Can / Am EMTP News

Voice of the Canadian/American EMTP User Group

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Salford Compiler and DOS Extender

Use of the /OPTIMISE switch to optimize ATP FORTRAN compilation using FTN77 / 486 was recommended by Robert A. Schultz of New York Power Authority (NYPA) in White Plains. This was briefly mentioned at the top of page 6 of the preceding issue. Well, attempts to optimize using Salford Rev. 2.66 on your Editor's 486/33 failed quickly. After correct solutions of DC-1 and 2, execution of DC-3 hanged, and had to be aborted by Ctrl-Break. Repeating the test (compilation, linking, and execution) with Version 2.71 on Dr. Tsu-huei Liu's computer lasted longer, but also hanged permanently: the simulation of DC-35 had to be aborted by turning the power off (COMPAQ is too cheap to provide the usual hardware reset button).

Cycloid Systems, Inc. of Flin Flon, Manitoba, Canada, is the replacement for OTG Systems of Clifford, Pennsylvania, as a North American distributor of Salford Software products. This information was carried in a letter from Cycloid President, G. I. Wood, dated February 14th. The mailing address has an extra P. O. Box 727 and the postal code R8A 1N5. In addition to Salford compilers (FORTRAN 77, 90, C, and Pascal), Cycloid Systems is said to handle Interacter.

MS Windows might be exploited using the separate product ClearWin as explained by Walter Dykas of Oak Ridge National Laboratory in Tennessee, USA. This was on May 10th, in public E-mail of the Fargo list server that began at address **wpd@ornl.gov** Mr. Dykas is a good contact for ATP developers because he has independent access to Salford-compatible software: PTI's PSS / E . He also seems appropriately skeptical: (*"the following is my interpretive summary of 'costs and promises' for ..."*). Use of ClearWin is said to require Version 2.72 of Salford FTN77/x86, which has not yet been acquired by BPA. The switch might not be easy, since Mr. Dykas wrote: *"I agree with Prof. Prikler, the user gets the benefits and the developer gets the burden. SMOYP - Simple Matter of Your Programming."* Earlier, Prof.

Laszlo Prikler in Budapest, Hungary, had responded to the question of possibly improving the efficiency of Salford EMTP execution within MS Windows: *"I agree with Mr. Dykas that a Windows-compatible Salford Compiler would have lot of advantages. Really, in this case, all graphics and printer driver interfaces would be provided by the Windows system. However, as in general, the disadvantages appear on the developers' side. Programming in a higher-level environment requires surplus work. (Ref: Experiences of my MS student, who made postprocessor SHOW for Windows)."* Well, we will see. Mr. Dykas concluded that *"basic functionality is probably not too different from MS PowerStation. PowerStation documentation and functions are much more complete (and complicated). Stephen Boroczky of Pacific Power (see separate story about MS PowerStation) should be able to compare."*

The **errorlevel** parameter of MS-DOS was added to RUNTP.BAT on April 10th in order to make it easier for the user to abort execution from within batch files such as RUN.BAT (to verify all standard test cases). Of course, at any time during ATP execution, **Ctrl-Break** would have interrupted Salford EMTP execution. Then **Esc** followed by **Shift-F1** would close the Salford debugger windows. On a slow computer, the user then would press **Ctrl-Break** again, and MS-DOS would ask whether the user wanted to terminate his batch job. The problem was, this became difficult for fast computers with disk caching, which would begin the next solution faster than the average user could make his keyboard request (the second **Ctrl-Break**). To solve the problem, BPA contractor Laurent Dubé had speculated that Salford DBOS probably sets the MS-DOS error flag, so this could be trapped. The concept was good, and addition of the statement IF ERRORLEVEL 1 PAUSE after the RUN77 command in RUNTP.BAT reflects this. But details are more complicated than originally hoped. After your Editor declared using the Fargo list server that he could detect nothing, Robert Schultz of New York Power Authority (NYPA) in White Plains explained the need for Salford DBOS_RESET QUIT_ON_ERROR and CALL EXIT (the latter in place of STOP to terminate program execution). This was in E-mail dated April 18th. Finally, after considerable experimentation that ended April 30th, it was decided to use an MS-DOS parameter to control whether or not **Ctrl-Break** would be trapped. At the bottom of RUN.BAT will be seen the statement SET CTRLBK=NOTRAP which causes ATP to ignore **Ctrl-Break**. As long as any other value (see the =TRAP near the top of the file) is in effect, Salford EMTP will respond to **Ctrl-Break** by an immediate halt (no Salford debugger windows with a blue background). For any case using RUNTP, execution then would be held at the previously-mentioned PAUSE. Those wanting to zero **errorlevel** need only execute the new ATP utility CLEARERR.EXE (this does require DBOS) that has been added to the GIVE2 disk.

UUENCODE and UUDECODE were changed in the late summer of 1992. But the output of UUENCODE did not reflect this change by indicating a new (higher) version number, unfortunately. This was explained in "News:" of the Fargo list server dated February 11th. So, Robert Schultz of NYPA doctored the executable file (these program surgeons are amazing!), and sent the modification to Portland by E-mail. But your Editor objected that the current date could be confusing, so Mr. Schultz also set this back to agree with UUDECODE. Although the date of EMAIL.ZIP on the GIVE2 disk now is new, the date of UUENCODE within it is not -- even though the file has been modified.

Coexistence of Novell Netware and Salford DBOS were the subject of public E-mail from Prof. Laszlo Prikler in Budapest, Hungary, on May 2nd. The challenge is to obtain adequate base memory (below 640 Kbytes) for Hoidalen's ATPDRAW (see separate story). Prof. Prikler explains about use of EMM386.EXE, the extended memory manager of MS-DOS, and the desirability of obtaining more or bigger upper memory blocks (UMBs). He concludes that his procedures make it possible to obtain about 612 Kbytes of free lower memory. This is said to be enough not only for GIGS and ATPDRAW, but also for APPEND usage, which is convenient for the networked environment.

Improvements to Salford TPPLOT

MS-DOS APPEND of TPPLOT caused trouble as reported on February 20th in E-mail from Robert Sarfi of the University of Waterloo in Ontario, Canada. Yes, this has been a problem for several years -- since Prof. Bruce Mork first recommended changes following a report of trouble by Prof. Robert Wilson (then a graduate student in Moscow, Idaho). Finally, On February 21st, the problem seems to have been corrected by removing the attempt to delete the old, existing diagnostic file DUMTPP.LIS (should this exist). What worked perfectly with no APPEND became too complicated with APPEND (some functions work whereas others do not). The deletion was not needed, anyway : connection using STATUS = 'UNKNOWN' is simpler, and should have the same effect. With older versions of the program, the batch file that runs TPPLOT can delete the files in both places prior to execution. This was explained by Prof. Mork in public E-mail dated February 24th.

PostScript output of the bar chart of FOURIER first was requested by Cezary Jach of Fermilab near Chicago, Illinois, USA. Actually, he just tried the POST choice within PAPER, and observed in E-mail dated April 8th that the result was quite erroneous. Yes, because the supporting code had not yet been written. Yet, Robert Schultz of NYPA had written such code for Salford EMTP, so this was copied during the weekend of April

16-17. The following week, Dr. Tsu-huei Liu debugged the new feature using BPA PostScript printers. Success was announced in public E-mail of the Fargo list server dated April 21st. The HP-GL was provided, too, and this was verified by both Ravitz PRINTGL and also the free, built-in interpreter (the HP-GL subcommand of the FILE command). Both outputs are automatic unless inhibited (binary switches NOPOST and NOHPGL, respectively). This is the modern trend.

PostScript has capabilities that far exceed EMTP uses thus far, it should be emphasized. About a third of monochrome page 9 of the May issue of *Computer Bits* magazine contains advertising by Computer Tools, Inc. Being sold is Big Color (tm) digital printing. Summary specifications are: *"Print method. PostScript compatible; liquid ink jet -- process colors: cyan, magenta, yellow and black. Size. 36" wide by up to 376" output."* At the bottom, under the banner reading *"big, beautiful color postscript output"* is seen *"$8.00 to $20.00 per square foot."* Being illustrated seems to be some large city's sky line just after sunset: one can see both clouds in the sky and lights in the many windows of the many buildings. Could this still be line drawing?

HP-GL output should have a grid if MGRIDX is made positive in TPPARAM.DAT (see the .HLP file). But until corrected April 2nd, this was defective. The report of trouble came from Roger Argenal of KADON Electromechanical Services in Calgary, Alberta, Canada, in E-mail on March 13: *"When I tell it to include a grid, it ALWAYS omits the last rightmost vertical line in the grid."* Use of FILE/HPGL resulted in an even more serious error (execution died). So, your Editor studied and corrected the problem as announced by the Fargo list server in E-mail dated April 3rd. In the process, use of color by the free HP-GL interpreter was improved. Rather than directly use pen number as the color number for screen display, now each pen number is sent through the mapping KCOLOR of curve color numbers. The result may be no better aesthetically, but at least now everything is highly visible (no more semi-invisible purple). Now, pens 1, 2, 3, 4, and 5 have strong and distinct colors.

News from Outside USA and Canada

The dominant EMTP news from overseas has to be the attempt to form a new European EMTP user group (see later, separate story) to replace the former LEC (Leuven EMTP Center) in Belgium. That must have been quite a struggle in Copenhagen.

A printed copy of the January newsletter was mailed by BPA to each of its primary EMTP contacts (only 8 following the removal of LEC) on February 15th --- the same day the operation was announced in E-mail of Prof. Bruce Mork's Fargo list server.

Size of the IEEE PES mailing list outside the USA is documented by Prof. Ned Mohan of the University of Minnesota in FAX dated January 25th. Membership totals in the different foreign regions are interesting: Canada 1320, Latin America 897, Japan 456, Korea 102, and Taiwan 76. It is easy to mail to everyone in these places rather than to all members in the USA. This is what has been done. Prof. Mohan did not mail to the southeastern United States, for example, to advertise his course.

Japan was updated with Salford EMTP materials when Takeshi Yamada of Tokyo Electric Power Company (TEPCO) returned home following a day at BPA on February 4th. In addition to the usual 3 disks, a fourth carried all WordPerfect files C:\PUB*.WP5 which include 4 years of the newsletter. Mr. Yamada agreed to forward the disks to the Japanese EMTP Committee at Doshisha University in Kyoto (Profs. Akihiro Ametani and Naoto Nagaoka) for distribution to others after copying for TEPCO's own use.

DEC Alpha ATP files were copied onto cartridge tapes for both CESI and ENEL of Milano, Italy, by Randy Suhrbier of BPA. As explained in E-mail of the Fargo list server on February 7th, these materials must be shared freely among all licensed ATP users of Europe who have interest: BPA will mail only one copy to any one EMTP user group. The two DEC cartridge tapes arrived from CESI by DHL on February 25th, and were returned by conventional Air Mail on March 16th along with photo-copy of validated Can/Am licenses for CESI and ENEL.

Taiwan Power Company in Taipei was updated with Salford EMTP materials on March 21st. This followed an E-mail inquiry from Prof. Cheng-Tsung Liu of National Sun Yat-Sen University in Kaohsiung, who seemed to be the first respondent to overseas advertising for Prof. Mohan's ATP short course this July in San Francisco. If others will be coming this far for EMTP education, they deserve to practice with the latest ATP materials ahead of time. So, Prof. Liu was referred to his own user group.

Prof. Nanming Chen of National Taiwan Institute of Technology, **nmchen@event.ee.ntit.edu.tw**, summarized his use of Chinese-language programs in windows. This was on March 23rd, in public E-mail of the Fargo list server. At the time, he was visiting North Carolina State University in Raleigh, where he was interested in use of those WordPerfect Rule Book files (see separate story). Prof. Chen was processing them using his *"Chinese Word for Chinese Windows. ... MS Chinese Windows is the Chinese window environment for IBM PC developed in Taiwan by Microsoft and the vendor in Taiwan. Version 3.1 is the most up-to-date version. I think most programs from regular MS Windows can be run under it. Everything is the same except all the names and commands are shown in Chinese. If the program is in English, it will show up in English. A more commonly*

used Chinese environment is ETEN. ET3 is the most up to date version. Any DOS command can be run under it, but it doesn't have the window feature. PE2 can be used to edit files in both Chinese and English. FORTRAN can be run under it. Of course all FORTRAN codes are in English, but if you enter Chinese in the print format, it will print Chinese output. Chinese Word for Windows is the word processor for CWINDOWS. Version 5.0 now has all functions of English WORD 2.0. ... Hitting Ctrl-Space toggles between Chinese input and English input. Several Chinese input methods are available, but I use only the one based on pronunciation spelling (Zhu-In-Fu-Hau ...). I don't know of any Chinese WordPerfect program."

"IEEE Adopts Metric Policy" is the headline of the cover story of the 12-page, January issue of *IEEE Standards Bearer* magazine. This is not a story **from** overseas, but rather a story that should please everyone overseas. Unlike the aborted, alleged conversion of two decades ago, this time everyone seems more serious. Yet, it will take time --- particularly where safety and manufacturing standards are involved, as Editor-in-Chief Kristin Dittmann writes on page 2. For example, some presently-legal minimum clearance of exactly 8 feet would not satisfy the metric equivalent if this were to be rounded to 3 significant digits (2.44 meters). Well, at least no change is needed for electrical voltage, current, or power!

More about Electronic Mail (E-mail)

The January newsletter was made available on the Fargo server as announced on February 16th by list server mail from Prof. Bruce Mork. This message called attention to the complication of differing fonts: *"The number of pages will depend on what fonts are available on your printer. For example, Word Perfect changes the font to my HP LJ IIIP's CG Times 10 pt, which must be slightly larger than the font Scott Meyer is using, and I end up with 21 pages of text."* That is correct. The printed copy has exactly 20 pages (every line is filled).

Details of E-mail use by ATP developers in Portland can be found in a separate, later story. Included are both the user group's Agora and also BPA's recent extension to AT&T mail, which can exchange with Internet.

The University of Nottingham in England provided the first meaningful test of FTP speed for a family of ASCII files. This was approaching noon in England on February 2nd. Martin Jones had requested DC-51, which consists of 88 Kbytes spread over 8 files. Connection to his IP = 128.243.76.85 was no problem, but the transmission was impractically slow (it required 41 minutes). Even allowing a few minutes for keying (files were sent one at a time), this is hopeless. Heavy time-sharing was occurring somewhere. Several of the small files (under 10 Kbytes) required 5 minutes or more each. Yet, the FTP summary statistics upon completion were unrelated to this reality (absurdly fast rates as high as 243 Kbytes/sec were reported). Is the 9600-baud connection of Agora to Rainnet the bottleneck? Maybe other users with other functions (e.g., Telnet) have higher priority? Certainly the channel on the Nottingham end is wide open. E-mail acknowledging the reception was received within two hours, and in it Mr. Jones explained that his *"server is running on an ibm pc with an ethernet connection."* The need for minor repair was reported, too: *"All the files were ok except each line was separated by a blank line. A CR/LF problem of some sort? Loading them into DOS 6.2's EDIT and saving them without actually editing them removes the bogus blank lines."*

A European mirror of disk files that are available from Prof. Bruce Mork's Fargo server was announced on January 27th by Harald Wehrend of the University of Hannover in Germany. This is quick implementation of the idea that was mentioned in the final paragraph on page 5 of the preceding issue. A 4766-byte E-mail announcement of the Fargo list server began with the title *"Additional anonymous FTP access for ATP materials within Europe."* Mr. Wehrend continued: *"An additional aFTP-server was setup at the computer-center of the University of Hannover, Germany, initiated by the Institut fur Elektrische Energieversorgung .... It will be fed by a weekly mirror-operation from the known server that is kept by Prof. Mork, named plains.nodak.edu"* Weekly as used seems to imply that the Hannover storage will be refreshed only once every 7 days. The address for FTP connection can be either **ftp.rrzn.uni-hannover.de** or **130.75.2.2** , and **cd /pub/special/atp** then will move to the beginning of ATP materials which are stored in various subdirectories below this. Because this is a Unix computer, users are reminded that lower-case letters are not the same as capitol letters. Finally, in case the reason for the new Hannover service has been forgotten, *"this mirror was setup to reduce the transfer-costs for Europeans, and to reduce the time one has to wait for a free transatlantic-line. ATP-service in the future."*

Profs. Akihiro Ametani and Naoto Nagaoka of Doshisha University in Kyoto, Japan, finally can be reached by E-mail. On May 12th, a message was received from **nnagaoka@duaic.doshisha.ac.jp**. This should be important for CABLE CONSTANTS users (much more about this subject can be expected in the next issue).

Use of old Kermit with time-shared computers is to be discouraged compared with XMODEM, YMODEM, or ZMODEM, it would seem. On March 2nd, MODELS author Laurent Dubé demonstrated by daytime use the difference for his **csos.orst.edu** --- a factor or 3 or 4 difference. March 3rd, computer expert David Szymanski independently made the same recommendation, which was accompanied by an explanation that old Kermit sends

a small block (hundreds of bytes), and then waits for returned acknowledgement before sending the next small block. If there is a delay at the other end due to significant time-sharing, this drastically reduces the average transmission rate. The *modem* protocols use more history and allow delayed confirmation of correct reception. As long as errors are rare, this is much more efficient. Mr. Szymanski reported observing ratios of 5/1 for his own computer use. Yet, he also noted that a new Kermit implementation might well incorporate the reforms of the existing ZMODEM utility.

Use of FTP for Salford EMTP distribution was announced on February 17th by Martin S. Jones of the University of Nottingham in England. The lucky recipient was none other than former Oregonian Gayle Collins, who now studies at the University of York in England. In E-mail of the Fargo list server, Mr. Jones writes: *"The whole process including logging in/making directories etc. takes roughly 10 minutes. I was supplied with a u/name and p/word which is by far the easiest for me ... Certainly with the number of users using the server, ftp seems the best way to transfer such files where possible."* Yes, this sounds just as Robert Sarfi had envisioned it (see top of column 2 on page 20 of the July, 1993, issue). It is important progress --- even if the initial service (from Nottingham) is limited to a small portion of the world (the U.K.). More precisely, is this the reason it was so fast --- because the transfer was confined to a strong network (JANET)? It is not obvious that Mr. Jones could report the same high speed sending files to continental Europe. This might be the next interesting, experiment.

Real Internet (FTP) is supposed to be coming to BPA --- finally. March 1st, Dr. Tsu-huei Liu volunteered to be a guinea pig for testing that might begin as early as April 1st (or was this an April Fool's joke?). As of May 15th as this paragraph is being frozen for publication, there has been no sign of actual usage.

Prof. Laszlo Prikler of the University in Budapest, Hungary, provided the second offer of ATP distribution by FTP within Europe. In list server mail dated February 22nd, he wrote: *"I received the new Salford ATP (PC version) disks last week by air mail from Scott Meyer. If anyone of European licensed subscribers who read this message would like to obtain it by FTP, just send your username and password to me and I will push it to your machine."* As Prof. Prikler began his message, *"traffic on the ATP-EMTP mail server clearly signals that ATP distribution by FTP is coming soon and probably (will) become more and more popular."* There followed some estimates of FTP speed, which were came from *"two sources: 1) tests carried out between T.U. Budapest in Hungary and Mr. Goetz Lipphard's RS6000 machine at T.U. Darmstadt in Germany; 2) numbers received after transferring the new ATPDRAW and January issue of Can/Am EMTP News from the Fargo server ....*

Transfer speed seen from Budapest to Darmstadt:
PUT (push) at heavy loaded period: 0.7 kB/sec
PUT at low loaded period: 1.9 kB/sec
GET at heavy loaded period: 0.2 kB/sec
GET at low loaded period: 0.6 kB/sec
Transfer speed in opposite direction .... :
PUT at heavy loaded period: 0.5 kB/sec
GET at heavy loaded period: 0.5 kB/sec
Transfer speed between Budapest and the Fargo server:
GET at low loaded periods (morning in Europe/night in the US): 1.4 kB/sec
Extrapolating from these figures, transfer of the complete ATP package (approx 2.7 MB) would take 23.5 minutes in the best of times, and 3.75 hours in the worst."

So, Salford EMTP distribution began from Budapest. In list server mail dated February 24th, Prof. Prikler summarized his initial four attempts in a table:

Destination	Day and Time (CET)	Speed	Total time
Marseilles	Tuesday, 19:00	2.2 kB/s	35 minutes
Zurich	Thursday, 16:10	4.2 kB/s	25 minutes
Darmstadt	Tuesday, 18:30	0.8 kB/s	2 hours
Wroclaw (Poland)	-	-	unsuccessful

Size of the communications was reported to be 3.3 Mbytes, and *"in the first two cases there was not any trouble with login to the host."* The files were pushed (FTP PUT) from Budapest. The third case (Darmstadt) seems to have been both more challenging and also more interesting. Twice there was trouble initiating the transmission interactively (*"the host refused me"*), so there was a switch to batch mode. The transmission was done *"automatically at night leaving my PC unsupervised in the office."* Your Editor believes this to be the most valuable experiment of all since it proves feasibility of batch mode transmission that practically would be demanded of a user group. Failure of the fourth case probably was because *"the host in Poland is connected to Bitnet rather than to Internet."* Names of the first 3 cooperating parties are not new to this newsletter: Capolino, Bacher, and Lipphardt, respectively.

BinHex 4.0 is encryption software such as the familiar UUENCODE. This was first seen March 9th in a short message from Ray O'Leary of S&C Electric Company in Chicago, Illinois, USA. From electronic address **roleary@cedar.cic.net** came the following :

(This file must be converted with BinHex 4.0)
:#90$6e48,P4B9!"849K869G*53#3"!(,!*!%*"Y%C@&b
Etc. Unfortunately, just as with your Editor's Agora last December (see the beginning of page 11 of the preceding issue), Mr. O'Leary was unaware of the mapping! This was learned by voice telephone March 14th. In server mail the preceding day, your Editor had shown only the first 3 lines of the message to subscribers of the Fargo list server, but this seemed to be enough to trigger decoding by at least one mail handler (this was the observation of Glenn Wrate of Michigan Tech). So much for the bad

news. The good news is that Mr. O'Leary is in contact with long-time EMTP contact Art Jahnke, and S&C Electric has access to Internet on at least one computer. The inquiry was about ATPDRAW, which S&C can acquire from the plains server by Anonymous FTP.

Pacifier Computers of Vancouver, Washington, USA, is another cheap source of Internet service in the greater Portland metropolitan area. On page 12 of the local, free, *Computer Bits* magazine for May can be found a sizable advertisement that says: *"25 lines and growing; 300/1200/2400/9600/14400; FTP ... Dial-up access for as low as $50.00 per year."* So, your Editor and Dr. Liu did dial the listed number one Friday afternoon toward 16:00, and were immediately accepted (no waiting). After some preliminary registration, color menus allow the new user to look around. Going into the Internet entry showed $50 for 2 hours/day. This might be believable as an added expense on top of some basic membership fee. The address is **pacifier.rain.com** so maybe Pacifier uses the same Rainnet as Agora.

BBSs seem to be so numerous as to be practically uncountable in the average American city. Page 37 of the May issue of *Computer Bits* magazine is filled with 47 such entries, which are described as *"a partial list of the electronic bulletin boards located in the Portland area."* Curiously, neither Agora nor Pacifier are included! The focus of many is unclear, but some are very specific and interesting. For example, there is *"Wireless BBS (692-7097: 14.4); HAM radio, SWLing & scanner buffs. RIME & RFnet."* RIME may be unknown, but HAM means amateur radio, and SWL indicates short wave listening. Another is clearly religious: *"Project America (760-6920: 2400); Christian BBS; family environment & healthy conversation about God & personal beliefs. Open to all."* Many use the word *adult*, which probably explains the disclaimer by magazine editors: *"Parents should note that many BBS's contain material that is not suitable for children."* The word for this seems to be *cyber sex* (or, in the case of high-resolution color bitmaps, ordinary old *pornography* might also be appropriate).

Speaking of pornography, prevention of its distribution by computer is difficult because Internet is international, with different parts being controlled by different persons in different countries. Constable John Ferguson of the Ottawa, Ontario, Canada, police is quoted as saying: *"You just cannot police Internet because nobody owns it or runs it."* This is in the lead story of the Law/Courts section of Portland's *Daily Journal of Commerce* dated May 9th which is from Reuters News Service. In this, author Anthony Boadle writes that *"police are overwhelmed by the mountains of data freely available on networks over which they have no jurisdiction because host computers are often located in other countries. They have also run into a legal limbo where no definition exists as to what constitutes possession or distribution of illegal electronic material. .... Defenders of free 'cruising' on Internet say it is the largest uncensored form of communication because it escapes the control of governments, who should have no place on it.* Yes, well, it does seem that maybe the average Canadian police department has more free time than the average American police department!

The clipper chip to encrypt electronic messages is the latest subject of debate within the United States about the information superhighway. *"The government has already purchased 9,000 clipper chip devices"* according to David Lawsky in another Reuters story on the same page 9. *"Powerful computer chips or software employing complex mathematical formulas scramble digital signals ... so someone would theoretically need thousands of years to decode a message."* Good (sounds like just what we need to protect ATP secrets!).

CompuServe might allow FTP use in southwestern Canada? E-mail dated May 1st from Gabor Furst of DC-22 fame indicated the following: *"I am experimenting with a B.C. Internet gateway called Mindlink. ... If I can figure out how to do FTP transfers, I will switch to this network. It is quite a bit cheaper then CompuServe, who still don't have FTP, although they claim that they will have it soon."* So, it would seem that CompuServe is being dragged kicking and screaming into the fast lane of that famous *information superhighway* (a popular current cliché in the United States). If and when FTP does come, CompuServe no doubt will charge plenty for it. So, Mr. Furst is advised to persevere. Even at only 9600 baud as used in Portland, FTP definitely is worth the struggle.

Too many subscribers is the problem of Agora. From a Unix shell on January 18th, **cd ..** followed by **ls** showed 541 names of which one was ATP . This would seem to illustrate the *salami technique* of accumulating wealth. The $5 paid each month by the user group may be negligible, but 500 times it is not! Could Agora grow into a regional CompuServe? This all seems quite amazing. As Laurent Dubé joked, *"the next thing you are going to learn is that Agora is run by some 15-year-old high-school kid!"* Maybe. But it has been good.

Illustrative data cases of power electronics were contributed to the plains FTP server by Dr. Sayeed Ghani of the University of Northumbria in England. In E-mail dated February 4th, he wrote: *"Please find below in one file twelve data cases on 'Voltage Sourced Reversible Rectifier (VSRR)'. They use TACS facility, therefore, may be included in /pub/atp/dcase for anonymous ftp transfer. ... I hope to send you further data cases for asynchronous machines. They are circuit models and quite distinct from the ATP official model. They also use TACS facility."* Who would review this in order to provide perspective?

Tokyo Electric Power Company (TEPCO) in Japan has been known for some time to have E-mail (see

column 1 on page 8 of the January, 1993, issue). But only recently has personal contact been established. Following a February 4th visit to BPA, Takeshi Yamada returned home and inquired about E-mail. After first using a colleague's address, on February 21st Mr. Yamada sent E-mail from his own address, which is **yamada@emm.pj.comm.tepco.co.jp** Unfortunately, he does not seem to enjoy FTP privileges.

Automatic UUDECODE use by local E-mail networks would seem to be a service no one should want. Robert Schultz of New York Power Authority (NYPA) in White Plains provides the perfect illustration. Your Editor had attempted to send the 155-Kbyte WordPerfect file of the January newsletter to Mr. Schultz electronically. Using PKZIP reduced the size to 59 Kbytes, but then UUENCODE use created two 43-Kbyte files. E-mail from Mr. Schultz on February 8 relates the following sad tale: *"Unfortunately, my BBS still has incompetent processing of uuencoded files. It automatically and erroneously decodes the first part of any multipart message, wreaking havoc with the overall process."* So, a second transmission later that same day consisted of nothing but the encoded information. That is, all markings of UUENCODE at the beginning and the end were removed in order to help EXECNET. But even this did not work, because EXECNET automatically splits large messages into smaller pieces. Again, the *service* seemed to be erroneous! So, instead of two pieces, your Editor sent six (Mr. Schultz thought that fewer than 250 lines should be safe) early on February 10th. *"I guess I am the only 'power E-mail' user (of EXECNET),"* Mr. Schultz observed! For those searching for E-mail service, this would seem to be one more important consideration.

EXECNET bundles interesting summary information along with files that it distributes. For example, Mr. Schultz sent the file UUEXE525.ZIP in E-mail during February. UNZIPping resulted in a screen display from which the following information was extracted: *"The Executive Network Information System -- 914 667-4567; An official Alpha test site for PCBoard(tm)! 50,000+ files, *4000* conferences, 10+ MB new files every single day! 20 Phone lines! The 1st Fax Gateway! 10+ GB on-line! International Host of the ILink(sm) Network!"* Yes, this does sound bigger than Agora!

Subscription to the Fargo list server continues its steady growth. In server mail dated March 17th, Prof. Bruce Mork mentioned *"about 170 subscribers."* What hath Mork wrought? The revolution in communication among ATP users continues!

Oregon State University in Corvallis continues to offer E-mail service that is appreciated by Laurent Dubé. Around the end of last year, he downloaded a 10-Kbyte memorandum from John Sechrest, Technical Director of Computer Science. Interesting excerpts from this follow: *"We have been successful in getting some donations. We have a long list of industrial sponsors who have been giving us equipment that allows us to do what we do. ... These companies have been very nice to us. We hope that you will be nice to them. In addition to hardware donations from companies, we have had a dedicated staff of volunteers."* What about size of the service, and growth? *"Last June we had 250 people. This month we have more than 500."*

"connect: No route to host" was the delayed (2 or 3 minutes) response to your Editor's attempt to use FTP to connect to Nottingham around 17:20 English time. Those transatlantic circuits must really have been busy!

W. Greg Wnuck of Maxwell Laboratories in San Diego, California, contributed to the plains server an ATP data case that seems to have prompted reorganization. In an announcement dated March 17th, Prof. Bruce Mork wrote: *"I have placed a file called atp/dcase/wnuckemi.zip on the plains ftp server. It is a sample data case, plus letter of explanation. The simulation is the result of his MS thesis investigation of an EMI power quality problem related to capacitor bank switching. I will begin to add index files in each subdirectory of the plains ftp server. The files will be named 00index.txt. The 00 prefix assures that it will appear at the top of the directory listing. These will be kept as a text file, and will contain a brief explanation of each of the files."*

WPVIEW is the name of new shareware to view and convert WordPerfect files. This was mentioned in public E-mail of the Fargo list server dated February 22nd when Prof. Bruce Mork announced its availability on the plains FTP server in **pub/atp/util** . Who first learned about this powerful new tool? Earlier that same day, Harald Wehrend of the University of Hannover in Germany had reported: *"I discovered a new shareware utility to view not only Word Perfect files up to version 6.0, but also Windows version included but also ASCII, MS Word 4/5, Winword 1/2, Ami Pro and Windows Write. Beside viewing and searching there is also the possibility of searching, printing and converting to ASCII."*

Kuwait may have E-mail, but it could not be demonstrated on March 1st when your Editor attempted to reach one address in that oil-rich Middle Eastern kingdom. This was in response to a conventional letter dated February 15th from Dr. Mansour H. Abdel-Rahman of Kuwait University. At the bottom of his letter, he had written his E-mail address: **rahman@eng.kuniv.edu.kw** Unfortunately, your Editor's message was returned to Agora on March 9th with the complaint: *"transport smtp: no connection to remote SMTP server: 499 timeout on read from remote SMTP process."* A subsequent "News:" release of the Fargo list server asked for an explanation (*"Any reader who understands what happened to the message during those 8 days is requested to share his*

knowledge"), but no insight has yet been received. So, conventional Air Mail was used to deliver a copy of the undelivered communication. This second attempt did succeed. How is this known? Because acknowledgement was received from Kuwait by E-mail dated March 27th! Two days later, your Editor had no trouble sending a message via Agora.

Those inverted English E-mail addresses (see column 1 on page 5 of the January, 1993, issue) may be coming to an end. E-mail from Martin Jones of the University of Nottingham in England shared a related news release in E-mail dated February 3rd. *"According to our Computer Centre's newsletter here at Nottingham, and I quote: 'The JNT (the Joint Network Team, who manage the Joint Academic NETwork, JANET) have sent a circular to all computer centre directors which announces that from 1st January 1994, the preferred ordering for mail names within the UK academic community will be reversed.' Hence the UK is to become 'little-endian' (e.g.,* ***eexmsj@unicorn.ccc.nott.ac.uk*** *) in line with the rest of the world."*

Rush Limbaugh and fellow conservatives are not the only ones to exploit CompuServe. To answer criticism that the famous and humorous *Doctor of Democracy* has been given too much exposure, evenhandedness shall be demonstrated by a balancing illustration of the exploitation of E-mail by Democrats controlling the government. Yes, CompuServe is being used to promote President Clinton's so-called *"Health Security Plan"* (otherwise known as socialized medicine by conservative critics). This was one of the items featured in the *"What's New This Week"* advertising as your Editor connected to CompuServe on October 30th. He pulled in the associated news story, which reads as follows: *"(28-Oct-93) The full text of the Health Security Act, President Clinton's official health reform package just presented to Congress, is available online. Visit the Democratic Forum's Library 8, 'Health Care Reform,' to download file LEGIS.EXE, a self-extracting file of the 1,600-page document. The new book, 'The President's Report to the American People,' which explains the health security plan, is also available in the library as file REPORT.EXE. .... Also, discuss the issues with members in the Democratic Forum's Section 3, 'Health Care,' or the Political Debate Forum's Section 4, 'Health Care.' .... To access the Democratic Forum or the Political Debate Forum, each a part of CompuServe's extended services, GO DEMOCRATS or GO POLITICS."* Of course; and in the case of that 1600-page manuscript, pay CompuServe big bucks (i.e., beaucoup d'argent) for the privilege!

E-mail addresses that are changed by administrators without the knowledge of the users are a serious problem. It happened at BPA on January 28th. So, Laurent Dubé's next attempt, addressed using his ORST address book, became undeliverable. A few days later, Martin Jones at the University of Nottingham in England related a similar story. Quoting from his E-mail of February 1st: *"Sorry for the incorrect mail address. I have just checked it and it is indeed* ***eexmsj@unicorn.ccc.nott.ac.uk*** *. It used to be @unicorn.nott.ac.uk but it seems the sysadmins have changed it again!"* What a pain, such help from the specialists. With friends such as these, ...

Those system administrators (sysadmins) **do** hold the power. In the case of Agora, it is owner/operator Alan Batie. As related to list server subscribers in "News:" dated March 28th, *"This writer recently mailed a check for $30 to Alan Batie, .. to pay for six more months of Agora service. Acknowledgement of reception came by E-mail, of course, from 'root (The Almighty SysAdmin)'."*

MATLAB Postprocesses . PL4 Files

MATLAB from The Math Works, Inc., describes itself as *"high-performance numeric computation and visualization software."* With headquarters in Natick, Massachusetts, the company can be reached by E-mail at **info@mathworks.com** (neat, eh?). Progress has been made since Dr. Matt Donnelly's suggestion at the start of page 4 of the preceding issue. In fact, a utility named PL42MAT now is available to convert .PL4 files into .MAT files, which are native files of MATLAB .

Raffaele Salutari of 3E Ingegneria srl in Pisa, Italy, is the person who created PL42MAT. The general public first was informed of the development in E-mail of the Fargo list server dated March 22nd. This was a project arranged by Massimo Ceraolo at the University of Pisa, who had made the original inquiry about .PL4 file structure. In explaining one disadvantage of using formatted input, Mr. Salutari wrote: *"MATLAB ASCII files may contain only data and can be read as a single matrix, thus losing all the information about the variable names. Also, ASCII files have generally big sizes and are much slower to process."* So, the conversion utility was written to provide a more efficient and higher-quality interface between ATP and MATLAB.

The fundamental structural difference between .PL4 files and .MAT files was explained as follows by Mr. Salutari in public E-mail dated March 25th: *"A MATLAB file is structured as a sequence of data variables: first all the data of the first variable, along with its name; second all the data of the second variable; and so on."* As a result, conversion is not a trivial, sequential (one time step at a time) operation as it was for COMTRADE. For maximum efficiency of a single-pass operation, then, one must have enough RAM available to store all points of all variables. But initially, only normal MS-DOS (not Salford DBOS or any other DOS extender) is being used, so execution can use only the first 640 Kbytes of RAM. Mr. Salutari writes: *"The size of the file to be*

converted can be very large. However, ... the program must proceed with different strategies in the cases of small and large size files: ... For large files (usually above 400 kB), the data of just a single variable at a time are read and written immediately on the MATLAB file, thus requiring multiple scannings of the .PL4 file. This requires much more time" (than for smaller files, which can be processed in a single pass). *"In either case, the size of the generated MATLAB file is practically the same as the size of the corresponding ATP file."*

Variable naming is just one of several details that illustrate the sophistication of Mr. Salutari's utility. He writes: *"After entering MATLAB, the data can be retrieved by means of the 'load' command. Typing 'who' at the prompt, the user is shown the loaded variables, which are named pretty intuitively as follows: 1) "t" is for time; 2) 'Vaaaaaa' is for bus voltage. Note that 'V' is upper case, and 'aaaaaa' (lowercase) is the name of the bus (if it is shorter than 6 characters, trailing blanks are omitted); 3) 'Vaaaaaa_bbbbbb' is for branch voltage. Again, trailing blanks in bus names are ignored. 4) 'Un_aaaaaa' is for Universal Machine variables, where 'n' is the number of the machine. Finally, 5) 'Taaaaaa' is for TACS or MODELS variables."*

Anonymous FTP has been approved for distribution of PL42MAT to licensed ATP users. This followed lack of objection to the idea as proposed by your Editor in list server mail dated March 24th. The reasoning is worth noting, since it should apply to other postprocessing programs: *"Since the only significant output would seem to be in MATLAB language, if secrets are revealed, they would seem to belong to MATLAB and not to ATP! This writer is not greatly troubled by the idea. What about other collaborators?"* Because no one objected, distribution using Anonymous FTP was approved.

Arcs in Air Modeled by Will Rogers

"Modeling of free-air arcs -- two methods examined" is the title of a 32-page report by BPA's William Rogers as first explained to the general public in E-mail of the Fargo list server dated March 16th. As an experiment in the electronic distribution of what originally was a conventional, printed (paper and ink), internal report, this was made available to the general public via the plains FTP server of Prof. Bruce Mork, which has electronic address **plains.nodak.edu** Text and graphics were purposely separated. The text was universal, so could be read by anyone as ordinary ASCII files. Graphics, on the other hand, were done by Mr. Rogers using HP-GL language. There are 20 such graphic files --- each on a separate page as produced by Randy Suhrbier's VAX / VMS plotting program. Each .HPG file was verified as being displayable using shareware PRINTGL from Ravitz Software before the archive of all files was sent to Prof. Mork by E-mail in UUENCODEd form.

One page of the Rogers archive, RPT_P00.TXT, provides the following summary: *"Two practical free-air arc models have been developed for use with EMTP. The models have been used to match the voltage versus current curves of several measured arcs and have proven useful as components of larger system models. The basic model consists of a zinc oxide component in shunt with an inductor for energy storage. A shunt resistor is connected across the ZnO component to adjust the slope and shape of the arc voltage versus current curve. A switch is used to initiate the fault and to terminate the fault current when the arc extinguishes. A voltage versus current arc curve is generated by driving the basic model with a current source. To create a model from measured field data, the measured V-I arc curve can be plotted and overlaid on a curve produced with the model. Then the model's parameters can be adjusted until the best achievable match is made. For the basic model, five variables are involved in this procedure: the ZnO reference voltage, the ZnO exponent, the resistance, the inductance, and the magnitude of the current source. The advanced model adds a damped capacitor and shunt resistor in parallel with the basic model. These additional components allow modeling of complex arc curves which cross over near the origin. With the extra parameters, matching a model to specific field data is more laborious than with the basic model. However, by understanding the effect that each component has on the shape of the arc curve, a model can be produced with just a few iterations."*

All 32 disk files were archived into a single disk file ROGERS.ZIP that Prof. Mork placed in the /atp/bpamem subdirectory of the plains server according to his public announcement on March 17th. In an announcement earlier that day, your Editor wrote: *"Readers are encouraged to respond to the contents of this report. The evaluation of Dr. Mustafa Kizilcay of Lahmeyer International in Frankfurt, Germany, should have particular significance because of his own publication of a more sophisticated model. Note there is little similarity between the work of Mr. Rogers and DC-43 --- TACS modeling of an arc that came from Dr. Kizilcay 7.5 years ago. .... How does the model described by Mr. Rogers compare with the model of Dr. Kizilcay from several points of view: 1) accuracy; 2) data availability; and finally, 3) simplicity of use? This writer asks because he does not know."*

European EMTP User Confusion

This is a continuation of the story that began on page 8 of the preceding issue. It documents the slow replacement of LEC (the Leuven EMTP Center), which somehow never seemed to understand the importance of honest financial accounting, by an all-new user group registered as a nonprofit corporation under the laws of

Germany. The transition was neither quick nor smooth, however, as this long story will attempt to summarize.

Copenhagen, Denmark, was the site of the first EMTP user group meeting in Europe this year. Or was it? Curiously, name tags for the general meeting that was held at the Emeritage Hotel in suburban Lyngby on April 19-20 mentioned neither EMTP nor ATP. Instead, they mentioned "*electromagnetic transients*." This seemed to be the first sign of what since has become known as the abortive Copenhagen Coup --- an incompetent attempt by opponents of Dr. Mustafa Kizilcay to keep an ATP user group out of Europe.

Since last December, Dr. Kizilcay had been refining the Charter for an ATP user group that would be a non-profit corporation registered under the laws of Germany. It would require ATP licensing using the Can/Am form letter LICENSE.ZIP This was Proposal A at the meeting. Proposal B seems to have been a hastily-written, last-minute offering that was unknown to the average former LEC member prior to the meeting. It was fundamentally different in that its organization would not be restricted to either users of EMTP or digital computers. Alerted by 4 pages of FAX that Dr. Kizilcay sent from the hotel on April 18, your Editor expressed his disapproval of the idea in a 2-page letter that was sent by both FAX and E-mail. The meeting apparently ended without any agreement, but amid considerable recrimination. One must say *apparently* because organizers did not tape record the proceedings. In retrospect, maybe this, too, was logical enough, considering the trickery involved.

In public E-mail of the Fargo list server dated April 24, your Editor encouraged Dr. Kizilcay to proceed on his own: *"The Can/Am user group has decided not to wait for Europeans to agree on a replacement for LEC. Instead, it has asked Dr. Mustafa Kizilcay to proceed with his own proposal for the distribution of any and all ATP materials in Europe. Note that a user group is not needed for such action. Can / Am licensing would be used, and Dr. Kizilcay could be authorized to validate applications the same way user groups in Taiwan and Korea have been doing for years. Later, if Dr. Kizilcay forms an ATP user group as a non-profit corporation under German law, this could provide the framework for expanded activities such as meetings and courses. .... But what would be prices for ATP materials such as the 3 Salford EMTP disks, an 800-page ATP Rule Book, or BPA's EMTP Theory Book? Dr. Kizilcay is asked to respond specifically, and to include estimated additional charges for Air Mail outside of Europe (most importantly, to the USA). Substantial numbers of non-Europeans might be expected to take advantage of such service. However, before the Can/Am user group approves of ATP licensing and distribution by Dr. Kizilcay, it wants to consider the reaction of others to publicly-disclosed prices."*

Proposed prices and services were distributed by Dr. Kizilcay in public E-mail of the Fargo list server on May 9th. Ideas about a future, associated European user group were included, but they need not concern us now (see the next issue). The immediate need in Europe is for the distribution of ATP materials. Because no serious, public objection was received during the following 3 days, final Can/Am authorization to perform both ATP licensing and the distribution of ATP materials from a base in Germany was announced publicly on May 12th.

Rule and Theory Books might cost how much? Pages will be 4-hole punched (the German standard) in order to be accepted as books by the German postal system. Then there is an optional 4-ring binder. Wrapping will include a cardboard box. Finally, using a current conversion rate of 1.67 German marks per U.S. dollar, proposed prices for the LEC's 944-page, printed ATP Rule Book would be approximately as follows for nonmembers:

	Without binder		In 4-ring binder	
	surface mail	air mail	surface mail	air mail
To Europe :	$78	$84	$84	$90
To USA :	$78	$105	$84	$117

Registration would add about $2 to each of these entries. Carefully note that these prices are only approximations, however. Your Editor has yet to read a final decision about what currencies are acceptable for payment, and in what form (the costly handling of foreign checks). There also is the matter of the remainder of the world. So, interested readers, instead of the above, rely on details that come from the new center itself. Inquire of :

Dr. Mustafa Kizilcay
Ahornstr. 10
D-63165 Muehlheim am Main
GERMANY
Voice phone : +49 69 6677 254
FAX phone : +49 69 6677 732

Survivor of DCG / EPRI Shipwreck ?

A single-page, anonymous, printed letter dated "2-1-1994" was postmarked in New York on January 31st. Addressed to the Chairman of BPA in "Vancouver, WA 98666," this pathetic example of both technical information and English writing reached your Editor via his supervisor, Robert Hasibar, on February 8th. The only indication that it had been anywhere else was handwritten marking of "EOHC" (the mail stop of Hasibar's group) on the plain manila envelope, which had been opened. Content, minus blank lines between paragraphs, follows between the next 2 blank lines:

"Subject : Dr. Scott Meyer ; Bonneville Power Administration Portland
- Abuse of Authority
Dear Sir/Madam:

I wish to bring the following to your kind attention for proper action. Dr. Scott Meyer act as the Administrator of the Electro Magnetic Transients Program (EMTP) for the past several years. This program was developed by H.W. Dommel at BPA during the 1970's. Further work was performed by Dommel and others such as EPRI. In distributing this software to various Universities and Companies Dr. Scott Meyer was partial and he declared he will not issue this program to several companies such as GE, Hydro-Quebec, and University of Wisconsin because they are associated with EPRI version of the EMTP. Furthermore, Dr. Scott Meyer writes very badly on those who are involved with EPRI Program in the following periodicals:

1. EMTP News
2. Canadian/American EMTP News

An example of his writing is attached herewith for your kind review. Dr. Scott Meyer has ruined the career of many Engineers by writing badly about them in the public forms. Could you kindly initiate appropriate disciplinary action for misusing his authority as a federal employee? Also every one will be benefitted by this program if Dr. Scott Meyer is displayed by another qualified and honest person.

Dr. Scott Meyer is an evil person and he declared that he will finish my career in front of a group of IEEE members and I am not in a position to defend against this person. Therefore, I am compelled to bring this matter to your kind attention." < End quotation >

The attached three sheets of photocopy were of pages 89-91 of the March, 1991, issue of LEC's *EMTP News* --- the original story that documented the embarrassingly slow simulation of EPRI's OS / 2 version of EMTP (*"Quarter-speed DCG / EPRI EMTP using OS / 2"*). As has been written many times about EMTP work, if the truth hurts, your Editor does not apologize. He **does** print corrections when warranted, but none has ever seemed to be appropriate for the EPRI OS / 2 story. During more than three years, not one person has ever indicated the slightest inaccuracy of any of the published information. About EPRI and OS / 2, the shoe fit.

At issue in such EMTP-related reviews are public, not private, matters. In such cases, U. S. law --- constrained by the First Amendment freedoms of speech and the press --- provides no shelter from truthful exposure. In the case of DCG and EPRI, vast sums of U.S. governmental financing are involved, so anyone has an obvious right to criticize publicly the incompetence and/or dishonesty as it is uncovered.

EPRI already has complained about your Editor's writing, it should be explained. But this was not by means of poorly-written, anonymous letters, obviously! No, EPRI politicians typically would contact BPA politicians at as high a level as practicable (e.g., BPA's Chief Engineer); and this would be done personally (and often verbally, so no written record would exist) rather than anonymously. According to reliable, informed sources, this happened after the initial 1988 writing (see *"Recent problems with credibility of DCG / EPRI EMTP Review"* on pages 31-41 of the March, 1988, issue of *EMTP News*), and again at the time of EPRI's notorious OS / 2 EMTP debacle. Conclusion of the first instance was summarized at a subsequent annual LEC meeting in Leuven: perfunctory dismissal by the BPA attorney who was involved. The second instance was at the time of OS/2 writing, and this complaint seemed to die in the talking stage as BPA engineering management began to appreciate its own potential liability (if it were to accommodate EPRI desires by attempting censorship).

It is important to note that BPA seems to be little involved in the latest complaint, despite the desires of our anonymous critic. Neither of the two periodicals mentioned is published by BPA, and writing was done in the name of the Can/Am user group (again, not BPA). There is no allegation that this writing was BPA work. About program code: as has been written many times, BPA's EMTP remains in the public domain contrary to the desires of DCG and EPRI. If our anonymous critic is not referring to BPA's EMTP, it must be assumed that he is referring to ATP. But ATP is not the property of BPA; and ATP is not in the public domain, although BPA has contributed portions that are. So, it makes no sense to complain to BPA management that ATP as a complete program is not being given free of charge to a few (those who have participated in *EMTP commerce*).

Today, no one is denied ATP. Universal access to ATP was announced in the January, 1992, newsletter (see the story entitled *"ATP Available to DCG and EPRI"* that begins near the end of page 8). Does our anonymous critic not understand this? The **mis**information about General Electric (GE) is particularly noteworthy since ATP is used free of charge at numerous GE factories around the country; and the center of the power system operation, in Schenectady, New York, is among these (see the associated story in the July, 1991, newsletter). One engineer from GE in Schenectady attended the Florida short course during March, and returned home with then-current Salford EMTP materials that were to be shared with colleagues.

If any reader has any idea what the allegation concerning *"a group of IEEE members"* is about, your Editor would appreciate being informed. Not having attended an IEEE PES conference or general meeting within the last dozen years, and not even being an IEEE member, your Editor does not have a clue as to date, place, subject, etc. This comment assumes the letter meant to say that your Editor *"declared in front of .... that he will ..."* Note that without such restructuring, the accusation promises high drama (the ending of a career) in front of an IEEE audience!

To conclude on a positive note, is this anonymous complaint not one more sign that the EMTP war is being won by the ATP side? There now is evidence that one crew member of the commercial competition might have been driven to desperate and inaccurate (not to mention ineffective) complaint by the truthful, public exposure of his inferior work. Alternatively, does the inaccuracy and incompetence of the anonymous complaint have an even simpler explanation: ordinary mental illness? Of course, it is entirely possible that no associate of DCG and/or EPRI is involved. Most readers realize that writing about OS / 2 has not been much in dispute this past year. Who else might have an even better reason to be angry about your Editor's recent publication of the truth? Well, speculation abounds. That anonymous letter from New York City has provided the most fun around EOHC since the Tonya Harding story ("skategate") broke!

ATP Rule Book using WordPerfect

Martin Jones, a doctoral student at the University of Nottingham in England, has singlehandedly converted LEC's disk files of the ATP Rule Book to WordPerfect format from the original Lotus Manuscript and Freelance files that were created by LEC in Leuven, Belgium. For background, see the January, 1993, newsletter. This development occurred during March, and it promises to have a profound impact on the worldwide community of ATP users.

Both DrawPerfect and WordPerfect can be used at the same time to work on Martin Jones' WordPerfect files of the ATP Rule Book. This critically-important mechanical detail was explained by Harald Wehrend in E-mail of the Fargo list server dated April 1st. In "News:" of April 6th, this was further explained for the record: *"A separate, thin (some 50-page) manual that is part of the DP documentation is entitled 'WordPerfect Shell 3.0'. .... Immediately following the Introduction is a section entitled 'Installing Shell and the Shell Macros.' There is an associated special disk entitled 'WordPerfect Shell 3.0; DrawPerfect Shell Macros.' This was the missing software. After installing, the menu of WP graphics editing has an added choice ('6 DrawPerfect') that provides the desired transfer. This is provided one runs WP from SHELL rather than by itself."*

Section I-E, which includes disk files STARTUP and GRAPHICS, was the first Rule Book file to be overhauled. It was sent back to Nottingham as announced by your Editor in public E-mail of the Fargo list server dated April 1st. Meanwhile, Dr. Tsu-huei Liu continues to work on the more challenging Chapter XXIII, which is for CABLE CONSTANTS . Whereas Sect. I-E only involved text, Chapter XXIII has a lot of graphics.

A Reinvented BPA Will Do What ?

"BPA hopes to raise $281 million a year from new products by FY '98" is the headline of a story on the front page of the February 28th issue of *Clearing Up*. *"BPA customers read their worst fears into the document: that Bonneville, under the guise of cutting costs, will charge either more money for services they already receive or the same amount for fewer services. ... Also under new products, BPA suggests raising $20 million a year by charging non-federal power systems increased or new fees for use of reactive power from BPA's control area .... Finally, the plan calls for raising another $70 million in revenues 'from unspecified sources.' Lon Peters, senior economist for the Public Power Council, derided the new and repositioned products as 'smoke and mirrors.' The plan 'shifts $100 million in costs from BPA to customers under the guise of repositioned products,' Peters said. 'Another $100 million is blowing smoke'"* (i.e., the associated claims are deceptive).

Meanwhile, BPA's policy of spilling water to help Salmon (see column 2 on page 10) has come under attack from those on the Eastern edge of the Columbia basin, near the continental divide. From the front page of *Clearing Up* one week later (March 7), one reads: *"BPA and other federal agencies took a beating last week in Kalispell over proposed hydro operations to benefit ESA-protected salmon. ... Montana has been simmering for some time over damage to its reservoirs, but the state boiled over recently when federal agencies, including BPA, agreed in the biological opinion to use huge amounts of Columbia River water to flush endangered fish to the ocean. ... 'You can't do a whole lot of boating on the rocks,' said one marina owner."* Yeah, that should not be too hard to understand! Meanwhile, BPA is being *reinvented* (the official term used by politicians in power in Washington). All of this would seem to have little to do with electric power engineering, of course.

"President Clinton has signed into law legislation (HR-3345) that will give thousands of federal employees incentives of up to $25,000 to separate or retire." Thus began the lead story of the April 4th issue of Federal Employees News Digest, a weekly newsletter. As part of its restructuring, BPA has fully embraced the program (which was not mandatory), and said that it will allow nearly anyone who qualifies to leave. This provides a unique opportunity for those with at least 20 years of service. It offers a chance to retire without financial penalty for those having fewer than the nominal 30 years. Many BPA employees (including your Editor) are thinking very hard about the possible move, which must be made by September 2nd. No need to worry about Dr. Tsu-huei Liu, since she does not have the required time (also, with kids in college, she probably could not afford it!).

E-mail in Portland : BPA and Agora

Agora continues to be used to receive EMTP-related E-mail for both the user group and BPA. Real Internet is not yet available at BPA, although it obviously is coming. What is the infallible sign? Politicians already are taking credit for it! Every BPA engineer received a one-page announcement entitled *"INTERNET -- What Can It Do for Me?"* Organized by John Weaver of BPA's Office of Engineering, this presentation is scheduled for May 24th (yes, it is this year --- 1994 !) .

In theory, PROCOMM PLUS allows avoidance of the use of Kermit or other file transfer programs for the uploading of files to the Unix computer upon which the mail system is running. This was the latest revelation of MODELS author Laurent Dubé during a visit to BPA on February 17th. Recall that downloading never has been a problem, since the log file that is turned on by **Alt-F1** seems to capture text (displayed using **cat** of Unix) perfectly. But uploading files from an MS-DOS PC to some Unix computers is trickier. For months, Mr. Dubé had used the paste buffer of MS Windows to communicate a file as if contents had been keyed (i.e., avoidance of Kermit-like programs). Why? Because, according to Mr. Dubé, he could not see how to use Kermit-like file transfer protocols with ORST! Whereas no such problem exists with Agora (use of Kermit works well), newer Pine did not allow the correct importation of such a file into E-mail (see beginning of page 11 of the preceding issue). Well, Mr. Dubé has shown that pressing the **Page Up** key for the Upload Protocols menu, followed by the **A** key for ASCII, results in a prompt for the name of the MS-DOS file that is to be communicated. That's the good news. The bad news is that, during two trials with the "News:" of February 17th, use quickly (after several screen loads of text had rolled by rapidly) broke the telephone connection to Agora: the ON-LINE indication of the lower-right corner switched to OFF-LINE and the NO CARRIER warning followed 10 or so seconds later. But use with ORST was even worse: the transmission began quickly but slowed down to a crawl, and had to be aborted manually after 5 minutes or so. Yet, Mr. Dubé reports that the procedure works well for him at night!

Microsoft PowerStation in Australia

The Microsoft PowerStation compiler was tested with ATP FORTRAN during March by Stephen Boroczky of Pacific Power in Sydney, Australia. This would seem to be the first such test that has relied on nothing but E-mail for all communication --- including delivery of the ATP FORTRAN using FTP transfers of Internet on March 2nd.

VARDIM was changed March 1st as a result of trouble reported by Mr. Boroczky, who had tried to use all-blank input. Previously, blank cards were acceptable for the simulation tables, but the fourth and final card required actual numbers. Now, a blank fourth card, too, is acceptable. It will be converted to the usual fixed J. Marti size of 742, and KARRAY will be 80000, which gives 56 conductors for LINE CONSTANTS.

New warning messages were a fringe benefit of using the MS PS compiler. What Salford apparently does not warn about is variables that are declared in an INCLUDE file, but are not in COMMON. Then routines that use the INCLUDE but not some of those variables logically should have a warning about the variables that are not used. An extreme case concerned DEKSEA from Prof. Xusheng Chen at Seattle University. Investigating warnings about ALG, DY, and DWI, your Editor could find no usage anywhere! DECK TACSTO presented a less extreme case: variables CHAR1 and CBUFF were not used outside USE2, XPR2, and TREAD. The use of minimum dimensioning for CHARACTER * 1 CSTO was a final improvement --- to avoid warnings about an EQUIVALENCE in TACSTO to CHARACTER*1232 CTBL . The changes were made March 5th.

Compatibility of arguments of subroutines with their calling statements seems to be an interesting requirement that was learned during linking. In E-mail dated March 15th, Mr. Boroczky wrote the following about trouble caused by SUBROUTINE DUMMY: *"The rest of the unresolved subroutine calls are because of the linker's insistence of the formal argument list being the same size as the actual argument list. I could not find any option to switch this off."*

A 486 switch exists for the MS PS compiler as explained by Glenn Wrate of Michigan Tech in E-mail dated March 3rd. But as Mr. Boroczky's response notes, having a switch and making it work may be two different things! Independently, computer expert David Szymanski made a similar observation verbally on March 3rd during a discussion of whether compiler writers yet exploit 586 hardware (Robert Schultz's question). Yes, remember when Salford Software sold FTN77/486 as a separate, more-expensive product even though its output seemed to be identical to output of the original FTN77 / 386. Such an experience does not exactly build consumer confidence!

COMPLEX CMPLXZ was added to PTTRAN of CABLE CONSTANTS in order to satisfy MS PS. It is surprising that no other compiler warned of this oversight (CMPLXZ is used five times within the short subroutine). Prior to modification, MS-DOS DIR on PTTRAN.SPL revealed a date 19 December 1991. It would seem that Apollo, H-P, and VAX/VMS all tolerate functions of undeclared type? Or are these other systems erroneously truncating the complex result to a real (we hope not!)?

News about Laurent Dubé's MODELS

Mr. Dubé was available near Toronto, Canada, on February 18th and 19th for that free, one-day ATP workshop at the University of Waterloo (UW). This was in Ontario, Canada, as explained in the preceding issue. The following report (the entire next paragraph) came from star participant Dubé in E-mail dated April 29th:

The 1994 Ontario/Quebec ATP Workshop was held at the University of Waterloo on Saturday February 19. The workshop was organized by Profs. Magdy Salama and Raymond Ramshaw, and by graduate student Robert Sarfi. Approximately 40 people attended the meeting (from a visual head count taken in the auditorium). The participants, using or interested in using ATP, were mostly from local universities and companies, with the notable exception of a group from Montreal and from neighboring Michigan. The tone of the meeting was friendly and informal. The meeting included a presentation of the use of ATP in the Engineering Program at U of W, a paper showing the use of ATP as a means of verifying a fault-location algorithm, open discussion periods on various modeling subjects, and a presentation on MODELS by Laurent Dubé. The meeting closed with an optimistic discussion on organizing subsequent meetings and courses to serve the needs of ATP users in the area.

Should MODELS do arithmetic for the phasor solution? This idea came early in November from Jerry Almos of BPA, who observed that ABB static var modeling of DCG / EPRI EMTP shows TACS data that does arithmetic to open or close switches during the phasor solution. No such control is now possible in ATP, of course. The idea is interesting, but is it more than just a solution in search of a problem? I.e., how practical would use be? Dr. Kurt Fehrle was not convinced of need for his problems when the idea was proposed to him. Are other readers enthused? If so, let's hear the reasoning. It occurred to your Editor that more than just switches could be handled. If the connection were to be provided, it could be like the one for SPY : allow the adjustment of anything that has not already been buried. Source magnitude is an obvious example. What do readers think?

Recursive subroutine calls were not tolerated by the DEC VAX / VMS FORTRAN compiler as explained 9 months ago (see column 1 on page 14 of the July, 1993, issue). Now, April 21st, Randy Suhrbier has clarified the situation. The Alpha compiler for VMS seems to allow recursive calls. It is only the ordinary, old VAX / VMS compiler that does not. However, the March/April issue of Digital Systems Journal (a magazine dedicated to news about DEC) says on page 12 that Version 6.0 of DEC FORTRAN should allow recursive calls. Mr. Suhrbier believes that BPA already has this newer software, but is not yet using it. Is Laurent Dubé still interested? Or is this progress too late for practical use?

New Ideal Transformer Branch

The Type-18 source has offered the combination of an ideal transformer and an ungrounded (possibly) source for a dozen or so years. What is new now is omission of the source, and acceptance of the remaining transformer as branch (rather than source) data. Mathematical modeling and storage requirements of ATP remain unchanged.

Prof. Bruce Mork of Michigan Tech in Houghton is the one who inspired the addition of an ideal transformer to the menu of ATP branches. In E-mail dated February 15th, he answered the question (see column 2 on page 19 of the preceding issue) about why he uses large numbers of Type-18 sources: *"I like the change to more type-18 sources. We would like to use a lot of them for protective relay simulations, for modeling CTs. Use of the TRANSFORMER element is undesirable, since you are forced to put some non-zero impedance in each winding. I also use type-18s in my duality-derived transformer models, to represent ideal magnetic coupling, again preferable due to topology constraints and the avoidance of having small reactances in the network."*

Completion of the new IDEAL TRANSFORMER as branch data was announced by E-mail of the Fargo list server on February 24th. The second subcase of DC-25 provides an illustration using three for the three phases of a generator transformer that is connected Delta-Wye.

Florida Short Course March 7 - 11

Prof. Dennis Carroll's 4.5-day EMTP short course at the University of Florida was attended by only 16 paying students this year. This was March 7-11 on the campus of the University of Florida in Gainesville. An added attraction this year was your Editor, who joined Dr. Liu for the entire course as backup for Prof. Carroll.

Nine new 66-MHz 486s were used this year, so half of the students enjoyed very fast execution. However, these computers were not perfect. For some unknown reason, batch-mode CALCOMP PLOT graphics appeared weak on the screens --- particularly on the left, and toward the bottom. Yet, graphs using TPPLOT appeared normal. Also, Gateway uses a nonstandard keyboard that your Editor did not at all appreciate. More than just up- and down-arrow keys, Gateway provides diagonal keys for a combination of the 2 standard directions. One final problem was incompatibility with the old, overhead projector in graphic mode. So, Prof. Carroll brought in his 386 portable of years past to drive the projector.

Two 486-based, color, Toshiba notebook computers were brought to the course by students from two different companies, and were used successfully. One student used

an external mouse, too (those built-in track balls are marginal)! Unfortunately, that same computer had an SX processor, so it was a little slow for number crunching and graphics. Otherwise, both machines were impressive, and they served their owners flawlessly.

Yin Yuexin, now a doctoral student of Prof. Carroll, again gave the U.M. lecture. This was unusual in that it seemed to cover every alternative by example. Mr. Yin seemed to have one data case to illustrate every major variation. Another innovation was distribution of ATP disks earlier -- on Thursday -- so students had plenty of time to verify the disks, and think about contents. The package looked very professional, with each disk having its own specially-printed label. The guy has talent!

Reason for the reduced registration (compared with the overflow crowd last year) is unknown. The economy is not obviously worse (yet), and advertising was as wide as last year. Some member of the office staff told Dr. Liu that 3500 brochures had been mailed. Yet, small business **is** worried about Pres. Clinton's proposed national health care, which might fall upon employers to fund. Another bad sign: recruiting of prospective graduates is clearly depressed in Oregon, according to James Randall (see July issue). Meanwhile, Prof. Ned Mohan has said that inquiries about his own course (see following story) have been many, but that paid registration has been slow. As of about May 11th, there were said to be 9. In retrospect, it is good Prof. Mohan began early, and advertised hard!

2 Mbytes is not sufficient RAM for quality support of Salford EMTP. This was proven by use of Prof. Carroll's portable computer, which again was used to drive the projector because one of those new Gateways seemed to be incompatible (one could see text, but not graphics). The SPY demonstration was particularly difficult: @5 was hopelessly slow, so @3 (tolerably slow) was used instead. To conclude, Salford EMTP as distributed to others requires more than 2 Mbytes of RAM.

Mohan Course: San Francisco, July 23-24

Prof. Ned Mohan of the University of Minnesota will be giving his portable EMTP short course immediately prior to the 1994 IEEE PES Summer Meeting in San Francisco. This was explained in the preceding issue. Since then, the course has only improved as explained in a sticky label that is being affixed on top of the return address of advertising brochures. It says:

"We have decided to add a two-hour session on MODELS on July 24th from 9:30 am to 11:30 am. ... Also, the demonstration of the graphical preprocessor ATPDRAW for schematic capture (graphical input data assembly) for EMTP will be given by its developer, Mr. Hans Hoidalen of the Norwegian EPRI."

Eigen Contribution by CESI & ENEL

Dr. Ivano Bonfanti of CESI in Milano, Italy, announced the contribution of program EIGEN for ATP use. This was in public E-mail of the Fargo list server dated May 9th. Funding was from the utility ENEL, also in Milano, so ENEL retains ownership. Although there is not space in this issue for any technical details, it is important for all to understand the legalities of the contribution. Dr. Bonfanti E-mail began: *"ENEL is granting the ATP community the perpetual right to use the code in accordance with presently-established principles (the royalty free nature of ATP). ENEL also will maintain the ownership of the code, and neither CAN /AM nor anyone else will be allowed to change it without ENEL permission."* The last sentence is interpreted as protection against someone modifying the contribution to become something else --- which then might escape the original restrictions on EIGEN .

Turbo Table Dumping Uses RAM

Robert A. Schultz of New York Power Authority (NYPA) in White Plains was the inventor of code that greatly improved the efficiency of dumping or restoring tables as required for START AGAIN (or the preceding, related data case having MEMSAV = 1), Monte Carlo (STATISTICS) studies, and finally, SYSTEMATIC simulations. The present writing is a continuation of the story that began on page 15 of the preceding (January, 1994) issue. The Schultz revolution continues.

Size of the compressed tables continues to shrink. Whereas the previous newsletter reported 13.7 Kbytes for DC-24, beginning April 7th this has been reduced to 11.5 Kbytes. For years, UMDECK had been dumped whether or not U.M. modeling was present. Yet, the burden was not negligible. Now, the U.M. storage is dumped only if it is being used.

$OPEN no longer is needed for the .BIN file that is created by a MEMSAV = 1 request (see the integer miscellaneous data card). $OPEN still is permitted for those who want to name their disk files specially. But most users will find it convenient to allow the program to do the naming. If STARTUP variable KTRPL4 < 0, the data file name will be used (modified by the .BIN file type). Note that this is consistent with existing policy regarding .PL4, .LIS, and .PCH files. On the other hand, if there is no such request for parallel naming, the fixed name TPTABLES.BIN will be used. What will happen to an old file of the same name will depend on computer since this decision is made in installation-dependent LU2REW (the Salford module OPENs the .BIN file with STATUS='UNKNOWN' whereas code for VAX / VMS uses 'NEW'). Standard test cases

DC-24 and DC-40 have been modified to take advantage of this change that became available April 9th. The former disk file named DC24AT40.BIN has become simply DC24.BIN because KTRPL4 < 0 is assumed. Deliberately, no such change has been made to DC-32 and DC-49, which continue to illustrate $OPEN use.

However, the Schultz code assumed storage on disk as connected by I/O channel LUNIT2. At least this is the way the code was written. Of course, for Salford EMTP, the storage was really not on disk at all, but rather was in RAM (for the user who had enough). Why? Because of either virtual scratch files or disk caching (if an external disk file was connected). But what about DEC VAX / VMS or other computers or compilers that do not allow such advances? Before the Schultz revolution, users of VMS at BPA dumped tables to RAM --- except for a possible final dump ordered by MEMSAV = 1. One concern of BPA's Randy Suhrbier was that VMS users not lose such high-speed transfers as a result of the switch to Mr. Schultz's table compression. So, your Editor went to work modifying the Schultz logic. New binary switch JSDISK now chooses between storage on LUNIT2 (if unity) and storage in the RAM cache of List 29 (if zero). That RAM cache of List 29 is the same vector JARRAY that has been used to store VAX/VMS tables for years. Development was done using Salford, and the feature first became available from UTPF translation on April 9th.

RAM TABLES is old data for VARDIM that is being used once again after several years of disuse. It provides a higher-level (English-language as opposed to numeric) way to dimension List 29, which dimensions a RAM cache to store tables that otherwise would be saved on disk. In the early days of Salford EMTP, this was used. But virtual scratch files (beginning in the January, 1992, issue, see USE_VIRTUAL_SCRATCH_FILES@) --- and even before that, disk caching --- made this obsolete. But what about systems such as DEC VAX / VMS that provide for neither? That is the thinking behind the resurrection of RAM TABLES. For Salford EMTP, its use makes little difference in speed. But for VAX/VMS, it automatically switches table storage from disk to RAM that is dimensioned equal to the total size of simulation tables (LTLABL words). Of course, unless tables are full, this is more space than is needed since Robert Schultz ignores all significant, undefined regions. So, the user may still want to define List 29 manually, even though this can be tricky because it depends on data (the tables being transferred).

No longer will DC24COPY.BIN be seen in DC-40 which continues using START AGAIN the Monte Carlo simulation of DC-24. The copy of DC-24 tables can be dispensed with as long as the RAM cache of List 29 is being used. This completes the reform that began with deterministic START AGAIN (see mention of DC-32 and DC-49 on page 17 of the preceding issue). Now, Salford copies from disk to RAM immediately, and then disconnects the disk file. After this, disk will not be used at all. Not only is this more convenient (no duplicate disk file), it also should be more reliable. If things go wrong, it is better to have RAM storage (which can be examined by a symbolic debugger) than sequential disk storage (which is unobservable).

VAX/VMS requires use of function %REF to pass the address of any CHARACTER argument to a numeric argument of a SUBROUTINE. This is an unfortunate, small, installation-dependent detail of the new coding. It occurs only in 2 places in the program: CALL MOVEC statements. These have been modularized in installation-dependent UTPF segments MOVEC1 and MOVEC2.

Increased speed of VMS table dumping has been very satisfying to BPA's Robert Hasibar, who carefully timed the difference using a STATISTICS case that was repeatable (parameter NSEED = unity). According to Mr. Hasibar, VMS DIFF proved that the old and new solutions were identical. As for the times, consider:

		CPU	Actual
VAXStation 4000 M60,	before :	1:10.5	1:52
	after :	0:40	0:52
Alpha 300 Model 400,	before :	14:41	19:11
	after :	3:21	3:30

The first computer was local, so the network or remote users were not a factor. The second computer (Alpha) is more interesting. Sitting on Randy Suhrbier's desk, it is connected to the same VAX cluster by high-speed DEC networking. What about your Editor's AT&T 486/33? Using the same RAM cache, and with reduced dimensions (compared LISTSIZE.BPA as used for the two VMS computers) in order to prevent paging to disk, 36:56 of elapsed time was required.

Cables and their Constants

CABLE CONSTANTS use within JMARTI SETUP was not possible prior to final correction by BPA's Dr. Tsu-huei Liu on May 6th. Modules LABL27, CCEIGN, and SUBR27 were changed as a result of debugging execution that used data from Ivano Bonfanti of CESI in Milano, Italy. Correction was prematurely announced as follows in public E-mail of the Fargo list server on May 1st: *"Since an associated comment referred to a letter from Prof. Akihiro Ametani dated 7 August 1985, it seems reasonable to conclude that trouble is at least that old. Apparently no one has complained about the broken connection since then!"* This is an important change because of use with GIS (Gas Insulated Substations). To ensure that Marti cable modeling continues to work, Dr. Bonfanti's data has been appended to DCNEW-6 as a new second subcase. It corresponds to about 100 meters of cable.

CABLE CONSTANTS is informed of the precision of its FORTRAN COMPLEX computation by means of ZNVREF in STARTUP. While rewriting Sect. I-G of the Rule Book, your Editor discovered that 1.E-6 was being used erroneously. This was explained in public E-mail of the Fargo list server dated April 1st. Changes were made to CCEIGN, MINVN, and MAIN27 to allow automatic, optimum adjustment. But that single-precision value of 1.E-6 has been retained until the experts in Japan (Profs. Ametani and Nagaoka of Doshisha University in Kyoto) have been able to consider the effect. *"It would seem that the old Apollo value of 1.E-6 has been used by Salford EMTP for the past 5 years without anyone noticing and objecting (amazing!). Yet, this is insanity, since Salford EMTP uses COMPLEX*16 for full COMPLEX precision. ZNVREF should be changed accordingly, but when it is, answers change significantly."* Dr. Liu needs expert assistance!

"A study of overvoltages in high voltage cables with emphasis on sheath overvoltages" is the title of a doctoral dissertation by Bjorn Gustavsen of NTH (Norges Tekniske Hogskole) in Trondheim, Norway. A copy was mailed to Portland along with a letter dated October 22nd. The research is both interesting and relevant to ATP, according to BPA's Dr. Tsu-huei Liu.

Need to Resubscribe for 1994

Subscribers who want to continue to receive this free newsletter by conventional mail from West Linn are hereby advised of their need to resubscribe prior to the next printing, which most likely will occur during August. Exactly as a year and a half ago, a hastily scribbled note on a brown paper bag, mailed to the Publishers and Mailers in West Linn, would be fine. Any change of telephone number or address should be included, of course.

Miscellaneous Intel PC Information

"Intel becomes state's largest high-tech employer" is the headline of a story on page E1 of the January 20th issue of *The Oregonian*. So, the ongoing movement to PCs is being felt locally, too. *"The company, with 6145 Portland-area workers, surpasses Tektronix, which employs 5868 in the area."* This is another sign of the times: the decline of Tektronix, which *"peaked at more than 24,000 employees worldwide in 1981, about 15,000 of them in the Portland area. .... Intel's growth has made the Portland area its largest work site among 29,500 employees worldwide. Founded in 1968 in Santa Clara, Calif., Intel still has about 5,000 workers in Northern California's Silicon Valley."*

Austin Computer Systems is a major mail-order supplier of MS-DOS computers, and BPA has been one of its customers for 486-based color notebook models. James Hall recently obtained one of these to support ATPDRAW. During booting, one sees 16384 Kbytes of RAM, so no need to worry about paging to disk! Not that there is any shortage of the latter: DIR shows more than 300 free megabytes! As for speed, "66 MHz DX2" was seen during booting. But what is time spent within the time-step loop of DC-1? 39 seconds, which is to be compared with 60 sec for your Editor's conventional 33-MHz 486). So, doubling the internal speed (DX2) is a worthwhile enhancement for simulation. The solution of all test cases by RUN.BAT required 22:34, which might be a minute faster than your Editor's computer. So, the disk probably is a little slower (no surprise, when one remembers that it runs on batteries!). The color really looks great for plotting. Only the cramped, non-standard keyboard and built-in mouse (using track ball) are to be regretted. There is no solution to this problem: smaller is not better for human fingers. There is a good reason the standard, extended-AT keyboard is big.

The IBM decline may have bottomed out according to a story on page B1 of the January 26th issue of *The Oregonian*. This story from the LA Times - Washington Post Service says that IBM *"on Tuesday announced its first profits in a year and a half. Citing cost-cutting that eliminated 45,000 employees last year, the troubled computer maker said it made $382 million (62 cents a share) in the quarter that ended Dec. 31. ... At year's end, the work force had shrunk to 256,000. The company said another 40,000 IBMers are expected to leave in 1994. IBM stock closed at $58.25"* To conclude, the company probably will survive even if many employees will **not**.

Meanwhile, DEC continues to bleed. *"Digital reports quarterly loss of $72 million"* is the headline of a short story on page E2 of the January 20th issue of *The Oregonian*. DEC *"is finding that the road to recovery is longer and more painful than it had expected. ... The loss, along with a 12 percent revenue decline, indicated that the company's turnaround effort is being hindered by the computer market's slowness to embrace machines using Digital's Alpha microprocessor chips."* That was written during January. So what does one read 3 months later? Dr. Tsu-huei Liu noted the following on page E1 of the April 16th issue of *The Oregonian*: The preceding day, DEC *"announced a $183 million loss for its third quarter, surprising analysts who thought the big computer company was adjusting better to changing markets. ... Digital stock dropped nearly 20 percent Friday."*

$1000 now will buy a complete 33-MHz 486-DX computer in Portland. This is as advertised on page C14 of the February 5th issue of *The Oregonian*. This Columbia computer costs $45 more than the 25-MHz 486-SX that was featured one year ago (see column 2 on page

17 of the April, 1993, issue). But avoidance of the SX disability (crippled number crunching) is worth it. The same reputable store (Smith's) makes the following offer in a small part of its full-page, color advertising: *"Columbia. 486/33 MHz processor; 4 MB RAM; 3.5 floppy disk drive; 210 MB hard disk drive; 2-button mouse; 14" color VGA monitor; DOS 6.0; Microsoft Windows 3.1; 1 year on-site warranty."* Three weeks later, the offer is repeated; and beside it on page C12 of the February 25th paper is an even more tempting choice: for $900, settle for a smaller disk (120 Mbytes) and only 2 Mbytes of RAM, but the addition of a 1.2-Mbyte drive. The only other difference would seem to be the disclaimer of *"limited quantities"* for this cheaper combination.

Ordinary, old VGA output cards and monitors can be purchased very inexpensively these days. Page 8 of the May issue of Computer Bits magazine carries advertising by G.T. Systems. A VGA output card and monitor are priced at $15 and $149, respectively.

About **Tab** characters that may inadvertently be inserted by MS-DOS EDIT (see the first full paragraph on page 17 of the preceding issue), readers are advised that shareware programs PC-Write and LIST both will reveal the problem. Using the former, there will be no indentation, and the **Tab** will be seen as a small, raised circle (reverse video of the **<LF>** representation). The normal display mode of LIST does not show this, but the hexadecimal mode of **Alt-H** will. So, no problem. But with Mike Albert's shareware utility FC, there is trouble. As with MS-DOS EDIT, a **Tab** seems to be invisible to FC. Your Editor found this out after removing three such consecutive usages in DC68.DAT using PC-Write on January 24th. The two files clearly were different (e.g., file sizes differed), but FC reported that all lines were the same. So, beware!

MV is the name of shareware by Bryan Higgins that recently was obtained from Laurent Dubé. As with Unix, name MV signifies *move* --- a function that is missing in MS-DOS. Yes, DOS has RENAME but this only works within a directory. MV is much more general. It is great for big files such as the 2707-Kbyte TPBIG that requires about 15 seconds to COPY from one directory to another. But it can be moved using MV in an instant (only the FAT seems to be altered) provided the disk drive is the same. In addition to the 11-Kbyte MV.EXE utility itself, there is a 4-Kbyte MV.DOC file from which the following has been pasted: *"The sources may be single files, file specifications containing wildcards, or multiple file specifications separated by commas. File specifications may include disk drives and/or directory names. .... If the target name ends with a backslash and no such directory exists, it will be created. .... If a target file exists, MV normally asks for verification before overwriting. .... If a target directory is specified and does not exist, it will be created. .... Permission is hereby given to reproduce and distribute this program without restriction for non-commercial use. The author may be reached/rewarded at .... Please specify MV version 4.2 when referring to this program. One of the Kramden Utilities."*

"PowerPC vs. Pentium" is the title of a story by Michael Slater on page 81 of the March 14th issue of *PC Week* newsmagazine. This is more information (refer to column 1 on page 19 of the preceding issue) about the attractive foundation for the next generation of Apple Macintosh. The information comes from Macintosh user Will Rogers of BPA, who is following the development closely. The story begins with the following prediction: *"Apple Computer Inc.'s introduction of the PowerPC-based Macintosh, which finally brings RISC to the high-volume desktop marketplace, sets the stage for the biggest microprocessor battle of all time. ... The outcome will affect not only the balance between Windows PCs and Macs, but eventually could lead to a shift away from the X86 in the Windows market."* About performance relative to Intel offerings, Mac supporters seem optimistic. The story says: *"The 80 MHz PowerPC 601 outperforms the 66 MHz Pentium by more than 25 percent on integer programs and almost 70 percent on floating-point programs, yet it costs about 25 percent less. ... The PowerPC 601 was created with time-to-market as the overriding goal ... The first high-performance chip to showcase PowerPC's capabilities will be the 604, which Motorola and IBM expect to have in production by the end of this year. IBM and Motorola claim that the 604's performance is about twice that of the 601."*

Windows NT is the new Microsoft operating system that is designed to compete with Unix. It seems to be one result (or cause?) of the split between Microsoft and IBM, with the latter wanting to continue beating the dead horse that OS / 2 turned out to be. Like Unix, MS Windows NT should be available for any modern computer having an abundance of memory (one of its requirements). Well, E-mail of the Fargo list server on February 15th provided the first public report on benchmarks for EMTP simulation using DC-1. The following table is a shortened version of one that was provided by Stephen Boroczky of Pacific Power in Sydney, Australia, where the experimentation was done:

	AXP 3000 Model 400	AXP 3000 Model 600	Alpha PC
Oper. system	VMS	VMS	Windows NT
Clock in MHz	130	150?	150
dT-loop sec	11.2	8.6	14.8

Needless to say, that final column does not look good when compared with the middle column. What present VMS user would willingly lengthen his simulation time by 72% in order to run under Windows NT? Even if the times were equal, what VMS user would want to make the switch? Perhaps DEC hopes to sell Alpha PC to non-VMS users?

The pipeline of modern, high-speed microprocessors is the key to peak performance. About DEC Alpha, Mr. Boroczky writes about the necessity of keeping this filled wherever possible: *"Any time an unexpected branch is taken, the pipeline stalls and has to be started again from the new branch point. There is a certain amount of 'branch prediction' which helps the compiler, but it relies on two simple rules, and the code would have to be structured to follow these rules: 1) Conditional branches backwards will be assumed to be taken (e.g., it is assumed at the end of a DO loop that the loop will continue, so only upon exiting the loop will the CPU pipeline stall); and 2) Forward conditional branches will be assumed* ***not*** *to be taken."* As an example of this second condition, *"the THEN part of an IF will be assumed, and only when the ELSE part is taken will the CPU pipeline stall. Hence IF statements should be written so that the most likely event will be in the THEN statement, and DO loops so that the loop will be executed as many times as possible."* Interesting. Needless to say, there never has been any conscious effort to structure EMTP FORTRAN this way. What reader knows about any other compiler of importance for ATP support?

First Intel Pentium timing of Salford EMTP came from Robert A. Schultz of New York Power Authority (NYPA) in White Plains. In E-mail dated April 25th, he reported 15.2 seconds in the time-step loop of DC-1, and 18.7 seconds total elapsed (wall-clock) times. Mr. Schultz explained that these results were obtained using a friend's *"$3995 Gateway 66-MHz Pentium system with 16M ram, 540-MB PCI IDE disk drive, PCI video, 17" 1280x1024 monitor, 2x CDROM and a soundcard. A 2-MB smartdrv cache was set up."* Mr. Schultz goes on to explain that Pentium is improving: *"Gateway now sells a 90-MHz in its place for the same price. All things being equal, we're talking (about) a 10 second time-step loop for a soon-to-be-common-place 100-MHz Pentium. Next, look at the code itself. It is imperative to have a Pentium-specific compiler if benchmarks are to be compared at all to other machines such as Power-PC and Alpha. All benchmarks generated on* ***those*** *machines are naturally targeted with CPU-specific code generation and optimization."*

Miscellaneous Small Items

Arguments supporting the public-domain nature of U.S. government programming were summarized in an official 3-page BPA Memorandum written by Dr. Tsu-huei Liu to her supervisor, Charles T. Wedick, Chief of the Branch of System Engineering. Dated 8 April 1993, this BPA Memorandum includes 8 pages of supporting photocopy that explain the applicability of FOIA (the U.S. Freedom of Information Act) to BPA programming. Rationale for the writing is informative. A nearby engineer who shall remain nameless had made a vague argument in support of his long-held hope that BPA could sell its programs. Dr. Liu's memo seems to have put such wishful thinking to rest this past year.

Prof. Don Stuehm of North Dakota State University in Fargo has produced a 28-page report entitled *"Inrush studies on the five-legged stacked core transformer."* This begins with 2 pages of text followed by 26 pages of comparative signals. Each comparison shows the measured signal above on the page, and the EMTP-simulated signal below. A cover letter to BPA's Robert Hasibar was dated September 7, and it begins as follows: *"Enclosed are some inrush tests and simulations as suggested by Ed Yasuda. They were performed on the five-legged stacked core transformer. The tests concentrated on looking at the voltages on the unenergized phases along with the inrush current, to see the degree of coupling."* This work recently came to your Editor's attention along with a 2-page review dated January 31st by BPA consultant Yasuda.

A SYSTEMATIC switch with T_{begin} (columns 15-24) zero was found by BPA's Robert Hasibar to result in erroneous simulations. The minimum time must be positive in order for a SYSTEMATIC switch to close properly within the time-step loop. So, if columns 15-24 of a SYSTEMATIC switch card now are found to be nonpositive, it was decided that EMTP would change this number to FLZERO (the very small positive number of STARTUP). The change was made February 3rd.

The burden of federal income tax laws has not decreased in recent years. Not only is the user group required to keep detailed records of all expenses to prove that they exceed income (from the $30 that is charged for a copy of the 800-page ATP Rule Book), but it also must contribute to the records of those who receive the Rule Books. Simple letters with requests for names and tax-payer identification numbers are not so bad. What **was** bad was the federal Form W-9 attached to an undated form letter that was postmarked Denver, January 12th. From Hathaway/Denver, the letter requested that Form W-9 be filled out and returned. Actually, the number of blanks to be filled in were not great, but the rest of the sheet, printed on both sides with a font that was so small it almost required a magnifying glass, would have been quite a challenge to understand. So, a telephone call was made to the Assistant Controller in whose name the letter was sent. "*You received one of those, too? Throw it in the trash can"* was the advice received by Dr. Liu!

The SVC (static var control) modeling of DC-22 was enhanced by Dr. Kurt Fehrle in preparation for the Florida course. This was on top of the changes of Gabor Furst (see page 20 of the October, 1993, issue). Most of Dr. Fehrle's changes were to comment cards, so did not affect the solution. However, one change to the data of NEW LIST SIZES is worth mentioning. Whereas your Editor had used the List-19 size of 120K (copied from

TP20), Dr. Fehrle recognized that 12K would be adequate. This reduced the total table size from the reported LTLABL = 283K words to 67K --- which is close to default dimensioning. A final important change is to Dr. Fehrle's telephone number: the old area code 215 should be changed to 610. In full: (610) 344-0432

5.25-inch, 1.2-Mbyte, MS-DOS floppy disks remain the preference of the user group for distribution other than at Prof. Mohan's portable short course. Economics of the latest acquisition are enough improved to deserve mention. An invoice dated February 18th confirms a price of 300 disks for $66, or 22 cents each. This includes the formatting and paper envelopes! The supplier used by the user group continues to be Midwestern Diskette of Creston, Iowa. The telephone number for information is (515) 782-5190 (use -4166 for FAX).

MS-DOS 6.0 caused very serious problems for some computers. It would seem that the mention in column 1 on page 2 of the July, 1993, issue may not have been appropriately ominous. BPA's Gerald Lee reported on March 4th that he had upgraded to Version 6.2 after a disaster using 6.0 on his home computer: it was necessary for him to reformat his hard disk! Fortunately, he had been using a cartridge tape for backup, so inconvenience was minimized (i.e., no files were lost).

"Zero T_{close} of a SYSTEMATIC switch resulted in output that was structurally wrong ..." This is the way a correction report began near the end of the July, 1992, newsletter. Well, almost 2 years later, the same Robert Hasibar came to your Editor with a similar complaint. An investigation showed that the 1992 correction to OVER4 was imperfect. It only covered one of the two variables that had to be changed from zero to a small positive value. TCLOSE had been done, but TSTAT was not done until March 4th of the present year. Rather than a fixed value of 1.E-18, variable FLZERO of STARTUP is used as the near-zero value.

FAULTS TO GROUND required that each node to be faulted be defined by a connected branch. This was prior to March 16th when definition by a switch was allowed in response to trouble ("Bad node name ... in fault ...") with a practical application at BPA. Daniel Goldsworthy was the user, and it was he who first recognized the coincidence that was improperly handled.

Parameter TIMULT of STARTUP was eliminated on March 25th. It was not independent, anyway, since its value was tied to that of later parameter IHS (the time units for plotting). It made no sense for the user to bother with this dependence when the computer could easily do it for him. User instructions (Section I-G of the Rule Book) are simplified, too. In fact, it is those LEC Rule Book files (see separate story) that must be credited with providing the inspiration for the change. The same table documenting the interdependence of IHS and TIMULT was noted to appear in two places! Now, there is no table -- just a verbal statement about the value of IHS.

Wind generation is fashionable once again, it seems. *"New turbines make harnessing wind more feasible"* is the title of a story by Kristian Foden-Vencil on page B7 of the March 30th issue of The Oregonian. *"Kenetech Windpower, the world's largest manufacturer of wind energy systems ... (which) runs some 4500 turbines across the globe, has also announced plans to build a $100 million wind farm in Eastern Oregon's rural Umatilla County. ... Durable and adjustable fiberglass propeller blades, combined with a computer, allow Kenetech 33M-VS turbines to start producing electricity at wind speeds as low as 8 mph and keep producing until they reach 65 mph. ... Wind power has a rich and varied history, with the ancient Persians building the first windmills to grind grain. The Dutch raised the design into an art form."*

LINEAR BIAS USAGE produced LUNIT6 output in which the reference angles were missing the final 2 bytes. This was until April 21st when there was correction following the first report of trouble by BPA's Daniel Goldsworthy. With 4 energizations, the printed values were 9, 18, 27, and 36. These four numbers were missing "0." on the right before correction was made below S.N. 5225 of MAIN20. It is important to note that the simulations were correct; only the display of one variable was in error.

Rao Atmuri of Teshmont in Winnipeg, Manitoba, Canada, supplied data that demonstrated an error with LINE CONSTANTS. BPA's Dr. Tsu-huei Liu learned during mid-February that there was a conflict between two output requests: 1) "44" for nominal Pi-circuit output, and 2) the equivalent-Pi output as requested by punches in columns 54-57. Each worked separately, and the nominal-Pi output always has been correct. But the infrequently-requested equivalent-Pi output was wrong when nominal-Pi output also was requested. This was prior to February 22nd when Dr. Liu changed some 4 lines of SUBR25 to correct the error.

The preceding issue reported correction to random number testing in OVER12. That was for random closing as illustrated by DC-50. But random opening also was in error for the same testing. Correction by Dr. Tsu-huei Liu has required a change of data. Previous use of ITEST (columns 9-16 of the STATISTICS miscellaneous data card) for the number of points per standard deviation was found to conflict with the meaning of this variable for random opening. So, it was decided to retain the original meaning for ITEST, and to move the number of points per standard deviation to KNTRPT of columns 49-56 (previously unused for the testing). This change will be seen in DC-50 beginning February 22nd. Also, a second subcase has been added to illustrate random opening.