IEEE life members newsletter

## contents



www.ieee.org/lmc

4th & 1st quarters

2005-2006

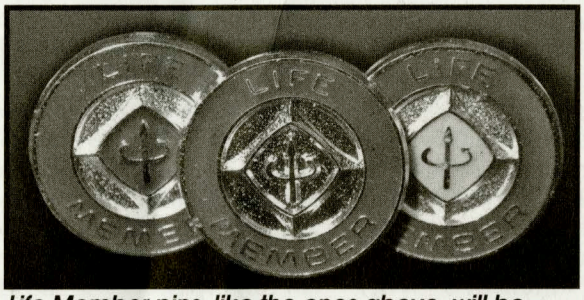
# Contributions Bring Life Members Valuable Returns

*Ted Hissey, LF, 2005 IEEE LMC member*

Now that we are Life Members (LMs), just what are our responsibilities to the IEEE? Some LMs say this question is a conundrum—and they question if they have any continuing responsibility to the IEEE.

Others look back on their journey through life—the time of their personal and professional development while at their university and in working life—and feel they owe a great deal to the IEEE and want to do everything they can to keep and help grow the IEEE's contributions to engineers and the public.

In response to the question of what-if-any responsibilities, I'd like to share my experience with the IEEE. During my 43-year career in the field of electric power system automation, the IEEE contributed greatly to my success by being a teacher, continuous educator, personal network provider, mentor, career guidance counselor, and much, much more.




*Life Member pins, like the ones above, will be awarded to members who support the LM Fund. See page 3 for details.*

When I entered the field in 1948, we were dealing with electromechanical equipment and solving a single, simple equation. In looking at the progress and changes in hardware that we experienced, by the 1990s, we had gone from electromechanical, to electronic, to solid state, to digital directed analog computers, to digital computers and high-speed digital data acquisition systems.

And where did I get the continuing education material and the operational and technical background information to assist me through that dynamic hardware transition? From the IEEE.

Certainly I had the privilege and pleasure to work for, and with, some of the icons of electric power system automation, and they instructed, mentored, and guided me well. They also made certain that I understood the value of working in the IEEE volunteer cadre, of participating in the technical paper creation and presentation, attending the local IEEE meetings, joining the technical committees, and in gathering a network of personal contacts around the world.

On the software side, we started out solving a simple equation via analog means. As the operational needs of the electric power system expanded, we were given the challenge, and opportunity, of bringing real-time data promptly into the control centers, solving many simultaneous and interlocking equations, assisting in the continuity of service, the efficiency of operation, and the forecasting of possible operational problems.

Helping create the designs and application of these systems and doing hands-on installation and training work in the field provided me with an interesting and gratifying personal working and engineering life experience.

However, the sharing and discussion of concepts, ideas, and problems through the IEEE technical committees, conferences, and seminars and networking through the IEEE really brought all of these things together into a meaningful and exciting engineering life. That is why I contribute my time, energy, and funds to the IEEE. I'm trying to return some of the investment and

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# What's New with the Life Member Committee

## Life Member Fund

Contributions to the IEEE Life Member Fund support numerous programs that are within the overall aims and objectives of the IEEE and benefit members at all levels.

With your assistance in recent years, the IEEE LMF has supported the following:

- The comprehensive pre-university education initiative of the IEEE's Educational Activities Board titled "Launching Our Children's Path to Engineering," which promotes engineering as a course of study and career choice to pre-university students and their educators.
- The IEEE History Center, which receives funds to assist in the preservation, research, and promotion of the history of information and electro-technologies including the development of an online museum.
- A major project of the History Center is the IEEE Virtual Musuem <http://www.ieee-virtual-museum.org/>.
- The Apprenticeships in Science and Engineering Program, which provides an eight-week summer apprenticeship to high school freshmen, sophomores, and juniors at a mentor's work location. For details on the program visit <http://www.saturdayacademy.org/>.
- The restoration of Random Access Method of Accounting and Control (RAMAC), the first computer system conceived around a radically new magnetic disk storage device.
- IEEE Milestones in Electrical Engineering and Computing with specific support provided for the Popov's Contribution to the Development of Wireless Communication and RAMAC milestones.
- A worldwide student paper contest, Life Member prize in electrical history, and graduate and undergraduate teaching awards.

Additional information on LMC programs is available at www.ieee.org/lmc.

### Update on grade-elevation decision

At the recommendation of the Life Member Committee (LMC), the Regional Activities Board agreed to elevate the LM with Associate grade to Member grade.

This resulted in 940 individuals being upgraded. Congratulations to everybody who was recently elevated to Member grade.

On 1 January 2006, the IEEE's LM population grew by 1,760 with those members who have attained LM status.

As of 31 December 2005, the number of LMs by region is as follows:

| Region | Life Member | Life Senior | Life Fellow | Total |
|---|---|---|---|---|
| 1 | 3,168 | 1,299 | 526 | 4,993 |
| 2 | 2,260 | 1,072 | 322 | 3,654 |
| 3 | 2,102 | 1,032 | 221 | 3,355 |
| 4 | 1,150 | 541 | 124 | 1,815 |
| 5 | 1,321 | 645 | 158 | 2,124 |
| 6 | 3,809 | 1,583 | 499 | 5,891 |
| 7 | 495 | 214 | 84 | 793 |
| 8 | 456 | 245 | 147 | 848 |
| 9 | 96 | 65 | 9 | 170 |
| 10 | 271 | 181 | 148 | 600 |
| Grand Total | 15,128 | 6,877 | 2,238 | 24,243 |

## Life Members Affinity Group Program Taking Root

The LMC has had an ongoing program of LM Chapters to encourage LMs to take an active role in the local IEEE Sections. For better amalgamation of LM activities with the local Sections, the LMC requested that the Regional Activities Board (RAB) establish LM Affinity Groups.

RAB approved the establishment of LM Affinity Groups in June 2005, and all existing LM Chapters were renamed LM Affinity Groups. The list of current LM Affinity Groups is shown below.

Region 1: Boston, New York, Mid-Hudson and Syracuse
Region 2: Northern Virginia, Philadelphia, Pittsburgh, Washington
Region 3: Canaveral, Charlotte, Daytona, Florida West Coast, Palm Beach
Region 4: Cedar Rapids, Chicago, Twin Cities
Region 5: Dallas/Fort Worth, Kansas City, Wichita
Region 6: Buenaventura, Los Alamos/Northern New Mexico, Montana
Region 7: Kingston, Hamilton, London, Montreal, Southern Alberta, Toronto, Vancouver, Winnipeg
Region 8: France, Israel
Region 9: Chile
Region 10: Bombay, New South Wales

An LM Affinity Group coordinator in the LMC has been designated as a point of contact for each Affinity Group's program and facilitator for the formation of new Affinity Groups.

LM Affinity Groups are a subunit of the IEEE LMC established upon petition to the Regional LM Affinity Group coordinator and with the cooperation of the Section chair. An LM Affinity Group is formed to meet the needs and concerns of the local LMs. A number of LMs are becoming active in their Sections, particularly with history projects such as milestones. If your Section doesn't have an LM Affinity Group, please contact your local Section Chair about establishing an LM Affinity Group within your area.



# The Privilege of Life Membership

Julian J. Bussgang, LF, 2005 Vice Chair, IEEE Life Members Committee & Region 1 LM Coordinator

Aging has many positives. For IEEE members who have reached or are about to reach 65, becoming an LM is one of them.

The IEEE LM status is an automatic process. IEEE members becom LMs when, their combined age and years of IEEE membership equal or exceed 100. Every member can eventually become an LM. Members who will be eligible on 1 January of the following year are notified by mail a month or two beforehand.

The grade of membership remains unchanged as one advances to life membership: an Associate Member automatically becomes a Life Associate (LA), a Member becomes a Life Member (LM), a Senior Member becomes a Life Senior Member (LSM), and a Fellow becomes a Life Fellow (LF).

The great privilege of being an LM, regardless of the particular grade, means that you are no longer required to pay annual dues and may receive reduced rates at IEEE conferences. Various IEEE Societies extend similar benefits.

The demographic trend of longer life expectancy, as well as the high cost of mailing publications, particularly abroad, has caused the IEEE Board of Directors to explore how to reduce the proportion of LMs within the IEEE and whether to redefine when one becomes an LM. The Board would be less likely to consider this proposal if LMs subscribed to electronic publications. However, most LMs still seem to prefer paper copies of *IEEE Spectrum*. If the Board of Directors decides to increase the age threshold and/or the combined age and years of membership so as to lower the cost of servicing, the current LMs will almost certainly be grandfathered.

Although the IEEE Board of Directors has not yet introduced a bylaw change tightening the LM definition, last year, they instituted a requirement that LMs reregister every year instead of continuing LM membership automatically. Many LMs failed to reregister. Thus, even without redefinition, the number of LMs dropped significantly.

Any change in policy aimed at decreasing the number of LMs must take into account that although LMs do not pay dues, they represent a valuable resource. Many make voluntary financial donations to the IEEE General Fund, the IEEE Foundation, the IEEE History Center Fund, the IEEE-USA Fund, and, of course, to the Life Members Fund.

LMs contributed US$214,000 to the Life Member Fund in 2004. This fund supports such projects as IEEE Student Branch Regional meetings, various educational competitions for engineering students for best studies of different scientific topics, student fellowships and internship programs focusing on electrical engineering history, and engineering accreditation workshops. Beginning in 2006, an LM pin of the appropriate grade will be awarded to any LM who contributes US$50 or more to the Life Member Fund. (See the pins picture on page 1.)

LMs are encouraged to volunteer their services in schools. Some LM chapters operate special programs for assisting teachers and tutoring and mentoring students, e.g., the LM Fund helps to support Project RESEED (a Northeastern University program that involves retired volunteers with science and engineering backgrounds to assist middle school science teachers). LMs also represent an invaluable repository of personal experiences involving the history of topics of interest to the IEEE. There is no end of worthy projects to support. The key is to encourage LMs to participate in activities, volunteer for projects, share their experiences with others, and facilitate their continued technical interests.

At the national level, the affairs of LMs fall under the jurisdiction of the IEEE Life Members Committee (LMC). The LMC is a joint committee of the IEEE Board of Directors and the IEEE Foundation. The committee has a broad representation with its members coming from different regions of the IEEE. The LMC meets twice a year at the IEEE headquarters in New Jersey, exchanges frequent e-mails, and holds telephone conferences. The LMC reviews applications for funding of projects of interest to LMs and authorizes disbursements from the Life Member Fund to support the projects it approves, such as recognition of electrical engineering milestones and support for various fellowships and awards. An important goal of the LMC is to encourage LMs to remain active in IEEE activities.

The LMC issues this newsletter, which is published twice a year and mailed to every LM or retired member age 62–64. The newsletter reports on the activities of the LMC and carries "Tales from the Vault" (also known as "war stories"), which are brief accounts of unusual professional experiences submitted by the readers. To enable LMs to exchange stories and communicate with each other, IEEE recently established a special Online Community, which can be found at <https://www.ieeecommunities.org/lifemembers>.

In the past, LMs formed Chapters within a section to hold their own programs, just like Technical Society Chapters. This year, the IEEE Board of Directors decided that LM activities would come under the jurisdiction of the Regional Activities Board (RAB). Thus, while the IEEE Societies have Chapters within a Section, a Life Members Group (LMG) within a Section is now considered administratively as an "Affinity Group." While an Affinity Group is a local IEEE unit, it is not related to a particular Society. This relationship is similar to the Women In Engineering (WIE) Group, Consultants' Network, or GOLD (Graduates of the Last Decade).

Region 1 has approximately 4,800 LMs. Currently, only five of our 22 Sections have an LM Group. However, it takes only six LMs to sign a request to petition to form an LM Group within any Section or jointly with a neighboring Section if there are at least 20 LMs in total. A recent survey showed that the majority of LMs are unaware that they can form an LM Group within their Section. It also showed that some Section leaders often do not

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# Matched Dollar Giving Has Ripple Effect on IEEE

Ever think about making a contribution to the IEEE Life Members Fund but did not feel your gift would make a difference? By taking advantage of your employer's, or former employer's, matching gift program, you could double or triple the amount of your gift. Many companies match donations to the IEEE Life Members Fund, which supports activities of interest to Life Members, potential engineers, and engineering students. Some companies even match gifts from their retirees.

To determine if you are eligible, check to see if you or your spouse's employer or former employer is listed below. If it is, then inquire in your human resources or community relations office to obtain a matching gift form, fill it out, and send it in with your next contribution to the IEEE Life Members Fund. Forms can be attached to your annual renewal notice.

Your gift will help support programs that encourage students to excel, put Life Members into middle school classrooms, help society understand technology, and much more.

The IEEE Development Office is available to answer any questions regarding this program. Please contact us by phone: +1 732 562 5550; fax: +1 732 981 9515; or e-mail: supportieee@ieee.org.

*Karen Galuchie*
*IEEE Development Office*

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# Life Membership Brings Valuable Returns *continued from page 1*

*Ted Hissey, LF, 2005 IEEE LMC member*

contributions that the IEEE made to me, for me, and in me.

How about you? Do you think you have a responsibility to the IEEE? If you think you do, how do you go about fulfilling it?

Some LMs contribute time and energy, which also aids their personal life by keeping them energized. Some LMs make tax-deductible contributions to the IEEE Foundation funds such as the Life Members fund, the IEEE Foundation General fund, and the IEEE History fund.

However, last year's average LM dues bill contribution was around US$14 with only about 26% of the 25,000 LMs contributing.

The LM Committee (LMC) has worked hard to protect the interests and the legacy of the IEEE LM and, so far, has been successful in maintaining the same free services that LMs would receive as full dues paying members.

Many of us feel that, for one reason or another, LMs do not recognize or appreciate the importance of tax-deductible contributions to the various IEEE Foundation funds, particularly the LM fund. These contributions will enable the IEEE LMC and the IEEE Foundation to continue the important philanthropic work of creating programs and tools for the continuing technical and personal education and development of engineers and of furthering the knowledge and importance of engineering to the general public.

The LMC and its various regional and local working groups have pledged to work hard over the next ten years to generate dues bill contributions from at least 50% of the LMs by the year 2015. The target amount for each LM is US$100, but whatever members can contribute will be appreciated.

We hope that you consider joining the effort as you renew your membership in the IEEE. I am certain many of you have had similar experiences to those mentioned here but perhaps did not recognize the value of contributing. I guarantee it makes you feel alive. Try it. You'll like it.



# "LETTERS"

With great interest, I have studied the "letter" of Mr. R. LaRosa in the second and third quarter's 2005 edition concerning the rise of the sea level.

First of all, I have the following comment. In my opinion, the larger amount of ice-masses is situated in the Antarctic on land. In the north Arctic, only Greenland is covered by large masses of ice. The glaciers on Iceland, Norway (where some are increasing in size), Canada, and Siberia are smaller, and the ice across the polar area is floating and, therefore, is of no concern as to the sea level.

Mr. LaRosa's proposal to slow down the Gulf Stream would then also "cool off" Scandinavia and, in particular, Norway, which, unlike Greenland, are populated. This would then change the climate in those area to that on Greenland, which would be disastrous. As a matter of fact, I have read in a Norwegian journal that the Gulf Stream's temperature already has decreased, causing problems for the seafood industry.

Prof. F. Nansen, the Norwegian Polar explorer, started to investigate the reason for the disappearance of the Norwegian communities (former Vikings) on Greenland in the 14th century. He estimated that a climatical change (temperature fall) was the cause, but he couldn't prove that in 1925. The investigations of Greenland's ice, in which drilling was performed some years ago, will probably give the answer.

And El Nino, what about cooling off this heat source as well? But how?

Then my question: Has somebody investigated or performed calculations concerning the temperature/$CO_2$ relationship in salt water? We know that the major amount of $CO_2$ is accumulated (absorbed) in the oceans. We also know that the absorption of $CO_2$ in water decreases with increasing temperature, the concentration of $CO_2$ in the atmosphere will, therefore, increase with increasing temperature, a.s.o... This represents a positive feedback system. But has the transfer function of this phenomenon been investigated? That would be very interesting to know: Is this a chicken/egg problem?

A final comment. A Norwegian meteorologist once stated that the amount of water vapor in the atmosphere is more important as to the climate than the $CO_2$ content. Is this the primary or secondary effect? What kind of feedback system could this system then represent?

I refer to the increase of inundations in Europe through recent years. Inundations, however, have appeared regularly in the past; consult the markers on a church tower in Meissen, Germany (Elbe river), dated back into the middle age.

*Ole Snedkerud, LSM*
*Windisch, Switzerland*

If you have something to say in resonse to an article you read in this newsletter, don't forget about our "letters" column. The column was created in response to feedback received by the LMC.

Comments on "Tales from the Vault," ideas for projects, and volunteer experiences and activities are welcome.

Letters may be edited due to space constraints. Those not published cannot be directly acknowledged.

Please include your name, Life grade, town, and state.

E-mail:
Lifemembers@ieee.org

# Privilege of Life Membership

*continued from page 3*

*Julian J. Bussgang, LF, 2005 Vice Chair,*
*IEEE Life Members Committee & Region 1 LM Coordinator*

recognize the important asset that LMs represent, if organized.

Numbers vary every year, but typically, LMs have constituted roughly 7.5% of the total IEEE membership. According to the current statistics, the Boston Section has the largest number of LMs of any IEEE section. The 1,120 LMs of the Boston Section constitute approximately 12% of its entire 9,240-member Section.

The Boston LM Group is also one of the most active. Under the dedicated leadership of Dr. Edward Altshuler, the Boston LM Group runs well-attended, regular monthly meetings, which draw outstanding speakers on a variety of current topics as well as on the history of our field.

Meetings are generally held at 4 p.m., a convenient time for both retirees and those who are able to take time off at the end of their business day. LMs attend these meetings because they enjoy staying informed about current trends. They are interested in reviewing technical history, in which some of them may have been involved. Since most LMs are retired and miss the personal interactions they had when they were employed, they welcome an opportunity to socialize with professional colleagues.

Recently, the LMC recommended to the IEEE Board of Directors that all LAs be automatically elevated to LM status. RAB concurred with this proposal. Moreover, both RAB and the LMC are encouraging the Sections to take the initiative to help promote LMs to LSM. This would not be an automatic promotion, but, if members are qualified, the local Sections should assist them in locating the three needed references.

We welcome comments and suggestions coming from LMs, whether addressed to the LMC, to this newsletter, or posted on the LM Forum Web site.

## Color Broadcasting Design

It was IRE when I joined in 1948/1949 as a freshman at Lehigh University. I graduated with honors and a B.S. in electrical engineering in 1952. After accepting an offer from Sylvania Electric Company, I was placed in the Advanced Development Department in Buffalo, NY, where they were initiating development and production of color TV sets.

I had the responsibility of establishing a "gold" room, which would produce and distribute a color TV signal for the lab and production test facilities. Within a year Sylvania announced their production of color receivers available for sale.

With no color broadcasting yet available, we set priorities for color broadcasting methods, which quickly presented a new set of problems. Unlike amplitude modulated black and white signals that could be transmitted via microwave linkage and easily received and locked in at any receiving location, the frequency modulated color signal required new technology. Our group went to work. We finally designed a unit we termed a quadrature encoder modulator, which solved the problem and was adopted into the industry.

Sylvania did not want to patent this process and gave Frank Fleming and me the authorization to capitalize on the design. We formed K&F Co. in early 1945 and quickly called CBS in New York who immediately gave us an order to produce and deliver large rack units (the transistor had just been developed). We proceeded with the order, manufactured units, delivered, and installed them in May 1954. CBS went coast to coast with color broadcasting shortly thereafter.

Frederick W. Kieshauer, LM
N. Myrtle Beach, SC

## Meeting Is Theater

In 1956, I was an aircraft generator designer working at GE's manufacturing plant in Erie, PA. I was also active in the Erie section of the AIEE. We decided to hold a joint meeting with the Dayton, OH, section because they had lined up a distinguished speaker: the chairman of Capital Airlines.

On the appointed day, we were introduced to the speaker who I can still see in my mind as a very distinguished-looking man with a short beard and stocky appearance. He spoke in a deep voice with an English accent. Before dinner, he spoke informally about his subject: his ideas were most interesting.

After a fine dinner, the Dayton section chairman introduced our speaker with a rendition of his qualifications. Thereupon, the chairman took over and began a most erudite presentation on the development of nuclear energy. At first, we could readily follow what he said. However, it then became difficult to understand his presentation.

We thought we were simply dense until it dawned on us that his presentation was getting worse and worse, until finally, he simply started babbling incoherently. At that point, the Dayton section program chairman stepped in and announced that our speaker was a well-known Hollywood actor! I say to this day that it was a most interesting affair and certainly taught me how easy it is to be taken in.

John Alger, LSM
Rumney, NH

### Donation Envelope

A special envelope appears in this newsletter for the convenience of LMs who are interested in making a donation to the Life Member Fund.

## Eager Beaver Gnaws on Nerves

It was fairly common Southern California weather: weak monsoon effects from the Gulf of Mexico reaching the high desert.

A four engine turboprop had shown erratic bus-switching—probably due to the transfer relay getting bumped about because of air turbulence over the mountains. As an avionics system engineer specializing in navigation, guidance, and control, I was asked to go on the next day's test flight to find a solution.

Early the next morning, we went through a series of touch-and-goes, supposedly avoiding the increasing thermals between flight over pavement versus desert versus alfalfa fields. But the ovals over the airport got increasingly bumpy, and the whole crew was happy when we headed toward 11,000+ ft. Old Greyback looking for turbulence between the base of the clouds and the mountaintops.

As we flew at 14,000 ft, the pilot got rather annoyed at some guys bumping behind his seat. An officer and I retreated to opposite port windows behind the wing. An eager beaver, who was an electromagnetic interference specialist stayed, leaning alternately over the pilot, flight engineer, and copilot.

Suddenly the aircraft leaped forward, nose dropping, the eager beaver crashing into the pilot. The pilot cursed and asked the flight engineer to pull back on his shoulders, so he could pull back the yoke and up the aircraft nose. The lights flickered and went out. Left only with emergency (battery) power for small essential instruments, the pilot had to move the controls with his muscle power solely.

In what seemed like no time, we were hurtling downhill in a narrow canyon. Looking left and right through port windows, I saw the rocky terrain and scattered pines that I had been used to seeing during my several hikes in that area—but no blue sky, no horizon. After some moments next to eternity, we finally leveled off over the high desert.

Upon exiting, the pilot stated, "I expect never to try anything like that again." As I left for home, the sun was exceptionally bright, the view so vivid, and I breathed air as I never had before in L.A.

Erik Unt, LM
Tarzana, CA





## Bat Experiments Reveal Bug Apprehension Techniques

As a new engineer at MIT Lincoln Laboratory in 1960, I was assigned to design an amplifier for driving electrostatic transducers. Lincoln was working with Harvard University to understand how bats were able to catch bugs in the dark.

It was known that bats used ultrasonic sonar with a chirp-like signal that is analogous to linear FM radar pulse-compression waveforms, hence the term chirp waveforms. But the angular accuracy of this sonar, as limited by the distance between the bat's ears, would not support catching the bugs in the bat's beak. Solving this mystery might help improve the angular accuracy of radars. The amplifiers were used in experiments where bats flew in a darkened room with obstructing wires. They provided thermal noise jamming, and its level was varied to see how it would affect the bat's ability to avoid the wires.

Designing the amplifier was not difficult once I realized that a large current is required to generate 300-volt peak-to-peak at 250-kilohertz (kHz) in the 6,000 pf load of the transducers. The previous unsuccessful designer, who was a physicist, had concentrated on a compound cathode follower, which produces a very low output impedance. But he used a miniature tube that supplied only a few milliamperes of current. My design used two large dual-triode 6336 tubes as output, providing up to 1 ampere peak-to-peak current swing.

In the course of the project, I occasionally visited the room at Harvard where these experiments were done. Once, when I was lost in the building, I asked a janitor where the bat room was. He gave me explicit instructions, left turn and third door on the right. Following these, I found myself facing a door labeled "MEN."

By the way, it was found that bats don't defy the laws of physics. They simply spread out their wings and scoop the bugs into their mouths. This was learned using the new high-speed stroboscopic photo technique developed by Harold Edgerton, a founder of EG&G. This and other work with bats is described in a fascinating book by Donald Griffin titled *Listening in the Dark.*

Dick Curry, LSM
Santa Barbara, CA

## Surge Protection Solves Surge Problem

In 1967/1968, National Life built their new office building in downtown Nashville, TN. It is now called the Tennessee Tower after it was sold to the state several years ago.

To enhance the public image of National Life, the lights in the building were left on all the time. I was told the airline pilots could see this building 40 miles out from Nashville. Later, when the energy crises erupted, the officials decided to reduce the number of lights on during the night and on the weekends.

Because the building was heated by lights, the building had to be air conditioned year round. When they started turning the lights off they had to throttle the air conditioner compressors down. But in the winter time, they had to turn the air conditioners off because without the lights the building would become too cold. The compressors were turned off on Friday night and were turned back on early Monday morning.

About eight years after the building was in service, I received a phone call, one Monday morning, informing me of a failure of one of the 1,500-kilovoltampere (KVA) open dry type transformers. I immediately went to investigate, and upon looking at this open bus structure, I informed them that lightning appeared to have gotten in on the circuit since there were pockmarks all over the bus indicating that a high voltage occurrence had happened.

The officials told me no lightning had gotten inside the building. We checked with the Nashville Electric Service to see if they had any indication of lightning at their substation feeding the building. They had no record of any problem. I recommended to National Life that surge protection should be added to their system. They would not "butt in" on this at that time. Repair was started on the unit at this time.

Three weeks later, on another Monday morning, I received another call about another failure of a 1,500-KVA unit on another floor in the building. By this time, the officials were getting very disturbed about the quality of the General Electric equipment, which I had sold them. My counter response was that something was causing this failure because dry types wouldn't fail on a Monday morning each time. Two weeks later, another 1,500-KVA transformer on another floor failed, on a Monday morning!

Since National Life was a big stockholder in General Electric, they were ready to call the president of General Electric to have a full investigation made of how the equipment was designed and built. I kept prevailing on the officials, telling them that electrical equipment of this type would not fail on a regular Monday morning basis and that something else was causing the failures.

An expert application engineer, from GE Schenectady, came and made an investigation. The engineer found that the reduced voltage reactor starters for the compressors were putting spikes on the circuit in the magnitude of 80-KV and dry types were rated 50-KV BIL (basic impulse insulation level) causing the dry types to fail after a period of time and then restart on Monday mornings. Surge protection was installed, and the problems did not occur again.

W.A. Sims, LM
Brentwood, TN

# My Eiffel Tower Adventure

Did you ever have one of those fantasies where you were all alone in a museum—or perhaps an amusement park—and you could wander all over, with no guard to stop you and with no locked doors? This is my account of such an adventure on the Eiffel Tower.

The Signal Corps had a repeater system for communications between London and the forward advance posts of Supreme Headquarters, Allied Expeditionary Force. In 1945, our MP force had radio equipment installed at the top of the Tower. We used a Motorola police radio transmitter/receiver pair to serve as a repeater. It picked up the communication from any of our 37 radio cars patrolling Paris and relayed it to our base station located at Palais Dufayel. I would make trips to the top of the Tower to check on our equipment.

Officially, the Tower elevators were inoperable, at least that's what was told to Hitler—he never went to the top. Actually, the water-powered pistons driving the elevator system were inoperable only during freezing weather.

During that time, every three days, two Signal Corps technicians would shoulder cartons of 10-in-1 rations, and take the nominal 950-ft hike on the stairs to the top. However, on this day in September 1945, an elevator operator took Sherl Martin and me to the top of the Tower.

In this period, the Tower was not open to the general public, and so we, along with two Signal Corps operators, happened to be the only people up there. We romped around on the third-level landing for a while and looked in at the working Signal Corps and MP radio equipment. We then walked up one flight of broad stairs to a level where there was a closed room. From outside this room, we walked up one more flight of stairs and were on a smaller platform. There was a large vertical iron tube to one side, about 2 1/2-ft in diameter, which had a door in the side.

I opened the door and found myself facing an iron ladder. I climbed up the ladder for what I guessed was about 20 ft, arriving at the top. There, at the top end of this tube, was a hole with a disc covering it. I swung the disc aside, climbed up and out, and grasped the flagpole that was up there. And that was the top of the Eiffel Tower.

Dor Hesselgrave, LSM
Los Altos, CA

# Crude Tools Got the Job Done

I was especially interested in the George Hero's experiences beginning in 1949 at Fort Bliss and White Sands Proving Ground (WSPG) because I was involved in the earlier work at WSPG as a student in 1946 and 1947.

After I was discharged from the Army Air Force as a radar/weather officer in April 1946, I enrolled at New Mexico State University (NMSU) for the start of my senior year of engineering. At that time, the establishment at White Sands was just getting organized, and a group was formed at NMSU to work on projects associated with White Sands.

A number of students worked in this activity under the head of the physics department. The initial project, beginning in the summer of 1946, related to tracking the numerous flights of German V-2 rockets fired at the White Sands range.

Tracking was done visually, using German photo recording theodolites mounted at fixed positions several miles apart at varying elevations. The theodolites were tracked manually with two operators, azimuth and elevation, to keep them pointed correctly. They took four frames per second, synchronized by signals from the blockhouse. As I recall, there were four of these instruments.

The locations of the theodolites were determined from measurements made by a German surveyor, Herr Doktor Schmidt, using his German instruments. Because of the effect of daytime heat on visual observations, all tracking had to be done at night. I learned of this when I was given the job of taking the raw data and coming up with the exact positions of the four instruments and the firing point relative to each other in three dimensions. Dr. Schmidt was somewhat apologetic about his data because some of his triangles failed to close by as much as five seconds of arc (we didn't take into account the curvature of the earth in these calculations). This was an interesting project because it was all done with a hand-cranked Friden calculator, ten-place trig tables, and a 4H pencil.

Then, when the five locations were quantified, a procedure was worked out for using data from any two of the instruments to define the position of the rocket, four times a second from firing until it was no longer visible. This involved training teams of part-time student workers (as I was) to read the films, correct each reading for departure of the target from the center of the frame, and correct for small time differences between the instruments. We then developed the procedure, using two of the aforementioned Friden machines, one with each hand, to calculate each position point. Clouds often obscured at least one of the instruments, so calculations had to be done using at least two pairs of data. We had a room full of students who were able to deliver trajectory data on each firing within days of the event. This information was for perhaps 30 or 40 seconds of the flight and, of course, the impact point was known.

Another project involved the development of servo amplifiers, using submarine glass triodes, about 0.25-in diameter, 1-in long. We were given six parameters: linearity, weight, dimensions, etc. At one point, we were able to exhibit six amplifiers, one of which would meet five of the requirements.

Then in May 1947, I was a member of the graduating class and left to spend a career as a materials engineer in the Westinghouse Transformer Division. The contrast between the crude methods and tools that we used almost 60 years ago and what we use today boggles the mind.

Landis E. Feather, LSM
Hermitage, PA





# Radio Service

I never earned my living as a radio seviceman, but while still at school and college, I ran a nice little sideline business in mending radios. An invaluable source of knowledge was Fred, proprietor of a local radio repair shop. By this time, about 1947 or 1948, his repair trade was still nearly all in mains radio sets, and he would give me old volume controls, where the built-in mains on/off switch worked but the track was shot, or vice versa.

I remember seeing Fred carefully wrap a valve in tissue paper, several turns of stout corrugated cardboard and then brown paper, addressed to the Tungsram Valve Company. Inside was a note on his headed paper saying that the valve had failed under guarantee and would they please send a replacement. He actually had no idea how old it was as he carefully hit the packet with a hammer until he heard a gentle pop as the glass shattered. "Good old Tungsram," he explained of his marking it damaged in post, "they always send a free replacement."

About this time, old discarded mains radio sets started to come my way. After a few painful shocks, I quickly learned to respect 240-Vac mains and the HT supplies used by these sets. I would frequent Charlie's radio repair shop on Saturday mornings, and a group of us exchanged yarns.

I had started repairing radio sets using a stock of spare parts I had salvaged from old mains sets and from other pieces of ex-government equipment. I was usually able to get a set going at little or no cost to myself, so that the 5 bob, 25 pence, that I charged was all profit. A set frequently came in with terrible distortion. This was invariably due to grid current in the output valve, the valve being a little soft, which upset the bias conditions. I would tell the customer their set needed a new output valve. The valve would cost 17 shillings and sixpence, 87 1/2 pence, plus the cost of fitting and "aligning," on an output valve.

Alternatively, I could offer my special fix, which would cure the problem and keep the set going for a year or more but no guarantee. Invariably, they opted for the inexpensive fix, which entailed lowering the grid leak from its original 330 k to 33 k. The grid current no longer upset the bias conditions and the set sounded fine, if a little short on bass. Remarkably effective, I never had a customer bring a set back.

A yarn I heard at Charlie's concerned the dodges employed by unscrupulous radio dealers like Fred. After the war, many men liked to listen to foreign stations late at night on the shortwave bands, often on a set bought before the war. It really needed a complete new set of valves, which, unlike transistors, gradually wear out and become less effective. A customer taking it to a radio repair shop might get his set back with assurances that it was now fine. On getting it home, its performance on medium and long wave was the same as ever but on shortwave, instead of finding only one or two stations across the whole of the band like before, the set would now be bursting with dozens of stations. Eventually it would dawn on him that he was finding the same few stations over and over again. If he complained, the dealer would assure him it was fine but, because of the Russian jamming, stations had to broadcast on lots of different frequencies.

In fact, it was a case of a grid leak again. The grid leak of the frequency changer triode oscillator section was usually 33 k, a little on the low side for long wave but OK, and just right on shortwave. If this were replaced by 33 k, the set would operate as before on long wave and medium wave, but, on short wave, the oscillator would oscillate in about 200,000 bursts per second. The result was effectively lots of oscillator frequencies, so that each station would be received by each of them in turn, all along the dial.

David May, LM
Waterlooville, UK

# Celebrating Ben's 300th Birthday

Some of Boston's finest IEEE members showed up to celebrate Benjamin Franklin's 300th birthday on 17 January 2006 at the Benjamin Franklin Institute of Technology (BFIT), a college located in Boston's historic South End. One of the oldest engineering and industrial colleges in New England, BFIT was created by a bequest from Benjamin Franklin to endow his vision of educating "the inhabitants of the Town of Boston." His desire was to equip young people with quality technical skills, hence creating productive and engaged citizens.

Aided by an additional gift from industrialist Andrew Carnegie, the BFIT opened in 1908. Section LMs and other Section members were among the birthday celebrants. From left to right they are Gil Cooke (LM), Edward Altshuler (LM), Benjamin Franklin, Ted Kochanski, Thomas Aprille, Fausto Molinet, and Michael Chester.

The photograph was taken in the college's lobby. For additional photographs, visit <http://www.benfranklinboston.com> and click on "Pictures of the 300th Birthday Party."

Gil Cooke, LSM
Framingham, MA

# Murphy's Law Strikes

In 1956, while with the Electricity Commission of New South Wales (NSW), I was appointed as assistant engineer to the Engineer Operations/South at the Control Centre in Goulburn, a town of 20,000. The Centre controlled operations in the south of the state of NSW, with a total demand of about 400 megawatts (MW), a large proportion of which was in Wollongong.

All major equipment, including generators, was purchased from Britain before World War II. Damage caused by German air raids resulted in equipment and generators ordered in 1939 being delivered from Britain in 1949. Thus, electricity to consumers had to be rationed for years.

The political solution was to amalgamate the state's four separate electricity bodies into the Electricity Commission of NSW in 1951.

In the rush to meet the expanding electricity demand, a temporary Yass 132-kilovolt (kV) switching station was cut into the 132-kV line between Goulburn and Burrinjuck Hydro Power Station (PS), from which 132-kV lines to Queanbeyan and Wagga were connected. The 132/132-kV isolating transformers were located at Wollongong to isolate this radial network to Goulburn from the rest of the state's neutral earthed 132-kV grid. On this radial network out of Wollongong, each neutral 132-kV transformer was earthed through an arc suppression coil to provide continuity of supply in the event of a single-phase fault.

In that period, work had started on the Snowy Mountains Hydro Electric Scheme that would have a 3,660-MW capacity when completed in 1974. Four 330-kV lines were planned to convey the Snowy Scheme's output to NSW. The first 330-kV line between Wollongong and Yass had been completed, initially being strung as a double circuit 132-kV line. The first Snowy PS of 60 MW had been running since 1955 when electricity rationing was lifted. Burrinjuck PS had four 5-MW hydro generators located on an irrigation dam: two near the control room and two others almost 1-km downstream.

Shortly before I arrived, one side of the 330-kV line had been connected into Goulburn 132-kV bus, providing two lines to Wollongong. The rest of the South was fed through a single 132-kV line between the Goulburn and Yass temporary switching station with no loss of supply until the follow event.

All preparations had been made to connect one 132-kV circuit of the 330-kV line into the Yass 132-kV switching station on Sunday to firm up supply. But on the preceding Friday afternoon, lightning struck the Queanbeyan line, not far from the Yass switching station, producing a two-phase fault.

Not only did the Queanbeyan–Yass 132-kV line trip out, but at Goulburn, the circuit breaker on the 132-kV line to Yass opened, leaving the southern system isolated from the main grid. The 60-MW Snowy hydro generators were able to maintain supplies to Queanbeyan and beyond. The demand at Wagga was 40 MW, too much for the 20 MW Burrinjuck PS.

Soon after this incident began, I entered the control room and observed from the back. In the middle of the control panel was an oscilloscope screen that had input from voltage transformers on both sides of the open, 132-kV circuit breaker. Normally when the breaker is shut, the screen shows a straight line at 45° to the horizontal, and when it is open, it shows a large circle. To my surprise, the oscilloscope showed a completely unexpected, slowly rotating Lissajou figure that I could see from the back of the room. To my everlasting regret, I could not later precisely recall the shapes.

The operator had been trying repeatedly to contact the operator at Burrinjuck PS over the power line carrier but could not elicit any reply. He transferred his efforts to communicating with operators at other substations. After 15 minutes, I took the initiative, called Burrinjuck PS and got a reply. Our operator then took over.

This incident offered some unexpected information.

The Burrinjuck operator attempted to switch off all four 5-MW generators. But the remote control could not activate the circuit breaker on one of them. So, the operator left his control room and walked to the old power station to disconnect the generator manually by switching its circuit breaker before returning. For this reason, he could not be initially contacted.

The 5-MW hydro-generator attained a "stable operating state" while connected to the "40-MW" Wagga load. But this stable state was at a reduced frequency, shown by the rotation of the Lissajou figure, and a much lower voltage. Had I been able to memorize the Lissajou figure I would have been able to estimate the voltage levels.

This incident demonstrated something not described in any text book, namely that a hydro generator can reach a stable, although unacceptable, operating state when supplying too large a load.

This incident was the most dramatic of my experiences with Murphy's Law.

Walter Lachs, LF
Blue Bay, Australia

## Turnout Strong at IEEE Sections Congress

More than 700 IEEE volunteers attended the IEEE Sections Congress held 14–17 October 2005 in Tampa, FL. The IEEE Life Members Committee (LMC) was well represented. The LMC sponsored the luncheon on Sunday and an exhibit table.

The exhibit table was a popular destination for the delegates. Many of the delegates took time to speak with Om Malik, 2005 LMC chair; George McClure, LMC Member, Dave McLaren, R3 LM coordinator or Jacob Baal-Schem, LMC Life Member Affinity Group coordinator.

The input from the delegates, which was taken through an informal questionnaire, indicates that most respondents (61%) are very interested in having LMs participate in their Section activities. Only 18% of the respondents indicated that their Section had an LM Affinity Group, but 89% would support the formation of Life Member Affinity Group within their Section.

Om Malik addressed the delegates during the LMC sponsored luncheon. He spoke about the benefits of contributing to the Life Member Fund, highlighted LMF sponsored programs, and reminded the Section delegates that LMs can support and participate in Section activities.





# My Brush with History

The tragedy of 9/11/2001 reminded many of another infamous date, 7 December 1941, when Pearl Harbor was attacked and thousands of Americans were killed, causing the United States to enter World War II.

Two men who had a part in that "day of infamy" were the young U.S Army radar operator who detected the incoming Japanese aircraft a half hour before the bombs dropped on our Navy ships and the Japanese squadron commander who gave the radio message "Tora, Tora, Tora" to begin the tragic bombing attack. I personally met these two men, and the rest of this story is to relate how these meetings took place.

The radar that detected the squadron of over 300 planes was built for the U.S. Army Signal Corps by the Westinghouse Electric Corporation in Baltimore, where I worked for 32 years. The radar was designated SCR-270 and was one of the earliest to be designed when radar technology was still in its infancy and shrouded in secrecy. Several of these SCR-270 units had been installed on the Hawaiian islands, with one near Oahu, which was close to Pearl Harbor in the Honolulu area.

Joseph Lockhart was on duty 7 December 1941, a Sunday morning. As he was getting ready to shut down the radar for the day, he noticed a larger "blip" on the primitive cathode-ray indicator. A strong echo was showing up from about 139 miles north of the island shore. He called his superior officer to report this unusual blip, but the officer told him it was probably some of our aircraft coming to Honolulu from the U.S. mainland. So Joe proceeded to shut the radar down. A half hour later, the bombs began to fall on our unsuspecting Navy fleet.

Fifty years later, there was an anniversary meeting of "Pearl Harbor Day" at Westinghouse in Baltimore. Joseph Lockhart was one of the three speakers at that meeting, which I had the privilege of attending. The other speakers were from the Signal Corps and from the Westinghouse upper management.

I have long since forgotten what the other speakers said, but I still remember most of Joe Lockhart's account of his experience. While it is a shame that his report was ignored, it must be remembered that radar at that time was new-fangled stuff, and not many people in the armed services had reason to have confidence in its performance.

The squadron commander of the Japanese bombing raid was Captain Mitsuo Fuchida. His aircraft led the squadron and was among the first to drop bombs. He was later promoted to lead a number of warships, some of which were sunk. He survived and was rescued. Near the end of the Pacific War, he was a high-ranking admiral of the imperial Japanese Navy.

After the U.S. raids on Hiroshima and Nagasaki, he was one of about a dozen high-ranking military men assigned by the Emperor to inspect the damage done by the U.S. atom bombs. The inspection team reported what they found to the Emperor, who then decided to surrender, ending the Pacific War.

Fuchida was devastated by this decision. He was a career Navy warrior and thought Japan should "fight to the finish." He resigned from the Navy and returned to civilian life. By then, all the other members of the inspection team had died of radiation poisoning, but for some strange reason, he survived. Nevertheless, he was not happy and did a lot of soul searching.

One day, he received a leaflet being handed out on the street by a member of the Pocket Testament League (PTL), which is an American evangelical organization. He eventually read the message of that tract and decided to convert to Christianity. After writing to the PTL, he was invited to visit the United States, where he spoke of his life story and conversion at various meetings.

One such meeting took place in Baltimore in the 1950s, which a dear friend, Martin Bankert, invited me to attend. That is where I personally met Mitsuo Fuchida, a new brother in Christ, transformed by the power of God through the Gospel message on a small but effective piece of paper. As the saying goes, "truth is stranger than fiction."

Helmut "Hal" Schrank, LF
Hunt Valley, MD

## Don't Touch the Radar

After my honorable discharge from the Navy as an electronics technicians mate 2/C in April 1946, I obtained a position with the war department Civilian Marine Personnel Transportation Corps as a radar maintenance officer (AAR 1st Lt.).

I was stationed aboard the the MIT Victory. The ship delivered German POWs from New York to Bremerhaven, Germany, and returned military to New York. My job was to maintain the ship's radar, supervise the assistant radar office, and stand radar watches when necessary.

My first day on the ship, while testing the radar equipment, the captain approached me and told me not to touch the radar. Of course, when he wasn't around, I did my job.

While at sea one night, we hit some stormy weather. We were summoned to the bridge by the captain. He told me and my assistant that the radar wasn't working, and unless we fixed it, there would be two less jobs when we got back to New York.

As we were trying to repair the radar, the captain held a lantern so we could see what we were doing. I determined that a rectifier tube was out, but my assistant said it couldn't be causing the problem. I told him to get the damn tube from the parts locker down below.

Luckily, we had all our spares and, sure enough, it was the rectifier tube that was the problem. I tuned up the radar. The captain was very pleased and from then on always asked me to make sure to check the radar.

Maurice S. Salamy, LSM
Orlando, FL

## Our Mailing List

The Life Members Newsletter is distributed to Life Members and those who are not Life Members but are 1) IEEE members 65 years and older, 2) retired IEEE members aged 62–64, and 3) members of special boards and committees.

## Submitting Articles

We welcome articles for this newsletter. In particular, we seek articles about projects initiated at the Section and Region level by Life Members as well as "Tales from the Vault." In general, published story lengths are:

1/4 page—200 words 1/3—300 words
1/2 page—450 words 1 page—900 words

Acronyms should be completely identified once. Reference dates (years) also should be included. Editing, including for length, may occur. If you wish to discuss a story idea beforehand, you may contact Emily M. Smith, managing editor, by e-mail at <lm-newsletter@ieee.org>. The deadline for possible inclusion in the next issue is 5 September 2006. Please include your Life grade, town, state, country, phone number, member number, and an e-mail address with your submission.

## Stopping IEEE Member Services

Those Life Members who wish to have all services stopped should contact IEEE Member Services. If you are doing it at the request of someone else, submit the member's name, number, grade, address, change date and your connection, e.g., Section chair.

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## Qualifying for LM Status

To qualify as a Life member, an IEEE member must be at least 65 years old, and the sum of the member's age and the number of years of paid membership must equal or exceed 100 years.

## Have Questions, Ideas, or Problems?

Have questions regarding your Life member status? Contact Member Services. Got something else you need to ask or discuss? E-mail the Life Members Committee or staff at Lifemembers@ieee.org, or call +1 732 562 5501, or fax +1 732 463 3657.

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