Bell Laboratories

subject: View Graph Macros
Case 39373-99

date: May 14, 1974

from: Rudd H. Canaday
T. A. Dolotta

MEMORANDUM FOR FILE

A set of "troff" [1] (photo-typesetter) macros have been created which will automatically format view graphs for the standard frame sizes of 7x7, 7x9, or 9x7 inches.* The view graphs may be used to create 2x2 inch slides also.

Every view graph must begin with the line:**

.VX [nn [dd [ii]]]

where "x" is "S", "H", or "W" for Square (7x7), High (7x9), or Wide (9x7), "nn" is an optional slide identifier (usually a number), "dd" is an optional date specifier, and "ii" is an optional identifier usually used for the initials of the person creating the view graph. If "dd" and "ii" are left blank, the previously specified values are used.

Every view graph must end with the line:

.VE

Examples of two view graphs are in Attachment A.*** As can be seen, there are four levels of indentation. (All levels are internally established via the .in command of troff.) The outermost level is the "A" level and is established by the .Vx macro or by the macro

.A

The second level is the "B" level. The macro

.B

establishes the second level and prints a "bullet" (large round spot).

---

* Last dimension is the vertical dimension.
** Square brackets indicate optional items.
*** Fancier view graphs can be obtained using full troff facilities. See [1,2,3].

The third level is the "C" level. The macro

.C

establishes the third level and prints a dash (called a "3/4 em dash"). The fourth level is the "D" level. The macro

.D

establishes the fourth level and prints a small "bullet".

The text that created the view graphs in Attachment A is shown in Attachment B.

There are several other macros which are often useful. The macro

.SZ ps [hs]

is used to specify a point size "ps" and a line length "hs" (horizontal size). Default values are ps=18 (14 for the 9 inch wide view graph), and hs=6i.* Notice that the line length specification is in inches. To change only the point size, use:

.SZ ps

This macro normally immediately follows one of the macros described here (other than the .UL macro), or a .sp command in order to avoid changing point sizes and/or line spacing in the middle of an output line.

The macro

.TB [t1 [t2...[t9]...]]

can be used to establish tab settings and the "no fill" mode for creating tables. An example is:

.TB 1.5 3 4.5

.TB without any arguments turns off all the tabs, and sets the "no fill" mode on. The tab positions which are arguments of the .TB macro are in inches from the current left margin, as specified by the most recent use of the .Vx, .A, .B, .C, or .D macros, and/or of the .PO macro.

The macro

.TE

---

*The 9x7 view graph is actually printed as a 7x5.45 image which must be enlarged by a factor of $\frac{9}{7}$ to obtain a 9x7 view graph. The 7x7 and 7x9 view graphs are printed in true size.

turns the "fill" mode on, and sets the tabs to the troff default setting, namely every half-inch.

The macro

```
.PO [n]
```

moves the entire view graph (tabs, indents, and all) either left or right by N inches (n negative to move left, unsigned to move to the right), with respect to the position established by the .A macro. The initial positioning (i.e., the position established by .A or .Vx) is restored by either of:

```
.Vx
.PO
```

Attempts to move left by more than half an inch from the initial (.A or .Vx) position lead to disaster.

The macro

```
.UL stringA [stringB]
```

will cause stringA to be underlined, and is useful for table headings, etc.; stringB will be appended (if present) to stringA, but will not be underlined. This is useful for underlining parts of words (e.g., first letter of a word), etc. Two troff commands are also quite useful:

```
.ce [n]
```

will center the next n lines of text. If n=0, centering is turned off. If n is absent, .ce behaves as if n=1.

```
.sp [n]
```

will space vertically (down if n is unsigned, up if n is negative) n lines (in current vertical space size!) from the current position on the page. If n is absent, .sp behaves as if n=1. If n is followed by the letter "i", spacing is in inches instead of (current size) lines. If n is preceded by a vertical bar (example: .sp |2i), spacing is with respect to the top of the page, which is arbitrarily located one inch above the top of the view graph.

The troff commands .br and .in are used just as in troff [1].

To get a rough printout of one or more view graphs on the typewriter, type the command:

```
sh try name1 [name2 ]... [name9]...]]
```

To print on the phototypesetter, use:

```
sh pr name1 [name2 [...[name9]...]]
```

At present, the view graph macros do not handle automatically the vertical positioning of the view graph. View graphs with only a few lines should be positioned down from the top of the frame, and/or point size and interline spacing should be increased, by using the .sp troff command and/or the .SZ macro, respectively.

The macros use the Geneva font only.

Attachment C is the listing of the macros. Note that comments are separated from the commands by at least one space and one or more tab characters. Omitting the spaces (i.e., using tabs as separators) on macro calls can lead to extremely obscure troubles in troff, because a tab does not convert to spaces in troff. Also, in troff, lines beginning with one or more tabs do not cause a break. Use a blank followed by one or more tabs (nroff users beware!).

RR-9152-RHC-TAD-ds Rudd H. Canaday T. A. Dolotta

[1] "TROFF Users' Manual", J.F.Ossanna, in preparation.
[2] B.W.Kernighan, "TROFF Made Trivial", TM-73-1273-10
[3] B.W.Kernighan & L.L.Cherry,"Typesetting Mathematics - Users' Guide", TM-74-1273-3 & TM-74-1271-3

Atts.

Copy to
Messrs. G. E. Dean
M. M. Irvine
J. F. Maranzano
M. D. McIlroy
Ms. M. L. Mondelli
Messrs. R. Morris
B. A. Tague
V. A. Vyssotsky
915 Supervisors
9152 Members
Mr. B. W. Kernighan

FOIL 1:simple
5/6/74
T.A.D.

"The time has come," the Walrus said,

"To talk of many things:

- Of shoes - and ships - and sealing wax -
- Of cabbages - and kings -
- And why the sea is boiling hot -
- And whether pigs have wings."

Of Bits & Bytes & Words

"But let your communication be,
Yea, yea; Nay, nay: for whatsoever
is more than these cometh of evil."*
Matthew 5:37

Binary notation has been around for a long time...

- Above dictum tells us to:
  - use binary notation
  - use redundancy
    - (in communicating!)
- Binary notation is not well suited for human use, above dictum to the contrary notwithstanding.

	Bits/Byte	Bytes/Word	Bits/Word
IBM 7090/94	6	6	36
IBM 360/370	8	4	32
PDP 11/45	8	2	16

* With apologies to Claude Shannon

```
.   EXAMPLE OF A SIMPLE VIEW GRAPH
.
.VS 1:simple 5/6/74 T.A.D.
.A
``The time has come,'' the Walrus said,
.A
``To talk of many things:
.B
Of shoes - and ships - and sealing wax -
.B
Of cabbages - and kings -
.B
And why the sea is boiling hot -
.B
And whether pigs have wings.''
.VE
.
.
.   EXAMPLE OF A FANCY VIEW GRAPH
.
.VH 2:fancy
.sp .4i
.SZ 24
.ce
Of Bits & Bytes & Words
.sp .5
.SZ 14
.in 3.6i
``But let your communication be,
Yea, yea; Nay, nay: for
whatsoever is more than these cometh of evil.''*
.in 4.5i
Matthew 5:37
.A
.SZ 20
.sp .5
Binary notation has been around
for a long time...
.B
Above dictum tells us to:
.C
use binary notation
.C
use redundancy
.D
(in
.UL communicating !)
.B
Binary notation is
.UL not
well suited for
.UL human
use, above dictum to the contrary notwithstanding.
.A
.SZ 16
.TB 1.7 3.4 5.1
```

```
        \c
.UL Bits/Byte    \c
.UL Bytes/Word   \c
.UL Bits/Word
.sp .3
IBM 7090/94              6         6      36
IBM 360/370              8         4      32
PDP 11/45                8         2      16
.TE
.sp
.PO
.A
.SZ 12
.UL ----------------
.br
* With apologies to Claude Shannon
.VE
```

```
.       Photo-Typesetter View Graph Macros - TAD/RHC - 5/7/74
.ds FL FOIL
.ds DT 9152
.ds NM UNIX
.de VS                          establish view graph start (7 SQUARE)
.)V \\$1 \\$2 \\$3
.nr )S 8i
.pl 9i
.SZ 18 6
.A
..
.de VH                          establish view graph start (7 wide * 9 HIGH)
.)V \\$1 \\$2 \\$3
.nr )S 10i
.pl 11i
.SZ 18 6
.A
..
.de VW                          establish view graph start (9 WIDE * 7 high)
.)V \\$1 \\$2 \\$3
.nr )S 6.4i
.pl 7.4i
.SZ 14 6
.A
..
.de )V                          common part of view graph start macro
.ps 10
.vs 12p
.ss 16
.fp 4 G
.ft G
.cs G
.tr -
.na
.fi
.nh
.ce 0
.in 0i
.po 0i
.ll 7.6i
.lt 7.6i
.ta 0.5i 1i 1.5i 2i 2.5i 3i 3.5i 4i 4.5i 5i 5.5i 6i
.if \\n(nl .bp
.tl ''''
.po 0.48i
.lt 7.07i
.sp 1
.if \\w'\\$1' .tl '''\\*(FL \\$1'
.if \\w'\\$2' .ds DT "\\$2
.if \\w'\\$3' .ds NM "\\$3
.tl '''\\*(DT'
.tl '''\\*(NM'
.sp |1i
.tl '+''+'
.po 0i
..
```

```
.de VE                  end view graph
.br
.ps 10
.vs 12p
.ss 16
.fp 4 G
.ft G
.cs G
.sp |\\n()Su            to bottom of view graph
.sp -1                  this and the preceeding line get around a typesetter ugly
.po 0.48i
.lt 7.07i
.tl ''+''
..
.de SZ                  define pointsize, offset, indents, and line lengths
.ps \\$1
.vs \\n(.sp*5u/4u
.ss 16
.nr AO 1i               first level (left margin)
.nr BO \\n(AOu+2m       second indent (large bullet)
.nr CO \\n(BOu+1.7m     third indent (3/4em dash)
.nr DO \\n(COu+2m       fourth indent (small bullet)
.if \\w'\\$2' .nr AL \\$2i+1i   line lengths
.nr BL \\n(ALu-0i       change the "0i" to pull in right margin
.nr CL \\n(BLu-0i       change the "0i" to pull in right margin
.nr DL \\n(CLu-0i       change the "0i" to pull in right margin
..
.de A                   establish top level indent (left margin)
.sp 0.5
.in \\n(AOu
.ll \\n(ALu
..
.de B                   establish second indent (large bullet)
.sp 0.5
.in \\n(BOu
.ll \\n(BLu
.ps -2
.ti -\\w'\(bu''u
\(bu \\s+2\\$1
..
.de C                   establish third indent (3/4em dash)
.sp 0.5
.in \\n(COu
.ll \\n(CLu
.ps -2
.ti -\\w'\(em''u
\(em \\s+2\\$1
..
.de D                   establish fourth indent (small bullet)
.in \\n(DOu
.ll \\n(DLu
.ps -8
.ti -\\w'\(bu''u
\(bu \\s+8\\$1
..
```

```
.de TB                          establish table start
.br
.nf
.ta \\$1i \\$2i \\$3i \\$4i \\$5i \\$6i \\$7i \\$8i \\$9i
..
.de TE                          end table
.br
.fi
.ta 0.5i 1i 1.5i 2i 2.5i 3i 3.5i 4i 4.5i 5i 5.5i 6i
..
.de PO                          page offset
.br
.po 0i
.if \\w'\\$1' .po \\$1i
..
.de UL                          underline
.       this mess must be changed when special font becomes available!
.if!\\w'\\$1'u-.42m \\$1\v'.61m'\l'|0\(ny'\v'-.61m'\\$2
.if!\\w'\\$1'u-.57m .if\\w'\\$1'u-.42m  \\$1\v'.61m'\l'|0\(en'\v'-.61m'\\$2
.if\\w'\\$1'u-.57m \\$1\v'.3m'\l'|0\(ru'\v'-.3m'\\$2
..
```

```
May  8 14:53  try Page 1

troff -a vm $1 $2 $3 $4 $5 $6 $7 $8 $9
```

```
May  7 13:57  pr Page 1

troff vm $1 $2 $3 $4 $5 $6 $7 $8 $9
```