Can / Am EMTP News

Voice of the Canadian/American EMTP User Group

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Salford Compiler & DOS Extender

Salford DBOS Rev. 2.70 has solved the networking problem at Michigan Tech. This good news was learned in E-mail dated July 13th, when Prof. Bruce Mork reported the following: *"DBOS 2.70 seems to have solved the problems we were experiencing in our network environment. Before, we could not install devices in highmem. Now we have installed everything including the network program in highmem, and dbos appears to function ok ..."* So, we can report a happy conclusion to the short mention in the previous issue (see the end of page 1). So, on July 27th, the user group requested an update from OTG Systems. Since the Salford newsletter, *Source File*, had reported even more accommodations for Rev. 2.71 (*"Support is provided for those users who wish to use both HIMEM.SYS and EMM386.EXE at the same time"*), this later version was chosen rather than Rev. 2.70. Subsequently, Prof. Mork provided a clean bill of health for Rev. 2.71, too. In E-mail of his Fargo list server dated August 16th, he wrote: *"Initial usage of DBOS 2.71 appears to have solved our network problems here at Michigan Tech. .... We still have more testing and tweaking to do, but it seems to function well with PC-NFS, HIMEM, and EMM386, under DOS 5.0. We have loaded as many devices into HIMEM as possible."*

Adobe PostScript use to provide an extra, auxiliary output for vector graphics of batch-mode plotting first became available to the general public on August 28th as should be detailed in a separate story in the next issue. This will be a continuation of the paragraph that ends the front page of the January issue. It concerns the important Salford EMTP work of Robert A. Schultz and Robert E. Meredith of New York Power Authority (NYPA) in White Plains.

Parameter D4FACT of STARTUP now is ignored if DISK usage begins execution. This is an extension of the omission of vector graphics when DISK is used (see the end of page 2 of the preceding issue). It should be clarified that vector graphics are not actually bypassed. Rather,

they merely are disconnected from the screen. The logic for this was simpler because it applies to all vector plots (no check for PEN PLOT usage to except Epson and LaserJet plots is required). So, the code using D4FACT was executed even though the user saw no graphics. Not only did this waste time, it could be confusing if a negative sign were applied to D4FACT to hold each plot until a **<CR>** were sent. Seeing no output in this case, the user would have no way of knowing that the program is waiting for a **<CR>** to end the unseen plot. So, beginning June 18th, D4FACT is ignored completely (regardless of its sign) for cases involving DISK use.

READF@ and WRITEF@ are Salford library functions that are used for I/O of C-like .PL4 files. Previously, there were many warning messages during compilation because the first argument (what is to be read or written) was not of uniform type within each module. The header contains both CHARACTER (e.g., for the date and the time) and INTEGER*4 variables, with the latter consisting of both scalars (e.g., the number of nodes NTOT) and vectors (e.g., IBSOUT that points from the variables to the associated names). To avoid Salford warnings in modules that involve the header, the first argument has been changed to scalar CHARACTER type in all cases. This is done by EQUIVALENCE without difficulty. Consider the case of IBSOUT for which we want to dump cells 1 through NC . The old output was done by the statement CALL WRITEF@ (IBSOUT, L4HAND, N8, IERROR) where L4HAND is the handle identifying the disk file, N8 = 4 * NC is the number of bytes being transferred, and finally, IERROR is an error-return flag. The change involves laying a new CHARACTER*4 CH4IBS scalar on top of vector IBSOUT by EQUIVALENCE (CH4IBS, IBSOUT(1)). Then CALL WRITEF@ (CH4IBS, ...) performs the desired transfer. Now HEADL4 and HEADFS compile without warnings.

MS-DOS 6 might cause data loss. This frightening possibility has been reported in computer magazines. An example is Steve Gibson's writing on page 39 of the May 31st issue of InfoWorld magazine: *"MS-DOS 6.0's default installation of its SmartDrive hard disk cache with deferred writing ... might be responsible for MS-DOS 6.0 data loss."* Are there any other reasons to stick with DOS 5? BPA generally is not upgrading, it would seem.

INCLSPY6.DAT is a new batch file for SPY that illustrates parametric studies involving supporting programs rather than simulation. This can be executed by sending SPY @6 in response to the opening prompt. It was late May that the need for such studies first was suggested to your Editor by BPA's Robert Hasibar, who wanted to determine sequence quantities of an overhead transmission line as a function of height above the earth. This appeared to be a natural application for SPY --- an interesting variation of what had been done for simulation in INCLSPY5.DAT. Well, it did not take long to produce the desired output on June 2nd, when your Editor transferred the JUNKE file (contents of the LUNIT6 window) to Mr. Hasibar for further consideration. The associated EMTP data case is named LINECONS.DAT which was added to the archive INCLSPY.ZIP of the Salford GIVE2 disk on September 11th.

ATPSETUP.LIS was corrected on June 5th by the addition of the following sentence to point number 4 of Section A: Simply copy uncompressed STARTUP, GRAPHICS, and GRAPHICS.AUX . Previously, all files of interest were compressed. But with the elimination of the .EGA, .VGA, etc. variations (see the middle of column 2 on page 3 of the preceding issue), archiving was seen to be more of a problem (it disguised the contents) than a solution. So STARTUP and GRAPHICS files were placed on the GIVE1 disk without ZIPping. Unfortunately, the installation instructions were not updated at the same time. Anyone following ATPSETUP.LIS during this period of uncertain length (2 or 3 weeks?) failed to copy the previously-named files. June 29th, the instructions were changed again to produce greater uniformity. Now, the entire contents of both GIVE1 and GIVE2 are copied to the hard disk; then .ZIP files are UNZIPped; finally, .ZIP files are deleted from the hard disk along with PKZ101.EXE (the original PKZIP archive).

Wall-clock time of the time-step loop was described in the middle of column 1 on page 2 of the preceding issue. While this was an improvement, it was not quite the overhaul that Robert A. Schultz of New York Power Authority (NYPA) in White Plains had in mind. In FAX dated June 29th, Mr. Schultz outlined a better idea than your Editor's. He suggested that we change the meaning of timing of the case-summary statistics. The label "I/O sec" will be changed to "Wait sec" and "Tot sec" will be changed to "Real sec" (or just "Wait" and "Real" in the abbreviated, 80-column form). Reform to the code was made on July 1st although labeling of BLOCKD51.BIN was not changed until August 4th for either Salford or VAX/VMS EMTP. Of course, the Salford (DOS) numbers are unchanged, but time-shared VAX/VMS now shows believable idle times. BPA's Randy Suhrbier contributed the intelligence about how to do this (use of SECNDS library routine).

1024 by 1280-pixel screen graphics failed for Prof. Riaz at the University of Minnesota in Minneapolis around the beginning of June. Prof. Riaz is the first to report the result of such attempted usage. Recall that disk file GRAPHICS is distributed with a blank NYMAX field, which means that the intelligence of DBOS will be relied upon for automatic selection of the highest resolution that is compatible with both the output card and the monitor. Well, after seeing no graphics during the execution of DC-18 on the 486 in his office, Prof. Riaz checked the

diagnostic output about graphical modes that can be found in DEBUG.LIS. Whereas your Editor's AT&T 486 shows a table with just 5 columns below the labeling "Auto NYMAX determination begins.", the machine in Minneapolis showed ten, and the last of these was the untested 1024 by 1280-pixel mode. For some reason, this does not yet work for Prof. Riaz. Others who might have interest in such use, and who have different hardware, are advised to contact your Editor. Meanwhile, Prof. Riaz is using standard VGA (he keyed 480 for the first parameter NYMAX of the GRAPHICS disk file).

TEXT.EXE is a trivial little utility that checks the mode of the screen, and switches the screen to text mode after first clearing it if the screen was in graphic mode as execution began. On the other hand, nothing occurs if the screen was in text mode as execution begins. The code used is a copy of what Salford EMTP or TPPLOT performs at the beginning of its own execution. But use of those larger programs to switch the screen is a little slow, and they require input data (STOP) . The need to escape from a graphic screen is common enough to warrant a special utility. So, TEXT is being provided on the GIVE2 disk beginning June 12th. To use, just key TEXT (no RUN77 seems to be required).

Improvements to Salford TPPLOT

CHARACTER*80 CCACHE(230) was used to store all records of all disk files of any one nested "@" usage. As seen, this had a limit of 230 lines, which first was reported to be inadequate by Frank DeCesaro of Cooper Power Systems. Like storage for plot points themselves, this could be made arbitrarily large because Salford DBOS only allocates the space as it is needed (one only pays for what he uses). So, on July 27th, the storage was increased from 230 to 2350, and a copy of the expanded TPPLOT.EXE was mailed to Mr. DeCesaro in Franksville, Wisconsin, for further evaluation.

IZGR1 is the color number of the outer grid for screen plotting. Beginning August 5th, 1000 can be added to this as a request that only the outline of the outer grid be drawn. Inspiration for this latest control came from Wenchun Zhu, a graduate student at Oregon State University who is simulating G.E. TCSC at BPA this summer. Actually, only 3 of the 4 edges of the outline are drawn. The left edge, which normally will be defined by the Y-axis, has been omitted until some user can convince your Editor of its importance. If this new offset of 1000 is used for IZGR1, the inner grid is never produced (control IZGR2 is ignored). The same extra 1000 can be added with the same effect to the color numbers for outer grids of window plotting (see the WINDOW command), too. As an illustration, this has been done for the fourth and final window of FOUR.WIN (color number 1001 gives a weak blue outline only).

FHTAX is the floating-point parameter (use index 32) giving the fractional height of the horizontal axis along the vertical axis. The default value of 0.5 means that the time axis will be placed in the middle (half way up) the vertical axis. But before August 5th, this always was overridden by the zero level if the Y-axis included zero. Wenchun Zhu then correctly observed that there are cases where she wanted to manually place the time axis even though the zero level was covered by the Y-axis. So, new logic has been adopted. The automatic movement of the T-axis to the zero level now occurs only if FHTAX has a value of 0.5 (the default). In the case of window plotting (e.g., see the TWO.WIN illustration), manual placement only applies to the bottom window (the one with the numbers and time-units labeling). If the user wants the T-axis in the middle even when the zero level might be elsewhere, specify a value very close to the default value (e.g., 0.499999).

A missing TPPARAM.DAT disk file resulted in a confusing crash of the program prior to August 6th. This is another of Wenchun Zhu's experiences that has led to program reform. Following modification, TPPLOT will display the following civilized error message: *"Error! Attempted connection of TPPARAM.DAT has failed. Most likely, the file is missing. Press any key to continue (next, the program will halt)."* Previously, program execution would continue until something went wrong, after when DBOS would halt execution with a complaint about an illegal window. Even more serious than the extraneous DBOS message was the fact that the dialogue window was not saved in JUNKTPP, so the user could not later go back to examine the command sequence to find his error. Looking at the screen was not informative because the crash often occurred too quickly. The first attempted connection of TPPARAM.DAT results from the automatic initialization of TPPLOT.BEG at the start of execution, typically; and execution of 486s is so fast the mind could not retain what flashed by on the screen!

Chinese language has been proven to be compatible with Salford DBOS for use with graphics. This is a continuation of the story that began in the January, 1992 issue (see the middle of column 2 on page 2). Dr. Liu returned from Taiwan (more details in a later story) with hard copy of a plot of EMTP variables. This is of interest because of the main title, which uses Chinese characters. Salford graphics are not limited to English!

News from Outside USA and Canada

A printed copy of the April newsletter was mailed by BPA to each of its primary EMTP contacts on May 20th as had been predicted in E-mail from the Fargo list server early that morning. An official preprint of Dr. Mustafa Kizilcay's paper on low-order network equivalents, which was scheduled for publication in the March/ April, 1993,

issue of ETEP (the European Transactions on Electrical Power Engineering), was included. Finally, an official (original) copy of the single sheet of advertising for Prof. Ned Mohan's course (see separate story) was included.

Photocopy of the April issue was single-sided to minimize distortion. However, double-sided, secondary reprinting continues to be encouraged for the recipients as a way of saving paper.

"Those LEC ATP Rule Book files" formed the beginning of a paragraph in the preceding issue that somehow never was converted from hastily-keyed notes to detailed, formal English. Yet, it should have been understandable, if the reader uses his imagination. Your Editor apologizes for the oversight, however.

Overseas EMTP education was the subject of Fargo list server mail dated June 4th and 5th. The exchange was initiated by Sayeed N. Ghani, Senior Lecturer of the Department of Electrical and Electronic Engineering and Physics at the University of Northumbria in Newcastle upon Tyne, England. He wondered why existing lecture notes for teaching EMTP use were less available than materials for other subjects: *"I recently approached Ms. Darcy Harrison of Interactive Software in California about an object-oriented programming language EIFFEL. Although Iteractive Software is completely a commercial organization, this is what they had to say. Myself: I intend to teach EIFFEL to our under and post graduate students. All courses given to industry and public at large are always through the university and never privately. The format for such a course to an external body is a two-day or a five-day intensive course at the university. .... Ms. Harrison: Thank you for this information. The University Partnership Program covers the courses given within the University to students pursuing degrees of some kind. If you wish to use our training material for courses given to the public at large or industry, we would ask that you sign a contract for sublicensing our course notes for these classes at a reasonable rate - say 20% of what is received in payment for the classes."* In his public response the following day, your Editor argued that *"EMTP education is much more involved than black and white printing of [existing short course] lecture notes. ... The teaching of EMTP by others requires new materials ... Color audio-visual materials probably would be much more effective than monochrome, printed notes. Just as one can purchase such "videos" (recordings for television sets) to learn DOS, or aerobic exercise (by watching Jane Fonda, etc.), so this writer can conceive of color tapes or disks for self-learning about all sorts of aspects of EMTP. Such materials could be used by schools for formal classes, ... but they also could be used by any individual anywhere. ... But who will create the new EMTP messages? ... The field is wide open to new, creative talent, readers! The only required hardware would seem to be a home video recorder (already inexpensive and common in North America)."*

Prof. Vedula V. Sastry of IIT in Madras, India, was this spring ending his stay as a Visiting Professor at the University of Washington in Seattle. ATP materials were rushed to him by Federal Express on May 19th in order that he could carry them back to India the following week. Verbal agreement was made with him to send us E-mail from Madras (yes, he has it), and also to inquire about what might have happened to the Indian EMTP user group. But nothing has yet been heard from Prof. Sastry --- or any other EMTP user in India during recent years. Is any reader in E-mail contact with an EMTP user there?

EZ JapaneseWriter is the registered name of *"software which makes writing in Japanese as easy as typing in English."* This is the claim that begins a full page of interesting advertising in the June 15th issue of *PC Magazine* (see page 117). The American distributor is EJ Bilingual Inc. of Torrance, California, although the product seems to come from Japan (*"EZ JapaneseWriter is a computer program copyrighted by Kamejima Sangyo Co., Ltd."*). Your Editor would love to try this, but is inhibited by the high price ($1200). Most information of the advertising is in the form of questions and answers. The fourth of these should raise doubts among even the most gullible: *"Q4. How accurate is the translation? A4. It could be 60% to 100% depending on the structure and vocabulary of your sentence."* Do you suppose these advertisers graduated from the same school as American politicians? Zero percent accuracy (complete failure) would seem to be another possibility!

Bulgaria was supplied with ATP materials by Harald Wehrend of the University of Hannover in Germany as mentioned in column 2 on page 3 of the January issue. Your Editor is grateful that someone on the scene was handling details, since the communication turned out to be anything but routine. Mr. Wehrend summarized the operation as follows in E-mail dated June 16th: *"The new user in Bulgaria received all ATP materials after several problems with the local Bulgarian customs office. It was necessary to write several FAX and letters stating that the ATP materials have no commercial value. Every word must have been weighed twice (joke)! But, in the end, the customs office did give the materials to the waiting ATP user. With Bulgaria, we have enormous problems of communication. FAX is sent only at midnight, and then not every night. Furthermore, it seems to be horribly expensive for the Bulgarians; and from Germany, there often is no free telephone line. Nevertheless, I hope this contact will continue."*

ELEKTRIE is the name of a scientific journal of the former Communist East Germany that seems to have survived unification with the larger and more modern West Germany, and seems to be successfully establishing itself in the now-united Germany. This information came from

Harald Wehrend of the University of Hannover, who is assisting the new head of his institute, Prof. Oswald, in the writing of an article for this publication. In E-mail dated June 16th, your Editor was asked to contribute a few words to this paper, which will be *"... about the essentials of state-space modelling of lines."*

Dr. Liu visited Taiwan Power Company June 29th and 30th during her 17-day vacation on the island. At least 50 persons (the number signing an attendance list) heard her talk about EMTP and TPPLOT all day long, both days.

Hidden LEC income and lack of democratic control by members are the subjects of a separate story. This is the really big foreign news of the year!

More about Electronic Mail (E-mail)

The April issue arrived in Houghton May 21st, but could not be put on the Fargo server immediately because the disk was full! So, Prof. Bruce Mork's announcement of availability by list server mail was delayed until June 7th. As Prof. Mork explained in private E-mail the following day, *"the operator at plains never informed me of resolving the disk storage problem. I just tried it again and there was room. I am trying to get info from him on how much room is available for additional ftp storage."* So, no matter how carefully one plans, things can and sometimes do go wrong (Murphy's Law remains in force). This time, the average Canadian or American subscriber received the news first --- in an envelope bearing a June 1st postmark.

Local Agora as an alternative to commercial CompuServe is an important enough idea to warrant a separate, later story.

Dr. Ivano Bonfanti of CESI in Milano, Italy, has provided a model response to a public request for help (broadcast by Prof. Bruce Mork's Fargo list server). When skeptics doubt the power of E-mail for finding a knight on a white horse, your Editor points to this example. It began on March 4th when Meirios Moechtar, a student at the University of Southern California (USC) in Los Angeles, complained that his ATP simulation of a fuse was not correct. Your Editor responded first, on March 6th, but could not be very specific because data was not included. But this did not stop Dr. Bonfanti, who seemed to understand the engineering significance of Mr. Moechtar's verbal description. Dr. Bonfanti was able to surmise the deficiency of the modeling. Not only that, in his 14-Kbyte response on March 16th, Dr. Bonfanti supplied a data case using MODELS that illustrated the phenomenon! It was an impressive demonstration of the importance of experience and understanding as a program user --- plus the willingness to share with others.

JAN90.WP5 is the WordPerfect disk file for the January, 1990, issue of the newsletter as explained in the preceding issue (see column 1 on page 14). However, until June 19th, the file type .WP5 was deceptive. Yes, as stated, the file looked correct using WordPerfect. But it was not a WordPerfect file. In fact, it instead was an intermediate .DCA file produced by Lotus Manuscript. This had several disadvantages, with one of the more noticeable being that the .DCA file was less readable using Vernon Buerg's shareware utility LIST : The right margin was not respected, so text typically would continue indefinitely on a single line until the end of a paragraph. Prof. Bruce Mork of Michigan Tech must somehow have noticed the difference since he mentioned this on June 7th in his announcement of availability: *"Note that Scott Meyer converted it from another word processor."* So, June 19th, your Editor completed the job by dumping the 1990 text into the framework of the April, 1993, issue. The original 6 pages of default LaserJet printing (10 characters/inch) collapsed to 4 pages, it was found. Only the date was changed in the banner that makes up the top third of the first page. Story headlines look different because most require two lines rather than the original one. Otherwise, text is unchanged. Within any story, nothing has changed. In E-mail dated July 11th, Prof. Mork informed others of availability of the corrected file on the Fargo server.

The first E-mail from Mexico came from Dr. Armando Llamas of the Electrical Engineering Department of ITESM - Monterrey Tech on May 12th. The address used for this general inquiry about ATP was (pasted): **allamas@mtecv2.mty.itesm.mx** Eight days later, E-mail arrived from a second site in Mexico: Carlos Tirado Ruiz of Centro de Graduados e Investigacion, Tecnologico de La Laguna of Torreon Coah. The electronic address used was : **lagu1004@bestit.seit.dgit.mx**

The first E-mail from Japan came from Prof. Yoshi-hiro Murai of Gifu University on May 29th. Apparently there is some working relationship with Prof. Thomas Lipo in Madison (the University of Wisconsin) because Prof. Murai reports that he has spent some 10 months there, and he now has a student there with whom he uses E-mail to communicate. It is worth mentioning that Madison provides a model of how ATP might be acquired and used free of charge by some (Prof. Lipo and others of his Wisconsin Electric Machines and Power Electronics Consortium) even though others on campus (in this case, Profs. Long, Alvarado, and Lasseter) might have been, or might still be, involved in EMTP commerce. The user group just needs some organizational isolation that will exclude those who can not be licensed for free use.

The Taipei, Taiwan, connection to CompuServe could not be located by Dr. Liu during her recent trip (see preceding story about foreign news). So, the service between Taipei and Portland was not tested, unfortunately. It had been assumed that a telephone book would yield the

number, but neither this nor a telephone operator could help. The problem was, the name used by CompuServe in Chinese language was not known! The basic root word in English -- computer -- provided a misleading clue. Only later did a knowledgeable person (Dr. Liu's God sister) indicated the Chinese name, which translates literally to the English "dragon door (or gate) network!"

LICENSE.ZIP is the WordPerfect disk file of the 6-page form letter that is used by the Can/Am user group to license ATP use anywhere in the world without charge. This now is available on the Fargo server as announced by Prof. Bruce Mork in E-mail dated July 11th. Many Europeans still do not seem to understand the conditions under which ATP can be acquired from North America. Well, for those having Internet, we now can recommend the acquisition of **/pub/atp/util/license.zip** by an FTP transfer.

Sri Lanka, formerly named Celon, is the large island just south of India. This was the location from which Dr. Mustafa Kizilcay of Lahmeyer International in Frankfurt, Germany, sent E-mail on June 15th using the address (pasted) **kizilcay@limm.ac.lk** Dr. Kizilcay explains that the *"Lahmeyer office in Colombo has an official E-mail connection via the University of Moratuwa in Colombo. The connection to Internet is established once per day between 8.00 and 10.00 a.m."* According to the CompuServe header, Dr. Kizilcay's message was received from **wildhog.Stanford.edu** (no joke)! Your Editor sent E-mail to Dr. Kizilcay on June 16th, and he responded on the 17th with the observation that there is effectively a one-day delay in the sending or receiving of E-mail (assuming no simultaneous use of the 2-hour window).

"+Postage Due+" is the disquieting prefix that CompuServe began appending July 1st to the *subject* of incoming mail as seen within the Filing Cabinet of CIM (the standard windowed DOS interface). CompuServe pioneer Laurent Dubé accepted responsibility for learning how billing had changed. In E-mail dated July 16th, new *"rates for standard pricing plan"* were copied. This says that the standard month fee *"includes an electronic mail allowance of $9.00. With this allowance you can send up to the equivalent of 60 three page messages per month with no additional charge."* But it does not say that one can receive any incoming mail without additional charge! This is the insidiously clever modification. Rather, to *"Read/Download Internet Messages,"* the cost is :

first 7500 characters	$ .15
additional 2500 characters	$ .05

Admittedly, some (not much) protection against junk mail has been provided: *"If Internet messages are deleted without reading or automatically deleted by the system after 30 days, no charges are incurred."* But how does a subscriber know whether a message is worth receiving without looking at it (which implies acceptance of the postage)?! To conclude, CompuServe has doubled or tripled the cost for use by your Editor, who is looking for an alternative. Once again, Mr. Dubé most likely will lead the way. Something more like Harald Wehrend's private mail box in Hannover, Germany (see the last paragraph on page 7 of the January issue) is of great interest here in Portland.

The first EMTP-related E-mail from Brazil arrived on July 8th when Dr. M. Afonso Carvalho of Universidade Federal de Pernambuco inquired about DECStation. He explained that *"we have been working with the ATP - DOS version on our digital simulation lab."* The mail came from **50macj@npd1.ufpe.br**

"Taking advantage of sound support offered by ... and other vendors plus encoding formats and conversion programs to support audio playback, Internet recently unveiled the latest in electronic mail transmissions: Internet Talk Radio." This is the fascinating beginning of a short story on page 8 of the July issue of *CompuServe Magazine*. Yet, the idea may be a little ahead of its time for the average budget: *"... shows are 30 minutes and occupy 15 MB of disk space."* Extrapolating, the daily three hours of Rush Limbaugh would require just under 100 Mbytes, which would be impossibly expensive to acquire by E-mail. Only college professors and students could afford it (see following paragraph)!

Free access to Internet by universities was made clearer by E-mail from Prof. Heydt of Purdue University on June 10th. The message seemed to go to all persons on the power mailing list, although it originated from Prof. Heydt's own internal access rather than the public address. The remainder of this column has been pasted from this message: I recently received the following message from Prof. Fischl at Drexel Univ. I thought that you might be interested... Subject: INTERNET FREE ACCESS THREATENED. Most of you are probably aware of a plan to limit free use of INTERNET to "scientists" transmitting huge files and to start charging for e-mail. Apparently, this is the result of private telecommunications interests putting pressure on the National Science Foundation. If this plan is realized, it will mean that the majority of the approximately 15 million users of INTERNET will be cut off. Sadly, this is occurring just when the potential of this network was starting to be realized. Something must be DONE. We can not let private interests deprive us of access to INTERNET. I suggest that all concerned users register their protest/concern directly with Clinton and Gore via e-mail. Their e-mail address have recently been posted and they are: Clinton = PRESIDENT@WHITEHOUSE.GOV Gore = VICE.PRESIDENT@WHITEHOUSE.GOV In addition, I also suggest that we identify the office in the NSF which is responsible for INTERNET and register electronic protests with them. Any help or suggestions would be appreciated, especially in locating the e-mail address for the office in the NSF. End of pasting. The

name and address at the bottom were not Prof. Fischl's, but rather: Carl H.A. Dassbach of the Department of Social Sciences of Michigan Tech in Houghton, who has Internet address **dassbach@mtus5.cts.mtu.edu** So, this is a continuing chapter in the story about Prof. Mork's record-setting E-mail transfer last fall (see column 2 on page 11 of the October, 1992, issue). As now understood, Mother passed the bill along to the U.S. Treasury! But for years, this institution has been falling ever deeper into debt. No reader should be surprised that politicians in Washington now are considering an end to the subsidy. We know that the University of Hannover does not have free access to Internet in Germany. How about others around the world? Your Editor's guess is that American university professors and students are among few who enjoy really free access, and that some limits might soon be applied to this.

TAPCIS is an accessory for CompuServe users that is said to save money because it *"keeps you off-line as much as possible."* The price quoted in a prominent advertisement on page 29 of the July issue of *CompuServe Magazine* is $79. Six pages later, NavCIS from John C. Dvorak, the computer journalist, is said to allow *"you (to) complete your everyday CompuServe activities faster, easier and less expensively. Off-line."* Any reader who can explain the relation between such claims and reality for users of E-mail is invited to submit an explanation for publication. Your Editor is baffled. The only time he spends on-line is under CompuServe's control. When the CIM user clicks on the **Send/Receive All Mail** entry of the mail menu, the dialing, connection, transmission, and finally, disconnection, are all automatic. How could more software make this faster? In any case, your Editor pays CompuServe based on the number of his messages (a maximum of 60 per month) and message sizes (each must be under 7500 bytes if surcharges are to be avoided) --- not based on connection time.

Gabor Furst ran many experiments about possible instability of the saturable TRANSFORMER during early May. This was mentioned in the third paragraph of column 2 on page 16 of the preceding issue. Fargo list server mail from Mr. Furst on May 20th summarized results of this research.

Employment resumes are the latest form of junk E-mail to which your Editor hereby announces that he will not respond. This follows the reception on July 10th of a cover letter to : *"Dr. W. Scott Meyer ; Electrical Engineering Dept."* The letter began: *"I am writing to you for a possible position of post doctoral research associate. I am about to finish my Ph.D in power systems from Clarkson University ..."* The objective was said to be a *"research associate position in Electrical Power Engineering ...."* In fact, the content was reasonable enough. But your Editor has no official connection with any college that might have an electrical engineering department. Also, although the communication consisted of personal (as opposed to Fargo list server) mail, your Editor did not know the individual who was writing. Two thoughts come immediately to mind: First, if there is not somewhere an Anonymous FTP depository for resumes of job applicants, there really should be. Second and finally, if (as seems likely) this message was sent to many persons across the country (indeed, around the world), your Editor is persuaded that NSF is wasting money on E-mail (see the preceding subject).

"Explore the INTERNET --- Free!" is the bold headline of a 9 by 11-cm advertisement on page D9 of Portland's daily newspaper, *The Oregonian*. This would seem to be a continuation of the suggestion in the preceding issue (see the middle of column 2 on page 8) from Prof. Bruce Mork of Michigan Tech. Yes, Delphi is the advertiser, and this time the offer should be irresistible to many: *"5-Hour Free Trial! Dial by modem, 1-800-365-4636; Press return once or twice; At Password, enter U2NP693. Questions? Call 1-800-695-4005 (voice). Send e-mail to INFO@delphi.com"* The only advertised restriction seems fair enough : *"Free time must be used during evenings and/or weekends."*

w.hubbi@ieee.org is the unusual address of Prof. Walid Hubbi of New Jersey Institute of Technology in Newark. Prof. Hubbi also works for IEEE, so is allowed to have his E-mail forwarded from there. As this E-mail address now is understood, Prof. Hubbi could change schools without the necessity of notifying others of his modified electronic address. Of course, IEEE would have to be notified in order that his mail forwarding would be changed appropriately. Interesting!

Paulus should have been **Pavlug** in the middle of column 1 on page 8 of the preceding issue. The trouble with artistic fonts is that distinction between letters is not always clear! Laura Young, BPA computer coordinator, says that the **lug** probably stands for "local user group." It is anybody's guess what the **Pav** means!

Rush Limbaugh, the most famous CompuServe user (see the final paragraph on page 11 of the October, 1992, issue), now can be heard on short wave! Prominently mentioned during late May and early June has been the frequency 15.420 MHz. This would be live, which is 12:00 through 15:00 East Coast (New York) time, Monday through Friday. The EIB (Excellence in Broadcasting) phenomenon continues to grow. As last heard, this self-proclaimed *Doctor of Democracy*, who heads the mythical *Limbaugh Institute for Advanced Conservative Studies*, is carried by some 610 radio stations ; and his weekly listening audience has surpassed 20 million. During one of his commercials on June 25th, he explained just how current CompuServe information is. The Steven Spielberg movie about dinosaurs, *Jurassic Park*, had just been released two weeks earlier. Yet, CompuServe already

offers a *Forum* for the exchange of dinosauer information (the command GO DINO provides access)! While sending and receiving mail automatically, CIM opens a quarter-size window in the upper right with title *"What's New This Week."* Seen July 1st as one of ten entries is: *"Win Prizes in Dinosaur Trivia Contest."* Wow!

Biz * File allows E-mail users to locate a business by name from among more than 10.5 million of the USA and Canada that have been compiled from more than 5000 *Yellow Page* (business telephone) directories. So claims American Business Information in the advertizing of its product on page 34 of the July issue of *CompuServe Magazine*. The CompuServe user keys GO BIZ*FIL to access the service. But how much does it cost to search those 5000 telephone books?! Any reader who knows is requested to inform your Editor, who is afraid to try at his own expense. Another thought: Why stop with *The Yellow Pages*? Why not offer *The White Pages* too? Then one could use the service to trace missing persons!

Richard D. Christie of **christie@ee.washington.edu** (the University of Washington in Seattle) broadcast on May 18th a surprising announcement using the power mailer of Purdue and Carnegie Mellon Universities (in the USA): *"An anonymous ftp site has been established at wahoo.ee.washington.edu (128.95.31.130) to make power systems related data and software easily available to the internet. For more information, please get the file "read.me" from the archive. .... The only file in the archive (just starting, you see) is the IEEE 118 bus test case in PECO PSAP format. I hope that additional data files will be added quickly now that this service exists."* Well, your Editor told subscribers of the Fargo list server on May 20th that he *"is mildly alarmed that Prof. Mork's efforts have not been recognized, and that there seems to be no distinction between single-phase, steady- state data (for load flow) and EMTP data."* Prof. Mork took on the job of informing readers of the mailer what already had been done for EMTP. This was in a group of three messages dated May 20th. A subsequent direct, personal communication from Dr. Christie, who is an Assistant Professor with interest in power system operations, led Prof. Mork to conclude in server mail the following day that there should be no problem with overlap of the two data bases. Prof. Christie seems to have interest only in steady-state (phasor) data, and he assured Prof. Mork that he *"... will put a pointer to your archive site in the read.me file in mine."*

Pacific Power and Light, with headquarters across the river in downtown Portland, would seem to be the first American power company with which the user group is in contact by E-mail. During a personal visit on May 13th, Jamie Austin indicated that Pacific Power had Internet, and she proved it with a note to your Editor the following day. This came from (pasted): **j_austin@upl.com**

The University of Waterloo in Ontario, Canada, has acquired LEC ATP materials for Sun on behalf of the Can/Am user group as described in a separate story. Use of E-mail to distribute the code is a milestone. Note that use of Anonymous FTP was rejected, however, due to its complete lack of security.

Mohan Course : Vancouver July 22- 23

Prof. Ned Mohan of the University of Minnesota gave his short EMTP short course in Vancouver, British Columbia, Canada, at the end of the 1993 IEEE PES Summer Meeting. This was July 22nd and the 23rd at the beautiful (but a little expensive) Delta Pacific Resort and Conference Center, which is located a few miles from the airport.

The names and addresses of 34 paying students are shown on an official attendance list that was compiled in Minneapolis on July 19. This is the largest crowd since 1990. Then, Prof. Mohan was at home, so in addition to lectures, he was able to offer both hardware and EMTP materials (yes, he distributed Rule Books there). More than one third of the registrants have addresses outside the United States and Canada: Two persons are shown for Europe (companies in Italy and England), two for Mexico (one company and one university), three for Venezuela (two universities and one company), two for Japan (both universities), one company in Korea, one university in Australia, and finally, one university in Puerto Rico. Yet, the most noteworthy address was from the United States : EPRI in Palo Alto. For the record, this would seem to be the first such official EPRI representative to attend an ATP short course, and it should be mentioned that he was not associated with the PSPO branch that since 1984 has been engaged in *EMTP commerce*. Final note: July 25th, Prof. Mohan indicated by telephone that 35 registrants had paid whereas only 33 actually attended.

Gabor Furst and Dr. Kurt Fehrle were unadvertised, last-minute additions to the faculty as announced in E-mail of the Fargo list server on July 9th. Each consultant was allowed about 15 minutes to explain a topic in which he had specialized. Mr. Furst described the SVC modeling that he contributed to the 4th subcase of DC-22. On the other hand, Dr. Fehrle gave a summary of Laurent Dubé's MODELS following Prof. Mohan's explanation of Mr. Dubé's TACS (the original control system modeling) .

Differences of course material from previous years were evolutionary rather than revolutionary, in this writer's opinion. The emphasis was shifted. A few small former topics were omitted, such as cable modeling by Prof. Albertson and Monte Carlo studies by John Kappenman. But mostly, it was a matter of reducing time on some old topics (e.g., the rotating machinery lecture of Prof. Riaz) in order to be able to spend more time on power electronics. Prof. Mohan seemed satisfied with the

change: he plans to repeat the 1993 format next summer in San Francisco.

Food was noteworthy. Your Editor ate only 3 meals during the 50 hours that he was away from Portland. One was lunch at the hotel salad bar --- not particularly noteworthy, but it **was** satisfying. Much more interesting were two dinners at a Chinese restaurant (*Top Gun*) that had been recommended by an employee of the hotel. Naturally, Dr. Liu handled the negotiation about food in Mandarine. It is well known that many American and Canadian cities have traditional *Chinatowns* in their older centers, and Vancouver is no exception. But this is **not** where course participants were directed. Instead, a mile or two from the hotel was found a sizable, enclosed shopping mall with stores of all types. The unusual aspect was that nearly all writing was in Chinese. About the only English your Editor remembers seeing was *Top Gun* --- presumably to attract Caucasians to the great food. Dr. Liu explained that the real (Chinese) name translates literally to the English *"sharp tip East"*). Thursday night, Dr. Liu and your Editor accompanied Prof. Mohan, John Kappenman, and one student who drove. Dr. Liu ordered an enormous bowl of Won Ton soup plus four plates (beef and broccoli, chicken and cashews, 4 mixed vegetables, and tofu) in addition to rice (each diner had a bowl), tea, dessert (iced milk and tapioca, flavored with papaya), and at least 4 types of cookies (but with no fortunes!). The five hungry diners consumed just about everything. Cost was reasonable. The following night, Dr. Liu, your Editor, and Dr. Kurt Fehrle (with car) returned for a quick meal. Dr. Liu returned with a carry-out dinner for Prof. Mohan, who had volunteered to watch the room while others ate.

Salford EMTP disk files were copied for many hours using several computers. As in Seattle 12 months before, Prof. Riaz and Dr. Liu were busy in the back of the room using there own computers. But several students, too, had their own computers. One of these, Bradford Rasmussen of G.E. in Seattle, rescued your Editor's demonstration of TPPLOT by offering his own laptop COMPAQ 486 as a replacement for Prof. Mohan's. Why? Because Prof. Mohan provided nothing other than the clumsy, built-in track-ball pointing device (not recommended!) whereas Mr. Rasmussen had a genuine, conventional, external, 3-button mouse with his, and this worked well.

Color of those two 486 COMPAQs looked good. As has been noted previously, the Sharp projector has decent color, but the COMPAQ screen displays were better. It would appear that color for portables has arrived as a practical option, even though it does cost substantially more. About that Sharp projector, Prof. Mohan would seem to have learned never again to take it outside the USA. Not only is there the added expense of shipping it separately, but even this had problems. The University of Minnesota was asked by U.S. Customs to pay $800 in duty because the broker who filled out the forms had failed to indicated that the equipment was being returned (as opposed to being imported for the first time). It seems likely that a projector will be rented locally, if and when the course might be given again outside the USA! After the course, Dr. Liu mailed Prof. Mohan advertising of the projector (from In Focus Systems) that she rents in a suburb of Portland for $150/day when BPA wants to project the graphical front end of its PowerFlow Program. This is even higher resolution (768 by 1024 pixels) than the standard VGA (480 by 640 pixels) used at the EMTP course. Dr. Liu observed that the In Focus unit also is noticeably lighter; it is truly portable as advertised. Recent advertising from a computer journal says: For more information and the location of your nearest dealer, call 1 - 800 - 327 - 7231 .

The lecture room itself left something to be desired. Apparently part of a much larger ballroom, acoustics were worse than in any previous location. Also, the shape of the room was less than optimal: there was plenty of room in the back, but not on the sides. Worst of all was proximity to Ballrooms A, B, and C (the EMTP course was in D). Friday night, it was partying rather than lectures that was occurring in one of these, and the associated rock music seemed to ooze through the walls. This is the second lesson of Vancouver: never accept from hotel management a room that has "ballroom" in its name!

Lack of sleep was a serious problem in Vancouver. Dr. Liu and your Editor reached their rooms just before 23:00 Thursday evening following an unscheduled evening session. The following day, the scheduled evening session did last until close to midnight. These two busy days followed Wednesday evening when your Editor only had 4 hours of sleep. So, there was dozing on chairs during lectures by others!

A major miscalculation about ATP materials was our failure to sell quickly enough the three ATP Rule Books that had been hand-carried to Vancouver. For a day and a half, both Dr. Liu and your Editor had responded to inquiries by students from overseas by saying that there was a shortage, and that rationing would require a later decision. Yet, when Friday evening arrived, no one from overseas could be found! Your Editor ended up carrying 2 of the 3 back through Customs (what a pain)!

Three - Phase Transformer Modeling

Professor Xusheng Chen of Seattle University has produced a 36-page *"Amendment to the Final Report"* having date May 23rd. For the original, 120-page final report, see column 2 on page 9 of the preceding issue. The amendment was announced to the world by E-mail (the Fargo list server) on June 21st. The following was explained: *"although his contract with BPA was completed weeks ago, Prof. Xusheng Chen of Seattle University has continued to work on his 3-phase*

transformer model (USE SEATTLE XFORMER) .... Should any reader want to contact Prof. Chen by E-mail, his address is (pasted): ***xchen@seattleu.edu*** *Any organization in the USA or Canada having interest in a copy of Prof. Chen's report need only make a written request of BPA. ... The limitation to a single 2-winding, 3-phase transformer (no tertiary) has not been removed, so do not inquire about this detail. The 3rd subcase of DC-31 has been used for many weeks to document performance of the Chen transformer. Last week, data was modified to agree with Fig. MVI-1 on page 20 of Prof. Chen's latest report. This is mentioned on a comment card that precedes the batch-mode plot cards of the new data case. The vector plot card need only be uncommented to show the same curves Prof. Chen does on page 20."*

Missing data would seem to be the serious, enduring problem of nonlinear, 3-phase, transformer modeling. Your Editor sees no practical or economical way to solve this problem. Certainly Prof. Chen's equivalent, average lengths and cross-sectional areas (of the magnetic circuits) could be produced by cooperative manufacturers. The first reader who succeeds with any such hope is advised to contact your Editor immediately with details since the news will be worth printing. Remember failure of that 1976 IEEE SSR working group to procure valid quadrature-axis subtransient data for its simulation of interest. Alternatively, required parameters can be determined by experimental measurements as advocated by Prof. Stuehm of NDSU in Fargo. But who is going to do this for existing, high-power equipment that already is in service? Maybe for new acquisitions, the buyer could afford to pay the manufacturer to perform the required tests. But the same might be true for Prof. Chen's physical dimensions. In either case, one is talking decades before data would be available for the average high-power transformer of interest. Following completion of BPA's two contracts on the subject, this is your Editor's perspective, anyway --- one of pessimism about practical application of the models we now have.

DCG / EPRI EMTP Propaganda

From time to time, it is educational to review what commercial competitors of ATP write. This is important work for EMTP historians because DCG , EPRI , and their agents seem naturally inclined to misrepresent whatever serves their own commercial EMTP interests. But your Editor is watching, and remains ready to rebut for the record their biased, self-serving presentations.

The January issue of IEEE *Computer Applications in Power* magazine contains advertizing or propaganda by DCG / EPRI participants. *"Running EMTP on PCs"* is the title of this work on pages 33-38 by four authors: Eric Gunther and Thomas Grebe of Electrotek Concepts, Dr. Rambabu Adapa of EPRI, and Doug Mader (for years, Chairman of the DCG Steering Committee). The concept of informing others about the use of PCs for the support of EMTP is good, of course. But this particular article has a number of problems, beginning with its creative rewriting of history. For example, the opening paragraph states: *"Traditionally, this program [EMTP] has existed only in mainframe and minicomputer environments, limiting its use to engineers and companies with access to these facilities. Recently, the EMTP has been made available for use on IBM and compatible personal computers (PCs) using the IBM OS / 2 and Microsoft Windows operating systems."* This may well summarize how EPRI eventually succeeded in supporting **some** version of EMTP on a PC. But such a jump from mainframes and minicomputers to PCs was only possible because EPRI missed the microcomputer revolution as it was happening. The real sequence of events was quite different. From minicomputers, EMTP first was moved to microprocessor-based Apollo personal computers, which later were called workstations in order to differentiate them from the IBM PC that followed. Detailed accounts can be found in *EMTP Memoranda* between 1981 and 1983. The biggest single step occurred in December of 1981 when your Editor joined Tom Varilek and Jim Weaver of Minnesota Power for two days of actual compilation and linking of EMTP FORTRAN in the Apollo office near Minneapolis (see pages DTTM-6 through -12 of Volume XI). Next, ATP was begun in February and March of 1984. This was critical because of 1984 and 1985 restructuring that allowed ATP to run on computers with reduced resources. The actual leap onto PCs was accomplished during the latter half of 1986 by Herbert E. Konkel, a BPA contractor who had an Intel 8088-based clone at home. Mr. Konkel succeeded in the support of EMTP under MS-DOS using your Editor's Lahey F77L compiler as documented in a 22-page paper that was sent around the world during the spring of 1987 (see Ref. 45 of the ATP Rule Book). Finally, existence of this and more sophisticated EMTP alternatives (e.g., the use of DOS extenders and Unix) for PCs was pointed out to readers of IEEE Transactions on Power Systems in 1989 (see the Can/Am discussion on pages 1555 and 1556 of the November issue). To conclude, maybe this latest DCG / EPRI attempt at writing should be nominated for some literary prize (the appropriate category would be **fiction** , of course).

The January, 1993, issue of *Transients*, the newsletter for users of the DCG / EPRI EMTP version, appears to be very professional. Including a glossy photo of Editor Tom Grebe, two colors of ink, and some text that is rotated either 45 or 90 degrees, the technical details are more than one step ahead of your Can/Am Editor. Content, however, is another matter. Inside the 4-page newsletter is a 4-page insert entitled "EMTP for Windows; Version 1.0 Released." Details are interesting. In the colored box entitled *"System Requirements,"* one sees *"4 MB RAM or more"* (compare with one or two for current

Salford EMTP), *"50 MB free hard disk space"* (compare with 10 Mbytes for Salford EMTP), and finally, *"80387 math coprocessor"* (Salford DBOS will emulate this if it is missing). So, at least some of the inferiority of Electrotek Concept's original use of OS / 2 (see pages 2 and 3 of the January, 1991, Can/Am newsletter) seems to have carried over to MS Windows. Concerning speed of simulation, the reader is left wondering whether this continues to suffer. For the record, your Editor never has seen or received any verifiable timings which would indicate that the original horrendous loss of speed (76% for DC-1 on a 33-MHz 386) might have been corrected by Electrotek or any other agent of DCG or EPRI. Finally, under the section entitled *"Price and Availability,"* the reader will find no price! Is this detail of the DCG / EPRI EMTP still too much of a shock to be put in print? Alternatively, has price been lowered from the original, preposterous levels of 1986 to more believable levels, and such a retreat itself might now represent an embarrassment to EPRI (which was to be the sole marketing agent)? If any reader knows the current Electrotek price for DCG / EPRI EMTP, and is able to forward printed confirmation to Portland, such information will be published in a future issue.

EPRI continues to try to profit from BPA's good name concerning EMTP. This is in spite of the fact that there never was any close working contact, and the one weak tie, through DCG, was broken at the end of 1987 by expiration of the DCG Agreement. Consider what is to be found in an EPRI *Technical Brief* dated January, 1993. The short entry for EMTP includes the following: *"For 15 years, the Bonneville Power Administration (BPA) and other utility and academic groups have been developing and expanding the digital EMTP. EPRI, in conjunction with a consortium of utility organizations called the EMTP Development Coordination Group, has enhanced ..."* Nowhere does the story explain that BPA is a part of neither the consortium nor the EPRI project to enhance EMTP.

The Graphical User Interface (GUI) of BPA's load flow program illustrates that it is not **always** impossible for the EPRI PSPO (Power System Planning and Operations) Program to cooperate in the public domain on the development of software for electric network solutions. Dr. Tsu-huei Liu, head of the Planning Methods Section of the System Engineering Branch at BPA, supervised BPA's latest work on load flow that was supported by some $254K of EPRI money. Since EPRI has been criticized for its bungled and divisive attempts to monopolize EMTP, it seems only fair to acknowledge another EPRI expenditure that was quite different. The first page of BPA's IPF User's Guide dated May, 1993, begins with the following explanation: *"Interactive Powerflow (IPF) was developed by BPA and its contractors with about 20% of the cost supported by Electric Power Research Institute (EPRI) . By mutual agreement, ... all results of this project --- including the computer program and its documentation --- are to be in the public domain."*

European Spring Meeting in Lisbon

Current Salford EMTP and TPPLOT materials were available at the European spring meeting, which this year was held June 17th and 18th at IST in Lisbon, Portugal. As last fall in Leuven, once again Laurent Dubé had the materials. This time, there was no problem with readability. Five floppy disks were created at BPA on June 8th, and contents were hand carried by Mr. Dubé the following day as announced to the world in E-mail dated June 9th. Unlike previous years, Mr. Dubé left his portable computer at home this year. Instead of carrying the computer, he now carries only a cartridge tape drive that connects to any parallel port (e.g., that of the new 486 that Prof. Correia de Barros had made available). A copy of the current UTPF for LEC, and VAX / VMS EMTP FORTRAN , also were carried by Mr. Dubé.

The printed Proceedings of the spring meeting arrived at BPA on July 7th by air mail from Lisbon. Contents are worth reviewing, but this will have to be delayed until the October issue. Concentration on the story about LEC finances (next) --- the really big news from Europe --- has forced your Editor to delay whatever else he can.

LEC Financial and Political Problems

The remainder of this story is a copy of the 2-page *"Introductory Summary"* of a 28-page memorandum that was written this summer by your Editor. Dated September 10th, and entitled *"Financial and political manipulation of LEC by Chairman Van Dommelen,"* printed copies were mailed by air from the Can/Am user group to about 160 European EMTP contacts on September 14th and to all foreign user groups except LEC the following day. The shortage of time (see Point 6 below) prompted your Editor to add the following note on three otherwise-blank lines at the bottom of final page 28: *"Final thought of WSM : If you miss the September 30th deadline but still want to terminate your LEC membership at the end of the year, check with your attorney. One might contend that LEC already has breached the agreement by its failure to report income during a third of each year."*

LEC is the Leuven EMTP Center of Leuven, Belgium. Created in 1985, LEC seems to be under the permanent control of Professor Daniel Van Dommelen of the Electrical Engineering Department of the university (K. U. Leuven). Since the 1992 annual LEC meeting in Leuven, Chairman Van Dommelen has been involved in an unprecedented struggle with LEC ' s own democratically-elected Steering Committee about finances,

accounting, and the voting rights of members. As a quick introductory summary of the problems, several points made by critics of LEC management will be summarized, after which an outline of the remainder of this long story will be presented:

Point 1. LEC bookkeepers do not carry over any unspent LEC funds from one year to the next. Instead, LEC funds that might be unspent at the end of one year simply disappear mysteriously. This is the amazing discovery of the Steering Committee last fall. Each year, LEC begins its accounting with a balance of zero, according to Chairman Van Dommelen.

Point 2. Precise accounting of LEC is impossible for anyone outside of LEC because substantial hidden income never has entered figures that are revealed to members. Organizations that pay their yearly dues late -- after August of any year -- are believed to be the principal unreported source as documented in Section IV-A.

Point 3. Chairman Van Dommelen seems to maintain that LEC members have no direct power to force the disclosure of all LEC income. Accompanied to Lisbon by the K.U. Leuven R&D Director (the lawyer responsible for contractual matters of LEC), Chairman Van Dommelen refused to comply with demands for full disclosure. Since then, he has refused to commit LEC to abide by the outcome of a popular vote on the dispute. Section VI-A provides details.

Point 4. Profit from LEC's recent advanced EMTP short course, held at K.U. Leuven July 5-8, 1993, is not being added to other LEC income for the support of EMTP by LEC. Chairman Van Dommelen made this declaration in Lisbon. Like the hidden income of Points 1 and 2, profit from the 1993 EMTP course would seem to be destined for persons and/or places unknown to LEC members. It is sizable, too: approximately 1/3 of the gross revenue, according to available LEC data. This does not count the 20% overhead of Leuven R&D (actual expenses are only about half of gross revenue).

Point 5. Creative accounting by LEC has provided additional income of which few members seem to be aware. Depreciation of computer equipment was treated as an expenditure in LEC budgets that were presented at the annual meetings. Details can be found in Section IV-B. Unlike Points 1 and 2, the depreciation is not hidden, but it is deceptive since it is not a real expense. Use of depreciation augments the amount of money that each year was not accounted for precisely by LEC bookkeepers.

Point 6. The end of September appears to be the deadline for each current member to declare by registered letter his intention to leave LEC if he is to avoid automatic re-obligation for the following year (1994). Any member who wants to remain uncommitted through the upcoming great debate at the fall meeting is advised to withdraw from LEC **before** October. This way, the member could examine details of the dispute at his leisure. If he later decides to continue as an LEC member, he could rejoin for the following year at any time. On the other hand, if he decides that he wants nothing more to do with LEC management (a decision that would be easy for this writer to understand!), he has retained his freedom to leave without penalty at the end of the year.

For the record, the idea of quitting, and then rejoining, is provided by Article 21 of the 1990 LEC agreement, which reads: *"Any Party can terminate the Agreement at the end of every year by giving notice of three months by registered letter to the other Party."* Carefully note the mention of *"every"* year. It sounds as though this would be a prudent thing for **every** member to do **every** year until LEC rescinds its September deadline. After all, the cost is low enough (one registered letter).

Detailed explanation and discussion of these points will follow in the remainder of this memorandum as follows:

Section II documents initial suspicions of the Steering Committee (the sudden insight of last fall in Leuven).

Section III discusses LEC's own proposal for reform, which was **not** accepted in Lisbon by the Steering Committee.

Section IV is reserved for a careful examination of the financial records that already have been released by LEC. This writer must concur with critics who charge that the annual balance of income and expenditures is not at all what the casual observer has been led by LEC management to believe it to be.

Section V explains those aspects of the ongoing dispute that are **not** of concern to BPA (Bonneville Power Administration) and the Can/Am user group (the Canadian/American EMTP User Group).

Section VI explains those aspects of the ongoing dispute that **are** of concern to the Can/Am user group. It ends with an ultimatum to LEC management: either submit to an independent, public audit of all income, and honor the voting rights of members as written in LEC membership contracts, or the Can/Am user group will, by the end of the year, declare LEC to be incompatible, and will rescind its ongoing policy of sharing ATP information with LEC.

European EMTP life without LEC is the subject of **Section VII**. After considerable discussion with other LEC members, this writer does not believe the possible demise of LEC to be a bleak prospect at all. Members are reminded that LEC does not enjoy a monopoly on ATP in

Europe or anywhere else in the world, and LEC has not dominated either ATP or EMTP development. So, the challenge is limited to providing alternate conduits for communication among existing LEC members and other ATP developers and users around the world. By reorganizing the flow of information, the average ATP user in Europe could gain. Companies clearly could save a lot of money (the present high LEC membership fees).

Finally, **Appendices A - H** provide a lot of background material for the preceding sections.

The present memorandum now is being mailed to Europe from Portland because LEC members have not thus far received any such useful information from LEC management in time to make an informed judgement prior to the end of September.

Bottom of BPA Cyclical Finances

Like the weather, BPA finances change cyclically. In fact, BPA finances change cyclically **with** the weather --- because most revenue comes from the transmission of electricity that is generated by falling water, and this in turn depends heavily upon rain and snow in the mountains at higher elevations. Well, on average, last winter was dry in the mountains (particularly far north in Canada), so BPA management has struggled with its budget during recent months. The following explanation has been copied verbatim from the June 7th issue of BPA's employee newsletter, *This Week*, so it should provide the official explanation:

Cuts announced:
To bring down a projected wholesale power rate increase, BPA will cut at least $250 million out of its 1993-95 programs through a combination of reductions and deferrals. These cuts are in addition to $175 million in cuts already adopted for the two-year period beginning in October. ... The cuts will cross all program areas. The deepest reductions are expected in transmission construction, where projects totaling more than $100 million have been proposed for deferral. ... All offices have already cut back contractor levels, eliminated non-mandatory training, slashed travel budgets, imposed tight controls on overtime and canceled orders for computers and software. BPA also has launched a function-by-function review to identify efficiencies and determine appropriate staffing levels.

LEC Short Course : Leuven, July 5 - 8

LEC would seem to have filled its short course early once again. This report comes from faculty member Laurent Dubé on June 8th, who had just received FAX from LEC . This reported that *"we even had to put 4 candidates on a waiting list. The course accommodation is promising too: 16 full 486 PC's (50 MHz) with Super VGA color screen, equipped with 8 Mb of RAM and all equipped with a 210 Mb hard disk. It will be possible to lecture in a separate room, or to lecture in the computer room (LCD screen connected to computer is available). The computers are not interconnected via network, though."*

The LEC EMTP short course July 5-8 was a success according to personal conversations with several faculty members. Yet, a noteworthy problem was some computer trouble --- in spite of the new hardware (486s) that was used. This would not have been a problem if service had been available (the unusual aspect of this course was lack of a repairman)!

The RMS value following a Fourier series tabulation was in error for cases having a constant (dc) term prior to correction on July 8th. This was the surprising discovery of Profs. Juan and Abelardo Martinez of Spain, according to July 8th E-mail from the Fargo list server. As LEC Manager Guido Empereur clearly stated, the constant coefficient was being treated no differently than other coefficients: after squaring, the sum was divided by two, and then a square root was taken to produce the RMS value. But this was wrong. The dc term should not have been divided by two. Upon learning this, correction by your Editor was trivial (a single statement) as documented in list server mail later the same day. Later that same day, Prof. Ned Mohan in Minneapolis offered an opinion of how such a gross error could have escaped notice for so long: usually there is no dc value for signals of interest. The THD statistic is not affected because it involves only the second and higher harmonics.

News about Laurent Dubé's MODELS

Multi-phase compensation for MODELS was made operational by Laurent Dubé on May 25th when he delivered changes in person, and approved of results using his own special test cases. Eight days earlier, Mr. Dubé had provided a disk containing 7 modified UTPF segments that had been processed by your Editor without difficulty. So, the new tool would seem to be ready for creative users who include Prof. Maria Teresa Correia de Barros of IST in Lisbon, Portugal, and Vincent Vanderstockt of Laborelec in Brussels, Belgium. A new VAX / VMS translation was created June 8th, and was carried to Lisbon on a floppy disk the following day by Mr. Dubé. This was announced to others in E-mail of the Fargo EMTP list server dated June 9th: *"News: Dubé carries EMTP to Lisbon."*

Reentrant subroutine calls would allow considerable simplification of MODELS code according to author Dubé. This detail came to your Editor's attention during

conversations at BPA on August 6th. By reentrant code, we mean a subroutine that can call itself. The most widely used Salford software had no trouble compiling, linking, and executing the following simple test:

```
a = 0.0
call recurs ( a )
end
subroutine recurs ( a )
a = a + 1
if ( a .lt. 3.0 ) call recurs ( a )
return
end
```

As well known, such capability in not in the ANSI FORTRAN 77 standard. But recursive subroutine calls are a common extension of modern compiler writers. Unfortunately, those who supply BPA's DEC VAX / VMS computers are not among them! When Mr. Dubé reported to VMS expert Randy Suhrbier that a compiler error resulted from the preceding test, the response was interesting. Although the VMS FORTRAN compiler does not allow a subroutine to call itself, it is easy to bypass the compiler trap (let A call B, and B call A). This then works correctly except for two limitations: 1) there must not be arguments; and 2) there must not be a need to preserve local variables (e.g., the index of a DO loop from within which such a call might be made). This is unfortunate.

The 55 Rule Book pages for MODELS continue to be available from BPA under the same conditions as most other EMTP documentation (e.g., the Theory Book). At some point, such material will be added to the ATP Rule Book, of course, but that time has not yet arrived for printing here in Portland. For the average user who might know nothing about control system modeling in ATP, the older alternative provided by TACS is believed to be a simpler, safer starting point. Without supporting tutorial materials, early exposure of beginners to MODELS might create more problems than it would solve, in your Editor's opinion.

FREQUENCY SCAN was connected to MODELS following a suggestion of the idea by Dr. Mustafa Kizilcay of Lahmeyer International in Frankfurt, Germany. This reached your Editor in E-mail dated July 16th: *"This would allow users to produce easily frequency scans of port-immittances in any form (e.g. Bode diagrams) and output into files using WRITE1 .... for further processing (fitting of the curves using a separate program)."* Well, Mr. Dubé provided the connection, and sent changes to Dr. Kizilcay by E-mail (reception was acknowledged by E-mail dated August 19th). The changes entered the UTPF during a visit to BPA by Mr. Dubé on August 17th. Of course, the usual MODELS variable "time" has been loaded with the phasor frequency in Hz.

Dr. Kizilcay has been using random numbers within MODELS as a part of his arc or circuit-breaker modeling that is being developed further in cooperation with the high voltage laboratory of FGH in Mannheim, Germany. In E-mail that was forwarded by Mr. Dubé on August 16th, Dr. Kizilcay wrote: *"I like MODELS, especially to define freely and easily such complicated random functions."* Look for publication that includes comparison with laboratory measurements (this is the real thing).

Suhrbier Extensions for .PL4 Files

Randall W. Suhrbier is BPA's local expert in all things related to DEC VAX / VMS computers that continue to be used by BPA's full-time production users. During the past 3 months, Mr. Suhrbier suggested two important optional extensions to .PL4 files as the shift from BPA's own EMTP to ATP continues.

UNFORMATTED .PL4 files now contain a flag that indicates the nature of the time variable. It is the final (6th) integer of the initial record that now provides the distinction. If unity, time in seconds is the independent variable. But if the value is 2 or 3, the independent variable is either frequency or the logarithm to the base 10 of frequency, respectively. The new discrimination allows any postprocessor (e.g., an interactive plotting program such as Salford TPPLOT) to adjust its treatment of the input file accordingly. Inspiration for this simple but valuable extension, which entered the UTPF July 1st, came from Mr. Suhrbier. As readers of this newsletter already know (see the final paragraph of column 1 on page 16 of the January issue), he has his own interactive plotting program PLOT for VAX / VMS computers, and this already recognizes the new intelligence.

The limitation to UNFORMATTED .PL4 files comes from the fact that only this type had an unused integer that could be appropriated for the new distinction. Yet, this is the type of interest to Mr. Suhrbier since VAX / VMS EMTP as created and used at BPA thus far uses only this type. There has not yet been any exploitation by Salford TPPLOT for which the C-like alternative is the most important. Current thinking is that a special comment would be added at the end of the file for FORMATTED or C-like cases. This would precede any conventional comments of the next paragraph.

Optional comment lines at the end of .PL4 files is the second extension inspired by Mr. Suhrbier. These are used by his VAX / VMS plotting program for automatic labeling of plots (if such comments are present). As the idea has been implemented for ATP, a maximum of five ranges of such comment blocks are allowed in a data case. Each such block must be immediately preceded by the special declaration $BEGIN PL4 COMMENTS and immediately followed by $END PL4 COMMENTS as illustrated by DC-3. This addition was made over the 4th of July weekend, and was verified for all 3 .PL4 file

types using MS-DOS shareware utility LIST to look in hex mode (the ALT-H switch) at the .PL4 files that were produced by Salford EMTP. July 7th, the revised VAX / VMS EMTP was turned over to Mr. Suhrbier for testing with his PLOT program.

Columns 1-2 and 79-80 of .PL4 comment lines are scrutinized for reserved symbols. If the user wants to see the text as part of LUNIT6 (printed) output, he should use standard EMTP comment cards (having the default symbol "C " in columns 1 and 2). In this case, the first two bytes of each line will be missing in the .PL4 file. To produce a .PL4 comment line longer than 78 or 80 columns, key $$ in columns 79 and 80 as an indication that the following line is to be taken as a continuation of the present one.

The code for FORMATTED or UNFORMATTED .PL4 file comments is universal, so will work for any computer. On the other hand, C-like code thus far has been provided only for Salford EMTP, although it might be hoped that the conventions assumed could apply for any other system, too. For C-like files, content through the final variable of the final time step remains unchanged. I.e., .PL4 comments are essentially an undocumented, appended extension of C-like files. However, in order to accommodate this rule, Salford TPPLOT had to be modified so as not to *correct* the total length of C-like files to include the comments. For FORMATTED and UNFORMATTED cases, a relic from years past has been resurrected: a final extra, bounding time step that has T = -9999 seconds has been added as a separator to mark the beginning of comments if and only if there are comments. Note carefully that there is no change if the user does not request comments for his .PL4 file.

LINE MODEL FREQUENCY SCAN

The METRIC alternative within LINE CONSTANTS data of a LINE MODEL FREQUENCY SCAN (LMFS) case was in error prior to July 26th when a correction by Dr. Liu entered the UTPF. This was in response to a complaint by BPA's Robert Hasibar.

DC-51 has been augmented by new 2nd and 3rd data subcases that illustrate LMFS usage for single and double-circuit Marti frequency-dependent line modeling, respectively. Unlike for other test cases, instructions for the use of this new modeling follow the data, and edited illustrative output (some 25 Kbytes) follow the user instructions. It was not practical to put the illustrative output on comment cards (the usual technique) because such data is read more than once with confusing effect (50% or more of the time, comments would not apply to the solution in which they would appear). It will be seen that end of the real EMTP data is marked by an EOF (columns 1-3) record which serves to truncate input (the instructions and illustrative output never should be read).

The stacking of data cases that involve LMFS is not recommended for others. Yes, it was done for DC-51, but operation is tricky. It is safer to put each LMFS usage in a separate disk file.

Salford materials dated July 30th reflect all changes of the present story. The former FSCAN.ZIP file has been removed from the GIVE2 disk, and mention of it has been removed from the READ_ME.DOC file. This freed enough space to add FC.ZIP and LIST.ZIP (the shareware utilities of Mike Albert and Vernon Buerg, respectively). To conclude, the implementation of LMFS in ATP finally is complete.

Isolated Corrections from LEC

Guido Empereur, the Manager of LEC, telephoned your Editor on July 1st. There followed about 90 minutes of very friendly discussion about the difficulties of closer cooperation in changes that are made to EMTP.

About complicated changes, your Editor repeated the long story of the still-unreconciled changes to CABLE CONSTANTS (see bottom of page 3 of the January issue). To summarize, developers in Portland do not accept changes from LEC that can not be understood.

Isolated corrections to ATP that LEC might have made, and can explain easily to anyone including us in Portland, are quite a different matter, it was agreed. Such changes will be accepted and used. Mr. Empereur said that he planned to send documentation of such isolated LEC corrections back with Laurent Dubé following the summer course in Leuven (see separate story). Your Editor agreed to consider such materials promptly.

Mr. Empereur volunteered to provide code for LEC's VAX / VMS version of EMTP that includes 3-window SPY. Your Editor agreed to accept such a tape, but refused to be the person who would "sell" (advocate) such an extension to production users within BPA .

Mr. Empereur again suggested that maybe he could travel to Portland in order to facilitate reconciliation of our two different UTPFs. Your Editor remained skeptical. Some LEC changes are rejected outright by us whereas others (e.g., CABLE CONSTANTS) require more than merely on-site representation by LEC in order to be accepted. Your Editor repeated the non-negotiable position dating to the end of 1991: developers in Portland do not agree to allow others to control what, how, and when work on ATP is done. We must be convinced that changes are correct and desirable before we make them.

Mr. Dubé did deliver to BPA the LEC materials from

Mr. Empereur. Sitting side by side in front of a computer, Mr. Dubé and your Editor reviewed the 8-page listing and associated disk files that supposedly documented isolated changes. Some were clear whereas most will require substantial study to be understood. In order to end this story a positive note, consider the one LEC-documented error that has been corrected thus far here in Portland (see the entire next paragraph).

Exclamation points ("!") rather than open braces ("{") were improperly used as the in-line comment symbol in various places of the UTPF. This is a bad habit that your Editor has fallen into since BPA abandoned its last Sun workstation for the support of EMTP. The two compilers still used at BPA, Salford FTN77/486 and VAX/VMS, will accept the exclamation points. In fact, they sometimes are preferred as a debugging technique since such comments are passed through the translator to the EMTP FORTRAN. Also, an exclamation point is the symbol used for comments in the source code of Salford TPPLOT (for which there is no translation), so the habit is acquired. Therefore, from time to time, it is necessary to search the UTPF for " ! " (note space before and after), and replace such exclamation points by braces. Since Mr. Empereur reminds us of the need, on August 3rd list was used for the search, and MS-DOS 5 EDIT was used for all substitutions. The following UTPF segments were purified: OVER13, RSTART, TABLES, TACS2, TGRUNT, SUBR1, SSTACS, CIMAGE, NEWPXX, SUBTS2, OVER16, TREAD, HANNFD, and SUBTS3 .

Agora : On-line Service in Portland

Agora is the name of a small, on-line computer service that is local to the Portland area. There is some similarity between this and Harald Wehrend's "private mailbox" in Hannover, Germany, as described at the bottom of page 7 of the January issue. But because Agora allows the use of Internet (including FTP transfers) at no extra charge, it seems better suited for the user group.

Laurent Dubé led the way onto CompuServe a couple of years ago, and now he is leading the way off, too! It is he who discovered the Agora service, which is local to Portland. Agora is operated by one Alan Batie, who has E-mail address **batie@agora.rain.com** It was during a visit to BPA on August 12th that Mr. Dubé configured Procomm to allow connection, after which your Editor joined.

Where do the names come from? The *Agora* seems logical enough after a look in a dictionary: *"An ancient Greek marketplace used as a gathering place for the populace."* The following *rain* would seem to come from RAINet, which provides access to the critical Internet (needed for worldwide communication).

Basic services of Agora seem very cheap: A mere $2 per month buys 15 minutes each day, or $6 buys 1 hour. For $12, one can have unlimited usage! If one pays 6 months in advance, 6 months costs 5 times the monthly rate. Users also are subject to a one-time fee for disk and tape (backup) space of $5 / megabyte. *"The **due** command will tell you where to send payment, as well as when your account will be expired if you don't. I don't bill, as it's too much hassle. You pay in advance, and when the money runs out, so does your account."*

After logging into Agora, the following information is obtained from the help command: *"You are logged onto Agora, a public access Unix system in Portland, Oregon. It is running on a 486 running at 33Mhz with 20 Meg of RAM, 2 gigabytes of disk, 9 public phone lines and 6 private lines. It is connected to the Internet via RAINet at 14.4 kbps. You are currently using a menu driven shell (command processor) called 'wish', written by Erik Bennett of Fenris Computer Services, Inc. Among other things, you have the option of reading or sending electronic mail (private messages between individuals), reading or posting USENET articles (public messages from around the world) and transferring files between your computer and agora."*

"Standard services include shell, email, USENET, Internet and various games. The preferred mail user agent is elm; the preferred newsreader is nn, but rn, tass, tin and vn are also available. telnet, ftp and gopher access are also provided."

Critical to speedy use are the modems, which are described as "Intel 9600EX [v.32/ v.42bis]." This is understood to imply data compression: using 9600 baud results in an effective transmission rate that is higher. Connected to your Editor's 486 at BPA is the Szymanski-supplied Robotics Courier V.32 modem that offers *"MNP Class 1 through 5 error control and data compression, increasing error-free throughput up to 80 percent."* A sticker on the front of the box says: *"Now Includes V.42 V.42 bis ; Full CCITT V.42 Error Control and V.42 bis Data Compression for error-free throughput up to 38,400 bps."* This does sound a whole lot better than expensive, commercial CompuServe, which does not yet seem to offer data compression (see bottom of column 1 on page 12 of the October, 1992, issue).

Agora runs on a Unix computer, so naturally it has a lot of free but sophisticated software. An example is Pine from the University of Washington, for alternative handling of mail. According to help text, *"The name 'Pine' originally stood for 'Pine Is Nearly Elm'; today 'Pine Is No-longer Elm' is more appropriate. ... Pine source code is available via anonymous FTP from **ftp.cac.washington.edu** on the Internet.* One feature of Pine that caught this reader's eye is MIME, about which help text says: *"MIME stands for 'Multipurpose Internet*

Mail Extensions' and it is a specification for including binary data in Internet mail messages, which until now have generally been limited to ascii text. MIME-capable mailers, such as Pine 3.0, allow word processing documents, spreadsheets, programs, images, audio, and other binary data to be attached to a message. MIME allows for alternative representations of the same data. For example, there can be an attachment in text form followed by one containing bitmap page images of the same information." Would this provide an automatic solution to the problem of accented foreign languages (see page 6, column 2 of the January issue for the account of Prof. Clerc in Lyon, France). Maybe, if both sender and receiver had MIME.

"USENET is best thought of as a world-wide distributed BBS. It should not be confused with the Internet, which is something completely different, although there is a significant overlap. There are around 2300 different subject areas to read and participate in."

Thus far, the main problem with accessing Agora has been busy telephone lines during the daytime. During recent daytime visits of Mr. Dubé, it has not been possible to practice together. Yet, this has to do only with learning to use the new system. It is not a serious limitation for the intended use, which is expected to be late at night or very early in the morning. For Mr. Dubé, night time minimizes long-distance telephone charges; for your Editor, this is when creative work is done!

Miscellaneous Intel PC Information

Intel might sell 30 million 486s this year. This is the amazing official estimate according to John Dvorak in the July issue of *PC Magazine*. At the start of his *Inside Track* column on page 95, Mr. Dvorak reminds readers that Intel no longer is the lone supplier, either: *"... now that AMD retrieved its legal right to sell its 486 using Intel microcode, we can expect all hell to break loose in the chip business."* Apparently already-low 486 prices should drop even further. *"Meanwhile, IBM is serious about making microprocessors a profit center. Look for its own version of the 486. There are two clock-tripled versions due out. One will run at 75 MHz and the other, dubbed Blue Thunder, at 99 MHz."* To conclude, it looks like the 486 juggernaut will continue to roll irresistibly onward for some time. It might be a while (years) before anyone in Portland has interest in the 586 (Pentium) or beyond. From your Editor's vantage point, the 486 looks extremely good for ATP simulation for the foreseeable future.

"Rivals challenging Intel's new super chip" is the title of an Associated Press story that appeared on page A12 of the July 13th issue of *The Spokesman-Review*, the principal daily newspaper of Spokane, Washington. The Intel chip of interest is Pentium, of course. So, who are the challengers? Understandably mentioned is DEC's high-performance Alpha, which is described as a 64-bit chip that runs at an unprecedented 150 MHz. More interesting in terms of politics, however, would seem to be PowerPC from Motorola in cooperation with both Apple and IBM. But are such chips a threat to Intel? After all, *"the x86 is the industry standard, powering about 85 percent of all personal computers."* According to a COMPAQ executive, *"Intel is so firmly established that to rock that would require either far superior performance or cost or both together."* Others (not including your Editor) believe the Intel architecture now can be challenged successfully. These insurgents would seem to be believers in the new, alternative operating systems such as MS Windows NT, too. After all, what good is a chip without an operating system? For more details, the interested reader is referred to pages 144 and 145 (the story *"Comparing CPU Architectures"*) of the June 15th issue of *PC Magazine* for more details.

Virus detection has been institutionalized by many large organizations including the U.S. Department of Energy (DOE) to which BPA is attached. Dr. Liu's 33-MHz, 486-based COMPAQ provides an illustration. The AUTOEXEC.BAT file begins with a command **c:\security\bootchek** that installs memory-resident protection. Disk file HELP.TXT in the same directory is the source of the following information, which may interest readers who continue to operate unprotected. It is your Editor's guess that almost any commercial product is just as good (virus detection is a very competitive business). So, from HELP.TXT : *"WINVIR ... scans the C: drive for viruses when the computer is least likely to be used (at 1:00 AM). It also records, in an easy to read text format, absolutely all changes made to executables on the C: drive, including those made by unknown viruses, mutation engines, polymorphs, human tampering, and file damage. ... The actual virus scan is performed by a DOS application called WIN-RS.COM written by DDI and licensed to DOE . A second scan occurs afterward that takes an 'electronic picture' of all of the executable code in your system. If anything changes at all, for any reason, WINVIR will spot it the next day ... and record it in a file called WINVIR.LOG in the security directory. Nothing is left memory resident, and no active processes occur automatically by day except the brief polling of the system clock every ten seconds.*

... This program is designed only to detect viruses, not remove them. If a virus is detected, a message box will appear. Call the Help Desk at 4347 to alert them to your infection. ... To remove viruses in an emergency, go to DOS and run the VIRHUNT program in the security directory."

PCs that consume less power have been the subject of several recent articles. The name *green PCs* sometimes is used because of improved impact on the environment.

Peter Lewis summarized some of the numbers in his *Computing* column that was published on page D1 of the May 26th issue of Portland's daily newspaper, *The Oregonian.* According to columnist Lewis, IBM's green offering *"will use about $15 in electricity a year. Conventional office PCs have an annual electric cost of $125 to $150."* One obvious way to save power is to eliminate cooling fans, which has the added advantage of reducing noise. *"When all its components are in use --- hard disk, floppy disk, keyboard, mouse and processor --- the computer [IBM's green 486, which has not yet been released] uses just 30 watts of power, and the display 21 watts. ... The real savings come when the computer is inactive ... Once it has detected no activity for a certain period, ... the green PC begins a gradual drift into sleep. The monitor ... has four stages of operation,"* with the lowest of these consuming a mere 3 watts. On the other hand, recovery from such hibernation is not instantaneous: *"it can take several seconds for the screen to spring back to life."* To summarize, energy-saving techniques that were necessary for battery-powered laptop computers now are being applied to conventional desktop machines in an effort to reduce electric bills. What electric power companies might think of this revolting development has yet to be reported (joke)!

"IBM makes lightning-strike overhaul of ailing PC business" is the title of a story by Stefan Fatsis of The Associated Press. In Portland, this appeared on page E1 of the May 30th issue of *The Oregonian*. It is a progress report on the semi-autonomous IBM Personal Computer Company that resulted from corporate restructuring last September. *"Among the steps toward improving morale and efficiency: axing a dress code that cultivated the image of corporate IBM and eliminating meetings that crippled action on pricing and development. IBM is rolling out new PC models as fast as every six months, compared with an old 36-to-40-month product cycle."* But is the strategy working? It may be too early to tell. IBM PC sales are up, but prices are down: *"A year ago, IBM PCs cost up to 90 percent more on average than cut-rate competitor Gateway 2000 ... Today, IBM prices are about 20 percent above the cheapest clones ..."* Is that enough of a change to regain significant PC market share in the USA (said to be 12.3% in 1992 vs. 26.9% in 1985)?

H-P DeskJet 500 provides 300-dots/inch hardcopy of Salford EMTP and TPPLOT graphics more affordably than ever. Seen in advertising by Alpha Computers on page K6 of the June 20th issue of Portland's principal newspaper, *The Oregonian*, is the price of $345 for either H-P DeskJet 500 or DeskWriter. Yet, this is not the end of the good news. Prices have continued to erode. Advertising by Office Max (the former BizMart) on page K3 of the August 1st paper shows an *"Everyday Low Price"* of $300. Meanwhile, the color DeskJet 500C had plummeted to $400 in Office Max advertising on page K14 of the August 15th paper.

Overhead projection of PC output is possible without use of a special, extra presentation panel that sits on top of the conventional overhead projector. The screen of a notebook computer named Rever Cruiser by Emco Computer Systems of Newbury Park, California, now can perform this function. For a description, see the article by Yvonne Lee entitled *"Notebook's screen is overhead projector"* on page 31 of the June 7th issue of InfoWorld magazine. This would seem to be the latest advance for those who want to travel light: *"Despite the dual function, the Rever Cruiser [name of the notebook computer] weighs only 6.2 pounds ...."*

"IBM unveils new OS / 2 system but faces hard fight" is the title of Peter Lewis's Computing column on page D1 of the June 23rd issue of *The Oregonian*. This story begins as follows: *"Refusing to concede defeat in the face of daunting opposition, the International Business Machines Corp. is once again attempting to convince the world that OS / 2 is the best operating system for the current generation of personal computers. This time it may be right, though right doesn't always make might in the software business. At a technical symposium last week in Austin, Texas, the home of its new personal software products division, IBM introduced what is by far the most impressive version yet of OS / 2 . .... OS / 2 was once heralded by Microsoft as the successor to DOS --- before Microsoft decided to ride Windows into the future and dumped OS / 2 into the hands of its estranged partner, IBM. It took IBM many years to learn how to develop PC software on its own ... Windows 3.1 captured the desktops and created a halo for Windows NT, and an estimated 24 million copies of Windows are in circulation, compared with 2 million copies of OS / 2 . ... many analysts believe that OS / 2 cannot possibly overcome Microsoft's momentum on the desktop ...."*

BPA funds Trondheim Data Assembly

Hans Kristian Hoidalen is the author of a graphical EMTP data-assembly program named ATPDRAW in which BPA has shown a special interest. This was summarized one year ago (see pages 7 and 8 of the July, 1992, issue). Now the story can be continued, as announced to the world by James Hall of BPA in E-mail of the Fargo list server dated June 25th. The remainder of this story is mostly copied from that 9117-byte electronic announcement that was entitled *"News : BPA funds ATPDRAW at EFI."*

The E-mail announced a contract that will pay about $100K of BPA money to EFI in Trondheim, Norway, to allow approximately one man-year of additional work on ATPDRAW. Previously, work had been done at the technical university NTH (Norges Tekniske Hogskole) in Trondheim, Norway, where Mr. Hoidalen had been employed as a scientific assistant. But now BPA money

goes to EFI (Energiforsyningens Forskningsinstitutt A/S) rather than to the university because Mr. Hoidalen had become a full-time employee of the neighboring commercial EFI by the time BPA was ready.

By clicking a mouse on menus and icons (symbolic pictures) of power system components, the user of ATPDRAW builds a schematic diagram of the electric network that he wants to simulate using the ATP version of EMTP. When the graphical assembly is complete, ATPDRAW can be asked to produce the corresponding disk file of data (80-column records) for simulation using ATP. This is the structural relationship between ATPDRAW and EMTP. So, ATPDRAW is a separate computer program.

Yet, data assembly, simulation, and subsequent plotting can be performed sequentially together in unified fashion when all three of ATPDRAW, ATP, and TPPLOT are driven from the same master menu. For an excellent illustrative explanation that applies to Intel 386- or 486-based microcomputers that run MS-DOS (so can support Salford EMTP and TPPLOT), any reader unfamiliar with the concept should study Mr. Hoidalen's paper entitled *"Graphical Interface for ATP"* on pages 32-44 of the December, 1991, issue of *EMTP News*.

Portability among various computers of practical interest is an important theoretical advantage of Mr. Hoidalen's approach. BPA wants the data assembly program to run on DEC VAX / VMS workstations in addition to the computers of greatest interest to the masses (Intel-based MS-DOS PCs that support Salford DBOS). For the latter, ATPDRAW relies only on royalty-free tools that have been especially connected to satisfy ATP needs. Whereas competing developers have chosen to rely on unrelated, general, additional, commercial software such as AutoCAD and AutoLISP, or Microsoft Excel, or simply Microsoft Windows, ATPDRAW requires no such extra bulky, complex, and/or expensive commercial software. The essential graphics instead have been provided by GIGS (a General Interface Generating System), which was developed by the Center for Computer Aided Learning at the University of Trondheim.

Readers should be assured that ATPDRAW will be available free of charge. By relevant U.S. law (FOIA, the U.S. Freedom of Information Act), BPA work is in the public domain. So any enhancements to ATPDRAW are necessarily public. However, ATPDRAW as it exists today is not. But, in exchange for the BPA money, those presently owning property rights to ATPDRAW have agreed to renounce those rights.

The work on ATPDRAW by Mr. Hoidalen has been divided into four sub-projects over a duration of one year. From 5 pages of FAX from EFI dated June 1, 1993, these are as follows:

1) Improve the handling of computer memory between June 1st and August 30th. Included will be an overhaul of the data structure to allow utilization of extended memory of MS-DOS computers. Also, provision for Laurent Dubé's MODELS and a procedure to imbed one circuit in another circuit.

2) Improve mechanics of the drawing, and generation of ATP input data file, during September and October. The handling of connections and the copying and moving of components, will be improved. Names will be given automatically.

3) Add warning messages to prevent subsequent possible errors during ATP execution. Introduce Help Menus. Finally, debug the changes --- all during November and December.

4) Finally, during the first 5 months of next year, write a user's manual for ATPDRAW, document the source code using English-language comments, and travel to Portland for a demonstration and discussion.

The project was financed by BPA through a Technical Design Service (TDS) contract involving Pacific Engineering Corp. of Portland as an intermediary. First EFI pays Hoidalen; then Pacific Engineering pays EFI; and finally, BPA pays Pacific Engineering. The budget provides $103,000 total for EFI: $75K in 1993 and $28K in 1994. The responsible party at BPA for services delivered under this contract is James L. Hall of the Division of Substation and Control Engineering. This includes relaying, which provided Mr. Hall's primary justification for the contract. Any readers who want to contact Mr. Hall are advised that his mail stop is "Route EEPB" and his telephone extension is 3735. We share the same FAX machine on floor 4: 3212. As for E-mail, see a separate paragraph about Mr. Hall in the preceding regular E-mail story.

Other graphical preprocessors exist, it should be emphasized. The BPA selection of ATPDRAW is not meant to be a discouragement to others. Since separate programs are involved, different persons can develop and use different preprocessors for reasons that may be as different as the users themselves. Another EMTP data assembler was acquired by MODELS author Laurent Dubé while attending the European spring meeting (see separate story). DESTRO comes from Myra Engenharia Elétrica e Consultoria Limitada of Rio de Janeiro, Brazil, which offers a free demonstration disk. It would seem that DESTRO is a commercial product, which is acceptable as long as Myra is not involved in *EMTP commerce* as this term is defined in the user group's form letter (disk file LICENSE.ZIP of the GIVE2 disk of Salford EMTP distribution, or Prof. Mork's Fargo server).

Waterloo Distributes EMTP for Sun

Acquisition of LEC's Sun EMTP by the University of Waterloo in Ontario, Canada, was the subject of the next to the last paragraph of the preceding issue (see page 20). Now there is more information about performance. In E-mail dated June 15th, Robert Sarfi provided your Editor with documentation of just how slow the simulation of DC-1 is on powerful SPARCstation 2. Readers are referred to column 1 on page 4 of the January, 1991, issue, for a summary of SPARCstation 2, which is said to be rated at 28.5 MIPS. Yet, Mr. Sarfi reports 81.163 seconds being spent within the time-step loop. As your Editor informed the world in E-mail broadcast by the Fargo list server the following day, *"this should be embarrassing to Sun, or LEC, or both. Compare the 81.163 seconds of simulation reported here with the 38.7 seconds spent in the time-step loop by Robert Meredith of New York Power Authority using Salford EMTP on his cheaper 66-MHz 486."* In fact, the difference probably is even greater because the Sun SPARC time should be **process** time --- not the longer **wall - clock** time reported to Salford EMTP by MS-DOS .

Lack of optimization during Sun compilation was confirmed during a telephone conversation with Guido Empereur of LEC on July 1st. In your Editor's opinion, this is the most likely cause of the sluggish SPARC simulation. If this is the problem, the fault is not Sun's. The practical need for optimization is a well-known, added requirement of RISC that readers should understand. Yes, RISC offers the potential for higher performance, but a big chunk (e.g., half) of this may be lost if the compilation is not optimized. Consider Hewlett-Packard RISC, for example. During a telephone conversation on March 30th, Robert Meredith of NYPA provided the numbers that he and colleague Robert Schultz had found for the time-step loop of DC-1 using their H-P Model 7xx. As received from LEC, 48 seconds were required. But this was about cut in half by optimization (a separate story about which more will have to be written later). The only other complaint from White Plains was that the H-P EMTP had no vector (CALCOMP) batch-mode plotting. Apparently LEC uses only interactive LECPLOT .

Dr. Bacher of ETH in Zurich was the first recipient of Sun EMTP and LECPLOT as distributed by Waterloo. Unfortunately, this was not by E-mail, as Mr. Sarfi explained in a message dated July 8th: *"Certain hosts are configured to accept e-mail of a maximum length. All machines that I tried to send the 14 MB tar file from would not accept such a long file. It was pointed out to me that some smaller hosts might not even have 15 MB for the entire /var/spool directory."* So, next time, smaller transmissions are to be used. Mr. Sarfi concludes: *"I am currently in the process of creating a script to set up atp and tpplot from e-mailed files. With such a script, the installation of atp and tpplot could proceed with the same ease as when using a tar file."*

Miscellaneous Small Items

DCNEW-9 is a U.M. data case that was modified to demonstrate that an identical second subcase could be simulated after the first. During a telephone conversation on May 18th with Prof. Juan Martinez of the University of Catalunya in Barcelona, Spain, your Editor learned that the first time step of such a second simulation was grossly erroneous. Well, by the addition of more initialization at the top of UMDATA (the data input routine of the U.M.), your Editor corrected the problem. To prove it, we added the second subcase, which simulates only a single step (to 200 microseconds).

Use of RECL = 256 for the output channel (or channels, if BOTH is used to begin execution) of the VAX / VMS version is a recent improvement based on the advice of BPA's Randy Suhrbier. For 14 years, any output line longer than about 135 columns had resulted in a VAX / VMS error interrupt complaining that *"output statement overflows record."* This occurred whether or not output channel LUNIT6 = 6 was connected to disk. In the case of the screen, Mr. Suhrbier advised your Editor to connect LUNIT6 to SYS$OUTPUT using an OPEN statement. This is what has been done June 2nd. It may be nonstandard, but it works fine!

Railroad signaling is an interest of Stuart McKay as explained in the preceding issue (see the middle of column 2 on page 20). Well, FAX from him dated June 12th indicates a change: *"I resigned from Ontario Hydro on May 28 and started with SEL Alcatel ..."* The FAX begins with a logo that uses the name *"Rail Systems Analytics,"* which seems to be a semi-commercial hobby. The name is followed by the description: *"Railway Signalling; Traction Noise; Train Operations."* Prof. Akihiro Ametani of Doshisha University in Kyoto, Japan, was able to advise Mr. McKay about the use of CABLE CONSTANTS by telephone during his visit to BPA on September 7th. One important recommendation was for Mr. McKay to use Dr. Naoto Nagaoka's FTP (the "F" indicating Fourier, or a frequency-domain solution) to study the importance of frequency-dependent modeling.