

IEEE

ELECTROMAGNETIC COMPATIBILITY GROUP

NEWSLETTER



ISSUE NO. 80, Winter, 1974

EDITOR: ROBERT D. GOLDBLUM

GENE CORY ELECTED PRESIDENT OF ADCOM

In a special mail ballot election, Gene Cory has been elected President of the G-EMC Administrative Committee. As of the November 30th deadline, sixteen (16) ballots had been received and the vote was unanimous in favor of the slate nominated. This was one of the few Ad Com elections which did not produce at least one write-in candidate. Elected to serve during 1974 were:

President:

Gene Cory
Southwest Research Institute
P. O. Drawer 28510
San Antonio, Tx. 78284

Vice President:--(incumbent)--

Eugene D. Knowles
2566 - 128th Ave. S.E.
Bellevue, Wa. 98005

Treasurer: (incumbent)

Warren A. Kesselman
31 Hope Road
New Shrewsbury, N.J. 07724

Secretary: (incumbent)

Leonard W. Thomas, Sr.
1604 Buchanan St., N.E.
Washington, D.C. 20017

FIVE G-27 MEMBERS ELECTED TO FELLOW GRADE

Five members of the G-EMC have been elected to the IEEE Fellow Grade as of January 1, 1974. Among these is Jack Bridges, who is an active participant on the Ad Com and Chairman of our Standards Committee. The recipients and their citations are listed alphabetically below:

Jack E. Bridges - For development of techniques and standards to control radio frequency interference, and for contributions to receiver design to suppress common-channel interference and noise.

John D. Dyson - For contributions to the development of log-spiral antennas.

Friedrich W. Gundlach - For contributions to the development of microwave tubes.

Bharat K. Kinariwala - For contributions to research in circuit and system theory and to engineering education.

Akio Matsumoto - For contributions to the theory and design of electrical networks and microwave filters.

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IEEE REFERENDUM VOTE AFFIRMS
EXISTING CORPORATE STRUCTURE

A referendum among the membership of the IEEE has reaffirmed the confidence of the members in the existing structure of the organization in regard to both technical and professional activities. This is the conclusion drawn from the results of the referendum, just reported by the Tellers Committee, according to Dr. Harold Chestnut, President of IEEE. Dr. Chestnut reported that the membership has voted by a margin of five to one against a proposal to set up a separate corporation to administer the Institute's technical activities.

Such a proposal had been instituted by the Governing Board of the IEEE Computer Society and had been opposed by the IEEE Board of Directors. Ballots which were mailed out contained statements for and against the proposal.

The Tellers Committee on November 8 reported that a total of more than 45,000 votes had been cast as valid ballots. Of this number more than 37,000--or over 83 per cent--were cast against the proposal. The ballot contained space for members to indicate whether they belonged to any of the IEEE Groups and Societies which might have been affected had the proposed new corporation been established. Among this class of voters, the vote was over 81 per cent against the proposal. Those with no Group or Society membership voted over 87 per cent against it.

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JACK BRIDGES ELECTED TO FELLOW IEEE

Jack Bridges is one of 105 new Fellows of IEEE. Five of the new Fellows are members of G-EMC but he is the only new Fellow whose citation is based on work in the field of EMC. Jack's citation reads "For his development of techniques and standards to control radio frequency interference and for his contribution in receiver design methods to suppress common-channel interference noise."

Jack has been involved with radio frequency interference since joining the Armour Research Foundation (now IIT Research Institute) in 1961. In 1963 he chaired the Ninth Tri-Service Conference on Electromagnetic Compatibility in Chicago. Jack is well known for his work in the standard field as a member of the ANSI Sectional Committee on Radio-Electrical Coordination (C63) and the ANSI Sectional Committee on Electromagnetic Radiation Hazards (C95-1) and more recently as Chairman of the G-EMC Standards Committee where he has a number of active standards programs ranging from electromagnetic interaction test procedures for cardiac pacemakers to definitions pertinent to the EMC field. He has been a major contributor to a number of reference texts prepared for the U.S. Government dealing with electromagnetic interaction problems. These include the Electromagnetic Compatibility Lecture Series, ASTIA No. AD 290-330 and the DASA EMP Handbook 2114. Jack is the principal investigator for the group which prepared the EMP Lecture Series and related DNA EMP Awareness Course Notes, DNA 2772.

In the area of control of radio-frequency interference Mr. Bridges has been an active leader developing techniques to reduce interference and other undesired electromagnetic interaction problems. He has published some 16 papers concerning special non-spurious response filters, electromagnetic pick-up of cables, electromagnetic shielding performance, and high-field interaction with cardiac pacemakers. In 1956 he received the Browder J. Thompson Memorial Prize Award for his paper published in the September 1954 IRE Proceedings, "Detection of Television Signals in Thermal Noise". Other honors include the Certificate of Achievement from the G-EMC presented at the 1972 International G-EMC Symposium.

Jack has also been an active inventor, holding 25 issued patents. Many of these are related to the field of commercial television and subscription television. Recent patents have to do with detecting stress and damage in turbine blades. In addition to his interest in EMC Jack is also a member of the Circuits and Systems Group, the Broadcast and television Receiver Group, the Communications Society, and the Geoscience Electronics Group.

MEETINGS & EVENTS

1974 IEEE G-MTT International Microwave Symposium June 12, 13, and 14, 1974

The 1974 IEEE G-MTT International Microwave Symposium will be held on the campus of the Georgia Institute of Technology, Atlanta, Georgia. The Symposium will be conducted independently during the same period with the 1974 International IEE/G-AP Symposium, the USNC/URSI Meeting, the 12th Symposium on Electromagnetic Windows, and the International Conference on Submillimeter Waves and Their Applications. Since all of these symposia will be "Together in '74" on the campus of Georgia Tech during the period of June 5-14, participants will have the opportunity to attend sessions of interest in any of the symposia (through appropriate registration) while also visiting the many attractions, or just enjoying the southern hospitality of the Greater Atlanta Area.

The International Microwave Symposium will emphasize "MAN - Microwave Applications Now" recognizing the use or potential use of microwave technology in reaching solutions to today's problems as related to man.

Papers that have not been previously published describing new contributions in and applications of microwaves in the following areas will be presented:

- +Millimeter Devices, Techniques, Systems and Applications.
- +Microwave Solid State Generators for High Power Applications
- +Commercial and Industrial Applications of Microwaves
- +Microwave Radiation Biological Effects
- +Medical Applications of Microwaves

The first day of the Microwave Symposium (Wednesday, June 12) is also the last day of the G-AP Symposium and will include sessions jointly planned and conducted. These sessions will address phased array

antennas, systems, components, and techniques.

AD COM MEETING

The next meeting of the G-EMC Administrative Committee will be held on Tuesday, March 26th, 1974, during INTERCON at the Statler-Hilton Hotel in New York City. Ad Com members will receive notices and the meeting time and room will be posted on the Hotel's directory. AdCom meetings are open to all members.

EMC SYMPOSIUM TO BE HELD IN MONTREUX

An International EMC Symposium and Technical Exhibition will be held from May 20 till May 22, 1975, in Montreux on Lake Geneva (Switzerland). The date of the EMC Symposium has been chosen just to precede the biannual (9th in 1975) International Television Symposium in Montreux, May 23-29, 1975. Most likely, the Working Groups of the Comite International Special des Perturbations Radioelectriques (CISPR) and the IEC Group on Electromagnetic Compatibility TC 77 will meet at Montreux in liaison with the planned EMC Symposium. Patron of the Symposium is Mr. F. Locher, Director General of the Swiss Federal Post and Telecommunications Authority (PTT). Cosponsors are the Union Radio-Scientifique Internationale (URSI), the Group on EMC of the IEEE and the Committee AE-4 on EMC of the Society of Automotive Engineers (SAE). Cosponsorship is further expected by National Societies of Electrical Engineers of Western Europe and some other international organizations. Present members of the Organizing Committee and Professor F.E. Borgnis and Mr. T. Dvorak (both Federal Institute of Technology, Zurich), Director R. Jaussi (Montreux) and past President of the CISPR, Professor F. L. Stumpers (Philips Research Laboratories, Eindhoven), who chairs the Scientific Program Committee. A first announcement and call for papers has been distributed. Further information may be obtained from: EMC Symposium, Box 97, 1820 Montreux (Switzerland).

The theme of the Symposium will be "World wide pollution-free electromagnetic environments". It shall cover the entire field of interaction between man produced electromagnetic radiation and electronic and biological systems. Beyond sessions on traditional radio frequency interference, new problems shall be explored which arise from the nearly exponential increase of electromagnetic emission into our environment:

- Social and economical impact of EMC
- Optimum organization of r.f. pollution control
- Spectrum economy and management
- Immunity of receptors and electronic systems
- Electromagnetic compatibility in modern transportation systems
- EMC hazards to ordnance and vital safety systems
- Biological effects of r.f. energy
- Electromagnetic Pulse (EMP) impact on electronic equipment and wire communications
- Interference and safety in medical electronics
- International cooperation in EMC

MEETINGS & EVENTS (continued)

The Technical Exhibition will include suppressed and high immunity equipment for use in r.f. exposed environment, suppressors for household, industry and transport, modern measuring apparatus, mobile and fixed facilities for interference testing and investigation, special components, shielding and absorbing materials, modern aids for EMC design, planning and control, EMC educational literature, standards and limits.

- The Symposium will be the first international conference in Europe on the subject of EMC
- It will provide a platform for extended international contacts and exchange of information. In EMC work this is of extreme importance because (a) EMC requirements on electrical equipment have to be internationally standardized in order to be internationally standardized in order to ease international trade, (b) as a complex interdisciplinary science EMC requires extensive statistical studies which in many instances may be carried out only in international cooperation, (c) the increasing world wide electromagnetic pollution can only be abated by joined efforts of all countries involved.
- The publication of a comprehensive Symposium Record in English will supply a survey of the latest advancements in the EMC field. In Europe such information is scattered over numerous periodicals in different languages and therefore difficult to collect.
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- US attendance secured through close cooperation with the IEEE and SAE Groups on EMC should enable the conference to serve as an interface between the highly technicized American approach and the long European experience with interference regulation.
- Manufacturers of EMC equipment will be able to introduce their products to a large international audience engaged in EMC work.
- The Symposium will stimulate closer international cooperation, ease the work of international standardization, open new marketing possibilities and in general raise the status of EMC for the benefit of a pollution free spectrum of tomorrow.

IEEE INTERCON TECHNICAL PROGRAM

IEEE Interson will present a three day program of 42 half-day sessions. Plans for the sessions and for one or more evening "highlight" sessions are nearing completion. The program will run from Tuesday through Thursday, March 26-28, with seven concurrent sessions each morning and each afternoon in the Statler Hilton, Intercon convention headquarters hotel. The three day format is one of several innovations in the 1974 program. The traditional four day program required sessions on Friday-- which is an almost mandatory "get-away day" for out-of-town visitors. The more compact schedule is expected to increase participation. Program sessions are concentrated in five high interest subject areas: Solid State Electronics, Computers and Information, Instruments and Instrumentation, Communications, and Marketing and Finance.

In addition to the 42 session "core" technical program, but still open to all Intercon registrants, there will be special meetings and programs organized by IEEE professional groups and other technical units, which will be scheduled at the Statler Hilton on Monday of the convention week.

SPEAKER'S OPPORTUNITY IEEE REGIONAL OUTSTANDING LECTURE TOURS

In 1972 a score of U.S. members gave lectures at IEEE section meetings in Europe and Japan when they were visiting these areas on business or vacation. The opportunity is still available for competent, audible and interesting speakers visiting any part of the world, who can advise IEEE headquarters approximately three months in advance of their travel plans, even if these are tentative. Do not delay until everything is definite; by then it may be too late to assemble the audience.

The expenses of deviating from your itinerary to fulfill an IEEE speaking engagement are reimbursable from IEEE funds for this program. Intercontinental travel costs are not reimbursable.

If you are interested in serving in this speaking role, please contact Dr. Peter D. Edmonds, IEEE headquarters, 345 E. 47 St., New York, N.Y. 10017 - Phone: 212/752-6800-Ext. 333, and advise him of your topic, probable itinerary and dates, and the name of a technical colleague who has heard you speak and could function as a peer reference. Your Group/Society officers would be glad to receive an information copy of your initial letter.

BOOK REVIEWS

by
James S. Hill

"A Glossary of Acronyms, Abbreviations and Symbols, by Donald R. J. White, Don White Consultants, 14800 Springfield Road, Germantown, Md. 20767, 1971, 235 pp, \$15.00.

Acronyms have been with us for centuries, some scholars trace them back to ancient Hebrew scriptures. In this country they have been with us from the beginning. The first American dictionaries carried such acronyms as okay or O.K. derived from that old yankee term Oll Korrekt.

Acronyms were finding their place in the federal government in the 19th century. World War I gave fresh impetus to their use, but nothing matched the proliferation of acronyms generated by Roosevelt's New Deal for the new alphabet agencies. World War II brought a plethora of new acronyms. Some, such as RADAR, have become words instead of acronyms.

By definition, an acronym is a word composed of the first or first few letters of different words. It may also contain the first plus the final syllables of words (motel for motor hotel). Some of the best acronyms are generated by a reverse process of selecting the acronym and then finding words to fit it. This has resulted in such tedious titles as Women Accepted for Voluntary Emergency Service to the acronym WAVES, describing a female member of the Navy. On the other hand, some acronyms deserve careful construction. The Department of Defense, which has been strong on acronyms, abandoned the acronym SOD for Secretary of Defense because it would require the most careful enunciation in order not to be construed as descriptive of the secretary. The more ponderous SECDEF is used instead.

There are no standards for pronunciation of acronyms. Many are pronounced as if they were complete words while others are spoken as individual letters. Some may be heard both ways. Because of this lack of standardization, the book gives only definitions, with occasional remarks indicating an obsolete listing or reference to another acronym.

There are 10,000 entries selected from an estimated 25,000 that may exist. The emphasis is on aerospace and communications - electronics but the selection is broad enough to include not only federal agencies, military organizations, titles and expressions, but also acronyms of many associations, societies, bodies and non-profit organizations. No acronyms are listed for state and local government agencies, associations and other in limited use.

This book should be particularly useful to the engineer and scientist, researcher and technician, the librarian or secretary who will venture into new fields of activity and find strange acronyms and abbreviations a barrier to his comprehension. This glossary should be a companion to his dictionary to avoid the frustration of today's cryptic communications used in our modern technology.

"A Handbook on Electrical Filters", by Don R. J. White, Don White Consultants Inc., 4800 Springfield Rd., Germantown, Md 20767; Third Printing, 1970, 279 pp, \$27.50

In the handbook on electrical filters, the authors expressed purpose is to provide useful and extensive filter design data which is easily understood by engineers and technicians, rather than attempt to embrace the entire subject with a comprehensive discussion of filters. To enhance the usefulness of the handbook, many illustrative examples are given on low-pass, high-pass, band-pass, and band-rejection filters.

The opening chapter contains a brief survey of the various types of filters employed in communications-electronics equipment. The highlight of the chapter is the section "How to use This Handbook". The "How to" is illustrated with a flow diagram which refers to specific chapters and pages to guide the reader in the use of the handbook. A second flow diagram shows how to design filters again with specific references to pages, sections, equations, figures, and tables. With this kind of help plus the Table of Contents with its complete, well identified list of figures, tables, and illustrative examples, this is a handbook which is easy to apply to practical problems requiring filter design. The index has been prepared with this same purpose.

The classical image-parameter method of filter design, while considered obsolete, is covered in one chapter. The rest of the handbook is devoted to synthesis, design, and application techniques stressing modern network filters having Butterworth and Tchebycheff responses. The emphasis is on the design and physical realizability of passive LC filters from power frequencies of 30 Hertz to communication system frequencies of about 500 Hertz. The final chapter covers tuning techniques for multistage filters and performance measurements such as insertion loss, input impedance, VSWR, and transient measurements.

BOOK REVIEWS (continued)

Two appendixes are devoted to, (A) a decibel conversion table, and (B) a list of filter manufacturers. The list is dated since the book was originally published in 1963 and some of the companies listed are now out of existence while there are a number of strong newcomers who should be on a list of this type. In addition there is a fine glossary of symbols so that there can be no misinterpretation of equations, tables, and text material.

Each chapter includes a substantial list of references so that the reader can explore the subject material in detail if he desires. While the handbook was originally published in 1963, it is now in its third printing and because it contains the basic principles still employed in filter design, it will probably go through further reprinting. Your reviewer recommends it for its excellent treatment of lumped constant filter design.

end.

ARMY EMC HANDBOOK

The U.S. Army Materiel Command (AMC) has a rather extensive program wherein a coordinated series of handbooks containing basic information and fundamental data useful in the design and development of Army materiel and systems are prepared through contractual effort. A recent addition to this program is the preparation of a Handbook on the subject of Electromagnetic Compatibility (EMC).

An Ad Hoc Working Group consisting of a representative from six AMC commands is presently being formed to technically review the draft chapters as prepared. It is recognized that considerable expertise is also available in the various professional and trade organizations in the EMC area. To assure that this publication is as complete and accurate as possible their assistance on a volunteer basis is being suggested.

The mode of operation consists of the contractor, which is the University of Pennsylvania, following a previously agreed upon outline, preparing a draft of the material to be incorporated in the final manuscript. These drafts, usually a complete chapter, are reviewed within thirty days of receipt for technical accuracy and comments furnished this office for submittal to, and incorporation by, the contractor in the final document. This procedure is quite similar to that utilized in the DOD specification standardization program in which many societies and trade organizations participate.

PROPOSED EIA STANDARD ON EMI FILTERS

The EIA has circulated a proposed standard on Radio Interference Filters to the Electromagnetic Compatibility (G-46) Committee for review and comment. The standard, if approved by EIA, may subsequently be among those EIA standards submitted to the American National Standards Institute for consideration as an ANSI Standard. Persons wishing additional information should contact:

Mr. Frank E. Garlington
Chief Engineer, Filter Division
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North Adams, Ma. 01247

DEFINITION OF TERMS AND REFERENCE BOOK

Telecommunications are not communicating. This paradox, classically an electronics problem, has prompted Andy Hish Associates to publish the "Electronic Warfare (EW), Spectrum Management (SM), Telecommunications and Electromagnetic Compatibility (EMC) Definition of Terms and Reference Book", a first-of-its-kind compilation of more than 3500 words common to specialized segments of electromagnetic spectrum engineering (\$29.50).

According to H. Dean McKay, publications director and vice president of AHA, a primary problem existing within telecommunications today is its inability to talk to itself at the inter-discipline level. "We believe this reference book will ease relatability to inter-discipline language, thus promoting more cooperative effort and an increased overall industry contribution" Mr. McKay said.

"...Definition of Terms..." is a complete reference document, clearly defined and well suited to preparation of technical reports, papers, operational procedures and documents in the following fields: Electronic Warfare, Spectrum Engineering, Frequency Management, Telecommunications, Electromagnetic Compatibility, Electromagnetic Pollution, ECM/ECCM, Electromagnetic Pulse, Radiation Hazards, TEMPEST and RINT.

Where, previously, an engineer would have to consult many reference books, written for other specialties, in order to communicate properly, now he can use just one -- "Definition of Terms and Reference Book" -- for correct and competent expression among many disciplines, Mr. McKay said.

"Definition of Terms and Reference Book" is published by Andy Hish Associates, 9710 Cozycroft Ave., Chatsworth, Ca. 91311; tel: 213-998-0222.

NEW IEEE STANDARDS CATALOG AVAILABLE

The new 32 page IEEE Standards 1974 Catalog is now in print. Copies may be obtained without charge. The new catalog lists more than 350 standards publications by subject as well as in numerical sequence. Included in this new set of listings are the many American National Standards published by IEEE.

Standards developed within the IEEE cover test methods, practices for electrical installations, units,, definitions, graphic symbols, letter symbols, and applications methods. 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.

Those of interest include:

Recommended Practice for Measurement of Field Intensity above 300 Megahertz from Radio-Frequency Industrial, Scientific, and Medical Equipments (IEEE Std 139-1952)	3.00
Open Field Method of Measurement of Spurious Radiation from Frequency Modulation and Television Broadcast Receivers (IEEE Std 187-1951)	3.00
Standards Report on State-of-the-Art of Measuring Field Strength, Continuous Wave, Sinusoidal (IEEE Std 284-1968)	3.00
Standards Report on Measuring Field Strength in Radio Wave Propagation (IEEE Std 291-1969)	4.00
Methods of Measuring (Below 1000 MHz) Electromagnetic Field Strength (IEEE Std 302-1969)	4.00
Requirements, Terminology and Test Procedure for Neutral Grounding Devices (IEEE Std 32-1972)	6.00
Guide for Safety in AC Substation Grounding (IEEE Std 80-1961) (Reaff 1971)	16.00
Recommended Guide for Measuring Ground Resistance and Potential Gradients in the Earth (IEEE Std 81-1962)	3.60
Recommended Practice for Grounding of Industrial and Commercial Power Systems (IEEE Std 142-1972) (ANSI C114.1-1973)	7.95

Application Guides for Ground Fault Neutralizers, Grounding of Synchronous Generator Systems, Neutral Grounding of Transmission Lines (IEEE Std 143-1954)	5.40
National Electrical Safety Code, 1973 edition (ANSI C2)	5.50
Test Procedure for Impulse Voltage Tests on Insulated Conductors (IEEE Std 82-1963)	3.00
Guide for Transformer Impulse Tests (IEEE Std 93-1968) (ANSI C57.98-1968 Appendix to C57.12.90-1968)	6.00
Recommended Practice for Minimization of Interference from Radio-Frequency Heating Equipment (IEEE Std 140-1950)	3.00
Radio Interference: Methods of Measurement of Conducted Interference Output to the Power Line from FM and Television Broadcast Receivers in the Range of 300 kHz to 25 MHz (IEEE Std 213-1961) (See also 214)	3.00
Radio Interference: Construction Drawings of Line Impedance Network (IEEE Std 214-1961) (See also 213)	4.00
Recommended Practices for Burst Measurements in the Time Domain (IEEE Std 257-1964) (Reaff 1971) (See 265 forin the Frequency Domain)	3.00
Recommended Practices for Burst Measurements in the Frequency Domain (IEEE Std 265-1966) (See 257 forin the Time Domain)	3.60
Techniques and Instrumentation for the Measurement of Potentially Hazardous Electromagnetic Radiation at Microwave Frequencies (ANSI C95.3-1972)	5.00
Measurement of Radio Noise Generated by Motor Vehicles and Affecting Mobile Communications Receivers in the Frequency Range 25 to 1000 Megahertz (IEEE Std 263-1965)	3.00

Single copies of the new catalog may be obtained free from the IEEE Standards Department, 345 E. 47th St., New York, N.Y.10017

PAC NEWSLETTER

During the past few years, Bob Ford has been doing an excellent job of disseminating information to G-EMC members located in Pacific areas. As Chairman of the Pacific Area Committee (PAC) and Editor of the PAC and Editor of the PAC Newsletter, Bob has made our world a bit smaller and our Group a bit larger through unselfish individual initiative. The following are examples of articles which appeared in his October 1973 issue of the PAC Newsletter:

Membership: Come on, fellows, you are not following through as well as were believing. The latest GEMC Newsletter contains a list of all GEMC members. A number of people on our distribution list have not yet joined. The benefits for EMC people are quite worthwhile. We have published several articles earlier enumerating the benefits and don't forget it is a tax deductible expense. For application blanks see me or write (to me or IEEE). Briefly from the 1973 Membership Information and Services Booklet:

Publications - many good ones.

- a. Proceedings - general coverage and very technical.
- b. Spectrum - general and easy reading; highly informative.
- c. GEMC Transactions - quarterly; EMC only, very good.
- d. GEMC Newsletter - Always good and up to date.
- e. GEMC PAC Newsletter - this old rag.

Meetings - We try! Most others are in the CONUS.

Educational Services - Correspondence course - Cassettes, special publications, etc.

Personal Contributions - "Gives personal satisfaction of accomplishment" etc. Allows you to donate your services to IEEE.

Personal Recognition - Status symbol stuff.

Other Benefits - IEEE Group flights program, travel discounts if going with an IEEE Group (usually start in New York or Los Angeles).

NSPE - Special rates on National Society of Professional Engineers, publications and services.

IEEE Insurance - Life, health, etc., at big discounts.

Library Services - If you happen to be near HQ IEEE, New York, N.Y.

Automotive Electronics: We have reported the EMC problems on braking systems, electronic ignition, etc. The other day an announcement was made by Volkswagen that the buckle in their new seat belt will contain an IC. It is interesting to contemplate what happens if it gets jammed by RFI. Put the transmission in neutral, turn off the ignition - unfasten the belt - get out of the car - get back in - fasten the belt - turn on the ignition - then restart (unless RFI is still present, in which case you push).

New book: Index to IEEE 1972 Periodicals is now available. 290 pages, 28,000 index entries, cost \$12.50 members or \$25.00 for those too cheap to join IEEE.

August 1973, IEEE Transactions on EMC: The first article is a favorite topic so it was with some keen anticipation that we started reading "Man-Made Noise Levels at 150 kHz to 32 MHz Near a Large Antarctic Base" by Drs. Stuart and Sites. It reminded me of old comic books - one of which had a regular feature: Count the number of mistakes. This study was made with untrained (PhD's) men using inadequate equipment (but blaming an FIM instead of their own lack of foresight on antenna choice). They made incorrect assumptions regarding both good and bad references. Their data shows 10 to 20 dB jumps of noise and signal amplitude corresponding somehow (unexplained) exactly with band changes on the FIM in use. They don't bother to explain how they managed to obtain good man-made noise data continuously across the spectrum, from 100 kHz to 20 MHz; that is 10 to 25 dB below the average background atmospheric noise (that certainly would mask it). Also mixed is data taken in peak detector position and data taken in average detector position. To add insult to injury - data was included from an article by Ed Skomal who in turn got it from several other sources, then they state, "The levels given by Skomal (2) for welders are comparable to the observed levels but it is not known whether any were operating at the time of the noise survey" (underline by Ye Ed). We will keep a copy on hand for an example of "how not to".

The second article on "Distribution of Peaks in Atmospheric Radio Noise" by S. N. Gupta is the most readable and comprehensive report of his series of studies on this subject. Very well done.

The remaining articles are all very good - quite theoretical but readable. EXCEPT - for the article, "On Cyclic Autocorrelation and the Walsh-Hadamard Transform". Ye Ed promises to study when time becomes available but in the interim would appreciate it if someone (in the Pacific Area Committee that understands Walsh functions) would abstract Walsh function literature and provide us readable resumes of same. It would help cultivate a greater interest if we could see practical applications for immediate use.

WASHINGTON STATUS REPORT

If we read a newspaper or watch the news we know that there are major dislocations of the normal sequence of events in Washington. However, the first session of the 93rd Congress has before it many important bills of concern to engineers. In addition to pensions, they concern science policy and the application of science to civilian problems, a host of proposals for organization, policy and research and development to deal with the energy crisis, metric conversion, environmental and conservation problems, occupational safety and health, transportation and mass transit, etc. The Congress had hoped to adjourn by mid-November, but with Vice Presidential confirmation, Watergate, and related issues before it, the probability is that it will remain in session well into December. Had it gone home early in November, completed action on most of the issues other than normal appropriation and authorization bills would have been very unlikely. However, with Congress staying in town there is a good chance of final action on metric conversion and pensions, even possibly some energy legislation.

PENSION REFORM

The October IEEE Professional News reviewed the major provisions of pension legislation of interest to engineers. The bill, passed by the Senate on September 19, 93-0, is a combination of S-4 and S-1179 grafted onto House bill H.R. 4200. Since about October 1st the House Ways and Means Committee has been marking up a new bill which (we are assured) will contain all the principles of interest to engineers contained in H.R. 4200. In the meantime the Committee on Education and Labor has been pushing a bill, H.R. 2, which has none of the "engineer amendments" and is much less satisfactory in most other respects. The Rules Committee has given Ways and Means a December 4 deadline for bringing pension legislation to the floor. Congressman Ullman, Acting Chairman Ways and Means told the Rules Committee he would have the pension reform bill out before Thanksgiving. If Congress is still meeting by Christmas (and it probably will be) there is an even money bet for pension legislation in 1973 and, if not, there is a high probability for early 1974. The more support Congressman get from their constituents for the legislative principles of H.R. 4200 (the new bill doesn't have a number) the more likely passage this year.

ENERGY

The fact that there are over 300 bills so far in this Congress dealing with various aspects of the energy problem is indication of its importance. IEEE has joined with a number of other engineering societies in the CCESP Energy Task Force. The Task Force responded to an AEC request of August 7, 1973, by naming a number of technical

advisors to assist the Commission and proposing urgently needed energy R&D projects in preparation of the Federal budget to be submitted to Congress for Fiscal Year 1975. The Commission has indicated it desires continuing assistance in planning the on-going programs.

There are rumors that consideration is being given to a Presidential Reorganization Plan to establish the Energy Research and Development Administration (ERDA) contained in S-2135 and H.R. 9090. This could avoid the delays inherent in the normal legislative route. Engineers should support such a plan with their Congressmen and Senators.

OFFICE OF TECHNOLOGY ASSESSMENT (OTA)

The Congress has appropriated \$2 million for OTA for Fiscal 1974, the Board has met and nominated former Congressman Emil Daddario of Connecticut (who has been a member of the IEEE Committee on Government Relations) as OTA's first Director. IEEE and EJC have nominated a number of engineers as possible members of the Technology Assessment Advisory Council.

AN EE FOR FCC

One of the shortest bills -- only 14 lines long-- coming to this correspondent's attention, H.R. 7667, calls for the amending of the Communications Act of 1934 to require that at least one member of the FCC be an electrical engineer. The bill, introduced by Mr. Staggers, has been referred to the Committee on Interstate and Foreign Commerce. IEEE Hq. is pushing this and individual members are encouraged to write your Congressmen.

REDUCTIONS IN AEROSPACE EMPLOYMENT

Citing continued restraints in government spending and an increase in foreign competition, the AIA anticipates a decline in employment in the aerospace industry through June 1974. In an analysis of employment in the industry, AIA estimates that the most significant decline will be among scientists and engineers. In that occupational classification there will be a reduction of 6000 professionals, representing a 3.6 per cent decrease from the December 1972 base.

FCC PLANS TO APPROVE 38-41-MHz BIOMED USE

The Federal Communications Commission has issued a notice of proposed rulemaking which would permit use of low power biomedical telemetering systems in the 38 - 41-MHz band.

The notice was in response to a petition by Cardiac Electronics, which suggested use of the 40-42 MHz band. The proposal was coordinated with the Office of Telecommunications Policy and the Interdepartment Radio Advisory Committee (IRAC). The committee, which advises OTP on such matters, concurred in the proposal.

SIDE EFFECTS

BEHAVIOR STUDY UNDER WAY

Exploring the effect of lighting on behavioral problems is the newest emphasis for time-lapse photography at Environmental Health and Light Research Institute.

In a pilot project conducted in a windowless elementary classroom by EHLRI, children showed such dramatic reactions to an improved lighting environment that the Sarasota County School Board has authorized an expanded comprehensive study.

Under their normal classroom lighting, some first graders in the study demonstrated nervous fatigue, irritability, lapses of attention and hyperactive behavior. After installing whiter full spectrum lighting with lead foil shields over the cathode ends of the fluorescent tubes to stop suspected soft x-ray and an aluminum screen grid over the entire fixture to stop known RF radiation, which is characteristic of all fluorescent tubes, a marked improvement appeared in the youngsters.

Without any use of drugs, the first graders settled down and paid more attention to their teachers. Nervousness diminished and teachers reported that overall classroom performance improved. The children were unaware of the special cameras mounted near the ceiling that snapped sequences of time-lapse pictures during the class day. With the standard type of unshielded lights still in operation, students could be observed fidgeting to an extreme degree, leaping from their seats, flailing their arms and paying little attention to their teachers. After the full spectrum shielded lighting was installed, the same children were filmed two and three months later. Behavior was entirely different. Youngsters appeared calmer and far more interested in their work. One little boy who stood out in the first films because of his constant motion and who was inattentive to everything, had changed to a quieter child, able to sit still and concentrate on routine. According to his teacher, he was capable of doing independent study and had even learned to read during the short period of time.

Mrs. Arnold C. Tacket, school principal, reported that an improvement had been noted in the behavioral problems of the group of children in whose homes TV sets had been found which were giving off radiation. She noted that one of the most hyperactive children had been sleeping on the other side of a wall from a TV set giving off .3 milliroentgens of radiation per hour through the wall. This is within the "safety" standards of .5mrh set up by the 1968 Radiation Control Act. Without the TV radiation, this child improved so markedly she could return to her regular school.

Dr. Ott's earlier research had shown that young rats placed close to a color TV set with the picture tube covered with black photographic paper became highly stimulated, then progressively lethargic. All died in 10 to 12 days. Other recent experiments showed abnormal biological responses in plants left close to the ends of fluorescent tubes. The cathode there is basically the same as in a TV picture tube or X-ray machine.

The current expanded study in nine windowless classrooms, kindergarten through second grade, will compare behavior patterns, scholastic achievement, attention spans and general health under the improved lighting environment with present standard classroom lighting. As in the pilot study, Dr. Ott's son, Henry, will be in charge of the time-lapse camera work. In addition, members of the Sarasota Dental Society will check the rate of tooth decay under the shielded, full spectrum lighting as compared to the ordinary lighting found in most schools. Doctors at the VA clinic in Boston and the School of Dentistry of the University of the Pacific in San Francisco, found a link between tooth decay in golden hamsters and the absence of natural or simulated sunlight. Hamsters exposed to fluorescent tubes with ultra-violet added to approximate natural sunlight averaged 2.2 cavities while hamsters exposed to standard cool-white fluorescent light averaged 10.9 teeth with cavities which were also 10 times as severe as those in the animals under the full spectrum lighting.

Dr. Ott first suspected soft X-ray as a result of time-lapse pictures he made of flowers for the Barbra Streisand film "On a Clear Day You Can See Forever". Flowers nurtured under high power fluorescent lights didn't grow as well near the end of the tubes. Additional tests on bean sprouts showed abnormal growth when near the ends of fluorescent tubes. With TV X-ray measuring equipment, Dr. Ott detected slight measurements of X-rays at the ends of the tubes that would penetrate aluminum foil, but not lead foil.

The non-visual response of the eye to wavelengths of light is why Dr. Ott has been so interested in the effects of tinted lenses, sunglasses and artificial light sources that produce a distorted light spectrum entering the eye. By chance he observed that his arthritis improved when he lost his glasses and had to work in natural sunlight without them. He found that ordinary window glass and automobile windshields shut out up to 90% of the ultra-violet rays. He helped develop the full spectrum plastic lenses that are now available in clear and neutral gray. Contact lenses can also be ultraviolet transmitting.

Estimates of the number of children in this country now taking drugs range as high as one million; a situation which prompted the Committee on Drugs of the American Academy of Pediatrics to propose regulations to the U.S. Food and Drug Administration to prevent abuses. Psychoactive drugs have been shown helpful in treating hyperkinesis, a restlessness that some experts believe derives from inimal brain damage or chemical imbalances. Dr. Ott's worry is for the future of the hyperactive boy in our pictures and the many other children like him. If he gets relief through drugs from stress caused by mal-illumination and radiation, will that lead to later addiction to drugs or even alcohol? Dr. Irving Geller, Chairman of the Department of Experimental Pharmacology at Southwest Foundation for Research and Education in San Antonio, has found that abnormal conditions of light and darkness can affect the pineal gland, one of the master glands of the endocrine system. Experimenting with rats, Dr. Geller discovered that rats under stress preferred water to alcohol until left in continuous darkness over weekends. Then they went on alcoholic binges. Nobel prize winner Dr. Julian Axlerod earlier found that the pineal gland produces more of the enzyme melatonin during dark periods. Injections of melatonin to rats on a regular light-dark cycle turned these rats into alcoholics.

"This may indicate that hyperactivity is a radiation stress condition," said Dr. Ott. "The improvement occurred when we supplied that part of the visible spectrum which is lacking in standard artificial light sources and eliminated excessive radiation."

Dr. Ott has found that many biological responses are to narrow bands of wave lengths within the total light spectrum. If these are missing in an artificial light source, the biological receptor responds as in total darkness. That alcoholism may be related to the pineal gland is also under study by Kenneth Blum, a pharmacologist at the University of Texas Medical School. (See Science News, April 28, 1973.) Under near total darkness rats with pineals drank more alcohol than water while rats without pineals drank more water than alcohol. When the animals were returned to equal periods of light and dark, rats with pineals retained their liking for alcohol. Applied to humans, Dr. Blum says "it is possible that alcoholics may have highly active pineals."

The hyperactive reaction to radiation from unshielded fluorescent tubes may have a correlation to the hyperactivity symptoms and severe learning disorders triggered by artificial food flavors and colorings. (See Newsweek, July 9, 1973.) Dr. Ben F. Feingold of the Kaiser-Permanente Medical Center, found that a diet eliminating all goods containing artificial flavors and colors brought about a dramatic improvement in 15 of 25 hyperactive school children studied. Any infraction of the diet led within a matter of hours to a return of the hyperkinetic behavior.

"This points out the possibility of an interaction between wave-length absorption bands of these synthetic color pigments and the energy peaks caused by mercury vapor lines in fluorescent tubes," said Dr. Ott. "This could explain the reaction or allergy to fluorescent lighting."

Dr. Ott's concern with the harmful effect of radiation from TV sets was tested in another school study, this time among hyperactive children placed at the Adjustive Education Center in Sarasota. TV sets in these children's homes which were found to be giving off measurable amounts of X-radiation were either repaired or discarded. Sets were moved so that none would back up against a wall where anyone might be working or sleeping in the next room. Parents cooperated in making their children sit back as possible and restricting the number of hours the children could watch TV.

Dr. Ott and EHLRI medical director Thomas G. Dickinson received the thanks of school superintendent Dr. Gene Pillot when they presented the pilot study pictures and the results at a public meeting of the school board on July 3, 1973. Dr. Edward J. Amontree, DDS, and a trustee of EHLRI, outlined the dental study. Dr. Amontree has indicated that if the children's teeth respond to the simulated natural light as did the hamsters, this experiment could be of tremendous significance in dental history. It might indicate the need for reviewing the present wide scale practice of adding fluoride to drinking water. Dr. Fenwick English, Assistant Superintendent Personnel/Program Development, Dr. Rick Nations, Coordinator Evaluation Services, and Mr. Bob Gerry, the school principal, are also cooperating on the study. Dr. Lewis Mayron, biochemist, will do the analytical work on the data, assisted by his wife Ellen, a specialist in learning disabilities.

The current school lighting study is made possible by grants to EHLRI from the Scott B. and Annie P. Appleby Foundation, Washington, D.C., and the Samuel J. and Evelyn L. Wood Foundation, Inc., New York City. Non-profit EHLRI is now seeking to raise additional funding on a wide scale basis in order to expand the program.

"In view of the immense implications and widespread interest coming in from around the country, we want to push ahead as fast as possible", said Dr. Ott.

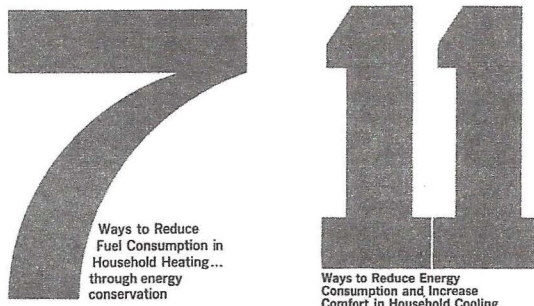
1974 IEEE
SYMPOSIUM ON ELECTROMAGNETIC COMPATIBILITY
SAN FRANCISCO JULY 16-18, 1974

ENERGY CRISIS

The August, 1973, issue of the NBS publication "Dimensions" was largely devoted to energy conservation. For instance, in an article entitled "Energy Conservation in Buildings", they offer the following suggestions:

Short term actions-voluntary and regulatory-that can save energy without additional expenditures:

- Set your thermostat lower.
- Close off rooms not used and turn off heat.
- On winter days let the sunshine in--pull shades at night.
- Reduce air leakage and ventilation.
- Be careful about open windows and doors.
- Reduce temperature in public spaces, lobbies, etc.
- Institute rigorous schedules for planned operation of ventilation.
- Wear heavier clothing.
- Maintain an efficient heating plant.
- Turn off-turn down lights and electric appliances except when needed.
- Concentrate evening work or meetings in a single heating zone.



As a public service, single copies of these energy conservation booklets will be supplied upon request to: National Bureau of Standards, Att: Editor, DIMENSIONS, NBS, Washington, D.C. 20234

DYNAMAGNETIC TO MANUFACTURE EMI FILTERS

Dynamic Air Engineering, Inc., a company with more than 30 years experience in design and manufacture of specialized components for the aircraft industry, has just established a new company, DynaMagnetic Engineering, Inc., to design, manufacture and market EMC/RFI filters. The company is located at 620 E. Dyer Road, Santa Ana, Ca. 92705.

The new company is headed by Mr. Lawrence J. Zynda, formerly with Genisco, Stoddart and LectorMagnetics. Mr. Zynda, a graduate of Michigan State and Senior Member of the IEEE, has more than 18 years experience in the EMC/RFI field, including a large proportion in management.

Short term actions requiring modest expenditures for readily obtainable materials and equipment:

- Add a clock thermostat.
- Add insulation, as much as feasible.
- Add insulating glass, or storm windows and doors.
- Caulk and seal around windows, doors and other openings.
- Insulate heating ducts, and seal against air leakage into nonheated spaces (attics, crawl spaces)
- Maintain heating equipment--clean heat transfer surfaces.
- Install heat recovery and conservation devices.
- Install automatic pilot light.
- Adjust ventilation system.
- Avoid use of portable electric heaters by improving main heating system.
- Replace defective or inefficient heating systems with systems of higher efficiency.
- Modify systems for zone control using systems of higher efficiency.
- Provide means to transfer heat from the core of a large building to the cool periphery needing heat.
- Install automatic door closers.

NEW FILTRON & UNIVERSAL SHIELDING TO CONTINUE OLD FILTRON LINES

Filtron, Inc., a division of Liquidonics, went into formal bankruptcy on February 9, 1973. According to reliable sources, a new organization was formed to acquire the trade names and assets of the filter division at auction on March 22nd. The new company, also named Filtron, is headed by George Barry, President, and Ed Greenwood, Vice President, both long time employees of the original company. Location: 200 Shames Dr., Westbury, N.Y. 11590 (212) HI 5-7000. Assets of the old Filtron shielding division were acquired by Universal Shielding Inc., 45 S. Service Rd., Plainview, N.Y. 11803 (516) 420-9538, Erwin Newman, President, and Jack Rance, Vice President. The new company will continue to market the original Filtron shielding lines.

RANDTECH RECEIVER AVAILABLE WITH PEAK, AVERAGE DETECTORS

A Field Strength Meter Model R-35A is now available with both a peak and an average detector, selectable from a front panel switch, according to information released by RANDTECH Corporation, 14 Division Street, Amsterdam, N. Y. 12010. The battery operated 3½ lb., calibrated receiver covers the frequency range of 34 MHz to 870 MHz. With a meter that reads in micro-volts and dB above a micro-volt, the R-35 provides uv/meter and dBuv/meter calibrated readings when the antenna factor of its calibrated dipole is added. It provides 90dB dynamic range.