SHORT REPORTS

News from the TEX Project

The news from Stanford is that METAFONT 1.0 is now officially released, along with the entire Computer Modern family. TEX 1.5, when used with the new CM fonts, is officially called TEX 2.0. Distribution tapes with all of this stuff should be done by the time you read this. Font tapes now come in GF format, and include more sizes and magnifications (as well as more different faces) than with the old AM series.

The five-volume series *Computers and Typesetting* is almost complete, and 90% of it has already gone to the printer as of this writing. Volume A is *The TEXbook*, B is the TEX program, C is *The METAFONTbook*, D is the METAFONT program, and E is about Computer Modern. *The TEXbook* and *The METAFONTbook* will both be available in softcover (like *The TEXbook* has been).

David Fuchs
Stanford University

CDC Cyber Site Report

This article introduces a new CDC TEX implementation. It has been running under NOS 2 on our Cyber 180-855 at the Academic Computing Center since the spring of 1985. Our first version was 1.1 but we upgraded to version 1.5 last fall. Printing is done by a pair of QMS Lasergrafix 1200 laser printers.

TEX is a big program and I made no attempt to overlay or split it in any way. We therefore usually run it as a batch job. This is not a problem since TEX formatting is essentially a batch process anyway. We also provide a small, online version that makes a useful learning tool, but is not capable of much real formatting. The batch TEX runs in about 370K (octally speaking); the online version takes about 230K.

Our printer driver (`PTeX`) is derived from `dvitype`. (My guess is that all printer drivers are derived from `dvitype`.) Ours has been extended to provide a very flexible and easy-to-use graphics insertion capability. Essentially, `PTeX` will scale, center, and draw a 'real' plot (e.g., a Calcomp plot), without the need for any custom fitting by the user. A `\special` control sequence specifies the file that contains graphics data, plus the height and width of the area the plot is supposed to fill. The file will automatically be scaled and drawn. The `\special` command is actually generated by library macros that also build the enclosing vbox. This command, for instance, drew a square, column-width Tektronix plot in the last *TUGBOAT*:

```
\graph{\file={bpr}
  \width=\columnwidth
  \height=\columnwidth}
```

The `\graph` macro has other, optional parameters that can specify a border and a surrounding rule. We presently support three graphics sources: Tektronix and Calcomp plots, and Macintosh MacPaint pictures.

I had the good fortune to already have a printer and fonts available when I started this project; these had been previously purchased from Talaris Systems, Inc., for use with a lesser formatter. Because of this, I did not have to do any conversion of `PXL` files. Unfortunately, I do not own the fonts and therefore cannot distribute them.

Finally, I would like to thank Pierre MacKay for providing me with the latest sources and for encouraging me to become a site coordinator for this implementation of TEX.

Jim Fox
University of Washington

Data General Site Report

We have successfully ported TEX 1.5c. Of course, it was absolutely no problem. The previous change file was sufficient. We use the "c" suffix to indicate that it uses the CM family of fonts. (See the next item.) I have not had enough time to create the program for using non-virTEX's.

We have upgraded our METAFONT port to 0.999999. I have spent a day or two making the `.GF` files. I am now testing these in preparation for a new release tape. It took about a day of CPU time on the MV10k to make the complete CM family at magsteps zero, half, one, and two.

As soon as I can complete the program for non-virTEX's and finish testing the new fonts, I will start sending the new distribution tapes out.

I have had a lot of requests for the utility items. These are available on MS-DOS diskette or several reasonable tape formats.

Bart Childs
Texas A&M University

Macintosh Site Report

TEX for the Apple Macintosh is available now, in a pre-release package for experienced TEX users. MACTEX runs on Macintosh XL, Macintosh 512, and Macintosh Plus computers; one double-sided or two single-sided floppy disk drives are required, with a hard disk recommended for large documents. MACTEX combines TEX82 version 2.0 and the new CM Computer Modern fonts with an integrated text editor, screen display viewer, and print drivers for the Apple ImageWriter and Apple LaserWriter.

The standard memory allocation (`mem` = 30000 words) is available in a 512KB Macintosh (or Switcher partition). Additional memory is automatically used to extend `mem` to 64000 words, allow more fonts, improve performance by reducing segment swapping, and to permit text editing to continue during TEX processing. In a 1 MB system, typical page processing time is 10-20 seconds.

The text editor supports very large files, multiple active windows, and the standard Macintosh selection, cut, and paste operations.

The screen display viewer accurately displays typeset documents, with random access to any page and a viewing magnification instantly changeable to any value from 100 through 5000.

Due to the high interest expressed, we are making the MACTEX package available for pre-release distribution (*translation: we'd like to get some of you out of our hair so we can finish it*). This pre-release package contains everything described above, but has only sparse documentation, several loose ends, and some missing features. However: it's truly a Macintosh program, so experienced TEX users will have no difficulty without a manual; and it includes automatically, at no extra charge, a copy of the published release (version 1.0) when available.

The published version 1.0 will have, among other niceties, the ability to include MacPaint and MacDraw pictures in TEX documents.

To obtain a copy of the pre-release package, contact Brenda Cavallaro, Addison-Wesley (EMSD), Reading, Massachusetts, 01867, or call her at (617) 944-6795.

Barry Smith
Kellerman & Smith

UNIX Site Report

Since October, I have been the only resident site coordinator for UNIX TEX, owing to Richard Furuta's departure for the University of Maryland. This will in part explain some of the delays in delivery which have intervened at various times, and arbitrary hardware failures or shortages of magnetic tape account for the rest. The backlog has been unmistakable evidence of the increasing interest in UNIX TEX, and I find myself wondering what the expected increase in the range of target machines will bring. We are still unable to provide anything guaranteed to work on System V machines, but the interest is now so widespread in both the System V and Xenix worlds, that we expect to hear of a free public-domain port to one or the other system before the end of the year. Richard Furuta and I still collaborate over the electronic mail network, and it is possible that our position on opposite sides of the country is actually an advantage in our search for new contributions.

The question has sometimes been asked, particularly at times when the backlog piled up, why we maintain a separate distribution at all. The reason lies in the nature of the UNIX TEX distribution, which is very much shaped by the particular character of the UNIX system itself. What we offer on our tapes is not just a collection of change files but something as close to a sort of turnkey system as we can manage. It is not quite possible to put a UNIX TEX distribution tape on the drive, copy it, type `make tex` and go home, but we have attempted to arrange files in such a way that we could actually provide a `Makefile` which would do that, if we really thought that any rational systems programmer would want to try it. Moreover, the UNIX TEX distribution has attracted to itself a rich variety of supporting programs, about half of which are quite specific to the UNIX system, and it is constantly attracting more. We are trying to offer much more than a set of change files which will bring up the various programs directly related to TEX and METAFONT. We are trying to offer an entire TEX-users environment, working in the UNIX system. In recent months we have been able to make that environment more comfortable and less restrictive by separating the 4.1 BSD and the 4.2/4.3 BSD distributions. As a result, we do not ask for a BSD source license any longer except from those few sites that still use 4.1 BSD. This also removes any restrictions about recopying and redistribution, though we do insist that any redistributed copy be complete, and include all the

files that were sent out with the original tape.

The past six months have seen major changes in just about every directory on the tape. TEX is now offered at version 2.0, LATEX is offered at version 2.09 (consistent with the manual published by Addison-Wesley), and METAFONT is offered at version 1.0. This last item is the most significant change on this occasion. Paul Richards of the University of Illinois has made a complete METAFONT system available in the `./mf84` directory, together with all the significant METAFONT-ware. The new version covers a number of different target systems, and appropriate `Makefiles` are created through an interactive `configure` script. Here, on one of the local 4.3 BSD UNIX machines, METAFONT came up absolutely smoothly, with no difficulties at all, and passed the `trap` test with complete success.

The approach to compilation on SUNs now assumes that the SUN assembler (the last stage of a `pc` compilation) is now capable of dealing with a unitary METAFONT (or TEX) file in something under a week of elapsed time. For those who are still running the old "whirling dervish" assembler, there is a `split_source` script to allow for compilation in four chunks. The problem with the old assembler has been identified by one of our correspondents. It includes "optimizing code" whose execution time increases as the cube of the number of statements in the source file. At the time of writing there are still some problems with SUN3 software. The old `undump` program no longer works, owing to a change in the format of both `core` and `a.out` files, and on some versions of the software there is an unexpected and, we trust, unintended limitation on the array bounds in SUN Pascal. We expect that both these problems will soon be resolved, and we have reports of sites which have successfully compiled `initex` and `virtex` using SUN3 software, which probably indicates that the array bounds problem is already corrected.

Paul Richards's `configure` script includes options for the Pyramid which he has validated. We have not yet had the opportunity to try them out at the University of Washington. We are also expecting change files for Pyramid compilations of TEX in the immediate future.

TEX 2.0 is functionally identical with the most recent release of TEX 1.5. The only change in the Pascal code comes in the addition of a couple of lines to clean up terminal interaction at one point in the program. The real significance of the new version is that it implies the use of `cm` fonts in place of the `am` fonts (which were modified versions of a yet earlier set of `cm` fonts). There is no impediment at all to preloading the old `plain.tex` into `virtex` 2.0, and we have therefore gone ahead with the distribution of TEX 2.0 on the tapes now being written. For about six months, we plan to continue with `am` fonts as the basic option, and `cm` as the alternate. The new versions of `plain.tex` and `webmac.tex` are provided under the names `cm.plain.tex` and `cm.webmac.tex`. As soon as all the supplementary LATEX fonts are available in new METAFONT format, we will switch over totally to the new fonts, but we will then allow a transition period during which `am.plain.tex` and `am.webmac.tex` remain on the tape as alternatives.

This brings us to a serious consideration of fonts and their effect on the sheer size of the distribution. The only thing that has made it possible to work out a relatively painless transition of this sort, with both varieties of fonts available simultaneously, is the timely release of Tomas Rokicki's PK format and its associated utility programs. As font styles and sizes proliferate, the storage requirement for the loosely packed PXL format becomes excessive. In the next few years we can expect that PK format will replace PXL format throughout the TEX community. (This change presents a new argument for `WEB`-coded output drivers, incidentally, since the essential code to unpack PK format can be patched into a `WEB`-coded driver directly out of Rokicki's `pktopx` program.)

On the distribution tape, we have begun by packing the entire list of 300 dpi fonts, leaving only the `*.1500pxl` fonts available in the loosely packed version. The 200/240 dpi fonts are all in `pxl` format still, but that is solely because they also serve as the working font library at this site. As we move into the full conversion to CM fonts, we hope to find enough space to offer both the CM and the AM fonts on the tape for a few months, but eventually we must be ready to drop the AM fonts altogether. We would urge all sites receiving UNIX TEX to keep this in mind, and to start preparing for the change now. The transition will be relatively painless if AM versions of favorite macro files are prepared in advance, and stored away for the arrival of "CM-day."

Among the last productions from the old version of METAFONT-in-SAIL program is the large collection of Cyrillic and

Special Symbol fonts which the American Mathematical Society has generously offered for free, unlicensed distribution. These are the fonts described and illustrated in *TUGBOAT* 6, no. 3: 124–128, and they are included on the tape in a separate directory `./amsfonts`, together with the essential macros used to call them into text.

In order to get all this new material packed down to fit onto a single reel of tape, we have had to resort to compression on an increasing number of text files. On the latest tapes, all the files in `*/doc` are compressed, using a very efficient program collected from `net.sources` and forwarded to us by Paul Richards. We have put this onto the tape in a separate `./compress` directory, so that those who have no immediate access to the net can `uncompress` these files.

Work on new drivers is continuing throughout the world. We have news that the long-awaited LN03 driver may soon appear, and a recent communication from Helsinki offers a driver for the HP Laserjet$^+$. For those who set their sights on something beyond the limits of dry toner resolutions, I recommend keeping a lookout for the announcement of a new 2400 dpi laser-diode photo-typesetter that will become available at well below $10,000, perhaps even as low as $5,000. That ought to trigger the next drop in the price of dry toner print engines to something like $1,000 apiece.

I have not even attempted to list all the names of individual contributors to the UNIX TEX distribution over the past six months, but that in no way diminishes my appreciation of their assistance. I should like instead to point out how the continuing growth of the UNIX TEX collection of free software justifies Richard Stallman's predictions at the time when the Free Software Foundation was being organized, that a very large number of very superior programmers will be quite ready to contribute their efforts to the enhancement of the entire programming environment. Some of the policies of the UNIX TEX distribution have been revised with the specific aim of bringing them more closely into line with the policies of the Free Software Foundation. The Free Software Foundation has chosen TEX as the appropriate vehicle for documentation of its programs, and I have recently had the pleasure of helping to set the GNU Emacs manual into type. We have by these actions started on a program of cooperation and resource sharing by which we hope to accelerate the collection and development of software tools which will be made freely available throughout the world to all competent users.

Pierre MacKay
University of Washington

VAX/VMS Site Report

"By the time you read this" — a handy phrase, attributed to D. Fuchs — we should have completed a VAX/VMS package containing the latest versions of TEX82 (2.0), LATEX (2.09), METAFONT(1.0), the new Computer Modern fonts (1.0), and all of the related TEXware and METAFONTware programs.

The package will also include additional software on an unsupported basis: Andrew Trevorrow's DVItoVDU preview display driver described elsewhere in this issue, and public domain drivers for the Versatec and LN03 printers. (Note that Kellerman and Smith also offer commercially supported Versatec and LN03 drivers as separately priced items.)

The above package includes executable images of all programs (VMS 4.2 or later), all sources and build command files, a copy of the TEXbook, and 150 pages of VAX/VMS specific documentation including turnkey installation procedures. The package is supplied in BACKUP format on a 1600 bpi, 2400 foot magnetic tape, and costs $200.00 (U.S.) including shipping within the U.S. and Canada. Add $50.00 (U.S.) for air freight shipment to other countries.

Note that this package no longer includes the Almost Computer Modern (AM) fonts, and that it requires VMS 4.2 or later (or at least the recent VMS Pascal library). We will continue to make the previous TEX 1.3 VMS release available on request, for the same distribution fee.

Barry Smith
Kellerman & Smith

LaTeX News

Starting with this issue, I will try keep users abreast of the latest LATEX news. I expect this news to be dull; LATEX was designed to be dependable, not exciting. No major bugs have been discovered and no noticeable enhancements are planned.

The first printing of the LATEX manual sold out quickly at many bookstores. A large number of copies from that printing are apparently on a boat en route

to Timbuktu, so Addison-Wesley rushed out a small second printing. No corrections were made to that printing.

Two new document-style options have been added: `bezier` for drawing curves and `ifthen` with conditional evaluation and looping commands. A document style that will format text for the ACM "transactions" journals is in preparation, and I will be negotiating with the ACM to allow authors to submit either camera-ready copy or LaTeX input files.

I suspect that many sites have installed LaTeX without installing the appropriate human system for maintaining it. There should be a site coordinator who is responsible for installing LaTeX (with any necessary site-specific changes), creating and maintaining the *Local Guide*, fielding questions from users, and obtaining the latest versions of LaTeX files.

Leslie Lamport
Digital Equipment Corporation

TeX is now truly multilingual. The restriction on the `trie_op` size has been removed. It is now possible to accommodate up to 65000 languages – although TeX currently has a consistency check that arbitrarily restricts it to 100.

Contrary to what was reported in the previous article, TeX cannot change hyphenation rules on a word by word basis. It is restricted to the language in force at the end of a paragraph. The reason for this is that the value of the `language` parameter is not carried along with the character in the same way as the font information. Most applications should be satisfied with paragraph by paragraph hyphenation. For those that are not, an extension involving an increase in the size of a `char` node is possible.

Michael J. Ferguson
INRS-Télécommunications

Multilingual TeX Update

This note updates the extension to TeX that allows for multilingual hyphenation reported in *TUGBOAT* 6, no. 2 (July 1985): 57–58. A key feature of the extension is that it accommodates *standard TeX fonts*, including words with accented letters. For details of the features the reader should refer to the *TUGBOAT* report. The changes and retractions are as follows: