Can / Am EMTP News

Voice of the Canadian / American EMTP User Group

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Salford Compiler and DOS Extender

The version 3.53 compiler FTN77/x86, which dates to 1996 (according to output to the screen), is being used for ATP development at BPA beginning August 17th. No, another copy of the compiler has not been purchased.

Instead, the 90-MHz Pentium across the hall has been abandoned for purposes of compilation and linking. Without serious difficulty, version 3.53 was installed on Dr. Liu's 486 DX2/66 in a new directory \SALFORD This parallels the default \DBOS.DIR and \FTN77.DIR of the old version 1.67 software --- directories that remain loaded, but no longer are being used under normal circumstances. Test cases demonstrated minor differences in round-off error, as expected, and DC-35 requires use of BOTH rather than DISK -- using Dr. Liu's 486 just as was the case using the P90. Otherwise, there were no surprises, and Dr. Kai-Hwa Ger begin distribution of the version 3.53 TPBIG the following day. About Internet access, a special JAUG-dimensioned copy (using command file VARDJAUG.BAT) was sent to Dr. Funaki at Osaka University on August 17th.   The biggest changes from previous list sizes are for Lists 19 and 24: 400K words for TACS and 120 phases of compensation for the maximum 6K nodes. Program tables **are** big: 5115 Kwords (i.e., more than 20 Mbytes).

Noda frequency-dependence was the detail that prompted the preceding compiler upgrade. This was requested in semi-public E-mail of the Fargo list server on August 10th. Since GNU and Watcom translations allowed Noda simulation, why not the Salford TPBIG as made available by Osaka University in Japan? Good question. Time simply ran out on version 1.67   Two or more years of EEUG verification of version 3.53 TPBIG should ensure minimal surprises for everyone else. Rather than continue to explain differences, it is simplest for the rest of the world to join EEUG members in use of TPBIG that is created using the newer compiler. Your Editor continues to use version 2.66 at home, but version 3.53 will be used before home-created changes are seen by others.

Salford FORTRAN 95, a product named FTN95, will **not** be purchased by the Can/Am user group. During the first half of September, this decision was made largely as a matter of principle. The decision followed an unpleasant experience using the Salford Software Web site. Archives of E-mail document the story, which can be summarized for the historical record as follows. First, on September 1st, your Editor sent E-mail having *"Subject: Download Problems."* In considerable detail, this documented unsuccessful submission of the *"Salford FTN95 30-Day Evaluation"* form. According to prominent advertising on the Web site, this was to allow 30 days of trial usage prior to payment. This was to follow a download from the Internet. But, after submitting all required information (name, address, etc.), no compiler could be downloaded. So, your Editor asked: *"Are we doing something stupid? Alternatively, must we wait for your personal approval?"* In his response the following day, Ivan Lucas, described as the Salford Webmaster, explained: *"We don't currently have a downloadable evaluation available. We can send you an evaluation by post. I'll pass on your details to our sales team ... and arrange for them to contact you with regard to evalutating FTN95."* Your Editor was not impressed. Later that same day, he responded: *"Very tricky. When we tried to download, it was in response to such a clear offer. This morning, when I return to your Web page, I can find no trace of the offer. ... From what I can see, you have retracted the download offer since the time we responded to it (less than 48 hours ago). Not nice. Laws are different in England, of course. Over here, you would be in trouble if you attempted such a change. Over here, companies are required to honor their advertising. I am not sure that we are interested, using snail mail. You see, we were in a hurry. This is the way the Internet is. The Japanese user group (JAUG) already had purchased following a 30-day free trial (following an Internet download), and had requested current ATP FORTRAN for FTN77 in order that work on conversion could begin. In response, I offered to do the work, provided we could download and use a free-trial copy of FTN95 immediately. Apparently not. I am very disappointed. ... Meanwhile (no response from Salford within 24 hours), I found the Lahey home page and reviewed their offerings."* About the final decision, read the separate story about Lahey F95, which is being used in Portland as an alternative to Salford FTN95.

PostScript output of a Fourier bar chart was corrected October 14th by the addition of missing bars and also plot termination (showpage). This was within SUBROUTINE DRWBAR. According to the April, 1998, newsletter, HP-GL reform was supposed to be make this universal, with SCRBAR created to contain computer-dependent screen graphics. Unfortunately, that reorganization of December, 1997, did not last long as DISLIN graphics used with GNU ATP required a different module than Salford VGA screen graphics in order not to clip the harmonic numbers at the bottom of the display. About credit for recognizing the PostScript deficiency, realization came during work with DC-42 as part of the Lahey ATP testing (see mention elsewhere). Those hollow rectangles were produced by 5 successive CALL PLOTXX statements in DRWBAR and these had been quickly replace by better RA (rectangle absolute?) commands from Orlando Hevia. Your Editor vaguely recalls manually shading the bars first, and that Mr. Hevia offered RA as a better, single, automated HP-GL command to replace these. Clearly, this was progress for HP-GL, but a disaster for PostScript because the bars no longer were being created by PLOTXX. So, the hollow rectangles have been added back --- but only for PostScript and GNUPLOT output. The RA continues to be used for HP-GL (no loss here). About missing plot termination, Dr. Liu's verification of DC42.PS using Ghostscript (GS) showed that the two bar charts were superimposed on top of the following time plot. Perhaps this always was true (missing PLOTXX should not affect this detail). Anyway, finally, the PostScript has been fixed, at least for GS. On the other hand, bars remain hollow. Any reader who wants the PostScript bars to be shaded is requested to describe a PS command that will do the job. Until then, PostScript bars will remain hollow.

The two minutes digits mm of the time hh.mm.ss in the heading of .LIS and the .PL4 files were incorrectly represented as "nx" prior to correction on October 26th. The first report of trouble came the preceding day, from Orlando Hevia of Universidad Tecnologica Nacional in Santa Fe, Argentina. In a later message, he explained: *"I received a C-like .pl4 file from Gabor, and I discovered the nx in this file. Gabor's PC is preparing to die, too."* This latter sentence is a humorous reference to your Editor's initial reaction of disbelief --- wondering whether Mr. Hevia's PC was showing advance signs of Y2K! Instead, lack of use of KOMPAR < 4 can be blamed for the oversight. Failure to define CHAR2 soon enough within SYSDEP was the problem.

Fortran 95 from Lahey Computer

Lahey Computer has supplied a Fortran 95 (F95) compiler that is being used in Portland to support ATP for MS Windows. Readers will recall that Masahiro Kan of Toshiba Corporation in Japan was the first to experiment with new language F95 for the support of ATP. This was using Salford FTN95 as mentioned in the April, 1999, newsletter. Well, developers in Portland intend to follow this lead, but using a different compiler. By using more than one, chances seem better that universality can be maintained while significant program changes are made.

Price is a dominant attraction of the Lahey offering, which has product name *LF95 Express*. Imagine, a new F95 compiler for just $199. Everyone thought the Watcom offering was cheap at $354 during 1995 (see July, 1995, issue). But that was for an old F77 compiler. Today, Lahey is offering a brand new one (F95) for substantially less. For more information, the interested reader is referred to **www.lahey.com** which first was investigated following

dissatisfaction with business practices of Salford Computer (see opening story of this issue). So, a purchase was made September 15th, and a Lahey CD-ROM was delivered the following day by DHL Worldwide Express.

Fujitsu, the Japanese computer giant, must be mentioned if only because its role is not fully understood. Fujitsu seems to be a partner of Lahey for purposes of F95. The red title line of the *"LF95 Express"* page has title *"Lahey/Fujitsu Fortran 95 Express v5.5"* On the other hand, it is not clear what if any part of the $199 product for MS Windows might come from Fujitsu. Were Linux of interest instead of MS Windows, then *"Fujitsu's Linux command-line FDB debugger"* would have been involved. (the Linux alternative became available September 17th). Also, if one pays more (the non-Express alternative for rich guys is $795 *"Lahey/Fujitsu Fortran 95 PRO"*), additional products and privileges are received, and some of these involve Fujitsu: *"The PRO edition includes the Fujitsu C Language System, Fujitsu Visual Analyzer, Fujitsu Scientific Subroutine Library, and unlimited telephone support."* But who needs these extra things, just to support ATP? Oh, there also is non-Intel hardware. Lahey sells *"Fujitsu Fortran 90 for Sun Workstations"* for $1195. *"Fujitsu Fortran is supported in the Sun OS, Solaris and SPARC64/OS environments."*

Lahey documentation consists of two PDF disk files: 1) 84-page *Express User's Guide*; and 2) 298-page *Language Reference*. The first allowed rapid and simple use from a DOS window. Learning time was minimal. Using the Lahey compiler was very simple. It is similar to Salford's old compiler this way. For $199, Lahey avoids the confusing complexity of more expensive MS Developer Studio (see mention in the April, 1996, issue). Lahey humorously makes this point in advertising that involves a black-background embedded window with the DOS prompt C:\> in the upper left corner. Annotating in white as if by hand at a blackboard, an arrow points to this and explains: *"the Express IDE for Windows :)"* KISS.

The -fix compilation switch was found to be critically important for existing F77 ATP source code. F95 seems to be fundamentally different from F77 in two important ways: 1) continuation lines are not necessarily noted by a punch in column 6; and 2) comment cards no longer begin with a C in column 1. By means of the -fix switch, these two conventions of F77 will be assumed by the compiler as part of *"Fortran 90 fixed source form."* Then ATP source code for Watcom was basically compatible. This was the starting point for the trial conversion: Watcom source code.

The ATP name PROMPT posed a conflict with the Lahey library, it should be noted. It seems PROMPT is the reserved name for some Lahey intrinsic function, so an EXTERNAL PROMPT declaration was required in order to make CALL PROMPT of ATP legal. Alternatively, the ATP name could be changed to avoid the conflict.

Compiler optimization comes in two levels as declared by either -O0 (none) or -O1 (some). Your Editor writes *some* for the latter because resulting ATP simulation speed was not much increased, and not good compared with either Watcom or Mingw32 ATP. On the other hand, no errors were noticed (better than experience with Salford FTN77/x86 or Watcom version 11 as used in Portland). Only one chunk of code was too big or complex to optimize. This was ROOT27 for CABLE CONSTANTS and CABLE PARAMETERS. As expected, splitting the disk file removed the trouble, which seemed to be caused by too much history rather than any particular subroutine. To conclude, optimization was a mild disappointment, and will require further study. Lahey does offer advice that has not yet been followed. Non-optimized Lahey compilation was pleasantly fast, though: about 1.5 minutes on Dr. Liu's 200-MHz Pentium Pro-based PC. This might represent half of Salford FTN77 compilation speed, so is no record. But Lahey compilation of ATP is several times faster than either GNU Mingw32 or Watcom compilation, so is a refreshing change from the alternatives on the NT computer.

Lahey ATP linking follows compilation. At about 11 seconds, this is slow by a good factor of 2 (maybe closer to 3) compared with either Watcom or Mingw32. Yet, Lahey can not be blamed, since the Phar Lap linker is being used. According to Lahey, this is *"tried and true"* (i.e., reliable, but not necessarily fast). Version number 9.2 is seen in screen output along with *"386/LINK"* and copyright dates 1986-98. It looks old, but no complaints. At least one does not pay for every last byte of virtual memory during linking (the Watcom problem). This was proved by compiling and linking VARDIM after an uninitialized COMMON block having 250 million INTEGER*4 words was added. No problem compiling or linking, although execution was refused as follows: "The system cannot execute the specified program." Size clearly was the problem. Execution seemed normal after 3 zeros were removed from the dimensioned size (making thousands rather than millions). Unlike Salford DBOS, it would seem that one **does** pay for unused vector storage at execution time. Yet, nothing like the paging of GNU djgpp at the start of execution was noted. Lahey ATP seems to start instantaneously --- assuming dimensions are not too big. If dimensions **are** too big, then a Lahey-compiled program can not be started at all.

Size of executable disk files produced by the Lahey compiler is a concern. Executable files are substantially larger for Lahey than they are for the old Salford compiler that relies upon DBOS. As an extreme illustration, consider a 3-line program that does nothing but write *"Hello, world!"* on the screen. Compare the Lahey size of 359 Kbytes with the Salford size of 464 bytes --- bytes, not Kbytes! Yet, this is a little unfair since Lahey avoids DBOS which is not small. It is fairer to compare the 359 Kbytes of Lahey with 83 Kbytes for Watcom and 57 Kbytes for GNU Mingw32. Both of these, too, avoid DBOS. Records can be found as disk files HELLO.* in all

3 directories of Dr. Liu's Pentium Pro PC that runs NT. Your Editor offers two conclusions: 1) the size of Lahey executable files is large compared with the competition (Watcom and Mingw32); and 2) we have yet another reason to believe the world might have been better if David Bailey (the DB of Salford DBOS) controlled operating systems of the world instead of Bill G.

BENCH-1 is the extended version of DC-1 as should be explained elsewhere in this issue.   Execution using unoptimized Lahey ATP is a little slow: about 34 seconds rather than 25 for record-holding Mingw32. Optimization (-O1) did not change this significantly, either.

The same DISLIN graphics code used with Mingw32 ATP could be used with Lahey ATP, although purchase would be required. The German price is 250 DM plus tax or $150 according to web site advertising to which Lahey provides a link. Developers in Portland are still thinking about this possibility. Meanwhile, …

Free OpenGL graphics have been tested using the new Lahey compiler. Recall OpenGL is the same name that was used with the Watcom compiler by Robert Schultz and Robert Meredith of the New York City area. This can be noted in newsletters beginning with the July, 1997, issue. Use of OpenGL with the Watcom compiler might well have required extraordinary ingenuity, so at the time it was considered to be an ATP secret of the NYPA Bobs. But times change. There is no OpenGL secret for Lahey, which prominently announces on its home page under the section heading *"News: ... Download the Lahey LF9x port of f90gl, a Fortran 90 interface to the OpenGL libraries."* In fact, the download was performed before the compiler was purchased (why not? As with GNU, the price was right)! For weeks, nothing was done with the package, however. Then, early in the morning of October 21st, your Editor found a note from Dr. Liu that stated: *"Lahey's OpenGL. Line, text can be done now. dum.exe <CR>"* On the screen was a window that included both a diagonal straight line and 4 text lines. The first of these states: *"This is written in a GLUT bitmap font."* The third explains: *"(positioned in pixels with upper-left origin)."* The graphics are window graphics, and each time the program is run, a new window is created. A mouse click on the "X" box in the upper-right corner closes the graphic window. Your Editor could pop windows, and move other windows on top;   there was only momentary erasure.   Later that morning, your Editor programmed a loop around Dr. Liu's straight line. This provided an elliptical spiral from the border to the center of the window --- 1000 points spread over some 15 revolutions. The following morning, your Editor found that Dr. Liu had changed the size of the window to full-width, relocated it on the screen, widened the pen for the curve, and added colors to both text and the curve. Yet, the display remains instantaneous (just the blink of an eye), it should noted. Lahey OpenGL graphics are plenty fast. On the other hand, they also are voluminous, for reasons that are not yet appreciated. More study will be

required. Files are stored in C:\LAHEYGL\EXAMPLES Addendum early in the morning of October 28th: Upon arriving, your Editor found a window containing text rotated 90 degrees. Following translation and rotation, a short character string is in a location that would be appropriate for Y-axis labeling. The last of the tricks required for a nice-looking screen display of CALCOMP PLOT seems to have been mastered. Also, a stroke font has replaced earlier use of a bit-mapped font. Imagine, all of this without a book!

News from Outside USA and Canada

Can Iran be mailed ATP materials from the USA as easily as any other foreign country? This question has arisen from time to time --- most recently in the form of E-mail from one Moosa Amiri of the Niroo Research Institute of the Ministry of Energy in Tehran. Dated August 23rd, this stated: *"... I use ATP version of EMTP, developed at 1987. Now I require a copy of ATP for Windows with its Theory and Rule Books."* Your Editor's response later that same day suggested semi-public discussion: *"The subject of ATP use within your country arises from time to time. As with Libya, until our two countries re-establish diplomatic relations, it probably is easiest for you to approach some other supplier. Let me show you what was published in our April, 1997, newsletter ..."* About sending books and computer disks to Iran, your Editor concluded: *"I do not know if it is possible. I can not recall anyone answering this question definitively. My guess is that Iran and Libya might be treated comparably by the U.S. government. That provides enough incentive not to try. Instead, maybe you should raise the subject once again via Fargo ... I have just checked the list of subscribers, and there are 4 from Iran. One (Ali Shirani) seems to be from your institute."* There has been no response to this suggestion, however. About Iran, what user group is able to ship ATP materials there without any extraordinary complication?

Mysteriously encoded messages from Korea were explained in the July issue. Well, the problem occurred again during late September when four such messages were received from the Fargo list server. These began September 26th, when only the *Subject:* was in English: *"Help me ! (I'm searching materials for machinery.)"* This came from someone within KERI, which uses domain name **keri.re.kr** The person will not be identified since he obviously was struggling with the language used by his computer, and meant no harm. His 3rd message had *"Subject: I'm sorry.*

One more ..." Finally, Ralph Folkers of Schweitzer Engineering Laboratories in Pullman, Washington, USA, is to be thanked for an English-language copy. Dated September 28th, Mr. Folkers preceded his message with a short note that explained: *"This gentleman is having problems getting through. Here's the decoded version."* To conclude, the need for moderation (approval by a select group of subscribers) of the Fargo list server continues.

Progress of the Indian ATP user group was received from Prof. Hariharan in E-mail dated October 3rd. Recall the last previous mention was in the January, 1999, issue. Well, the latest message was sent to JAUG (the Japanese ATP User Group), which maintains the records that control access to its Internet storage of ATP information. It documented ATP licenses numbered 22 through 26 for India.

"Apple drops British English MacOS" is the headline of a story found at *The Register* the morning on November 6th. Since *The Register* is London-based, the perspective is interesting. The story mentions the MacOS distinction between *wastebasket* (British) and *trash* (American), and AOL's distinction between *post* (British) and *mail* (American). More than just a matter of national pride is involved. Some users *"grumble about the lack of UK-specific plug-ins for the MacOS' Internet search technology, Sherlock. More worrying is the effect on software, most notably QuarkXPress, which requires a localised version of the OS."* But there will be gain as well as loss: *"Our take on the issue is rather more positive. Having been forced in the past to wait months for Apple to localise the MacOS for UK Macs, it will be nice for once to get the damn thing immediately."* About spelling, note the British *localise* above, which American Bill G underlines in red as a spelling error (s should be z) in Word. About conspicuous environmentalism, *Recycle Bin* is the WinNT 4.0 name for the waste basket. Shame on Steve J.

More about the Internet and E-mail

Supermarket or delicatessen shopping via the Web is the revolutionary business of Webvan Group, Inc. of Foster City, California. *Wired News* of **www.wirednews.com** is another of Walter Powell's favorite Web sites, and a story about Webvan was found there within the Business section on July 10th. The previous day, Clark Howard had discussed the subject at length during his daily radio show (see **www.clarkhoward.com** for details). About the name, a van is a small truck --- presumably used to delivery the groceries that are ordered via the Web. The story about Webvan was dated July 10th, and was written by Joanna Glasner. She observed that Webvan, *"founded last year by bookstore magnate Louis Borders, currently offers grocery deliveries only in the San Francisco Bay Area. However, it is looking to build a nationwide chain over the next two years, with a second warehouse slated to open in Atlanta early next year. ... The privately held*

company has so far raked in about $120 million in start-up funding and will probably be taking out loans for the bulk of the project. ... Webvan faces competition from PeaPod.com, which owns warehouses in Boston, Long Island, Chicago, and San Francisco, as well as from NetGrocer, which ships groceries to customers through Federal Express." For details, consult **www.webvan.com** itself. About *Wired News*, this is a service of *Wired Digital* in San Francisco, California.

"Used-car shoppers use the Web" is the title of a story dated August 3rd. From **latimes.com** of The Los Angeles Times: *"One in four people shopping for a used car goes to the Internet for help, according to a study. ... The nearly 10,000 used-car buyers ... said they most frequently visited the Web site of Kelley Blue Book for pricing and other general information."* Readers who have not seen this are encouraged to take a look. Like telephone directories (see *Yellow Pages* in the July, 1996, issue), car pricing seems to be another ideal application for the Internet because there are so many different brands, and years, and equipment choices. Yet, **www.kbb.com** seems to offer everything at no cost. Motorcycles and new cars, too. It is amazing. So how can Kelley afford to keep the site running? Advertising is not conspicuous, although there **are** links to car manufacturers and sources of financing.

Free E-mail is offered by many sites on the Internet, with Yahoo mentioned in the April issue. What was not mentioned, however, is the length of the offer. At the top of Yahoo's home page, as investigated July 14th, was the following: *"Yahoo! Mail. Free email for life."* But whose life? I.e., how good is the promise? Clicking on this link, and then *Terms of Service* at the bottom of *Welcome to Yahoo! Mail*, shows a long set of rules that begin as follows: *"Yahoo provides its service to you, subject to the following Terms of Service ("TOS"), which may be updated by us from time to time without notice to you."* To conclude, the free E-mail service seems to be guaranteed for the life of the free E-mail service!

The S&P 500 has been mentioned without explanation more than once in writing of years past. Now, with the Web, it is possible to refer any interested reader to easily-accessible information. Web site **Indexfunds.com** is run by IndexFunds, Inc. of Austin, Texas. It is unclear who or what pays for this, since nothing is being sold overtly. There **are** inconspicuous links to many companies, however, and revenue from these may be all that it takes. In any case, there is a lot of good information about various financial indices and index fund investing --- today dominated by stock mutual funds that track the Standard & Poor's (S&P) 500. This is basically a size-weighted average of the 500 largest American companies, which represent about 80% of the value of public corporations in America. The full address is **www.indexfundsonline.com** which was discovered by clicking on a link near the bottom of Bob Brinker's Web page **www.bobbrinker.com** Bob Brinker, in turn, is a popular radio talk show host. He, too, has gone

global, and can be heard anywhere in the world via radio stations that pipe his weekend broadcasts (*"Money Talk"*) to the Internet. Details are available from his Web site.

Major newspapers of the country can be searched by the general public, although copies of articles generally are not free. The *Atlanta Journal and Constitution* of Atlanta, Georgia, provides an illustration. Begin at **www.ajc.com** and click on *"search the stacks"* in the left margin to find: *"Welcome to the Stacks Archive of Atlanta Journal and Constitution staff-written and other selected articles from 1985 to the present! Find stories related to your topic by entering a question, keyword, phrase, or proper name. ... Your searches are free of charge. However, to retrieve the full text of any articles, you must first purchase one of our Electronic Library Cards or subscribe to the Stacks Archive. ... Articles in the Stacks Archive do not contain photos or other graphics." About cost: "Charges apply when you click on a title from your search results list. At that time you will be prompted to enter a method of payment and select one of several options for purchasing our service. Individual accounts: For $5.95, you can get an Electronic Library Card, good for viewing the full text of 20 articles or 24 hours (whichever comes first). ... For $9.95 per month, you can subscribe to the Stacks archive service on an ongoing basis."* At the bottom of Web pages is seen *"Copyright © 1998 Cox Interactive Media, Inc."*

Domain names that involve trademarks owned by others have been in dispute, and fast-food giant Wendy's has countered with aggressive legal action. *"Firm Sued Over Domain Names"* is the title of an AP story found on the ABC News Web site September 10th. Being sued is one *"Brenan Hofstadter and his company, Beswick Adams Corp."* of Dallas (presumably in Texas). According to the suit filed in U.S. District Court in Columbus, Ohio, Wendy's uses Web address **www.Wendys.com** whereas four similar Web addresses --- 1) **Wendys.org** 2) **WendysRestaurant.com** 3) **WendysRestaurants.com** and 4) **WendysIntlInc.com** --- were registered by Beswick Adams. Why? Financial gain, of course: *"The suit alleges Hofstadter devised a scheme to extort payments from Wendy's and at least 10 other major U.S. companies. ... The Wendy's suit says Beswick Adams also has registered Web sites in the names of Miller Brewing, Taco Bell, State Farm Insurance, Coca-Cola, Pepsi-Cola, McDonald's, Ameritech, Sony Corp., Subway restaurants and Burger King."*

The Internet has 150 million users, if one can believe a story that was found at *The Register* September 13th. One Frank Gens of IDC gave this current estimate, explaining that the number stood at 19 million just four years earlier. He also predicted "500 million users by 2003" when *"European Internet use will overtake the US."* This was *"at the IDC European IT Forum in Paris this morning."* About such a shift of power, story author Graham Lea observed that *"nothing was said about the cultural differences, and the reluctance of European users to use*

credit cards online." Why? Is loss not limited in Europe as it is within the USA? By federal law, the American owner of a credit card is not responsible for more than $50 of fraudulent use by others. This is provided an appropriate report is made in writing (i.e., all incorrect charges are contested using the back of the bill) within 60 days. What credit card holder in Europe does not enjoy similar protection?

"UPS OnLine Courier makes use of the latest technology to overcome the obstacles that you normally face with secure e-mail." This is the way United Parcel Service (UPS) describes its recent adaptation to the Internet. According to UPS advertising: *"The process works like this: ... The document is securely uploaded to the secure UPS OnLine Courier server. The secure UPS OnLine Courier server sends an e-mail notification to the recipient that there is a document delivery for them. The recipient uses the URL provided in the e-mail to download the document from the secure UPS OnLine Courier server via a Web browser. As an option, the sender may specify that the recipient may only download the file if they've (sic) obtained a password from the sender, ensuring the sender that only the intended recipient may open the delivery. For less confidential documents that don't require this optional security measure, the sender can deselect the option, yet still have all the ease of use and tracking capabilities --- at a lower price."* For more information, begin at the UPS home page **www.ups.com** (viewed September 12th).

American political campaigns are using the Web. Bill Bradley, former New Jersey Senator and professional basketball player, is the only Democrat who has had the courage to challenge sitting Pres. Bill Clinton for their party's nomination for President in next year's elections (November, 2000). The Internet is an important tool of the campaign, if one can believe a *Wired News* story by Lindsey Arent dated August 18th. Before Bradley *"travels anywhere, staffers send out a flurry of emails days ahead, alerting local supporters to upcoming events and rallies. Wherever Bradley goes, a staff photographer follows, snapping numerous digital photos, which are then emailed to Reed, who promptly slaps the best ones up on the campaign Web site. For the Bradley camp, the Internet has played a key role in an underdog campaign."* Why the need? Clinton controls the party machinery, and favors Al Gore, *"the incumbent Vice President who has every institutional advantage."* According to the Bradley campaign's Internet consultant, Lynn Reed, the Internet *"is not replacing TV or radio, but it is supplementing almost every aspect of what campaigns do --- fundraising, organizing, public relations. It's a tremendous tool."*

How is FAX surviving and/or adapting during the Internet revolution? Web site **www.efax.com** summarizes one of the more interesting ways: *"eFax.com lets you receive all your faxes at your existing email address! Easy to afford -- In fact, it's free! No setup fees, no per-page charges, no hidden costs. Easy to get started -- Go to the*

sign-up page, fill in the information, and get your personal eFax.com number. Easy to use -- Customers, co-workers, friends or family members simply dial your eFax.com number to send faxes from their computer or fax machine. Easy to receive -- eFax.com documents look and work just like emails with attachments. Just open the attachment in the eFax.com Microviewer and see your fax on-screen, print it out, or forward to other email addresses. It's that easy! ... eFax.com is a publicly traded company (EFAX)."

Credit cards might yet be honored by ATP user groups, thanks to progress related to the Internet. Recall that the mention in the July, 1997, newsletter was not optimistic. However, the context must be recalled. That pessimistic report followed a discussion with EEUG Chairman Kizilcay, who had made inquiries of banks in Germany. Banks, of course, are part of the profitable and exclusive old-world system of finance. The Internet offers newer and cheaper alternatives --- at least in the USA. Clark Howard mentioned warehouse retailer COSTCO during his October 1st radio program, and your Editor found interesting information at **www.costco.com** the following day. Pull down the *"member services"* menu at the top, and click on *"credit card processing."* Below the heading "Low rates and no monthly fees of any kind," one learns: *"*) 2.04% for mail order or phone order merchants plus $0.28 per Visa and Mastercard transaction. ... *) One time $25 application fee; *) Low $20 monthly minimum."* For the record, Nova Information Systems, Inc. provides the service, *"for more than 400,000 merchant locations."*

"Talk forever for free" is the prominent title used by **www.aplio.com** as mentioned October 14th by Clark Howard. The subject is Internet telephoning, as first mentioned in the April, 1995, newsletter. The cost is just under $200 for each phone --- dedicated hardware that removes former reliance upon a general-purpose computer (e.g., a PC). *"It's easy to setup because it attaches to your existing telephone just like an answering machine."* Of course, the user does require a local telephone and also his own Internet access. About quality, the claim is *"true telephone sound quality."* Well, maybe --- at least some, or even most, of the time. But can you imagine during rush hours on the Internet? About availability, *"the Aplio/Phone is as close as your Office Depot store. With 780 stores around the U.S. ..."* About impact, a *Newsweek* story dated April 12, 1999, states: *"Losing revenue to the Internet hasn't been easy for traditional phone companies to swallow. The major carriers initially dismissed Internet telephony and VoIP as a hobbyists' obsession, like ham radio. Instead, it's becoming a cash cow."* Here *VoIP* stands for *voice over IP* where IP indicates *Internet protocol*. AT&T's Burke Stinson predicts that *"the entire telecom industry will retool its networks to use the Internet for cheap transmission of voice, data and video."*

Gambling on the Internet has encountered a serious problem as documented in a story of *The Register* dated October 15th. *"Woman walks away from $70k online gambling debt"* is the title of a sarcastic account about a California woman who gambled her way into serious debt using credit cards. After losing, she was sued by these companies as well as her bank (the notorious Providian National) for the debt. But she counter-sued, and won. *"MasterCard and Visa are unable to collect online gambling debts according to California state law."* California is one of those states (see the January, 1998, issue) that considers Internet gambling illegal, and contracts involving crime generally can not be enforced by law. Makes sense to this American (it did not to the author of the British-based publication). It would seem that those American Indian tribes must henceforth insist on cash, which is not easy to send over the Internet. Alternatively, they themselves could assume the liability for debt (not likely, for an unknown Internet address in cyberspace). To conclude, police may have had a partial last laugh without extended litigation.

Web site tricks and/or graffiti are the latest challenge to high-profile candidates for political office in the USA. Hillary Rodham, the wife of President Bill Clinton, is considering a possible bid to become a Senator from New York. She has a Web page, which some hacker managed to connect to www.hillaryno.com (a site that is run by opponents). Then Presidential candidate Bush was victimized. The title of an AP story dated October 19th was: *"BushwHacked! Candidate's Web Site Hit With Graffiti."* Note the pun (in the wild west, to bushwhack someone was to shoot him in the back). The story explained: *"Hackers vandalized the campaign Web site for presidential candidate George W. Bush early today, briefly replacing his photo with an image of a hammer and sickle and calling for 'a new October revolution.' The embarrassing lapse in computer security came the day after the Bush campaign launched what it described as its 'innovative new design' for its Internet site, www.georgewbush.com ...The Web site runs software from Microsoft Corp., called Internet Information Server, that has suffered several serious security problems during the past year. Microsoft has distributed patches in each case but relies on local computer administrators to install them correctly."* In the case of the Bush site, an AP investigation found *"computer files plainly visible that experts recommend deleting for security reasons. One file includes instructions for users to edit Web pages on the site."* So users sometimes are careless. How about MS itself? Read on.

"A Microsoft-operated site was cracked and defaced Monday by someone calling himself 'flipz.' It was the first time a Microsoft Web site has been breached successfully. Microsoft downplayed the first-of-its-kind attack, pointing out that the vandalized site was relatively obscure. A Microsoft representative, speaking on condition of anonymity ..." Thus began an abcnews.com story dated October 26th. *Speaking on condition of anonymity*? Learning the truth about MS has become as difficult as learning the truth about what goes on within the White House or the Pentagon!

European EMTP User Group (EEUG)

The EEUG Web site is maintained by Laszlo Prikler of T.U. Budapest in Hungary. Your Editor had stumbled onto this site for the first time in many months, and had written several complimentary observations. In a response dated August 23rd, Prof. Prikler explained several interesting things including his opinion about complexity and cost: *"Most of the HTML coding was done in '98 as part of my contract with EEUG Association. It was paid by EEUG, so it must look a bit more professional than my voluntary work. ... It is difficult to compete with commercial web sites --- too much work for nothing. Once I tried to modify the menu at left on the EEUG Web site with Java-based 'live' 3D menu bars. I.e, the surface of the menu item changes when the cursor is on top of it or when a mouse button is clicked and released. Not an easy task, and not so important for the purpose the Web site was designed for."* Your Editor had observed that the display of some file using Acrobat was slow, and had speculated: *"Maybe Acrobat required loading, or the file had to be loaded entirely before Acrobat would display anything. Anyway, after the initial delay, everything was responsive."* Prof. Prikler confirmed this: *"There is a check box somewhere in the Acrobat reader which controls this. I.e., either wait until the last byte arrives or display the first complete page and download the remaining part in the background."*

Instability of the saturable TRANSFORMER component has been mentioned from time to time --- most recently in the July, 1998, issue. No, not yet a continuation of that story from Prof. Xusheng Chen of Seattle University. But there would seem to be improved understanding in Europe. Your Editor was privileged to be able to review an advance copy (actually, a draft copy) of a paper by Prof. Mustafa Kizilcay of FH Osnabrueck in Germany. To be presented at the 1999 EEUG meeting in Italy, this has title *"Remarks on Modeling of Three-Winding Transformers using Saturable Transformer Component. Part 2."* The Abstract follows: *"This paper is the continuation of the contribution on three-winding transformer modeling using Saturable TRANSFORMER Component (STC) in ATP presented at the EEUG Meeting 1998 in Prague [1]. Because of the star equivalent used by STC, negative winding reactance may appear in the representation of a three-winding transformer. The phenomenon of unstable numerical computation due to negative reactance has been investigated closely in this paper and the origin of instability is verified by means of test cases."*

Prof. Kizilcay confirmed that his new Internet address **m@kizilcay.de** was adequate for receiving updated GNU ATP. This was November 5th, the week before the annual EEUG meeting in Italy, when he wrote: *"Downloading of TPFGH.ZIP and REST.ZIP was no problem, both files arrived ... in good condition. A plus for the new Internet provider!"* Yes, although a delay of one day delivering the packages remains unexplained. Bernd Stein was sent a copy at the same time (using "cc"), and he acknowledged reception at FGH in Mannheim, Germany, the preceding day. Why the one day of delay in Osnabrueck?

Watcom ATP for MS Windows

Robert Meredith of the New York City area carefully explained demands on memory during Watcom ATP linking. This is a continuation of what was begun in the preceding issue. *"Linking with Watcom takes me an incremental 60 MB above the normal 50 MB of usage. My LABCOM was about 4 MB, the last I looked. Linking is readily accommodated by use of about 50 MB of swap file, above and beyond the real 64 MB of memory. It takes well less than a minute, probably 15 seconds plus or minus on my 166 MHZ."* But your Editor objected: this is for normal-sized tables. Try much larger sizes. So, Mr. Meredith did, with the result reported in E-mail dated March 31st: *"OK, I experienced some of your problems. I increased LABCOM tables to 40 megawords and encountered the following error with 250 MB available: ... Error(3009): dynamic memory exhausted. ... I increased my swap file to 700 MB, just to be sure. Now linking took longer -- 8 seconds instead of five. ... Peak swap file usage was 420 MB, confirming your assertion that more was needed. My LABCOM tables now: ... Total size of LABCOM tables = 39671359 INTEGER words. ... It does take a bit longer to run dc1, without LISTSIZE.DAT It is usually under 10 seconds. ... WNT was using about 48 million bytes before linking, so 417 - 48 = 369 million bytes to link ATP with a 317 million byte LABCOM size. That represents about 52 million bytes of memory use above and beyond obvious LABCOM and WNT requirements. ... I can confirm that the 'peak' committed memory from the performance monitor is very accurate. I was unable to link with 'Limit' = 413 million bytes. However, I could link in the same 7.5 seconds with 423 million bytes available. Remember the 'Peak' was measured as 421 million bytes. Enough is enough and nothing less will do. Watcom does not even attempt to use the memory, unless the peak requirement is there. The 'peak' usage does not move from 48 MB when it fails to link -- a graceful failure. Third, I can confirm that nearly the same 'Limit' memory is required to run ATP as to link it. Running the gigantic ATP, with or without LISTSIZE.DAT = 3 x default, required 417 million 'peak' bytes available. Again, having 413 million available was not enough to run it, **even with small LISTSIZE.DAT**! The error message 'The system cannot execute the specified program' appears if the 'Limit' is less than 417 million bytes. This is a **very** graceful failure. ... So I think it is fair to say that anyone wishing to run the Watcom version of ATP must have a total of real and swap file memory of about 80 to 100 MB more than the size of LABCOM in MB. That allows 50 MB for the WNT operating system plus the 30-50 MB otherwise unaccounted for in program requirements. ... If you are*

taking minutes to link, it must be because you are forcing the operating system and the linker program to swap out, not just because of the linker creating some large one-time tables in swap memory. I still link in seconds, apparently because my 64 MB of real memory can hold all the operating system's 48 MB requirement and still find room to swap the rest out. You need 64 MB, badly."

"Watcom an Orphan?" was the subject of semi-public E-mail by Mr. Meredith dated October 9th. This critical response to your Editor's advocacy of GNU Mingw32 ATP was not at all understood or appreciated. Although your Editor did refute publicly Mr. Meredith's assertion about an orphan later that same day, he chose not to respond to various other accusations: *"Anger seems to have clouded Mr. Meredith's interpretation --- of both writing about Watcom and thinking in Portland. The preceding is just the first of several assertions that could be contested vigorously. But why bother? The bottom line is this: the average ATP user should have no interest in Watcom ATP today unless it is superior to Mingw32 ATP in some sense. What is that sense? Nowhere in Mr. Meredith's writing does one find an explanation."* Following substantial explanation about relative merits of the two versions, the message ended as follows: *"Back to the challenge: In what way is existing Watcom ATP superior to existing Mingw32 ATP? Unless we can find a significant one, ..."* Your Editor is still waiting for the first way. As for the unanswered accusations, if any reader has concerns, he is advised to write privately.

News About TACS and MODELS

The Type-13 TACS-controlled switch has been generalized so that switch opening can be delayed until the first current zero. The command DO NOT OPEN UNTIL CURRENT 0 will have this effect. Recall, as coded by author Dube (see Section VI-D of the Rule Book), a Type-13 switch will open if the CLAMP signal of columns 71-76 is not positive. But when will it open? Dube would open the switch immediately --- even if it is carrying substantial current. But for engineering applications, one often wants to wait for the next current zero. This observation first was made by Orlando Hevia of Universidad Tecnologica Nacional in Santa Fe, Argentina, in E-mail dated September 9th. Of course, Mr. Hevia could himself (in TACS) monitor the switch current, and delay the non-positive signal CLAMP until a zero is detected. But this represented a substantial, low-level burden on the user. Mr. Hevia wondered why ATP did not take care of such work internally. Your Editor agreed: it makes sense to transfer the burden from the user's data to code. Burden is the right word, too. Mr. Hevia explained the difference for his data in E-mail two days later: *"The burden for the user would be reduced a lot. A TACS generated signal then could control the open-close-open action of a single switch, without the added resources of a resistor separating two (or three, in*

some cases) switches. This would be for each phase at each end of a line, so 12 switches, 12 resistors, and 12 more buses. A new switch type would reduce this to only 6 switches, no resistors, and simpler logic in TACS." In 3 words, a great idea. Operation began September 15th as illustrated by the new 4th subcase of DC-19. See associated comments for details of format and an alternative numerical (as opposed to English-language) request.

PTI's transient stability program seems to offer MODELS. Page 294 of the IPST'99 *Proceedings* ends with the following reference: [4] L. Dube, 'User Guide to MODELS in PSS/E', DEI Simulation Software, August 1998. Of course, PTI is Power Technologies, Inc. of Schenectady, New York.

DEC ATP for VAX / Open VMS

If the date and time are used to name .PL4 files, there are fundamental differences compared with PC versions. VMS offers long names, and these are being used. Also, there is no need to perturb the time, for the 2nd or later such file within the same second (possible even if real time is used rather than WW I time). Thanks to version numbers, a separate version always should be created (i.e., STATUS = 'NEW' is used on the OPEN statement). A version number should be included as part of the file name in the heading that begins .LIS output, it is to be noted. So, to produce identical .LIS files (value KOMPAR = 4 is used for verification of all standard test cases), PLOT*.PL4;* are deleted as execution begins. With name structure plotyymmddhhmmss, this becomes plot181111110000 for the armistice that ended the First World War, of course.

Compaq has experienced financial trouble recently, and different observers point to different problems. A quick company response was the much-publicized termination of Eckhard Pfeiffer, who had been involved in the purchase of DEC (see the April, 1998, issue). According to a story dated July 23rd, available from *The Register*, the DEC acquisition has had a huge impact on Compaq in Europe: *"The mistake was so big that many thousands of individuals in Compaq Europe could possibly lose their jobs in the next six months ..."* Why might Pfeiffer have decided to purchase DEC? *"John Rose persuaded and reminded Eckhard Pfeiffer of his egregious plan to become a $100 billion corporation by the end of the century. Eck demurred, but Rose persuaded him. And so the deal was done."* This sounds something like Novell's misguided purchase of WordPerfect (see the April, 1996, issue).

Open VMS as opposed to VAX operation and testing is to be considered first by Stephen Boroczky of TransGrid in Sydney, Australia. Files finally were sent from BPA on July 23rd. More precisely, this was when shipment first was attempted. But packages bounced, and completion required

three more days (the weekend). In any case, it is worth documenting Dr. Liu's great discovery about MS-DOS COPY for the removal of version numbers. The problem is this: since E-mail operates from an Intel PC, it was necessary to pass many files from VAX to the PC using software from Hummingbird Communications --- a program that runs under MS Windows. The result was VAX version numbers. On the PC, DIR would show a name such as VAXMODS.FTN;2 with the ;2 being part of the WinNT name. Unfortunately, PKZIP would modify this to VAXMOD~1.FTN in the absence of remedial action.   As for Dr. Liu's discovery,   COPY DC* \DUM*.DAT worked for the 114 data cases. This removed the semicolons and numbers following them.

JARRAY is the enormous vector that once was used to store program tables (e.g., for restoration at the start of each energization of a Monte Carlo simulation). Prior to the Schultz Revolution in the fall of 1993, this was used because tables were assumed to be full, and transferring such volume to and from disk was substantially slower than using RAM. But Robert Schultz's compression eliminated much of the benefit. See the April, 1994, newsletter for mention of compression to RAM for VMS. Data typically is much smaller (i.e., tables are nowhere near full), so the value of using RAM is reduced. Yet, dimensioned size of JARRAY could not be reduced because the worst case required accommodation, and this corresponded to full tables. Even that was tolerable, until limiting dimensions began approaching infinity without any end in sight. For example, the burden of JARRAY for GNU ATP would exceed 8 Mbytes (2069 Kwords). Since other popular versions (Watcom and GNU) already have abandoned the saving of tables using JARRAY, it seemed appropriate to make the change for VMS ATP, too. This was done September 9th, when List 29 in VARDIM20.COM was changed from blank to 300 (which is essentially zero). Solutions of test cases were unaffected, of course.

L23TOT is the limit on working space to perform statistical tabulations in DICTAB. For Salford EMTP, there never has been a problem of overflow following the expansion mentioned in the July, 1997, newsletter. But other versions do not enjoy this advantage. Specifically, VMS ATP was limited to the total size of SPACE1 and SPACE2 blocks. This is better than the minimum size of List 23 by nearly a factor of four. But still, it could be easily overflowed by an arbitrary increase in the number of energizations. This happened to BPA's Dan Goldworthy early in September, when he attemped 3000 (unheard of a decade ago). Curiously, though, execution was not halted during the energizations. Instead, following energization number 3000, requests for statistical tabulation were rejected as first understood by Dr. Tsu-huei Liu on September 9th. There was adequate space, but an indexing error in DICTAB prevented the use of approximately half of this until later that same day. Any version created after this date will have about twice the space at no extra cost. There is not any more space for the accumulation of

extrema (the energizations themselves), but there is an increase for subsequent tabulation.

Brain - Damaged MS Windows

"Waiting for Windows Refund Day" is the title of a *Wired News* story by Chris Oakes. Dated July 24th, this explained the hope of some who want to avoid MS Windows: *"If you don't use Windows, why should you pay for it? That's the logic driving a group of Linux users who want to make good on a tiny clause built into the Windows end-user license. The clause offers a refund to PC owners who buy a computer preloaded with Windows 98, but don't use the operating system. If it gathers steam, their effort could lead to legal action requiring Microsoft and PC vendors to make it easier to opt out of using the Windows OS on their PCs."*

"... when the BSA cracks down on piracy overseas, it's Bill Gates who turns out to be the pirate. Representatives from rival firms complain that Microsoft is abusing its power within the BSA to speed its global dominance." Here BSA stands for Business Software Alliance --- a group that tries to prevent software piracy around the world. The charge against MS was made in an article in   *Mother Jones* magazine, as reported by *The Register* in a story dated July 23rd. The title of this was *"BSA accused of dancing to Microsoft's tune."* Included were signs of dissatisfaction among members, such as: *"The magazine also claims that Novell is just one software vendor to have parted company with the BSA."*

MS payments to politicians and their friends have become conspicuous as a verdict in the government's case against MS nears. Dated October 22nd,   *The Register* published a story by Graham Lea that nicely summarizes the problem. MS is prepared   *"for adverse findings, with lobbyists at the ready in all states that are participating ... The thrust of the campaign was going to be that the economy would suffer as a result of any persecution of"* MS. *"Between 1997 and 1998, Microsoft tripled its total political contributions of soft and hard money ... The soft money includes paying for parties and supporting advertisers that back approved candidates ... In March Microsoft sponsored a table at a National Republican Congressional Committee fund raiser, and although the table fee was on $25,000 it is normal practice for much larger sums to be give. Time magazine reported its belief that the committee had asked Microsoft for $1 million. ... Gates is reckoned to be a closet Democrat insofar as he cares about politics at all."* About applicable English proverbs, two come to mind: 1) *"penny wise and pound foolish*; and 2) *"a stitch in time saves nine."*

Caldera in Utah represents a continuing problem for MS as the government's case advances in the nation's capitol. Two separate stories dated November 5th were found on

The Register to summarize progress. The first story has headline *"Caldera wins another round in MS antitrust case."* About timing, MS *"did everything possible to delay the Caldera case while it was engaged with the DoJ, but now the worst possible scenario has arisen: the Caldera case will go to trial on 17 January, probably between Judge Jackson's findings of fact and the next hearings on remedies. The Caldera case will diffuse Microsoft's major argument that the DoJ case is an example of the US government having acted improperly against Microsoft. Even worse, there will be a jury for the Salt Lake City trial, and Caldera is a local favourite."*

"Guilty: judge rules MS has monopoly power, and abuses it" is the headline of a story found at *The Register* the morning after the historic verdict was issued in federal court in the nation's capital. Dated November 6th, this story begins: *"Judge Thomas Penfield Jackson found Microsoft guilty of antitrust law violations, and held that the company unfairly and illegally wielded monopoly power. In unusually strong language, Judge Jackson's 200-plus page finding of facts came down in favour of the Department of Justice's case in virtually all areas."* About timing, a *Morningstar Newswire* story dated 18:37 the preceding day emphasized Wall Street's perspective: *"Government Wins Round One Against Microsoft. ... On May 18, 1998, the U.S. Justice Department and 19 states began a landmark antitrust trial against Microsoft MSFT. ... In findings released after the close of trading today, U.S. District Court Judge Thomas Jackson ruled the firm had a monopoly for personal computer operating systems. ... Microsoft stock is trading down in after-hours trading and could flounder until the matter is resolved. In the meantime, the managers of the many large-cap growth funds that have loaded up on the stock -- such as Janus Twenty JAVLX ... --- are likely pausing for second thoughts."* As for *The Oregonian*, its banner headline the following morning was: *"Court: Microsoft a monopoly."* An *ABC News* story begins its summary as follows: *"In a crushing blow to Microsoft's antitrust case, a federal judge Friday ruled that the software company does indeed hold a monopoly thanks to its pervasive Windows operating systems."* To conclude, much bad press for Bill G and MS as this story is being closed before noon on November 6th. More next time, of course. This is a **big** story --- the biggest court case affecting computers since DoJ failed to break up IBM a quarter of a century ago.

Real - time EMTP - like Simulation ?

"Real-time simulation based on EMTP" was the Subject of semi-public E-mail that began considerable discussion of the subject. This was August 23rd, when Didier Wiot wrote: *"In the context of deregulation of the Belgian power grid, we at Laborelec and Electrabel are willing to review our test methods and the tools which are being used today for the test of protection relays and secondary systems in*

general. *ATP-EMTP has now been accepted as a new base for the simulation of transient phenomenon but some people would like to go further with the program, I mean go real-time."*

The first to respond was your Editor. Later that same day, he asked more questions than he answered: *"Only for testing the relays? Or do you want real-time ATP simulation? These are two quite different situations. Many organizations, including BPA, have tested relays in real time using ATP. But the ATP signals have been generated ahead of time --- and much more slowly --- as part of a separate, preceding simulation. Using iteration, one should be able to account for relay operation during the ATP simulation, of course."* The idea of iteration was explained in detail. This concluded: *"That would be one iteration. Using the revised ATP signals, the relay evaluation would be advanced to a later time. Each relay operation would require one adjustment to the ATP data, to produce correct signals. This would constitute one iteration. Typically, not many are required."* There also was mention of the story (same title as the present one) in the January, 1994, newsletter. Your Editor asked where the need was: *"In most cases, one has hours or days or weeks or months to solve a problem, so it is much more important to solve it accurately rather than try to solve it much faster (in real time, for hybrid simulation involving a real relay). Who needs to close the loop as Marti did? Let's hear the counter arguments, if there are readers who see the need, and can afford to pay the price."*

Tom Field of FREEP fame (see the April and July, 1997, issues) provided the most informative and believable response --- again, later that same day. Writing from his AOL address, Mr. Field's initial response began as follows: *"The third international conference on digital power system simulators was held in Sweden this summer. There are several companies that make real time simulators. I work with a real time simulator that is based on EMTP. However, you can accomplish the same thing with open loop simulations. Therefore, ATP can be used with standard test equipment that your company already owns to run simulations for evaluation of relays and other apparatus. The simulator that I work with comes from a company called TLI in Texas. They also make other software that can work with ATP. If you want to know about the conference this summer, you may want to get a copy of the proceedings ... There are many software and hardware products available for what you are looking for. You can also make your own if you want to. ATP can be used to do what you want to do. By researching the past conferences on simulators, you should be able to learn how to do this."*

Your Editor's response to Mr. Field consisted of several questions about real time: *"Using what computer? How big a network can be simulated in real time? If you do not model long transmission lines as frequency-dependent (Marti did not), how do you justify the resulting error? ...*

It would be really interesting to see how fast some standard ATP test cases might simulate on such hardware. ... For example, how fast does DC-41a simulate? This uses Dr. John Hauer's high-order data with Semlyen modeling of a single, 3-phase transmission line. Could one of these new platforms simulate DC-41a in real time?" Unfortunately, such specific questions never were answered by anyone.

About possible ATP modification, your Editor wrote: *"If one wants to close the loop in real time, ... reprogramming to speed the simulation is advised. This was the idea of Dr. Marti's 1993 paper: Pre-compute the complications of switching. Is this writer now reading endorsement by an impartial expert? If so, might such a feature profitably be added to standard ATP? Maybe not, if other changes would be required. Maybe it is more practical to customize a version of EMTP just for the task."* No one responded to this question, either.

Harald Wehrend of SEG in Kempen, Germany, posed the most interesting questions of Tom Field --- probably because he works on the manufacturer's side rather than the user's (the utility) side. In the end, disagreement seemed to be reduced. Mr. Field had the final word. On August 26th, he wrote: *"Sorry about the confusion. All the points so far are correct. ... we cannot afford to allow relays that have not been thoroughly tested to be put on the system. I don't know of a single relay that has come through here in the past 16 months that has not had either a complete failure in the testing process or shown other problems either in hardware or functions. ... Sorry about this position, but it is based on fact. I cannot disclose manufacturers or specific problems, but I believe reports can be purchased. ... You are correct in my opinion. Closed loop testing does not accomplish anything that open loop testing can't for relays. There are even some advantages to open loop testing due to limitations on most of the current simulators. I am just curious about what can be gained from putting out higher frequency signals from either open loop or closed loop. For some devices such as FACTS devices, closed loop is probably required, but not for relays."*

Real-time simulation of more complicated transients was the hope of Francisco Javier Penaloza Sanchez of CFE LAPEM Centro Occidente in Morelia, Mich., Mexico. On August 23rd, he wrote: *"What about synchronous machine voltage and speed regulators? ... SVCs, DVRs, etc., control modules?"* He expressed the hope that devices of ATP simulation might someday *"run simultaneously with their own controls. Actually, the simulators used in these activities include poor --- small, simplistic, case-limited, hard-wired, too expensive, etc. --- representations of the power system. ... It will be wonderful to have available an ATP real-time version, self-configured according to the computer capabilities and case, for continuous operation with external modules --- devices to be tested --- having a simple and flexible --- through memory --- I/O interface; no matter the bandwidth of the model is limited by the computer speed, there will always be a powerful*

application." In response, James Wikston of Hatch Associates in suburban Toronto, Ontario, Canada, responded: *"This type of simulation has been done before. And could be incorporated into ATP with a moderate amount of effort."* The published reference was: J. M. Wikston, *"Digital simulation of static var compensators with real-time control constraints,"* M.A.Sc. Thesis, University of Waterloo, Ontario, Canada, 1991.

Mr. Field's employer might not have encouraged open discussion, it was concluded. Limits were explained in an August 26th message from Fargo about another old subject: FREEP. Mr. Field explained well an increasing problem of the industry: *"Being in the industry with an investor owned utility, the intellectual property agreement was clarified to me by my employer. This agreement did not allow me to give anything away that I worked on here at or after work unless my employer gave permission to do so. The few modifications to reduce the installation notes and fix the bug in the menu system were the only things that my current employer allowed me to give away. You may have noticed a comment about other tutorials for sale by my current employer. Unfortunately, time was never allowed to do this either, so no further work was done here. I had been in the process of seeking another position over the past few months. I have a new employer that I will start with in a few weeks. I will try to get the passwords sent to be included in the list in the next week. The password list is very convenient since verifying licenses was a time consuming task. Since the information is free to anyone that has an ATP license, you can certainly give it to others with a license. Since it sounds like you may have some very good material to add to it, that is certainly welcome since helping people learn how to use ATP better can only help the power community. The notes were written without time to proofread them usually, so rewriting them and correcting errors would be appreciated since I cannot do that legally. Putting the notes into an html format has several advantages. That would also be appreciated. ... I appreciate your interest in helping people learn ATP. I would have done more over the past couple of years, but being a member of industry has limits that academia does not place on work. I do not know how I can help you with my new employer yet. Most investor owned utilities have similar intellectual property agreements, so I will have to leave it at that. I will be able to do some very interesting work in my new position and am thankful to them for giving me this new opportunity."*

Akpinar Induction Motor Model

Alternative induction motor modeling should come from Prof. Eyup Akpinar of Dokuz Eylul University in Buca-IZMIR, Turkey. Gabor Furst of suburban Vancouver, B.C., Canada, has been the North American most involved with the extension. It seems Mr. Furst was Chairman of the IPST'99 session in Budapest where Prof. Akpinar presented

a paper on induction machine dynamics. A printed copy can be found in the proceedings on pages 265-270. The title is *"ABCdq model of a 3-phase induction motor for bus transfer and drives,"* and the authors are E. Akpinar and E. Ungan. While ATP developers do not yet have any special interest in the alternative variable transformation (ABCdq), they certainly do have interest in an independent alternative to the U.M. modeling of induction machines by Hian Lauw.

The University of New Orleans was mentioned in the October, 1993, newsletter. Then, UM TO TACS was used by Prof. Pragasen Pillay to pass into TACS the signals of some 10 induction motors, recall. Well, Akpinar was there, and the same Pillay is seen as a co-author with Akpinar in the list of references on page 270 of the IPST Proceedings. It would seem that the ABCdq formulation was an outgrowth of troubles using the U.M. to represent multiple induction motors. Not only might there be an alternative to U.M. modeling of induction motors, one might hope for more reliable performance in cases where motors are not isolated in subnetworks (by definition, separated by distributed transmission circuits). I.e., for cases where compensation can not be used with the U.M., there is hope that Prof. Akpinar's modeling might be more reliable. It might simulate slower, but that probably would not be much of a concern in this Pentium age. All should be happy if the new modeling simulates correctly for cases where the U.M. iteration without compensation might fail to converge. Parallel motors are of particular interest.

The GNU Mingw32 FORTRAN compiler g77 is to be used for testing. New disk file usernl.f was prepared as an illustration, with SUBROUTINE INDMOT coded for the simple case of three balanced R-L branches as the materials left BPA on September 29th. Prof. Akpinar's job will be to replace equations of the R-L branches by his own induction motor equations. At least for initial testing, this will use the new interface for user-supplied compensation. Recall the January, 1997, issue sought existing code to model an induction motor. Well, Prof. Akpinar has provided the first positive response to this call for help, and his offer has been accepted following considerable investigation of the engineering significance by Gabor Furst. More about differences and limitations later.

Non - Graphic GNU ATP Details

Linux and djgpp are the GNU alternatives to Mingw32. Although once used at BPA, neither is used there today. At BPA, only Mingw32 has been tested and used during recent months, although Linux continues to be accounted for at execution time using variable LINUSE (not seen by the user). I.e., whenever Masahiro Kan of Toshiba Corporation in Japan explains some change that is required for Linux ATP use, it can be accounted for. But not so for djgpp, which seems to have required some special handling. Orlando Hevia and Masahiro Kan have

exchanged information about the operation of both GNU alternatives to Mingw32, and the status of djgpp ATP is summarized in Mr. Hevia's E-mail dated September 30th: *"I am using djgpp TPBIG for production, and I think that it can be uploaded to Osaka. The following major changes were made for SPY: 1) The SPY get_key function works correctly; 2) The SPY SPYPLOT command works decently; 3) The SPY HELP command works correctly; 4) The INDUCTION MOTOR DATA works correctly; 5) The LEN_TRIM intrinsic function is used where possible; 6) The -R in data filename problem was solved completely; 7) The JARRAY dimension was corrected, and the binary now is smaller, and loads faster; 8) The DISLIN batch and runtime plot looks nice; 9) The LISTSIZE.DAT has JAUG dimensions (I tried a bigger version for a special user without difficulty)."*

INTEGER*2 use began October 13th following the approval of Masahiro Kan. First, your Editor and BPA's Dr. Tsu-huei Liu had confirmed successful handling using the Mingw32 compiler. This was for SALFPL which involved a lot of 2-byte variables for Salford DBOS. Previously, the GNU translator had made a substitution that removed the INTEGER*2 declarations. But Mr. Kan advised that all GNU compilers now should be able to handle the Salford code resulting in more uniformity and a small amount of saved memory. The previous day, he had written: *"INTEGER*2 has been supported since g77-0.5.18. We are now using g77-0.5.25 for Mingw32 and djgpp, and g77-0.5.23 for Linux. I plan to upgrade to g77-0.5.25 for Linux after I purchase the new PC. The current PC for Linux is rather old and slow (dx 486/66)."*

Text remains external (the BLOCKD51.BIN file) because the GNU compiler still can not handle the big BLOCK DATA subprogram that is involved. The first mention of BLOCKD51 can be found in the April, 1996, issue, when Walter Powell was struggling with equivalent C because he was unable to compile BLOCKD51 Fortran using g77. Since then, the solution has been avoidance: removal of text from the program. I.e., a return to use of an external file, as was done for all compilers prior to the Schultz Revolution (fall of 1993). Well, the 1996 trouble compiling was using computers with reduced resources (e.g., 32 Mbytes or less of RAM), and the compiler was older. Using the current compiler on Dr. Liu's 128-Mbyte Pentium Pro PC running NT at BPA, two attempts were made to compile BLOCKD51 on October 14th. Rapidly, the compiler issued a warning: *"Initialization of large <610160-unit> aggregate area ... currently very slow and takes lots of memory during g77 compile -- to be improved in 0.5"* Then two different things happened. The first time, much like troubled Watcom linking (see inadequacy of 200 Mbytes in the April, 1999, issue), the task failed. An NT window opened, suggesting more resources (paging file?). But rather than supply this, the DOS window was recovered (a slow operation), and **Ctrl-Break** was used to kill the compilation (this too was slow, requiring maybe 5 or 10 seconds). Thereafter, for a while, the operating system was

unbelievably sluggish. Popping windows took several seconds, even though nothing was running. An attempt to save trivial contents of a Notepad window on disk failed. That was immediately after the trouble. A few minutes later, operation seemed to have returned to normal by itself, however. Presumably those parts of the OS that had been paged from RAM to disk during the compilation took a few minutes to restore. At least the OS did it without user intervention. So, that was the first attempt: nearly a disaster. But the second was quite different. For some 3 hours, the compilation continued until Dr. Liu was forced to abort it manually because she needed her computer for other things. Termination was uneventful.

Program text could be made internal by splitting the BLOCK DATA module into 3 or 4 pieces. This was done as a test. But it was only a test because improvement was small. In order that results not be forgotten or misplaced, the numbers will be summarized. Four pieces of 2000 (or fewer) card images each were involved. Although the same warning about slow compilation was issued, compilation was quick enough to be practical: about one minute for each. Of course, standard test case solutions DC*.LIS were unaffected. Total times to execute RUN.BAT without any graphics (use NODISK = 1) were: 1) 3:10 for text external; and 2) 3:03 for text internal. As to why 3:10 and not 2:51 as reported in the July newsletter, the retarding effect of DISLIN graphics has been greatly reduced by the newer compiler, but might not have been totally eliminated. That is one possibility. The other is random variation due to always-present networking. This could explain a 10 or 20 second difference, unfortunately.

RAM storage of external program text is an alternative to reading from the disk file each time text is required. This had been used for years with other computers such as DEC VAX, prior to the Schultz Revolution of 1993. The idea is simple. Suppose line KK is needed by READ11, and that lines through MAX11 have been read and stored, where KK > MAX11. Lines MAX11 + 1 through KK next will be read and stored. For the 2nd or later stacked subcase, then, text has been pre-loaded, so operation is from RAM rather than disk. On the other hand, the first subcase involves the loading of more text than ever will be needed. During mid-October, efficiency of this alternative logic was measured for the first time using Mingw32 ATP. Results were not encouraging. Total elapsed times for three successive verifications of all test cases were, in order: 1) 3:22; 2) 3:12; 3) 3:12 These tests began at 07:27, 07:33, and 09:01, respectively. Tries 2 and 3 are obviously consistent, and the anomalous first result might be explained by ever-present networking.

500-MHz Pentium III benchmarks for ATP first were reported by Orlando Hevia of Universidad Tecnologica Nacional in Santa Fe, Argentina. October 30th, using the Fargo list server, he shared the following comparison between 150- and 500-MHz PCs. The first two columns of numbers are times in seconds that djgpp ATP spends in

the time-step loops of the two computers:

```
#    File name      150 MHz    500 MHz    % Gain
-------------------------------------------------
1.   BENCH1.dat     68.901     10.956     528.89
2.   BENCH22E.dat   45.275      7.275     522.34
3.   BENCH47.dat    37.648      6.418     486.60
4.   BENCHN18.dat   41.868      6.275     567.22
```

Since clock rate alone explains 333% (500/133) of the increase of speed, this leaves a factor of about 1.67 to be accounted for by the more modern architecture (note 555% is about the average of the final column). A second interesting result was the comparison of djgpp ATP with Mingw32 ATP for the same new computer. As expected (due to front-end paging of the entire virtual image), the total times for djgpp were longer. But surprisingly, times spent within the dT loop generally (3 out of 4) were shorter for djgpp than for Mingw32 --- presumably because of limited memory (64 Mbytes of RAM). Remember Robert Meredith's observations about the demands of NT. These began in the October issue, and were continued into the present issue (see the Watcom story). Third and finally, Mr. Hevia compared the ATP speed of djgpp ATP with that for Linux ATP using Mandrake Software 5.3 Linux ATP generally was slower, with djgpp winning all 4 comparisons that involved only time spent in the dT loop. To concluded, as long as tables need not be dimensioned too large, djgpp ATP and real DOS continue to remain attractive for Mr. Hevia. There is similarity to Salford ATP and DBOS on your Editor's PC at home: the 16 Mbytes of RAM limit alternatives.

ATP Licensing Problems

Siemens Power Transmission & Distribution in Roswell (suburban Atlanta), Georgia, no longer is licensed to use ATP free of charge. The story that began in the preceding issue now is being continued.

Siemens is **not** a small company at all, of course. One particular office might be small, but Siemens remains a giant conglomerate of the industry. Siemens is to Germany as General Electric (G.E.) is to the USA. For more information, begin at **www.siemens.com** followed by a click on *The Company* at the top. The claim of more than 400K employees worldwide will be seen. It is important for readers to understand how Siemens has been handled in Europe. Prof. Mustafa Kizilcay, the EEUG Chairman, has been a model of caution and cooperation because of the known potential problem with Netomac. When a Siemens office or plant inquires about possible EEUG membership, there are two questions. First, is Netomac available for use at your plant? If not, there is no problem. In this case, the plant can be licensed to use ATP free of charge via EEUG membership. In this case, there is no need for the second question. But if Netomac might be available locally, a second question is to be asked: How much did you pay for the privilege? I.e., does the plant really operate independently from the parent company (if so, it should have paid the same fee for use of Netomac as the general

public would)? This is the test used by tax collectors. If it walks like a duck, and if it quacks like a duck, ...

Reciprocity would apply to those who fail the preceding test of independence. That leads to the question: what is the price of Netomac to the general public? We have heard about DCG and EPRI prices (see $50K and $14,550 figures in the January issues of 1992 and 1994). What are Siemens prices for Netomac? If any reader knows, the information would be appreciated.

Dr. Yin Yuexin, who is part of Prof. Dennis Carroll's annual Florida ATP short course, is not affected by the preceding EMTP commerce. Yes, he works for Siemens; and yes, he lives in Roswell, Georgia. But as he clarified in E-mail dated August 16th, there is both geographical and organizational separation between him and Mr. Jalali: *"I have never used Netomac! I was not even aware of the Netomac. .... Geographically, my office is about 5~10 miles from Mr. Jalali. Within Siemens, I am in the industry application division .... Siemens Power Corporation is a totally different entity and has no connection with my division."* To conclude, Dr. Yin's license to use ATP free of charge remains unaffected.

Virginia Tech in Blacksburg has a comparable ATP licensing problem to the University of Wisconsin in Madison. This was summarized for subscribers of the Fargo list server in a message dated September 24th. Why? Because one Xuzhu Dong using Internet address **xudong3@vt.edu** continued to use the service -- even after having been informed that he could not, free of charge, be licensed to use ATP. About the licensing problem: *"This was due to the presence of Prof. Arun Phadke. If he remains, your EE department can not be accepted for 'organization' on the ATP licensing form. A personal license might be possible, provided you do not exchange technical information with Prof. Phadke. What is your status within the department?"* The answer did not facilitate free ATP licensing: *"In fact, we are the same group with Prof. Arun Phadke."* So, your Editor concluded: *"If you might exchange technical information with Prof. Phadke, perhaps you should consider using the same electromagnetic transients program he does. This is **not** ATP."* About continued unauthorized use of the Fargo list server, your Editor concluded: *"What is not clear about this? This list server is restricted to ATP-licensed persons, and you seem not to be ATP-licensed. Therefore, kindly de-subscribe immediately --- either that or Prof. Bruce Mork will remove your name from the list."*

The Center for Power Electronics Systems (CPES) within Virginia Tech was licensed to use ATP free of charge. The preceding paragraph mentions the problem of Xuzhu Dong, who seemed to be closely associated Prof. Phadke. This problem was not shared by Ling Chen, who uses address **lchen@vt.edu** September 27th, this second gentleman explained that *"I am a research associate in the power electronics group at VT and I work with Dr. Alex Huang. Prof. Phadke is not part of our group (I think he is in the power systems group) and I will make sure that information related to ATP should not be communicated with him."* The user group had required a separate organization, and CPES seemed to satisfy the need for separation from EMTP commerce elsewhere within the Electrical and Computer Engineering Dept.

Comings and Goings

Jules Esztergalyos is retiring from BPA after many years of work on relaying. As this paragraph is being keyed, a luncheon buffet in his honor has been scheduled for October 15th. A second retirement also should be mentioned. Walter Powell retired from BPA some months ago. But circumstances are quite different. Walter continues to work in his same old office, as a contractor rather than an employee. This way, he is being paid twice (retirement after 30 years makes financial sense for any employee who remains in demand)!

Power Company Politics and Religion

The great August, 1996, blackout on the West Coast was caused by BPA's defective tree cutting and/or trimming as mentioned in the October, 1996, and April, 1997, issues as well as RANDYWLD.LIS (*Randy's World* of January, 1998). Well, the official BPA view was published on pages 967-979 of the August issue (vol. 14, no. 3) of *IEEE Trans. on Power Systems*. The principal author, Dr. Dmitry Kosterev, is an ATP user. However, this paper is not about ATP, but rather is about transient stability --- or is it instability? Ref. [2] is the paper that was mentioned in the July, 1992, issue in conjunction with Goldsworthy's hvdc archive. For the record, that 1992 paper by Hammad, etc., seems to have been published on pages 367-375 of the January, 1993, issue of *IEEE Trans. on Power Delivery*. About the blackout, the authors carefully avoid the all-important issue of responsibility. But a former BPA employee was more forthcoming in his discussion. The interested reader is referred to Dr. John Hauer's observations that begin with *"the decline in engineering resources"* of BPA and the industry. I.e., we experience engineering emergencies today because management neglected the need for quality engineering yesterday. There has been *"a progressive fragmenting, and effective loss, of collective knowledge under the erosive pressures of utility restructuring. ... With the arguable exception of HVDC effects, it appears that all of the modeling problems and repairs found by the authors are among those reported some years earlier by SOWG."* Yet, this is hard for persons outside our industry to understand. Inadequate tree cutting on right-of-ways is easier for anyone to visualize.   A better argument might be this: Did you really expect support for

quality engineering from the management that was stupid enough not to cut or trim trees on right-of-ways? So how much did this little oversight cost? No dollar estimate is seen. Another question: What transient stability program (TSP) was used to produce the simulations that are described? Suspected answer: not the one currently recommended by BPA management! Final detail: At the bottom of page 967, in the margin, will be seen the following prominent notice: *"U.S. Government Work Not Protected by U.S. Copyright."* This is because of FOIA (the U.S. Freedom of Information Act), of course.

IBM pension reform was mentioned in the October issue along with a promise of more information later. The issue is far bigger than IBM, which was simply a large and conspicuous example that caught the attention of national news media, and hence politicians in Washington. Several good summary articles can be found in *USA Today* (the daily newspaper) using links from the IBM union home page. Dated September 17th is a story having title *"Under pressure, IBM alters pension plan."* The change has not gone away, however; its effect merely has been softened. More long-time employees are being allowed to continue with the old pension plan, which obviously was better for them than the new one would be. IBM *"told employees in a letter that about 65,000 workers who were at least 40 years old on June 30 and have at least 10 years' service at IBM can choose which plan they want. Previously, only about 30,000 workers within five years of retirement had a choice."* As stated, this looked like a compromise to reduce the fallout. Did it work? Maybe. But union organizing continues, and time will be required to know the fate of this initiative. Also, the government is looking at legality of such changes: *"Congress, the Internal Revenue Service and the Equal Employment Opportunity Commission are stepping up scrutiny of the cash balance plans, now adopted by an estimated 300 companies."* That is the name of the new system: *cash balance*. It differs from traditional pension plan in that it is fair. Historically, pension systems have been unfair in that they favored long-term employees. The new system sets *"aside the same amount of savings each year, instead of accelerating the contributions toward the end of an employee's career."* So, it seems fair if these were the rules established at the beginning. The problem is, they were not for long-time employees, who for years have been counting on the old rules. The average employee with many years of service would lose a lot of money, if forced to switch. It is happening all across America as companies restructure, and it happened within the U.S. government (and at BPA) a decade or so ago. At BPA, the change was voluntary for longer-term employees (maybe ten or more years).
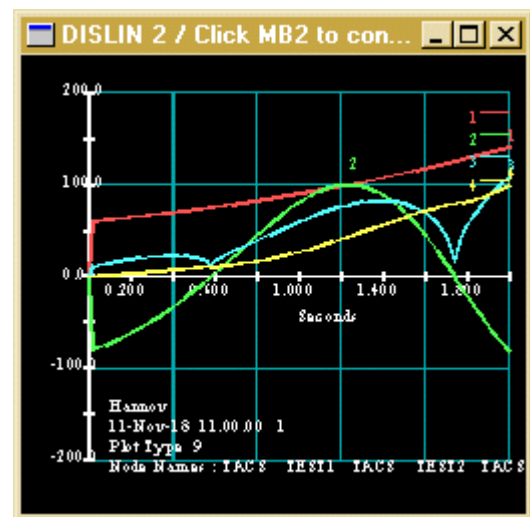
Stu Cook Uses Apple Macintosh

Apple Macintosh ATP continues to be supported by Stu Cook of JUST Services in Rideau Ferry, Ontario,

Canada. Lack of mention in the preceding issue was the fault of your Editor, not Mr. Cook.

A new Macintosh ATP translation was ready to be performed for the first time during the night of October 25th. How new? New in the sense that installation-dependent files had been completely reworked. As a major departure from the past, evolution was abandoned and Macintosh files were recreated by modification of Lahey (see mention elsewhere in this issue) ATP files. The previous day, Mr. Cook had provided Mac-specific details about how to delete and rename a file from within a FORTRAN program (no problem).

DISLIN Use by GNU Mingw32 ATP

EIGHTH.AUX was mentioned in the preceding issue. *Size now is narrow enough to fit within one column of this newsletter.* Six months late, here is proof using the screen plot of DC-18 :

This would seem to be the first meaningful color in newsletters. About file size, 4.6 Kbytes were added to the .DOC file, and 5.0 Kbytes to the .PDF file, by the inclusion of this figure. Screen resolution of Windows is 768 x 1024 pixels, and the figure accounts for about 1/8 of 60% of the total --- bit-mapped, of course.

HP-GL output of NOHPGL = 0 was limited to square plots prior to generalization on October 9th. The problem was not noted earlier because those HP-GL outputs that are verified along with all standard DC*.LIS files happen to be square (actually, 8 inches high by 10 inches wide, approximately). Of course, this is all we ever had using Salford DBOS. But, using MS Windows, the shape is arbitrary, and double-width plots now are common. Such windows use the full width of the screen, if the graphic window covers 60% of the height. Such windows have 20 *inches* for the horizontal axis rather than 10. So, HP-GL X-coordinates can be twice as large. But the limits on the

SC0 declaration at the top of the HP-GL file were not adjusted according. After October 9th, the original 11000 should be replaced by 22000 for any double-wide case. Values INCHX and INCHY of the .AUX file are used for this determination.

GNU Mingw32 ATP SPY PLOT

80-column displays are a special problem of MS-DOS, as known from Lahey F77L days (before Salford use began in late 1979). The SPY HELP display is a prominent example. Prior to August 22nd, the display appeared double spaced on the screen. Although imperfect, a temporary remedy was easily provided at the top of WINDOX: ignore blank column 1 or 80. This must have been what was done for Lahey ATP. Recall there was no such problem for Salford EMTP because scrollable windows -- provided by Salford DBOS, not Bill G's MS Windows, of course -- were used.

About HELP, a SAVE statement was needed for two local variables of HELPER as discovered August 24th. Apparently neither Apollo nor Salford compilers required such help in years past, but Mingw32 certainly did today. Within HELP, use of TOP following BOT behaved as if ALL had been keyed rather than TOP. Yet, this trouble disappeared when diagnostic printout was turned on, making the detective job a little difficult. But special diagnostic WRITEs to the screen showed that N27 and INHELP were undefined (i.e., garbage).

Frequency Scans and Harmonics

Fourier bars of a bar chart (e.g., graphics of DC-42 or DCNEW-26) changed slightly on October 9th due to the correction of a small error in SUBROUTINE DRWBAR. The value printed above the peak is not affect, although the heights and widths of the bars changed a little. BPA's Dr. Tsu-huei liu took the *before and after* HP-GL output of DC-42 into WP 7, and displayed one on top of the other so as to cover most of the screen. The two looked about the same. It is hard to be sure there is a difference. This is probably the reason no one ever complained. As for why the error was discovered now, Lahey ATP was using dummy DRWBAR and this attracted attention because output was truncated. Upon studying GNU DRWBAR, it was noted that it was wrong because Salford DRWBAR was wrong. The offsets were fixed rather than variable, and they was being performed after the multiplication rather than before. This was for the conversion from graphical coordinates (Salford screen pixels) to plot inches.

Use of widexx with a screen plot of CALCOMP PLOT was made to work for the first time October 25th. This corrected an old problem or limitation that first was noted by others in E-mail dated May 7th. The need for Gabor

Furst's harmonic analysis was explained as follows by Orlando Hevia of Universidad Tecnologica Nacional in Santa Fe, Argentina: *"I send to you a case corresponding to Gabor's course, but with a problem. The case can't be run with wide10 format, as Gabor's program HFSPLOT.EXE requires. I tried with Salford and djgpp versions, and both abort."* Preferring standard test cases, your Editor demonstrated trouble using Salford EMTP with wide08. This died in SERIES with a division by zero for data such as the 4th subcase of DCNEW-21. Since not all program versions can perform vector screen plotting, the error was not truly universal. But all versions should support widexx, so the trouble should have occurred for any version that can display CALCOMP PLOT on the screen (hence GNU Mingw32 ATP, too). Alterations were not trivial, with segments POSOUT, LODPLT, and HEADFS requiring additions.

$INSERT code of CIMAGE was modified October 29th in order to define NUMOLD upon release of the disk file. This was found to be necessary to avoid a KILL = 3 error (S.N. 2156 within OVER3) for a case involving TO SUPPORTING PROGRAM that re-computed line constants for each frequency of a FREQUENCY SCAN (FS) loop. The data was c:\atp\sup.dat on Dr. Liu's 486, which eventually evolved to the 7th subcase of DCNEW-25. The concept for such use first was suggested by Mr. Hevia.

Recall the use of EXACT PHASOR EQUIVALENT (EPE) was mentioned in the preceding issue. For the record, EPE resulted from creative work with power line carrier frequencies. This was during 1989, by Robert Meredith of the New York City area, although no mention can be found in newsletters prior to the January, 1995, issue. Use was documented by the 2nd subcase of DC-11, however (see comments mentioning date March 25, 1989). Also, the all-new 7th subcase of DCNEW-25 (see preceding paragraph) now illustrates usage, even though in this case the answer is not much affected.

Year 2000 Compliance of ATP ?

IBM has blamed poor 3rd-quarter performance on Y2K. A Morningstar story dated October 20th quotes IBM CEO Louis Gerstner as follows: *"we saw a Y2K slowdown toward the end of the quarter, particularly in our large servers, and to a lesser extent in services and operating systems software."* Well, Y2K always has been described as a problem of big computers, and IBM is one of the few big-computer manufacturers left. About the future, Gerstner stated: *"next year has the potential to be a very good year for IBM, once we get past any lingering Y2K effects."* To conclude, Y2K was a convenient excuse for IBM management. Can we expect similar excuses from other companies that might have poor sales early next year?

Cash hoarding by smaller companies is the latest possible complication of Y2K. *"Y2K to Suck Market*

Volume Dry" is the headline of a story by Harry Milling, described as Morningstar's market commentator. This M* story dated November 10th predicts: *"Investment banks are anticipating a big trading volume decline and are positioning themselves accordingly. These pros are setting up alternative channels for money during the New Year's weekend and are already unwinding speculative derivative trades for hard cold cash. ... Because a run on cash could make money yields spiral, the Federal Reserve is issuing options on cash financing between mid-December and early January for banks. Demand for these options have (sic) become so fierce that the Fed had to expand the number of times it will auction them to seven from five."*

The Millennium Award for Y2K Stupidity was won by BPA's computer establishment. The competition was not even close. First, BPA politicians --- continued next issue.

Branch Data Input Restructured

Uncoupled branches that are short circuited were prohibited by the introduction of a new KILL = 239 error termination on June 9th. This followed commentary about ###### as a $INCLUDE argument (the subject of semi-public E-mail of the Fargo list server the preceding day). To your Editor's surprise, an uncoupled branch that connects any one node with itself (i.e., a branch that is permanently short circuited) was allowed by the new branch input logic. While not an error in the sense of Kirchhoff or Maxwell, such use was wasteful, and now has been prohibited. Note that a closed switch can not provide the short circuit since a switch always connects two nodes having different names. Also, branches of multi-phase components --- either distributed or lumped --- escape the check. For coupled phases, a short circuit may have physical and engineering meaning, of course.

A saturable TRANSFORMER might sometimes conflict with compensation of two or more nonlinear elements prior to correction on June 18th. The first report of trouble with such data, produced using ATPDraw, was illustrated earlier that same day in E-mail from David Alvira of Red Electrica de Espana in Spain. Three lines of special initialization in OVER1 solved the problem, which was traced to data sorting by class. Symptoms of the trouble were not at all subtle: a false KILL = 9 error termination.

A $INSERT file that contained two or more different branch types was not envisioned when $INSERT was invented (see the July issue). So, it was no surprise that such data failed when tried August 20th. The data was received via Masahiro Kan of Toshiba Corporation in Japan, who wrote as follows the preceding day: *"... Institute of High Voltage Research, Uppsala University in Sweden reported a problem ... I attach a sample file which Mihael Zitnik sent to me."* Curiously, older programs avoided the trouble, for some reason. Although practical use is not appreciated (why use $INSERT for a small file?), it

seemed easier to correct the problem than to warn others of the trouble. So changes were made to CIMAGE later that same day (see NUMDSV additions).

Interactive Plotting Programs

GTPPLOT is the interactive plotting program from Orlando Hevia of Universidad Tecnologica Nacional in Santa Fe, Argentina. GTPPLOT has been enhanced substantially beyond the brief mention in the October issue. In E-mail dated October 1st, author Hevia summarized more recent progress. First, changes dated June 27th: *"1) The DICE command was added to menu. 2) The delay routine was enhanced."* Second, dated July 8th: *"3) The sizes of all text were increased. 4) The PostScript output file now is generated by hp2xx (*), from the HP-GL file. 5) The pcx output was added, using hp2xx (*). 6) The time units can be changed either in gtpplot.ini or using the SET command. 7) The program now starts instantaneously, but the output files are not deleted at this time. The clean script does the work, if the user wants to maintain his disk without old output files. (*) hp2xx is a free program that may be obtained for DOS, Windows and Linux."* Third, dated July 20th: *"8) The spacing of text in labels was improved. 9) The axis numeric labels for logarithmic axis was improved."* Fourth, dated July 27th: *"10) An error for C-like with MODELS was corrected. 11) The NOCLEAN option was added to gtpplot.ini"* Fifth, dated July 28th: *"12) Salford unformatted pl4 files now can be read. 13) The SHAFT command now redirect the output to independent .out files, with the same name of data file."* Sixth, dated August 8th: *"14) The new parameter in gtpplot.ini, NOREV, controls the background color for screen plots. 0 is for a white background whereas 1 is for black. 15) CSIZE is a new parameter of gtpplot.ini that sets the size of the text font. 0.5 <= CSIZE <=1.0."* Seventh and finally, dated September 20th: *"8) A bug in FOURIER for HFS (HARMONIC FREQUENCY SCAN) cases was killed. 9) Minor cosmetic corrections were added. 10) The WMF (Windows Meta File) format was added. The NOWMF parameter in gtpplot.ini controls this format. 11) SSIZE is a new parameter in gtpplot.ini that sets the size of symbols for plots where 0.5 <= SSIZE <=1.0. 12) The X label may be now 60 bytes long."*

Randy's Plotter is the plotting program written by BPA's Randy Suhrbier for DEC VMS years ago. VMS users loved it, and mention can be found in various issues of this newsletter since January, 1993. But what about newer Wintel PCs? For years, there was talk about possible conversion, although this would not necessarily have been an easy (even practicable) task. After author Suhrbier was not allowed to work on the project as part of his present (a different) job at BPA, and after he declined to participate in conversion as a paid contractor using his own (personal as opposed to company) time, others were involved. Progress is documented by E-mail from James Hall to interested persons within BPA. First, there was speculation by Walter

Powell *"that Randy's Plotter has been ported to a PC via a local software company .... and is now being used by your group. ... Several of us in Planning have been eagerly waiting for this development, and would like to install it on our machines."* That was for transient stability use, although the same program should apply to ATP, too. This was September 21st, when Mr. Hall clarified details. First, there is the new name: *ATP Analyzer.* Mr. Hall wrote that this *"is a quickly evolving program. It is in its infancy but Glen Fortner (TDS contractor with PEC) is making progress with leaps and bounds."* Some days later, a demonstration by PEC (the same Pacific Engineering that has provided access to ATPDraw author Hoidelen) was performed on Mr. Powell's NT Pentium here in the Dittmer Building. To conclude, there is yet another alternative for graphs of those who support ATP using MS Windows.

IPST in Budapest June 20 - 24

The preceding two issues included reports from the 1999 IPST conference that was held in Budapest, Hungary, during June of 1999. More information about IPST'99, organized locally by Laszlo Prikler, follows.

"Authors retain copyright of their papers ..." is a notice at the front of the published Proceedings of IPST'99. Recall those in charge of printing the IPST'97 Proceedings seemed to forget this important detail (see the October, 1998, issue).

Misinformation about ATP is a common problem of conferences that include persons who are not ATP-licensed. A good illustration is provided by one of the IPST'99 papers. On pages 13-18 of the *Proceedings* will be found a paper entitled *"A comparison between three tools for electrical transient computations."* This comes from three authors at Delft University in The Netherlands. In that ATP is not one of the three programs that are compared, there is no problem. Unfortunately, this did not prevent the authors from commenting erroneously about ATP and EMTP. The first paragraph of Section III ends with the explanation that certain DCG/EPRI features *"are not available in the public domain version of the program: the ATP."* Sorry, guys; ATP is **not** in the public domain. Earlier in the paragraph, there are historical errors, too: *"It became popular when Dommel (as its creator) and Scott-Meyer ... made the source code public domain."* The facts: 1) no program named EMTP existed during the period Dommel worked at BPA (1966 through July of 1973); and 2) the public-domain nature of BPA's EMTP resulted from U. S. law (FOIA) rather than any particular largess of Drs. Meyer or Liu (the latter having joined the effort in 1975). Finally, there is a detail about EMTDC. In the *Introduction*, the authors write: *"Besides the well-known EMTP [1,2] (and its variants like ATP, EMTDC, etc.) ..."* There are two problems with this statement, too: 1) references [1] and [2] by Dommel do not mention EMTP; and 2) EMTDC is not known to have descended from EMTP. Recall that the second of these points was made in the April, 1995, and

January, 1998, issues, and your Editor is still waiting for evidence to substantiate such an improbable claim.

A computer virus might not be as dangerous as the program that is supposed to protect against it. Prof. Kizilcay provided this strange report about happenings at IPST'99. Only the name of the commercial product that failed to do its job has been changed to XXX in order to limit legal liability (how might one prove such an allegation?): *"... I noticed that I could not read drive 'C:' and this occurred three hours before our EEUG presentation on Tuesday (6.22.99) in the afternoon! It was impossible to recover the file system on the hard disk. I am almost sure that the cause of this crash is XXX, because one day before, Dr. Murari Saha had asked me to give him a copy of ATP Control Center. Of course, he provided a floppy disk. I checked that disk using XXX and during testing, XXX recommended to 'vaccinate' the system. I thought the message was related to the floppy disk not to the hard disk. What happened is, XXX destroyed the 32-bit FAT assuming it to be a 16-bit FAT. ... You would ask how I succeeded to perform my presentation at the ATP promotion meeting? Well, I could not perform my presentation using PC about EEUG. That part I did verbally, explaining that my PC had crashed. Dr. Saha loaned me his PC on which ATP Control Center and PCPLOT were already installed. Within one hour, I prepared a demonstration using DC-4."*

Miscellaneous Intel PC Information

RISC and CISC are converging. This according to papers that have been featured by *Ars Technica.* The Web address is **www.ars-technica.com** which describes itself as *"The PC enthusiast's resource."* Found there October 22nd was a paper entitled *"RISC vs. CISC: the Post-RISC Era. A historical approach to the debate"* by Hannibal. This begins with a provocative summary: *"The majority of today's processors can't rightfully be called completely RISC or completely CISC. The two textbook architectures have evolved towards each other to such an extent that there's no longer a clear distinction between their respective approaches to increasing performance and efficiency. ... Thus the 'RISC vs. CISC' debate really exists only in the minds of marketing departments and platform advocates whose purpose in creating and perpetuating this fictitious conflict is to promote their pet product by means of name-calling and sloganeering."*

"The acronym EPIC stands for Explicitly Parallel Instruction Computing. Like RISC or CISC before it, EPIC isn't a strict set of rules or a design specification; it's the name for a collection of techniques and an overall design philosophy. The guys at HP and Intel have taken the lessons learned from RISC and CISC and combined them with the latest advances in compiler technology to create a new computing paradigm." This from *"A preview of Intel's IA-64"* by Hannibal --- a short paper that was found

at *Ars Technica* October 30th. Recall Robert Schultz mentioned IA-64 in the October issue. He also mentioned *superscalar*, about which Hannibal explains: *"Modern superscalar architectures have what are called multiple functional units. Some of these functional units handle integer calculations, and some handle floating point ... So a four-way superscalar machine would have four of these functional units. The number of functional units is sometimes referred to as the machine width."*

Miscellaneous Small Items

DATA BASE MODULE began with fixed limits on both the maximum number of arguments and the maximum number of argument uses. But the latter of these two limits was removed two years ago (see the July, 1997, issue), when List 2 was used as the new variable limit for convenience. Now, it is the turn of arguments themselves. The previously-fixed LIMARG = 85 was replaced by the List 6 (switches) limit on July 5th, completing variable dimensioning of the DBM feature. As distributed by the user group, LSWTCH = 1200, so it should be a while before DBM again is overflowed. For the historical record, work was prompted by semi-public E-mail from Omar Kristoschek of UFRJ in Brazil. Your Editor responded via Fargo the following day, July 2nd. Although he asked how large a limit might be required, no answer was received. So, rather than increase fixed limits, it seemed best to complete the variable dimensioning. Done.

Batch-mode use of CENTRAL STATISTICS FILE is illustrated by DC-66. Prior to modification of OBSERV on July 30th, however, the batch-mode user was accorded no protection against a bad file name. The first report of such trouble came from Stephen Boroczky of TransGrid in Sydney, Australia, in E-mail earlier that same day. As explained in a separate story, Mr. Boroczky had been testing VMS ATP using Alpha, and had tripped over the name DISK22: that is used at BPA. The result was an infinite loop. Using Salford EMTP, your editor observed similar behavior after changing legal F: to illegal M: at home. This was for batch-mode execution using RUNTP, which henceforth should be protected by the error message: *"Halt in OBSERV. Service ERR= on OPEN. Most likely the disk file name being used is bad."* Why is batch mode mentioned? Because the code was developed for interactive use, and this allows re-prompting for a corrected file name. But with data read from a disk file rather than the keyboard (Apollo input pane), the concept of interactive correction obviously fails.

Too much precision for free-format input numbers was not prohibited prior to August 26th. The trouble was discovered while constructing BENCH22E (see mention elsewhere). Halving the 1-degree time step to DELTAT = .00002314814814814815 (note use of one more digit to ensure no loss of accuracy) resulted in the following interpretation by Salford EMTP:

```
 Misc. data.   2.315E+15   2.500E-01   6.000E+01 |
```

That was prior to the addition of protection that resulted in the following error message: "Halt in .... Bad .00002314814814814815" Of course, an increase in the maximum width would be better, but is not trivial. Such improvement will not be undertaken in the absence of evidence that more precision has practical engineering consequence. Might it? Any reader who believes this to be the case is asked to initiate semi-public explanation and discussion using Prof. Bruce Mork's Fargo list server.

Lubarsky's Law was mentioned in the July newsletter, along with a dispute at the 1990 annual LEC meeting in Leuven, Belgium. For more detail about this argument, see the July, 1992, issue (*"Removing the last EMTP error"*).

The name of a $INCLUDE file was limited to just over 50 bytes prior to a universal reform that began September 20th. BPA's Randy Suhrbier suggested the single-line change to OVER1 following his analysis of trouble using data of Dan Goldsworthy. At no cost, 20 characters were gained. Why only 20? For years, the length of the name was limited artificially for no good reason. But now it is limited by the 80-column nature of ATP data. With $INCLUDE, requiring 9 columns, that leaves about 70 for the file name (minus the prefix and the suffix). Does anyone need more? If so, for this special use, one can imagine special accommodations. But the work will not precede an explanation of practical need.

TPBIG DC6. is a DOS command that illustrates ATP execution involving a single parameter. As learned October 5th, this seems to have been a victim of the recent logic change that returned to the opening prompt following use of DISK or BOTH (see the October newsletter). Even though single-parameter use was not part of the original design, it seems to have worked, and was useful. So, operation was restored following E-mail from Masahiro Kan of Toshiba Corporation in Japan: *"I forward the message from Jovan Mrvic <jmrvic@ieent.org> of Institute of Nicola Tesla in Belgrade, Yugoslavia ... then simulation (after being successfully finished) starts over and over again endlessly, and has to be interrupted from keyboard. This makes it useless to start ATP from PFE (Programmer's File Editor) because it falls into same endless loop."* A correction to STOPTP later that same day solved the problem by specially terminating execution for the case of at least one, but fewer that the normal three, parameters of execution.

Extraneous apostrophes were removed from universal program text file KILLCODE.MUP on July 12th. This followed comparison of all standard Salford test cases DC*.LIS for two situations: 1) text internal (normal); 2) text external, in separate .BIN file. See the first story for further details. DC-49 revealed one difference, and this was traced to an extraneous trailing apostrophe. In all, about a half dozen of these were found and removed.