Awards Committee, chaired by Jim Hill, for this long to be remembered honor.

Election of Officers for 1978-79

Prior to our 15 June technical presentation by Sam Segner, we will hold our annual elections for Chairman and Vice-chairman. Our slate of Marge Stone and Bill Chriss for these two positions, respectively, were announced in our May Newsletter. We still have a vacancy for the secretary/treasurer post. Anyone interested should call Don Heirman on 949-5535 ASAP. Mail ballots for those chapter members who will not make this meeting will be accepted until 14 June 1978. Mail all ballots to Marge Stone, 130 Summit Ave., Neptune City, Neptune, NJ 07753. Please sign the envelope flap to validate the ballot.

Anniversary Dinner Prints Available

Prints ordered at our 18 May 1978 meeting will be available for pickup at our 15 June 1978 meeting. Cost is $2.50 for the 5x7" size; $5.00 for the 8x10" size. A final order will be placed on prints for those of you

who still want copies. A set of 29 candid prints taken by John O'Neil and Don Heirman were sent to Bob Goldblum, our national S-EMC Newsletter Editor, to include in a feature story of our dinner to appear in a forthcoming Newsletter. Prints of Dr. and Mrs. Emberson were mailed directly to them with our Chapter's compliments.

News Briefs

Joe Chislow Elected Section Vice-chairman

Our Joe Chislow was elected Section Vice-chairman at the 24 May 1978 Section meeting. We wish Joe success in his important position.

Ford Tour A Success

Seventy attended our Chapter and Section field trip to the Ford Motor Assembly Plant in Mahwah, NJ on 11 May 1978. Fred Bauer, from Ford in Dearborn,MI, provided an outstanding technical presentation which highlighted the combination plant tour and talk. Well over 30 Section members had to be placed on a waiting list in case of cancellations which did not materialize. We, therefore, hope to have a future tour for the 1978-79 technical program. We need help in arrangements. Those interested in helping should call Don Heirman (201) 949-5535 or Bill Chriss (201) 949-6633 before 1 July 1978.

EMC Symposium in Atlanta

The advance program for our EMC Symposium in Atlanta on 20-22 June 1978 has not arrived as yet in the mails. To ensure a hotel room, call direct to the Sheraton-Biltmore on (404) 881-9500 and mention you are attending the Symposium.

The national AdCom will hold its meeting on Monday, 19 June 1978, at 1:30 PM in the Alabama Room of the Sheraton-Biltmore Hotel. This is an excellent opportunity to see the activities of our AdCom and to learn first-hand the issues and future events of importance to our Society. If you are arriving ahead of the Symposium, why not attend the meeting which is open to our members.

Standards Reviews Are Due

Comments on the applicability of 5 IEEE Standards are due by 14 June 1978. The review of these standards was assigned to us as a chapter project by Bud Taggart, NBS, who is the S-EMC Standards Chairman. Three reviews have been received so far. A progress report must be made at the 19 June AdCom meeting. Mail your comments to Marge Stone with your completed questionnaires. More information on the Standards is contained in our February/March 1978 Newsletter.

OUR CHAPTER HISTORY --- Part Seven

by John O'Neil

A major effort during this time was the preparation of a PERT-type chart listing all major milestones to be accomplished in the required time frame for all committee chairmen. This chart was then further detailed and prepared in booklet form and presented to each chairman. At each symposium steering committee meeting the booklet was used as a guide of progress or problem areas. In some instances, various chairmen grew to detest the booklet, but it served a very useful purpose.

It was considered that advisors should be available and Mr. C. Fowler of AEL and Mr. L. Milton of Filtron agreed to perform this function. A loan of one thousand dollars was obtained from the EMC Group for payment of costs incurred prior to the Symposium and each chairman was requested to indicate how the monies would be expended. Mr. Brown, Finance Chairman, kept a very close watch on this funding. Symposium stationary was designed with the assistance of Honeywell and Vitro Labs graphic arts departments. However, prior to printing, a Symposium theme had to be considered. Numerous meetings were devoted to this problem with suggestions such as "EMC-Before it's too late". At the last meeting, which it was agreed would last until a theme had been agreed upon, the owner of the restaurant where the meeting was held also joined in with "Don't cut the cheese cake with the butter knife". This apparently pointed out that a theme was not really necessary and it was agreed that we would not have a theme. Chuck Joly then proposed that we use a symbolic theme which is still used on our Chapter Newsletter Masthead. Later, pins displaying this symbol were ordered and furnished to each Symposium attendee.

In the Summer Newsletter, we will discuss the joint meeting, the hectic symposium activities, including the banquet speaker, the election of new officers, etc.

N.J. Coast EMC chapter 60TH anniversary dinner

4 - 15 - 78

Book Reviews

by Jim Hill, EMXX Corporation

As promised in the Fall 1977 issue of this Newsletter, we have a review of Dr. Sidney Frankel's new book, "Multiconductor Transmission Line Analysis." The material presented is intended to provide a unified approach to understanding the physical behavior of multiwire transmission lines. The author begins with the simplest model that can yield a wide range of useful results and then adds refinements which though they tend to obscure the essential simplicity of multiwire TEM propagation, are otherwise necessary for predicting with desired accuracy line behavior in certain special situations. The scope of development is restricted to monochromatic behavior of linear, time-invariant systems. The book is divided into three major sections. The first section outlines the theory of lossless multiconductor lines embedded in homogenous isotropic dielectrics. Section Two introduces and analyzes the effects of dielectric losses and small conductor losses. The effect of the use of mixed dielectrics is scrutinized from a quasistatic perspective. In conclusion, Section Three discusses the determination of multiline parameters and external field coupling parameters.

Dr. Frankel is a technical consultant in Menlo Park, CA, engaged primarily in electromagnetic research with special interest in coupling effects in multiwire lines and cables. He has authored numerous papers and has nine patented inventions. He was elected a Fellow of IEEE in 1957. The publisher's price of this book is $30.00.

The review of Dr. Frankel's book was done by Dr. Clayton R. Paul, Associate Professor of Electrical Engineering at the University of Kentucky. Dr. Paul has authored several papers and reports on multiconductor transmission line analysis (reference IEEE Transactions on EMC, Vol. EMC-20, Number 1, February 1978, page 216).

The opinions expressed in the review are those of the reviewer and not necessarily those of the book review or Newsletter editors.

"Multiconductor Transimission Line Analysis"

BY

Sidney Frankel

Publisher, Artech House, Inc., 1977

I should like to, first of all, compliment Dr. Frankel for writing a detailed treatment of this subject of multiconductor transmission lines. The text is the same as a report he authored for the Harry Diamond Laboratories ("Cable and Multiconductor Transmission Line Analysis," HDL-TR-091-1, June, 1974) which may be obtained from the National Technical Information Service (ADA00848, $11.90). This report seems to be an assortment of several other technical reports published by Dr. Frankel.

In the EMC community, we have tended to concentrate on the antenna-to-antenna interference coupling mode and neglected the sometimes more severe wire-to-wire and field-to-wire coupling modes. Dr. Frankel's publication of the results of his many years of research into these two areas of interference coupling represents an important contribution.

Chapter 1 (Introduction) is basically a review of Maxwell's equations and the simplifications resulting from the TEM mode assumption. My basic problem with this chapter is its brevity, although brevity may be its strong point. I dislike seeing a summary of equations. Illustrations (there are none in this chapter), as well as word discussions of the equations, are essential for a full understanding of their meaning and impact. It it is presumed that the reader already has sufficient knowledge of these equations so that words and illustrations are unnecessary, then so are the equations. Nonetheless, this section includes nearly all the background and equations required to proceed with the study.

The book is divided into three parts: Part I - Lossless Lines in Homogenous, Isotropic Dielectrics; Part II - Low-loss Lines, Mixed Dielectrics; Part III - Determination of Line Parameters and External Field Coupling Parameters. This division of topics is a natural and useful one in the sense that lossless lines in homogenous dielectrics are the simplest from an analysis standpoint followed in increasing difficulty by lossy and/or mixed dielectric cases. The calculation of the per-unit-length parameters in the transmission line equations in Part III is essential to the analysis. Without them, the solution of the transmission line equations would be simply a math exercise.

Chapter 2 (Line Parameters and Transfer Relations) concerns the formulation of the equations characterizing the wave behavior on lossless lines which are surrounded by homogeneous, lossless dielectrics. An initial review of the TEM mode and voltage and current concepts is presented followed by a terminal characterization of an n conductor line (n conductors plus a reference conductor). This chapter is, in my opinion, flawed by some fairly sloppy notation as are other parts of the book. For example, the symbols $\underline{V}$ and $\underline{I}$ are used to represent the forward and backward traveling wave voltages and currents on the line (p. 17, 18) as well as the total voltages and currents on the line (p. 21). Similarly, the vectors $\underline{A}$ and $\underline{B}$ in the wave admittance form on p. 21, equation (2-25) are not the same as the $\underline{A}$ and $\underline{B}$ vectors on p. 22, equation (2-27) for the wave impedance form. Also, numerous vector-matrix products are not written correctly. For example, on p. 27, the 2n X 2n matrix (E) is, as written, a 2 X 2 matrix; n X n identiy matrices are needed for it to be a proper matrix for multiplication in equation (2-34). Perhaps, the author intended for this to be simplified notation; as is clear from the remainder of the text and his many years of work, he certainly knows better. To people working in this area, the notational problem is no real problem. For the beginner or casual reader, I suspect it could be, at the very least, annoying. I also disagree with the form of what he calls the cascade (2-31), admittance (2-34) and impedance (2-36) forms. These should (by convention) relate only the terminal currents and voltages and not things like $\underline{\mathcal{B}}\underline{J}$; $\underline{\mathcal{B}}$ should be placed in the cannonical matrix.

Chapter 3 (Configurations for Practical Applications) basically is concerned with the traditional synthesis of microwave circuits (directional couplers and filters). I find the discussion of the directional coupler to be unnecessarily complicated. (See Matick, reference[1]).

Chapter 4 (Line Excitation) considers the general representation of the terminal networks and the solution for the line voltages and currents. Also considered in the case of distributed excitation of the line as with external, electromagnetic fields incident on the line. For my tastes, the coverage of this latter topic is unnecessarily complicated from a notation standpoint.

Chapter 5 (Introduction: Dielectric Losses) concerns the inclusion of losses in the surrounding dielectric. For this chapter, the dielectric is assumed to be homogenous and the results are well known; replace in the lossless case with (1 + /). Losses in inhomogeneous dielectrics such as wire insulations surrounded by free space are not covered in the text.

Chapter 6 (Conductor Losses) is a fairly conventional treatment of conductor resistance produced by lossy conductors. The solution of the transmission line equations having inhomogeneous dielectrics is, for some unknown reason, included at the end of this chapter when it should more appropriately be placed in the next chapter.

Chapter 7 (Quasi-TEM Line Theory) discusses the solution to the transmission line equations when lossy conductors and/or inhomogeneous dielectrics are considered. Here again, I find some particularly bothersome notation which can be confusing as well as annoying.

Chapter 8 (Small Wire Theory) begins Part III which concerns the determination of the per-unit-length quantities (although resistance was covered in Chapter 6 and conductance was covered in Chapter 5). Conventional results are obtained for the per-unit-length capacitance parameters for multiwire lines under the assumption of wires having small radii compared to their spacing. The important problem of determining the per-unit-length inductance meters is only allotted one sentence on p. 216. Granted, this is a simple problem once the capacitance of the line with the dielectrics removed is determined, but it's an important enough concept that it deserves more emphasis.

Chapter 9 (Conformal Mapping) is a rather traditional treatment of the technique of determining capacitances of one structure from those of a simpler structure.

Chapter 10 (External Field Coupling Parameters) considers the relationship between the parameters of some external field incident on the line and the resulting induced source terms in the transmission line equations. I basically disagree with his assumption of uniform variation of the incident field in the line vicinity. The reader, however, can evaluate the merits of this assumption.

Chapter 11 (Analog Methods) concerns the well known determination of the per-unit-length quantities from analogous, experimental measurements such as conductive sheets, resistive networks, etc.

Chap. 12 (Numerical Methods) discusses a numerical approximation method for determining the per-unit-length capacitances; the finite-difference method. I would have also preferred a discussion of the method of moments technique which is finding recent popularity.

The text concludes with a discussion of the accuracy of the quasi-TEM approximation in Chapter 13 (Quasi-static Approximations: Limits of Accuracy). This subject is, perhaps, one of the most neglected areas in multiconductor transmission line theory and needs more consideration. We tend to have a qualitative feel for the accuracy of the transmission line formulation for the mixed dielectric case (Quasi-TEM), perhaps through the correlation of experiments and predictions. We need a more quantitative assessment (if that is possible).

In closing this review, I should make it clear that Dr. Frankel's many years of work in the area of multiconductor transmission lines represent a significant contribution. Unfortunately, I do not feel that this text does justice to that work. My two outstanding objections are the sometimes inconsistent notation and the technical report atmosphere of the presentation. The notational problems can be annoying and quite confusing to a beginner in this field. The equation derivations are too detailed, it seems to me, to promote a desire on the reader's part for continued study. I would, therefore, recommend it only to those who are intimately involved in the area of multiconductor transmission lines.

[1] R. E. Matick, Transmission Lines for Digital and Communication Networks, McGraw-Hill, New York, 1969, Chapter 7.

REVIEWER: Clayton R. Paul
Dept. of Electrical Engineering, Univ. of Kentucky

EMC SOCIETY AWARDS PRESENTED AT THE ATLANTA SYMPOSIUM

The EMC Society Administrative Committee recognized the outstanding contributions and achievements of a number of EMC Society members with special award certificates. Those receiving the awards were:

The Certificate of Appreciation to Jim C. Toler for his service in organizing the technical committees and as President of the EMC Society; and to Eugene D. Knowles for his service on the AdCom and most recently as Vice President.

Certificate of Achievement to Robert B. Cowdell for his original work in the evaluation of shielding requirements and for leadership in the TEMPEST area; and to Gerald P. Rothhammer for outstanding administrative and application engineering in the areas of EMC instrumentation and measurements.

Certificate of Acknowledgement to Jim C. Toler for services rendered as Chairman of the 1978 International Symposium on Electromagnetic Compatibility; to Edward F. Vance as Guest Editor of the Transactions Special Issue on Nuclear Electromagnetic Pulse; to George H. Hagn as Guest Editor of the Transactions Special Issue on Spectrum Management; and to the following Associate Editors of the Transactions on Electromagnetic Compatibility for their services in past years: Nasir Ahmed, Herbert M. Bartman, Fred Haber, Donald A. Miller, and Dwayne R. Awerkamp.

1977 Transactions Prize Paper Awards to Henning R. Harmuth for his paper titled "Selective Reception of Periodic Electromagnetic Waves with General Time Variation," published in the IEEE Transactions on EMC, Volume EMC-19, Number 3, August 1977, Part I; and to David Middleton for his paper titled "Statistical-Physical Models of Electromagnetic Interference," published in the IEEE Transactions on EMC, Volume EMC-19, Number 3, August 1977, Part I.

Chapter-of-the-Year Award to the New Jersey Coast Chapter (reported elsewhere in this issue).

Certificate of Recognition to Don Bowen, featured speaker at the Awards Luncheon.

REPORT OF THE VICE PRESIDENT FOR COMMUNICATIONS SERVICES

Abstracts Committee

Ed Bronaugh reports that EMCABS are going slower than anticipated. He expects to receive more abstract material from committee members this summer.

Newsletter Committee

Discussion with Joe Banasiak indicates that Newsletter activities are proceeding smoothly. Bob Goldblum will present his report at the AdCom meeting.

Transaction Committee

Dick Schulz's report states that no problems are noted.

Symposium Committee

Brief reports from each past and future symposium committee will be presented at the AdCom meeting. These include:

1. Seattle, 1977
2. Atlanta, 1978
3. San Diego, Oct. 9-11, 1979
4. Baltimore, Oct. 7-9, 1980
5. Boulder/Denver, 1981
6. San Francisco, 1982. Subject to receipt of formal proposal.
7. Washington, DC, Oct. 18-20, 1983

Suggestions for possible hosts for the 1984 symposium are requested. We are trying to maintain a five-year in advance symposium commitment schedule.

Respectfully submitted,

Gene Cory

COMMISSION ON FEDERAL PAPERWORK COMPLETES WORK

The Commission on Federal Paperwork established two years ago by Congress is expected to announce some 750 recommendations for reducing paperwork which could result in annual savings of $10 billion. It will also recommend the establishment of a Department of Administration to coordinate management of paperwork, records and communications within the government.

AEROSPACE EMPLOYMENT DECLINING

U.S. aerospace employment is expected to decline to 890,000 by December 1978, according to a survey by the Aerospace Industries Association.

This projected decline in employment is primarily due to the cancellation of the B-1 bomber program. Some of the downturn in government work, however, will be partially offset by expected increases in the production of civil aircraft.

The outlook for the missile and space segment of the industry has shown an increase in the 1977, reaching 195,000 in June 1977. It is, however, expected that the downturn in employment on missile and space projects will resume, dropping about two percent by December 1978.

The category of "other related products" - avionics, non-aerospace and basic research - dropped during the first half of 1977 by nearly nine percent. It is expected that this trend will be reversed and that 219,000 people will be working on such programs by December 1978 - an increase of 14,000 over June 1977.

The Pacific region accounts for about 40 percent of all aerospace employees, followed by New England with 15 percent and the Middle Atlantic region with 12 percent.

NUCLEAR REACTOR AFFECTED BY TOILET FLUSHING

"Please don't flush the toilet while the reactor is running," reads the sign on the building's lavatory door. "The situation is merely a nuisance," a spokesman for the Nuclear Regulatory Commission said, adding no safety violation is involved.

The reactor at the University of Florida which uses 7.5 pounds of uranium, has a powerful water-fed cooling system fed by a well for risky experiments. But low-risk experiments run on a secondary cooling system tied in by a city water main to the toilet. Untimely flushes have caused the reactor to be shut down five times in the past three years, sending students' experiments down the drain.

ROTTERDAM EMC SYMPOSIUM

MAY 1-3, 1979

The EMC Society has agreed to cooperate with the Dutch Electrotechnical Committee to hold an EMC Symposium in Rotterdam, The Netherlands, May 1-3, 1979. The date was chosen to coordinate with the CISPR meeting at nearby The Hague. The Symposium organization is made up of Dr. F. E. Borgnis, T. Dvorak, and Dr. F. L. Stumpers, responsible for the success of the 1975 and 1977 Montreux EMC Symposia. Working with them is Dr. P. Leuthold of the Swiss Institute of Technology of Zurich. The continuance, on a biannual basis, of a Western European EMC meeting again offers an opportunity for an interchange of EMC technology between the EMC communities of the eastern and western hemispheres.

It is planned to organize a group to travel to the Rotterdam Symposium, taking advantage of group rates for air travel and hotel accommodations. Details will be announced in the next issue of the EMC Society Newsletter. For more information on the technical program, exhibition, or group travel, contact: Jim Hill, 6706 Deland Drive, Springfield, VA 22152; Tel.: 703-451-4619, days - evenings - weekends.

EMC SOCIETY HISTORY

Approved 10/10/57 as Radio Frequency Interference Group.

Name changed 5/15/63 to Electromagnetic Compatibility Group.

Became Society 1/1/78.

Fees

12/1/57	$2.00
7/1/66	$4.00
1/1/70	$5.00
1/1/73	$7.00

INSTITUTIONAL LISTINGS

The IEEE Electromagnetic Compatibility Society is grateful for the assistance given by the firms listed below and invites application for Institutional Listings from other firms interested in the electromagnetic compatibility field.

SERVICE DIVISION, AMERICAN ELECTRONICS LABS., INC., Richardson Rd., Montgomeryville, PA 18936
EMI/EMC, shield, enc. consult. test. & anal.; Scrn. rm. (incl. for large veh.); Comp. instr. for Mil. EMI test.

SINGER INSTRUMENTATION, 5340 Alla Road, Los Angeles, CA 90066
Computer operated/automatic/manual EMI test system, EMI meters, antennas, and components.

SPECTRUM CONTROL Inc., 152 E. Main St., Fairview, PA 16415
Telephone (814) 474-5593 Telex 510/699-6848

EMC test and consulting VDE, CISPR, MIL 461, FCC. Mfr. RF, filters, RFI capacitors, chips, variable caps—in stock at HALLMARK.

ELECTRO-METRICS, Division of Penril Corp., 100 Church St., Amsterdam, NY 12010
EMI meters and automated systems incl., calculator/computer-based;20 Hz-40 GHz*MIL-STD/CISPR/VDE/SAE/FCC.

LECTROMAGNETICS, INC., 6056 W. Jefferson Blvd., Los Angeles, CA 90016
Telephone (213) 870-9383.

RF shielded enclosures, modular, prefabricated & all welded. RFI/EMI power line filters; signal line filters.

EMERSON & CUMING, INC., Canton, MA—Gardena, CA—Northbrook, IL.

Eccoshield RF shielded chambers—Eccoshield EMI/RFI gaskets and materials—Eccosorb anechoic chambers.

METEX ELECTRONIC SHIELDING GROUP, A Unit of Metex Corporation, 970 New Durham Road, Edison, NJ 08817

EMI/RFI, EMP & EMC Shielding Materials, Custom-Engineered Conductive Components, and Coatings.

CENTRALAB/USCC, 4561 Colorado Blvd., Los Angeles, CA 90039
EMI/RFI Filters, Monolithic Ceramic Capacitor (Chips).

An Institutional Listing recognizes contributions to support the publication of the IEEE Newsletter and TRANSACTIONS ON ELECTROMAGNETIC COMPATIBILITY. Minimum rates are $75.00 for listing in one issue; $200.00 for four consecutive issues. Larger contributions will be most welcome. No agency fee is granted for soliciting such contributions. Inquiries, or contributions made payable to the IEEE, plus instructions on how you wish your Institutional Listing to appear, should be sent to M. Bonaviso, The Institute of Electrical and Electronics Engineers, Inc., 345 East 47 Street, New York, NY 10017.