Name

grolj4 − *groff* output driver for HP LaserJet 4 and compatible printers

Synopsis

grolj4 [−**l**] [−**c** *num-copies*] [−**d** [*n*]] [−**F** *font-directory*] [−**p** *paper-format*] [−**w** *line-width*] [*file . . .*]

grolj4 −−help

grolj4 −v
grolj4 −−version

Description

This GNU *roff* output driver translates the output of *troff* (1) into a PCL5 format suitable for an HP LaserJet 4 printer. Normally, *grolj4* is invoked by *groff* (1) when the latter is given the "−**T lj4**" option. (In this installation, **ps** is the default output device.) Use *groff* 's −**P** option to pass any options shown above to *grolj4*. If no *file* arguments are given, or if *file* is "−", *grolj4* reads the standard input stream. Output is written to the standard output stream.

Typefaces

grolj4 supports the standard four styles: **R** (roman), **I** (*italic*), **B** (**bold**), and **BI** (***bold-italic***). Fonts are grouped into families **A**, **C**, **G**, **O**, **T**, **TN**, **U**, and **UC** having members in each style.

AB	Arial Bold
ABI	Arial Bold Italic
AI	Arial Italic
AR	Arial Roman
CB	Courier Bold
CBI	Courier Bold Italic
CI	Courier Italic
CR	Courier Roman
GB	Garamond Halbfett
GBI	Garamond Kursiv Halbfett
GI	Garamond Kursiv
GR	Garamond Antiqua
OB	CG Omega Bold
OBI	CG Omega Bold Italic
OI	CG Omega Italic
OR	CG Omega Roman
OB	CG Omega Bold
OBI	CG Omega Bold Italic
OI	CG Omega Italic
OR	CG Omega Roman
TB	CG Times Bold
TBI	CG Times Bold Italic
TI	CG Times Italic
TR	CG Times Roman
TNRB	M Times Bold
TNRBI	M Times Bold Italic
TNRI	M Times Italic
TNRR	M Times Roman
UB	Univers Bold
UBI	Univers Bold Italic
UI	Univers Medium Italic
UR	Univers Medium
UCB	Univers Condensed Bold
UCBI	Univers Condensed Bold Italic

UCI	Univers Condensed Medium Italic
UCR	Univers Condensed Medium

The following fonts are not members of a family.

ALBB	Albertus Extra Bold
ALBR	Albertus Medium
AOB	Antique Olive Bold
AOI	Antique Olive Italic
AOR	Antique Olive Roman
CLARENDON	Clarendon
CORONET	Coronet
LGB	Letter Gothic Bold
LGI	Letter Gothic Italic
LGR	Letter Gothic Roman
MARIGOLD	Marigold

The special font is **S** (PostScript Symbol); **SYMBOL** (M Symbol), and **WINGDINGS** (Wingdings) are also available but not mounted by default.

Paper format and device description file

grolj4 supports paper formats "**A4**", "**B5**", "**C5**", "**com10**", "**DL**", "**executive**", "**legal**", "**letter**", and "**monarch**". These are matched case-insensitively. The **−p** option overrides any setting in the device description file *DESC*. If neither specifies a paper format, "letter" is assumed.

Font description files

grolj4 recognizes four font description file directives in addition to those documented in *groff_font*(5).

pclweight *n*

Set the stroke weight to *n*, an integer in the range −7 to +7; the default is 0.

pclstyle *n*

Set the style to *n*, an integer in the range 0 to 32767; the default is 0.

pclproportional *n*

Set the proportional spacing Boolean flag to *n*, which can be either 0 or 1; the default is 0.

pcltypeface *n*

Set the typeface family to *n*, an integer in the range 0 to 65535; the default is 0.

Drawing commands

An additional drawing command is recognized as an extension to those documented in *groff*(7).

\D'R *dh dv*'

Draw a rule (solid black rectangle) with one corner at the drawing position, and the diagonally opposite corner at the drawing position +(*dh*,*dv*), at which the drawing position will be afterward. This generates a PCL fill rectangle command, and so will work on printers that do not support HP-GL/2, unlike the other **\D** commands.

Fonts

Nominally, all Hewlett-Packard LaserJet 4-series and newer printers have the same internal fonts: 45 scalable fonts and one bitmapped Lineprinter font. The scalable fonts are available in sizes between 0.25 points and 999.75 points, in 0.25-point increments; the Lineprinter font is available only in 8.5-point size.

The LaserJet font files included with *groff* assume that all printers since the LaserJet 4 are identical. There are some differences between fonts in the earlier and more recent printers, however. The LaserJet 4 printer used Agfa Intellifont technology for 35 of the internal scalable fonts; the remaining 10 scalable fonts were TrueType. Beginning with the LaserJet 4000-series printers introduced in 1997, all scalable internal fonts have been TrueType. The number of printable glyphs differs slightly between Intellifont and TrueType fonts (generally, the TrueType fonts include more glyphs), and there are some minor differences in glyph metrics. Differences among printer models are described in the *PCL 5 Comparison Guide* and the *PCL 5 Comparison Guide Addendum* (for printers introduced since approximately 2001).

LaserJet printers reference a glyph by a combination of a 256-glyph symbol set and an index within that symbol set. Many glyphs appear in more than one symbol set; all combinations of symbol set and index that reference the same glyph are equivalent. For each glyph, *hpftodit*(1) searches a list of symbol sets, and selects the first set that contains the glyph. The printing code generated by *hpftodit* is an integer that encodes a numerical value for the symbol set in the high byte(s), and the index in the low byte. See *groff_font*(5) for a complete description of the font file format; symbol sets are described in greater detail in the *PCL 5 Printer Language Technical Reference Manual*.

Two of the scalable fonts, Symbol and Wingdings, are bound to 256-glyph symbol sets; the remaining scalable fonts, as well as the Lineprinter font, support numerous symbol sets, sufficient to enable printing of more than 600 glyphs.

The metrics generated by *hpftodit* assume that the *DESC* file contains values of 1200 for *res* and 6350 for *unitwidth*, or any combination (e.g., 2400 and 3175) for which $res \times unitwidth = 7\,620\,000$. Although HP PCL 5 LaserJet printers support an internal resolution of 7200 units per inch, they use a 16-bit signed integer for positioning; if **devlj4** is to support U.S. ledger paper (11 in $\times$ 17 in; in = inch), the maximum usable resolution is $32\,767 \div 17$, or 1927 units per inch, which rounds down to 1200 units per inch. If the largest required paper dimension is less (e.g., 8.5 in $\times$ 11 in, or A5), a greater *res* (and lesser *unitwidth*) can be specified.

Font metrics for Intellifont fonts were provided by Tagged Font Metric (TFM) files originally developed by Agfa/Compugraphic. The TFM files provided for these fonts supported 600+ glyphs and contained extensive lists of kerning pairs.

To accommodate developers who had become accustomed to TFM files, HP also provided TFM files for the 10 TrueType fonts included in the LaserJet 4. The TFM files for TrueType fonts generally included less information than the Intellifont TFMs, supporting fewer glyphs, and in most cases, providing no kerning information. By the time the LaserJet 4000 printer was introduced, most developers had migrated to other means of obtaining font metrics, and support for new TFM files was very limited. The TFM files provided for the TrueType fonts in the LaserJet 4000 support only the Latin 2 (ISO 8859-2) symbol set, and include no kerning information; consequently, they are of little value for any but the most rudimentary documents.

Because the Intellifont TFM files contain considerably more information, they generally are preferable to the TrueType TFM files even for use with the TrueType fonts in the newer printers. The metrics for the TrueType fonts are very close, though not identical, to those for the earlier Intellifont fonts of the same names. Although most output using the Intellifont metrics with the newer printers is quite acceptable, a few glyphs may fail to print as expected. The differences in glyph metrics may be particularly noticeable with composite parentheses, brackets, and braces used by *eqn*(1). A script, located in */usr/local/share/groff/1.23.0/font/devlj4/generate*, can be used to adjust the metrics for these glyphs in the special font "S" for use with printers that have all TrueType fonts.

At the time HP last supported TFM files, only version 1.0 of the Unicode standard was available. Consequently, many glyphs lacking assigned code points were assigned by HP to the Private Use Area (PUA). Later versions of the Unicode standard included code points outside the PUA for many of these glyphs. The HP-supplied TrueType TFM files use the PUA assignments; TFM files generated from more recent TrueType font files require the later Unicode values to access the same glyphs. Consequently, two different mapping files may be required: one for the HP-supplied TFM files, and one for more recent TFM files.

Options

−−help displays a usage message, while **−v** and **−−version** show version information; all exit afterward.

−c *num-copies*
   Format *num-copies* copies of each page.

−d [*n*] Use duplex mode *n*: 1 is long-side binding (default), and 2 is short-side binding.

−F *font-directory*
   Prepend directory *font-directory*/dev*name* to the search path for font and device description files; *name* is the name of the device, usually **lj4**.

–l Format the document in landscape orientation.

–p *paper-format*

Set the paper format to *paper-format*, which must be a valid paper format as described above.

–w *line-width*

Set the default line thickness to *line-width* thousandths of an em; the default is **40** (0.04 em).

Environment

GROFF_FONT_PATH

lists directories in which to seek the selected output device's directory of device and font description files. See *troff* (1) and *groff_font*(5).

Files

/usr/local/share/groff/1.23.0/font/devlj4/DESC

describes the **lj4** output device.

*/usr/local/share/groff/1.23.0/font/devlj4/*F

describes the font known as *F* on device **lj4**.

/usr/local/share/groff/1.23.0/tmac/lj4.tmac

defines macros for use with the **lj4** output device. It is automatically loaded by *troffrc* when the **lj4** output device is selected.

Bugs

Small dots.

See also

HP PCL/PJL Reference: PCL 5 Printer Language Technical Reference Manual, Part I ⟨http://www.hp .com/ctg/Manual/bpl13210.pdf⟩

hpftodit(1), *groff* (1), *troff* (1), *groff_out*(5), *groff_font*(5), *groff_char*(7)