Merits and some problems of producing texts with diacritical marks and multilingual editions using TEX were shown by G. Koch in examples from Hebrew texts and bilingual book projects.

Philosophical and technical insights into printing old German documents with appropriate old fonts were presented by Yannis Haralambous. He introduced old German Fraktur, Gotisch, Schwabacher and Initialen fonts he created with METAFONT, and showed old German works of print he has typeset in them. The fonts are *fontastic*! Yannis will make them available in Heidelberg soon.

G. Bienek announced the availability of a new TEX bulletin board. It is accessible under the number +49-8024-8416 and will carry the offerings of the normal DANTE distribution.

A new twist to including graphics in TEX documents was introduced by F. Sowa. A preprocessor converts Tag Image File Format (TIFF) graphic files into a `.pk` font file which is then simply printed by including a `.tex` file also produced in the process. The bitmap is distributed over a number of characters, so even old drivers should be able to handle them. His graphic inclusion mechanism hence does not require the use of a `\special`. The preprocessor is capable of dealing with simple bitmaps and has dithering capabilities to deal with grayscale and RGB pictures.

From the user interface "department", L.P. Kurdelski presented a `Smalltalk` based system to simplify the creation and processing of TEX documents on PCs and their output via printers connected to a heterogeneous network, so as to relieve the user from having to deal with `DOS` or network software.

The final day of the meeting had four tutorials on the agenda. H. Kopka introduced the use of PICTEX macros, while B. Burr gave an introductory LATEX tutorial. A tutorial on how to change LATEX style files (H. Partl) and one on METAFONT (F. Sowa) were followed by a final discussion.

Conclusion

Many different uses of TEX in Germany are reflected by the talks outlined above. As more and more people are using TEX here, many more will be thought of. As all TEX meetings that I have attended this meeting too was very short.

The challenges for the immediate future are clear: introduction of the new 256 character Latin fonts, for which the encoding scheme has been tentatively approved at the Cork meeting. Only new German hyphenation patterns and a revised `german.sty` will then be needed to make full use of TEX's hyphenation capabilities for German language texts.

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Philology

Russian TEX

Basil Malyshev, Alexander Samarin and Dimitri Vulis

For processing Russian texts [1] by TEX one should adjust TEX to use: Russian language hyphenation, coding of the Russian characters, and fonts with the cyrillic symbols.

TEX 3.0 can be adjusted without changes!

The hyphenation patterns described in [2] are used for Russian language. Actually TEX is bilingual—the Russian and English hyphenation patterns are loaded by following file:

```
\language=0         % English
\lefthyphenmin=2
\righthyphenmin=3
\input ehyphen.tex
\language=1         % Russian
\lefthyphenmin=2
\righthyphenmin=2
\input cyrdef.tex
\input rhyphen.tex
\language=0         % English as default
```

In the file `cyrdef.tex` proper `catcode`, `uccode`, `lccode` and `mathcode` are set for cyrillic characters.

Switching between Russian and English hyphenation is performing by `\language`: setting `\language=0` means English, `\language=1` means Russian. English words are not hyphenated if the Russian patterns are active and reversely. Another possibility is to merge the English and Russian hyphenation patterns as a single language.

TEX can use any 8-bit coding scheme for Russian characters — "alternative"[1], KOI-8[2], ISO 8859-5[3], etc. The hyphenation patterns and `.tfm` files should correspond to the coding scheme being used. Russian TEX works with virtual fonts; each of them consists of an original Computer Modern font (below the 128th code) and a font with cyrillic characters (above the 128th code). For TEX the cyrillic characters are completely equal in "rights" with Latin characters. One could define new commands as Russian words! The simultaneous usage of cyrillic and Latin characters does not require any additional commands for switching or separating them.

For creating the `.tfm` file of a virtual font the program `tfmerge` was designed. It merges the `.tfm` for a Computer Modern font and `.tfm` for a cyrillic font into a virtual font `.tfm` and `.vf` in accordance with the coding scheme of the Russian characters.

The managing of the program `tfmerge` is performed by a file which contains the table of correspondence between the position of a character in a virtual font and the position of the same character in a cyrillic font. E.g., the correspondence between alternative coding into virtual fonts and "phonetic"-like coding (with swapped lower/upper case) into cyrillic fonts [3] is expressed by the following pairs:

```
\200:a
\201:b
\202:w
.....
\360:Q
```

The left part of a pair (up to delimiter character ":") is the position in virtual fonts and the right part is the position in cyrillic fonts. The position can be specified by a symbol or by an octal number. When sorted by left parts the file becomes simpler:

```
\200:abwgdevzijklmnoprstufhc~{}\177yx|'q
\240:ABWGDEVZIJKLMNOP
\340:RSTUFHC^[]_YX\\@Q
```

The correspondence between ISO 8859-5 coding in virtual fonts and the "phonetic"-like coding in cyrillic fonts is expressed by:

```
\260:abwgdevzijklmnoprstufhc~{}\177yx|'q
\320:ABWGDEVZIJKLMNOPRSTUFHC^[]_YX\\@Q
```

The calling sequence of `tfmerge` program is:

```
TFMERGE  [-d]  cmr10  cmcyr10  xcmr10
```

where `cmr10` and `cmcyr10` are source Latin and cyrillic fonts. `xcmr10` is the virtual font, which will consist of two files: `xcmr10.tfm` and `xcmr10.vf`. They are accepted by the standard program `vftopl`.[4]

Note that such merging is correct because the cyrillic fonts are created by METAFONT on the base of the same setup files, like `cmr10.mf`. The font parameters are identical for Latin and cyrillic fonts.

The files are merged by the following couples:

`cmbx*`	`cmcbx*`	`xcmbx*`
`cmbxsl10`	`cmcbxsl10`	`xcmbxsl10`
`cmbxti10`	`cmcbxti10`	`xcmbxti10`
`cmbxsl10`	`cmcbxsl10`	`xcmbxsl10`
`cmbxti10`	`cmcbxti10`	`xcmbxti10`
`cmmi5`	`cmcyr5`	`xcmmi5`
`cmmi6`	`cmcyr6`	`xcmmi6`
`cmmi*`	`cmcti*`	`xcmmi*`
`cmmib10`	`cmcbx10`	`xcmmib10`
`cmr*`	`cmcyr*`	`xcmr*`
`cmsl*`	`cmcsl*`	`xcmsl*`
`cmsltt10`	`cmcsltt10`	`xcmsltt10`
`cmss*`	`cmcss*`	`xcmss*`
`cmssbx10`	`cmcssbx10`	`xcmssbx10`
`cmssdc10`	`cmcssdc10`	`xcmssdc10`
`cmssi*`	`cmcssi*`	`xcmssi*`
`cmti*`	`cmcti*`	`xcmti*`
`cmtt*`	`cmctt*`	`xcmtt*`

Mathematical Italic fonts `cmmi*` are merged with Cyrillic Text Italic fonts and proper `mathcode`'s have been set. One can use Russian letters in math.

To use another realization of the cyrillic fonts one should create the table of correspondences for `tfmerge` and select other couples for merging.

Files `plain.tex` for TEX and `lfonts.tex` for LATEX should be changed to substitute the references to the Latin font being merged by references to the proper virtual font.

For a VAX/VMS realization, creating `.fmt` files requires only setting the parameter `trie_size` to `16000`. For `SB30TEX (on MS-DOS)` some `.tfm` files are not preloaded, because the size of the `.tfm` files is increased. For `EmTEX [3a]` the options `-i -o -8 -mt:12700` have been set.

The main problem with virtual fonts is that not all `.dvi` drivers can handle the virtual fonts. To avoid that problem the program `PosTeX` has been designed. It reads a `.dvi` file, expands the virtual fonts and writes a new `.dvi` file which is accepted by any `.dvi` driver.

There are some `.dvi` drivers which already accept the virtual fonts, e.g. from the fine collection

[1] Used mainly on the IBM PC, alphabetically ordered, almost identical to Microsoft's codepage 866.

[2] Used on some UNIX-like systems, based on "phonetic" correspondence between Latin and cyrillic characters.

[3] Used on VAX/VMS, alphabetically ordered.

[4] Really more comprehensive utilities are needed to create virtual fonts.

by Eberhard Mattes. One can use such `.dvi` drivers without `PosTeX`. But extensive usage of virtual fonts with a previewer will require more memory and increase the time before showing the first page. For a `.dvi` file which consists of a single cyrillic character, three files `xcmr10.vf`, `cmr10.pk` and `cmcyr10.pk` are opened instead of one file `cmcyr10.pk`, and total required memory is increased by one-third. This example only shows that extensive usage of virtual fonts will require more economic realization.

Another reason to use the program `PosTeX` is the portability of `.dvi` files. Our virtual fonts refer to local coding of Russian characters and immediately after TEXing a `.dvi` file is not portable. After being transforming by `PosTeX` a `.dvi` file becomes portable — it refers only to ordinary fonts.

It's also possible to enter Russian text using pure ASCII, for people who don't do much Russian TEXing, but need to set an occasional citation. In this case, control sequences can be used, and it is necessary to specify the boundary between Russian and non-Russian text to switch the hyphenation patterns. E.g., for printing this article in *TUGboat* the `WNcyr` realization of the cyrillic characters by Thomas Ridgeway has been used.

An integration of Russian into "International LATEX" by Joachim Schrod is done by the following `Russian.sty` file:

```
\def\contentsname{Содержание}
\def\listfigurename{Список рисунков}
\def\listtablename{Список таблиц}
\def\abstractname{Аннотация}
\def\partname{Часть}
\def\chaptername{Глава}
\def\appendixname{Приложение}
\def\refname{Литература}
\def\bibname{Библиография}
\def\indexname{Алфавитный указатель}
\def\figurename{Рис.}
\def\tablename{Табл.}
\def\enclname{Вложение}
\def\ccname{Копия}
\def\headtoname{К:}
\def\pagename{Страница}
\def\today{\number\day\space\ifcase\month
\or января\or февраля\or марта\or апреля
\or мая\or июня\or июля\or августа
\or сентября\or октября\or ноября
\or декабря\fi\space\number\year}
\language=1
```

The macros `\Alph` and `\alph` are redefined too.

References

[1] Barbara Beeton, *Mathematical symbols and cyrillic fonts ready for distribution (revised). TUGboat* **6** (1985), no. 3, pp. 124-128.

[2] Dimitri Vulis. *Notes on Russian TEX. TUGboat* **10** (1989), no. 3, pp. 332-336.

[3] Н.Л. Глонти и др. *Метапроект кирилловского алфавита для печатающих устройств с высоким разрешением*: Препринт ИФВЭ. 90-66, Протвино, 1990.

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