Can / Am EMTP News

Voice of the Canadian/American EMTP User Group

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Salford Compiler & DOS Extender

Salford DBOS/486 Rev. 2.67 was supplied to the user group by Salford distributor OTG Systems by mail that was postmarked August 4th. Not only did OTG send DBOS without being asked to do so, a new copy of the compiler was included as well. The first EMTP user in North America to test DBOS/486 Rev. 2.67 was Bruce Mork, who was sent a copy by Federal Express on August 20th. The user group is not anxious to switch beyond Rev. 2.66 because it was found that Rev. 2.67 no longer will fit on a single 1.2-Mbyte disk (a 1.44-Mbyte, 3.5-inch disk would be required).

Dynamic dimensioning of EMTP tables was first accomplished by computer expert David Szymanski using standard Unix (then System V, Release 3). The concept was simple enough: at the start of execution, the EMTP would size its tables according to user desires as expressed by the VARDIM input disk file LISTSIZE.DAT. Well, there is hope that Salford EMTP might remove the dimensioning problem in an even simpler way. Rather than resize tables at the beginning of execution, it is possible for Salford EMTP simply to be dimensioned very large without much added cost. From the beginning, your Editor has told this to others without ever actually testing the idea much beyond the 8 Mbyte tables of TP20 that now are used by many. Well, any doubt was removed by further experimentation on June 21st when 99 times default dimensioning was used, resulting in a total table size of 28.9 Megawords (over 115 Mbytes). There was no noticeable slowdown during linking, or for the subsequent execution using DC-3, which did not pause noticeably anywhere. This clearly proved that Salford EMTP users pay for only the table space that their data actually requires. With no swap file or partition on disk, paging was limited to the 11 Mbytes of extended memory that support your Editor's 80486-based computer at BPA. Yet, it is important to note that a true 100 times default dimensioning has badly-distorted proportions for the square matrix $[Z_{thev}]$ that provides the compensation interface. There would be 300-phase compensation for 25000 nodes of network, accounting for 7.5 million words in each of two vectors (one INTEGER*4 and the other REAL*8) . It is more realistic to save most of this storage by holding the number of phases fixed at the 24 used for TP20. This is what was done to create the TP99 that Dr. Liu carried to Japan on October 13th (another story).

Hewlett-Packard PaintJet or PaintJet XL should be supported for hardcopy by Salford DBOS at some point in the future. In FAX dated September 4th, Bob Jackman, the

Salford graphics expert, mentions that *"work is nearing completion. ... A spin off will be an LJ3 driver which will offer much reduced file sizes."* Readers may recall that disk files for LJ2 are large at 300 pixels/inch (page 16 of the preceding issue indicates 953 Kbytes).

The /PARAMS option, which DOS provides to allow the passage of parameters into a batch file, now is usable for Salford EMTP execution. This extension was added during the weekend of August 22nd and 23rd following inspirational E-mail the preceding day from Dr. Mustafa Kizilcay of Lahmeyer International in Frankfurt, Germany. Parameters allow the execution of Salford EMTP by means of a single, self-contained, executable command as further explained in a separate story about the idea.

DR-DOS was tried by BPA's Fred Elliott on his home computer, and found to have some compatibility problems with Salford EMTP running under DBOS Rev. 2.60. There was some trouble opening files (e.g., an output $PUNCH file). So, Mr. Elliott upgraded to DBOS Rev. 2.66, and was happy to report during the morning of August 28th that all troubles seem to have disappeared. The incompatibilities with DR-DOS had been upsetting because those in Hannover (Ir. Harald Wehrend and associates) never had reported any such trouble.

MORK.EXE of the GIVE1 disk was updated on August 27th to accommodate the new structure of the DBOS Rev. 2.66 disk. See the story about E-mail for more about this. In E-mail dated August 26th, Dr. Mork explained the need for change : *"... the test used previously to find out if a valid DBOS disk was inserted looked for file DBOS . CPR in the root directory. Beginning with 2.66, this file is contained in a subdirectory \ DBOS . DIR on the diskette. So I've corrected this."*

Use of /DISK_CACHE (Salford disk caching) has made the execution of batch files too quick to be interrupted using **Ctrl-Break** ! A good example is RUN.BAT that is used to execute all 80 or so standard test cases DC*.DAT. Of course, **Ctrl-Break** can be used at any time to interrupt Salford EMTP execution. Then DBOS will open its debugger windows, which the user will exit using **Esc** followed by **Shift-F1**. All of this works properly, but does not represent much progress because MS-DOS merely progresses from one Salford EMTP execution to the following one. The 486-based computer used at BPA is so fast it is not possible for your Editor to issue another **Ctrl-Break** during the DIR command that separates the two executions! Rebooting the machine (**Ctrl-Alt-Del**) certainly breaks the execution, but is messy. Can any reader suggest a better solution?

50-MHz Intel 80486 simulation speed first was reported by Prof. Bruce Mork of Michigan Tech in Houghton. This came to your Editor in E-mail dated September 10th, which ended with pasted times from his DC1.LIS that was created using the DBOS options /DISK_CACHE and SHIFT_INTERRUPTS. Time spent in the time-step loop is 49.2 seconds, which is 76% of the 64.5 seconds reported for BPA's 33-MHz computer at the top of column 1 on page 2 of the previous issue. While the improvement is a little short of what clock speed alone would suggest (33/50 = 66%), it nonetheless is respectable, and is well worthwhile. For those wanting peak simulation speed, the real 50-MHz chip (DX , which has the same internal and external speeds) seems to be clearly preferable to the speed doubling of a DX2 chip. Compare Prof. Mork's 49.2 seconds with the 75.4 seconds reported by Dr. Matt Donnelly on page 20 of the preceding issue for his DX2 machine. Your Editor concludes that DX2 chips remain attractive for the upgrading of existing computers (without changing mother boards), but probably they would not be the first choice of a power-hungry user who was purchasing a new computer.

Microsoft Windows 3.1 will slow such high-speed simulations, the reader is reminded. Ralph Folkers of Midwest Power in Sioux City, Iowa, provided the first hard numbers for 50-MHz simulation of DC-1. Late in September, times spent by his 50-MHz Compaq in the time-step loop were reported as follows: a) 97.4 sec if output went to the bit-mapped screen; b) 70.9 sec if output instead went to disk. Conclusion: Bill Gates, former worker (as was your Editor) on software of BPA's control center, now some 37 years old, did not just become the richest man in America by building the most efficient windowing system! But then, for a price of about $50, who can complain about Windows 3.1?

Laszlo Prikler of the Technical University of Budapest in Hungary, continues to perform interesting experiments with Salford EMTP. Most recently, he published a two page summary entitled *"Experiences with ATP in PC Network"* at the spring meeting on the island of Crete (see preceding issue, page 7, column 1). Following E-mail and voice telephone contact, the decision was made on September 13th to send the latest Salford EMTP and TPPLOT materials to Budapest. This was done via the BPA Mail Room the following day. In addition to the fourth disk for TP20, a fifth was loaded with the nearly one Mbyte of WordPerfect disk files storing our North American newsletters. Mr. Prikler had not received *Can/Am EMTP News* from LEC, so was unaware of recent work in Portland. His E-mail does not yet allow FTP transfers that would be required to pick up these files from the Fargo server, either. So, BPA is supplying a copy of all disk files, and is encouraging him to pass the same information along to anyone else having interest.

Apollo modules of the UTPF (the Universal Transients Program File, which is ATP source code) were replaced by Salford modules during the weekend of September 26th and 27th. See a separate story for details of

this important, long-overdue change by ATP developers in Portland. Finally, on October 1st, BPA replaced Dr. Liu's Sun-3/140 workstation by a 33-MHz, 486-based COMPAQ PC (no Unix!). The transition now is complete: all ATP development in Oregon is being done on PCs using the Salford FTN77 /386 or /486 compilers. This is a milestone --- the fourth generational step in computer hardware. EMTP began on mainframe computers, and used minicomputers and workstations in between.

Improvements to Salford TPPLOT

A mouse was necessary between the addition of QUEUE (see the preceding issue, column 2 of page 16) and August 27th when the bug was removed. Dr. Bruce Mork was the first to complain that, without a mouse, execution would hang with the first plot on the screen (a **<CR>** would not result in a return to text mode) .

Variable MOUSET of TPPLOT.INI no longer need be set to zero if there is no mouse. Beginning September 3rd, a user without a mouse is protected by logic that was contributed two days earlier in E-mail from Dr. Mustafa Kizilcay of Lahmeyer International in Frankfurt, Germany. As before, if MOUSET is zero, the program avoids all use of the mouse (no change for this case). But if MOUSET is unity (as distributed by the user group), immediately after reading the .INI file, TPPLOT determines experimentally whether a mouse driver is running. If so, execution continues as before. If not, TPPLOT issues a single-line warning message to the top of the dialogue window, and it converts MOUSET to the appropriate value of zero. Previously, TPPLOT execution would hang in the latter case. In confusing fashion, the program would not respond normally to keyboard input. Well, that problem finally has been solved. One final, subtle distinction: Dr. Kizilcay reminds the user that it is software (the mouse driver) rather than hardware (the mouse itself) that is checked. TPPLOT still has no way to knowing whether mouse hardware is connected physically; instead, it checks the software connection. Presumably anyone who tries to execute a mouse driver without a mouse will be informed of the error of his ways by the driver.

LPRINT is supposed to be the number of the parallel port for a printer that is to be fed by the QUEUE command. A zero value prevents attempted printing, for those who do not have a printer. But what about those who make a mistake in specifying the port number? If the printer really is connected to LPT2 whereas the user thought it was connected to LPT1, what will happen? Alternatively, suppose the printer is where it should be, but is not ready (for example, it might be out of paper). What will be the response of TPPLOT in such cases? Prior to September 5th, there would have been serious trouble (program execution would have hung). After this date, thanks to more useful information from Dr. Kizilcay in his E-mail dated September 1st, TPPLOT will protect itself by halting the printer queue. There will be an associated, 3-line message that summarizes the problem. To illustrate, the following message was produced after the cable to the printer was disconnected from the 486-based computer at BPA : *"Warning! Either no printer is connected to parallel port LPRINT = 1 or a connected printer is not ready. Salford status (binary) = 10111000. The program now will protect itself from hanging by halting the printer queue."*

The DIR subcommand was added to the QUEUE command during the weekend of August 8th and 9th. Associated with this was new code to handle free-format integers and integer ranges. This was needed to permit the user to select multiple files conveniently from the table produced by DIR (both existing subcommands KILL and PRINT were enhanced this way). An illustration is easily provided. Using the keyboard, any DOS DIR command could be issued (e.g., "DIR \DATA\PLOT*.EPS"). The result will be a compacted tabulation of just the names of the disk files that satisfy this inventory request. If the user just clicks the mouse on the DIR button, of course the path will be implied. The default path is *.LJ2 under the assumption that most users already have, or soon will have, a laser printer. Yet, this is easily changed by SET DATA : it is alphanumeric index number 85 that allows the user to redefine the associated 8 bytes.

A screen editor for QUEUE was added during the weekend of August 15th and 16th. For mouse users, this supersedes and preempts the line-oriented coding of the preceding paragraph. This development follows the pattern established by previous window editors for the LABEL, CURVE, and WINDOW commands. In terms of total complexity, the editor of QUEUE certainly is simpler than those that support CURVE and WINDOW. Yet, the QUEUE editor does use some new concepts. Like the windows for LABEL or CURVE, the window for QUEUE is of fixed size. Yet, it is split into a variable number of panes (either 2 or 3) that depends on whether the user is displaying DIR information (the middle pane, if it exists). The first (top) pane consists of just a single window command line with buttons HALT, RUN, DELETE, DIR, and EXIT. The current status of each of the first three of these is indicated by color, and the 4th is used to make the 2nd pane visible. This DIR pane is made to disappear (if the user clicks on the ABORT button of its heading) to gain space for the listing of files of the print queue below it. An alternative would have been to make the panes scrollable. This was considered, but was rejected as being unnecessarily complex. It was easier to service an ABORT button to give 18 rows to the tabulation of the third pane. As long as the user is satisfied with the limit of 18 files for the print queue, operation remains both simple and quick. The mouse is used to mark entries (file names)

of either the 2nd or 3rd pane. Alternatively, there is an ALL button if the user wants to mark all entries. If the user marks some entry erroneously, a second click on it will cancel the previous marking whereas the ERASE button will erase all marking. Finally, if the user is satisfied with his selected file names (which will appear highlighted), he accepts them with a click on either the PRINT button (if pane 2) or KILL (if pane 3). The former of these copies file names from the 2nd to the 3rd pane, whereas the latter removes file names from the 3rd pane.

Computer expert David Szymanski must be thanked for the just-explained idea that a previously-marked (and therefore highlighted) entry could be canceled by a second click of the mouse. This suggestion came on September 8th when your Editor first demonstrated operation for him. As originally implemented, your Editor had an UNDO button to erase the most recent marking. The idea of a second click on the entry of interest is unquestionably superior, so was adopted immediately (the UNDO buttons were removed the same day).

Any serious user of TPPLOT who still does not employ a mouse at this late date is being very foolish. Thousands of lines of code have been written to support such a Microsoft-compatible device, which makes operation both simpler and faster. A color monitor is important, too. While not new, these thoughts continue to be ignored by some, so need to be repeated. It is not possible for your Editor to overemphasize the idea.

Use of the WINDOW command while running under MS Windows 3.1 resulted in a missing first (top) window. The first report of this trouble came from Dr. Tsu-huei Liu upon her return from Tokyo (see separate story). Well, once the trouble was recognized, correction was easy enough. The cause was identical to that reported for regular plots in the preceding issue (see the middle of column 2 on page 14). The same missing initialization of the mouse cursor (CALL HAIRON) was added to the window-plotting code to correct the problem on October 19th.

The STOP and START subcommands of the QUEUE command for users without a mouse were redefined to HALT and RUN on September 5th. This is to make the names agree with those available to mouse users within the window editor of QUEUE .

That extra initialization of CALL HAIR (see the middle of column 2 on page 14 of the preceding issue) is not required by all users of Microsoft Windows. A graduate student at North Carolina Agricultural and Technical State University, Chris Hicks, provided this important information on August 18th. Although the graph was missing from the screen of some 486-based computer of the department, TPPLOT execution on a 386-based computer was perfect for a version of the program that Mr. Hicks had obtained on July 17th while attending the short course in Seattle. A revised copy of the GIVE2 disk was mailed from BPA on August 20th in the hopes of extending graphics to the 486.

The BOLD command was not operable within a SET DATA command prior to August 17th when special code was added to transfer scalar storage of KBOLD (integer index 59) to the 20 cells of the vector that control each curve. The need was pointed out in E-mail of the same date by Dr. Kizilcay in Frankfurt.

Constraints on text cursor movement were put under user control August 19th. There now are two alternatives. The first of these was mentioned in the preceding issue (see the middle of column 1 on page 6). After Dr. Kizilcay reported success for the prototype code in E-mail dated August 17th, the feature was made permanent. If positive (the default value is zero), new variable LIMYMS is the limit on vertical pixels. The second alternative was inspired by Harald Wehrend of the University of Hannover in FAX dated August 13th. The suggestion was to use Salford library routine SET_MOUSE_BOUNDS@ immediately upon switching to text mode from graphic mode. If positive, new variables MAXMSH and MAXMSV are used as upper limits in the call to this routine. If the user makes no change, this is what he will be using because default values for the pair are 632 and 192, respectively, corresponding to a screen of 80 columns and 25 lines. Yet, all three control variables mentioned in this paragraph can be defined by SET DATA (see TPPARAM.HLP for details).

Logic for HPGL has been modified in order to give Dr. Kizilcay control over the placement of Y-axis numbers. Along with E-mail dated August 19th, Dr. Kizilcay sent disk file STAB.PL4 of transient stability simulation to illustrate his point. Your Editor sent into WordPerfect an HPGL*.LIS file that he produced by plotting the first curve of this, and observed that numbers did slightly overlap Y-axis tic marks. To correct the problem, two new variables YAXHPX and YAXHPY were added to replace the previous use of fixed offsets 0.9 and 0.1, respectively. These specify how far to the left and below the middle of the associated tic mark the number is to begin. For details, consult disk file TPPARAM . HLP .

The BOLD command allows the painting of curves on the screen using a broader brush as explained in the preceding issue (see the bottom of column 1 on page 5). Well, prior to September 6th, it did not apply to WINDOW plotting. For practical engineering, this was no great loss. But for demonstrations where not every observer has a good, close view of the screen, it is useful to emphasize the curves. So, thinking of Dr. Liu's lecture in Japan, your Editor added BOLD to WINDOW plotting, too.

"Rubber banding" was connected to button 2 of the mouse on Labor Day (September 7th). Unchanged is the use of button 1 to mark the location of the graphic cursor. Previously, button 2 then would draw a straight line between the last-marked point and the cursor, and would report the slope of that line. Now the digital readout is delayed. Button 2 still produces a line, but no longer is it fixed; instead, it moves with the graphic cursor. The user now sees the line before deciding to make it permanent by a subsequent click on button 1. Alternatively, if the user decides not to make the line permanent, he need only click a second time on button 2, which effectively cancels the first click. The digital readout of the slope will be seen only if and when the rubber band is made permanent. The F8 switch still is a binary toggle that allows the user to construct a piecewise-linear curve by clicking the mouse as it is moved. Rubber banding has improved this, too. The user now can see each line segment (as a rubber band) prior to fixing it with a click of button 1. Integer index 253 of SET DATA usage will change the color number of the rubber band, KOLXOR , which is equal to 240 plus the normal Salford color number. The default value is 255, which corresponds to bright white (normal Salford color number 15).

The SLOPE command was removed shortly after the rubber banding of the previous paragraph was added. Essentially, SLOPE involves pre-programmed, general logic. With the user able to adjust the slope of his own line interactively, it is not believed that the old, fixed, batch-mode logic has much use. Any reader who disagrees is advised to contact your Editor quickly (the logic still could be recovered, if a legitimate argument for its restoration can be made).

Y-axis scaling and the format for Y-axis numbers of a screen plot were put under manual control on the 3rd of October. For a long time, Prof. Corwin Alexander of Oregon State University has complained that Y-axis numbers are not presented artistically enough to satisfy the needs of publication. Well, as a simple experiment, a new floating-point parameter SCLYAX now allows optional, manual scaling of Y-axis numbers. If positive, SCLYAX is taken to be the manual scaling factor, which will be omitted from the Y-axis labeling. For example, if a signal is in volts, and if the user wants to label manually the Y-axis as involving kilovolts, he would use FMTYAX = 1.E-3. A second parameter is LEFTYN . If SCLYAX is positive, LEFTYN is the number of bytes the Y-axis numbers will be shifted to the left. This is an artistic control that allows the user to provide more separation (negative values are not honored) between the numbers and the axis. Finally, there is the issue of X-axis numbers. Since the user has had control over time-axis units (e.g., milliseconds) since day one, a new manual scaling factor generally is not needed. But an integer output of the numbers is. New binary switch INTXAX will result in such new integer output of times if value unity is assigned. As usual, the user is referred to TPPARAM . HLP for the controlling indices.

News from Outside USA and Canada

Those 13 UTPF segments from LEC (see column 1 on page 4 of the preceding issue) still had not yet been merged with our own on October 15th when a renewed request for our UTPF was received by E-mail. But all standard test cases recently had been run and verified, so, the following day, a package containing 3 floppy disks was sealed, marked Air Mail, and turned over to BPA's Mail Room. Included were a standard Salford GIVE2 disk to satisfy requests for FSCAN and TPPLOT, the entire 6457-Kbyte UTPF, the all-new Salford translator (see separate story), and new files for compilation and linking. Much has changed.

Lack of a US-based intermediary to forward ATP materials has been a continuing problem for many foreigners who are interested in acquiring ATP from the user group. That much is obvious. If no check is enclosed with the licensing form, the user group simply validates and returns the license along with a letter pointing our the need for an American address to which materials heavier than two sheets of paper should be shipped. This situation is clear. Less clear is what will happen in other cases. Examples follow.

As a first illustration of trouble complying with terms of the user group's form letter dated January 30th, consider the Belgian from Genk who supplied an American address but did not attach payment for the Rule Book that he had ordered. Only the floppy disks for the program itself were mailed promptly, of course. Later, an envelope from the U.S. Postal Service in St. Louis carried a money order for the missing $30, but nothing explaining the context. By then, your Editor had forgotten that only the money had been missing, so the money order was set aside. Some six weeks later the context was discovered as the backlog of orders having difficulties finally was liquidated during the weekend of September 19th and 20th.

A second illustration of trouble is provided by an order from London, England, in which the domestic address was neither forgotten nor supplied. Rather, the space for it was filled with the following: *"None. Would you please send the materials to me directly. If required, I would pay you back the postage. With thanks. $30 is enclosed."* Had the check actually been for only $30, the order would have been refused, of course. But, in fact, the check was for double this amount. Apparently someone in the Finance Office of the university had a little more business sense than the professor who had requested Salford EMTP. After weeks of deliberation, this second order finally was filled. No, the user group did not want to encourage such orders. On the other hand, the $30

was close to the expense for Air Mailing the materials --- or so your Editor thought as he carefully wrapped one single package of both the ATP Rule Book and four 3.5-inch floppy disks (TP20 was included). Unfortunately, the post office refused to accept the package for shipment by air because it exceeded some limit of 4 pounds! In response to your Editor's question about alternatives, the postal employee's only suggestion was surface mail for $12.85, which your Editor accepted. To conclude the unhappy episode, your Editor wrote a separate Air Mail letter dated September 21st which detailed these complications and served as cover for a refund of $20.17 in the form of a personal check. The letter ended with the following parting advice: *"I recommend that you never again attempt to purchase services from us that have not been offered. Next time, I will not reply."*

The moral of the story is this: comply with the clearly-stated requirements and the user group will respond promptly to an order for Salford EMTP. Any case of noncompliance runs the risk of delay and/or rejection. One final warning should be issued. Under no circumstances is the user group responsible for materials lost or damaged in transit during mailing outside the USA.

Naoto Nagaoka, the former graduate student of Prof. Akihiro Ametani at Doshisha University in Kyoto, Japan, successfully defended his doctoral dissertation in a final oral examination that was scheduled for September 12th. Additional good news was learned by voice telephone during early October: Dr. Nagaoka has no plans to leave the university as would be common place in this country. As your Editor has observed many times over the years, EMTP is complicated, and it requires a lot of background and continuity to be handled successfully. It is really good news to learn that Dr. Nagaoka will continue well into the '90s his involvement that began in the late '70s.

The Japanese EMTP Committee meeting of Friday, October 16th, was addressed in person by Can/Am Co-Chairman Dr. Tsu-huei Liu. An interested reader is referred to the January issue for details of this and other events during four days in Japan.

That FGH workshop in Mannheim, Germany (see column 1 on page 7 of the preceding issue), was attended by some 200 persons, and of these, 25 saw Salford EMTP demonstrated by Dr. Mustafa Kizilcay and Ir. Bernd Stein on September 22nd. In E-mail dated October 2nd, Dr. Kizilcay explained that EMTP was just one of some 30 different computer programs for network planning and operation that were featured. In the limited time available (10:30 16:00), attendees were forced to select only those presentations that were of the greatest interest. Such a format must be hard work for those doing the teaching! Dr. Kizilcay reports that the same one-hour demonstration was given twice in its entirety, but that the third and final presentation had to be truncated as the workshop was ending. Yet, this must have been great for the audience: with an average attendance of fewer than 10 per demonstration, every seat must have been excellent! Execution under DESQview by Quarterdeck was featured, and this was the basis of a novel scheme to avoid the need for a second overhead projector. The information that normally would be contained on sheets of plastic was instead stored as graphical frames within DrawPerfect, which was running in another window of DESQview. It certainly was quicker and easier for Dr. Kizilcay to switch between two windows of DESQview than it would have been to remove or reinstall the plasma plate on top of the extra-bright overhead projector. As long as it is not necessary to see both displays at the same time, this is a superb idea. This technique probably is better suited for a quick presentation than a real short course, however.

The South African EMTP user group is headed by ESKOM (the Electricity Supply Kommission) in Johannesburg. Following extraordinary initiative by a student at the University of Cape Town (see separate story about E-mail), full user group relations with BPA were restored during the first week of September. This began with two pages of FAX on September 3rd from Willie J. G. Naudé, who has the title of *"Coordinator"* of the user group. From this and another page the following day, it seems clear that all requirements of compatibility are fulfilled: *"... we have 13 separate company or university members in the South African usergroup. ... I also confirm that membership in our usergroup is free and that none of its members is engaged in 'EMTP commerce'. Also that our licensing does prevent ATP disclosure to non-members."* New Salford EMTP materials should have been mailed to ESKOM by the BPA Mail Room on September 4th. Included were DBOS/486 Rev. 2.66 (Mr. Naudé indicated that he had nothing newer than 2.61) in order that Erica Johnson and others could run in Enhanced mode under MS Windows 3.0 or 3.1. A separate, large envelope contained not only the July issue of our newsletter, but also the April issue and a preprint of Laurent Dubé's ETEP paper, which somehow had not been received. Mr. Naudé confirmed reception of only the initial package. He wrote: *"We will be happy to receive any future CAN/AM newsletters which we would then distribute to the usergroup members free of charge."* FAX from your Editor dated September 4th reassured Mr. Naudé that *"there is no intention of encouraging your user group or any other to break its ties with LEC."*
It is unknown where such an idea, expressed months earlier by the Australian user group, comes from. Your Editor reiterates that it is unfounded. Breaking the LEC monopoly on ATP is not necessarily the same as breaking LEC. The latter might possibly be a result, but it certainly is not the goal.

The Indian EMTP User Group was run by NTPC of New Delhi. The lack of response to mail from BPA might well be related to a splitting of NTPC into two

parts. News of this disruption was learned from S. M. Mujumdar of Maharashtra State Electricity Board in Bombay during his visit to IREQ in Montréal. In a telephone conversation October 6th, it was agreed that Mr. Mujumdar would carry back to India our wishes for renewed contact with an EMTP user group there.

More about Electronic Mail (E-mail)

CompuServe is working well for ATP developers in Portland. For those who missed the important announcement in the preceding issue, your Editor has joined under a slightly modified name. Because only a first name and a middle initial were accommodated by the registration form, your Editor specified *"Scott W"* rather than the correct *"W. Scott."* His CompuServe User ID number is "71155,1153" which translates into INTERNET : 71155 . 1153 @ COMPUSERVE . COM for those who have access to Internet. Carefully note that the comma of CompuServe has become a period for use with Internet!

South Africa provided ATP developers in Portland with the first E-mail that did not come from North America or Europe. This was on August 27th when mail arrived unexpectedly from Erica Johnson, a Master's degree student at the University of Cape Town. From Dr. Bruce Mork's E-mail user group in Fargo, those in Cape Town already had copied the WordPerfect disk files of this newsletter. In his reply, your Editor specifically mentioned the lack of response from ESKOM to mailings from BPA. In her reply, Ms. Johnson mentioned that, *"earlier this week in fact, I had contacted the Escom software support group ... and told them you were expecting a response."* Thanks to this initiative involving E-mail, ESKOM is back in EMTP contact with BPA (see separate story about foreign news). To conclude, geographical isolation does not imply informational isolation. In this case, E-mail made the difference: the University of Cape Town had it, whereas ESKOM did not. E-mail also provided first confirmation that new Salford EMTP disks from BPA had arrived safely at ESKOM . In a message dated September 23rd, Ms. Johnson wrote: *"... I have received the Salford EMTP on Monday (the 21st). My supervisor brought it back from his trip to Johannesburg. It works beautifully under Windows and I am enjoying using EMTP."*

The October issue of *IEEE Spectrum* magazine carries a detailed look at E-mail. The existence of this first was called to your Editor's attention by Prof. Bruce Mork, and then later by Laurent Dubé. The title that dominates both the cover and all of pages 22 through 33 is : *"E-mail --- Pervasive and Persuasive."* This is recommended reading for anyone who still does not believe that a revolution is ongoing. The subtitle that precedes the article reads : *"The net of networks now embracing the globe is bypassing corporate and other hierarchies."* It's true (believe it)!

Correction. **KIZILCAY @ LIFRA.LIF.DE** is the E-mail address for Dr. Mustafa Kizilcay of Lahmeyer International in Frankfurt, Germany. The July issue erroneously stated this in column 2 on page 8. The amazing thing is that no one noticed the error in print, it would seem. Only after your Editor had passed the erroneous information along to all subscribers of the Fargo list server did Harald Wehrend of the University of Hannover notice the error and provide a correction in E-mail dated October 6th.

Universidad de Los Andes in Bogota, Colombia, provided the first E-mail from Latin America. On the 28th of September. Nestor Ceron, who describes himself as **nceron%andescol.bitnet@cunyvm.cuny.edu** was answered via Internet without apparent trouble.

Pakistan will receive information about ATP from Charles Stuart ("Stu") Cook, the President of Just Services which is located in Mont-St. Hilaire (a suburb of Montréal), Québec, Canada. Mr. Cook already has spent weeks in Pakistan, and will be returning to that country again soon. Responding to his telephoned request on September 16th, Mr. Cook was mailed an extra copy of the two most recent newsletters (July and April) and the 6-page form letter dated 30 Jan 1992 that is used for licensing.

The first Canadian user of CompuServe to exchange E-mail messages with your Editor turned out to be none other than static var modeler (see DC-22) Gabor Furst of White Rock (a suburb of Vancouver), British Columbia. This was on September 8th. As expected, there was no problem crossing the international border. There was no need to go outside of CompuServe. Whereas messages to and from other parts of the world are accompanied by a dozen or more lines showing at what times the message is passed from one network or server to another, the message from Mr. Furst shows nothing more than his CompuServe User ID number 70410,1153. This is encouraging. Think of the extrapolation. What is special about Canada? Suppose a Korean subscriber of CompuServe wanted to send your Editor E-mail. Would that, too, be internal to CompuServe? If not, why not?

Australia is the first overseas country to provide an answer for this question. While looking through the list of subscribers of Prof. Bruce Mork's E-mail network in Fargo, your Editor noted that all CompuServe members were grouped together. One of these is half way around the world: Dr. Brian Elliott of Pacific Power (formerly ECNSW, Electricity Commission of New South Wales) in Sydney, Australia. Immediately, during the early morning hours of September 30th, your Editor sent E-mail to "100032,1742" that asked Dr. Elliott about his E-mail

usage. A detailed response came in the form of E-mail dated October 7th, from which the following quotation has been copied : *"Who pays for CompuServe? Pacific Power pays for CompuServe! Our Group head does realise the value of such a facility. CompuServe Pacific provides a local access number which connects us directly to a US CompuServe node. It operates at 300/1200/2400 baud. The charges are A$18/hour for communications surcharge from Sydney to US, plus the standard A$18/hour connection rate. The link to the US is a satellite link involving Fujitsu. This is reasonably expensive, but much cheaper than an international call. It is not too bad for E-mail, but you do tend to spend a lot of time when searching through the forums and downloading libraries. As we have only had access for a month now, we expect that our usage will reduce as we bring ourselves up to date on what is available."*

Names without locations is a weakness of the subscription list of Dr. Bruce Mork's E-mail network in Fargo. Of course, each subscriber knows where he, himself, is located, but how does anyone else?! For example, consider Laurent Dubé, for whom there is no information other than his CompuServe address. It happens that Mr. Dubé is located in the United States, but there is no way to know this from the Fargo list. Dr. Elliott was known to be in Australia because he followed his name by some explanation: "Pacific Power (ECNSW), S" It would appear that the trailing "S" probably was the beginning of "Sydney, Australia," which was truncated. For others, the E-mail address reveals the country even though the name might not. An example of this is Frank Menter in Germany. No, Mr. Menter did not forget to provide a description of where he was, but truncation made what was retained ("Frank E. Menter, Technical University o") useless for the purpose of determining location!

Dr. Ivano Bonfanti of CESI in Milano, Italy, is another recent user of E-mail. His E-mail address was found among recent subscribers to the Fargo list server. CESI is an important organization of the world-wide power industry, and this is important progress from what was reported earlier this year (see lines 3-6 on page 15 of the January issue).

A busy signal was obtained from the 9600-baud Portland CompuServe number for the first time around 09:40 Monday morning, August 31th. While unavailable lines have not been a problem, this detail should be mentioned as a potential complication for those who want to use CompuServe during normal business hours.

Failure of CompuServe to allow logging onto its computer in the middle of the night is the occasional hazard of night-time use. Computer expert David Szymanski explains this infrequent problem as most likely being an indication that the CompuServe computer had crashed. During business hours, there presumably is human maintenance and/or support to keep all equipment running; at night there may well be none. The inability to send messages occurred for your Editor around 2:30 in the morning of September 10th. Trying again around 8:20, there was no difficulty. Whether different telephone numbers (e.g., for lower speed) would be connected to a different computer is not known, and has not been tried.

MODELS author Laurent Dubé confirmed the *"E-mail cost"* of his recent move to the Oregon Coast. During a telephone conversation of September 9th, Mr. Dubé confirmed that his calls to CompuServe no longer are free! Mr. Dubé has switched from a Portland number to a Salem number, which during the off hours incurs long-distance charges by the telephone company of 11 cents per minute. Well, as long as only letters are involved, and one agrees to use E-mail only at night, the added expense is inconsequential.

CompuServe software can be installed and used on more than one computer of a subscriber. BPA's Jim Hall was the first to point this out to your Editor and Dr. Liu, who immediately imagined the interesting possibility of sending mail to oneself! Consider a small company that can afford only a single CompuServe membership. For mail to others, this is adequate. But what happens when one employee travels, and wants to exchange mail with his home office? Voila! Of course, both parties to such communication must keep careful track of whose turn it is to send mail! Remember, he who receives his own letter has, in effect, destroyed it!

Yin Yuexin, graduate student at the University of Florida in Gainesville, first sent E-mail to your Editor on September 10th. As the main site of ATP education within North America, the Electrical Engineering Department of the University of Florida is important to ATP developers. Access to E-mail means that data that might cause trouble during Prof. Carroll's next short course (March, 1993) could be sent rapidly to Portland for analysis, if this might be beneficial. Those wanting to contact Mr. Yin could try sending mail to: **yin@ugrad.ee.ufl.edu** Unfortunately, two attempts by your Editor simply vanished. The problem is believed to be somewhere on the Gainesville campus, however (see next paragraph).

Prof. Dennis Carroll has his own E-mail address in Gainesville. When he heard that mail to Mr. Yin was being lost, Prof. Carroll suggested that we try his own address, **dcarr@mailgate.engnet.ufl.edu** This was a good idea, it turned out, because this third try was returned by **Postmaster@mailgate.engnet.ufl.edu** with the complaint that Prof. Carroll's address was not known. A printed copy of this refused communication was then sent to Prof. Carroll by FAX on October 9th in order that E-mail experts somewhere on campus might be able to

figure out what went wrong.

The University of Northumbria in Newcastle upon Tyne, England, seemed to be comparably unreachable when your Editor tried to respond to a conventional letter from Senior Lecturer Sayeed N. Ghani. This was using the E-mail address that had been printed on his letter: **s.n.ghani@uk.ac.npy.vaxa** In this case your Editor's message was returned with the complaint "host unknown." Well, on October 22nd, Dr. Ghani succeeded in sending mail to Portland from a second campus address, **efu3@vaxa.newcastle-poly.ac.uk** , and your Editor replied to it without difficulty. Hmmmm, for use outside the United Kingdom, I can well believe that an address must end in **.uk** !

Laszlo Prikler of the Technical University of Budapest in Hungary, first exchanged meaningful E-mail with your Editor on Sunday, September 13th. Mr. Prikler's incoming message of 6952 bytes was received uneventfully from CompuServe. But after your Editor responded with a 7616-byte message at 19:50 the same day, he was surprised to find an extra piece of E-mail in his CIM "In basket." From the network itself, this said: *"ALERT: Message sent but $0.20 surcharge was added."* Apparently your Editor exceeded the 3-page limit of 7500 bytes, according to Dr. Liu! Well, since even a minimal conventional letter within the USA costs 29 cents ($0.29) for First Class, the magnitude of any such CompuServe charge for long letters is not a serious concern. For others wanting to send E-mail to Budapest, the preferred (local) E-mail address is : **priki@vmt.bme.hu**

But a 60-cent surcharge was added by CompuServe for the transmission of a 28-Kbyte file by your Editor to Prof. Chen of Seattle University. This was at 6:30 on a Thursday morning (September 24th). Your Editor can only conclude that Prof. Bruce Mork in Houghton is lucky to have free E-mail (see later story about the mother of all E-mail transfers)!

The EMTP E-mail network in Fargo, which reproduces and resends any message sent to Internet address **atp-emtp@vm1.nodak.edu** , obviously is a big success. According to its originator, Prof. Bruce Mork, some 75 subscribers existed as of early October. It would seem that the problem of undeliverable E-mail has been increasing with size, however. On September 10th, Prof. Mork reminded each recipient to cancel his membership using a SIGNOFF command prior to any possible discontinuance of the member's E - mail address . *"Rejected messages occupy too much of the LISTSERV administrator's time already. If we can avoid wasting too much of his time, he will be more willing to quickly help us when there really is a problem."* For those who missed Prof. Mork's E-mail address in the preceding issue, it will be repeated: **bamork@mtu.edu**

Purdue and Carnegie Mellon Universities seem to be sponsors of another E-mail list about which Prof. Mork notified all of his subscribers on September 21st: *"Most of the subscribers are university professors engaged in power-related teaching and research activities. Correspondence seems related to upcoming conferences, calls for papers, open faculty positions, and other items of academic interest. Subscribers are from all over the world. ... ... If you have questions or want to subscribe, contact* ***heydt@ecn.purdue.edu*** *or* ***power-list-request@globe.edrc.cmu.edu*** *, not me."* Your Editor passes this summary mention along to readers as just another sign of the changing times. It should be obvious that E-mail is useful for things other than EMTP. This is one illustration of another application.

Prof. Gerald T. Heydt of the Electrical Engineering Department of Purdue University in West Lafayette, Indiana, is the person behind the preceding E-mail address. On October 18th, he sent your Editor E-mail that included the following interesting first paragraph: *"I am distributing a directory of email addresses of power engineers worldwide. Can we include your name and address? I'll send you a copy if you are interested."* Of course, your Editor approved. Then, on October 21st, incoming mail revealed a big file of some 23 Kbytes from Purdue. Yes, this was a current copy of the directory including your Editor! Text that precedes the listing includes the following: *"Please send corrections and additions to Dr. G. T. Heydt, heydt@ecn.purdue.edu .... Updated approximately monthly and distributed free of charge. .... Power Engineering Remailer Facility: If you send mail to power@globe.edrc.cmu.edu or .... it will automatically be forwarded to people in the Power Engineering Directory. If you find problems with the list, send mail to .... Mail to the power list will be archived. The archive is available through anonymous ftp on the machine globe.edrc.cmu.edu It is in the file .... Below is a transcript of how to retrieve the archive file through anonymous ftp."* Passing on to the directory itself, the first two entries convey the style (note the 2nd of these is for Prof. Ali Abur, an ATP user in College Station!):

D I R E C T O R Y

Eyad H. ABED abed@src.umd.edu
EE, U Maryland

Ali ABUR abur@ee.tamu.edu
EE, Texas A&M Univ

VRM (Variable Reluctance Machine) modeling by one Ajmal Saeed of Atlantic Orient Corporation in Norwich, Vermont, was the subject of your Editor's first call for help using the list server. This was October 16th, following a telephone discussion with Mr. Saeed about his letter dated October 8th, which had asked whether EMTP could be used to simulate a VRM using equations from two papers by Torrey and Lang. Your Editor explained that

he did not know, but would, himself, be willing to broadcast the appeal because Atlantic Orient did not seem to have access to E-mail. The goal is *"accurate drive description needed to support optimal-efficiency excitation and control."* Since known subscribers to the Fargo server include experts in the use of EMTP to simulate power electronics such as Prof. Ned Mohan in Minneapolis and Prof. G. A. Capolino in Marseille, the idea offered hope.

Lack of a conclusion to stories that are spread via the Fargo list server is another problem. Or so it seems to your Editor, who will illustrate with an example. On August 19th, the server in Fargo reproduced a call for help from Meirios Moechtar of the University of Southern California. Lack of screen graphics when running TPPLOT under MS Windows 3.1 was the complaint. Responding to Mr. Moechtar the following day via E-mail, your Editor explained that the problem of the missing graph had been solved as described in our July newsletter. Next, Mr. Moechtar responded with E-mail dated August 22nd in which he confirmed his need for a corrected program. Finally, user group records show that your Editor mailed this by First Class (air mail) on August 26th, and E-mail from Mr. Moechtar on August 31st confirmed reception. But how did any of the other subscribers know the problem had been solved? At the time, your Editor discussed precisely this detail with Dr. Mork, who said that your Editor could either respond via the network or write a concluding summary for the network. As a matter of record, your Editor did neither. This explains why, on September 11th, Dr. Laszlo Prikler issued server mail confirming that the same graphic problem existed in Hungary. This was in response to Mr. Moechtar's original plea for help on August 19th! Your Editor would propose that it be the responsibility of the person who issues the original public plea to be sure that all subscribers are informed of any conclusion. In an effort to reach a consensus on this matter, your Editor encourages any reader who disagrees to discuss the matter publicly. This began on September 12th when this paragraph was sent to Fargo for distribution.

UUENCODE and UUDECODE are encoding and decoding utilities for the transmission of arbitrary (e.g., binary) files using Internet as first described in the January, 1992, issue (see column 1 of page 14). Both were updated within EMAIL.ZIP on October 9th in order to allow the more convenient transmission of large files in pieces of around 40 Kbytes each. For details, refer to a separate story.

Limits on file size seem to be the most serious impediments to your Editor's use of CompuServe for the transmission of disk files. Yet, this is not exactly a CompuServe problem, it should be emphasized. The CompuServe manual clearly indicates that files as large as 1/2 Mbyte, either ASCII or binary, can be handled. But such large files can not be sent through Internet! Harald Wehrend of the University of Hannover was the first to point out this problem to your Editor. This was on August 13th when he explained in E-mail that his single file of CDC FORTRAN changes had to be split into 7 pieces, each less than 64 Kbytes, for transmission to me on CompuServe. Subsequently, your Editor, not always the fastest of learners, rediscovered the phenomenon when he tried to send the ZIPped and UUENCODEd WordPerfect file for the 20-page July issue of the newsletter to Dr. Mork in Fargo. During the early morning of August 20th, CompuServe rejected the 105-Kbyte transfer with the explanation : *"(3) Message too long."* To conclude, CompuServe E-mail is wonderful for letters and small files; it becomes cumbersome for big files of hundreds of Kbytes that would require transmission via Internet. For example, we are a long way from being able to send the entire UTPF, which exceeds 6 Mbytes!

No, JUL92.WP5 was not split into pieces in order that it could be sent to Fargo electronically. This was considered to be both risky and more trouble than it was worth. Instead, the disk file storing the July newsletter was sent on August 20th by overnight delivery service along with other materials that were needed by Dr. Mork prior to his departure the following week for Michigan Tech in Houghton. Dr. Mork subsequently notified all list server subscribers of its availability via FTP in E-mail dated August 21st.

FAX can be sent via E-mail more conveniently and economically than by conventional FAX machines. This reminder came from Laurent Dubé, who has used the FAX extension of E-mail for sites in both Latin America and Europe. For text, ordinary E-mail is the preferred medium, of course. But to reach those who do not have E-mail, FAX serves as an alternative. One begins the same way in either case --- by writing a message off-line using a text editor. If your Editor were doing it, this would be inside CompuServe's CIM. Then he would send the message. For normal E-mail to other parts of the world, the address of the destination begins with >INTERNET: (which is CompuServe's way of connecting with Internet). To connect with FAX instead, CompuServe members use >FAX: followed by the regular international telephone number. Cost is a dominant advantage for an American CompuServe member such as Mr. Dubé who needs to send FAX to Europe. In the following table of numbers (supplied by Mr. Dubé on September 12th), the first number is the CompuServe cost for the first 1000 bytes, and the second number is the added cost for each additional Kbyte or fraction thereof:

Within North America:	0.75	.25
To Europe :	0.90	.90
To Japan :	4.40	.90
To Taiwan :	5.20	1.10

To put this in perspective, a typical full page of printed letter requires just over a minute using the conventional FAX machine at BPA.

MORK.EXE is the 43-Kbyte, self-dearchiving file by Dr. Bruce Mork for Salford EMTP installation. Use of UUENCODE increased file size to 61 Kbytes --- barely within the CompuServe limit. So, Dr. Mork reasoned, there should be no trouble sending this to Portland as E-mail. Yet, the transmission was less direct than expected. Reading the mail using CIM in Portland revealed only the following cryptic message: *"The size of the file is 61236 bytes. The file has been written to NONAME.DAT."* It would seem that more than just the transmission is limited! When Gayle Collins thought to try the OPEN subcommand of the FILE menu of CIM on the name NONAME . DAT, an error window complained as follows: *"Can not read... File exceeds 32000 bytes."* Your Editor concludes that the CompuServe filing cabinet is for telegrams, **not** for magazines or books! Too bad! CIM for MS-DOS probably is PC XT-compatible!

Internet FTP transfers have no known, practical limitation on file size, it should be emphasized. This recently was proven by Prof. Bruce Mork of Michigan Technological University (MTU) in Houghton. To complete his move from North Dakota State University (NDSU) in Fargo, Prof. Mork archived all files of interest and transferred them in what can only be described as the Mother of All E-mail. In a message to your Editor dated September 9th, he reports: *"By the way, last night I transferred a 36-Mbyte .ZIP file from NDSU to MTU. It took 8-1/2 hours to transfer, but arrived intact. I unarchived it during my lecture this morning. All my research data files seem to be intact."*

Big FTP transfers of the University of Hannover are not free of charge, however. Ir. Harald Wehrend made this point during a telephone conversation early in the morning of October 23rd. There may be no limit on file size, but large transmissions are discouraged because free usage is limited to 20 Mbytes per month for the entire university (not department). This does seem a little more realistic and fair. After all, there are costs associated with building and maintaining the network. Just as for CompuServe, at the university in Hannover, the bill for substantial file transfers is proportional to the burden on the system. There is no such thing as a free lunch ... anywhere! So now the question is, what rate does the University of Hannover pay? How many dollars per megabyte? This rate will determine how practical or impractical E-mail might be for the transmission of voluminous ATP materials such as the ATP Rule Book.

Rush Limbaugh, conservative radio talk show host, would seem to be the most conspicuous member and advocate of CompuServe. Listened to by an audience of more than 13 million, Mr. Limbaugh is broadcast three hours or more each weekday on more than five hundred radio stations across the country. Those wanting to share political ideas with the host have been invited to send E-mail to him via CompuServe. Mr. Limbaugh claims to read all mail, although he could not possibly respond to all of it. On or around October 21st, he explained to his listeners that sometimes the system is overloaded. It seems a CompuServe mail box only holds 100 messages, and Mr. Limbaugh's requires emptying every two hours or so! CompuServe even offers a special Limbaugh forum about which your Editor knows nothing. For those not familiar with the terminology, a few introductory words about the idea will be reproduced from the CompuServe Users Guide: *"Forums are special interest groups within the CompuServe community. Members join a forum to meet people with similar interests. ... CompuServe has more than 150 forums, and each one is dedicated to a unique special interest. There are forums for microcomputers, ... HAM radio, travel, and even wine tasting."*

German access to CompuServe does not appear to be as attractive as American access according to information that was obtained by Harald Wehrend of the University of Hannover. This was communicated to your Editor in FAX (perhaps the last Mr. Wehrend ever will use for sending messages to Portland!) dated August 13th. Although rates are reasonable, usage is paid for only by the hour, it would seem. Nothing comparable to the attractive flat (fixed) rate of $7.95/month that Laurent Dubé and your Editor pay would seem to be available in Germany. Mr. Wehrend indicates $12.50/hour for 2400 baud use (compare with 12.80/hour for metered service at this speed in USA).

A bigger problem with German use of CompuServe would seem to be limited direct access: there are only two CompuServe numbers within all Germany! On the other hand, one can access CompuServe **indirectly** by going through the Datex-P public network of the Deutsche Bundespost. Access numbers for Datex-P are listed by CompuServe for 21 cites of Germany, but there would seem to be an extra charge for use of this second network. In addition, unlike the world-famous Autobahn, there also are some annoying speed limits. The list of available numbers shows nothing faster than 1200 baud for Mannheim (where our friend, Ir. Bernd Stein of FGH, is located) and 2400 baud for Hannover. Only two cities in Germany enjoy 9600-baud service, which is provided by the genuine CompuServe numbers in Frankfurt and Mannheim. Your Editor's conclusion is that we American's should count our blessings in one more way. We are very fortunate to have the access to E-mail that we do at the **price** we do. CompuServe does not seem to offer the same bargain in Germany. But does any other company or computer network offer reasonable, fixed rates there or anywhere else in the world? Your Editor will pass along a summary of any such bargain E-mail rates that might be brought to his attention by informed readers.

9600 baud would seem to be the maximum connection speed for CompuServe --- at least for the amount of money your Editor is paying! Three cities within Oregon do have numbers for 9600 baud, and the Portland area is

one, of course. Your Editor switched to this for the first time on August 15th, and it works well. Yet, computer expert David Szymanski was surprised to learn that CompuServe does not support higher speeds such as 38400 baud. Readers may recall that the Robotics modem supplied to BPA by Szymanski along with a 486-based computer can be used at this speed over conventional telephone lines. Well, for anything other than the transmission of large disk files, higher speeds do not add much to the value of the service, so it does not matter much.

Modems that include the capability of FAX transmission directly from a conventional disk file are a recent advance for personal computers. If E-mail is not available, this might be the next best choice. With the new modems, one avoids the need for a printer (to produce a printed copy of what is to be communicated) and an optical scanner (built into a conventional FAX machine). The personal computer creates the bit map itself directly from the disk file. Dr. Liu's notebook computer came equipped with one, and Dr. Kizilcay sent FAX from Frankfurt to Portland on August 22nd to demonstrate his own *"which is connected to my serial port externally."* Harald Wehrend in Hannover has done the same thing since then. On the receiving end, the printed message appears unusually sharp and fine.

A nice feature of CIM (CompuServe Information Manager) software is that one can click on the **Reply** button after reading an incoming letter. In this way, one can avoid keying the **To:** and **From:** addresses and the subject, and possibly making a mistake in the process. Alternatively, if one clicks on **From:** of an existing message, a window labeled "Address Entry" will open, and the name and E-mail address will be transferred to it. A subsequent click on the **Save** button then will transfer this new entry to permanent storage in the CIM Address Book, which can be used to address any future E-mail by simply clicking on the entry of interest. To summarize, CIM makes the saving and pasting of addresses very simple.

Shareware editor PC-Write 4.0 accepts WordPerfect data files according to advertising received by mail from Quicksoft during early September. This latest version of PC-Write offers something called the Perfect Filter, which is said to be built in.

Salford EMTP Allows Parameters

The /PARAMS option can be used for the execution of Salford EMTP from a single line of a batch file. Previously, execution from a single line of a batch file was possible only if input was taken from an auxiliary, associated disk file. Recall that for standard test cases, these were the DC*.TEX files. No longer is such extra, external input, pointed to by the "<" symbol, required. Those DC*.TEX files have disappeared (the former ALLTEX.ZIP file of the GIVE2 disk no longer is being distributed). As explained previously, the inspiration for this latest progress came from Dr. Mustafa Kizilcay of Lahmeyer International in Frankfurt, Germany.

An illustration probably explains the new usage better than words. It now is possible to execute Salford EMTP using any input data file such as DC3.DAT as follows : RUNTP DISK DC3. DC3. -R where batch file RUNTP.BAT connects to Salford EMTP the four parameters following RUNTP as follows: RUN77 TP3.EXE /PARAMS %1 %2 %3 %4 If RUNTP is to be executed two or more times within a batch file (e.g., for standard test cases, disk file RUN.BAT contains 80 such repetitive executions), the RUNTP must be preceded by a CALL command. This was Dr. Kizilcay's final contribution, around 03:30 Sunday morning, when your Editor observed that the first execution worked perfectly, but then RUN.BAT would abort. Yes, the use of CALL RUNTP solved the problem.

A final advantage of the use of parameters is that they have application beyond just the execution of Salford EMTP. Copies of any argument can be applied to any MS-DOS command. Previously, RUN.BAT had a separate command to show the .LIS file following each execution (e.g., DIR DC3.LIS) . Well, these 80 or so commands no longer exist. The same effect now is produced by the following single line within RUNTP : DIR %2LIS. Note that for the execution of DC-3, the 2nd argument will be "DC3." so %2LIS would become DC3.LIS as required to inventory the output file.

DC-68 illustrates the use of arguments with data files. Unfortunately, these complicate the preceding procedure somewhat. Fortunately, the average user has never used such capability. Those who do can look at the example in RUN.BAT. Note that a pounds sign can be used to reserve a blank space anywhere, and the tilde character "~" is to be used instead of a comma. This is because MS-DOS treats both blanks and commas as separator characters for arguments. Any arguments must be tied to the preceding data file name without any imbedded blanks.

No longer does negative D4FACT of STARTUP conflict with batch-mode execution that involves screen graphics. Previously, the READ_ME.DOC file warned of such trouble. That warning has been removed. This is a small, unexpected additional advantage of our cessation of reliance upon redirected input (the former use of "<" within RUN.BAT) .

Quarterdeck's DESQview execution of Salford EMTP in the background provided the motivation for Dr. Kizilcay to request the use of batch-mode parameters. Although RUNTP has been illustrated for the case of standard test

cases, the real demand came from use with DESQview, as Dr. Kizilcay no doubt will describe soon in writing somewhere.

CDC EMTP Used in Hannover

A current (new) version of ATP for CDC is being worked on by Harald Wehrend of the University of Hannover in Germany as the remainder of this story will document.

The CDC translator was converted from Apollo to Intel 486 and Salford FORTRAN in order to update Harald Wehrend at the University of Hannover. This was during the weekend of April 25-26. Features of the old CDC translator were transferred to a copy of the translator that then was used for Salford EMTP. In-line library functions have been included (the CDC computer in Hannover is powerful). Changes since the previous usage in 1989 include replacement of the illegal period in a file name by the underscore character. For example, the disk file name DC3.DAT of most computers becomes DC3_DAT for CDC usage. A second structural reform unified the entire CDC EMTP (except VARDIM), as a single output file of the translator. This is all ready for storage and manipulation by newer CDC software that resembles the old CDC UPDATE of a decade and a half ago. What for most computers would be different chunks of EMTP FORTRAN are separated for CDC using different * DECK declarations . For ease of remembering, these were selected to correspond to the segmentation points used for Salford. Single precision (64-bit words) is used throughout CDC EMTP FORTRAN. To conclude, translation procedures for CDC remain distinct from those used for the more common byte-organized computers that today dominate the power industry. This is why working with CDC or other non-standard computers is important: it keeps us honest by further testing our universality.

The front third of the old EMTP FORTRAN for CDC was sent from Hannover to Portland by E-mail on August 17th in order to document changes that had been made there by Mustafa Kizilcay. The first such massive transfer involving your Editor, this was seen as an educational test of the new, faster communication medium. For more details, refer to a later story about UUENCODE. The single . ZIP file had to be split into 8 pieces of about 47500 bytes each to pass into CompuServe, and these took about 25 minutes to read in Portland at 2400 baud using the **Get all mail** button. Since then, your Editor has switched to 9600 baud, for obvious reasons! The transfer was monitored in a special window that dynamically reported the fraction completed along with window labeling such as *"Receiving message 5 of 8."*

New CDC EMTP FORTRAN would have been sent to Hannover by E-mail if Mr. Wehrend had been ready to work on it immediately. Unfortunately, he was unusually busy with new students as the school year was beginning. So, instead, one floppy disk was delivered to the BPA Mail Room on October 23rd.

A dollar sign ($) in explicit text is prohibited by one new CDC compiler in Hannover. Harald Wehrend was told by experts at his computer center that the dollar sign was reserved as an indicator of vector operations! This explains the most bizarre extension to UTPF rules in recent years. Previously (for the past ten years or so), the front end of EMTP FORTRAN involved a number of explicit character strings such as '$INCLUDE' or '$LEVEL' at the beginning of execution. Well, by October 22nd, such usage had been converted from constants to variables (from explicit to implicit usage). This assumes that CDC continues to allow the dollar sign as a data character (your Editor loaded the associated program variables from the dollar sign that appears in STARTUP) .

Multi - Phase Transformer Modeling

Both North Dakota State University in Fargo and Seattle University continue to work for BPA on low-frequency, multi-phase, transformer modeling under contracts that have been extended through the end of February, 1993.

The 2nd progress report from NDSU was received October 15th, and was immediately photocopied for distribution to others. On October 21st, copies of this 34-page report, with its cover letter from Prof. Don Stuehm dated October 7th, were mailed by BPA to three addresses : 1) Leuven, Belgium, in time for the annual LEC meeting on November 9th and 10th; 2) Prof. Xusheng Chen in Seattle; and 3) Robert Meredith of the New York Power Authority in White Plains. A second mailing of copies by BPA should accompany this newsletter.

Dr. Bruce Mork moved to Michigan Tech in Houghton, Michigan, around the end of August. His telephone number has changed from the one printed in the preceding issue. It now is: (906) 487-2861.

Prof. D. J. Wilcox of University College Galway in Ireland is yet another researcher who is working on the challenge of transformer representation for EMTP-like studies. If an important contribution to ATP results, Prof. Ned Mohan in Minneapolis deserves part of the credit because it was his mailing to Europe last spring (see page 12 of the preceding issue) that prompted Prof. Wilcox to write ATP developers in Portland. In a telephone conversation on August 18th, Dr. Liu and your Editor agreed to exchange information. Prof. Wilcox agreed to send documentation of his ideas to BPA in the form of several technical papers. In return, BPA would mail a

copy of the ATP Rule Book and Salford EMTP with which those in Galway had no exposure. On September 3rd, photocopies of Prof. Wilcox's 5 papers were air mailed by BPA to others who might have interest in the unique, linear, modal approach. These four were: 1) Prof. Akihiro Ametani and Naoto Nagaoka of Doshisha University in Kyoto, Japan; 2) Robert Meredith of New York Power Authority in White Plains; 3) Prof. Bruce Mork at Michigan Tech in Houghton; and finally, 4) Vincent Vanderstockt of Laborelec in Brussels, Belgium.

New UUENCODE and UUDECODE

Revised encoding and decoding utilities to assist the transmission of non-text files by E-mail were received from Dr. Mustafa Kizilcay of Lahmeyer International in Frankfurt, Germany, on Sept 8th. They replaced the original ones in EMAIL.ZIP of the GIVE2 disk of Salford EMTP distribution on October 9th.

The new version of UUDECODE contains output that documents the author and minimal conditions governing his generous contribution. The remainder of this paragraph is text that was extracted from the executable file: "Ver. 2.1, Copyright (C) 1988, 1989 by Theodore A. Kaldis. This program may be distributed freely, without charge. Distribution for profit is strictly prohibited. Please report bugs (and forward comments/ suggestions) to:

Theodore A. Kaldis
P.O. Box #1212
Woodbridge, NJ 07095
kaldis@topaz.rutgers.edu (ARPA/INTERNET)

Harald Wehrend of the University of Hannover in Germany provided your Editor with the first big test of Mr. Kaldis's powerful software when he sent some 1191 Kbytes of CDC EMTP FORTRAN to Portland by E-mail. First, Mr. Wehrend archived his 4 disk files into a single disk file FTN_NEW . ZIP of size 233 Kbytes. Applying UUENCODE to this resulted in 7 files of about 45 Kbytes each. Following reception in Portland, without any editing to remove addressing information of E-mail at the top, UUDECODE was applied to recreate the .ZIP file. This worked even though your Editor had given the seven files different disk file names than Mr. Wehrend!

A **<CR>** and **<LF>** are used by MS-DOS to terminate lines. The decimal character codes of these are 13 and 10, respectively (alternatively, 0D and 0A hexadecimal). UUDECODE requires this, it has been learned. A Unix file is missing the **<CR>** (lines are terminated by **<LF>** alone), and the chaining of two or more such segments will fail. This was learned by Mr. Wehrend and your Editor the hard way. Those seven CDC segments were not initially recombined correctly. While talking on the telephone, PC TOOLS was used simultaneously in Hannover and Portland in an attempt to discover some difference. Of course, it did not take long to realize that Mr. Wehrend had sent a DOS file, but your Editor had received a Unix file from CompuServe! Computer expert David Syzmanski was consulted the following day, and he suggested using PC-Write to make the conversion back to DOS. Yes, it worked like a charm. For those interested, the feature is somewhat obscure. It can be found in the section entitled *"Finding or Stripping Non-ASCII Characters"* of the *PC-Write User's Guide.* **Alt-F4** brings up the **Misc-Ops** menu from which one selects using **F6** . Then **F10** selects *"Strip all non-ascii"* and a final **F10** is required to complete the job.

Need to Resubscribe for 1993

Readers who want to continue receiving this free newsletter by conventional mail from the user group are hereby advised of their need to resubscribe prior to the next printing, which most likely will occur early in February of 1993. Exactly as one year ago, a hastily scribbled note on a brown paper bag, mailed to the Publishers and Mailers in West Linn, would be fine. Kindly include any change of telephone number or address, of course.

Reading WordPerfect Newsletter Files

Disk files storing these North American newsletters in WordPerfect format are available to any licensed ATP user anywhere in the world. The interested ATP user need only make an FTP file transfer of E-mail as explained by Prof. Bruce Mork in the preceding issue (see page 9, column 1). But then, what? If neither genuine WordPerfect nor some other publishing program that accepts files of WordPerfect format is available, how can the reader make sense of the disk files? There are several alternatives.

WP5LOOK is a DOS shareware utility by David Seidman that allows the user either to page through or to search methodically (for some character string of interest) a family of WordPerfect files. This is yet another contribution to EMTP users from TACS and MODELS author Laurent Dubé, who obtained it from the Public Software Library (PSL) of Houston, Texas (USA). WP5LOOK is compact (50 Kbytes of disk space for 2 files), fast (unlike WordPerfect 5.1 on a 286-based PC), and most important of all, simple and intuitive to use. For all of these reasons, it has been placed on the server in Fargo along with disks files of these newsletters in WordPerfect format. Yet, it has a problem in that it can not legally be used indefinitely by a reader without payment of a small fee. The WP5LOOK.DOC file indicates that the recipient is allowed free *"use of the program for a period of 30 days for evaluation and testing. .... Usage after the 30 day evaluation and testing period requires payment of a license fee. For a single copy*

(plus necessary archival copies), to be used on only one computer at a time, the fee is $15.00." To conclude, WP5LOOK probably will not be distributed to others much longer. It is only a stop-gap solution --- to be used only until a good, free alternative can be developed.

PC Tools by Central Point Software provides yet another way to display and/or search WordPerfect files of the user group. The 33-Kbyte utility VIEW.EXE does a very nice job on newsletters, for example. Of course, fonts, italics, bold face, and even pages are lost, although lines remain unchanged (although not right-adjusted). For the July issue, VIEW provides continuous scrolling or paging of a single column that is 2288 lines long. A disadvantage for the user group is that VIEW.EXE is not shareware, so can not legally be transferred to anyone else.

Microsoft Word for Windows 2.0 would seem to be ideal for reading our WordPerfect newsletter files. In E-mail dated October 14th, Laszlo Prikler of the university in Budapest, Hungary, first reported on his attempt to read our *.WP5 disk files. Amazingly, his Microsoft publishing software preserved our *"original page format (paragraphs, columns, bold and italic characters, etc.)."* Lack of our SWFTE Glyphix soft fonts resulted in *"smaller letters in the Can/Am EMTP News headline,"* but who cares? After readability, the most important detail is preservation of columns and pages. Why? Because references frequently include these statistics. So, MS Word for Windows has yet another attraction (it seems to be a winner). Those wanting to communicate with Mr. Prikler using E-mail are advised to use his more local address, which is **priki@vmt.bme.hu**

NEWS . EXE is a special Salford program (i.e., DBOS is required) that is being written to read, search, and print the WordPerfect disk files of this North American newsletter. Most of the final weekend of August was spent working on the experimental reading and display of JUL92.WP5 --- WordPerfect storage of the previous (July, 1992) issue.

Salford Replaces Apollo in UTPF

Apollo modules of the UTPF (the Universal Transients Program File, which is ATP source code) were replaced by Salford modules during the weekend of September 26th and 27th. This marks the end of an era. The first UTPF, created in 1974, involved CDC (Control Data) modules. This era ended in 1979 with the switch to DEC VAX / VMS. ATP began in 1984 with Apollo modules. Now, finally (more than two years after BPA ended its use of Apollo), the Apollo modules have been replaced by Salford modules for use with DBOS / 486 .

The Salford Editor/Translator (translator for short) was the first to reflect the change. To begin with, this has become a distinct translator that is not used to produce EMTP FORTRAN for any other computer. It can be run in two different modes: 1) to produce a complete translation of the UTPF; 2) to produce a revised translation corresponding to the change of just selected UTPF segments. The latter of these two modes, referred to as a *minor-update* procedure, is new. In years past, it was used first on CDC, then on VAX, then on Apollo, and finally on Sun computers. With the switch of ATP developers in Oregon to the use of MS-DOS PCs, it is important to have minor-update capability for these computers. As with other systems, it is file type (e.g., *.PUM, *.QUM, etc.) that is used to distinguish the modified UTPF segments. This file type now is an argument of UP.BAT that updates Salford EMTP. For a full translation, one executes SALFET.BAT with argument SPL . All new is logic that retranslates each major chunk of FORTRAN that involves a change. Previously, only the UTPF modules that had changed were translated. But the Salford linker does not reject the second or later copy of a module that it processes, unfortunately. Instead, it issues a fatal error message. So, more code must be translated. Yet, it is not a practical problem for two reasons: 1) 486-based computers are so fast; and 2) the chunks of FORTRAN have been made smaller (there now are 21 not counting VARDIM).

New variable KOMBIG is one of just three parameters that are fed to the Salford translator. It comes from the single-line disk file SALFET.DAT --- all that remains of what once was a big file of library function definitions (now built into the translator), Salford DECKs (now in the UTPF), and REMMOD requests to destroy Apollo modules (no longer needed). KOMBIG is a binary flag that controls whether or not the COMMON blocks of simulation are to have real sizes. The Salford symbolic debugger will not allow the examination of arrays beyond dimensioned limits, so this change is important for program developers.

The speed of Salford EMTP translation has been increased primarily by the replacement of virtual scratch disk files by explicit storage in RAM . A complete translation now is performed by executing SALFET.BAT using argument SPL --- an operation that required just under four minutes to complete when last timed on your Editor's 33-MHz AT&T 486.

Linking of Salford EMTP definitely is faster now, even though the reason is not yet known for sure. For the 3 times default dimensioning that is created by VARDIM3 , elapsed times between 23 and 28 seconds have been observed for your Editor's 33-MHz 486.

A new VAX / VMS translation of ATP passed its testing on October 31st when the last of all standard test cases had been carefully inspected. While your Editor

does not want to encourage VAX / VMS usage compared with Salford EMTP, this is one of those infrequent good times for those who are determined to acquire a VAX / VMS version. Eastern Utilities has been waiting months, and their tape will be the first one copied when business resumes next week. Some 8 months have passed since the last complete, methodical validation of VAX solutions, so it was to be expected that several minor obstacles might be encountered. Two of these were associated with the data-file (not $INCLUDE) argument of DC-65 : 1) an uninitialized variable N19 in OVER1, zeroed by VAX / VMS, was discovered; 2) additional spaces preceding the single argument were not tolerated. Finally, one bug most likely can be blamed on inadvertent use of the text editor EDIT of MS-DOS version 5.0, which has been observed to insert one or more **Tab** characters (character code 9) following a **<CR>** if the preceding line is indented. Beware of this, users!

Florida ATP Short Course March 8 -12

Prof. Dennis Carroll again will be offering his 4.5-day EMTP short course during spring break at the University of Florida. The course will be one day earlier than last time. It is scheduled for Monday, March 8th through Friday, March 13th, 1993.

Faculty this year is expected to be the same as last year, with Dr. Liu representing program developers during the entire week. Dr. Fehrle has expressed his own willingness to be there the entire week as the voice of industrial usage (highly recommended). New this year is the electronic (E-mail) connection to Portland. This should allow your Editor, supported by source code and compiler (including interactive debugger), to examine within minutes (hours in the worst case) any unsolvable data sets that might be encountered.

Following survival of the great IEEE advertizing disaster of one year ago (see column 2 on page 9 of the January issue), Prof. Carroll has decided not to try to purchase the IEEE PES mailing list again this year. Of course, the mailing list of the user group continues to grow, as does the list of students from previous years (favorable reports by word of mouth now are believed to be a dominant reason for success). It would seem that the Florida short course may have outgrown the need for general mailing lists such as IEEE sells!

News about Laurent Dubé's MODELS

Fatal error messages of MODELS have been converted to normal KILL codes by author Laurent Dubé. Previously, explanations were disconnected (they had been appended to disk file DC68.DAT simply so as not to be forgotten). Now, these messages are carried along with normal program text in disk file BLOCKD51 . BIN , which has grown from 295 Kbytes to 362 Kbytes. A peculiarity of the new error terminations is that the usual nearby statement number and overlay number have no meaning. Yes, the places in the code where errors were recognized could have been recorded and reported, but who would have used the information? It was not clear that the extra effort to make such changes could be justified, so the work was not done. For the record, Mr. Dubé's new error messages first were seen by others on October 13th when the GIVE1 disk of Salford EMTP distribution was changed.

Compiled (as opposed to interpreted) MODELS data once again has been the preoccupation of Laurent Dubé. This story was introduced at the bottom of column 1 on page 12 of the January, 1992, issue. Nine months ago, only research was involved. Now, this is the real thing. At the end of October, the procedure is completely functional except for usage of **combine** , which is expected to be completed later this year. It is to be remembered that C-language, not FORTRAN, is involved. The translator was written in C, and the output, to be linked with other EMTP FORTRAN , is in C language, too. Readers are to be reassured that Mr. Dubé has indicated no disappointment about increased speed: the execution of MODELS really is an order of magnitude faster. Details must be delayed until some future publication, unfortunately. But it probably is worth listing the computers and compilers that already have been used to verify operation at CESI: 1) Microsoft C for Intel microcomputers; 2) An ENCORE 91 near-supercomputer that is built around Motorola 88100 RISC chips and uses an ANSI C compiler; 3) Sun SPARC. Of course, Mr. Dubé uses a 386-based computer, and he selected Borland C for this. Thus far, testing is outside of EMTP.

Encapsulated Post Script (EPS)

Encapsulated PostScript (EPS) is what TPPLOT really should be producing with its POST command. This important suggestion came from computer expert David Szymanski on September 8th after he challenged your Editor's long-standing assertion that WordPerfect will accept HP-GL files but not PostScript files. No, it still is not obvious that any PostScript file can be displayed on the screen by WordPerfect (using **View Document** within **Print**). Nor is it believed that a page involving such graphics could be printed on a non-PostScript printer. But Szymanski was right: in a severely-limited sense, WordPerfect **will** accept a special sort of PostScript file.

Suddenly, other software is understood to be equally as discriminating as WordPerfect about the dialect of PostScript. Not DECstation, which will display what is produced by the POST command of TPPLOT following a trivial modification (one needs **%!** at the top of the

file). But the Sun PostScript previewer now is understood to require Encapsulated PostScript. Somehow the need for Encapsulation was not appreciated before, and no user ever documented trouble with the output of TPPLOT. In order to make the POST*.LIS output files more useful, it now is understood that the dialect of PostScript that is produced really should be changed.

For the record, the "WordPerfect for DOS Reference" book for Version 5.1 treats Encapsulated PostScript in the bottom 2/5 of page 251, which is within the section entitled "Graphics, Formats, and Programs."

FIND of Monte Carlo Tabulations

Dr. Thomann of Power Technologies (PTI) inspired changes to the FIND alternative of statistical tabulations during a telephone inquiry of April 6th. This story was omitted first from the April issue, and then from the July issue, in order to save space. Well, even though space is short here, too, the time for a quick summary finally has come. Few readers know anything about the FIND feature even though it should be useful to any person who studies Monte Carlo results. Dr. Thomann's question was simple enough: Will ATP show me which energization produced the largest overvoltage for some set of nodes? The answer is yes, although a little work was required to make the old Apollo coding compatible with Salford EMTP usage.

The operation of FIND is illustrated in the batch mode immediately after the first statistical tabulation of DC-24. The interested reader is advised to consult the .LIS disk file in addition to the .DAT file because program output, including printout of the HELP subcommand, provides the best explanation of all. For interactive rather than batch usage, $KEY is to be inserted in the data case at the point of interest. When encountered, $KEY causes the program will suspend batch-mode input and switch to the keyboard for data input. This continues until the user relinquishes control by means of an END subcommand. Any conventional statistical tabulation request can be used to define the variable set that is to be searched.

Intel i860 RISC Processor

An Intel i860 accelerator card was mentioned in passing on page 11 of the preceding issue. For those wanting more simulation speed than conventional 486-based computers can deliver, it is worth summarizing the present status of such interest. Despite initial discouraging reports from WSCC (Western Systems Coordinating Council, the power pool for the western third of the 48 contiguous states) about i860 use for the acceleration of other system planning programs, ATP developers remain interested.

Alacron advertises ***"200 MFLOPS OF POWER!"*** for its i860 board. This is the headline found on page 98 of the July, 1992, issue of *Computer Design* magazine as provided for your Editor by computer expert David Szymanski. This illustrates one of the more elegant implementations in which the board becomes the computer by running *"Native Unix Sys V.4 with X windows 11.4"* while working with as much as 64 Mbytes of RAM. As long as one can avoid transfers to or from the board, execution should be plenty fast. I/O would seem to be the bottleneck.

General Dynamics in Groton, Connecticut, will be using the Intel i860 RISC chip to speed simulation. This is a continuation of the story that began in the preceding issue (see page 11, column 1). A telephone call from Ed Thaxton on September 9th indicated that four 486-based computers had been ordered, and that two of them would be accelerated with i860 boards from MicroWay. Both FORTRAN and C-language compilers should be available, so Laurent Dubé's compiled MODELS could be tried at no extra cost. Also see the separate story about MODELS .

Network Equivalents for Simulation

NETWORK EQUIVALENT is the request word that begins the computation for a constant-parameter (not frequency-dependent) equivalent circuit based on positive- and zero-sequence short circuit data as well as impedances for those branches that are to be excluded from the equivalent. Punched output consists of three-phase, mutually-coupled R-L branches (Type 51-52-53) that connect pairs of 3-phase interface busses. For an illustration of usage, the reader is referred to standard test case DC-14.

For a network that typically is distant from the transients of interest, a constant-parameter equivalent may provides a good approximation. It was created by your Editor close to a decade ago following inspiration and feasibility studies by BPA's expert program user, Dan Goldsworthy, who has been using it ever since within BPA's EMTP. Since Goldsworthy correlates his simulations with field measurements whenever possible, don't even think about questioning the validity of his recommendation!

From the beginning, ATP has had the feature (named FAULT DATA USAGE in BPA's EMTP, it should be noted in passing). In fact, implementation in ATP is substantially nicer than in BPA's EMTP. On the other hand, your Editor never documented a real-world use, and the punched output of DC-14 has been incorrect for years (Salford produces strings of question marks indicating undefined values). Even though your Editor did the programming, he forgot most of what he did, so correction was not trivial. Since the middle eighties, he has declared

that work would have to be done when the first serious potential user appeared and asked for assistance.

Enter Eugene Davis of BPA, who works with Goldsworthy as a production user, and had been assigned the task of converting to ATP use the NETWORK EQUIVALENT data that already was known to work properly with BPA's EMTP. This was August 24th : the beginning of progress. This time, your Editor would be using realistic data, and had independent confirmation of the answer. Yet, in fact, the preparation for trouble was anticlimactic. After stumbling through some required changes to input data format (e.g., the termination of branches by a blank rather than a numerically-zero card), Mr. Davis quickly reported comparable answers using ATP. In order to commemorate this accomplishment, the former 2nd of two data subcases of DC-14 was moved to become the new 3rd subcase, and Mr. Davis's data was inserted to become a revised 2nd data subcase beginning August 30th. A final change was made September 25th when the order of sequence data input was switched to correct the punched cards. Otherwise, the two solutions are independent, and it really does not matter in which order they are performed. But the first solution produces the Type-51 branch card, and EMTP expects this to correspond to the zero sequence for the case of symmetrical-component input (blank 3rd card).

Miscellaneous Small Items

PTI (Power Technologies, Inc. of Schenectady, New York) recently mailed an 8-page brochure entitled *"Short Courses; Fall 1992; Spring 1993."* In the middle of page 1 is an offering entitled *"Transient Analysis Using EMTP"* that is to be given October 26-30 at PTI headquarters in Schenectady for a price of $1340. As most readers already know, PTI offers many courses, so description is limited to four short sentences. For the record, the user group does not object to this as it did to the four pages of EMTP-related advertising from Madison (see criticism in the preceding issue on page 7, column 2). PTI refers to *using EMTP* and to *EMTP topics* rather than *the EMTP* (the University of Wisconsin advertising never identified which EMTP version was being used, recall). Unlike those giving EMTP short courses in Madison, Dr. Gary Thomann and his colleagues at PTI **are** licensed to receive ATP materials, so can more honestly appeal to the enormous community of ATP users. Although this is not an endorsement, the user group does want to clarify that it is **not** discouraging attendance of ATP users in Schenectady as it has discouraged such attendance in Madison. Not all EMTP short courses are created equal, and not all flunk the test of truth in EMTP advertising as did Prof. Long in Madison.

Bob Wilson, the former relay-modeling doctoral student at the University of Idaho in Moscow, has graduated. His final oral examination was on August 20th, when he successfully defended his thesis entitled "EMTP Macromodels of Distance Relays." Despite a tight job market in academia, Dr. Wilson was able to find a faculty position not far from home: He now is Nicholson Visiting Assistant Professor of Electrical Engineering at the University of Wyoming in Laramie. New Salford EMTP disks were mailed to Laramie by the user group on Sept. 17th. As for E-mail (which Laurent Dubé and your Editor continue to recommend to Prof. Wilson), the problem is being worked on!

Two disk files OCTA92.WP5 and OCTB92.WP5 have been used to store the present issue of this newsletter. For 2-stamp issues (having as many as 20 pages), this pattern is expected to continue because of the problem WordPerfect 5.1 has with bigger files. The July issue, which at times reached 22 or 23 pages, was so difficult mechanically for your Editor that he has resolved never to repeat the struggle. The new system is simple enough: for more than 10 pages, an issue always will be split with just the new Table of Contents and the first four stories in the first ("A") half: 1) news about Salford EMTP; 2) news about Salford TPPLOT; 3) news from other user groups or overseas developers; and 4) news about E-mail. The structure of the first half should be constant, and the second half will contain everything else.

The *"Postage and fees paid"* mailing privilege of BPA as a U.S. government agency ended July 27th. As part of the program to make the U.S. Postal System more independent and self-supporting, BPA now is required to pay precisely for each piece of mail just as any commercial company would. Previously, payments were based on estimates of usage. An unfortunate consequence of the new accountability is that it no longer is easy to mail after normal business hours. Previously, an envelope or package could be sealed at any hour of the day or night and mailed anywhere (e.g., at the main post office, if one were in a hurry). Well, no longer is this possible. If BPA mail does not reach the Mail Room early enough Friday afternoon, it will wait until Monday. The July issue is the first issue of this newsletter to be mailed under the new system. Exactly as before, the same old envelopes were prepared, marked, and sealed on Friday, August 14th. The eight envelopes then were rushed to the BPA Mail Room around 15:45. Was this in time for processing that day? Who knows? In the case of Air Mail, was adequate postage affixed? Again, who knows? To summarize, mailing from BPA is neither as convenient nor as certain as in years past.

Office Depot did a poor job printing the July issue that was mailed to all but two of the 137 subscribers in the USA and Canada during mid-August. Foreign user groups did not see this problem because separate, single-sided copies were made for them using a well-adjusted BPA copier. Your Editor apologizes to domestic readers. In the future,

he should examine more closely the copies before he pays for the printing.

WordPerfect Presentations is the new name for what in the past has been named DrawPerfect. Why the new name? The WordPerfect newsletter for Fall, 1992, explains the change this way on page 2: "*... version 2.0 is such a giant step forward that we knew we had to change the name. Our new name ... better reflects the product's capabilities. After all, it's the most powerful presentation graphics package in its class."* The cover shows three colored transparencies or slides that seem to illustrate background images, clip art of persons, and pie and bar charts. This definitely is the interest of those involved with education such as the short course in Florida: the making of transparencies for lectures. No longer must these be monochrome, it would seem.

Pizazz+ provides colored hard copy of the bit-mapped, colored screen plot of Salford TPPLOT. This first report of such usage was received on September 9th from static var modeler Gabor Furst of White Rock (a suburb of Vancouver), British Columbia, Canada. Recall such a report 15 months ago, from Prof. Riaz at the University of Minnesota (see the middle of column 2 on page 4 of the July, 1991, issue). The difference is that Mr. Furst is producing colored hard copy using his H-P DeskJet 500C printer (see page 17, column 2 of the January issue) whereas Prof. Riaz was only producing black and white copy. Of course, Prof. Riaz's copying of the bit-mapped screen was only a stop-gap measure; it no longer has much meaning following activation of the LJ2 subcommand of the PAPER command. Similarly, Mr. Furst now uses Pizazz+ only because Salford DBOS does not yet directly support color plotting. Yet, this, too, is coming (see initial story of this issue for more news).

WordPerfect is not a monochrome program as stated in the January issue. Computer expert David Szymanski was the first to explain one way color could enter the document (as opposed to be used for its storage and manipulation, which has been understood for a long time). On September 8th, he showed your Editor that the **Font** command offers a final choice **Print Color**. So, just as one can change the size or shape of letters at any point in the document using **Font**, so it seems that color also could be changed. A second example involves HP-GL . This was provided by Static var modeler Gabor Furst in E-mail dated September 10th. Mr. Furst shocked your Editor by claiming that the curves of an HPGL*.LIS file are automatically displayed on the screen in different colors. For unknown reasons, this never has been the case with BPA's 10-MHz, 286-based computer that is used for EMTP documentation. But, surprise! When an experiment was repeated on BPA's 80486-based computer, the curves are distinguishable not only by line structure, but also by color. Some labeling also was in color.

Yin Yuexin, graduate student at the University of Florida in Gainesville, corrected the U.M. as described in the June, 1992, issue of *EMTP News* (see pages 57-64). On September 11th, your Editor finally added to the UTPF the two associated correction lines from Mr. Yin, and verified the corrected performance using the illustrative data case YIN42.DAT .

The University of Nevada in Reno will host the 24th annual North American Power Symposium October 5th and 6th, 1992. There is a Session 2-B entitled "Power System Simulation." Two of the four papers at this session involve EMTP, and both of these are written by Salford EMTP users: 1) *"Steady-state and dynamic testing of EMTP models of distance relays"* by Robert E. Wilson; 2) *"Evaluation of shunt capacitor switching using EMTP"* by P. K. Sen and Jeff D. Selman. Even though titles of the two remaining papers do not include EMTP, in fact the principal authors are licensed to use ATP: 3) Charles Thompson of Purdue University; and 4) Leonard Bohmann of Michigan Tech in Houghton.

Clemson University in South Carolina provides the most recent example of mass licensing for the delivery of Salford EMTP to students. Attached to his letter dated September 17th, Prof. David Lubkeman sent 12 forms that had been completed by individuals having interest in Salford EMTP. After validating, your Editor returned photocopy of the licenses on September 24th. Needless to say, it is much easier for the user group to deal with one professor than with each of his students one at a time. The user group encourages others who plan to teach a course on simulation to follow the example of Clemson.

IEEE PES rules governing the use of fonts in manuscripts first were sent to your Editor by Prof. Bruce Mork of Michigan Tech. Electronic mail dated September 23rd indicates that the answer can be found on pages 22-26 of the September, 1992, issue of IEEE Power Engineering Review. Prof. Mork indicates that *"a new publication guide will be released in early 1993. For proportionally spaced fonts, 10pt is the minimum size in the text body; 8pt is the minimum for figure captions."* This is understood to be for full-size (not over-sized) manuscripts that would be printed on a conventional laser printer using 8.5 x 11-inch paper.

A fatal error message, characterized by a positive KILL value, will be held on the screen for the user to read until he sends a **<CR>** . But this will happen only if two conditions are true: 1) Output is **not** being sent to disk (by either DISK or BOTH) ; 2) Batch-mode vector graphics **are** being held on the screen until just such a **<CR>** (equivalently, D4FACT of the STARTUP file is negative). Inspiration for this extension came from Prof. Juan Martinez in Barcelona, Spain, who complained during a telephone conversation on October 27th that an error message sometimes is lost off the top of the screen before the user is able to halt the program to read it. Although

Prof. Martinez was using Salford EMTP, the change is universal; it applies to any translation performed on or after the following day.

The METRIC option of LINE CONSTANTS by itself is believed to work correctly. But when used with JMARTI SETUP, operation was incorrect. This first was pointed out to BPA on October 14th in 4 pages of FAX from Marco Polo Pereira of FURNAS in Rio de Janeiro, Brazil. The error is really gross, with parameters scaled by the conversion factor of 1.609 (kilometers per mile). As Mr. Pereira correctly observed, the modal travel time in seconds, which appears on the lead card (following an integer which is the order of the polynomial) that begins the second half of data for each mode, is similarly in error. For the example given, the program erroneously gave a travel time of .58 msec for the second mode (compare with about .36 msec at the speed of light). One correction was designed by FURNAS and communicated to LEC by FAX dated September 29th. After study of the problem in Portland, it appeared to those at BPA that a simpler modification of just a single line of FORTRAN should remove the error. This change was communicated back to Rio by FAX on November 3rd. In order to verify correct performance in the future, a simplified version of the FURNAS data case has been added as a new 2nd subcase of DCNEW-5. In order to speed execution and provide variety, only a single phase conductor and one of the two ground wires were retained. The resulting single travel time then appears on the punched cards as a believable .38 msec.