IEEE
Networking the World™

the Life Members newsletter

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2nd-3rd quarters
1997

Greetings from your new Chairman of the Life Members Committee (LMC). I succeed a good friend and a dedicated IEEE volunteer, Ted Saad, who leaves big shoes to fill. I suggest you look on the last page of this newsletter to see who the other committee members are. They are truly an outstanding group.

The LMC reports jointly to the IEEE Foundation Board and to the Institute's Board of Directors apart from the major Boards. One of our primary responsibilities is to administer the Life Member Fund which is used to support worthy projects that meet the objectives and purposes of the IEEE. We also are the one body in IEEE with a primary focus on matters affecting Life members (LMs). At the end of 1996, there were over 27,000 LMs scattered around the world.

At the recent LMC meeting, the committee voted to look into ways LMs can continue to be active and helpful. LMs are a valuable (and underutilized) IEEE resource because they are mature, experienced, technical professionals. One way the LMC feels it can encourage our LMs to remain in contact with one another and become engaged in useful activities is to assist in the formation of LM Clubs at the Section level. It's noteworthy that this has already begun in at least two Sections that we know of. By year-end we hope to have plans and materials in the works that will be helpful. Any thoughts you might have for appropriate LM projects in your local area are welcome and can be sent to me.

There are two other items that were discussed at the last LMC meeting that should be of interest. The first is that TAB has established an ad hoc committee to look at years of society membership for qualifying as a Society Life member. (It need not be the same as qualifying for Institute Life membership.) Along with this, they are looking into which society publications should be provided to LMs, and what charges associated with attending conferences and other activities are proper. We'll keep you informed of what we learn.

The second item is our response to a letter received from a new LM. He expressed disappointment that upon becoming a LM all he received from the Institute was a simple letter of notification and a "gold" Life member card. He thought a certificate would have been more suitable. The committee fully agreed with him. It was observed that long and faithful membership in the IEEE was indeed an achievement worthy of a certificate. The staff was directed to bring recommendations about implementing this suggestion to our next meeting.

I will close now by saying that I welcome your thoughts, suggestions and questions. I'll try to respond to all received.

Dick Jaeger, Chair
Life Members Committee

IEC celebrates 100 in 2004

International agreements and standards during the Middle Ages took place when trade among countries rapidly developed. Standardization for electrical products began in the 19th century but was not that important since the quantity traded was rather limited.

However, during the World Electrical Congress in 1904 in St. Louis, Missouri, a number of scientists got together. They formed a body to create international standards in the electrical field, namely the International Electrotechnical Commission (IEC).

From 1904 to 1925, scientific aspects mainly dominated the work of IEC committees.

Got anything we can use?

The fact that IEC is almost 100 years old has brought a few "old-timers" together. The idea is to collect information which might be suitable for a "Centennial Book" to be published by the IEC in 2004. Anyone who has access to historical material pertinent to the earlier years of the IEC is requested to contact:

Leendert van Rooij,
Generaal Foulkesweg 359
Wageningen, 6703DP Netherlands
Fax +31 317 472 359. **—LVR**

This was because international trade in electrical products was still limited. Thus, international discussions did not yet relate to interchangeability, safety aspects or ease of replacing components. These were purely national matters.

From 1925 to 1940, most technical committees concentrated on defining concepts relating to products and measuring methods relating to the requirements associated with industrial products crossing national borders. A typical example is the creation in the early thirties of TC 12: Radiocommunication. In its first standard, subjects covered included: dimensions of valvebases, color codes for resistors and some safety requirements. This was important for the radio industry which gradually developed international export policies.

From the USA, participation was mainly by scientists during this time. Industrial interest was limited. One general meeting was held in New York in 1926. Two US citizens were Presidents during this twenty-year period: Dr. C. O. Mailloux (1919-1923) and James Burke (1935-1938).

After World War II, companies realized that the world was changing. Efficient production was becoming more and more important. Also professional customers, such as power stations, telecommunication services and huge industrial buyers, were more critical when purchasing products. Funds' shortages in many countries required critical review of what was bought. So the economic aspects often governed the choice.

On the other hand, a large variety of product standards had been developed during the war, for example in the USA and the UK. Although intended for military purposes, their applications for nonmilitary supplies increased. Typical examples were the standards for RF cables and for electronic components.

Another increasingly important aspect became full interchangeability of components. This related to products such as capacitors and resistors (TC 12) and even more significantly electrical batteries (TC 35).

Influences on IEC after 1970 included:

- The development of international markets;
- The importance of regional activities;
- The influence of industrial development in various parts of the world, e.g. USA, Japan and southeast Asia;
- The growing interests of consumers,
- Relations to other international bodies.

During this period, greater interchangeability of product in the fullest sense came about. Also the development of safety standards, certification, and the early steps in standardizing information technology were taken.

Looking to the future, aspects needing greater attention include: the variety of countries serving as suppliers, e.g. China and Korea, and standardizing functions rather than components.

Leendert van Rooij
Life Senior

Editor's note: Leendert van Rooij spent nine years in Geneva (Switzerland) as Deputy General Secretary of the International Electrotechnical Commission (IEC).

Internet for the chronologically challenged

When I followed Life Member Committee Chairman, Dick Jaeger, as the Director of Division III, he told me that I would find e-mail a valuable tool. I must admit that I was very dubious. In the dim, dark past, e-mail was something that my secretary did, but retirement has changed all that.

When I joined the Board, IEEE was on a system called Compmail. It provided e-mail service but not full Internet access. The features were very limited by today's standards. You composed messages while connected online to the mail server. When you completed a line of text in a message there was no going back to correct errors or change your choice of words. Perhaps it was those early limitations that fostered a tolerant attitude with regard to grammar and spelling errors in e-mail. Even now with text editors and spell-checkers, this tolerance seems to continue in the interest of speedy responses.

My personal favorite e-mail package is Eudora, from Qualcomm, Version 1.4, which is free. However, the latest version, 3.0, is significantly better in its features and functions. For example, it allows you to compose off-line, check the spelling, queue outgoing messages, add attachments, and zap them off when you check your mail for incoming messages. Frankly, it has more features than I have learned to use. I keep thinking that some day I will read the instruction manual to grasp the software's full potential.

Part of the problem is that I bought the e-mail program from the company via the Internet. This purchase was one of my initial forays into electronic commerce. Everything went fine with one big exception. They sent the instruction manual in Adobe's Portable Document Format, all 214 pages! I can't imagine reading all of that on my PC screen and printing it is a major operation. I've been doing it in stages, when I have the time, producing a loose-leaf notebook of instructions.

(My advice? Don't buy software through the Internet unless you are so desperate that you can't get by with overnight delivery from a reputable catalog source. You don't really save money and you are stuck with makeshift instruction manuals. But I digress.)

One big frustration with e-mail is that messages are limited to the ASCII character set. (ASCII is an old acronym that hardly anyone knows or cares what it stands for.) Upper and lower case, yes, but no underlining, bold fonts, different-sized fonts, reliable indenting, etc. In short, all the things that give a document style and enhance its readability are missing.

One solution is to compose the main document/content on a word processor and send it as an e-mail attachment. This is a good idea but with one fatal flaw. Those who do not have a compatible word processor can't open the attachment and do not get the message. There is such a diversity of platforms and software out there that this approach just doesn't work. This is especially true with multiple recipients, e.g. IEEE committees and boards.

Fortunately, an answer has evolved. From recent membership surveys, we have determined that most IEEE members and virtually all active volunteers have access to the Internet. As you know, the Internet is platform independent thanks to its basic language, HTML (HyperText Markup Language). Preparing a HTML document by adding tags can be self-taught, but is laborious. However, many word processors today will automatically add the tags, behind the scenes, to make the document HTML compliant. Then it can be opened in all its glory on any Web browser. Voilà!

Much is written about the fun of surfing the Web. However, I think Internet's real power is its ability to communicate in a universal language at a level above the teletype machine.

Fred Andrews, Life Fellow

http://www.ieee.org/history_center/

History buffs, check out the above web address. In particular, click onto the Oral Histories link. Full interviews as well as abstracts are provided. Our past LMC Chair Ted Saad is even there with pithy comments about the Radiation Laboratory at MIT (MA).

Of course, the basic http://www.ieee.org/ is always a good general starting point for finding out the goings on within the Institute.

—MKC

Remote virtual intruders

In the late '50s, I was a young engineer with a company that manufactured TV receivers. Remote control was beginning to be an important feature. Thus, my project that year was to design the company's first remote control system.

It was a very simple and inexpensive one function affair. The system worked by magnetic induction of a 6 kHz unmodulated signal, using ferrite loopsticks in the transmitter and receiver. The frequency was not regulated by the FCC (Federal Communications Commission). However, it was safely above normal 60 Hz harmonics and below the 15.75 kHz magnetic energy present in the TV set. The receiver sensitivity was low and the transmitter power relatively high (about 700 milliwatts input). The range was limited to about 15 feet. When the receiver detected a signal above a threshold level, it advanced the tuner to the next pre-selected channel. The "channel 1" position turned the TV (but not the remote) off.

Tests of pre-production models in homes around town showed the system to be reliable. We were all aware of the system's inherent susceptability to noise, but the cost was very attractive. It was felt that enough testing had been done to show that the design precautions were effective. (Competitive systems at that time could be triggered by telephones and doorbells.) So, it was released for production.

However, once the model began to be sold nationally, we received complaints about false triggering. Old vacuum cleaners, sparking relays and switches, and things unknown were able to set it off. By this time, I had already completed the design of a more costly two function remote. This system modulated the 6 kHz carrier and had very good noise immunity. The original model was quickly taken out of production and replaced with the improved version.

Long after we thought the issue was behind us, a complaint letter crossed my desk. A woman, somewhere in the Midwest, had been home alone and had gone to bed. She was awakened by voices in her living room (from the TV set, which had switched itself on). Thinking there was an intruder, she tried to escape through the bedroom window. It was a ranch style house and the windows were horizontal, high on the wall and the type which open with a crank handle.

She managed to get out the window and jumped down onto the ground. But her nightgown caught on the crank handle and stayed up there beyond her reach. She was forced to endure the embarrassment of going to a neighbor for help.

By the time the letter got to me, our service representative had given her a new TV set and enough apologies to make her feel better. It took quite a while, however, before I felt better.

Joseph V. Demarinis, Life Senior

Responding to the "magnetron problem"

R. J. Dippy's comments on radar ('96/'97 LMs newsletter) that it wasn't the magnetron that caused the enemy troubles, may also benefit from some elaboration. I was only involved with German carrier-frequency telephones. But I got to know one of the experts in the *Dezimeterwellen* after the war when I studied in Vienna, Austria.

Professor Koenig came from Siemens to join the faculty in 1948. As a result, one story making the rounds there was rooted in the very trouble Dippy disputes. Dr. Koenig's Siemens lab group had so much grief getting a magnetron to oscillate that his staff devised this birthday surprise:

When Koenig entered the lab that morning, he was greeted by a chorus singing, "*es schwingt, es schwingt!*" At which point, one person let go of a magnetron body, and indeed it oscillated above everybody's heads—on a long string.

Although I wasn't there, I have no reason to doubt the story. After all, who goes around making up failures? Not even an engineer turned teacher, and a darn good one at that.

Max J. Schindler, Life Senior

Stringing up a better way

In April, 1941, I arrived in Alexandria, Egypt. (This was after a 13 week voyage round the Cape of Good Hope. It was too dangerous to sail through the Mediterranean.) I was in charge of a small GL (gun laying) radar servicing detachment that serviced the radars directing the anti-aircraft guns defending Alexandria. (Alexandria was the most important harbor for the British Mediterranean fleet.) Initially, the installed GL radars could measure only bearing and range. Our first job was to install a modification that would enable them to measure height as well.

The way in which height had been measured indicates just how elementary radar was at that time. Three radars around the harbor transmitted the ranges and bearings they measured to a central control unit. At central control, a map of the harbor was attached to a table. There were three holes in the map corresponding to the positions of the three radars.

Running through each hole was a piece of string with a weight at the bottom. A length of string corresponding to the range given from each radar would be pulled out of the hole representing the radar's position, and held to correspond with the relevant bearing. The point where the three strings met above the map would be the position of the target at the time the measurements were made; measuring this point's height above the map with a scale ruler gave the height of the incoming bombers.

This system took too long to be used for firing at individual aircraft. However, bombers needed a straight and level run to aim. When the anti-aircraft guns were informed of the height by central control, they fired what was called a barrage, which formed a line of bursting shells slightly ahead of the bombers. This forced them to alter course and so impaired their aim.

Our modification that enabled the radars to measure height was a goniometer. This device compared the phase of waves received directly from an aircraft with the phase of the waves reflected from the ground. To be accurate, the ground had to be level; to achieve this, an "artificial" ground was created with chicken wire pegged out level slightly above the real ground.

Robert C. Winton, Life Senior

The doughnut connection

I went to work as a test technician for an outfit called Logistics Research, Inc. in Redondo Beach, CA in June, 1955. This company had been formed by the Swedish industrialist, A. L. Wenner-Gren (who owned the European franchise for Servel). It was to be the technical base for his plan to install a monorail system in Los Angeles.

Wenner-Gren became convinced that because of the complexity of the route selection problem, he needed a computer to do the necessary linear programming. Since available computers were either million dollar Univacs or just born IBM 650's, he directed that Logistics Research build him his own small computer possibly as another product. So a team of Northrop engineers who had worked on the SWAC (Standards Western Automatic Computer) was put together around 1953. They built a prototype, the Alwac II, which worked well but was somewhat limited by today's standards.

A successor, the Alwac III-E, actually had some commercial success (if seven installations can be called that). This was a vacuum tube machine with all data stored on a magnetic drum. The binary words were 32 bits plus sign and parity (we were ahead of IBM on this); add time was .5 milliseconds (using one word recirculation lines on the drum); the clock ran at 56 kHz and the large model memory stored 8192 32- bit words. Selection among the 256 tracks on the drum was by a tree of mechanical relays. Input/output was by a Flexowriter; the medium at first was punched paper tape. The "E" stood for E-register. This could hold a number that could be added to an instruction to permit decremented addressing.

Kam Noguchi, another technician, and I worked back to back shifts putting these machines together from wiring racks, printed circuit boards and vacuum tubes that we unpacked and plugged in. Considerable time was spent trying to get the machines to work since we were

War stories (continued)

constantly having to correct errors in the logic equations produced by engineers. (They usually couldn't tell if something would compute or not since no computers were available.)

The first program I ever wrote was a revision of the Alwac II "start/ fill/ copy/ correct" routine (something like Bill Gates' BIOS). This program had to run in one channel of 32 double instructions. We booted the machine by poking a particular diode with a screwdriver.

This machine was so successful that Wenner-Gren decided to go for a bigger machine, the Alwac 800. Our design engineers concluded, on the basis of some excellent articles in the IRE *Proceedings* about magnetic domains, that flip-flops could be made by two- and three-holed magnetic doughnuts. Also, these would be far more reliable and cheaper than transistors. (Although they were in the running, this was before the invention of the microprocessor.)

We staffed up to produce these great new machines which would easily leave IBM in our dust. The first one was finished by 1957. Alwac had grown to 150 people in two big buildings in Hawthorne. I was in Sweden at the time designing applications for these new marvels. Thus, I missed the great event—what we used to call the "smoke test." As it was explained to me later, if Bob and Joe had switched the whole system on at the same time, lights would have dimmed all over southern California. Evidently those thousands of magnetic doughnuts looked to the power supply like an infinite capacitor.

Alwac never did recover and LA never did get its monorail. But our team spread out from there and had a great impact on the computer industry. Because everything had to be invented, we all now were inventors and carried that spirit with us. Ed Ward, who went on to run the Navy PGS computer center at Monterey, wrote 30 programs in 30 days implementing Hastings approximations. I wrote the first numerical control program for a small machine and the first full trace, a kind of interpreter. George Graves figured out a feedback circuit that wrote the clock accurately on the drum in a second instead of three days.

Jim Rocks, Life Associate

Life Member Club proposal

Art Winston, Region 1 Director and member of the Life Member Committee, presented the Life Member Club proposal at the June, 1997 RAB meeting. The main points were:

1) Establishment of Life Member Clubs in the Sections.

2) LMC funding of expenses for mailings and club support.

3) Club activities to be publicized in *The Life Members Newsletter*.

4) Establishment of awards to recognize outstanding Life member activity.

After hearing the presentation, RAB endorsed the proposal and will encourage the Regions and Sections to establish Life Member Chairs in their organizations.

BoD approved

At the June '97 IEEE Board of Directors meeting in Cleveland, OH (USA), the old algorithm for qualifying as a Life member was reinstated. That is, an IEEE member has to be at least 65 years old, and the sum of the member's age and the paid number of years of membership (IEEE or one of its predecessor societies) equals or exceeds 100 years. This rule goes into effect for 1998 qualifying Life members. However, members who achieved Life Membership status under the 1994 revised IEEE Bylaw will remain Life members.

In 1993, the qualifications for Life Member status were changed to 40 years of paid IEEE (and/or parent society) membership with no age requirement. However, based on complaints and queries received, a careful review of the IEEE Life members was undertaken by the Life Member Ad Hoc Committee. They recommended reinstating the previous age and membership rules.

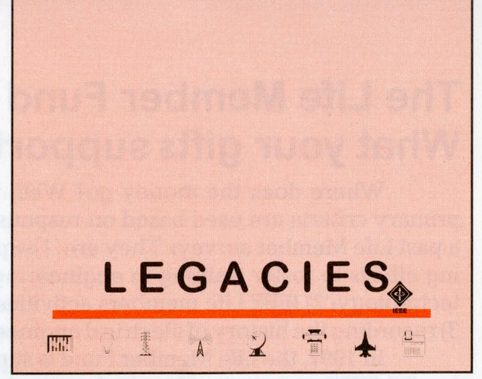
The requirements for Society Life member status are still being reviewed by the Technical Activities Board. Presently, they are not less than five years of Society membership immediately prior to attaining Life Membership or while a Life member. Life Membership in a Society entitles the member to receive, free of charge, *the services and publication(s) provided for the basic Society fee*. However, the Life member must confirm each year that such services/ publication(s) are still desired.

Engineering in the 20th Century

Electrical, power, aerospace and...oh, yeah...computer engineering came into their own this century. As we enter the 21st century, *Legacies* remembers – on a one-on-one basis– how engineers impacted and were impacted by technology in the 1900s.

This compilation tells tales about school, war and work. *Legacies* shows how IEEE members in forging their careers have promoted progress. Tightly edited vignettes ranging from: working on the Manhattan Project to helping Japan rebuild after the war; surviving the Depression to surviving retirement; from getting the countryside powered up to getting the space age off the ground and much more.

Reminisce and learn just how much engineers have touched our cultures' and each other's achievements. IEEE's greatest success has been allowing its diverse members a forum to exchange information. *Legacies* gives an inkling of just how vital this role has been.



In years to come, this book will gain in sociological and historical significance. More importantly, *Legacies* will help you tabulate just how popular re-inventing the wheel stays in the new millennium.

Complimentary to Life members, you only pay shipping and handling costs. Here's what just one reader had to say:

You have produced an attractive and readable work that is a worthwhile contribution to the history of electrical engineering. I am enjoying it very much.

Please send me my copy!! Product # JP27023

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☑ Please send me "Legacies."

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The Life Member Fund
What your gift$ support

Where does the money go? Well, three primary criteria are used based on responses to a past Life Member survey. They are: 1)supporting efforts to foster training in engineering and technology; 2) IEEE Life members activities, and 3) recording the history of electrical engineering.

In 1997, the Life Member Fund is supporting RE-SEED, a program in which retired engineers and scientists assist middle school teachers in science activities. The IEEE Student Prize Paper Contest that awards financially the top three papers in each of the 10 IEEE Regions; the *History of IEEE Technologies* Project which includes a three-volume overview that attempts to cover electrical technology since 1830. Other projects include: Graduate Fellowship Program in the History of Electrical Engineering, the Donald G. Fink Prize Paper Award and, of course, this newsletter.

All contributions are greatly appreciated. If you wish to make a contribution, please make your check payable to: *IEEE Life Member Fund.*

Stopping services

As Life members, membership in IEEE is free. This is great! But what happens when it's time to terminate services? Those who wish to have all services stopped must submit this request in writing. Many use the label on this newsletter with a brief note and signature. This way IEEE has something for its records. Sorry – phone calls cannot be accepted as notification.

Submitting articles

We welcome articles for the newsletter. Generally, they should be 500 to 1000 words in length. Acronyms should be spelled out once. Reference dates (years) should also be included. Editing, including length if needed, may occur. If you want to check out an idea before hand, please query by letter, phone: (908) 562-5526 or e-mail: regional.activities@ieee.org

The deadline for possible inclusion in the next newsletter is 31 October 1997.

Please include a phone number and/or an e-mail address (if you have one).

John E. Martin, Editorial Liaison

Where to write

Any ideas or opinions you would like to share? Questions or problems that require help? Contact the Life Members Committee or its Staff by writing to: IEEE Regional Activities, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331.

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