# Can / Am EMTP News

## Voice of the Canadian/American EMTP User Group

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### Salford Compiler and DOS Extender

Chicago is the code name for MS Windows of the future. If and when it ever becomes generally available, Windows 95 is said to be its official name. Windows 4.0 would have been too logical for Microsoft just as 586 was too logical for Intel. Clearly, those in control seem to want to keep changing the names of products in order to make harder the planning and advertising of competitors.

*MS-DOS itself might be nearing its end?* Thus began a paragraph of the preceding newsletter that now can be clarified. As expected, computer expert David Szymanski once again was right. The Winter 1994 issue of *Microsoft Magazine*, published by Microsoft Corporation, covers pages 8 and 9 with a mostly-graphical display entitled *"Special preview: Windows 95."* Above the illustrative screen display is a note: *"Long live MS-DOS. Windows 95 replaces the Microsoft MS-DOS operating system but has complete backward compatibility with it ...."* To conclude, this *long live* nonsense would seem to convey the same irony as the stereotypical affirmation to a European monarchy of centuries past. Upon the death of a king, one would hear: *"The king is dead. Long live the king!"* It appears as though DOS **is** about to die. This is **not** good news for those who would like to enjoy a simpler EMTP life outside of MS Windows.

MS Windows 95 has been delayed again. Was the original announcement of release by the end of 1994 anything more than FUDding by Bill Gates? The lead story on page B1 of the December 21st issue of *The Oregonian* has headline: *"Microsoft says new program ready in August; Early testing of Windows 95 shows some kinks that need to be worked out --- specifically in compatibility with current programs."* This was an Associated Press story by James L. Eng, who offers the perspective that *"IBM's OS-2 software has only about 5 percent of the market, another analyst noted."*

The name TPP was used twice in the preceding issue where TP would have been correct. This was in column 2 on page 1, in the paragraph that begins: *"MOUSET is the ..."* The discussion was about Salford EMTP, so TP rather than TPP is involved, of course. Dr. Tsu-huei Liu first reported this error, on December 27th.

The hope that MATLAB might run efficiently from within Salford EMTP (see July, 1994, mention) seems premature. This according to a report from Gayle Collins of the University of York in England. Her E-mail dated December 14th contained the following summary: *"The gist of the meeting at Salford Software is that the Salford compiler does make provisions through 'terminate and stay resident' interrupts to talk to other programs, and there have been successful, simultaneously-running versions of Salford-compiled programs with commercial programs such as Mathcad. In the case of MATLAB, however, there are few provisions in MATLAB to talk to other programs, and while it could be done, it would be very slow."* It remains to be seen whether Ms. Collins might be able to interest The Math Works, maker of MATLAB, in improved connectivity for its product.

The HELP command at the beginning of execution has been made installation-dependent. Salford EMTP will open a special window for this, and contents can be scrolled up and down in intuitive fashion. The display is ended by pressing the **Esc** key. Colors of the window headline and general contents are the same as for SPY : variables KOLRS and KOLSPY, respectively, which nominally are bright red (12) and the weak white (7) of DOS. Two more colors are used, for each headline (there are two) and the frame around it. Nominally, these are bright green (10) content in a bright yellow (14) frame. But if the user wants different colors, NOHELP of STARTUP (see next paragraph) can be given a packed value rather than the usual unity or zero. The frame color NFRAME is offset by 1000 from the inside color NINSID. I.e., NOHELP = 1000 * NFRAME + NINSID

NOHELP is a new STARTUP variable that can be used to suppress (if value unity) or automatically display (if value zero, as distributed by the user group) the HELP information at the beginning of execution. The idea was inspired by Prof. Bruce Mork of Michigan Tech in private E-mail dated January 4th: *"While I was at Basin Electric [in Bismarck, North Dakota], it was mentioned that ATP, for all its sophistication, lacks any intro screen when the program comes up. ... With all the glitzy programs around, it was suggested that a beginning user of ATP ... Maybe a simple boxed text screen identifying the program would be a good step forward. When the program starts, blank the screen and pop up the ATP box/logo ... Maybe the list configuration could be incorporated in the text box."* This explains why the associated disk file has been named GLITZ.LIS (colorless content of HELP screen). Of course, many non-American readers might be looking for *glitz* in their dictionaries about now, and not finding an entry. The unabridged Second Edition from Random House says glitz is slang meaning *"ostentatious glitter or sophistication." Glitzy* is even better: *"pretentiously or tastelessly showy."* That's the new help screen, all right! What a great idea, the implementation of which was completed January 11th!

Turbo table dumping by Robert Schultz of New York Power Authority (NYPA) in White Plains has one tricky aspect that was described in the January, 1994, issue. See the paragraph that began as follows: *"EQUIVALENCE-d INTEGER and REAL vectors ..."* The problem is that, during table dumping, Salford DBOS might open its error window and issue a complaint such as the following:
**Error: Invalid floating Point number.**
**In TAPSAV_DWRITE at line 181.**
Such trouble, triggered by different data, has not been seen for at least half a year or so. But Dr. Gary Thomann of Power Technologies (PTI) in Schenectady, New York, provided such a new, troublesome case by E-mail on January 2nd. Within an hour, the correction had been made to protect VOLTK within SUBR10 . Now, your Editor repeats the advice of one year ago: Any Salford EMTP user who might experience such trouble is advised to contact developers in Portland immediately.

Novell networking is asked about from time to time. A report of operation compatible with Salford EMTP, and also Hans Kristian Hoidalen's ATPDRAW, was received from Prof. Laszlo Prikler of T. U. Budapest in Hungary. In E-mail dated January 4th, he wrote: *"During the last three months, a heavy test of ATPDRAW was performed by my graduate students preparing their homework. They used the program in a Novell-networked environment, and everything worked fine. I have strengthened my previous opinion that ATPDRAW Version 2.0 is much more stable in usage then the previous one was. I have found that for convenient usage, 5 MB (or more) of RAM is needed. In this case, the simulation program can be invoked inside of ATPDRAW frame (using the very top left pull down menu), and even TPBIG is running fast without paging to disk."*

STATUS='READONLY' is the qualifier that is needed to avoid duplication of configuration files in a networked environment. This is the conclusion of Prof. Bruce Mork at Michigan Tech, who had observed for the networked computers in Houghton that STARTUP could be remote whereas LISTSIZE.DAT and GLITZ.LIS had to be local. Comparing the OPEN statements, it was noticed that STARTUP had been handled with the Salford FTN77/x86 qualifier READONLY whereas the other two files had not. So, January 26th, the other two were made comparable.

TP99 tables have overflowed in Australia! This would seem to be the first case where universal overkill

has failed to satisfy everyone. In E-mail dated October 13th, Stephen Boroczky of Pacific Power wrote that the record-setting user is SEQEB (believed to be South East Queensland Electricity Board). So, a few exceptional list sizes were used to modify TP20 dimensioning, and the result was mailed by air from BPA on November 14th.

## Improvements to Salford TPPLOT

PORTLP is alphanumeric parameter number 68, as is explained in the TPPARAM.HLP file. This 68 **is** the correct index. Unfortunately, as pointed out by Prof. Bruce Mork of Michigan Tech in private E-mail dated December 30th, this is not what HELP for the PAPER command has been advising users for years. So, the following day, 72LPT1 was changed to 68LPT1 in disk file TPPLOT.HLP (text of the HELP command).

The POST subcommand of the PAPER command is used to produce a PostScript approximation to the preceding screen plot. As first pointed out on November 28th in E-mail from Dan Leonard of General Electric in Schenectady, New York, this would result in DBOS ending execution with a complaint about a missing file ("File does not exist at User/7F..."). Of course, the program was corrected shortly thereafter. Yet, any old version remains usable if one knows how to fool it. Your Editor provided GE with the following advice in E-mail dated December 1st: *"Simply copy HEADER1.LIS into HEADER?.LIS where ? is digit 5 through 9. This assumes you wanted paper size 1 of the HEADER1 file."* The problem was with the digit, which inadvertently was being redefined by another use. Fortunately, the modified value was a positive integer less than 9, which is the I1 limit used in building the file name.

STATUS='READONLY' is the qualifier of OPEN that was changed for some EMTP files. Well, the same idea applies to files TPPLOT.BEG, TPPLOT.INI, and others. Corresponding corrections to TPPLOT were made around the end of January.

## News from Outside USA and Canada

The dominant EMTP news from overseas has to be reorganization of the European EMTP user group (see later, separate story) to replace the former LEC (Leuven EMTP Center) in Belgium.

A printed copy of the October newsletter was mailed by BPA to each of its 9 primary EMTP contacts on November 18th. This was one day after the availability of OCT94.ZIP was announced in public E-mail of the Fargo list server by Prof. Bruce Mork. The anonymous FTP site in question is **plains.nodak.edu** of course, and all six years of newsletters can be found in ... **/pub/atp/canam** There also are two *mirrors* (exact copies, albeit delayed in time) of the plains server, with one being in Europe, as later paragraphs will explain.

The South African user group briefly dropped out of contact. The July newsletter and ETEP preprint, which had been addressed to Willie Naudé of ESKOM using the same computer-printed label as in months past, was returned to your Editor at BPA on December 23rd. It had been sent from BPA on September 2nd at a cost of $3.76, according to the postage metering. The delay is noteworthy: not only must a boat have been used, it must have been a very **slow** boat. Well, clarification came by E-mail from Cornel Brozio on January 6th. *"Willie Naude has left ESKOM, in fact he left the country shortly before the April 1994 elections. I believe he now lives in Australia. He was replaced by Lloyd Jones as EMTP contact. Lloyd maintained a list of users but says that he had not received any materials for distribution 'for a very long time'. Lloyd is now also leaving (at the end of this month), and is being replaced by Dr Warren Levy. Warren is your EMTP contact person."* Dr. Levy is said to use E-mail address **a48469@it1.eskom.co.za** As for a conventional mailing address, this seems to have changed slightly : Information Technology Department; Megawatt Park D1 Y42; PO Box 1091; Johannesburg 2000. So, the ATP contact with ESKOM has been reestablished. But what about other foreign ATP user groups? The lesson should be obvious: notify developers in Portland of any such change when (or before) it occurs in order that mailings from BPA not be badly delayed. Also, read newsletters on disk (available from Prof. Bruce Mork's plains server) to learn what you are missing!

Europeans with access to Internet still can receive Salford EMTP and TPPLOT materials from Prof. Laszlo Prikler of T. U. Budapest in Hungary. In E-mail dated January 4th, he wrote: *"My offer to send ATP to other licensed users in Europe was an open-ended offer, so I am ready to send it through Internet by FTP during this year also."* Of course, program developers do not want Prof. Prikler to distribute old materials, so new GIVE1 and GIVE2 disks were mailed by air from BPA later that same day. In cyber space, Prof. Prikler's address remains as in years past : **priki@vmt.bme.hu** Finally, the institution name should be clarified at least once. In Hungarian, Prof. Prikler's school has the name Budapesti Müszaki Egyetem, which is translated into English as the Technical University (T.U.) of Budapest.

## More about Electronic Mail ( E-mail )

CompuServe, Prodigy, AOL, and other on-line services of the United States seem about to undergo a direct challenge from Microsoft. This is gleaned from the upper-right corner of page 9 of the previously-mentioned

issue of Microsoft Magazine. Under a headline that reads *"The Microsoft Network: Microsoft's own online service,"* one learns: *"When you upgrade to Microsoft Windows 95, you can merge onto the information highway while you're at it. Windows 95 includes access to a new, easy-to-use online service, The Microsoft Network, that puts you in touch with the entire world. And it's your direct connection to Microsoft."* That's ***super****highway*, Bill, not an ordinary, old, conventional highway. If you are going to compete with the established leaders, you must learn to exaggerate along with the telecommunications industry!

The Montréal, Québec, Canada area has good, cheap E-mail service as reported in "News:" of the Fargo list server dated June 26th. The following is pasted from that source. The E-mail service used by Stu Cook is clearly commercial, but a lot cheaper than CompuServe. In a private E-mail message dated June 22nd, he wrote: *"By connecting to their gopher server, I found the following file: Welcome! Inter'Acces is an Internet Connectivity Provider in the Montreal, Quebec area. The company provides not only Internet hookups, but also a complete spectrum of Internet connectivity services. Here are some of the areas we can help you with: Installation and maintenance of 'Private Virtual Networks' which can connect your branch offices at a fraction of other alternatives. Installation and maintenance of Firewalls to ensure company data integrity and security. Setting up Gopher, WWW and Mosaic information servers to help your company publicise its products and services Marketing your products across the Internet. This new medium has become a booming market with over 20 million users worldwide. This number is expected to more than double every year! .... Contract us at sales@Interax.net, or at (514) 367-0002."* End of advertising. Mr. Cook concluded with a table in Canadian dollars (each is worth about 3/4 of an American dollar):

Shared Dial-In SLIP/PPP Service (9600 or 14400)
No Subscription Charge, No Minimum Charge!
Monthly Usage Sliding Scale:

| Hours | Hourly Rate |
|---|---|
| 0-3 | $6 |
| 3-8 | $4 |
| 8-18 | $2 |
| 18+ | $1 |

In later mail dated June 24th, Mr. Cook clarified about speed: *"In practice I find that after a few early slow blocks I am transferring data at about 1600 B/s on a regular basis and this doesn't seem to vary with the time of day, at least not that I have noticed. So my costs are* ***very****, very much lower than on CompuServe."* True, with CompuServe charging US$20 per Mbyte (i.e., 2 cents/Kbyte). Suppose Mr. Cook were overly optimistic; suppose he could transfer only 1 Kbyte/second. That would be 3.6 Mbytes in an hour, or US$72 (about $100 Canadian) at CompuServe rates. Even those first three hours look very cheap by CompuServe standards (6 vs. 100 CanaBucks, in Cook-speak!).

CompuServe might profitably be avoided for yet another good reason: to protest what has been called the CompuServe-Unisys GIF Tax. This development first came to your Editor's attention in E-mail from Robert Meredith of NYPA. Dated January 9th, the header shows a news group posting dated January 2nd by Michael Dillon at **mpdillon@halcyon.com** The bulk of the 10 Kbytes is an articulate, open (public) letter from Pat Clawson, President and CEO of TeleGrafix Communications Inc. in Huntington Beach, California, who is said to be reachable at address **rip.support@telegrafix.com** Selected portions of this letter summarize the problem: *"The announcement by CompuServe and Unisys that users of the GIF image format must register by January 10 and pay a royalty or face lawsuits for their past usage, is the online communications community's equivalent of the sneak attack at Pearl Harbor. .... We at TeleGrafix Communications have no quarrel with those who seek to protect their intellectual property and profit from it. .... But in our opinion, the timing and circumstances of the CompuServe-Unisys action indicates this is a shakedown of the online communications community by two powerful corporations, rather than a reasonable effort to protect intellectual property. The GIF format has been in widespread public use since 1987. Its widespread use and royalty-free licensing has been encouraged by CompuServe for years. Neither CompuServe or Unisys have made any significant improvements to GIF or its underlying LZW algorithm and compression process to justify charging for what has been free. .... We expect that the CompuServe-Unisys action will spell the death of GIF as a commercially viable technology, shifting the attention of the online communications community to JPEG imaging."* Fortunately, ATP developers have not yet used any .gif pictures. But they are everywhere on the Internet.

Teleport for Internet access in Portland? This first was called to your Editor's attention by Laurent Dubé in E-mail dated November 19th. No, Teleport would not be cheaper than Agora ($5/month). But it probably would be better, and certainly is much bigger. Advertising on page 42 of the December issue of *Computer Bits* magazine claims 2500 users, 181 phone lines, and 8 Sparc stations! The company's on-line information includes the following history: *"Teleport originated in a technical bookstore in Beaverton, OR[egon,] and has been providing Internet email continuously since 1987. Starting with one PC in a bedroom, Teleport has grown to fill a downtown Portland office with multiple (7 currently) SPARCstations running SunoS 4.1.3 and dozens of modems (12 in Vancouver, 8 in Salem, 145 (89 dialup, 56 IP) in Portland) and 25 GB of disk."*

More real junk E-mail arrived from the Fargo list server on November 4th. The sales pitch began as follows: *"Computer Software now available; Electrical*

*Engineering Professional Engineer Exam Review for DOS. Now you can take advantage of computer-based training to prepare for the licensing exam!"* Etc. Money ($69.95 minus a *"Power Systems Server user discount"* of $10) was to be sent to Opercon Systems at an address in Alameda, California. What reader knows if there is a connection to PG&E (Pacific Gas & Electric), the big power company of the area? The name given is Wayne Hong, and the E-mail address is said to be the simple **wxh2@pge.com** even though the header shows the message originated at the more complicated address **WxH2%TsSPC%PS@bangate.pge.com** Has Prof. Bruce Mork opened his list server to overt peddling (in this case of a product that has nothing to do with ATP ) ? The user group hopes not, and CompuServe users, who have to pay for such garbage, hope not even more.

Trinidad, an island of the West (i.e., American as opposed to real, Asian) Indies, was first heard from by E-mail on December 7th. This was when Dr. Chandrabhan Sharma, who uses address **<sharma@ldc.uwi.tt>** at the University of the West Indies in St. Augustine, asked: *"how I may obtain a license for your software package EMTP."* In his response by return E-mail later that same day, your Editor attached great importance to the new channel of communication. This is another story of the importance for those who are isolated: *"BPA did receive FAX from Trinidad and Tobago Electricity Commission about that time. This was from Indarjit Singh, who asked questions about which we have no particular knowledge or expertise. These were appropriate questions for the Fargo list server, however .... If you know Mr. Singh, I would encourage you to have him submit such questions to the Fargo list server. Details are in the file EMAIL.ZIP on the GIVE2 disk. Why ask just us when one can ask 200 other address at the same time?"*

The Hannover mirror of the plains FTP server is available to anyone who might have trouble connecting to the plains server. This reminder was issued by Mathias Noe of the University of Hannover in Germany. In public E-mail of the Fargo list server dated November 17th, he wrote about *"the anonymous ftp server at the University of Hannover. It contains a mirror of the server at **plains.nodak.edu** that is updated weekly. .... The login procedure is:*

*internet number : 130.75.2.2*
*login : anonymous*
*password : guest or your complete Email number*

*The information is located in the path **pub\special\atp**"* Following the departure of Harald Wehrend at the end of last year (see preceding issue), Mr. Noe, who uses the address **noe@server.iee.uni-hannover.de**, is the main EMTP contact in Hannover. His reminder followed a complaint the preceding day from someone in Chicago. Sure, if the American server might be unreachable at some time for some reason, try the European mirror!

A second mirror of the plains FTP server was announced by Prof. Bruce Mork of Michigan Tech. His public E-mail of the Fargo list server dated January 20th explained: *"I have established a mirror of the plains ftp site at Michigan Tech. To access this site, do an anonymous ftp login to **ftp.ee.mtu.edu** The directories are in the exact same structure as at the plains site: /pub/atp is the root directory. Our site will do a daily update from **plains.nodak.edu** Eventually (probably this summer) I will make the Michigan Tech site the master ftp site, and change the plains site to a mirror. We will then gradually phase out the plains site."*

Execnet is used by Robert Schultz of New York Power Authority ( NYPA ) in White Plains, as has been mentioned many times. Well, a nice review of this service can be found on page 628 of the January issue of *Computer Shopper*. The fee structure is interesting. *"Subscriptions are based on either connect time or the quantity of your downloads. They start at $10 for 1,800 minutes or 33 MB of file downloads good for 30 days."* Compare this with CompuServe's $20 for each Mbyte (the old days, before your Editor knew better)! Incidentally, *Execnet* is a great name. Probably it was grabbed early. Agora is not bad, although a little esoteric. But what about **csos.orst** as used by Laurent Dubé? The service must be better than the name (Mr. Dubé seems happy)!

Ajoy Bose of Commonwealth Associates in Jackson, Michigan, provided an inspiring tale about his search for better E-mail. In a message that arrived on September 8th from **ba841@freenet.carleton.ca** , Mr. Bose explained: *"I made several enquiries. A colleague recommended using Michnet, and gaining access to the freenets through gopher. This is how I am sending you email now. The freenet does have FTP capabilities. Detroit allows FTP to any site. Traverse City asks that the user send email so that the site the user is interested in will be put on their FTP menu. The only financial cost to the user of these facilities is a donation (not mandatory). I dial in to a local number at Jackson Community College and can get through to the freenet free. Of course their fastest modem is 2400 baud and with data compression I believe we can go up to 9600 baud. Yesterday evening I FTPed the July 94 Can/Am EMTP News. It took 5 - 6 seconds for the FTP. To transfer to my PC however took 30 - 40 minutes. That was at 5.10 pm. I am told that these transfers are much faster at 5.00 am. I will have to come in to the office that early when I try to get ATPDRAW. The maximum login time on the freenet seems to be 60 minutes."* In case the reader did not notice, the message came from Canada (see **.ca** at end). Yet, Michigan is one of the 50 United States! That's the beauty of E-mail: no hassle with Customs at the border!

Superb public advice about harmonic analysis was provided by Gabor Furst of suburban Vancouver, British Columbia, Canada. In 10 Kbytes of E-mail from the

Fargo list server dated September 14, Mr. Furst began: *"In recent months, there were a number of requests on the Server related to power systems harmonic analysis. I responded to some, and I also had some private enquiries. Not all, but most, of those who wanted some help were relative newcomers to ATP. Their desires to use EMTP for harmonic analysis were specific to this problem, with the knowledge acquired in this process for other uses of EMTP being a very useful benefit. As a transmission planning engineer who has worked during the last ten years as an independent consultant, I have been involved in a variety of transmission system harmonic problems. I would like to summarize some of my thoughts on this subject in perhaps two brief reports to the Server, hoping that other colleagues will add their experience and comments. I would divide transmission system harmonic problems into 5 major classes.* ***Group A*** *: harmonic pollution analysis --- this would include the analysis of some indicators such as voltage distortion or IT products etc.;* ***Group B*** *: harmonic problems related to shunt capacitor banks and harmonic amplification in circuit elements.* ***Group C*** *: resonance and ferro-resonance problems; and finally,* ***Group D*** *: interaction and interference of harmonics with control circuits.* ***Group E****: Interference with telecommunication circuits. I will deal only with A, B, and C, with C in lesser detail, as amongst our colleagues of the some 200 subscribers to the Server, there are those who have are far more knowledgeable on C, D and E than I am."*

Digitized historical documents numbering in the millions should be available via Internet around the end of the decade. This comes from a story entitled *"Library of Congress to Digitize"* on page 23 of the December, 1994, issue of *Computer Bits* magazine. *"The library has unveiled its multi-million dollar National Digital Library project, with five million rare American artifacts to be available digitally .... The National Science Foundation has awarded $24 million in grants to six university-led teams to work on digital library technologies."* But what about commercial, multi-media exploitation? This will be left to others. A Civil War (1861-65) photo by Mathew Brady was cited as an illustration: *"It would be up to third parties, Disney perhaps, to combine the Brady photo with period music, a narration, and battlefield maps to produce a commercial Civil War CD-ROM. That is how the Library operates today with its public domain archival material."*

GO CORP is the CompuServe way of connecting with a company, The Company Corporation, that is located in Wilmington, Delaware (USA). Incorporation is the service being sold in advertising on page 37 of the December issue of CompuServe magazine. *"Take about 8 minutes and call or fax the number below. Or contact us on-line; we'll incorporate you within 24 hours!"* How big an operation is this, and how much does the service cost? *"You can form a Delaware corporation for forty-five dollars only plus a state filing fee of $74, any other state for just $100 plus state filing fees. We have been doing this for 22 years. And we've set up over 110,000 corporations. That's all we do. We are hooked up to affiliate offices in every state in the country."* No Internet address is given, but FAX is (302) 575-1346.

Fraud is a serious problem when it comes to buying or selling via E-mail. From an editorial note by JE on page 49 of the December issue of CompuServe magazine: *"Consumer advocate and forum regular David Horowitz says people are more exposed to consumer fraud today than at any other point in history, and computer bulletin boards, the Internet, and other high-tech resources are now augmenting the post office and the telephone as con artists' tools of choice."*

Copyright protection of ATP materials that might be distributed by E-mail remains a concern. *"How copyright laws will affect on-line data"* is the headline of a story on page 17 of the December 5th issue of *PC Week* magazine. *"In July, the Working Group on Intellectual Property Rights ... issued proposed changes to the 1976 Copyright Act that are supposed to address, among other things, electronic distribution of information."* It would seem that the legal status of materials at Anonymous FTP sites is less than clear. Any reader who is legally inclined is encouraged to submit half a page or so of clarification, if he is able.

Is it a civil rather than a criminal matter, if one steals software in the USA? I.e., do penalties consist only of monetary damages rather than possible time in prison? Historical practice seems to indicate this. Recently, an important case involving MIT has added to the precedent. *"A judge in Boston dismisses an indictment against a student, saying new laws are needed to deal with illegal copying of programs"* is the sub-headline of a story on page A23 of *The Oregonian* dated January 1st. *"The student .... was indicted in April for using two of the university's computers as secret electronic bulletin boards, where computer users linked to the Internet could trade illegally copied software. .... Judge Richard Stearns .... said the government had erred in trying to use the criminal penalties of the wire fraud statutes against what was, at most, a civil violation of copyright laws."* A lot of money was involved (*"more than $1 million worth of illegally copied software ... had passed through the system during the few weeks it was in operation"*), but it is not obvious from whom damages might be collected. The student probably has no assets, and prosecuting individual BBS users might be practically impossible.

The usual Microsoft Mail system used at General Electric in Schenectady, New York, USA, seemed unable to handle a UUENCODEd file. In E-mail from Dr. Daniel Baker at address **bakerda@psedmail.sch.ge.com**, a description of the problem came first on November 10th:

*"I received your new files via E-mail and tried saving them out of MS Mail .... I used UUDECODE and got MAIN27.ZIP with no problems. However, when I unzipped MAIN27.ZIP, I got the same warning message"* about the file failing a CRC error check. Within an hour, added clarification was received: *"Our computer people here think the latest problem with the MAIN27.UUE that you sent is in the gateway to our MS Mail system. They suggest you send the files to my VAX account mail address of ...."* Of course, your Editor rapidly repeated the 2-part transfer, only to the VAX-based address. The following day, Dr. Baker confirmed success: *"It was received OK, and decoded and unzipped properly. I am now in the process of linking."* Are there any other good reasons to dislike the way Bill Gates handles mail? Your Editor later observed to Dr. Baker that the Microsoft Mail package that runs under MS Windows on Dr. Liu's BPA computer is disliked because only the body of the message is shown. I.e., the preceding transaction records, which form the E-mail header, are concealed from the user.

## POSTPROCESS PLOT FILE

POSTPROCESS PLOT FILE can create a .PL4 file as output as illustrated by DC-46. However, prior to November 27th, the file type of that output had to be the same as the file type of the input (the signals to be processed by TACS are a .PL4 file that is connected to I/O unit LUNIT2). Well, as correctly observed by BPA's Randy Suhrbier, this was unnecessarily restrictive. Actually, Mr. Suhrbier's complaint was even simpler: Why should he need to modify his own STARTUP file just to perform the postprocessing of someone else's .PL4 file? This was a good question for which there was no good answer other than convenience (it was assumed the LUNIT2 file conformed to the STARTUP choice). A smarter program would not make this assumption. That is the essence of the latest change: the file type is remembered from how the user declared it on his $OPEN statement, so reliance upon STARTUP no longer is necessary. This is the new role of CHLMFS within CIMAGE and SSTACT. The idea was suggested on October 13th, as Mr. Suhrbier was trying to help BPA's Jules Esztergalyos process a .PL4 file that had been received from someone outside of BPA. Such exchanges with the outside world should henceforth be easier.

**FORM=C-like** is a new tag for the $OPEN card, and it will be needed if a C-like .PL4 file is to be connected to LUNIT2 for POSTPROCESS PLOT FILE use. Before, when agreement with STARTUP was forced, there was no need for such specificity. But now, the input file can be of any type. Use of the new tag is illustrated by DC-46, which was modified on November 28th.

**FORM=C-like** also is needed for the $OPEN connection of any C-like .PL4 file to LUNIT4 (the normal I/O channel for .PL4 output). The same code that serviced LUNIT2 also applies to LUNIT4. So, whereas before no FORM= qualifier was used when STARTUP indicated C-like use, now that information must be given on the $OPEN card. The change can be seen in standard test cases DC-24, 40, and 53.

The date and time of a .PL4 file that is created by POSTPROCESS PLOT FILE use will correspond to the operating system time at the beginning of execution. This seems logical enough, but was not true prior to November 28th. For years, the program time was redefined as the program read the header of the file to be postprocessed. So, the output file was given the same date and time as the input file. Well, no longer. The general rule is that the date and time in the header of a .PL4 file correspond to the beginning of execution.

## More WWW ( World Wide Web )

*"The (relatively) new tool MOSAIC for handling the World Wide Web (WWW)"* was demonstrated by Harald Wehrend of the University of Hannover at the meeting of European ATP users (see separate story). Thus began a paragraph within the story about E-mail in the preceding issue. Now, there is a separate story with more detail.

Dan Clark is a computer-oriented National Systems and Research (NSR) employee who presently works as a contractor in BPA's Planning Software Support section. Several days after Mr. Wehrend's mention, Mr. Clark happened to raise the subject of WWW in conversation with your Editor. After being shown Mr. Wehrend's writing, Mr. Clark's response was quite unexpected: *"Come to my workstation and I will demonstrate WWW for you."* Of course, this was done, using the 19-inch monitor of a DEC workstation, for both Dr. Liu and your Editor! An information page about Lawrence Livermore Laboratory (LLL) in California was retrieved as an illustration. Yet, this was slow -- apparently because of the color picture that was imbedded in the page, making for a large file.

The *Digital Systems Journal* magazine describes itself as *"an independent technical magazine"* from Cardinal Business Media, Inc., of Fort Washington, Pennsylvania. The initial article, which covers pages 5 through 8 of the July/August issue, is by Prof. E. Loren Buhle of the School of Medicine at the University of Pennsylvania. Entitled *"World Wide Web Internet Servers,"* this story begins with summary explanations of other tools such as Gopher (*"conceived at the University of Minnesota" where athletes are the Golden Gophers*), WAIS (Wide Area Information Server), and Archie (*"designed by two graduate students at McGill University"* in Montreal, Quebec, Canada --- *"and has nothing to do*

*with the Archie of comic book fame."*). .... *"The WWW goes a step beyond Gopher in merging the techniques of networking, hypertext and hyperMedia to make an easy, but powerful global information system. ... The WWW appears as a series of menus pointing to documents and other hypertext links. T.H. Nelson defined hypertext as 'a body of written or pictorial material interconnected in [such] a complex way that it could not be conveniently represented on paper.' ... Hypertext documents often contain further links to other documents, other resources, or links to locations internal to the original document."* Etc. (four full pages of such relevant information).

## Replacement European User Group

This is a continuation of the same story in the preceding issue. It documents the slow replacement of the former LEC ( the Leuven EMTP Center on the campus of K.U. Leuven in Belgium). To summarize the important news : an ATP user group has returned to Europe.

The Congress-Center in Hannover, Germany, was the site of the formative, first meeting of the new European EMTP-ATP User Group (hereafter abbreviated EEUG). This was November 7$^{th}$ and 8$^{th}$, as reported to the general public on January 10$^{th}$ by the new Chairman, Prof. Mustafa Kizilcay of the university in Osnabrueck, Germany. In public E-mail of the Fargo list server, Prof. Kizilcay provided the following information (all but the final paragraph):

Attendance was respectable: 31 persons representing 27 companies and universities in 14 different countries participated. Of these, 12 became founding members of EEUG --- well in excess of the minimum of 7 required by German law. It is understood that founding members were not more numerous because the average delegate lacked authorization to commit his organization legally. That is the trouble with a meeting of working engineers as opposed to high-level managers and their lawyers: little legal authority.

The Executive Board of EEUG was filled by the election of the following persons:

**Chairman** : Dr. Mustafa Kizilcay, a Professor at Fachhochschule of Osnabrueck in Germany.

**Deputy Chairman** : Dr. Juan A. Martinez-Velasco, a Professor at Universitat Politecnica de Catalunya in Barcelona, Spain.

**Secretary** : Dr. Murari Mohan Saha of ABB Relays AB in Vasteras, Sweden.

**Treasurer** : Dr. Bernd R. Oswald, a Professor at the University of Hannover in Germany.

**Member** : Dr. Soren Stovring-Hallson of NESA AS in Hellerup, Denmark

**Member** : Dr. Thor Henriksen of EFI (the Norwegian Electric Power Research Institute) in Trondheim.

Auditors must not be overlooked, either. For those unfamiliar with the closure of LEC in 1993, unreported (i.e., hidden) income was responsible. Well, the new EEUG is to have public disclosure of all finances. The following two individuals have legal responsibility *"to evaluate and approve the financial report of 1995:"*

**Auditor** : Jose Elguezabal of Lahmeyer International GmbH in Frankfurt, Germany

**Auditor** : Dr. Juergen Schlabbach, a Professor at Fachhochschule of Bielefeld in Germany.

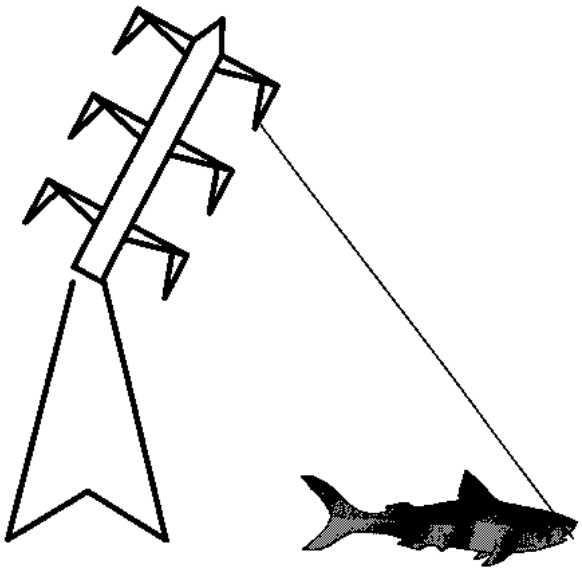
Membership dues were set at 500 DEM (German marks) per year for each university and twice this figure for each commercial entity. It was explained that costs will be watched closely during the first year, and dues might be adjusted accordingly next year.

A technical session was held the following morning (Tuesday, November 8$^{th}$). Prior to the presentation of 4 ATP-related papers, Prof. Kizilcay summarized recent program developments, and supported his talk with a draft of the October newsletter that had been hurried to Hannover the day before by E-mail. A trans-Atlantic telephone connection ended Prof. Kizilcay's presentation, with Laurent Dubé and your Editor on the American end. This was amplified for the audience in Hannover to hear. Then came the technical papers. Finally, another *first* for EMTP user groups was the on-line demonstration of ATP-related E-mail by Harald Wehrend, who used a telephone connection from a portable computer to his service at the University of Hannover. This was projected on a large screen for the audience to see. What an excellent way to end the historic meeting!

Tuesday afternoon, the first meeting of the Executive Board of EEUG took place. It was a short but efficient meeting dealing with several items such as *ATP Journal* (a proposed periodical to publish full-length, ATP-related papers), the next ATP short course (typically held in the summer), and the next EEUG annual meeting. Look for details of these important topics in future issues.

A better E-mail address than the one mentioned in the preceding (October, 1994) issue should be noted. At the end of his message dated November 13$^{th}$, Prof. Kizilcay wrote: *"I have now a second e-mail address, which should be preferred because it is on a server that can be accessed easily by Pegasus Mail under MS-Windows :* ***kizilcay@fhos-rz-hermes.rz.fh-osnabrueck.de****"*

## A Reinvented BPA Will Do What ?



TEOS replaces EOHC as the mail stop for ATP developers within BPA. This is yet another unnecessary complication of the stupid reinvention. On the positive side, at least now we know what the first two letters stand for (Transmission Engineering). Impressive, eh?

A new logo for BPA is to be selected, and employees are being involved in the selection process according to a December 5th memorandum from the Administrator. *"If we get a clear choice from employees, we should have a new logo ready for use by the end of December."* On the other hand, Administrator Hardy does not promise to abide by the wishes of the majority, it must be noted! Anyway, there are 3 choices (see below). The first of these is described as follows: *"This logo captures the essence of the new BPA by drawing strength from hydro-electric and river abstracts, depicting movement in a focused direction. The contemporary design communicates a service-oriented organization drawing from the past, moving into the future."* Well, engineering of the new BPA may be suffering, but advertising would seem to have risen to new heights! Personally, that first logo reminds your Editor of all the water BPA spills, so it may be the most appropriate. Another reviewer agreed, but then suggested that it might look better upside down. Maybe (i.e., that would be appropriate)!

BONNEVILLE P·O·W·E·R ADMINISTRATION

BONNEVILLE B P A

B P A

Other, unofficial logos, too, have been circulating among BPA employees. One of the more suggestive, from an author who prefers to remain anonymous, was placed at the beginning of this story. Addendum during late January: An official BPA memorandum (*This Week*) dated January 23rd states that *"BPA's new logo is below. It was designed by BPA's graphics department on the basis of employee input."* No, the new BPA logo is none of the preceding 3 upon which BPA employees were urged to vote. Is any reader surprised?

BPA load flow, transient stability, and short circuit programs all are to be developed no further. This bad news was learned by Dr. Tsu-huei Liu, who heads such developers, on December 7th. No one is being fired (no authority for that is believed to exist). But two former workers already have been reassigned, and the final disposition of the remainder is unclear. It might take a year to complete the transition. Needless to say, your Editor's decision nearly 11 years ago --- to remove EMTP from BPA control --- looks better than ever. For the record, work on ATP at BPA has not yet been stopped. Even if it were, ATP would continue.

Rejection of U.S. Pres. Bill 6Clinton is seen by most political observers as the reason his fellow Democrats lost control of both houses of Congress during national elections on November 8th. The defeat was both massive and largely unexpected by the mainstream media. This is said to be the most sudden shift of power in 48 years (it was in 1946 that the same party suffered a comparable defeat at the end of the World War II). The difference is, this time there were no hardships of war! In fact, the economy has been good, with slow but steady expansion during the past two years. As a result of the shift of power, might BPA reinvention be reversed? Probably not. On the scale of war (in Bosnia, Korea, or Chechnya), floods in California, debt, GATT, and collapse of the Mexican Peso, the efficiency of government agencies seems not to be of much concern. Reducing their size **is**, however --- if only to reduce their cost. So, the reinvention nonsense continues unchallenged.

Unacceptably slow postal service has been observed by several persons in recent months. Your Editor began keeping track of such horror stories about the time BPA sent a floppy disk to Dr. Daniel Baker of General Electric in Schenectady, New York. Dr. Baker wrote: *"I finally received the disks with ATP material yesterday (the 9th). The slowness did not appear to be on your end as it was postmarked the 31st."* In theory, the service is by air. Yet time in the air would not account for more than a few hours of the 9 days. No doubt service by train 100 years ago was faster! As for mail service in the other direction, there was a letter and floppy disk mailed to BPA by Dr. Gary Thomann of Power Technologies (PTI) --- also in Schenectady. The postage metering bore the date November 3rd, but it was received by your Editor on November 9th. Then there is Dr. Liu, who reported that it took a week to send some item by First Class (air) to

her son at Duke University in Durham, North Carolina. Remember, the Post Office already has been reinvented, so we probably should not expect much of it. E-mail never looked better or more important.

## BPA EMTP Theory Book in WP 5.1

Text of the 700-page EMTP Theory Book of BPA has been converted to WordPerfect 5.1 storage from the crummy, old, paper copy that was submitted to BPA in 1987 by its contractor, Hermann Dommel. The present mention is a continuation of the story in the last issue.

Kwang-yi Ger, the daughter of Drs. Tsu-huei Liu and Kai-hwa Ger, did finish all non-table text (including all equations) with some help from her mother at the end of the ordeal. The result is an easily-managed total of some 2100 Kbytes (under 650 Kbytes after PKZIPping) when an inventory of files in C:\TB was made on January 29th.

Scanning of the figures began on December 22nd when BPA temporary employee Velma Spears-Penn, a student at Prairie View A&M University in Texas, became available during the year-end holidays. It was decided that both high- (300 dpi) and low- (75 dpi) resolution copies would be provided. Clearly, such figures are to be kept as external files, so the manuscript itself has no graphics, and the user can choose his own resolution (either high or low). Where feasible, titles of figures are not part of the graphics --- which saves disk space, of course. As an illustration, those preceding BPA logos all were scanned using 75 dpi (dots per inch).

Any expert who is ready to take a chapter for both review and revision is advised to contact developers at BPA. Remember, ATP has changed a lot over the past 10 years. It is an **ATP** Theory Book that is desired, of course, and many changes are required to transform the writing of BPA's original contractor accordingly. Also, more than changes from what was applicable to BPA's decade-old EMTP are involved. For example, in many places one can find references to the UBC Transients Program (T.P.), which is not EMTP at all (see pages 1555 and 1156 of *IEEE Trans. on Power Systems* dated November, 1989). As an example recently corrected by your Editor, see Table 4-61, which was described as *"UBC version input."* Such non-EMTP *pollution* is not appreciated by BPA EMTP experts, needless to say.

Whole new chapters will be needed to document the new frequency-dependent transmission circuit of Taku Noda, the frequency-dependent network equivalent of Prof. Mustafa Kizilcay, the MODELS control system modeling of Laurent Dubé, CABLE PARAMETERS by Prof. Akihiro Ametani, and ATPDRAW by Hans Kristian Hoidalen. In addition, massive changes to other, existing chapters are anticipated. Soon, we all will have **an** EMTP Theory Book from the '80s. To make this a current, complete **ATP** Theory Book probably will take substantially longer.

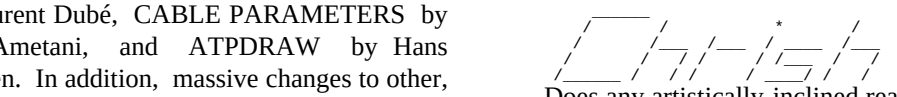
## E-mail in Portland : BPA and Agora

About BPA E-mail (use of **thliu@bpa.gov** on Dr. Tsu-huei Liu's PC), the most important thing to be remembered is its location: remote. If the network is down, or if the remote mail computer is not working properly, there will be no mail. So, although MS Mail under MS Windows on Dr. Liu's computer generally works well during normal working hours (more about this later), it may have reliability problems at other times.

Speed of Agora FTP continues to be impressive. This is a continuation of the mention of *"a T1"* in the preceding issue. When the 62-Kbyte October newsletter, OCT94.ZIP, was sent to Prof. Bruce Mork at Michigan Tech in Houghton around 16:50 on November 17th, fewer than 3 seconds were reported; and once again, human perception confirmed the reasonableness of this figure.

How fast is a T1? Chris Hockert of neighboring Benson High School was the first to respond to this question. In E-mail dated November 29th, he wrote the following: *"Let me see, a T1 is a 1 Megabit device that is able to do serial communications over the Internet. That's just an educated guess."* Initially, this was thought to be too speculative to be used. But it seems to have been confirmed. The second person to respond about T1 was Walter Dykas of Oak Ridge National Laboratory (ORNL) in Tennessee. In E-mail from **wpd@ornl.gov** dated December 6th, he wrote : *"I am not a expert, but this is what I have gleaned from several phone conversations this afternoon. T1 - is a high speed data line, over a phone line, with a data rate about 1.54 MB/sec. T3 - another high speed line, over a phone line, needing special equipment (compression, data correction), with a data rate about 40-50 MB/sec. There are others here at ORNL, Ethernet (10 MB/sec), Token Ring (4 or 16 MB/sec), and FDDI (100 MB/sec), all with different topologies and equipment requirements."* Yes, that is fast. There is no comparison with the original Agora connection of 9600 baud. Rather than an improvement of ***an*** *order of magnitude*, it is about **two** (a factor of 10**2 = 100)! That seems to be the way with these electronic revolutions: improvements are staggering --- in this case, at no extra cost.

Speaking of Chris Hockert, his E-mail ends with the imaginative, character-based logo that follows:




Does any artistically-inclined reader have a suggestion for

the Can/Am user group? Before Mr. Hockert's use, the only other such logo that your Editor can recall was that unforgettable LEC Christmas tree that accompanied the since-denied signature of Chairman Van Dommelen (see the January, 1993, newsletter)!

Agora finally has been used to send ATP FORTRAN to someone in need. It was early in the morning of November 30th that DEC VAX/VMS source code was **put** on the computer of Ivano Bonfanti of CESI in Milano, Italy. While an important development, there were problems. In addition to the usual, slow upload (using a 9600-baud telephone connection), there was slow transmission. Quoting from your Editor's explanation later that same day: *"Why Agora was so slow last night, I have no idea. I have never felt it to be so sluggish. Any meaningful step necessitated a delay on the order of 10 seconds. Clearly, someone with higher priority was monopolizing the machine. So, whether slowness of the transfer was due to Agora, or the transatlantic circuits, is unknown. In any case, the FTP of ALLFTN.ZIP required nearly an hour. It began at 03:19, and ended at 04:12. This is terrible, for less than a Megabyte."*

Cornel Brozio of ESKOM in South Africa was on the receiving end of the first big electronic mailing of ATP materials from BPA. He was the one who encouraged the experiment. In E-mail dated January 9th, he wrote: *"Like Tsu-huei's, my machine runs Windows, with Pegasus Mail, which automatically UU en- and decodes attached binary files. Like I said, I have had success with this method. Recently some pretty large files (around 1 MB) were transferred to me from Oxford University .... Everything worked fine on this end. So, I would be most willing to give it a try!"* So, we **did** --- first with the 417-Kbyte TPPLOT.ZIP. After this transfer seemed perfect, the second test was the entire GIVE1 disk (except for unneeded PKZIP204G), which totaled 981 Kbytes after archiving. For this, there was a delay of about a minute (MS Windows hour glass) after clicking on the **Attach** button --- presumably as the local file GIVE1.ZIP was sent over the network to a remote mail computer. One after another, such pieces of the 3-disk package were mailed, and received successfully. For anyone having a compatible system, this would seem to be ideal because it is batch-mode (i.e., it ties up nothing in real time). As Mr. Brozio wrote after the initial success, *"E-mail certainly seems like a way to go! ... Overnight door-to-door delivery between continents!"*

FTP transfers of GIVE1, GIVE2, and DBOS (all .ZIP archives of the corresponding floppy disks) began from BPA on January 13th, when Prof. Bruce Mork of Michigan Tech in Houghton became the first guinea pig. Speed was acceptable during normal working hours (sorry, there is no record of precise time). In the order stated, transfer rates were remembered to be around 6, 10, and 14 Kbytes/sec, respectively. Since this is done using the time-shared environment of MS Windows on Dr. Liu's COMPAQ 486, the computer is free for other uses at the same time. An advantage of the remote mail system at BPA is simple: there is no load on Dr. Liu's computer as the enormous files actually are being pushed (FTP PUT). A remote mail computer (someone else's hardware) is doing the actual work. This has its advantages.

Walter Dykas of Oak Ridge National Laboratory (ORNL) in Tennessee endorses MS Mail's automatic UUENCODEing as described 2 paragraphs above. After first sending all Salford EMTP materials by FTP to a special address using a special password, DBOS.ZIP (contents of the DBOS disk) was sent a second time to correct a transmission error. This second time, FTP was not used. In E-mail dated January 19th, Mr. Dykas reported: *"Why did we even consider FTP? The file DBOS.ZIP was transferred to me from my mail server, decoded (correctly), and filed in less than 30 seconds!! I use PC Eudora for Windows."*

## News about Laurent Dubé's MODELS

A MODELS Primer has been written by Gabor Furst of suburban Vancouver, British Columbia, Canada. As a 66-page WordPerfect 5.1 disk file, availability to the general public was announced on January 17th. In E-mail of his Fargo list server, Prof. Bruce Mork announced: *"I've placed the file **atp/models/tutor/modprime.zip** on the plains ftp site."* On January 23rd, Mr. Furst provided some context: *"Based on my experience as a first time MODELS user, and after converting some of my TACS files including the DC-22 Sub-case 4, SVC model, to MODELS, I wrote a MODELS Primer to assist the first time and novice MODELS user. The Primer was reviewed by Laurent Dubé, Dr. Sayeed Ghani (University of Northumbria U.K.), Dr. Kurt Fehrle (who gives the MODELS session at the Florida course) and Bruno Ceresoli (ENEL Research, Milan). Any comments re. errors, omissions, and suggestions for the improvement of the Primer, will be much appreciated and included in the next version. You may send them directly to me or via the Server."*

## Taku Noda Frequency Dependence

New frequency-dependent modeling for cables, overhead lines, and who knows what else (time will tell) is being supplied by Taku Noda, the former student of Profs. Akihiro Ametani and Naoto Nagaoka at Doshisha University in Kyoto, Japan. Thus began the story having this same title in the preceding issue. Now, more is known and can be reported.

That proposed IEEE PES paper by Noda, Nagaoka, and Ametani was accepted, subject to changes, for

presentation at the 1995 Winter Meeting in New York City. The revised manuscript was completed and sent by delivery service to New York on December 15th, so any copy older than that is just a draft. The paper, IEEE number 95 WM 245-1-PWRD, is to be presented by Mr. Noda himself on Tuesday morning, January 31st.

Mr. Noda is back at Doshisha University as a doctoral student of Prof. Ametani as this paragraph is being keyed on January 14th. E-mail was received from him earlier in the week, from address **dt941101.duaic.doshisha.ac.jp** Doctoral students seem not to be given nice mnemonic beginnings (e.g., **nnagaoka** for Prof. Naoto Nagaoka).

The request NODA SETUP has been removed from CABLE PARAMETERS and given full status along with JMARTI SETUP and the many other request words that precede the miscellaneous data cards. Avoidance of duplication is the reason for this change. Believing that NODA SETUP is needed by LINE CONSTANTS as well as CABLE PARAMETERS, the code to request it has been moved to the universal location that precedes all supporting programs. So, the final two data subcases of DC-27, which illustrate the use of NODA SETUP with CABLE PARAMETERS, had their data cards reordered a little on December 25th.

TAKUNODA.CCC is the name of an ordinary edit file that is being used to connect with Taku Noda's fitter beginning December 30th. That is, initially, for all testing, the fitting is being done outside of ATP as a postprocessing operation. So, TAKUNODA.CCC is a reserved name that users should avoid for any other use. If such a file exists at the start of execution of any data case involving NODA SETUP, the file will be over-written (i.e., destroyed).

Yes, LINE CONSTANTS **has** been connected to NODA SETUP following the detailed advice and continual supervision of BPA's Dr. Tsu-huei Liu. She designed for LINE CONSTANTS what earlier had been done for CABLE PARAMETERS in order to satisfy the needs of Mr. Noda's separate fitter. The NODA SETUP connection to LINE CONSTANTS became operational January 7th, as illustrated by the new 8th data subcase of DC-59. This is a 3-phase example with line geometry taken from DCNEW-3 (BPA's 500-kV overhead line that connects John Day with Lower Monumental).

The Z-transform upon which the new procedure is based is responsible for one important complication that probably would not be understood by the average reader of the IEEE paper. It was December 15th that Mr. Noda explained this detail at BPA: simulation time-step size DELTAT is required input to the data generator that will be connected via request word NODA SETUP. This is unlike SEMLYEN SETUP or JMARTI SETUP for which the output can be used with any time step. If not clear from the IEEE paper itself, this detail should be clarified in the closure.

About CABLE PARAMETERS by Prof. Akihiro Ametani (see the July, 1994, newsletter), those 18 test cases that were added to DC-27 and DC-28 had their solutions documented on comment cards for the first time November 12th. This was not important for BPA, where old solutions are retained for future mechanical comparisons (using shareware FC). But it is important for the average user, who had no idea what the solutions might look like. At least now every user can see what selected parts of the output look like.

## Free - Format STARTUP File

STARTUP now allows free-format specification of parameters as an alternative to the regular, fixed-format file of years past. The suggestion for this extension came from MODELS author Laurent Dubé during his visit to BPA on December 15th. To visualize the concept, think of the existing TPPARAM.DAT (for TPPLOT use), or the better-known SYSTEM.INI file of MS Windows. The user specifies just one parameter per line, by name (following the MS Windows model rather than the TPPARAM one since the latter uses the more primitive numbers rather than names). In-line comments are allowed on the right in order that users could write themselves notes about their changes. Entire comment lines, too, can be added, just as with ATP data. Finally, order is arbitrary, so the user can group his changes according to function (now, there is an artificial separation of integer, floating, and alphanumeric data).

STARTUP.FRE is a free-format example that can be found on the GIVE1 disk of Salford EMTP distribution. At the time of addition December 31st, it was the free-format equivalent of STARTUP on the same disk. If one copied STARTUP.FRE onto STARTUP, execution should be unaffected.

Speed of free-format processing is not too bad. Yes, it is slower, and the difference can be measured. On the other hand, for your Editor's 486/33, the difference is so small as to escape detection based on human perception. It is on the order of 1/10th of a second for the case of minimal comments, which results in files of nearly the same size. Of course, unlimited comments could be added, and any such usage will slow execution further, as is the case for comments in EMTP data. Yet, comments are discarded as fast as they are recognized, so there is no burden other than the initial input. Another change that might slow execution is reordering of the entries. As distributed, entries are in natural order, and this is maximally efficient. This is because numerical searches are circular, with the next one beginning where the previous one ended. Yet, the effect of ordering is small

now, and should remain small as long as the number of parameters is not expanded drastically from the present 200 or so. This is because the searching is in RAM, so is much faster than the input from disk. Even if the disk file is held in RAM by disk caching, the original input is slower because library routines that do I/O are relatively slow when compared with searches in RAM. That is what the testing seems to indicate, anyway.

The WordPerfect disk file H01E.WP5 of Section I-E of the Rule Book contains explanation of all STARTUP parameters. This was announced publicly in "News:" of the Fargo list server dated 1 April 1994. So, any user wanting a fully-annotated file can add text from the WP5.1 file to his STARTUP.FRE file. Remember that any text preceding the last parameter will be handled whereas text following $EOF will never be read. So, comments at the bottom of the file are free in the sense that they should not slow execution.

## Destruction of Comment Cards

NOCOMM is a new parameter of STARTUP that is used to kill comment cards (data lines that have the letter "C" followed by a blank in columns 1 and 2) as quickly as they are detected. Value unity will ignore all comments this way, whereas value zero means no change from years past (i.e., comments are stored and sorted).

The idea for this latest choice came from BPA's Randy Suhrbier on December 8th as a form of partial relief from the demands of James Randall's 46K-card data case (see the October, 1993, issue). Salford EMTP for MS-DOS computers had no real problem, but DEC VMS computers did. For the latter, expansion of the card cache from 75K to 100K lines was the straw that broke the camel's back. Or, more accurately, it was the straw that raised the concern of camel driver Suhrbier. With 80 bytes for each line, 100K requires 8 Mbytes of virtual address space. For VMS, this is an extra burden on the operating environment --- whether or not data of usage actually requires any such storage. Such is not the case for Salford DBOS (using it, one only pays for what one actually uses, and even this could be returned at the end of usage). So, DEC VMS had a problem. If the extra burden could be requested in STARTUP, this probably would have been acceptable. But as coded today, the 75K is fixed in FORTRAN, so is particularly unsatisfying.

It should be mentioned that $COMMENT is a binary toggle that can be used to make invisible all comments of an arbitrary block of data. I.e., the user will never see such comment cards. Unfortunately, this control occurs later --- at the time of output. It in no way reduces the burden of the card cache for which the DEC VMS user has to pay such a high price. Variable KOMENT of the STARTUP file is said to destroy comments, but it works through the switch of $COMMENT, so is too late (the burden of input and sorting have already been paid). Of course, when KOMENT was constructed during the mid-80s, no one was thinking of 50K or 100K. Probably 10K had never been exceeded. To conclude, the new solution is a response to a new crisis of proportions.

Actually, Mr. Suhrbier says that the idea to destroy comments earlier --- at the instant of detection --- was Mr. Randall's. This is believable. Who better than the source of all this trouble to appreciate the magnitude of the waste?! I.e., how many thousand comments did Mr. Randall himself contribute (the problem with kids just out of college is they work too fast!) ? Seriously, though, it does all make sense. Anyone who would assemble tens of thousands of data cards can not possibly remember many details of what he has created. So, upon serious consideration, it is natural enough for the largest cases to have more than their share of comments. The biggest of cases presents a great, new, opportunity for saving. Even if VMS had not been particularly burdened, the change is desirable because the burden of $INCLUDE use and sorting by class is reduced, and this speeds execution.

It should be remembered that all $INCLUDE files, too, are affected by the new switch. Take DC-58 as an example. Output of this begins as follows:

```
 EMTP begins.  Send (SPY, file_name, DISK, HELP, ...
  ---   59   cards of disk file read into card cache ...
  --- Pass 1.  Card = 36.  ... $INCLUDE = dc58inc1.dat
  --- Pass 1.  Card = 54.  ... $INCLUDE = dc58inc2.dat
  --- Pass 2.  Card = 56.  ... $INCLUDE = DC58INC3.DAT
```

This was before the change. Using NOCOMM = 1, these 4 numbers are reduced to 22, 10, 28, and 29, respectively. Had KOMENT instead of NOCOMM been used to kill the comments, there would be no such reduction in the numbers.

Any $INCLUDE that is continued onto a second or later line no longer involves a comment card. DC-8 illustrates such usage. Well, the card immediately following $INCLUDE now has a blank rather than a "C" in column 1. This is true regardless of the value of NOCOMM. This is a change of the rules for everyone, readers are warned.

LINE MODEL FREQUENCY SCAN (LMFS) makes special use of comment cards immediately following the $INCLUDE statements for the models. The second and third subcase of DC-51 illustrate this. Such usage has not changed. However, it is incompatible with the use of NOCOMM = 1. Should the program discover that an LMFS data case has NOCOMM = 1, this switch will be changed to zero automatically. Since LMFS data cases typically are small, lack of the NOCOMM switch is not much of a hardship.

Standard test cases DC-13, 14, 29, 36, and N10 required minor modifications for use with NOCOMM =

1 to kill all comments immediately. The parameter KASEND = 5 of STARTUP is related. Recall that this five means that a data subcase is assumed to have at least 5 card images. Previously, this could include comments. The 4th data subcase of DC-13 provides a good example. After comments are ignored, it no longer contained this minimum. So, extra data cards were added, even though they never will be executed --- just to exceed the KASEND minimum for stacked data cases. The solution that results is cleaner than before. Having comments at the end would lead to the extraneous CIMAGE warning about data having been exhausted. No longer is this seen.

## NORUN for $INCLUDE and Sorting

NORUN is a new switch of STARTUP that allows the user to perform only data modularization (which processes all $INCLUDE cards) and data sorting by class (which processes all /-cards). At this point, the complete set of input data will be sent to output -- much as $PUNCH will send cards of a punch buffer to output. Then the program will halt. Those wanting to recover the input data need only use DISK or BOTH, which will send the input data to the .LIS file. Of course, some screen scrolling programs such as SCROLLIT (but not PC Magazine's PERUSE) provide another means of recovery.

Robert Meredith of New York Power Authority (NYPA) in White Plains must be credited with inspiration of the NORUN switch. In public E-mail of the Fargo list server dated November 30th, Mr. Meredith wrote: *"At NYPA we have an option on the Apollo ATP version which outputs the sorted ATP data file before processing. It is very handy for troubleshooting sorting problems."* At the time, Mr. Meredith was advising Glenn Wrate of Michigan Tech about a problem with sorting. Yet, the use of NORUN goes beyond such cases of trouble, it is important to observe. Large data cases typically involve tens, and maybe even hundreds, of $INCLUDE files; and these might be scattered across several directories. As a result, it probably would not be quick or easy to move such data to another computer. By using NORUN = 1, a single output file is created ---- one that can be used immediately in any directory of any other computer.

NORUN is located within STARTUP in the position that once was occupied by KOMENT. As explained in a separate story, KOMENT had been superseded by the more immediate NOCOMM. It was felt that the retention of KOMENT no longer could be justified, so it was replaced by NORUN on December 10th. Values of the NORUN switch are either zero to ignore the new choice or unity to enable it. Finally, a minus sign before the unity will suppress all .LIS output that precedes the desired data cards. This makes the resulting file a legal ATP data file without need for editing to cut off the preceding several lines of output. Using DC-3 as an example, value unity results in DC3.LIS that begins:

```
   ---   96   cards of disk file read into card ....
 Alternative Transients Program (ATP), Salford  ....
  Date (dd-mth-yy) and time of day (hh.mm.ss) = ....
 >>>>  Parameter  NORUN  of  STARTUP  is unity, ....
 >>>>  Any 2nd or later data subcases are discard  ...
 C data:DC3.dat
 BEGIN NEW DATA CASE
```

Here, there are 5 extra lines. The final two of these do contain useful information that the user should understand. In its entirety, this message reads: "Parameter NORUN of STARTUP is unity, so prepare to output the sorted 1st data subcase. KCARD2 = 96. Any 2nd or later data subcases are discarded by this operation. Familiar BNDC and BLANK cards are added at the end."

## JMARTI Instability : Cables & Lines

The preceding 2 issues had a story about possible instability associated with CABLE CONSTANTS use within JMARTI SETUP . Well, overhead lines, too, can display such troublesome instability.

In years past, there have been occasional, isolated mentions of the trouble with the proper retention of trapped charge on a line. That is, the problem occurs when a circuit is disconnected at both ends. The subject gained increased notoriety on November 18th when public E-mail of the Fargo list server came from Dr. Gary Thomann of Power Technologies (PTI) in Schenectady, New York. *"I am issuing a note of caution about the frequency dependent line model for overhead lines which is generated by LINE CONSTANTS. The problem I have been seeing is for transmission lines with shunt reactors connected to the line. When you drop a transmission line with a shunt reactor connected to it, the line voltage will oscillate (usually at a little less than system frequency), and the oscillations will die out as energy is lost in the line and reactor resistance. However, when the frequency dependent line model is used, the voltage will sometimes increase with time. I had been noticing this problem only with double circuit (6 total phases) lines, and with the non-balanced frequency dependent model (a model which has the transformation matrix at the end). However, today I experienced the problem for a single circuit 345 kV transmission line which was 81% compensated with shunt reactance. When a balanced three phase frequency dependent line model was used, the voltages started slowly increasing when the line was dropped."*

## IBM OS / 2 Warp tested by NYPA

IBM's OS / 2 is one alternative to business as usual (Salford EMTP running on MS-DOS). Robert Meredith of NYPA (New York Power Authority in White Plains) is the latest person to play with this --- first at home, and more recently at the office along with NYPA coworker Robert Schultz. The general public learned of this from

his public E-mail of the Fargo list server dated November 30th, which ended with the explanation that he was *"now 'Warping' on OS/2 (at home)."* That does seem to be the right word (Warp) for the latest version. Price is reasonable enough, Mr. Meredith explains: *"While selling for $89 directly from IBM, the street price now is $75 or less as evidenced by the January catalog from Comput-ability, which lists it on CDROM for that price, or a dollar less on disk, excluding shipping. Prior to the end of the year, the older (2.1) version was being liquidated at fire sale prices of as low as $15, and was accompanied by a $50 rebate coupon that could be redeemed if Warp were purchased by the end of the year. The rebates undoubtedly contributed to the report that Warp sales exceeded one million copies worldwide by early January."* As for the name *Warp*, this may be appreciated by Star Trek aficionados, and IBM promotional people; but there are more conventional, and less-complementary, connotations (look in any dictionary)!

A $50 price for OS/2 Warp was obtained by Glenn Wrate of Michigan Tech in Houghton. This was through a campus bookstore, and it involved a $25 rebate from IBM for prior OS/2 users --- an offer that expired at the end of 1994. The final detail was learned in E-mail from Mr. Wrate dated January 4th. Such is the story of your Editor's life: the discovery of meaningful rebate offers, or great discounts, only after they already have expired!

How has OS/2 changed recently? Eric Grevstad writes the following on page 176 of the January issue of *Computer Shopper: "The new release slims OS/2 to run in 4 MB of RAM; simplifies its installation and broadens its device-driver library; ... and bundles a number of desirable applications ..."*

The initial report about OS / 2 itself came in private E-mail dated December 1st. Mr. Meredith wrote: *"I've had a copy of Warp for about two weeks now. It's a lot easier to install than Unix (Apollo or H-P), but not necessarily 'easy'. There are plenty of potential hardware problems, based on problems reported on the OS/2 Usenet groups. Since the release, the OS/2 groups have been running close to 500 messages a day. Its just about impossible to even skim them. There seems to be no end to them, although several knowledgeable people are responding with help. I've even been putting my 2 cents worth in about ways to get PAS-16 sound boards to work. 'Team OS/2' members are probably keeping the level of frustration down more than IBM is, since the latter is a 9-5 operation on a toll line. My luck has been good. It seemed I could make a career of installing 2.1 from floppies, I had tried so many times with limited success. Warp was no problem, though. The CD installation went perfectly on my home machine. I even tried it on a 25 MHz with ESDI drives at work. It took a second install after a full reformat (not default quick format) to eliminate a corrupt file which may have been due to a bad spot on the disk. But it installed well, using a cannibalized H-P CD-ROM (Toshoba in disguise) and a surplus Adaptec 1540 SCSI board. Its been running in both places without a crash since then. I like it! It looks like OS/2 or WNT could finally replace the Apollo Aegis."*

To conclude, low price and good operation make OS/2 itself attractive after it is installed. But could the average Salford EMTP user easily handle installation by himself? Messrs. Meredith and Schultz are decidedly **above** average in computer skills (among other things). While reporting no trouble, even they have qualifications. For example, Mr. Meredith wrote that *"the optimal drive repartitioning to install the OS/2 boot manager --- to allow one to boot either DOS or OS/2 --- does require data backup and restoration skills."*

Then there is the matter of ATP FORTRAN. Mr. Meredith continues his story: *"We reached a milestone today. The WatCom compiler arrived 2 days ago. Today we converted a 2000 line Fortran program to run under OS/2. It could have been done for Windows or (Rational System's) Extended DOS as well, if we had another 1/2 hour or so. Its that easy to set up different platforms! It was all text output, but the compiler was easy to use. It turned up several mistakes that the usually thorough Apollo compiler had missed. So, I am impressed. You can be sure that an attempt will be made on the ATP code within a few days. We are awaiting new computers, so there could be a setup delay as we really get organized."*

Robustness seems to be a major attraction of OS/2 when compared with MS Windows 3.1 What user of the latter has not been obliged to reboot his computer from time to time? Of course, such trouble can be avoided, often, since it seems to be correlated with other demands on the computer, such as networking. The most quotable critic seems to be Glenn Wrate at Michigan Tech in Houghton. In E-mail dated January 3rd, he reacted to mention of the phenomenon by Robert Meredith in White Plains: *"Windows 3.1 crashing is not big news. The change from 3.0 to 3.1 was to allow an attempt to kill the misbehaving process. The only person I know that doesn't crash Windows frequently only uses it for a screen saver!"* The following day, Mr. Wrate provided more context of the trouble: *"At MTU, everyone runs PC-NFS (Sun's networking software). Also, the person who doesn't crash Windows is the system administrator. He's using his Sun Workstation most of the time. Finally, I only run Windows at school; I use OS/2 at home."*

Success using the WatCom compiler on ATP source code was announced shortly before Christmas. E-mail from Mr. Meredith on December 20th was introduced by *"Subject: DC1.DAT running on OS/2."* This began: *"Yes, it is! The approach of commenting out everything that offends WatCom has worked. Test case DC1.DAT is running correctly under OS/2."*

How much better is IBM's new OS/2 Warp (not to be confused with the crummy, 16-bit software that was embraced by EPRI in the late '80s; see the January and April, 1991, newsletters)? In that same pre-Christmas report, Mr. Meredith wrote the following: *"Can I sell you on OS/2? Some of my favorite features are the full capability enhanced editor (multiple sessions, stream or line editing, rectangular cut and paste, built-in search/replace, pop up windows or rolling 'ring' of files); compatibility with peruse in dos windows with selective, rectangular copy capability from the window; ability to set a 100 line scrollback in OS/2 windows with same copy capability (using a command window in the enhanced editor can give unlimited scrollback with the extra step of opening the editor); a file name or text string (grep functionality) seek and scan utility; highly customizable desktop; superb hypertext help available from OS/2 command line, F1 key and menuing system; pop up menus; and superb 'try-it' tutorial. Other people rave about the IAK (internet access kit), which gives SLIP or PPP access to IBM's Advantis internet system or to other providers. I do not have SLIP so I cannot comment on that. I also have heard good words about bug fixes from IBM. Apparently IBM posts the fixes at* ***watson.ibm.com****, rather than selling them to users à la MS Dos 6.22 'step-up'. Apparently there was even a post of a seven disk upgrade to OS/2 2.1. IBM is trying harder. I'm going to give them a chance, since I have little to lose on my minimal investment."* To be continued next time.

More news comes from Mr. Meredith in E-mail dated January 24th. NYPA reports *"additional successful Warp installations on new Pentium 90-Mhz EIDE machines, and having achieved the paged display of ATP CalComp plots from the Postscript printer file already being produced, with minor changes to that file."* However, there does seem to be ongoing difficulty with fonts *"due to the lack of any documentation or examples of such Fortran Presentation Manager Gpi calls from Watcom. Such are the travails of pioneer programmers! SMOYP, indeed!"*

## Macintosh ATP by Stu Cook

Stu Cook of JUST Services in suburban Montréal, Québec, Canada, has been compiling new Macintosh ATP FORTRAN using the Language Systems compiler on his Apple Quadra (a Motorola 68040-based Mac). The idea is to update the work done some two years ago by Prof. Jim Smith of Montana State University in Bozeman.

The communication of Macintosh ATP FORTRAN from Portland to Montréal was accomplished using the Attach button of MS Mail on Dr. Tsu-huei Liu's computer at BPA. This was the first big test following experimental use with ESKOM (see earlier mention). Mr. Cook reported success as follows in E-mail dated January 18th: *"I have down loaded the e-mail file and converted it successfully. Some of the stats are:*

```
Full Message      1260189 bytes
UU Portion        1259867
ZIP file           914400
108 files         3971685
```

*Download time was 13-14 minutes."*

Placement of an EQUIVALENCE statement prior to the dimensioning of a vector involved in it was found to be a fatal error for the Mac compiler. Prof. Smith must have corrected these himself, manually, two years ago. This time, corrections were made to the UTPF -- some 40 segments.

January 27th, the first correct simulation results were received by E-mail. There is a lot more to tell about Mac ATP, but limited space. To be continued next time.

## Florida Short Course March 6 - 10

Prof. Dennis Carroll again will be offering his 4.5-day EMTP short course during spring break at the University of Florida in Gainesville. The course will be even earlier this year. It has been scheduled for the first complete week of March: Monday the 6th through Friday, the 10th of March, 1995.

Faculty this year is expected to be the same as two years ago, with Dr. Tsu-huei Liu representing program developers during the entire week. Dr. Kurt Fehrle again expects to be there the entire week as the voice of industrial usage (highly recommended). New this year, he will have Gabor Furst's Primer on MODELS when this subject is taught on Thursday.

## Mohan Course : Portland, July 22 - 23

Prof. Ned Mohan of the University of Minnesota will be giving his portable EMTP short course immediately prior to the 1995 IEEE PES Summer Meeting here in Portland, Oregon. As has become traditional, this will be in a reasonably-priced hotel near the airport (Howard Johnson, *"$59 plus tax for single/double room"*).

Content should be similar to the previous year as described in January and April, 1994, newsletters. Again this year, MODELS author Laurent Dubé should be allowed some two hours. Better than last year in San Francisco (where he had other preoccupations), Mr. Dubé should be available after class this year, for those who might want to talk to him privately.

Graphical preprocessor ATPDRAW for *schematic capture* (the graphical assembly of ATP data) will be demonstrated again this year, although not by author

Hans Kristian Hoidalen as in San Francisco. The duty this year is expected to fall on Prof. Riaz.

A free Can/Am user group meeting is scheduled to follow the nominal end of Prof. Mohan's course (around 17:00 on Sunday, July 23rd). This should be in the same meeting room, which, along with computer and projection facilities, should be available until midnight thanks to Prof. Mohan's generosity, which is greatly appreciated.

## News about Intel Pentium

Pentiums are not selling well to industry, it would seem. Who needs them (i.e., 486s work fine)? *"Pentium processor has yet to get the call from American corporations"* is the title of a column by John Dodge on page 3 of the October 3rd issue of *PC Week* news magazine. *"The thirst for desktop CPU power is driven more by personal choice than corporate fiat. .... an estimated 5 percent of all Pentium sales are to corporations."*

But Pentium sales are accelerating as summarized in a short note on page B16 of the November 22nd issue of *The Oregonian*. It seems *"analyst Tom Kurlak of Merrill Lynch said demand for .... Pentium chip would increase dramatically in the fourth quarter. .... Kurlak said shipments of Pentium chips would reach about 2.3 million in the fourth quarter, double the number shipped in the third quarter. He also expected Pentiums to account for one-third of all PCs in 1995, up from 10 percent in 1994."*

Pentium notebook computers would seem to have arrived, with several companies advertising them in the December issue of *Computer Shopper*. Recall that the preceding newsletter contained a paragraph that began as follows: *"RISC notebooks in trouble .... With Pentium notebooks on the horizon, the window of opportunity for some RISC notebooks demonstrated last fall appears ready to slam shut."* Yes, the window has slammed shut. Take the "Mobile Pentium T4900CT" by Toshiba, which can be is seen on page 19 in advertising by CDW (Computer Discount Warehouse). This is a 75-MHz model. Right next to it is the proven, older technology: "T4800CT ... SL-enhanced Intel DX4 75-MHz CPU." So, will many customers pay the extra $1000 ($6399 vs. $5399) for Pentium? Your Editor certainly would not! Of course, Toshiba is not the cheapest offering. Page 25 is the second of several pages purchased by EPS Technologies. This advertising begins with a 60-MHz offering for $2795 (if dual color) or $3695 (if active color). Other specifications are not at all minimal: 540-Mbyte hard drive, 8 Mbytes of RAM, sound card and 2 built-in speakers, NIMH battery and ac adapter, carrying case, etc. On the down side, computed results may be wrong (see next paragraph)!

Pentium has defective double-precision mathematics! This astounding revelation was first seen in a short story *"from wire reports"* on page E1 of the November 24th issue of *The Oregonian*. Apparently one Howard High of Intel is attempting to control the damage with false assurances, so all readers should be forewarned. For example: *"Even most engineers and financial analysts require accuracy only to the fourth or fifth decimal point, High said."* Maybe for final answers, but not for the internal mathematics! Specifically, *"more than 2 million of the Pentium chips shipped by Intel"* would seem to be imperfect for EMTP use. *"Pentiums can make errors in equations involving calculations to the ninth digit"* is the way the story described the problem. The ninth digit is about half of the 80-bit precision of the Intel floating point unit (FPU), and this is why your Editor has chosen to characterize the latest Intel blunder as an error with double precision. Yes, 36-bit Univac and Honeywell translations were still in use 15 years ago, but the spread between small numbers and large numbers was necessarily limited. For example, singularity tolerance EPSILN was given a default value of 1.E-5 rather than the value 1.E-8 that applies to Salford EMTP and other 64-bit versions. No one who has been using 64-bit computation should want to return to earlier days of reduced precision. For one thing, too much data that requires higher precision already has been assembled. So, beware, consumers! High-speed 486s continue to look better than ever.

The preceding was written before receiving ideas from anyone else. Well, there has been a lot of discussion since the story hit the newspapers. Nearly everyone seems critical of Intel for attempting to downplay the seriousness of its error. Perhaps the most effective criticism has been humorous. The remainder of this story is a sample, which came from NYPA's Robert Meredith in private E-mail dated December 1st. *"Let me leave you with the following post from Usenet: From: dmethvin@aol.com (DMethvin) Newsgroups: comp.sys.intel*
*Subject: Pentium Bug Humor :-)*
*Q & A : THE PENTIUM FDIV BUG*

*Q: How many Pentium designers does it take to screw in a light bulb?*
*A: 1.99904274017, but that's close enough for non-technical people. ....*

*Q: What's another name for the "Intel Inside" sticker they put on Pentiums?*
*A: Warning label.*

*Q: What do you call a series of FDIV instructions on a Pentium?*
*A: Successive approximations.*

*Q: Complete the following word analogy: Add is to Subtract as Multiply is to*

*1) Divide*
*2) ROUND*
*3) RANDOM*
*4) On a Pentium, all of the above*

*A: Number 4. ....*

*Q: Why didn't Intel call the Pentium the 586?*
*A: Because they added 486 and 100 on the first Pentium and got 585.999983605.*

*Q: According to Intel, the Pentium conforms to the IEEE standards 754 and 854 for floating point arithmetic. If you fly in aircraft designed using a Pentium, what is the correct pronunciation of "IEEE"?*
*A: Aaaaaaaiiiiiiiieeeeeeeeeeee!*

*Top Ten New Intel Slogans for the Pentium*

| | |
|---|---|
| *9.9999973251* | *It's a **Flaw**, Damn it, not a Bug* |
| *8.9999163362* | *It's Close Enough, We Say So* |
| *7.9999414610* | *Nearly 300 Correct Opcodes* |
| *6.9999831538* | *You Don't Need to Know What's Inside* |
| *5.9999835137* | *Redefining the PC -- and Mathematics As Well* |
| *4.9999999021* | *We Fixed It, Really* |
| *3.9998245917* | *Division Considered Harmful* |
| *2.9991523619* | *Why Do You Think They Call It **Floating** Point?* |
| *1.9999103517* | *We're Looking for a Few Good Flaws* |
| *0.9999999998* | *The Errata Inside"* End pasting. |

A simple test for the Pentium error was provided by Mathias Noe of the University of Hannover in Germany. His public E-mail of the Fargo list server dated December 15th contained the following advice: *"It is easy to verify if your processor is right or wrong. Just calculate 5505001 / 294911 . The result must be 18.66665197... The pentium test returns 18.6660..."* Note there is no ninth decimal digit here! Shame on Intel for attempting to dismiss an error that seems to be demonstrable using a 7-digit division. Furthermore, the answer is correct through the 5th digit only? This is terrible. If this can be believed, the Pentium user does not even have accuracy of 32-bit, floating point arithmetic!

Prof. Thomas R. Nicely, a 51-year-old mathematician at tiny Lynchburg College in Virginia, seems to be the man who made public the Pentium flaw. This according to a story on page F1 of *The Oregonian* dated December 18th. *"He called Intel in late October, only to be brushed off. So six days later, he sent messages on the global Internet computer network and, sure enough, others he asked to run the same calculation reported the same problem. Intel called the next day. In the whole Intel fiasco, Nicely may be the only one to emerge with his reputation enhanced."*

*"PC vendors pledge to swap Pentium"* is the headline of a story on the front page of *PC Week* magazine dated December 5th. This was the next serious complication in Intel's magnification of the problem: computer makers sided with irate customers rather than with Intel. *"As Intel scurried to stanch a public-relations disaster, most PC makers pledged to satisfy customers."* Eventually, Intel surrendered. The headline on the front page of *The Oregonian* dated December 21st reads: *"Intel flip-flops to take its chip off the ol' block; The maker of the flawed Pentium chip bows to pressure from outraged customers."* This was an Associated Press story by Catalina Ortiz.

Advanced Micro Devices (AMD) is building its own alternative to Pentium according to a story by Michael Slater on page 52 of the January issue of *Computer Shopper. "AMD started with the requirement for software compatibility --- in essence, the 486 instruction set --- and then created a unique internal chip design to execute this instruction set at faster-than-Pentium speeds. AMD also chose to use the same interface signals and pin arrangements as the Pentium, so system designers could use the K5 in their Pentium motherboards. .... AMD expects the K5 to outperform Pentium by at least 30 percent at the same clock rate."*

## Miscellaneous Intel PC Information

Circuit City is the latest national electronics and appliance retailer that has opened stores in the Portland area. Recent advertising, mailed from Richmond, Virginia (some 4000 Km away), shows three suburban stores, with two near (but not within) shopping centers. Value would seem to be the attraction: *"We'll beat any price. We'll beat any competitor's price on everything we sell or you get 110% of the difference."* BPA's Walter Powell was convinced. He recently reported having purchased for under $1000 a complete, 33-MHz, 486SX-based, multi-media computer from these people. Would you believe a 250-Mbyte hard disk, 4 Mbytes of RAM, FAX modem, a 3.5-inch floppy, a 14-inch color monitor, and a double-speed CD-ROM drive with lots of software (e.g., MS Works, MS Money, Prodigy, etc.). What a deal!

*"17-inch monitors to become a system standard by fall"* is the headline of the first story in the *Trends and Technology* section on page 49 of the December issue of *Computer Shopper*. Lower prices (around $700) are one attraction. Another is said to be more sophisticated use of windows in the form of MS Windows 95 and NT. The saving of energy seems to be yet another advantage of a new monitor: *"IBM's $1,199 17P display powers down to 8 watts when idle, well below the Energy Star goal of 30 watts and a large screen CRT's normal 80 to 110 watts."*

Microprocessors are 25 years old, although the mainstream media did not pay much attention. *"Silver anniversary of microprocessor is hardly noticed"* is the

headline of a story on page E5 of *The Oregonian* dated October 30th. According to this account by Evan Ramstad of the Associated Press, *"In October 1969, executives of Busicom, a Japanese company trying to make an electronic calculator, told Intel Corp. it would pay for an all-purpose chip to run it instead of 12 chips with specific functions. Nine months later, Intel had created the first microprocessor. ... Intel later gave back to Busicom the $60,000 it had invested in the microprocessor, leaving Intel with the rights to sell it for use in devices besides the calculator. In 1974, a New Mexico hobbyist named Ed Roberts used Intel's third-generation microprocessor, the 8080, to put together a machine that became known as the world's first personal computer, the Altair. The demand for microprocessors has not let up since and never will."*

The Intel 486 DX4/100 microprocessor is not quite what the name implies, readers are reminded. In fact, there are two uses. Both have internal speed of 100 MHz, but external speed can be either 50 MHz or 33 MHz. As explained by M. David Stone in his story on page 308 of the January issue of *Computer Shopper*, nearly everyone who buys a DX4/100 receives the slower of the two: *"a DX4/100 will have better throughput in clock-doubled mode, with a 50 MHz system clock than in clock-tripled mode, communicating at 33 MHz. Yet because the whole point of hiking internal processor speed is to boost performance without needing a faster, more expensive motherboard, virtually all DX4/100 systems so far are clock-tripling machines based on 33 MHz motherboards."*

## Miscellaneous Small Items

The CIA --- yes, the U.S. Central Intelligence Agency --- is the latest branch of the U.S. government to have requested ATP. The initial inquiry was by telephone, at which time your Editor requested written confirmation of the address. This arrived in E-mail from a user of **netcom.com** on October 27th. So, what was the name of the organization? Office of Research and Development (typically inconspicuous, these spies)!

119 printed copies of the October newsletter were mailed on November 29th. Two more were hand-carried to BPA, and 18 of the 119 went to Canada. This is the end, however, for those who will not have responded in writing prior to the January, 1995, mailing. For anyone who did not see it at the time, there was a story entitled "Need to Resubscribe" in the April newsletter. That need had better be satisfied by early February.

Retail wheeling of electric power has not yet come to the Pacific Northwest, but it is coming to California as part of a desperate attempt by government to lower rates. A long, illustrated article on the subject dominates pages F1 and F4 of *The Oregonian* dated October 23rd. Under the headline *"Powerful Choices,"* author Bill McKenzie summarizes as follows: *"California considers 'retail wheeling,' which would let electricity consumers choose where to buy power."* In short, the present monopolies of utilities would be broken. How great is the need down south? *"Residential customers pay an average of 12.13 cents per kilowatt-hour in Southern California vs. about 5.37 cents per kilowatt-hour in Portland."*

Monte Carlo ( STATISTICS ) simulations end with miniature printer plots of switch closing times T-close . This sentence began the final paragraph of the newsletter one year ago. The correction then was in response to an observation by BPA's Robert Hasibar. Nine months later, another example of trouble with those same plots came from Dr. Gary Thomann of Power Technologies (PTI) in Schenectady, New York, in an envelope dated November 3rd. In this more recent case, there was certainty that the code was misbehaving: Salford DBOS terminated execution with a complaint about integer overflow. The row number of the plot should have been confined to the range [1, 25]. But sloppy mathematics seemed to be producing values of 0 or 26, or even 27. Storing with these bad indices then overwrote other integers that in turn produced astronomical integers that halted execution in an extreme case that Dr. thomann happened to notice. Later, the formula might be reconsidered. But for now, it seemed adequate merely to limit the row number. Any number less than 1 was forced up to this legal minimum, and any number more than 25 was forced down to this legal maximum. After that change, Dr. Thomann's case was observed for 500 shots (the original complaint was for 50), and the plots of switching times were noted to be believable. A uniform rather than Gaussian (normal) distribution was involved, of course --- otherwise it would be highly unlikely to have switching times near the ends (tails of a Gaussian distribution). The correction was made November 16th. The diagnostic file DEBUG.LIS will contain 3 lines of output for each illegal subscript that is to be corrected, with the following being the final such warning of the PTI case having 500 energizations:

```
Warning. Monte Carlo mini switch plot < 1.
    K, N, N3, L1 =    3    490   12948    0
    ARRAY1(N3), TWDEP = 7.700694...E-03  ...
```

Here K is the plot number (1, 2, or 3 for the 3 stacked plots), N is the shot number, and L1 is the bad subscript.

The EXACT PHASOR EQUIVALENT feature had unwanted, extra diagnostic prior to its removal on November 25th. Usage is illustrated in the second subcase of DC-11, which indicates implementation in March of 1989. At the time, there was need for extra printout to verify the computation, of course. Could this have gone unnoticed for five and a half years? Maybe. The problem was first pointed out to ATP developers in E-mail dated October 10th from Massimo Ceraolo at the university in Pisa, Italy, writing from **<ceraolo@dsea.unipi.it>** It seems that for the FREQUENCY SCAN case of interest,

diagnostic output file DEBUG.LIS exceeded 6 Mbytes!

The letter "K" is used to indicate thousands (kilo) for list sizes 13, 15, or 23 if a blank separator otherwise would be missing on the left as these entries are encoded at the beginning of execution. All three list sizes are allowed six digits each, so as long as 99999 is not exceeded, a blank separator will exist on the left (no objection in this case). But for 100000 or more, the missing separator makes reading difficult. Stephen Boroczky of Pacific Power in Sydney, Australia, raised the issue in his E-mail dated October 10th. His interest may have been in numbers at the end of output, but the idea is the same. To illustrate, consider what happens when the usual limits of 36400 and 64800 for lists 13 and 15 are preceded by an 8. Before the change, the 132-column header line that shows these began as follows:

```
 13140 120000  460  900  360  900836400   255864800
```

Messy, eh? Well, after the change, this becomes:

```
 13140 120000  460  900  360  900  836K   255  864K
```

Here limiting numbers of LISTSIZE.BPA were used, except for lists 13 and 15. The improvement was made November 25th. Later, if needed, lists other than the three just mentioned could be protected. Lists 13, 15, and 23 simply seemed to have the greatest need, so they were protected first.

About those *"Actual List Sizes"* at the end of the .LIS file, all 3 rows of numbers were encoded using 10I6 in the case of 80-column output (automatic when STARTUP parameter KOMPAR has a value of unity or more). Each of these has been protected the same way as just described for lists 13, 15, and 23 of the heading. Of course, the need here is less since it is only actual usage, rather than the limits, that are involved.

/-cards that are used to sort data by class use the second BEGIN NEW DATA CASE card to mark the bottom of the first data subcase. This bounds the data that applies to the first subcase. As a result, this separator must not precede any data that is a part of the first subcase. This seems logical enough, and is illustrated by DC-33. Yet, as discovered by Glenn Wrate, a doctoral student of Professor Bruce Mork at Michigan Tech in Houghton, this does not agree with the illustration in Section I-J of the Rule Book. His public E-mail dated November 30th alerted others to this problem.

The Type-18 source component provides for an ideal transformer in series with a voltage source. Commonly the latter is ignored, so a special, transformer-only case was recently provided (see IDEAL TRANSFORMER in the April, 1994, newsletter). That was Prof. Bruce Mork's inspiration. But another degenerate case would involve the ungrounded source without any transformer. This was the use of Arvind Chaudhary of Sargent and Lundy, a consulting company in Chicago, Illinois, USA, as first made public in E-mail of the Fargo list server dated December 3rd. As he correctly observed, the program warning about lack of connectivity to ground ("Diagonal admittance Ykk is zero!") was wrong. In the ATP explanation, R-add should have been G-add. Program operation was correct, however, so only details of the warning message required modification.

*"FACTS and HVDC Modeling Using TACKS"* is said to be the title of a short course that was offered by the University of Wisconsin in Madison. This according to the announcement on page 37 of the May, 1994, issue of *IEEE Power Engineering Review*. The name given for information is Prof. Willis F. Long, who remains in the forefront of advertising, as sharp as a TAC (pun)!

The 2nd subcase of DC-48 was designed to illustrate that a TACS HYBRID data case could be handled. This seems to have been added 27 May 1994 after correction of a bug that made such execution possible. Execution of the 2nd subcase occurred, but was not correct, it first was observed during mid-December, 1994. Actually, the data subcase itself posed no problem; i.e., it could be solved correctly if placed in a separate disk file. The problem was with its location: following a STATISTICS data case. Neither TACS HYBRID nor STATISTICS had anything to do with one error. For example, it was found that replacing the 2nd subcase by the data of DC-3 resulted in erroneous output. A failure to properly reinitialize after any Monte Carlo simulation was found to be the first problem, rectified by the initialization of KSTOUT in SUBR1 on December 31st. But there were other problems that did have to do with STATISTICS in the 2nd or later data subcase. Data, too, has changed: the $STARTUP card of the 2nd subcase of DC-48 has been removed. In its place, special, conditional initialization of two more parameters --- different for the first subcase than for the 2nd or later subcase --- has been added to SUBR1 near the top. This **is** progress: the replacement of massive reading from disk by more intelligent, selective reinitialization. The new, selective initialization was found to be enough for DC-24, too. Removal of $STARTUP from that data case left the answers unchanged, so this change, too, was adopted --- January 1st.

Computer expert David Szymanski continues to work on his radical ideas that ended the preceding newsletter. The present mention is largely an historical note: In case this possibly might succeed somehow, your Editor wants to be able to prove that he once knew the Nobel Prize winner (joke)! So, here is the log. During the afternoon of December 1st, your Editor spent some 3 hours on phone with Szymanski talking about his object-oriented programming. Dr. Tsu-huei Liu heard only the beginning and the end because she had to leave for a 2 hour meeting in between! Then, on January 5th, such telephone communication was repeated (this time, Dr. Liu heard all two hours). Mr. Szymanski reports that he has not yet given up on ATP. Although only some 200 lines of code have been written, a lot of design work has been done.