A torture test for TEX

by

Donald E. Knuth

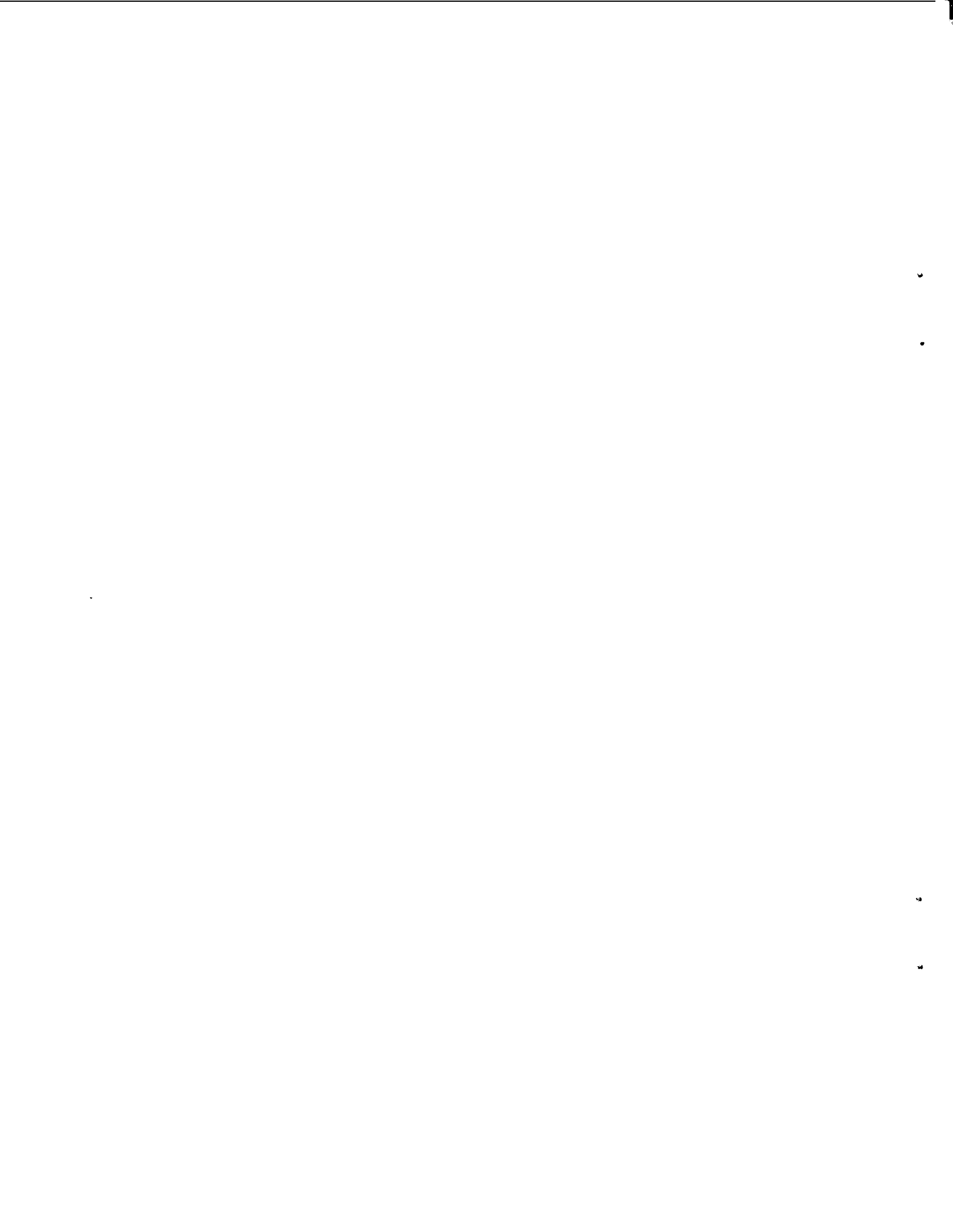## Department of Computer Science

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Programs that claim to be implementations of TeX82 are supposed
to be able to process the test routine contained in this report,
producing the outputs contained in this report.

Introduction. People often think that their programs are "debugged" when large applications have been run successfully. But system programmers know that a typical large application tends to use at most about 50 per cent of the instructions in a typical compiler. Although the other half of the code -which tends to be the "harder half"---might, be riddled with errors, the system seems to be working quite impressively until an unusual case shows up on the next day. And on the following day another error manifests itself, and so on; months or years go by before certain parts of the compiler are even activated, much less tested in combination with other portions of the system, if user applications provide the only tests.

How then shall we go about testing a compiler? Ideally we would like to have a formal proof of correctness, certified by a computer. This would give us a lot of confidence, although of course the forinal verification program might itself be incorrect. A more serious drawback of automatic verificat ion is that the formal specifications of the compiler are likely to be wrong, since they aren't much easier to write than the compiler itself. Alternatively, we can substitute an informal proof of correctness: The programmer writes his or her code in a structured manner and checks that appropriate relations remain invariant, etc. This helps greatly to reduce errors, but it cannot be expected to remove them completely; the task of checking a large system is sufficiently formidable that human beings cannot do it without making at least a few slips here and there.

Thus, we have seen that test programs are unsatisfactory if they are simply large user applications; yet some sort of test program is needed because proofs of correctness aren't adequate either. People have proposed schemes for construc ting test data au tomatically from a program text, but such approaches run the risk of circularity, since they cannot assume that a given program has the right structure.

I have been having good luck with a somewhat different approach, first used in 1960 to debug an **ALGOL** compiler. The idea is to construct a test file that is about as different from a typical user application as could be imagined. Instead of testing things that people normally want to do, the file tests complicated things that people would never dare to think of, and it embeds these complexities in still more arcane constructions. Instead of trying to make the compiler do the right thing, the goal is to make it fail (until the bugs have all been found).

To write such a fiendish test routine, one simply gets into a nasty frame of mind and tries to do everything in the unexpected way. Parameters that are normally positive are set negative or zero; borderline cases are pushed to the limit; deliberate errors are made in hopes that the compiler will not be able to recover properly from them.

A user's application tends to exercise 50% of a compiler's logic, but my first fiendish tests tend to improve this to about 90%. As the next step I generally make use of frequency-counting software to identify the instruc tions that have still not been called upon. Then I add ever more fiendishness to the test routine, until more than 99% of the code has been used at least once. (The remaining bits are things that can occur only if the source program is really huge, or if certain fatal errors are detected; or they are cases so similar to other well-tested things that there can be little doubt of their validity.)

Of course, this is not guaranteed to work. But my experience in 1960 was that only two bugs were ever found in that ALGOL compiler after it correctly translated that original fiendish test. And one of those bugs was actually present in the results of the test; I simply had failed to notice that the output was incorrect. Similar experiences occurred later during the 60s and 70s, with respect to a few assemblers, compilers, and simulators that I wrote.

This method of debugging, combined with the methodology of structured programming and informal proofs (otherwise known as careful desk checking), leads to great er reliability of production software than any other method I know. Therefore I have used it in developing TeX82, and the main bulk of this report is simply a presentation Of the test program that was used to get the bugs out of TeX.

Such a test file is useful also after a program has been debugged, since it can be used to give some assurance that, subsequent modifications don't mess things up.

The test file is called TRIP. TEX, because of my warped sense of humor: TeX is pronounced "techhh", so the name reminded me Of a triptych (and besides, I wanted to take a trip through the program while tripping it up, etc.).

The contents Of this test file are so remote from what people actually do with TeX, I feel apologetic if I have to explain the correct translation of TRIP. TEX; nobody really cares about most of the nitty-gritty rules

that are involved. Yet I believe TRIP exemplifies the sort of test program that has outstanding diagnostic ability, as explained above.

If somebody claims to have a correct implementation of TEX, I will not, believe it until I see that TRIP. TEX is translated properly. I propose, in fact? that a program must meet two criteria before it can justifiably be called 'l&X: (1) The person who wrote it must be happy with the way it works at his or her installation; and (2) the program must produce the correct results from TRIP. TEX.

TEX is in the public domain, and its algorithms arc published; I've done this since I do not want to discourage its use by placing proprictary restrictions on the software. However, I don't want faulty imitations to masquerade as TEX processors, since users want TEX to produce identical results on different machines. Hence I am planning to do whatever I can to suppress any systems that call themselves TEX without meeting conditions (1) and (2). I have copyrighted the programs so that I have some chance to forbid unauthorized copies; I explicitly authorize copying of correct TEX implementations, and not of incorrect ones!

The remainder of this report consists of appendices, whose contents ought to be described briefly here:

Appendix A explains in detail how to carry out a test of TEX, given a tape that contains copies of the other appendices.

Appendix B is TRIP. TEX, the fiendish test file that has already been mentioned. People who think that they understand TEX are challenged to see if they know what TEX is supposed to do with this file. People who know only a little about TEX might still find it interesting to study Appendix B, just to get some insights into the methodology advocated here.

Appendix C is TRIP . PL, the property-list description of a special font called trip. This is the only font used by TRIP.TEX. There are no graphic characters associated with trip that could possibly be printed; indeed, TRIP. PL describes the properties of a font that is as weird as the "document" described by TRIP. TEX.

Appendix D is TRIPIN.LOG, a correct transcript file TRIP.LOG that results if INITEX is applied to TRIP. TEX. (INITEX is the name of a version of TEX that does certain initializations; this run of INITEX also creates a binary format file called TRIP. FMT.)

Appendix E is a correct transcript file TRIP. LOG that results if INITEX or any other version of TEX is applied to TRIP. TEX with format TRIP. FMT.

Appendix F is TRIP . TYP, the symbolic version of a correct output file TRIP . DVI that was produced at the same time as the TRIP. LOG file of Appendix E.

Appendix G is TRIPOS. TEX, a short file written out and read in by TEX when it processes TRIP .TEX.

Appendix H in TRIP. FOT, an abbreviated version of Appendix E that appears on the user's terminal during the run thatproduces TRIP.LOG and TRIP.DVI.

The debugging of TEX and the testing of the adequacy of TRIP. TEX could not have been done nearly as well as reported here except for the magnificent software support provided by my colleague David R. Fuchs. In particular, he extended our local PASCAL compiler so that frequency counting and a number of other important features were added to its online debugging abilities.

The method of testing advocated here has one chief difficulty that deserves comment: I had to verify by hand that TEX did the right things to TRIP.TEX. This took many hours, and perhaps I have missed something (as ι did in 1960); I must confess that I have not checked every single number in Appendices E and F. However, I'm willing to pay $10.24 to the first finder of any remaining bug in TEX, and I will be surprised if that bug doesn't show up also in Appendix E. (I plan to write a technical report about all of the errors ultimately found in TEX; that report will tell whether any bugs are discovered between now and then!)

Appendix A: How to test TEX.

0. Let's assume that you have a tape containing TRIP .TEX, TRIP. PL, `TRIPIN.`LOG, TRIP. LOG, TRIP.TYP, and TRIP.FOT, as in Appendices **B**, C, D, **E**, **F**, and **G. Furthermore,** let's suppose that you have **a** working WEB system, and that you have working programs TFtoPL, PLtoTF, DVItype, as described in the TEXware report.

1. Use PLtoTF to convert TRIP. PL into TRIP .TFM. **Then** USC TFtoPL to convert TRIP.TFM into TMP.PL. Check that TMP . PL is identical to TRIP. PL (this is a partial test of PLtoTF and TFtoPL). Install TRIP. TFM in the standard file area for TEX font metric files.

2. Prepare a version of INITEX. (This **means** that your WEB **change** file should have **init** and **tini defined** to be null.) The **stats** and **tats macros** should also be null, so that statistics are kept and other **special** features are enabled. Set *mem_min* and *mem_bot* equal to 1, and set *mem_top* and *mem_max* equal to 3000, for purposes of this test version. Also set *error_line = 64, half_error_line = 32,* and *max_print_line* = 72; these parameters affect many of the lines of the test output, so your job will be much easier if you use the same settings that were used to produce **Appendix E.** You probably should also use the "normal" settings of other **parameters** found in TEX.WEB (e.g., *stack_size = 200, font_max = 75,* etc.), since these show up in a few lines of the test output.

3. Run the INITEX prepared in step 2. In response to the first '* * *' prompt, type carriage return (thus getting another '**'). Then type '\input trip'. You should get an output that matches the file `TRIPIN.`LOG (Appendix D). Don't be alarmed by the error messages that you see, unless they are different from those in Appendix D.

4. Run INITEX again. This time type '␣&trip␣␣trip␣'. (The spaces in this input help to check certain parts of TEX that aren't otherwise used.) You should get outputs TRIP. LOG, TRIP. DVI, and TRIPOS . TEX; there will also be an empty file 8TERMINAL .TEX. **Furthermore,** your terminal should receive output that **matches** TRIP. FOT (Appendix H). During the middle part of this test, however, the terminal will not be getting output, because \batchmode is being tested; don't worry if nothing seems to be happening for a while--- nothing is supposed to.

5. **Compare** the TRIP. LOG file from **step** 4 with the "master" TRIP. LOG file of step 0. (Let's hope you put that master file in a safe place so that it wouldn't be clobbered.) There should be perfect agreement between these files except in the following respects:

   .a) The dates and possibly the file namca will naturally be different.

   b) Glue settings in the displays of TEX boxes are subject to system-dependent rounding, so slight deviations are permissible. However, such deviations apply only to the 'glue set' values that appear at the end of an \hbox or \vbox line; all other numbers should agree exactly, since they are computed with integer arithmetic in a prescribed system-independent manner.

   c) If you had different values for *stack_size*, *buf_size*, etc., the corresponding capacity values will be different when they are printed out at the end.

   d) The total number and length of strings at the end may well be different.

   e) If your TEX uses a different memory allocation or packing scheme or DVI output logic, the memory usage statistics may change.

6. Use DVItype to convert your file TRIP . DVI to a file TRIP. TYP. The following options should be set when using DVItype:

   Output level = 2
   .Starting page = *.*.*.*.*.*.*.*.*.*
   Number of pages = 1000000   (this is the default)
   Resolution = 7227/100   (this is one point per pixel)
   New magnification = 0   (this is the default)

The resulting file should agree with the master TRIP. TYP file of step 0, except that some of the values might be a little off due to floating-point rounding discrepancies. Furthermore there may be differences between '*right*' and '*w*' and '*x*' commands, and between '*down*' and '*y* ' and '*z*'; the key thing is that all characters and rules and *xxx*'s should be in almost the same positions as specified in Appendix F. (If your DVI-writing routines differ substantially from those in TEX. WEB, you may want to write a **DVIcompare**

program that detects any substantive differences between two given DVI files. Such a routine would be of general use besides. On the other hand, if you have set dvi_buf_size to 800, then your DVI file should be virtually identical to the one supplied.)

7. You might also wish to test TRIP with other versions of TEX (i.e., VIRTEX or a production version with other fonts and macros preloaded). It should work unless TEX's primitives have been redefined. However, this step isn't essential, since all the code of VIRTEX appears in INITEX; you probably won't catch any more errors this way, unless they would already become obvious from normal use of the system.

Appendix **B:** The TRIP.TEX file.   The contents of the test routine are prefixed here with line numbers, for case in comparing this file with the error messages printed later; the line numbers aren't actually present.

```
 1 % This is a diabolical test file for TeX82. Watch your step.
 2 \catcode `{ = 1 \endlinechar=13
 3 \catcode `} = 2
 4 \catcode `$ = 3 {\catcode`$13\gdef\dol{$}}
 5 \catcode `& = 4
 6 \let\paR=\par
 7 \let\%=\relax
 8 \outer\xdef\par{\catcode `\% 14}
 9   % this line should change % from type 5 to type 14
10 \let\par=\paR \defaulthyphenchar=`- \defaultskewchar=256
11 \ifx\initex\undefined \def\initex{} % next lines are skipped if format loaded
12   \catcode `# = 6 \catcode `U=\catcode`# % # for parameters
13   \catcode `^ = 7 \catcode `| = 8 % ^ for superscripts and | for subscripts
14   \catcode `~ = 9 % ~ will be ignored
15   \catcode `* = 10 % * will be like a space
16   \catcode `E = 12 % E is not a letter
17   \catcode`\@ = ~15 % @ will be invalid
18   \catcode `^^A = 0008 % this is another way to get a subscript
19   \catcode `\^^@ = 11 % a strange letter will be allowed
20   \catcode `\^^? = 0 % and so will a strange escape delimiter
21   \fontdimen12\nullfont=13pt % give the null font more parameters
22   \font\trip = trip\relax % see TRIP.PL for details of this font
23   ^^?trip  \font\smalltrip=trip scaled 500 % this will be our symbols font
24   \global\fontdimen22\smalltrip 7pt % the axis height
25   \textfont2=\smalltrip \scriptfont2 \smalltrip \scriptscriptfont2 \smalltrip
26   \nonstopmode\lccode128-0\mathchardef\a="8000\def\a{SCALED 3-2769)
27   \font\rip=trip\a % font \rip will be the same as \trip
28   \skewchar\rip=`B \countdef\countz % \countz will be \count0
29   \def\on{1}\toksdef\tokens=256 \show\errorstopmode
30   \showthe\font  \showthe\pageshrink  \showthe\pagegoal
31   \font\bigtrip=trip at 20pt % this will be extension font
32   \textfont3=\bigtrip\chardef\?=`b
33   \patterns{\?50aa1b3 *1aca. bb bb1 0b2b0 b1c} % remember that *==space
34   \hyphenation\relax{b-\?-\char`b -b-b-b tiny }
35   \skip200 = 10pt plUs5fillllminus 0 fill
36   \setbox200=\vbox{\hrule\vskip\skip200} \wd200-2pt \setbox100=\hbox{A}
37   \skipdef\shkip100\skip  -18pt plus\catcode`\}fil minus 10fil
38   \advancc\shkip by \skip200
39   \dimen33=3pt
40   \count33=-\dimen33
41   \divide\shkip by \count33
42   \multiply\shkip by \count33 % so \skip100=-6pt plus 3filll minus 9fil
43   \count200 -5
44   \multiply\count200 by -100 % \count200 is 600
45   \count100=1000000
46   \divide\count100 by \count200 % \count100 is 2000
47   \dimen100=.00152587890625in % (100/65536)in = 7227sp
48   \multiply\dimen100 by 65636
49   \divide\dimen100 by 9 % \dimen100 is 803pt
50   \lineskip 0pt plus 40pt
```

```
51    \baselineskip=10pt plus 41pt
52    \parskip -Opt plus 42pt minus 8pt
53    \splittopskip 1pt plus 43pt
54    \splitmaxdepth -2pt \boxmaxdepth 1000pt
55    \belowdisplayskip 3pt plus 44pt minus\baselineskip \abovedisplayskip3pt
56    \abovedisplayshortskip 1pt plus 45pt minus\dimen100
57    \belowdisplayshortskip -\count33sp plus 46pt
58    \global\mathchardef\minus"232D % mathbin, family 3, character "2D (-)
59    \thinmuskip 1mu plus 2fill minus 3mu
60    \medmuskip 2mu minus 3mu
61    \thickmuskip -4mu
62    \def\gobble#1{} \floatingpenalty 100
63    \everypar{A\insert200{\baselineskip400pt\splittopskip\count15pt\hbox{\vadjust
64        {\penalty999}}\hbox to ~10pt{}}\showthe\pagetotal\showthe\pagegoal
65      \advance\count15by1\mark{\the\count15}\splitmaxdepth-1pt
66      \paR\gobble} % this aborts every paragraph abruptly
67    \def\weird#1{\csname\expandafter\gobble\string#1 \string\csname\endcsname}
68    \message{\the\output\weird\one}
69    \hyphenpenalty 88 \exhyphenpenalty 89
70    \clubpenalty 125 \widowpenalty 125 \displaywidowpenalty -126
71    \brokenpenalty 37
72    \interlinepenalty -125
73    \doublehyphendemerits 1000
74    \finalhyphendemerits 100000
75    \mag    2000    `
76    \delimiterfactor 10
77    \delimitershortfall 190pt
78    \showboxbreadth 9999
79    \showboxdepth 9999
80    \tracingstats=4\tracinglostchars=2\tracingparagraphs\day \tracingpages\year
81    \nulldelimiterspace --+.1pt
82    \scriptspace\ifOO-O.\fi\ifnum'\ifnumlO=lO 12="\fi
83      A 01p\ifdim1,Opt<'^^Abpt\fi\fi % this boils down to -O.Olpt
84    \overfullrule 5pt \voffset-2pt
85    \def\sh{\ifnum\count4>10\else\dimen5=\count4pt
86        \advance\dimen5 by 10pt
87        \xdef\a{\a\the\count4pt \the\dimen5}
88        \advance\count4 by 1 \sh\fi}
89      \count4=1 \def\a{} \sh % \def\a{1pt 11pt 2pt 12pt . . . 10pt 20pt}
90  \let\next=\dump  \everyjob{\message{#}}
91  \else\let\next=\relax\fi
92  \next % if no format was preloaded, this will dump the trip.fmt file and halt
93  \tracingcommands2\tracingrestores+2\write-1{log file only}
94  \openout- '78terminal \openoutlO=tripos % we will write three lines on tripos.tex
95  \write10{} % the first line is empty
96  \write10{\uppercase{\number{\outputpenalty}}} % O{\outputpenalty} + error
97  \write10{[\uppercase{\romannumeral-\the\outputpenalty}} % "mmmmmmmmmm" (-10000)
98  \vsize 2000pt
99  \vbadnesa=1
100 \topskip 20pt plus lfil
101 \penalty -12345 % this will be ignored since the page is still empty
102 \maxdepth=2pt
103 \tracingoutput\on ·
```

```
104 \moveleft20pt\copy200
105 \moveright20pt\hbox{\vrule depth20pt height-19pt width1pt}
106 \penalty-10000 % now we'll compute silently for awhile, after default output
107 \batchmode\output={\tracingcommands0\showthe\outputpenalty
108    \showboxbreadth 9999 \showboxdepth 9999 \hoffsetlsp
109    {\setbox 254=\box255\shipout\ifvbox2\ifhbox254 \error\fi54\copy25\fi4}
110    \ i f v o i d   254\relax\else\error\fi
111    }
112 \setbox255\vbox{}
113 \dimen200=10000pt
114 {\output{\dimen 9=\ht200\count5=\dimen9
115     \global\countz=\outputpenalty
116     \setbox255\copy255 % at end of group, \box255 reverts to former value
117     \shipout\hbox{\box100\box200\vsplit 255 to 55pt}
118     \unvcopy255\showlists\showthe\insertpenalties
119     \message{\topmark:\firstmark:\botmark:\splitfirstmark:\splitbotmark}
120     \globaldefs1\halign{#\tabskip\lineskip\cr}
121     \showboxdepth1\showboxbreadth2}
122    \insert100{\def\box{\vbox to 267.7pt{}} \vskip0pt plus 1fil
123     \baselineskip 0pt \lineskip 0pt minus .4pt
124     \box \penalty-101 \box \penalty-100 \box \penalty-1000
125     } % since \dimen100=803pt<3*267.7pt, the insertion splits;
126    % and the natural height+depth of the split-off part is 267.7pt;
127    % now since \count100=2000,
128    % this insertion adds about 535.4pt to the current page
129    \topskip1pt plus 44pt
130    \vbox spread 1000pt{} % beginning of new page
131    \insertpenalties=-50\penalty12345
132    \cleaders\hbox{\lower2pt\vbox to 17pt{}
133     \leaders\hrule\hskip10pt
134     \cleaders\hbox{A}\hskip 9pt % the A is 2pt wide
135     \leaders\hbox{A}\hskip 9pt
136     \xleaders\hbox{A}\hskip 9pt
137     \write111{\help} % \write will be ignored in leaders
138     }\vskip50pt minus 10pt
139    \mark{alpha}
140    AAA\everypar=\errhelp % because of previous \everypar, this makes 3 paragraphs
141    % and each paragraph consists of A\insert 200{400pt of stuff}\mark{n}
142    % but \count200=500 so the inserts are rated 200pt each
143    % so the third insertion will be split
144    \kern-50pt
145    A\hfill\vadjust{\special{\the\prevdepth}\penalty-5000}%
146    \penalty-1000000000 % forces line break in paragraph
147    % this is not the end of paragraph
148    A\par\insert200{\vskip10000pt\floatingpenalty3}% this insert will be held over
149    \pagefilstretch-1pt\showthe\insertpenalties\penalty99999999\showlists
150    \showthe\pagefilllstretch\vskip 1000pt\penalty-333\hbox to 23pt{} % output now
151    \vsize.pt\global\vsize=16383.99999237060546875pt % page size \approx infinity
152    } % now we revert to the former output routine
153 {\tracingoutput-2\tracingstats1\shipout\hbox{\closeout10\closeout-10}}
154 \showthe\everypar
155 \everypar{}\showthe\everypar
156 \def\showlonglists{{\tracingcommands0\pagefillstretch-1\dimen100
```

157   \showboxbreadth 9999 \showboxdepth 9999 \showlists **\pagegoal=10000pt}}**
158 **\tracingmacros=1**
159 \def\t12#101001#{-.#1pt}
160 **\dimendef\varunit=222\varunit=+1,00101pt**
161 \ifdim -0.01001\varunit=\t1201001010010011{\relax}\else\error\fi
162 **\countz=-1**
163 \ifodd\count0\advance\countz by -1\fi
164 **\penalty** -12345 % output the remaining stuff
165 \tracingmacros\tracingstats % the next part tests line-break computations
166 % the two competing ways to set the paragraph have respective demerits
167 % (30+1)^2+(30+1)^2+a and (51+1)^2+1^2, where a=adjdemerits, l=linepenalty
168 **\adjdemerits=782**
169 \linepenalty=1
170 \def\1#1{\hbox to#1pt{}}
171 **\valign{\baselineskip20ptplus1pt\global\parfillskip0pt**
172   **\global\global\leftskip4pt**
173   \rightskip-1pt
174   **\global\hsize13pt**
175   \setbox2\12
176   **\noindent\copy2\hskip2pt plus5pt** minus1pt
177   **\copy2\hskip5pt minus2pt**
178   \lower2pt\11\hskip3pt % this affects depth of the second line
179   **\copy2 \hskip2pt plus.5pc**
180   **\box2#\cr**
181   **\noalign{\spacefactor=2000\global\xspaceskip=-1pt}**
182   **\noalign{ \vrule width0pt{ }}**
183   \cr % set that paragraph with **a=782, l=1** (demerits 2704 **vs** 2705)
184   **\adjdemerits=784** \cr % increase a, so the second alternative is better
185   **\linepenalty=2\hbadness=51\cr** % increase 1 by I, suppress diagnostic **typeout**
186   **\noalign{ \spacefactor=1}}\message{\the\spacefactor}**
187 {\hsize1000pt\par\parindent1pt\indent}\leftskip3pt\def\?{\vrule width-2pt
188 \hbox **spread2pt{}}\noindent\indent\hbox spread2pt{\hskip0pt plus-1bp}**%
189 **\discretionary{\?AΛAB}{\?B-}{\?/A\kern2pt}**% the resp widths are **7pt,4pt,** 6pt
190   **\vbox{\hrule** width **6pt} \par** % should set with nothing overfull
191 \penalty-22222 % end of demerits test, hyphenation is next
192 **\looseness-10**
193 \uchyph=1
194 \hsize **100pt**
195 A **/A\char'A** BBBBCACAC//% that becomes /k [AA] k **[BB]** k **[BB][CA][CA][C/]/,**
196 · % where [] means a ligature and k means a kern.
197 ˙% the word "aabbbbcaca" should be hyphenated to "aa1b3b2b2b1c1aca",
198 % which becomes {[AA]k-||[AA]k}{B-|[BB]kBk|[BB][BB]}{C-|A|[CA]}[CA]
199 % if I use the notation {x|y|z} for **\discretionary{x}{y}{z}**. (one hyphen lost)
200 \vadjust{\uchyph=0\ BBBBBB}% underfull box will show no hyphens
201 \vadjust{\ \closeout1BBBBBB}{\hyphenchar\trip'C}% this time we get hyphens
202 \hyphenation{BbB-BbB}\vadjust{\ BBBBBB\kern0ptB}% different hyphens
203 \hyphenchar\rip'-\vadjust{\def\B{B}\ \pretolerance10000 B\B BBBB} % no hyphens
204
205 \hbox{\sfcode'B=1234AB aB }\noindent \scriptscriptfont3 \smalltrip
206 $$\eqno^{}$\scriptfont3=\rip\fontdimen2\smalltrip=0pt
207 {\rightskip0pt plus **104pt** minus **100fil**
208   \looseness 5 \spaceskip 4pt plus 2pt minus 1fil
209   A\spacefactor32767\discretionary{}{-}{B\kern2pt} C$ \scriptfont2=\trip

```
210   \mathsurround143pt$ C $\mathsurround40pt$$\mathsurround60pt\hbox{$$}$\par}
211 \uccode'm='A\font\mumble=mumble\input tripos % "AAAAAAAAAA"+errors
212 \par\penalty-33333 % end hyphenation, math is next
213 {\catcode'?=13 \font?xyzzy at0pt\font ? xyzzy scaled1?} % nonexistent
214 \font\enorm=trip at 2047.999992370605468749999 pt
215 \font\ip trip at -10pt % through the looking glass
216 \showthe$
217 \showthe\font
218 \message{\fontname\ip}
219 \rip
220 \textfont1=\font \scriptfont1=\smalltrip \scriptscriptfont1=\bigtrip % [sic]
221 \def\symbolpar #1*#2*#3*{\global\fontdimen#1\smalltrip = #3 pt}
222 {\tracingmacros-1         .
223    \symbolpar8 num1 9.1
224    \symbolpar9 num2 9.2
225    \symbolpar10 num3 9.3
226    \symbolpar11 denom1 3.1
227    \symbolpar12 denom2 3.2
228    \symbolpar13 sup1 8.1
229    \symbolpar"E sup2 8.2
230    \symbolpar15 sup3 8.3
231    \symbolpar16 sub1 4.1
232    \symbolpar17 sub2 4.2
233    \symbolpar18 supdrop 0.3
234    \symbolpar19 subdrop 0.4
235    \symbolpar20 delim1 10
236    \symbolpar21 delim2 20
237    }
238 \mathcode'+='20457 % mathbin, family I, character '57 (/)
239 \mathcode'=="322D % mathrel, family 2, character "2D (-)
240 \delcode'["161361 % small (family I, character "61 (a)), large (3,"61)
241 \catcode'(=13 \catcode'(=13 \mathcode'y"7320\mathcode'z"8000
242 \def({\delimiter"4162362 }{\catcode'z=13\global\let z=(}
243 \parshape 10 \a \chardef\x200
244 \hangindent- \parshape pt\hangafter-12% \parshape will take precedence
245 \begingroup
246 \looseness 2
247 \rightskip 0pt plus 10fil minus 1sp
248 \--\--\char-0-A\- % this makes lines 1 to 3
249 $$\number\the\delcode'\relax\over{{{}}}}\pagestretch=-1\pagetotal\showlists
250 \halign to\the\displaywidth{#&#\crcr\crcr\cr} % the display counts as lines 4--6
251 \global\count6=\displayindent
252 \predisplaypenalty=101
253 \global\postdisplaypenalty-\predisplaysize*
254 \eqno % another error (actually causes two error messages and inserts $$)
255 \looseness-2
256 $\right\relax\mathchardef\minus="322D % locally \minus is the same as =
257 \left.A\over A\abovewithdelims .?\right(+\mskip1A\minus=A+\penalty+1000A
258 \relpenalty-2222
259 \binoppenalty-3333
260 \mathsurround.11em$\x % this formula goes on line 7
261 $$ % here we begin a hairy display that covers lines 8 to 10
262 \mkern-9mu \the\prevgraf \prevgraf=8 \insert255{\penalty999}
```

```
263 \x\vcenter spread-2pt{} {\mathaccent"32D {A}}|-
264 ^{\raise 2pt\hbox{a}\displaystyle\char'+\textstyle}
265 \overline{^A A|\minus\mathinner{}^
266    (A \mathchar"141 \char'B^^A{\mathaccent"7161
267       {\mathop A \mathbin A \mathopen A \mathpunct A\mathclose A \mathrel A
268          \global\scriptscriptfont0=\trip
269          \mathaccent"161 {\fam13A9\the\scriptscriptfont-1}}}}}}
270 \mathop\char'B^\mathchar"143
271 \mathop b\nolimits\limits|C
272 \mathord \radical"161 % missing { will be inserted
273    {\textstyle\radical"282382{\left(\scriptscriptstyle\mathop{\underline{
274          A\atop\displaystyle A|{A\hfil\over B\nonscript\kern1pt}^=}}
275       \nolimits|{\mathop y\nonscript\textstyle\nonscript\mskipQmu minuslfil
276          \showthe\lastskipB\abovewithdelims(.2pt\displaylimits}^z
277          \discretionary{\showthe\spacefactor-}{\smalltrip A\hss}{\smalltrip A}
278       \right[A}}}
279 \let\penalty=\minus
280 \eqno\scriptstyle\penalty % reader, be alert
281 (\mathpunct{AA}
282 |{B\fam1-}^{\hbox{A}}{\above9pt{u\overwithdelims..
283       \displaystyle{A\atopwithdelims((\vrule height 9pt}}
284    \show\penalty
285    \showlonglists$$ % end of the hairy display, missing } will be inserted
286 \parshape=-1 % now the hanging indentation is relevant
287 \leftskip \parshape pt plus -10fil
288 \spacefactor1\raise1pt\hbox{\special{\the\hangafter} } \penalty-10000
289 \showbox0\spacefactor=0
290 \write10{\the\spacefactor}\par % it's illegal to \write the space factor
291 } % this fails to match \begingroup
292 \endgroup % this restores \parshape
293 \mark{\the\spacefactor} % \spacefactor: not in vertical mode
294 $$\global\count7=\predisplaysize
295 \mskip18mu minus 18mu \catcode'J=13 \catcode'j=\the\catcode'J \def j{\relax}
296 \vtop to\displaywidth{\everydisplay{\global}\vbox to -1sp{}\noindent$$
297    \count9=\predisplaysize\lowercase{AaJ}$$}\hss
298 \leqno\mathchardef A\/\left(\over\left($$
299
300 \hangindent1pt\par\showthe\hangindent\hangindent  254cm
301 \parfillskip Opt plus 100pt
302 \the\fam % begins a paragraph, but there's no 0 in the font
303 A \char'202$$\global\count8=\predisplaysize\leqno\kern1009pt$\par
304 \showlists {\catcode'!13\global\everyhbox{\def!{}}}
305 \count5=\lastskip % \lastskip=3pt (\belowdisplayskip)
306 \baselineskip 10pt
307 {\sfcode'A=500\vfuzz18pt\everyvbox{ }% overfull \vbox won't be shown: 37-8=11+18
308    \vbox to 11pt(\hsize 10pt\tolerance 1 A A A A A\clubpenalty10000\par
309       \hbadness100\hfuzz 3pt A A A A A\leaders\vrule\hskip5pt\par}
310    }
311 \vbox to 10pt{\hbadness 99\hfuzz1pt\hbox to Opt{\hskip 10pt minus 9pt}
312    \hbadness100\hbox to 10bp{\hskip Opt plus 10pt}\tracingcommands1 \if00\fi}
313 \lineskiplimit-1pt\everyhbox{}
314 \def\space{ } \dimendef\df=188 \dimen188=1pt
315 \vbox to 11pt(\tracinglostchars-9 A\/\space\space\ignorespaces\space\space J
```

```
316   \vskip2pt\moveleft1pt\vbox to10pt{\boxmaxdepth=-1pt\mark{vii}}\vskip3pt
317   \unskip\setbox22=\lastbox\showthe\lastskip % \lastskip=-1pt (\baselineskip)
318   \unskip\vskip-\lastskip\kern\lastkern\penalty\lastkern\showbox22}
319 \showbox22\kern3pt\message{\the\lastkern}\unkern
320 \show\botmark
321 \lineskiplimit-0.9999 \space\df\space\count9 0
322 \vbox\space to 11pt{\accent\x\space\accent\space"42 \def\^^M{\ } \char'101
323 A\      \fontdimen    4  \trip  =  88    pt\     \spaceskip    2    pt      \
324   \vskip 10pt minus 10pt}
325 \penalty-2147483647 % that's the largest value TeX will scan
326 \penalty-2147483648 % see?
327 \tabskip 1009.9sp minus .25cc % and now for alignment tests
328 \let\A=\relax\count1=2{\errhelp{all is lost}\errmessage{}}
329 \def\d#1\d{#1#1} \looseness-1
330 \setbox3=\vtop{\vskip-3mm} % this box has a depth of -3mm
331 \halign spread-12.truedd{&#\span\iftrue\A\span\else\span\fi\span&
332   \vbox{\halign to 0pt{\t2\dp3\A\crcr}#A}
333   &\hss\tabskiplex plus7200bp minus 4\wd4\d#\d\cr % \d#\d becomes (erroneous) ##
334   \global\let\t=\tabskip \spaceskip=4pt minus 1sp
335   \def\A{B}\def\xx{\global\gdef\A{\global\count\count1=####\cr
336     \omit\cr\tabskip}}\expandafter\xx\span % please don't ask what this does
337   A&\omit\valign to -5pt{#&#\cr A\char'}\span\cr{ }\span\cr}\cr
338   \global\edef\A{\uppercase{
339     \message{\fontname\smalltrip\the\font\romannumeral1009}\lowercase{uq}} }
340   \lccode'Q='b \span\omit$$\span\At\show\cr\omit\cr
341   \noalign{\global\prevdepth20pt\errmessage{\count2=\the\count2}}
342   \omit\mark{a}&\omit\mark{b}\cr} % \count2 was set to -6mm=-1118806sp
343 \errmessage{\prevdepth=\the\prevdepth}
344 \penalty-88888 % end alignment test, now miscellaneous error messages
345 \newlinechar` \global\unskip\newlinechar\lastpenalty\unpenalty\unkern\lastbox
346 \penalty5\message{\the\lastpenalty\the\newlinechar}\textfont16=\relax
347 \outer\def{}?
348 \dimen5=-'7777777777sp\showthe\dimen5 % this should be OK
349 \dimen6=-'40000pt\showthe\dimen6 % this should overflow
350 \dimen7=.51\dimen5\showthe\dimen7 \multiply\dimen7 2\showthe\dimen7
351 \a^^@^^@a@ % an undefined control sequence followed by invalid character
352 {\aftergroup\gobble\aftergroup\c\gdef\b{\c} \def\c{} \b} % \c undefined
353 \def\b#1\par{}
354 \outer\gdef\a^^@^^@a#1\par#2{}\tokens{\a^^@^^@a\par!
355 \long\gdef\l#1{}
356 \outer\global\long\edef\lo#1#2U3#4#5#6#7#8#8#9#{\relax}
357 \ifcase 1 \undefined\or\l\par\b{\par % occurrence of \par aborts \b
358 \b{\l\undefined}\par\else\b{\par}\fi % but not there!
359 \ifcase\iftrue-1a\else\fi \ifcase0\fi\else\ifcase5\fi\fi
360 \catcode'^^C = 6 % another parameter symbol
361 \let\^^C=\halign
362 \def\^^@^^C{}
363 \^^C{{\span\ifcase3 \lo#\cr............89{}}\cr} % runaway preamble?
364 \def\a^^C1{\d#1\d\l1{#2}\l#1\par\a^^@^^@a#1\par# % runaway in definition; #2 bad
365 \xdef\a^^C1{\d#1\d\l1{#2}\l#1\par\a^^@^^@a#1\par# % runaway in definition; #2 OK!
366 ^^?a^^@^^@a\par{\lo\par % runaway in use
367 \lo\par\par\par  P \par\par\par\par\par\par89{} \muskip3=-\thickmuskip
368 \muskipdef\shmip=3 \shmip=5mu plus \muskip3minus.5\shmip \showthe\shmip
```

```
369 {\advance\shmip by \shkip\endlinechar-1
370 \divide\shmip by \shkip\endlinechar'}
371 \global\multiply\shmip by 2
372 \showthe\shmip
373 \div^^)de\count88
374 By ^^p \toks1={\a\test}
375 ^\leaders\vrule\mskip\shmip M\leaders\hrule\nonscript\hskip\thinmuskip
376
377 {\setbox3\hbox{\vfill\vsplit 3 0pt}
378 \def\a#2{}
379 \show A
380 \show\a^^@^^@a
381 \show (
382 \message{\meaning\lo\noexpand\lo}
383 \show\^^C
384 \show\batchmode
385 \show\error
386 \showthe\output
387 \showthe\thinmuskip
388 \showthe\fontdimen1\enorm
389 \ifx  T\span\else\par\if\span\else\else\else\fi\fi
390 \ifdim72p\iftrue tli\fi n\fi\fi \message{\jobname\ifx\lo\lo OK}\fi
391 \hangindent 2pt
392 {\if 11 \prevgraf=--1\if 0123\error\else\relax\fi\else\error\fi
333   \prevgraf1\global\hangafter=2}\showthe\hangafter\showthe\prevgraf
394 \char'203\showthe\prevgraf$\indent\mark{twain}
395 \setbox3\hbox{\vrule}&\moveleft\lastbox % can't do that in math mode
396 \unhbox234\unhcopy3\accent\x\vfill\vfil\vfilneg\vss % \vfill exits, \vss bad
397 \def\a}
398 \def\a{ab
399
400   \c}\def\b{ab*\par\c}\let\c\b \def\b{\a\c} \ifx\a\ifx \.
401 \else\expandafter\ifx\b   \ifinner\error\else\relax\fi\else\error\fi\fi
402 \ifvmode$\ifmmode\hbox tt\ifhmode\hfilneg\else\error\fi}$\fi\fi % missing {
403 \noalign\omit\endcsname % these are extra
404 \fontdimen1000=20\varunit\showthe\fontdimen1000\trip\let\PAR=\par
405 \gdef\par{\relax\PAR}\expandafter\ifx\csname xyzzy\endcsname\relax \mag=1999
406
407 \fi\noindent\halign to 1truemm{#&#&\1{#}\cr
408   \global\let\endt=&\endt&$&&&.}
409
410 \hbox{\/\hrule\textfont3=\enorm\prevdepth\advance\xspaceskip by-\xspaceskip
411   \spacefactor2000{ }\everymath{\radical"3}\fontdimen2\rip=0pt
412   $62{}\delimiterfactor1600\left(Aa$AA\/}
413 \openin 15 tripos\closein 15\iftrue{\ifeof 15\openin 100 tripos
414   \def\loop{\ifeof 0\let\loop=\relax\else{\global\read0to \a}\show\a\fi\loop}
415   \catcode'015\catcode'[1\outer\def\uppercase{}\loop}\else\fi
416 \endt\def\test#1{\let\test= }\test. \show\test
417 \def\a#1{\ifcat#1 \message\ifx#1 {\the\tokens\fi\fi}}
418 \pretolerance-1\tokens\toks1\unhbox16\par\everycr{\noalign{\penalty97}}
419 \ifcase1\or\ifeof\fi\def\stopinput{\error\let\input\die}
420 \let\lb={\let\rb=}\halign\relax{\span\iffalse}\fi\cr#&\ifnum0='{\fi\cr\cr}
421 \def\trap#1{\def#1{danger}\global\let\trap#1\show#1\trap}\def\unbalanced
```

```
422     {\halign\lb}\unbalanced#\cr\relax\expandafter\trap\cr\show\cr\trap}
423
424 \expandafter\stopinput\input tripos\endinput\input % one line of tripos
425 \setbox10=\vbox to8192pt{\hbox{\hbox{\vadjust{A}}}}\vrule\unhbox10\hrule
426 \output{\showthe\deadcycles\global\advance\countz by1\global\globaldefs-1
427     \gdef\local{}\unvbox255\end\rb}\futurelet\dump\maxdeadcycles=3\show\dump
428 \catcode`q=7 \catcode`\qqM=0 \expandafter\let\csname^^Mendcsname=\^^@\relax
429 \relax \catcode`\^^M=13 \defqqM{\relax}#\begingroup{\showboxdepth=4\showbox10}
430
431 \long\def\l#1\l{#1}\immediate\write10{\string\caution \l} % living dangerously
432 \escapechar`|\tracingoutput0\shipout\vbox{\copy10\box10}
433 \setbox9\hbox{\fontdimen8\rip Opt % \over becomes \atop in \scriptstyle
434     \afterassignment\relax\advance\prevdepth\afterassignment\relax\futurelet\x
435     \message{\noexpand\l\meaning\l\the\skewchar\ip}\vbox{\hyphenchar\ip-1%
436     \-\ BBBBBB}\if$\expandafter\noexpand\dol\fi% hyphenation is suppressed
437     \expandafter\expandafter\noexpand\undefined\noexpand\expandafter%
438     $\begingroup\mathop{\vbox{\vss}}\limits^\mathchoice{}a}{A|{}}{\mathchoice}
439     {}{\relax{}{B\over}\endgroup\showlonglists$}\showboxbreadth9\showboxdepth9
440 \showbox9\PAR{\output{}\penalty-10001\deadcycles=2}\scrollmode%
441 \hbox{\write-100000{\if01{\else unbal}\fi}\showlists\tracingonline1%
442 \escapechar127\global\tracingoutput1\global\escapechar128\end
443 % things not tested:
444 % interaction (error insertion/deletion, interrupts, \pausing, files not there)
445 % system-dependent parsing of file names, areas, extensions
446 % certain error messages, especially fatal ones
447 % things that can't happen in INITEX
448 % unusual cases of fixed-point arithmetic
```

Appendix C: The `TRIP.PL` **file.** The "font" defined here has only a few characters, but they include all the complexities that TeX must deal with: ligatures, kerns, lists of characters, and extensible characters. Some of the dimensions arc negative, just to make things worse yet. (The format of property-list files like this is explained in the documentation to `PLtoTF`, in the TeXware report.)

```
(FAMILY  UNSPECIFIED)
(FACE F MRR)
(CODINGSCHEME TEX TEST: NOT A REAL FONT)
(DESIGNSIZE  R  10.0)
(COMMENT DESIGNSIZE IS IN POINTS)
(COMMENT OTHER SIZES ARE MULTIPLES OF DESIGNSIZE)
(CHECKSUM 0 32107654321)
(FONTDIMEN
   (SLANT R -2.0)
   (SPACE R 0.400001)
   (STRETCH R 0.200001)
   (SHRINK R 0.1)
   (XHEIGHT R 0.46)
   (QUAD R 1.0)
   (EXTRASPACE R 0.200001)
   (PARAMETER D 8 R 0.05)
   (PARAMETER D 9 R 0.1)
   (PARAMETER D 10 R 0.200001)
   (PARAMETER D ii R 0.3)
   (PARAMETER D 12 R 0.400001)
   (PARAMETER D 13 R 0.6)
   )
(LIGTABLE
   (LABEL 0 55)
   (LIG 0 0 0 55)
   (LABEL 0 67)
   (KRN C A R 0.1)
   (STOP)
   (LABEL C A)
   (LIG C A C A)
   (KRN C B R 0.200001)
   (KRN 0 66 R 0.3)
   (STOP)
   (LABEL C B)
   (LIG C B C A)
   (LIG 0 66 C C)
   (KRN C C R 0.400001)
   (STOP)
   (LABEL C C)
   (LIG C A 0 202)
   (LIG 0 67 C B)
   (STOP)

(CHARACTER 0 0
   (CHARWD R 0.700001)
   (CHARHT R -0.1)
   (CHARDP R 0.200001)
   )
(CHARACTER 0 66
```

```
(CHARWD R -0.6)
(COMMENT
   (LIG 0 0 0 66)
   (KRN C A R 0.1)


(CHARACTER 0 67
   (CHARWD R 0.1)
   (COMMENT
      (KRN C A R 0.1)


(CHARACTER C A
   (CHARWD R 0.200001)  .
   (CHARHT R 0.700001)
   (CHARDP R 0.1)
   (CHARIC R 0.1)
   (COMMENT
      (LIG C A C A)
      (KRN C B R 0.200001)
      (KRN 0 66 R 0.3)


(CHARACTER C B
   (CHARWD R 0.3)
   (CHARHT R 0.8)
   (CHARDP R 0.200001)
   (COMMENT
      (LIG C B C A)
      (LIG 0 66 C C)
      (KRN C C R 0.400001)

   )
(CHARACTER C c
   (CHARWD R 0.400001)
   (COMMENT
      (LIG C A 0 202)
      (LIG 0 67 C B)

   )
(CHARACTER C M
   (CHARWD R 0.6)
   (CHARIC R 0.200001)
   (VARCHAR
      (MID C A)
      (BOT C B)
      (REP 0 0)


(CHARACTER C a
   (CHARWD R 0.200001)
   (CHARHT R 0.700001)
   (CHARDP R 0.1)
```

```
     (CHARIC R 0.1)
     (NEXTLARGER O 202)
     )
(CHARACTER c b
     (CHARWD R 0.3)
     (CHARHT R 0.8)
     (CHARDP R 0.200001)
     (NEXTLARGER c M)

(CHARACTER O 202
     (CHARWD R 0.400001)
```

Appendix D: The TRIPIN. LOG file. When INITEX makes the TRIP. FMT file, it also creates a file called
TRIP. LOG that looks like this.

```
This is TeX, Version 1.3 (INITEX) 26 NOV 1984 13:54
**\input trip
(trip.tex
! Bad character code (128).
<to be read again>

1.26    \nonstopmode\lccode128-
                             0\mathchardef\a="8000\def\a{SC...
The numeric code for a character must be between 0 and 127.
I changed this one to zero.


 ! Bad math code (32768).
<to be read again>
                   \def
1.26 . . .\mathchardef\a="8000\def
                                \a{ SCALED 3~2769}
A numeric math code must be between 0 and 32767.
I changed this one to zero.


 ! Illegal magnification has been changed to 1000 (32769).
<to be read again>
                   \skewchar
. 1.28    \skewchar
                 \rip='B \countdef\countz % \countz will be \c...
The magnification ratio must be between 1 and 32768.


 ! Missing number, treated as zero.
<to be read again>
                   \def
 1.29    \def
         \on{1}\toksdef\tokens=256 \show\errorstopmode
A number should have been here: I inserted '0'.
 (If you can't figure out why I needed to see a number,
· look up `weird error' in the index to The TeXbook.)


 ! Bad register code (266).
 1.29 . . .{1} \toksdef\tokens=256
                                \show\errorstopmode
A register number must be between 0 and 266.
I changed this one to zero.


> \errorstopmode=\errorstopmode.
 1.29 . . .=256 \show\errorstopmode



> \rip .
<recently read> \font

 1.30    \showthe\font
                   \showthe\pageshrink\showthe\pagegoal
```

> 0.0pt.
1.30 ...font \showthe\pageshrink
                                      \showthe\pagegoal

> 16383.99998pt.
1.30 ...shrink \showthe\pagegoal

! Bad \patterns.
1.33   \patterns{\?
                    50aa1b3 *1aca. bb bbl 0b2b0 b1c} % remembe...
(See Appendix H.)

! Nonletter.
1.33   \patterns{\?50
                    aalb3 *1aca. bb bbl 0b2b0 b1c} % remembe...
(See Appendix H.)

! Duplicate pattern.
1.33 . . . 1b3 *1aca. bb bb1 0b2b0
                                   b1c} % remember that *==space
(See Appendix H.)

! Illegal unit of measure (replaced by filll).
1.35 ...ip200 = 10pt plUs5fillll
                                  minus 0 fill
I dddon't go any higher than filll.

\one \csname
Beginning to dump on file trip.fmt
 (preloaded format=trip 84.11.25)
1177 strings of total length 22702
467 memory locations dumped; current usage is 92&270
330 multiletter control sequences
\font\nullfont=nullfont
\font\rip=trip
\font\smalltrip=trip at 5.0pt
\font\bigtrip=trip at 20.0pt
645 words of font info for 3 preloaded fonts
1 hyphenation exception
Hyphenatibn trie of length 137 has 6 ops
No pages of output.

AppendixE:TheTRIP.LOG file.   Here is the major output of the TRIP test; it is generated by running INITEX and loading TRIP.FMT, thenreadingTRIP.TEX.

```
This is TeX, Version 1.3 (preloaded format=trip 84.11.25) 26 NOV 1984 15:09
** &trip t r i p
(trip. tex ##
(vertical mode: \tracingrestores}
{\write}
{blank space }
{\openout}

! Bad number (-7).
<to be read again>
                    8
1.94 \openout-'78
                    terminal \openoutlO=tripos % we will write t...
Since I expected to read a number between 0 and 15,
I changed this one to zero.

{\openout}
{\write}
(blank space }
{\write}
{blank space }
{\write}
(blank space }
{\vsize}
{\vbadness}
{\topskip}
{\penalty}
{\maxdepth}
{\tracingoutput}
{\moveleft}
%%g o a l  height=2000.0, max depth=2.0
% t=0.0 g=2000.0 b=10000 p=0 c=100000#
{\moveright}
(restricted horizontal mode: \vrule}
{end-group character }}
% t=20.0 plus 1.0fil g=2000.0 b=O p=0 c=0#
(vertical mode: blank space }
{\penalty}
% t=48.0 plus 41.0 plur 1.0fil g=2000.0 b=O p=-10000 c=-10000#

Completed box being shipped out [0.0.0.0.11]
\vbox(2000.0+2.0)x21.0, g l u e set 1952.0fil
.\write-{log file only)
.\openout0=8terminal
.\openoutlO=tripoa
.\write 100
.\write10{\uppercase {\number {\outputpenalty }}}
.\write10{[\uppercase {\romannumeral -\the \outputpenalty }}
.\glue(\topskip) 9.6 plus 1.0fil
.\vbox(10.4+0.0)x-2.0, shifted -20.0
..\rule(0.4+0.0)x*
..\glue 10.0 plus 6.011111
.\glue(\baselineskip) 10.0 plue 41.0
.\hbox(0.0+20.0)x1.0, shifted 20.0
..\rule(-19.0+20.0)x1.0

log file only
{no mode: \number}

! Missing number, treated as zero.
<to be read again>
                        {
<write> \uppercaee {\number {
                                \outputpenalty }}
<inserted text>
                    }\endwrite
1.106 \penalty-10000
                    % now we'll compute silently for awhile,...
```

A number should have been here; I inserted '0'.
(If you can't figure out why I needed to see a number,
look up 'weird error' in the index to The TeXbook.)

{\romannumeral}
{\the}
Memory usage before: 155&302; after: 980270; still untouched: 1621
{vertical mode: \batchmode}

{\output}
{blank space }
{\setbox}
(Internal vertical mode: end-group character }}
(vertical mode: blank apace }
{\dimen}
(begin-group character {}
{\output}
(blank space }
{\insert}
{internal vertical mode: \def}
{blank space }
{\vskip}
{\baselineskip}
{\lineskip}
{\vbox}
(end-group character }}
{\penalty}`
{\vbox}
{end-group character }}
{\penalty}
{\vbox}
(end-group character }}
{\penalty}
(end-group character }}
(restoring \lineskip=0.0pt plus 40.0pt}
(restoring \baselineskip=10.0pt plus 41.0pt}
{restoring \box=\box}
%% goal height=2000.0, max depth=2.0
! Insertions can only be added to a vbox.
1.126   3
            % since \dimen100=803pt<3*267.7pt, the insertion . . .
Tut tut: You're trying to \insert into a
\box register that now contains an \hbox.
Proceed, and I'll discard its present contente.

The following box has been deleted:
\hbox(7.0+1.0)x2.0
.\rip A

! Infinite glue shrinkage inserted from \skip100.
1.126   3
            % since \dimen100=803pt<3*267.7pt, the insertion . . .
The correction glue for page breaking with insertions
must have finite shrinkability. Dut you may proceed,
since the offensive shrinkability has been made finite.

% split100 t o   803.0,267.7 p=-101
(vertical mode: blank space }
{\topskip}
{\vbox}
(internal vertical mode: end-group character }}
% t=0.0 plus 3.011111 minus 9.0 g=1470.63013 b=0 p=0 c=-101#
(vertical mode: blank space }
{\insertpenalties}
{\penalty}
{\cleaders}
{restricted horizontal mode: \lower}
(internal vertical mode: end-group character }}
<restricted horizontal mode: blank space }
{\leaders}
{\cleaders}

```
{the letter A3
{end-group character }}
{\leaders}
{the letter A3
(end-group character }}
{\xleaders}
{the letter A)
(end-group character }}
{\write}
{blank s p a c e }
(end-group character }}
(vertical mode: \mark}
(blank space }
(the letter A3
% t=1050.0 plus 44.0 plus 3.011111 minus 19.0 g=1470.63013 b=0 p=0 c=-50
(horizontal mode: the letter A)
{\insert}
<internal vertical mode : \baselineskip}
{\splittopskip}
{\hbox}
{restricted horizontal mode: \vadjust}
(internal vertical mode: \penalty}
{end-group character }}
(restricted horizontal mode: end-group character }}
<internal vertical mode : \hbox}
(restricted horizontal mode: end-group character }}
{internal vertical mode: end-group character }}
(restoring \splittopskip=1.0pt plus 43.0pt}
<restoring \baselineskip=10.0pt plus 41.0pt}
(horizontal mode: \showthe}
> 1050.0pt.
<everypar> ...howthe \pagetotal
               \                          \showthe \pagegoal \advance \...
<to be read again>               .     .
                       A
1.140     A
          AA\everypar=\errhelp % because of previous \everypar.


{\showthe}
> 1470.63013pt.
<everypar> ...showthe \pagegoal
                                 \advance \count 15by1\mark {\...
<to be read again>
                       A
1.140     A
          AA\everypar=\errhelp % because of previous \everypar...


{\advance}
{\mark}
{\splitmaxdepth}
{\par}
0firstpass
0secondpass
[] \rip A[][]
0\par v i a  000 b=* p=-10000 d=0
001: l i n e  1.3- t=0 -> 000


Overfull \hbox (2.0pt too wide) in paragraph at lines 140--140
[]\rip A]

\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
. \penalty 10000
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0


{vertical mode: the letter A}
% t=1060.0 -plus 127.0 plus 8.011111 minus 27.0 g=1255.43756 b=0 p=0 c=-5
```

```
0
(horizontal mode: the letter A}
{\insert}
(Internal vertical mode: \baselineskip}
{\splittopskip}
{\hbox}
(restricted horizontal mode : \vadjust}
{internal vertical mode: \penalty}
(end-group character }}
(restricted horizontal mode: end-group character }}
(Internal vertical mode : \hbox}
{restricted horizontal mode: end-group character }}
(internal vertical mode: end-group character }}
(restoring \splittopskip=1.0pt plus 43.0pt}
(restoring \baselineskip=10.0pt plus 41.0pt}
(horizontal mode: \showthe}
> 1061.0pt.
<everypar>...howthe \pagetotal
                                    \showthe \pagegoal \advance \...
<to be read again>
                          A
1.140 A A
         A\everypar=\errhelp % because of previous \everypar...

{\showt he3
> 1255.43766pt.
<everypar>`...showthe \pagegoal
                                    \advance \count 15by1\mark {\...
<to be read again>
                          A
1.140 A A
         A\everypar=\errhelp % because of prevlour \everypar...

{\advance}
{\mark}
{\splitmaxdepth}
{\par}
@firstpass
Qeecondpase
Cl \rip A[][]
O\par via 000 b=* p=-10000 d=0
@@1: l i n e  1.3- t=0 -> @@0


Overfull \hbox (2.0pt too wide) In paragraph at lines 140--140
[]\rip A|

\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
. \penalty 10000
.\glue(\parfillskip) 0 . 0
.\glue(\rightskip) 0 . 0
.\rule(*+*)x5.0

{vertiçal mode: the letter A)
% t=1070.0 plus 210.0 plus 8.011111 minus 36.0 g=1055.44061 b=7 p=0 c=-4
3
{horizontal mode: the letter A3
{\insert}
(internal vertical mode: \baselineskip}
{\splittopskip}
{\hbox}
(restricted horizontal mode: \vadjust}
(internal vertical mode: \penalty}
(end-group character }}
(restricted horizontal mode: end-group character }}
<internal vertical mode: \hbox}
{restricted horizontal mode: end-group character }}
<internal vertical mode: end-group character }}
(restoring \splittopskip=1.0pt plus 43.0pt}
```

```
{restoring \baselineskip=10.0pt plue 41.0pt}
{horizontal mode: \showthe}
> 1071 .Opt.
<everypar> . . .howthe  \pagetotal
                                   \showthe \pagegoal \advance \...
<to be read again7
                        A
1.140    AAA
            \everypar=\errhelp % because of previous \everypar...

{\showthe}
7 1055.44061pt.
<everypar> . . .showthe  \pagegoal
                                  \advance \count 15by1\mark {\. . .
<to be read again7
                        A
1.140    AAA
            \everypar=\errhelp % because of previous \everypar . . .

{\advance}
{\mark}
{\splitmaxdepth}
{\par}
Ofirstpass
Osecondpaes
[] \rip A[] []
O\par via OOO b=* p=-10000 d=0
001: line 1.3- t=0 -7 000


Overfull \hbox (2.0pt too wide) in paragraph at lines 140--140
[]\rip A|

\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
.\penalty 10000
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0


% split200 to -51.11694,0.0 p=999
<vertical mode: \everypar}
{\kern}
<the letter A3
% t=1080.0 plus 293.0 plue 8.011111 minus 43.0 g=1055.44061 b=18 p=0 c=9
67            .
{horizontal mode: the letter A3
{\hfill}
{\vad just)
{internal vertical mode: \special}
{\penalty}
<end-group character }}
{horizontal mode: \penalty}
{the letter A3
{\par}
Ofirstpass
Osecondpaes
[]\rip A
0 via OOO b=* p=0 d=0
OO1: line 1.3 t=O -> OOO
[]
O\penalty via 001 b=* p=-10000 d=O
OO2:line 2.2 t=0 -7 OO1
A
O\par v i a  OO2 b=* p=-10000 d=0
003: line 3.3- t=0 -7 OO2


Overfull \hbox (2.0pt too wide) in paragraph at lines 145--148
[]\rip A|
```

```
\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0


Overfull \hbox (2.0pt too wide) in paragraph at lines 145--148
\rip A|

\hbox(7.0+1.0)x0.0
.\rip A
.\penalty 10000
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0

% t=1040.0 plus 376.0 plus 8.011111 minus 61.0 g=1055.44061 b=0 p=0 c=94
9
% t=1050.0 plus 417.0 plus 8.011111 minus 61.0 g=1055.44061 b=0 p=-5000
c=-4051#
(vertical mode: \insert}
<Internal vertical mode: \vskip}
{\floatingpenalty}
(end-group character }}
{restoring \floatingpenalty=100}
(vertical mode: \pagefilstretch}
{\showthe}
> 962.
l.149 . . .ehowthe\ineertpenaltiee
                              \penalty99999999\showlists

{\penalty}
{\showlists}

### vertical mode entered at line 0
### current page:
\insert100, natural size 803.09999; eplit(1.0 plus 43.0,-2.0); float cos
t 100
.\glue 0.0 plus 1.0fil
.\vbox(267.7+0.0)x0.0
.\penalty -101
.\glue(\lineskip) 0.0 minus 0.4
.\vbox(267.7+0.0)x0.0
.\penalty -100
.\glue(\lineskip) 0.0 minus 0.4
.\vbox(267.7+0.0)x0.0
.\penalty -1000
\glue(\topskip) 0.0 plus 44.0
\vbox(1000.0+0.0)x0.0
\penalty 12346
\cleaders 60.0 minus 10.0
.\hbox(15.0+2.0)x45.0
. .\vbox(17.0+0.0)x0.0, shifted 2.0
..\glue 4.0 plus 2.0 minus 1.0
..\leaders 10.0
...\rule(0.4+0.0)x*
..\cleadere 9.0
...\hbox(7.0+1.0)x2.0
. . ..\rip A
..\leadere 9.0
...\hbox(7.0+1.0)x2.0
....\rip A
..\xleadere 9.0
...\hbox(7.0+1.0)x2.0
....\rip A
..\write*{\help }
..\glue 4.0 plus 2.0 minus 1.0
\mark{alpha}
\glue(\parskip) 0.0 plus 42.0 minus 8.0
```

```
\glue(\baselineskip) 3.0 plus 41.0
\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
.\penalty 10000
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0
\insert200, natural size 400.0; split(0.0,-2.0); float cost 100
.\hbox(0.0+0.0)x0.0
.\penalty 999
.\glue(\baselineskip) 400.0
.\hbox(0.0+0.0)x-10.0
\mark{1}
\glue(\parskip) 0.0 plus 42.0 minus 8.0
\glue(\baselineskip) 2.0 plus 41.0
\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
.\penalty 10000
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0
\insert200, natural size 400.0; split(1.0,-1.0); float cost 100
.\hbox(0.0+0.0)x0.0
.\penalty 999
.\glue(\baselineskip) 400.0
.\hbox(0.0+0.0)x-10.0
\mark{2}
\glue(\parskip) 0.0 plus 42.0 minus 8.0
\glue(\baselineskip) 2.0 plus 41.0
\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
.\penalty 10000
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0
\insert200, natural size 400.0: split(2.0,-1.0); float cost 100
.\hbox(0.0+0.0)x0.0
.\penalty 999
.\glue(\baselineskip) 400.0
.\hbox(0.0+0.0)x-10.0
\mark{3}
\kern -60.0
\glue(\parskip) 0.0 plus 42.0 minus 8.0
\glue(\baselineskip) 2.0 plus 41.0
\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0
\glue(\baselineskip) 9.0 plus 41.0
\hbox(0.0+0.0)x0.0
.\penalty -1000000000
.\glue(\rightskip) 0.0
\special{-1000.0pt}
\penalty -6000
\glue(\baselineskip) 3.0 plus 41.0
\hbox(7.0+1.0)x0.0
.\rip A
.\penalty 10000
.\glue(\parfillskip) 0   .   0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0
\insert200, natural size 10000.0; split(1.0 plus 43.0,-1.0); float cost
3
.\glue 10000.0
\penalty 99999999
total height 1060.0 plus 468.0 plus -1.0fil plus 8.011111 minus 61.0
 goal height 1066.44061
```

```
\insert100 add8 636.36987, #1 might split
\insert200 adds 406.19714, #3 might split
prevdepth 1.0, prevgraf 3 lines

! OK.
<recently read> \showlists

1.149 ...nalty99999999\showlists


{\showthe}
> 8.0pt.
1.160 ...howthe\pagefilllstretch
                              \vskip 1000pt\penalty-333\hbo...

{\vskip}
{\penalty}
% t=2061.0 plus 468.0 plus -1.0fil plus 8.011111 minus 61.0 g=1055.44061
 b=* p=-333 c=*
! \box255 is not void.
<to be read again>
                     \hbox
1.160 ...1000pt\penalty-333\hbox
                              to 23pt{} % output now
You shouldn't use \box255 except in \output routines.
Proceed, and I'll discard its present contents.
                  ~
The following box has been deleted :
\vbox(0.0+0.0)x0.0

(internal vertical mode: \dimen}
{\count}
{\global}
{\setbox}
{\shipout}
{restricted horizontal mode: \box}
{\box}
{\vsplit}

Overfull \vbox (986.0pt too high) has occurred while \output is active
\vbox(55.0+-1.0)x45.0, glue set - 1.0
.\glue(\topskip) 0.0 plus 44.0
.\vbox(1000.0+0.0)x0.0
.\penalty 12346
.\cleadere 60.0 minus 10.0
..\hbox(15.0+2.0)x45.0
...\vbox(17.0+0.0)x0.0, shifted 2.0
...\glue 4.0 plus 2.0 minus 1.0
...\leaders 10.0
....\rule(0.4+0.0)x*
...\cleaders 9.0
....\hbox(7.0+1.0)x2.0
.....\rip A
...\leaders 9.0
....\hbox(7.0+1.0)x2.0
.....\rip A
...\xleaders 9.0
....\hbox(7.0+1.0)x2.0
.....\rip A
...\write*{\help }
...\glue 4.0 plus 2.0 minus 1.0
.\mark{alpha}

<end-group character }}

Completed box being shipped out [-5000.0.0.0.11.53110374]
\hbox(810.4+0.0)x45.0
.\vbox(267.7+0.0)x0.0
..\glue 0.0 plus 1.0fil
..\vbox(267.7+0.0)x0.0
.\vbox(810.4+0.0)x0.0
```

```
..\rule(0.4+0.0)x*
..\glue 10.0 plus 6.011111
..\hbox(0.0+0.0)x0.0
..\penalty 999
..\glue(\baselineskip) 400.0
..\hbox(O.O+O.O)x-10.0
..\hbox(0.0+0.0)x0.0
..\penalty 999
..\glue(\baselineskip) 400.0
..\hbox(O.O+O.O)x-10.0
..\hbox(0.0+0.0)x0.0
.\vbox(55.0+-1.0)x45.0, glue set - 1.0
..\glue(\topskip) 0.0 plus 44.0
..\vbox(1000.0+0.0)x0.0
..\penalty 12346
..\cleadere 60.0 minus 10.0
...\hbox(15.0+2.0)x45.0
....\vbox(17.0+0.0)x0.0, shifted 2.0
....\glue 4.0 plus 2.0 minus 1.0
....\leaders 10.0
.....\rule(0.4+0.0)x*
....\cleaders 9.0
.....\hbox(7.0+1.0)x2.0
......\rip A
....\leaders 9.0
.....\hbox(7.0+1.0)x2.0
......\rip A
....\xleadera 9.0
.....\hbox(7.0+1.0)x2.0
.....\rip A
....\write*{\help }
. . ..\glue 4.0 plus 2.0 minus 1.0
..\mark{alpha}

Memory usage before: 743&460; after: 577&457; still untouched: 1616
(internal vertical mode: blank space }
{\unvcopy}
{\showlists}

### internal vertical mode entered at line 160 (\output routine)
\glue(\splittopskip) 0.0 plus 43.0
\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip    A
.\penalty 10000
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0
\mark{1}
\glue(\parskip) 0.0 plus 42.0 minus 8.0
\glue(\baselineskip) 2.0 plus 41.0
\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
.\penalty 10000
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0
\mark{2}
\glue(\parskip) 0.0 plus 42.0 minus 8.0
\glue(\baselineskip) 2.0 plus 41.0
\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
.\penalty 10000
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0
.\rule(*+*)x5.0
\mark{3}
\kern -60.0
\glue(\parskip) 0.0 plus 42.0 minus 8.0
```

```
\glue(\baselineskip) 2.0 plus 41.0
\hbox(7.0+1.0)x0.0
.\hbox(0.0+0.0)x0.0
.\rip A
.\glue(\rightskip) 0. 0
.\rule(*+*)x5.0
\glue(\baselineskip) 9.0 plus 41.0
\hbox(0.0+0.0)x0.0
.\penalty -1000000000
.\glue(\rightskip) 0. 0
\special{-1000.0pt}
prevdepth ignored
### vertical mode entered at line 0
### current page: (held over for next output)
\insert100, natural size 636.4; split(1.0 plus 43.0,-2.0); float cost 10
0
.\glue(\splittopskip) 0.0 plus 43.0
.\vbox(267.7+0.0)x0.0
.\penalty -100
.\glue(\lineskip) 0.0 minus 0.4
.\vbox(267.7+0.0)x0.0
.\penalty -1000
\insert200, natural size 2.0; split(2.0,-1.0); float cost 100
.\glue(\splittopskip) 2.0
.\hbox(0.0+0.0)x-10.0
### recent_contributiona:
\penalty 10000
\glue(\baselineskip) 3.0 plus 41.0
\hbox(7.0+1.0)x0.0
.\rip A
.\penalty 10000
.\glue(\parfillskip) 0. 0
.\glue(\rightskip) 0. 0
.\rule(*+*)x5.0
\insert200, natural size 10000.0; split(1.0 plus 43.0,-1.0); float cost
3
.\glue 10000.0
\penalty 99999999
\glue 1000.0
\penalty -333
prevdepth 1.0, prevgraf 3 liner

! OK.
<recently read> \showlists

<output> . . .vcopy 255\showlists
                                    \showthe \insertpenalties \me...
<to be read again>
                   \hbox
1.160 . . .1000pt\penalty-333\hbox
                                  to 23pt{} % output now

{\showthe}
> 2.
<output>...he \insertpenalties
                                    \message {\topmark :\firstmar...
<to be'read again>
                   \hbox              .
1.160 . . .1000pt\penalty-333\hbox              .
                                  to 23pt{} % output now

{\message}
{\topmark}
{\firstmark}
{\botmark}
{\splitfirstmark}
{\splitbotmark}
:alpha:3:alpha:alpha
(blank space }
{\globaldefs}
{\halign}
```

```
(blank space }
{\showboxdepth}
{\showboxbreadth}
(end-group character }}
(restoring \globaldefs=0}
(restoring \box255=
\vbox(1055.44061+0.0)x45.0, glue set 0.01306 []}
(restoring \count5=0}
(restoring \dimen9=0.0pt}
! Output routine didn't use all of \box255.
<to be read again>
                    \hbox
l.150 ...1000pt\penalty-333\hbox
                                   to 23pt{} % output now
Your \output commands should empty \box255,
e.g., by saying '\shipout\box255'.
Proceed ; I'll discard its present contents.

The following box has been deleted:
\vbox(1055.44061+0.0)x45.0, glue set 0.01306
.\glue(\topskip) 0.0 plus 44.0
.\vbox(1000.0+0.0)x0.0
.etc.

%% goal height=2000.0, max depth=2.0
! Infinite glue shrinkage inserted from \skip100.
<to be read again>
                    \hbox
l.160 . . .1000pt\penalty-333\hbox
                                   to 23pt{} % output now
The correction glue for page breaking with insertions
must have finite shrinkability. But you may proceed,
since the offensive shrinkability has been made finite.

% t=0.0 plus 8.011111 minus 9.0 g=924.23029 b=0 p=0 c=0#
% t=7.0 plus 44.0 plus 8.011111 minus 9.0 g=924.23029 b=0 p=0 c=0#
% t=17.0 plus 127.0 plus 8.011111 minus 17.0 g=924.23029 b=0 p=0 c=0#
% t=27.0 plus 210.0 plus 8.011111 minus 26.0 g=924.23029 b=0 p=0 c=0#
% t=-13.0 plus 293.0 plus 8.011111 minus 33.0 g=924.23029 b=0 p=0 c=0#
% split200 to 1832.4686.10000.0 p=-10000
% t=1008.0 plus 376.0 plus 8.011111 minus 33.0 g=-4075.76971 b=* p=-333
c=*
{\dimen}
{\count}
{\global}
{\setbox}
{\shipout}
{restricted horizontal mode : \box}
{\box}
{\vsplit}
{end-group character }}

Completed box being shipped out [10000.0.0.0.11.131072]
\hbox(535.4+0.0)x0.0
.\vbox(535.4+0.0)x0.0 []
.\vbox(2.0+0.0)x0.0 []
.etc.

Memory usage before: 471&446; after: 286&442; still untouched: 1498
(internal vertical mode: blank space }
{\unvcopy}
{\showlists}

### internal vertical mode entered at line 160 (\output routine)
prevdepth ignored
### vertical mode entered at line 0
### recent contributions:
\glue(\baselineskip) 9.0 plus 41.0
\hbox(0.0+0.0)x0.0
.\penalty -1000000000
.\glue(\rightskip) 0.0
```

```
etc.
prevdepth 1.0,  prevgraf 3 liner

! OK.
<recently read> \showlists

<output> . ..vcopy 255\showlists
                                \showthe \insertpenalties \me...
<to be read again>
                    \hbox
1.160 . . .1000pt\penalty-333\hbox
                            to 23pt{} % output now

{\showt he)
> 0.
<output>...he \insertpenalties
                            \message {\topmark :\firstmar...
<to be read again>
                    \hbox
1.160 . . .1000pt\penalty-333\hbox
                            to 23pt{} % output nov

{\message}
{\topmark}
{\firstmark}
{\botmark}
{\splitfirstmark}
{\splitbotmark}
3:1:3:1:3
{blank s p a c e }
{\globaldef 8)
{\halign}
{ b l a n k  space }
{\showboxdepth}
{\showboxbreadth}
<end-group character }}
< r e s t o r i n g  \globaldefs=0}
(restoring \box255=
\vbox(924.23029+1.0)x0.0, glue set 3.19876 []3
(restoring \count5=0}
{restoring \dimen9=0.0pt}
! Output routine didn't use all of \box255.
<to be read again>
                    \hbox
1.160 . . .1000pt\penalty-333\hbox
                            to 23pt{} % output now
Your \output commands should empty \box255,
e.g., by saying '\shipout\box255'.
Proceed ; I'll discard its present contents.

The following box ha8 been deleted:
\vbox(924.23029+1.0)x0.0, glue ret 3.19876
.\glue(\topskip) 0.0 plus 44.0
.\hbox(7.0+1.0)x0.0 []
.etc.

%% goal height=2000 .0, max depth=2 .O
% split200 to 3955.99365,10000.0 p=-10000
% t=1012.0 plus 86.0 plus 6.011111 g=-3010.0 b=* p=-333 c=*#
{\dimen}
{\count}
{\global}
{\setbox}
{\shipout}
<restricted horizontal mode : \box}
{\box}
{\vsplit}

Overfull \vbox (958.0pt too high) has occurred while \output is active
\vbox(55.0+-1.0)x0.0
.\glue(\topskip) 1.0 plus 44.0
```

```
.\hbox(0.0+0.0)x0.0 []
.etc.

(end-group character }}

Completed box being shipped out [-333.0.0.0.11.655360000]
\hbox(10000.0+0.0)x0.0
.\vbox(10000.0+0.0)x0.0 []
.\vbox(55.0+-1.0)x0.0 []

Memory usage before: 2120436; after: 1458434; still untouched: 1498
<internal vertical mode: blank space }
{\unvcopy}
{\showlists}

### internal vertical mode entered at line 160 (\output routine)
prevdepth ignored
### vertical mode entered at line 0
### recent contributions :
\penalty 10000
prevdepth 1.0, prevgraf 3 liner

! OK.
<recently read> \showlists

<output>...vcopy 255\showlists
                              \showthe \insertpenalties \me...
<to be read again>
                  \hbox
1.160 ...1000pt\penalty-333\hbox
                           to 23pt{} % output now

{\showthe}
> 0.
<output>...he \insertpenalties
                            \message {\topmark :\firstmar...
<to be read again>
                  \hbox
1.160 ...1000pt\penalty-333\hbox
                           to 23pt{} % output non

{\message}
{\topmark}
{\firstmark}
{\botmark}
{\splitfirstmark}
{\splitbotmark}
3:3:3::
{blank space }
{\globaldefs}
{\halign}
{blank space }
{\showboxdepth}
{\showboxbreadth}
(end-group character }}
{restoring \globaldefs=0}
<restoring \box255=
\vbox(-3010.0+0.0)x0.0 []}
<restoring \count5=0}
{restoring \dimen9=0.0pt}
! Output routine didn't use all ot \box255.
<to be read again>
                  \ h b o x
1.160 ...1000pt\penalty-333\hbox
                                to 23pt{} % output now
Your \output commands should empty \box255,
e.g., by saying '\shipout\box255'.
Proceed ; I'll discard it8 present contents.

The following box has been deleted:
\vbox(-3010.0+0.0)x0.0
```

```
. \glue (\topskip) 1 .O plus 44 .O
.\hbox(0.0+0.0)x0.0 []
.etc.

(vertical mode: \hbox}
(restricted horizontal mode: end-group character }}
%% goal height=2000.0, max depth=2.0
(vertical mode: blank space }
{\vsize}
{\global}
! Dimension too large.
1.161 . . .83.99999237060546875pt
                              % page size \approx infinity
I can't work with sizes bigger than about 19 feet.
Continue and I'll use the largest value I can.

(end-group character }}
<retaining \vsize=16383.99998pt}
(restoring \everypar=A\insert 200{\baselineskip 400pt\ETC.}
<restoring \splitmaxdepth=-2.0pt}
<restoring \count15=0}
<restoring \topskip=20.0pt plus 1.0fil}
(restoring \output={\tracingcommands 0\showthe \outputpenalty \ETC.}
(blank space }
{begin-group character {}
{\tracingoutput}
{\tracingstats}
{\shipout}
(restricted horizontal mode: \closeout}
{\closeout}
(end-group character }}
[-333.0.0.0.11]
(vertical mode: end-group character }}
{restoring \tracingstats=4}
(restoring \tracingoutput=1}
{blank s p a c e }
{\showthe}
> A\insert 200{\baselineskip 400pt\splittopskip \count 15pt\hbox {\vadju
et {\penalty 999}}\hbox t o -10pt{}}\showthe \pagetotal \showthe \pagegoa
1   \advance \count 15by1\mark {\the \count 15}\splitmaxdepth ~1pt \paR \  g
obble .
1.164  \showthe\everypar


{\everypar}
{\showthe}
> .
1.166  ...ypar{}\showthe\everypar


{\def}
<blank space }
{\tracingmacros}
{\def}
(blank space }
{\dimendef}
{\dimen222}
{\ifdim}

\ t 12#101001{->- .#1pt{
#1<-01001010
(true)
(begin-group character {}
{\relax}
(end-group character }}
{\else}
{\count0}
{\ifodd}
{true}
{\advance}
{\fi}
```

```
{\penalty}
% t=1.0 plus 44.0 g=2000.0 b=10000 p=-12345 c=-12345#
(internal vertical mode: \tracingcommands}
> -12346.
<output>...wthe \outputpenalty
                                \showboxbreadth 9999 \showbox...
1.164 \penalty -12346
                % output the remaining stuff


Completed box being shipped out [-2.0.0.0.11]
\vbox(2000.0+0.0)x23.0, glue set 46.43182
.\glue(\topskip) 1.0 plus 44.0
.\hbox(0.0+0.0)x23.0

Memory usage before: 1180320; after: 1020320: still untouched: 1498
(restoring \box254=void}
(restoring \hoffset=0.0pt}
(restoring \showboxdepth=1}
(restoring \showboxbreadth=2}
(restoring \tracingcommands=2}
<vertical mode: \tracingmacros}
{\adjdemerits}
{\linepenalty}
{\def3
{blank space }
{\valign}
(horizontal mode: \valign}
<restricted horizontal mode: \spacefactor}
{\global}
{end-group character }}
<blank space }
{\vrule}      ˋ
{begin-group character {} .
{blank space }
{end-group character }}
(end-group character }}
(internal vertical mode: \baselineskip}
{\global}
{\global}
{\rightskip}
{\global}
{\setbox}

\1#1->\hbox to#1pt{}
tic-2
{restricted horizontal mode: end-group character }}
{internal vertical mode: blank space }
{\noindent}
{horizontal mode: \copy}
{\hskip}
{\copy}
{\hskip}
{\lower}

\1#1->\hbox to#1pt{}
#1<-1
<restricted horizontal mode: end-group character }}
<horizontal mode : \hskip}
{\copy} ˙
{\hskip}
{\box}
{end of alignment template)
Ofirstpaee
Osecondpaes
El
0 via 000 b=10000 p=0 d-100020783
001: line 1.0 t=100020783 -> 000
[]
0 via 000 b=51 p=0 d=2704
0 via 001 b=10000 p=0 d=100020001
```

```
002: line 1.1 t=2704 -> 000
 Cl
 0 via 000 b=30 p=0 d=961
 0 via 001 b=10000 p=0 d=100020001
 0 via 002 b=10000 p=0 d=100020001
003: line 1.3 t=961 -> 000
 Cl
 0 via 002 b=10000 p=0 d=100020001
 0 via 003 b=10000 p=0 d=100020783   .
004: line 2.0 t=100021744 -> 003
 []
 0\par via 002 b=0 p=-10000 d=1
 0\par via 003 b=30 p=-10000 d=1743
 0\par via 004 b=10000 p=-10000 d=100020001
006: line 2.1- t=2704 -> 003
006: line 2.2- t=2705 -> 002
```

```
Tight \hbox (badness 30) in paragraph at lines 183--183
 Cl [] Cl
```

```
\hbox(0.0+2.0)x13.0, glue set - 0.66667
.\glue(\leftskip) 4.0
.\hbox(0.0+0.0)x2.0
.etc.
```

```
Loose \hbox (badness 30) in paragraph at lines 183--183
 Cl []
```

```
\hbox(0.0+0.0)x13.0, glue set 0.66667
.\glue(\leftskip) 4.0
.\hbox(0.0+0.0)x2.0
.etc.
```

```
<restoring \box2=void}
(restoring \rightskip=0.0pt}
{restoring \baselineskip=10.0pt plus 41.0pt}
(internal vertical mode: \baselineskip}
{\global}
{\global}
{\rightskip}
{\global}
{\setbox}
```

```
\1#1->\hbox to#1pt{}
#1<-2
{restricted horizontal mode: end-group character }}
{internal vertical mode: blank space }
{\noindent}
<horizontal mode: \copy}
{\hskip}
{\copy}
{\hskip}
{\lower}
```

```
\1#1->\hbox to#1pt{}
#1<-1
<restricted horizontal mode: end-group character }}
<horizontal mode: \hskip}
{\copy}
{\hskip}
{\box}
{\adjdemerits}
<end of alignment template)
Qfirstpass
Oeecondpase
 II
 0 v i a 000 b=10000 p=0 d=100020785
001: line 1.0 t=100020785 -> 000
 II
```

```
0 via 000 b=51 p=0 d=2704
0 via 001 b=10000 p=0 d=100020001
002: line 1.1 t=2704 -> 000
II
0 via 000 b=30 p=0 d=961
0 via 001 b=10000 p=0 d=100020001
0 via 002 b=10000 p=0 d=100020001
003: line 1.3 t=961 -> 000
[]
0 via 002 b=10000 p=0 d=100020001
0 via 003 b=10000 p=0 d=100020785
004: line 2.0 t=100021746 -> 003
[]
0\par via 042 b=O p=-10000 d=l
O\par via 003 b=30 p=-10000 d=1745
O\par via 004 b=10000 p=-10000 d=100020001
005: line 2.1- t=2706 -> 003
006: line 2.2- t=2705 -> 002
```

Loose \hbox (badness 61) In paragraph at lines **184--184**
 [] 11

```
\hbox(0.0+0.0)x13.0, glue set 0.8
.\glue(\leftskip) 4.0
.\hbox(0.0+0.0)x2.0
.etc.
```

```
(restoring \adjdemerits=782}
(restoring \box2=void}
(restoring \rightskip=0.0pt}
{restoring \baselineskip=10.0pt plus 41.0pt}
<internal vertical mode: \baselineskip}
{\global}
{\global}
{\rightskip}
{\global}
{\setbox}
```

```
\1#1->\hbox to#1pt{}
#1<-2
(restricted horizontal mode: end-group character }}
(Internal vertical node: blank space }
{\noindent}
(horizontal mode: \copy}
{\hskip}
{\copy}
{\hskip}
{\lower}
```

```
\1#1->\hbox to#1pt{}
#1<-1
(restricted horizontal rode: end-group character }}
(horizontal mode: \hskip}
{\copy}
{\hskip}
{\box}
{\linepenalty}
{\hbadness}
{end of alignment template)
Ofirstpass
Osecondpaee
[]
0 via 000 b=10000 p=0 d=100040786
001: line 1.0 t=100040786 -> 000
[]
0 via 000 b=51 p=0 d=2809
0 via 001 b=10000 p=0 d=100040004
002: line 1.1 t=2809 -> 000
[]
O-via 000 b=30 p=0 d=1024
```

```
0 via 001 b=10000 p=0 d=100040004
0 via 002 b=10000 p=0 d=100040004
003: line 1.3 t=1024 -> 000
[]
0 via 002 b=10000 p=0 d=100040004
0 via 003 b=10000 p=0 d=100040786
004: line 2.0 t=100041810 -> 003
[]
O\par via 002 b=0 p=-10000 d=4
O\par via 003 b=30 p=-10000 d=1806
O\par via 004 b=10000 p=-10000 d=100040004
006: line 2.1- t=2830 -> 0 0 3
006: line 2.2- t=2813 -> 0 0 2


<restoring \hbadness=0}
(restoring \linepenalty=1}
<restoring \box2=void}
(restoring \rightskip=0.0pt}
(restoring \baselineskip=10.0pt plus 41.0pt}
{restricted horizontal mode: blank space }
{\spacefactor}
<end-group character }}
(horizontal mode: \message}
1
(blank space }
(begin-group character {}
{\hsize}
{\par}
Ofirstpasa
Osecondpaee
[]
0 via 000 b=10000 p=0 d=100020783
001: line 1.0 t=100020783 -> 000
!                                    .
0 via 000 b=10000 p=0 d=100020783
0 via 001 b=10000 p=0 d=100020001
002: line 1.0 t=100020783 -> 000
[] [] []
0 via 000 b=10000 p=0 d=100020783
0 via 001 b=10000 p=0 d=100020001
0 via 002 b=10000 p=0 d=100020001
003: line 1.0 t=100020783 -> 000
O\par via 0 0 0 b=10000 p=-10000 d=100020783
O\par via 001 b=10000 p=-10000 d=100020001
O\par via 002 b=10000 p=-10000 d=100020001
O\par via 003 b=10000 p=-10000 d=100020001
004: line 1.0- t=100020783 -> 0 0 0


Underfull \hbox (badness 10000) in paragraph at lines 171--187
 [] I [] II []

\hbox(22.0+0.0)x1000.0, glue set 237.6
.\glue(\leftskip) 4.0
.\hbox(0.0+0.0)x0.0
.etc.

%% goal height=16383.99998, max depth=2.0
<vertical mode: \parindent}
{\indent}
% t=22.0 p l u s 1.0fil g=16383.99998 b=0 p=0 c=0#
<horizontal mode: end-group character }}
(restoring \parindent=0.0pt}
{restoring \hsize=13.0pt}
{\leftskip}
{\def}
{\noindent}
{\indent}
{\hbox}
<restricted horizontal mode: \hskip}
(end-group-character }}
```

Underfull \hbox (badness 10000) detected at line 188

\hbox(0.0+0.0)x2.0, glue set -1.99266
.\glue 0.0 plus -1.00374

<horizontal mode: \discretionary}

\?->\vrule width-apt \hbox spread2pt{}
{restricted horizontal mode: \vrule}
{\hbox}
(end-group character }}
(the letter A3
<end-group character }}

\?->\vrule width-apt \hbox spread2pt{}
{\vrule}
{\hbox}
<end-group character }}
{the letter B}
(end-group character }}

\?->\vrule width-apt \hbox spread2pt{}
{\vrule}
{\hbox}
{end-group character }}
(the character /}
{\kern}
(end-group character }}
<horizontal mode: \vbox}
(internal vertical mode: \hrule}
{end-group character }}
(horizontal mode: blank space }
{\par}
Ofirstpaes
[]Cl Cl I[]\rip AAAB I Cl B-
@\discretionary via 000 b=0 p=88 d=7745
001: line 1.2- t=7745 -> 000
Cl
O\par via 001 b=0 p=-10000 d=100001
002: line 2.2- t=107746 -> 001

% t=32 .O plus 83.0 plus 1 .Of il minus 8.0 g=16383.99998 b=0 p=162 c=162
(vertical mode : \penalty}
% t=42.0 plus 124.0 plus 1.0fil minus 8.0 g=16383.99998 b=O p=-22222 c=-
22222#
\output->{\tracingcommands O\showthe \outputpenalty \showboxbreadth 9999
 \showboxdepth 9999 \hoffset lsp {\setbox 254=\box 255\shipout \ifvbox 2
\ifhbox 2 6 4 \error \fi 54\copy 25\fi 4) \ifvoid 254\relax \else \error \
fi 3
{Internal vertical mode: \tracingcommands}
> -22222.
<output> . . .wthe \outputpenalty
                                      \showboxbreadth 9999 \showbox...
1.191 \penalty-22222
                    % end of demerits test, hyphenation is next

Completed box being shipped out [-2.0.0.0.11]
\vbox(16383.99998+0.0)x1000.0, glue set 16342.0111
.\glue(\topskip) 0.0 plus 1.0fil
.\hbox(22.0+0.0)x1000.0, glue 'set 237.6
. .\glue(\leftskip) 4.0
..\hbox(0.0+0.0)x0.0
..\glue(\xspaceskip) -1.0
..\rule(22.0+0.0)x0.0
..\glue 4.0 plus 2.0 minus 1.0
..\vbox(22.0+0.0)x13.0
. . .\glue(\tabskip) 0.0 plus 40.0
. ..\vbox(22.0+0.0)x13.0, glue set 2.0

```
....\hbox(0.0+2.0)x13.0, glue set - 0.66667
.....\glue(\leftskip) 4.0
.....\hbox(0.0+0.0)x2.0
.....\glue 2.0 plus 6.0 minus 1.0
.....\hbox(0.0+0.0)x2.0
.....\glue 6.0 minus 2.0
,....\hbox(0.0+0.0)x1.0, shifted 2.0
.....\glue(\rightskip) -1.0
....\penalty 126
....\glue(\baselineskip) 18.0 plus 1.0
....\hbox(0.0+0.0)x13.0, glue set 0.66667
.....\glue(\leftskip) 4.0
.....\hbox(0.0+0.0)x2.0
.....\glue 2.0 plus 6.0
.....\hbox(0.0+0.0)x2.0
. . . ..\penalty 10000
.....\glue(\parfillskip) 0.0
.....\glue(\rightskip) -1.0
...\glue(\tabskip) 0.0 plus 40.0
..\vbox(22.0+0.0)x13.0
...\glue(\tabskip) 0.0 plus 40.0
...\vbox(22.0+0.0)x13.0
....\hbox(0.0+0.0)x13.0, glue set 0.8
.....\glue(\leftskip) 4.0
.....\hbox(0.0+0.0)x2.0
.....\glue 2.0 plus 6.0 minus 1.0
.....\hbox(0.0+0.0)x2.0
.....\glue(\rightskip) -1.0,
....\penalty 126
....\glue(\baselineskip) 20.0 plus 1.0
....\hbox(0.0+2.0)x13.0
.....\glue(\leftskip) 4.0
.....\hbox(0.0+0.0)x1.0, shifted 2.0
.....\glue 3.0
.....\hbox(0.0+0.0)x2.0
.....\glue 2.0 plus 6.0
.....\hbox(0.0+0.0)x2.0
.....\penalty 10000
......\glue(\parfillskip) 0.0
.....\glue(\rightskip) -1.0
...\glue(\tabskip) 0.0 plus 40.0
..\vbox(22.0+0.0)x13.0
. ..\glue(\tabskip) 0.0 plus 40.0
...\vbox(22.0+0.0)x13.0
....\hbox(0.0+0.0)x13.0, glue set 0.8
.....\glue(\leftskip) 4.0
.....\hbox(0.0+0.0)x2.0
.....\glue 2.0 plus 6.0 minus 1.0
.....\hbox(0.0+0.0)x2.0
   .\glue(\rightskip) -1.0
::::\penalty 126
. ...\glue(\baselineskip) 20.0 plus 1.0
....\hbox(0.0+2.0)x13.0
.....\glue(\leftskip) 4.0
.....\hbox(0.0+0.0)x1.0, shifted 2.0
.....\glue 3.0
.....\hbox(0.0+0.0)x2.0
.....\glue 2.0 plus 6.0
.....\hbox(0.0+0.0)x2.0
. . . ..\penalty 10000
.....\glue(\parfillskip) 0.0
.....\glue(\rightskip) -1.0
...\glue(\tabskip) 0.0 plus 40.0
..\glue 4.0 plus 2.0 minus 1.0
..\penalty 10000
..\glue(\parfillskip) 0.0
..\glue(\rightskip) 0.0
.\glue(\parskip) 0.0 plus 42.0 minus 8.0
.\glue(\baselineskip) 2.0 plus 41.0
.\hbox(8.0+2.0)x13.0
..\glue(\leftskip) 3.0
```

```
..\hbox(0.0+0.0)x1.0
..\hbox(0.0+0.0)x0.0
..\hbox(0.0+0.0)x2.0, glue act -1.99266
...\glue 0.0 plus -1.00374
..\discretionary
..\rule(*+*)x-2.0
..\hbox(0.0+0.0)x2.0
..\rip A (ligature AAA)
..\kern2.0
..\rip B
..\glue(\rightskip) 0.0
.\penalty 162
.\glue(\baselineskip) 7.6 plus 41.0
.\hbox(0.4+0.0)x13.0
..\glue(\leftskip) 3.0
..\rule(*+*)x-2.0
..\hbox(0.0+0.0)x2.0
..\rip C (ligature B-)
..\vbox(0.4+0.0)x6.0
...\rule(0.4+0.0)x6.0
..\penalty 10000
..\glue(\parfillskip) 0.0
..\glue(\rightskip) 0.0

Memory usage before: 990&368; after: 584&362; still untouched: 498
(restoring \box254=void}
{restoring \hoffset=0.0pt}
(restoring \showboxdepth=1}
{restoring \showboxbreadth=2}
(restoring \tracingcommands=2}
(vertical mode: \looseness}
{\uchyph}
{\hsize}      \
(the letter A}
(horizontal mode: the letter A}
<blank space }
(the character /}
{\vadjust}
<internal vertical mode: \uchyph}
{\ 3
(horizontal mode: \ }
(the letter B}
<end-group character }}
Ofirstpaeb
Osecondparr
II
0 via 000 b=10000 p=0 d=100020783
001: line 1.0 t=100020783 -> 000
\rip BBBBBB
O\par via 000 b=10000 p=-10000 d=100020783
O\par via 001 b=10000 p=-10000 d=100020001
002: line 1.0- t=100020783 -> 000


Underfull \hbox (badness 10000) in paragraph at lines 200--200
 [] \rip BBBBBB

\hbox(7.0+1.0)x100.0, glue set 41.6
.\glue(\leftskip) 3.0
.\hbox(0:0+0.0)x0.0
.etc.

(restoring \uchyph=1}
{restoring \looseness=-10}
{\vadjust}
(internal vertical mode: \ }
(horizontal mode: \ }
{\closeout}
(the letter B}
{end-group character }}
Ofirotpass -
```

Oeecondpaes
[]
0 via 000 b=10000 p=0 d=100020783
001: line 1.0 t=100020783 -> 000
[]\rip BB-
0\discretionary via 000 b=10000 p=88 d=100028527
0\discretionary via 001 b=10000 p=88 d=100027745
002: line 1.0- t=100028527 -> 000
B-BBB
O\discretionary via 000 b=10000 p=88 d=100028527
0\discretionary via 001 b=10000 p=88 d=100027745
0\discretionary via 002 b=10000 p=88 d=100028745
003: line 1.0- t=100028527 -> 000
O\par via 000 b=10000 p=-10000 d=100020783
0\par via 001 b=10000 p=-10000 d-100020001
0\par via 002 b=10000 p=-10000 d=100120001
O\par via 003 b=10000 p=-10000 d=100120001
004: line 1.0- t=100020783 -> 000

Underfull \hbox (badness 10000) in paragraph at lines 201--201
 [] []\rip BB-B-BBB

\hbox(7.0+1.0)x100.0, glue set 41.6
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

(restoring \looseness=-10}
<begin-group character {}
{\hyphenchar}
(end-group character }}
{\hyphenation}
{\vadjust}
(Internal vertical mode: \ }
<horizontal mode: \ }
(the letter B}
{\kern}
(the letter B}
(end-group character }}
Ofirstpase
Osecondpass
[]
0 via 000 b=10000 p=0 d=100020783
001: line 1.0 t=100020783 -> 000
\ripBBBCBBB
0\discretionary via 000 b=10000 p=88 d=100028527
0\discretionary via 001 b=10000 p=88 d=100027745
002: line 1.0- t=100028527 -> 000
B
O\par via 000 b=10000 p=-10000 d=100020783
O\par via 001 b=10000 p=-10000 d=100020001
O\par via 002 b=10000 p=-10000 d=100120001
003: line 1.0- t=100020783 -> 000

Underfull \hbox (badness 10000) in paragraph at lines 202--202
 []\rip BBBCBBBB

\hbox(8.0+2.0)x100.0, glue oet 40.0
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

{restoring \looseness=-10}
{\hyphenchar}
{\vadjust}
<Internal vertical mode: \def}
{\ }
<horizontal mode: \ }
{\pretolerance}

{the letter B}

\B ->B
{end-group character }}
Ofirstpase
[]
0 via 000 b=10000 p=0 d=100020783
001: line 1.0 t=100020783 -> 000
\rip BBBBBB
O\par via 000 b=10000 p=-10000 d=100020783
0\par v i a 001 b=10000 p=-10000 d=100020001
002: line 1.0- t=100020783 -> 0 0 0

Underfull \hbox (badness 10000) in paragraph at lines 203--203
 [] \rip BBBBBB

\hbox(7.0+1.0)x100.0, glue set 41.6
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

(restoring \pretolerance=0}
{restoring \B=undefined}
{restoring \looseness=-10}
<blank space }
{\par} ~
Ofirstpase
Oeecondpase
[]\rip A
0 via 000 b=10000 p=0 d=100020783
001: line 1.0 t=100020783 -> 000
/AA-
0\discretionary via 000 b=10000 p=88 d=100028527
002: line 1.0- t=100028527 -> 000
O\discretionary via 001 b=10000 p=88 d=100027746
003: line 2.0- t=200048528 -> 001
B-BBB
0\discretionary via 000 b=10000 p=88 d=100028527
004: line 1.0- t=100028527 -> 000
0\discretionary via 002 b=10000 p=88 d=100028745
0\discretionary v i a 001 b=10000 p=88 d=100027746
006: line 2.0- t=200048528 -> 001
0\discretionary v i a 003 b=10000 p=88 d=100028745
006: line 3.0- t=300077273 -> 003
C - A
0\discretionary via 000 b=10000 p=88 d=100028527
007: line 1.O- t=100028527 -> 000
0\discretionary v i a 004 b=10000 p=88 d=100028745
0\discretionary v i a 002 b=10000 p=88 d=100028745
O\discretionary via 001 b=10000 p=88 d=100027746
008: line 2.0- t=200048528 -> 0 0 1
O\discretionary via 006 b=10000 p=88 d=100028745
0\discretionary via 003 b=10000 p=88 d=100028746
009: line 3.0- t=300077273 -> 003
0\discretionary via 006 b=10000 p-88 d=100028746
0010: line 4.0- t-400106018 -> 008
CAC// [][][][]
O\par via 000 b=10000 p=-10000 d=100020783
0011: line 1.0- t=100020783 -> 000
O\par via 007 b=10000 p=-10000 d=100120001
O\par via 004 b=10000 p=-10000 d=100120001
O\par via 002 b=10000 p=-10000 d=100120001
O\par via 001 b=10000 p=-10000 d=100020001
0012: line 2.0- t=200040784 -> 001
O\par via 008 b=10000 p=-10000 d=100120001
0\par v i a 006 b=10000 p=-10000 d=100120001
O\par via 003 b=10000 p=-10000 d=100120001
0013: line 3.0- t=300168529 -> 003
O\par via 009 b=10000 p=-10000 d=100120001
O\par via 006 b=10000 p=-10000 d=100120001

```
0014: line 4.0- t=400197274 -> 006
O\par via 0010 b=10000 p=-10000 d=100120001
0016: line 5.0- t=500226019 -> 0010
```

Underfull \hbox (badness 10000) in paragraph at lines 195- -204
 Cl\ripA /AA-B-BBBC-ACAC//

```
\hbox(8.0+2.0)x100.0, glue set 33.63377
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.
```

```
%% goal height=16383.99998, MX depth-1.0
(vertical mode: \hbox}
(restricted horizontal mode: \sfcode}
{the letter A}
{blank space }
(the letter a)
(blank space }
(end-group character }}
(restoring \sfcode66=999}
% t=55.0 plus 1.0fil g=16383.99998 b=O p=0 c=0#
(vertical mode: \noindent}
% t=64.0 plus 41.0 plus 1.0fil g=16383.99998 b=O p=0 c=0#
<horizontal mode: \scriptscriptfont}
(math shift character $}
{display math mode: \eqno}
(math mode : superscript character ^}
<end-group character }}
{math shift character $}
! Math formula deleted: Insufficient extension fonts.
l.206 $$\eqno^{}$
                 \scriptfont3=\rip\fontdimen2\smalltrip=Opt
Sorry, but I can't typeset math unless \textfont 3
and \scriptfont 3 and \scriptscriptfont 3 have all
the \fontdimen values needed in math extension fonts.
```

```
<restoring \fam=-1}
! Display math should end with $$.
<to be read again>
                    \scriptfont
l.206 $$\eqno^{}$\scriptfont
                           3=\rip\fontdimen2\smalltrip=Opt
The '$' that I just saw supposedly matches a previous '$$'.
80 I shall assume that you typed '$$' both timer.
```

```
(restoring \displayindent=0.0pt}
<restoring \displaywidth=0.0pt}
(restoring \predisplaysize=0.0pt}
(restoring \fam=0}
% t=66.0 plus 83.0 plus 1.0fil minus 8.0 g=16383.99998 b=O p=0 c=0#
% t=85.0 plus 210.0 plus 1.0fil minus 811.0 g=16383.99998 b=O p=0 c=0#
(horizontal mode: \scriptfont}
{\fontdimen}
{begin-group character {}
{\rightskip}
{\looseness}
{\spaceskip}
(the letter A3
{\spacefactor}
{\discretionary}
(restricted horizontal mode: end-group character }}
{the character -}
(end-group character }}
{the letter B}
{\kern}
{end-group character }}
(horizontal mode: blank space }
(the letter C}
(math shift character $}
```

{math mode: blank space }
{\scriptfont}
{\mathsurround}
{math shift character $}
! Math formula deleted: Insufficient symbol fonts.
<recently read> $

1.210   \mathsurround143pt$
                                  C $\mathsurround40pt$$\mathsurrou...
Sorry, but I can't typeset math unless \textfont 2
and \scriptfont 2 and \scriptscriptfont 2 have all
the \fontdimen values needed in math symbol fonts.

(restoring \mathsurround=0.0pt}
(restoring \scriptfont2=\smalltrip}
(restoring \fam=0}
(horizontal mode: blank space }
(the letter C}
(blank space }
(math shift character $}
(math mode: \mathsurround}
(math shift character $}
<restoring \mathsurround=0.0pt}
(restoring \fam=0}
(horizontal mode: math shift character $}
(math mode: \mathsurround}
{\hbox} ~
{restricted horizontal mode: math shift character $}
(math mode: math shift character $}
(restoring \fam=-1}
(restricted horizontal mode: end-group character }}
{math mode: math shift character $}
{restoring \mathsurround=0.0pt}
<restoring \fam=0}
(horizontal mode: \par}
! Infinite glue shrinkage found in a paragraph.
1.210 . . .round60pt\hbox{$$}$\par
                          3
The paragraph just ended Includes some glue that has
Infinite shrinkability, e.g., '\hskip 0pt minus 1fil'.
Such glue doesn't belong there---It allows a paragraph
of any length to fit on one line. But It's safe to proceed,
since the offensive shrinkability has been made finite.

@firstpass
Osecondpasr
\rip A-
0\discretionary v i a 000 b=76 p=89 d=13850
001: line 4. I- t=13850 -> 000
O\kern via 000 b=69 p=0 d=4900
002: line 4.1 t=4900 -> 000
O\kern via 001 b=lOO p=0 d=10201
003: line 6.0 t=24051 -> 001
 C$$
O\math via 000 b=17 p=0 d=324
004: line 4 . 3 t=324 -> 000
O\math via 002 b=12 p=0 d=169
0\math v i a 001 b=8 p=0 d=81 .
005: line 6.2 t=5069 -> 002
O\math via 003 b=12 p=0 d=951
006: line 6.2 t=25002 -> 003
 c
0 via 004   b=7 p=0 d=5966   .
007: line 6.1 t=6290 -> 004
0 via 005 b=71 p=0 d=5184
008: line 6.1 t=10253 -> 005
0 via 006 b=71 p=0 d=5184
009: line 7.1 t=30186 -> 006
$$$[]$
0\par via 007 b=57 p=-10000 d=4146
0010: l i n e 6.3- t=10436 -> 007

```
0\par via 908 b=57 p=-10000 d=4146
0011: line 7.3- t=14399 -> 008
0\par via 009 b=57 p=-10000 d=4146
0012: line 8.3- t=34332 -> 009


Loose \hbox (badness 76) in paragraph at lines 206--210
 \rip A

\hbox(7.0+1.0)x100.0, glue set 0.91347
.\glue(\leftskip) 3.0
.\rip A
.etc.


Loose \hbox (badness 94) in paragraph at lines 206--210
 \rip

\hbox(0.0+0.0)x100.0, glue set 0.98077
.\glue(\leftskip) 3.0
.\rip -
.etc.


Tight \hbox (badness 12) in paragraph at line8 206--210
 \rip C$$

\hbox(0.0+0.0)x100.0, glue set - 0.6
.\glue(\leftskip) 3.0
.\rip C
.etc.


Loose \hbox (badness 71) in paragraph at lines 206--210
 \rip C

\hbox(0.0+0.0)x100.0, glue set 0.89423
.\glue(\leftskip) 3.0
.\rip C
.etc.


Tight \hbox (badness 67) in paragraph at lines 206--210
 []$

\hbox(0.0+0.0)x100.0, glue set - 0.83
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x120.0 []
.etc.

% t=95.0 plus 261.0 plus 1.0fil minus 811.0 g=16383.99998 b=0 p=37 c=37
% t=105.0 plus 292.0 plus 1.0fil minus 811.0 g=16383.99998 b=0 p=-125 c=
-126t
% t=115.0 plus 333.0 plus 1.0fil minus 811.0 g=16383.99998 b=0 p=-125 c=
-1261
% t=125.0 plus 374.0 plus 1.0fil minus 811.0 g=16383.99998 b=0 p=0 c-0
<vertical mode: end-group character }}
{restoring \spaceskip=0.0pt}
<restoring \looseness=0}
(restoring \rightskip=0.0pt}
(blank space }
{\uccode}
{\font}
{\input}
! Font \mumble=mumble not loadable: Metric (TFM) file not found.
<to be read again>
                   \relax
<to be read again>
                   \input
1.211 ...ont\mumble=mumble\input
                              tripos % "AAAAAAAAAA"+errors
```

I wasn't able to read the size data for this font,
so I will ignore the font specification.
[Wizards can fix TFM files using TFtoPL/PLtoTF.]
You might try inserting a different font spec;
e.g.,type 'I\font<same font id>=<substitute font name>'.

{\relax}
{\input}
(tripos.tex
{\par}
{\uppercase}
{the character O}
% t=135.0 plus 415.0 plus 1.0fil minus 811.0 g=16383.99998 b=O p=0 c=0
(horizontal mode: the character O}
Missing character: There is no O in font trip!
(begin-group character {}
{\outputpenalty}
! Missing number, treated as zero.
<to be read again>
                          3
1.2 ...case {0{\outputpenalty }}

A number should have been here: I inserted '0'.
(If you can't figure out why I needed to see a number,
look up 'weird error' in the index to The TeXbook.)

{end-group character }}
(restoring \outputpenalty=-22222)
(blank space }
{the character {}
Missing character: There is no [in font trip!
{\uppercase}
{the letter A}
(blank space }

{\par}
Ofirstpass
Osecondpass
[]
O via OOO b=10000 p=0 d=100020783
001: line 1.0 t=100020783 -> 000
\ripAAAAAAAAAA
O\par via OOO b=10000 p=-10000 d=100020783
O\par via OO1 b=10000 p=-10000 d=100020001
002: line 1.O - t=100020783 -> OOO

Underf ull \hbox (badness 10000) in paragraph at lines 2--212
 []\rip AAAAAAAAAA

\hbox(7.0+1.0)x100.0, glue set 46.6
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

<vertical mode: \penalty}
% t=145.0 plus 498.0 plus 1.0fil minus 819.0 g=16383.99998 b=O p=-33333
c=-33333#
\output->{\tracingcommands 0\showthe \outputpenalty \showboxbreadth 9999
 \showboxdepth 9999 \hoffset lsp {\setbox 254=\box 255\shipout \ifvbox 2
\ifhbox 2 6 4 \error \fi 54\copy 25\fi 4} \ifvoid 254\relax \else \error \
fi 3
(internal vertical mode: \tracingcommands}
> -33333.
<output> ...wthe \outputpenalty
                                \showboxbreadth 9999 \showbox...
1.212 \par\penalty-33333
                      % end hyphenation, math is next

Completed box being shipped out [-2.0.0.0.11]

```
\vbox(16383.99998+1.0)x100.0, glue set 16239.0111
.\glue(\topskip) 12.0 plus 1.0fil
.\hbox(8.0+2.0)x100.0, glue set 33.63377
..\glue(\leftskip) 3.0
..\hbox(0.0+0.0)x0.0
..\rip A
..\glue 4.0 plus 1.99799 minus 1.00099
..\rip /
..\kern1.0
..\discretionary replacing 2
...\rip A (ligature AA)
...\kern3.0
...\rip -
..\rip A (ligature AA)
..\kern2.0
..\discretionary replacing 3
. ..\rip C (ligature B-)
..|\rip A (ligature BB)
..|\kern2.0
..|\rip B
..|\kern4.0
..\rip A (ligature BB)
..\kern2.0
..\rip A (ligature BB)
..\discretionary replacing 1
...\rip C
. ..\rip --
..|\rip A
..\rip ["82] (ligature CA)
..\rip ["82] (ligature CA)
..\rip B (ligature C/)
..\rip /
..\penalty 10000
..\glue(\parfillskip) 0.0
..\glue(\rightskip) 0.0
.\hbox(7.0+1.0)x100.0, glue set 41.5
..\glue(\leftskip) 3.0
..\hbox(0.0+0.0)x0.0
..\glue 4.0 plus 2.0 minus 1.0
..\rip A (ligature BB)
..\kern2.0
..\rip A (ligature BB)
..\kern2.0
..\rip A (ligature BB)
..\penalty 10900
..\glue(\parfillskip) 0.0
..\glue(\rightskip) 0.0
.\hbox(7.0+1.0)x100.0, glue set 41.5
..\glue(\leftskip) 3.0
..\hbox(0.0+0.0)x0.0
..\glue 4.0 plus 2.0 minus 1.0
..\closeout1
..\discretionary replacing 2
. ..\rip A (ligature BB)
...\kern3.0
...\rip -
..\rip A (ligature BB)
..\kern2.0
..\discretionary replacing 3
...\rip C (ligature B-)
..|\rip A (ligature BB)
..|\kern2.0
..|\rip B
..\rip A (ligature BB)
..\kern2.0
..\rip A (ligature BB)
..\penalty 10000
..\glue(\parfillskip) 0.0
..\glue(\rightskip) 0.0
.\hbox(8.0+2.0)x100.0, glue set 40.9
..\glue(\leftskip) 3.0
```

```
..\hbox(0.0+0.0)x0.0
..\glue 4.0 plus 2.0 minus 1.0
..\rip A (ligature BB)
..\kern2.0
..\discretionary replacing 3
...\rip B
...\kern4.0
...\rip C
..|\rip A (ligature BB)
..|\kern2.0
..|\rip B
..\rip A (ligature BB)
..\kern2.0
..\rip A (ligature BB)
..\kern 0.0
..\rip B
..\penalty 10000
..\glue(\parfillskip) 0.0
..\glue(\rightskip) 0.0
.\hbox(7.0+1.0)x100.0, glue set 41.6
..\glue(\leftskip) 3.0
..\hbox(0.0+0.0)x0.0
..\glue 4.0 plus 2.0 minus 1.0
..\rip A (ligature BB)
..\kern2.0
..\rip A (ligature BB)
..\kern2.0
..\rip A (ligature BB)
..\penalty 10000
..\glue(\parfillskip) 0.0
..\glue(\rightskip) 0.0
.\glue(\baselineskip) 0.0 plus 41.0
.\hbox(8.0+2.0)x20.0
..\rip A
..\kern2.0
..\rip B
..\glue 4.0 plus 2.0 minus 1.0
..\rip a
..\rip B
..\glue 4.0 plus 2.46799 minus 0.81036
.\glue(\parskip) 0.0 plus 42.0 minus 8.0
.\penalty 0
.\glue(\abovedisplayshortskip) 1.0 plus 46.0 minus 803.0
.\glue(\baselineskip) 8.0 plus 41.0
.\hbox(0.0+0.0)x0.0, shifted 60.0
.\penalty 10000
.\glue(\baselineskip) 10.0 plus 41.0
.\hbox(0.0+0.0)x0.0, shifted 100.0
.\penalty 0
.\glue(\baselineskip) 3.0 plus 41.0
.\hbox(7.0+1.0)x100.0, glue set 0.91347
..\glue(\leftskip) 3.0
..\rip A
..\discretionary
..\glue(\rightskip) 0.0 plus 104.0 minus 100.0
.\penalty 37
.\glue(\baselineskip) 9.0 plus 41.0
.\hbox(0.0+0.0)x100.0, glue set 0.98077
..\glue(\leftskip) 3.0
..\rip -
..\kern 0.0
..\glue(\rightskip) 0.0 plus 104.0 minus 100.0
.\penalty -126
.\glue(\baselineskip) 10.0 plus 41.0
.\hbox(0.0+0.0)x100.0, glue set - 0.6
..\glue(\leftskip) 3.0
..\rip C
..\mathon, surrounded 143.0
..\mathoff
..\glue(\rightskip) 0.0 plus 104.0 minus 100.0
.\penalty -126
```

```
.\glue(\baselineskip) 10.0 plus 41.0
.\hbox(0.0+0.0)x100.0, glue set 0.89423
..\glue(\leftskip) 3.0
..\rip c
..\glue(\rightskip) 0.0 plus 104.0 minus 100.0
.\glue(\baselineskip) 10.0 plus 41.0
.\hbox(0.0+0.0)x100.0, glue set - 0.83
..\glue(\leftskip) 3.0
..\hbox(0.0+0.0)x120.0
...\mathon, surrounded 60.0
...\mathoff, surrounded 60.0
..\mathoff, surrounded 60.0
..\penalty 10000
..\glue(\parfillskip) 0.0
..\glue(\rightskip) 0.0 plus 104.0 minus 100.0
.\glue(\parskip) 0.0 plus 42.0 minus 8.0
.\glue(\baselineskip) 3.0 plus 41.0
.\hbox(7.0+1.0)x100.0, glue set 46.6
. .\glue(\leftskip) 3.0
..\hbox(0.0+0.0)x0.0
..\glue 4.0 plus 2.0 minus 1.0
..\rip A (ligature AAAAAAAAAA)
..\penalty 10000
. .\glue (\parfillskip) 0.0
..\glue(\rightskip) 0.0
```

```
Memory usage before: 942&521; after: 542&439; still untouched: 464
{restoring \box254=void}
{restoring \hoffset=0.0pt}
{restoring \showboxdepth=1}
{restoring \showboxbreadth=2}
{restoring \tracingcommands=2}
{vertical mode: begin-group character {}
{\catcode}                  .     .            .
{\font}
! Improper 'at' size (0.0pt), replaced by 10pt.
<to be read again>
                    \font
l.213 ... \font?xyzzy at0pt\font
                                    ? xyzzy scaled1?} % nonexistent
I can only handle fonts at positive sizes that are
less than 2048pt, so I've changed what you said to 10pt.


! Font ?=xyzzy at 10.0pt not loadable: Metric (TFM) file not found.
<to be read again>
                    \ font
l.213 . . . \font?xyzzy at0pt\font
                                    ? xyzzy scaled1?) % nonexistent
I wasn't able to read the size data for this font,
so I will ignore the font specification.
[Wizards can fix TFM files using TFtoPL/PLtoTF.]
You might try Inserting a different font spec;
e.g.,type 'I\font<same font id>=<substitute font name>'.

{\font}
! Font ?=xyzzy scaled 1 not loadable: Metric (TFM) file not found.
<to be read again>
                    ?
l.213 . ..t\font ? xyzzy scaled1?
                                    3 % nonexistent
I wasn't able to read the size data for this font,
so I will ignore the font specification.
[Wizards can fix TFM files using TFtoPL/PLtoTF.]
You might try inserting a different font spec;
e.g.,type 'I\font<same font id>=<substitute font name>'.

(select font nullfont}
(end-group character }}
(restoring current font=\rip}
{restoring ?=undefined}
{restoring \catcode63=12}
```

```
{blank space 3
{\font}
{\font}
! Improper 'at' size (-10.0pt), replaced by 10pt.
1.216 \font\ip trip at -10pt
                                % through the looking glass
I can only handle fonts at positive sizes that are
less than 2048pt, so I've changed what you said to 10pt.

{\showthe}
! You can't use 'math shift character $' after \the.
1.216 \showthe$

I'm forgetting what you said and using zero Instead.

> 0.
1.216 \showthe$


{blank space 3
{\showthe}
> \ip .
<recently read> \f ont

1.217 \showthe\font


{\message}
{\fontname}
trip
{blank space 3
(select font trip)
{\textfont}\
{\scriptfont}
{\scriptscriptfont}
{\def}
{blank space 3
<begin-group character {}
{\tracingmacros}
{\global}
{\global}
{\global}
{\global}
{\global}`
{\global}
{\global}
{\global}
{\global}
{\global}
{\global}
{\global}
{\global}
{\global}
<end-group character 33
<restoring \tracingmacros=4}
<blank space 3
{\mathcode}
{\mathcode}
{\delcode}
{\catcode}
{\catcode}
{\mathcode}
{\mathcode}
{\def3
{begin-group character {}
{\catcode}
{\global}
<end-group character 33
<restoring \catcode122=11}
(blank space 3
{\parshape}
```

```
\   a    ->1pt 11.0pt2pt 12.0pt3pt 13.0pt4pt 14.0pt5pt15.0pt6pt 16.0pt7pt 17.
0pt8pt 18.0pt9pt 19.0pt10pt 20.0pt
{\chardef}
{\hangindent}
{\hangafter}
{\begingroup}
{\looseness}
{\rightskip}
{\-}
(horizontal mode: \-}
(the character -}
{\-}
(the character -}
{\-}
{blank space }
{math shift character $}
@firstpass
[]\ip -
@\discretionary v i a  @@0 b=0 p=88 d=7745
0 0 1 :  line 1.2- t=7745 -> @@0
            -
@\discretionary v i a  @@0 b=0 p=89 d=7922
@@2: line 1.2- t=7922 -> @@0
@\discretionary v i a  @@1 b=0 p=89 d=8922
0 0 3 :  line 2.2- t=16667 -> @@1

@\discretionary via @@0 b=0 p=88 d=7745
@@4: line 1.2- t=7745 -> @@0
@\discretionary v i a  @@2 b=0 p=88 d=8745
@\discretionary v i a  @@1 b=0 p=88 d=8745
006:  lint 2.2- t=16490 -> 001
@\discretionary v i a  @@3 b=0 p=88 d=8745
0 0 6 :  line 3.2- t=25412 -> 003


@\discretionary v i a  @@0 b=0 p=89 d=7922
007:  lint 1.2- t=7922 -> @@0
@\discretionary v i a  @@4 b=0 p=89 d=8922
@\discretionary via 002 b=0 p=89 d=8922
@\discretionary via 001 b=0 p=89 d=8922
0 0 8 :  line 2.2- t=16667 -> 0 0 1
@\discretionary via 006 b=0 p=89 d=8922
@\discretionary v i a  @@3 b=0 p=89 d=8922
0 0 9 :  l i n t 3.2-t=25412 -> 0 0 6
@\discretionary via 006 b=0 p=89 d=8922
0010:  lint 4.2- t=34334 -> 0 0 6
A-
@\discretionary via 000 b=0 p=88 d=7745
0011:  lint 1.2- t=7745 -> 0 0 0.
@\discretionary v i a  @@7 b=0 p=88 d=8745
@\discretionary v i a  @@4 b=0 p=88 d=8745
@\discretionary v i a  @@2 b=0 p=88 d=8745
@\discretionary via 001 b=0 p=88 d=8745
0012:  lint 2.2- t=16490 -> 0 0 1
@\discretionary v i a  @@8 b=0 p=88 d=8745
@\discretionary via 0 0 6  b=0 p=88 d=8745
@\discretionary via @@3 b=0 p-08 d=8745
9013:  lint 3.2- t=25235 -> @@5
@\discretionary via 009 b=0 p=88 d=8745
@\discretionary v i a  @@6 b=0 p=88 d=8745
0014:  lint 4.2- t=34157 -> 0 0 6
@\discretionary via 0010 b=0 p=88 d=8745
9016:  line 5.2- t=43079 -> 0010
O\par via @@0 b=0 p=-10000 d=1
0016:  line 1.2- t=1 -> 0 0 0
@\par v i a  @@11 b=0 p=-10000 d=100001
O\par via @@7 b=0 p=-10000 d=100001
O\par via 004 b=0 p=-10000 d=100001
@\par via @@2 b=0 p=-10000 d=100001
O\par via 001 b=0 p=-10000 d=100001
```

```
0017:  lint 2.2- t=107746 -> 001
0\par via 0012 b=0 p=-10000 d=100001
0\par via 008 b=O p=-10000 d=100001
0\par via 005 b=O p=-10000 d=100001
0\par via 003 b=O p=-10000 d=100001
0018:  line 3.2- t=116491 -> 006
0\par v i a  0013 b=0 p=-10000 d=100001
0\par via 009 b=0 p=-10000 d=100001
0\par via 006 b=O p=-10000 d=100001
0019:  line 4.2- t=125236 -> 0013
0\par via 0614 b=0 p=-10000 d=100001
0\par via 0010 b=0 p=-10000 d=100001
0020:  line 5.2- t=134158 -> 0014
0\par via 0015 b=O p=-10000 d=100001
0021:  line 6.2- t=143080 -> 0016


%% goal height=16383.99998, max depth=2.0
% t=20.0 plus 1.0fil g=16383.99998 b=O p=37 c=37#
% t=30.0 plus 41.0 plus 1.0fil g=16383.99998 b=O p=-213 c=-213#
(display math mode: \number}
{\the}
! Improper alphabetic constant.
<to be read again>
                    \relax
1.249 . . .mber\the\dtlcodt'\relax
                                \over{{{}}}}\pagestretch=-1\p...
A one-character control sequence belongs after a 'mark.
So I'm essentially inserting \O here.

{the character -}
{the character 1}
{\relax}
{\over}
(begin-group character {}
<math mode: begin-group character {}
<begin-group character {}
(end-group character }}
{end-group character }}
(end-group character }}
(display math mode: end-group character }}
! Extra }, or forgotten $.
1.249 . ..code'\relax\over{{{}}}}
                                \pagestretch=-1\pagetotal\sho...
I've deleted a group-closing symbol because it stems to be
spurious, as in '$x}$'. But perhaps the } is ltgftimate and
you forgot something else, as In '\hbox{$x}'. In such cases
the way to recover is to Insert both the forgotten and the
deleted material, e.g., by typing 'I$}'.

{\pagestretch}
{\showlists}

### display math mode entered at line 249
\mathord
.{}
this will be denominator of:
\fraction, thickness = default
\\mathord []
\\mathord []
### vertical mode entered at line 0
### current page:
\glue(\topskip) 20.0 plus 1.0fil
\hbox(0.0+0.0)x11.0, glue set 1.3fil, shifted 1.0
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.
etc.
total height 40.0 plus -40.0 plus 1.0fil
 goal height 16383.99998
prevdepth 1.0, prevgraf 3 lines
```

! OK.
1.249 ...=-1\pagetotal\showlists

{\halign}
! Improper \halign inside $$'s.
1.260 \halign
                to\the\displaywidth{#&#\crcr\crcr\cr} % the dir...
Displays can use special alignments (like \eqalignno)
only if nothing but the alignment itself is between $$'s.
So I've deleted the formulas that preceded this alignment.

(internal vert ical mode : \the}
{restricted horizontal mode: end of alignment t e m p l a t e 3

Loose \hbox (badness 1) in alignment at lines 250--250
  El   []   .

\hbox(0.0+0.0)x15.0, glue set 0.1876
.\glue(\tabskip) 0.0 plus 40.0
.\unsetbox(0.0+0.0)x0.0
.ttc.

! Missing $$ inserted.
<to be read again>
                \eqno
1.264 \eqno
            % another error (actually causes two error messag...
Displays can use special allgnments (like \eqalignno)
only if nothing but the alignment itself is between $$'s.

{restoring \predisplaypenalty=0}
{restoring \displayindent=0.0pt}
<restoring \displaywidth=0.0pt}
(r e s t o r i n g \predisplaysize=0.0pt} '
(restoring \fam=0}
% t=40.0 plus -40.0 plus 1.0fil g=16383.99998 b=O p=101 c=lOl
% t=53.0 plus 1.0 plus 1.0fil g=16383.99998 b=O p=-1245184 c=-1245184#
\output->{\tracingcommands O\showthe \outputptnalty \showboxbrtadth 9999
 \ehowboxdepth 9999 \hoffset lsp {\setbox 254=\box 255\shipout \ifvbox 2
**\ifhbox 2 6 4   \error \fi 54\copy 25\fi 4} \ifvoid 254\relax \else \error **
fi 3
{internal vertical node: \tracingcommands}
> -1246184.
<output> . ...wthe \outputptnalty
                        \showboxbrtadth 9999 \showbox...
<to be read again>
                \eqno
1.264 \tqno
            % another error (actually causes two error mtesag...

Completed box being shipped out [-2.0.0.0.11.0.327680]
\vbox(16383.99998+0.0)x20.0, glue set 16331.0111
.\glue(\topskip) 20.0 plus 1.0fil
.\hbox(0.0+0.0)x11.0, glue set 1.3111, shifted 1.0
. .\glue(\leftskip) 3.0
..\hbox(0.0+0.0)x0.0
..\discretionary
..\lp - '
..\glue(\rightskip) 0.0 plus 10.0fil minus 0.00002
.\ptnalty 37
.\glue(\baselineskip) 10.0 plus 41.0
.\hbox(0.0+0.0)x12.0, glue set 1.9111, shifted 2.0
..\glue(\leftskip) 3.0
..\lp -
..\discretionary
..\discretionary
..\lp -
..\glue(\rightskip) 0.0 plus 10.0fil minus 0.00002
.\ptnalty -213

```
.\glue(\baselineskip) 3.0 plus 41.0
.\hbox(7.0+1.0)x13.0, glut set 1.7111, shifted 3.0
. .\glue(\leftskip) 3.0
..\ip - (ligature -
)
. .\ip -
..\discretionary
..\kern1.0
. .\ip A
..\discretionary
  .\ip -
::\ptnalty 10000
..\glue(\parfillskip) 0.0
..\glue(\rightskip) 0.0 plus 10.0fil minus 0.00002
.\penalty 101
.\glue(\abovedisplayskip) 3.0
.\glue(\baselineskip) 9.0 plus 41.0
.\hbox(0.0+0.0)x15.0, glut set 0.1876, shifted 6.0
. .\glue(\tabskip) 0.0 plus 40.0
..\hbox(0.0+0.0)x0.0
..\glue(\tabskip) 0.0 plus 40.0
```

```
Memory usage before: 331&405; after: 2320397; still untouched: 464
<restoring \box254=void}
(restoring \hoffset=0.0pt}
(restoring \showboxdepth=1}
(restoring \showboxbreadth=2}
(restoring \tracingcommands=2}
(restoring \parshape=10}
(restoring \hangafttr=-12)
<restoring \hangindent=-10.0pt}
(restoring \looseness=2}
(horizontal mode: \eqno}
! You can't use '\eqno' In horizontal mode.
<recently read> \tqno
```

```
l.264 \eqno
              % another error (actually causes two error mtssag...
Sorry, but I'm not programmed to handle this case;
I'll just pretend that you didn't ask for it.
If you're in the wrong mode, you might be able to
return to the right one by typing 'I}' or 'I$' or 'I\par'.
```

```
{\looseness}
(math shift character $3
{math mode: \right}
! Missing delimiter (. inserted).
<to be read again>
                \mathchardef
l.266 $\right\relax\mathchardef
                          \minus="322D % locally \minus . . .
I was expecting to set something like '(' or '\{' or
'\}' here. If you typed, e.g., '{' Instead of '\{', you
should probably delete the '{' by typing '1' now, so that
braces don't get unbalanced. Otherwise just proceed.
Acceptable delimiters are characters whose \delcode is
nonnegative , or you can use '\delimiter <delimiter code>'.
```

```
! Extra \right.                                    .
<to be read again>
                \mathchardef
l.256 $\right\relax\mathchardef
                          \minus="322D % locally \minus . . .
I'm ignoring a \right that had no matching \left.
```

```
{\mathchardef}
{\left}
{the letter A3
{\over}
{the letter A3
{\abovewithdelims}
```

! Missing delimiter (. Inserted).
<to be read again>

1.267 ...ver A\abovewithdelims.?
                              \right(+\mskip1A\minus=A+\pen...
I was expecting to see something like '(' or '\{' or
'\}' here. If you typed. e.g., '{' instead of '\{', you
should probably delete the '{' by typing '1' now, so that
braces don't get unbalanced. Otherwise just proceed.
Acceptable delimiters art characters whose \dtlcode is
nonnegative, or you can use '\delimiter <delimiter code>'.

! Missing number, treated as zero.
<to be read again>
                         ?
1.267 ...ver A\abovewithdelims.?
                              \right(+\mskip1A\minus=A+\pen...
A number should have been here; I inserted '0'.
(If you can't figure out why I needed to see a number,
look up 'weird error' in the Index to The TeXbook.)

! Illegal unit of measure (pt inserted).
<to be read again>
                         ?
1.267 . ..vtr A\abovewithdelims.?
                              \right(+\mskip1A\minus=A+\pen...
Dimensions can be in unite of em, tx, in, pt, pc,
cm, mm, dd, cc, bp, or sp; but yours is a new one!
I'll assume that you meant to say pt, for printers' points.
To recover gracefully from this error, it's best to
delete the trrontoua units; e.g., type '2' to delete
two letters. (Set Chapter 27 of The TeXbook.)

! Ambiguous; you need another { and }.
<to be read again>
                         Y
1.267 ...ver A\abovewithdelims.?
                              \right(+\mskip1A\minus=A+\pen...
I'm ignoring this fraction specification, since I don't
know whether a construction like 'x \over y \over z'
means '{x \over y} \over z' o r   'x \over {y \over z}'.

{the character ?}
{\right}

(->\delimiter " 4 1 6 2 3 6 2
<the character +}
{\mskip}
! Illegal unit of measure (mu inserted).
<to be read again>
                         A
1.267 ...elims.?\right(+\mskip1A
                              \minus=A+\penalty+1000A
The unit of measurement In math glut must be mu.
To recover gracefully from this error, it's best to
delete the erroneous units; e.g., type '2' to delete
two letters. (See Chapter 27 of The TeXbook.)

{the letter A)
{\mathchar"322D}
{the character =}
(the letter A)
{the character +}
{\penalty}
{the letter A3
(blank space }
{\relpenalty}
{\binoppenalty}
{\mathsurround}
(math shift character $}
! \scriptfont 0 is undefined (character ?).

```
<recently read> $

1.260 \mathsurround.11em$
                              \x % this formula goee on line 7
Somewhere in the math formula just ended. you used the
stated character from an undefined font family. For example,
plain TeX doesn't allow \it or \sl In subscripts. Proceed,
and I'll try to forget that I needed that character.

(restoring \mathsurround=0.0pt}
(restoring \binoppenalty=0}
(restoring \relpenalty=0}
{restoring \minus=\mathchar"232D}
{restoring \fam=0}
(horizontal mode: \char"C8}
Missing character: There is no ["C8] in font trip!
{math shift character $}
@firstpass
$[] \lp /
O\ptnalty via 000 b=O p=-3333 d=-11108888
001: lint 7.2 t=-11108888 -> 000
  A \smalltrip --
O\penalty via 000 b=0 p=-2222 d=-4937283
002: line 7.2 t=-4937283 -> 000
O\penalty via 001 b=O p=-2222 d=-4937283
003: lint 8.2 G-16046171 -> 001
 \lp A /
O\penalty via 000 b=0 p=1000 d=1000001
004: line 7.2 t=1000001 -> 000
O\ptnalty via 002 b=0 p=1000 d=1000001
O\penalty via 001 b=0 p=1000 d=1000001
006: lint 8.2 t=-10108887 -> 001
O\penalty via 003 b=0 p=1000 d=1000001
006: line 9.2 t=-16046170 -> 003
 A$
O\par via 000 b=0 p=-10000 d=1
0 0 7 :  l i n e  7.2- t=1 -> 0 0 0
O\par via 004 b=0 p=-10000 d=1
O\par via 002 b=0 p=-10000 d=1
O\par via 001 b=0 p=-10000 d=1
008: line 8.2- t=-11108887 -> 001
O\par via 006 b=0 p=-10000 d=1
O\par via 003 b=O p=-10000 d=1
009: lint 9.2- t=-16046170 -> 003
O\par via 006 b=0 p=-10000 d=1
0010: line 10.2- t=-16046169 -> 006


%% g o a l  height=16383.99998, max depth=2.0
{display math mode: blank space }
{\mkern}
{\the}
<the character 7}
{\prevgraf}
{\insert}
! You can't \insert255.
<to be read again>
                   {
1.262 ...\prevgraf=8 \insert255{
                                 \penalty999}
I'm changing to \insert0; box 265 is special.

(internal vertical mode: \penalty}
(end-group character }}
(restoring \parshape=10}
(restoring \hangafter=-12)
{restoring \hangindent=-10.0pt}
(restoring \looeentes=-2)
(display math mode: blank space 3
{\char"C8}
{\vcenter}
(internal vertical mode: end-group character }}
```

```
{restoring \parshape=10}
(restoring \hangafter=-12}
(restoring \hangindent=-10.0pt}
(restoring \looseness=-2}
(display math mode: blank space 3
(begin-group character {}
(math mode: \mathaccent}
{the letter A3
(end-group character 33
(end-group character 33
(display math mode: subscript character I3
<blank space 3
(superscript character ^}
<math mode: \raise}
(restricted horizontal mode: the letter a)
(end-group character 33
<math mode: \displaystyle}
{\char}
{\textstyle}
{end-group character 33
(display math mode: blank space 3
{\overline}
(math mode: superscript character ^}
{blank space 3
{the letter A3
{subscript character |}
{\mathinner}
(end-group character 33
{superscript character '3
(the letter A3
{blank space 3
{\mathchar}
{\char}
(subscript character ^^A}
{\mathaccent}
{\mathop}
(blank space 3
{\mathbin}
(blank space 3
{\mathopen}
<blank space 3
{\mathpunct}
{\mathclose}
<blank space 3
{\mathrel}
{blank space 3
{\global}
{\mathaccent}
{\fam}
{the letter A3
{the character 93
{\the}
! Bad number (-1) .
<to be read again>
                    3
1.269 ,..the\scriptscriptfont-1}
                        3333
Since I expected to read a number between 0 and 16,
I changed this one to zero.                    .

{select font trip3
<end-group character 33
{restoring current font=\ip} '
(restoring \fam=-13
{end-group character 33
(end-group character 33
{end-group character 33
(end-group character 33
(display math mode: blank space 3
{\mathop}
{superscript character '3
```

```
{\mathop}
{\nolimits}
{\limits}
<subscript character |}
(blank space 3
{\mathord}
! Missing { inserted.
<to be read again>
                     \radical
1.272 \mathord \radical
                         "161 % missing { will be inserted
A left bract was mandatory here, so I've put one in.
You might want to delete and/or insert some corrections
so that I will find a matching right bract soon.
(If you're confused by all this, try typing 'I}' now.)

<math mode : \radical}
{\textstyle}
{\radical}
{\left}

(->\delimiter "4162362
{\scriptscriptstyle}
{\mathop}
{\underline}
{blank s p a c e }
{the letter A)
{\atop}
{\displaystyle}
{the letter A3
(subscript character |}
{the letter A3
{\hfil}
{\over}
{the letter B}
{\nonscript}
{\kern}
(end-group character }}
(superscript character ^}
(end-group character }}
<end-group character 33
{blank space }
{\nolimits}
{subscript character |}
{\mathop}
{\nonscript}
{\textstyle}
{\nonscript}
{\mskip}
{\showthe}
> 9.0mu minus 1.0fil.
1.276          \showthe\lastskip
                                  B\abovewithdelims(.2pt\displa...

{the letter B}
{\abovewithdelims}

(->\delimiter "4162362
{\displaylimits}
! Limit controls must follow a math operator.
<recently read> \displaylimits

1.276 ...lims(.2pt\displaylimits
                                 3-t
I'm ignoring this misplaced \limits or \nolimits command.

{end-group character }}
(superscript character -3

z->\delimiter "4162362
(blank space  3
```

```
{\discretionary}
(restricted  horizontal  mode: \showthe}
> 1000.
1.277 .,.ry{\showthe\spacefactor
                              -}{\smalltrip A\hss}{\smalltr...

(the character -}
(end-group character }}
(select font trip at 5.0pt}
(the letter A3
{\hss}
(end-group character }}
(restoring current font=\ip}
! Improper discretionary list.
1.277 ...tor-}{\smalltrip A\hss}
                              {\smalltrip A )
Discretionary lists must contain only boxes and kerns.

The following discretionary sublist has been deleted:
\glue 0.0 plus 1.0fil minus 1.0fil

(select font trip at 5.0pt}
(the letter A3
(end-group character }}
(restoring current font=\ip}
! Illegal math \discretionary.
1.277 ...ip A\hss}{\smalltrip A)

Sorry : The third part of a discretionary break must be
empty, in math formulas. I had to delete your third part.

<math node: blank space }
{\right}
{the letter 'A3
(end-group character }}
(end-group character }}
(end-group character }}
(display math mode: blank apace }
{\let}
{\eqno}
{math node: \scriptstyle}
{\mathchar"232D}

(->\delimiter "4162362
{\delimiter}
{\mathpunct}
{the letter A3
(the letter A3
{end-group character }}
<blank space }
{subscript character |}
<the letter B}
{\fam3
(the character -}
<end-group character }}
{restoring \fam=-1}
{superscript character ^}
{\hbox}
(restricted horizontal rode: the letter A3
{end-group character }}
(math mode: end-group character }}
(begin-group character {}
{\above}
{begin-group character {}
{the letter u}
{\overwithdelims}
(blank space }
{\displaystyle}
{begin-group character {}
{the letter A3
{\atopwithdelims}
```

```
(->\delimiter "4162362

(->\delimiter "4162362
{\vrule}
(end-group character }}
(end-group character }}
(blank space }
{\show}
> \penalty=\mathchar"232D.
1.284   \show\penalty



\showlonglists ->{\tracingcommands 0\pagefillstretch -1\dimen 100 \showb
oxbreadth 9999 \showboxdtpth 9999 \showlists \pagtgoal =10000pt}
(begin-group character {}
{\tracingcommands}

### math mode entered at lint 286
### math mode entered at line 282
\mathord
. \fraction, thickness = default
.\\mathord
.\.\fam1 u
./\displaystyle
./\mathord
././\fraction, thickness 0.0, left-delimiter "162362, right-delimiter "16
2362
./.\\mathord
./.\.\fam1 A
././\rule(9.0+*)x0.4
\mathord
this will be denominator of:
\fraction, thickness 9.0
\{}
### math mode entered at line 280
\scriptstyle
\mathbin
.\fam3 -
\mathoptn
.\fam1 b
\mathpunct
.\mathord
..\fam1 A
. \mathord
..\fam1 A
^\hbox(7.0+1.0)x2.0
^.\ip A
_\mathord
_.\fam1 B
_\mathord
_.\fam0 -
\mathord
### display math mode entered at line 261
\mkern-9.0mu
\mathord
.\fam0 7
\insert0, natural size 0.0; split(1.0 plus 43.0,-2.0); float cost 100
.\ptnalty 999
\mathord
.\fam0 ["C8]
\vcenter
.\vbox(-2.0+0.0)x0.0
\accent\fam3 -
.\fam1 A
^\mathord
^.\hbox(7.0+1.0)x2.0, shifted -2.0
^..\ip a
^\displaystyle
^\mathbin
```

```
^.\fam1 /
^\textstyle
_\fam0 -
\overline
. \mathord
.^\fam1 A
.\mathord
..\fam1 A
.._\fam3 -
.\mathinner
..{}
.^\mathord
.^.\fam1 A
.^\mathord
.^.\fam1 A
.^\mathord
.^.\fam1 B
.^_\accent\fam1 a
.^_.\mathop
.^_..\fam1 A
.^_.\mathbin
.^_..\fam1 A
.^_.\mathopen
.^_..\fam1 A
.^_. \mathpunct
. _..\fam1 A
.^_.\mathclose
.^_..\fam1 A
.^_.\mathrel
.^_..\fam1 A
.^_.\accent\fam1 a
.^_..\mathord
.^_...\fam13 A
.^_..\mathord
.^_...\fam13 9
\mathop
.\fam1 B
^\fam1 C
\mathop\limits
.\fam1 b
_\fam1 C
\mathord
.\radical"161
..\textstyle
..\radical"282382
...\mathinner
....\left"162362
....\scriptscriptstyle
....\mathop\nolimits
.....\underline
......\fraction, thickness 0 .O
......\\mathord
......\.\fam1 A
....../\displaystyle
....../\mathord
....../.\fam1 A
....../^\fam2 -
....../_\fraction, thickness = default
....../_\\mathord
....../_\.\fam1 A
. . . . ../_\\glue 0.0 plus 1.0fil
....../_/\mathord
....../_/.\fam1 B
....../_/\glue(\nonscript)
....../_/\kern 1 .0
....^\fam1 b
....._\fraction, thickness 2.0, left-delimiter "162362
....._\\mathop
....._\.\fam3
....._\\glue(\nonscript)
....._\\textstyle
```

```
....._\\glue (\nonscript)
....._\\glue(\mskip) 9.0mu minus 1.0fil
....._\\mathord
....._\.\fam1 B
....._/{}
....\discretionary
.....\ip -
....|\smalltrip A
....\right"161361
...\mathord
....\fam1 A
### vertical mode entered at line 0
### current page:
\glue(\topskip) 7.3 plus 1.0fil
\hbox(12.7+3.7)x17.0, glue set 0.17223111, shifted 7.0
.\glue(\leftskip) 3.0
.\mathon, surrounded 1.1
.\hbox(12.7+3.7)x4.80002
..\hbox(0.0+0.0)x0.1, shifted -7.0
..\hbox(12.7+3.7)x1.70001
...\hbox(0.0+0.0)x0.1, shifted -7.0
...\vbox(12.7+3.7)x1.5
....\hbox(3.5+0.5)x1.5
.....\smalltrip A
....\kern1.2
....\rule(1.0+0.0)x*
....\kern6.2
....\hbox(3.5+0.5)x1.5
,....\smalltrip A
...\hbox(0.0+0.0)x0.1, shifted -7.0
..\hbox(8.0+2.0)x3.0, shifted -4.0
...\ip b
.\glue(\medmuskip) 0.66664 minus 0.83331
.\ip /
.\penalty -3333
.\glue 0.27777
.\glue(\medmuskip) 0.66664 minus 0.83331
.\ip A
.\kern1.O
.\glue(\thickmuskip) -1.11108
.\smalltrip -
.\smalltrip -
.\penalty -2222
.\glue(\thickmuskip) -1.11108
.\ip A
.\glue(\medmuskip) 0.66664 minus 0.83331
.\ip /
.\penalty 1000
.\glue(\medmuskip) 0.66664 minus 0.83331
.\ip A
.\kern1.O
.\mathoff, surrounded 1.1
.\penalty 10900
.\glue(\parfillskip) 0.0
.\glue(\rightskip) 0.0 plus 10.0fil minus 0.00002
total height 21.7 plus 1.0fil plus -803.0fill
 goal height 16383.99998
prevdepth 3.7, prevgraf 8 lines

! OK.
\showlonglists . ..99 \showlists
                               \pagcgoal =10000pt}
l.286    \showlonglists
                    $$ % end of the hairy display, missing ...

<restoring \showboxdepth=1}
{restoring \showboxbreadth=2}
{restoring \tracingcommands=2}
(math shift character $}
! Missing } inserted.
<inserted text>
```

```
                       }
<to be read again>
                          $
1.286    \showlonglists$
                             $ % end of the hairy display, missing . . .
I've inserted something that you may have forgotten.
(See the <inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my insertion and my current dilemma will both disappear.


(end-group character }}
(math shift character $}
Missing character: There is no u in font trip!
{restoring \fam=-1}
! \textfont 0 is undefined (character 7).
1.286    \showlonglists$$
                             % end of the hairy display, missing . . .
Somewhere in the math formula just ended, you used the
stated character from an undefined font family. Por example,
plain TeX doesn't allow \it or \sl In subscripts. Proceed,
and 1'11 try to forget that I needed that character.


! \textfont 0 is undefined (character ["C8]).
1.286    \showlonglists$$
                             % end of the hairy display, missing . . .
Somewhere-U the math formula juet ended, you used the
stated character from an undefined font family. For example,
plain TeX doesn't allow \it or \sl in subscripts. Proceed,
and I'll try to forget that I needed that character.


! \scriptfont 0 is undefined (character -).
1.286    \showlonglists$$
                             % end of the hairy display, missing . . .
Somewhere in the math formula just ended, you used the
stated character from an undefined font family. Por example,
plain TeX doesn't allow \it or \sl in subscripts. Proceed,.
and I'll try to forget that I needed that character.


! \scriptscriptfont 13 is undefined (character A).
1.286    \showlonglists$$
                             % end of the hairy display, missing . . .
Somewhere in the math fornula just ended. you used the
stated character from an undefined font family. For example,
plain TeX doesn't allow \it or \sl in subscripts. Proceed,
and I'll try to forget that I needed that character.


! \scriptscriptfont 13 is undefined (character 9).
1.286    \showlonglists$$
                             % end of the hairy display, missing . . .
Somewhere in the math formula juet ended, you used the
stated character from an undefined font family. For example,
plain TeX doesn't allow \it or \sl in subscripts. Proceed,
and I'll try to forget that I needed that character.

Missing character: There is no   in font trip!

Overfull \hbox (48.4746pt too wide) detected at line 286
E1 [] [] [] E1 C1 I                                          .

\hbox(68.26251+98.15005)x19.0, glue set ~ 1.0
.\kern-2.49994
.\vbox(6.0+-8.0)x0.0
.etc.

(restoring \penalty=\penalty}
(restoring \displayindent=0.0pt}
{restoring \displaywidth=0.0pt}
{restoring \predisplaysize=0.0pt}
{restoring \fam=0}
% t=21.7 plus 1.0fil plus -803.01111 g=10000.0 b=O p=0 c=0$
```

```
% t=269.41258 plus 80.0 plus 1.0fil plus -803.01111 g=l0000.0 b=0 p=-124
6184 c=-1245184#
\output->{\tracingcommands O\showthe \outputpenalty \showboxbreadth 9999
 \showboxdepth 9999 \hoffset 1sp {\setbox 254=\box 255\shipout \ifvbox 2
\ifhbox 254 \error \fi 54\copy 25\fi 4} \ifvoid 254\relax \else \error \
fi }
(internal vertical mode: \tracingcommands}
> -1246184.
<output> . ..wthe \outputpenalty
                                      \showboxbreadth 9999 \showbox...
1.286   \showlonglists#$
                              % end of the hairy display, missing . . .


Completed box being shipped out [-2.0.0.0.11.0.327680]
\vbox(10000.0+2.0)x28.0, glue set 9730.6874111
.\glue(\topskip) 7.3 plus 1.0fil
.\hbox(12.7+3.7)x17.0, glue set 0.17223111, shifted 7.0
. .\glue(\leftskip) 3.0
..\mathon, surrounded 1.1
..\hbox(12.7+3.7)x4.80002
...\hbox(0.0+0.0)x0.1, shifted -7.0
...\hbox(12.7+3.7)x1.70001
....\hbox(0.0+0.0)x0.1, shifted -7.0
....\vbox(12.7+3.7)x1.5
.....\hbox(3.5+0.5)x1.5
......\smalltrip A
.....\kern1.2
.....\rule(1.0+0.0)x*
.....\kern6.2
....\hbox(3.5+0.5)x1.5
......\smalltrip A
....\hbox(0.0+0.0)x0.1, shifted -7.0
...\hbox(8.0+2.0)x3.0, shifted -4.0
....\ip b
..\glue(\medmuskip) 0.66664 minus 0.83331
..\ip /
. .\penalty -3333
. .\glue 0.27777
..\glue(\medmuskip) 0.66664 minus 0.83331
..\ip A
. .\kernl.O
. .\glue(\thickmuskip) -1.11108
..\smalltrip -
  \smalltrip -
::\penalty -2222
. .\glue(\thickmuskip) -1.11106
..\ip A
..\glue(\medmuskip) 0.66664 minus 0.83331
..\ip /
..\penalty 1000
..\glue(\medmuskip) 0.66664 minus 0.83331
..\ip A
..\kern1.0
..\mathoff, surrounded 1.1
. .\penalty 10000
. .\glue(\parfillskip) 0.0
. .\glue(\rightskip) 0.0 plus 10.0111 minus 0.00002
.\penalty 0
.\glue(\abovedisplayskip) 9.0
.\glue(\lineskip) 0.0 plus 40.0
.\hbox(68.26251+98.15005)x19.0, glue set - 1.0, shifted 9.0
..\kern-2.49994
..\vbox(6.0+-8.0)x0.0
..\vbox(17.1+4.2)x5.99
...\kern17.1
...\hbox(0.0+0.0)x0.0, shifted 8.6
....\bigtrip -
. . .\kern-17.1
...\hbox(17.1+4.2)x5.99
....\ip A
```

```
. . ..\vbox(21.3+0.0)x3.99, shifted 4.2
. . ...\hbox(9.0+0.0)x2.99, shifted 1.0
. . ....\hbox(7.0+1.0)x2.0, shifted -2.0
. . .....\ip a
. . ....\ip /
. . ...\kern12.3
. . ...\hbox(O.O+O.O)x-0.01
..\vbox(25.76251+4.1)x15.0156
. ..\kernl.O
...\rule(1.0+0.0)x*
...\kern3.0
...\hbox(20.76251+4.1)x15.0156
....\hbox(3.5+0.5)x1.49, shifted -8.3
.....\smalltrip A
....\ip A
. . ..\hbox(0.0+0.0)x-5.01, shifted 4.1
.....\ip -
. . ..\glue(\thinmuskip) 0.27777 plus 2.0fill minus 0.83331
....\hbox(0.0+0.0)x0.0
....\hbox(4.0+16.20003)x16.25781, shifted -16.76261
.....\smalltrip A
.....\kern0.5
. . . ..\kernl.O
.....\smalltrip B
. . . ..\vbox(16.00002+2.0)x12.2678, shifted 14.20003
......\kern8.99998
......\hbox(0.0+0.0)x0.0, shifted 2.1389
.......\bigtrip ["82]
......\kern-8.99998
......\hbox(16.00002+2.0)x12.2778
. . . . . ..\hbox(14.00002+2.0)x6.00002, shifted -0.99998
........\bigtrip A
. . . . . ..\glue(\thinmuskip) 0.27777 plus 2.0fill minus 0.83331
.......\bigtrip A
.......\kern2.0
......\vbox(16.00002+0.0)x0.0
. . . . . ...\hbox(14.00002+2.0)x0.0, shifted -3.0
........\bigtrip a
........\kern0.0
........\hbox(0.0+0.0)x0.0
..\glue(\thinmuskip) 0.27777 plus 2.0fill minus 0.83331
..\vbox(28.0+0.0)x3.0
...\kern10.0
...\hbox(0.0+0.0)x3.0, glue set' 0.5fil
....\glue 0.0 plus 1.0fil minus 1.0fil
....\smalltrip C
....\glue 0.0 plus 1.0fil minus 1.0fil
...\kern6.0
...\hbox(12.0+0.0)x3.0
....\hbox(8.0+2.0)x3.0, shifted -4.0
.....\ip 8
..\glue(\thinmuskip) 0.27777 plus 2.0fill minus 0.83331
..\vbox(7.0+18.0)x8.0
...\hbox(7.0+0.0)x8.0
....\hbox(0.0+0.0)x8.0, shifted - 7 . 0
.....\ip M
...\kern8.0
. ..\hbox(0.0+0.0)x8.0, glue set 3.0111, shifted -1.0
. . ..\glue 0.0 plus 1.0111 minus 1.0fil
....\smalltrip C
. . ..\glue 0.0 plus 1.0fil minus 1.0fil
. ..\kernlO.O
..\glue(\thinmuskip) 0.27777 plus 2.01111 minus 0.83331
..\hbox(68.26251+98.15005)x39.63556
...\hbox(68.26251+98.15005)x39.63556
. . ...\hbox(7.0+1.0)x3.0, shifted -64.26251
.....\ip a
....\vbox(68.26251+98.15005)x36.63556
.....\kern7.0
.....\rule(7.0+0.0)x*
.....\kernt.56248
```

```
.....\hbox(52.70003+98.15005)x36.63556
.... ..\hbox(0.0+0.0)x0.1, shifted -62.70003
......\vbox(52.70003+98.15005)x36.53555
....... \kern0.0
....... \rule(0.0+0.0)x*
....... \kern1.25
....... \hbox(51.45003+98.15005)x36.53555
........ \hbox(51.45003+98.15005)x33.25778
.........\vbox(-1.00002+22.99995)x7.0, shifted -18.99998
.......... \hbox(-1.00002+2.0)x7.0
...........\ip

.........\hbox(-1.00002+2.0)x7.0
...........\ip

..........\hbox(7.0+1.0)x3.0
...........\ip A
..........\hbox(-1.00002+2.0)x7.0
...........\ip

.........\hbox(-1.00002+2.0)x7.0
...........\ip

..........\hbox(8.0+2.0)x3.0
...........\ip B
...........\hbox(35.75003+94.55006)x8.39005
.........\vbox(35.75003+94.55006)x8.3900S
..........\hbox(35.75003+49.05003)x8.3900S
...........\hbox(0.0+0.0)x0.1, shifted -7.0
...........\vbox(35.75003+49.05003)x8.19003
............\hbox(14.00002+2.0)x8.19003, glue set 1.09602111
.............\glue 0.0 plus 1.0fil minus 1.0fil
.............\bigtrip A
.............\kern2.0
.............\glue 0.0 plus 1.0fil minus 1.0fil
.............\kern27.30002
............. \hbox(8.1+33.40002)x8.19003
.............\ip A
.............\vbox(27.75002+13.75002)x6.19003, shifted 19.66001
.............\hbox(0.0+0.0)x-2.61, shifted 1.0
..............\smalltrip -
.............\kern4.0
.............\hbox(23.75002+13.75002)x6.19003
.............\hbox(0.0+0.0)x0.1, shifted -7.0
.............\vbox(23.75002+13.75002)x6.00002
..............\hbox(14.00002+2.0)x6.00002
..............\bigtrip A
..............\kern2.0
..............\glue 0.0 plus 1.0fil
.............\kern0.S
.............\rule(0.5+0.0)x*
.............\kern0.S
.............\hbox(16.0+4.00002)x6.00002, glue set 0.00002fil
.............\glue 0.0 plus 1.0fil minus 1.0fil
.............\bigtrip B
.....,.........\glue(\nonscript)
..............\glue 0.0 plus 1.0fil minus 1.0fil
..............\hbox(0.0+0.0)x0.1, shifted -7.0
.......... ..\hbox(0.0+0.0)x0.1. shifted -7.0         .
..........\kern27.30002
..........\rule(9.1+0.0)x*
......... \vbox(146.40009+3.2)x11.86772, shifted 94.96006
......... ..\hbox(16.0+4.00002)x5.99
..........\bigtri p b
..........\kern106.40007
.......... \hbox(20.0+3.2)x11.86772
..........\hbox(16.0+4.00002)x6.0, shifted -1.0
..........\bigtrip b
..........\vbox(20.0+3.2)x5.77771
..........\hbox(8.0+2.0)x5.77771
.......... ..\hbox(0.0+0.0)x0.0, shifted -7.0
```

```
............\glue(\nonscript)
............\glue(\nonscript)
............\glue 2.49994 minus 1.0fil
............ \glue(\thinmuskip) 0.27777 plus 2.0fill minus 0.83331
............\ip B
...........\kern2.0
...........\rule(2.0+0.0)x*
...........\kern9.2
...........\hbox(0.0+0.0)x5.77771
...........\hbox(0.0+0.0)x0.1, shifted -7.0
.........\discretionary
..........\ip -
.........|\smalltrip A
.........\hbox(14.00002+2.0)x6.00002, shifted -0.99998
..........\bigtrip a
........ \glue(\thinmuskip) 0.27777 plus 2.0fill minus 0.83331
........ \ip A
........\kern1.0
..\rule(*+*)x5.O
.\penalty 10000
.\glue(\lineskip) 0.0 plus 40.0
.\hbox(20.5+57.80002)x9.39003, shifted 18.60997
..\i p -
..\smalltri p b
..\hbox(3.5+0.5)x1.5
...\smalltri p A
...\kern0.5
..\vbox(26.0+4.00002)x1.99, shifte d 10.8
...\hbox(7.0+1.0)x1.99
....\i p A
...\kern2.0
...\hbox(16.0+4.00002)x0.99
....\bigtri p B
....\ip -
..\hbox(20.5+57.80002)x9.40002
...\hbox(20.5+57.80002)x9.40002
....\hbox(0.0+0.0)x0.1, shifted -7.0
....\vbox(20.5+57.80002)x9.20001
.....\hbox(0.0+0.0)x9.20001
.....\kern9.0
.....\rule(9.0+0.0)x*
.....\kern9.0
.....\hbox(20.65001+30.65001)x9.20001
......\hbox(20.65001+30.65001)x9.20001
.......\hbox(20.65001+30.65001)x9.20001
........\hbox(0.0+0.0)x0.1, shifted -7.0
........\vbox(20.65001+30.65001)x9.0
.........\hbox(0.0+0.0)x9.0
.........\kern9.1
.........\rule(9.1+0.0)x*
......... \kern9.1
.........\hbox(18.5+5.5)x9.0
..........\hbox(18.5+5.5)x9.0
...........\hbox(8.0+2.0)x3.0, shifted -4.0
...........\ip b
...........\vbox(18.5+5.5)x3.0
............\hbox(7.0+1.0)x3.0
............\ip A
...........\kern7.0
...........\hbox(9.0+0.0)x3.0, glue set 1.3111
............\glue 0.0 plus 1.0fil minus 1.0fil
............\rule(9.0+*)x0.4
............\glu e 0.0 plus 1.0fil minus 1.0fil
..........\hbox(8.0+2.0)x3.0, shifted -4.0
...........\i p b
.......\hbox(0.0+0.0)x0.1, shifted -7.0
......\hbox(0.0+0.0)x0.0
....\hbox(0.0+0.0)x0.1, shifted -7.0
```

Memory usage before: 2150&498; after: 1169&443; still untouched: 112
(restoring \box254=void}

```
(restoring \hoffset=0.0pt}
(restoring \showboxdepth=1}
(restoring \showboxbreadth=2}
{restoring \tracingcommands=2}
(restoring \parshape=10}
(restoring \hangafter=-12}
(restoring \hangindent=-10.0pt}
(restoring \looseness=-2}
(horizontal mode: \parshape}
{\leftskip}
{\spacefactor}
{\raise}
(restricted horizontal mode: \special}
{blank space }
(end-group character }}
(horizontal mode: blank space }
{\penalty}     .
{\showbox}
> \box0=
\vbox(0.0+0.0)x0.0
.\penalty 999

! OK.
<to be read again>
                      \spacefactor
1.289 \showbox0\spacefactor
              ~
                             =0

{\spacefactor}
! Bad space factor (0).
1.289 \showbox0\spacefactor=0

I allow only values in the range 1..32767 here.

{\write}
{\par}
@firstpass
@secondpaso
[]
0 via 000 b=10000 p=0 d=100020783
001: line 12.0 t=100020783 -> 000
0\penalty via 000 b=10000 p=-10000 d=100020783
002: line 12.0 t=100020783 -> 000
0\penalty' via 001 b=10000 p=-10000 d=100020001
003: line 13.0 t=200040784 -> 001
[]
0\par via 002 b=10000 p=-10000 d=100020001
004: line 13.0- t=200040784 -> 002
0\par via 003 b=10000 p=-10000 d=100020001
006: line 14.0- t=300060785 -> 003


Underfull \hbox (badness 10000) in paragraph at lines 285- -290
 []

\hbox(1.0+0.0)x90.0, glue set 41.0
.\glue(\leftskip) 0.0 plus -10.0fil
.\hbox(0.0+0.0)x4.0, shifted -1.0 []
.etc.


Underfull \hbox (badness 10000) in paragraph at lines 286--290
 []

\hbox(0.0+0.0)x100.0
.\glue(\leftskip) 0.0 plus -10.0fil
.\write10{\the \spacefactor }
.etc.

%% goal height=16383.99998, max depth=2.0
% t=20.0 plus 1.0fil g=16383.99998 b=0 p=125 c=125#
```

```
(vertical mode: end-group character }}
! Extra }, or forgotten \endgroup.
l.291 3
        % this rails to match \begingroup
```
I've deleted a group-closing symbol because it seems to be
spurious, as in ` $x3$ `. But perhaps the } is legitimate and
you forgot something else, as in '\hbox{$x}'. In such cases
the way to recover is to Insert both the forgotten and the
deleted material, e.g., by typing 'I$}'.

```
(blank space }
{\endgroup}
(restoring \hangafter=-12}
{restoring \hangindent=-10.0pt}
(restoring \leftskip=3.0pt}
{restoring \parshape=10}
(restoring \rightskip=0.0pt}
{restoring \looseness=0}
{\mark}
! Improper \spacefactor.
l.293 \mark{\the\spacefactor
                            } % \spacefactor: not in vertical...
```
You can refer to \spacefactor only in horizontal mode:
you can refer to \prevdepth only In vertical mode; and
neither of these is meaningful inside \write. 80
I'm forgetting what you said and using zero instead.

```
(blank space }
(math shift character $}
% t=30.0 plus 41.0 plus 1.0fil g=16383.99998 b=O p=0 c=0$
(horizontal mode: math shift character $}
@firstpass
Osecondpase
[]
O\par via 000 b=* p=-10000 d=783
001: line 1 .O- t=783 -> 000


Underfull \hbox (badness 10000) in paragraph at lines 294--294
 Cl

\hbox(0.0+0.0)x11.0
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

{display math mode: \global}
{\mskip}
{\catcode}
{\catcode}
{\the}
{\def}
(blank space }
{\vtop}
(Internal vertical mode: \everydisplay}
{\vbox}
(end-group character }}
{\noindent}
(horizontal mode: math shift character $}
\everydisplay->\global
(display math mode: \global}
{\lowercase}
(the letter a)
(the letter a)

j->\relax
{\relax}
(math shift character $}
(restoring \displayindent=3.0pt}
(restoring \displaywidth=13.0pt}
(restoring \predisplaysize=24.0pt}
```

```
(restoring \fam=-1}
<horizontal mode: end-group character }}
{restoring \everydisplay=}
<restoring \parshape=10}
(restoring \hangafter=-12}
{restoring \hangindent=-10.0pt}
{display math mode: \hss}
{\leqno}
{math mode: \mathchardef}
! Hissing control sequence inserted.
<inserted text>
                \inaccessible
<to be read again>
                    A
1.298 \leqno\mathchardef A
                    \/\left(\over\left($$
Please don't say '\def cs{...}', say '\def\cs{...}'.
I've inserted an Inaccessible control sequence so that your
definition will be completed without mixing me up too badly.
You can recover graciously from this error, if you're
careful ; see exercise 27.2 in The TeXbook.

! Missing number, treated as zero.
<to be read again>
                    A
1.298 \leqno\mathchardef A
                    \/\left(\over\left($$
A number should have been here; I Inserted '0'.
(If you can't figure out why I needed to see a number,
look up 'weird error ' in the index to The TeXbook.)

(the letter A}
{\/}
{\left}

(->\delimiter "4162362
{\over}
{\left}

(->\delimiter "4162362
<math shift character $}
! Missing \right. inserted.
<inserted text>
                \right .
<to be read again>
                    $
1.298 ...f A\/\left(\over\left($
                              $
I've Inserted something that you may have forgotten.
(See the <inserted text> above .)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my insertion and my current dilemma will both disappear.

{\right}
{math shift character $}
! Missing \right. Inserted.
<Inserted text>
                \right .
<to be read again>
                    $
1.298 ...f A\/\left(\over\left($
                              $
I've inserted something that you may have forgotten.
(See the <inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my insertion and my current dilemma will both disappear.

{\right}
(math shift character $}
```

```
(restoring \inaccessible=undefined}
<restoring \fam=-1}
(restoring j=undefined}
(restoring \catcode106=11}
(restoring \catcode74=11}
{restoring \displayindent=0.0pt}
<restoring \displaywidth=0.0pt}
(restoring \predisplaysize=0.0pt}
(restoring \fam=0}
% t=40.0 plus 124.0 plus 1.0fil minus 8.0 g=16383.99998 b=0 p=0 c=0#
% t=66.00002 plus 164.0 plus 1.0fil minus 8.0 g=16383.99998 b=0 p=-12451
8 4 c=-1245184#
\output->{\tracingcommands 0\showthe \outputpenalty \showboxbreadth 9999
 \showboxdepth 9999 \hoffset 1sp {\setbox 254=\box 255\shipout \ifvbox 2
\ifhbox 2 6 4  \error \fi 54\copy 25\fi 4} \ifvoid 254\relax \else \error \
fi 3
{internal vertical mode: \tracingcommands}
> -1246184.
<output> . ...wthe \outputpenalty
                                  \showboxbreadth 9999 \showbox...
1.298 . . . A\/\left(\over\left(##
```

```
Completed box being shipped out [-2.0.0.0.11.0.327680.1572864.0.-1073741
823]
\vbox(16383.99998+2.0)x100.0, glue eet 16318.0111
.\glue(\topskip) 19.0 plus 1.0fil
.\hbox(1.0+0.0)x90.0, glue set 41.0
..\glue(\leftskip) 0.0 plus -10.0fil
..\hbox(0.0+0.0)x4.0, shifted -1.0
...\special{-12}
. ..\glue 4.Q plus 2.0 minus 1.0
..\glue 4.0 plus 2.0 minus 1.0
..\penalty -10000
..\glue(\rightskip) 0.0 plus 10.0fil minus 0.00602
.\penalty 126
.\glue(\baselineskip) 10.0 plus 41.0
.\hbox(0.0+0.0)x100.0
. .\glue(\leftskip) 0.0 plus -10.0fil
..\write10{\the \spacefactor }
. . \penalty 10000
. .\glue(\parf illskip) 0.0
..\glue(\rightskip) 0.0 plus 10.0fil minus 0.00092
.\mark{0}
.\glue(\parskip) 0.0 plus 42.0 minus 8.0
.\glue(\baselineskip) 10.0 plus 41.0
.\hbox(0.0+0.0)x11.0, shifted 1.0
..\glue(\leftskip) 3.0
..\hbox(0.0+0.0)x0.0
. .\penalty 10000
. .\glue (\parf illskip) 0.0
. .\glue (\rightskip) 0.0
.\penalty 0
.\glue(\abovedisplayskip) 3.0
.\glue(\lineskip) 0.0 plus 40.0
.\hbox(12.0+13.00002)x13.0, shifted 3.0
..\hbox(12.0+4.0)x8.1778
...\ip A
...\kern1.0
. . .\kern0.0
. ..\glue(\thinmuskip) 0.27777 plus 2.0fill minus 0.83331
...\hbox(12.0+4.0)x4.90002
. . ..\hbox(8.0+2.0)x3.0, shifted -4.0
.....\ip b
....\hbox(9.2+4.0)x1.80002
. . ...\hbox(0.0+0.0)x0.1, shifted -7.0
. ....\vbox(9.2+4.0)x1.6
......\hbox(0.0+0.0)x1.6
......\kern1.7
......\rule(1.0+0.0)x*
```

```
......\kern1.0
......\hbox(9.5+0.0)x1.6
.......\hbox(4.0+1.0)x1.5, shifted -6.6
........\smalltrip b
.......\hbox(0.0+0.0)x0.1, shifted -7.0
.....\hbox(0.0+0.0)x0.1, shifted -7.0
....\hbox(0.0+0.0)x0.1, shifted -7.0
..\kern5.0
..\hbox(0.0+13.00002)x-0.1778, glue set - 67.67767111
...\glue 4.99988 minus 4.99988
...\vbox(-0.00002+13.00002)x52.6, glue set - 0.00247
....\vbox(-0.00002+0.0)x0.0
....\glue(\parskip) 0.0 plus 42.0 minus 8.0
....\penalty 0
....\glue(\abovedisplayshortskip) 1.0 plus 46.0 minus 803.0
....\glue(\baselineskip) 3.0 plus 41.0
....\hbox(7.0+1.0)x5.0, shifted 47.6
.....\ip a
.....\ip a
.....\kernl .O
....\penal ty - 1246184
....\glue(\belowdisplayshortskip) 3.0 plus 46.0
...\glue 0.0 plus 1.0fil minus 1.0fil

\write->\the \spacefactor
! Improper \spacefactor.
<write> \the \spacefactor

<inserted text>
                }\endwrite
<to be read again>
                          3
<output> . . .\fi 54\copy 25\fi 4 )
                                   \ifvoid 254\relax \else \err...
1.298 . . . A\/\left(\over\left($$

You can refer to \spacefactor only in horizontal mode;
you can refer to \prevdepth only in vertical mode; and
neither of these is meaningful inside \write. 80
I'm forgetting what you said and using zero instead.

0
Memory usage before: 640&407; after: 397&402; still untouched: 112
( r e s t o r i n g  \box254=void}
(restoring \hoffset=0.0pt}
<restoring \showboxdepth=1}
(restoring \showboxbreadth=2}
(restoring \tracingcommands=2}
{restoring \parshape=10}
(restoring \hangafter=-12}
<restoring \hangindent=-10.0pt}
{horizontal mode: \par}
{vertical mode: \hangindent}
{\par}
{\showthe}
> O.Opt.
1.300 ,..\par\showthe\hangindont
                                \hangindent - 254cm

{\hangindent}
{\parfillskip}
{\the}
{the character 0}
(horizontal mode: the character 0}
Missing character: There is no 0 in font trip!
(blank space }
{\char}
<math shift character $}
Ofirstpass
Osecondpaas
[]\ip A  '
```

```
0 via 000 b=10000 p=0 d=100020783
001: line 1.0 t=100020783 -> 000
["82]
O\par via 000 b=62 p=-10000 d=3969
002: line 1.1- t=3969 -> 0 0 0
```

```
Loose \hbox (badness 62) in paragraph at lines 302--303
 []\ip A ["82]
```

```
\hbox(7.0+1.0)x100.0, glue set 0.86296
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.
```

```
%% goal height=16383.99998, max depth=2 .0
(display math mode: \global}
{\leqno}
{math mode: \kern}
(math shift character $}
<restoring \fam=-1}
! Display math should end with $$.
<to be read again>
                     \par
1.303 . . .e\leqno\kern1009pt$\par
```

```
The '$' that I just saw supposedly matches a previous '$$'.
so I shall assume that you typed '$$' both times.
```

```
(restoring \displayindent=0.0pt}
<restoring \displaywidth=0.0pt}
(restoring \predisplaysize=0.0pt}
<restoring \fam=0}
% t=20.0 plus 1.0fil g=16383.99998 b=0 p=0 c=0#
% t=40.0 plus 82.0 plus 1.0fil g=16383.99998 b=0 p=-1245184 c=-1245184#
\output->{\tracingcommands O\showthe \outputpenalty \showboxbreadth 9999
 \showboxdepth 9999 \hoffset 1sp {\setbox 254=\box 255\shipout \ifvbox 2
\ifhbox 2 6 4 \error \fi 54\copy 25\fi 4 )  \ifvoid 254\relax \else \error \
fi 3
(internal vertical mode: \tracingcommands}
> -1246184.
<output > . ..wthe \outputpenalty
                                    \showboxbreadth 9999 \showbox...
<to be read again>
                     \par
1.303 . . .e\leqno\kern1009pt$\par
```

```
Completed box being shipped out [-2.0.0.0.11.0.327680.1572864.1073741823
. - 10737418231
\vbox(16383.99998+0.0)x8236.0, glue set 16344.0111
.\glue(\topskip) 13.0 plus 1.0fil
.\hbox(7.0+1.0)x100.0, glue set 0.86296
..\glue(\leftskip) 3.0
..\hbox(0.0+0.0)x0.0
..\ip A
..\glue 4.0 plus 1.99799 minus 1.00099
..\ip ["82]
..\penalty 10000
..\glue(\parfillskip) 0.0 plus 100.0
. .\glue(\rightskip) 0.0
.\penalty 0
.\glue(\baselineskip) 9.0 plus 41.0
.\hbox(0.0+0.0)x1009.0, shifted 7227.0
. .\kern 1009.0
. \penalty 10000
.\glue(\baselineskip) 10.0 plus 41.0
.\hbox(0.0+0.0)x-7127.0, shifted 7227.0
```

```
Memory usage before: 2360393; after: 178&391; still untouched: 112
```

```
{restoring \box254=void}
<restoring \hoffset=0.0pt}
(restoring \showboxdepth=1}
<restoring \showboxbreadth=2}
{restoring \tracingcommands=2}
<restoring \hangindent=7227.0pt}
(horizontal mode: \par}
{vertical mode: \showlists}

### vertical mode entered at line 0
prevdepth 0.0, prevgraf 4 lines

! OK.
1.304 \showlists
                  {\catcode'!13\global\everyhbox{\def!{}}}

(begin-group character {}
{\catcode}
{\global}
(end-group character }}
<restoring \catcode33=12}
<blank space }
{\count}
{\baselineskip}
(begin-group character {}
{\sf code)
{\vfuzz}
{\everyvbox}
{\vbox}
\everyvbox->
(Internal vertical mode: blank space  3
{\hsize}
{\tolerance}
(the letter A)
(horizontal mode: the letter A3
(blank space }
<the letter A3
(blank space }
<the letter A3
{blank space }
(the letter A}
(blank space }
{the letter A3
{\clubpenalty}
{\par}
@firstpass
@secondpass
[]\ip A A A
0 via 000 b=* p=0 d=1
001: line 1.3 t=1 -> 000
A A
0\par via 001 b=* p=-10000 d=1
002: line 2.2- t=2 -> 001


Overfull \hbox (3.0pt too wide) in paragraph at lines 308--308
 []\ip A A A|

\hbox(7.0+1.0)x10.0, glue set - 1.0
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.


Tight \hbox (badness 12) In paragraph at lines 308- -308
 \ip A A

\hbox(7.0+1.0)x10.0, glue set - 0.6
.\glue(\leftskip) 3.0
.\ip A
.etc.
```

```
<internal vertical mode: \hbadness}
{\hf uzz)
{the letter A)
<horizontal mode: the letter A)
{blank s p a c e }
{the letter A)
(blank space }
{the letter A)
{blank s p a c e }
{the letter A3
{blank s p a c e }
(the letter A3
{\leaders}
{\par}
@firstpass
Qeecondpass .
[]\ip A A A
0 v i a 000 b=* p=0 d=1
001: line 1.3 t=l -> 000
A A
0\par via 001 b=* p=-10000 d = 1
002: l i n e 2.2- t=2 -> 001

{internal vertical mode: end-group character }}
{restoring \hfuzz=0.0pt}
(restoring \hbadness=0}
{restoring \clubpenalty=125}
<restoring \tolerance=10000}
<restoring \hsize=100.0pt}

Overfull \vbox (18.0pt too high) detected at line 309

\vbox(11.0+1.0)x10.0, glue set - 1.0
.\hbox(7.0+1.0)x10.0, g l u e s e t - 1 . 0 []
.\penalty 10000
.etc.

%% g o a l height=16383.99998, max depth=2.0
(vertical mode: blank space }
(end-group character }}
<restoring \everyvbox=}
<restoring \vfuzz=0.0pt}
{restoring   \sfcode65=999}    .
<blank space }
{\vbox}
<internal vertical mode: \hbadness}
{\hfuzz}
{\hbox}
\everyhbox->\def !{}
(restricted horizontal mode: \def}
{\hskip}
<end-group character }}
<restoring !=undefined}

Overfull \hbox (1.0pt too wide) detected at line 311


\hbox(0.0+0.0)x0.0, glue set - 1.0
.\glue lb.0 minus 9.0

<internal vertical mode: blank space }
{\hbadness}
{\hbox}
\everyhbox->\def !{}
<restricted horizontal mode: \def}
{\hskip}
(end-group character }}
(restoring !=undefined}

Underfull \hbox (badness 101) detected at line 312
```

```
\hbox(0.0+0.0)x10.03749, glue set 1.00375
.\glue 0.0 plus 10.0

(internal vertical mode: \tracingcommands}
(end-group character }}
(restoring \tracingcommands=2}
(restoring \hfuzz=0.0pt}
(restoring \hbadness=0}
% t=20.0 plus 1.0fil g=16383.99998 b=0 p=0 c=0#
<vertical mode: blank space }
{\lineskiplimit}
{\everyhbox}
(blank space }
{\def}
(blank space }
{\dimendef}
{\dimen}
{\vbox}
(internal vertical mode: \tracinglostchars}
{the letter A)
<horizontal mode: the letter A3
{\/}

\space ->
(blank s p a c e }

\space ->
(blank space }
{\ignorespaces}

\space ->

\space ->
(the letter J}
(blank space }
{\vskip}
{\par}
0firstpass
0secondpase
[]\ip A
0\kern v i a 000 b=10000 p=0 d=100020783
001: line 1.0 t=100020783 -> 000

0\par v i a 000 b=56 p=-10000 d=3249
0\par v i a 001 b=10000 p=-10000 d=100020001
002: line 1.1- t=3249 -> 090
```

Loose \hbox (badness 56) in paragraph at lines 315--316
```
 []\ip A

\hbox(7.0+1.0)x100.0, glue set 0.82696
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

(internal vert lcal mode : \vskip}
{\moveleft}
{\boxmaxdepth}
{\mark}
(end-group character }}
(restoring \boxmaxdepth=1000.0pt}
```

Underfull \vbox (badness 10000) detected at line 316
```
\vbox(10.0+-1.0)x0.0
.\mark{vii}

{\vskip}
```

```
{\unskip}
{\setbox}
{\showthe}
> -1.0pt.
1.317 ...astbox\showthe\lastskip
                                 % \lastskip=-1pt (\baselines...


{\unskip}
{\vskip}
{\kern}
{\penalty}
{\showbox}
> \box22=
\vbox(10.0+-1.0)x0.0
.\mark{vii}


! OK.
<to be read again>
                  }
1.318 ...lty\lastkern\showbox22}


(end-group character }}
{restoring \box22=void}
{restoring \tracinglostchars=2}


Underfull `\vbox (badness 10000) detected at line 318

\vbox(11.0+0.0)x100.0
.\hbox(7.0+1.0)x100.0, glue set 0.82696 []
.\glue 2.0
.etc.


% t=31.0 plus 40.0 plus 1.0fil g=16383.99998 b=0 p=0 c=0#
{vertical mode: blank space }
{\showbox}
> \box22=void

! OK.
<to be read again>
                  \kern
1.319 \showbox22\kern
                     3pt\message{\the\lastkern}\unkern


{\kern}
{\message}
3.0pt
{\unkern}
{\show}
> \botmark=\botmark:
0.
1.320 \show\botmark


{\lineskiplimit}

\space ->

\space ->
(blank space }
{\count}
{\vbox}

\space ->
(internal vertical mode: \accent}
(horizontal mode: \accent}
Missing character: There is no ["C8] in font trip!

\space ->
(blank space }
{\accent}
```

```
\space ->
{the letter A3
{\ 3
{\fontdimen}
{\ 3
{\spaceskip}

\^^M->\
{\ 3
{\vskip}
{\par}
@firstpass
Qeecondpass
 Cl
Q via QQO b=10000 p=0 d=100020783
QQ1: line 1.0 t=100020783 -> 000
[]\ip AA
Q via QQO b=10000 p=0 d=100020783
Q via QQ1 b=10000 p=0 d=100020001
QQ2: line 1.0 t=100020783 -> QQO


Q\par via QQO b=44 p=-10000 d=2025
Q\par via QQ1 b=45 p=-10000 d=2116
Q\par via QQ2 b=10000 p=-10000 d=100020001
003: line 1.1- t=2025 -> QQO



Loose \hbox (badness 44) in paragraph at lines 322--324
 El []\ip AA

\hbox(10.50002+1.0)x100.0, glue set 0.76414
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0          .
. etc.

(internal vertical mode : \vskip}
(end-group character 33
<restoring \spaceskip=0.0pt}
(restoring \^^M=undefined}

Overfull \vbox (0.50002pt too high) detected at line 324

\vbox(11.0+0.0)x100.0, glue set - 1.0
.\hbox(10.50002+1.0)x100.0, glue set 0.76414 []
.\glue 10.0 minus 10.0


% t=41.0 plus 40.0 plus 1.0fil g=16383.99998 b=0  p=0  c=0#
(vertical mode: blank space }
{\penalty}
% t=52.0 plus 80.0 plus1.0filg=16383.99998 b=O p=-2147483647 c=-214748
3647#
\output->{\tracingcommands 0\showthe \outputpenalty \showboxbreadth 9999
 \ehowboxdepth 9999 \hoffset lep {\setbox 254=\box 255\shipout \ifvbox 2
\ifhbox 264 \error \fi 54\copy 25\fi 43\ifvoid 254\relax \else \error \
fi 3
(internal vertical mode: \tracingcommands}
> -2147483647.
<output> . . . wthe \outputpenalty
                                \ehowboxbreadth 9999 \showbox...
1.326 \penalty-2147483647
                        % that 's the largest value TeX will.. .


Completed box being shipped out [-2.0.0.0.11.196608.327680.1572864.10737
41823]
\vbox(16383.99998+0.0)x100.0, glue set 16332.0111
.\glue(\topskip) 9.0 plus 1.0fil
.\vbox(11.0+1.0)x10.0, glue set - 1.0.
..\hbox(7.0+1.0)x10.0, glue set - 1.0
...\glue(\leftskip) 3.0
```

```
...\hbox(0.0+0.0)x0.0
...\ip A
...\glue 4.0 plus 1.0 minus 2.0
...\ip A
...\glue 4.0 plus 1.0 minus 2.0
...\ip A
...\glue(\rightskip) 0.0
.\rule(*+*)x5.0
::\penalty 10000
..\glue(\baselineskip) 2.0
..\hbox(7.0+1.0)x10.0, glue set - 0.6
...\glue(\leftskip) 3.0
...\ip A
...\glue 4.0 plus 1.0 minus 2.0
...\ip A
...\penalty 10000
...\glue(\parfillskip) 0.0 plus 100.0
...\glue(\rightskip) 0.0
..\glue(\parskip) 0.0 plus 42.0 minus 8.0
..\glue(\baselineskip) 2.0
..\hbox(7.0+1.0)x10.0, glue ● et - 1.0
...\glue(\leftskip) 3.0
...\hbox(0.0+0.0)x0.0
...\ip A
. ..\glue 4.0 plus 1.0 minus 2.0
...\ip A
...\glue 4.0 plus 1.0 minus 2.0
...\ip A
...\glue(\rightskip) 0.0
..\penalty 10000
..\glue(\baselineskip) 2.0
..\hbox(7.0+1.0)x10.0, glue set - 0.6
...\glue(\leftskip) 3.0
...\ip A
. ..\glue 4.0 plus 1.0 minus 2.0
...\ip A
...\penalty 10000
. ..\glue(\parfillskip) 0.0 plus 100.0
...\glue(\rightskip) 0.0
.\glue(\lineskip) 0.0 plus 40.0
.\vbox(10.0+0.0)x10.03749
..\hbox(0.0+0.0)x0.0, glue ret - 1.0
...\glue 10.0 minus 9.0
..\glue(\baselineskip) 10.0
..\hbox(0.0+0.0)x10.03749, glue set 1.00375
...\glue 0.0 plus 10.0
.\glue(\baselineskip) -1.0
.\vbox(11.0+0.0)x100.0
..\hbox(7.0+1.0)x100.0, glue set 0.82696
...\glue(\leftskip) 3.0
...\hbox(0.0+0.0)x0.0
...\ip A
...\kern 1.0
...\glue 4.0 plus 1.99799 minus 1.00099
...\glue 4.0 plus 1.99799 minus 1.00099
...\penalty 10000
...\glue(\parfillskip) 0.0 plus 100.0
...\glue(\rightskip)  0.0  .
..\glue 2.0
..\glue -2.0
..\kern 0.0
..\penalty 0
.\glue(\lineskip) 0.0 plus 40.0
.\vbox(11.0+0.0)x100.0, glue set - 1.0
..\hbox(10.50002+1.0)x100.0, glue set 0.76414
...\glue(\leftskip) 3.0
...\hbox(0.0+0.0)x0.0
. ..\glue 4.0 plus 2.0 minus 1.0
. ..\kern -6.60003
...\hbox(8.0+2.0)x3.0, shifted -2.60002
....\ip B
```

```
...\kern 2.60003
...\ip A
...\ip A
...\glue 4.0 plus 2.0 minus 1.0
...\glue 4.0 plus 2.0 minus 88.0
...\penalty 10000
...\glue(\parfillskip) 0.0 plus 100.0
...\glue(\rightskip) 0.0
..\glue 10.0 minus 10.0
```

Memory usage before: **651&418**; after: *4170404:* still untouched: 112
(restoring **\box254=void}**
(restoring **\hoffset=0.0pt}**
<restoring **\showboxdepth=1}**
(restoring **\showboxbreadth=2}**
{restoring **\tracingcommands=2}**
(vertical mode: **\penalty}**
 ! Number too big.
1.326 **\penalty-2147483648**
                              % see?
I can only go up to **2147483647='17777777777="7FFFFFFF,**
so I **'m** using that number Instead of yours.

{\tabskip}
{\let}
{\count}
(begin-group character **{}**
{\errhelp}
{\errmessage}

1.328 . . .l is **lost}\errmessage{}**
                                         3
all is lost

<end-group character **}}**
<restoring **\errhelp=}**
(blank space **}**
{\def}
<blank space **}**
{\looseness}
{\setbox}
{internal vertical mode: **\vskip}**
(end-group character **}}**
<restoring **\looseness=-1}**
<vertical mode: blank space **}**
{\halign}
{Internal vertical mode: **\iftrue}**
{true}
{\else}

\d **#1\d ->#1#1**
#1<-##
! Only one **#** is allowed per tab.
<argument> **##**

\d **#1\d ->#1#1**

1.333 . . .**7200bp** minus **4\wd4\d#\d**
                                 \cr **%** **\d#\d** becomes **(erroneou...**
There should be exactly one **#** between *k's,* when an
\halign or **\valign is being** set up. In **this case you had**
more than one, so I'm ignoring all but **the first.**

(restricted horizontal mode: **\global}**
{\spaceskip}
{\def}
{\def}
{\expandafter}

\A ->B

```
\xx ->\global \gdef \A {\global \count \count 1=####\cr \omit \cr \tabsk
ip 3
{\global}
(the letter B}
{end of alignment template)
{\vbox}
<internal vertical mode: \halign}

\A ->\global \count \count 1=##\cr \omit \cr \tabskip
{restricted horizontal mode: end of alignment template)
{\global}
{end of alignment template)
{restoring \tabskip=4.49998pt plus 7227.0pt}
(internal vertical mode: the letter A3
{horizontal mode: the letter A3
(end-group character }}
Of irstpass ,
Osecondpaes
[]\ip AA
O\par via 000 b=* p=-10000 d=1
001: line 1.1- t=1 -> 000


Loose \hbox (badness 86) in paragraph at lines 337--337
 []\ip AA

\hbox(7.0+1.0)x100.0, glue set 0.96
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

{restoring \looseness=-1}
{restricted horizontal mode: blank space }
(end of alignment template)
(restoring \xx=undefined}
(retaining \A=macro:->\global \count \count 1=##\cr \ETC.}
{restoring \spaceskip=0.0pt}
{\valign}
(internal vertical mode: the letter A}
(horizontal mode: the letter A3
Missing character: There is no } in font trip!
{end of alignment template)
Ofirstpass
Osecondpa'ss
[]\ip A
0\par via 000 b=* p=-10000 d=1
001: line 1.1- t=1 -> 000


Loose \hbox (badness 86) in paragraph at lines 337--337
 []\ip A

\hbox(7.0+1.0)x100.0, glue set 0.96
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

{Internal vertical mode: end of alignment template>
(restoring \looseness=-1}
{begin-group character {}
(blank space }
(end-group character }}
{end of alignment template)
{end of alignment template)
{restoring \looseness=-1}


Overfull \vbox (21.99997pt too high) in alignment at lines 337--337

\vbox(-5.0+0.0)x0.0
.\glue(\tabskip) 4.49998 plus 7227.0
.\unsetbox(0.0+0.0)x0.0
```

```
.etc.

<restricted horizontal mode: end of alignment template)
{\global}
{\fontname}
{\romannumeral}
(blank space }
{\lccode}

\A ->\uppercase { \message <trip at 5.0pt\ip mix}\lowercase {uq}}
{\uppercase}
(blank space }
{\message}
TRIP AT 5.OPT\ip AIX
{\lowercase}
(the letter u}
Missing character: There is no u in font trip!
(blank space }
<end of alignment template)
(math shift character $}
(math mode : math shift character $}
<restoring \fam=0}
{restricted horizontal mode: end of alignment template)

\A ->\uppercase { \message (trip at 5.0pt\ip mix}\lowercase {uq}}
{\hss}
{\uppercase}
(blank space }
{\message}
TRIP AT 5.OPT\ip AIX
{\lowercase}
{the letter u}
Missing character: There is no u in font  trip !
(blank space }
{end of alignment template)
(restoring \lccode81=113}
{\show}
> \A=macro:
->\uppercase { \message (trip at 5.0pt\ip mix}\lowercase {uq}} .
<template> \A
              \endtemplate
1.340 . ..\omit$$\span\A&\show\cr
                                  \omit\cr

(end of alignment template)
{end of alignment template)
<internal vertical mode: \global}
{\errmessage}
!\count 2=-1118806.
<recently read> }

1.341 . ...ge{\count2=\the\count2}
                              3
This error message was generated by an \errmessage
command, so I can't give any explicit help.
Pretend that you're Hercule Yolrot, examine all clues,
and deduce the truth by order and method.

<end-group character }}                           .
(restoring \looseness=-1}
{restricted horizontal mode : \mark}
{end of alignment template)
{\mark}
(end of alignment template)
(restoring \tabskip=0.0154pt minus 3.21002pt}

Tight \hbox (badness 12) in alignment at lines 331--342
 [] II [] []

\hbox(0.0+0.0)x205.12613, glue set - 0.6
 .\glue(\tabskip) 0.0154 minus 3.21002
```

```
.\unsetbox(0.0+0.0)x0.0
.etc.

%% goal height=16383.99998, max depth=2.0
% t=20.0 plus 1.0fil g=16383.99998 b=0 p=0 c=0#
% t=30.0 plus 1.0111 g=16383.99998 b=0 p=0 c=0#
% t=40.0 plus 1.0fil g=16383.99998 b=0 p=0 c=0#
(vertical mode: blank space }
{\errmessage}
! \prevdepth =0.0pt.
1.343  ...evdepth=\the\prevdepth}

(That was another \errmessage.)

(blank space }
{\penalty}
% t=40.0 plus 40.0 plus 1.0fil g=16383.99998 b=0 p=-88888 c=-88888#
\output->{\tracingcommands 0\showthe \outputpenalty \showboxbreadth 9999
 \showboxdepth 9999 \hoffset 1sp {\setbox 254=\box 255\shipout \ifvbox 2
\ifhbox 264 \error \fi 54\copy 25\fi 4} \ifvoid 264\relax \else \error \
fi 3
(internal vertical mode: \tracingcommands}
> -88888.
<output>...wthe \outputpenalty
                              \showboxbreadth 9999 \showbox...
1.344 \penalty-88888
         `~              % end alignment test, now miscellaneous . . .


Completed box being shipped out[-2.2.-1118806.0.11.196608.327680.157286
4.10737418231
\vbox(16383.99998+0.0)x205.12613, glue set 16344.0111
.\glue(\topskip) 0.0 plus 1.0fil
.\hbox(20.0+2.0)x205.12613, glue set - 0.6
..\glue(\tabskip) 0.0164 minus 3.21002
..\hbox(20.0+2.0)x0.0, glue set - 1.0
...\ip B
...\vbox(20.0+1.0)x100.0
....\hbox(0.0+0.0)x0.0, glue set 0.00174
.....\glue(\tabskip) 4.49998 plus 7227.0
.....\hbox(0.0+0.0)x0.0
.....\glue(\tabskip)-17.07162
....\glue(\baselineskip)10.0
....\hbox(0.0+0.0)x0.0, glue set 0.00174
.....\glue(\tabskip) 4.49998 plus 7227.0
.....\hbox(0.0+0.0)x0.0
.....\glue(\tabskip)-17.07162
....\glue(\parskip) 0.0 plus 42.0 minus 8.0
....\glue(\baselineskip) 3.0
....\hbox(7.0+1.0)x100.0, glue set 0.96
.....\glue(\leftskip) 3.0
.....\hbox(0.0+0.0)x0.0
......\ip A(ligature AA)
.....\penalty 10000
.....\glue(\parfillskip) 0.0 plus 100.0
.....\glue(\rightskip) 0.0
...\glue(\spaceskip) 4.0 minus 0.00002
..\glue(\tabskip) 0.0154 minus 3.21002
..\hbox(0.0+0.0)x106.9846
..\glue(\tabskip) 0.0164 minus 3.21002
..\hbox(20.0+2.0)x100.0
...\vbox(-5.0+0.0)x100.0
....\glue(\tabskip) 4.49998 plus 7227.0
....\vbox(0.0+0.0)x100.0
.....\hbox(7.0+1.0)x100.0, glue set 0.96
......\glue(\leftskip) 3.0
......\hbox(0.0+0.0)x0.0
.......\ip A
......\penalty 10000
......\glue(\parfillskip) 0.0 plus 100.0
......\glue(\rightskip) 0.0
```

```
....\glue(\tabskip) 0.0
....\vbox(8.0+0.0)x0.0
....\glue(\tabskip) 4.49998 plus 7227.0
...\vbox(-5.0+0.0)x0.0
....\glue(\tabskip) 4.49998 plus 7227.0
....\vbox(0.0+0.0)x0.0
....\glue(\tabskip) 0.0
....\vbox(8.0+0.0)x0.0
....\glue(\tabskip) 4.49998 plus 7227.0
..\glue(\tabskip) 4.49998 plus 7227.0
.\glue(\baselineskip) 0.0
.\hbox(8.0+2.0)x205.12613, glue set - 0.6
..\glue(\tabskip) 0.0164 minus 3.21002
..\hbox(8.0+2.0)x0.0, glue set 177.80637111
...\glue 4.0 plus 2.0 minus 88.0
...\glue 4.0 plus 2.0 minus 88.0
...\ip b
...\glue 4.0 plus 2.0 minus 88.0
...\mathon
...\mathoff
...\glue 0.0 plus 1.0fil minus 1.0fil
...\glue 4.0 plus 2.0 minus 88.0
...\ip b
...\glue 4.0 plus 2.0 minus 88.0
..\glue(\tabskip) 0.0164 minus 3.21002
..\hbox(0.0+0.0)x106.9846
..\glue(\tabskip) 0.0164 minus 3.21002
..\hbox(0.0+0.0)x100.0
..\glue(\tabskip) 4.49998 plus 7227.0
..\hbox(8.0+2.0)x0.0
..\glue(\tabskip) 0.0164 minus 3.21002
.\glue(\baselineskip) 8.0
.\hbox(0.0+0.0)x205.12613, glue set - 0.6
..\glue(\tabskip) 0.0164 minus 3.21002
..\hbox(0.0+0.0)x0.0
..\glue(\tabskip) 0.0154 minus 3.21002
.\glue(\lineskip) 0.0 plus 40.0
.\hbox(0.0+0.0)x205.12613, glue set - 0.6
..\glue(\tabskip) 0.0154 minus 3.21002
..\hbox(0.0+0.0)x0.0
..\glue(\tabskip) 0.0164 minus 3.21002
..\hbox(0.0+0.0)x106.9846
..\glue(\tabskip) 0.0164 minus 3.21002
.\mark{a}
.\mark{b}
```

```
Memory usage before: 7760427; after: 464&421; still untouched: 112
(restoring \box254=void}
<restoring \hoffset=0.0pt}
{restoring \showboxdepth=1}
(restoring \showboxbreadth=2}
(restoring\tracingcommands=2}
<restoring \looseness=-1}
<vertical mode: \newlinechar}
{\global}
! You can
t use a prefix with '\unskip

<to be read again>
                    \unskip
1.346 ...inechar'
\global\unskip
                                    \newlinechar\lastpenalty\unpe...
I
11 pretend you didn
t say \long or \outer or \global.

{\unskip}
{\newlinechar}
{\unpenalty}
! You can't use '\unpenalty' in vertical mode.
```

```
1.346 .  ..r\lastpenalty\unpenalty
                                 \unkern\lastbox
Sorry.. .I'm usually unable to take things from the current
page. Perhaps you can make the output routine do it.
```

{\unkern}
```
 ! You can't use '\unkern' in vertical mode.
1.346 .  ..enalty\unpenalty\unkern
                                \lastbox
Sorry. ..I'm usually unable to take things from the current
page. Try 'I\kern-\lastkern' instead.
```

{\lastbox}
```
 ! You can't use '\lastbox' In vertical mode.
1.346 . . .npenalty\unkern\lastbox
```

Sorry...I'm usually unable to take things from **the current page.** This **\lastbox** will therefore be void.

{\penalty}
{\message}
```
6 10000
```
{\textfont}
```
 ! Bad number (16) .
<to be read again>
                      =
1.346 ...ewlinechar}\textfont16=
                                  \relax
Since I expected to read a number between 0 and 16,
I changed this one to zero.

 ! Missing font identifier.
Cto be read again>
                    \relax
1,346 . ..char}\textfont16=\relax

I was looking for a control sequence whose
current meaning has been defined by \font.
```

{\relax}
{\outer}
```
 ! Missing control sequence inserted.
<inserted text>
                \inaccessible
<to be read again>
                    {
1.347 \outer\def{
              34
Please don't say '\def cs{...}', say '\def\cs{...}'.
I've inserted an inaccessible control sequence so that your
definition will be completed without mixing me up too badly.
You can recover graciously from this error, if you're
careful ; see exercise 27.2 In The TeXbook.
```

{the character **?}**
{horizontal mode: the character **?}**
```
Missing character: There is no ? in font trip!
<blank space }
```
{\dimen}
{\showthe}
> -16383.99998pt.
```
1.348 ...77777sp\showthe\dimen5
                                % this should be OK
```

{\dimen}
```
 ! Dimension too large.
<to be read again>
                    \showthe
1.349 \dimen6=-'40000pt\showthe
                                \dimen6 % this should overflow
I can't work with sizes bigger than about 19 feet.
```

Continue and I'll use the largest value I can.

{\showthe}
> -16383.99998pt.
1.349 . . .**40000pt\showthe\dimen6**
                                    % this should overflow

{\dimen}
{\showthe}
> -8355.74998pt.
1.360 . . .**\dimen5\showthe\dimen7**
                                    \multiply\dimen7 2\showthe\di...

{\multiply}
! Arithmetic overflow.
<to be read again>
                    \showthe
1.360 . . .**ltiply\dimen7 2\showthe**
                                \dimen7
I can't carry out that multiplication or division,
since the result is out of range.

{\showthe}
> -8355.74998pt.
1.360 . . .**dimen7 2\showthe\dimen7**

(undefined)
! Undefined control **sequence.**
1.361 **\a^^0^^0a**
                0 **%** an undefined control sequence followed by . . .
The control sequence at the end of the top line
of your error message was never **\def** 'ed. If you have
misspelled it (e.g., **'\hobx'),** type 'I' and the correct
spelling (e.g. , 'I\hbox **')** . Otherwise just continue,
and I'll forget about whatever was undefined.

! Text line contains an invalid character.
1.361 **\a^^0^^0a0**
                    % an undefined control sequence followed by . . .
A funny symbol that I can't read has just been Input.
Continue, and I'll forget that It ever happened.

<begin-group character **{}**
{\af tergroup)
{\aftergroup}
{\gdef}
{blank space **}**
{\def}
{blank space **}**

\b **->\c**

\c ->
{end-group character **}}**
(restoring **\c=undefined}**

\gobble #1->
#1<-\c
(blank space **}**
{\def}
(blank space **}**
{\outer}
{\toks0}
Runaway text?
! Forbidden control sequence found while scanning text of **\tokens.**
<inserted text>
                3
<to be read **again>**
                    \a^^0^^0a
1.364 ...**ar#2{}\tokens{\a^^0^^0a**

```
                                        \par !
I suspect you have forgotten a '}', causing me
to read past where you wanted me to stop.
I'll try to recover; but if the error is serious,
you'd better type 'E' or 'X' now and fix your file.


\a^^0^^0a #1\par #2->
#1<-
#2<-!
(blank space }
{\long}
(blank space }
{\outer}
! Parameters must be numbered consecutively.
<to be read again>
                            .       8
1.366 . . .ef\lo#1#2U3#4#5#6#7#8#8
                                    #9#{\relax}
I've inserted the digit you should have used after the #.
Type '1' to delete what you did use.

! You already have nine parameters.
1.366 . . .\lo#1#2U3#4#5#6#7#8#8#9
                                    #{\relax}
I'm going to Ignore the # sign you just used.

(blank space }
{\if case)
(case 13


\l #1->
#1<-\par    ﹨


\b #1\par ->                         .
Runaway argument?
{
! Paragraph ended before \b was complete.
<to be read again>
                    \par
1.367 . . .defined\or\l\par\b{\par
                                    % occurrence of \par abort.# \b
I suspect you've forgotten a '}', causing me to apply this
control sequence to too much tixt. How can we recover?
My plan is to forget the whole thing and hope for the best.

{\par}
Ofirstpass
Qsecondpass
[]
@ via @@0 b=10000 p=0 d=100020783
@@1: line 1.0 t=100020783 -> @@0

O\par via 000 b=22 p=-10000 d=529
@@2: line 1.1- t=529 -> @@0
O\par via @@1 b=10000 p=-10000 d=100020001
@@3: line 2.0- t=200040784 -> @@1


Loose \hbox (badness 22) in paragraph at lines 347--367
 []

\hbox(0.0+0.0)x100.0, glue set 0.60627
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

%% goal height=16383.99998, max depth=2.0

\b #1\par ->
#1<-\l \undefined
```

```
(vertical mode: \else}
{\if case)
{\iftrue}
(true)
{case -13
{\if case)
{\fi}
<case 63
{\fi}
{\catcode}
{\let}
{\def}
<blank space }
{\halign}
(internal vertical mode: \ifcase}
(case 33
! Incomplete \ifcase; all text was ignored after line 363.
<inserted text>
                \fi
<to be read again>
                \lo
1.363 \^^C{{\span\ifcase3 \lo
                     #\cr...........89{}\cr} % runaw...
A forbidden control sequence occurred in skipped text.
This kind of error happens when you say '\if . . . ' and forget
the matching '\fi' . I've inserted a '\fi'; this might work.

Runaway preamble?
{
! Forbidden control sequence found while scanning preamble of \^^C.
<inserted text>
                \cr 3
<to be read again>
                \lo
1.363 \^^C{{\span\ifcase3 \lo
                     #\cr...........89{}\cr} % runaw...
I suspect you have forgotten a '}', causing me
to read past where you wanted me to stop.
I'll try to recover; but if the error is serious,
you'd better type 'E' or 'X' now and fix your file.

 ! Missing # inserted In alignment preamble.
<to be read again>
                   \cr
<Inserted text> \cr
                  3
<to be read again>
                \lo
1.363 \^^C{{\span\ifcase3 \lo
                     #\cr............89{}\cr} % runaw...
There should be exactly one # between k's, when an
\halign or \valign is being set up. In this case you had
none, so I've put one in; maybe that will work.


\lo #1#2U3#4#5#6#7#8#989{->\relax {
#1<-##
#2<-\cr
U3<-.
#4<-.
#5<-.
#6<-.
#7<-.
#8<-.
#9<-,.....
{vertical mode: \relax}
{begin-group character {}
<end-group character }}
{\cr}
 ! Misplaced \cr.
1.363 ...#\cr...........89{}\cr
```

```
                              } % runaway preamble?
I can't figure out why you would want to use a tab mark
or \cr or \span just now. If something like a right brace
up above has ended a previous alignment prematurely,
you're probably due for more error messages, and you
might try typing 'S' now just to see what is salvageable.

(end-group character }}
! Too many }'s.
1.363 ...\cr...........89{}\cr}
                                 % runaway preamble?
You've closed more groups than you opened.
Such booboos are generally harmless, so keep going.

(blank space }
{\def}
! Illegal parameter number In definition of \a.
<to be read again>
                   2
1.364 \def\a^^C1{\d#1\d\l{#2
                           }\l#1\par\a^^0^^0a#1\par#% runaw...
You meant to type ## instead of #, right?
Or maybe a } was forgotten somewhere earlier, and things
are all screwed up? I'm going to assume that you meant ##.

Runaway definition?
^^C1->\d ^^C1\d \l {##2}\l ^^C1\par
! Forbidden control sequence found while scanning definition of \a.
<Inserted text>
                 3
<to be read again>
                   \a^^0^^0a
1.364 . ..\l{#2}\l#1\par\a^^0^^0a
                                 #1\par# % runaway In definiti...
I suspect you have forgotten a '}', causing me
to read past where you wanted me to stop.
I'll try to recover; but if the error is serious,
you'd better type 'E' or 'X' now and fix your file.


\a^^0^^0a #1\par #2->
#1<-##1
#2<-##
<blank space }
{\xdef}

\d #1\d·->#1#1
#1<-##1

\l #1->
#1<-##2

\l #1->
#1<-##
Runaway definition?
^^C1->^^C1^^C1l\par
! Forbidden control sequence found while scanning definition of \a.
<Inserted text>
                 3
<to be read again>
                   \a^^0^^0a
1.366 . ..\l{#2}\l#1\par\a^^0^^0a
                                 #1\par# % runaway in definiti...
I suspect you have forgotten a '}', causing me
to read past where you wanted me to etop.
I'll try to recover; but if the error is serious,
you'd better type 'E' or 'X' now and fix your file.


\a^^0^^0a #1\par #2->
#1<-##1
```

```
#2<-##
(blank space }

\a^^O^^Oa #1\par #2->
#1<-
Runaway argument?
{
! Forbidden control sequence found while scanning use of \a**O^^Oa.
<Inserted text>
                \par
<to be read again>
                        \lo
1.366 ^^?a^^O^^Oa\par{\lo
                          \par % runaway in use
I suspect you have forgotten a '}', causing me
to read past where you wanted me to stop.
I'll try to recover; but if the error is serious,
you'd better type 'E' or 'X' now and fix your file


\lo #1#2U3#4#5#6#7#8#989{->\relax {
#1<-\par
Runaway argument?
 ! Forbidden control sequence found while scanning use of \lo.
<inserted text>
                   \par
<to be read again>
                   \lo
1.367 \lo
        \par\par\par P \par\par\par\par\par\par89{} \muski...
I suspect you have forgotten a '}', causing me
to read past where you wanted me to stop.
I'll try to recover; but if the error is serious,
you'd better type 'E' or 'X' now and fix your file.


\lo #1#2U3#4#5#6#7#8#989{->\relax {
#1<-\par
#2<-\par
U3<-\par
#4<-P
#5<-\par
#6<-\par
#7<-\par
#8<-\par
#9< - \par \par
{\relax}
{begin-group character {}
<end-group character }}
(blank space }
{\muskip}
{\muskipdef}
{\muskip3}
{\showthe}
> 5.0mu plus 4.0mu minus 2.0mu.
1.368 ....5\shmip\showthe\shmip


(begin-group character {}
{\advance}
 ! Incompatible glue units.
1.369 {\advance\shmip by \shkip
                            \endlinechar-1
I'm going to assume that lmu=lpt when they're mixed.

{\endlinechar}
{\divide}
{\endlinechar}
{\global}
{\showthe}
> 0.0mu minus -0.00003fil.
```

```
1.372 \showthe\shmip


(end-group character }}
(restoring \endlinechar=13}
(retaining \muskip3=0.0mu minus -0.00003fil}
{\divide}
! Arithmetic overflow.
1.374 By --p
              \toks1={\a\test}
I can't carry out that multiplication or division,
since the result is out of range.

{\toks}
(blank space }
(superscript character ^}
! Missing $ inserted.
<inserted text>
                $
<to be read again>
                ^

1.376 ^
        \leaders\vrule\mskip\shmipM\leaders\hrule\nonscript\h...
I've inserted a begin-math/end-math symbol since I think
you left one out. Proceed, with fingers crossed.

<math shift character $}
% t=20.0 plus 1.0fil g=16383.99998 b=0 p=0 c=0#
(horizontal mode: math shift character $}
(math mode:  superscript character ^}
! Missing { inserted.
<to be read again>
                    \leaders
1.376 ^\leaders
                \vrule\mskip\shmipM\leaders\hrule\nonscript\h...
A left brace was mandatory here, so I've put one in.
You might want to delete and/or Insert some corrections
so that I will find a matching right brace soon.
(If you're confused by all this. try typing 'I}'now.)

{\leaders}
(the letter M}
{\leaders}
! Leaders not followed by proper glue.
<to be read again>
                    \nonscript
1.376 . ..leaders\hrule\nonscript
                              \hskip\thinmuskip
You should say '\leaders <box or rule><hskip or vskip>'.
I found the <box or rule>, but there's no suitable
<hskip or vskip>, so I'm Ignoring these leaders.

{\nonscript}
{\hskip}
! Incompatible glue units.
1.376 ,..script\hskip\thinmuskip

I'm going to assume that 1mu=1pt when they're mixed.

{\par}
! Missing $ inserted.
<inserted text>
                  $
<to be read again>
                    \par
1.376

I've inserted a begin-math/end-math symbol since I think
you left one out. Proceed, with fingers crossed.

(math shift character $}
```

```
! Missing } inserted.
<Inserted text>
                3
<to be read again>
                    $
<to be read again>
                    \par
1.376

I've Inserted something that you may have forgotten.
(See the <inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my insertion and my current dilemma will both disappear.

(end-group character }}
(math shift character $}
(restoring \fam=0}
{horizontal mode : \par}
@f irstpass
Qsec ondpas $
[]$[]$
@\par via @@@ b=* p=-10000 d=1
@@1: line 1.1- t=1 -> @@@


Loose \hbox (badness 80) in paragraph at lines 375--376
 []$[]$

\hbox(8.2+0.0)x100.0, glue set 0.9301
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
 .etc.

(vertical mode: begin-group character {}
{\setbox}
(restricted horizontal mode: \vfill}
! Missing } inserted.
<Inserted text>
                3
<to be read again>
                \vfill
1.377 {\setbox3\hbox{\vfill
                        \vsplit 3 0pt}
I've Inserted something that you may have forgotten.
(See the <Inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my Insertion and my current dilemma will both disappear.

{end-group character }}
(vertical mode: \vfill}
{\vsplit}
! Missing 'to' inserted.
<to be read again>
                    0
1.377 . ..\hbox{\vfill\vsplit 3 0
                                pt}
I'm working on '\vsplit<box number> to <dimen>';
will look for the <dimen> next.

 ! \vsplit needs a \vbox.
<to be read again>
                    }
1.377 . ..ox{\vfill\vsplit 3 0pt)

The box you are trying to split is an \hbox. .
I can't split such a box, so I'll leave it alone.

fend-group character 33
<restoring \box3=
```

```
\vbox(0.0+-8.53581)x0.0 []}
(blank space }
{\def}
! Parameters must be numbered consecutively.
<to be read again>
                      2
1.378 \def\a#2
             {}
I've inserted the digit you should have used after the #.
Type '1' to delete what you did use.

(blank space }
{\show}
> the letter A.
1.379 \show A


(blank space }
{\show}
> \a^^0^^0a=\outer macro:
#1\par #2->.
1.380 \show\a^^0^^0a


{\show}
> (=macro:
->\delimiter "4162362 .
1.381 \show (


<blank space }
{\message}
{\meaning} \
{\noexpand}
\long\outer macro:#1#2U3#4#5#6#7#8#989{->\relax{\lo
(blank space }
{\show}
> \^^C=\halign.
1.383 \show\^^C


(blank space }
{\show}
> \batchmode=\batchmode.
1.304 \show\batchmode


{\show}
> \error=undefined.
1.386 \show\error


{\showthe}
> {\tracingcommands 0\showthe \outputpenalty \showboxbreadth 9999 \showb
oxdepth 9999 \hoffset lap {\setbox 254=\box 255\shipout \ifvbox 2\ifhbox
 264 \error \fi 54\copy 25\fi 4} \ifvoid 254\relax \else \error \fi }.
1.386 \showthe\output


{\showthe}
> 1.0mu plus 2.0fill minus 3.0mu.
1.387 \showthe\thinmuskip


{\showthe}
> -2.0pt.
<recently read> \enorm

1.388 \showthe\fontdimen1\enorm
```

```
{\ifx}
{\false}
{\par}
% t=30.0 plus 42.0 plus 1.0fil minus 8.0 g=16383.99998 b=0 p=0 c=0#
{\if}
{\else}
{true}
{\else}
{\fi}
{\if dim)
{\iftrue}
{true}
! Missing = inserted for \ifdim.
<to be read again>
                        .
1.390 \ifdim72p\iftrue tl
                            i\fi n\fi\fi \message{\jobname\ifx\l...
I was expecting to see '<','=', or '>'. Didn't.

{\fi}
{\fi}
(false)
{\fi}
! gxtra \fi.
1.390 . ..p\iftrue tli\fi n\fi\fi
                                \message{\jobname\ifx\lo\lo...
I'm ignoring this; it doesn't match any \if.

{\message}
{\jobname}
{\if x3
{true}
tripOK
{\fi}
{\hangindent}
{begin-group character {}
{\if}
{true}
(blank space }
{\prevgraf}
{\if}
{false)
! Bad \prevgraf (-1).
<to be read again>
                      \relax
1.392 . ..f 0123\error\else\relax
                                \fi\else\error\fi
I allow only nonnegative values here.

{\relax}
{\fi}
{\else}
{\prevgraf}
{\global}
{end-group character }}
{\showthe}
> 2.
1.393 . ..er=2}\showthe\hangafter
                                \showthe\prevgraf .

{\showthe}
> 1.
1.393 ...gafter\showthe\prevgraf

{\char}
(horizontal mode: \char}
Missing character: There is no ["83] in font trip!
{\showthe}
> 0.
1.394 \char'203\showthe\prevgraf
```

$\indent\mark{twain}

```
(math shift character $}
{math mode: \indent}
{\mark}
(blank space }
{\setbox}
(restricted horizontal mode: \vrule}
(end-group character }}
(math mode: alignment tab character &}
! Misplaced alignment tab character &.
1.396 \setbox3\hbox{\vrule}&
                            \moveleft\lastbox % can't do that.. .
I can't figure out why you would want to use a tab mark
here. If you just want an ampersand, the remedy is
simple: Just type 'I\&' now. But if some right brace
up above has ended a previous alignment prematurely,
you're probably due for more error messages, and you
might try typing '$' now just to see what is salvageable.

{\moveleft}
! You can't use '\movelef t ' in math mode.
1.396 . ..\hbox{\vrule}&\moveleft
                                \lastbox % can't do that in m...
Sorry, but I'm not programmed to handle this case;
I'll just pretend that you didn't ask for it.
If you're In the wrong mode, you might be able to
return to the right one by typing 'I}' or 'I$' or 'I\par'.

{\lastbox}
! You can't use '\lastbox' in math mode.
1.396 ...rule}&\moveleft\lastbox
                                % can't do that in math mode
Sorry; this \lastbox will be void.

{\unhbox}
{\unhcopy}
! Incompatible list can't be unboxed.
<to be read again>
                    \accent
1.396 \unhbox234\unhcopy3\accent
                                \x\vfill\vfil\vfilneg\vss % \...
Sorry, Pandora. (You sneaky devil.)
I refuse to unbox an \hbox In vertical mode or vice versa
And I can't open any boxes in math mode.

{\accent}
! Please use \mathaccent for accents in math mode.
<recently read> \accent

1.396 \unhbox234\unhcopy3\accent
                                \x\vfill\vfil\vfilneg\vss % \...
I'm changing \accent to \mathaccent here; wish me luck.
(Accents are not the same in formulas as they are in text.)

! Missing { inserted.
<to be read again>
                    \vfill
1.396 . ..unhcopy3\accent\x\vfill
                                \vfil\vfilneg\vss % \vfill ox...
A left brace was mandatory here, so I've put one in.
You might want to delete and/or insert some corrections
so that I will find a matching right brace soon.
(If you're confused by all this, try typing 'I}' now.)

{\vfill3
! Missing $ inserted.
<inserted text>
                $
<to be read again>
                    \vfill
```

```
1.396 ...unhcopy3\accent\x\vfill
                            \vfil\vfilneg\vss % \vfill ex...
I've Inserted a begin-math/end-math symbol since I think
you left one out. Proceed, with fingers crossed.

<math shift character $}
! Missing } inserted.
<inserted text>
                3
<to be read again>
                      $
<to be read again>
                      \vf ill
1.396 ...unhcopy3\accent\x\vfill
                            \vfil\vfilneg\vss % \vfill ox...
I've Inserted something that you may have forgotten.
(See the <inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my insertion and my current dilemma will both disappear.

<end-group character }}
{math shift character $}
! \textfont 0 is undefined (character ["C8]).
<recently read> $

<to be read again>
                      \vf ill
1.396 ...unhcopy3\accent\x\vfill
                            \vfil\vfilneg\vss % \vfill ex...
Somewhere in the math formula just ended, you used the
stated character from an undefined font family. For example,
plain TeX doesn't allow \it or \sl in subscripts. Proceed,
and I'll try to forget that I needed that character.

(restoring \box3=
\vbox(0.0+-8.53581)x0.0 []}
(restoring \fam=0}
{horizontal mode : \vf ill)
{\par}
@firstpass
@secondpass
[]$[][]$
@\par via' @@0 b=$ p=-10000 d=1 `
@@1: line 1. 1- t=1 -> @@0


Loose \hbox (badness 91) in paragraph at lines 394--396
 []$[][]$

\hbox(0.0+0.0)x100.0, glue set 0.97
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

<vertical mode: \vfill}
{\vfil}
{\vfilneg}
{\vss}
{\def} `
! Missing { Inserted.
1.397 \def\a}

Where was the left brace? You said something like '\def\a}',
which I'm going to interpret as '\def\a{}' .

{blank space }
{\def}
{\def}
{\let}
{\def}     '
```

```
{blank space 3
{\ifx}
(false3
{\expandafter}

\b ->\a \c
{\ifx3
(true)
{\ifinner}
{false}
{\relax}
{\fi}
{\else}
{\fi}
{\ifvmode}
{true}
(math shift character $3
% t=40.0 plus 84.0 plus 1.0fil plus 1.0fill minus 16.0 g=16383.99998 b=0
 p=o c=0#
! Infinite glue shrinkage found on current page.
<to be read again>
                        $
1.402 \if vmode$
                  \ifmmode\hbox tt\ifhmode\hfilneg\else\error\fi...
The page about to be output contains some infinitely
shrinkable glue, e.g., '\vss' or '\vskip Opt minus 1fil'.
Such glue doesn't belong there; but you can safely proceed,
since the offensive shrinkability has been made finite.

(horizontal mode: math shift character $3
{math mode: \ifmmode}
{true}
{\hbox}
 ! Missing { Inserted.
<to be read again>
                        t
<to be read again>
                        t
1.402 \ifvmode$\ifmmode\hbox tt
                              \ifhmode\hfilneg\else\error\fi...
A left brace was mandatory here, so I've put one in.
You might want to delete and/or insert some corrections
so that I will find a matching right brace soon.
(If you're confused by all this. try typing 'I}' now.)

{restricted horizontal mode: the letter t}
Missing character: There is no t in font trip!
Missing character: There is no t in font trip!
{\ifhmode}
{true}
{\hfilneg}
{\else}
<end-group character 33
(math mode: math shift character $3
{restoring \fam=0}
{horizontal mode: \fi}
{\fi}
{\noalign}
 ! Misplaced \noalign.
1.403 \noalign
              \omit\endcsname % these are extra
I expect to see \noalign only after the \cr of
an alignment. Proceed, and I'll Ignore this case.

{\omit}
 ! Misplaced \omit.
1.403 \noalign\omit
                   \endcsname % these are extra
I expect to see \omit only after tab marks or the \cr of
an alignment. Proceed, and I'll ignore this case.
```

{\endcsname}
 ! Extra \endcsname.
1.403 \noalign\omit\endcsname
                                    % these are extra
I'm ignoring this, since I wasn't doing a \csname.

{\f ontdimen)
 ! Missing font identifier.
<to be read again>
                        =
1.404 \f ontdimen 1000=
                        20\varunit\showthe\fontdimen1000\trip\l...
I was looking for a control sequence whose
current meaning has been defined by \font.

 ! Font \FONT? has only 12 fontdimen parameters.
<to be read again>
                        =
1.404 \fontdimen 1000=
                        20\varunit\showthe\fontdimen1000\trip\l...
To increase the number of font parameters, you must
use \fontdimen Immediately after the \font is loaded.

{\showthe}
 ! Font \ip has only 13 fontdlmen parameters.
<recently read> \trip

1.404 . ..wthe\fontdimen1000\trip
                                \let\PAR=\par
To increase the number of font parameters, you must
use \fontdimen immediately after the \font is loaded.

> 0.0pt.
(recent 1 y read> \trip

1.404 . ..wthe\fontdimen1000\trip
                                \let\PAR=\par

{\let}
{\gdef}
{\expandafter}
{\csname}
{\if x3
(true)
{\mag}

\par ->\relax \PAR
{\relax}
{\par}
Ofirstpass
Osecondpass
[]$[]$
0\par via 000 b=* p=-10000 d=1
001: line 1. 1- t=1 -> 000

Loose \hbox (badness 91) in paragraph at lines 402--406
 []$[]$

\hbox(0.0+0.0)x100.0, glue set 0.97
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
 .etc.

{vertical mode: \fi}
{\noindent}
% t=50.0 plus 126.0 plus 2.0111 plus 2.01111 minus 26.0 g=16383.99998 b=
0 p=o c=0#
(horizontal mode : \halign}

\par ->\relax \PAR

{\relax}
{\par}
{vertical mode: **\halign}**
! Incompatible **magnification (1999);**
 the previous value will be retained (2000).
1.407 . . .**oindent\halign** to ltrue
                                mm{#&#&\l{#}\cr
I can handle only one magnification ratio per job. So I've
reverted to the magnification you used earlier on this run.

{restricted horizontal mode: **\global}**
{end of alignment template3
{end of alignment template3

\l #1->
#1<-&
{end of alignment template3
 ! Extra alignment tab has been changed to **\cr.**
<template> **}\endtemplate**

1.408 **...obal\let\endt=&\endt&$&**
                                &&.}
You have given more **\span** or **&** marks than there were
in the preamble to the **\halign** or **\valign** now in progress.
So 1'll assume that you meant to type **\cr** inetead.

<end of **alignment** template3
(end of alignment template3

\l #1->
#1<-.
(blank space 3

\par **->\relax \PAR**   .
{\relax}
{\par}
! Missing 3 Inserted.
<Inserted text>
                    3
<to be read again>
                        \PAR
1.409

I've Inserted something that **yóu** may have forgotten.
(See the <inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing **'2'** now; then
my insertion and my current dilemma will both disappear.

(end-group character 33
! Missing \cr inserted.
<inserted text>
                    \cr
<to be read again>
                    3
<to be read **again>**
                    \PAR
1.409

I'm **guessing** that you meant to end an alignment here.

{\cr}
! Hissing **{** inserted.
<inserted **text>**
                    {
<to be read **again>**
                    \cr
<to be read again>
                    3
<to be **read** again>
                    \PAR

1.409

I've put in what seems to be necessary to fix
the current column of the current alignment.
Try to go on, since this might almost **work.**

<begin-group character **{}**
<end-group character **}}**
{end of alignment template)

Tight \hbox (badness 1) in alignment at lines **407--409**
  Cl **[] []**

\hbox(0.0+0.0)x1.42262, glue set **-** 0.20662
.**\glue(\tab**3**kip)** 0.0164 minus 3.21002
.**\unsetbox(0.0+0.0)x0.0**
 .etc.

% t=60.0 plus 168.0 plus 2.0111 plus **2.0fill** minus 33.0 **g=16383.99998** b=
0 p=o **c=0#**
(vertical mode : **\par}**
{\hbox}
(restricted horizontal mode: **\/}**
{\hrule}
 ! You can't use **'\hrule'** here except with leaders.
1.410 **\hbox{\/\hrule**
                    \textfont3=\enorm\prevdepth\advance\xspac...
To put a horizontal rule in an hbox or an alignment,
you should use **\leaders** or **\hrulefill** (see The **TeXbook).**

{\textfont}
{\prevdepth}
 ! You can't use **'\prevdepth'** in restricted horizontal **mode.**
1.410 . .**.tfont3=\enorm\prevdepth**
                              \advance\xspaceskipby-\xspac...
Sorry, but I'm not programmed to handle this case;
I'll just pretend that you didn't ask for It.
If you're in the wrong mode, you might be able to
return to the right one by typing **'I}'** or **'I$'** or **'I\par'.**

{\advance}
{\spacefactor}
(begin-group character **{}**
(blank space **}**
<end-group character **}}**
{\everymath}
{\fontdimen}
<math shift character **$**3
\everymath->\radical "3
(math mode : **\radical}**
(end-group character **}}**
{\delimiterfactor}
{\left}

(->\delimiter "4162362
<the **letter** A3
<the letter a)
(math shift character **$}**
 ! Missing **\right.** inserted.
<Inserted text>
                    \right .
<to be read **again>**
                        $
1.412 . .**.iterfactor1600\left(Aa$**
                              AA\/}
I've inserted something that you may have forgotten.
(See the **<inserted** text> above.)
With luck, this will get me unwcclged. But **if** you
really didn't forget anything, try typing '2' now: then
my Insertion and my current dilemma will both disappear.

```
{\right}
{math shift character $3
(restoring \delimiterfactor=10}
<restoring \fam=0}
{restricted horizontal mode: the letter A3
{\/}
(end-group character 33
(restoring \everymath=}
{restoring \xspaceskip=-1.0pt}
<restoring \textfont3=\bigtrip}
% t=70.0 plus 168.0 plus 2.0fil plus 2.01111 minus 33.0 g=16383.99998 b=
0 p=o c=0#
(vertical mode: blank space 3
{\openin}
{\closein}
{\if true)
{true}
(begin-group character {}
{\ifeof}
{true}
{\openin}
 ! Bad number (100).
1.413 . ...e{\ifeof 15\openin 100
                                tripos
Since I expected to read a number between 0 and 16
I changed this one to zero.

{\def}
{blank space 3
{\catcode}
{\catcode}
{\outer}

\loop ->\ifeof 0\let \loop =\relax \else {\global \read Oto \a }\show \a
 \fi \loop
{\ifeof}
(false)
(begin-group character {}
{\global}
<end-group character 33
{\show}
>\a=macro :
->\par .
\loop...\read Oto \a }\show \a
                              \fi \loop
1.416 . ...er\def\uppercase{}\loop
                                  }\else\fi

{\fi}

\loop ->\ifeof 0\let \loop =\relax \else {\global \rQad Oto \a }\show \a
 \fi \loop
{\ifeof}
{false}
<begin-group character {}
{\global}
Runaway definition?
->
! Forbidden control sequence found while scanning definition of \a.
<Inserted text>
                 3
<read 0> \uppercase
                   {0{\outputpenalty }}
\loop ..., {\global \read Oto \a
                               }\show \a \fi \loop
1.416 ...er\def\uppercase{}\loop
                              }\else\fi
I suspect you have forgotten a '}', causing me
to read past where you wanted me to stop.
I'll try to recover; but if the error is serious,
you'd better type 'E' or 'X' now and fix your file.
```

```
! Text line contains an invalid character.
<read 0> \uppercase {0
                           <\outputpenalty 33
\loop... {\global \read Oto \a
                                        }\show \a \fi \loop
1.416 . ..er\def\uppercase{}\loop
                                   }\else\fi
A funny symbol that I can't read has just been input.
Continue , and I'll forget that it ever happened.


Runaway definition?
-> }{{\outputpenalty 33 [
! Forbidden control sequence found while scanning definition of \a.
<inserted text>
                 }
<read 0> [\uppercase
                      {mmmmmmmmm}
\loop... {\global \read Oto \a
                                        }\show \a \fi \loop
1.416 . ..er\def\uppercase{}\loop
                                   }\else\fi
I suspect you have forgotten a '}', causing me
to read past where you wanted me to stop.
I'll try to recover: but if the error is serious,
you'd better type 'E' or 'X' now and fix your file.


Runaway definition?
-> }{{\outputpenalty 33 [ }{mmmmmmmmm}
! File ended within \read.
<read 0>

\loop... {\global \read Oto \a
                                        }\show \a \fi \loop
1.416 . ..er\def\uppercase{}\loop
                                   }\else\fi
This \read has unbalanced braces.


(end-group character 33
{\show}
> \a=macro:
-> }{{\outputpenalty 33[ }{mmmmmmmmm} \par .
\loop...\read Oto \a }\show \a
                                      \fi  \loop
1.416 . ..er\def\uppercase{}\loop
                                   }\else\fi


{\fi}

\loop ->\ifeof 0\let \loop =\relax \else {\global \read Oto \a }\show \a
 \fi \loop
{\ifeof}
{true}
{\let}
{\else}
{\relax}
(end-group character 33
(restoring\uppercase=\uppercase}
(restoring \catcode91=12}
(restoring \catcode48=12}
(restoring \loop=undefined}
{\else}
{end of alignment template3
! Extra end of alignment template.
1.416 \endt
          \def\test#1{\let\test= }\test. \show\test
Things are pretty mixed up, but I think the worst is over.


{\def}

\test #1->\let \test =
```

```
#1<-.
{\let}
{\show}
> \test=blank space .
1.416 ...est= }\test. \show\test


{\def}
{blank space }
{\pretolerance}
{\toks0}
{\unhbox}
% t=3754.40189 plus 208.0 plus 2.0fil plus 2.0fill minus 33.0 g=16383.99
998 b=0 p=0 c=0#
(horizontal mode: \unhbox}

\par ->\relax \PAR
{\relax}
{\par}
C|
0\par via 000 b=* p=-10000 d=1
001: line 1. 1- t=1 -> 000


Loose \hbox (badness 91) in paragraph at lines 418--418
 []

\hbox(0.0+0.0)x100.0, glue set 0.97
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

(vertical mode : \everycr}
(blank space }
{\if case)
{\or}
(case 13
{\ifeof}
{\fi}
! Hissing number, treated as zero.
<to be read again>
                  \relax
<to be read again>
                  \fi
1.419 \ifcase1\or\ifeof\fi
                          \def\stopinput{\error\let\input\die}
A number should have been here; I Inserted '0'.
(If you can't figure out why I needed to see a number,
look up 'weird error' in the index to The TeXbook.)

{true}
{\relax}
{\fi}
{\def}
(blank space }
{\let},
{\let}'
{\halign}
(Internal vertical mode: \iffalse}
(false)
\everycr->\noalign {\penalty 97)
{\penalty}
<end-group character }}
<restricted horizontal mode : \cr}
! Misplaced \cr.
<template> \cr


<to be read again>
                  \cr
1.420 . . .cr#&\ifnum0='{\fi\cr\cr
```
                    3

```
I can't figure out why you would want to use a tab mark
or \cr or \span just now.  If something like a right brace
up above has ended a previous alignment prematurely,
you're probably due for more error messages, and you
might try typing 'S' now just to see what is salvageable.

(alignment tab character &}
! Misplaced alignment tab character &.
<template> &
             \ifnum 0='{\fi \endtemplate
1.420 ...cr#&\ifnum0='{\fi\cr\cr
                              3
I can't figure out why you would want to use a tab mark
here.  If you just want an ampersand, the remedy is
simple: Just type 'I\&' now.  But if some right brace
up above has ended a previous alignment prematurely,
you're probably due for more error messages, and you
might try typing 'S' now just to see what is salvageable.

{\ifnum}
{\fi}
{false}
{end of alignment template)
\everycr->\noalign {\penalty 973
{internal vertical mode : \penalty}
<end-group character }}
% t=3756.40189 plus 290.0 plus 2.0111 plus 2.0fill minus 41.0 g=16383.99
998 b=0 p=97 c=97
% t=3766.40189 plus 290.0 plus 2.0111 plus 2.0fill minus 41.0 g=16383.99
998 b=0 p=97 c=97
(vertical mode: blank space }
{\def}
{\def}

\unbalanced ->\halign \lb
{\halign}
\everycr->\noalign {\penalty 97}
<Internal vertical mode : \penalty}
<end-group character }}
<restricted horizontal mode: \relax}
{\expandafter}

\trap #1->\def #1{danger}\global \let \trap #1\show #1\trap
#1<-\endtemplate
{\def}
! Missing control sequence inserted.
<inserted text>
                 \inaccessible
\trap #1->\def #1
                 {danger}\global \let \trap #1\show #1\trap
1.422 ...lax\expandafter\trap\cr
                               \show\cr\trap}
Please don't say '\def cs{...}', say '\def\cs{...3'.
I've inserted an inaccessible control sequence so that your
definition will be completed without mixing me up too badly.
You can recover graciously from this error, if you're
careful; see exercise 27.2 in The TeXbook.

{\global}
{\show}
> \endtemplate=end of alignment template.
<argument> \endtemplate

\trap ...l \let \trap #1\show X1
                                  \trap
1.422 ...lax\expandafter\trap\cr
                               \show\cr\trap}.

{end of alignment template)
(restoring \inaccessible=\outer macro:->)
\everycr->\noalign {\penalty 97)
```

```
{internal vertical mode: \penalty}
(end-group character }}
<restricted horizontal mode: \show}
> \endtemplate=\outer endtemplate:

<template> \endtemplate

1.422  ...ndafter\trap\cr\show\cr
                                \trap}

(end of alignment template)
\everycr->\noalign {\penalty 97)
(internal vert ical mode : \penalty}
{end-group character }}
% t=3766.40189 plus 290.0 plus 2.0fil plus 2.01111 minus 41.0 g=16383.99
998 b=0 p=97 c=97
% t=3776.40189 plus 290.0 plus 2.0fil plus 2.0fill minus 41.0 g=16383.99
998 b=0 p=97 c=97
% t=3786.40189 plus 290.0 plus 2.0fil plus 2.0fill minus 41.0 g=16383.99
998 b=0 p=97 c=97
(vertical mode: blank space }

\par ->\relax \PAR
{\relax}
{\par}
{\expandafter}
{\input}    ˜
{\endinput}
{\input}
(trlpos. tex
\stopinput ->\error \let \input \die
(undefined)
 ! Undefined \control sequence.
\stopinput ->\error       .
                \let \input \die       .
1.1

The control sequence at the end of the top line
of your error message was never \def'ed. If you have
misspelled it (e.g., '\hobx'), type 'I' and the correct
spelling (e.g., 'I\hbox'). Otherwise just continue,
and I'll forget about whatever was undefined.

{\let}

\par ->\relax \PAR
{\relax}
{\par}
)
{\relax}
{undefined}
 ! Undefined control sequence.
<recently read> \input

1.424 . . .t tripos\endinput\input
                                  % one line of tripos
The control sequence at the end of the top line
of your error meeaage was never \def'ed. If you have
misspelled it (e.g., '\hobx'), type 'I' and the correct
spelling (e.g., 'I\hbox'). Otherwise just continue,
and I'll forget about whatever was undefined.

{\setbox}
(internal vertical mode: \hbox}
{restricted horizontal mode: \hbox}
{\vadjust}
(Internal vertical mode: the letter A)
<horizontal mode: the letter A)
<end-group character }}
[]\ip A
0\par via 000 b=* p=-10000 d=1
```

001: line 1. **1- t=1 ->** 000

Loose \hbox (badness 86) In paragraph at lines 426--426
 []\ip A

\hbox(7.0+1.0)x100.0, glue set 0.96
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

<restricted horizontal mode: end-group character **}}**
<end-group character **}}**
(internal vertical mode: end-group character **}}**

Underfull \vbox (badness 10000) detected at line 426

\vbox(8192.0+0.0)x0.0
.\hbox(0.0+0.0)x0.0 []

(vertical mode: **\vrule}**
(horizontal mode: **\vrule}**
{\unhbox}
! Incompatible list can't be unboxed.
<to be read again>
                   \hrule
1.426 ⌐..}}**\vrule\unhbox10\hrule**

Sorry, Pandora. (You sneaky devil.)
I refuse to unbox an \hbox in vertical mode or vice versa.
And I can't open any boxea in math mode.

{\hrule}

\par ->\relax \PAR
{\relax}
{\par}
[]I
O\par via 000 **b=* p=-10000d=1**
001: line **1.1-** t=1 **->** 000

Loose \hbox (badness 89) In paragraph at lines 426--426
 []I

\hbox(0.0+0.0)x100.0, glue set 0.966
.\glue(\leftskip) 3.0
.\hbox(0.0+0.0)x0.0
.etc.

(vertical mode: **\hrule}**
{\output}
{\futurelet}
{\maxdeadcycles}
{\show}
> **\dump=the** character **=.**
1.427 . ..xdeadcycles=3**\show\dump**

{\catcode}
{\catcode}
{\expandafter}
{\csname}
{\let}
{\relax}

\csname\endcsname{->{
! Use of **\csname\endcsname** doesn't match **its** definition.
1.429 **\relax**
          \catcode'\^^M=13 \defqqM{\relax}#\begingroup{\sh...
If you say, e.g., `**\def\ai{...}**', then you must always

put **'1'** after **'\a'**, since control sequence names are
made up of letters only. The macro here has not been
followed by the required stuff, so I'm ignoring It.

{\catcode}
{\def}
{macro parameter character **#}**
! You can't use 'macro parameter character **#'** in vertical mode.
1.429 . . . **^^M=13 \def^^M{\relax}#**
                                 \begingroup{\showboxdepth=4\s...
Sorry, but I'm not programmed to handle this case;
I'll just pretend that you didn't ask for it.
If you're in the wrong mode, you might be able to
return to the right one by typing **'13'** or **'I#'** or **'I\par'**.

{\begingroup}
(begin-group character **{}**
{\showboxdepth}
{\showbox}
> \box10=
\vbox(8192.0+0.0)x0.0
.\hbox(0.0+0.0)x0.0
..\hbox(0.0+0.0)x0.0
...\vadjust
....\hbox(7.0+1.0)x100.0, glue set 0.96 **[]**

! OK.
<to be read **again>**
                          3
1.429 . . .**owboxdepth=4\showbox10}**

(lend-group character **}}**
(restoring **\showboxdepth=1}**

^^M->\relax
{\relax}

^^M->\relax
{\relax}
{\long}
{\immediate}
\write->\string \caution \1
(no mode: **\string}**

\1 #1\1 ->#1
! Argument **of \1 has an extra }.**
<inserted text>
                    \par
<to be read again>
                      3
<inserted text> **}**
                    \endwrite
1.431 . . .**e10{\string\caution \1}**
                                % livi ng dangerous1 y
I've run across a **'}'** that doesn't **seem** to match **anything.**
Par example. **'\def\a#1{. . .}'** and '\a)' would produce
this error. If you **simply proceed now,the '\par'** that
I've just **inserted will cause** me to report a runaway
argument that might be the root of the **problem.** But **if**
your **'}'** was spurious. just **type** '2' and it will go awa·9.

Runaway argument?
! Paragraph ended **before \1** was **complete.**
<to be read again>
                    \par
<to be read **again>**
                      3
<inserted **text>** 3
                  \endwrite
1.431 . . .**e10{\string\caution \1}**

% living dangerously
I suspect you've forgotten a **'}'**, causing me to apply this
control sequence to too much text. **How** can we recover?
My plan is to forget the whole thing and hope for the best.

\par ->\relax \PAR
\caution\relax **\PAR**
(vertical mode: blank space **}**
{\escapechar}
{|tracingoutput}
{|shipout}
(internal vertical mode: **|copy}**
{|box}
{end-group character **}}**
[-2.2.-1118806.0.11.196608.327680.1572864.1073741823
! Huge page cannot be shipped out.
<recently **read> }**

1.432 . ..**out\vbox{\copy10\box10}**

The page **j**ust created **is** more than 18 feet tall **or**
more than 18 feet wide, so I **suspec**t something went wrong.

The following box has been deleted:
|vbox(16384.0+0.0)x0.0
. **|vbox(8192.0+0.0)x0.0[]**
.**|glue(|lineskip)** 0.0 plus 40.0
.etc.

j
Memory usage before: **819&389;** after: **720&387;** still untouched: **112**

^^M->|relax   .
(vertical mode : **|** relax)
{|setbox}
(restricted horizontal mode: **|fontdimen}**
{|afterassignment}
{|advance}
! **You can't** use '**|prevdepth**' after ladvance.
1.434 . ..relax\advance\prevdepth
                              \afterassignment\relax\future...
I'm forgetting what you said and not changing anything.

{|relax}
{|afterassignment}
{|futurelet}
{|relax}

^^M->|relax
{|relax}
{|message}
{|noexpand}
{(meaning)
|1 |long macro:#1|1 ->#166
{|vbox}
{internal vertical mode: lhyphenchar)
{|-}
{horizontal mode: **l-3**
{| }   ˙
{the letter **B}**
(end-group character **}}**
[]
0|discretionary via 000 **b=10000 p=89 d=100028704**
001: line 1.0- **t=100028704 ->** 000

0 via **000** b-10000 **p=0 d=100020783**
0 via **001 b=10000 p=0 d=100020001**
002: line 1.0 **t=100020783 ->** 000
|1p BBBBBB
0|par via **000 b=62 p=-10000 d=3969**

```
0|par via 001 b=62 p=-10000 d=103969
0|par via 002 b=66p=-10000 d=4489
003: line 1.1- t=3969 -> 000


Loose \hbox (badness 62) in paragraph at lines 436--436
 [] lip BBBBBB

|hbox(7.0+1.0)x100.0, glue set 0.86294
.|glue(|leftskip) 3.0
.|hbox(0.0+0.0)x0 0
.etc.

{restricted horizontal mode: |if}
{|expandafter}

|dol ->$
{|noexpand}
{true}
{|fi}
(lexpandafter)
{|noexpand}
(lexpandafter)
{|noexpand}
(undefined)
! Undefined control sequence.
<recently read> |undefined

<to be read again>
                   |notexpanded: |expandafter
1.437 . ...ed\noexpand\expandafter
                                   %
The control sequence at the end of the top line
of your error message was never \def'ed. If you have
misspelled it (e.g., '\hobx'), type 'I' and the correct
spelling (e.g., 'I\hbox'). Otherwise just continue,
and I'll forget about whatever was undefined.

{|relax}
(math shift character $}
(math made : | begingroup}
{|mathop}
{Ivbox}
(internal vertical mode: |vss}
{and-group character }}
(math mode: end-group character }}
{|limits}
{superscript character ^}
! Missing { inserted.
<to be rend again>
                   |mathchoice
1.438 . . . .ss}}\limits^\mathchoice
                                    {}a}{A|{}}{\mathchoice}
A left brace was mandatory here, so I've put one in.
You might want to delete and/or insert some corrections
so that I will find a matching right brace soon.
(If you're confused by all this, try typing 'I}' now.)

{|mathchoice}
{end-group character }}
! Missing { inserted.
<to be read again>
                   a
1.438 . ...}\limits^\mathchoice{}a
                                  }{A|{}}{\mathchoice}
A left brace was mandatory here, so I've put one in.
You might want to delete and/or insert some corrections
so that I will find n matching right brace soon.
(If you're confused by all this, try typing 'I}' now.)

{the letter a}
```

```
(end-group character }}
{the letter A)
{subscript character |}
<end-group character }}
(end-group character }}
{|mathchoice}
! Missing { inserted.
<to be read again>
                 3
1.430 . ..{}a}{A|{}}{\mathchoice}

A left brace was mandatory here, so I've put one in.
You might want to delete and/or insert some corrections
so that I will find a matching right brace soon.
(If you're confused by all this, try typing 'I}' now.)

(end-group character }}


^^M->|relax
(end-group character }}
{|relax}
(begin-group character {}
<end-group character }}
(begin-group character {}
(the letter B}
{| over3
{end-group character }}
{|endgroup}
! Missing } inserted.
<inserted text>
                 3
<to be read again>
                |endgroup
1.439 . ..elax{}{B\over}\endgroup
                               \showlonglists$}\showboxbread...
I've inserted something that you may have forgotten.
(See the <inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my insertion and my current dilemma will both disappear.

(end-group character }}
! Missing { inserted.
<to be read again>
                |endgroup
1.439 . ..elax{}{B\over}\endgroup
                               \showlonglists$}\showboxbread...
A left brace was mandatory here, so I've put one in.
You might want to delete and/or Insert some corrections
so that I will find n matching right brace soon.
(If you're confused by all this, try typing 'I}' now.)

{|endgroup}
! Missing } Inserted.
(Inserted text>
                 3
<to be read again>
                |endgroup
1.439 . ..elax{}{B\over}\endgroup
                               \showlonglists$}\showboxbread...
I've inserted something that you may have forgotten.
(See the <inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my Insertion and my current dilemma will both disappear.

(end-group character }}
{|endgroup}
! Missing } inserted.
<Inserted text>
                 3
```

```
<to be read again>
                    Iendgroup
1.439 ...elax{}{B\over}\endgroup
                              \showlonglists$}\showboxbread...
I've inserted something that you may have forgotten.
(See the <inserted text> above. )
With luck, this will get meunwedged. But if you
really didn't forget anything, try typing '2' now; then
my insertion and my current dilemma will both disappear.

<end-group character }}
{|endgroup}
! Missing } inserted.
<inserted text>
                3
<to be read again>
                    Iendgroup
1.439 . ...elax{}{B\over}\endgroup
                              \showlonglists$}\showboxbread..
I've inserted something that you may have forgotten.
(See the <Inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my Insertion and my current dilemma will both disappear.

<end-group character }}
{|endgroup}

lshowlonglists ->{|tracingcommands 0|pagefillstretch -1|dimen 100 |showb
oxbreadth 9999 lahowboxdepth 9999 |showlists |pagegoal =10000pt}
{begin-group character {}
{|tracingcommands}

### math mode entered at line 439
### math mode entered at line 438
|mathop|limits
.|vbox(0.0+0.0)x0.0
.. lglue 0.0 plus 1.0fil minus 1.0fil
^|mathchoice
^T|mathord
^T.|fam1 a
^S|mathord
^S.|fam1 A
^S_{}        .
^s lmathchoice
^sS|mathord
^sS.{}
^sS| mathord
^sS.|fraction, thickness = default
^sS.\|mathord
^sS.\.|fam1 B
^sS./{}
lmathord
### restricted horizontal mode entered at line 433
|vbox(7.0+1.0)x100.0
.|hbox(7.0+1.0)x100.0, glue set 0.86294
..|glue(|leftskip) 3.0
..|hbox(0.0+0.0)x0.0
..|discretionary
..|glue 0.0 plus 2.0 minus 88.0
.. lip A (ligature BB)
.. Ikern2.0
.. lip A (ligature BB)
..|kern2.0
.. lip A (ligature BB)
..lpenalty 10000
..|glue(|parfillskip) 0.0 plus 100.0
..|glue(|rightskip) 0.0
spacefactor 1000
### vertical mode entered at line 0
### current pnge:
```

```
|glue(|topskip) 20.0 plus 1.0fil
|hbox(0.0+0.0)x100.0, glue set 0.60627
.|glue(|leftskip) 3.0
.|hbox(0.0+0.0)x0.0
.|glue 4.0 plus 2.0 minus 88.0
.|glue 4.0 plus 2.0 minus 88.0
.|glue 4.0 plus 2.0 minus 88.0
.|glue 4.0 plus 2.0 minus 88.0
.|glue 4.0 plus 2.0 minus 88.0
.|glue 4.0 plus 2.0 minus 88.0
.|glue 4.0 plus 2.0 minus 88.0
.|penalty 10000
.|glue(|parfillskip) 0.0 plus 100.0
.|glue(|rightskip) 0.0
|glue(|parskip) 0.0 plus 42.0 minus 8.0
|glue(|baselineskip) 1.8
|hbox(8.2+0.0)x100.0, glue set 0.9301
.|glue(|leftskip) 3.0
.|hbox(0.0+0.0)x0.0
.|mathon
.|hbox(0.0+0.0)x3.99, shifted -8.2
..|leaders 0.0 minus -0.00003fil
...|rule(*+*)x0.4
..|smalltrip M
..|kernl.0
..|glue(|nonscript)
.|mathoff
.|penalty 10000
.|glue(|parfillskip) 0.0 plus 100.0
.|glue(|rightskip) 0.0
|glue 0.0 plus 1.0fill
|glue(|parskip) 0.0 plus 42.0 minus 8.0
|glue(|baselineskip) 10.0
|hbox(0.0+0.0)x100.0, glue set 0.97
.|glue(|leftskip) 2.0
.|hbox(0.0+0.0)x0.0
.|mathon
.|hbox(0.0+0.0)x0.0
.|hbox(0.0+0.0)x0.0
.|mathoff
.|penalty 10000
.|glue(|parfillskip) 0.0 plus 100.0
.|glue(|rightskip) 0.0
|mark{twain}
|glue 0.0 plue 1.0fill
|glue 0.0 plus 1.0lll
|glue 0.0 plus -1.0fil
|glue 0.0 plus 1.0fil minus 1.0
|glue(|parskip) 0.0 plus 42.0 minus 8.0
|glue(|baselineskip) 10.0
|hbox(0.0+0.0)x100.0, glue set 0.97
.|glue(|leftskip) 3.0
.|hbox(0.0+0.0)x0.0
.|mathon
.|hbox(0.0+0.0)x0.0
..|glue 0.0 plus -1.0fil
.|mathoff
.|penalty 10000
.|glue(|parfillskip) 0.0 plus 100.0
.|glue(|rightskip) 0.0
|glue(|parskip) 0.0 plus 42.0 minus 8.0
|glue(|baselineskip) 10.0
|hbox(0.0+0.0)x1.42262, glue set - 0.20662
.|glue(|tabskip) 0.0164 minus 3.21002
.|hbox(0.0+0.0)x0.0
.|glue(|tabskip) 0.0164 minus 3.21002
.|hbox(0.0+0.0)x0.0
.|glue(|tabskip) 0.0164 minus 3.21092
.|hbox(0.0+0.0)x4.0
.|glue(|tabskip) 0.0164 minus 3.21002
|glue(|baselineskip) 10.0
```

```
|hbox(0.0+0.0)x1.42262, glue set - 0.20662
.|glue(|tabskip) 0.0164 minus 3.21002
.|hbox(0.0+0.0)x0.0
.|glue(|tabskip) 0.0164 minus 3.21002
.|hbox(0.0+0.0)x0.0
.|glue(|tabskip) 0.0164 minus 3.21002
.|hbox(0.0+0.0)x4.0
..|glue 4.0 plus 2.0 minus 88.0
.|glue(|tabskip) 0.0164 minus 3.21002
|glue(|lineskip) 0.0 plus 40.0
|hbox(3545.60136+140.80052)x636.77809
.|glue 6.0 plus 4.0 minus 44.0
. lmathon
.|hbox(3545.60136+140.80052)x614.40031
..|hbox(1638.40019+409.6015)x614.40031,shifted-268.80098
... lenorm b
..|vbox(3545.60136+0.0)x0.0
...|kern1638.40019
...|rule(1638.40019+0.0)x*
...|kern268.80098
...|hbox(0.0+0.0)x0.0
.|glue(|thinmuskip) 0.27777 plus 2.01111 minus 0.83331
.|hbox(19.99994+5.99994)x13.1
..|vbox(-1.00002+26.9999)x7.0,shifted -20.99996
...|hbox(-1.00002+2.0)x7.0
....|ip^^@
...|hbox(-1.00002+2.0)x7.0
....|ip^^@
...|hbox(-1.00002+2.0)x7.0
.... lip ^^@
...|hbox(-1.00002+2.0)x7.0
....|ip^^@
...|hbox(7.0+1.0)x3.0
....|ip A
...|hbox(-1.00002+2.0)x7.0
.... lip ^^@
...|hbox(-1.00002+2.0)x7.0
....|ip^^@
...|hbox(-1.00002+2.0)x7.0
....|ip^^@
...|hbox(-1.00002+2.0)x7.0
....|ip^^@
...|hbox(8.0+2.0)x3.0
....|ip B
..|ip A
..|kern1.0
..|ip a
. . Ikernl.0
..|hbox(0.0+0.0)x0.1,shifted -7.0
.|mathoff
.|ip A (ligature AA)
.|kern 1.0
|glue(|parskip) 0.0 plus 42.0 minus 8.0
|glue(|lineskip) 0.0 plue 40.0
|hbox(0.0+0.0)x100.0, glue set 0.97
.|glue(|leftskip) 3.0
.|hbox(0.0+0.0)x0.0
.|penalty 10000
.|glue(|parfillskip) 0.0 plus 100.0
.|glue(|rightskip) 0.0
|penalty 97
|glue(|baselineskip) 10.0
|hbox(0.0+0.0)x0.03079
.|glue(|tabskip) 0.0164 minus 3.21002
.|hbox(0.0+0.0)x0.0
.|glue(|tabskip) 0.0164 minus 3.21002
|penalty 97
|penalty 97
|glue(|baselineskip) 10.0
|hbox(0.0+0.0)x0.03079
.|glue(|tabskip) 0.0164 minus 3.21002
```

```
.|hbox(0.0+0.0)x0.0
.|glue(|tabskip) 0.0164 minus 3.21002
|penalty 97
|glue(|baselineskip) 10.0
|hbox(0.0+0.0)x0.03079
.|glue(|tabskip) 0.0164 minus 3.21002
.|hbox(0.0+0.0)x0.0
.|glue(|tabskip) 0.0164 minus 3.21002
|penalty 97
|glue(|parskip) 0.0 plus 42.0 minus 8.0
|glue(|baselineskip) 10.0
|hbox(0.0+0.0)x100.0, glue set 0.966
.|glue(|leftskip) 2.0
.|hbox(0.0+0.0)x0.0
.|rule(*+*)x0.4
. lpenalty 10000
.|glue(|parfillskip) 0.0 plus 100.0
.|glue(|rightskip) 0.0
total height 3796.40189 plus 332.0 plus 2.0111 plus -803.01111 minus 49.
0
 goal height 16383.99998
### recent contributions:
|rule(0.4+0.0)x*
prevdepth ignored, prevgraf 1 line

! OK.
|showlonglists ...99|showlists
                              lpagegoal=10000pt}
1.439 ...\endgroup\showlonglists
                              $}\showboxbreadth9\showboxdepth9

irestoring|showboxdepth=1}
<restoring|showboxbreadth=2}
(restoring|tracingcommands=2}
(math shift character $3
(restoring|fam=0}
<restricted horizontal mode: end-group character 33
(restoring|x=|char"C8}
<vertical mode: |showboxbreadth}
{| showboxdepth)

^^M->|relax
{|relax3
{|showbox}
> \box9=
|hbox(19.6+1.0)x101.26778
.|vbox(7.0+1.0)x100.0
..|hbox(7.0+1.0)x100.0, glue set 0.86294
...|glue(|leftskip) 3.0
...|hbox(0.0+0.0)x0.0
...|discretionary
...|glue 0.0 plus 2.0 minus 88.0
...|ip A (ligature BB)
... Ikern2.0
... lip A (ligature BB)
...|kern2.0
... lip A (ligature BB)
...etc.
.|mathon
.|vbox(19.6+0.0)x0.99
..|kern10.0
..|hbox(3.5+4.1)x0.99
... lsmalltrip A
...|hbox(0.0+0.0)x-0.01, shifted 4.1
..|kern2.0
..|hbox(0.0+0.0)x0.99, glue set 0.49601111
... lglue 0.0 plus 1.0fil minus 1.0fil
...|vbox(0.0+0.0)x0.0
.... lglue 0.0 plus 1.0fil minus 1.0fil
... lglue 0.0 plus 1.0fil minus 1.0fil
.|glue(|thinmuskip) 0.27777 plus 2.01111 minus 0.83331
```

```
.|hbox(0.0+0.0)x0.0
.|mathoff

! OK.
<to be read again>
                      | PAR
1.440 \showbox9\PAR
                    {\output{}\penalty-10001\deadcycles=2}\scr...

{|par}
(begin-group character {})
{|output}
{| penalty3
% t=3796.80188 plus 332.0 plus 2.0111 plus -803.01111 minus 49.0 g=10000
.O b=O p=-10001 c=-10001#
[-2.2.-1118806.0.11.196608.327680.1572864.1073741823]
Memory usage before: 845&390; after: 2400374; still untouched: 112
{|deadcycles}
(end-group character }}
{restoring |output={|showthe Jdeadcycles |global |advance |ETC.}
{|scrollmode}

{[hbox}
{restricted horizontal mode: |write}
{|showlists}

### reetrfcted horizontal mode  entered at line 441
|write-{|if 0i{|else unbal}|fi }
spacefactor 1000
### vertical mode entered at line 0
prevdepth ignored, prevgraf 1 line

! OK.          .
1.441 . . .se unbal}\fi}\showlists
                                   \tracingonline1%

{|tracingonline}
{|escapechar}
{^^?global}
{^^?global}
{end}
 ! Missing 3 inserted.
<inserted text>
                  3
<to be read again>
                    end
1.442 . . .lobal\escapechar128\end

I've inserted something that you may have forgotten.
(See the <inserted text> above.)
With luck, this will get me unwedged. But if you
really didn't forget anything, try typing '2' now; then
my insertion and my current dilemma will both disappear.

(end-group character }}
(retaining escapechar=128}
{restoring tracingonline=0}
%% goal height=16383.99998, max depth=2 .O
(vertical mode: end)
% t=20.0 plus 1.0fil g=16383.99998 b=O p=0 c=0#
% t=20.0 plus 1.0fil plus 1.0fill g=16383.99998 b=O p=-1073741824 c=-107
3741824s
output->{showthe deadcycles global advance countz bylglobal globaldefs -
1 gdef local {}unvbox 255end rb }
(internal vertical mode: showthe}
> 3.
<output> {showthe deadcycles
                            global advance countz bylglobal . . .
<to be read again>
                    end
1.442 . . .lobal\escapechar128\end
```

```
{global}
(global)
{gdef}
{unvbox}
{end}
! You can't use 'end' in internal vertical mode.
<recently read> end

<output>...cal {}unvbox 255end
                                    rb }
<to be read again>
                      end
1.442 ...lobal\escapechar128\end

Sorry, but I'm not programmed to handle this case;
I'll just pretend that you didn't ask for it.
If you're in the wrong mode, you might be able to
return to the right one by typing 'I}' or 'I$' or 'I\par'.

<end-group character }}
! Unbalanced output routine.
<output>... {}unvbox 266end rb
                                    3
<to be read again>
                      end
1.442 ...lobal\escapechar128\end

Your sneaky output routine has fewer real {'s than }'s.
I can't handle that very well; good luck.

(restoring local=undefined}
%% goal height=16383.99998, maxdepth=2.0
% t=20.0 plus 1.0fil g=16383.99998 b=0 p=0 c=0#
(vertical mode: end)
% t=20.0 plus 1.0fil plus 1.01111 g=16383.99998 b=0 p=0 c=0#
% t=20.0 plus 1.0fil plus 2.0fill g=16383.99998 b=0 p=-1073741824 c=-107
374182411
! output loop---3 consecutive dead cycles.
<to be read again>
                      end
1.442 . ..lobal\escapechar128\end

I've concluded that your \output is awry; it never does a
\shipout, so I'm shipping \box255 out myself. Next time
increase \maxdeadcycles if you want me to be more patient!


Completed box being shipped out [-1.2.-1118806.0.11.196608.327680.157286
4.10737418231
vbox(16383.99998+0.0)x100.0, glue set 8182.01111
.glue(topskip) 20.0 plus 1.0fil
.hbox(0.0+0.0)x0.0
..write-{if 01{else unbal}fi 3
.hbox(0.0+0.0)x100.0
.glue 0.0 plus 1.0fill
.penalty 10000
.hbox(0.0+0.0)x100.0
.glue 0.0 plus 1.01111

write->if 01{else unbal}f 1
{no mode: if}
{false}

! Unbalanced write command.
<write> if 01{else unbal}fi

<inserted text>
                }endwrite
<to be read again>
```

```
                        end
1.442 . . .lobal\escapechar128\end

On this page there's a \write with fewer real {'s than }'s.
I can't handle that very well; good luck.
```

unbal
```
Memory usage before: 2840386; after: 2420372; still untouched: 112
(vertical mode: end)
(end occurred inside a group at level 1)
(end occurred when if on line 442 was incomplete)
(end occurred when ifcase on line 419 was incomplete)
(end occurred when iftrue on line 413 was incomplete)
Here is how much of TeX's memory you used:
 43 strings out of 1820
 229 string characters out of 9278
 2888 words of memory out of 3000
 368 multiletter control sequences out of 2100
 729 words of font info for 4 fonts, out of 20000 for 76
 2 hyphenation exceptions out of 307
 51,7n,9p,113b,38s stack positions out of 2001,40n,60p,500b,600s

Output written on trip.dvi (16 pages, 2888 bytes).
```

Appendix **II?**: The **TRIP.TYP file.**   **Here is another major component of the** test. **It shows** the **output of DVItype** applied **to** the file **TRIP. DVI that was created at the** same **time** Appendix E **was** produced.

```
This is DVItype, Version 2.7
Options selected:
  Starting page = *.*.*.*.*.*.*.*.*.*
  Maximum number of pages = 1000000
  Output level = 2 (verbose)
  Resolution =  72.27000000 pixels per inch
numerator/denominator=25400000/473628672
magnification=2000;       0.00003062 pixels per DVI unit
'TeX output 1984.11.25:1509'

42: beginning of page 0.0.0.11.0.0.0.0.0
87: down4 129106920 v:=0+129105920=129105920, vv:=3940
92: down3 666360 v:=129105920+655360=129761280, vv:=3960
96: push
level 0:(h=0,v=129761280,w=0,x=0,y=0,z=0,hh=0,vv=3960)
97: right3 1310720 h:=0+1310720=1310720, hh:=40
I 1
101: down3 1310720 v:=129761280+1310720=131072000, vv:=4000
106: setrule height 65536, width 66636 (2x2 pixels)
 h:=1310720+65536=1376256, hh:=42
114: pop
level 0:(h=0,v=129761280,w=0,x=0,y=0,z=0,hh=0,vv=3960)
116: eop

116: beginning of page -5000.0.0.0.11.53110374.0.0.0.0
161: push
level 0:(h=0,v=0,w=0,x=0,y=0,z=0,hh=0,vv=0)
162: down4 116090470 v:=0+116090470=116090470, vv:=3543
167: push
level 1:(h=0,v=116090470,w=0,x=0,y=0,z=0,hh=0,vv=3543)
168: right3 262144 h:=0+262144=262144, hh:=8
[ 1
172: setrule height 26214, width 665360 (1x20 pixels)
 h:=262144+655360=917504, hh:=28
181: right3 32768 h:=917504+32768=950272, hh:=29
I 3
186: push
level 2:(h=950272,v=116090470,w=0,x=0,y=0,z=0,hh=29,vv=3543)
186: fntdef1 0: trip ---loaded at size 666360 DVI units
 (this font is magnified 200%)
206: fntnum0 current font is trip
207: setchar65 h:=950272+131072=1081344, hh:=33
[A]
208: pop
level 2:(h=950272,v=116090470,w=0,x=0,y=0,z=0,hh=29,vv=3543)
209: w3 131072 h:=950272+131072=1081344, hh:=33
[ 1
213: push
level 2:(h=1081344,v=116090470,w=131072,x=0,y=0,z=0,hh=33,vv=3543)
214: setchar65 h:=1081344+131072=1212416, hh:=37
[A]
216: pop
level 2:(h=1081344,v=116090470,w=131072,x=0,y=0,z=0,hh=33,vv=3543)
216: w0 131072 h:=1081344+131072=1212416, hh:=37
I 1
217: push
level 2:(h=1212416,v=116090470,w=131072,x=0,y=0,z=0,hh=37,vv=3543)
218: setchar65 h:=1212416+131072=1343488, hh:=41
[A]
219: pop
level 2:(h=1212416,v=116090470,w=131072,x=0,y=0,z=0,hh=37,vv=3543)
220: w0 131072 h:=1212416+131072=1343488, hh:=41
[ 1
221: push
level 2:(h=1343488,v=116090470,w=131072,x=0,y=0,z=0,hh=41,vv=3543)
222: setchar65 h:=1343488+131072=1474560, hh:=45
[A]
223: pop
```

```
level 2:(h=1343488,v=116090470,w=131072,x=0,y=0,z=0,hh=41,vv=3543)
224: right3 229376 h:=1343488+229376=1572864, hh:=48
[ I
228: push
level 2:(h=1572864,v=116090470,w=131072,x=0,y=0,z=0,hh=48,vv=3543)
229: setchar65 h:=1572864+131072=1703936, hh:=52
[A]
230: pop
level 2:(h=1572864,v=116090470,w=131072,x=0,y=0,z=0,hh=48,vv=3543)
231: w0 131072 h:=1572864+131072=1703936, hh:=52
[ ]
232: push
level 2:(h=1703936,v=116090470,w=131072,x=0,y=0,z=0,hh=52,vv=3543)
233: setchar65 h:=1703936+131072=1835008, hh:=56
[A]
234: pop
level 2:(h=1703936,v=116090470,w=131072,x=0,y=0,z=0,hh=52,vv=3543)
236: w0 131072 h:=1703936+131072=1835008, hh:=56
El
236: pueh
level 2:(h=1835008,v=116090470,w=131072,x=0,y=0,z=0,hh=56,vv=3543)
237: setchar65 h:=1835008+131072=1966080, hh:=60
[A]
238: pop
level 2:(h=1835008,v=116090470,w=131072,x=0,y=0,z=0,hh=56,vv=3543)
239: w0 131072 h:=1835008+131072=1966080, hh:=60
[ ]
240: push
level 2:(h=1966080,v=116090470,w=131072,x=0,y=0,z=0,hh=60,vv=3543)
241: setchar65 h:=1966080+131072=2097152, hh:=64
[A]
242: pop
level 2:(h=1966080,v=116090470,w=131072,x=0,y=0,z=0,hh=60,vv=3543)
243: w3 144179 h:=1966080+144179=2110259, hh:=64
[ ]
247: push
level 2:(h=2110259,v=116090470,w=144179,x=0,y=0,z=0,hh=64,vv=3543)
248: setchar65 h:=2110259+131072=2241331, hh:=68
[A]
249: pop
level 2:(h=2110259,v=116090470,w=144179,x=0,y=0,z=0,hh=64,vv=3543)
260: w0 144179 h:=2110259+144179=2254438, hh:=69
[ I
261: push
level 2:(h=2254438,v=116090470,w=144179,x=0,y=0,z=0,hh=69,vv=3543)
262: setchar65 h:=2254438+131072=2385510, hh:=73
[A]
263: pop
level 2:(h=2254438,v=116090470,w=144179,x=0,y=0,z=0,hh=69,vv=3543)
264: w0 144179 h:=2254438+144179=2398617, hh:=73
[ I
266: push
level 2:(h=2398617,v=116090470,w=144179,x=0,y=0,z=0,hh=73,vv=3543)
266: setchar65 h:=2398617+131072=2529689, hh:=77
[A]
267: pop
level 2:(h=2398617,v=116090470,w=144179,x=0,y=0,z=0,hh=73,vv=3543)
258: w0 144179 h:=2398617+144179=2542796, hh:=78
[ I
269: pueh
level 2:(h=2542796,v=116090470,w=144179,x=0,y=0,z=0,hh=78,vv=3543)
260: setchar65 h:=2542796+131072=2673868, hh:=82
[A]
261: pop
level 2:(h=2542796,v=116090470,w=144179,x=0,y=0,z=0,hh=78,vv=3543)
262: pop
level 1:(h=0,v=116090470,w=0,x=0,y=0,z=0,hh=0,vv=3543)
263: down3 1114112 v:=116090470+1114112=117204582, vv:=3577
267: pueh
level 1:(h=0,v=117204582,w=0,x=0,y=0,z=0,hh=0,vv=3577)
268: right3 262144 h:=0+262144=262144, hh:=8
```

```
[ |
272: eetrule height 26214, width 666360 (1x20 pixels)
 h:=262144+655360=917504, hh:=28
281: right3 32768 h:=917504+32768=950272, hh:=29
286: push
level 2:(h=950272,v=117204582,w=0,x=0,y=0,z=0,hh=29,vv=3577)
286: setchar65 h:=950272+131072=1081344, hh:=33
[A]
287: pop
level 2:(h=950272,v=117204582,w=0,x=0,y=0,z=0,hh=29,vv=3577)
288: w3 131072 h:=950272+131072=1081344, hh:=33
[ I
292: push
level 2:(h=1081344,v=117204582,w=131072,x=0,y=0,z=0,hh=33,vv=3577)
293: setchar65 h:=1081344+131072=1212416, hh:=37
[A]
294: pop
level 2:(h=1081344,v=117204582,w=131072,x=0,y=0,z=0,hh=33,vv=3577)
296: w0 131072 h:=1081344+131072=1212416, hh:=37
[ ]
296: push
level 2:(h=1212416,v=117204582,w=131072,x=0,y=0,z=0,hh=37,vv=3577)
297: setchar65 h:=1212416+131072=1343488, hh:=41
[A]
298: pop
level 2:(h=1212416,v=117204582,w=131072,x=0,y=0,z=0,hh=37,vv=3577)
299: w0¨ 131072 h:=1212416+131072=1343488, hh:=41
[ ]
300: push
level 2:(h=1343488,v=117204582,w=131072,x=0,y=0,z=0,hh=41,vv=3577)
301: setchar65 h:=1343488+131072=1474560, hh:=45
[A]
302: pop
level 2:(h=1343488,v=117204582,w=131072,x=0,y=0,z=0,hh=41,vv=3577)
303: right3 229376 h:=1343488+229376=1572864, hh:=48
[ ]
307: push
level 2:(h=1572864,v=117204582,w=131072,x=0,y=0,z=0,hh=48,vv=3577)
308: setchar65 h:=1572864+131072=1703936, hh:=52
[A]
309: pop
level   2:(h=1572864,v=117204582,w=131072,x=0,y=0,z=0,hh=48,vv=3577)
310: w0 131072 h:=1572864+131072=1703936, hh:=52
[ ]
311: pueh
level 2:(h=1703936,v=117204582,w=131072,x=0,y=0,z=0,hh=52,vv=3577)
312: setchar65 h:=1703936+131072=1835008, hh:=56
[A]
313: pop
level 2:(h=1703936,v=117204582,w=131072,x=0,y=0,z=0,hh=52,vv=3577)
314: w0 131072 h:=1703936+131072=1835008, hh:=56
[ I
316: pueh
level 2:(h=1835008,v=117204582,w=131072,x=0,y=0,z=0,hh=56,vv=3577)
316: setchar65 h:=1835008+131072=1966080, hh:=60
[A]
317: pop
level 2:(h=1835008,v=117204582,w=131072,x=0,y=0,z=0,hh=56,vv=3577)
318: w0 131072 h:=1835008+131072=1966080, hh:=60
[ I
319: push
level 2:(h=1966080,v=117204582,w=131072,x=0,y=0,z=0,hh=60,vv=3577)
320: setchar65 h:=1966080+131072=2097152, hh:=64
[A]
321: pop
level 2:(h=1966080,v=117204582,w=131072,x=0,y=0,z=0,hh=60,vv=3577)
322: w3 144179 h:=1966080+144179=2110259, hh:=64
[ I
326: push
level 2:(h=2110259,v=117204582,w=144179,x=0,y=0,z=0,hh=64,vv=3577)
327: setchar65 h:=2110259+131072=2241331, hh:=68
```

[A]
328: pop
level **2:(h=2110259,v=117204582,w=144179,x=0,y=0,z=0,hh=64,vv=3577)**
329: **w0** 144179 **h:=2110259+144179=2254438, hh:=69**
[I
330: push
level **2:(h=2254438,v=117204582,w=144179,x=0,y=0,z=0,hh=69,vv=3577)**
331: eetchar66 **h:=2254438+131072=2385510, hh:=73**
[A]
332: pop
level **2:(h=2254438,v=117204582,w=144179,x=0,y=0,z=0,hh=69,vv=3577)**
333: **w0** 144179 **h:=2254438+144179=2398617, hh:=73**
[I
334: push
level **2:(h=2398617,v=117204582,w=144179,x=0,y=0,z=0,hh=73,vv=3577)**
336: **setchar65 h:=2398617+131072=2529689, hh:=77**
[A]   .
336: pop
level **2:(h=2398617,v=117204582,w=144179,x=0,y=0,z=0,hh=73,vv=3577)**
337: **w0** 144179 **h:=2398617+144179=2542796, hh:=78**
[I
338: push
level **2:(h=2542796,v=117204582,w=144179,x=0,y=0,z=0,hh=78,vv=3577)**
339: **setchar65 h:=2542796+131072=2673868, hh:=82**
[A]
340: pop
level **2:(h=2542796,v=117204582,w=144179,x=0,y=0,z=0,hh=78,vv=3577)**
341: pop
level **1:(h=0,v=117204582,w=0,x=0,y=0,z=0,hh=0,vv=3577)**
342: pop
level **0:(h=0,v=0,w=0,x=0,y=0,z=0,hh=0,vv=0)**
343: eop

344: beginning of page **10000.0.0.0.11.131072.0.0.0.0**
389: push
level **0:(h=0,v=0,w=0,x=0,y=0,z=0,hh=0,vv=0)**
390: down4 32460719 **v:=0+32460719=32460719, vv:=991**
396: push
level **1:(h=0,v=32460719,w=0,x=0,y=0,z=0,hh=0,vv=991)**
396: **fntnum0** current font **is** trip
397: **setchar65 h:=0+131072=131072, hh:=4**
[A]
398: down3 66636 **v:=32460719+65536=32526255, vv:=993**
402: eetrule height 624288, width 327680 **(16x10** pixels)
 h:=131072+327680=458752, hh:=14
411: pop
level **1:(h=0,v=32460719,w=0,x=0,y=0,z=0,hh=0,vv=991)**
412: **y3** 1880637 **v:=32460719+1880637=34341356, vv:=1048**
416: push
level **1:(h=0,v=34341356,w=0,x=0,y=1880637,z=0,hh=0,vv=1048)**
417: **setchar65 h:=0+131072=131072, hh:=4**
[A]
418: down3 66636 **v:=34341356+65536=34406892, vv:=1050**
422: **setrule** height 624288, width 327680 (16x10 pixels)
 h:=131072+327680=458752, hh:=14
431: pop
level **1:(h=0,v=34341356,w=0,x=0,y=1880637,z=0,hh=0,vv=1048)**
432: **y0** 1880637 **v:=34341356+1880637=36221993, vv:=1105**
433: push
level **1:(h=0,v=36221993,w=0,x=0,y=1880637,z=0,hh=0,vv=1105)**
434: **setchar65 h:=0+131072=131072, hh:=4**
[A]
436: down3 66636 **v:=36221993+65536=36287529, vv:=1107**
439: **setrule** height 624288, width 327680 **(16x10** pixels)
 h:=131072+327680=458752, hh:=14
448: pop
level **1:(h=0,v=36221993,w=0,x=0,y=1880637,z=0,hh=0,vv=1105)**
449: down3 -1396163 **v:=36221993-1396163=34825830, vv:=1063**
463: pueh
level **1:(h=0,v=34825830,w=0,x=0,y=1880637,z=0,hh=0,vv=1063)**
464: **setchar65 h:=0+131072=131072, hh:=4**

[A]
466: down3 66636 v:=34825830+65536=34891366, vv:=1065
469: **setrule** height 524288, width 327680 (16x10 pixels)
 h:=131072+327680=458752, hh:=14
468: pop
level 1:(h=0,v=34825830,w=0,x=0,y=1880637,z=0,hh=0,vv=1063)
469: pop
level 0:(h=0,v=0,w=0,x=0,y=0,z=0,hh=0,vv=0)
470: eop

471: beginning page -333.0.0.0.11.655360000.0.0.0.0
616: push
level 0:(h=0,v=0,w=0,x=0,y=0,z=0,hh=0,vv=0)
517: down4 661689984 v:=0+661689984=661689984, vv:=19888
622: xxx '-1000.0pt'
633: down3 655360 v:=651689984+655360=652345344, vv:=19908
637: push
level 1:(h=0,v=652345344,w=0,x=0,y=0,z=0,hh=0,vv=19908)
638: **fntnum0** current font **is** trip
639: **setchar65** h:=0+131072=131072, hh:=4
[A]
640: down3 65536 v:=652345344+65536=652410880, vv:=19910
644: **setrule** height 524288, width 327680 (16x10 pixels)
 h:=131072+327680=458752, hh:=14
663: pop
level 1:(h=0,v=652345344,w=0,x=0,y=0,z=0,hh=0,vv=19908)
664: pop
level 0:(h=0,v=0,w=0,x=0,y=0,z=0,hh=0,vv=0)
666: eop

666: beginning of page -333.0.0.0. 11.0.0.0.0.0
601: eop

602: beginning of page -2.0.0.0.11.0.0.0.0.0
647: **eop**

648: beginning of page 2.0.0.0.11.0.0.0.0.0
693: down4 1072300032 v:=0+1072300032=1072300032, vv:=32724
698: push
level 0:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
699: push
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
700: push
level 2:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
701: down3 -1441792 v:=1072300032-1441792=1070858240, vv:=32680
705: down3 1441792 v:=1070858240+1441792=1072300032, vv:=32724
709: pop
level 2:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
710: pop
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
711: push
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
712: push
level 2:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
713: down3 -1441792 v:=1072300032-1441792=1070858240, vv:=32680
717: **down3** 1310720 v:=1070858240+1310720=1072168960, vv:=32720
721: pop
level 2:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
722: pop
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
723: push
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
724: push
level 2:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
726: down3 -1441792 v:=1072300032-1441792=1070858240, vv:=32680
729: down3 1310720 v:=1070858240+1310720=1072168960, vv:=32720
733: pop
level 2:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
734: pop
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
736: pop

```
level 0:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
736: y3 666360 v:=1072300032+655360=1072955392, vv:=32744
740: push
level 0:(h=0,v=1072955392,w=0,x=0,y=655360,z=0,hh=0,vv=32744)
741: right3 393217 h:=0+393217=393217, hh:=12
[ I
745: fntnum0 current font is trip
746: setchar65 h:=393217+131072=524289, hh:=16
747: right3 131072 h:=524289+131072=655361, hh:=20
751: setchar66 h:=655361+196608=851969, hh:=26
[A B]
752: pop
level 0:(h=0,v=1072955392,w=0,x=0,y=655360,z=0,hh=0,vv=32744)
753: y0 655360 v:=1072955392+655360=1073610752, vv:=32764
754: push
level 0:(h=0,v=1073610752,w=0,x=0,y=655360,z=0,hh=0,vv=32764)
755: right3 196609 h:=0+196609=196609, hh:=6
759: setchar67 h:=196609+262144=458753, hh:=14
[ C]
760: push
level 1:(h=458753,v=1073610752,w=0,x=0,y=655360,z=0,hh=14,vv=32764)
761: putrule height 26214, width 393216 (1x12 pixels)
770: pop
level 1:(h=458753,v=1073610752,w=0,x=0,y=655360,z=0,hh=14,vv=32764)
771: pop
level 0:(h=0,v=1073610752,w=0,x=0,y=655360,z=0,hh=0,vv=32764)
772: top ⌐

773: beginning of page 2.0.0.0.11.0.0.0.0.0
818: down4 1066418762 v:=0+1065418752=1065418752, vv:=32514
823: push
level 0:(h=0,v=1065418752,w=0,x=0,y=0,z=0,hh=0,vv=32514)
824: right3 196609 h:=0+196609=196609, hh:=6
I 1
828: fntnum0 current font is trip
829: setchar65 h:=196609+131072=327681, hh:=10
830: right3 4653056 h:=327681+4653056=4980737, hh:=152
834: setchar47 h:=4980737+65536=5046273, hh:=154
836: right3 66636 h:=5046273+65536=5111809, hh:=156
839: setchar65 h:=5111809+131072=5242881, hh:=160
840: w3 131072 h:=5242881+131072=5373953, hh:=164
844: setchar65 h:=5373953+131072=5505025, hh:=168
846: w0 131072 h:=5505025+131072=5636097, hh:=172
846: setchar65 h:=5636097+131072=5767169, hh:=176
[A /A A A]
847: set1 130 h:=5767169+262144=6029313, hh:=184
849: set1 130 h:=6029313+262144=6291457, hh:=192
861: setchar66 h:=6291457+196608=6488065, hh:=198
852: setchar47 h:=6488065+65536=6553601, hh:=200
[B/]
863: pop
level 0:(h=0,v=1065418752,w=0,x=0,y=0,z=0,hh=0,vv=32514)
854: y3 589824 v:=1065418752+589824=1066008576, vv:=32532
858: push
level 0:(h=0,v=1066008576,w=0,x=0,y=589824,z=0,hh=0,vv=32532)
859: right3 5898241 h:=0+5898241=5898241, hh:=180
863: setchar65 h:=5898241+131072=6029313, hh:=184
864: w3 131072 h:=6029313+131072=6160385, hh:=188
868: setchar65 h:=6160385+131072=6291457, hh:=192
869: w0 131072 h:=6291457+131072=6422529, hh:=196
870: setchar65 h:=6422529+131072=6553601, hh:=200
[A A A]
871: pop
level 0:(h=0,v=1066008576,w=0,x=0,y=589824,z=0,hh=0,vv=32532)
872: down3 524288 v:=1066008576+524288=1066532864, vv:=32548
876: push
level 0:(h=0,v=1066532864,w=0,x=0,y=589824,z=0,hh=0,vv=32548)
877: right3 6898241 h:=0+5898241=5898241, hh:=180
881: setchar65 h:=5898241+131072=6029313, hh:=184
882: w3 131072 h:=6029313+131072=6160385, hh:=188
886: setchar65 h:=6160385+131072=6291457, hh:=192
```

```
887: w0 131072 h:=6291457+131072=6422529, hh:=196
888: setchar65 h:=6422529+131072=6553601, hh:=200
[ A A A]
889: pop
level 0:(h=0,v=1066532864,w=0,x=0,y=589824,z=0,hh=0,vv=32548)
890: y0 689824 v :=1066532864+589824=1067122688, vv:=32566
891: push
level 0:(h=0,v=1067122688,w=0,x=0,y=589824,z=0,hh=0,vv=32566)
892: right3 6701633 h:=0+5701633=5701633, hh:=174
896: setchar65 h:=5701633+131072=5832705, hh:=178
897: w3 131072 h:=5832705+131072=5963777, hh:=182
901: setchar65 h:=5963777+131072=6094849, hh:=186
902: w0 131072 h:=6094849+131072=6225921, hh:=190
903: setchar65 h:=6225921+131072=6356993, hh:=194
904: setchar66 h:=6356993+196608=6553601, hh:=200
[ A A AB]
906: pop
level 0:(h=0,v=1067122688,w=0,x=0,y=589824,z=0,hh=0,vv=32566)
906: y0 689824 v. :=1067122688+589824=1067712512, vv:=32584
907: push
level 0:(h=0,v=1067712512,w=0,x=0,y=589824,z=0,hh=0,vv=32584)
908: right3 6898241 h:=0+5898241=5898241, hh:=180
912: setchar65 h:=5898241+131072=6029313, hh:=184
913: w3 131072 h:=6029313+131072=6160385, hh:=188
917: setchar65 h:=6160385+131072=6291457, hh:=192
918: w0 131072 h:=6291457+131072=6422529, hh:=196
919: setchar65 h:=6422529+131072=6553601, hh:=200
[ A A A]
920: pop
level 0:(h=0,v=1067712512,w=0,x=0,y=589824,z=0,hh=0,vv=32584)
921: y0 689824 v:=1067712512+589824=1068302336, vv:=32602
922: pueh
level 0:(h=0,v=1068302336,w=0,x=0,y=589824,z=0,hh=0,vv=32602)
923: right1 1 h:=0+1=1, hh:=0
926: setchar65 h:=1+131072=131073, hh:=4
926: right3 131072 h:=131073+131072=262145, hh:=8
930: setchar66 h:=262145+196608=458753, hh:=14
931: right3 262144 h:=458753+262144=720897, hh:=22
936: setchar97 h:=720897+131072=851969, hh:=26
936: setchar66 h:=851969+196608=1048577, hh:=32
[A B aB]
937: pop
level 0:(h=0,v=1068302336,w=0,x=0,y=589824,z=0,hh=0,vv=32602)
938: down3 2031616 v:=1068302336+2031616=1070333952, vv:=32664
942: pueh
level 0:(h=0,v=1070333952,w=0,x=0,y=589824,z=0,hh=0,vv=32664)
943: right3 196609 h:=0+196609=196609,hh:=6
947: setchar65 h:=196609+131072=327681, hh:=10
[ A]
948: pop
level 0:(h=0,v=1070333952,w=0,x=0,y=589824,z=0,hh=0,vv=32664)
949: y3 665360 v:=1070333952+655360=1070989312, vv:=32684
963: push
level 0:(h=0,v=1070989312,w=0,x=0,y=655360,z=0,hh=0,vv=32684)
964: right3 196609 h:=0+196609=196609, hh:=6
968: oetchar46 h:=196609-327680=-131071, hh:=-4
[ -1
969: pop
level 0:(h=0,v=1070989312,w=0,x=0,y=655360,z=0 hh=0,vv=32684)
960: y0 666360 v:=1070989312+655360=1071644672  vv:= 32704
961: push
level 0:(h=0,v=1071644672,w=0,x=0,y=655360,z=0 hh=0,vv=32704)
962: right3 196609 h:=0+196609=196609, hh:=6
966: eetchar67 h:=196609+262144=458753, hh:=14
[ C]
967: pop
level 0:(h=0,v=1071644672,w=0,x=0,y=655360,z=0 hh=0,vv=32704)
968: y0 666360 v:=1071644672+655360=1072300032  vv:= 32724
969: pueh
level 0:(h=0,v=1072300032,w=0,x=0,y=655360,z=0 hh=0,vv=32724)
970: right3 196609 h:=0+196609=196609, hh:=6
```

```
974: setchar67 h:=196609+262144=458753, hh:=14
[ C]
976: pop
level 0:(h=0,v=1072300032,w=0,x=0,y=655360,z=0,hh=0,vv=32724)
976: y0 656360 v:=1072300032+655360=1072955392, vv:=32744
977: y0 666360 v:=1072955392+655360=1073610752, vv:=32764
978: push
level 0:(h=0,v=1073610752,w=0,x=0,y=655360,z=0,hh=0,vv=32764)
979: right3 6422629 h:=0+6422529=6422529,hh:=196
983: setchar65 h:=6422529+131072=6553601, hh:=200
[ A]
984: pop
level 0:(h=0,v=1073610752,w=0,x=0,y=655360,z=0,hh=0,vv=32764)
986: eop

986: beginning of page -2.0.0.0.11.0.327680.0.0.0
1031: down4 1071448064 v:=0+1071448064=1071448064,vv:=32698
1036: push
level 0:(h=0,v=1071448064,w=0,x=0,y=0,z=0,hh=0,vv=32698)
1037: right3 262145 h:=0+262145=262145, hh:=8
[ 1
1041: fntnum0 current font is trip
1042: setchar45 h:=262145-327680=-65535, hh:=-2
t-1
1043: pop
level 0:(h=0,v=1071448064,w=0,x=0,y=0,z=0,hh=0,vv=32698)
1044: y3 655360 v:=1071448064+655360=1072103424, vv:=32718
1048: push
level 0:(h=0,v=1072103424,w=0,x=0,y=655360,z=0,hh=0,vv=32718)
1049: right3 327681 h:=0+327681=327681, hh:=10
1053: setchar45 h:=327681-327680=1, hh:=0
1064: setchar45 h:=1-327680=-327679, hh:=-10
[ --]
1066: pop
level 0:(h=0,v=1072103424,w=0,x=0,y=655360,z=0,hh=0,vv=32718)
1056: y0 656360 v:=1072103424+655360=1072758784, vv:=32738
1067: push
level 0:(h=0,v=1072758784,w=0,x=0,y=655360,z=0,hh=0,vv=32738)
1068: right3 393217 h:=0+393217=393217, hh:=12
1062: setchar45 h:=393217-327680=65537, hh:=2
1063: setchar45 h:=65537-327680=-262143, hh:=-8
1064: right3 66536 h:=-262143+65536=-196607, hh:=-6
1068: setchar65 h:=-196607+131072=-65535, hh:=-2
[ --Al
1069: pop
level 0:(h=0,v=1072758784,w=0,x=0,y=655360,z=0,hh=0,vv=32738)
1070: down3 861968 v:=1072758784+861968=1073610752, vv:=32764
1074: eop

1076: beginning of page 2.0.0.0.11.0.327680.0.0.0
1120: down4 638883424 v:=0+638883424=638883424, vv:=19497
1125: push
level 0:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)
1126: push
level 1:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)
1127: push
level 2:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)
1128: push
level 3:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)
1129: down3 -602931 v:=638883424-602931=638280493, vv:=19479
1133: push
level 4:(h=0,v=638280493,w=0,x=0,y=0,z=0,hh=0,vv=19479)
1134: right3 740669 h:=0+740559=740559, hh:=23
[ I
1138: fntdef1 1: trip ---loaded at size 327680 DVI units
1158: fntnuml current font is trip
1169: eetchar66 h:=740559+65536=806095, hh:=25
[A]
1160: pop
level 4:(h=0,v=638280493,w=0,x=0,y=0,z=0,hh=0,vv=19479)
1161: right3 740669 h:=0+740559=740559, hh:=23
```

[ ]
1166: down3 176947 **v:=638280493+176947=638457440, vv:=19484**
1169: **putrule** height **65536**, width 98304 (2x3 pixels)
1178: down3 635699 **v:=638457440+635699=639093139, vv:=19504**
1182: push
level **4:(h=740559,v=639093139,w=0,x=0,y=0,z=0,hh=23,vv=19504)**
1183: **setchar65 h:=740559+65536=806095, hh:=25**
[A]
1184: pop
level **4:(h=740559,v=639093139,w=0,x=0,y=0,z=0,hh=23,vv=19504)**
1185: pop
level **3:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)**
1186: pop
level **2:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)**
1187: push
level **2:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)**
1188: right3 846417 **h:=0+845417=846417, hh:=26**
[3
1192: down3 -262144 **v:=638883424-262144=638621280, vv:=19489**
1196: **fntnum0** current font is trip
1197: aetchar98 **h:=845417+196608=1042025,hh:=32**
[b]
1198: pop
level **2:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)**
1199: pop
level **1:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)**
1200: right3 1078433 **h:=0+1078433=1078433, hh:=33**
1204: **setchar47 h:=1078433+65536=1143969, hh:=35**
1206: right3 54612 **h:=1143969+54612=1198581, hh:=37**
1209: **setchar65 h:=1198581+131072=1329653, hh:=41**
1210: right2 -7280 **h:=1329653-7280=1322373, hh:=41**
[/Al
1213: fntnuml current font **is** trip
1214: **setchar45 h:=1322373-163840=1158533, hh:=36**
1215: **setchar45 h:=1158533-163840=994693, hh:=31**
1216: right3 -72816 **h:=994693-72816=921877, hh:=29**
[--]
1220: **fntnum0** current **font** is trlp
1221: **setchar65 h:=921877+131072=1052949, hh:=33**
1222: **w3** 36408 **h:=1052949+36408=1089357, hh:=34**
1226: eetchar47 **h:=1089357+65536=1154893,hh:=36**
1227: **w0** 36408 **h:=1154893+36408=1191301, hh:=37**
1228: **setchar65 h:=1191301+131072=1322373, hh:=41**
[A/A]
1229: pop
level **0:(h=0,v=638883424,w=0,x=0,y=0,z=0,hh=0,vv=19497)**
1230: down3 4912743 **v:=638883424+4912743=643796167, vv:=19647**
1234: push
level **0:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)**
1235: push
level **1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)**
1236: push
level **2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)**
1237: right3 983046 **h:=0+983045=983045, hh:=30**
[I
1241: **fntdefl** 2: trip ---loaded at size 1310720 DVI units
 (this font **is** magnified **400%)**
1261: **fntnum2** current font **is** trip
1262: eetchar46 **h:=983045-655360=327685,hh:=10**
[-]
1263: pop
level **2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)**
1264: push
level **2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)**
1266: right3 425989 **h:=0+425989=425989, hh:=13**
[1
1269: **fntnum0** current font is trip
1270: **setchar65 h:=425989+131072=557061, hh:=17**
[A]
1271: push
level **3:(h=557061,v=643796167,w=0,x=0,y=0,z=0,hh=17,vv=19647)**

```
1272:  down3 -630842 v:=643796167-530842=643265325, vv:=19631
1276:  push
level 4:(h=557061,v=643265325,w=0,x=0,y=0,z=0,hh=17,vv=19631)
1277:  push
level 5:(h=557061,v=643265325,w=0,x=0,y=0,z=0,hh=17,vv=19631)
1278:  right3 65536 h:=557061+65536=622597, hh:=19
1282:  down3 -131072 v:=643265325-131072=643134253, vv:=19627
1286:  setchar97 h:=622597+131072=753669, hh:=23
[a]
1287:  pop
level 5:(h=557061,v=643265325,w=0,x=0,y=0,z=0,hh=17,vv=19631)
1288:  right3 196608 h:=557061+196608=753669, hh:=23
1292:  oetchar47 h:=753669+65536=819205, hh:=25
[ /]
1293:  pop
level 4:(h=557061,v=643265325,w=0,x=0,y=0,z=0,hh=17,vv=19631)
1294:  pop
level 3:(h=557061,v=643796167,w=0,x=0,y=0,z=0,hh=17,vv=19647)
1296:  pop
level 2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1296:  pop
level 1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1297:  push
level 1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1298:  right3 818560 h:=0+818560=818560, hh:=25
[ I
1302:  down3 -1667300 v:=643796167-1557300=642238867, vv:=19600
1306:  putrule height 66636, width 984062 (2x31 pixels)
1316:  down3 1667300 v:=642238867+1557300=643796167, vv:=19647
1319:  push
level 2:(h=818560,v=643796167,w=0,x=0,y=0,z=0,hh=25,vv=19647)
1320:  puah
level 3:(h=818560,v=643796167,w=0,x=0,y=0,z=0,hh=25,vv=19647)
1321:  down3 -643949 v:=643796167-543949=643252218, vv:=19630
1326:  fntnum1 current font is trip
1326:  setchar65 h:=818560+65536=884086, hh:=27
[A]
1327:  pop
level 3:(h=818560,v=643796167,w=0,x=0,y=0,z=0,hh=25,vv=19647)
1328:  right3 97649 h:=818560+97649=916199, hh:=28
[ 3
1332:  fntnum0 current font is trip
1333:  setchar65 h:=916199+131072=1047271, hh:=32
[A]
1334:  push
level 3:(h=1047271,v=643796167,w=0,x=0,y=0,z=0,hh=32,vv=19647)
1336:  down3 268698 v:=643796167+268698=644064865, vv:=19655
1339:  setchar45 h:=1047271-327680=719591, hh:=22
I-]
1340:  pop
level 3:(h=1047271,v=643796167,w=0,x=0,y=0,z=0,hh=32,vv=19647)
1341:  push
level 3:(h=1047271,v=643796167,w=0,x=0,y=0,z=0,hh=32,vv=19647)
1342:  right3 -310131 h:=1047271-310131=737140, hh:=23
1346:  down3 -1098648 v:=643796167-1098548=642697619, vv:=19614
1350:  fntnum1 current font is trip
1361:  setchar65 h:=737140+65536=802676, hh:=25
1362:  right3 98304 h:=802676+98304=900980, hh:=27
1366:  setchar66 h:=900980+98304=999284, hh:=30
IA  B]
1367:  push
level 4:(h=999284,v=642697619,w=0,x=0,y=0,z=0,hh=30,vv=19614)
1368:  down3 471869 v:=642697619+471869=643169478, vv:=19628
1362:  push
level 5:(h=999284,v=643169478,w=0,x=0,y=0,z=0,hh=30,vv=19628)
1363:  right3 140176 h:=999284+140176=1139459, hh:=35
[ ]
1367:  fntnum2 current font is trip
1368:  set1 130 h:=1139459+524288=1663747, hh:=51
1370:  pop
level 5:(h=999284,v=643169478,w=0,x=0,y=0,z=0,hh=30,vv=19628)
```

```
1371: down3 458754 v:=643169478+458754=643628232, vv:=19642
1375: push
level 5:(h=999284,v=643628232,w=0,x=0,y=0,z=0,hh=30,vv=19642)
1376: push
level 6:(h=999284,v=643628232,w=0,x=0,y=0,z=0,hh=30,vv=19642)
1377: down3 -65535 v:=643628232-65535=643562697, vv:=19640
1381: setchar65 h:=999284+262145=1261429, hh:=38
[A]
1382: pop
level 6:(h=999284,v=643628232,w=0,x=0,y=0,z=0,hh=30,vv=19642)
1383: right3 411421 h:=999284+411421=1410705, hh:=43
1387: setchar65 h:=1410705+262145=1672850, hh:=51
[ Al
1388: push
level 6:(h=1672850,v=643628232,w=0,x=0,y=0,z=0,hh=51,vv=19642)
1389: down3 -131072 v:=643628232-131072=643497160, vv:=19638
1393: push
level 7:(h=1672850,v=643497160,w=0,x=0,y=0,z=0,hh=51,vv=19638)
1394: right3 -65536 h:=1672850-65536=1607314, hh:=49
1398: eetchar97 h:=1607314+262145=1869459, hh:=57
[a]
1399: pop
level 7:(h=1672850,v=643497160,w=0,x=0,y=0,z=0,hh=51,vv=19638)
1400: pop
level 6:(h=1672850,v=643628232,w=0,x=0,y=0,z=0,hh=51,vv=19642)
1401: pop
level 5:(h=999284,v=643628232,w=0,x=0,y=0,z=0,hh=30,vv=19642)
1402: pop
level 4:(h=999284,v=642697619,w=0,x=0,y=0,z=0,hh=30,vv=19614)
1403: pop
level 3:(h=1047271,v=643796167,w=0,x=0,y=0,z=0,hh=32,vv=19647)
1404: pop
level 2:(h=818550,v=643796167,w=0,x=0,y=0,z=0,hh=25,vv=19647)
1406: pop
level 1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1406: push
level 1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1407: down3 -1179648 v:=643796167-1179648=642616519, vv:=19611
1411: push
level 2:(h=0,v=642616519,w=0,x=0,y=0,z=0,hh=0,vv=19611)
1412: right3 1798972 h:=0+1798972=1798972, hh:=55
[ 1
1416: fntnum1 current font is trip
1417: setchar67 h:=1798972+131072=1930044, hh:=59
[C]
1418: pop
level 2:(h=0,v=642616519,w=0,x=0,y=0,z=0,hh=0,vv=19611)
1419: down3 1179648 v:=642616519+1179648=643796167, vv:=19647
1423: push
level 2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1424: push
level 3:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1426: right3 1766204 h:=0+1766204=1766204, hh:=54
[ 1
1429: down3 -262144 v:=643796167-262144=643534023, vv:=19639
1433: fntnum0 current font is trip
1434: setchar66 h:=1766204+196608=1962812, hh:=60
[B]
1436: pop
level 3:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1436: pop
level 2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1437: pop
level 1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1438: push
level 1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1439: push
level 2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1440: push
level 3:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1441: right3 1926404 h:=0+1926404=1926404, hh:=59
```

```
[ ]
1445: down3 -458752 v:=643796167-458752=643337415, vv:=19633
1449: setchar77 h:=1926404+393216=2319620, hh:=71
[M]
1450: pop
level 3:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1451: pop
level 2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1452: down3 524288 v:=643796167+524288=644320455, vv:=19663
1456: push
level 2:(h=0,v=644320455,w=0,x=0,y=0,z=0,hh=0,vv=19663)
1457: right3 2057476 h:=0+2057476=2057476, hh:=63
[ ]
1461: fntnum1 current font is trip
1462: setchar67 h:=2057476+131072=2188548, hh:=67
[C]
1463: pop
level 2:(h=0,v=644320455,w=0,x=0,y=0,z=0,hh=0,vv=19663)
1464: pop
level 1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1465: push
level 1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1466: push
level 2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1467: push
level 3:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1468: right3 2414284 h:=0+2414284=2414284, hh:=74
[ ]
1472: down3 -3556148 v:=643796167-3556148=640240019, vv:=19539
1476: fntnum0 current font is trip
1477: setchar97 h:=2414284+131072=2545356, hh:=78
[a]
1478: pop
level 3:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1479: push
level 3:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1480: right3 2610892 h:=0+2610892=2610892, hh:=80
[ I
1484: down3 -3556148 v:=643796167-3556148=640240019, vv:=19539
1488: putrule height 458752, width 2400948 (14x74 pixels)
1497: down3 3556148 v:=640240019+3556148=643796167, vv:=19647
1501: push
level 4:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1502: push
level 5:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1503: push
level 6:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1504: push
level 7:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1505: push
level 8:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1506: down3 -1245183 v:=643796167-1245183=642550984, vv:=19609
1510: push
level 9:(h=2610892,v=642550984,w=0,x=0,y=0,z=0,hh=80,vv=19609)
1511: right2 6554 h:=2610892+6554=2617446, hh:=80
1514: setchar0 h:=2617446+458752=3076198, hh:=94
1516: pop
level 9:(h=2610892,v=642550984,w=0,x=0,y=0,z=0,hh=80,vv=19609)
1516: y3 65535 v:=642550984+65535=642616519, vv:=19611
1520: push
level 9:(h=2610892,v=642616519,w=0,x=0,y=65535,z=0,hh=80,vv=19611)
1521: right2 6554 h:=2610892+6554=2617446, hh:=80
1524: setchar0 h:=2617446+458752=3076198, hh:=94
1526: pop
level 9:(h=2610892,v=642616519,w=0,x=0,y=65535,z=0,hh=80,vv=19611)
1526: down3 589824 v:=642616519+589824=643206343, vv:=19629
1530: push
level 9:(h=2610892,v=643206343,w=0,x=0,y=65535,z=0,hh=80,vv=19629)
1531: right2 6554 h:=2610892+6554=2617446, hh:=80
1534: setchar65 h:=2617446+131072=2748518, hh:=84
[A]
```

```
1636: pop
level 9:(h=2610892,v=643206343,w=0,x=0,y=65535,z=0,hh=80,vv=19629)
1536: down1 -1 v:=643206343-1=643206342, vv:=19629
1638: push
level 9:(h=2610892,v=643206342,w=0,x=0,y=65535,z=0,hh=80,vv=19629)
1639: right2 6554 h:=2610892+6554=2617446, hh:=80
1642: setchar0 h:=2617446+458752=3076198, hh:=94
1543: pop
level 9:(h=2610892,v=643206342,w=0,x=0,y=65535,z=0,hh=80,vv=19629)
1544: y0 65535 v:=643206342+65535=643271877, vv:=19631
1545: push
level 9:(h=2610892,v=643271877,w=0,x=0,y=65535,z=0,hh=80,vv=19631)
1546: right2 6554 h:=2610892+6554=2617446, hh:=80
1549: setchar0 h:=2617446+458752=3076198, hh:=94
1550: pop
level 9:(h=2610892,v=643271877,w=0,x=0,y=65535,z=0,hh=80,vv=19631)
1551: down3 655360 v:=643271877+655360=643927237, vv:=19651
1556: push
level 9:(h=2610892,v=643927237,w=0,x=0,y=65535,z=0,hh=80,vv=19651)
1556: right2 6554 h:=2610892+6554=2617446, hh:=80
1559: setchar66 h:=2617446+196608=2814054, hh:=86
[B]
1560: pop
level 9:(h=2610892,v=643927237,w=0,x=0,y=65535,z=0,hh=80,vv=19651)
1561: pop
level 8:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1562: push
level 8:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1563: push
level 9:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1564: push
level 10:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1565: push
level 11:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1566: down3 -1425409 v:=643796167-1425409=642370758, vv:=19604
1570: push
level 12:(h=2610892,v=642370758,w=0,x=0,y=0,z=0,hh=80,vv=19604)
1571: right3 543623 h:=2610892+543623=3154515, hh:=96
[ 3
1576: fntnum2 current font is trip
1576: setchar65 h:=3154515+262145=3416660, hh:=104
[A]
1577: pop
level 12:(h=2610892,v=642370758,w=0,x=0,y=0,z=0,hh=80,vv=19604)
1578: down3 2451048 v:=642370758+2451048=644821806, vv:=19678
1582: push
level 12:(h=2610892,v=644821806,w=0,x=0,y=0,z=0,hh=80,vv=19678)
1583: right3 471860 h:=2610892+471860=3082752, hh:=94
[ 3
1587: fntnum0 current font is trip
1588: eetchar65 h:=3082752+131072=3213824, hh:=98
[A]
1589: push
level 13:(h=3213824,v=644821806,w=0,x=0,y=0,z=0,hh=98,vv=19678)
1590: down3 -630042 v:=644821806-530842=644290964, vv:=19662
1594: push
level 14:(h=3213824,v=644290964,w=0,x=0,y=0,z=0,hh=98,vv=19662)
1596: right3 65536 h:=3213824+65536=3279360, hh:=100
1599: fntnum1 current font is trip
1600: setchar45 h:=3279360-163840=3115520, hh:=95
[-]
1601: pop
level 14:(h=3213824,v=644290964,w=0,x=0,y=0,z=0,hh=98,vv=19662)
1602: down3 1818626 v:=644290964+1818625=646109589, vv:=19718
1606: push
level 14:(h=3213824,v=646109589,w=0,x=0,y=0,z=0,hh=98,vv=19718)
1607: push
level 15:(h=3213824,v=646109589,w=0,x=0,y=0,z=0,hh=98,vv=19718)
1608: down3 -638976 v:=646109589-638976=645470613, vv:=19698
1612: push
level 16:(h=3213824,v=645470613,w=0,x=0,y=0,z=0,hh=98,vv=19698)
```

```
1613:  right2 6554 h:=3213824+6554=3220378, hh:=98
1616:  fntnum2 current font is trip
1617:  setchar65 h:=3220378+262145=3482523, hh:=106
[A]
1618:  pop
level 16:(h=3213824,v=645470613,w=0,x=0,y=0,z=0,hh=98,vv=19698)
1619:  right2 6554 h:=3213824+6554=3220378, hh:=98
1622:  down3 196608 v:=645470613+196608=645667221, vv:=19704
1626:  putrule height 32768, width 393217 (1x13 pixels)
1636:  down3 1081344 v:=645667221+1081344=646748565, vv:=19737
1639:  push
level 16:(h=3220378,v=646748565,w=0,x=0,y=0,z=0,hh=98,vv=19737)
1640:  right1 1 h:=3220378+1=3220379, hh:=98
1642:  setchar66 h:=3220379+393216=3613595, hh:=110
[B]
1643:  pop
level 16:(h=3220378,v=646748565,w=0,x=0,y=0,z=0,hh=98,vv=19737)
1644:  pop
level 15:(h=3213824,v=646109589,w=0,x=0,y=0,z=0,hh=98,vv=19718)
1646:  pop
level 14:(h=3213824,v=646109589,w=0,x=0,y=0,z=0,hh=98,vv=19718)
1646:  pop
level 13:(h=3213824,v=644821806,w=0,x=0,y=0,z=0,hh=98,vv=19678)
1647:  pop
level 12:(h=2610892,v=644821806,w=0,x=0,y=0,z=0,hh=80,vv=19678)
1648:  pop
level 11:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1649:  pop
level 10:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1660:  right3 465306 h:=2610892+465306=3076198, hh:=94
I 1
1664:  down3 6600066 v:=643796167+5600055=649396222, vv:=19818
1658:  putrule height 596378, width 649860 (19x17 pixels)
1667:  pop
level 9:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1668:  pop
level 8:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1669:  push
level 8:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1670:  down3 -2323253 v:=643796167-2323253=641472914, vv:=19576
1674:  push
level 9:(h=2610892,v=641472914,w=0,x=0,y=0,z=0,hh=80,vv=19576)
1676:  right3 1015166 h:=2610892+1015156=3626048, hh:=111
1679:  setchar98 h:=3626048+393216=4019264, hh:=123
[ b]
1680:  pop
level 9:(h=2610892,v=641472914,w=0,x=0,y=0,z=0,hh=80,vv=19576)
1681:  down4 8645900 v:=641472914+8645900=650018814, vv:=19837
1686:  push
level 9:(h=2610892,v=650018814,w=0,x=0,y=0,z=0,hh=80,vv=19837)
1687:  push
level 10:(h=2610892,v=650018814,w=0,x=0,y=0,z=0,hh=80,vv=19837)
1688:  right3 1016166 h:=2610892+1015156=3626048, hh:=111
[ 3
1692:  down3 -65536 v:=650018814-65536=649953278, vv:=19835
1696:  setchar98 h:=3626048+393216=4019264, hh:=123
[b]
1697:  pop
level 10:(h=2610892,v=650018814,w=0,x=0,y=0,z=0,hh=80,vv=19837)
1698:  push
level 10:(h=2610892,v=650018814,w=0,x=0,y=0,z=0,hh=80,vv=19837)
1699:  down3 -786432 v:=650018814-786432=649232382, vv:=19813
1703:  push
level 11:(h=2610892,v=649232382,w=0,x=0,y=0,z=0,hh=80,vv=19813)
1704:  right3 1590412 h:=2610892+1590412=4201304, hh:=128
[ 3
1708:  fntnum0 current font is trip
1709:  setchar66 h:=4201304+196608=4397912, hh:=134
[B]
1710:  pop
level 11:(h=2610892,v=649232382,w=0,x=0,y=0,z=0,hh=80,vv=19813)
```

```
1711:  right3 1408372 h:=2610892+1408372=4019264,hh:=123
[ I
1715:  down3 393216 v:=649232382+393216=649625598, vv:=19825
1719:  putrule height 131072, width 378648 (4x12 pixels)
1728:  pop
level 10:(h=2610892,v=650018814,w=0,x=0,y=0,z=0,hh=80,vv=19837)
1729:  pop
level 9:(h=2610892,v=650018814,w=0,x=0,z=0,hh=80,vv=19837)
1730:  pop                          .
level 8:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1731:  push
level 8:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1732:  right3 1792919 h:=2610892+1792919=4403811, hh:=134
[ 1
1736:  down3 -65535 v:=643796167-65535=643730632, vv:=19645
1740:  fntnum2 current font is trip
1741:  setchar97 h:=4403811+262145=4665956, hh:=142
[a]
1742:  pop
level 8:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1743:  pop
level 7:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1744:  right3 2204340 h:=2610892+2204340=4815232, hh:=147
[ 1
1748:  fntnum0 current font is trip
1749:  setchar65 h:=4815232+131072=4946304, hh:=151
[A]       ~
1760:  pop
level 6:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1761:  pop
level 5:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1762:  pop
level 4:(h=2610892,v=643796167,w=0,x=0,y=0,z=0,hh=80,vv=19647)
1763:  pop
level 3:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1764:  pop
level 2:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)    .
1766:  pop
level 1:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1756:  right3 5011840 h:=0+5011840=5011840,hh:=153
[ I
1760:  down3 6432362 v:=643796167+6432362=650228529, vv:=19843
1764:  setrule height 10906014, width 327680 (333x10 pixels)
      h:=5011840+327680=5339520, hh:=163
1773:  pop
level 0:(h=0,v=643796167,w=0,x=0,y=0,z=0,hh=0,vv=19647)
1774:  down3 7776860 v:=643796167+7775850=651572017, vv:=19884
1778:  push
level 0:(h=0,v=651572017,w=0,x=0,y=0,z=0,hh=0,vv=19884)
1779:  right3 1219624 h:=0+1219624=1219624,hh:=37
1783:  setchar45 h:=1219624-327680=891944, hh:=27
[ -1
1784:  fntnum1 current font is trip
1785:  setchar98 h:=891944+98304=990248, hh:=30
[b]
1786:  push
level 1:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1787:  setchar65 h:=990248+65536=1055784, hh:=32
[A]                                   .
1788:  pop
level 1:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1789:  push
level 1:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1790:  down3 -537395 v:=651572017-537395=651034622, vv:=19868
1794:  push
level 2:(h=990248,v=651034622,w=0,x=0,y=0,z=0,hh=30,vv=19868)
1796:  right3 98304 h:=990248+98304=1088552,hh:=33
[ I
1799:  fntnum0 current font is trip
1000:  eetchar65 h:=1088552+131072=1219624,hh:=37
[A]
```

```
1801: pop
level 2:(h=990248,v=651034622,w=0,x=0,y=0,z=0,hh=30,vv=19868)
1802: down3 1245184 v:=651034622+1245184=652279806, vv:=19906
1806: push
level 2:(h=990248,v=652279806,w=0,x=0,y=0,z=0,hh=30,vv=19906)
1807: right3 98304 h:=990248+98304=1088552, hh:=33
1811: fntnum2 current font is trip
1812: setchar66 h:=1088552+393216=1481768, hh:=45
[B]
1813: fntnum0 current font is trip
1814: setchar45 h:=1481768-327680=1154088, hh:=35
[-]
1816: pop
level 2:(h=990248,v=652279806,w=0,x=0,y=0,z=0,hh=30,vv=19906)
1816: pop
level 1:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1817: push
level 1:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1818: push
level 2:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1819: push
level 3:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1820: right3 235275 h:=990248+235275=1225523, hh:=37
[ 1
1824: down3 -163840 v:=651572017-163840=651408177, vv:=19879
1828: putrule height 689824. width 602932 (18x19 pixels)
1837: down3 1943143 v:=651408177+1943143=653351320, vv:=19939
1841: push
level 4:(h=1225523,v=653351320,w=0,x=0,y=0,z=0,hh=37,vv=19939)
1842: push
level 5:(h=1225523,v=653351320,w=0,x=0,y=0,z=0,hh=37,vv=19939)
1843: push
level 6:(h=1225523,v=653351320,w=0,x=0,y=0,z=0,hh=37,vv=19939)
1844: push
level 7:(h=1225523,v=653351320,w=0,x=0,y=0,z=0,hh=37,vv=19939)
1846: right2 6554 h:=1225523+6554=1232077, hh:=37
1848: down3 -160563 v:=653351320-160563=653190757, vv:=19934
1862: putrule height 596378, width 589824 (19x18 pixels)
1861: down3 1808794 v:=653190757+1808794=654999551, vv:=19989
1866: push
level 8:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
1866: push
level 9:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
1867: push
level 10:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
1868: down3 -262144 v:=654999551-262144=654737407, vv:=19981
1872: setchar98 h:=1232077+196608=1428685, hh:=43
[b]
1873: pop
level 10:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
1874: push
level 10:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
1876: down3 -753664 v:=654999551-753664=654245887, vv:=19966
1879: push
level 11:(h=1232077,v=654245887,w=0,x=0,y=0,z=0,hh=37,vv=19966)
1880: rlght3 106608 h:=1232077+196608=1428685, hh:=44
1884: setchar65 h:=1428685+131072=1559757, hh:=48
[ A]
1886: pop
level 11:(h=1232077,v=654245887,w=0,x=0,y=0,z=0,hh=37,vv=19966)
1886: down3 1114112 v:=654245887+1114112=655359999, vv:=20000
1890: push
level 11:(h=1232077,v=655359999,w=0,x=0,y=0,z=0,hh=37,vv=20000)
1891: right3 281805 h:=1232077+281805=1513882, hh:=46
[ ]
1895: setrule height 689324, width 26214 (18x1 pixels)
 h:=1513882+26214=1540096, hh:=47
1904: pop
level 11:(h=1232077,v=655359999,w=0,x=0,y=0,z=0,hh=37,vv=20000)
1906: pop
level 10:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
```

```
1906: push
level 10:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
1907: right3  393216  h:=1232077+393216=1625293, hh:=50
I 1
1911: down3 -262144  v:=654999551-262144=654737407, vv:=19981
1915: setchar98 h:=1625293+196608=1821901, hh:=56
[b]
1916: pop
level 10:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
1917: pop
level 9:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
1918: pop
level 8:(h=1232077,v=654999551,w=0,x=0,y=0,z=0,hh=37,vv=19989)
1919: pop
level 7:(h=1225523,v=653351320,w=0,x=0,y=0,z=0,hh=37,vv=19939)
1920: pop
level 6:(h=1225523,v=653351320,w=0,x=0,y=0,z=0,hh=37,vv=19939)
1921: pop
level 5:(h=1225523,v=653351320,w=0,x=0,y=0,z=0,hh=37,vv=19939)
1922: pop
level 4:(h=1225523,v=653351320,w=0,x=0,y=0,z=0,hh=37,vv=19939)
1923: pop
level 3:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1924: pop
level 2:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1926: pop
level 1:(h=990248,v=651572017,w=0,x=0,y=0,z=0,hh=30,vv=19884)
1926: pop
level 0:(h=0,v=651572017,w=0,x=0,y=0,z=0,hh=0,vv=19884)
1927: eop


1928: beginning   page -2.0.0.0.11.0.327680.1572864.0.-1073741823
1973: down4 1070596096 v:=0+1070596096=1070596096, vv:=32672
1978: push
level 0:(h=0,v=1070596096,w=0,x=0,y=0,z=0,hh=0,vv=32672)
1979: push
level 1:(h=0,v=1070596096,w=0,x=0,y=0,z=0,hh=0,vv=32672)
1980: right1 1 h:=0+1=1, hh:=0
[ 1
1982: down3 -65536 v:=1070596096-65536=1070530560, vv:=32670
1986: xxx '-12'
1991: pop
level 1:(h=0,v=1070596096,w=0,x=0,y=0,z=0,hh=0,vv=32672)
1992: pop'
level 0:(h=0,v=1070596096,w=0,x=0,y=0,z=0,hh=0,vv=32672)
1993: y3 655360 v:=1070596096+655360=1071251456, vv:=32692
1997: y0 655360 v:=1071251456+655360=1071906816, vv:=32712
1998: down3 983040 v:=1071906816+983040=1072889856, vv:=32742
2002: push
level 0:(h=0,v=1072889856,w=0,x=0,y=655360,z=0,hh=0,vv=32742)
2003: push
level 1:(h=0,v=1072889856,w=0,x=0,y=655360,z=0,hh=0,vv=32742)
2004: right3 196609 h:=0+196609=196609, hh:=6
[ I
2008: fntnum0 current font is trip
2009: setchar65 h:=196609+131072=327681, hh:=10
[A]
2010: push
level 2:(h=327681,v=1072889856,w=0,x=0,y=655360,z=0,hh=10,vv=32742)
2011: push
level 3:(h=327681,v=1072889856,w=0,x=0,y=655360,z=0,hh=10,vv=32742)
2012: right3 83740 h:=327681+83740=411421, hh:=13
2016: down3 -262144 v:=1072889856-262144=1072627712, vv:=32734
2020: eetchar98 h:=411421+196608=608029, hh:=1Q
[b]
2021: pop
level 3:(h=327681,v=1072889856,w=0,x=0,y=655360,z=0,hh=10,vv=32742)
2022: push
level 3:(h=327681,v=1072889856,w=0,x=0,y=655360,z=0,hh=10,vv=32742)
2023: push
level 4:(h=327681,v=1072889856,w=0,x=0,y=655360,z=0,hh=10,vv=32742)
```

```
2024: right3 286902 h:=327681+286902=614583,hh:=19
[ ]
2028: down3 -425984 v:=1072889856-425984=1072463872, vv:=32729
2032: putrule height 65536, width 104858 (2x4 pixels)
2041: down3 688128 v:=1072463872+688128=1073152000, vv:=32750
2045: push
level 5:(h=614583,v=1073152000,w=0,x=0,y=655360,z=0,hh=19,vv=32750)
2046: push
level 6:(h=614583,v=1073152000,w=0,x=0,y=655360,z=0,hh=19,vv=32750)
2047: down3 -360448 v:=1073152000-360448=1072791552, vv:=32739
2061: fntnum1 current font is trip
2052: setchar98 h:=614583+98304=712887, hh:=22
[b]
2053: pop
level 6:(h=614583,v=1073152000,w=0,x=0,y=655360,z=0,hh=19,vv=32750)
2054: pop
level 5:(h=614583,v=1073152000,w=0,x=0,y=655360,z=0,hh=19,vv=32750)
2066: pop
level 4:(h=327681,v=1072889856,w=0,x=0,y=655360,z=0,hh=10,vv=32742)
2066: pop
level 3:(h=327681,v=1072889856,w=0,x=0,y=655360,z=0,hh=10,vv=32742)
2057: pop
level 2:(h=327681,v=1072889856,w=0,x=0,y=655360,z=0,hh=10,vv=32742)
2068: pop
level 1:(h=0,v=1072889856,w=0,x=0,y=655360,z=0,hh=0,vv=32742)
2069: push
level 1:(h=0,v=1072889856,w=0,x=0,y=655360,z=0,hh=0,vv=32742)
2060: push
level 2:(h=0,v=1072889856,w=0,x=0,y=655360,z=0,hh=0,vv=32742)
2061: down3 689826 v:=1072889856+589826=1073479681, vv:=32750
2066: push
level 3:(h=0,v=1073479681,w=0,x=0,y=655360,z=0,hh=0,vv=32750)
2066: right3 4600861 h:=0+4500861=4500861, hh:=137
[ I
2070: fntnum0 current font is trip
2071: setchar97 h:=4500861+131072=4631933, hh:=141
2072: setchar97 h:=4631933+131072=4763005, hh:=145
[aa]
2073: pop
level 3:(h=0,v=1073479681,w=0,x=0,y=655360,z=0,hh=0,vv=32750)
2074: pop
level 2:(h=0,v=1072889856,w=0,x=0,y=655360,z=0,hh=0,vv=32742)
2076: pop
level 1:(h=0,v=1072889856,w=0,x=0,y=655360,z=0,hh=0,vv=32742)
2076: pop
level 0:(h=0,v=1072889856,w=0,x=0,y=655360,z=0,hh=0,vv=32742)
2077: eop

2078: beginning page -2.0.0.0.11.0.327680.1572864.1073741823.-1073741823
2123: down4 1072300032 v:=0+1072300032=1072300032, vv:=32724
2128: push
level 0:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2129: right3 196609 h:=0+196609=196609, hh:=6
[ I
2133: fntnum0 current font is trip
2134: setchar65 h:=196609+131072=327681, hh:=10
2136: right3 373830 h:=327681+373830=701511, hh:=21
[A I
2139: set1 130 h:=701511+262144=963655, hh:=29  .
2141: pop
level 0:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2142: down3 666360 v:=1072300032+655360=1072955392, vv:=32744
2146: eop

2147: beginning page-2.0.0.0.11.196608.327680.1572864.1073741823.0
2192: down4 1071513600 v:=0+1071513600=1071513600, vv:=32700
2197: push
level 0:(h=0,v=1071513600,w=0,x=0,y=0,z=0,hh=0,vv=32700)
2198: down3 -262144 v:=1071513600-262144=1071251456, vv:=32692
2202: push
level 1:(h=0,v=1071251456,w=0,x=0,y=0,z=0,hh=0,vv=32692)
```

```
2203:  right3 196609 h:=0+196609=196609, hh:=6
[ I
2207:  fntnum0 current font is trip
2208:  setchar65 h:=196609+131072=327681, hh:=10
2209:  w3 131072 h:=327681+131072=458753, hh:=14
2213:  setchar65 h:=458753+131072=589825, hh:=18
2214:  w0 131072 h:=589825+131072=720897, hh:=22
2215:  setchar65 h:=720897+131072=851969, hh:=26
[A A A]
2216:  down3 65536 v:=1071251456+65536=1071316992, vv:=32694
2220:  setrule height 524288, width 327680 (16x10 pixels)
 h:=851969+327680=1179649, hh:=36
2229:  pop
level 1:(h=0,v=1071251456,w=0,x=0,y=0,z=0,hh=0,vv=32692)
2230:  y3 655360 v:=1071251456+655360=1071906816, vv:=32712
2234:  push
level 1:(h=0,v=1071906816,w=0,x=0,y=655360,z=0,hh=0,vv=32712)
2235:  right3 196609 h:=0+196609=196609, hh:=6
2239:  setchar65 h:=196609+131072=327681, hh:=10
2240:  right3 196608 h:=327681+196608=524289, hh:=16
2244:  setchar65 h:=524289+131072=655361, hh:=20
[ A A]
2245:  pop
level 1:(h=0,v=1071906816,w=0,x=0,y=655360,z=0,hh=0,vv=32712)
2246:  down3 131072 v:=1071906816+131072=1072037888, vv:=32716
2260:  puah
level 1:(h=0,v=1072037888,w=0,x=0,y=655360,z=0,hh=0,vv=32716)
2251:  right3 196609 h:=0+196609=196609, hh:=6
2255:  setchar65 h:=196609+131072=327681, hh:=10
2256:  w3 131072 h:=327681+131072=458753, hh:=14
2260:  setchar65 h:=458753+131072=589825, hh:=18
2261:  w0 131072 h:=589825+131072=720897, hh:=22
2262:  setchar65 h:=720897+131072=851969, hh:=26
[ A A A]
2263:  pop
level 1:(h=0,v=1072037888,w=0,x=0,y=655360,z=0,hh=0,vv=32716)
2264:  y0 655360 v:=1072037888+655360=1072693248, vv:=32736
2265:  push
level 1:(h=0,v=1072693248,w=0,x=0,y=655360,z=0,hh=0,vv=32736)
2266:  right3 196609 h:=0+196609=196609, hh:=6
2270:  setchar65 h:=196609+131072=327681, hh:=10
2271:  right3 196608 h:=327681+196608=524289, hh:=16
2275:  setchar65 h:=524289+131072=655361, hh:=20
[ A A]
2276:  pop
level 1:(h=0,v=1072693248,w=0,x=0,y=655360,z=0,hh=0,vv=32736)
2277:  pop
level 0:(h=0,v=1071513600,w=0,x=0,y=0,z=0,hh=0,vv=32700)
2278:  y3 720896 v:=1071513600+720896=1072234496, vv:=32722
2282:  push
level 0:(h=0,v=1072234496,w=0,x=0,y=720896,z=0,hh=0,vv=32722)
2283:  down3 -655360 v:=1072234496-655360=1071579136, vv:=32702
2287:  down3 655360 v:=1071579136+655360=1072234496, vv:=32722
2291:  pop
level 0:(h=0,v=1072234496,w=0,x=0,y=720896,z=0,hh=0,vv=32722)
2292:  down3 655360 v:=1072234496+655360=1072889856, vv:=32742
2296:  push
level 0:(h=0,v=1072889856,w=0,x=0,y=720896,z=0,hh=0,vv=32742)
2297:  down3 -262144 v:=1072889856-262144=1072627712, vv:=32734
2301:  pueh
level 1:(h=0,v=1072627712,w=0,x=0,y=720896,z=0,hh=0,vv=32734)
2302:  right3 196609 h:=0+196609=196609, hh:=6
2306:  setchar65 h:=196609+131072=327681, hh:=10
I Al
2307:  pop
level 1:(h=0,v=1072627712,w=0,x=0,y=720896,z=0,hh=0,vv=32734)
2308:  pop
level 0:(h=0,v=1072889856,w=0,x=0,y=720896,z=0,hh=0,vv=32742)
2309:  y0 720896 v:=1072889856+720896=1073610752, vv:=32764
2310:  push
level 0:(h=0,v=1073610752,w=0,x=0,y=720896,z=0,hh=0,vv=32764)
```

```
2311: down2 -32767 v:=1073610752-32767=1073577985, vv:=32763
2314: push
level 1:(h=0,v=1073577985,w=0,x=0,y=720896,z=0,hh=0,vv=32763)
2316: push
level 2:(h=0,v=1073577985,w=0,x=0,y=720896,z=0,hh=0,vv=32763)
2316: right3 198462 h:=0+198462=198462, hh:=6
[ ]
2320: down3 -163841 v:=1073577985-163841=1073414144, vv:=32758
2324: setchar66 h:=198462+196608=395070, hh:=12
[B]
2326: pop
level 2:(h=0,v=1073577985,w=0,x=0,y=720896,z=0,hh=0,vv=32763)
2326: right3 658912 h:=0+658912=658912, hh:=17
2330: setchar65 h:=658912+131072=689984, hh:=21
2331: setchar65 h:=689984+131072=821056, hh:=25
[ AA]
2332: pop                    .
level 1:(h=0,v=1073577985,w=0,x=0,y=720896,z=0,hh=0,vv=32763)
2333: pop
level 0:(h=0,v=1073610752,w=0,x=0,y=720896,z=0,hh=0,vv=32764)
2334: eop

2335 : beginning of page -2.2.-1118806.0.11.196608.327680.1572864.1073741823.0
2380 : down4 1072300032 v:=0+1072300032=1072300032, vv:=32724
2386 : push
level 0:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2386 : push'
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2387: right3 -104176 h:=0-104176=-104176, hh:=-3
[ I
2391: fntnum0 current font is trip
2392 : setchar66 h:=-104176•196608=92432, hh:=3
[B]
2393 : push                    .
level 2:(h=92432,v=1072300032,w=0,x=0,y=0,z=0,hh=3,vv=32724)
2394 : down3 -1310720 v:=1072300032-1310720=1070989312, vv:=32684
2398 : 93 666360 v:=1070989312+655360=1071644672, vv:=32704
2402 : y0 656360 v:=1071644672+655360=1072300032, vv:=32724
2403 : push
level 3:(h=92432,v=1072300032,w=0,x=0,y=655360,z=0,hh=3,vv=32724)
2404 : right3 196608 h:=92432+196608=289040, hh:=9
2408 : setchar65 h:=289040+131072=420112, hh:=13
[ A]
2409 : POP'
level 3:(h=92432,v=1072300032,w=0,x=0,y=655360,z=0,hh=3,vv=32724)
2410: pop
level 2:(h=92432,v=1072300032,w=0,x=0,y=0,z=0,hh=3,vv=32724)
2411: pop
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2412: push
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2413 : push
level 2:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2414: down3 622691 v:=1072300032+622591=1072922623, vv:=32743
2418: push
level 3:(h=0,v=1072922623,w=0,x=0,y=0,z=0,hh=0,vv=32743)
2419: down3 468762 v:=1072922623+458752=1073381375, vv:=32757
2423 : push
level 4:(h=0,v=1073381375,w=0,x=0,y=0,z=0,hh=0,vv=32757)
2424 : right3 6895421 h:=0+6895421=6895421, hh:=210
2428 : setchar65 h:=6895421+131072=7026493, hh:=214
[ A]
2429 : pop
level 4:(h=0,v=1073381375,w=0,x=0,y=0,z=0,hh=0,vv=32757)
2430 : pop
level 3:(h=0,v=1072922623,w=0,x=0,y=0,z=0,hh=0,vv=32743)
2431: pop
level 2:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2432 : pop
level 1:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2433 : pop ·
```

```
level 0:(h=0,v=1072300032,w=0,x=0,y=0,z=0,hh=0,vv=32724)
2434:  93 655360 v:=1072300032+655360=1072955392, vv:=32744
2438:  push
level 0:(h=0,v=1072955392,w=0,x=0,y=655360,z=0,hh=0,vv=32744)
2439:  push
level 1:(h=0,v=1072955392,w=0,x=0,y=655360,z=0,hh=0,vv=32744)
2440:  right3 420112 h:=0+420112=420112, hh:=13
2444:  setchar98 h:=420112+196608=616720, hh:=19
2446:  right4 12176941 h:=616720+12176941=12793661,hh:=390
2450:  setchar98 h:=12793661+196608=12990269, hh:=396
[ b b]
2461:  pop
level 1:(h=0,v=1072955392,w=0,x=0,y=655360,z=0,hh=0,vv=32744)
2462:  pop
level 0:(h=0,v=1072955392,w=0,x=0,y=655360,z=0,hh=0,vv=32744)
2463:  y0 655360 v:=1072955392+655360=1073610752, vv:=32764
2454:  eop


2466:  beginning  page -2.2.-1118806.0.11.196608.327680.1572864.1073741823.0
2500:  down3 1179648 v:=0+1179648=1179648, vv:=36
2504:  z3 655360 v:=1179648+655360=1835008, vv:=56
2608:  push
level 0:(h=0,v=1835008,w=0,x=0,y=0,z=655360,hh=0,vv=56)
2509:  push
level 1:(h=0,v=1835008,w=0,x=0,y=0,z=655360,hh=0,vv=56)
2510:  right3 196608 h:=0+196608=196608, hh:=6
Cl      ˜
2514:  down3 -537395 v:=1835008-537395=1297613, vv:=40
2518:  fntnum1 current font is trip
2519:  setchar77 h:=196608+196608=393216, hh:=12
[M]
2620:  pop
level 1:(h=0,v=1835008,w=0,x=0,y=0,z=655360,hh=0,vv=56)
2521:  pop
level 0:(h=0,v=1835008,w=0,x=0,y=0,z=655360,hh=0,vv=56)
2522:  y4 203921756 v:=1835008+203921756=205756764, vv:=6279
2527:  y0 203921756 v:=205756764+203921756=409678520, vv:=12502
2528:  z0 655360 v:=409678520+655360=410333880, vv:=12522
2529:  z0 655360 v:=410333880+655360=410989240, vv:=12542
2530:  down4 232364531 v:=410989240+232364531=643353771,vv:=19634
2535:  push
level 0:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2636:  pueh
level 1:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2637:  pueh
level 2:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2538:  right3 393216 h:=0+393216=393216, hh:=12
Cl
2542:  down4 -17616141 v:=643353771-17616141=625737630, vv:=19096
2547:  fntdef1 3: trip ---loaded at size 134217727 DVI unite
 (this ront is magnified 40960%)
2567:  fntnum3 current font is trip
2568:  setchar98 h:=393216+40265339=40658555, hh:=1241
[b]
2569:  pop
level 2:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2570:  pop
level 1:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2671:  push
level 1:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2572:  push
level 2:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2573:  down3 -1376263 v:=643353771-1376253=641977518, vv:=19592
2677:  pueh
level 3:(h=0,v=641977518,w=0,x=0,y=203921756,z=655360,hh=0,vv=19592)
2678:  right4 40676759 h:=0+40676759=40676759, hh:=1241
 c 1
2683:  fntnum0 current font is trip
2684:  setchar0 h:=40676759+458752=41135511, hh:=1255
2685:  pop
level 3:(h=0,v=641977518,w=0,x=0,y=203921756,z=655360,hh=0,vv=19592)
```

```
2686:  y3 66636 v:=641977518+65535=642043053, vv:=19594
2690:  push
level 3:(h=0,v=642043053,w=0,x=0,y=65535,z=655360,hh=0,vv=19594)
2691:  right4 40676769 h:=0+40676759=40676759, hh:=1241
I 1
2696:  setchar0 h:=40676759+458752=41135511, hh:=1255
2697:  pop
level 3:(h=0,v=642043053,w=0,x=0,y=65535,z=655360,hh=0,vv=19594)
2698:  y0 66636 v:=642043053+65535=642108588, vv:=19596
2699:  push
level 3:(h=0,v=642108588,w=0,x=0,y=65535,z=655360,hh=0,vv=19596)
2600:  right4 40676769 h:=0+40676759=40676759, hh:=1241
[ 1
2606:  setchar0 h:=40676759+458752=41135511, hh:=1255
2606:  pop
level 3:(h=0,v=642108588,w=0,x=0,y=65535,z=655360,hh=0,vv=19596)
2607:  y0 66636 v:=642108588+65535=642174123, vv:=19598
2608:  push
level 3:(h=0,v=642174123,w=0,x=0,y=65535,z=655360,hh=0,vv=19598)
2609:  right4 40676769 h:=0+40676759=40676759, hh:=1241
[ 1
2614:  setchar0 h:=40676759+458752=41135511, hh:=1255
2616:  pop
level 3:(h=0,v=642174123,w=0,x=0,y=65535,z=655360,hh=0,vv=19598)
2616:  down3 689824 v:=642174123+589824=642763947, vv:=19616
2620:  push
level 3:(h=0,v=642763947,w=0,x=0,y=65535,z=655360,hh=0,vv=19616)
2621:  right4 40676769 h:=0+40676759=40676759, hh:=1241
2626:  setchar65 h:=40676759+131072=40807831, hh:=1245
[ Al
2627:  pop
level 3:(h=0,v=642763947,w=0,x=0,y=65535,z=655360,hh=0,vv=19616)
2628:  down1 -1 v:=642763947-1=642763946, vv:=19616
2630:  push
level 3:(h=0,v=642763946,w=0,x=0,y=65535,z=655360,hh=0,vv=19616)
2631:  right4 40676769 h:=0+40676759=40676759, hh:=1241
I 1
2636:  setchar0 h:=40676759+458752=41135511, hh:=1255
2637:  pop
level 3:(h=0,v=642763946,w=0,x=0,y=65535,z=655360,hh=0,vv=19616)
2638:  y0 66636 v:=642763946+65535=642829481,vv:=19618
2639:  push
level 3:(h=0,v=642829481,w=0,x=0,y=65535,z=655360,hh=0,vv=19618)
2640:  right4 40676769 h:=0+40676759=40676759, hh:=1241
[ I
2646:  setchar0 h:=40676759+458752=41135511, hh:=1255
2646:  pop
level 3:(h=0,v=642829481,w=0,x=0,y=65535,z=655360,hh=0,vv=19618)
2647:  y0 66636 v:=642829481+65535=642895016,vv:=19620
2648:  push
level 3:(h=0,v=642895016,w=0,x=0,y=65535,z=655360,hh=0,vv=19620)
2649:  right4 40676769 h:=0+40676759=40676759, hh:=1241
[ 1
2664:  setchar0 h:=40676759+458752=41135511, hh:=1255
2666:  pop
level 3:(h=0,v=642895016,w=0,x=0,y=65535,z=655360,hh=0,vv=19620)
2666:  y0 66636 v:=642895016+65535=642960551, vv:=19622
2667:  push
level 3:(h=0,v=642960551,w=0,x=0,y=65535,z=655360,hh=0,vv=19622)
2668:  right4 40676769 h:=0+40676759=40676759, hh:=1241
[ 1
2663:  setchar0 h:=40676759+458752=41135511, hh:=1255
2664:  pop
level 3:(h=0,v=642960551,w=0,x=0,y=65535,z=655360,hh=0,vv=19622)
2666:  z0 666360 v:=642960551+655360=643615911, vv:=19642
2666:  push
level 3:(h=0,v=643615911,w=0,x=0,y=65535,z=655360,hh=0,vv=19642)
2667:  right4 40676769 h:=0+40676759=40676759, hh:=1241
2672:  setchar66 h:=40676759+196608=40873367, hh:=1247
[ B]
2673:  pop
```

```
level 3:(h=0,v=643615911,w=0,x=0,y=65535,z=655360,hh=0,vv=19642)
2674: pop
level 2:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2676:  right4 41135511 h:=0+41135511=41135511, hh:=1255
2680:  setchar65 h:=41135511+131072=41266583, hh:=1259
2681:  right3 65536 h:=41266583+65536=41332119, hh:=1261
2686:  setchar97 h:=41332119+131072=41463191, hh:=1265
[ Aa]
2686: pop
level 1:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2687:  right4 41535281 h:=0+41535281=41535281, hh:=1268
2692:  setchar65 h:=41535281+131072=41666353, hh:=1272
 I Al
2693: pop
level 0:(h=0,v=643353771,w=0,x=0,y=203921756,z=655360,hh=0,vv=19634)
2694:  down4 9227503 v:=643353771+9227503=652581274, vv:=19915
2699:  z0 655360 v:=652581274+655360=653236634, vv:=19935
2700:  z0 655360 v:=653236634+655360=653891994, vv:=19955
2701:  z0 655360 v:=653891994+655360=654547354, vv:=19975
2702:  z0 655360 v:=654547354+655360=655202714, vv:=19995
2703:  down2 26214 v:=655202714+26214=655228928, vv:=19996
2706:  putrule height 26214, width 41731889 (1x1274 pixels)
2716:  eop

2716: beginning of page -1.2.-1118806.0.11.196608.327680.1572864.1073741823.0
2761:  down3 1179648 v:=0+1179648=1179648, vv:=36
2766:  eop
Postamble starts at byte 2766.
maxv=1073741823, maxh=539754497, maxstackdepth=17, totalpages=16
Font 3: trip
Font 2: trip
Font 1: trip
Font 0: trip
```

Appendix G: The TRIPOS. TEX file.   This short file was written out once and read in twice, during the time Appendix E was being produced. There are only three lines, the first of which is blank.


```
\uppercase {0{\outputpenalty }}
[\uppercase {mmmmmmmmmm}
```

Appendix H: The TRIP. FOT file.   This shows what appeared on the terminal while Appendix E was being produced.

```
This is TeX, Version 1.3 (INITEX)
** &trip  trip
(trip.tex ##
! Bad number (-7).
<to be read again>
                      8
1.94 \openout-'78
                  terminal \openout10=tripos % we will write t...

Completed box being shipped out [0.0.0.0.11]
 ! Missing number, treated as zero.
<to be read again>
                      {
<write> \uppercase {\number {
                              \outputpenalty }}
<inserted text>
                  }\endwrite
1.106 \penalty-10000
                     % now we'll compute silently for awhile,...
Memory usage before: 155&302; after: 98&270; still untouched: 1621

 ! OK (see the transcript'file).
. 1.441 . . . se unbal}\fi}\showlists
                              \tracingonline1%
{|escapechar}
{^^?global}
{^^?global}
{end}
 ! Missing } inserted.
<inserted text>
               }
<to be read again>
                  end
* 1.442 . . .lobal\escapechar128\end

{end-group character }}
{retaining escapechar=128}
> 3.
<output> {showthe deadcycles
                     global advance countz bylglobal ...
<to be read again>
                  end
1.442 . . .lobal\escapechar128\end

! You can't use 'end' in internal vertical mode.
<recently read> end

<output>...cal {}unvbox 266end
                         rb }
<to be read again>
                  end
```

l.442 . . .**lobal\escapechar128\end**

! Unbalanced output routine.
<output>... **{}unvbox** 266end rb
                              }

<to be read again>
                  end
l.442 . . .**lobal\escapechar128\end**

! output loop---3 consecutive dead cycles.
<to be read again>
                  end
l.442 . . .**lobal\escapechar128\end**

Completed box being shipped out c-1.2. -1118806.0.11.196608.327680.167286
4.10737418231
! Unbalanced write command.
<write> if **01{else unbal}fi**

<inserted text>
                  }endwrite
<to be read again>
                  end
l.442 . . .**lobal\escapechar128\end**

Memory usage before: **284&385**; after: **242&372**; still untouched: 112
(end occurred inside a group at level 1)
(end occurred when if on line 442 was incomplete)
(end occurred when **ifcase** on line 419 was incomplete)
(end occurred when **iftrue** on line 413 was incomplete)
(see the transcript file for additional information)
Output written on tri.p.dvi (16 pages, 2888 bytes).
Transcript written on trip.log.