

```

\def\}{\def\0{\sts\p}\def\1{\sts*\p}
\def\2{\sts**\p}\def\3{\sts***\p}
\def\4{\sts****\p}\def\5{\sts*****\p}
\def\6{\sts*****\p}\def\7{\sts*****\p}
\def\8{\sts*****\p}
\def\9{\sts*****\p}\def\q{}
\def\sts#1\p#2\q#3{\csname#3\endcsname
#1#2#2#2#2#2#2#2#2#2\q}

```

After these, to set `\asts` to contain just `\n` asterisks you just have to type

```

\xdef\asts{\expandafter\sts
\expandafter\p\expandafter\q
\the\n]}

```

I have deliberately left the above uncommented as I hope some readers will enjoy working out for themselves how the macros work. Note the use of `\csname... \endcsname` to provide a look-up table; a trick that every `TeX` hacker should know, though I used it here because I wanted to eliminate conditional commands since I regard them as “almost” primitive commands. The macro works for bigger `\n` than the previous one. I have used it to produce 54250 asterisks. Furthermore it seems to be marginally faster on the local implementation. I shall be interested to see whether anyone can find a still faster macro!

Exercise for `METAFONT` hackers: Appendix D of *The METAFONT book* begins with the problem of defining a macro containing exactly `n` asterisks. Rewrite the above bits of `TeX` in `METAFONT` to solve this as well.

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TeX and Envelopes

Dimitri Vulis

I have revised and improved the `LATEX` envelope macros that I posted to `TeXHAX` some years ago. Using them may save money.

Why bar codes on envelopes and other USPS gossip

It is reported that recently the United States Postal Service board of governors approved the 27-cent “public automation rate” for first-class mail whose envelopes are pre-printed with a ZIP+4 code¹ and a Postnet code, the bar code often found in lower right corner of business reply and courtesy envelopes, saving 2 cents off the new 29-cent rate for first-class mail. In the past, organizations simultaneously mailing 10 pieces in the same ZIP code, or mailing 250 and even 500 pieces pre-sorted by ZIP code were given discounts; now the discount may extend to single letters.

The existing Post Office sorting machines read the bar code placed in the lower right corner of a letter-sized envelope, but the new wide-area scanners, to be installed in the spring of 1991, will read the bar code virtually anywhere on the envelope, and it will be possible to bar code larger letters, magazines, and catalogs — so called flats.

USPS optical scanners already generate Postnet bar codes while processing envelopes with address legible enough for the optical character reader (i.e., not handwritten), but the Post Office would prefer to deal with letters already with a Postnet bar code. USPS expects to save \$40 to \$80 million on every 1% of mail that is sent “pre-bar-coded”, and it passes a part of that saving back to the senders.

When a letter without a Postnet code is processed by the Post Office, an attempt is first made to feed it to an optical character reader (OCR) machine; if it succeeds in reading the address, it attempts to look up the ZIP+4 code in a database, sprays the Postnet code on the envelope, and from then on the envelope is handled automatically by bar code sorters (BCSs) at several points, until it reaches the destination post office; only then does a letter carrier read the address once again. However the OCR machines are known to be very finicky and it’s very difficult to print an address that will be reliably scanned. The OCR machines want the

¹ The system of 9-digit numeric codes developed by the United States Postal Service that identifies small groups of delivery addresses.

address to be printed in one of the few pre-approved fonts, in all capital letters and devoid of punctuation (the machines don't register differences in size, and may mistake a comma for a '9', or a period for an 'O').

A letter that is mailed already preprinted with the Postnet code and a facing identification mark (FIM—a series of longer bars on the top of the envelope, two inches from the right edge) bypasses the OCR and goes directly to the BCSs. While the OCR scanning doesn't take much time, pre-printing the bar codes eliminates the possibility that the address will not be readable by the OCR, and that the address would have to be read by Post Office personnel several times during manual sorting, with a greater chance of human error, just as the case would be with a handwritten address.

Vendors of commercial bar code printing programs claim that putting a Postnet code and a FIM on an envelope speeds up delivery, but the Post Office denies this. My limited tests seem to indicate that there is no speed-up for mail sent locally in New York City, but non-local mail is sometimes delivered a day faster if it has pre-applied bar codes. The time saving is reported to be greater during Christmas season, when the postal system is flooded with letters with handwritten addresses.

The Post Office does say that using postage meter imprints, which don't need to be faced and canceled, instead of adhesive stamps, speeds up mail processing, and also saves time for the sender, who does not have to apply stamps.

By 1993 the Post Office plans to implement an 11-digit system, where the additional two digits will be used to sequence the mail in route delivery order. The `TeX` macros presented here should be compatible with this change.

`TeX` is very good at making bar codes. Some years ago I used `METAFONT` to make 3 of 9 bar codes, and Peter Flynn pointed out that `TeX` is very good with rules and can be used to make bar codes by itself, so I wrote these macros.

Unfortunately, mail with FIMs, ZIP+4 codes, and bar codes looks like junk mail, and recipients may throw it away without opening.

A solution to the problem of having to print the address on both the envelope and the letter inside it that is gaining popularity is to print the address, with the Postnet code beneath it, on the right side of the letter, and to fold and insert the letter into an envelope with a large transparent window, so that the address and the bar code are visible in the correct area on the envelope. Although envelopes with windows are more expensive, their cost is

offset by not having to print the address on the envelope and to match letters and envelopes. But there is a difference between what one wants to put on the letter and what the Post Office wants to see on the envelope to make it easier to read by OCR machines and letter carriers. In addition to specifying a visually unattractive typeface, all capitals and no punctuation, the Post Office wants the sender to simplify the OCR's and letter carrier's lives by using the standard, unattractive, 4-letters-or-less abbreviations for street suffixes:

Alley	ALY	Light	LGT
Annex	ANX	Loaf	LF
Apartment	APT	Locks	LCKS
Arcade	ARC	Lodge	LDG
Avenue	AVE	Loop	LOOP
Bayou	BYU	Mall	MALL
Beach	BCH	Manor	MNR
Bend	BND	Meadows	MDWS
Bluff	BLF	Mill	ML
Bottom	BTM	Mills	MLS
Boulevard	BLVD	Mission	MSN
Branch	BR	Mount	MT
Bridge	BRG	Mountain	MTN
Brook	BRK	Neck	NCK
Burg	BG	North	N
Bypass	BYP	Northeast	NE
Camp	CP	Northwest	NW
Canyon	CYN	Orchard	ORCH
Cape	CP	Oval	OVAL
Causeway	CSWY	Park	PARK
Center	CTR	Parkway	PKY
Circle	CIR	Pass	PASS
Cliffs	CLFS	Path	PATH
Club	CLB	Pike	PIKE
Corner	COR	Pines	PNES
Corners	CORS	Place	PL
Course	CRSE	Plain	PLN
Court	CT	Plains	PLNS
Courts	CTS	Plaza	PLZ
Cove	CV	Point	PT
Creek	CRK	Port	PRT
Crescent	CRES	Prairie	PR
Crossing	XING	Radial	RADL
Dale	DL	Ranch	RNCH
Dam	DM	Rapids	RPDS
Divide	DV	Rest	RST
Drive	DR	Ridge	RDG
East	E	River	RIV
Estates	EST	Road	RD
Expressway	EXPY	Row	ROW
Extension	EXT	Run	RUN
Fall	FALL	Room	RM
Falls	FLS	Shoal	SHL
Ferry	FRY	Shoals	SHLS
Field	FLD	Shore	SHR
Fields	FLDS	Shores	SHRS

Flats	FLT	South	S
Ford	FRD	Southeast	SE
Forest	FRST	Southwest	SW
Forge	FRG	Spring	SPG
Fork	FRK	Springs	SPGS
Forks	FRKS	Spur	SPUR
Fort	FT	Square	SQR
Freeway	FWY	Station	STA
Gardens	GDNS	Stravenue	STRA
Gateway	GTWY	Stream	STRM
Glen	GLN	Street	ST
Green	GRN	Suite	STE
Grove	GRV	Summit	SMT
Harbor	HBR	Terrace	TER
Haven	HVN	Trace	TRCE
Heights	HTS	Track	TRAK
Highway	HWY	Trail	TRL
Hill	HL	Trailer	TRLR
Hills	HLS	Tunnel	TUNL
Hollow	HOLW	Turnpike	TPKE
Inlet	INLT	Union	UN
Island	IS	Valley	VLV
Islands	ISS	Viaduct	VIA
Isle	ISLE	View	VW
Junction	JCT	Village	VLG
Key	KY	Ville	VL
Knolls	KNLS	Vista	VIS
Lake	LK	Walk	WALK
Lakes	LKS	Way	WAY
Landing	LNDG	Wells	WLS
Lane	LN	West	W

For example, OCR machines prefer to read addresses of this form:

JOHN DOE
11 PINE ST APT 4
ANYTOWN CA 10101-1000

On the other hand, the recipients prefer their address on the letter inside the envelope to be in mixed case, in the same typeface as the body of the letter, with punctuation, and spelled out:

John Doe
11 Pine Street, Apt. 4
Anytown, Calif. 10101

One can use control sequences \St, \Ave, et al., that expand to full words in the letter and to abbreviations on the envelope, to achieve this. One can also bypass the OCR machines by pre-printing the Postnet code.

Finding out ZIP+4 codes of your correspondents

In a few years we can expect that giving one's ZIP+4 code as part of one's postal address will be as common as giving the regular ZIP code, or the area code of the telephone number. Not giving

someone your ZIP+4 code will mean that that person either won't be able to take advantage of the lower postage or will have to make an extra effort to find out the full ZIP+4 code. Users of these macros are also likely to be faced with the problem of adding the 4-digit suffix to existing address files.

The Post Office says it will add ZIP+4 codes to a printout of an address list for free. I have not tested this service, but it says one can print out the contents of one's address book, send it to the Post Office, and get it back with the ZIP+4 codes added, which one can then add to one's file. The Post Office also says it would accept a mailing list (between 350 and 50,000 entries) on a floppy disk (in ASCII format with fixed length fields), and update it with ZIP+4 codes for free. (Ask for form 5603, "Request for ZIP+4 coding of address files on diskettes".)

There is a public-access terminal in New York Central Post Office which allows one to key in one's addresses and obtain the corresponding ZIP+4 codes. I've used it to update much of my address book to ZIP+4 codes. However, I found that for many people I correspond with the only kind of postal address I have is of the form

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The public access terminal calls such an address insufficient (indeed, it lacks the street address!), and refuses to give the ZIP+4 code. Experience shows that mail addressed in this manner still gets delivered, although 'Emanuelle University' is not what the Post Office calls a valid delivery address—the street address of its mailroom would be one. The 10101 post office in Smalltown knows where Emanuelle University is. Presumably, the same software is used by the Post Office for its free service, so such addresses won't be automatically ZIP+4-coded.

Luckily, both the street address and the ZIP+4 code are often found on preprinted departmental stationery, whose return address was presumably composed by Emanuelle University's mailroom in cooperation with the 10101 post office. Occasionally, distinct departments have distinct ZIP+4 extensions. The stationery also sometimes includes an internal mail stop; putting that on the envelope may make internal delivery faster after the Post Office delivers the letter to Emanuelle University's mailroom.

One should be wary of databases that match the 5-digit ZIP code with a city and state. The correct


```

\newbox\FIMAbox
\setbox\FIMAbox\vbox{%
  \hrule\@height.625in\@width.031in}
\setbox\FIMAbox\hbox{\copy\FIMAbox
  \hskip.0315in\copy\FIMAbox\hskip.1565in
  \copy\FIMAbox\hskip.1565in
  \copy\FIMAbox\hskip.0315in\copy\FIMAbox}
\newif\if@FIMA

```

Now we will arrange these bar codes and the two addresses on the envelope. The numerous boxes, some of which might be extraneous, are meant to insure that the bar codes start and end in the locations where the present scanners will look for them. I use envelopes with a pre-printed return address, and only the name needs to be filled in. Users of these macros may want to move the `\FromBox` around if they use blank envelopes. If one wishes to add a company logo, or other rasterized graphics, on the envelope using a `\special`, the Post Office recommends that it go to the left of the return address. If your device driver doesn't allow mixing of graphics and rotated output, this can be circumvented by rotating the picture in a paint program before including it.

```

\newbox\AddressBox
\newbox\FromBox

\setbox\FromBox\null

% font used for printing the address
\let\addressfont\twlsf

\def\EnvMakeBox#1#2{
  \setbox#1\vbox{
    \parindentOpt \leftskip0pt
    \lineskip1pt \baselineskip14pt
    \rightskip\@flushglue
    \addressfont #2}
  }

\def\envaddress#1{\EnvMakeBox\AddressBox{#1}}
\def\from#1{\EnvMakeBox\FromBox{#1}}

\def\envelope{
  \@FIMAFalse
  \gdef\zipcode{\empty}
  \setbox\PostNetBox\null
  \setbox\AddressBox\null
  }

\def\endenvelope{
  \newpage
  \if@FIMA
    \vbox to Opt{
      \hbox to \hsize{\hfill\copy\FIMAbox\hskip2in}
      \vss}
  \fi

```

```

% These magic numbers are for my stationery
\vbox{\vskip.435in
  \hbox{\hskip.32in\copy\FromBox}}
\vfill
\vbox to Opt{\vss
% Address is 1 inch from the left
% and 1 inch from the bottom
  \hbox{\hskip1in\box\AddressBox}
  \vskip.375in}
\vbox to .625in{
  \vfill
  \hbox to \hsize{%
    \hfill
    \hbox to 3.875in{%
      \unhbox\PostNetBox\hfill}}
  \vskip.25in
  }}

```

For mail going outside of the US, the country name in capital letters should be the only information present on the last line of the address. Endorsements for special services (restricted delivery, do not forward, registered mail, forwarding and address correction requested, etc.) should be placed above and flush left with the delivery address. All these data can be given as an argument to the `\envaddress` macro.

Finally, here is a L^AT_EX file which actually produces an envelope.

```

\documentstyle[env]{article}
\nofiles
\pagestyle{empty}
\textwidth9.5in
\textheight4.125in
I hard-coded Commercial #10 size; other common envelope sizes are Monarch, 3.875in × 7.5in, and in Europe: DL, 110mm × 220mm and C5, 162mm × 229mm. Calling the macros is simple:
\begin{document}

\from{Dimitri Vulis}

\begin{envelope}
\ZipBar{10036-8099}
\envaddress{
Dimitri Vulis\
Department of Mathematics/Box 330\
Graduate School \& University Center\
City University of New York\
33 West 42 Street\
New York, New York\quad\zipcode
}
\end{envelope}
\end{document}

```

The argument of `\ZipBar` is saved in `\zipcode` and may be reused, but it may be preferable to use

only the 5 digit ZIP code in `\envaddress` so as to make the envelope look less like junk mail:

```
New York, New York\quad10036
```

It's possible to print several envelopes at once by repeatedly calling `\begin{envelope}` and `\end{envelope}`.

There are absolutely no conventions about feeding envelopes into various printers and telling the device driver to print landscape. With Eberhard Mattes' excellent `dvihplj` driver² and my unusual printer I seem to achieve reasonable results with the options `/tr3 /l-1in /t3.5in` (rotate 90 degrees clockwise, and change offsets). It's desirable to have the FIM facing the inside, since most printers can't print on the outside edge. One needs to discover the correct options and envelope feeding procedure for one's driver/printer combination by trial and error.

Managing address files and the future

The layout of database tables for mass mailing lists and for one's personal correspondence is similar: each row should contain a unique identifier for joining with other data tables, an optional salutation, and the complete address (preferably, with ZIP+4 code and carrier route, and room for ZIP+6). But the operations are somewhat different for the two applications. For a mass mailing list, it's desirable to detect similar entries (i.e., slight variations of the same addressee) to avoid duplicate entries, and to be able to select a random sample of a specified size (so-called *n*th sample, used for tests); while for a personal address file it would be convenient to have a tool similar in spirit to `BIBTEX`, where the user would reference only a name tag, or a name and a department tag, in the `TEX` file, and one or more clever programs would pull the missing address information from the address table and complete the letter and the envelope, just like `BIBTEX` retrieves references from tags in a `LATEX` file. Oren Patashnik suggested that `BIBTEX` itself may be capable of doing this.

I may eventually write such a program. Alas, few people now write `TEXware` and distribute it

² I use `emTEX`, the excellent implementation of `TEX` for MS-DOS, also by Eberhard Mattes, that's available for free; `SBTEX` is another such implementation, by Wayne Sullivan. Anecdotal evidence suggests that, regrettably, many *The TEXbook* readers are unaware that it's not necessary to spend hundreds of dollars to obtain `TEX`, and that free implementations are usually just as good as the commercial ones.

freely with source code. If I do write such a program, it will be distributed in the same spirit as `TEX` itself.

These macros have not been certified by the Post Office, and are not warrantied to do anything at all. You may use them at your own risk. The certification process costs \$375, and I'm not making any money by giving them away for free. The macros are copyrighted, though, and I intend to defend them strenuously against unauthorized commercial use.

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L^AT_EX

The L^AT_EX Column

Jackie Damrau

There has been much discussion as to what this column tries to cover. I would like to provide a few comments of what I view this column's purpose to be. I certainly welcome any comments from others on what they would like to see in this column as well.

I see my role as Associate Editor of this column to put forth questions, answers, and macros that other users—especially those of the novice class—would find most useful. However, what may work at one particular site may not always work the same at another. Bear in mind that most users can obtain an idea of how to create macros from what has been accomplished by others in creating their own macros. These are what I try to print in the `LATEX` column. These may not be the most sophisticated nor the most clever solutions to problems or situations. When I put forth a question that has been sent to me, I do not always provide an answer. I feel that anyone who would like to submit an answer to be published in the next issue deserves a chance to do so. It also helps to solicit answers from users who