Can / Am EMTP News

Voice of the Canadian/American EMTP User Group

Publishers and Mailers:
Kwang-yi and Kwang-chien Ger
3179 Oak Tree Court
West Linn, Oregon 97068
United States of America

Authorized by Co-chairmen :
Dr. W. Scott Meyer, Editor
Dr. Tsu - huei Liu
E - mail : atp @ agora . rain . com
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Table of Contents

The preceding table of contents was generated by Dr. Tsu-huei Liu using WordPerfect. Previous such structures had been constructed manually as ordinary text. The new usage begins with **Mark Text** (Alt-F5), followed by **Define** (5), and then (1) **Define Table of Contents**. Each story headline is marked as an entry by first using **Block** (Alt-F4), then **Mark Text** (Alt-F5) after moving the cursor to the other end of the headline, and finally, **ToC** (1). So, recipients who have different paper size or fonts are able to recreate a correct table in short order, if they so desire, and have WordPerfect. Of course, page numbers now are being printed automatically (before, they were applied manually using a typewriter).

Salford Compiler and DOS Extender

MATLAB connection to Salford EMTP continues to be of interest to Gayle Collins of the University of York in England. As a continuation of the mention in the two preceding issues, there is a letter from the University of York to The Math Works, Inc., which makes MATLAB. In this letter dated January 18th, Ms. Collins and Ron Patton write the following: *"We are interested in compiling a program .... (EMTP) with MATLAB on the PC using the external interface routines available in MATLAB. .... We think it would be mutually beneficial if MathWorks would consider integrating the Salford FORTRAN compiler into the next version of MATLAB. The advantages are clear for power engineers, that a link is established between MATLAB and EMTP where the controller is modelled in MATLAB and the system is modelled in EMTP .... To this end, David Vallance of Salford Software has agreed to provide a complimentary copy of the Salford FORTRAN compiler to MathWorks. Additionally, Dr. W. Scott Meyer at Bonneville Power Administration in Portland, Oregon, has offered to provide assistance with any questions you may have regarding EMTP."* Whether the Salford DBOS market is big enough to interest The Math Works remains to be seen.

The **Esc** key can be used in place of STOP to respond to the opening prompt ("EMTP begins."). This convenience was effective January 10th. The operation of **Esc** is identical. In fact, **Esc** is translated into STOP as the character is recognized. The feature was added for

two reasons. First, there was the desire for consistency with SPY (which can be halted at any time by pressing **Esc**). Second, using a single key to halt the program should save some time and effort each time this is done interactively.

The C-like .PL4 file of a Monte Carlo study can be saved for later use with TPPLOT. But, as illustrated by DC-48, special data is required. Of course, it is the base case that is of interest, and the trick is to disconnect the .PL4 file immediately before the blank card that ends plot cards of this. Comment cards in DC-48 after February 12th explain peculiarities of the change, which was inspired by Prof. Mustafa Kizilcay at the university in Osnabrueck, Germany. He had observed that, without such special preparation, the C-like .PL4 file was not usable upon the conclusion of the subsequent shots. This was not really a bug because no one before ever had asked for the saving of a .PL4 file from a Monte Carlo simulation. Well, such use is possible today, as DC-48 illustrates.

The **Backspace** key can be used to correct any error that might be keyed during a reply to the opening prompt. This follows correction on March 2nd, in response to a complaint about misoperation that came from Dr. Mustafa Kizilcay, Professor at Fachhochschule of Osnabrueck in Germany. At issue was keyboard input, which had been changed from in-line **READ (*, ...** within CIMAGE to a call to external FLAGER last September. Operation was found to be trickier than realized at the time. So, corrections were made to FLAGER and PROMPT.

Binary switch NEWPL4 of STARTUP allows the user either to accept (value unity) or reject (value zero) new code that will compress the header of a .PL4 file by the removal of unused names. As explained in a separate story, this was developed using Salford EMTP.

NEDIG, NFDIG, and NOCOMM are parameters of MS-DOS for control of a new utility TRUNCATE that is the subject of a separate, later story. The utility was written to reduce the floating-point precision of .LIS files for easier comparisons using Mike Albert's shareware FC (distributed on the GIVE2 disk).

Use of DISK or BOTH with $INCLUDE data was confusing for cases that never made it through the data assembly (e.g., due to a bad file name). Salford EMTP would stop properly, but error messages were no where to be seen. There was no .LIS file, as first observed by Massimo Ceraolo of the University of Pisa in Italy. This was in E-mail dated April 21st. The problem was simple enough: the output file name, which is read in SYSDEP, had not yet been defined as the program prepared to halt after first flushing output text to disk. Typically buffered output will be used, and this will not nearly have reached the limit LU6VRT = 32768 bytes as the program stops. So, such output was lost. This was prior to the addition of more logic to TFLUS4 later that same day. Now, if the first connection to disk fails, a second try is made using a Salford-generated random name. The name supplied by TEMP_FILE@ will have .TMP changed to .LIS to satisfy ATP custom. Both on the screen and in DEBUG.LIS will be seen a one-line reminder of this. For example: "Assign default .LIS file name LU6NAM = F$014125.LIS"

Improvements to Salford TPPLOT

The GO command is equivalent to ALL TIME for the first plot, of course. But for the second or later plot, it reused the time limits of the preceding plot. This generally was what was desired if the .PL4 file was not changed. But a different .PL4 file generally will have a different time span, so reusing the beginning and ending times of the preceding plot often is not at all what was wanted. So, as changed January 15, a new .PL4 will reinitialize the GO command, making it equivalent to ALL TIME for the new file. To illustrate the change, begin with HHMMSS (which uses seconds) and then switch to DC3.PL4 (which uses milliseconds).

The JOIN subcommand of the EXPORT command can be used to merge two .PL4 files that involve the same time steps. Details are in a separate story.

The CHARACTER*8 storage of node names, and other 6-character EMTP variable names, has ended at the same time JOIN code was added. This was a final holdover from DEC VAX/VMS TPPLOT, which dates to 1979 --- before FORTRAN 77 and CHARACTER variables. The original 60-bit CDC words (yes, before the original VAX-11/780, TPPLOT was developed for use on BPA's time-shared mainframe computers) were changed to REAL*8 for VAX storage. This was true for TPPLOT just as it was for EMTP. For Apollo, this became CHARACTER*8. But .PL4 files only used 6 bytes for names, so an interface routine A6TOA8 was used to interface these with the 8-byte storage of TPPLOT. Well, no longer. Not only is effort of the conversion saved, so is the extra 8-byte storage.

News from Outside USA and Canada

A printed copy of the January newsletter was mailed by BPA to each of its 9 primary EMTP contacts on February 7th. This was 4 days after the availability of JAN95.ZIP was announced in public E-mail of the Fargo list server by Mathias Noe of the University of Hannover in Germany. This availability was from the **Hannover** mirror, not the **plains** FTP server! Although the file had been sent to Houghton by FTP two days earlier, at that time Prof. Bruce Mork was in New York City attending the IEEE PES Winter Meeting. This is why JAN95 was

not placed on the plains server promptly. So, two days later, your Editor sent a copy to Mr. Noe. For once, the mirror was ahead of the master site! As for the mailing of paper, two names (but no addresses) have changed: Mathias Noe has replaced Harald Wehrend in Hannover, and, as explained in the January issue, Dr. Warren Levy has replaced Willie Naudé at ESKOM in South Africa.

The Korean user group has not yet received its printed copy of the January newsletter, which was returned by the postal system. Shortly thereafter, on March 28th, your Editor sent E-mail to JinBoo Choo (see the October newsletter) at address **jbc@hanbit.kepcorc.re.kr** About KEPCO, this explained: *"I continue to use the same old address, which is: 117-15, Yong Jeon Dong, Dong-Gu; Dae Jeon. BPA will re-mail the envelope if a correct address can be learned."* There has been no response thus far.

Prof. Mustafa Kizilcay's European ATP center was supplied on January 24th with new GIVE1 and GIVE2 disks of Salford EMTP distribution. However, for the first time, rather than conventional air mail, E-mail was used. This was using the **Attach** button of MS Mail on Dr. Tsu-huei Liu's computer at BPA to append the archives GIVE1.ZIP and GIVE2.ZIP as described in the preceding issue. Any other foreign user group can request similar service at any time, it should be mentioned. However, flawless delivery can not be guaranteed. Prof. Kizilcay experienced big trouble during early March, when such deliveries were rejected by his university mail system. Even a file as small as ALLDAT.ZIP was refused. But then, about a week later, such files were received by Dr. Kizilcay! Apparently the BPA E-mail post office continues to try, and eventually succeeds, without being asked to do so. So why does the operation succeed a week later? Is the path different?

"Metric De-Conversion?" is the title of a short, summary paragraph in the February 27th issue of Federal Employees News Digest. *"The Senate has approved language requiring a study of how much the government directed national switch to the metric system --- still more theory than reality --- is costing the federal government as well as other governments. Sponsor Sen. Byron Dorgan, D-N.D., believes that whatever is being spent, it's a waste."* North Dakota does have its own politics, and Democrats there are not automatically on board Clinton's internationalist bandwagon (Somalia, Bosnia, NAFA, GATT, etc.). North Dakota exports a lot of wheat, and this can be sold either by the English or the metric ton, it would seem!

Indians might have access to ATP materials via a new, alternative user group. Now this vague hope in the October, 1994, issue might be briefly explained. On February 8th, BPA mailed a printed ATP Rule Book and three Salford floppy disks to Prof. Prakash Khincha of Bangalore, who then was a Visiting Professor at the National University of Singapore, where he used address **elepk@leonis.nus.sg** E-mail from your Editor dated January 14th explained the reasoning: *"I agree with Prof. Mohan that the next step is for you, or someone who works with or under you, to learn about ATP. Before anyone goes any further, you had better understand what is being considered, and be convinced that this is of substantial value to industry and academia of your country. A real understanding can only be accomplished by doing."*

Gayle Collins has followed her advisor from the University of York to the University of Hull in England. But she continues to use her old E-mail address at York: **gfc@ohm.york.ac.uk** This was most recently noted in her public E-mail of the Fargo list server dated May 15th. She explained that "it's a transitional time."

More about Electronic Mail (E-mail)

The sparky server has replaced the plains server, as unlikely as this may seem. Prof. Bruce Mork of Michigan Tech wrote the following in public E-mail of the Fargo list server dated March 29th: *"I have just found out that our ATP files have been moved to a different address at North Dakota State University. I've had a guest account there for maintenance of the ftp site, but apparently no one bothered to tell me about the change beforehand. Files are available as before, but they are now accessible thru **sparky.nodak.edu**"* So, there now seems to be one more good reason to prefer the Houghton mirror, which should be under better control. **ftp.ee.mtu.edu** is the address of this, as explained in the preceding issue.

"Schultz demiming utility for E-mail" is the title of a later separate story about Mime encoding of E-mail.

CompuServe's rate of $20 per Mbyte has been much criticized in recent issues. Well, February 5th, prices were drastically reduced if one can believe a form letter at the start of the February issue of *CompuServe Magazine.* On page 3, Editor Kassie Rose wrote: *"Each additional 7,500 characters costs 2 cents, a decrease of more than 85% ..."* Yes, $2.67 is a whole lot better than $20 for each megabyte. This is a believable price for high-volume transfers. On the other hand, small files are only slightly less expensive than before: *"Sending the initial 7,500 characters now costs 10 cents, a 33 percent decrease ..."* Also, tricky CS has raised its flat rate to $9.95 per month. Yes, the customer may now receive more (e.g., *"90 three-page messages, an increase of 50 percent from the previous level"*), but can he use it? It would appear that CS continues to charge for **all** incoming mail (the figure 90 is for messages **sent**, not received). It would appear that CS is playing games, pricing its service at whatever it believes the market will bear at any particular time. Well, in the case of large files, CS reasonableness

is probably too late, as many if not most users with such transfers long ago deserted the service. About FTP, not a word is seen in the form letter.

Teleport, mentioned in the January issue, was selected by BPA's Fred Elliott, who uses it for WWW. Among the extra services procured by his higher fees ($15/month) seems to be a monthly newsletter. On pages 2 and 3 of the 8-page February issue are pictures, names, and summary biographies of staff, who now are numerous. This is quite a success story: *"A year ago Teleport had one employee, who was also the owner. Today there are eleven of us. .... At this time last year, Teleport consisted of 400 users and Jim. .... By the new year the total was almost 4000. .... Such rapid growth is not surprising given that, by some estimations, the Internet is doubling in users every eight months."* Obviously, the number of sites or nodes is not, so this latest statistic would seem provide a measure of growth within existing sites on the network.

Teshmont Consultants Inc. of Winnipeg, Manitoba, Canada, first was heard from by E-mail on March 20th when Rao Atmuri issued a plea for help with Type-59 S.M. data. This was using the Fargo list server. Since Teshmont has for some time shared its knowledge of ATP availability with its international clientele (e.g., see mention in the April, 1993, newsletter), their recent addition of E-mail as a medium for the communication of ATP information could be important for others around the world. For those unfamiliar with the origin of the name Teshmont, the *mont* was from Montreal Engineering, and the *sh* was from Shawinigan. Both of these two were names of consulting companies in Montréal, Québec, that were associated with the founding some three decades ago. So confirms Stu Cook of JUST Services, who lives in the greater Montréal area, and who, during the '70s and '80s, was himself employed by Montreal Engineering (which became Monenco). Peculiar about the Teshmont address is lack of any person's name. The E-mail came from **teshmont@mbnet.mb.ca** The **From:** line did also display the name David Rivers as a comment (on the right, within parentheses), however.

Dr. Kurt Fehrle in West Chester (a suburb of Philadelphia), Pennsylvania, USA, is one of the final ATP collaborators to establish E-mail contact with the user group. Yet, there is progress. March 10th, Dr. Fehrle explained by telephone that he had joined some computer club that uses the computer services of his county library, which has access to Internet. Of course, your Editor promised to "Reply" to the first note that might be received from Dr. Fehrle. For those in small towns who have trouble locating inexpensive, E-mail, a local library represents yet another possibility.

Minnesota Power in Duluth first sent E-mail to the user group on March 3rd. The main ATP contact there is John Kappenman, an instructor in Prof. Mohan's short course. Well, **jgkappenman@mnpower.com** is Mr. Kappenman's E-mail address.

CompuServe users finally have FTP. The March issue of *CompuServe Magazine* offers a big story about this on pages 26-30. Notable by its absence is any mention of price, however. So, this would seem to be business as usual (i.e., charge whatever the market will bear for as long as it will bear it) for CompuServe. On the positive side, the article does a good job of describing the great variety and usefulness of Internet resources: *"NASA, for example, maintains a site containing images from its space flights, while the National Public Telecomputing Network in Cleveland, Ohio, manages an archive of historical documents. The University of Illinois at Urbana-Champaign supports Project Gutenberg, with hundreds of classic literary works in ASCII text format, free for the downloading."*

More about Trinidad, that island of the West Indies that was mentioned last time. On February 3rd, E-mail was received from Ravi Shukla of the power company. Pasting from the "From:" line of the E-mail header, this came from **sun@opus-networx.com** Mr. Shukla wrote: *"I have recently gotten access .... If you receive my message, could you reply to me at ...."* So, your Editor did, of course. But his mail was rejected for a reason quite unlike any seen before. February 11th, mail from **sysop@opus-networx.com** had *"Subject : Non-Delivery Notification."* An *"Automated Notice"* stated the following: *"E-mail replies to this user should have the following on the first line of message text: TO: RAVI SHUKLA - T&TEC, TRINIDAD."* In retrospect, trouble was to be expected since it is unlikely that "sun" is used only by Mr. Shukla! What a pain, though, requiring special content for each E-mail message. Only in Trinidad (who else has heard of such a demand)? Worse, an attempt to add the recommended line did not seem to help. Such a special message was sent February 11th, but that message, too, was rejected the same way! Curiously, an extra blank line automatically seems to be added by the Agora mailer Elm, thereby preventing compliance with the request of the Trinidad BBS.

Robert J. Meredith of New York Power Authority (NYPA) in White Plains had free E-mail service through IIA (the International Internet Association) as explained in the July, 1994, issue. Note the past tense of the verb (had). Well, that free lunch has ended, as first learned in E-mail dated March 8th. Mr. Meredith wrote: *"Those of us who never signed up for (800) number access at $.15 per minute are about to be relocated to a new iia2.org address. It turns out that the access number for ii22.org is in Superior Wisconsin! Not exactly a local call for the 'free' users near Hackensack, New Jersey. (950 miles away as a crow might fly, if it could make it.) I think I have until March 20 to find a new internet home. Since there are national services using (800) numbers for $.09 per minute, the iia (800) offer is not attractive."*

meredith@interactive.net is the address being used by Robert Meredith as this issue goes to print. The following information was received in a note dated March 15th: *"Cost is $9.95/month plus $2.70 to extend my local calling area to include it for up to 20 hours per month. I passed up the chance to get a SLIP account for a total of $18 per month plus a $30 setup charge."*

The **Reply** button of mail-handling programs such as Unix Elm can be dangerous when applied to mail of the Fargo list server. Several persons have been burned this way during the past year or two, readers are reminded. A safe, general rule is this: never **Reply** on-line to mail that comes from a mailing machine. Why? Even though the **From:** field of mail from Fargo indicates an address other than **.nodak.edu**, in fact Fargo is the source of the message, and Fargo will be the place **Reply** will send the response. That is, the **Reply** will be public.

Expert advice about arc modeling was given by Dr. Ivano Bonfanti of CESI to BPA's Robert Hasibar in E-mail dated December 16th. This long explanation began as follows: *"Arc modeling is a serious problem, and it has to be known for which purpose it has to be done. If it is for investigating the interaction between a 'generic' breaker and the system, then it is just a matter of using a 'black box' model (more or less like the one I used) and see what happens. Instead, if the issue is of investigating the interaction of a specific breaker with a specific system, then it is not as easy. On the other hand, this last situation is the real problem of utilities when, having successfully tested a breaker in a lab, they want to know if the same breaker will behave correctly in a non-standard situation (steeper Transient Recovery Voltage than tested, higher current, and so on), or will be restrike-free for situations other than the ones tested. To 'predict' such behavior, a complete identification of the breaker during tests is needed, and the arc model is part of the identification. There are several possibilities to identify the arc model: one is choosing a model 'a priori' and determine its parameters by tests ...."* Etc. (much more than can be printed here). Note once again the difficulty with data (ATP has more tools than the average user ever will satisfy with appropriate data), and the need for user intelligence. Simply having an error-free EMTP does not help much. The challenge is more difficult than that. As your Editor has observed many times, years after EMTP modeling is perfect, users still will be struggling with the choice among models, and the search for data to use them intelligently. All the bureaucratic talk about salvation via ISO 9000 seems illusory --- a little like *structured programming* in the late '70s.

At least 60K BBSs exist in the USA according to discussion on page 608 of the April issue of *Computer Shopper*. About a half are said to be free, and a third are fee-based, with $51/year being the average. So, the $60 per year of either Agora or ORST (used by Laurent Dubé) seem to be typical in spite of their quality Internet service (as opposed to games, etc.). *"If we conservatively allow each BBS an average of 250 subscribers, we're talking 5.5 million subscriptions, or a total annual gross of about $280 million. .... Phil Becker ... thinks those estimates are low. He puts the number of BBS callers in the 17-million-to-20-million range, dwarfing the roughly 4 million served by online services"* (CompuServe, etc.).

Different possible addresses were imaginatively displayed by Doug Selin at the end of his public E-mail from the Fargo list server dated February 15th:

```
work_space: Arizona Public Service  ....
vista_space: dselin
cyber_space: dselin@apsc.com
phone_space: (602) 371-6388 (or  ....
fax_space :  (602) 371-6612
earth_space: P.O. Box 53933,  ....
```

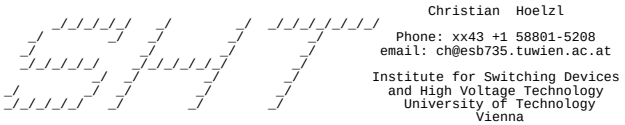
Voice telephone communication using PCs and the Internet is described in an Associated Press story by Evan Ramstad on page F1 of *The Oregonian* dated March 19th. *"Internet Phone, a new program by VocalTec Inc. of Northvale, N.J."* (New Jersey) makes this possible for $50. *"I've had a pretty clear connection to Italy. I've talked to people in the Netherlands and lots of different places"* according to one user, Richard Haus of the San Francisco Bay Area. "*People can't talk simultaneously"* using the present software. But, *"by June, Camelot Corp. of Dallas plans to sell Pick, a Windows program it says has better sound and allows both people to speak simultaneously."*

ISDN is the latest communications alternative for those who need more throughput than a regular telephone line can provide. The average American customer of a Baby Bell should have this alternative by the end of the year. From a map on page N/1 of January 9th issue of PC Week news magazine, availability will vary from a low of 50% for Nynex (which serves New York state plus New England) to a high of 81% for Ameritech (Chicago and neighboring states). *"Videoconferencing is one application that uses the 128K-bps bandwidth of ISDN lines"* according to a story on page N/3. Future issues might explain more. But now, only one detail: acronym ISDN comes from **I**ntegrated **S**ervices **D**igital **N**etwork.

Address **dube@peak.org** will be seen in the header of recent E-mail from MODELS author Laurent Dubé. This does not mean that there will be trouble using his original address, however. In a message dated April 17th, Mr. Dubé explained: *"The Computer Science Outreach Service (CSOS) of Oregon State University (ORST) has changed its Internet domain name to **peak.org** The change went into effect in January, to provide CSOS with more flexibility in the use of the Internet services it offers to the public by releasing it from the computer usage rules of the University. All E-mail addressed to **csos.orst** will continue to be accepted by **peak.org** for years to come, although the users have been encouraged to convert their address to the new domain name."* So, this is similar to **rain.com** (still valid even though outgoing mail from Agora shows **rdrop.com**) .

28.8 Kbps modems are the next step beyond 14.4, which has been the common speed for several years. The price differential no longer is objectionable, it may be noted. Page 272 of the March issue of *Computer Shopper* is devoted to modem advertising by Midwest Micro. The 28.8 Kbps V.34 offering from Infotel is priced at $149 for internal mounting. The corresponding 14.4 Kbps offering from Infotel is priced at $79. But what reader has successfully used a modem at 28.8 Kbps over a normal, public telephone line? Of course, both modems will handle FAX. About the 14.4 Kbps unit, *"its voicemail feature acts as a personal answering machine."*

Character logos (as opposed to bit-mapped pictures) were mentioned at the end of page 10 of the preceding issue. Well, Christian Hoelzl in Vienna, Austria, put a good one on the Fargo list server February 16th. His public E-mail ended as follows:



The acronym can be deduced from the name in German: Institut für Schaltgeräte und Hochspannungstechnik

METDST follows the time of day in the header of an E-mail message from Dr. Soren Stovring-Hallsson of NESA in Hellerup, Denmark. For example:

Wed, 8 Mar 1995 16:19:23 +0200 (METDST)

Your Editor was curious what this means, so he asked. Surprisingly, the answer is clear in English: *"In Denmark, METDST is interpreted as Mid European Time Danish Standard Time."*

"Internet 101" is the headline of a story that covers both the front and the back pages of Section C of the March 14th issue of *The Oregonian*. Profusely illustrated with numerous small color sketches and diagrams, this tutorial by David Sun is clearly aimed at the masses. It is significant, however, as an indication of how rapidly and far the home computer connection to cyberspace has gone. Also, one can find definitions of trendy, new lingo. For example: *"**net'-i-zen** (net'e zen) n. 1. A person who belongs to a community of computer users. 2. A user who abides by the informal Net etiquette (netiquette)."* And what would a newcomer to the Internet be? A newbie! About WWW, one finds the following endorsement: *"All the other stuff is OK, but face it: the World Wide Web is THE cool thing to do in cyberspace. Sure, the multimedia presentations help, but mostly it's the sheer novelty and creativity that attract net surfers to WWW sites."* Next issue: making a Web page for ATP.

TPPLOT will JOIN 2 .PL4 Files

The JOIN subcommand of the EXPORT command of Salford TPPLOT for MS-DOS computers can be used to merge two .PL4 files that involve the same time steps of interest (an interval). The two input .PL4 files can be of any (even different) file types, and the output file can be of any (even a different) file type. The user can select whichever signals he wants from each input file, and whatever time span he wants (not necessarily the full span of either file). Of course, for compatibility, the same time span --- and normally, the same time steps --- should be selected from each file in order to avoid distortion in the form of time-scaling.

EPJOIN is a tolerance of JOIN that can be accessed by integer index number 92 of TPPARAM (to change from the default value 1.E-3). EPJOIN is used to verify the consistency of the two timespan that are to be merged. It is the maximum, normalized discrepancy of these. Of course, if identical time steps were requested, and if either C-like or UNFORMATTED files are involved, REAL*4 precision should provide agreement to 7 or 8 decimal points (the roundoff limit). But FORMATTED files might involve reduced precision due to limited column width, so the user of these must be careful. In case the tolerance is not met, an error message will be issued. In any case, the user will be shown the two time spans first: "1st .PL4 T-span =', E13.6, ..." If a halt due to inconsistency is required, this will read as follows: "Error! These differ by more than roundoff. Halt.' Of course, assigning a very large value such as 1.E20 to EPJOIN should effectively disable this protection. If the user wants to time-scale one signal (the first), this is the way it is done. Time steps of the output file come from the second .PL4 file.

The relationship of JOIN to RELAY is worth understanding. For years, RELAY has allowed the selection of signals from a single .PL4 file, followed by simplified, formatted output of these signals over some time span. That output consisted of columns of numbers. Except that the output code of RELAY is ignored, JOIN uses this same RELAY logic twice. After the first .PL4 files has been read, the user will be prompted to repeat the operation for a second .PL4 file:

```
Ok, 1st .PL4 has been loaded, so now connect a 2nd.
```

Unlike RELAY, JOIN creates a regular .PL4 file for which the user will be prompted to specify a type:

```
Output .PL4 file type [ UNFORMATTED; FORMATTED; C-like ]:
```

Just a <CR> will be interpreted as a request for the most efficient of this: C-like. Should the user instead select the second, there is the additional need for precision of the numbers and width of each line:

```
Ok, FORMATTED. Next, specify each line [ 6E12.4 ] :
```

Of course, before the type, the name of the output file will be requested. This is identical to RELAY use except that the default name (response to <CR> or click of the mouse) no longer is RELAY.LIS :

```
SEND DISK FILE NAME FOR OUTPUT [ JOIN.PL4 ] :
```

A final difference can be seen at the start. TPPLOT will acknowledge the JOIN command as follows:

```
--- Instead of plot, next specify 1st
    half of combination of 2 .PL4 files.
```

When JOIN is complete, an MS-DOS DIR inventory of the creation will be shown, and the JOIN request will

be cancelled automatically.

Disk files JOIN1 and JOIN2 were added to the archive TPPLOT.ZIP on March 21st to illustrate usage of the JOIN command in the batch mode. The first is intentionally trivial: In addition to the regular 11-point HHMMSS .PL4 file, a new FORMATTED version of this, HHMMSSF, has been added to illustrate a mixture of these two input file types. The output file type will be C-like. Curves of HHMMSSF have the same shapes as those of HHMMSS, but are slightly (typically 5% or 10%) smaller. This makes visual verification of the output file JOIN.PL4 easy using TPPLOT : simply plot the same variable from both halves, and note the slight reduction in amplitude of the second. As for JOIN2, this is more meaningful, extracting curves from both C-like and UNFORMATTED versions of 600-point .PL4 files of DC-4 (note that DC4U.PL4 is new). The output is FORMATTED in type.

About variable ordering in the output file, the three classes --- node V, Branch V, and branch I --- have been preserved. Within any class, all signals of the first file precede all signals of the second. This makes for easy interactive selection using the mouse in spite of possible duplicate names. The distinction of TACS, MODELS, or rotating machinery variables has not been preserved, however, at least initially. This concerns possible offsets to the two pointers of branch currents, which have been ignored initially. Unless and/or until someone can explain why this might be important, the offsets will not be added to agree with EMTP output.

The CACHE command largely avoided the need for JOIN during earlier years. But note that it can not easily be used to place curves from different files in different windows. Addition of the WINDOW command revealed a shortcoming or limitation in the approach that is used by the CACHE command. But today, JOIN has filled the gap. Recursive use means that any number of .PL4 files could contribute to a single window plot.

European EMTP User Group

This is a continuation of related stories in preceding issues. It documents the continuing evolution of ATP user organization in Europe. EEUG is the European EMTP User Group as formed in Hannover during November (see preceding issue).

Chairman Mustafa Kizilcay and Deputy Chairman Juan Martinez submitted important public E-mail to the Fargo list server on April 26th. This progress report began as follows: *"We are pleased to inform you that the EEUG Association 'European EMTP-ATP Users Group e.V' has been registered by the local court of Offenbach am Main, Germany, on March 7, 1995. The name extension 'e.V' stands for 'registered association' in German. Following the registration, a bank account for the association has been opened at Postbank Niederlassung (branch) in Hannover; account no. 6340 71-307; bank code 250 100 30. After having finally completed the formalities (still some letters of authority are missing), we start to contact all interested parties (about 150 companies/universities), who have sent us letters of intent, to ask for the membership. At the second stage, remaining approx. 100 ATP users will be written."*

Following information about ATP for computers other than Intel PCs, Profs. Kizilcay and Martinez ended with the following outline: *".... following activities are planned in 1995: *) Publishing a regular ATP-EMTP News (quarterly); *) Organization of an annual European EMTP-ATP Meeting (intended place and date: Hannover in November 1995). ... The members will acquire regularly the last available issue of 'Can/Am EMTP News' together with the 'ATP-EMTP News.' A copy of the membership application form, ATP licensing form and 2-page form letter updated and approved by the Can/Am EMTP User Group, Charter of the EEUG Association and a questionnaire for new members will be available in the next days via FTP file server. These files are created using WordPerfect 5.1."*

A possible logo was received February 25th by E-mail from the EEUG Chairman, Dr. Mustafa Kizilcay, Prof. at Fachhochschule of Osnabrueck, Germany. This was received as a WordPerfect figure, so can be easily included as follows:

Prof. Kizilcay explained that this was just a first try, and that the plot on the right is armature current of an induction motor during start up. This is from DC-35, as recorded in the HP-GL output that is distributed along with Salford TPPLOT. An interesting use, eh?

A Reinvented BPA Will Do What ?

Your Editor did retire from BPA at the end of February (actually, at the end of March 1st) as predicted in preceding issues. ATP development and use at BPA are not expected to be much affected in the short term, however. Continuing cooperative collaboration for purposes of ATP development has been negotiated by Dr. Tsu-huei Liu in accord with a letter from your Editor to her dated February 21st. This ended as follows: *"My first preference would be to continue working with you personally, as we have for more than 20 years. If that is not possible, my preference then would be to work with*

others in BPA outside of System Planning. Note that a copy of this letter goes to the system protection (relay) people across the hall." Acting on behalf of BPA users of ATP, Gerald Lee immediately (within minutes of receiving his copy) took the initiative, and pressed the issue with the head of System Planning, who subsequently approved. Rather than an employee, your Editor now is an official BPA *Volunteer* (maybe the first?!).

Water spilling by BPA could increase unless the law is changed. The January 23rd issue of *Clearing Up* begins the story at [17] on page 7 as follows: *"The Northwest could be facing a fish recovery bill that exceeds a half billion dollars a year, under the latest version of the hydro operating scheme known as a biological opinion. ... the council's Strategy for Salmon is certain to add to Bonneville's total fish commitment, pushing the bill as high as $600 Million, according to some sources. .... But Republicans were not receptive. .... Signed by Smith and 11 other Republicans from the Northwest, the letter said NMFS' proposal would devastate the economy and destroy BPA. .... Smith and several other Northwest Republicans are also spearheading a move to scale back the Endangered Species Act."* So, help from the new Republican majority in Congress may be on its way. But will it arrive in time? Congress moves slowly, and it has so many more important preoccupations.

"We are experiencing the High Sheriff of Nottingham effect" is the way Cyrus Noë described those who now administer *"the fish tax on Northwest hydro-electric power."* On page 6 of the January 23rd issue, he defined this as follows: *"take as much as you can extort in January and come back later for even more. So long as peasants and gentry have anything worth stealing, it gets stolen. No one knows how much the Sheriff wants to steal, only that he is conditioned to steal at the drop of the hat, which he carries with him at all times. The only possible cure is poverty."*

But what if BPA customers find the tax too high, and decide to take their business elsewhere? Then the High Sheriff of Nottingham would actually have less to steal. Suddenly, it would seem, the environmental wackos are worried. This is the first of two topics treated at length by Cyrus Noë in the January 16th issue of *Clearing Up*: *"1] the Clinton administration's search for fish bucks because BPA is on the cusp of a power price death spiral."* It goes without saying that imaginative legal manipulation is being considered. *"One way they are considering would force BPA to cut off new power sales agreement talks and leave old agreements in place. These contracts have seven-year exit provisions, in contrast to shorter periods proposed in the newer contracts. ... With new statutes, BPA could go the stranded investment route by levying an exit fee high enough to keep most systems on the BPA lines."* Twenty years ago, customers were fighting for a share of cheap BPA power. Now, customers are fighting to avoid BPA power --- not so much for today, but for future years when the fish tax might be even higher.

"BPA full-requirements customers look for an out in August 1995" is the headline of story [2] on the front page of the January 16th issue of *Clearing Up*. One small utility thinks it has found the way. *"Western Oregon Electric Co-op, a full-requirements customer of BPA, announced last week it has signed a 10-year power purchase agreement with Pacific-Corp to serve its 7 aMW load beginning in July 1995."* The reasoning of general manager David Seuss seems clear enough: *"This is not just a price issue. We look at this as a risk management problem."* Mr. Seuss is *"concerned about the predict-ability of future BPA rate increases due to recent political decisions involving fish, BPA reinvention, and continued congressional pressure to sell BPA to the highest bidder."*

"Canby selects PGE as power supplier, hopes to leave BPA." This is the headline of another such story, number [4], two weeks later (the January 30th issue). But will such an attempt succeed? It seems that BPA is holding Canby Utility Board and other customers hostage: *"With BPA's White Book deficit already filled, Canby may not be granted an exit visa this year in any case."*

"Regional power managers are reacting with shock to the federal government's new scheme to operate the Columbia River hydro system." This is the beginning of story [14] of the February 6th issue. Why the latest shock? *"The salmon recovery mandate --- which ranks river priorities as flood control first, fish second and power production third --- threatens the system's reliability and all but destroys the ability to follow load. Electric utility consultant Merrill Schultz said the draft 1995 biological opinion from the National Marine Fisheries Service 'radically and fundamentally' changes the region's power system. Power managers will be completely unable to predict how much power the system can produce, he said."* Again, the wacko environment-alists are still in control. Hurry, Republicans!

The Register-Guard is the principal newspaper of Eugene, which is home for the University of Oregon. A major story by John Carr, entitled *"BPA now on Northwest's endangered list,"* can be found in the February 13th issue. This begins: *"The Bonneville Power Administration, once the Northwest's benevolent energy giant, is economically weak and near collapse. If the four Northwest states, their congressional delegations and the Clinton administration fail to act soon to rescue the agency, BPA will tumble into insolvency by this fall."* Yes, in the sense that it likely would miss a payment to the U.S. Treasury. But not in the sense that it would fail to pay other obligations. This *insolvency* would be kept within the family!

"Bailing out of BPA and stranded debt: who stays and who pays" is the headline of story [14] on page 3 of the

March 6th issue of *Clearing Up*. This is another long story by Cyrus Noë --- long because it goes back to the early '80s and the WPPSS debacle (bankruptcy of the state of Washington Public Power Supply System to the north of Oregon). It seems that BPA is still paying for some of these worthless plants. There also are those staggering costs of fish and wildlife. *"A number of regional interests ... have brought up the issue of paying back the nuclear plant debt in the context of utilities planning to leave or actually leaving the Bonneville system. To the extent that this happens, the obligation to pay back the money on the bonds becomes a stranded debt to be paid by an ever-shrinking base of Bonneville customers --- a situation likely to trigger even more desertions and a kind of demand collapse or even a death spiral."*

E-mail in Portland : BPA and Agora

About BPA E-mail (use of **thliu@bpa.gov** on Dr. Tsu-huei Liu's PC), the most important thing to be remembered is its location: remote. If the network is down, or if the remote mail computer is not working properly, there will be no mail. So, although MS Mail under MS Windows on Dr. Liu's computer generally works well during normal working hours (more about this later), it may have reliability problems at other times.

The UUENCODEd forms of GIVE1 and GIVE2 floppy disks of Salford EMTP, created automatically by the **Attach** button of MS Mail, have been successfully received, and enthusiastically endorsed by several more parties. Ivano Bonfanti of CESI in Milano, Italy, received Salford EMTP this way during mid-February as a test. He did not need this update, but he wanted to be sure that CESI was ready for a quick transfer when Taku Noda's new frequency dependence became available!

Double- and triple-decker messages, where a single note is used as the framework to which the contents of either 2 or 3 floppy disks are **Attach**-ed, are convenient for the sender. The first to acknowledge successful handling of such an enormous single message of 4 or 5 Mbytes was Alex Carter at the University of Bath in England. In E-mail dated March 13th, he wrote: *"Our mail system did manage to cope with the very big file. We experienced no major problems in decoding it. However, it may possibly be slightly easier to decode if they are sent as separate messages as it avoids the problem of the multiple begin and end statements within the one long message."*

The Australian user group has a 256-Kbyte limit on the size of E-mail, it would seem. This was learned during an attempt to append GIVE1.ZIP and GIVE2.ZIP to a cover note using the **Attach** button of MS Mail as explained in the preceding issue. The mail was promptly returned with the following warning: *"Your message was not delivered to stephen.j.boroczky@pacpower.... for the following reason: Incompatibility between two sites on the route of the message .... Authorisation failure at site 'clix.aarnet.edu.au' for recip 'Stephen.j.boroczky.... Reason : msg size 3185193 exceeds channel limit of 256000."* This was just after midnight on March 8th. The test had been encouraged earlier that same day by Stephen Boroczky in Sydney, who explained: *"I don't see why it should not work. (We don't have to pay for incoming mail fortunately. We make up for it by paying A$0.50/kB for outgoing mail.)"* Actually, as just learned, Pacific Power makes up for it by being denied large incoming mail! To conclude, because the E-mail failed, two conventional floppy disks were sent from BPA's Mail Room March 10th.

Speed of Agora FTP continues to be impressive. This is a continuation of the mention of *"a T1"* in the preceding issue. When the 66-Kbyte January newsletter, JAN95.ZIP, was sent to Prof. Bruce Mork at Michigan Tech in Houghton around 03:45 on February 1st, a mere 2.12 seconds were reported; and once again, human perception confirmed the reasonableness of this figure.

"Agora now has 32 serial ports" is the way an information line following login began early in February. Yes, during the daytime, Agora has been easier to enter than it was last summer. Speed of response has not been noticeably reduced, either. But there are more subscribers. Recall the 541 accounts mentioned in the April, 1994, newsletter. Repeating the inventory (the experiment of counting directories at the root, following **cd ..**) yielded 1042 on February 12th. If a 15-year-old high school kid **is** running Agora, he certainly is a good businessman!

Fran Gardner of *The Oregonian* staff would seem to be among the more famous Agora users. Page D1 of the February 20th edition contains an article by her entitled *"Spreading the joys of Internet."* This is the story about Bob Phillips, a poet, who spreads the word about Internet to anyone who will listen. *"He's not selling anything, other than an idea. .... He just wants to plant the idea of this new form of communication ... On one weekend day, he's set up shop in the Barnes & Noble bookstore on Northeast Broadway, ready to tell anyone who'll listen about the wonders of the Internet. And of his real love, the World Wide Web. In the space of just a few months, the World Wide Web -- colorful, playful, easy to use -- has moved from obscurity to the forefront of Internet conversations. If the Internet is radio, the World Wide Web is color television."* Oh, the address: **fran@agora...**

News about Laurent Dubé's MODELS

Laurent Dubé is under contract with BPA, working on MODELS once again. But work now is different from

the situation six months ago, when the addition of MODELS to BPA's Transient Stability Program (TSP) was Mr. Dubé's preoccupation. As announced in the preceding issue, higher management of System Planning terminated such work. However, the relay people across the hall -- Jules Esztergalyos and James Hall -- were able to find money to support Mr. Dubé's continued work with, and on, MODELS. If TSP is the obvious loser from the change, ATP certainly is not. A productive year of work by Mr. Dubé is planned, as was detailed during an April 3rd meeting at BPA. As different tasks are completed, they should be summarized in this publication. See next issue.

SVC (static var compensation) modeling by Gabor Furst of suburban Vancouver, British Columbia, Canada, has since 1992 been located in DC-22 as the 4th data subcase. As well known, this used the old control system modeling TACS. But newer MODELS more recently has been used by Mr. Furst for the same problem as was explained in the preceding issue (see quotation about his primer). Well, that data case was received from Mr. Furst by E-mail on February 6th, and was promptly appended to DC-22 as a new, fifth data subcase.

The use of MODELS with Monte Carlo studies is illustrated by a new third data subcase of DC-48. Recall that TACS HYBRID use was illustrated by the second subcase as mentioned in the preceding (January) issue. Well, in E-mail dated April 18th, Laurent Dubé contributed the same data except that TACS data had been replaced by MODELS data to prove that such usage with STATISTICS is possible.

Schultz Demiming Utility for E-mail

"Mime is the encoding utility of Pine that caused so much trouble around the end of 1993. Well, Robert Meredith and Robert Schultz of NYPA (New York Power Authority in White Plains) know a lot more. Mr. Schultz even wrote a demiming program! Details next time?" So began a paragraph in the October, 1994, issue. Now the story can be completed, beginning with the disk file:

```
DEMIME  EXE  28727  08-01-94  9:03a
```

Execution without any parameter produces the following advice about usage:

```
This is the MIME "octet-stream BASE 64 ONLY"
                Decoder, Program Version 1.00
Copyright (C) by New York Power Authority 1994.
Usage: DEMIME inputfile outputfile
 where inputfile is the source file and
  outputfile is the desired output file name.
Return code 16
```

All of this was known last August. Yet, DEMIME was not successfully used in Portland prior to March 31st. Why the delay? Apparently your Editor did not follow directions closely enough. There **was** a warning that all preceding and following non-Mime text must be removed, and apparently this should be taken literally. Nothing other than the uniform 60-byte column of random characters should be left. This was your Editor's error last fall, it would seem. As with UUDECODE, he left the MIME error-checking numbers and associated text at the start and at the end. Well, after some 8 months of procrastination, the experiment was repeated --- this time with success on a 1.84-Mbyte file that contained OS/2 ATP FORTRAN from Robert Meredith of NYPA (see separate story). This time, DEMIME worked: out dropped a 1.33-Mbyte disk file ATPCODE.ZIP on Dr. Liu's computer. Why not Agora? Because sending the file to BPA avoided the 9600-baud bottleneck of your Editor's telephone connection. On the other hand, BPA's use of MS Mail under MS Windows did not recognize the Mime encoding, so there was sudden need of the new Schultz utility DEMIME (end of procrastination).

Mr. Meredith offered the following perspective about Mime use in E-mail dated April 2nd: *"On the subject of MIME, it seems to be the up and coming thing that will eventually replace UUENCODE. .... PC Magazine (4/25) reviews nine E-mail programs for PCs, including Eudora, Z-mail for Windows and Ultimedia Mail for OS/2.* ***All*** *of them received praise for including MIME decoding/encoding. The same issue reviews four LAN E-mail gateways for the Internet, such as Lotus cc:Mail and (NYPA's) Novell Groupwise. Only the Lotus Notes Mail Gateway for OS/2 includes MIME now, but* ***all*** *the others plan to add it (OS/2 was the technical* ***and*** *low cost leader of the pack they reviewed). MIME's advantage is that it is more compact and it uniquely identifies several multimedia formats. Intelligent decoding can automatically play audio or video attachments in many formats as well as display documents in their original fonts, presumably including pictures. Bob Schultz's MIME decoder might not do all those things yet, but it's a start!!"*

How much more compact might Mime be? Consider a letter from Dr. Soren Stovring-Hallsson of NESA in Hellerup, Denmark. On April 4th, this was sent to the European Chairman, Prof. Mustafa Kizilcay, with a Mime-encoded "cc" to Agora. MS-DOS DIR shows:

```
SSH  MIM   2878   04-04-95   3:42p
SSH  LIS   2088   04-04-95   3:43p
SSH  UUE   2972   04-04-95   4:07p
```

The third row was created only for comparison. The second was produced by applying Schultz's DEMIME to the first entry. Note there is a saving of about 3% -- not enough to make much difference. But the multimedia connection to audio and video might well.

So, what was Mr. Schultz's reaction to a draft of the first two paragraphs of this story: *"I must state outright that my program is a quick hack, and is not expected to be used in a commercial way. I do not have access to any documentation on Mime at all (my limited implementation was deduced based on observation of mimed vs. original text)."* Amazing (talent is as talent does)! Mr. Schultz

goes on to point out that today there are alternatives for other interested persons: *"I would suggest that any ATP users obtain any of the freeware / shareware demiming programs for DOS and/or OS/2 which have cropped up over the last six months for complete and thorough mime support. I haven't tested any of them yet, do to a lack of need at this point."*

NEWPL4 = 1 for smaller .PL4 files

Binary switch NEWPL4 of STARTUP allows the user either to accept (value unity) or reject (value zero) new code that will compress the header of a .PL4 file by the removal of unused names.

BPA's Randy Suhrbier inspired the compressed header perhaps six months or a year ago. He had been looking at the header of a DEC VMS .PL4 file, and wondered why there were so many more names than signals. This is because all program names have been dumped since the year one. For small networks, this was never much of an issue. But as networks grow to infinity, this burden, too, will grow to infinity --- unlike the burden of the signals, which often will remain largely unchanged (assuming they are selected individually). So, during a free moment, it was decided that optional relief should be provided.

Initially (March 10th, as the new feature enters segment HEADL4 of the UTPF), the compressed header is available only for Salford EMTP. Later, the code might be available for other computers. It is installation-dependent because C-like files are one alternative. Also, as written for the Salford compiler, it uses local storage that must hold the two ALPHANUMERIC vectors of the header after compaction. There also is an INTEGER vector of pointers, with 2 cells for each output quantity. For Salford EMTP, dimensions 3000, 3000, and 6000, respectively, were used for these 3 vectors. It seems unlikely that any user will have 3000 output variables, so this should suffice for a while. If any realistic usage ever might demand more, it could be provided. As a test, 1000 times more space was added, with no noticeable consequence. As has been written many times before, with Salford DBOS running under DOS, one seems to pay only for what one uses. But other compilers and/or operating systems are not so charitable, so a decision about how to proceed with each computer must be made on a case-by-case basis.

NEWPL4 = 0 as distributed by the user group. This means that there will be continuity with the past (i.e., no change). Any user who wants to experiment with the new compression must himself change NEWPL4 to unity.

The distinction among variables as to class -- electric network voltages and currents, TACS or MODELS variables, the Type-59 S.M., and the Universal Machine (U.M.) --- should be preserved during the compression. Although not necessary for plotting, such continuity with the past was believed to be important in order to avoid trouble with unknown postprocessing software. Any user who believes that some variable might have changed class as a result of compression is advised to send his evidence to Portland for analysis.

MS Windows 95 and ATP

MS Windows 95 are of interest to Walter Dykas of Oak Ridge National Laboratory (ORNL) in Tennessee. One year ago (see the April, 1994, issue), there was mention of ClearWin to aid the interface between the Salford compiler and MS Windows. One year later, the appropriate product would seem to be ClearWin+ (with the plus sign suggesting an enhancement). Mr. Dykas should be following this, although there is no news to report about use with ATP as this paragraph is frozen for publication on the 23rd of May.

"Windows 95 will ship on May 20, 2009. I base this prediction on a linear regression with a 98 percent correlation, of five previously promised release dates vs. the times at which those promises were made." Thus begins the humorous criticism of MS delays by Peter Coffee in the January 9th issue of *PC Week* magazine. Quality also is a concern. Mr. Coffee maintains that Windows 95 *"design is fundamentally compromised by the goals of getting it to market quickly (oops) and making it run in 4M bytes of RAM."* So, readers, to avoid later disappointment, do not raise too high your hopes for Windows 95. A more prudent position would seem to be based on pragmatism: MS has the inertia, so Windows 95 must be considered for ATP use. For better or for worse, Windows 95 is coming (eventually).

"Judge rejects antitrust pact with Microsoft" is the headline of the lead story of the Business section on page B14 of *The Oregonian* dated February 15th. The story begins: *"A federal judge rejected the Justice Department's proposed antitrust settlement with Microsoft Corp., saying it fails to break the software giant's monopoly or correct its 'anticompetitive practices.' In a 45-page ruling issued late Tuesday, U.S. District Judge Stanley Sporkin said he was unable to find --- as required by law --- that the proposed settlement was in the public interest."* So, that proposed settlement, negotiated last July, did not end Bill Gates' troubles as nearly everyone had expected it would. Where we go from here is anybody's guess. This latest complication deserves to be watched closely.

DEC OSF Unix use by NESA

Dr. Søren Støvring-Hallsson of NESA in Hellerup, Denmark, first was sent ATP FORTRAN for DEC

OSF Unix by E-mail from BPA on March 20th. Two days later, he reported success: *"The very good news is that ATP is by now pretty much working ... I have run a few test-cases ... The results so far seem to be identical to what we get on HP-UX workstations, though somewhat faster execution."* That was the first speed record (who can recall faster success by someone who was new to the job of setting up ATP?).

A new speed record for DC-1 was reported in E-mail dated March 25th. Time spent in the time-step loop, and total time, were 5.9 and 6.8 seconds, respectively --- without buffered output (i.e., using LU6VRT = 0) for the .LIS file. So what was the NESA hardware? *"The test was performed on a DEC/Alpha version 3000 model 700. The machine is running at 225 Mhz and is equipped with 128 MB of memory. Even though no plot-output is produced, it seems like choosing unformatted plot-output is a little bit faster than choosing formatted output."* So DEC Alpha remains several steps ahead of Intel Pentium, which is limited to 100 MHz as of March, 1995.

"Cray Computer Corp. sought protection Friday in U.S. Bankruptcy Court." So begins a small story on page B12 of *The Oregonian* dated March 25th. How serious are problems viewed by Wall Street? *"Its stock plunged from 94 cents to 25 cents in trading Friday."* First the minicomputer market was destroyed by PCs. Then came the mainframes and the supercomputers. Who needs (or can afford) a supercomputer these days? Because of high-end workstations such as NESA's Alpha, the market for supercomputers seems to be shrinking. More good news for the consumer.

All DEC compiler warning messages were pursued, and code was modified to avoid them. Most such changes were in universal segments of the UTPF (it is not just a question of DEC OSF Unix code). A new compiler is involved, for VAX/VMS at BPA as well as for OSF Unix at NESA. The same warnings discovered at NESA could be duplicated at BPA using VAX/VMS on the big, timeshared computers downstairs. This was seen late last year for the first time, but then was avoided by Randy Suhrbier's access to an old compiler on a local computer. No longer. The new VAX/VMS compiler has been used at BPA, and it produces compilation without any warnings except for SPYTABLES and BLOCKD51 (more about these later). The most unusual warning of the new DEC compiler is associated with any character string that spans more than one line. Unlike any other compiler used during the past two decades, it will warn about each such usage as follows : *"%FORT-I-CHACONCONTD, Character, Hollerith, or RAD50 constant continued across lines; may be non-portable."* Presumably the frequent blank characters on the right (through column 72) immediately before the continuation are the problem. The code of MODELS author Laurent Dubé provided the most interesting such examples, with the following being the first of 5 similar occurrences within XPR2 :

```
      WRITE(JUNIT6,
     1  '(18H MISUSING PREDVAL(, A,
     1    17H, TVAL) FOR TVAL=, G13.7,
     1    11H < SIMTIME=, G13.7)')
     1  CBUFF(1:STPL2), R5, R3
```

Note the apostrophe at the beginning of the second line and near the end of the fourth line. What about all the unused space in between on the second and third lines? If this were counted, JUNIT6 would overflow! The following replacement for lines 2, 3, and 4 should remove all ambiguity:

```
FORM90 = '(18H MISUSING PREDVAL(, A,'  //
1      ' 17H, TVAL) FOR TVAL=, G13.7,' //
2      ' 11H < SIMTIME=, G13.7)'
 WRITE (JUNIT6, FORM90).
```

Speed of ATP compilation and linking at NESA are not of much use to the end user, but they are interesting. The following came in E-mail dated April 3rd:

```
Compilation time:
  Without optimization   : 6 min,  2 sec
  With optimization (-O5): 6 min, 44 sec
Linking time: 4 seconds
```

This time to compile is **not** fast, since the Salford compiler on a 486 will easily beat it. But the small retardation for optimization is unusual; and the 4 seconds for DEC Alpha linking has to be a new speed record. Linking is important for user-supplied source code, of course, DEC OSF Unix seems to be extremely fast for this. Could one really link ATP in 4 seconds? Is it possible the linking is delayed as with Salford dynamic link libraries? Probably. But who cares (don't look a gift horse in the mouth)?

Sun ATP Testing in Waterloo

Robert Sarfi of the University of Waterloo in Ontario, Canada, was sent current ATP FORTRAN for Sun Unix workstations by E-mail on February 19th. Although very busy with other things (heavy time-sharing), Mr. Sarfi has managed to demonstrate correct operation for a few test cases. This was mentioned briefly in "News:" of the Fargo list server dated May 17th. Sun Solaris 2.3 seems to be the operating system used for compilation. Look for more information in the next issue.

IBM OS / 2 Warp Tested by NYPA

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

"I believe OS / 2 is destined to become the most important operating system, if not program, of our time." Mr. Meredith ended his public E-mail of the Fargo list server on February 10th with this memorable quotation by head MS Windows 95 salesman Bill Gates. *"That was a few years ago, but we all know how he [Bill Gates] looks*

ahead." Some. But in this case, not quite far enough, obviously! That quote must be a favorite among OS/2 Warpies. For readers who do not understand, MS was a partner of IBM, developing and pushing that crummy, old OS/2 of the late '80s. At that time, both MS and IBM were proclaiming that OS / 2 would to be the next-generation operating system for the tens of millions of 16-bit IBM PC AT-compatible (Intel 286-based) computers. This was the plan, anyway --- before MS realized that it could burn its bridge to IBM, and make much more money by further developing and selling its own MS Windows as 32-bit software (Windows 3.0).

The greatest threat to OS/2 now seems to come from IBM itself. Although Warp seems to be a technical success, it is not obvious that IBM is making any or enough money from it to continue. *"OS/2: where to?"* is the title of the main story of the February 20th issue of *Information Week* magazine. From page 13: *"CFO York has indicated that if Warp's revenue doesn't climb significantly, IBM may shift the emphasis of its marketing to that of workstation and server rather than desktop operating system. .... he has said OS/2 is on trial."*

Availability of OS/2 ATP to the general public of licensed ATP users was announced by Mr. Meredith in that same public E-mail dated February 10th. He wrote: *"OS/2 is nothing less than superb. It is the missing ingredient that turns, at negligible cost, a PC into a workstation superior in all respects to the Apollo and H-P Unix workstations we have used for years. Although one does sacrifice some potential speed (10-30%) in the GUI environment, the gains in multitasking make it well worthwhile. We encourage everyone to try OS/2 because ATP for OS/2 is well under way. Notwithstanding Microsoft's hype about waiting for Windows 9x, OS/2 appears to offer more than the latter ever will at less cost right now. In fact we have found OS/2 'Warp' to best even Windows NT in all but two features. Networking support is left for a 2nd Q 1995 release and full featured tape backup, as opposed to WNT's uncompressed backup, is available for as little as $50 (Dualstor v1.06). .... I could write several pages discussing the many benefits of OS/2, but will refrain. I will just say that I went from a completely discouraged OS/2 2.1 'user' in October .... to the unequivocal OS/2 advocate I am now. .... I believe OS/2 will auto install with > 95% of all equipment but some will have problems, particularly with sound boards. .... There is a wealth of native freeware and shareware available for OS/2, that dwarfs that available for unix systems and WNT. Of course, OS / 2 does run most Windows and DOS programs, too. Under the Boot Manager installation, you can always revert to your present setup if something does not run under OS/2. .... In terms of ATP support, we have a port of heavily modified two year old Apollo code running with Calcomp screen graphics. We have not supported SPY or TPPLOT at this time. Graphics is done in fully scaleable windows with cursor paging. The graphics files are all saved in compact vector format for replay at any time. Printing of selected plots at one, two or four plots per page is supported for Postscript printers only. The same support program produces '.eps' graphics files for inclusion in documents (without bitmap rendition). .... I would recommend not less than 8 MB of RAM for potential OS/2 users. .... OS/2 being a multi-windowed environment, I would also recommend not less than 1024 x 768 monitor resolution, if you intend to view 132 column output. ...."*

Gayland Bloethe of Sargent and Lundy in Chicago, Illinois, USA, provided the first reaction to NYPA's OS/2 ATP distribution. E-mail dated March 22nd contained a report about performance using more modest hardware: Mr. Bloethe's home computer, which is a 33-MHz DX with 8 Mbytes of RAM. For DC-1 simulation itself, OS/2 in fact beat Salford EMTP (61.900 vs. 63.352 seconds, respectively, for the time-step loop). This was using DISK to send output to disk. Had output gone to the screen, the OS/2 advantage probably would have increased (DOS output to the screen is slow). About difficulty using the NYPA materials, Mr. Bloethe wrote: *"Installation of the program was very simple. I just unZIPped the file and it was ready to run."* About other programs, and OS/2 in general, Mr. Bloethe wrote: *"I have ported another program to both OS/2 and extended DOS and found the execution times to be virtually identical when the OS/2 program is run in a full-screen session. Apparently the overhead associated with running a true multitasking environment is very modest in the case of OS/2. However, OS/2 has proven to be extremely stable and forgiving --- certainly much more reliable than DOS / Windows."* This fine recommendation came from **william.g.bloethe@slchicago.infonet.com**

The mixture of C-language with FORTRAN should be possible using Watcom compilers. This is an important detail for MODELS author Laurent Dubé. There is a thin Watcom book entitled *"Commonly Asked Questions and Answers,"* and Chapter 3 of this is entitled *"Inter-Language calls: C and FORTRAN."* This covers pages 27 through 37.

MS-DOS, MS Windows, and Windows NT are other possible operating systems and/or environments to support ATP FORTRAN that is designed for the Watcom compiler. That is, by its choice of the Watcom FORTRAN 77^{32} compiler, NYPA has not limited itself to OS/2. Look for more about this exciting prospect in the next issue.

Macintosh ATP by Stu Cook

Stu Cook of JUST Services in suburban Montréal, Québec, Canada, has been compiling new Macintosh ATP FORTRAN using the Language Systems compiler on his

Apple Quadra (a Motorola 68040-based Mac). This is a continuation of the story that began in the preceding issue.

Slowness of ATP simulation using Macintosh is one important conclusion of Mr. Cook's experimentation. It should be carefully noted that high-end hardware is being used, so that is not the problem. A 25-MHz Motorola 68040 is the engine that drives the Macintosh Quadra 900, and this should have plenty of raw power. But this is not seen in Mac ATP simulation speed, as the following times spent within the time-step loop show:

	DC-7	30-A	30-C	DC-53	DCN-1
Mac:	6.47	10.35	24.15	15.62	6.08
486:	2.41	2.86	5.28	4.45	1.87

Note the variety, with the second using TACS, the third using MODELS, the fourth using the Type-59 S.M., and the fifth using the U.M. The 486 times came from your Editor's 33-MHz AT&T 486 running Salford EMTP. So who should be blamed for the loss of speed? Is the trouble all in the LS compiler? Alternatively, did Apple cut corners on Mac Quadra hardware? Either way, those who demand simulation speed are advised not to shift from a 486 to a Quadra unless and/or until performance can be increased by about a factor of three.

JMARTI SETUP is the slowest of all the supporting programs. Mac Quadra is better for this, as total times in seconds for the four subcases of DCNEW-3 show:

Mac:	103.40	77.90	120.38	142.53
486:	46.32	34.12	52.20	61.15

This is mainly a test of REAL*8 library functions, and there is consistency (all ratios are 2.2 or 2.3) .

DATA statements do not imply SAVE to preserve local variables of a SUBROUTINE or FUNCTION that is to be compiled using the Language Systems compiler. Early debugging by Mr. Cook seemed to indicate this, so he wrote to the factory. Confirmation was passed along to your Editor in E-mail dated February 8th. The problem is: since the late '70s, UTPF rules have assumed that DATA did imply SAVE . The rule was adopted during work on EMTP for Burroughs with Stonewall Jackson McMurray III of Ebasco Services in New York City. For a decade and a half, no compiler has been found that failed to comply with this assumption --- until now.

Robert Schultz of NYPA (New York Power Authority in White Plains) must be credited with recognizing the danger late in 1993. This was at the time of his ATP revolution. The FORTRAN that Mr. Schultz sent to Portland did have SAVE statements added for local DATA variables. Of course, your Editor knew these were not needed, so he ignored them! Well, it did not take long for Schultz to be proven right --- **again** !

DATA statements that use a continuation line for character strings was another difference of the Language Systems compiler. This is a curious minor complication of the Schultz Revolution, which pulled program text back inside ATP as described in the January, 1994, newsletter. Running OVER51NY under Salford DBOS did not output any trailing blanks through column 72, at the end of the first of two lines for each of the thousands of DATA statements. Robert Schultz's code wrote 42 bytes on that first line, but if byte 42 was blank, DBOS somehow omitted it and any others that might follow the final non-blank character. Your Editor was amazed. For a FORMATTED output file, blanks are not allowed to precede a carriage return! However, this apparently made no difference for Salford EMTP, Apollo, or HP Unix as used by Messrs. Meredith and Schultz at New York Power Authority (NYPA) in White Plains. But the LS compiler ignored the missing blanks, which had the effect of removing an occasional space or spaces between words of output text. So, modification was required. A switch to C-like output was made March 5th. The 2 lines of each DATA statement now are assembled manually in RAM, using the same technique that provides a buffer for the .LIS file (see LU6VRT = 32768 in STARTUP for Salford EMTP). With manual insertion of <CR><LF> after byte 42, FTN77 or DBOS is not allowed to play any tricks. To summarize, Salford FORMATTED output is being avoided, and the resulting BLOCKD51.FTN is some 23 Kbytes bigger --- all blanks!

Program SPACES was Mr. Cook's own correction of the preceding problem, as he waited for your Editor to correct OVER51NY in Portland. This 23-line utility will add the missing blanks to BLOCKD51. The work was of permanent importance because it independently confirmed correctness of the change to OVER51NY. Received by E-mail on March 5th, utility SPACES depends on the LS compiler in that it uses a STRING declaration.

Honoring of the STATUS=APPEND qualifier on the $OPEN card for the .PL4 file of DC-49 is one nice extension that Mr. Cook has been able to provide. So, the new Macintosh ATP can concatenate a .PL4 file for the case of START AGAIN (resumption of a hibernating simulation). There is not yet any Turbo table dumping, however, so users are forewarned to be careful of table sizes that are used for dynamic dimensioning. Using 3 times default dimensioning, note how time spent in the time-step loop of DC-32 compares: 51.85 seconds for Mac vs. 2.69 for your Editor's 486!

PowerPC timings using the LS compiler first were received on March 13th. Rather than EMTP, the trial code was a DO-loop that executed double-precision functions DABS, DCOS, and DEXP a million times (the reason for this testing can be found in the next paragraph). The following are elapsed times in seconds, with the first row being just the DO-loop (no functions). Although the speed of counting has not changed much, those library functions show more than a factor of 4 improvement:

	25-MHz 68040	50MHz 601
Null loop	0.250	0.233
Direct Lib Usage	31.817	6.533

To summarize, counting may not be much faster using

Mac RISC, but the library functions certainly are, by a factor of 4 or 5.

Library functions of RFUNL1 were not being forced in-line by the LS compiler. In an effort to speed slow execution, the special requests used for Apollo and Salford were added to MACET.DAT (translator input). The corrected Mac ATP FORTRAN (translator output) was sent by E-mail on March 18th, and promptly test by Mr. Cook. Unfortunately, this increased simulation speed only slightly. But the improvement for JMARTI SETUP was worthwhile: Mr. Cook reduced the total time by 15 percent (from 103.4 to 87.9 seconds).

BinHex 4.0 is encryption software such as the familiar UUENCODE. Thus began a paragraph in the April, 1994, issue. One year ago, developers in Portland did not know how to handle such encoding. Today, they just go to BPA's Fred Elliott, who can decode it at home using his freeware Pegasus (for MS Windows) mail handling program! This was demonstrated successfully on March 16th when Mr. Cook sent installation-dependent files for Macintosh back to Portland. By mistake, encoding of BinHex 4.0, which seems to be standard in the Macintosh world, was used in place of UUENCODE of the DOS world.

Utility Aids Comparison of .LIS Files

TRUNCATE is the name of a new utility to aid the comparison of .LIS files --- most commonly, the LUNIT6 output of ATP --- using Salford DBOS (for MS-DOS computers). It also can be used profitably on .PCH files that are output by JMARTI SETUP. Utility TRUNCATE might, without much difficulty, be converted to run on other computers. But it begins running only on MS-DOS computers under DBOS.

The concept of TRUNCATE is simple enough. All computers have utilities to compare two files line by line. Of course, some are better than others. Mike Albert's shareware FC as distributed on the GIVE2 floppy disk of Salford EMTP is preferred by your Editor over all others because it highlights differences. However, this seems to occur by words (separated by blanks) rather than bytes. The .pch file of JMARTI SETUP provides an extreme illustration of the problem. Because more significant digits are used than REAL*8 computation can support, the slightest change (e.g., compilation with /DEBUG to request the symbolic debugger for a relevant part of the program) will make JMARTI output change slightly. Unfortunately, an entire high-precision number will be highlighted by FC as being different even though only the least-significant digit or two of the 3E26.18 output might have changed. The power and value of FC comparison can be restored by a reduction in precision of the output.

FILEIN, NEDIG, NFDIG, and NOCOMM are parameters of MS-DOS that control the reduction of floating-point precision. The first of these is the input file name, and the second and third are maximum widths in bytes of F-field and E-field numbers. The output file will parallel the input (extension .OUT is assumed). Finally, NOCOMM equal to unity will result in the destruction of all lines that interpret comment cards. All of this is explained if the program is run without the assignment of FILEIN (e.g., SET FILEIN=DC29.LIS).

As an illustration of usage, BPA's Dr. Tsu-huei Liu had created a family of solutions *.LIS using a new DEC VAX/VMS version of ATP. But were these right, and did they agree with Salford EMTP (disk files *.SAL are always current)? Where there was doubt, the VMS solutions were passed to her MS-DOS computer using the Ethernet connection. Next, one at a time, batch file DIFF.BAT was used. For example "DIFF DC29" will compare the two solutions for DC-29. DIFF.BAT appears as follows:

```
SET FILEIN=%1.NEW
SET NFDIG=5
SET NEDIG=10
SET NOCOMM=1
RUN77 TRUNCATE
COPY  %1.OUT  %1.111
SET FILEIN=%1.LIS
RUN77 TRUNCATE
COPY  %1.OUT  %1.222
DEL   %1.OUT
DIR %1.*
FLC  %1.111  %1.222
```

Florida Short Course May 8 - 11

Prof. Dennis Carroll's 4.5-day EMTP short course March 6th through the 10th at the University of Florida in Gainesville was cancelled due to insufficient registration. A break-even minimum of 13 students had not registered as of two weeks prior to the start of the course, so the takeoff was aborted.

This is not the end of ATP education in Gainesville, it is important to emphasize. Prof. Carroll will still proceed this spring, but at a later date (May 8-11), and using a lower-cost format. This first was announced to the general public in E-mail of the Fargo list server dated March 4th. Changes from the 1989-1994 courses include the following:

1) No course banquet Wednesday evening;

2) No outside speakers unless and/or until enrollment exceeds a certain level.

3) Use of Prof. Carroll's own laboratory rather than the larger, general computer laboratory of the Department.

4) Printing and mailing of advertising done by an outside company rather than the university;

5) Increased tuition for late arrivals: the original $850 has been raised to $1050 for registration after April 1st.

6) A $100 discount for any student who brings his own computer (rather than requiring a university computer).

Dr. Kurt Fehrle, who teaches TACS and MODELS for power electronics, was added back to the faculty as registration grew. This good news came on March 31st in E-mail from Prof. Carroll. As in previous years, Dr. Fehrle should be present for the entire course.

E-mail was used to supply computer materials for the course. Instead of sending Salford GIVE1 and GIVE2 floppy disks by regular mail, contents were sent as 2 big E-mail messages using the **Attach** button of MS Mail. This was February 19th, following an update. Yin Yuexin had no trouble recovering all files on his end.

Non-ATP Madison Short Course

Prof. Willis Long's EMTP course at the University of Wisconsin in Madison is as ambitious as ever, if one can believe the 4-page, mass-mailed advertising this year. But this course, too, is undergoing big change. For a previous review, see the April, 1992, issue.

The Madison course finally has switched to PCs, it would seem. *"Computer laboratory exercises will feature the latest version of the DCG/EPRI PC code using the Windows operating system."* Also, EMTP finally is being distributed at the course: *"Licensed users of the DCG/EPRI code will receive an upgraded beta version ..."* Such practices are old for the ATP world, dating to the pioneering enterprise of Prof. Saul Goldberg at Cal Poly in San Luis Obispo, California, during the summer of 1988. His two weeks continue to hold the EMTP record for length, it would seem.

What about changed course content, though? Again this year, Prof. Long offers 3 independent sections spanning a week and a half. The middle Section II, *"Switching Studies and Insulation Coordination, will be offered next in 1997."* Next year, *"Introduction to EMTP and Distribution and Power Quality Applications of EMTP"* will be given, the reader is told. One might infer from this that the present 3 sections might shrink to two. This year, the section on hvdc and SVC seems to have been replaced by Section III, *"EMTP Models for Protective Relaying Systems."* For those who forget, Section I consists of the 2-day *"Introduction to EMTP"* for a price of $695 --- expensive compared with Florida.

An important distinction between the Florida and Madison courses is that licensing is required for the former but not the latter. In either place, EMTP is distributed only to licensed users. However, one does not need to be licensed to attend the Madison course. Is it possible that all EPRI-sold EMTP materials will be available to any (even unlicensed) student in Madison throughout the course? It seems unlikely that EPRI would allow this. If any knowledgeable reader knows otherwise, he is advised to send documentation to the user group for possible future publication. The subject of who can disclose what is important, and discussion of it is ongoing.

Mohan Course : Portland, July 22 - 23

Prof. Ned Mohan of the University of Minnesota will be giving his portable EMTP short course immediately prior to the 1995 IEEE PES Summer Meeting here in Portland, Oregon, at the Howard Johnson motel near the airport. This is a continuation of the story that began in the preceding issue.

A free Can/Am user group meeting is scheduled to follow the nominal end of Prof. Mohan's course (around 17:00 on Sunday, July 23rd). This should be in the same meeting room, which, along with computer and projection facilities, should be available until midnight thanks to Prof. Mohan's generosity, which is greatly appreciated. In addition to the usual Salford EMTP for the MS-DOS operating system, it is hoped that Watcom ATP for OS/2 can be demonstrated at the meeting. This would be by Robert Schultz of NYPA (New York Power Authority in White Plains), using a portable computer that he plans to bring with him according to last-minute information as this issue goes to press (E-mail dated May 22nd).

Good public transportation exists for those traveling between the airport and downtown. Tri-Met is the name of the municipal transit service. Its bus number 12, named *Sandy* (after Northeast Sandy Boulevard upon which it travels much of the way), travels between the center of Portland and the airport (end of the line) for $1. This bus passes right by the front door of the Howard Johnson Airport Hotel. So explained a hotel employee, who was asked about the matter by telephone.

News about Intel Pentium

Intel Pentium OverDrive processors finally are available. The idea is simple enough, and it differs from the 486 OverDrive (mentioned in the October, 1994, newsletter) only in that a Pentium is used rather than a 486. But is Pentium OverDrive a good buy? Maybe. But then again, maybe not. Page 109 of the January 23rd issue of *PC Week* magazine contains two stories that provide plenty of doubt. It seems Pentium OverDrive is not a big hit with corporate buyers. Some question the price/performance ratio while *"others said the Pentium OverDrive chip arrives too late after Intel's original promises to gain much interest."* Pentium OverDrive is said to be priced at $449 whereas a 486 DX2 is $149.

Early Pentium PC designs did not do justice to the microprocessor, it would seem. A story on page 39 of the February 6th issue of *PC Week* magazine has title *"New technologies will speed PCI chips."* This begins: *"The new crop of Pentium systems due this spring using enhanced PCI chips is expected to be 30 percent faster and $200 less expensive than previous models thanks to EDO memory, a new type of high-speed RAM, and pipe-lined burst mode cache, an enhanced cache design. These technologies will make it possible to create systems that support data-transfer rates of 100M bytes per second."*

The price penalty for Intel speed continues to drop. *"New Pentium PC price points cast shadow on 486s"* is the headline of a story on the cover of the March 6th issue of *PC Week* news magazine. Inside, on page 11, a full page of advertising by Zeos International succinctly shows the price spread for its Pantera line. There are 4 different packages, with the first (Package 1) being the minimum (4 Mbytes of RAM, 340-Mbyte IDE hard drive, 768 x 1024 color monitor with .28 mm dot pitch, etc.) In the following table, the cost in dollars is shown below the speed in MHz for 7 different choices of microprocessor:

<-----	486 DX	----->	<-----	Pentium	---->
2-50	2-66	4-100	60	75	90	100
1345	1395	1545	1645	1695	1995	2195

Speculative execution should provide the next major performance gain after Pentium. This information appears on page 64 of the December issue of *Computer Shopper* in a column by Michael Slater. *"In the 386, every instruction takes several clock cycles to execute. The 486 speeds things up by using a now-universal technique called pipelining. .... The Pentium takes the next step by introducing superscalar execution. There are two pipelines, and the instruction decoder looks at two instructions at a time."* The problem with this is conditional branches (e.g., IF-statements of FORTRAN). But these need not represent delays if the processor guesses which path will be taken --- and preserves following results in order to be able to back up in case it has guessed wrong. That is where the speculation enters. DEC Alpha might already be using this for its Alpha (see Stephen Boroczky's comment about pipelines in the April, 1994 issue). This is not the end, though. *"Out-of-order execution is even more exciting. While your first reaction may be that a processor that executes instructions out of order must be broken, this is, in fact, a powerful technique."*

The K5 microprocessor by AMD is an imitation Pentium that is expected to provide significant competition for Intel. Bill Machrone writes the following on page 67 of the March 6th issue of PC Week : *"the K5 shares many architectural features with Intel's P6, minus Intel's secondary cache, multiprocessor capability, and lofty goals. The K5 is designed to beat the tar out of Pentium chips for less money, period. As a result, you'll be able to buy machines that come close to single-processor P6 chips for sub-Pentium prices ... Everyone will be happy except Intel's shareholders."* Of course, the P6 is Intel's yet-unnamed 686 --- expected in highly-limited quantities by the end of the year. The only logical name after Pentium would seem to be *Sexium*, which then could be changed to *Genderium* for reasons of political correctness.

Miscellaneous Intel PC Information

More about Energy Star computer components was learned on page 107 of the January issue of Computer Shopper. For background, see the July, 1994, issue. What appears to be a public-service (noncommercial) advertisement states that *"over 2000 computers, monitors and printers have earned the right to bear the Environmental Protection Agency's Energy Star℠ logo. ... To receive a list of available products call the Energy Star℠ Hotline at 202 775-6650."* If TM indicates a trademark, what does this SM stand for?

The *"meanwhile, DEC continues to bleed"* story was missing in the preceding issue only because the report about quarterly losses was not noted in the newspaper as it often is. That does not mean the bleeding had stopped. In fact, it did not stop until year's end. The following report was noted on page 102 of the January 23rd issue of *PC Week* magazine: *"DEC, out of the red for the first time in six quarters, reported earnings at $18.9 million for its second fiscal quarter of 1995, which ended Dec. 31, 1994. .... Driving the profitable quarter was DEC's ongoing reorganization, which has cut worldwide employee ranks by 25 percent, to 65,600 .."* The problem is, this latest profit is negligible. For the same period, Microsoft earned $373 million on sales of $1.48 billion (see page 99). DEC is barely floating. It is not out of trouble yet.

CD-ROM seems to have replaced 5.25-inch floppy disk drives as peripherals of computers being sold in the Portland area. This is the case of most advertising, anyway. The change may be good news for those wanting to install voluminous software packages such as OS/2 Warp, but it is a step backward for backup capability, economy, and compatibility with the past. An external cartridge tape drive, connected through a parallel port, looks more important than ever before. Recall such an arrangement is used by MODELS developer Laurent Dubé, who takes the cartridge, drive, and cable with him when he travels, thereby being able to work anywhere he can find a PC. But Mr. Dubé now has CD-ROM, too, he explained on March 8th. What does he use it for? Many gigabytes of shareware from the Public Software Library (PSL)! Before, he would receive a catalog of offerings, and then would pay nominal copying charges for each product that he ordered on a floppy disk. Now, he pays substantially more ($19.95/month), but receives 1/6 of the entire PSL library on CD-ROM each month!

With 600-plus Mbytes of storage on each, the medium is ideal for this use involving gigabytes of shareware.

A writable CD-ROM that is affordable might be only a year away. This exciting prospect has been gleaned from page 50 of the March issue of *Computer Shopper*. Plasmon Data is one company to watch, and before full CD-compatibility, there will be related PDs: *"Plasmon's new platter is a high-capacity phase-change optical disk, but it has the same physical dimensions as a CD-ROM --- single-sided with a 650 MB capacity. The disk will cost about $50, with the Matsushita quad-speed, half-height drive around $800. .... by the end of this year, Plasmon and other companies will be showing true rewritable CDs that you can pop into any CD player, a Plasmon representative says."*

Comdex, the annual November computer show, has grown to dominate the casino and entertainment city that hosts it: Las Vegas, Nevada. According to a story on page D1 of *The Oregonian* dated November 20th, *"It's the only event all year that outshines the Strip, and the locals hate it. The computer folks --- some 180,000 registrants, as well as the employees of the 2,000 companies on display --- don't gamble and don't tip the way they're supposed to. As a consequence, for one week in Las Vegas, the hotel business subsidizes the casino and entertainment operations. Hotel rooms that rent for less than $50 a night for 51 weeks a year go for $200 during Comdex."* Are computer-related companies happy, and grateful for the opportunity to display their wares? Story author Mike Francis who uses address **bizmike@aol.com** does not convey this impression: *"What people resent is paying $41 a square foot for a parcel of convention center floor space, and knowing that a slice of the hotel revenue goes directly to Adelson's organization. Still, they feel they have no choice."* The Adelson here is *"Sheldon Adelson ... the CEO of the Las Vegas-based Interface Group (that) has created an annual event that draws the biggest names in information technology to the Strip."*

IBM's famous dress code of suits and ties has ended. This note can be found on page 8 of the February 20th issue of *Information Week* magazine. *"Workers in Big Blue's Armonk, N.Y., headquarters --- now up for sale --- are no longer expected to wear suits."* This would seem to be another sign of the changing computer times: those 3-piece suits no longer sell computers to higher management as they once did.

TOP20 is the name of shareware that was obtained from Laurent Dubé a year or two ago. TOP20 is a useful utility for those short of disk space. Whereas Vernon Buerg's shareware LIST can be used to order files based on size, this is only within any one directory at a time. What about the entire disk, irrespective of directory boundaries? Well, TOP20 will do the job for an entire disk drive (e.g., C:) --- at least for the 100 largest files (20 is the default number, from which the name would seem to have been derived). On-line help indicates Version *"1.11 (Jan-3-91) ... You may not distribute it for money or any other form of compensation. You may, however, give it freely to anyone who wishes to use it, as long as you do not modify this program in any way. ... If you find this program useful a contribution of $7 would be greatly appreciated. To contribute, send $7 and your name, address, version number of XDEL that you have, type of floppy drives you have, and your phone number (optional). You will receive a disk with the newest versions of several dos utilities including TOP20, XDEL, DSPACE and possibly more. Any questions, bug reports, suggestions, or contributions should be sent to: Bryan Bouwman; P.O. Box 856; Bellevue, Washington 98009-0856 or Send Electronic Mail to Bryan Bouwman user # 75140,3672 on CompuServe."*

Corsair by Novell was mentioned in the October, 1994, issue. The good news now is that the *"graphical, networked desktop operating system is alive and in development at a Novell Inc. spin-off Caldera Inc."* This from page 27 of the March 20th issue of *PC Week* news magazine. *"Caldera is positioning the product as a high-end operating system for Intel Corp. platforms and not as a direct competitor to Windows 95."* The Linux dialect of Unix seems to be the foundation of this new product.

The O.J. Simpson murder trial in Los Angeles was being used by computer firms to advertise their products. This was possible because of television coverage of this program, Circus of the American Judicial System, which is watched religiously by tens of millions as it drags on month after month thanks to the best defense that money and associated, unprecedented publicity can buy. Well, a short summary can be found on page 10 of the February 20th issue of *Information Week* magazine: *"Following complaints that the Sony and IBM names were blatantly displayed on courtroom computers, a Sony monitor was replaced and an oversized IBM logo was removed. We the jury find both vendors guilty of shameless self-promotion."* Only in America, folks.

Hard disk prices continue to plummet. Some very encouraging predictions for 1-Gbyte drives can be found in a story on page 52 of the April issue of *Computer Shopper*. Author Howard Grund writes: *"Analysts expect 1 GB drives to drop below the $400 mark this summer, and erode further at 10 percent monthly, falling below $300 by year's end."* Why the need for so much more storage? Use of CD-ROM with multimedia computers seems to fill 500-Mbyte disks in a hurry.

About PowerPC, *"Apple/IBM plan goes off track"* was the headline of a story on page B2 of the September 15th issue of *The Oregonian*. A continuation of this story in the October, 1994, issue, is provided on page 112 of the March 13th issue of *PC Week* magazine. The headline reads: *"PowerPC: Much hype, little demand."* Writing from the CeBIT computer show in Hannover,

Germany, Neal Boudette concludes that *"lagging system and software development continues to keep the PowerPC from breaking out of the Macintosh niche and winning converts in the PC mainstream."* Phil Hester, general manager of IBM's Systems and Technology Division in Austin, Texas, is quoted as saying: *"It's going to take two to three years for us to really challenge Intel."* It does look that way, in spite of Intel's mismanagement of that FDIV Pentium flaw (see preceding issue).

Miscellaneous Small Items

About that *"survivor of DCG / EPRI EMTP ship-wreck"* (see the story on pages 10 and 11 of the April, 1994, issue), no further tangible evidence has been received. From time to time, there are inquiries, so many readers must be wondering. No, your Editor knows nothing more than he already has published. If any reader might, it is requested that he send the information to Portland. Of course, any request for anonymity of the source would be respected.

Is PKZIP available for non-DOS and non-Intel computers? This was suggested in E-mail dated October 4th from Robert Meredith of New York Power Authority (NYPA) in White Plains. The story ends with information about a free FORTRAN compiler. Mr. Meredith writes: *"This is an interesting story of one thing leading to another. Bob Schultz and I have obtained a copy of the unix zip utility for our H-P, which we compiled under HPUX. It can create or decompress files compatible with pkzip 2.04 ('.zip'), as opposed to unix compress ('.Z'). We wanted to also install it on Apollo, but could not because the code was written in C -- we have no C compiler on Apollo. However, there is a GNU C compiler for Apollo, which we downloaded from archive.umich.edu. It turned out to be tarred and compressed with GNUzip ('tar.gz'), so we had to get the GNUzip utility and figure it out. After unzipping the '.gz' file on H-P it had to be processed by 'tar' to break out the individual files. That can be done on either H-P or Apollo, if one has 50 MB of disk free to temporarily hold the 'tar' and the individual files. The next step is to get the GNU assembler for Apollo -- which is what Bob S was attempting as I left for the day. Just for good measure I am getting some 'bin2.0.utilities.for.apollo10.4' from Europe (ftp.eb.ele.tue.nl). All this to get 'pkzip-like' compression on Apollo! But it's also practice. A GNU FORTRAN 77 compiler (g77) is in the works. A free compiler that will run on almost any platform (Motorola, Sun, Vax, Intel, etc) sounds interesting -- No?"* Yes, it all sounds **very** interesting. Those EMTP experts at NYPA may have ignored the information superhighway (Internet) initially, but they obviously are expert and productive users of it today.

ATPDRAW is the graphical preprocessor that was written by Hans Kristian Hoidalen of Trondheim, Norway. BPA paid for the work as explained in the July, 1994, story. Although well received, the resulting program was unfortunately restricted by the 640-Kbyte limit of DOS. All agreed that the next logical step would be to allow ATPDRAW to spill into extended memory. Plans for this extension, as well as other, smaller changes, had begun last summer. Again, Jim Hall is the man at BPA who arranged the funding. Attached to his memorandum dated August 15th is a proposed work statement that begins as follows: *"A. Rewrite and recompile GIGS in protected mode. EFI proposes to use Odd Gunnar Dahl for this task. B. Rewrite and recompile ATPDRAW in protected mode. Modify data structure to take advantage of direct accessing of upper memory."* Well, this work is well under way. Look for a progress report in the next issue.

Critical Damping Adjustment, abbreviated CDA, was the subject of public E-mail of the Fargo list server dated January 27th. In this, Roger Argenal of Calgary, Alberta, Canada, wrote: *"I have read from some sources that some versions of EMTP, mainly Dr. Dommel's UBC version and EMTDC from the Manitoba Research Center have a routine that minimizes oscillations due EMTP's trapezoidal rule. .... A very rough idea as to how the CDA routine works is as follows: When numerical oscillations arise, the value oscillates around the true value (I am not sure if this is always true). The CDA routine works by first noting there has been a break in the circuit (switching, breaker opening, etc) and allows the simulation to proceed one time step. It then interpolates what the value would be at half the time step (hopefully close to the true value) and the simulation would proceed with the original time step after that. .... Does anyone have any operating experience with other EMTP version that back the CDA routines success/failure? .... I am told that the CDA routine has made the trapezoidal rule of integration in ATP very rugged."* Ignoring the **mis-**characterization of Prof. Dommel's Transients Program (and EMTDC which may have been derived from it) as EMTP, the question is good. Since no public E-mail on the subject was received, this request for information is being repeated in the newsletter. There is a position of ATP developers on the subject, but an explanation of this will be delayed until some definite, informed, believable feedback about CDA has been received. Your Editor is not going to write in the absence of a minimum level of interest in the subject.

The letter "K" is used to indicate thousands (kilo) for list sizes 13, 15, or 23 if a blank separator otherwise would be missing on the left as these entries are encoded at the beginning of execution. Thus began a paragraph at the top of final page 20 of the preceding issue. That was for 132-column output, but not for 80-column output as can be seen in DC-11. So, February 18th, the same reforms were extended to 80-column output. List 29 was included, since this can be as big as all the other sizes combined. It was not a problem for 132-column output,

however, because it is not printed due to lack of space. The before and after excerpts here appear as follows:

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List limits 21-End:   300   450 .. 4  9600205763
List limits 21-End:   300  1050 .. 4 21000  232K
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"Total size of LABCOM tables = 205763" 4-byte integer words has been shown in the heading since the introduction of dynamic dimensioning in the fall of 1993. This was for 3 times default dimensioning as distributed by the user group. At the time, this probably was correct. Since then, several default list sizes have changed, but this total size has not, unfortunately. For years, default list sizes have been built into VARDIM, and this remains unchanged. But dynamic dimensioning resulted in default sizes being used in a second place, too: DIMENS. It was this second place that was not updated in parallel with VARDIM during the past year. Simulation is unaffected, fortunately. It is just the numbers in the heading of each new case that were incorrectly reported for users of default dimensioning. Apparently no one noticed before Stu Cook, who recently had trouble dimensioning the LINE CONSTANTS code of his Macintosh translation (see separate story). The correct total size is 232163 words, and old and new list sizes 20-28 (the end of the string of numbers in the heading) appear as follows:

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1980   300   450 12000    9  1200   252   4   9600
2580   300  1050 12000    9  1200   252   4  21000
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Free printed copies of the 20-page January newsletter were mailed by First Class (air) to 8 Canadian and 69 American addresses on February 25th. This followed the purge of the mailing list about which readers were warned in the preceding issue. No, nothing close to 77 persons resubscribed. Perhaps half this number did. Everyone else then became a candidate for deletion. At that point, the criterion was whether the person was known to be using the program, had contributed something of ATP value to others, etc. A good example is provided by Prof. Ned Mohan at the University of Minnesota. He clearly provides substantial value to the community of ATP users through his annual short course. There is no way Prof. Mohan would be purged from the list.

The Erie Job Center in Erie, Pennsylvania, is looking for a power electronics engineer who knows how to use EMTP, among other things. This from computer expert David Szymanski, who reported about a long classified advertisement in the March 12th edition of his local paper. EMTP is mentioned twice, the first time misspelled! The pay, $66K/year, seems attractive, although an *"M.S. in Electrical Engineering and 4 years experience"* are required. The employer is not named, but might be G.E. The work sounds like what Dr. Kurt Fehrle did there a decade or so ago: *"locomotives and electrical trains."*

"Low ratio current transformer models in the Electromagnetic Transients Program" is the title of a paper that was presented in Chicago, Illinois, at the American Power Conference on April 19. The authors of this 6-page paper are Glenn Wrate and Prof. Bruce Mork from Michigan Tech in Houghton, and Kalyan Mustaphi of Northern States Power Company in Minneapolis, Minnesota. The end of the Abstract succinctly summarizes innovation of the paper: *"... an EMTP model of a current transformer is developed using a duality derivation. Unlike other models in the literature, this model includes only a small impedance on the primary."* It is interesting to note the authors' observation about the DCG / EPRI version: *"the Type-93 element requires that the **i** value of the last point of saturation characteristic be greater than any current encountered in the simulation .... to avoid a clipped output. The ATP version does not have this problem."* It is possible BPA's EMTP of 11 years ago had this trouble. Like that upper-case text mentioned in the October issue, a lot of what EPRI today is trying to sell under the name EMTP is more than a decade old, and came from BPA via the public domain.

Branch voltage output requests have a "-5" type code in columns 1 and 2 if a pair of bus names is used for each signal. Normally, this is for transient output, of course. But what about usage when there is only a phasor solution (when TMAX is nonpositive)? Well, BPA's Robert Hasibar was the first to complain that such requests were not being honored for this case of no transients. Not only that, he was right. Worse than an error in the logic, it was discovered that there was no such logic where it was required for the case of phasor solution only. So, a block of new code to service previously-ignored requests for voltage differences (in fact, no corresponding branch is required) was added to OVER11 on March 24th. Usage is illustrated by the first subcase of DC-11 to which a request for two branch voltage outputs was added. There were none previously, so the former, isolated heading now is followed by two rows of numbers. So, that takes care of "-5" requests. But what about "-2" requests? These also are for branch (or switch) voltages, but using a single branch name for each rather than the pair of terminal node names. If and when some serious user might explain the need, code to service "-2" requests could be added. But BPA seems not to be interested, so no such extension is being made now. Instead, for this or any other unsupported request number (-1, -3, or -4), a rejection message should be issued: "Ignore output request with bad type code. Only 0 or 1 for node V and -5 for branch V are legal."

The DEC VAX / VMS translation was pronounced correct on April 12th as the last of the complete set of test cases was resolved. Although this effort began using the new DEC compiler (see the preceding story about DEC OSF Unix), a few of the warnings did not make sense, and optimization resulted in extraneous (incorrect) error messages. Randy Suhrbier observed that BPA is not using the latest version of this new software, so it might be easiest just to continue using the old compiler for a while. He connected this to symbol F59 (to recall version number 5.9) for use by Dr. Liu and your Editor.