

SCANFAX

January 1999

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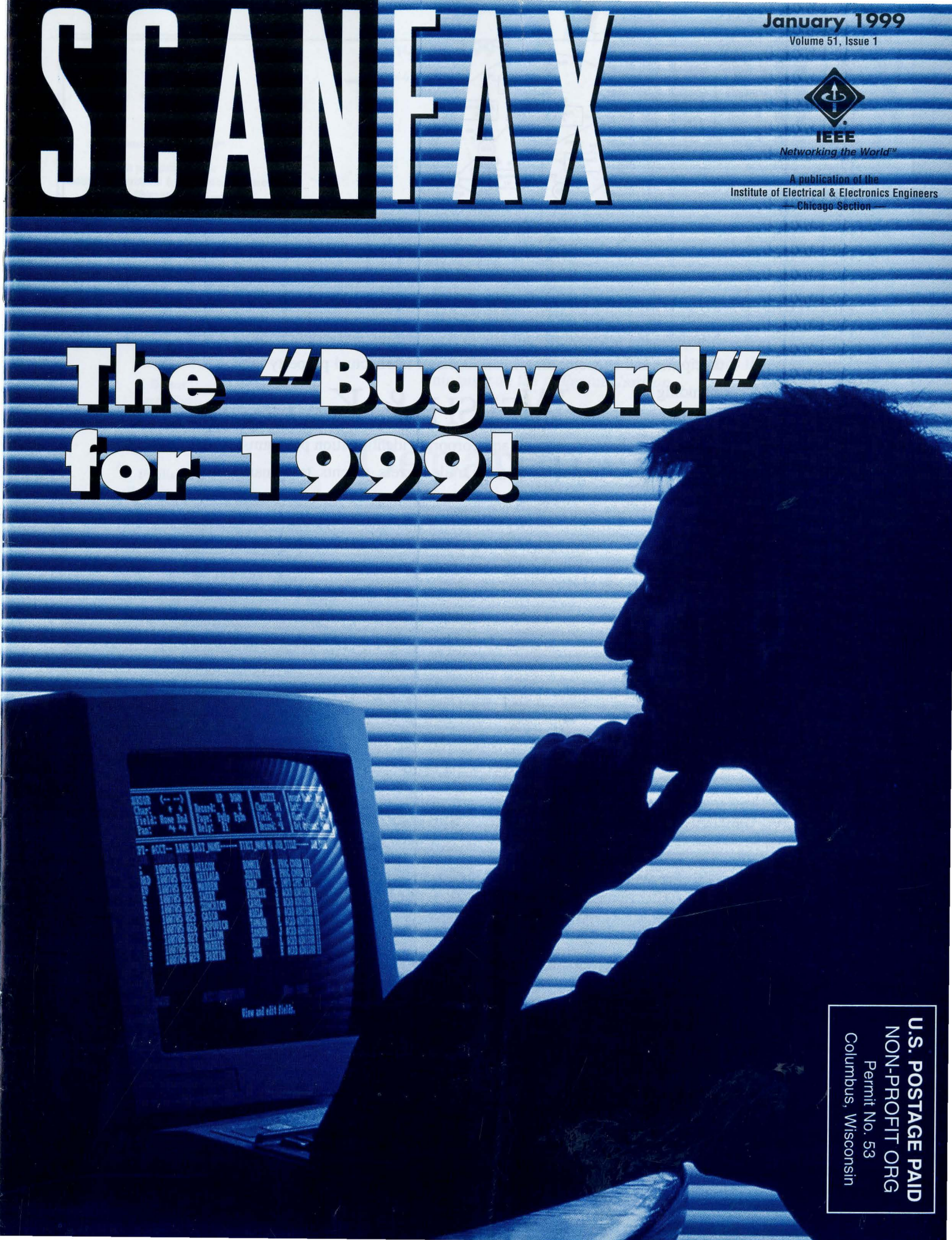


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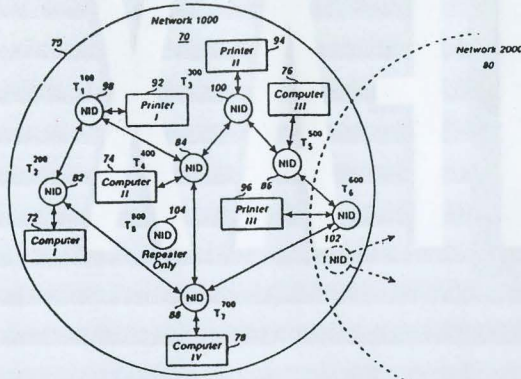
The "Bugword" for 1999!



NAME	LAST	FIRST	MIDDLE	INITIAL	DATE
100785	820	WELCH	DOUGLAS	W	100785
100785	821	WELCH	DOUGLAS	W	100785
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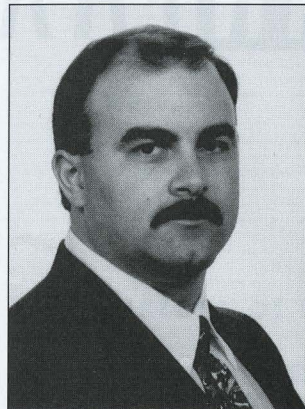
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Chairman's Message



Howard W. Penrose
IEEE Chicago Section,
Chairman

As we welcome in 1999, I would like to thank all of our volunteers, supporters, speakers, and advertisers for all of the efforts over the past year. 1998 heralded new technologies and concerns for the coming millennium, from issues of the information super-highway to deregulation, and from emerging energy technologies to the Y2K problem. This is an exciting time for our chosen profession, and, as such, it is a time for sharing our experiences and leadership within the engineering community.

As the last year of the century and millennium begins, we must reflect on the accomplishments of the engineers of the past thousand years. Science and engineering have brought our society out of the dark ages to where we are now. Not even ten years ago few people could imagine that most homes would have a personal computer, that most businesses would be advertising on the internet, or that alternate energy vehicles would be a reality. Only 40 years ago the thought of going into space and landing on the moon was science fiction. Now we are arguing over who is going to provide financing for a multi-national space station. At the beginning of the century who knew that so many homes would have more than one car, or that those homes would all have at least one telephone and electricity. Now we are discussing how to reduce the pollutants from all those vehicles in teleconferences or in online chat rooms while the telecommunication and power industries are being deregulated. All of this while we are watching wars on television, live, or talking to each other while in our cars or on airplanes. Yes, this has certainly been an exciting time to be alive and an engineer, having a significant impact on the quality of life of our fellow man.

Through all of this our professional society has thrived. The Institute of Electrical and Electronics Engineers, Inc.

has provided us with the opportunity to network, share ideas, and educate each other through individual and team efforts. Last year IEEE adopted "Networking the World" as part of its logo, and in our way we have started this process within the Chicago Section.

Over the past year we have been working towards providing for the Chicago Section membership by introducing a new and improved *Scanfax* magazine. We have also been working on increasing joint programs with other organizations in order to provide access to knowledge in other areas of the engineering profession. In the last six months we have had joint meetings with: neighboring IEEE sections and organizations; the US Department of Energy; the Environmental Protection Agency; the Illinois Department of Commerce and Community Affairs; the Illinois Small Business Development Centers; the Association of Professional Energy Consultants; the Electrical Apparatus Service Association; and many others. At the same time the chapters have continued to find quality speakers who have donated their time, with support of their businesses, to provide excellent technical programs. This effort requires the time and effort of our many volunteers.

It is my hope that this effort will continue. In order to accomplish this we will need more active volunteers. Presently, our officers, committee members, and other volunteers have been putting on a valiant effort to provide the technical programs and services that we all enjoy. In order to continue the level of activity within our section, and our impact on our profession, we need more volunteers. Please contact any of the Chicago Section, Fox Valley or Northwest Subsection, or chapter officers to volunteer your time. Let us continue to lead the engineering profession into the next millennium.

The "Bugword" for 1999!



By: Christine M. Sloat, P.E.

"Giant Bug Unleashed On Unsuspecting World!"

"The Bug Is Here! Consequences Disastrous!"

"World Changed by the Millenium Bug!"

"Gotcha" headlines from the numerous sensation magazines scattered about the checkout counter at the grocery store, right? Well, not exactly. Headlines and comments like these can be found throughout technical, business and trade publications, and of course all over the internet. And most of us know what they are referring to – the infamous Year 2000 computer glitch, the millenium bug or Y2K for the buzzword savvy.

Computers virtually maintain our lives – from commerce to defense, from industry to our homes, we are impacted by

when and how computers work. Think about it – computers running appliances and cars, spitting out paychecks, approving credit card purchases, providing guidance to airplanes, ships, even missiles, tracking our finances, giving medical assistance, etc. Last year, we printed a *Scanfax* article about Y2K, including discussions on the why and how of this microchip infestation. We won't go into that detail again in this issue, but as 1999 dawns, we thought it appropriate to revisit the issue. Here is a smattering of Y2K implications that still loom ominously on the millenium horizon.

- Admittedly, most computer users are aware of the Year 2000 numeric code problem, and are working diligently to solve it within their respective spheres of influence. But most is not all, and with today's global interconnectivity, what affects one computer can easily affect many more. So as we ensure that our own systems are compliant, we nervously wait for the other shoe to fall when someone else's non-compliant sys-

Continued on page 4.

Here is a smattering of Y2K implications that still loom ominously on the millenium horizon.

tem causes us problems. Think "domino effect."

- The US Small Business Administration has issued a Y2K warning. Over 330,000 of the estimated 23 million small businesses in America are at risk of closing down, and another 370,000 could be temporarily or permanently "infected." Implication - service shutdowns, loss of jobs, transportation problems like shipping and delivery, and more. Think about your own employers. Are

they compliant? Are they sure that their vendors are compliant? What if your major customers are not compliant and go out of business, either temporarily or permanently. Will you still have a job?

- It is a programmer's nightmare! Y2K can affect hardware, operating systems, and applications. Different solutions are required for different systems, even different models of the same brand of machine! And, many of our two-digit programs were written years ago, with

numerous layers added over time. Is anyone around who remembers where all of the digit problems may reside?

- Then there are embedded systems (microchips, controllers, etc.), components in larger systems that control or assist operations. With embedded systems, it is not as simple as running out code and looking for non-compliant date fields. In many cases, software codes were poorly documented, if at all. Even if code can be extracted from ROM, simulated on another system, language-supported on compilers, edited and returned to the embedded system, the work is far from done. These systems often are part of larger systems that can accept input from data acquisition systems. Testing the solution then becomes a gargantuan task! Engineers and programmers will have to go well beyond a simple "does it work" testing program.

- The date fix is not just a problem of clearing the 1/1/2000 hurdle. Actually, we are already experiencing problems. Some credit card systems have problems recognizing cards with expiration dates that end in 00. Even September 9, 1999 has a lot of people nervous. Historically, programmers used 9/9/99 to indicate an invalid date field in their programs. Then there is the 99th day of 1999, which is April 9. What kind of glitch will that cause? Who knows!

- Air traffic control communication networks managers have been working feverishly to "de-bug" their operations, and the word is that systems are almost completely safe from the millenium bug. But the risk of failure has not been completely ruled out, especially in remote parts of the world. Imagine being on a plane on January 1, 2000 and knowing that control systems are 99 percent compliant. And what about the other one percent?!

- The tremendous task of reprogramming banking systems is well under way. The FDIC has been very aggressive in requiring banks to be prepared and compliant. Even among nonmember banks, early testing has shown that these generally smaller banks are already about 88 percent compliant. "On schedule" is fine, but what about

ATM's, global banking that relies on satellites and GPS generated time signals for instantaneous interest calculations, etc. And, financially speaking, what about the implications of companies that go out of business and take stock portfolios down with them?

- Utilities... imagine a week (or even weeks) without water, electricity, phones, etc. The electric power industry has an enormous amount of work to do. This industry is heavily reliant on embedded systems. In the case where embedded systems cannot be fixed, or are not able to be upgraded, whole pieces of machinery must be replaced. This is very expensive, and, worse yet, a time problem. Some machines must be ordered years in advance. Even coal-fired plants are under the gun. The huge amounts of coal that supply the system are delivered by rail. What happens when rail car movements, controlled by embedded systems, are snarled by failure?

- Watchdog groups are very concerned about nuclear plants around the world. As plants shutdown when the "00" in the year 2000 hits, grids begin to fail and darkness sets in. Then, without power, the scramble begins as plant personnel rush to provide supplementary power so that reactor cores can cool. Many such plants rely on diesel generators, not entirely reliable but let's hope they all work. The scariest part of the scenario is that governments in other parts of the world are only beginning to look at the problem. That includes Russia, where 15 nuclear reactors provide 40 percent of its power. Already in serious economic trouble, a loss of power and/or a nuclear incident will be devastating.

- Y2K... technical problem, right? Wrong! Think of all of the legal, political and public relations issues. Risk management is very important, and lawyers are geared up for all of the potential lawsuits. Many insurance carriers, when questioned closely, claim that provisions in current policies do not cover incidents resulting from millenium bug problems! Politically, are our governments putting enough dollars into fixing the

problem? And are local governments geared up to handle disaster management when problems do arise? The PR will continue to look like sensation headlines, with doomsayers growing exponentially in numbers. From a business perspective, that's costly. We spend a great deal of money fixing the problem, and then spend a great deal more on PR as we explain to our customers that we are ready, and not to panic.

The preceding list is just a small sample of the issues that float around the

Y2K issue. Interestingly enough, the millenium bug may only be the tip of the iceberg! Other problems, some related, loom just beyond 2000 that could run up a tab of more than \$5 trillion dollars to resolve! Here's what IEEE Spectrum Newsletter pointed out:

The Euro.

The European Monetary Union (EMU) begins moving toward a unified currency - the *euro* - on Jan. 1, 1999, with a total conversion by mid-2002. The tim-

Continued on page 6.



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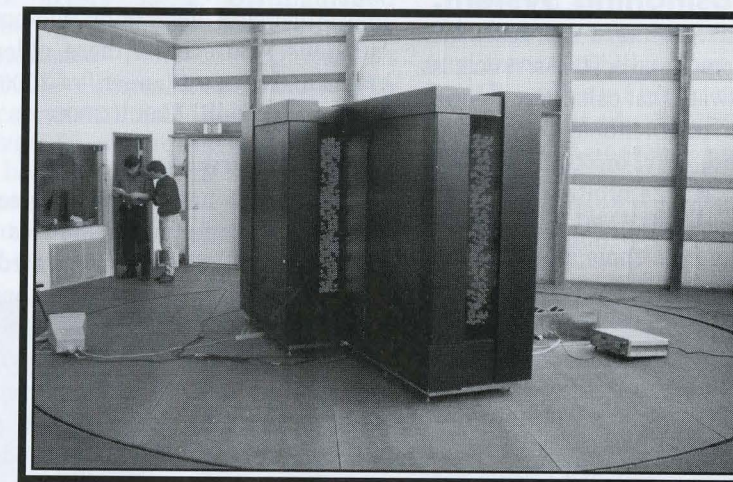
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50 Hz	480V, 3Ø, 20A	480V, 3Ø, 100A	480V, 3Ø, 100A
	230V, 1Ø, 20A	230V, 1Ø, 80A	230V, 1Ø, 80A
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Continued from page 5.

ing couldn't be worse, since it pits the world's second largest software issue (compatibility with the euro) against the world's largest (Year 2000). If not fixed, software's failure to recognize well-established products priced in euros, or both euros and another currency simultaneously, could disturb stock market trading and banking, and may interfere with any kind of long-term trend analysis. On top of everything else, the symbol for the euro can only be displayed and printed with select few word processors (Microsoft Word alone among Windows '95 applications). So even if older applications can handle the currency conversion issue, they still won't be able to print the symbol.

Global Positioning System.

Ships won't get lost at sea, but many non-navigational applications, such as financial software that calculates interest payments on international transactions to the second, rely on GPS-generated time signals. The 24 orbiting GPS satellites keep track of time by recording elapsed weeks from some arbitrary date, a common practice. But to save memory, the clock must reset itself on occasion. In this case, the counter is programmed to reset after 1,024 weeks from midnight, Jan. 5, 1980. As bad luck would have it, that arrives at midnight Aug. 21, 1999. So not only will GPS time-dependent applications have to be tested for the GPS

rollover, but also for euro and Year 2000 compliance, more or less simultaneously.

Leap Year.

On top of everything else relating to the Millenium Bug, the year 2000 will be a leap year - by default. A leap year - which compensates for the extra quarter day it takes the earth to revolve around the sun - is defined as any year divisible by four (Rule 1), unless it is also divisible by 100, in which case 2000 is not a leap year (Rule 2). But under Rule 3, which says if a year is also divisible by 400 it's a leap year, we'll be making the leap Feb. 29, 2000. Today, 2000's leap status is among the best known in computer history, but in the 1970s and '80s, that status often escaped the attention of programmers. As a result, affected applications may either shut down or double-post calculations. So even if these older programs make it past January of 2000, they may not last until March 2000.

Call Forwarding.

Whenever a new telephone area code is assigned, affected businesses must print new stationery, business cards and company brochures. Expect a bonanza for print shops around 2015, when the number of phone numbers begins to exceed the capacity of the current 10-digit system. To accommodate phone line growth, a five-digit area code and nine-digit number would serve quite

well - a trillion number system allowing everyone on earth to have several lines. Of course, massive and costly software updates will be the order of the day since numeric fields in millions of applications will have to be extended. Also, millions of hand-held personal information managers will become obsolete by their inability to cope with expanded phone formats.

Social Insecurity.

Unlike phone numbers and many other numbers, social security numbers are "retired" once they are used, and cannot be reassigned, even after death. The capacity of the current nine-digit system is about one billion numbers; about 383 million have been assigned to date, and about six million more are issued each year. In theory, the supply of numbers should last another 75 years, but the consequences of running out are profound and will affect all forms of financial and government applications. With the idea of a global personal identity code in the wind, a more thoughtful solution is needed than simply attaching a digit or two. Whatever fix is adopted, social security number expansion will likely rival the Year 2000 in total costs within the United States. ■

Christine M. Sloat, P.E. is president of Copper Creek, a consulting group in Reedsburg, Wisconsin. She may be reached at (608) 524-1397.

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Electron Devices Circuits & Systems Solid State Circuits Societies

Internet Telephony

**Wednesday,
January 13, 1999**

EVENING MEETING

Chuck Byers, Lucent Technologies, Bell Labs

About the topic:

This talk will discuss some of the properties of Internet telephony, and the construction of systems to support it. There will be a brief introduction to packet networks and the Internet, an overview of the standards, and an overview of some of the network elements needed to provide Internet Telephony service. The talk will conclude with some analysis of the Internet telephony marketplace, and an overview of some of the major commercial players.

About the speaker:

Chuck Byers is a Distinguished Member of Technical Staff at Lucent Technologies Bell Laboratories in Naperville, Illinois. During his twelve year career with Bell Labs, he has been involved in electronic design at the chip, board and system level, as well as system architecture and marketing. He is currently working on advanced Internet access products in the

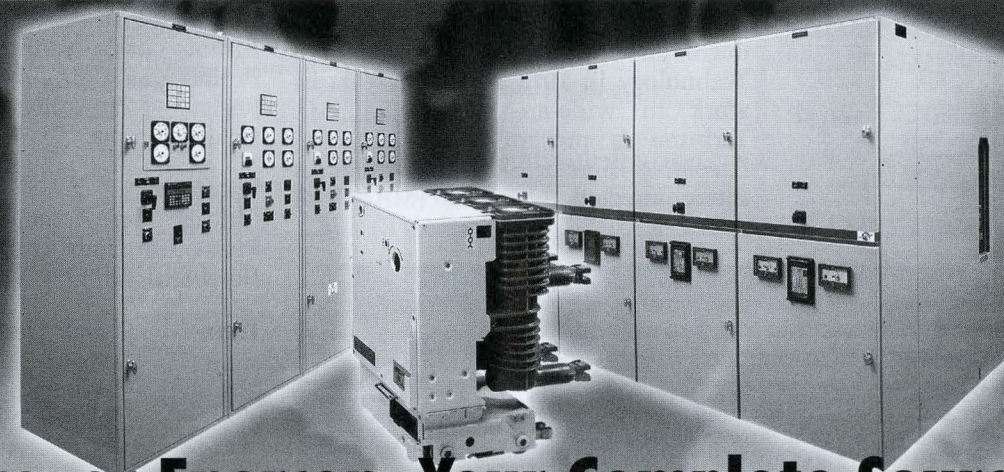
Broadband Switching Concept Department. Chuck has a BS in Electrical and Computer Engineering, and an MS in Electrical Engineering, both from the University of Wisconsin.

Location:

Motorola Schaumburg Campus, 1301 Agonquin Road. Enter Campus using Gate A, westmost gate off Algonquin Road, west of Meacham. Door 13 is under Motorola sign on west face of six story building.

Time: Social: 7:00 pm.
Presentation: 7:30 pm.

For more information, visit:
http://www.ece.iit.edu/~flueck/chicago_pes/
Dr. Alexander J. Flueck: email: flueck@ece.iit.edu, Electrical and Computer Engineering; phone: 312-355-3480, Illinois Institute of Technology, fax: 312-567-8976, Chicago, IL 60616-3793



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LUNCH MEETING

IEEE PES CHICAGO CHAPTER

Management of Reliability Summer, 1998

Wednesday,
January 13, 1999

Chuck Ball, Assistant Executive Director of the Mid-America Interconnected Network (MAIN)

About the topic:

Harry L. Terhune, Assistant Executive Director of the Mid-America Interconnected Network (MAIN) will discuss last summer's critical electric power supply operating conditions, including the events underlying the infamous "price spikes" of June 25, 1998. Mr. Terhune will report on the analysis and projection of reliability conditions performed by regional and national reliability groups during the spring, reflecting the impact of extended nuclear outages. He will also describe the actions taken by MAIN and its member electric utilities to prepare for potentially constrained capacity and transmission conditions. Finally, he will cover the actual performance of the MAIN systems in Wisconsin, Illinois and Missouri during the summer of 1998, including transmission loading relief events and emergency capacity relief actions.

About the speaker:

Harry L. Terhune graduated from the University of Notre Dame with the BSEE degree in 1967, and received the MSEE degree from the Illinois Institute of Technology in 1975, after doing thesis work in wide-area blackouts. Mr. Terhune is presently the Assistant Executive Director of the Mid-America Interconnected Network (MAIN), a

regional reliability council which is part of the North American Electric Reliability Council (NERC). He has primary staff responsibility for developing programs for compliance with the NERC planning and operating policies and standards. He is also involved in the security coordination function, training and voltage stability issues. Mr. Terhune was previously employed by Commonwealth Edison Company (ComEd) from 1967 through April, 1998. He served in a wide variety of responsible engineering, training and technical managerial assignments, including System Planning Manager from 1990 to 1997 (responsible for planning of the ComEd bulk power transmission system from 765 kV through 69 kV), and Transmission and Distribution Planning Manager in 1997 and 1998 (responsible for all electrical system planning from the generator terminals through the transmission system and distribution feeder system). Mr. Terhune is a Senior Member of the Institute of Electrical and Electronics Engineers, an individual member of CIGRE, and a member of the Illinois and National Societies of Professional Engineers. He is a Registered Professional Engineer in the state of Illinois.

Location:

Chicago Bar Association, 321 South Plymouth Court (near Jackson and Dearborn), Chicago, IL 60604.

Time: Social: 11:30am.
Lunch: 12:00pm.(optional)
Presentation: 1:00pm.
Meeting Adjourns: 1:00pm.

Lunch tickets can be purchased in the lobby bookstore (\$10.50). Please call the IEEE Business Office at (800) 898-IEEE to make your reservation.

For more information, please visit the Chicago Chapter IEEE PES web site: http://www.ece.iit.edu/~flueck/chicago_pes/
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IAS/IES DINNER MEETING

Randy AmOrde, Training Engineer, ABB Service, Inc.

About the topic

Proper and regular testing of electrical distribution equipment is essential to electrical safety and reliability. Mr. AmOrde will present a slide-based tour of substation equipment that shows how and why failures occur. Accepted maintenance procedures will be addressed that identify and help prevent such failures. This presentation will be particularly valuable to engineers and maintenance personnel who maintain, modify, and upgrade electrical distribution equipment. A question and answer session will follow the presentation.

About the speaker

Mr. AmOrde is a Certified Engineering Technologist in Canada and an IEEE member. After receiving his diploma in Control Systems Engineering Technology from Mohawk College,

Mr. AmOrde commissioned and maintained switchgear for Rondar Service. For Canada Training Group, he presented electrical maintenance seminars and updated the seminar materials. At Westinghouse, Randy had responsibilities including field service operations, developing and implementing maintenance and safety training for Westinghouse personnel and clients, and making presentations at technical symposiums. At Kiemle-Hankins Flint Apparatus Service, he was responsible for sales, engineering, and delivery of electrical service and switchgear as well as developing safety and training programs. Currently with ABB Service, Randy delivers maintenance training programs on safety, maintenance and code compliance for ABB and its clients.

Location:

Como Inn, 564 N. Milwaukee Ave, Chicago, IL

Directions: The Como Inn is located on Milwaukee Avenue just off the expressway on the east side of 90/94.

Time: Social: 5:30pm.
Dinner: 6:00pm.
Presentation: 7:00pm.

For reservations:

Cost: \$20 includes the presentation and your choice of a chicken or pasta four course dinner. Please call the IEEE Business Office at (800) 898-IEEE or (630) 493-4333 with your entree preference.

NOTE: Attendance at IEEE Technical Meetings is acceptable as one PDH (Professional Development Hour) per meeting, where continuing education is required for renewal of the P.E. licenses.

The upcoming 1999 IEEE - IAS meeting dates are: Mar. 24, Apr. 21, and May 12.



IAS/IES

Field Testing of Equipment and Cables

Wednesday,
January 20, 1999

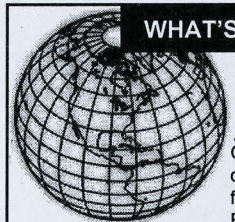
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IEEE CHICAGO CHAPTER

Jack Kilby to Receive Washington Award

**Tuesday,
February 23, 1999**

Jack St. Clair Kilby, acknowledged as one of the 20th Century's most important inventors, has been elected to receive the 1999 "WASHINGTON AWARD," one of engineering's prized honors. Mr. Kilby's invention of the "Chip," the Monolithic Integrated Circuit, in 1958 at Texas Instruments spawned the microelectronics revolution. The IEEE has awarded Jack Kilby the David Sarnoff Award, the Cleo Brunetti Award, the Consumer Electronics Award and the Medal of Honor. Jack St. Clair Kilby is a IEEE Fellow.

The award will be presented to Mr. Kilby during National Engineers week at a banquet to be held Tuesday

evening February 23, 1999 at the Union League Club of Chicago. The IEEE is a sponsoring society of this annual event. The Chicago Section in showing support of this prestigious award is arranging tables for our members so we can be seated together. For reservations please phone Dennis Lamont at (847) 398-4510. Tickets are \$65.00 each.

Location:

Union League Club, 65 W. Jackson Blvd., Chicago, IL 60604.

Time:

Social: 5:30pm.
Dinner: 7:00pm.

AWARDS DINNER

Calendar of Events

DATE	EVENT
Jan. 12, 1999	IEEE Chicago Section EXECUTIVE COMMITTEE MEETING
Jan. 13, 1999	Electron Devices/Circuits & Systems/Solid State Circuits Societies INTERNET TELEPHONY
Jan. 13, 1999	Power Engineering Society MANAGEMENT OF RELIABILITY — SUMMER, 1998
Jan. 20, 1999	IAS/IES FIELD TESTING OF EQUIPMENT AND CABLES
Feb. 23, 1999	IEEE WASHINGTON AWARDS DINNER

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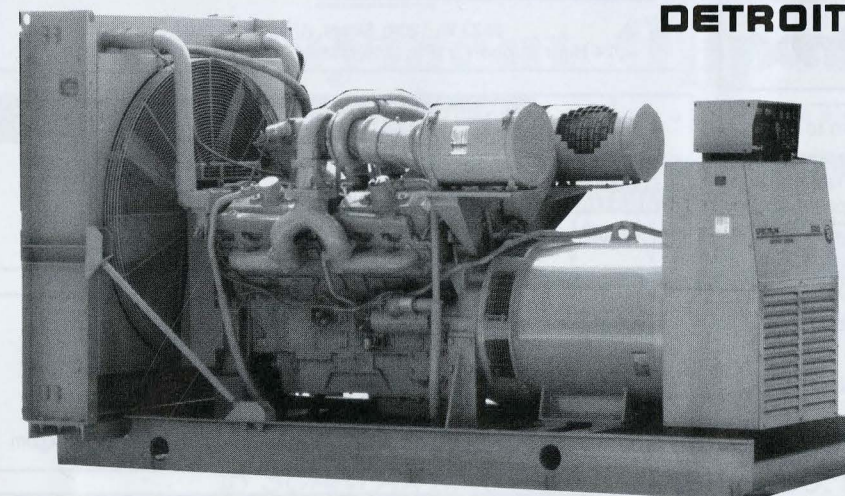


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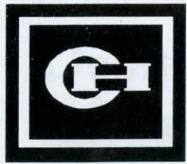
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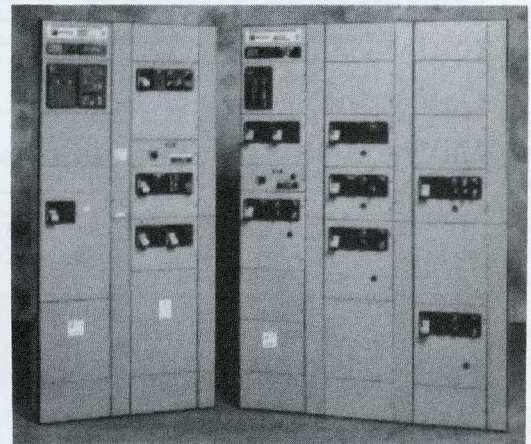
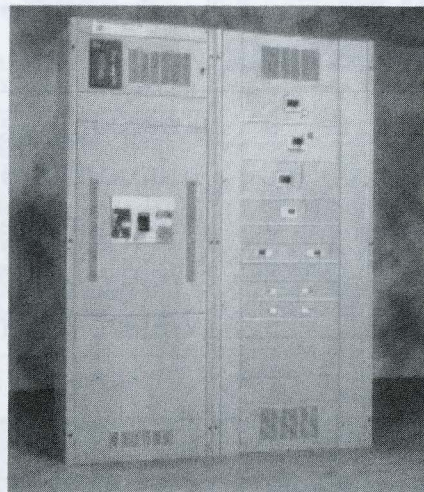
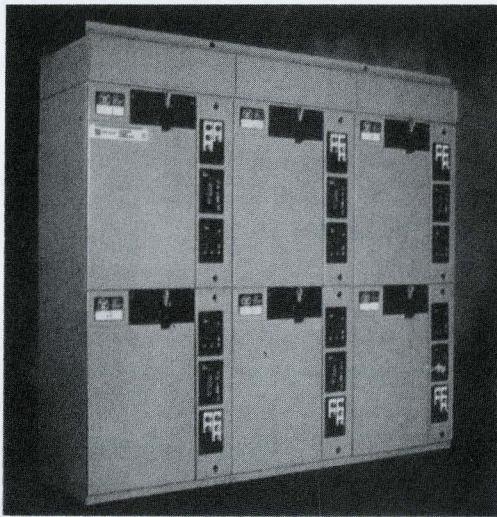


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