

# *The Making of the President, 1999*



*For Kenneth Laker, a synergy  
between career and IEEE service.*

**I**t is hard to believe that more than ten years has gone by since I served the IEEE as its 1999 president. That is because being president of IEEE was such a unique opportunity that many of the resulting experiences have been integrated into my professional life. In this article, my objective is to provide a window for readers into the conditions leading to my election, the experiences that unwittingly prepared me to be IEEE president, and my accomplishments in that role.

In both my career and my IEEE volunteer endeavors, I have been blessed with special collaborations; all have enriched my technical and IEEE achievements, as well as my personal life, beyond anything I could have imagined. I learned the

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power of synergistic partnerships early in my career, and they served me well over the years in both my career and IEEE volunteer work. My experience in IEEE taught me a great deal about teamwork, the value of achieving a clear common purpose, leadership in word and deed, and the importance of sharing credit. The same principles apply when one is leading a technical project, collaborating on a paper or proposal, or launching a new company. I have done all of these multiple times, and I believe my collaborations have enabled me to accomplish far more than I could have by working alone. Through both my work and IEEE, I have sought to continually improve my collaboration and teamwork skills. I now teach these skills to undergraduate students through our capstone senior design experience.

When I was traveling around the world as IEEE president, and for some years afterwards, the two questions I was most often asked were these: How does one get to be IEEE president? And why did I want to become IEEE president? These two questions are related, and I believe my answers to them provide an interesting context for this article.

### **A Journey to Become IEEE President as a Petition Candidate**

I will begin by considering how one gets to be IEEE president. There are two answers to this question; the first is procedural, and the second is intellectual. Since the procedural answer is entirely fact-based, I will give it first. To become IEEE president, a candidate must win an international election involving IEEE members from all over the globe. IEEE elections are interesting undertakings in their own right, particularly when one realizes that many members reside in countries where elections are either new or absent from the political culture entirely. I have always been fascinated by the workings of democratic IEEE governance amid the diversity of cultures across the global IEEE.

To become IEEE president in 1999, I had to win an election in 1997. To run for IEEE president, the candidate must first qualify to be placed on the IEEE presidential ballot. This qualification can either be achieved by winning nomination from the IEEE Board of Directors or by a petition of the membership. As I did not secure a nomination from the IEEE Board of Directors, I earned my nomination by petition. At the time, the criterion for a successful petition was to secure the signatures of at least 1% of the voting IEEE membership—or in round numbers, to secure at least 3,000 valid signatures. The IEEE petition had a rigid format and included spaces for a member to print his or her name and member number and to enter a signature. The IEEE hand-validated each signature by comparing the associated printed name and member number against the IEEE membership database—a very labor-intensive process. Due to disqualifications resulting from duplicative signatures and signatures from members in arrears with their dues, a petition candidate actually needed about 3,600 actual signatures to ensure that there were at least 3,000 valid signatures. Electronic signatures, e-mails and faxed signatures were not considered valid signatures.

I was not the first petition candidate for IEEE president; there were a couple of successful petition candidates before me. At the time, the formulaic strategy for securing at least 3,000 signatures was to send a letter by snail mail to  $n \times 3,000$  IEEE members containing a petition form, a message from the candidate, and a stamped, preaddressed return envelope to be used by the recipient for returning the signed petition. The number  $n$  was usually at least ten; hence, the petition candidate mailed on the order of 30,000 pieces of mail, each with a stamped envelope for the return trip. The need for 30,000 mailings to yield at least 3,000 signed petitions is based

on IEEE's experience with mail surveys, where a yield of about 10% of mailed surveys is considered good. The purpose of the stamped envelope was to make the return of a petition cost-neutral to the sender. Besides the high cost incurred by the candidate, I was bothered that such a traditional petition scheme required no commitment by the petition signer. Hence, I was determined to try something radical, an approach that took excellent advantage of e-mail and required at least a minimal commitment by the petition signer. During last few days of 1996 and the initial days of 1997, I concocted my radical scheme. It had the following attributes:

- 1) It made the maximum use of e-mail, i.e., by sending an e-mail message with a printable attached petition form to about 150 selected IEEE friends all over the globe, including many from the solid-state circuits community. The purpose was to secure signatures and to have them forward the same e-mail to their individual networks of IEEE friends with whatever cover message they wished to add. I theorized that this advocacy-based mailing would be far more effective than a random mailing to  $n \times 3000$  IEEE members, a large percentage of whom would likely know little or nothing about me.
- 2) It incurred zero financial cost, i.e., there were no mass mailings by snail mail and no stamped addressed envelopes for the return of the signed petitions. The member who desired to support my petition had to make the minimal commitment of printing the attached petition form, purchasing an envelope, addressing the envelope, and purchasing a stamp for the return of the petition. I considered this to be a reasonable commitment for an IEEE member to make if that person desired to support my petition.
- 3) The return address for all of the signed petitions was my home address, rather than an IEEE

address. I was thus able to track my progress and alert my advocates when I sensed that my progress was falling behind, which I did on more than one occasion. I reasoned that an advocate, who had worked to secure signatures for me, would be disappointed in me if I fell short of the requisite number of signatures and did not give him or her a chance to secure a few more to put me over the 3,000-signature threshold.

The result was incredibly positive. By the June 1997 deadline, I had received more than 5,000 signed petitions from all over the globe. A number of them arrived in bulk, delivered by couriers like DHL and FedEx and containing as many as 100 or more signatures in a single mailing. Almost all of the return mailings included letters of encouragement from the senders, which I greatly appreciated.

### **To become IEEE president, a candidate must win an international election involving IEEE members from all over the globe.**

My petition campaign was a deeply personal and satisfying experience, far beyond anything I expected. I felt that my petition success was a significant personal accomplishment in its own right, independent of my winning or losing the election.

#### **My Preparation to Become IEEE President**

As I look back more than ten years, I credit my decision to run for the presidency of IEEE, as well as my petition and election successes, to the following three factors:

1) I had an extensive IEEE network that I developed over a 20-year period by connecting with IEEE members in my IEEE technical communities—the IEEE Circuits and Systems Society (CASS), the IEEE Solid-State Circuits Society (SSCS), and the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society (UFFCS)—and with

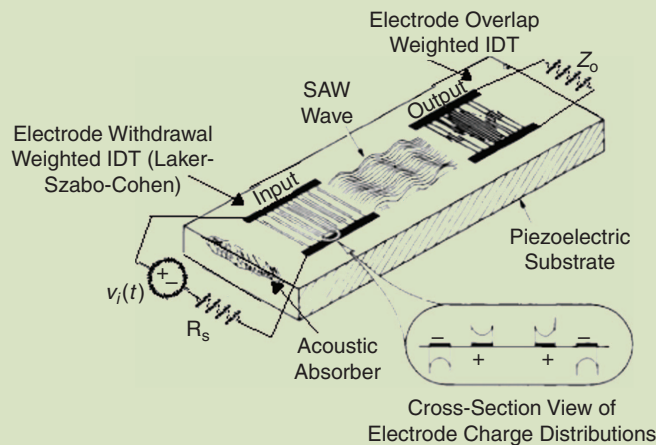
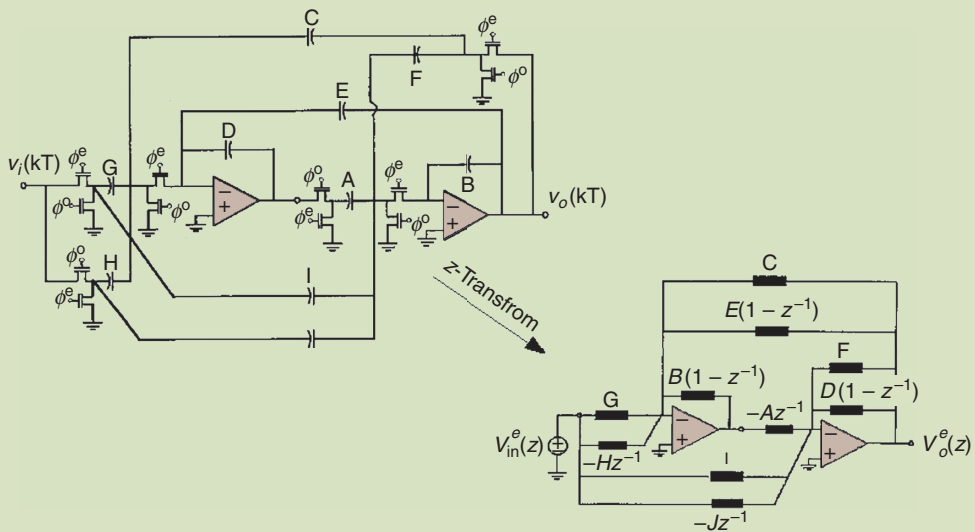
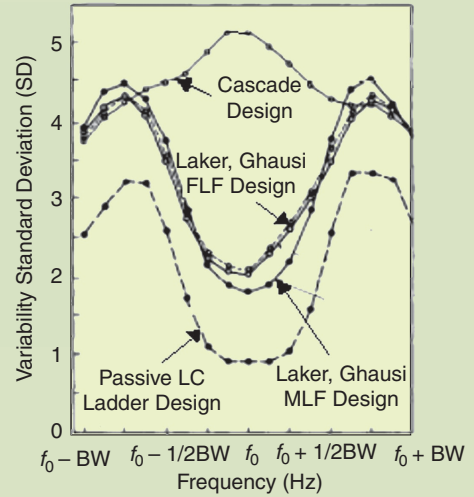
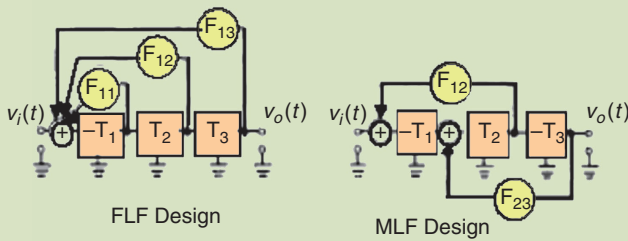
many other members through my volunteer activities, which spanned the entire IEEE. I never consciously set out to build this network; it seemed to happen naturally. It was in many ways a natural outcome of my dedication to being productive in my field, to contributing in meaningful ways to our profession as an IEEE volunteer, and to being positive in general about whatever I was doing.

2) I had received a great deal of IEEE exposure for my technical accomplishments, e.g., my papers, presentations, textbooks, and awards. By 1997, I was known in the electronic circuits and ultrasonic device communities for my contributions in active-RC filters [1]–[4], surface acoustic wave (SAW) devices [5]–[7], and switched-capacitor (SC) filters [8]–[13]. These contributions are represented by the

collage of illustrations in Figure 1 and documented in references [1]–[13]. The parasitic-capacitance-insensitive active-SC biquadratic filter, shown in Figure 1(b), was particularly important and timely. The patent [10] for this family of circuits was awarded to Paul Fleischer and me in 1982. In 1994, Paul Fleischer and I were awarded AT&T's Clinton J. Davisson Trophy, based on the impact of this patent. I had also coauthored three textbooks [14]–[16]; the last one, *Design of Analog Integrated Circuits and Systems*, was written with Willy Sansen in 1994. The book *Modern Filter Design: Active RC and Switched Capacitor*, written in 1981 with Mohammed Ghausi, was the first textbook to seriously address switched-capacitor circuits. I was elected an IEEE Fellow in 1983 for my contributions to filter design and microcircuit implementation.

3) By 1997, my IEEE service included four years in CASS as a member of its administrative committee (AdCom) (1979–1983) and as president (1983). Also by 1997, I had served for four years on the IEEE Board of Directors, first as director of Division I (Circuits and Devices) in 1992 and 1993 and then as vice president of educational activities in 1994 and 1995. I had also served as Technical Activities Board (TAB) liaison to the IEEE U.S. Activities Board (1992–1993), the first strategic planning chair for the IEEE Publications Board (1993–1994), coauthor of the 1993 IEEE Strategic Plan (the goals for electronic delivery of IEEE content and education), and chair of the IEEE Philadelphia Section (1994–1995). My IEEE service from 1979 to 1997 thus spanned the entire IEEE, with the single exception of the Standards area. My career experience over the same period included four years of military service (in the U.S. Air Force), eight years in industry (at AT&T Bell Labs), and six years in academe (at the University of Pennsylvania). In some ways, the diversity of my career and IEEE experience were tailor-made to aid my run for IEEE president. At no time was any of it planned; the more I did and did well, the more I was asked to do.

To place the period of my IEEE presidential election into historical context, I must point out that in January 1997 when I officially started my run for IEEE president, there was no SSCS. The IEEE Solid-State Circuits Council then represented the solid-state circuits community within IEEE. The members of IEEE councils were—and still are—only the participating IEEE societies. The IEEE Societies who form the IEEE Council have the individual members, not the Council. The only formal members of an IEEE Council are the IEEE Societies who form the Council. According to the TAB Operations Manual “A



**FIGURE 1:** Collage of technical accomplishments: (a) multi-loop feedback active-RC filters (from [4]); (b) parasitic-insensitive active-SC filters (from [13]); (c) SAW filters (from [6]).



**FIGURE 2:** The 1999 IEEE Board of Directors. Bottom row, from left to right: D.J. Senese, executive director; D.A. Conner, treasurer; D.R. Benigni, VP regional activities; A.W. Winston, VP educational activities; B.A. Eisenstein, president-elect; K.R. Laker, president; J. Bordogna, past president; M. Papo, secretary; M.S. Adler, VP technical activities; M.R. Barbacci, director, Division V. Center row, from left to right: E. Herz, director emeritus; L.A. Luceri, director, Region 1; J.A. Kolasky, director, Region 2; D.C. Caston, director, Region 3; R.D. Adams, director, Region 4; G.R. Dean, director, Region 5; W.C. Anderson, director, Region 6; J.C. Miguez, director, Region 9; R.A. Remshardt, director, Region 8; P.J. Kostek, IEEE USA president; D.J. Kemp, director, Region 7. Top row, from left to right: L.A. Morley, VP publication activities; B.W. Johnson, director, Division VIII; T.W. Hissey Jr., director emeritus; M.R. Lightener, director, Division I; L.L. Grisby, director, Division VII; D.G. Daut, director, Division III; W.G. Gjertson, director, Division IV; B.C. Russo, director, Division II; J.M. Fouke, director, Division X; L.T. Gandia, director, Division VI; D.C. Loughry, VP standards association. (Photo courtesy of Julie Cozin.)

technical council has Member Societies but no individual members. In all respects except membership, a Technical Council operates generally like a Society." Since IEEE councils have no individual members, members of the IEEE solid-state circuits community achieved access to IEEE solid-state circuits publications by being members of one or more of the participating IEEE societies, which included CASS. In 1983, as CASS president, the members of the CASS AdCom that I served with were T.J. Aprille Jr., I.E. Getreu, P.R. Gray, C.W. Gwyn, G.D. Hachtel, Y.L. Kuo, P.V. Lopresti, G.S. Moschytz, R.A. Rohrer, P.M. Russo, M.A. Soderstrand, L.M. Terman, Y.P. Tsvividis, S.A. White, and B.A. Woolley. Several are prominent members of the IEEE solid-state circuits community. It is coincidental that I currently hold the Alfred Fitler Moore Professorship of Electrical Engineering at the University of Pennsylvania, since the Penn Moore School of Electrical Engineering and the IEEE Philadelphia Section were two of the early sponsors [17] of the first IEEE

International Solid-State Circuits Conference (ISSCC) in 1954 (then called the IRE-AIEE Conference on Transistor Circuits).

I successfully ran against the two IEEE Board of Directors nominees, winning a close election. There are several stories, some quite amusing, that I could tell about my IEEE election experience, but there is not enough space in this article to do so. If a reader wishes to hear some of these stories, I respond well to invitations to meet at a convenient location for a beer.

I ran for IEEE president on a platform expressed in the following candidate statement:

My uniquely broad range of IEEE service, which includes Society President, Section Chair, Division Director, and Vice President Educational Activities, has prepared me well to lead the Institute. Being that my career has been evenly divided between industry and academe, I am tuned into the needs of members in both communities, and to those of students. As IEEE president I will work to my full

capacity to enhance the value of IEEE membership by focusing on the following objectives.

- A) The greatest value that IEEE membership can return to members and their employers is career vitality. I will be unwavering in leading the charge to provide members with the most relevant and accessible professional development resources.
- B) IEEE, through its publications and standards, has been a major catalyst in the advancement of the electronic information revolution. My goal is for IEEE to be the most innovative user of information technologies and thus align its practice with its new slogan, "NETWORKING THE WORLD." This will enhance the image of IEEE, and advance its competitive position as a publisher of information products to a global membership.
- C) The cost and value of IEEE membership to students, and their retention as full members is an issue that is central to the future vitality of the Institute. I will seek opportunities like the IEEE/Sloan Career Education Project to increase the impact IEEE has on the professional development of students and their transition from student to working professional.
- D) The public image of engineers, and the value society gives to engineering accomplishments, are concerns of IEEE members worldwide. In partnership with other engineering Societies, I will seek to focus IEEE resources to develop a visible pre-college outreach program that serves to advance science/math education while

enhancing the image of the engineer as a societal leader.

I believe my accomplishments during my three years (1998–2000) as president-elect, president, and past president delivered on all four objectives.

During my IEEE presidency, I became interested in the testing of mixed-signal VLSI chips and systems on a chip (SoCs). A paper titled “A New Paradigm for Mixed-Signal and RF Testing” [19], which I coauthored with A. Grochowski, D. Bhattacharya, and T.R. Viswanathan, appeared in the August 1997 issue of *IEEE Transactions on Circuits and Systems—Part II*. This paper was selected to receive the 1998 IEEE CASS Sydney S. Darlington Best Paper Award. I also worked with several early-stage start-up companies; most notably, I served on the founding board of directors of AANetcom Inc. (1998–2000) and cofounded DFT Microsystems Inc. in 2002.

### My IEEE Accomplishments

During my service to IEEE, I have had the good fortune of being in the right places at the right times to help IEEE realize several strategic goals for technical, publication, and educational activities and the global organization.

During my service as president-elect and president of CASS in 1982 and 1983, respectively, Fredrick (Rick) Dill (then the president of the IEEE Electronic Devices Society) and I

***It was truly a privilege to have led IEEE at that critical time and to have contributed what I could to the profession and the organization.***

redesigned IEEE Division I to achieve a technology-coherent unit that collectively addresses the design, fabrication, and packaging of integrated physical systems. Our vision for this new division included the creation of *IEEE Circuits and Devices Magazine* to serve as an intellectual bridge for the members of the IEEE societies within the division. For more than 20 years, the magazine provided its readership with fully edited articles that highlighted important new technologies and methodologies that affected the design, fabrication, and packaging of electronic and optical systems. It was the first multisociety IEEE division magazine, and it was published continuously from 1984 to 2006.

I am proud over the years to have worked with so many excellent IEEE volunteers and staff members to make IEEE a glowing example of best practices in the use of information technologies and the Internet in all of its services and business activities. Among these volunteers and staff are the members of the 1999 IEEE Board of Directors shown in Figure 2.

This work has led to every aspect of IEEE’s Internet presence [18], [20]–[22], including:

- 1) **IEEE Xplore:** the backbone for the electronic retrieval of all IEEE publications
- 2) **IEEE Web site:** the IEEE information portal
- 3) **IEEE Virtual Museum:** the award-winning Web site designed to present electrical and information technology developments to students, educators, and the general public in a captivating manner and bring technology to life through highly visual, interactive presentations that demonstrate the contributions of engineering and engineers and their global social relevance within their historical contexts.

I am also proud to have been part of several important IEEE accomplishments relating to precollege, college, and postgraduate continuing education, including:

- 1) **Sloan Career Cornerstone Center:** a resource center to assist university students majoring in fields under the IEEE umbrella to explore their postgraduation career options
- 2) **Industry 2000:** the first IEEE global initiative to promote awareness of and develop industry



**FIGURE 3:** 1999 IEEE Region 10 Meeting in Bali, Indonesia. (a) A greeting befitting an IEEE president outside the Sheraton Nusa Indah Hotel. (b) Ken and Mary Ellen Laker at a Region 10 social. (c) Ken and Mary Ellen Laker recruiting IEEE members.



(a)



(b)

**FIGURE 4:** 1998 IEEE Region 8 Student Branch Congress at Bogazici University in Istanbul, Turkey. (a) Participating students with Ken Laker. (b) Students representing IEEE student branches in Iran.

support for continued professional development

3) **IEEE Presidents' Scholarships:** the first IEEE-wide college scholarship, first awarded at the Intel International Science Fair in 1999. It was at its inception the largest single award given at this prestigious science fair.

The volume of travel invitations received by an IEEE president is daunting. Although I received far more invitations than I could fulfill, I appreciated every one of them. My only regret was that I could not have fulfilled more of them. During

my visits to all ten IEEE regions, my wife, Mary Ellen, and I met many wonderful IEEE volunteers, members, and students. I learned a great deal from them about how the IEEE was perceived worldwide and what they expected from their IEEE. It is tempting to assume that these expectations are for the most part static and the same for all members. I suspect that neither has ever been the case, but especially today it is a gross oversimplification of the diversity of the IEEE membership and the realities of contemporary careers in IEEE fields.

I was fortunate to travel to all the regions outside North America,

i.e., IEEE Regions 8, 9, and 10. Some of the highlights of these trips are shown in Figures 3–6. I note that I was the first IEEE president to visit the IEEE Iran Section, which is part of IEEE Region 8. By the end of 1999, the IEEE Iran Section had one of the largest IEEE student memberships in IEEE Region 8. In my opinion, one of the invaluable benefits that IEEE provides globally is that it is a learned institution that transcends the adversarial politics of governments. One need only attend a couple of annual meetings in IEEE Regions 8, 9, and 10 to witness this phenomenon.



(a)



(b)

**FIGURE 5:** Photos from visits to the IEEE Iran and Saudi Arabia sections. (a) Ken Laker and Rolf Remshardt (director, IEEE Region 8) and University of Tehran students during the 1999 visit to Iran. (b) Ken Laker and Saudi IEEE leaders during the 1999 visit to King Fahd University of Petroleum and Minerals, in Dhahran, Saudi Arabia.



(a)



(b)

**FIGURE 6:** Photos from visits to the IEEE Delhi (India) and Panama sections. (a) Ken and Mary Ellen Laker taking an elephant ride during the 1999 visit to Jaipur, India. (b) Mary Ellen Laker participating in an IEEE outing during the 1999 IEEE Region 9 meeting in Panama City, Panama.



(a)



(b)

**FIGURE 7:** The 1999 IEEE Honors Ceremony in London's Whitehall Palace. (a) A group photo of the IEEE president, president-elect, secretary, and the medal and award recipients. Bottom row, left to right: B.J. Baliga (Lamme Medal), B. Eisenstein (president-elect), C. Concordia (Medal of Honor), K.R. Laker (president), M. Papo (secretary), B. Parkinson (Elmer A. Sperry Award). Middle row, left to right: K.A. Schouhamer Immink (Edison Medal), A. Ishimaru (Henrich Hertz Medal), K. Morii (Medal for Engineering Excellence), V.K. Bhargava (Haraden Pratt Award), L.R. Rabiner (Jack S. Kilby Signal Processing Medal). Top row, left to right: D.G. Messerschmitt (Alexander Graham Bell Medal), E. Parrish (Richard M. Emberson Award), G.W. Heilmeier (John Fritz Medal), A. Van Dam (James H. Mulligan Jr. Education Medal). (b) London's renowned Banqueting House, whose ceiling was painted by Peter Paul Rubens, the site of the 1999 IEEE Honors Ceremony. (Photo courtesy of Julie Cozin.)

### The 1999 IEEE Honors Ceremony

IEEE honors its medal winners annually with the IEEE Honors Ceremony, usually held along with the June

meeting of the IEEE Board of Directors. Since this is always an incredibly classy event led by the IEEE president, I would be surprised if

it were not one of the major highlights for all IEEE presidents. The 1999 IEEE Honors Ceremony was particularly special because it was



held outside North America for the first time, in London. It was indeed a milestone in the recognition of IEEE as a global society. I can tell all you future IEEE presidents that being introduced to lead this awe-inspiring event by a British toastmaster with trumpets blaring in the magnificent main hall of the historic Banqueting House is not bad. The true stars of the evening, however, were the medal winners, all of them pioneers and luminaries who have contributed a great deal to their fields and to society. A group photo of the 1999 IEEE president, president-elect, and the medal recipients is shown in Figure 7. Also shown in Figure 7 is the historic and beautiful main hall of the Banqueting House. It is the site for many of Queen Elizabeth's social functions. IEEE awards are held in great esteem, and the IEEE Honors Ceremony is the crown jewel of IEEE's awards program.

### Board of Directors Resolution and the Emberson Award

I was most pleased and proud that in the traditional citation presented to the IEEE president by the Board of Directors at the last meeting at the completion of the term of office, I was commended for my integrity, principles, leadership, and deep-rooted commitment to the profession and to IEEE, as well as for being a strong proponent of electronic publications and for accelerating IEEE's movement toward Web-based activities.

It was truly a privilege to have led IEEE at that critical time and to have contributed what I could to the profession and the organization. I was subsequently honored in 2004 with the Richard M. Emberson Award for distinguished service to the technical objectives of IEEE. I was cited for my "vision and leadership on behalf of the Institute's technical and educational activities, particularly electronic delivery of technical and educational information."

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### About the Author

**Kenneth R. Laker** received a B.E. in electrical engineering from Manhattan College in 1968 and M.S. and Ph.D. degrees from New York University in 1970 and 1973, respectively. In 2000 he received the Honorary Doctorate of Electronics and Computer Engineering from the Technical University of Crete, Greece. From 1973-1977, he served as an officer in the U.S. Air Force, and in 1977 he joined AT&T Bell Labs. He was appointed to the University of Pennsylvania faculty as professor (1984-present) and also served as department chair (1984-1993). In 1990, he was appointed Alfred Fittler Moore Professor of Electrical Engineering. He served on the board of directors of AANetcom (1998-2000) and cofounded DFT Microsystems Inc. in 2002. His work in microelectronic circuits has resulted in four textbooks, more than 100 articles, and six patents. He was elected an IEEE Fellow in 1983. His awards include the 1994 AT&T Clinton J. Davisson Trophy for patents in microelectronics, the 1998 IEEE CASS Darlington Best Paper award for a paper published in *IEEE Transactions on Circuits and Systems—Part II*, the 2004 IEEE Richard M. Emberson Award, and the 2007 Delaware Valley Electrical Engineer of the Year Award.

