Can / Am EMTP News

Voice of the Canadian / American EMTP User Group

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Table of Contents

Salford Compiler and DOS Extender

MOUSET is the STARTUP parameter that indicates whether or not a mouse is to be checked for input in response to the opening prompt. Prior to correction of FLAGER on October 15th, the user of real MS-DOS (as opposed to an MS-DOS window of MS Windows) had a problem if he informed ATP that he had a mouse when in fact the mouse was not running. Salford DBOS ver. 2.66 would return an illegal button number (e.g., -26528 the time your Editor documented the problem on his Pentium) rather than zero (meaning no button was pressed). So, protection was added. Henceforth, if either a negative value or a positive value greater than 3 is found, MOUSET will be set to zero automatically. This should prevent continued, erroneous interrogation of the mouse using DBOS library function GET_MOUSE_POSITION@

Improvements to Salford TPPLOT

The COMTRADE command has been substantially improved as a result of serious use by Prof. Bruce Mork of Michigan Tech in Houghton. Details can be found in a separate story.

Adaptation to MS Windows has been a faint hope for years. The most promising possibility following review of that new Salford compiler for MS Windows (see the July, 1996, newsletter) comes from magician Robert Schultz of the New York City area. A separate story breaks news of his latest work using MS Windows (versions NT and 95, anyway). In response, your Editor wrote: *"The ability to create and use a menu would be neat. It almost sounds as though I might have the tools to convert Salford TPPLOT to MS Windows. Do you think so? Do you think* ***even I*** *could learn to do such programming? It is hard to tell about old dogs, particularly after they retire!"*

News from Outside USA and Canada

Taiwan is served by a user group in Taipei at Taiwan Power Company (Taipower). The first communication by E-mail was received from these people on September 10th. This message, from Shui-Hsiu Lin, brought good news: *"Taipower has a WWW site http://www.taipower.com.tw, though the pages are built in Chinese. Now we can directly access the internet via our LAN. And the E-mail address of our department is d023@taipower.com.tw (Telephone: 886-2-3666912, Telefax: 886-2-3676503). Mr. Chiang-Tsung Huang was promoted Chief Engineer. Our new Director is Mr. Anthony Yung-Tien Chen."* No doubt individual mail boxes will be created later. But, for now, note the importance of including the name of the person to whom one is sending E-mail at Taipower. As for size of the mail box, there would seem to be no problem for ATP use. The three archives of Salford EMTP and TPPLOT use were received by Mr. Lin without difficulty.

kizilcay@fh-osnabrueck.de is the new, much-simpler office E-mail address for Prof. Mustafa Kizilcay, Chairman of EEUG (see separate story). This information was received in an E-mail message dated September 8th. Prof. Kizilcay reported: *"... my (very long and no longer valid) E-mail address kizilcay@fhos-rz-hermes.... should be replaced by ..."* Yet, it is not obvious that EEUG recommends use of this address. Along with Prof. Kizilcay's agenda for his September 29th workshop, the address **eeug@aol.com** is seen. Of course, the AOL address has the advantage that it can be accessed from many locations in Europe (actually, the world) without long distance telephone charges.

"The Australian user group has a 256-Kbyte limit on the size of E-mail ...." Thus began a paragraph in the April, 1995, newsletter. As expected, such bottlenecks are rapidly disappearing. When Stephen Boroczky of TransGrid in Sydney was asked about this problem during September, he stated his belief that he now could receive the 2-Mbyte packages as required for the MIME-encoded communication of the Salford ATP archives. So, the transmission was attempted, and September 21st, Mr. Boroczky reported successful reception. The transmission of GIVE2 was imperfect, however, so it was sent a second time (this time without difficulty).

The Korean EMTP Users' Group is headed by its Chairman, Dr. Dong Wook Park, who is Manager of the Power System Research Division of KERI (Korea Electrotechnology Research Institute) in Changwon, South Korea. Since the first mention of this fact in the April issue, a Can/Am-compatible licensing agreement has been worked out with Dong-Hak Jung, who supports Dr. Wook in ATP-related matters. Entitled KOREALIC (meaning *Korean license*), .DOC, .WP5, and .TXT versions were sent to both KERI and Prof. Bruce Mork attached to E-mail dated August 27th. Upon his return from Europe, Prof. Mork placed at least one of these disk files in his **pub/atp/licenses** directory. His announcement dated September 16th stated: *"Licensing forms for the ATP users groups in South Africa and Korea have been added to the master aFTP site. They are in pub/atp/license/sa/salicens.zip*
/pub/atp/license/korea/korealic.zip"

Modern (post-LEC) Korean ATP licensing was slowed by differences of language --- both human and computer, it is interesting to note. First, the human languages, which are easy enough to understand. Years ago, your Editor had encouraged Koreans to translate from Can/Am English to their own language, for purposes of licensing in South Korea. At the time, this seemed like a good idea. But times change --- in this case because of E-mail. The new-world troubles began when Robert Meredith of the New York City area received from Korea an E-mail request for Watcom ATP. For years, the policy has been to require modern (post-LEC) licensing. Yet, neither Meredith nor your Editor nor Dr. Liu could read what Koreans had been using for licensing! So, it seemed best to begin anew, and this time text would remain in English. As your Editor observed to Mr. Jung, despite its irregularity of grammar, and frequently-inconsistent spelling, English seems to be the only common language that is read by most ATP users around the world. We are all stuck with it for purposes of shared, global communication about ATP. Context and details of the English licensing letters might be explained in cover letters of other languages, of course.

Korean MS Word may not be compatible with English MS Word, it has been learned. Twice, Mr. Jung sent disk files of his MS Word storage of English text to Portland, and twice BPA's MS Word 6 and WP 7 for Windows NT failed to recognize the file format. At first it was thought that some Internet error might have been involved, but that hope no longer is held. The best guess now is that Mr. Jung's files have Oriental MS Word format rather than English MS Word format. One can use Vernon Buerg's freeware LIST to inspect the contents, and Dr. Liu noted that every other byte is blank! Since each of the more-numerous Oriental characters requires two bytes for storage, it would appear that English is accommodated by a 50% waste of space. Yet, is it not possible to choose American format when **Save as** is used? Your Editor asked *"whether you might not have some choices that include English MS Word. …For communication with much of the rest of the world, it might be useful. For the record, our* ***Save as*** *window of MS Word has a pane with title 'Save file as type.' We have about a dozen choices here, although none refers to the Orient. But the comparable Corel WP 7 function does. We have noticed a 'Word-Perfect 5.1/5.2 Far East' entry as well as an 'RTF Japanese' entry. To conclude, we are not surprised that your .DOC files are incompatible with our MS Word program."*

Lutz Hofmann has replaced Mathias Noe as the person at the University of Hannover in Germany who has access to the aFTP storage of ATP-related disk files (e.g., the

Houghton mirror). So, when the July newsletter was released on August 11th, the copy for Europe was sent to Mr. Hofmann rather than Mr. Noe. As for the latter, he reported as follows on June 26th: *"I will start a new job in Switzerland in July. .... I hope that I can use ATP/EMTP in my new job too."*

More about Electronic Mail (E-mail)

REVIEW ATP-EMTP (Prof. Bruce Mork's Fargo list server) revealed 505 subscribers in 49 countries on October 27th. This is up from 419 as reported one year ago (in the October, 1996, issue).

"July newsletter is available on the Web" was the Subject of public E-mail from Laszlo Prikler at T. U. Budapest in Hungary on August 11th. In past years, persons who would make a copy available from the aFTP sites in Houghton and Hannover have been away from their offices at this time of year. So Prof. Prikler announced yet another new service: *"As long as the July'97 issue of the News will not be available via FTP, the EEUG Web site offers a link to this document. For the record the address is: http://www.vmt.bme.hu/eeug. If you need a copy just click on the top right red link and your browser (hopefully) will download a .zip archive that stores the MS-Winword version of the News."* As it turned out, Prof. Bruce Mork **was** at work in Houghton, that day, however, and he promptly announced publicly the availability of his copy. Nonetheless, the idea of access via the EEUG Web page in Budapest was great, and is worthy of use in the future. Clearly, if a file is of general importance, a copy should be sent to Prof. Prikler at the same time it is sent to Houghton, Hannover, and Japan (those ATP-related E-mail services begun by Masahiro Kan of the Hamakawasaki Works of Toshiba Corporation). Redundancy of ATP information clearly is improving.

Teleport, Oregon's largest Internet provider, seems to have stopped growing. Customers numbering 21000 were mentioned in the July, 1996, newsletter. Well, according to a story that covers page A22 of *The Oregonian* dated August 28th, *"Teleport … with 22,700 customers, has a user-to-modem ratio of about 9-to-1."* Teleport is not the subject of the story, but rather an illustration. The story headline is *"The Internet invasion,"* --- how privacy is being eroded by computers. At the bottom is an explanation of cookies: *"Many Web sites tag visitors, through their Internet browser, with 'magic cookies,' or bits of code. This helps a site record what a user is looking at and notes the next time he returns to that site. It even can track him to other sites. Cookies can help marketers learn what an Internet user is interested in …."*

Free E-mail was mentioned in the preceding issue following the reception of a message from Robert Sarfi, who used Hotmail. Shortly thereafter, such usage was explained by a article in *The Oregonian*. Page B1 of the August 9th edition carried a sizable story entitled *"**Fre**e-mail,"* and Hotmail is by far the largest of the five free services that are compared in a table. Economics are summarized as follows: *"In return for free e-mail services, consumers watch ads scroll across their screens."* About Hotmail, the table shows 5.5 million users. Juno Online Services, said to be the oldest such free operation, is said to have started April 22nd, 1996. Clearly, this is new, and is worthy of consideration by anyone who wants to save the price of Internet access. After price, global accessibility would seem to be an important attraction for some readers. *"In Philadelphia, Prague or downtown Portland, as long as you can find a computer .. you can access a Web-based E-mail account."* For more about the services mentioned, check **www.juno.com** and **www.hotmail.com**

"Apparent bounce from Fargo" was the subject of your Editor's note to Prof. Bruce Mork of Michigan Tech in Houghton. Dated September 19th, this complained as follows: *"My recent public E-mail about statistical tabulation had one bounce that came to Agora"* as though the message had been sent from Portland rather than NDSU in Fargo, North Dakota. The returned mail ('Your message to the following recipients was undeliverable') complained about address daries@designpower.co.nz The following explanation was provided by Prof. Mork's response: *"I've just manually deleted him from the list. Apparently their mail server is not properly configured to reply to the listserver - it sends bounce messages to the originator of the message instead. This happens rarely, but is aggravating when it does. I enjoyed the same frustration when I posted the notice about the atpdraw patches yesterday."*

A list of gullible E-mail users might have been the object of a special sort of spam (junk E-mail). According to a short story on page C1 of *The Oregonian* dated August 12th, *"The e-mail message tells the story of 7-year-old Jessica Mydek's terminal cancer. With no hope for her, it encourages the reader to send the missive out to 10 friends, claiming that with each one, 3 cents will be donated to the American Cancer Society. But there is no Jessica,"* and the ACS denies all knowledge. Who was the sender? Some AOL subscriber. *"America Online canceled the address, but the Internet provider is shielding the identity of whoever held the official-sounding address of acs@aol.com"* About the list of those who replied to the plea, Dan Langen of the National Charities Information Bureau in New York was quoted as saying: *"What a wonderful list this will be for the scam operator."*

CompuServe finally allows more than just numbers to distinguish its members. Harald Wehrend of SEG in Kempen, Germany, first supplied this information, which has been confirmed by Dr. Tsu-huei Liu (another CS user). Mr. Wehrend ended his message dated September 23rd with two different prefixes preceding the familiar **@compuserve.com** : 1) 100532.3573 and 2) HAWE Apparently these two are equivalent. In a later message, Mr. Wehrend explained: *"As I remember, it (use of*

names rather than numbers only) was announced during the summer of 1996 here in Germany. The CS command to be used here in Germany is GO NEWMAIL."

Free software was mentioned by Catherine Lake, a subscriber of the Fargo list server who uses E-mail address catherine@ctynet.com Her short contribution on July 29th read as follows: *"Want to download some free software? Then go to* ***http://www.sfsace.com/*** *Take a look at ACE 3.1 a powerful contact manager - FREE. ACE 3.4 gives you Email capabilities not available in ACT! Also has links to other FREE software sites."*

Libel on the Internet, and whether the Internet service provider has any responsibility, remains an unanswered question in the USA according to a story on page B1 of the August 29th issue of The Wall Street Journal. The title is: *"Will threat of libel suits chill cyberspace chatter?"* The real interest concerns the Internet provider, who generally has the deeper pockets. The most recent case concerns one Matt Drudge who maintains an AOL Web page. The two have been sued for $30 million by *"Clinton White House adviser Sidney Blumenthal."* The old questions are raised once again: *"Will users have to bite their tongues in chat rooms and electronic bulletin boards? Will on-line services need to screen what their customers and contributors say, or even resort to outright censorship?"* But are American judges qualified to deal with the subject? How many understand operation of the Internet?

"WorldCom is quietly buying up the Internet as it joins America Online's purchase of CompuServe." This is the sub-headline of a full-page story on page A14 of the September 11th issue of *The Oregonian*. Written by Jared Sandberg of *The Wall Street Journal*, this story includes the following summary: *"Three-way deal. * AOL picks up CompuServe's customers and says it will concentrate on content instead of Internet access. It says the combined membership will get fewer busy signals by using WorldCom's modems. * CompuServe finds a way out of its financial troubles. Its members, mostly businesses and professionals, will get technical upgrades. * WorldCom, an Internet service provider, gets to add more than 11 million people to its customer base, which already includes Microsoft's 2.3 million."* A graph documents growth of *"Internet and on-line service users in the United States."* The 1997 number is 46.0 million --- ten times the number four years earlier (4.6 million in 1993). Current estimates of the leading services, based on numbers of subscribers in the USA, are: 1) AOL with 9 million; 2) CompuServe with 2.6 million; 3) MS Network with 2.3 million; and finally, 4) Prodigy with 1 million. Clearly, AOL has won the war to subscribe the masses.

Financial reports of companies are expected to move from paper to the Internet. *"Reports in cyberspace"* is the title of a small mention in the STREET TALK column on page 38 of the April 10th issue of *USA Today* newspaper. *"IBM's Web site, www.ibm.com / AnnualReport /, is one of a growing number of experimental Internet tools corporations are using to promote shareholder relations. IBM includes three guides for reading annual reports written by a business school dean, a CEO and a high school economics teacher. Users can do nifty stuff, such as graph trends in gross profit margins."*

Growth of Internet usage continues. The January, 1995, newsletter reported 20 million users worldwide. A Dataquest Inc. graph on page C1 of *The Oregonian* dated September 11th shows 23.2 million for 1995 and 82 million for this year (1997). Despite the growth, it is expected that the number of Internet suppliers soon might begin to shrink rapidly: *"The little guys who provide Internet service are caught in a vise as the communications giants raise rates and bigger service providers present stiff competition."* According to a graph from The Gartner Group, the number of Internet providers might peak this year at 4.5 million before it falls rapidly (e.g., to 2 million next year).

European EMTP User Group (EEUG)

That free *"one-day ATP-EMTP Workshop"* in German was given on September 29th by the EEUG Chairman, Prof. Mustafa Kizilcay. This was on the campus of FH Osnabrueck in Germany. Ten days earlier, Prof. Kizilcay published an agenda of the meeting using the Fargo list server. He also explained that registration remained open even though 15 already were expected. From the agenda, it would appear that the day was full (no shortage of subjects).

Barcelona, Spain, is to be the location of the annual EEUG meeting this year as organized by Prof. Juan Martinez Velasco of Universitat Politecnica de Catalunya. The meeting itself, to be held November 10-11 (Monday and Tuesday), is to be attended by BPA's Dr. Tsu-huei Liu at EEUG expense. Look for a full report next time.

Uwe Tassemeier is *"the name of the laboratory engineer … who is willing and responsible to develop a user shell for Watcom ATP. He will try to finish a beta version for the ATP workshop."* This news about ATP progress at FH Osnabrueck was received in E-mail from Prof. Kizilcay dated September 2nd. This progress follows the initial report on May 14th, when Prof. Kizilcay wrote: *"I would like to discuss with you during my visit …. 1) A likely 'European Union' project 'Leonardo' with regard to complete revision of the Rule Book and Theory Book to bring them on a CD; and 2) Watcom ATP and creation of a simple user shell for Windows (input data file selection, execution of TPBIG, viewing of .LIS file)."* Leonardo is mentioned here to remind readers that FREEP (see separate story) is not the only player thinking about putting ATP materials on a CD.

The use of Dr. Taku Noda's fitter ARMAFIT to generate data for Kizilcay frequency dependence is being documented by Prof. Kizilcay. In E-mail dated September

2nd, Prof. Kizilcay explained the starting point: *"Taku Noda had provided me with the first part of user instructions in Word format concerning only frequency dependent line modeling. I converted his document to WP7 and added …The archived .ZIP file is called HXVIII.ZIP …. Caution, the WP7 file inside is very big (about 5 MBytes!) due to bitmap graphics …. I plan to announce this progress first at ATP workshop, but my actual goal is the Barcelona meeting."* The use of Corel WP7 is in accord with work in Portland (see separate story). As explained there, Envoy output rather than the WP7 files, could be made available to the general public when the time comes. That is the user group's recommendation, anyway: read- and print-only files, rather than modifiable files.

Video conferencing has been suggested as a new and economical way to bring overseas expertise to EEUG meetings. Developers in Portland received a written inquiry about the possibility on September 18th. From Budapest, Hungary, Prof. Laszlo Prikler wrote: *"What do you think about a 'virtual' participation? By means of a video conference using the Internet, I mean. My wife is working for a GE venture in Hungary, and video conferencing is an everyday practice in that company."* So, technology advances. Your Editor and MODELS author Laurent Dube participated by voice telephone in the 1994 Meeting in Hannover, Germany. Three years later, serious consideration is being given to adding the video component and minimizing the cost (unlike long-distance telephone calls, the Internet calls are free).

Watcom ATP for MS Windows

The Watcom compiler has been used for about three years for the support of ATP by Robert Meredith and Robert Schultz of the suburban New York City area. Most recently, emphasis has been shifted from IBM's OS/2 to MS Windows NT --- both of which were Salford DBOS-incompatible.

BPA's Dr. Tsu-huei Liu began the altered Watcom use in Portland by successfully compiling old ATP source code using appropriately-modified copies of Robert Meredith's WinNT scripts (batch files). This milestone on September 5th marked the abandonment of Watcom's free DOS extender WAT4GW following lack of resolution to that problem using /SC (see preceding issue). A new directory D:\WATNT is being used. As for the delay, your Editor must confess to confusion about those Watcom ATP object files from Robert Schultz. Somehow it was assumed that these came from C, and that same-vintage C compilation would be required as warned about more than once in public E-mail by Harald Wehrend of SEG in Germany. The plan had been to use new Watcom compilers (already purchased by BPA), but this had been delayed because of the alleged need for some 600 Mbytes of free disk space for installation. As Dr. Liu's Pentium only had about 150, she was waiting for another disk. Finally, it was Robert Meredith who corrected the confusion about C in E-mail dated September 4th. As it turned out, those old Watcom object files from Schultz work fine with output of either the old or the new (version 11) Watcom FORTRAN compiler.

Loss of STATUS='APPEND' on OPEN statements was a surprise. One would have thought that all platforms would treat OPEN comparably, but apparently not. This worked under WAT4GW but failed under WinNT at execution time. ATP would abort with the message: *ERR* IO-28 illegal 'status=' specifier. So, in the case of the change of diagnostic files in SYSDEP, the existing file must be connected as 'OLD' and then records are read until an end-of-file mark. At least this works (users then are allowed to WRITE at this point).

Almost instantaneous starting (so fast it is difficult for the eye and mind to detect), and very quick passage through overlays outside the time-step loop, are characteristics of Watcom ATP for WinNT as observed on Dr. Liu's Pentium with 32 Mbytes of RAM. The fast simulation within the time-step loop had been noted by Robert Meredith (9 seconds for DC-1 was mentioned for a 120-MHz PC in the January, 1996, issue). As for total solution time, from DOS prompt to DOS prompt, RUNTP solution of DC-6 requires less than a second on Dr. Liu's PC. This is using DISK --- something of a misnomer since everything must be in RAM as the experiment is repeated over and over using DOSKEY.

Compiler optimization generally works, but there were isolated exceptions. The original optimization /5 and /fp5 from Robert Meredith were replaced by /OD (understood to mean optimization disabled) for two major chunks of FORTRAN: MAIN00 and OVER24. Before removing the optimization, the files were segmented. It does seem that optimization is made more difficult by concatenation of many subroutines in the same disk file. Segmentation did solve the problem. On the other hand, removal of the optimization seemed easier, so this alternative was adopted.

Installation of the new Watcom compilers (Version 11) was completed September 12th. Unfortunately, this did not offer a quick solution to the minor problems of the old compiler. Without changing anything, recompilation proceeded normally, but then linking failed with the message: "Error! E3009: dynamic memory exhausted." Dr. Liu did eventually work around this problem, First, following a hint from some help file, all object files were copied into a single disk file prior to linking. Then the error message changed to "Out of virtual memory. System running low on virtual memory." There was a suggestion that an additional paging file be added. This was a reference to the WinNT paging file, which contained a mere (joke) 43 Mbytes. With the assistance of the system administrator (users are not given the required password),

this was increased by 50 Mbytes to 93, and all has worked well ever since. Source code and supporting files were E-mail to Mr. Meredith on September 16th.

Standard test cases were verified as usual, with only the 2nd subcase of DC-46 continuing to be troubled (see the preceding issue). The newer .GNU output has been verified. Unfortunately, the new compiler has changed roundoff significantly. Using Mike Albert's freeware FC, the differences file DIFF.LIS that is produced by FCWATCOM had size 1338 Kbytes. This is as bad as if, using the Salford compiler, use of the symbolic debugger were turned off or on. A curious difference was noted in DC12.LIS where a source with angle 118.5 degrees was rounded down to 118E+02 for interpretation by the old compiler, but rounded up to 119E+02 using the new.

The WinNT TPBIG.EXE as produced at BPA is compatible with Win95 as used by your Editor at home. This important property was predicted by Prof. Mustafa Kizilcay of FH Osnabrueck, and verified early in the morning of September 17th. Later that same day, Dr. Liu created for Prof. Kizilcay a special copy having the larger EEUG dimensions, and E-mailed this in plenty of time for the workshop (see separate story) at the end of the month.

Noda frequency dependence remains missing in Watcom ATP. Prof. Kizilcay was reminded of this remaining problem for Watcom ATP in E-mail dated September 16th. Lacking expertise in C, neither Dr. Liu nor this writer expect to work on conversion from the code for Salford to code for Watcom.

Watcom ATP execution speed on Dr. Liu's 133-MHz Pentium running WinNT can be compared with Salford EMTP execution speed on your Editor's Pentium. Clock speed is the same, although Dr. Liu's PC has twice the RAM (32 Mbytes rather than 16). Both compilations were without optimization (use /OD with Watcom). Finally, your Editor uses Win95 rather than WinNT. The time to execute all standard test cases using RUN.BAT was compared on October 7th. The DATE command of DOS wrote to DATE.LIS the following: Total time

Watcom ATP under WinNT	310 sec
Salford EMTP under Win95	362 sec

Harald Wehrend of SEG in Kempen, Germany, is probably the most interested in Watcom ATP. For those who do not know, his usage is extraordinary. The following summary was received on September 23rd in a message from **h.wehrend@avkseg.com (a** new E-mail address at work): *"I would like to explain to you our doing in software development for protection relays and machine controller. We start with the software development before any hardware is available. For this we use ATP as a nearly perfect tool. Our protective or controlling part of software is written in C, it later runs on a Motorola signal processor. This software can be tested completely within a foreign-declared MODELS model, coded in C. I get my samplings from ATP like interrupts later on the real hardware, feeding the measured values into my C-coded algorithm. The next step will be to use the trip command generated by the C-code to perform switch operation within ATP. For the reason that the code of our modules is C-only they can be used in ATP and on the later hardware identically, without any change. This I think is very important for software testing and software quality. The specialty of the Motorola DSP chip is its numerical format: 24 bit and fract-format -1....0...+1. We simulate that for the C-modules connected with ATP / MODELS by a C++ class, that make the PC-program (our C-module) compute with 24 bit and within that fract format. So our MODELS module exists of several protective c-files and one C++ file simulating the DSP specialties.* So why is the WATCOM compiler important? It "is also supported by MATLAB's C-interface and MATHCAD's C-interface. So the same module tested with the MODELS C-interface (for power simulation purposes) can be connected to MATLAB or MATHCAD for example to make filter layout and other things for which MATLAB is specialized."

An output file named -R.LIS was created for the interactive user who keyed "-r" for the output file name. This was prior to correction on October 6th. What was the problem, and why did Salford EMTP not exhibit this behavior? According to in-line comments, Mr. Meredith had wanted to allow minus signs embedded in file names, with the letter R following one of these. For example, file name BOB-FILE.DAT would be tolerated. Whereas Salford EMTP checked for just the two characters -R in any location and any order (and erased them after recognizing them), Watcom ATP required a blank in front of the -R. This was fine for batch-mode use, but failed for an interactive response of just the two bytes -R. So, logic was added to handle the interactive case. What about Salford EMTP users? Do any have need of an embedded -R in file names?

The new Windows 95 key --- the one that is marked with the waving Microsoft flag at the bottom of an MS keyboard --- was mentioned in the October, 1996, newsletter. The good news about WinNT 4.0 is that the key no longer is dead (as it was for older NT). It **does** finally function as it was designed (like an Apollo pop key).

Sybase was mentioned in the preceding issue. Seen on the screen during both compilation and linking is the message: *"Watcom is a trademark of Sybase, Inc."* This looks like a buyout or takeover of Watcom, all right.

Windows and Graphics by Schultz

Windows and graphics for ATP exploitation under MS Windows NT and/or 95 is an exciting recent development from Robert Schultz of the New York City

area. News arrived on September 16th in E-mail from his new home address **rschultz@bestweb.net** While your Editor initially was tempted to refer to this revelation as *Schultz Revolution II* (for the original, refer to the October, 1993, newsletter), he has decided instead to call it simply *Schultz Magic*!

So what did the computer magician report? The following is a carefully-edited (to preserve secrets) excerpt: *"I've been working hard the last few nights on a special project …This is the breakthrough I've been waiting for. To whet your appetite, I am attaching the demo program Atlantis which will run under NT and W95 if xxxxx is installed. …. mouse and keyboard control, menuing system --- efficient, high-performance and free. Much more to follow, obviously. Free at last! Wow!"* About Atlantis, when executed, this does open an NT window in which various fish swim on Dr. Liu's screen. Yet, your Editor is a skeptical guy. In response to claims of revolutionary features, your Editor wrote (remainder of this paragraph): I would be happy with text windows that scrolled fast, and a separate graphics window that scrolled a la Apollo DOMAIN. I am not a greedy person. Only Bill G's crummy software makes my demands seem unusual. Apollo users merely want what we had 15 years ago (although not in color, then)! We obviously like the *free* part (ATP users are a parsimonious bunch).

The apparent necessity to use C or C++ is what has prevented your Editor from working with MS Windows. But as long as someone else does all the work and the interfacing, who is your Editor to complain? He certainly is prepared to use any tool that can be accessed from FORTRAN without too much inconvenience. Recall this is the way Noda frequency dependence entered ATP as described in the October, 1995, newsletter. Dr. Noda wrote the C and ATP CALLed it. Recall this also was the way computer expert David Szymanski had proposed doing windows using MS products (the October, 1996, issue explains about using threads and C). One last time for those who do not yet understand: C **is** allowed in ATP provided: 1) there is a good reason, and 2) most importantly, someone else does the work!

An interactive viewer of ATP PostScript files was received from Meredith on September 29th. This is the program that originally was written for OS / 2 (see the numerous newsletter references to PSPLOT), but now has been converted in New York to run under WinNT. Author Meredith wrote: *"Type meredith 8 to start displaying the eighth plot of default file name postplot.ps. …The home/end, page up/down plus/minus and cursor up/down keys all allow paging the plots. The 1,2,3,4,etc keys toggle display of those curves. The window can be resized to allow viewing strip plots - those longer than 10 inches. We have yet to add scaleable fonts, vertical text, text suppression and text/curve color selection. All are possible, however. This program comes close to the capabilities we had under OS/2."*

Speed of graphic display at BPA was a problem for several days, however. Using Meredith's program of the preceding paragraph, plots looked normal; but they were painted on the screen very slowly. Full-screen, the 14 plots of DCN15.PS could be paged by Meredith in 20 seconds using his 166-MHz home computer. But, as documented in E-mail dated October 1st, Dr. Liu's 133-MHz Pentium required a whopping 130 seconds. Why?

MS Windows Editor by Alan Phillips

PFE (Programmer's File Editor) is the name of a powerful, free editor that runs under WinNT as well as other flavors of MS Windows. Written by Alan Phillips at **A.Phillips@lancaster.ac.uk** (the relatively-new Lancaster University in northwestern England), this superb freeware product first was recommended to program developers in Portland by Prof. Mustafa Kizilcay of FH Osnabrueck in Germany. This was in E-mail dated April 22nd. Some weeks later, PFE was independently recommended by the New York Bobs (Meredith and Schultz), and this second reference was enough to prompt BPA's Dr. Tsu-huei Liu to pick up and test her own copy.

http://www.lancs.ac.uk/people/cpaap/pfe is the Web page that is referenced in the README.TXT file that accompanies the PFE Editor. The abstract follows: *"This is the 0.07.001 release of Programmer's File Editor, a large-capacity multi-file programming oriented editor for Windows 95, Windows NT 3.51 and 4.0 on Intel and PowerPC platforms, and Windows 3.1x PFE includes the following features: *) The size of file it can handle is limited only by the total amount of virtual memory available; *) No arbitrary limit on the number of lines a file can contain; *) It can edit multiple files, the number being limited only by the available system resources; *) Allows multiple edit windows showing the same file; *) Multi-level undo facility; *) Can read and write files in UNIX format using LF as line terminator, with automatic format detection; *) Line numbers can be shown in any edit window if required; *) Text can be copied and moved by dragging and dropping; *) Right-click mouse menus give access to commonly required functions; *) DOS commands such as compilers, can be run with the output captured in an edit window; *) Commonly-used text can be inserted in a simple operation from template libraries; *) Fully-remappable keyboard, including two-key operation similar to MicroEMACS and mapping of Alt keys to functions; *) Keystrokes and menu commands can be recorded in replayable keyboard macros which can be collected into libraries; *) Files can be printed either in total, by line range, or selected text only; *) Automatic line indenting and removal of trailing spaces Automatic configuration of edit options depending on file type; …*) Optional automatic text wrapping at configurable margin."*

About free usage, the README.TXT file states the following: *"PFE may be used in any way, for any purpose, at no cost. In may be distributed by any means, provided that the original files as supplied by the author remain intact and no charge is made other than for reasonable distribution costs. You do not need to register to use PFE, or buy a licence to use it PFE may be placed on any archive or BBS system. PFE may not be distributed with any commercial product without a prior license agreement with the author."*

Installation of the 32-bit PFE on Dr. Liu's Pentium was uneventful. This agrees with the README.TXT file: *"There is no setup program for PFE, as it doesn't really need one. Installation is done by simply copying the supplied files." For the 32-bit version, "Copy pfe32.exe, pfe.hlp, pfedos32.exe to a suitable directory. This need not be on your path; but it's important that all the files are in the same directory. Next, read upgrade.txt carefully, and if you wish, use the ini2reg utility to convert your existing initialisation file PFE32.INI into the Windows Registry."*

Type - 20 Source Models Op Amp

A new Type-20 source for the electric network was added to represent an operational amplifier (op amp). The subject first was raised publicly by Masahiro Kan of the Hamakawasaki Works of Toshiba Corporation in Japan. His E-mail of the Fargo list server dated August 19th had title *"Opamp and Type 94 MODELS interface."* Mr. Kan explained: *"I am experimenting with the Type 94 MODELS interface by simulating an inverting amplifier using an opamp (operational amplifier). I modeled an opamp by Type 94 MODELS interface, but it didn't work properly. The same model worked properly using SPICE. The opamp was modeled by a voltage-controlled voltage source."*

The new Type-20 source was conceived after Mr. Kan revealed a complete lack of response to his call for help with MODELS and that Type-94 element. Since no one showed Mr. Kan how to make his Type-94 data operate as intended, your Editor volunteered to supply a simpler and better alternative. Feasibility became obvious following Mr. Kan's private clarification that he needed only a constant gain, an infinite input impedance, and zero output impedance. These all make modeling so simple that there is no need for any supporting dynamics (TACS or MODELS), and no need for compensation. The zero output impedance implies a voltage source. The infinite input impedance means that no current is drawn from the nodes where voltage is sensed (just as when TACS or MODELS senses a voltage). Finally, the constant gain means that the source can be built into the network [Y] just as an ideal transformer can be (the Type-18 source). One fundamental difference must be noted, however: the contribution of an op amp to the network [Y] is **not** symmetrical. In this sense, the new Type-20 source is a natural companion to MODEL [R][L] (see a separate story).

The op amp output (i.e., the node to which the Type-20 source is applied) must not touch a switch, in general. This was discovered by Mr. Kan and reported in E-mail dated September 3rd. In theory, there is no problem. But in practice, an op amp connected to a switch substantially complicates switch logic. It is not obviously in anyone's interest to have this change made now. Some day? Perhaps! But not right now. For now, users are advised to separate any switch node from a Type-20 source by a very small resistance. Later, this addition might be performed automatically by the program, if there is sufficient interest. Programming would not be difficult. The only uncertainty is about naming of the internal node. If the user might not want to supply the 6-character name himself, what is the best rule for building it internally? For a source name consisting of 5 or fewer nonblank characters, it is easy enough to add a sixth. But what if all six are nonblank? Your Editor's inclination is to perturb the right-most character. What reader disagrees, and why?

Usage of op amp modeling is illustrated by a trivial, new 4th data subcase of BENCHMARK DCNEW-22. Comment cards mark the data fields, which should be obvious. About speed, the burden of a Type-20 source is negligible --- only slightly greater than that of a MEASURING switch between the output and the input of the amplifier. Except for the avoidance of switch nodes, there is believed to be no complication of usage. In this sense, op amp modeling is simpler than ideal transformer (and ungrounded voltage source) modeling. Recall the Type-18 source involved a zero diagonal element.

Line and Cable Constants

CABLE CONSTANTS and CABLE PARAMETERS of ATP are the contribution of Prof. Akihiro Ametani of Doshisha University in Kyoto, Japan. In the preceding issue, CABLE PARAMETERS can be found where CABLE CONSTANTS should have been used. Following correction, the sentence becomes *"The mention of CABLE CONSTANTS is irrelevant, …"*

DC-27 had a new subcase added at the bottom on August 14th. This involves the same data of CABLE PARAMETERS as the first CP subcase of the file except for two omissions: 1) the CC declaration at the top; and 2) its associated blank card at the bottom. The new data documents correct operation of the more logical data structure as described in the preceding issue. It was added following a change. BPA's Dr. Tsu-huei Liu noticed a problem with operation, so logic was fixed. The new code shows dimensioning as part of interpretation of the CP card. This is either with or without a preceding CC card.

Previously, dimensioning was shown only if there was a preceding CC card.

The second subcase of DC-27 resulted in an error termination when the data was copied to (and hence read from) a separate file. This was prior to August 15th, when BPA's Dr. Tsu-huei Liu discovered a lack of proper initialization for such data using Salford EMTP. Note that this is for older CABLE CONSTANTS rather than newer CABLE PARAMETERS (i.e., the error might be two decades old).

Use of METRIC in LINE CONSTANTS data might result in erroneous output of an equivalent Pi-circuit. This was prior to September 19th when BPA's Dr. Tsu-huei Liu applied a correction to handle data from Prof. Laszlo Prikler of T.U. Budapest in Hungary. The complaint the preceding day read as follows: *"I think I have found (or just re-discovered) a bug …. When I calculated nominal and equivalent PI circuit of a 400 kV line some strange behaviour has been observed. The length of the line has been increased by a factor of 1.609 …. The input file is attached to this mail."* Provision of an example was the key because the unintended stretching only occurs for certain combinations of parameters on the frequency card. Coincidentally, another European (Prof. Ramzi Dib of FH Friedberg in Germany) had complained of such trouble from Minneapolis (the University of Minnesota) on August 1st, but had provided no illustrative data. Dr. Liu, therefore, was forced to construct her own example, and this unfortunately did not demonstrate the problem. As often as not, words are inadequate in such cases. Readers are reminded to send a .DAT and .LIS file along with the words in order to avoid misunderstanding.

Lack of punched cards to represent the equivalent Pi was observed by Prof. Prikler. It is worth explaining why, and asking readers whether they feel deprived. First, note that a single multiphase branch of Type 1,2,… can not be used because the shunt path is purely capacitive. For an equivalent Pi based on so-called long-line (hyperbolic) formulas, shunt resistance must be added. Using existing components, a Type-51,52,… branch to ground would be required at each end. Furthermore, as Prof. Prikler observed, the result could not be used for transient simulation. But is that a good reason not to produce punched output? The Rule Book states: *"equivalent PI-circuit can not be used for transient phenomena. Accordingly, no punch card output is possible."* Prof. Prikler questioned the *accordingly*, wanting to use the equivalent Pi for steady state modeling. Why not? But what format is preferable for punched cards? Are three Type-51,52,53 branches really preferable to a single, complex, 6x6 matrix (ATP already allows component [Y] for steady-state use, recall)? Alternatively, should a new, more-efficient input format be used? Note that [Y] is a little wasteful (4 partitions compared with only 3 of the Type-51,52,53 branches), but it has the advantage of preventing transient simulation. GIGO is the fear your Editor has about punching Type-51,52,53 branches. It seems inevitable that some user somewhere would continue into the time-step loop and then wonder why his transients seemed strange.

Japanese Share ATP using Internet

Japanese continue to enjoy the best of ATP-related Internet services thanks to the initiative of Masahiro Kan. His latest expansion was summarized in public E-mail of the Fargo list server dated September 16th: The subject was: *"ATP distribution via secure WWW pages; g77; Japanese translation."* Mr. Kan explained: *"Recently, the password protected WWW pages have been studied and established by Dr. Arita of Hitachi Corporation, Dr. Kasiwagi of Kisarazu College and Dr. Funaki of Osaka University. So, I decided to move the distribution of latest software and the discussion about the important subjects to these secure WWW pages. These pages are maintained on a volunteer basis, and have nothing to do with JEC (Japanese EMTP Committee) now."*

About the new ATP-related Web services in Japan, Mr. Kan continued (remainder of this paragraph): *"We have the following three secure WWW pages now:*

1) (JATP-WWW-BOARD This is a password protected forum for discussion and information exchange about ATP. http://www.arienter.com/atp/ This page is maintained by Dr. Arita of Hitachi Corporation.

2) (JSecure-WWW-pages for ATP-EMTP) These are password protected servers for distributing ATP materials:

a) http://beam.kisarazu.ac.jp:8080/~kasiwagi/atp/

b) http://pels.pwr.eng.osaka-u.ac.jp/~atp/restricted/

These sites are maintained by Dr. Kasiwagi of Kisarazu College and Dr. Funaki of Osaka University. Please refer to the following about the detail of the maintenance of the password: http://www02.so-net.or.jp/~m_kan/index-e.htm BTW, GNU Fortran (g77) for djgpp was put on the anonymous FTP site of Osaka University. This can be found in ftp://pels.pwr.eng.osaka-u.ac.jp/pub/atp/g77/"

A Japanese-language translation of the ATP Rule Book seems to have been started. Recall this was mentioned in the July newsletter, and Mr. Kan provided further information in his September 16th announcement: *"It was written by Mr. Takahasi of Toshiba and now covers the following chapters: 1) Machine dependent features (1.E); 2) TACS; 3) Switches; 4) Type 59 SM models; 5) Type 96 Nonlinear inductance."*

"Secure WWW pages for the world" was the Subject of public E-mail from Mr. Kan on September 26th. No doubt about it, mention of *the world* generated a lot of attention, and resulted in substantial public discussion. Mr. Kan's history-making announcement began: *"… we in Japan have begun Secure WWW service. This service is primarily intended to serve Japanese and East-Asian ATP users, but is not limited to them, of course. This service is maintained by the following people in Japan on*

a volunteer basis, and has nothing to do with JEC (the Japanese EMTP Committee) now: 1) Dr. Arita of Hitachi Corporation; 2) Dr. Funaki of Osaka University; 3) Dr. Kasiwagi of Kisarazu National College of Technology; and 4) Masahiro Kan of Toshiba Corporation. The following services are available now …."

Prof. Bruce Mork of Michigan Tech in Houghton responded on September 25th by questioning the limits and procedures associated with his own services: *"I would like to poll the subscribers of the ATP list to see if they would like password-controlled access to web, ftp site, listserver, and listserver archives. What is the trade-off between password security and the convenience of one less password to remember? The newest listserver upgrade being released has the capability of password-only access, WWW-based listserver, as well as password protected web-accessible archives of all past correspondence. We could also provide a password-secure ftp site for distribution of the ATP program to licensed users. Laszlo Prikler has been doing this for some time. It takes some extra work to maintain the password, however."*

Your Editor echoed the concern of some that present services not be lost in a rush for change. Quoting from list server mail dated September 27th: *"Marco Polo Pereira of Furnas in Rio de Janeiro, Brazil, expressed well the appreciation of the many users of Prof. Mork's services. There seems to be a valid concern that these valuable services not somehow be compromised …. Note that the Japanese have not proposed changing Prof. Mork's services at all. That is the advantage of having someone new provide a new service: there is no necessary impact on the old. If new services were to be offered by Prof. Mork, his old services presumably would be affected. Prof. Mork's time already is in short supply."*

ATP Education on CD - ROM ?

Tom Field of Nashville Electric in Tennessee has been the driving force behind a bold initiative to offer ATP education on CD-ROM in the foreseeable future. This story about FREEP, which began in the April issue, now is being continued. A June 24th meeting at IPST'97 in suburban Seattle altered the direction quite unexpectedly.

BPA's public-domain EMTP and its documentation were considered by FREEP following refusal of the Can/Am user group to grant permission for desired modifications (see preceding issue). In E-mail dated May 29th, Mr. Field asked: *"One of the people suggested that we use the BPA documentation to prevent biasing the tutorial to a commercial version. Do you know if the old program or the version of program used by BPA which can be obtained through the freedom of information act is in a compiled form which can run on a pc? It may be a means of teaching the basic data files without biasing to any version. Then the specialized parts of ATP could be taught on a separate disk. Since the commercial stuff should not be as long as the ATP portion, this could probably be on the same disk as the commercial people. They will probably still take up a good bit of room with their student versions. Oh, is there a way of possibly digitizing certain ATP related free documentation with the author's release to do so?"*

Your Editor's response on June 1st was not supportive. About PCs: *"I can not recall BPA using any computer other than DEC VAX/VMS for its EMTP during the past dozen or so years. An Intel-based PC never has been used, as far as I know. By the time PCs arrived, ATP was available."* About digitizing ATP documentation, your Editor clarified as follows: *"Some things do not even require the author's release. An example is the MODELS documentation, which is in the public domain. So, can FREEP digitize 'certain ATP related' writing? Of course. But many other items are more complicated (the devil is in the details, about which you have provided none)."* About acquiring BPA EMTP materials, your Editor advised: *"Whether paper or computer files, 'records' are involved (the legal term of FOIA). Your legal advisor should be able to inform you of requirements. The law is quite precise, as I recall. One thing I am sure of: the request is not to be mailed to either me or Tsu-huei, although we might be mentioned in the request (as we were in that famous FOIA request of March, 1985 --- the one that burst the DCG/EPRI bubble)."* About *the best form for pc use*, your Editor observed: *"FOIA makes no provision for modification or adaptation to suit the person making the request, as I recall. Neither does it require advice about use of the records that might be obtained."*

A draft of printed materials and/or transparencies that were to be used at the Seattle meeting were received by public E-mail dated June 10th. Your Editor's public response the following day had title: *"Can/Am User Group refuses to approve of FREEP writing about ATP."* At issue was SLIDE6.DOC which stated: *"One version will remove all ATP references and other material that Dr. Meyer feels should not be given to the rest of the EMTP community …"* Your Editor responded as follows: *"No such offer to approve of any FREEP disclosure has ever been made by this writer, and it is not expected that one ever will be made. If FREEP is to disclose ATP information to persons who are not ATP-licensed, it does so at its own legal peril. All who participate in any such activity are warned once again about the risk. The nondisclosure agreement LICENSE.ZIP (the user group's form letter) seems clear on this subject: the release of ATP information to any unlicensed person is prohibited. It is not the responsibility of the Can/Am user group or anyone else involved in ATP development to ensure that FREEP does not release important ATP information to unlicensed users. This is FREEP's responsibility."*

"IPST meeting" was the Subject of E-mail from Mr. Field on June 25th. Although initially private, this became public the following day when a FREEP supporter

responded to it publicly. Mr. Field began: *"The meeting was a complete disaster. I was unable to present my presentation. There was arguing between the commercial people and the ATP people. I would be able to give a transcript, but one of the ATP people that was attacking me and stirring things up made me give him the video and audio tapes afterwards. Anyway, at one point the commercial people did not like the requirement that people have an ATP license. This should not have been an argument since they came in knowing this would be the case. Then they said why do we need ATP. I believe the same can be said of them. Anyway, I said this is for education, suppose someone goes to a small company out of school that cannot afford the expensive commercial versions, do we penalize them because of their requirement? Then the commercial people said that makes ATP in competition with them taking their customers. Anyway, after the personal attacks and disruption, I am very disgusted. They tried to get me to decide to go without ATP. I will not do this just as I will not start a trend paying for ATP material. This is the cornerstone of our project of improving the power community by providing educated undergraduate power engineers the ability and knowledge to use emtp to advance the power industry. I will ask the commercial people in email if they will be men of their words and still provide the templates and student versions. We will not change the ATP issue of requiring an ATP license. I told them we could strip it out for the few schools involved in emtp commerce, but that was not good enough for them. They actually thought we would fill the ATP version with derogatory information about them. I have been through one headache after another with this for months. Dr. Camacho is right, we do need to move on beyond the politics. The meeting was not setup and the announcement was not read, so I had to force the issue with Electrotek and get a room and make flyers and an overhead. I believe there are enough good ATP people to make use of the universities with multi-media departments and all the other ideas that have come from people in the ATP community and not the commercial people who have only managed to ruin it for people at the conference that came to the meeting with educational interests. ... It really got to me when the ATP person that was stirring things up with no other purpose than to create chaos told me when requesting the tapes that I did not know anything about these people. I guess he was right, I thought they were there for a productive meeting as interested educators to bring a good idea to life instead of ruining it for others from other countries that were interested. … I believe we should consider dumping the commercial people. I will not attend another conference at my own expense and vacation time to be insulted by those people with nothing good coming from it. I should probably write a better letter, but I just got home to my computer."*

IEEE PES COMTRADE of TPPLOT

The COMTRADE command of Salford TPPLOT, which runs under the Salford DOS extender DBOS on Intel-based PCs, was substantially improved during August as a result of serious usage by Prof. Bruce Mork and associates at Michigan Tech in Houghton. Of course, as explained in preceding writing, COMTRADE is a format for digitally-recorded signals; it is an IEEE PES standard that can be created using the EXPORT command.

Prior to a correction on August 12th, COMTRADE output might be in error for data that had been extracted from large .PL4 files. Prof. Mork was the first to report the problem, which involved overflow of a 2-byte integer. Unfortunately, such overflow is not fatal for DBOS, so the conversion continued using the wrong subscript. On the other hand, extrema and scaling were wrong, so any alert user would realize something was grossly incorrect. Prof. Mork complained as follows in E-mail dated August 6th: *"Apparently, TPPLOT is not doing a min/max magnitude scan of the entire length of the waveforms to be exported. From the symptoms, it only scans the initial part of the waveform."* With 6 signals defined for 10K steps, indexing was well beyond the 16-bit limit of 32767. If unity is added to this maximum, the result is -32768 (wraparound from the maximum to the minimum).

Automatic labeling of COMTRADE output was an idea from Randy Suhrbier, recall. As explained in the October, 1995, issue, the user can avoid LABEL= usage and rely instead on default signal naming by the program. Well, prior to correction on August 12th, the default names correctly corresponded to .PL4 variable names only if there were no branch quantities involved. About labeling of branch quantities, Prof. Mork observed that the units of output were fixed at "V" rather than being switched to "A" in the case of branch currents. Finally, the letter used to indicate phase was fixed at "A" rather than varied (e.g., A, B, or C) About variation, there is no way to satisfy everyone since style is involved. Prof. Mork suggested that the right-most nonblank byte of the first nonblank name be used, and this assumption was adopted. For example, the default phase indication of a branch current from ground to BUSC would be "C".

Two date and time stamps are required for the .CFG output file. If the user does not specify the first of these using its associated data tag TIME1, the program will supply a default value. Rather than the fixed, artificial default of years past, Prof. Mork suggested that it should correspond to the date and time in the header of the input .PL4 file. Yes, another good idea (the change was made).

A station name and number begin the .CFG output file. Prof. Mork made an excellent suggestion for improvement of the default name: document the name of the input .PL4 file using this line. This has been done. If not user-defined, the station name will be "TPPLOT creates from …" where the name of the input .PL4 file is missing on the right.

The default output file names no longer have the fixed form COMTRADE.YYY. Instead, if the user fails to

provide an output name, names of the two output files will be parallel to the input file. For example, a .PL4 file named MORK.PL4 will produce output files MORK.CFG (the configuration file) and MORK.DAT (the signal file) in the absence of a user-supplied name.

Use of the I/O status window has been improved in two ways. First, it no longer is left open during input of tagged COMTRADE data. Not only was the information in it (status of loading from the .PL4 file) no longer of interest, its presence was found to distract the interactive user. The second reform has to do with window content. *"Make COMTRADE signals"* is the new labeling that will be seen in the heading line during actual creation of the output file.

BINARY is the more efficient alternative to the default ASCII for COMTRADE output. First mentioned in the April, 1993, newsletter, BINARY files finally have been tested, and found lacking. When Prof. Mork left for Europe, communication on this subject was shifted to his graduate student Huihua ("Maggie") Yan, who had been feeding the COMTRADE output of TPPLOT into Doble software. About BINARY files, she wrote on August 20th that *"the waveforms look just like white noise."* Both Prof. Mork and Ms. Yan encouraged the change from standard FORM = 'UNFORMATTED' to ACCESS='DIRECT' as is used by Watcom ATP to create C-like .PL4 files. This **did** work, as first tested on September 3rd.

To illustrate how BINARY saves disk space, consider the example supplied by Prof. Mork. This involved six analog signals with 10K time steps for each. In bytes, the sizes of the signal files are as follows. The first column of numbers is for the file as created by TPPLOT whereas the second is for the PKZIP output of these files :

	Original	Archived
ASCII	650000	171179
BINARY	200000	105764

The compressed difference is not that great. In this day and age of huge disks, it is not obvious that this saving will be viewed as critical. Probably more important will be faster speed of handling (BINARY files avoid the overhead of formatting that is inherent with ASCII). This is comparable to the observation that FORMATTED .PL4 files are slower than either UNFORMATTED or C-like --- for either creation or reading.

Use of Salford COMSPACE may be required of those who create BINARY COMTRADE files. There is an attempt to delete the signal file prior to creation of a new one, and this requires real memory. The DOS command COMSPACE d'100000' is adequate for your Editor's Pentium using Salford DBOS version 2.66

Speed of BINARY input to Doble software was reported by Ms. Yan on September 4th. In response to your Editor's inquiry, she wrote: *"Binary data files do go much faster than ascii data files. It takes Trans2 less than one second to read in binary files with 10001 points, while with ascii files, it takes around 4~5 seconds. That's just a rough estimation. Hope it's satisfactory for your use."*

COMTRBIN is a new, binary version of the original command file COMTRADE for TPPLOT. The same variables from the same .PL4 file are used, but it differs in several ways. First, the BINARY switch is thrown. Second, default values are assumed for all other choices. No other tags are used, so the output files are parallel to the input .PL4 file. This is the source of new HHMMSS.DAT and HHMMSS.CFG (they illustrate output from TPPLOT, rather than input for it).

On - Line Records of ATP Licensing

The end of paper photocopy of licenses entered the user group's form letter on August 12th. Quoting from E-mail to Prof. Bruce Mork of Michigan Tech in Houghton, *"Please again change LICENSE.ZIP of your storage. The only change we just made was below the line for our signature. We no longer promise to return photocopy by snail mail. Now, the promise is confirmation by E-mail (although Dr. Ger still returns photocopy)."* In order that the final parenthetical comment not be misunderstood, this is for users who purchase materials from Dr. Ger by snail mail.

Spam (junk E-mail) that did not involve the Fargo list server first was received in your Editor's mailbox at Agora on August 11th. That same Catherine Lake (see previous, apparently-noncommercial mention) seems to be involved. Although tastefully written and low-key, this second message seems clearly commercial: *"Are you tired of waiting online to speak with tech support? Are you …The nationally acclaimed …. video is now available for sale online. In just 40 minutes you can learn …visit our website today and start …"* It would seem that a list server might be operating from a list that has recently been augmented by the addresses of Prof. Bruce Mork's subscribers. It is precisely to prevent such usage that the user group is not going to publish E-mail addresses, telephone numbers, or street addresses of all licensed ATP users.

Compiled TACS Speeds Simulation

Compiled TACS is the much faster, and also more flexible, way to simulate control system modeling. The story that began in January is being continued now. It is necessary to consider carefully those language differences that distinguish single precision from double precision. Also, COMPILED TACS MAKE capability has been released to the general public via Salford EMTP.

TACS library functions require special treatment for use with double-precision computation (now standard). Names such as COS or SQRT are single precision in standard

ANSI FORTRAN 77, so must be replaced. It seemed clearer for the user to have ATP convert these automatically to the corresponding double-precision names DCOS, DSQRT, etc. So such changes will be seen in the output produced by COMPILED TACS MAKE (CTM). Also, there were two names that involve conflicting meanings: SIGN and NOT. These are modified to SIGNZ and NOTZ in conformity with long-standing UTPF practice. Along with nonstandard names TRUNC, RAD, DEG, SEQ6, MINUS, INVRS, and RAN, these are supplied automatically by the program, of course.

The preceding paragraph describes what happens to TACS function names if they do **not** appear in the BB half of a split definition (see April issue). No conversion yet is applied to BB lines. Yes, it could be, but it seems both easiest and most efficient to have the user supply his own coding. For example, functions such as MINUS and INVRS have no practical use for someone writing FORTRAN because it is easier to program the operations involved than it is to use the TACS functions.

Constants that are not exactly represented in binary require special care. An example is 1/10 = 0.1 --- exact in decimal, but an infinitely-repeating fraction in binary. If left as 0.1, the result will be single precision according to FORTRAN 77 rules. So, until conversion to double precision later might be performed automatically, the user is expected to supply his own letter D. Recall that 0.1D0 is the double-precision equivalent. Also, uses of E-field numbers should be converted to D-field if full precision is required. For example, 1.E-5 is single precision whereas 1.D-5 is double. Integers should not be affected, note, since they **can** be represented exactly in binary. Data case DC22A illustrates such a change (variable DELAY1).

DC-18 has been slightly modified in order that the rules of TACS logical variables be more completely illustrated. The two sources FST and SCND have been outputted on the right. Otherwise, the solution is unchanged. This then compares with the CTM solution of DC18A.DAT, which was created to mimic the unique rules of TACS logical variables rather than to illustrate the power of FORTRAN LOGICAL variables (see example in the April newsletter).

Supplemental variables must be of the newer, free-format type rather than the original (old), fixed-format type. That is, CTM applies only to the new, not the old. This is because user-supplied FORTRAN is required, and the old format is not FORTRAN at all. Data case DC22A was modified as follows to comply with the restriction:

```
Original: 98DELAY1         .001
Modified: 98DELAY1  = .001D0
```

If such a conversion were not made, DELAY1 would simply be missing in the output FORTRAN, resulting in erroneous operation. So, a local error termination has been added. It reads: *" Error. COMPILED TACS now in use does not support old, fixed-format supplemental variable of preceding data card."* Later, automatic translation from old to new might be provided, if there is sufficient interest. But not initially.

Stacked data subcases generally are not allowed. For production usage, stacking normally is avoided, so the restriction is not an issue. If one CTM subcase is followed by either a CTM or a CTU subcase, execution will be halted locally in OVER4 after source input. One CTM subcase **is** allowed to follow a CTU subcase, however; and one CTU data subcase can follow another as long as data is structurally identical. While verification of identical structure is rather crude today, the structure is in place, so it might be perfected later.

October 16th was the date compiled TACS became available to the general public via Salford EMTP. A directory named \ATP is required for this initial release. This is for the FORTRAN that will be created by CTM execution. Continued next time, when there is more room.

More About Kilo - Scaled Voltages

Robert Hasibar of BPA asked about the feasibility of scaling voltages and currents of ZnO use by a factor of a thousand. I.e., rather than volts and amperes, kV and kA would be the units associated with numbers that are produced by ATP. This was the equivalent for surge arresters of what Dr. Gary Thomann did for the Type-59 S.M. Readers may recall the story in the July, 1995, newsletter that summarized early use at Power Technologies (PTI) in Schenectady, New York. Two years later, the concept is being revisited. No longer is the concept viewed as a special case. This second time, the perspective has been generalized. Why not?

INPUT KV AND KA was the first new change that responds to the suggestions. Separate from the issue of kilo-scaled networks is Mr. Hasibar's observation that surge arrester data from manufacturers is in units of KV and KA rather than V and A. It is true that moving the decimal point three places is easy enough. But why should this be necessary if a user prefers the units of manufacturers (as seen in headings of tables and labeling of graphs)? Using the new special-request word, it no longer is. For an illustration, see the new 2nd subcase of DC-39.

Historical precedent for acceptance of manufacturer's data by supporting programs was set long, long ago. Readers may recall Prof. Hermann Dommel's use of kV for data input to XFORMER (which produces [R] and [L] to represent 2- or 3-winding transformers having just a single-phase). For ZNO FITTER, the user now has a choice (the best of both worlds). Whether other supporting programs might be so generalized will depend on user demand. As a concept, the generalization is supported. Programming is simple enough, and no one cares any more about associated expansion in the size of the program.

Increases are small compared with the waste caused by Bill G and associates (MS Windows software).

Reconsider kilo-scaled solutions. That 1995 exposure was discouraging in that it illustrated the most difficult of possible applications: rotating machinery. Not only does one scale terminal voltage and current, there also is the confusion that accompanies internal variables such as torque. Originally in million newton-meters, these became trillion n-m. In the absence of such machine dynamics, is there significant confusion? It would seem not --- for use with transmission networks, anyway. Voltages typically are many thousands of volts, and sometimes hundreds of thousands. It is easier for the user to work with 345 than it is with 345000. Currents might not be as ideally suited for reduction by 1000, but are not particularly complicated by such scaling, either. On average, the product of the two (power) is much more convenient when expressed in megawatts rather than watts. The data of transmission lines and linear branches remain unscaled, note. It is only the data of nonlinear elements that require scaling. Why not?

KILOVI was used as a Type-59 S.M. declaration two years ago. This was the way the user informed ATP that Type-59 data to follow was to be used with voltages in kV (and, as a result, currents in kA). Now, the concept is being generalized. No longer is the declaration restricted to the Type-59 S.M. Now, it applies to nonlinear branches, too. Since the preceding type code 59 no longer is used in columns 1 and 2, more description has been adopted. The new declaration is VOLTAGE SOURCES IN KV as illustrated by new 4th and 5th subcases of DC-37. Although the old KILOVI declaration will continue to be honored, the new long form suffices as a replacement. Finally, the user is allowed to supply such scaling as part of the environment of execution if he prefers. Variable FACTVI of STARTUP will normally have value zero, meaning no such scaling. If given value 1000, this has the same effect as VSIK (the abbreviated form).

Arbitrary scaling of output variables was the thoughtful response of Prof. Mustafa Kizilcay of FH Osnabrueck in Germany. In E-mail dated September 22nd, he responded to the VSIK idea as follows: *"For me, it would be useful, if I could scale any EMTP output variable by entering a base value, for example to get directly overvoltage factors or p.u. units like in the case of STATISTICS switching studies."* Once again, the question must be: why not?!

Output-variable scaling is not new. In fact, it has been available to the interactive user for nearly a dozen years. This is the SPY CSP (CONCURRENT SEQUENTIAL PROCESSING) command. However, a fundamental difference exists. CSP was basically interactive in that it served SPY. It was something of a case of overkill, by having TACS process output variables. Somehow, no one suggested a much simpler, batch-mode alternative to handle just the constant scaling of output variables. Upon reading Prof. Kizilcay's sentence, the simpler possibility came to mind. Beginning September 25th, uniform scaling of all true output voltages and currents (not including rotating machinery or control system variables) was made possible as illustrated by a new 6th subcase of DC-37. The new request words are BASE VOLTAGE IN VOLTS (BVIV) and BASE CURRENT IN AMPERES (BCIA) with default values of 1000. This is the beginning: uniform scaling of output of the time-step loop. More will follow, no doubt, if the concept is well received by users.

Unsymmetric Type-51, 52, … [R] & [L]

This present story is an outgrowth of another one in the preceding issue. Recall the headline *"Compensation represents series R-L."* This explained that the extension to series [R] and [L] without any assumption of symmetry began with reliance on compensation. Type-91 elements MODEL Z0Z1Z2 and MODEL [R][L] were involved in that initial work. But now such special requests (the same key words) are allowed on Type-51,52,… branches in order to handle cases where the associated matrices [R] and [L] are not assumed to be symmetric as in years past.

Advantages of the new Type-51,52,.. include faster execution and freedom from conflicts of compensation. For example, any subnetwork was limited to a single group of coupled Type-91 elements (and no other use of compensation), but it can involve an arbitrary number of Type-51,52,.. branches. The only serious disadvantage compared with compensation would seem to be the constant nature of the matrices. Using compensation, it was possible to modify any parameter of a typical element at every time step using a signal from either TACS or MODELS or SPY. Modeling was separated from the network [Y], and easily accessible. This is not the case for Type-51,52,.. modeling.

The previous limit of 49 on the number of coupled phases has been eliminated for the new model. Although the 2-digit type code of columns 1-2 (assuming fixed-format rather than free-format data) remains, wraparound is allowed. After 99 comes 00, then 01, etc. for phases numbered 100, 101, etc. Does any user need such an extension for Pi-circuits (presently numbered 1 through 50 maximum)? If so, make your case publicly using Prof. Bruce Mork's Fargo list server. If there is a practical need, that extension, too, certainly could be provided.

The 2-phase case (just 51 and 52) of MODEL [R][L] is of sufficient interest to deserve special consideration. There is enough otherwise-unused space on the two branch cards to read the parameters, so this compact alternative is offered the user. If columns 27 through 44 of the Type-51 branch are blank, then [R] and [L] are assumed to be separate. If not, parameters will be read from the branch cards to the right of the text (which ends in column 26). The Type-51 branch carries parameters of row 1 and the Type-52 branch carries parameters of row 2. For an illustration, see BENCHMARK DCNEW-23.

Column-80 punches for branch output are allowed for MODEL [R][L] or MODEL Z0Z1Z2 branches just as they are for frequency-dependent distributed branches. This is a dominant advantage of the new modeling over the old (for symmetric matrices), which allowed no such output. It is expected that a common use of the new modeling will be for symmetric data where the user wants coil currents. It should be aesthetically more pleasing, easier to key, more economical of memory, and more computationally efficient to use a new model than it is to use the old model with an artificially-added switch in series with each phase. Only the saving of memory might not be obvious. Yes, more storage is required for List 3 (branch parameters), but this generally is more than compensated for by reduced storage for nodes (List 1) and switches (List 6). For the most common 2- or 3-phase cases, there is a big saving for the new modeling if all currents are wanted. It is only for substantially higher order (e.g., 9 for a 3-phase, 3-winding transformer) that the old modeling would enjoy a storage advantage. About speed, the new current computation is faster for current outputs of all phases. But for sparse outputs, the old procedure would be more efficient since one only pays for those currents that are requested. For the new component, the entire branch [Y] * V product is performed -- even for those rows (phases) that involve no current output. Of course, if no branch has current output, there is no such computation.

USE AR (originally USE AB) might provide the most important practical need for the new model. Recall [A] is the inverse of inductance matrix [L], and this is particularly important when [L] does not exist. This is the practical case of a transformer model that makes no provision for magnetizing current. The branch admittance matrix [Y] exists, but is singular, so can not be inverted to produce [Z] = [R] + jw[L]. The alternative is to use [A] and [R]. Yet, this previously was limited to cases where the [A][R] product was symmetric (e.g., the 2x2 matrices of each winding after the first in the saturable TRANSFORMER model). There no longer is any such limitation. Now, [A] and [R] are arbitrary, if the new models are used. Bring on the data for high-order models that allow no magnetizing current!

SUBROUTINE INFULL reads, processes, and stores all data associated with the new component. For many years there has been a desire to simplify the logic of branch input, which presently is a model for *spaghetti code*. Present input executes fast, and occupies little space, but is complicated. As virtual computers are used by all, and memory has become so cheap and plentiful that some of it can be wasted during data input, some isolation of input for the different models seems desirable. New INFULL is a beginning of what later might well become more-widespread structural reform. The experiment seems to be a success, and the change is worthy of note for historical reasons.

Where to from here? I.e., might the assumption of symmetry profitably be removed from some other electrical model? For example, what about models for rotating machinery? Recall Vladimir Brandwajn became Dr. Brandwajn for his demonstration that a balanced, 3-phase synchronous machine could practicably (the Type-59 model) be approximated by a Norton equivalent that included a constant, symmetric resistance matrix. Prof. Hian Lauw later modified his Universal Machine (U.M.) to avoid compensation by some related technique that involved prediction. Finally, last year there was the addition of TEPCO's Type-58, phase-domain S.M. model. While Dr. Hiroshi Okamoto of TEPCO already has explained in E-mail dated September 18th that the Type-58 model is inherently symmetric, the situation of the preceding two is less obvious. Might either of them, which has not yet been touched, profit from the new ability to represent matrices that are not necessarily symmetric? What machinery expert knows the answer?

Counterpoises or Grounding Electrodes

The complexity of modeling counterpoises and / or grounding electrodes was made by several public E-mail messages toward the beginning of September. The discussion began on September 11th with an inquiry from Carlos Mata, a graduate student at the University of Florida in Gainesville. *"… I have found very odd results. … The system is very simple, it is a counterpoise buried at 0.4 meters from the surface and a cable buried at 0.6 meters. … The results for different parameters are quite amazing. … How is this possible??? Now the only thing I can conclude from here is that the program calculates the capacitance assuming perfect ground outside the insulator layer, It doesn't matter what the ground resistivity is. So even when the soil is a very poor conductor this parameter is the same as if it was a perfect conductor. What is going on? Does the cable constants program work with bare conductors?"*

Robert Meredith of the New York City area was the first to question modeling assumptions. He was not surprised by the reported troubles. Later that same day, he wrote: *"You are attempting to deal with a counterpoise, presumably in continuous contact with the earth. This is an invalid condition for all calculation routines that use Carson's equations or a variation on them to determine an earth return impedance. To me it intuitively has to do with the lack of a calculable propagation velocity in the absence of a capacitance to the (ground) return path. … High frequency effects will be most affected. If you are looking at lightning or switching transients, you need realistic capacitances. … the result is unreasonable in any practical situation, since the insulating layer is an artifice introduced in a failed attempt to bypass the limitations of Carson's equations. You will eventually want to ground the ends and possibly intermediate points in an attempt to return to something closer to reality. Forget it, if you are dealing*

with high frequencies. Between the grounded points the propagation velocity and the high frequency impedance of the counterpoise-earth return path will be heavily influenced by the capacitance value you have artificially determined. i.e. high frequency effects will likely be wrong. There is no escape from the fact that capacitance within the surrounding earth must be realistically calculated to determine the high frequency impact of a counterpoise. CABLE CONSTANTS is not designed for that task. You might try finite elements. I hesitate to even think what effect dielectric breakdown of the 'earth-as-insulator' model might add to a transients calculation involving a counterpoise. We certainly know that lightning can hit buried cables, clearly representing dielectric breakdown of the earth."

Meredith also warned about ignoring end effects, *"which severely affect low frequency modeling accuracy. The calculations all assume that the impedance from the point of earth contact to the depths at which low frequency currents flow are negligible. For example, a cable a 100 feet long could well be 'calculated' to have earth return currents flowing several miles below the cable. …. the fact that calculated earth return resistance does not depend upon earth resistivity. In high resistivity earth the currents are just assumed to flow more deeply through semi-infinite cross sectional areas, if necessary, to hold the earth resistance constant for any given frequency. …. In short you will have different calculation errors at both high and low frequencies due to the counterpoise. There is no realistic method of determining the high frequency effects in EMTP. Low frequency effects might be approximated by ignoring either the earth or the counterpoise … Just a few thoughts on your very non-trivial, non-simple configuration."*

Gabor Furst of the suburban Vancouver, B.C., Canada, area, contributed an experienced engineering perspective of the complexity. Two days later, he wrote: *"The problem with a counterpoise is that its characteristic impedance is not constant but varies with time from the initial value of the traditional surge impedance sqrt(l/c) to the final dc grounding resistance reached in about six times the travel time of the counterpoise. An overall insight into the performance of a counterpoise can be gleaned from Bewley's still invaluable 1933 text 'Traveling Waves on Transmission Systems' chapters 8 and 10. An in-depth analysis of the counterpoise using field theory can be found in the text 'Earth Conduction Effects in Transmission Systems' by E. D. Sunde (1949) . This text with its advanced mathematics is not for the faint hearted, but useful graphs and formulae for counterpoise characteristics are given for practical engineering applications."*

Prof. Miguel Martinez Lozano of Universidad Simon Bolivar in Caracas, Venezuela, seemed to offer some hope later that same day (September 13th): He wrote: *"I simulated the transients behavior of grounding electrodes in the ATP, using equivalent circuits (pi), calculating the effect of resistivity, soil ionization and other phenomenon. The paper recommended for it: - 'Analytical Modelling of grounding electrodes (Transient Behavior)' by. R. Velazquez and D. Mukhedkar, IEEE Transactions PAS-103 No. 6. June 1984."*

Prof. Akihiro Ametani of Doshisha University in Kyoto, Japan, first contributed to discussion of the Fargo list server by reacting to the preceding. BPA's Dr. Tsu-huei Liu keyed text from Prof. Ametani's FAX dated September 29th, and this was submitted from Agora. Look in the following issue for a summary.

Hoidalen Improves ATPDRAW

MS Windows versions of ATPDRAW were explained in some detail in the preceding issue. Well, August 13th, they became available by snail (actually, air) mail from Portland. Three new flavors of ATPDRAW were added immediately after the old DOS one, to the order form used by Dr. Kai-Hwa Ger. This is at the end (pages 7 and 8) of the form letter LICENSE.ZIP, and a copy was sent to Prof. Bruce Mork in order that he update his storage.

ATPDRAW author Hans Kr. Høidalen of EFI in Trondheim, Norway, announced the first corrections and changes to the new MS Windows versions in E-mail of the Fargo list server dated August 18th: *"The first update of ATPDraw, called patch1, is now available at ftp.ee.mtu.edu in directory pub/atp/gui/atpdraw/ad_win16 or ad_win32 …. The files to download to obtain the updated version are called patch116.zip and patch132.zip for the 16-bit and 32-bit versions respectively. …. Patch1 corrects the following bugs: graphic on clipboard error related to ground symbol, error in $Vintage when using nonlinear branch components in high-precision mode. The author of ATPDraw has also noticed all other requests and comments mainly dividable in two groups: 1) more flexible miscellaneous card usage (frequency scan etc.) and 2) better handling of electrical machines. The author's policy right now is to just correct bugs and delay further development until his PhD is completed around X-mas. A User Manual is planed, however."*

Large data cases are being assembled using ATPDRAW, it would seem. Present limits, and plans for their expansion, were summarized by author Hoidalen in public E-mail dated September 11th: *"Has someone really hit the limit? Yes, 400 connections seems to be the upper limit. I will consider the limit settings and probably increase them in the next release. Most of the memory is dynamically allocated so increasing the limits should have few drawbacks. An other important limit is the maximum 400 user specified node names. Finally I believe that 1000 components are allowed in a circuit."*

$INCLUSE rather than $INCLUDE in the output of ATPDRAW for MS Windows was a problem for a while.

But the growing contingent of ATPDRAW users seems to be a resourceful bunch. On September 13th, Shun-ichi Hirose of the Fuchu-Works of Toshiba in Japan offered an AWK script to compensate for the spelling error. In a subsequent message, he referred to himself as an *"enthusiastic ATPDRAW fan."*

The complexity of graphic exportation was explained by author Hoidalen in public E-mail dated September 22nd. He wrote: *"I have just tested the two options: MetaFile on the Windows Clipboard (mf) and Encapsulated PostScript file on disk (eps). I have tried to import those two formats into WordPerfect 6.1 and Word 7.0 running under the Windows NT operative system. The connected printer was of type HP LaserJet. Neither WP nor Word managed to print out the eps format, but a program like GhostView manages to display the file. The problem related to the eps format must be due to 1) the printer is not a PostScript printer or 2) WP and Word do not treat the eps format properly (probably by requiring a special format of the file's header). The problem with the mf format is that the icons are printed out in a very dotted, almost invisible, way. I discovered no problem with the Clipboard import and everything looked fine on the screen (and even by using the Preview option in WP or Word). The problem arose when printing the file. In fact the 'pixels' of the component's icon (41x41) are printed out as single dots on paper and these dots become very small (and almost invisible) on an e.g. 600 dot/inch printer. Decreasing the printer resolution to e.g. 150 dot/inch improved the result, but is of course not an acceptable final solution. I have just switched to the Windows NT platform so it is really the first time I have had a chance of actually printing out the MetaFile imported objects in WP or Word. Until now I have relied on the Preview facility, but this is apparently not enough. I did not discover any problems under the Windows 3.1 platform, however. The Bitmap format supported in the Windows 3.1 version of ATPDraw (Copy as Bitmap) still seems to work ok. I also had no problem with printing out the eps imported files under Windows 3.1 (even if just the enclosing box was displayed on the screen with the information 'PostScript Printers only' in it). This could be due to a different printer support under NT (system settings at my computer). I see some long term solutions: 1) Drop the MetaFile format and go for BitMap formats only. 2) Try to implement the header information in PostScript files required by WP or Word. Those of you that need Clipboard exchange between ATPDraw and WP/Word better stick to the Windows 3.1 version of ATPDraw (16-bit)."*

Publishing Programs and Viewers

Envoy is the name of a free document viewer that can be obtained from Novell, and which is bundled with Corel WP 7. As long as interest is restricted to Intel-based PCs that run MS Windows of flavor 3.1 or newer, Envoy provides an excellent way to view documents that are created by WP7. But why WP7? For one thing, it is inexpensive, and is more nearly compatible with older WP 5.1 disk files that already are being used for a lot of storage (e.g., BPA's EMTP Theory Book). MS Word as used at BPA fails the Theory Book compatibility test. Perhaps most important of all, EEUG (Prof. Mustafa Kizilcay), BPA, and the Can/Am user group all already are using Corel WP7, so it seems the easiest for those presently doing substantial ATP-related documentation.

WP 5.1 files of the Theory Book can be converted to WP7 as explained in the preceding issue by BPA's Dr. Tsu-huei Liu. In one sense, the work will never be done because optimal positioning of equations and figures, and improvement of some tables, are complicated issues that have been largely ignored thus far. But in the sense that files are as readable using WP7 was they were using WP 5.1, work was completed by Dr. Liu on August 13th. It is an important milestone that prompted serious thought about the next step. Unlike the WP 5.1 files of Kwang-yi and Kwang-chien Ger (see the July, 1995, newsletter), the new WP7 disk files are not being made available to any licensed ATP user. Instead, any licensed user is to be allowed access to Envoy-format versions of the files.

Inability to modify Envoy files is an attribute that has not yet been mentioned, and is worthy of explanation. To document this important detail, the following answer was found on page 339 of Corel WP 7 *"Quick Results"* book: *"Once you publish a document in Envoy, you cannot edit the resulting Envoy file."* This responded to the question: *"How do I change a misspelled word in the Envoy document?"* In effect, the answer is: you do not!….Next, consider the reason this is an attribute for many or most document creators, rather than a limitation. The preceding issue explained that ATP materials must not be modified without approval of all the owners. This was in the ongoing story about FREEP. Well, WP Envoy files emphasize the prohibition on modification without approval by making the process much more difficult. The old WP 5.1 files allowed open access to anyone having a copy of the disk file. Envoy files end this. In theory, Envoy files are *read-only* for those not having the original WP7 text. Of course, protection is not perfect since the recipient always could key what he sees in his Envoy viewer; or he could use OCR (optical character recognition) on a scanned paper copy. But such theft would be much more laborious and error-prone.

The term hyperlink is well known to WWW (World Wide Web) users. The same capability exists for Envoy documents. This was demonstrated for your Editor by BPA's Dr. Tsu-huei Liu on August 13th. Months earlier, the capability was demonstrated with a WP7 document. The important change on August 13th was the switch to Envoy. That is, a link was provided in one WP7 file to a second WP7 file, and then these two files were converted to Envoy format. Finally, the resulting two Envoy files were viewed using Envoy viewers on 3 different PCs running the 3 different MS Windows of interest (3.1, 95, and NT). The

links work fine. Just as using a Web browser, the links appear in color and the cursor changes into a hand as it passes over the link. This is perfect --- just what we need to enhance the numerous references to other locations (e.g., *see Appendix II*). Using hyperlinks, the user is just a click of his mouse away from the remote resource.

Chapter I of the Theory Book was the first portion that was converted to Envoy. Although the result looked perfect using Envoy viewers on Win95 and WinNT computers, Dr. Liu discovered some trouble with equations as viewed using version 3.1 of Windows. What should have been a plus sign was a percent sign, and what should have been an equal sign was a plus sign. In short, some characters were not mapped properly. This was show to your Editor August 15th. Is it a serious flaw? How can the trouble be avoided? Of course, time will solve this problem (eventually, Bill G will convince 3.1 users to upgrade to newer MS products).

Fargo News Not To Be Republished !

Warning! Those who subscribe to Prof. Bruce Mork's Fargo list server **atp-emtp@listserv.nodak.edu** have no general right of republication or disclosure. Material received from the Fargo list server is **not** in the public domain, and generally must not be disclosed to persons who are not ATP-licensed. This paragraph and headline is copied from the April issue. The story was supposed to be continued in the July issue, but by the time its absence was realized, there was not space. So, it is continued now.

emtp@ee.ubc.ca & **customer.support@emtp96.com** are E-mail addresses used by persons who are involved in EMTP commerce --- persons who can **not** be ATP-licensed free of charge. In fact, no one maintaining these addresses is known to be ATP-licensed. Yet, a subscriber of the Fargo list server contributed a copy of your Editor's writing to these two addresses on date Wed, 9 Oct 1996 08:47:39 -0500. This according to reports from contacts who are kind enough to report unauthorized usage of ATP information. This was the first knowledge your Editor had of a problem with unauthorized republication of mailings from the Fargo list server. That UBC address is understood to be a list server (if so, the unauthorized disclosure was not at all discreet, either).

An honest mistake apparently was responsible for the unauthorized disclosure on October 9th. For this reason, the subscriber who made the mistake will not be identified publicly. Following a firm objection and demand for retraction by your Editor, the person complied, so the matter was not pursued further. About motive, the unidentified person had explained: *"I was trying to help you get that information"* (about DCG/EPRI extensions involving TACS). Your Editor responded: *"That would be acceptable, and even praiseworthy, if your initiative were so limited. It was not. Rather than inquiring of commercial developers about what they were doing, your message revealed to commercial developers our own plans for future ATP development. That is strictly forbidden."*

No great secrets are believed to have been revealed in this case, so the actual dispute was more about principle than anything else. Your Editor was outraged to learn that his writing had been used without approval to fill an apparent void of information associated with ongoing EMTP commerce in Vancouver, B.C. The first person to report reception of the October 16th message from the UBC list server had written: *"I get about one message every few months from emtp@ee.ubc.ca."* Compare this with the 72 messages from Prof. Bruce Mork's Fargo list server that were received by Agora during that same month of October.

The EMTDC people in Winnipeg, Manitoba, Canada, became involved in such unauthorized disclosure of ATP information later. More precisely, the news of the problem was received later, even though the actual disclosure began earlier. This was a separate, unrelated incident that first was learned about on May 9th when copies of communications from the Fargo list server were *"found at the mail archive of the EMTDC mailing list at EMTDC WWW site."* Unlike the problem with UBC, this violation involved others, and seems to have involved ongoing storage rather than a single mailing on some date. But because your Editor had handled the UBC problem, he showed others how the UBC problem had been handled, and he promised to handle the EMTDC problem similarly. That is what happened. Again, an honest mistake seems to have been made, so the party involved will not be identified publicly. The person offered to *"ask to remove it hoping that this can help to close the problem. At the same time I can write to the EMTDC developers in Winnipeg explaining that my message was a mistake …."* Your Editor accepted this offer as follows: *"This is precisely what the user group wants. Until you do this, commercial developers can plead ignorance. If you do not write to EMTDC developers about the subject, the Can/Am user group probably would. But it is simpler if you do it. This is what happened last fall with the UBC … list server. The person who submitted the information simply explained that he made a mistake in submitting information from Fargo, and he requested that his contribution be retracted. So, Prof. Dommel and associates should have been warned last fall not to handle ATP information. This spring, it is the turn of EMTDC developers in Winnipeg."*

Machinery Saturation Questioned

Saturation modeling of the Type-59 S.M. (synchronous machine) was observed to differ substantially from such modeling of the Type-19 U.M. (universal machine). This is your Editor's summary conclusion after reading list server mail dated September 24th from Dr. Eiichi Haginomori of Toshiba Corporation in Tokyo, Japan. Attached was a data archive SMDAT.ZIP that contained illustrative data for the short circuit study of interest. About the problem, Dr.

Haginomori wrote: *"with saturation characteristics and DC components in short-circuit currents, the differences of the results between both models are great."*

About his illustrative data, Dr. Haginomori wrote: *"I introduced three attached model cases, each of which has:*
** Only one pair of symmetrical d/q rotor windings.*
** Less damping --- very long time constants.*
** Very deep saturation characteristics.*
** Machine parameters are the same for the three.*
The No. 19-59 SM model and No. 19-1 SM Model produce the same results. But the No. 59 SM produces quite different results." That is, simulations involving the two Type-19 U.M. alternatives agree with each other, but not with simulation that relies on the independent Type-59 S.M.

Consequences of the difference were interpreted by Dr. Haginomori as follows: *"Using X-Y PLOT in TPPLOT, … the (strange) phenomena are clarified. Under saturated conditions, the trapped magnetic flux in the armature increases and rotates gradually."* Transient stability seems to have been the computation of interest, and there were important differences for this. About general cases, the Type-59 model was reported to reduce maximum power transmission (the stability limit) by about 20% compared with the Type-19 model. Clearly, this is a serious discrepancy, for purposes of engineering.

Power Company Politics & Religion

BPA politicians may be forced to abandon religion, guesswork, or political favoritism as the basis of its spending for fish protection? Amazing! *"Power council does about-face on fish recovery"* is the headline of a story on the front page of *The Oregonian* dated August 28th. *"The Northwest Power Planning Council reversed tradition and got tough with states and tribes …. The council oversees salmon recovery efforts in the Columbia Basin and recommends what programs BPA should underwrite. Its professional staff made the proposals at a work session in Spokane, arguing that recovery programs should not be financed unless the projects are scientifically shown to be effective in restoring depleted salmon runs. …. The hard stance departs from past practice, in which the planning council allowed BPA to spend its annual allocation … without requiring scientific justification or results. …It also comes in the Northwest's 16th year of trying to restore salmon runs, a failed effort that has expended $3 billion while fish numbers dropped from 1.1 million in 1981 to 909,000 in 1996."*" What a radical idea (joke)! It would represent a real hardship for BPA, though, being forced either to use science or to demonstrate results. Might this be the light at the end of the tunnel? Are environmentalists finally losing control, three thousand million dollars later? It is hoped the reader now better understands why your Editor refers to this group as *wacko environmentalists*.

The wackiest physics since cold fusion lies behind the promise of BlackLight Power Inc. of Malvern (suburban Philadelphia), Pennsylvania, USA. There has been sudden interest locally because PacifiCorp, parent company of Pacific Power and Light, has invested a million dollars. *"PacifiCorp's hydrogen gamble"* is the headline of a story on page E1 of *The Oregonian* dated August 20th. Randell Mills is the company founder, and peddler of new-age physics that claims to involve hydrogen as follows: *"Using potassium to spur a chemical reaction, Mills claims he has lowered the energy state of hydrogen and created heat 100 to 1,000 times greater than that produced by burning hydrogen. … The byproduct of Mills' chemical reaction is a 'hydrino,' the lower-energy hydrogen atom. It is chemically inert and floats into space in much the same way helium …"* No doubt about it, if this really **would** work, it would be the discovery of the century, with greater economic impact than nuclear power. But who believes it? The view from the establishment was voiced by *"Robert Park, physics professor at the University of Maryland and director of public information for the American Physical Society."* He is quoted as follows: *"A lot of people have been chuckling about PacifiCorp's investment. Other utilities have made similarly foolish investments. They go on the Pennsylvania lottery theory …."* Yes, the odds of winning a lottery are nearly zero. Yet, foolish gamblers continue to be attracted by the huge first prize. It does not matter that the probability of winning is less than the probability of being struck by lightning. *Hope springs eternal*. As a PP&L customer, your Editor is appalled.

"BPA favoritism costs consumers millions" was the headline at the top of the front page of *The Oregonian* dated September 14th. It is true that Mother Teresa's funeral was given more space (if one counts the color picture), but not by much! In the wake of Randy Hardy's resignation, Portland's dominant newspaper seems to be pursuing BPA conspicuously. A sidebar summary (one of several special offerings of modern newspapers, designed to assist the semiliterate) had heading *"The price of power,"* and it explained: *"* Today: To save itself from financial collapse in 1995, Bonneville shifted $447 million in costs onto 2 million Northwest electricity consumers. * Monday: Is Bonneville worth saving? The Northwest must decide whether it's willing to pay the price."* So, who saved the money? The summary under the headline explains as follows: *"A review by The Oregonian shows the agency gives rate breaks to aluminum companies at consumers' expense."* To conclude, even a politically-correct newspaper must eventually question politics that have led to disaster. I.e., failure is a political orphan once the light of reality conspicuously illuminates mistakes. But would the newspaper have run the story if Randy Hardy had not earlier announced his resignation (see preceding issue)? Did Mr. Hardy perhaps have advance knowledge of the story, when he decided to resign? About that famous excuse, a possible error must be reported. Your Editor wrote that the BPA job was separated from family in Seattle by *some 150 miles*. Not by **car**, according to BPA's Dr. Liu. Having made the trip many times, she reported that *"everybody knows it is*

180 miles to Seattle." What a sacrifice that man had been making for years, commuting 180 miles each way (joke)!

Miscellaneous Intel PC Information

Intel and DEC are suing each other over patent-related claims. Since DEC began the legal struggle, it must be assumed that DEC believes some of the originality of its Alpha microprocessor has been unfairly exploited by Intel. Now comes news of the countersuit, in a New York Times News Service story on page C2 of the August 13th issue of *The Oregonian*. *"The countercharges are a response to a lawsuit Digital filed in May accusing Intel of violating 10 of its patents …. Digital's suit stunned both the computer industry and Intel, which had received no warning …"* Rather than negotiate or merely defend itself, Intel has raised the stakes: *"Tuesday's counterclaim appears to go even further than Digital's original suit. It contents that Digital not only violated Intel patents in the design of its microprocessors, but also in the design of its entire line of personal computers, work stations, and servers."*

Apple Computer is to be rescued (or bought off?) by Microsoft. This surprising announcement was made August 5th, and it became the headline story of *The Oregonian* the following day. As for cost, *"Microsoft will invest $150 million in Apple stock --- worth about 7 percent of the struggling computer maker."* But why? Some point out that MS already is the largest software supplier for Macs, so MS might be protecting this market. Others view the move more suspiciously because Apple is expected to drop its remaining legal claims against MS in exchange for patent-related payments *"that could add up to hundreds of millions of dollars."* Bill G just might view the deal as a very cheap insurance policy, or as a hedge bet. As for possible antitrust objections by the government, these seem unlikely because MS is being given no voting rights, and because Apple will remain an independent company. More likely to inspire legal concerns is the Internet part of the deal: *"Recent deals prompt Justice to expand Microsoft inquiry"* is the headline of a small story on page E1 of *The Oregonian* dated August 20th. About Apple: *"the deal also calls for Apple to make Microsoft's Internet Explorer browser the easiest way for Mac users to cruise the Internet, dealing the latest blow to rival browser-maker Netscape Communications Corp. … With the Apple pact, Microsoft has agreements with nearly every big PC-maker."* Meanwhile, Apple's board of directors is having trouble finding a replacement for ousted former CEO Amelio, it would seem. *"Apple names Steve Jobs interim CEO"* according to a story on page A3 of The Wall Street Journal dated September 17th *"One person close to Apple said the company's directors recently reiterated their desire to have Mr. Jobs take over as full-time CEO, but that Mr. Jobs has remained adamant that he stay on only in a transitional role."* Length of the transition is increasingly an embarrassment, and itself an obstacle to recovery.

"Java is finding Niches but isn't yet living up to its early promises" according to the title of a story on the front page of *The Wall Street Journal* dated August 27th. A creation of Sun Microsystems, Java was to *"allow any kind of computer running any kind of operating system … to run any kind of program. The idea: To free the world of the monopolistic grip of Microsoft Corp. and Intel Corp."* Alas, the task is not easy. *"More than two years after its introduction, the technology is used on less than 1% of all World Wide Web pages, although it was originally touted as an ideal Web language."*

Miscellaneous Small Items

Type-51,52,… branches have represented mutually-coupled coils since year one. Yet, the connection to ground of both ends of one such coupled coil has not been possible since your Editor began work in 1972. For the last 20 years, the result would be KILL = 17 in overlay 10, which refers to a possible logic breakdown in the middle of John Walker's code that forms the complex nodal [Y] for the phasor solution. August 25th, special code circumvented the problem. But rather than adopt this, the decision was made to overhaul completely branch card input of the program. This should be explained in a separate story in the following issue.

Dr. Shi-Yi Liu, youngest sister of Tsu-huei, continues to contribute insight about Microsoft. Remember MS cars in the April, 1996, issue)? Well, now we have MS soup --- from an unknown author once again. The following arrived by E-mail on February 18th. The title is: *"If restaurants functioned like (Microsoft) software."*

Patron : Waiter!
Waiter : Hi, my name is Bill, and I'll be your Support Waiter. What seems to be the problem?
Patron : There's a fly in my soup!
Waiter : Try again, maybe the fly won't be there this time.
Patron : No, it's still there.
Waiter : Maybe it's the way you're using the soup; try eating it with a fork instead.
Patron : Even when I use the fork, the fly is still there.
Waiter : Maybe the soup is incompatible with the bowl; what kind of bowl are you using?
Patron : A **soup** bowl!
Waiter : Hmmm, that should work. Maybe it's a configuration problem; how was the bowl set up?
Patron : You brought it to me on a saucer; what has that to do with the fly in my soup?!
Waiter : Can you remember everything you did before you noticed the fly in your soup?
Patron : I sat down and ordered the Soup of the Day!
Waiter : Have you considered upgrading to the latest Soup of the Day?
Patron : You have more than one Soup of the Day each day?? Etc. (on and on; you get the idea).