Can / Am EMTP News

Voice of the Canadian / American EMTP User Group

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Table of Contents

Salford Compiler and DOS Extender 1
Improvements to Salford TPPLOT 2
News from Outside USA and Canada 2
More about Electronic Mail (E-mail) 3
European EMTP User Group 6
News about Laurent Dubé's MODELS 6
Szymanski Uses Windows 95 for ATP 7
IBM OS / 2 Warp Used by NYPA 9
Type - 26 TACS Source 10
BPA Reinvention : Some Rotten Fruit 11
Trapezoidal Rule Oscillations 12
Hewlett - Packard (HP) Unix ATP 12
Juan Martinez U. M. Data Cases 13
Florida Short Course March 11 - 14 13
European Short Course July 1 - 5 14
MATH Command of Salford TPPLOT 14
Type - 59 S . M . Damping Error ? 14
Macintosh ATP by Stu Cook 15
Linux ATP by Walter Powell 16
WordPerfect 5.1 vs . MS Word 17
Orbach Pricing : $20K → $600 ? 17
Miscellaneous Intel PC Information 18
Miscellaneous Small Items 18

Salford Compiler and DOS Extender

Negative IPRSUP in STARTUP was given meaning following a telephone conversation on November 21st with Prof. G. Corwin Alexander of Oregon State University in Corvallis (USA). Earlier E-mail had suggested the desirability of controlling diagnostic printout that is written to DEBUG.LIS even when the user requests no diagnostic. For example, DC-3 execution produced 114 lines. The idea was to make it possible for the user reduce this from a 3-digit number to a single-digit number. IPRSUP = -1 in STARTUP will do this. For DC-3, that single-digit number is unity, corresponding to a line that is written as DEBUG.LIS is connected. This line has been expanded to explain the IPRSUP control.

NEWPL4 is the binary switch of STARTUP that, if set to unity, will result in the removal of unused names in the header of a .PL4 file. Prior to a correction made on February 4th, use of NEWPL4 = 1 resulted in erroneous pointers to U.M. variables. This was seen in the CHOICE display of TPPLOT. For that UMIST data file from Prof. Juan Martinez (see separate story), all U.M. variables had wrong (mostly blank) names. The error was obvious to anyone. Only the pointers were in error, however; the signals themselves were correct.

Lines 3 and 4 of GRAPHICS have been changed by the addition of fonts for the new NYPA PostScript (see story last time). Unsure how best to connect such data, Robert Meredith left this detail to his helpers in Portland. So, following experimentation that included real basics such as learning how big a point is (1/72nd of an inch), BPA's Dr. Tsu-huei Liu completed the job by adding three more fonts to the two that Mr. Meredith provided in GRAPHICS. The 3 new variables begin card 3:

```
C FNTHED  FNTSUP  FNTTIT  WHTBAK  ....
     0.4     .17     .17     0.3
```

Meanings are explained in H01E.WP5 (WP 5.1 storage

of the Rule Book section). Note that FNTHED replaces NPGRID, which has been moved to the end of line 4 in order to separate floating-point and integer variables. The change was made to BEGPLT on January 12th.

ATPDIR is a new DOS symbol that allows the remote storage of disk files STARTUP, GRAPHICS, GRAPHICS.AUX , STARTSPY , GLITZ.LIS , HEADPOST.LIS , and STARTSPY --- small files that can be found on the GIVE1 disk. Prior to February 23rd, these files had to be local. Now, they can be located anywhere. Implementation in Salford EMTP followed earlier use by NYPA for Watcom ATP. Your Editor suddenly saw the idea while reading E-mail from Prof. Mustafa Kizilcay of FH Osnabrueck in Germany. Dated February 13th, one item was as follows: *"In his article on OS/2 and Windows NT support of ATP, Bob Meredith wrote: 'Set an environmental variable for atpdir to point to the directory where you unzipped the package, to avoid having to edit command scripts, i.e. SET ATPDIR=D:\ATPOS2 ATP can then be run from any directory, using the emtp.cmd command or its corresponding .bat file in the other environments.' Is this feature (DOS variable ATPDIR) only available with the OS/2 and Windows NT versions of ATP? If this would be available with Salford ATP, then no APPEND usage is needed to access ATP and TPPLOT from any directory."* Well, better late than never (i.e., why do those NYPA guys always seem to be first with the great ideas?!). The mechanism used by NYPA for those more sophisticated operating systems is not known. But for Salford and MS-DOS, a new CHARACTER*80 variable PATH is loaded just once with the content of symbol ATPDIR. This is done in installation-dependent code at the start of execution using the Salford DBOS library function DOSPARAM@ Total path length, including the file name, is limited to 80 bytes. Of course, if the user never SETs ATPDIR, this extension will be ignored.

The Salford compiler for MS Win95 or WinNT was tested as mentioned in the separate story about EEUG (the European EMTP User Group).

Quality time-sharing of Salford EMTP simulation under Windows 95 could not be demonstrated during mid-April, when several public E-mail messages of the Fargo list server were concerned with the problem. Details next time?

Improvements to Salford TPPLOT

MATH is a command for mathematical processing of the user-selected signals as they are loaded from the .PL4 file. A separate story provides details.

The HELP text of disk file TPPLOT.HLP has been expanded to include secondary or hidden commands (those that are not in the yellow pull-down menu). This change was made January 1st, following the addition of MATH --- not to the primary menu, but to the green .PL4 submenu. But MATH is among the more complex commands, and it requires considerable explanation. So, the HELP concept was generalized. Clicking button 2 of the mouse on any entry of any secondary menu now works in intuitive fashion provided the associated advice has been added to the .HLP disk file.

Links from one HELP entry to another, related one are now being used. For example, the final line of the explanation for WAIT appears as follows:

```
Click on  [ PAUSE ]  to transfer there.
```

Yes, this is a mouse target (use button 1) within square brackets. After the user clicks on it, the file will be repositioned, including that mahogany highlighting. The delay is not noticeable on your Editor's 486/33 in spite of the fact that searching of all text is required.

ATPDIR is a new DOS symbol used with ATP. Well, it applies to TPPLOT, too, for the various small, fixed files such as TPPLOT.BEG, TPPARAM.DAT, etc. This began March 29th.

MOLASS of integer index 274 (for use with TPPARAM.DAT) is the added, extra, artificial time delay in msec that precedes each line of output to the dialogue window. This is a response to Pentium, which makes changes of the dialogue window too fast to be comprehended by the human eye. This is fine as long as execution is normal. But if usage crashes, how can the user learn what flashed across the screen? The default value of MOLASS is zero, of course. To slow output to 1 or 2 lines a second, value 200 works well. This enhancement began April 14th.

HPDOWN of floating index 93 (for use with TPPARAM.DAT) is an added vertical offset for the HP-GL that is produced during plotting of the WINDOW command. The default value is 0.5 (inches), and the name reflects the fact that a positive value offsets the plot downward by about this amount on the page. Usage became effective April 17th after Dr. Liu discovered that a nearby networked printer (a QMS 1725) honored HP-GL, but was chopping the top for some reason. So, an offset was added to compensate.

News from Outside USA and Canada

A printed copy of the January newsletter was mailed by BPA to each of its 9 primary EMTP contacts as usual. For the first time, however, the double-sided printing of the user group was involved --- another sign of the decreased importance of paper. The placement of

JAN96.ZIP on his Houghton FTP server was announced by Prof. Bruce Mork of Michigan Tech in public E-mail dated January 10th.

Europeans can receive Salford EMTP and TPPLOT materials via secure (password-protected) FTP transfers. This free service is provided by Prof. Laszlo Prikler of the Technical University of Budapest, Hungary, who was updated on February 20th by E-mail (using **Attach** within MS Mail). About this latest transfer, Prof. Prikler acknowledged reception as follows: *"Both GIVE1.ZIP and GIVE2.ZIP arrived in good shape. I did not even need to UUENCODE the attachments because my Pegazus Mail for Windows 2.23 has learned everything from the message header sent by your MS-Mail. I just click on the Attachment button followed by clicking on the Save to file button."* As for subsequent FTP transfers to others, Prof. Prikler explained: *"I use shareware FTP software Ws_FTP32 that is running under MS-Windows 3.1 with the Win32S socket extensions (or under WfW 3.11 or Win95). The usage is as simple as the usage of File manager of Windows or of Norton Commander under DOS. You have two windows: one showing your local directory, and the other showing the directory of the FTP server to which you are connected. Everything is automated. Login to the host, movement in the directory tree, put or get (one ore more files at once), and logout are all controlled by mouse clicking."*

Supelec of Gif-sur-Yvette, France, taught a French-language short course December 5-7, 1995, if one can believe public E-mail of the Fargo list server dated November 14th. Later that same day, your Editor responded with a public warning about the need for licensing, if general ATP information is to be disclosed. However, more noteworthy than these details was the use of French language by the Supelec author, Patrick Bastard. Since your Editor reads this easily enough, he, himself, had no problem. But the average subscriber certainly does not read French. There is some concern that a trend might have begun. After all, why stop with French? If an ATP user in Greece knows of a Greek-language course that might be of interest to his fellow countrymen, why not advertise this in Greek? There certainly are plenty of ATP users in Japan who could write messages that would be incomprehensible to nearly everyone outside of Japan. Etc. Maybe Prof. Bruce Mork should think about making English the official language of his Fargo list server? Private E-mail to Supelec encouraged an English-language translation, but none ever was received in Portland. In fact, no response at all was received from Supelec.

"Mass Chinese PC market stymied by massive keyboard" is the title of an article on page B1 of the February 21st issue of the *Wall Street Journal*. What is the latest hope for input? *"It turns out that Chinese is far better suited to voice and handwriting recognition than English. Developers of the new system say the tone-based language is easier for a computer to 'learn' because there are relatively few sounds to choose from. And while there are a multitude of Chinese characters, they have precise stroke placements. People learn to write them much the same way, for example, compared with the highly individualized scrawls of Americans. Apple's voice-recognition system requires a user to dictate 33 pages of documents into a microphone attached to an Apple computer. .... Apple plans to bundle the speech recognition kit with the Macintosh computers it sells in China and Taiwan, hoping the system will increase its current 2% market share in China."*

Magnetic bank routing information must be printed across the bottom of any check that is used to compensate Dr. Ger for ATP services. The context for this requirement is explained in LICENSE.ZIP where the existing "drawn on an American bank" *seems to be inadequate. It was during March that a check from Macedonia of the former Yugoslavia (as opposed to Greece) was found to be drawn on a prominent American bank (Citibank of New York City) but to be missing the magnetically-readable digits (also visible to the eye as strangely-formed printing) that allow it to be processed by computer. Such checks certainly can be cashed, but they involve special fees. In theory, a check from the USA or Canada, too, could have this problem, but none has ever been encountered among the thousands that have been processed. So, the announcement is being categorized as an international story. But the requirement applies to everyone everywhere beginning April 4th, and it also applies to money orders. As for an alternative, any major international money order should have the required information. The rule is simple: if an American financial institution will not cash the check or money order free of charge, the order will be refused and the check or money order will be returned to the sender.*

More about Electronic Mail (E-mail)

BPA supplied the worst E-mail story of the holiday season. This immediately followed the heroic service of Alan Batie, who kept Agora running from his own power supply during the blackout (see preceding issue). BPA never had a power outage, yet E-mail to the outside was disrupted far more. Worst of all, the sender (your Editor) had no way of knowing that his mail to the outside was not being sent. It would disappear normally from Dr. Liu's PC, and a record of it would appear in **Sent mail** of MS Mail. Unfortunately, all mail was secretly being held hostage by a remote BPA computer, it seems! Only days later did this become clear, when

some 8 copies that had been sent to Agora all arrived at the same time. This was during the period when corrected TPBIG was being sent to both Gifu University and the University of Minnesota for testing of the new GIFU switch logic (see separate story). Recipients waited and waited (the better part of a week). Eventually, it was concluded that some other means of delivery would be required, so Agora's FTP was used following a 55-minute upload at 9600 baud using Kermit. Documentation is provided by your Editor's final complaint to one Brian Roth of BPA's computer establishment. Of the two separate attempts to send TPBIG to Minneapolis during two weeks, the first was rejected ("Returned by Administrator"). The second did eventually arrive as your Editor explained to Mr. Roth in E-mail dated January 3rd: *"On December 28th, Naik wrote: 'I received both the FTPed file in the salmon system, and a uuencoded mail yesterday.' So how long did it take? Tsu-huei's 'Sent mail' index shows the 2nd try was sent on December 22nd at 14:59. The complaint to you was about 'Returned by Administrator.' We had never seen this before. What does it mean? One objection I have to MS Mail is that Bill G. hides much of the useful header information that normally would be seen using a common Unix mail system. If there was trouble on the Minnesota campus, this would be seen in the header of the returned message. But I can not see this with MS Mail. .... Somewhere, somehow, the BPA post office seems to be holding mail for days before sending it. We have ample evidence from the outside if you want to see it."* But there has been no further response or contact from anyone in BPA's computer establishment. Maybe the new BPA does not much care? After all, this communication with the outside world did not involve a BPA *Account Executive* (the politically-correct, non-sexist, 90s-speak for salesman or peddler) !

Information about ATP short courses can be obtained more easily by Web browsers following a change by Prof. Bruce Mork. In private E-mail dated January 8th, he wrote: *"I've put the short announcement of Dennis Carrol's short course on the ATP WWW site. It is at:* ***http://www.ee.mtu.edu/atp*** *Click on 'Training --- Upcoming Courses & Seminars' and you will see it posted. It only took me about 5 minutes to set up. Interested persons can click on Dennis' e-mail address and directly send him e-mail inquiries. As I said earlier, I can also put links to the ftp or WWW sites in Florida or Minnesota, if there is additional information to be had there. .... If you want to add more information or links, I can do that as well."*

Dr. Yin Yuexin, the experienced U.M. user, once again can be reached by E-mail. January 29th, the first E-mail since he left Gainesville was received. This came from his new personal address (used from home outside Atlanta, Georgia) **yuexinyin1.aol.com**

"Internet's popularity threatens to swamp the on-line services" is a headline on the front page of the January 18th issue of the *Wall Street Journal*. *"Subscriber defection is just one of myriad challenges besetting the commercial services. Media companies that had used them to set up a newsstand in cyberspace are now bypassing them to go directly to the Internet. That has forced the on-line services into a bidding war for 'content,' even as they cut monthly prices to keep growing. Rates may fall even more as cable systems and telephone companies enter the Internet access business."* Apart from the problems of CompuServe, Prodigy, and a few others, the article carries useful statistics about growth: *"Last year, the number of commercial addresses on the Internet rose almost six-fold to 170,000 .... The number of business sites on the Web soared in 1995 to almost 20,000 from fewer than 1,700 a year earlier ..."*

"*Apple plans to shut down on-line service*" is the headline of a brief AP story on page B13 of *The Oregonian* dated March 6th. *"eWorld ….. was started two years ago .... but it won only 147,000 subscribers. .... Service will end March 31 …..... The decision is the latest indication of upheaval in the on-line industry ….. Late last month, Sears Roebuck & Co. said it would sell its 50 percent stake in Prodigy. AT&T, meanwhile, is in the process of abandoning its commercial on-line service for one that provides access to the Internet."*

MIME might be the encoding of the future according to Robert Meredith of NYPA (see the April, 1994, issue). Well, a story on pages 610-621 of the January issue of *Computer Shopper* seems to reinforce this prediction. The introduction explains that *"MIME extensions provide updates and workarounds for many current e-mail limit-ations, including unlimited line and message lengths ...; multiple data objects ...; and international character sets and text formatting, which provides support for various fonts and typefaces. On a more advanced scale, MIME supports images, full-motion video, audio, and application-specific binary data elements. It will even allow for pointers to files on remote servers ..."* What came first? *"Simple Mail Transfer Protocol (SMTP), which is still the most popular standard in use today."* But *"it has become a bottleneck in this age of smart documents and multi-media."*

A 270-Kbyte limit on message size seems to exist for Prof. Juan Martinez at UPC in Barcelona, Spain. When your Editor attempted to send a 222-Kbyte archive of IMTEST*.LIS solutions using the **Attach** button of MS Mail to UUENCODE, it was rejected as follows on January 29th: *"<martinez@ee.upc.es>... Message is too large; 270000 bytes max 554 <martinez@ee.upc.es>... Service unavailable."* Compare with that 256-Kbyte limit in Australia (see the April, 1995, newsletter).

Robert Schultz of NYPA has switched from his old Execnet address to new **rschultz@usa.nai.net** Dated February 8th, the first message from this new service explained: *"The provider is North American Internet, for which I have a PPP account. It is one of only two providers with local access telephone numbers in the northern Westchester County area, where I moved 18 months ago. The old Execnet account, which with PPP cost approx. $15/month, incurred a minimum $3/hr local telephone charge going out of my local calling area. This was unacceptable. At $25/mo with 180 hr/mo included usage, the change makes economic sense. The lack of really competitive PPP providers (i.e., $15-$20/mo, 100+ included hours) in the home district of IBM T.J. Watson labs is really astonishing."* So, 180 hours/month? This really is power usage, tailored for Web surfers (in the case of Schultz, ideal for growing children). It is another sign of changing times.

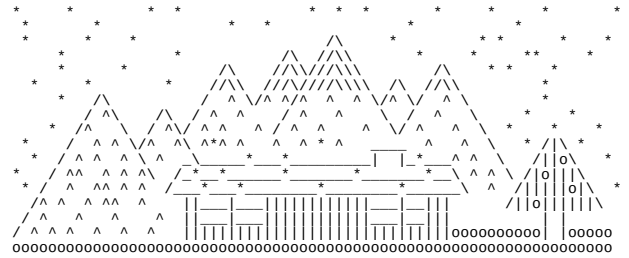
"Brokers begin to list homes on the Internet" is the headline of a story on page B1 of the January 19th issue of the *Wall Street Journal*. This is a big story because the selling of real estate involves big money. *"For the first time, home listings for whole communities are making their way onto the Internet. While just about 10% of homes are on-line now, information on more than half the approximately 1.8 million existing homes for sale in the U.S. is expected to be on-line by year end, listing services say."* As author Karen Blumenthal observes, *"the presence of listings on-line represents a big change in the real-estate industry. Realtor associations for years treated their listings and other data ... as precious trade secrets."*

Teleport is Oregon's largest E-mail provider, and during some 8 days, it worried many customers by proposing the imposition of a 1-Mbyte limit. The original proposal dated March 14th was received from BPA's Fred Elliott, who uses Teleport for his Web surfing at home. Well, on the 22nd there was a retraction of the porposed change at the end of the month. *"It seems that there are a large number of internet users out there who don't have full access to the internet. Instead, they only have email accounts to which files can be sent or received. …. we're now working on a plan to implement email size restrictions on a per user basis."* Wow, what a radical concept (limits that vary from user to user)! These guys are professionals (not too bright, the existing policy)? As for using large attachments, Teleport does not understand that this has nothing to do with lack of full access in BPA's case? Unreal. Might Teleport be growing into another CompuServe, with distributed and ever-changing stupidity?

NCSA Mosaic became available on Dr. Liu's computer at BPA around December 21st. This is the date of all directories on the hard disk that is about 540 Mbytes larger (a very important improvement). The CPU also is faster (a DX2/66 rather than a DX/33), although nobody cares about this detail. On the down side, the new computer crashes frequently when one tries to use old WP 5.1 --- another good reason to switch to MS Word for Windows (see later mention).

The BBS and user group listings of *Computer Shopper* exist no longer in printed form. As explained on page 622 of the February issue, this information has been moved to on-line sites. This is another sign of the changing times (don't bet on paper).

The user group award for the best logo of the holiday season goes to Prof. Mustafa Kizilcay of FH Osnabrueck in Germany. Clearly, we have come a long way since that crummy Christmas tree that accompanied that famous holiday message from LEC around the end of 1992. Prof. Kizilcay ended his January 4th message as follows:



Instability of CompuServe rates continues to confuse. The best recent story comes from Prof. Mustafa Kizilcay of FH Osnabrueck in Germany, who had wondered what the cost would be to receive GIVE1 and GIVE2 at home (i.e., via his CS account). From E-mail dated January 11th: *"Some minutes ago, I called Compuserve and asked about Email costs. Independent of the size, each Email costs DM 0.50 (I thought Email is free and included in the monthly fee of 5 hours free usage time). If this information is correct (I doubt, ..."* Your Editor's reaction was less equivocal: *"If this information is correct, CS has gone crazy, and will not remain in business much longer. I don't believe it. 1/2 DM is much too much for a short note, and too little for an enormous archive such as DBOS.ZIP .... I must tell you, with its repeated and illogical changing of its own rules, CS is largely responsible for its own problem. You must have reached an agent who had heard one too many revision, and had himself gone crazy (joke)! Either that or he is about to lose his job because CS is losing market share, and he decided to sabotage the company before leaving!"*

Printed matter about Salford EMTP and TPPLOT no longer is being distributed by BPA. Neither does the user group mail (by snail, which in this country has the name of U.S. Postal Service) its 8-page form letter to anyone who asks. This is an important milestone that should be understood by readers. The proliferation of E-mail has made the difference. If someone telephones, and asks

about ATP, it is requested that he send E-mail to Agora. The response then is not conventional mailing, but rather an E-mail **Reply** that contains MORK.LIS (a standard 7-Kbyte information file about the services of Prof. Bruce Mork's Houghton aFTP server and Fargo list server). 1995 saw this radical change. The address file CANAM.LIS no longer records most new contacts.

CompuServe seemed unable to pass the 34-Kbyte Rule Book file H01E.ZIP to Prof. Mustafa Kizilcay. This was on January 31st, when **Attach** of MS Mail was used twice on the same file, and twice Prof. Kizilcay received only part of the UUENCODEd message at his home outside Frankfurt, Germany. Both message truncations occurred at essentially the same place (within 1 byte of each other), so a random error during transmission seemed unlikely. As a third attempt, your Editor manually used an old copy of UUENCODE and then manually split the result into two pieces because Notepad of MS Windows 3.1 could not handle the total. This time, the two messages were received normally, and the desired file was recreated correctly according to Prof. Kizilcay's report dated February 13th. Note for skeptics: the file on Dr. Liu's computer obviously was correct since it had been sent the preceding week to Prof. Mork for placement on the Houghton aFTP server. Further, the manual UUENCODE was applied to this same file.

Meaning of *Heimbrent Hovedstad* was explained in humorous terms by ATPDRAW author Hans Hoidalen. This followed casual use of the term (*"How is life in the Heimbrent Hovedstad?"*) at the end of Prof. Bruce Mork's E-mail, which might have been sent to the list server by mistake. From public E-mail dated February 23rd, we have Mr. Hoidalen's clarification about what the average American knows as *moonshine* (named because those who distill alcohol illegally, such as comic strip character Snuffy Smith, tend to do their work in remote locations in the middle of the night): *"The golden days of the Heimbrent are probably gone. The police are very offensive, running a public campaign against our culture. They even seize sugar and yeast these days."* Yeah, well, it is part of American culture, too. The first serious threat to George Washington's authority as first American President was the Whiskey Rebellion in western Pennsylvania during 1794.

AOL (America On Line) seems to prohibit very large E-mail. This was discovered February 13th during an attempt to send Salford EMTP GIVE1.ZIP to Dr. Yin Yuexin using **Attach** of MS Mail to encode the 1074-Kbyte archive (minus PKZ204G to save space). The mail was returned with the following explanation: *"While talking to a.mx.aol.com.: >>> MAIL From: <thliu@bpa.gov> SIZE=1480985 ... Message size exceeds fixed maximum message size (1150000) .... Service unavailable."* So, AOL is not recommended for ATP use as presently restricted.

"MCI joins AT&T in offering period of free Internet access" is the headline of a story on page B12 of the March 19th issue of the *The Oregonian*. This is for existing customers. *"MCI's pricing structure is like AT&T's: 5 hours free, with charges of $2.50 an hour after that, or unlimited access for $19.95 a month. .... MCI has 2 million Internet users and claims about 20 percent of the U. S. long-distance market. Under contract with the National Science Foundation, MCI has built a large part of the nation's Internet network. On Monday, the company said the speed of that network will increase threefold by the middle of April."*

European EMTP User Group

July 1-5, 1996, is to be the date of the first user-group-sponsored ATP short course in Europe since LEC closed its doors in 1993. The announcement was made April 21st in public E-mail of the Fargo list server from EEUG Chairman Mustafa Kizilcay. The course will be given on the campus of Prof. Kizilcay's university, F.H. Osnabrueck in Osnabrueck, Germany. A separate story provides more details.

The Salford Windows NT/95 compiler was acquired by EEUG from the German distributor for purposes of evaluation. E-mail from Prof. Kizilcay dated March 22nd summarized the arrangement as follows: *"I contacted again QT Software in Munich in order to get a copy of FTN77 Win32 for Windows NT/Windows 95 for test purposes for a certain period. Some minutes ago, I learned that an evaluation copy of FTN77 was shipped on last Tuesday .... Provided Salford Win32 would meet our expectations, I offer that EEUG will pay then for the compiler. This could be a chance for a small contribution to ATP from EEUG."* Far from being a small contribution, this was an important initiative that allowed testing of the new compiler in Portland under Windows 95 beginning April 5th. Look in the following issue for a summary of the testing, which was less than fully successful.

MODELS from Laurent Dubé

"name() and name[]" was the headline of a short *MODELS Technical Note* that was broadcast from the Fargo list server on February 3rd. Author Laurent Dubé wrote: *"In an expression, a name followed by a left parenthesis is interpreted as a function name. A name followed by a left bracket is interpreted as an array name. In these instances, no space is allowed between the name and the symbol. In ATP versions produced before November 1995, the MODELS parser was not enforcing this no-space rule. More recent versions do,*

and will generate error messages reporting an attempt to read a name starting with an illegal character."

"Access to ATP program variables" was the headline of a *MODELS Technical Note* that was broadcast from the Fargo list server on February 14th. *This began: "All numerical ATP program variables and arrays accessible to SPY can now be monitored and modified directly from MODELS. It is possible to monitor these value using a new type of inputs to the MODELS section, or, in a model, using the new function atp( ). It is possible to modify these values from inside a model, by using the new statement DEPOSIT( ). This makes it possible to modify the value of any ATP program variable dynamically during the simulation, from inside any model."*

"New type-94 Norton component" was the headline of a short *MODELS Technical Note* that was broadcast by the Fargo list server on February 15th. This began as follows: *"The Norton type-94 component has been installed in ATP. This brings to three the available methods of defining a type-94 component : Thevenin, iterated, and Norton."* Now, in elementary linear circuit theory one is taught that Thevenin and Norton equivalents are comparable, and that one can be converted to the other easily enough. Well, not for ATP use. In addition to a lot of other good comparative advice, author Dubé explained the difference for ATP use : *"Because the admittance or admittance matrix supplied by the Norton type-94 component is an admittance to ground, this type is normally used with its left nodes connected to the circuit, and its right nodes unconnected. This provides an opportunity to assign the following additional function to this component: when the component is connected to the circuit on both sides, it is interpreted by ATP to be operating in transmission mode, actually isolating the subnetworks on each side from each other. Each side of the component provides its own admittance matrix and set of current sources to the circuit. This interpretation is not possible with the Thevenin and iterated types, because they are branch-based instead of node-based."*

Dr. Robert E. Wilson recently returned to using MODELS with data that dates to 1992 when he was a doctoral student at the University of Idaho in Moscow. He wanted to know what changes might be required to make this compatible with modern ATP. Well, author Dubé first advised him as follows according to E-mail dated April 27th: *"Many things have been added since 1992. One thing has been eliminated: the function pastval, because it was consuming too much execution time. It's been replaced by the more efficient function delay(). …. Also, no more need to use the STORAGE directive."* Later, working with Dr. Wilson's actual data, which had mysteriously died during initialization, Mr. Dubé made further changes, which he summarized as follows: *"b) remove occasional spaces between a function name and its left parenthesis for ex:*

write (...) --> write(...)

atan2 (...) --> atan2(...) ….

c) replace exclamation points by double hyphens for inline comments." These simple changes seem to have solved the problem. Alert readers might wonder about Dr. Wilson's ATP licensing, so it is appropriate to explain that it is personal rather than organizational, and it remains in effect for IEEE and other non-employment-related activities. When Dr. Wilson left the University of Wyoming, he returned to WAPA (the Western Area Power Administration in Montrose, Colorado), which is a DCG member. WAPA is not eligible for free ATP licensing, so Dr. Wilson uses ATP on his home PC .

"New MODELS Users Guide" was the subject of public E-mail from author Dubé on May 6th. This began as follows: *"After one year of putting the material together, the Users Guide is finally ready. To give an overview of its purpose and its contents, I'm pasting below a copy of its preface, and also a list of the main topics. .... There will be two files, both using Microsoft Word for Windows 2, one formatted for 8.5x11 paper, the other in A4. Each version prints at around 160 pages. The file names are 965ugmus.zip and 965ugma4.zip. They will be found in the models/tutor directory."* The Preface provided the following additional explanation: *"This Users Guide has been written with the purpose of introducing the MODELS language for use with ATP. It is written mostly in a conversational style, as opposed to the more formal descriptions found in the MODELS Language Manual of the ATP Rule Book. The purpose of this guide is to explain how the MODELS language is held together, and to illustrate its usage with discussions and examples. .... This first version covers the basic aspects of using the MODELS language. The main features of the language are discussed in detail and illustrated with examples. The interface between MODELS and ATP is also discussed at length. What is not included are detailed examples of electrical and control components, descriptions which, in my opinion, are beyond the scope of this introduction."*

Szymanski uses Windows 95 for ATP

A 133-MHz Pentium-based PC was ordered from computer reseller David Szymanski on December 4th as explained in the preceding issue. About the new, 650-Mbyte removable storage, Szymanski wrote the following in E-mail dated January 2nd: *"Panasonic PowerDrive PD/ CD-ROM is a 4X CD-ROM and rewritable optical disk all in one. This drive looks like a regular CD-ROM drive that will accept standard CD-ROM discs or 650mb rewritable optical disks. When reading from the drive, performance appears equivalent*

to that of a 4x CD. When writing, the PowerDrive is 1/3rd to 1/10th the speed of the SCSI hard disk. This wide variation is caused by the slow seek times of CD-ROM hardware and the need to update the directory entries and allocation table while writing to a file. The PowerDrive optical disks cannot be read in standard CD-ROM drives." Szymanski illustrated the different speeds for copying a 60-Mbyte file among the different media :

From	to	Time in sec
CD-ROM	hard disk	100
hard disk	hard disk	65
hard disk	PowerDrive	305
PowerDrive	hard disk	70

A defective motherboard resulted in slow (but correct) execution at first. This was reported by Szymanski during a telephone conversation on January 23rd. Instead of the expected 9 or 10 seconds for the time step loop of DC-1, he observed substantially longer times; and the longer he monitored the situation, the slower the computer ran (e.g., 30 or 40 seconds toward the end) --- all the while producing correct answers! All of his own diagnostics revealed nothing abnormal, so Szymanski turned to the factory, which supplied special diagnostic software that quickly isolated the trouble, we were told. So, the motherboard was replaced.

MS-DOS EDIT under Win95 has been pleasantly improved compared with the crippled editor of real DOS that began with version 5. Rather than being limited to a single file, the EDIT user now can split his screen, and can hold open 2 or more files at a time. Equally important is removal of the previous limitation on file size (about 1/3 Mbyte). Your Editor had no trouble entering 885 Kbyte BLOCKD51.FTN and pasting some 5000 lines from it into 7054-line OVER1.FTN while also holding 2321-line OVER2.FTN open. Operation remained quick throughout such maneuvers (i.e., no unnecessary paging to disk was noted) .

MS PS translation required a special, new rule to accomodate library routines. It was necessary to delay the usual IMPLICIT statement until the last of the USE declarations has been past. Well, USE itself is new, although it may be standard in FORTRAN 90 (to which the compiler is supposed to conform). So, as first encountered, F90 has presented a complication rather than an advantage or opportunity. Has any reader figured out anything that it might be good for, in the case of ATP for Intel PCs?

Developer Studio is a multi-language, interactive, multi-colored development and debugging framework that can be used with the MS compilers including MS PS. Not only **can** it be used, it **must** be used for ATP unless and/or until someone can show ATP developers in Portland how to link properly from the DOS command line. Compiling from the command line is simple enough, but linking is complicated by the need to specify which libraries should be used. But there are many, and routine names seem not be be unique, so presumably the order in which library names are listed is critical. Well, Developer Studio seems able to keep track of this complexity, so it will be allowed to do so until some informed reader can supply the appropriate, equivalent DOS commands. A make file .mak does the actual work, so if any informed, cooperating reader wanted to inspect the 1448-line W95ATPB.MAK for ATP, it could easily be provided by E-mail. Found in this file are .LIB file names kernel32, user32, gdi32, winspool, comdlg32, advapi32, etc. (half a dozen more). In short, MS has succeeded in making the simple complicated.

Slowness of scrolling is a problem of text windows of the MS PS compiler. Certainly creation and use are simple enough: a file OPEN statement, followed by WRITEs to the associated I/O unit, are all that it takes. But lack of speed for display is a problem serious enough to delay usage for SPY. Szymanski-supplied illustration SAMPLE.FOR opens 3 windows that store a maximum of 500 lines of 132 columns. About this, your Editor reported the following in E-mail dated February 23rd: *"I timed execution of your program SAMPLE. The original window opens quickly enough, but the remaining 3 that are the result of SETWINDOWCONFIG use are extremely slow. Writing output to these windows is not fast, either. Using a wall clock with a sweep second hand, I timed the following milestones:*

36 seconds --- time at opening of the 1st window;
56 seconds --- time at opening of the 2nd window;
71 seconds --- time at opening of the 3rd window;
111 seconds --- time at completion, after having written 200 shorts lines to each of the 3 windows.

This is with a 133-MHz processor. Recalling my 12-MHz Apollo, I suspect completion would have required 10 seconds or less. Worse yet, the MS windows are limited to 500 lines. Presumably the delays are proportional to this size. But 500 lines is short by .LIS file standards."

Apollo-like, 3-window SPY also has not been provided because of a serious error in the MS PS compiler. As first explained to Szymanski in E-mail dated April 2nd, a 12-line, self-contained program clearly and easily illustrates the trouble using library routine PEEKCHARQQ (supposed to determine whether or not a key has been pressed). This works as a DOS (console) application, but fails as an MS Windows program. May 6th, Szymanski provided a definitive answer from MS itself. This was Article Q150127 having revision date: 26-APR-1996: *"Microsoft has confirmed this to be a bug …. We are researching this problem and will post new information here in the Microsoft Knowledge Base as it becomes available."* Note the lack of a promise to

fix anything in timely fashion. Maybe in time for Windows 97?

C-like .PL4 files were added to MS PS ATP by use of the Watcom ATP code (see the July, 1995, issue), which required only very minor modification. The massive transfers of Salford DBOS may not be possible (if anyone sees how, send word to Portland), but at least the Watcom code beats the crummy byte-at-a-time alternative using FPUTC, FGETC, etc. (routines within PortLib of MS PS). This C-like alternative is important for those wanting to use Salford TPPLOT to plot an MS PS .PL4 file. Recall that a FORMATTED file is universal but inefficient. The UNFORMATTED alternative might be efficient, but is not universal. Do not try to use Salford TPPLOT on one as there will be an error message during reading of the very first record.

"Humor at Microsoft's expense ..." is the subject of jokes about MS business practices that were contributed by Dr. Shi-yi Liu, Tsu-huei's youngest sister, on October 27th. She, in turn, received this from someone who seems to prefer anonymity (if anyone knows the real author, this detail will be published later). Humorously purported to be a memo from Bill Gates to Hardware Manufacturing Services, this explains *"The top ten ways things would be different if Microsoft built cars: 1. A particular model year of car wouldn't be available until* ***after*** *that year, instead of before. 2. Every time they repainted the lines on the road, you'd have to buy a new car. 3. Occasionally your car would just die for no reason, (and) you'd have to restart it. For some strange reason, you would just accept this. 4. You could only have one person at a time in your car, unless you bought a car '95 or a car NT, but then you'd have to buy more seats. .... 7. People would get excited about the 'new' features in Microsoft cars, forgetting completely that they had been available in other brands for years. ... 9. We'd all have to switch to Microsoft Gas (tm). 10. The company store would sell Microsoft cars that retailed for $25K for an employee discounted price of $3K. Employee relatives and friends would constantly pester you to buy them a car using their VISA #, and ship it to them."*

IBM OS / 2 Warp Used by NYPA

IBM's OS / 2 is being used for the support of ATP by Robert Meredith and Robert Schultz of NYPA (the New York Power Authority in White Plains). This is a continuation of the same story in the preceding issue.

A current Watcom ATP translation was E-mailed to NYPA on March 4th following the validation of all standard test cases. Included was reconciliation with the new Salford PostScript output as described in the January newsletter. As part of the standard test procedure, DC18.PS and DCN15.PS now will be verified every time RUN.BAT is executed. There is exact agreement now between Salford and Watcom .PS files.

Availability *"for OS/2 and Windows NT/Windows 95"* was announced to the general public on April 8th by Robert J. Meredith and Robert A. Schultz of NYPA. This included the following information: *"Requesters must identify any limitations in their e-mail boxes which could restrict acceptance of a uuencoded file which slightly exceeds 2 MB, in the case of WNT, or 1.8 MB in the case of OS/2 (the latter even includes an additional program.) The uuencoded package can be sent in two or three parts, if necessary to meet mailbox limitations. …. Watcom's cross-platform capability does not include support for screen graphics, which remains unique to each operating system. NYPA's past work with embedded screen graphics calls for Apollo Domain, HPUX and Salford operating systems has convinced us that having embedded screen graphics calls is one of the major impediments to supporting multiple platforms. Consequently, NYPA's approach to screen graphics is to generate them from the Postscript print file, an extremely efficient means of storing vector format graphics for later display and printing. We believe this is a first step in simplifying support across platforms and possibly towards a multi-threaded approach to ATP programming. A separate program, called by the ATP batch execution script, now produces the screen displays from the plot information contained in the Postscript print file. The only drawback to this approach is that SPY is not now supported by NYPA's code. Only "Calcomp" plots can be displayed on the screen. The offsetting advantages to this approach are that plots can be displayed and compared at any time after execution, even on different operating systems. At this time users of OS/2 have two choices for screen plot display: the Display2 program from NYPA or Ghostview/ Ghostscript, freely available on the Internet. Display2 has speed, memory utilization and customization advantages, such as allowing isolation of individual curves and execution in simultaneous display sessions to compare results from different cases. At this time it is only for OS/2 plot display, however. Ghostview/ Ghostscript is slower to execute, but runs on many operating systems and allows printing of plots to several non-Postscript printers. Users of WNT/W95 must rely on Ghostview/ Ghostscript or hard-copy printing until such time as Display2 or an equivalent program can be ported to WNT/W95. Either program can be invoked to begin display of the Postscript plots by simply clicking on the Postscript file's icon, if appropriate associations are defined in the operating systems. The Postscript file also serves double duty, since it also provides for the highest quality printed plots at one, two or four plots per page using NYPA's Psplot spooling program for Postscript printers. Use of the Ghostview/ Ghostscript programs allows (possibly color) printing to several non-Postscript*

printers, even in the multiplot per page layouts produced by Psplot."

"IBM sold one million licenses for its OS/2 Warp operating system in December" according to a Dow Jones News story that was forwarded by Robert Meredith of NYPA on January 29th. Continuing, *"IBM said the sales figures increase the total number of OS/2 Warp licenses to six million and overall OS/2 sales to more than 12 million."*

A dual-pentium PC could be purchased, but is not recommended. This was explained by Mr. Meredith in public E-mail dated January 24th. Apparently the Watcom compiler offers no such support. The NYPA experiment detected no gain: *"Running a single instance of ATP under WNT 3.5 on a dual 90 MHz Pentium processor (Neptune chip set) machine shows no increase in execution speed over that of a single 90 MHz processor also using the Neptune chip set."* Even if compiler support for 2 or more processors were available, there are some unfavorable economics: *"Pentium dual processor machines are not cost effective. Our dual 90 MHz machine involved an extra cost of about $4000 about 5 months ago. .... Today a single Pentium Pro chip would easily outperform the dual processors at less cost and without need of multi-threaded software. The dual Pentiums seem to have offered a momentary window of superiority, which has since closed."* Even if economics were favorable, there is doubt whether ATP would benefit much: *"The sequential nature of the ATP solution may not even be amenable to multi-threading."*

"IBM cuts off OS/2 for PowerPC" is one of two headlines on page 20 of the January 29th issue of *Information Week* magazine. *"Citing lack of demand, IBM will instead steer customers to Microsoft Windows NT or AIX .... According to sources, Thompson told employees the PowerPC chip was designed for power users and the volume desktop market had standardized around Intel processors. .... IBM had touted a multiplatform OS/2 strategy known as Workplace, and OS/2 for PowerPC was a key part of that. This latest development again raises questions about IBM's commitment to OS/2."* So writes Brian Gillooly.

PL42MAT is the utility that converts ATP .PL4 files into MATLAB files. As explained in the July, 1995, newsletter, this recently has been supported by Massimo Ceraolo of the University of Pisa in Italy. So, this is the individual to whom Glenn Wrate of Michigan Tech complained when he had trouble using PL42MAT on a .PL4 file that was created by Watcom ATP. In E-mail dated April 29th, he wrote: *"I believe Dr. Meyer has solved the mystery. I just confirmed … that the Salford version of the file also does not work with PL42MAT. How easy will it be to change the code?"* So, why is this a Watcom story and not a Salford story? Because the average Salford EMTP user never touches LENREC of STARTUP. This binary flag is distributed as zero, and is left as zero by nearly everyone. But for Watcom ATP, a value of unity is built into the program. This means that for C-like files (the kinds used by Mr. Wrate), extra null bytes are inserted immediately before the signals begin in order that signals are offset by an integer multiple of the length of records for the output vectors of the time-step loop. As explained in the January, 1994, newsletter, this speeds transfers based on the Watcom (not Salford) compiler. As your Editor wrote Mr. Wrate on April 27th, *"It is believable that PL42MAT logic does not allow this possibility of null bytes. TPPLOT obviously does."* That *"Salford version of the file"* mentioned by Mr. Wrate was created after changing LENREC to unity. This increased file size by 7 bytes --- equal to the file size produced by Watcom ATP. As your Editor concluded, *"The solution is for those who maintain PL42MAT to use the pointer to the first time as given in the header."*

Apollo workstations no longer are being supported for ATP use, it should be mentioned. This is yet another sign of the changing computer times in which it is increasingly difficult to compete against Intel-based PCs. Robert Meredith of NYPA summarized the sad ending in public E-mail of the Fargo list server dated February 21st. *"NYPA found its 50-MHz HP-Apollo 720 so incompetent a machine, even with 32 MB of memory and two disk drives, that we retired it about a year ago. That ended our support of ATP under both the Apollo Domain (a superb Unix O/S) and HPUX (dog-dog-dog!) operating systems. We've found OS/2 superior in every way. We even stripped the disk drive from the old machine, so recovery of the HPUX ATP code is all but impossible at this time."*

Type-26 TACS Source Uses SPY

A new Type-26 TACS source was introduced to provide the user with the value of any numeric variable that SPY recognizes. Practically, this is any numeric program variable of consequence. February 1st was the date of first availability. This followed changes to OVER2 and TSTACS .

Gabor Furst outside Vancouver, British Columbia, Canada, provided the inspiration for the new Type-26 source. In E-mail dated January 30th, he wrote: *"In the process of helping David Alvira in Madrid with his lightning backflash study, I thought it might be neat if one could have a way of recognizing in say a SYSTEMATIC run .... where you are in the sequence (1st, 2nd ...nth run), and do something depending on it ...."* Variable KNT is the energization number, and it could easily be provided as a built-in source just as step

number ISTEP has been since day one (this was 1975 for author Laurent Dubé). But where would such additions end? It was logical enough to generalize the request to handle all 823 symbols currently recognized by SPY.

DC-19 has an existing 2nd subcase that seemed to be particularly simple. So, it was chosen to illustrate the new Type-26 TACS source. This is disconnected from the rest of the problem, so just adds one column to the output without changing the other columns. For simplicity, scalar T (simulation time) is used, but any cell of any numeric vector could be accessed just as easily using the optional offset (see comment card), which is to be one less than the subscript (i.e., cell 1 has no offset, cell 2 has an offset of 1, etc.).

MODELS users should not be deprived of the new power, of course. By telephone, MODELS author Laurent Dubé agreed to provide similar capability. He was sent the TACS code by E-mail dated February 1st. The usual separate story about MODELS should summarize this related, subsequent work. Later addition: The first report of its successful, practical use came from Mr. Furst in E-mail dated April 17th. A self-terminating Monte Carlo simulation was the project, as the following will explain. In reading this, the reader is advised that KNT is the current energization number, and NENERG is the total number of energizations. Mr. Furst wrote: *"I am simulating a lightning backflash with the stroke to the tower having a normal-log distribution. After each energization, a number of points on the stroke current versus KNT curve are stored using the Deposit function in MODELS . After each block of twenty energizations, this value is compared with the corresponding points on the theoretical cumulative probability curve for the specified sigma. If the points fall within a user specified band, which could be of different width along the curve, NENERG is set to KNT+1, again using the MODELS Deposit function, and the process is terminated with the usual outputs. The random choice of the stroke current is done inside MODELS, and this has nothing to do with the random choice of breaker closing or opening in EMTP."*

BPA Reinvention : Some Rotten Fruit

BPA's official newspaper, *Circuit*, has suffered serious loss of credibility during BPA's reinvention of the past two years. Of course, no one your Editor knows ever believed stories from management about politics. After all, *Circuit* is a government-run newspaper, so it naturally reflected the official party line. But what about technical details about electricity? During February flooding, the politicians were quick to pat themselves on the back even though BPA's role was minor. *"The flood of 1996 called for quick action by BPA"* is the headline of the March issue. Beside an aerial photograph of the Willamette River flowing through downtown Portland is found an explanation that *"the Burnside and Steel bridges (top right) are open to allow debris to flow through and because if water reached the electric generators, those bridges couldn't be opened."* However, BPA has no connection at all with these bridges. The bridges **do** have electric motors that raise and lower the spans, of course, allowing ocean-going ships to pass. But there are no associated dams, turbines, or generators.

Sunriver is the resort location where BPA peddlers vacation at government expense, it would seem. A local television station (channel 6) recently exposed the scandal to the general public. According to a widely-circulated E-mail message dated March 8 from Sharon Blair of Route T, "Steve Hickok is turning the matter over to internal audit. Disciplinary action will await audit's review." So how abusive was the activity? **Very**, according to available evidence. The widely circulated BPA memo attributed to Ruth Bennett sets the following work schedule: Peddlers *"leave District office"* at noon on Wednesday, February 28. They arrive at Sunriver at 16:00, have dinner at 18:00, *"Clean-up"* at 19:00, work for half an hour at 19:30 (*"Update: Regional Forum"*), and then watch a movie (at 20:00 one sees *"Humor in the Workplace"* on the schedule to end the day). Then what is on the schedule for Friday? 08:00 through 17:00 is described shamelessly as *"Self-Directed Play-Time."* This is followed by a repetition of dinner and cleanup so that the second half hour of work can begin at 19:30 (this time the half hour of work is entitled *"Update on the Competition."*). The second day ends with a group discussion at 20:00. A really grueling work schedule, eh? As one anonymous but eloquent critic summarized (the following are his section headings): *"1) Stupidity and arrogance is alive and well; 2) Ethics in government is just rhetoric; and 3) Merit frequently has absolutely nothing to do with getting promoted."*

BPA discrimination based on race and sex (as opposed to merit) was mentioned in the October, 1994, newsletter. Forgotten, however, was a third alternative: age. A story on page 16 of the February 14-20 issue of Portland's *Willamette Week* newspaper contains some interesting allegations. It seems that three BPA employees *"have filed a class-action lawsuit claiming the agency discriminated on the basis of age. ... Their suit alleges that throughout the promotion process, the BPA 'forcefully emphasized the promotion of women, minority and younger workers' .... The plaintiffs claim that one of the committees ... gave 42 percent of its promotions to women and minorities even though they comprised only 20 percent of those eligible for promotion."* So what was the immediate response of BPA politicians? It looks like damage control. One BPA attorney is quoted as saying *"If the court allows a class-action lawsuit, it would cost a bloody fortune at the*

taxpayers' expense." Now, the reader must ask himself, does this sound like the response of a defendant who can prove his innocense (joke)?!

Trapezoidal Rule Oscillations

This is a continuation of the story having the same title in the preceding issue. Recall that Prof. Yoshihiro Murai of Gifu University in Japan first stated the need for *on-line bridge thyristor selection,* which has been named *dynamic current redirection.* This is provided by GIFU switches (named after the request word that appears in columns 61-64 of a switch card).

One or more experimental steps are taken for any time instant where a GIFU switch changes status. At the end of this step, diodes are checked for illegal forward voltage or reverse current. If any is found, the step will be repeated with modified switching. The new logic will switch a maximum of two diodes on any such step: 1) the diode with the largest forward voltage; and 2) the diode with the largest reverse current. Only when all diodes are operating legally will the experimental step be accepted, and the simulation allowed to continue. That was the original concept, allowing only diodes to change during the experimental step. But testing at Gifu rapidly revealed the need to include the opening of thyristors that carry illegal reverse currents. The new logic will not respond to forward voltage of a thyristor, but it will open if there is a reverse current.

Unlike interpolation, the new GIFU logic is simple. This is a great attraction. Coding is confined to switching. It has nothing to do with TACS, the U.M., etc. --- all of which would require special treatment for interpolation. Another advantage is: the new GIFU logic requires the saving of tables only for those steps that involve GIFU switching. This is not like interpolation where tables had to be saved at the start of every time step because the need for interpolation could not be anticipated (it was known only at the end of the step). For an experimental GIFU step, the need to save tables is known before the step begins. To conclude, changes to the code were minimal even though no modeling is excluded.

The first report of 3-phase use of the new GIFU logic came in E-mail dated January 13th. Prof. Murai wrote that the *"new TPGIFU is working fine. Nimal tested it by six-transistor, six anti-parallel diode PWM inverter circuit, and the result was fine without any spikes. The fact that he didn't use any snubber on this simulation is amazing."* It might be observed that a snubber generally still is required to suppress oscillation following opening on a current zero. But if opening occurs during the experimental step, then a snubber might not be needed. This was explained in E-mail dated December 12th following Prof. Mohan's observation that EX9 required no snubber whereas Prof. Murai's dual battery charger (a generalization of Mohan's EX10) did require one. This is a subtle detail that probably will be misunderstood for years. The distinction is easy to forget.

January 26th is the date GIFU switches first became available to the general public. Having heard no complaints in weeks, OVER16 was added to the UTPF. New standard test case DCNEW-17 has been created to illustrate and document such usage. It begins with just five single-phase subcases. If Prof. Murai or anyone else will contribute a simple 3-phase case, it will be added.

Prof. Hermann Dommel of the University of British Columbia in Vancouver, B.C., Canada, has published a recommendation for GIFU-like switches. This startling news was learned on March 10th during a telephone conversation with Prof. Ned Mohan, who had just returned from Japan (he had participated in an ATP-related workshop organized by Prof. Akihiro Ametani, Chairman of the Japanese EMTP Committee). Dated '96.3.7, Prof. Dommel's Japanese-language cover page (a summary) refers to his CEA paper of a year earlier. This 9-page, English-language paper dated March, 1995, follows. The last paragraph of section 4, at the top of page 8, reads as follows: *"Another approach, which has not yet been implemented in any of the EMTP versions, is to move the solution one time step forward after a GTO (or any other power electronic device) turns off, but treat this step as an 'exploratory' move for the sole purpose of checking the voltage across the diodes. .... In principle, this scheme is very simple, but its implementation requires code changes in many places of an existing code. If a program is rewritten from scratch, this approach would be fairly easy to implement."* Well, only the comment about *"many places"* is wrong for EMTP. It might be true for Professor Dommel's own Microtran, but it obviously is incorrect for EMTP. The coding of GIFU switches should be easy and localized for anyone who understands basic EMTP (not to be confused with Prof. Dommel's own Microtran) structure; and it is trivial compared with coding of that Manitoba interpolation (see the preceding issue) .

Hewlett - Packard (HP) Unix ATP

Hewlett-Packard (HP) Unix has a new ATP version thanks to the work of Prof. G. Corwin Alexander of Oregon State University in Corvallis (USA).

"Features of the HP-Unix version of ATP vs. the Salford version" is the title of a 32-Kbyte information file written by Prof. Alexander. This is stored on the ORST aFTP server under disk file name 9-95fea.msg ,

and it contains a subtitle reading: *"Implemented in August 1995 through February 1996."* Anyone wanting to know how HP Unix ATP differs from Salford EMTP is referred to this detailed comparison. Only a few highlights will be mentioned in the remainder of this story. Anyone wanting to discuss specifics can contact Prof. Alexander at address **gca@ece.orst.edu**

The comparison consists of IEEE-like, double-column writing, with the left column applying to Salford and the right to HP Unix. Feature by feature, the differences appear side by side. In order, the titles of the features are :

1) File-Name Case Sensitivity
2) Directory Option
3) Batch-Mode Operation
4) PL4 File Management
5) PL4 File Naming
6) C-like PL4 Files
7) Diagnostics in the Output File
8) Effect of KTRPL4
9) Source of BLOCKD51 Data
10) Timing Listings
11) The SPY Function
12) Debug File Naming
13) Elapsed-Time Stamping

Most unusual and original, in your Editor's opinion, is the third of these. Whereas Salford EMTP is limited to about 3 choices, Prof. Alexander distinguishes among 11 different cases. For example, his 10th legal input is of the form "disk prob. -r" with the following effect: *"The internal form of the input file name will be 'prob.dat'. The parameter '-r' will be read as the output-file name and converted to a blank; so the output file will be named 'prob.lis'. If the file name already exists, the old file will be overwritten. The PL4 file is named as in example 4."*

As this story is being frozen for publication on May 9th, Prof. Alexander has just returned output from compilation and linking of a new translation that was sent to him the preceding week. Included was code for HP-GL and PostScript output, even though screen plotting is not yet being supported. Yes, screen plotting has been discussed, and Prof. Alexander has suggested the X Window System. But it is understood that the average user might not have access to this because HP Unix computers often are being used as time-shared, remote file servers. The X Window System graphics of the computer itself may not extended to the many time-shared users (e.g., Prof. Alexander, who might log in using his Intel-based PC as a dumb terminal). So, it is unclear how important screen graphics might be.

Juan Martinez U . M . Data Cases

Universal Machine (U.M.) compensation was changed on January 26th to correct the ATP simulation of IMTESTA3.DAT --- one file among two sets of data cases that were received on a floppy disk from Prof. Juan Martinez of Universitat Politecnica de Catalunya in Barcelona, Spain. Only the addition above DO 5700 in OVER16 was involved. The corrected solution will be preserved for posterity as a new third data subcase of DCNEW-16 --- a new collection associated with the correction of compensation troubles.

Simulation of DCNEW-9 and DCNEW-10 now is different. While changes are neither great nor obvious, they are significant in an engineering sense. For example, the axis limits of the PRINTER PLOT for torque TQGEN in DCN9.LIS were (-1.150, 8.166). After the change, they are: (-1.836, 7.254). Now, the skeptical reader might wonder how the new answers are known to be correct. In fact, there is no such knowledge. But the new answers are close to answers obtained using BPA's "M39.+" DEC VAX / VMS EMTP that dates to 1984. The VAX limits for TQGEN are : (-1.832, 7.256).

Ivano Bonfanti of CESI in Milano, Italy, published trouble with Universal Machine (U.M.) modeling in the September, 1989, issue of LEC's EMTP News. This, too, has been corrected as documented by the new fourth subcase of DCNEW-16. Answers are a little different, but should be comparable for engineering purposes. The induction motor clearly is in the steady state, and is perfectly stable through 1 second (although the test case has been shortened to 20 msec for quicker execution) .

The SHARE feature allows two or more U.M.s to share the same shaft, with common usage being for a motor-generator pair. Well, this, too, has been fixed as documented by the new DCNEW-18 . Dr. Yin Yuexin of Global Engineering in suburban Atlanta, Georgia, has approved of this solution.

Florida Short Course March 11 - 14

Prof. Dennis Carroll of the University of Florida in Gainesville gave his annual short course on schedule March 11th through the 14th. As last year, the initial smaller format overflowed, so the course had to be moved to the bigger departmental laboratory. Unlike last year and previous years, no IEEE mailing list was purchased or used to advertise. This makes increased enrollment this year all the more satisfying.

In E-mail dated March 22nd, Prof. Carroll provided the following summary: *"The new concentrated 4-day, 3-night format was used similar to last year, with additional time allotted this year for power electronics and motor drives. Other topics covered included*

transmission lines, line constants, transformers, electric machines, TACS and MODELS, switching surges, lightning surges, and surge arresters. The course was attended by 11 registered participants of various backgrounds, including one from Venezuela and one from South Africa. Four registrants were from academia. In addition to the 11 registrants, several local graduate students also attended. Both the hardware and software performed flawlessly throughout the course. As in previous years, each student had a dedicated PC in front of him throughout the course. All PC's were either 486-66 or Pentium, with high resolution color monitors and local dedicated printers. During the daytime sessions the PCs were used to run lecture examples, and in the evening sessions the PCs were used to work on assigned problems or individual work. Instructors were available in the evening to answer questions and help students individually. Course instructors were Dennis Carroll, Kurt Fehrle and Yuexin Yin."

European Short Course July 1 - 5

A 5-day ATP short course is to be given on the campus of F.H. Osnabrueck in Germany during the week of July 1-5, 1996. The course fee is DM 1400 for EEUG members and DM 1900 for nonmembers. Included are *"course notes with a computer diskette containing input data files for all examples, ... refreshment breaks, one course dinner and transport from hotel to the university."*

A distinguished faculty is planned. In alphabetical order, the teachers are expected to be :

1) Laurent Dube from the Oregon Coast, USA
2) Hans Kr. Hoidalen of EPRI in Trondheim, Norway
3) Prof. Mustafa Kizilcay of F.H. Osnabrueck, Germany
4) Prof. Juan Martinez-Velasco from Barcelona, Spain
5) Mathias Noe from University of Hannover, Germany
6) Prof. Laszlo Prikler from T.U. Budapest, Hungary

The daily schedule consists of three theory lectures per day between 08:30 and 13:00. Then comes lunch. Finally, PC laboratory exercises will end the day (14:30 through 18:00). About the laboratory, 2 students are allowed per computer, and it seems there must be 19 of these because *"enrollment will be limited to 38 participants."* There might be an attempt to accommodate more, however. The form that is used for registration includes the following: *"|_| Yes, I can bring and use my own portable PC during laboratory sessions."* This is similar to Prof. Dennis Carroll's inquiry of one year ago (for his first small-format ATP short course in Florida) except that no corresponding reduction of the fee is noted.

The Park Hotel in Osnabrueck is being used to house students. Daily rates are bounded by the following two:

single room incl. breakfast, category 2	DM 85
double room incl. breakfast, category 1	DM 160

MATH Command of Salford TPPLOT

MATH is a command for mathematical processing of the user-selected signals as they are loaded from the .PL4 file. Usage is illustrated by five MATHX files that were added to TPPLOT.ZIP on January 1st. In order, these are: 1) convert voltages and currents of a bank of 3-phase surge arresters into powers and energies; 2) like 1 except that total 3-phase power and energy are added to create eight variables from the original six; 3) like 2 except that the phase powers are ignored after the total 3-phase power and energy are computered; 4) like 1 except that currents and voltages are plotted before the powers and energies; and 5) like 2 except that signals are sent to disk rather than plotted on the screen.

MATH1.DAT is used by MATH1 to change voltages and currents into powers and energies. This data provides a quick understanding of general concepts:

```
LOOP     3       Begin DO-loop this many times
LOAD     1       Load Va which is signal 1 ...
MULT     4       Multiply by Ia,  which is ...
SAVE     7       Save power Pa in cell 7  ...
1/S     10   0.0 Integrate Pa to produce  ...
END              End of  DO-loop.  1,4,7 ...
OUT              Copy 2nd vector (7:12) ...
```

Each line is read as (A4, I8, E8.0) so all text on the right is ignored. The floating-point parameter is used only by the integrator, to which it provides an initial condition (here, zero energy). The looping changes 1, 4, 7, and 10 of the first pass into 2, 5, 8, and 11 on the second pass, etc. Upon completion of the loop, the new outputs in cells 7 through 12 are laid on top of the originals (Va, Vb, Vc, Ia, Ib, Ic) in cells 1 through 6. This completes the conversion to powers and energies.

Next, consider MS OLE. Why should your Editor code such processing logic himself if much more powerful logic already exists in programs such as MATLAB (see Gayle Collins' idea in the July, 1994, newsletter). At the time she did not know about OLE, but we all do now (see preceding newsletter). To conclude, MATH logic is just a quick patch that later might (probably should) be replaced by a call to some separate, much more powerful processing program. Yet, MATLAB is not free. Rather than a replacement, one can envision an alternative for those who have the separate, alternative program.

Type - 59 S . M . Damping Error ?

No is the answer to this question that served as the title of a story in the October, 1995, newsletter. That

story began: *"Damping of the Type-59 S.M. was of concern to Douglas Selin of Arizona Public Service in Phoenix (USA)."* It turns out that GIGO (**G**arbage **I**n, **G**arbage **O**ut) best summarizes the confusion. I.e., EMTP answers are no better than the data that produces them, and rotating machinery can be tricky.

The following written explanation was received on February 1st from Prof. Bruce Mork of Michigan Tech in Houghton. His colleague, Prof. Leonard Bohmann, seems to have received the following explanation from Prof. Hermann Dommel at the University of British Columbia in Vancouver (Canada). With *"Subject: Type-59 S.M. damping error,"* this explains: *"At the request of EPRI, I looked into this problem, and came to the following conclusion: the old type-50 synchronous machine model (which no longer exists) assumed that the turbine torque remains constant during speed changes. In the new type-59 synchronous machine model, it is assumed that the turbine power remains constant during speed changes. In both cases, the assumptions are made if there is no governor control modelled with TACS . The constant turbine power assumption is used in the DCG / EPRI EMTP, in the BPA EMTP and in the ATP."* True, true. Constant power is different than constant torque, as known for half a century or more by those who simulated transient stability. Neither is right, of course --- any more than constant field voltage Vf would be right. So, a connection to TACS (and a decade later to MODELS by the same author Laurent Dubé) was provided from the beginning in 1975.

Mike Hall and John Alms of SCE (the Southern California Edison Company) installed Type-50 modeling in an early IBM mainframe translation as documented in *EMTP Memoranda*, Vol. IV, 9/14/75 through 4/16/76. Next, the influence of TACS on SSR was prominently demonstrated by Mr. Hall during the presentation of his work at the first EMTP meeting, which was held in Portland during July of 1976 (during the IEEE PES Summer Meeting). The widely distributed *EMTP User's Manual* dated Nov 77 stated the following for BUS under Rule 2 on page 35v: *"The numerical value of this TACS variable will then be used by the EMTP logic as a multiplicative factor for scaling the otherwise-constant (steady-state) torque value."* That was for the SCE code.

The present ATP model can be traced to Dr. Vladimir Brandwajn, a BPA contractor at that time (1977). One can find a good summary of differences between the SCE code and Dr. Brandwajn's newer Type-59 model in Vol. VII of *EMTP Memoranda*. On page CBVB-3 of a missive that was closed 21 January 1978, there is *"**Point 5** : The applied mechanical force on the shaft of the S.M. is **torque** for the SCE machine; it is **power** for the Brandwajn machine. In the absence of a TACS connection to modify this, the SCE machine provides a **constant torque** representation, while the Brandwajn machine will give **constant power** ... Of course since power is equal to torque multiplied by angular velocity, it is simple to use TACS to convert from one to the other."* Here a bold font replaces the original underlining.

Closure: After the preceding story already had been written, Mr. Selin explained the confusion between constant torque and power to the general public. This was in E-mail of the Fargo list server dated February 22nd.

Macintosh ATP by Stu Cook

Stu Cook of JUST Services in suburban Montréal, Québec, Canada, has been compiling new Macintosh ATP FORTRAN using the Language Systems compiler on his Apple Quadra (a Motorola 68040-based Mac).

That PowerPC expansion card does finally support ATP properly. Mr. Cook provided a summary of the breakthrough in E-mail dated January 4th: *"The secret to getting ATP operational on the PPC was to read the documentation on the latest CD from Language Systems which gave me the linker options to produce a map and a list of used and unused code. The unused code listing showed that as the subroutines in 'newmods.f.o' weren't referenced, they were omitted from the executable."* In effect, ATP dimensioning had been omitted (most COMMON blocks had unity size). So, subroutine calls to the VARDIM modules made them referenced --- an unwanted first for any compiler currently in use to support ATP. But Mr. Cook had to do more: *"That cleared up the unused status of these subroutines but not the dimensioning problem. I then added statements in each of the newmods.f subroutines to set the first element of each of the COMMON arrays to zero or blank. Presto et voila, success!"*

Mysterious loss of speed continues to plague the Mac version. Like Quadra, PowerPC is short by a factor of 3 or 4, it would seem. Mr. Cook: *"A run made yesterday on a 120-MHz 604 yielded 31 seconds for the DC-1 time step loop."* That was without optimization. It is true that optimization recovers some of the loss. For level 2, Mr. Cook reported 18.5 and 22.0 seconds (dT loop and total time, respectively). But this still is less than half the speed of Robert Meredith's home Pentium (see preceding issue). Also, unless execution is perfect for all data of interest (it is not yet), optimization is of little practical use. It is a potential problem of all RISC processors compared with Intel architecture.

Software emulation might possibly be used by Apple Macintosh users to run Salford EMTP, which is a DOS program. Mr. Cook clarified the possibility of

using SoftWindows, an emulator from Insignia, in public E-mail of the Fargo list server dated March 20th: *"I have no direct experience of using SoftWindows so I checked with Insignia to see what they had to say. Neither Sales nor Tech Support had heard of DBOS, but this is what I garnered: 1. You will need to use Soft-Windows for the PowerMac in order to get 386/486 emulation. 2. Version 3.0 of this emulator will be coming out on Monday and it is claimed to be 35% faster than the current version on the market. The price will be $279 (Uncle Sam Bucks). There is a 30-day money back policy on the software and it is 'guaranteed' to run any 386/486 program. .... Reviews that I've seen of previous versions indicated that at least 16MB of RAM was needed to run SoftWindows and that this gives you about 6MB for the WinTel environment which should be plenty for ATP. A PowerMac with a 120mhz 604 could possibly be equivalent to a 66MHz 486 (SX or DX, I'm not sure). System 7.5.3 and a 604e may also give some extra boost."*

Linux ATP by Walter Powell

Linux is free Unix as explained in the July, 1995, newsletter. Well, we finally have important progress. During December, a request for Linux ATP was received from Israel Barrientos-Torres of Universidad Autonoma de Nuevo Leon in Mexico. At the same time, BPA's Walter Powell was purchasing a 100-MHz Pentium for home use, and this included Linux (why not, since it is free ? !) .

Linux interest in Nuevo Leon is understood to be for DEC Alpha. But it was decided that Linux for PCs was the simpler platform for all initial testing. So, with Walter Powell's encouragement, your Editor hurriedly established files GNU* for a Linux translation by minor editing of the files for Hewlett-Packard. A floppy disk of basic ATP FORTRAN was provided on January 5th.

g77 is the name of the GNU FORTRAN compiler, and gcc is the name of the GNU C compiler. The former requires the latter. Quoting from Mr. Powell's E-mail dated January 8th, *"On Friday, 5 January, I downloaded the 0.74 Mbyte file g77-0.5.17.tar.gz from the GNU ftp address* ***ftp://ftp.eunet..ch/software/gnu****, uncompressed it with GNU's patent-free uncompression routine gunzip, and extracted the modules with the Unix tar feature. An installation file ... explains that the source code for the GNU C-compiler is necessary to build the g77 compiler. .... Note that this does not mean a Fortran-to-C conversion (f2c), but that g77 is an add-on to the gcc compiler. .... I attempted several times to download the huge 8.4-Mbyte file gcc-2.7.1 from the same site, but the transfer was always prematurely terminated with residual file sizes ranging from 3-5 Mb. .... I presumed that this problem was due to some daytime limitations imposed at either end, and decided to try again very late Friday night. My efforts at home were successful but tedious. It took over one hour to download the file using my new Teleport service (at an average speed of 1.8 kbytes/sec), even with my 28-Kbaud modem."*

The next report came from Mr. Powell early in February, when he wrote the following undated note: *"I took advantage of the bad weather this weekend to install gnu fortran on my linux system, and I think I have succeeded. It was simply awesome, the depth and complexity of the make/configure procedures ..."* So, choose between simplicity and price; it seems obvious you can not have both. Linux may be free, but the user pays in other, more-subtle ways.

Lack of INTEGER*2 variables was the most surprising discovery about g77 rules. Of course, the FORTRAN 77 standard does not provide for bytes, so this is perfectly legal. On the other hand, your Editor has never heard of any commercial compiler with such a restriction. Who would pay money for such a limitation?

BLOCKD51 includes a very large BLOCK DATA subprogram to store all program text (some7300 lines). Well, this proved to be too much for g77. Quoting from Mr. Powell's report (E-mail dated March 17th): *"I next tried to convert it to an equivalent C routine using GNU's Fortran-to-C conversion routine f2c . The conversion succeeded, if success means completing the conversion with no errors. However, the equivalent C routine was over 2.2 MB, and exceeded the capacity of GNU's C compiler gcc. I then tried to write my own equivalent C routine, knowing that the code should not require much more than 80*3707 bytes, and that is where I am. I succeeded in converting BLOCKD51 to an equivalent C routine, but have a few quirks to work out."*

Masahiro Kan of the Hamakawasaki Works of Toshiba Corp. in Japan has been an effective advocate of Linux using public E-mail that began March 16th. In this first message, he explained that *"in Japan, several books with CDROM about Linux are sold in bookstores, and articles about Linux are serially appearing in several computer magazines .... Linux is said to be very stable, ... Information about Linux is easily available in computer magazines, books and internet newsgroups. If there is bugs, they may be fixed soon. There are persons that port Linux to other machins like MIPS, PowerPC, PowerMAC. There is also Japanese environment (JE). .... I hope ATP for Linux will be supported in the future."* That all was quite general, of course, should might easily be dismissed or overlooked. But Mr. Kan's public E-mail dated April 23rd was harder to ignore: *"I tried porting M39-EMTP for Linux by using*

the source code for VAX. I used f2c (Fortran to C translator, it is free software copyrighted by ATT)and gcc. For the simplicity, I ignored supporting routines. The test results are compared with that of ATP on Win95." To be continued next time when there is more room.

WordPerfect 5.1 vs. MS Word

"Novell bought WordPerfect in 1994 for $855 million," and now *"Corel Corp. of Ottawa has agreed to buy the ailing applications business for about $190 million ..."* This continuation of the story in the preceding issue was found on page 26 of the February 5th issue of *Information Week* magazine. It provides a classic illustration of how to lose big money fast. Bill Gates obviously laughed all the way to the bank, as his MS Word (including *for Windows*) has been replacing WP as the industry leader.

WordPerfect 6.1 for MS Windows is incompatible with Version 5.1 disk files as used to store newsletters on the Houghton aFTP server. This startling and disconcerting news first was learned in public E-mail of the Fargo list server dated March 1st. Toshihisa Funabashi of Meidensha Corporation in Tokyo, Japan, observed the following: *"I purchased WordPerfect V6.1 for Windows directly from the USA to read the latest Can/Am EMTP News. .... I tried to open JAN95.WP5 file using WordPerfect V6.1, but failed. The message seen on the screen is 'Unknown file format.' We use Windows 3.1J (J=Japanese), but no problem has occured using US software thus far."* Your Editor's public response later that same day confirmed compatibility with older WP 6.0 as used at BPA, and others stated that WP 6.1 also should be compatible. But several others confirmed the report of Mr. Funabashi. The idea of using WP 5.1 files as a lowest common denominator has been compromised by Novell, clearly. Your Editor's public E-mail on March 6th raised the possibility of a switch to MS Word for Windows for newsletters, and this is being tried for the present issue. In fact, it is Version 6.0 on Dr. Liu's computer at BPA that is being used to key the present text. When complete, an attempt will be made to export a WP 5.1 copy for those who want this alternative format for reasons of continuity with the past. For example, this should be important for those who search the family of all newsletters using Vernon Buerg's share-ware LIST. WP 5.1 disk files are much more readable using LIST than *.DOC files of MS Word for Windows are.

Section XIX-C of the Rule Book treats BCTRAN . For years, details have been missing in the set of WP 5.1 disk files that are stored by Prof. Bruce Mork on his Houghton aFTP server. But now doctoral student Glenn Wrate has contributed text for MS Word for Windows. In E-mail dated April 22nd, he summarized how he began with the original Lotus Manuscript file of LEC: *"I've been working on H19C.DOC on and off since last summer. I have both WordPerfect 5.2 for Windows and MS Word 6.0a. I downloaded the file from Dr. Mork's FTP site along with the file README.DOS from Martin Jones. I followed Martin's instructions to add in the figures using WordPerfect. I had to revise his macros to use the US files. I was disappointed to find that the equations had to be converted by hand. Finally, since I generally use Word for Windows, I converted the file using Word's built-in filter."* In subsequent mail, Mr. Wrate explained more about the README.DOS file : *"It is now 00README.IMPORTANT . It is in the /pub/atp/ruleb/wpnofigs directory"*

Orbach Pricing : $20K → $600 ?

A peddler of ATPDRAW - like data assemblers used Prof. Bruce Mork's public E-mail (the Fargo list server) on April 9th. Then Tamir Orbach, said to be writing on behalf of Kim Development USA Inc. of Washington, D.C. (the nation's capitol), contributed a sales pitch from address t**amirorb@aol.com** This has subject *"ATP For Windows,"* which is a misnomor that must be protested. The Windows come from MS, of course, and Mr. Orbach obviously is not supplying ATP. So, the beginning was inauspicious.

On to the advertising: *"In the past two and a half years, I have developed a Graphical User Interface for ATP called ATP for Windows. ATP for Windows is a Windows 3.x (or better) CAD style drag and drop interface which is of a very high professional standard and is very easy to use. It allows you to draw a circuit, and then edit each element using standard Windows dialogue boxes, using whatever format you like. It is extremely user friendly, and includes typical CAD functionality such as cut and paste, and scrolling. Every screen has a message bar at the bottom of the screen which gives detailed descriptions of each entry when you move the mouse over that entry. ATP for Windows GENERATES ATP DATA FILES for you, and can save you many, many hours of time. …. is now selling ATP for Windows for a nominal price of $1000 per copy for educational institutions, and $2000 per copy for companies. This price includes a 150 page User Reference Manual and a Quick Start Manual, both of which adhere to ISO9001 standards (it also includes shipping and packaging) …. Kim Development USA Inc do have demonstration disks available, and will gladly send one to anyone who is interested. I realize that ATP is a non-profit program, which is why Kim Development USA Inc is selling a program that would normally sell for up to $20000, for only $2000 or $1000.*

… ATP for Windows was presented as part of a paper at the 9th International Symposium for High Voltage Engineering (Graz 1995)…"

So, what knowledgeable ATPDRAW user has tried the free Kim demo disk, and would be willing to contribute an evaluation? Until such an objective evaluation is available, readers are advised to be **extremely** skeptical. As for previous contact with Mr. Orbach, see the October, 1995, newsletter.

Well, Orbach's prices dropped rapidly enough. No, this is **not** a reference to the unbelievable $20K figure that was mentioned during April. Within a month, the $2000 and $1000 figures had shrunk to $600 and $200. This was learned in public E-mail dated May 6th. It would seem that Mr. Orbach underestimated the intelligence of ATP users (if his April announcement was to be taken seriously). Question: does Mr. Orbach continue to underestimate the intelligence of ATP users? Let's hope so, and that Prof. Bruce Mork considers a prohibition on such commercial advertising. If not, where and when might it all end? Remember, DCG, EPRI, and their agents are not the only ones who deliberately distort the truth about royalty-free ATP materials because of their monetary interests in competing, commercial materials.

Miscellaneous Intel PC Information

Apple Macintosh still is not winning, despite PowerPC and Macintosh clones. The entire page 72 of the January issue of *Computer Shopper* is devoted to a summary entitled *"Facing tough future, Apple lowers prices, tightens belt."* Dataquest's Rob Enderle is quoted as saying: *"The biggest problem that Apple has is the fact that it's one of the last true vertically integrated PC companies --- [it] does everything from software to hardware, and [that] creates a significant competitive disadvantage for them."* Dataquest *"predicts slow growth for the Mac OS over the next few years --- growth too gradual to prevent Apple from continuing to lose market share."* So, how big is the Apple slice of the current PC pie? According to author David English, Apple has suffered *"a decline in market share from about 13 percent to 8 percent during the past year."* The price cuts were an apparent attempt to stem this erosion.

The decline of Macintosh is well summarized by Chris O'Malley on a *Mac Watch* page (number 562) of the January issue of *Computer Shopper*. This begins with the explanation: *"Last year I bought a new Macintosh. Again. I also recommended Macs to a good many colleagues .... But this year, I'm not so sure. .... And the roots of this uncertainty seem to be deeper as the months roll by."* The five section headings that summarize Mac troubles are 1) **Higher prices** (*"Apple talks about competitive prices, but it only occasionally delivers"*); 2) **Cautious cloning** (i.e., too cautious; *"little real competition"*); 3) **Microsoft persistence** (Bill G. usually is not first, but he is a formidable competitor); 4) **Chip stumbles** (PowerPC is **not** obviously superior to Pentium as it was supposed to be); 5) **Shrinking software** (program developers concentrate on the 90% share of the PC market that Intel has). There is some similarity to what happened to Apollo workstations: being better than Sun did not save Apollo. Intel and MS have taken the profit out of Apple just as Sun took the profit out of Apollo Computer a decade ago, and forced its sale to HP. In the case of point 4, note where those who bet on RISC rather than CISC made their mistake: easier, faster engineering may not be decisive against a competitor that is an order of magnitude larger (Intel can afford more and slower engineering because it sells more --- **much** more). Note carefully that this lesson applies not only to PowerPC, but also to Sun (Sparc) and DEC (Alpha). Two years ago, Robert Schultz of NYPA said that his bet was on Intel. Well, history has proven him to be correct (again).

Miscellaneous Small Items

Free printed copies of the 20-page January newsletter were mailed by First Class (air) to 9 Canadian and 75 American addresses on January 9th. But how much longer might the free printing and delivery continue to be offered? Current thinking is that it might end with the year. Any subscriber who does not yet know how to pick up free copies of the disk files from Prof. Bruce Mork's Houghton aFTP server is believed to be in need of some special encouragement. Discontinuation of free delivery of printed copies might provide precisely the stimulus that is needed to coax any such laggards onto the onramp of the information superhighway named Internet.

The saturable TRANSFORMER had its leakage inductance interpreted in units of [Henry] beginning December 7th. Prior to that, the user's input number, in ohms or mH, was shown. But the interpretation of series R-L-C branchs has shown L [Henry] for years, so why not comparable treatment for the winding cards of a saturable TRANSFORMER component? Good question! The inconsistency first was seen in public E-mail of the Fargo list server the day before. This was from Dr. Maurizio Fauri of Universita' di Padova in Italy.

Extreme range is a problem of floating point numbers as were being used by Lionel Ramon Orama of Rensselaer Polytechnic Institute. Writing from address **oramal@rpi.edu** on December 16th, Mr. Orama explained why he was using such small numbers in TACS : *"the constant is the mass of copper ions*

(1.056E-25kg) ..." Your Editor was able to advise the use of more extreme FLTINF (value 1.E+18 can be found in STARTUP as distributed by the user group). It seems TACS was taking the reciprocal of this as a minimum on small, positive numbers! The conclusion is obvious: without considering context, it is practically impossible for ATP to be able to tell the difference between significant numbers and roundoff that might accumulate as a result of arithmetic that should produce an exact zero. Mr. Orama has supplied a perfect illustration of the problem. Fortunately ATP has the flexibility via STARTUP to allow user modification (the medicine worked, in this case).

XFORMER was missing $VINTAGE,0 at the end of punched cards. This was prior to its addition December 12th to rectify an inconsistency that was pointed out by BPA's Robert Hasibar. Some months ago, he asked why punched cards of XFORMER were missing the ending restoration to narrow format that is familiar to users of other supporting programs. Another good question!

Switches that touch compensation-based elements sometimes have resulted in erroneous simulation. This is an old problem dating to 1989 and Ivano Bonfanti of CESI as explained in a separate story about the U.M. But before that important progress, which was made at the time of Prof. Juan Martinez's trip to the USA for the IEEE PES Winter Meeting, there was correction for the simpler, single-phase case involving no machinery. The data came from MODELS author Laurent Dubé, and has been preserved as the first subcase of new test case DCNEW-16. As documented on comment cards, 17 December 1995 was the date of this first correction involving compensation.

Within LISTSIZE.BPA of VARDIM (used to set limits on dynamic dimensioning), variable LCHAR is for List 10 -- the total number of points of List-9 (typically nonlinear) element characteristics. Well, this was increased from 900 to 1900 on January 3rd in response to an inquiry from Tim Day and Frank DeCesaro of Cooper Power Systems in Franksville, Wisconsin. No, nonlinear resistance or inductance was not involved. For such normal use, demands on list 10 typically are small. No, Cooper had a more interesting application that could require much larger amounts of storage: the Type-91 element that represents time-dependent resistance . If random numbers are involved to represent a stochastic process, the data is bounded only by the frequency of the process and the length of the simulation. It might be more usual to put such modeling in MODELS where the dice would be rolled every time new data is required. But there are cases where one wants to use fixed random numbers that come from someone else. Connecting these via the Type-91 characteristic is one easy, obvious way. So, the expansion of limiting LCHAR is reasonable.

"In the field of lightning performance calculation, coming within 100% of the actual flashover rate is probably pretty good." This dose of reality came from Dr. Gary C. Thomann of Power Technologies, Inc. of Schenectady, New York (USA). It was the beginning of a public E-mail (the Fargo list server) response to a January 12th contribution by David Alvira of Red Electrica in Madrid, Spain. Mr. Alvira explained that he was trying *"to calculate the rate of back-flashovers in a certain line. For this I use two methods."* The first was ATP simulation followed by use of the Anderson-Eriksson *"probability distribution of stroke amplitudes curve."* The second was *"the method developed by IEEE's Working Group on Lightning Performance of Transmission Lines."* Mr. Alvira concluded: *"I try to compare both calculations and they don't match at all."* As Dr. Thomann explained, this would seem to be like a comparison between apples and oranges. *"The IEEE method does not do a detailed modeling of the physics of the lightning stroke. However, the results from the IEEE formulas have been calibrated against the results of measurement programs at several voltage levels, so there is some confidence in the IEEE results. With ATP, you are trying to make a little more detailed model of the lightning flash and the back-flashover. However, there are a couple of severe short-comings. First, the flashover performance of any gap is highly geometry dependent, so it is difficult to determine what flashover vs time curve to use for any given structure. Second, corona (line and structure) can effect backflashover performance ...."* About corona, there is the model of Prof. Maria Teresa Correia de Barros of IST in Lisbon, Portugal (see the April, 1993, newsletter). Finally, Gabor Furst of suburban Vancouver, British Columbia, Canada, reinforced Dr. Thomann's opinion later that same day: *"I think the differences you are referring to are not unreasonable, and while they seem to be large in absolute numbers, they are relatively small when the inherent accuracy of the simulations and calculations are taken into account, and the differences in assumptions which are implied .... This is true even if you were very careful to make the two approaches compatible. I have done a few similar studies for EHV lines using the two methods ..."* To summarize, ATP results are no better than the data used to produce them (GIGO). Also, long after the mechanics of using ATP are mastered, the challenge of engineering interpretation and usefulness will remain. That's the good news, since it keeps thousands of engineers employed around the world.

LICENSE.XLS is the MS Excel ver. 5.0a storage that summarizes all ATP licenses presently in the possession of the Can/Am user group. The file occupies 218 Kbytes, and had 1363 entries (one per license) when it was completed by Dr. Tsu-huei Liu on January 29th.

The work was begun by son Kwang-chien during his Christmas vacation from studies at Duke University. But time ran out, so once again a little help from mother was required to complete the task. The abbreviation "d.s." was used for 27 entries that were made on the final day. These are peculiar in that they were submitted many months or years earlier, but were never signed at the time. The two biggest sources of these exceptional entries were: 1) Mohan short courses; and 2) PTI short courses. Since Dr. Liu chose to use the date of signing (d.s.) rather than the date of submission for the single date that is associated with each entry, this fact should be noted.

INT_CONVERT is the creation of Robert Schultz of NYPA as explained in the January, 1994, issue. Recall that it replaced LEC's illogical and erroneous *correction* to OVER12 for those computers that had trouble fixing (i.e., integer truncation of) a floating-point variable. This is an important matter because, as Mr. Schultz explained, both Intel and Motorola microprocessors had trouble as tested using popular compilers (Salford for Intel). But a function call was involved, and this seemed unnecessarily wasteful to your Editor. Multiplying by factor (1.0 + FLZERO) was proposed as a simpler, universal alternative. Should this ever fail, the associated "Trouble with integer truncation" message was to be reported. Well, it was, on January 30th, by Laurent Dubé. What was stated is true: *"This should have the effect of producing the same value on all computers when the travel time is a multiple of the time step."* But one must not conclude from this statement that Meyer and Schultz always will produce the same integer! The problem with the proposed change is that it fails to distinguish between additive and subtractive roundoff. The dubé case had H3 = 99.9999 .... through 15 decimal digits. Whereas Schultz would truncate this to 99, your Editor's simpler logic raised it to 100. Well, the theoretically correct value is 100, so your Editor might be proud. But he is not. Instead, he is worried --- about the consequences of tampering with roundoff. Certainly the addition of one extra (and unused) point to the storage of past history is not progress. Remembering that OVER12 precedes the time-step loop, so is executed just once, speed of execution is not a great concern. Your Editor has decided to abandon his efforts to improve upon the Schultz logic.

Type codes 88, 98, and 99 of TACS classify supplemental variables and devices according to whether a variable is internal, output, or input, respectively, in relation to the simultaneous solution. Prof. Ned Mohan returned from Japan (see preceding mention) with the clear impression that most users there were unaware of the contribution by Ma Ren-ming during 1984. It is the recollection of both Laurent Dubé and your Editor that Mr. Ma modified TACS to convert any component having type code 88 to the appropriate alternative if the component is not actually internal. As a result, the user should be able to ignore type codes 98 and 99. It would seem that this was Prof. Mohan's surprising advice for those wanting simplicity of data preparation. If a printed reference to *EMTP Memoranda* could be given, it would be. Unfortunately, Mr. Ma's changes are believed to have been made after *Memoranda* were halted in order to make life more difficult for the commercial competition (DCG, EPRI, and their EMTP friends). Recall that the "M39." version of July, 1984, contained Mr. Ma's improvements whereas *Memoranda* were halted around March of that year. The last bound volume was number XIV, which ended January 2nd. In any case, Prof. Mohan's advice is believed to be correct. Why was the Rule Book not changed to reflect this progress? No one remembers. Of course, TACS author Dubé already was thinking about a new generation rather than evolutionary changes. The result was MODELS, which only became an alternative to (rather than a replacement for) TACS during July of 1989. The survival of TACS was not anticipated by author Dubé during the mid-'80s.

Cray and CDC users are being asked to respond quickly or lose ATP compatibility. In public E-mail of the Fargo list server dated February 22nd, Robert Schultz of NYPA wrote the following: "*Developers in White Plains and Portland would like to ascertain the current state of affairs regarding ATP usage on Cray and CDC mainframes. We would like to evaluate the possibility of cleaning up the universal Fortran code to eliminate constructs peculiar to these two machines. I would like to request that any current user of either CDC or Cray ATP versions acknowledge such usage on the listserver, indicating the vintage of code being used.*" Actually, it is not just Cray and CDC that are involved. Rather, these are the only two modern computers of ATP interest that still used single-precision computation. So, rephrasing in all generality, who still uses or has interest in an ATP version for single-precision computation? If no one responds quickly, the ability to produce such a translation might be lost.

$INCLUDE use with arguments has a 1 in 25 chance of requiring a zero continuation line for the first of five pointer vectors KARD. This always has been handled correctly. What was not handled correctly prior to March 24th was the following four vectors KARG, KBEG, KEND, and KTEXT. These should not be terminated by extra, all-zero continuation lines. This was explained in public E-mail dated March 24th.

Correction: IDG Books is the publisher of *"PCs for dummies"* and other such titles. In the preceding issue, IDG was misspelled as IDL. As for *dummy*, there are several unrelated meanings. The intended one in a 1984 copy of Webster's II new Riverside dictionary would seem to be: *"3. A stupid person: dolt."*