NAME

fig2dev – translates Fig code to various graphics languages

SYNOPSIS

fig2dev –L *language* [**–m** *mag*] [**–f** *font*] [**–s** *fsize*] [*other options*] [*fig-file* [*out-file*]]

DESCRIPTION

Fig2dev translates fig code in the named *fig-file* into the specified graphics *language* and puts them in *out-file*. The default *fig-file* and *out-file* are standard input and standard output, respectively

Xfig (Facility for Interactive Generation of figures) is a screen-oriented tool which runs under the X Window System, and allows the user to draw and manipulate objects interactively. This version of fig2dev is compatible with xfig versions 1.3, 1.4, 2.0, 2.1, 3.0, 3.1 and 3.2.

Xfig version 3.2.3 and later saves and allows the user to edit comments for each Fig object. These comments are output with several of the output languages, such as PostScript, CGM, LaTeX, MetaFont, PicTeX, (as % comments), tk (as # comments), and pic (as .\" comments).

GENERAL OPTIONS

–L Set the output graphics language. Valid languages are **box, cgm, epic, eepic, eepicemu, eps, gif, ibmgl, jpeg, latex, map (HTML image map), mf (METAFONT), pcx, pdf, pic, pictex, png, ppm, ps, pstex, pstex_t, sld (AutoCad slide format), textyl,** tiff, tk (tcl/tk), tpic, xbm and **xpm.**

Notes:
dvips and *xdvi* must be compiled with the tpic support (-DTPIC) for epic, eepic and tpic to work.
You must have ghostscript and ps2pdf, which comes with the ghostscript distribution to get the pdf output and the bitmap formats (png, jpeg, etc.), and the netpbm (pbmplus) package to get gif, xbm, xpm, and sld output.

–h Print help message with all options for all output languages.

–m Set the magnification at which the figure is rendered to *mag.* The default is 1.0.

–f Set the default font used for text objects to *font.* The default is Roman; the format of this option depends on the graphics *language* in use. In TeX-based languages, the font is the base of the name given in lfonts.tex, for instance "cmr" for Roman, or "tt" for teletype. In PostScript, it is any font name known to the printer or interpreter.

–s Set the default font size (in points) for text objects to *fsize.* The default is 11∗mag, and thus is scaled by the **-m** option. If there is no scaling, the default font is eleven point Roman."

–V Print the program version number only.

other options

The other options are specific to the choice of graphics *language*, as described below.

CGM OPTIONS

CGM is Computer Graphics Metafile, developed by ISO and ANSI and is a vector-based plus bitmap language. Microsoft WORD, PowerPoint and probably other products can import this format *and display it on the screen*, something that they won't do with EPS files that have an ASCII preview.

–r Position arrowheads for CGM viewers that display rounded arrowheads. Normally, arrowheads are pointed, so fig2dev compensates for this by moving the endpoint of the line back so the tip of the arrowhead ends where the original endpoint of the line was. If the **-r** option is used, the position of arrows will *NOT* be corrected for compensating line width effects, because the

rounded arrowhead doesn't extend beyond the endpoint of the line.

EPIC OPTIONS

EPIC is an enhancement to LaTeX picture drawing environment. It was developed by Sunil Podar of Department of Computer Science in S.U.N.Y at Stony Brook.

EEPIC is an extension to EPIC and LaTeX picture drawing environment which uses tpic specials as a graphics mechanism. It was written by Conrad Kwok of Division of Computer Science at University of California, Davis.

EEPIC-EMU is an EEPIC emulation package which does not use tpic specials.

–A Scale arrowheads by *factor*. The width and height of arrowheads is *divided* by this factor. This is because *EPIC* arrowheads are normally about double the size of *TeX* arrowheads.

–l Use "**\thicklines**" when width of the line is wider than *lwidth*. The default is 2.

–v Include comments in the output file.

–P Generate a complete LaTeX file. In other words, the output file can be formatted without requiring any changes. The additional text inserted in the beginning and at the end of the file is controlled by the configuration parameter "Preamble" and "Postamble".

–S Set the scale to which the figure is rendered. This option automatically sets the *magnification* and size to *scale* / 12 and *scale* respectively.

–W Enable variable line width. By default, only two line widths are available: The normal line width (hinlines), and thick lines (hicklines), if a line width of more than one is selected in xfig.

–w Disable variable line width. Only "**\thicklines**" and/or "**\thinlines**" commands will be generated in the output file.

When variable line width option is enabled, "**\thinlines**" command is still used when line width is less than *LineThick*. One potential problem is that the width of "**\thinlines**" is 0.4pt but the resolution of Fig is 1/80 inch (approx. 1pt). If *LineThick* is set to 2, normal lines will be drawn in 0.4pt wide lines but the next line width is already 2pt. One possible solution is to set *LineThick* to 1 and set the width of the those lines you want to be drawn in "**\thinlines**" to 0.

Due to this problem, Variable line width *VarWidth* is defaulted to be false.

IBM-GL OPTIONS

IBM-GL (International Business Machines Graphics Language) is compatible with HP-GL (Hewlett-Packard Graphics Language).

–a Select ISO A4 (ANSI A) paper size if the default is ANSI A (ISO A4) paper size.

–c Generate instructions for an IBM 6180 Color Plotter with (without) an IBM Graphics Enhancement Cartridge (IBM-GEC).

–d Restrict plotting to a rectangular area of the plotter paper which has a lower left hand corner at *(xll,yll)* and a upper right hand corner at *(xur,yur)*. All four numbers are in inches and follow **-d** in a comma-sparated list - *xll,yll,xur,yur* - with no spaces between them.

–f Load text character specifications from the table in the *fonts* file. The table must have 36 entries - one for each font plus a default. Each entry consists of 5 numbers which specify the 1.) standard character set (0 - 4, 6 - 9, 30 - 39), 2.) alternate character set (0 - 4, 6 - 9, 30 - 39), 3.) character slant angle (degrees), 4.) character width scale factor and 5.) character height scale factor.

–l Load area fill line patterns from the table in the *patterns* file. The table must have 21 entries - one for each of the area fill patterns. Each entry consists of 5 numbers which specify the 1.) pattern number (-1 - 6), 2.) pattern length (inches), 3.) fill type (1 - 5), 4.) fill spacing (inches) and 5.) fill angle (degrees).

–m The magnification may appear as the first element in a comma separated list - *mag,x0,y0* - where the second and third parameters specify an offset in inches.

–p Load plotter pen specifications from the table in the *pens* file. The table must have 9 entries - one for each color plus a default. Each entry consists of 2 numbers which specify the 1.) pen number (1 - 8) and 2.) pen thickness (millimeters).

–P Rotate the figure to portrait mode. The default is landscape mode.

–S Set the pen speed to *speed* (centimeters/second).

–v Plot the figure upside-down in portrait mode or backwards in landscape mode. This allows you to write on the top surface of overhead transparencies without disturbing the plotter ink on the bottom surface.

Fig2dev may be installed with either ANSI A or ISO A4 default paper size. The **-a** option selects the alternate paper size. Fig2dev does not fill closed splines. The IBM-GEC is required to fill other polygons. Fig2dev may be installed for plotters with or without the IBM-GEC. The **-c** option selects the alternate instruction set.

OPTIONS COMMON TO ALL BITMAP FORMATS

-b borderwidth

Make blank border around figure of width *borderwidth.*

-g color

Use *color* for the background.

-S smoothfactor

This will smooth the output by scaling the figure by the *smoothfactor* factor, which forces ghostscript to render the figure at the higher scale to improve font rendering, then passing through pnmscale to reduce to original size, which also smooths the image by averaging colors of adjacent pixels. A value of 2 or 3 for *smoothfactor* is reasonable. xfig uses 2 when the "smooth" option is used in the export panel.

GIF OPTIONS

-t color Use *color* for the transparent color in the GIF file. This must be specified as a six-digit hexadecimal RGBvalue with the # sign, e.g. #ff0000 (Red).

JPEG OPTIONS

-q image_quality

use the integer value *image_quality* for the JPEG "Quality" factor. Valid values are 0-100.

LATEX OPTIONS

–l Sets the threshold between LaTeX thin and thick lines to *lwidth* pixels. LaTeX supports only two different line width: \thinlines and \thicklines. Lines of width greater than *lwidth* pixels are drawn as \thicklines. Also affects the size of dots in dotted line style. The default is 1.

–d Set a separate magnification for the length of line dashes to *dmag.*

–v Verbose mode.

LaTeX cannot accurately represent all the graphics objects which can be described by Fig. For example, the possible slopes which lines may have are limited. Some objects, such as spline curves, cannot be drawn at all. Fig2latex chooses the closest possible line slope, and prints error messages when objects cannot be drawn accurately

MAP (HTML image map) OPTIONS

Xfig version 3.2.3 and later saves and allows the user to edit comments for each Fig object. The fig2dev map output language will produce an HTML image map using Fig objects that have href="some_html_reference" in their comments. Any Fig object except compound objects may used for this. Usually, besides generating the map file, you would also generate a GIF file, which is the image to which the map refers.

For example, you may have an xfig drawing with an imported image that has the comment href="go_here.html" and a box object with a comment href="go_away.html". This will produce an image map file such the user may click on the image and the browser will load the "go_here.html" page, or click on the box and the browser will load the "go_away.html" page.

After the map file is generated by *fig2dev* you will need to edit it to fill out any additional information it may need.

-b borderwidth
Make blank border around figure of width *borderwidth.*

METAFONT OPTIONS

fig2dev scales the figure by 1/8 before generating METAFONT code. The magnification can be further changed with the **-m** option or by giving magnification options to **mf.**

In order to process the generated METAFONT code, the mfpic macros must be installed where **mf** can find them. The mfpic macro package is available at any CTAN cite under the subdirectory: graphics/mfpic

-C code
specifies the starting METAFONT font code. The default is 32.

-n name
specifies the name to use in the output file.

-p pen_magnification
specifies how much the line width should be magnified compared to the original figure. The default is 1.

-t top specifies the top of the whole coordinate system. The default is **ypos.**

-x xneg specifies the minimum x coordinate value of the figure (inches). The default is 0.

-y yneg specifies the minumum y coordinate value of the figure (inches). The default is 0.

-X xpos
specifies the maximum x coordinate value of the figure (inches). The default is 8.

-Y ypos
specifies the maximum y coordinate value of the figure (inches). The default is 8.

PIC OPTIONS

-p Enables the use of certain PIC extensions which are known to work with the groff package; compatibility with DWB PIC is unknown. The extensions enabled by each option are:

arc	Allow ARC_BOX i.e. use rounded corners
line	Use the 'line_thickness' value
fill	Allow ellipses to be filled
all	Use all of the above
psfont	Don't convert Postscript fonts generic type (useful for files going to be Ditroff'ed for

and printed on PS printer). DWB-compatible.

allps Use all of the above (i.e. "all" + "psfont")

PICTEX OUTPUT

In order to include PiCTeX pictures into a document, it is necessary to load the PiCTeX macros.

PiCTeX uses TeX integer register arithmetic to generate curves, and so it is very slow. PiCTeX draws curves by **put**-ing the *psymbol* repeatedly, and so requires a large amount of TeX's internal memory, and generates large DVI files. The size of TeX's memory limits the number of plot symbols in a picture. As a result, it is best to use PiCTeX to generate small pictures.

POSTSCRIPT, ENCAPSULATED POSTSCRIPT (EPS), and PDF

With PostScript, Fig can be used to create large posters. The figure will be created by printing multiple pages which can be glued together. Simply specify the -M option to produce a multi-page output. Due to memory limitations of most laser printers, the figure should not be too complicated. Great for text with very big letters.

The EPS driver has the following differences from PostScript:

- o No showpage is generated because the output is meant to be imported into another program or document and not printed
- o The landscape/portrait options are ignored
- o The centering option is ignored
- o The multiple-page option is ignored
- o The paper size option is ignored
- o The x/y offset options are ignored

The PDF driver uses all the PostScript options.

Text can now include various ISO-character codes above 0x7f, which is useful for language specific characters to be printed directly. Not all ISO-characters are implemented.

Color support: Colored objects created by Fig can be printed on a color postscript printer. There are 32 standard colors: black, yellow, white, gold, five shades of blue, four shades of green, four shades of cyan, four shades of red, five shades of magenta, four shades of brown, and four shades of pink. In addition there may be user-defined colors in the file. See the xfig FORMAT3.2 file for the definition of these colors. On a monochrome printer, colored objects will be mapped into different grayscales by the printer. Filled objects are printed using the given area fill and color. There are 21 "shades" going from black to full saturation of the fill color, and 21 more "tints" from full saturation + 1 to white. In addition, there are 16 patterns such as bricks, diagonal lines, crosshatch, etc.

-b borderwidth

Make blank border around figure of width *borderwidth.*

-c option centers the figure on the page. The centering may not be accurate if there are texts in the *fig_file* that extends too far to the right of other objects.

-e option puts the figure against the edge (not centered) of the page.

-g color

Use *color* for the background.

-l dummy_arg

Generate figure in landscape mode. The dummy argument is ignored, but must appear on the command line for reasons of compatibility. This option will override the orientation specification in the file (for file versions 3.0 and higher).

This option is only honored when not using the -P option (add showpage). This is because the figure doesn't need to be rotated when generating Encapsulated PostScript (EPS).

-M Generate multiple pages if figure exceeds paper size.

-p dummy_arg

Generate figure in portrait mode. The dummy argument is ignored, but must appear on the command line for reasons of compatibility. This option will override the orientation specification in the file (for file versions 3.0 and higher). This is the default for Fig files of version 2.1 or lower.

-P indicates that the figure describes a full page which will not necessarily be inserted into a document, but can be sent directly to a PS printer. This ensures that a showpage command is inserted at the end of the figure.

-n name

Set the Title part of the PostScript output to *name*. This is useful when the input to *fig2dev* comes from standard input.

-x offset

shift the figure in the X direction by *offset* units (1/72 inch). A negative value shifts the figure to the left and a positive value to the right.

-y offset

shift the figure in the Y direction by *offset* units (1/72 inch). A negative value shifts the figure up and a positive value down.

-z papersize

Sets the papersize. Available paper sizes are:
"Letter" (8.5" x 11" also "A"),
"Legal" (11" x 14")
"Ledger" (11" x 17"),
"Tabloid" (17" x 11", really Ledger in Landscape mode),
"A" (8.5" x 11" also "Letter"),
"B" (11" x 17" also "Ledger"),
"C" (17" x 22"),
"D" (22" x 34"),
"E" (34" x 44"),
"A4" (21 cm x 29.7cm),
"A3" (29.7cm x 42 cm),
"A2" (42 cm x 59.4cm),
"A1" (59.4cm x 84.1cm),
"A0" (84.1cm x 118.9cm),
and "B5" (18.2cm x 25.7cm).

PSTEX OPTIONS

The **pstex** language is a variant of **ps** which suppresses formatted (special) text. The **pstex_t** language has the complementary behavior: it generates only LaTeX commands necessary to position special text, and to overlay the PostScript file generated using **pstex.** These two drivers can be used to generate a figure which combines the flexibility of PostScript graphics with LaTeX text formatting of special text.

-g color

Use *color* for the background.

-n name

sets the Title part of the PostScript output to *name*. This is useful when the input to *fig2dev* comes from standard input.

-p file specifies the name of the PostScript file to be overlaid. If not set or its value is null then no PS file will be inserted.

TK OPTIONS

-l dummy_arg

Generate figure in landscape mode. The dummy argument is ignored, but must appear on the command line for reasons of compatibility. This option will override the orientation

specification in the file (for file versions 3.0 and higher).

-p dummy_arg
Generate figure in portrait mode. The dummy argument is ignored, but must appear on the command line for reasons of compatibility. This option will override the orientation specification in the file (for file versions 3.0 and higher). This is the default for Fig files of version 2.1 or lower.

-P Generate canvas of full page size instead of using the bounding box of the figure's objects. The default is to use only the bounding box.

-z papersize
Sets the papersize. See the POSTSCRIPT OPTIONS for available paper sizes. This is only used when the -P option (use full page) is used.

SEE ALSO

[x]fig(1), pic(1) pic2fig(1), transfig(1)

BUGS and RESTRICTIONS

Please send bug reports, fixes, new features etc. to:
xfig-bugs@epb1.lbl.gov (Brian V. Smith)

Arc-boxes are not supported for the tk output language, and only X bitmap pictures are supported because of the canvas limitation in tk.

Picture objects are not scaled with the magnification factor for tk output.

Because tk scales canvas items according to the X display resolution, polygons, lines, etc. may be scaled differently than imported pictures (bitmaps) which aren't scaled at all.

Rotated text is only supported in the IBM-GL (HP/GL) and PostScript (including eps) languages.

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