This is a list of all corrections made to *Computers & Typesetting*, Volumes A–E, between 16 June 1987 and 20 February 1989. Corrections made to the softcover version of *The TeXbook* are the same as corrections to Volume A. Corrections to the softcover version of *The METAFONTbook* are the same as corrections to Volume C. Some of these corrections have already been made in reprints of the books. Some of these corrections affect the indexes and mini-indexes of Volumes B and D in ways not shown here. Corrections made up to 15 June 1987 appear in other files.

Page A159, line 22
\tolimits' if the normal \displaylimits convention has been overridden; a Rad

Page A213, lines 34–35
(12/23/87)
text will be a single control sequence token, defined to be like \relax if its meaning is currently undefined.

Page A299, line 30
(7/6/88)
Fatal format file error; I'm stymied.

Page A326, line 12
(12/12/87)
its natural width. The \hbox version also invokes \everymath.

Page A359, line 2
(11/6/88)
\mathchardef\ldotp="613A\mathchardef\cdotp="6201\mathchardef\colon="603A

Page A359, lines 35–38
(5/24/88)
\def\updownarrow\delimiter"326C33F \def\arrowvert\delimiter"033C000 
\def\Updownarrow\delimiter"326D377 \def\Arrowvert\delimiter"033D000 
\def\vert\delimiter"026A30C \def\Vert\delimiter"026B30D 
\def\backslash\delimiter"026E30F \def\bracevert\delimiter"033E000 

Page A364, line 35
(11/6/88)
\def\fmtname{plain}\def\fmtversion{2.94} % identifies the current format

Page A379, line 15
(10/12/87)
\def\deleterightmost#1{\edef#1{\expandafter\xyzzy#1\xyzzy}}
Consequently there was plenty of room for more macros: $52821 - 27618 = 25203$ unused cells of main memory, $2500 - 1172 = 1328$ of name memory, $1685 - 209 = 1476$ of string memory, and $17636 - 1659 = 15977$ of character memory. But a fairly large \TeX{} was being used, and only the macros of Appendices B and E were loaded; in other circumstances it might have been necessary to conserve space.
Page A473, entry for ‘page builder’
when exercised, 122, 280–283, 286–287. (8/13/87)

Page A474, left column (12/27/88)
\texttt{\parshape}, 101–102, 214, 271, 277, 283,
\texttt{\vdots}, 177, 359.

Page A480, right column (2/15/88)
\texttt{\z@}, 347, 348.
\texttt{\z@skip}, 347, 348.

Page A481, right column (7/3/87)
\texttt{\z@}, 347, 348.
\texttt{\z@skip}, 347, 348.

Page B2, line 32 (2/20/89)
\begin{verbatim}
define banner \texttt{\`This\_is\_\TeX\_\_Version\_2.97\`} \{ printed when \TeX\ starts \}
\end{verbatim}

Page B38, lines 7–9 from the bottom (11/6/88)
[Delete this paragraph; it is being moved to page B214.]

Page B38, line 5 from the bottom (12/14/88)
begin if \texttt{log\_opened} then selector \leftarrow \texttt{term\_and\_log}

Page B39, line 5 (12/14/88)
if \texttt{log\_opened} then \texttt{error};

Page B52, line 5 (8/13/87)
cannot be done, i.e., if \texttt{hi\_mem\_min} = \texttt{lo\_mem\_max} + 1, we have to quit.

Page B54, lines 34–35 (7/9/88)
begin if \texttt{hi\_mem\_min} – \texttt{lo\_mem\_max} \geq 1998 then \texttt{t} \leftarrow \texttt{lo\_mem\_max} + 1000
else \texttt{t} \leftarrow \texttt{lo\_mem\_max} + 1 + (\texttt{hi\_mem\_min} – \texttt{lo\_mem\_max}) \texttt{div} \texttt{2}; \{ \texttt{lo\_mem\_max} + 2 \leq \texttt{t} < \texttt{hi\_mem\_min} \}

Page B108, new line after line 8 (5/24/88)
d: integer; \{ number of characters in incomplete current string \}
str_room(l); d ← cur_length;
while pool_ptr > str_start[|str_ptr|] do
  begin dekr(pool_ptr); str_pool[pool_ptr + l] ← str_pool[pool_ptr];
  end; { move current string up to make room for another }
for k ← j to j + l - 1 do append_char(buffer[k]);
text(p) ← make_string; pool_ptr ← pool_ptr + d;

Page B115, line 12 (4/28/88)

group_code = 0 . . max_group_code; { save_level for a level boundary }

Page B141, line 19 (4/28/88)

par_token: halfword; { token representing ‘\par’ }

Page B150, line 24 (4/28/88)

358. The present point in the program is reached only when the expand routine has inserted

Page B151, mini-index (4/28/88)

Delete the entry for ‘no_expand’; replace it by:

expand: procedure, §366.

Page B154, lines 25, 29, 34 respectively (9/20/87)

cvl_backup, radix_backup, co_backup: small_number; { to save cur_val_level, etc. }
co_backup ← cur_order; backup_backup ← link(backup_head);
cur_order ← co_backup; link(backup_head) ← backup_backup;

Page B155, new entry for mini-index (9/20/87)

cur_order: glue_ord, §447.

Page B156, line 28 (12/23/87)

begin eq_define(cur_cs, relax, 256);

Page B157, mini-index (12/23/87)

Delete the entries for ‘eqtb’ and ‘frozen_relax’; replace them by the following:

eq_define: procedure, §227.
relax = 0, §207.

Page B162, lines 12–14 (4/30/88)

repeat link(temp_head) ← null;
  if (info(r) > match_token + 127) ∨ (info(r) < match_token) then s ← null
  else begin match_chr ← info(r) - match_token; s ← link(r); r ← s; p ← temp_head; m ← 0;
Page B177, bottom line before mini-index (7/13/88)

```
cur_val ← 0;  cur_val_level ← int_val;  radix ← 0;  cur_order ← 0;
```

Page B181, line 31 (4/28/88)

[Change ‘x units per sp’ to ‘x sp per unit’! This change also should be made on line 1 of page B183 and line −8 of page B590.]

Page B188, line 8 (5/25/88)

```
function str_toks(b : pool_pointer): pointer;  { changes the string str_pool[b . . pool_ptr] to a token list }
```

Page B188, line 13 (5/25/88)

```
begin str_room(1);  p ← temp_head;  link(p) ← null;  k ← b;
```

Page B188, line 20 (5/25/88)

```
pool_ptr ← b;  str_toks ← p;
```

Page B188, new line after line 28 (5/25/88)

```
b:  pool_pointer;  { base of temporary string }
```

Page B188, line 31 (5/25/88)

```
else begin old_setting ← selector;  selector ← new_string;  b ← pool_ptr;
```

Page B188, line 41 (5/25/88)

```
selector ← old_setting;  the_toks ← str_toks(b);
```

Page B190, lines 16–18 (5/25/88)

```
b:  pool_pointer;  { base of temporary string }
begin c ← cur_chr;  (Scan the argument for command c 471);
old_setting ← selector;  selector ← new_string;  b ← pool_ptr;  (Print the result of command c 472);
selector ← old_setting;  link(garbage) ← str_toks(b);  ins_list(link(temp_head));
```

Page B210, line 36 (5/25/88)

```
begin if (pool_ptr + name_length > pool_size) ∨ (str_ptr = max_strings) ∨ (cur_length > 0) then
```

Page B211, new line of code before the mini-index (12/14/88)

```
log_opened:  boolean;  { has the transcript file been opened? }
```

Page B212, line 5 (12/14/88)

```
job_name ← 0;  name_in_progress ← false;  log_opened ← false;
```
Page B213, line 24  (12/14/88)

\[ \text{log}_{\text{name}} \leftarrow \text{a\_make\_name\_string(log\_file)}; \ \text{selector} \leftarrow \text{log\_only}; \ \text{log\_opened} \leftarrow \text{true}; \]

Page B214, lines 2 and 3  (12/14/88)

messages or even to show_context. The prompt_file_name routine can result in a fatal_error, but the error routine will not be invoked because log_opened will be false.

The normal idea of batch_mode is that nothing at all should be written on the terminal. However, in the unusual case that no log file could be opened, we make an exception and allow an explanatory message to be seen.

Page B214, lines 7–11 reduce to a single line  (12/14/88)

\begin{verbatim}
begin selector \leftarrow \text{term\_only};
\end{verbatim}

Page B224, second-last line  (4/28/87)

\text{done: if file\_opened then b\_close(tfm\_file);} 
\text{read\_font\_info} \leftarrow g;

Page B229, lines 6–8  (11/17/87)

than \(2^{27}\). If \(z < 2^{23}\), the individual multiplications \(b \cdot z, c \cdot z, d \cdot z\) cannot overflow; otherwise we will divide \(z\) by 2, 4, 8, or 16, to obtain a multiplier less than \(2^{23}\), and we can compensate for this later. If \(z\) has thereby been replaced by \(z' = z/2^e\), let \(\beta = 2^{4-e}\); we shall compute

Page B229, lines 11–12  (11/17/87)

if \(a = 0\), or the same quantity minus \(\alpha = 2^{4+e}z'\) if \(a = 255\). This calculation must be done exactly, in order to guarantee portability of \TeX{} between computers.

Page B230, lines 2–5  (11/17/87)

\begin{verbatim}
begin alpha \leftarrow 16;
while z \geq 40000000 do 
begin z \leftarrow z \text{ div} 2; \ alpha \leftarrow alpha + alpha; \ end;
\text{beta} \leftarrow 256 \div \text{ alpha}; \ alpha \leftarrow alpha * z;
\end{verbatim}

Page B245, new entry for mini-index  (8/7/87)

\text{cur\_s: integer, §616.}

Page B254, line 29  (8/7/87)

\text{cur\_s: integer; } \{ \text{current depth of output box nesting, initially } -1 \}\}

Page B254, line 31  (8/7/87)

[Remove the statement ‘\text{cur\_s} \leftarrow -1;’ and put it on page B244 at the end of line 31.]
Page B259, line 13

\begin{verbatim}
    begin rule wd ← rule wd + 10; \{ compensate for floating-point rounding \}
    edge ← cur h + rule wd; lx ← 0; \{ Let cur h be the position of the first box, and set \}
\end{verbatim}

Page B259, line 17

\begin{verbatim}
    cur h ← edge − 10; goto next p;
\end{verbatim}

Page B263, line 21

\begin{verbatim}
    begin rule ht ← rule ht + 10; \{ compensate for floating-point rounding \}
    edge ← cur v + rule ht; lx ← 0; \{ Let cur v be the position of the first box, and set \}
\end{verbatim}

Page B263, line 25

\begin{verbatim}
    cur v ← edge − 10; goto next p;
\end{verbatim}

Page B266, line 8

\begin{verbatim}
    dvi out(eop); incr(total_pages); cur s ← −1;
\end{verbatim}

Page B266, new code between lines 31 and 32

\begin{verbatim}
    while cur s > −1 do
        begin if cur s > 0 then dvi out(pop)
        else begin dvi out(eop); incr(total_pages)
        end;
        decr(cur s);
        end;
\end{verbatim}

Page B285, line 21

is subsidiary to the nucleus field of some noad; the dot is replaced by ‘_’ or ‘*’ or ‘/’ or ‘\’ if p is

Page B338, second-last line

\begin{verbatim}
    q ← link(head); s ← head;
\end{verbatim}

Page B339, line 4

\begin{verbatim}
    s ← q; q ← link(q);
\end{verbatim}

Page B339, new code to insert after line 10

\begin{verbatim}
    if o ≠ 0 then
        begin r ← link(q); link(q) ← null; q ← hpack(q, natural);
        shift_amount(q) ← a; link(q) ← r; link(s) ← q;
        end;
\end{verbatim}

[These new lines also imply changes to the index that aren’t shown in this errata list.]
is quite short. In the following code we set $hc[hn + 2]$ to the impossible value 128, in order to

$$hc[0] ← 127; hc[hn + 1] ← 127; hc[hn + 2] ← 128; \{ \text{insert delimiters} \}$$

(Enter as many hyphenation exceptions as are listed, until coming to a right brace; then return 961);

[The same change applies to lines 20–21, and to page 582.]

begin \( c ← trie_c[p]; \)
\( \text{if } c < trie_min \text{ then } trie_min ← c; \)
\( \text{if } trie_min = 0 \text{ then } z ← trie_link(trie_size) \)
\( \text{else } z ← trie_link(trie_min − 1); \{ \text{get the first conceivably good hole} \} \)

\( r ← trie_size; \{ \text{finally, we will zero out the holes} \} \)

\( shrink\text{-}order(r) ← \text{normal}; delete\text{-}glue_ref(q); \text{glue_ptr}(p) ← r; q ← r; \)

\( q ← new\text{-}skip\_param(top\_skip\_code); \{ \text{now temp_ptr} = \text{glue_ptr}(q) \} \)

\( shrink\text{-}order(r) ← \text{normal}; delete\text{-}glue_ref(q); \text{glue_ptr}(p) ← r; q ← r; \)
if log_opened then selector ← selector + 2;

if log_opened then

if log_opened then

co_backup: 366.
cur_order: 366, 447, 448, 454, 462.
cur_s: 593, 616, 619, 629, 640, 642.

[Remove ‘372’ from eqtb and put it into eq_define.]

[Insert ‘358’ into expand.]

[Remove ‘372’ from frozen_relax.]

log_opened, 92–93, 527, 528, 534–535, 1265, 1333–1334.

[Delete the entry for low_mem_max.]

[Remove ‘358’ from no_expand.]

Page B567, left column (12/23/87)

[Insert ‘372’ into relax.]

Page B568, left column (4/28/88)

[Move ‘269’ from save_index to save_level.]

Page C26, bottom line (7/18/87)

What angle corresponds to the direction North-Northwest?

Page C107, line 13 (10/7/87)

\[ \text{pickup penrazor xscaled heavyline rotated (angle}(z_{32} - z_{31}) + 90); \]

Page C164, line 10 (4/27/88)

\[ y_{kc} = \text{top} y_{k}; \quad y_{kd} = y_{kr}; \quad x_{kc} = x_{k} - \text{left\_jut}; \quad x_{kd} = x_{k} + \text{right\_jut}; \]

Page C175, line 23 (1/11/88)

expand into a sequence of tokens. (The language SIMULA67 demonstrated that it is

Page C241, line 11 (5/25/88)

\[ \text{numeric ht\#}, dp\#; \quad \text{ht\#} = \text{body\_height}\#; \quad .5[\text{ht}\#, -\text{dp}\#] = \text{axis}\#; \]

Page C248, line 21 becomes two lines (1/24/89)

which might not be numerically stable in the presence of rounding errors.) Another case, not really desirable, is left_jut = right_jut = 0.

Page C262, line 15 (12/23/88)

\[ \text{string base\_name, base\_version}; \quad \text{base\_name}="plain"; \quad \text{base\_version}="1.7"; \]

Page C271, line 12 (1/4/89)

the user and METAFONT’s primitive picture commands. First, some important program

Page C271, line 4 from the bottom (12/23/88)

\[ \text{def cutdraw expr} \ p = \ % \text{caution: you may need autorounding=0} \]

Page C272, lines 5 and 6 (12/23/88)

\[ (\text{cut\_scaled} \ i=\text{max}(\text{pen\_lft,pen\_rt,pen\_top,pen\_bot})) \]
\[ \text{rotated theta shifted z)t}; \]
Page C273, lines 20 and 22 (9/26/88)
(z+(0,pen_top))t_=round((z+(0,pen_top))t_); z_ enddef;
(z+(0,pen_bot))t_=round((z+(0,pen_bot))t_); z_ enddef;

Page C290, line 6 from the bottom (12/23/88)
(2) A throwaway variable, ‘whatever’, nullifies an unwanted equation at the beginning

Page C331, just below the illustration (7/18/87)
Such a pattern is, of course, rather unlikely to occur in a gf file, but GFtoDVI would

Page C337, line 11 (4/28/88)
An online “menu” of the available test routines will be typed at your terminal

Page C346, entry for autorounding (12/23/88)

Page C350, left column (7/6/88)
Fatal base file error, 226.

Page C356, left column (1/11/88)
SIMULA67 language, 175.

Page C358, right column (2/15/88)
yoffset, 212, 220, 315, 324.

Page D2, line 27 (12/14/88)
define banner ≡ ‘This is METAfont, Version 1.7’ {printed when METAfont starts}

Page D36, lines 3–5 (11/6/88)
[Delete this paragraph; it is being moved to page D349.]

Page D36, line 7 (12/14/88)
begin if log_opened then selector ← term_and_log

Page D36, line 16 (12/14/88)
if log_opened then error;

Page D66, lines 34–35 (7/9/88)
begin if hi_mem_min − lo_mem_max ≥ 1998 then t ← lo_mem_max + 1000
else t ← lo_mem_max + 1 + (hi_mem_min − lo_mem_max) div 2; { lo_mem_max + 2 ≤ t < hi_mem_min }
log\_opened: boolean; \{ has the transcript file been opened? \}

job\_name \leftarrow 0; \ log\_opened \leftarrow false;

log\_name \leftarrow \text{a}\_make\_name\_string(log\_file); \ selector \leftarrow \text{log}\_only; \ log\_opened \leftarrow \text{true};

print error messages or even to show\_context. The prompt\_file\_name routine can result in a fatal\_error, but the error routine will not be invoked because log\_opened will be false.

The normal idea of batch\_mode is that nothing at all should be written on the terminal. However, in the unusual case that no log file could be opened, we make an exception and allow an explanatory message to be seen.

begin selector \leftarrow \text{term}\_only;

if txx \ mod \ unity = 0 \ then

done: if eq\_type(x) \neq \text{tag}\_token \ then \ clear\_symbol(x, \text{false});

if equiv(x) = \text{null} \ then \ new\_root(x);

scan\_declared\_variable \leftarrow h;

if log\_opened \ then \ selector \leftarrow selector + 2;

if log\_opened \ then

if log\_opened \ then

log\_opened, 87–88, 782, 783, 788–789, 1023, 1205, 1208.
zscaled primitive: 893.
Zabala Salelles, Ignacio Andres: 812.

Page D545, left column (10/31/87)

after which comes ‘math.axis’; generate mathsy (which we won’t bother to

Page E111, line 29 (10/16/88)

\[ lft x_{11} = \text{hround} u; \quad x_{11} - x_{11} = x_2 - x_2 = x_2 - x_2 = \text{hround} 1.6 \text{cap.jut}; \]

Page E285, bottom line (12/1/87)

Due to Technical Developments (1968)

Page E333, lines 9–11 (1/9/89)

\[ \text{if not monospace: } r := \text{hround}(x_5 + x_1 + r - w); \text{ fi} \quad \% \text{ change width for better fit} \]

Page E353, lines 38–39 (8/12/87)

\[ \text{else: fill diag_end(6r, 5r, 1, 5l, 6l) \ldots .9[z5r, z6l]} \]
\[ \ldots \{z5 - z6 \}_1[z5r, z6r] \text{ -- cycle}; \quad \% \text{ middle stem} \]

Page E387, line 13 (8/12/87)

\text{pickup tiny.nib; bulb}(3, 4, 5); \quad \% \text{ bulb}

Page E413, lines 37–38 (8/12/87)

\[ \text{else: fill diag_end(6r, 5r, 1, 5l, 6l) \ldots .9[z5l, z6r]} \]
\[ \ldots \{z5 - z6 \}_1[z5r, z6r] \text{ -- cycle}; \quad \% \text{ middle stem} \]

Page E459, line 24 (8/7/87)

[Delete the ‘=’ sign between ‘lft’ and ‘x_{5}’.

Page E471, line 5 (12/11/88)

\[ x_2 = \text{good x.5w; center_on}(x_2); \]

Page E471, insert two lines below the rule at bottom of page (12/11/88)

\text{def center_on(expr x) = if not monospace: } \quad \% \text{ change width for symmetric fit}
\[ r := r + 2x - w; \quad w := 2x; \text{ fi enddef;} \]
Page E477, line 20 (12/11/87)

\[ x_4 = x_8 = \text{good} \cdot 5w; \quad \text{center_on}(x_4); \quad x_2 = w - x_6 = \text{good} \cdot x(x_4 + a); \]

Page E483, third line of elementary division operator (12/11/88)

\[ x_3 - 0.5 \cdot \text{dot_size} = \text{hround}(0.5w - 0.5 \cdot \text{dot_size}); \quad \text{center_on}(x_3); \]

Page E485, line 4 (8/7/87)

[Delete the '=' sign between ‘lft’ and ‘x’.

Page E487, line 17 (8/4/88)

\[ \text{fill} \ \text{fullcircle scaled (bold + 3.8 \cdot dw + \text{eps}) shifted (0.5[z_4, z_8]); \quad \% \text{ dot} \]

[Also remove page 487 from the index entry for \text{dot_size}, and add it to the entries for \text{bold} and \text{dw}.

Page E515, lines 5 and 12 (12/11/88)

\[ 0.5[x_1, x_2] = x_3 = \text{good} \cdot 5w; \quad \text{center_on}(x_3); \quad \text{lft} x_1 = \text{hround}(0.5w - u + \text{sqrt}48); \]

Page E515, line 21 (1/23/89)

\[ \text{labels}(5, 6); \quad \text{zero_width}; \quad \text{endchar}; \]

[Also put labels ‘5’ and ‘6’ on the upper right figure, page E514.

Page E521, lines 4 and 14 (12/12/88)

\[ x_1 = x_2 = \text{good} \cdot 5w; \quad \text{center_on}(x_1); \quad \text{lft} x_3 = \text{hround} u; \quad x_4 = w - x_3; \]

Page E537, line 6 (12/11/88)

\[ x_1 = x_2 = x_3 = x_4; \quad x_1 - 0.5 \cdot \text{stem} = \text{hround}(0.5w - 0.5 \cdot \text{stem}); \quad \text{center_on}(x_1); \]

Page E537, line 19 (12/11/88)

\[ x_1 = x_2 = x_3; \quad x_1 - 0.5 \cdot \text{stem} = \text{hround}(0.5w - 0.5 \cdot \text{stem}); \quad \text{center_on}(x_1); \]

Page E539, line 4 (12/11/88)

\[ x_1 = x_4 = x_{30} = x_{33} = \text{good} \cdot 5w; \quad \text{center_on}(x_1); \]

Page E539, line 21 (12/11/88)

\[ x_1 = x_4 = \text{good} \cdot 5w; \quad \text{center_on}(x_1); \]

Page E541, line 4 (12/11/88)

\[ x_1 = x_5 = \text{good} \cdot 5w; \quad \text{center_on}(x_1); \]
Page E541, line 17 (12/11/88)

\[ x_1 = x_{10} = \text{good} \cdot 0.5w; \text{center}_on(x_1); \]

Page E550, new line after line 23 (8/15/87)

\[ \text{forsuffixes } \$ = \text{notch}_\text{cut}, \text{cap}_\text{notch}_\text{cut}; \text{if} \; \$ < 3; \; \$ := 3; \; \text{fi endfor} \]
[To make room for this, combine lines 38 and 39 into a single line.]

Page E550, line 29 (7/9/88)

\[ \text{define}_\text{whole}_\text{vertical}_\text{blackier}_\text{pixels}(\text{vair}, \text{bar}, \text{slab}, \text{cap}_\text{bar}, \text{cap}_\text{band}); \]

Page E572, new entry at bottom (12/11/88)

\[ \text{center}_\text{on}, 471, 477, 483, 515, 521, 537–541. \]