NAME

xfig - Facility for Interactive Generation of figures under X11

SYNOPSIS

xfig [*options*] [*file*]

DESCRIPTION

Xfig is a menu-driven tool that allows the user to draw and manipulate objects interactively under the X Window System. **It runs under X version 11 release 4 or higher** and requires a two- or three-button mouse. *file* specifies the name of a file to be edited. The objects in the file will be read at the start of *xfig*.

For a HTML-based *xfig* reference guide, see the Help menu in *xfig* or *index.html* provided with the *xfig* distribution, usually in the *Doc/www* directory. There are both English and Japanese versions.

When using a two-button mouse use the <*Meta*> key and the right button at the same time to effect the action of the middle button.

Xfig is available via anonymous ftp from ftp://ftp.x.org/contrib/applications/drawing_tools/xfig and usually from ftp://epb1.lbl.gov/xfig .

The *TransFig* package is used when printing or exporting the output from *xfig*. The *fig2dev* program from the *TransFig* package is automatically called by *xfig* as a back-end processor to produce various types of output:

LaTeX	*fig2dev –L latex* translates *xfig* to *LaTeX* picture environment commands which can be processed along with other *LaTeX* commands.
Metafont	*fig2dev –L mf* produces *Metafont* output.
PostScript	*fig2dev –L ps* produces an *Encapsulated PostScript* output. *fig2dev –L tk* produces a *tk* output. This is for the tcl/tk tool command language/tool kit package. Canvas objects are generated from the Fig primitives and a toplevel canvas is created.
Bitmaps	*fig2dev* can also convert Fig to GIF, JPEG, PCX, PNG, PPM, TIFF (no compression), XBM, XPM, and AutoCAD Slide.
IBM-GL	*fig2dev –L ibmgl* produces a *IBM-GL (HP/GL)* output.
Pic	*fig2dev –L pic* produces a *pic* output.
PiCTeX	*fig2dev –L pictex* produces *PiCTeX* output. This contains macros that can be used with the *PiCTeX* environment under *TeX* or *LaTeX*.
Others	*fig2dev* has options for these other languages: *box*, *epic*, *eepic*, and *eepicemu*.

The *TransFig* package is available via anonymous ftp from *ftp.x.org* in **/contrib/applications/drawing_tools/transfig**.

OPTIONS

–help

Print all command-line options for xfig and quit.

–bal[**loon_delay**] *msec*

Cause popup information balloons to be delayed by *msec* milliseconds. The default is 500 milliseconds.

–bol[**d**] *font*

Cause the font used for displaying the file name and confirmation messages to be *font* (default = 8x13bold).

–butt[**on**] *font*

Cause the font used for most buttons to be *font* (default = 6x13).

–but_[per_row] *number*
Specify the number of buttons wide the mode panel should be. This is useful in conjunction with the **–pheight** parameter to reduce the canvas height for small screens.

–cbg *color*
Use *color* as the background color for the canvas. If you want to set the background of everything in xfig (e.g. menus, etc.) use the general -bg option.

–center
Set the print option to print the figure centered on the page. This is the default.

–centim[ers]
Make centimeters the unit of choice. See also -metric.

–cfg *color*
Use *color* as the default color for objects. If you want to set the foreground of everything in xfig (e.g. menus, etc.) use the general -fg option.

–deb[ug]
Turn on debugging mode. Prints various debugging messages like font names etc.

–dep[th]
Choose depth of visual desired. Your server must support the desired visual and depth chosen. Use *xdpyinfo* to see what visuals and depths are supported. See also the **–visual** option.

–dontsh[owballoons]
Prevents xfig from popping up the information balloons. See also -showballoons.

–dontsw[itchcmap]
Prevents xfig from switching to a private colormap if there aren't enough colors available in the default colormap. See also **–max_image_colors.**

–e[xportLanguage] *language*
Specifies the language to be used for when exporting a fig file. Choices are:

Name	Language
box	LaTeX box (figure boundary)
latex	LaTeX picture
epic	LaTeX picture + epic macros
eepic	LaTeX picture + eepic macros
eepicemu	LaTeX picture + eepicemu macros
pictex	PiCTeX macros
ibmgl	IBMGL (or HPGL)
eps	Encapuslated PostScript
ps	PostScript
pstex	Combined PS/LaTeX (both PS and LaTeX parts)
textyl	Textyl special commands
tpic	TPIC
pic	PIC
mf	MF (MetaFont)
acad	ACAD (AutoCad slide)
pcx	PCX
png	PNG
gif	GIF*
jpeg	JPEG (JFIF)
tiff	TIFF
tk	TK
ppm	PPM (portable pixmap package)
xbm	X11 Bitmap

xpm X11 Pixmap (XPM3 package)

*xfig must be compiled with USEGIF to have GIF export.
See README file for patent warning.

–fl[**ushleft**]
Set the print option to print the figure flush left. The default is to center the figure on the page.

–geom[**etry**] [*WxH*][*+X+Y*]
You may use the -geometry option or resource to *size and/or position the xfig window,* or you may use -pwidth and/or -pheight to specify the canvas size in inches or centimeters.

–iconG[**eometry**] *+X+Y*
Specifies the position for the icon.

–im[**age_editor**] *editor*
Specify bitmap editor to use when ‘‘Edit Image’’ button is pressed in Picture Object panel.

–inc[**hes**]
Make inches the unit of choice (default).

–internalBW *width*
Use lines of width *width* between all buttons and panels (default = 1).

–k[**eyFile**] *compose-key-file*
Use *compose-key-file* instead of *CompKeyDB* for compose (meta) key database. If there are no ‘‘**/**’’s in the name, the file must reside in the *xfig* library directory, *$XFIGLIBDIR*, usually **/usr/local/lib/X11/xfig**. If there are any ‘‘**/**’’s in the name it is taken as is (not relative to *$XFIGLIBDIR*). If there is a leading ‘‘**~/**’’ in the string then the ‘‘~’’ is expanded to the user’s home directory.

–lan[**dscape**]
Make *xfig* come up in landscape mode (10.5" x 8"). This is the default; however as the orientation is stored with Fig files, when you load a Fig file the orientation will change as required. This is only true for files of version 3.0 or higher.
See also -portrait.

–lat[**exfonts**]
Start *xfig* with *LaTeX* font selection. Normally, the *PostScript* fonts are available as the default. This flag selects the *LaTeX* fonts to start.

–le[**ft**]
Change the position of the side panel window to the left of the canvas window. This is the default.

–li[**brary_dir**] *directory*
Specify directory where Fig object libraries are located. There may be sub-directories there and sub-sub-directories, etc.

–mag[**nification**] *mag*
Set export and print magnification in %.

–max[**_image_colors**] *numcols*
Limit the number of colors used for EPS, GIF, JPEG, PCX or XPM images to *numcols (default 64).*

–me[**tric**]
Make centimeters the unit of choice. Also -centimeters.

After *xfig* is started you may change the units from metric to imperial or vice versa from a popup menu available by pressing mouse button 3 in the *units* box where the two rulers meet.

–mo[**nochrome**]
Use black and white only.

–mu[**ltiple**]
Sets multiple page mode for print or export. See also **–single.**

–nor[**mal**] *font*
Cause the font used for the message window to be *font*. This font is also used on the canvas when the selected font is not available in an X11 font (default = 6x13).

–nos[**calablefonts**]
Disables use of the X11R5 or OpenWindows scalable fonts. You might want to use this for debugging.

–not[**rack**]
Turn off cursor (mouse) tracking arrows.

–pa[**per_size**] *size*
Set the initial paper size for Export and Print. Choices are
Letter (8.5" x 11"),
Legal (8.5" x 14"),
Ledger (17" x 11"),
Tabloid (11" x 17"),
A (8.5" x 11"),
B (11" x 17"),
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 84.1 cm),
A0 (84.1 cm x 118.9cm),
B5 (18.2cm x 25.7cm)

Note that this doesn't affect the size of the drawing canvas. Use the -pheight and -pwidth options for that.

–ph[**eight**] *height*
Make the *xfig* canvas *height* high (where *height* is either cm or in, depending on the -metric setting).

–po[**rtrait**]
Make *xfig* come up in portrait mode (8.5" x 9"). See note about landscape mode.

–pw[**idth**] *width*
Make the *xfig* canvas *width* wide (where *width* is either cm or in, depending on the -metric setting).

–ri[**ght**]
Change the position of the side panel window to the right of the canvas window (default: left).

–sc[**alablefonts**]
Allows use of the X11R5 or OpenWindows scalable fonts (this is the default). If the scalable fonts aren't available *xfig* will automatically switch to non-scaling fonts.

–showa[**llbuttons**]
Show all the *xfig* indicator buttons instead of only those relevant to the current drawing mode. Normally, the buttons *line width*, *area-fill*, *grid mode*, *text size*, etc. are only visible when they are relevant to the current drawing mode. The **–showallbuttons** option makes all of the indicator buttons visible at all times. This takes up more screen real estate, but allows the user

to see all settable parameters.

–showb[alloons]
Forces xfig to pop up the information balloons when the mouse passws over a button. This is the default. See also -dontshowballoons.

–showl[engths]
Makes xfig show the lengths of lines being drawn, in red text near the line itself. Also, when points are moved or added. In addition, imagine a triangle formed with the line segment as the hypotenuse, and a vertical and horizontal line forming the other two sides. These lines and their lengths are also drawn in red as the point is moved or added. This mode is ignored when drawing in freehand mode.
This flag may be toggled by pressing <Meta>i (default).

–si[ngle]
Sets single page mode for print or export. This is the default. See also **–multiple.**

–spec[ialtext]
Start *xfig* with the *special text* mode for text objects. Special text means that special characters in the string are not specially processed but are passed directly to *LaTeX*. This is most useful for writing LaTeX equations. If this flag is not set, then the backslash character '\' is changed to the \backslash command, a brace '{' is turned into a brace command \{, etc.

–spel[lcheckcommand] *command*
Use *command* for the external spell checking program when using the spell check/search/replace popup. The string *command* should include the string ''%s'' which is replaced by a temporary filename. Default is ''spell %s''.

–startfi[llstyle] *stylenumber*
Set the starting fill style for area fill (-1 to 21).

–startfo[ntsize] *pointsize*
Set the default font size for text objects (default = 12pt).

–startg[ridmode] *modenumber*
Set the starting grid mode (0 to 3). Mode 0 is no grid. In imperial (inches) mode, grid mode 1 is 1/4 inch, mode 2 is 1/2 inch and mode 3 is 1 inch. In metric mode, grid mode 1 is 5mm, mode 2 is 1cm and mode 3 is 2cm.

–startla[texFont] *font*
Set the starting font name for *LaTeX* fonts.

–startli[newidth] *width*
Set the starting line width.

–startpo[snmode] *modenumber*
Set the starting point positioning mode (0 to 4) In imperial (inches) mode, positioning mode 0 is ''any'', mode 1 is 1/16 inch, mode 2 is 1/4 inch, mode 3 is 1/2 inch and mode 4 is 1 inch. In metric mode, mode 0 is ''any'', mode 1 is 1mm, mode 2 is 5mm, mode 3 is 10mm and mode 4 is 20mm.

–startp[sFont] *font*
Set the starting font name for *PostScript* fonts.

–startt[extstep] *stepsize*
Set the starting text step.

–ta[blet]
Specifies that xfig should use the input tablet instead of the mouse for drawing. You must have the XInputExtension in your X server and an input tablet for this to work. Also, you must modify the Imakefile to include the USETAB and TABLIB variables.

–tr[**ack**]
Turn on cursor (mouse) tracking arrows (default).

–users[**cale**] *scale*
Set the multiplier for displayed line lengths etc. This factor is multiplied by the actual length, radius or diameter of the object currently being drawn on the canvas. It is useful for making scale drawings, where e.g. 1 inch = 1 foot (userscale = 12.0) or 1cm = 1m (userscale = 100.0).

–useru[**nit**] *units*
The *units* string is printed with the length information when drawing objects. For example if the *userscale* = 1.0 and the *userunit* = *ft* then a line which is 3 inches long on the canvas would be displayed as ''length = 3 ft'' when it is being drawn.

After *xfig* is started you may change the *userscale* and the *userunit* from a popup menu available by pressing mouse button 3 in the *units* box where the two rulers meet.

–visual *visualname*
Use *visualname* as the visual for xfig. The names are TrueColor (case is not important), StaticColor, DirectColor, StaticGray, GrayScale and PseudoColor. *xfig* uses the default visual unless this is specified. Your server must support the desired visual. Use *xdpyinfo* to see what visuals and depths are supported. See also the **–depth** option.

–zoom *zoomscale*
Set the starting zoom scale.

GRAPHICAL OBJECTS

The objects in *xfig* are divided into **primitive objects** and **compound objects**. The primitive objects are: *ARC*, *CIRCLE*, *ELLIPSE*, *POLYLINE*, *POLYGON*, *PICTURE*, *BOX*, *ARC-BOX*, *CLOSED SPLINE*, *OPEN SPLINE*, and *TEXT*.

A primitive object can be moved, rotated, flipped vertically or horizontally, scaled, copied, aligned within a compound object or erased. The *TEXT* primitive may not be flipped. The attributes of any primitive object can be edited using a popup panel (discussed below), so you can, for instance, set the position of an object manually.

A compound object is composed of primitive objects. The primitive objects that constitute a compound can not be individually modified, but they can be manipulated as an entity; a compound can be moved, rotated, flipped vertically or horizontally, scaled, copied or erased. A compound that contains any boxes or arc-boxes may only be rotated by 90 degrees.

Objects may overlap other objects according to their ''depth''. Objects with larger depth number are obscured by objects with smaller depth.

Regular polygons may be created using a special drawing mode, but a general *POLYGON* is created as a result, which may then be modified, i.e. the individual vertices may be moved if desired. Conversions between *POLYLINE* , *POLYGON* , *OPENSPLINE* and *CLOSEDSPLINE* are achieved by the *CONVERT* tool.

DISPLAY REGIONS

There are ten regions in the *xfig* window: the command region, top ruler, side ruler, drawing mode, editing mode, filename, message, mouse function indicator, canvas (drawing area), and indicator region with buttons to show and change settings such as line thickness, line style, color, etc. (The mouse function indicator region was inspired by the UPS debugger from the University of Kent.) The drawing and editing mode regions may be placed (together) to the left or right of the the canvas region (default: left).

In addition, when the mouse passes over certain buttons or regions there are ''balloons'' (messages) which popup to indicate the function of the area under the mouse. These may be turned on and off by clicking on the button labelled ''Balloons'', to the right of the message region. There is a check mark indicating their state.

COMMAND PANEL FUNCTIONS

Quit Exit from *xfig*, discarding the figure. If the figure has been modified and not saved, the user will be asked to confirm the action, by clicking mouse button 1 on a confirm/cancel popup menu. The accelerator *<Meta>q* will also perform this function. This and all other accelerators are defined in the *app-defaults* file and may be changed if desired.

Port/Land
Change shape of xfig canvas from/to portrait/landscape. Note: the canvas will automatically change to the portrait/landscape configuration specified in Fig files of version 3.0 or higher when loading those files.

New Delete all objects from the canvas window and erase current file name to make a new drawing (may be undone). The accelerator *<Meta>n* will also perform this function. If you attempt to save the new figure using the keyboard accelerator *<Meta>s* or with mouse button 3 on the *File* button the popup file menu will appear for you to enter a file name.

You may use the accelerator *<Meta>d* to delete all the objects from the canvas and retain the current file name.

Undo Undo the last object creation, deletion or modification. The accelerator *<Meta>u* will also perform this function. If an undo of a *Paste* or file *Merge* is done, any user-defined colors in the figure pasted in or the file just merged will NOT be undefined.

Redraw Redraw the canvas. There are also two accelerators which do a redraw — *<Meta>r* and *<Ctrl>l.*

Paste Paste the object previously copied into the cut/paste file into the current figure. The object will appear on the canvas under or near the mouse where it may then be moved and placed by pressing mouse button 1. The accelerator *<Meta>t* will also perform this function.

File Pressing mouse button 3 on this button invokes *Save* function without popping up the file panel. Before the figure is saved the original file is first renamed with the suffix ''.bak'' appended. This provides a backup file.

Mouse button 1 or *<Meta>f* pops up a panel which contains several file-related functions. Do not use this function for importing images (picture objects). See the ''IMPORTING PICTURE OBJECTS'' section.

Current Filename
This is read-only AsciiTextWidget which contains the filename that will be used to write output to a file *if there is no name specified in* the *Filename* panel.

Filename
This is an editable AsciiTextWidget which contains the filename selected either by clicking on a filename from the *Alternatives* list or by typing a name in directly. Pressing return in the Filename window will *Load* the file and copy the name to the *Current Filename* widget.

Note that xfig will automatically uncompress or gunzip any files that have .Z, .z or .gz as the suffix.

(File) Alternatives
Pressing mouse button 1 on a filename in the file alternatives window will copy the filename into *Filename* window and show a preview of the figure in the file. It also shows the size of the figure in its drawing units (in or cm). Pressing return in this window will *Load* the file specified in the *Filename* window (if any) or the *Current Filename* widget.

Filename Mask
A wildcard mask may be typed into this editable AsciiTextWidget to restrict the

search of filenames to a subset ala the *ls* command. Pressing return in this window will automatically rescan the current directory. This string may be set by setting the X toolkit resource **Fig*file_panel*mask*string**.

Current Directory
This is an editable AsciiTextWidget which shows the current directory. It may be modified by the user to manually set a directory name. When return is pressed in this window the directory specified is scanned for files matching the *Filenamemask*, if any.

The ~ (tilde) character may be used to specify a user's home directory, ala unix shell tilde expansion.

(Directory) Alternatives
Pressing mouse button 1 on a directory name in the directory alternatives list will do a ''change directory'' to that directory.

Pressing mouse button 3 in either the file or *Directory Alternatives* window will do a ''change directory'' to the parent directory.

Load/Merge figure offset
These two editable AsciiTextWidgets allow one to load or merge a figure with an offset on the canvas. The figure will be offset by the amounts specified (in Fig units) in the X and Y panels. A negative value in the X offset will shift the figure to the left, and a negative value in the Y offset will shift the figure up.

Home Pressing this button will change the directory to the *$HOME* directory of the user.

Rescan Pressing this button or *<Meta>r* will rescan the current directory.

Cancel Pressing this button or *<Meta>c* will pop down the *File* panel without making any changes to the directory or file name.

Save Pressing this button or *<Meta>s* will save the current contents of the canvas in the file specified in the *Filename* window *if any*, or the name specified in the *Current Filename* if the former is empty. If the filename being saved is different from the current figure name and that file already exists a confirmation popup menu will appear asking the user to confirm or cancel the save. If there is a filename in the *Filename* window it is copied to the *Current Filename* window.

The current Export directory is updated to the current File directory when Save is pressed.

Before the figure is saved the original file is first renamed with the suffix ''.bak'' appended. This provides a backup file.

Load Pressing this button or *<Meta>l* will clear the canvas of any current figure and read the figure from the filename specified in the *Filename* menu item *if any*, or the name specified in the *Current Filename* if the former is empty. The figure will be offset by the amounts specified (Fig units) in the X and Y load/merge offset widgets. If there is a figure currently on the canvas and any modifications have been made to it and not saved, a popup query window will first appear asking if the user wishes to discard the current figure or cancel the *Load* operation.

The current Export directory is updated to the current File directory when Load is pressed.

Note that xfig will automatically uncompress or gunzip any files that have .Z, .z or .gz as the suffix.

A popup message window will appear and diagnostic messages will be written if *xfig* changes any ''illegal'' object values to legal values. For example, older versions of *xfig* were lax about initializing unused parts such as *depth*, and would produce very large, random values. *Xfig* now will ''clean up'' bad values and inform you when it

does so. Also, if you read in an older file format, *xfig* will inform you that it is converting it to the current format for that version of *xfig*.
This window can be popped down by clicking the mouse button on the *Dismiss* button.

Merge Pressing this button or *<Meta>r* will read the figure from the filename specified in the *Filename* window *if any*, or the name specified in the *Current Filename* if the former is empty, and merge it with the figure already on the canvas. It is first made into a compound object so it may be easily moved later. The figure will be offset by the amounts specified (Fig units) in the X and Y load/merge offset widgets. Any user-defined colors in the file being merged will be renumbered if necessary to unique values so as not to conflict with any user-defined colors already defined. There is *no* comparison of the color values of the existing user-defined colors with the colors being merged in so there may be identical colors with different numbers.

See *Load* above for a description of the popup message window.

Export Will let you export the figure to an output file in one of several formats. Pressing mouse button 3 on this button invokes *Export* function without popping up the export panel.
Mouse button 1 or *<Meta>e* pops up a directory browser widget and a menu with several export-related functions:

Magnification
This is an editable AsciiTextWidget which contains the magnification to use when translating figure to the output language. The default is 100%.

Fit to Page
Pressing this button will set the magnification so that the figure will just fit the current paper size with no less than a 1/2 inch margin.

Fig Size:
This label shows the figure size at the current magnification. It is updated when the panel is popped up and when the user changes the magnification and shows the size in inches or cm depending on the current units.

Paper Size
This is a pulldown menu which allows you to select the paper size for printing. The choices are:

Letter (8.5" x 11"),
Legal (8.5" x 14"),
Ledger (17" x 11"),
Tabloid (11" x 17"),
A (8.5" x 11"),
B (11" x 17"),
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 84.1 cm),
A0 (84.1 cm x 118.9cm),
B5 (18.2cm x 25.7cm)

Orientation
This button will toggle the output orientation between Landscape (horizontal) and Portrait (vertical). The default orientation is the same as the mode that *xfig* was started with, or the orientation in the Fig file when loading a Fig file of version 3.0 or

higher.

Justification
This window will only be sensitive when the language selected is ‘‘ps’’ (*PostScript*). You may choose that the figure is *flush left* or *centered* in the output file.

Pages With this pulldown menu you can select whether the figure should be exported as a single page or multiple pages. The multiple page option would only be useful if the figure is larger than the current physical paper size.

Export Offset
These two editable AsciiTextWidgets allow one to export a figure with an offset. The figure will be offset by the amounts specified (in inches or cm) in the X and Y panels. A negative value in the X offset will shift the figure to the left, and a negative value in the Y offset will shift the figure up. These offsets are in addition to any centering done with the centering option.

Language
The translation language to use for *xfig* output. The default is specified in the resource Fig.exportLanguage and is Encapsulated PostScript as xfig is distributed.
Several languages are available; PostScript, Encapsulated PostScript, LaTeX, TPIC, PIC, Textyl, IBM/GL (HP/GL), MetaFont, and serveral bitmap formats; GIF, JPEG (JFIF), PNG, PCX (PC Paintbrush), ACAD (AutoCad slide), TIFF (no compression), tk (tcl/tk), PPM (Portable Pixmap package), XBM (X11 monochrome bitmap) and XPM (XPM3 package, producing color pixmaps).

Image quality (%)
For JPEG(JFIF) export, this entry will appear, and you may select the quality factor for the JPEG image. Valid values are 1 to 100%. The default quality of 75% seems to be fine for figures containing only solid objects (no images) and adequate for figures containing imported images (GIF, JPEG, etc.).

Transparent Color
For GIF export, this menu button will appear and you may choose that one of the colors in the figure is ‘‘transparent’’, meaning that for those GIF viewers that support transparent color (Netscape, for example) that color will not appear in the figure. Instead, the background of the viewer will show through in place of that color
The default is ‘‘None’’ (no transparent color).

Default Output Filename
This is read-only AsciiTextWidget which contains the filename that will be used to write output to a file *if there is no name specified in* Output File. The default is the figure name plus an extension that reflects the output language used, e.g. **myfigure.ps** if *PostScript* is the current language used. If the file already exists a confirmation popup menu will appear asking the user to confirm or cancel the save.

Output Filename
This is an editable AsciiTextWidget which contains the filename to use to write output to a file. Pressing return in this window will *Export* the file and copy the name to the *Default Output Filename* widget. If the file already exists a confirmation popup menu will appear asking the user to confirm or cancel the save.

(File) Alternatives
Pressing mouse button 1 on a filename in the file alternatives window will select that file by copying the filename into *Filename* window. Pressing return in this window will *Export* the file and copy the name to the *Default Output Filename* widget.

Filename Mask
A wildcard mask may be typed into this editable AsciiTextWidget to restrict the search of filenames to a subset ala the *ls* command. Pressing return in this window

will automatically rescan the current directory. This string may be set by setting the X toolkit resource **Fig*export_panel*mask*string**.

Current Directory
This is an editable AsciiTextWidget which shows the current directory. It may be modified by the user to manually set a directory name. When return is pressed in this window the directory specified is scanned for files matching the *Filenamemask*, if any.

It is automatically updated to follow the current File directory when a File Load or Save is done.

The ~ (tilde) character may be used to specify a user's home directory, ala unix shell tilde expansion.

(Directory) Alternatives
Pressing mouse button 1 on a directory name in the directory alternatives list will do a ''change directory'' to that directory.

Pressing mouse button 3 in either the file or *Directory Alternatives* window will do a ''change directory'' to the parent directory.

Home Pressing this button will change the directory to the *$HOME* directory of the user.

Rescan Pressing this button or *<Meta>r* will rescan the current directory.

Cancel Pressing this button or *<Meta>c* will pop down the *Export* menu without doing any print operation.

Export Pressing this button or *<Meta>e* will write (export) the figure to the file using the selected language. If the file already exists, a confirmation window will popup to ask the user to confirm the write or cancel. Pressing return in the Output Filename window will also Export the file.

Print Pressing mouse button 3 on this button invokes *Print to Printer* function without popping up the print panel. Pressing the *Shift* key and mouse button 3 invokes the *Print to Batch* function. Pressing mouse button 1 or *<Meta>p* pops up a menu with several print-related functions:

Magnification
This is an AsciiTextWidget which contains the magnification to use when translating figure to the output language.

Fit to Page
Pressing this button will set the magnification so that the figure will just fit the current paper size with no less than a 1/2 inch margin.

Fig Size:
This label shows the figure size at the current magnification. It is updated when the panel is popped up and when the user changes the magnification and shows the size in inches or cm depending on the current units.

Paper Size
This is a pulldown menu which allows you to select the paper size for printing. See the Export menu for the paper sizes.

Orientation
This button will toggle the output orientation between Landscape (horizontal) and Portrait (vertical). The default orientation is the same as the mode that *xfig* was started with, or the orientation in the Fig file when loading a Fig file of version 3.0 or higher.

Justification
This button will bring up a sub-menu from which you may choose *center* or *flush left* to justify the figure on the page. The default is *flush left*.

Pages With this pulldown menu you can select whether the figure should be printed as a single page or multiple pages. The multiple page option would only be useful if the figure is larger than the current physical paper size.

Printer This is an AsciiTextWidget which contains the printer to use if output is directed to a printer. The name of the printer may be set setting the X toolkit resource **Fig*printer*string**. If no resource is set, the environment variable *PRINTER* is used.

Print Job Params
This is an AsciiTextWidget which into which you may put any extra command-line parameters that your lpr or lp program needs for printing. If the meta sequence *%f* appears in the string the current figure name will be substituted. It may appear more than once. This may be set using the resource **Fig*job_params*string**.

Figures in batch
This indicator shows how many figures have been put in the batch file for printing

Dismiss Pressing this button or <*Meta*>*c* will pop down the *Print* menu.

Print FIGURE/BATCH to Printer
Pressing this button or <*Meta*>*p* will send the current figure (or the batch file if it is has any figures in it) to the printer, by passing it through *fig2dev* to convert it to *PostScript* then to the unix *lpr* (on BSD equivalent Unixes) or *lp* (on SYSV systems) program. If the batch file is printed by this button then it is removed after printing. The message in the button changes to reflect whether the batch file will be printed (when there are any figures in the batch file) or the current figure.

Note that the figure that is printed is what you see on the canvas, not necessarily the figure file. I.e., if you haven't saved the figure since the last changes, the figure from the canvas is printed. *Xfig* writes the figure to a temporary file to do this. The name of the file is *XFIGTMPDIR*/**xfig-print***PID*, where *XFIGTMPDIR* is the value of the environment variable by that name and *PID* is the process ID of *xfig*. If the environment variable *XFIGTMPDIR* is empty or not set, the **/tmp** directory is used. *Print FIGURE to Batch* Pressing this button or <*Meta*>*b* will append the figure (in *PostScript* form) to a batch file. The *Print to Printer* button will send the batch file to the printer.

Clear Batch
Pressing this button or <*Meta*>*x* will erase the accumulated figures from the batch file.

Help The *Help* button pulls down a menu to view various help information.

The first entry will launch an external *HTML* browser specified by the Fig.browser resource to view the xfig html reference manual written by T. Sato. *netscape* is the default browser.

The next entry will launch an external *PDF* viewer specified by the Fig.pdfviewer resource to view the *Xfig How-to Guide* written by Peter Hiscocks. *acroread* is the default viewer.

The third entry will launch an external *PDF* viewer to view the xfig pdf man pages. However, the HTML pages are much better.

The last entry will popup a window showing the xfig version and copyright information.

INDICATOR PANEL COMMAND DESCRIPTIONS

The indicator panel contains buttons to set certain drawing parameters such as line thickness, canvas grid, rotation angle etc. All of the buttons use the same mouse buttons for setting values. Pressing mouse button 1 on the indicator will pop up a panel in which either a value may be typed (e.g. for a line thickness) or the mouse may be clicked on one of several buttons (e.g. for grid style or font name). For those that expect a value, pressing return in the value part of the window will set the new value and pop down the menu.

Pressing mouse button 2 on an indicator will decrement the value (e.g. for line thickness) or cycle through the options in one direction (e.g. font names), while pressing mouse button 3 will increment the value or cycle through the options in the other direction.

ZOOM SCALE

The canvas zoom scale may be set/increased/decreased with this button. The zoom scale is displayed within the zoom button. Ruler, grid and linewidth are scaled, too.
Pressing mouse button 1 will popup a panel where the zoom amount may be entered manually. There is also a checkbox that if checked, will force zooming with the mouse to use integral zoom values (e.g. 2, 3, 4).
Pressing mouse button 2 will decrease the zoom factor by 1.0 unless it is less than 1.0 already in which case it will reduce to the nearest 0.25.
Pressing mouse button 3 will increase the zoom factor by 1.0 unless it is less than 1.0 in which case it will increase it to the nearest 0.25.
Pressing the control key and mouse button 3 together will set the zoom scale to 1.

The figure may also be zoomed by defining a zoom rectangle on the canvas by pressing the Control key and mouse button 1 together. This will define one corner of the zoom rectangle. Move the mouse and click mouse button 1 again to define the opposite corner of the zoom rectangle. If the ''Integral area zoom'' checkbox in the zoom popup is checked, the area will be zoomed by an integral value (e.g. 2, 3, 4).

GRID MODE

With this button the user may select no grid, 1/4 inch (5mm in metric mode) grid 1/2 inch (10mm) grid, or 1 inch (20mm).

POINT POSITION

This button controls the coarseness of object placement on the canvas. The options are exact (on pixel) placement, 1/16 inch (1mm in metric mode), 1/4 inch (5mm), 1/2 inch (10mm) or 1 inch (20mm). This allows the user to easily place objects in horizontal or vertical alignment.

This also restricts which objects may be ''picked up'' by the mouse when editing. If a corner of an object is not positioned on the canvas on a multiple of the point positioning resolution you may not be able to pick it. If this happens, a black square will temporarily appear above the mouse cursor. This square will also appear anytime the user tries to pick a nonexistent object.

ROTATION ANGLE

The rotation angle for rotating objects may be set/increased/decreased with this button. Note that not all objects may be rotated, and certain objects may only be rotated by certain angles. Pressing mouse button 2 will decrease the angle in steps of 15 degrees, while mouse button 3 will increase the angle the same amount. To select other angles, press mouse button 1 and enter the angle in the popup menu.

DEPTH The depth at which new objects will be created may be set/increased/decreased with this button.

NUMBER OF POLYGON SIDES

The number of sides used in creating a *REGULAR POLYGON* is set with this button.

NUMBER OF COPIES

The number of copies to make when doing a *COPY & ROTATE* function on an object. Each copy will be rotated an additional *ROTATION ANGLE* angle from the previous.

NUMBER OF X (or Y) COPIES

The number of copies to make in the X (or Y) direction when doing a *COPY* function on an object.

SMART-LINKS MODE

This button controls the smart-links mode. When turned on, lines which link box-like objects

together (henceforth called *links*) are treated specially when one of the box-like objects is moved or copied. For a copy, the link is also copied. When set to *MOVE* mode, the end point of the link which touches (or is very near) the perimeter of the box is moved with the box so that the box and the end point remain linked. When set to *SLIDE* mode, the end segment of the link slides so that the box remains linked and the angle of the end segment is maintained. This is useful for keeping the last segment of a link horizontal or vertical.

(At the moment, smart-links only work for the *MOVE* and *COPY* functions and only works for *POLYLINE* links and box-like objects. Another limitation at the moment is that if both ends of a link touch the box being operated on, only one end of the link will be adjusted.)

VERTICAL ALIGN

This sets the vertical alignment mode for the *ALIGN* button in the editing mode panel. The choices are no vertical alignment, align to top edge, middle or bottom edge of compound, distribute the centres or edges evenly, or abut the vertical edges together. The *HORIZONTAL ALIGN* and *VERTICAL ALIGN* indicator settings are used together to align objects inside a compound or in canvas.

HORIZONTAL ALIGN

This sets the horizontal alignment mode for the *ALIGN* button in the editing mode panel. The choices are no horizontal alignment, align to left edge, middle or right edge of compound, distribute the centres or edges evenly, or abut the horizontal edges together. The *HORIZONTAL ALIGN* and *VERTICAL ALIGN* indicator settings are used together to align objects inside a compound or in canvas.

ANGLE GEOMETRY

The following settings are available to restrict the drawing angle of line segments in *POLYLINES*, *POLYGONS* and *SPLINES*.

UNRESTRICTED

Allow lines to be drawn with any slope. This is the default setting.

LATEX LINE

Allow lines to be drawn only at slopes which can be handled by *LaTeX* picture environment lines: slope = *x*/*y*, where x,y are integers in the range [–6,6].

LATEX VECTOR

Allow lines to be drawn only at slopes which can be handled by *LaTeX* picture environment vectors: slope = *x*/*y*, where x,y are integers in the range [–4,4].

MANHATTAN-MOUNTAIN

Allow lines to be drawn in the horizontal, vertical or diagonal direction only.

MANHATTAN

Enforce drawing of lines in the horizontal and vertical direction only. The name *Manhattan* comes from the horizontal/vertical look of the Manhattan (New York City) skyline.

MOUNTAIN

Enforce drawing of only diagonal lines. The name comes from the pointed shape of mountains.

FILL STYLE

This button allows the user to select the area fill darkness (grey scale or color intensity) or fill patterns for all objects except *TEXT* and *PICTURE*, or to turn off area fill altogether.

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 (currently only available for PostScript, GIF, JPEG, PNG, PCX, ACAD, TIFF, TK, PPM, XPM and XBM output):

30 degree left-leaning diagonal lines,
30 degree right-leaning diagonal lines,
30 degree crosshatch,
45 degree left-leaning diagonal lines,
45 degree right-leaning diagonal lines,
45 degree crosshatch,
bricks,
circles
horizontal lines,
vertical lines,
90 degree crosshatch,
fishscales,
small fishscales,
octagons,
horizontal ''sawtooth'' and
vertical ''sawtooth''.

PEN COLOR

This button is used to select one of 32 standard colors for the borders of objects, or one of the user-defined colors

FILL COLOR

This button is used to select one of 32 standard colors or user-defined color to fill objects with if they have a fill style.

Pressing mouse button 1 on either the fill or pen color buttons will popup an extended color panel, allowing the user to select either a standard color or a user-defined color from menus.

The 32 standard colors are 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.

To select one of the standard colors either click mouse button 1 on the desired color and either press Return or click mouse button 1 on the ''Ok'' button. The latter step will pop down the color panel. You may also double click mouse button 1 on the desired color to select it and pop down the color panel in one step.

To add a user-defined color press mouse button on the ''Add Color'' button in the ''User Defined Colors'' section. User defined colors are assigned values sequentially starting from 32 for a maximum of 512 colors.

A user color may be deleted by pressing mouse button 1 on the color box to select it and then pressing the ''Del Color'' button.

The last color deleted may be undeleted by pressing the ''UnDel Color'' button.

To edit a user color first select the color square by pressing mouse button 1 on the desired square. A solid or dashed line will be drawn around the box to show that it is selected. Then choose the color either by using the RGB (red, green, blue) or the HSV (hue, saturation, value) sliders or by typing a hexadecimal value into the window under the pen or fill color boxes representing the red, green and blue components (00 to FF). If the latter is used, typing carriage return in the hexadecimal window will set the color.

Additionally, there is a button above each of the RGB sliders which when activated will ''lock'' two or more sliders together at their current setting and allow you to increase or

decrease their values together with the ‘‘lock’’ slider.

If the user color being edited was just created, a dashed line will be drawn around the box instead of a solid line to indicate that it is new. The color that is currently in the pen or fill boxes will be copied into the user color cell for modification. In this way you may start with a standard color or other user color and modify it from there.

The user color is said to be ‘‘defined’’ when any of the sliders is moved or a carriage return is typed into the hexadecimal window. This will be shown by a solid line being drawn around the square instead of dashed.

The pen or fill color choice is activated when the panel is popped up by the respective button in the indicator panel, but you may switch to editing the other color by pressing either the ‘‘Edit Pen’’ or ‘‘Edit Fill’’ button.

Note that *TransFig* supports color output for *PostScript*. On monochrome screens the objects are created with the selected color, but black (or white) is used to draw the objects on the canvas.

LINE WIDTH

The width of lines may be selected with this button. Zero width lines may be drawn for the purpose of having filled areas without outlines.

LINE STYLE

The choices for line style are solid, dash, dot, dash-dot, dash-dot-dot and dash-dot-dot-dot. Once created, a dashed or dotted line may be edited to change the length of dashes or the spacing of dots respectively. The dash length and dot gap can be changed from the default using the popup menu.

JOIN STYLE

Lines may be joined with a *miter*, *rounded* or *bevel* joint. This is only used for *POLYLINE* or *POLYGON* objects.

CAP STYLE

The ends of lines may be capped with *butt*, *round* or *projecting* cap. This is only used for *POLYLINE*, *SPLINE* or *OPEN ARC* objects.

ARROW MODE

This button selects the auto-arrow mode for drawing lines. The options are no arrow heads, backward-pointing arrow head, forward-pointing arrow head or both. If one or both arrow head modes are turned on, then arrow heads are automatically drawn when drawing *POLYLINE*, *OPEN SPLINE* or *OPEN ARC* objects.

ARROW TYPE

There are four types of arrows which may be filled with white or the object color.

ARROW SIZE

Clicking mouse button 1 here will popup a panel where you may set the arrow head thickness, width and height (length) either as absolute values or as multiples of the current line thickness. Check the box labelled ‘‘Absolute Values’’ to use absolute values (the default) or the box labelled ‘‘Multiple of Line Width’’ to use that feature. The values to change are under their respective check boxes. The arrow measurements are in the same units as line widths (1/80 inch). This has changed from earlier versions where the width and height were in Fig units. Clicking on mouse buttons 2 or 3 here will cycle through displaying the current thickness, width, and height settings.

BOX CURVE

The radius of the corners on *ARC-BOX* objects may be set with this button.

TEXT JUSTIFICATION

The adjustment of text may be set to *left*, *center* or *right justification*.

TEXT SIZE

The text size may be set/increased/decreased with this button. The default is 12 points.

TEXT STEP

The interline spacing of text may be set/increased/decreased with this button. The number displayed gives the multiple of the font height that will be placed between lines on hitting <*return*>. The default is a factor of 1.2 times the current font size.

TEXT FONT

This button allows a selection of 35 fonts available for most Apple *PostScript* printers. There are two buttons at the top of the menu. The *cancel* button pops down the menu without changing the current font. The *use latex fonts* will switch the menu to the *LaTeX* font choices. When the *LaTeX* font menu is up, besides a *cancel* button there is a button to switch back to the *PostScript* fonts.

The name of the font is printed in the font itself so that one may see what that font looks like. If a corresponding X11 font exists, new text is created on the canvas using that font. *xfig* uses the size of X11 font closest to that selected by the font size button. If the X11 font doesn't exist, *xfig* uses the font selected by the **–normal** option. To abort selection of a font, click mouse button 1 on *cancel*.

TEXT FLAGS

This button displays the current setting of the text flags. You may use mouse buttons 2 and 3 to step back and forth through the three flag settings: *Hidden*, *Rigid* and *Special*. To change any of the flags you must use mouse button 1 to popup a menu from which you may change any or all of the flags.

The *Hidden* flag is used for figures that will be used with *LaTeX* and is applicable only to the display of the document in *xfig*. It means that the text itself is not shown onscreen, but only the string ''<text>''. This is to keep long sequences of *LaTeX* formatting commands from making the screen messy and hard to read. The default for the *Hidden* flag is *off*.

The *Special* Special flag means that special characters in the string are not specially processed but are passed directly to *LaTeX*. If this flag is not set, then the backslash character '\' is changed to the \backslash command, a brace '{' is turned into a brace command \{, etc. The default for the *Special* flag is *off* unless *xfig* is started with the command-line parameter **–specialtext** (resource specialtext).

The *Rigid* attribute forces text to remain the same size even if inside a compound object that is scaled up or down. The default is *off*.

DRAWING AND EDITING MODE PANELS

Icons in the drawing and editing mode panel windows represent object manipulation functions, modes and other drawing or modification aids. Manipulation functions are selected by positioning the cursor over the icon representing the desired drawing/editing function and clicking mouse button 1. The selected icon is highlighted, and a message describing its function appears in the message window. The hilighting remains on until another function is selected.

DRAWING MODE PANEL COMMAND DESCRIPTIONS

The drawing mode panel contains buttons used to create the various *xfig* objects. Once the drawing mode is selected, the object is created by moving the mouse to the point on the canvas where the object is to be placed and pressing and releasing mouse button 1. After that the mouse is moved to the second point and mouse button 1 is again pressed for the next point. For those objects which may have more than two points (e.g. a line), mouse button 1 may be pressed for each successive point, and mouse button 2 must be pressed to finish the object. If the cap style is rounded, the point object will be a filled circle. Newly created points may be deleted by pressing the shift key and mouse button 1. For

the *ARC* object, which requires exactly three points mouse button 1 is used for all three points.

At any time mouse button 3 may be pressed to cancel the creation of the object.

ARC Create an arc. Specify three points using mouse button 1. The first and last points will form the endpoints of the arc and the second specifies any point on the arc. There are two types of arcs, open and pie-wedge.

BOX Create rectangular boxes. Start by clicking mouse button 1 on any corner of the desired box and finish with the same mouse button on the diagonally opposite corner of the box.

ARC-BOX
Create rectangular boxes with rounded corners. Start and finish with mouse button 1 in the same way as *BOX*. The radius of the corners is selected by the *BOX CURVE* button.

CIRCLE
Create circles by specifying their radii or diameters. Click mouse button 1 on the center of the circle and drag the mouse until the desired radius or diameter is attained. Click mouse button 1 again to finish the circle.

ELLIPSE
Create ellipses using the same procedure as for the drawing of circles.

IMPORTING PICTURE OBJECTS
The following picture types may be imported into a figure:

- Encapsulated PostScript files
- GIF files
- JPEG (JFIF) files
- PCX (PC Paintbrush)
- X11 bitmap (monochrome) files
- X11 pixmap (XPM3) color files

Compressed (.Z) and gzipped (.z or .gz) files are also handled. You must have the XPM3 libraries installed to use the XPM import/export features. See the README and Imakefile files.

As it says, you may now import Fig (xfig) files as picture objects. These may not be edited, but may be scaled and rotated.

Import is by reference for all picture types. This means that the picture file is not copied into the Fig file, only the picture file name is stored with the Fig file.

A Floyd-Steinberg dithering is applied to color images for monochrome displays.

For EPS files, xfig will attempt to use *Ghostscript* to generate a color image if xfig is running on an color display. *Ghostscript* must be compiled with with the ‘‘pcx256’’ and ‘‘pbmraw’’ drivers. The pbm driver is used when you run xfig on a monochrome display and the pcx256 driver is used on a color display.

Ghostscript is available from *prep.ai.mit.edu*.

A neural network color allocation scheme is used when the number of colors for all the color images on the canvas exceeds the lesser of the number of free colorcells or the value in the resource Max_image_colors (command-line parameter -max_image_colors). Whenever a new color image is added to the canvas, the colors for all the images on the canvas are reallocated and the images are redrawn. No reallocation is done when images are deleted from the canvas.

Click mouse button 1 on any corner for the *PIC* object and finish by clicking mouse button 1 again on the diagonally opposite corner. The *EDIT* popup panel will appear and the file name of the *PIC* object may be entered. After pressing *DONE* or *APPLY* (see the description of the *EDIT* panel for the difference between the *DONE* and *APPLY* buttons) the bitmap part of the *PIC* object will appear in the box just created. If no *PIC* file is available yet or no name is

entered or in the case of an Encapsulated PostScript file there is no *preview bitmap* pressing *DONE* will pop down the edit panel and the word *<empty>* or the *PIC* file name will remain in the *PIC* box. Later, when the name of the *PIC* file is known or the file is available, you may re-read the *PIC* file using the popup edit panel and the bitmap part of the *PIC* file will replace the name in the box.

If you want the original size of the *PIC* object, press the ''Use orig size'' button and the eps bitmap will enlarge or shrink to the size specified in the preview bitmap of the *PIC* file. Or, to scale as a percentage of the original size, enter a percentage value and press the ''Scale by %'' button.

If you want the *PIC* object to be approximately the size of the rectangle specified with the mouse but want the aspect ratio to be same as the original, press either ''Shrink to orig'' or ''Enlarge to orig'' buttons. You must press the *APPLY* button to see these effects.

The *Screen Capture* button will unmap the xfig windows, allowing you to capture either the contents of a window or a rectangular section of the screen to a GIF* file, which becomes the current import file. After pressing the *Screen Capture* button, if you press and release mouse button 1 on a window (or the root window) it will capture that window (without any window manager frame). To capture a rectangular area of the screen, you press and release mouse button 2 at one corner of the area you want to capture, drag out the rectangle and press and release mouse button 2 to finish. You may cancel the operation by pressing either of the two other mouse buttons (1 or 3). The filename given to the capture file is the base of the figure name plus the time in seconds since 00:00:00 GMT, Jan 1, 1970 (from the Unix time() call), e.g. myfigure_828065129.gif.

*If xfig was compiled without the USEGIF symbol then the capture file is in PCX format (PC Paintbrush) with the suffix ''.pcx''.

The *Edit Image* button will call an external image viewer/editor (see resource Fig.image_editor: in the Fig.ad file) to allow you to edit the current image. The file is reimported automatically after exiting the editor. The xfig windows are automatically unmapped during the call of the editor.

The *Reread* button will cause xfig to re-read the image file in case it has changed. This is useful (e.g.) when you have made changes to the image file in a program external to xfig and you wish to update the imported image.

The *Browse* button which will popup a file browser to allow you to search directories for image files. The default search mask will match *.gif*, *.jpg*, *.pcx*, *.xpm*, *.xbm*, *.ps* and *.eps*. This mask is in the Fig.ad application defaults file.

POLYLINE

Create polylines (line segments connecting a sequence of points). Enter points by clicking mouse button 1 at the desired positions on the canvas window. Click mouse button 2 to finish.

To create a freehand line press mouse button 2 to start drawing. As the mouse is moved points will be added to the line without having to click the mouse buttons. To finish the freehand line press mouse button 2 again.

For both modes, newly created points may be deleted by pressing the Shift key and mouse button 1 before pressing mouse button 2. The message window shows how many points have been created as you add points to the line.

A single point object may be created by simply pressing mouse button 3. If the cap style is rounded, the point object will be a filled circle.

POLYGON

The function is similar to *POLYLINE* except that a line segment is drawn connecting the first and last points entered.

REGULAR POLYGON

The number of sides is first selected with the *NUM SIDES* button in the indicator panel. Then mouse button 1 is clicked on the center and the mouse dragged to the desired size. The object may be rotated as it is being created by moving the mouse up or down relative to the starting point. Click mouse button 1 to finish.

INTERPOLATED SPLINE

The function is similar to *POLYLINE* except that an open interpolated spline (a spline curve that passes through the control points) is drawn. At least two points must be entered.

CLOSED INTERPOLATED SPLINE

The function is similar to *POLYGON* except that a closed interpolated spline is drawn. At least three points must be entered.

APPROXIMATED SPLINE

The function is similar to *POLYLINE* except that an open approximated spline (a spline curve that passes through the two boundary points and approximates the shape of the other points) is drawn. At least two points must be entered.

CLOSED APPROXIMATED SPLINE

The function is similar to *POLYGON* except that a closed approximated spline is drawn. At least three points must be entered.

Note: xfig provides conversion tools to switch between any two of the following objects: polylines, polygones, open interpolated spline, closed interpolated spline, open approximated spline, closed approximated spline. This conversion can be done either globally for the whole object (see LINE<->SPLINE and OPEN<->CLOSED) or locally for each individual point (see EDIT POINT).

TEXT Create text strings. Click mouse button 1 at the desired position on the canvas window, then enter text from the keyboard. Text may be pasted from the PRIMARY cut buffer (*xterm* cut/paste buffer) by pressing the *F18* function key (the *Paste* key on Sun keyboards) or any key/button defined in the translation table for the canvas. See the default **Fig.ad** file for example. Text is drawn using the current font, font size and justification settings.

A Control-H (backspace) will delete a character to the left of the cursor, while the Delete key or Control-D will delete the character to the right of the cursor. A Control-X will erase all the text to the left of the cursor, while a Control-K will erase all the text to the right of the cursor. The Home key or Control-A will move the cursor to the start of the text, while the End key or Control-E move the cursor to the end of the text. The left arrow key or Control-B move the cursor left one character and the right arrow or Control-F move the cursor right one character. Finish entering/editing text by clicking mouse button 2 or typing the <*return*> key. If <*return*> is used, the text pointer automatically moves to the next ''line'', a distance of the font height times the value in the *TEXT STEP* button, and text input mode is re-entered. To finish text fully, click mouse button 2 or choose any panel button that changes modes (e.g. box, save, etc). To edit text, click on an existing text string with mouse button 1. Insertion of characters will take place at that point. Or, use the popup *EDIT* mode to modify the text.

Eight-bit (8-bit) characters may be entered using the meta (compose) key. For example, to create an ''a umlaut'', press and release either the Meta key, the Alt key or the Compose key, then the letter ''a'', then " (quote). To create a ''c cedilla'', use <meta>c followed by comma.

When modifying text in the popup edit panel, only the Compose key will work.

The following is a list of all special characters available using the Meta, Alt or Compose keys:

Keys	Character Name
!!	upside-down exclamation point
??	upside-down question mark
C/	cent sign

L–	British pound
OX	currency
Y–	yen
__	broken vertical bar
SO	section
""	dieresis
CO	copyright
RO	registered trademark
_a	ordfeminine
_o	ordmasculine
<<	guillemotleft
>>	guillemotright
-|	notsign
—	hyphen
+–	plusminus
^–	macron
^*	degree
^.	periodcentered
^1	onesuperior
^2	twosuperior
^3	threesuperior
14	onequarter
12	onehalf
34	threequarters
**	multiply
–:	division
/u	mu
P!	paragraph
A‘	A accent grave
A’	A accent acute
A^	A accent circumflex
A~	A accent tilde
A"	A dieresis
A*	A ring
AE	AE
a‘	a accent grave
a’	a accent acute
a^	a accent circumflex
a~	a accent tilde
a"	a dieresis
a*	a ring
ae	ae
C,	C cedilla
c,	c cedilla
D–	Eth
d–	eth
E‘	E accent grave
E’	E accent acute
E^	E accent circumflex
E"	E dieresis
e‘	e accent grave
e’	e accent acute
e^	e accent circumflex

e"	e dieresis
I‘	I accent grave
I’	I accent acute
Iˆ	I accent circumflex
I"	I accent dieresis
i‘	i accent grave
i’	i accent acute
iˆ	i accent circumflex
i"	i dieresis
N˜	N tilde
n˜	n tilde
O‘	O accent grave
O’	O accent acute
Oˆ	O accent circumflex
O˜	O accent tilde
O"	O dieresis
O/	O slash
OE	OE
o‘	o accent grave
o/	o accent acute
oˆ	o accent circumflex
o˜	o accent tilde
o"	o dieresis
o/	o slash
oe	oe
P|	Thorn
p|	thorn
ss	German ss (s-zed)
U‘	U accent grave
U’	U accent acute
Uˆ	U accent circumflex
U"	U dieresis
u‘	u accent grave
u’	u accent acute
uˆ	u accent circumflex
u"	u dieresis
Y’	Y accent acute
y’	y accent acute
y"	y dieresis

Note: the two special characters OE and oe are not displayed on the screen, but they are printed by fig2dev.

Spell Checking and String Search in Text Objects

By pressing <Meta>h in the canvas area a popup panel will appear which lets you search for strings in the text objects and/or do string replacement and spell checking.

The external spell checking program can be specified by the -spellcheckcommand command-line argument (resource Fig.spellCheckCommand). The default is the ‘‘spell’’ program. See the -spellcheckcommand description for usage details.

The ‘‘Search/Replace/Update’’ button will search all text objects for the pattern given in the ‘‘Search:’’

entry. A panel pops up showing any matching text objects. If the ‘‘Replace’’ button is pressed, the matched pattern in the text objects will be replaced by the string in the ‘‘Replace with:’’ entry. If the ‘‘Update’’ button is pressed, the matching text objects’ attributes will be updated from the current settings in the bottom indicator panel.

If the search pattern is empty all text objects will be listed. If the Update button is pressed in that case, all text objects will be updated.

EDITING MODE PANEL COMMAND DESCRIPTIONS

When a button in the editing mode panel is pressed, any objects that may be affected by that editing operation will show their corner markers. Only those objects may be affected by the particular edit mode. In cases where two edit modes exist for one button, it may be that the corner markers will appear for objects that may be affected by one button but not the other.

SELECTING OBJECTS

When multiple objects have points in common, e.g. two boxes that touch at one corner, only one object can be selected by clicking on that point. To select other objects, hold down the shift key while pressing mouse button 1: the markers of one object will be temporarily highlighted. By repeatedly clicking mouse button 1 while holding down the shift key, it is possible to cycle through all candidates for selection at that point. To perform the selected action, e.g. deleting one box, click on the point without holding down the shift key. The operation will be performed on the highlighted object.

Note: If the mouse is not clicked near enough to an object marker or for whatever reason *xfig* cannot ‘‘find’’ the object the user is trying to select, a black square will temporarily appear above the mouse cursor.

GLUE COMPOUND

Compound objects are created by first tagging the objects to be compounded and then pressing mouse button 3 to group the tagged objects into a compound object. Single objects are tagged by clicking on them with mouse button 1. A number of objects can be tagged at once by using mouse button 2 to define the upper-left and lower-right corners of a region enclosing the objects. Tagged objects are shown with highlighted markers. Tagged objects which are selected (see the **SELECTING OBJECTS** section above) will be temporarily unhighlighted. There is currently no special command to tag or untag all of the objects within a figure. You can untag all of the objects by changing from *GLUE* mode to some other mode (apart from *BREAK*) and back again.

BREAK COMPOUND

Break a compound object into separate component parts. Click mouse button 1 on one of the corner markers of the compound object or along one of the imaginary lines defining the compound box. Clicking with mouse button 2 will achieve the same effect but will also tag the component parts for re-gluing into a compound later (although you will not see the tags until you change to the *GLUE* mode).

OPEN COMPOUND

Open a compound object temporarily for editing of its components. The compound object selected will be opened, and all other objects in the figure that are not part of the compound will disappear. You can make any changes to objects in the open compound including adding and deleting objects. If you delete all the objects in the compound, the compound will be removed entirely.

A popup panel with two buttons appears which lets you close the compound again. The first, labeled ‘‘Close This Compound’’ will close the currently open compound. If you open a compound within a compound, you may close all the compounds with one step by clicking on the second button labelled ‘‘Close All Compounds’’.

After all compounds are closed, the rest of the original figure will reappear.

IMPORTANT NOTE: A side effect occurs when you open a compound, delete an object in that compound, close the compound and ‘‘undo’’ the delete operation. The object you deleted will reappear but it will not be part of the original compound anymore. You may use this to remove objects from a compound.

Conversely, if you delete an object from the canvas, open a compound then undo the delete of the original object, it will now be part of the open compound.

PLACE LIBRARY OBJECT

Pressing this button will popup a library panel where you may load a library from a list of libraries. The default library directory is *XFIGLIBDIR/Libraries* which is defined in the Imakefile. This directory contains libraries which are defined by sub-directories. The command-line argument *-library_dir* (resource *Fig.library_dir*) may be used to specify a different directory. The choice of libraries is presented in a pull-down menu. After choosing the library, the objects from the library will be loaded. The status line shows how many objects or any error messages that may occur. Once a library is loaded if you single-click on an object name in the listbox area it will show a preview of the object in the right side preview window. If you double-click on one of the object names or single-click on one and press the *Select object* button, this will pop down the library panel and you will immediately see the chosen object appear under the mouse on the canvas, where it may be dragged around and placed by pressing mouse button 1 at the desired location. You may place as many of these objects as you wish by simply moving to the new location and pressing mouse button 1 each time.

If mouse button 2 is pressed, the library panel pops up again where either a different object or library may be selected.

Pressing moust button 3 will cancel the library mode altogether.

Pressing Shift and mouse button 1 at the same time will switch from drawing the object itself as it is dragged, to only drawing the outline of the bounding box of the object. This second mode is desirable on slow machines or with complex objects.

A library is simply a directory with .fig files, each containing one library object. When xfig loads the .fig files as library objects, it makes each one into a compound object so it may be moved, scaled, etc. as a unit.

There are two ways to create your own libraries in xfig. For the first method, create the file *xfiglib* in your home directory (~/xfiglib). Each line of the *xfiglib* file contains the absolute path of the directory containing the .fig files in that library, followed by the name of the library, which may be multiple words with whitespace. There may be at most 50 libraries. The length of the library name (not the path) may be at most 40 characters long, and any library may have no more than 400 objects, each of whose name (the name of the .fig file) may not be more than 40 characters.

You must then either start xfig with ‘‘ *-library_dir* ~/xfiglib’’, or set the resource ‘‘Fig.library_dir: ~/xfiglib’’.

Here is an example:

/xfig/Examples/Libraries/Electrical/Physical Electrical Parts
/xfig/Examples/Libraries/Electrical/Schematic Electrical Schematic Components
/xfig/Examples/Libraries/Logic Logic Symbols
/xfig/Examples/Libraries/Flowchart Flowchart Elements
/xfig/Examples/Libraries/Buildings Buildings

The other method is to use the X resource *Fig.library_dir* or command-line argument *-library_dir* to point to a directory which may contain Fig files (.fig) and sub-directories, each of which may also contain .fig files and sub-directories if desired.

To link your libraries with the ones that come with xfig, simply make a symlink for each xfig

library in your library directory or make one symlink to the top-level xfig library directory in your library directory.

This is more versatile than using the xfiglib file because you can add more directories in the top-level directory (or sub-directories) and there is no need to edit the xfiglib file. Using this method, the names of the libraries are simply the names of the directories, e.g. if the resource *Fig.library_dir: /xfig/Examples/Libraries* is defined, the */xfig/Examples/Libraries/Electrical* directory will result in the library name *Electrical*.

It is hoped that users will contribute Fig objects to the libraries to expand and enhance them for all xfig users. If you wish to contribute any Fig objects to existing or new libraries, please send them to me at xfigmail@epb1.lbl.gov. You may restrict their usage by users if you wish, but all will benefit if you allow free usage, i.e. copying, using them in published reports, etc.

SCALE OBJECT

Any object may be scaled. If mouse button 1 is pressed on any corner of a *BOX* or *ARC-BOX* object, then that object will be scaled proportionally to its aspect ratio. If pressed on an edge then that dimension will be scaled. For other objects only mouse button 2 may be used for scaling; said object will be scaled larger or smaller about its center. Mouse button 2 may be used on boxes too. Text may only be scaled if inside a compound object and then only if its *RIGID* flag is set to *NORMAL* (using the popup edit panel). See the *TransFig* manual for description of text options.

ALIGN Align objects. Click mouse button 1 to align objects inside a compound object or mouse button 2 to align all objects on canvas according to the setting in the *VERTICAL ALIGN* and *HORIZONTAL ALIGN* indicators. Note that alignment with respect to the canvas doesn't work for distributing or abutting. The choices are the cumulative effect of vertically aligning the objects to the *TOP*, *MIDDLE* or *BOTTOM* edge and horizontally aligning to the *LEFT*, *MIDDLE* or *RIGHT* edge of the compound, along with distributing or abutting the objects vertically or horizontally.

MOVE POINT

Modify the position of a point of any object except *TEXT* and *COMPOUND* objects. For unrestrained movement, click mouse button 1 over the desired point, reposition the point, and click the *left* button again. For horizontally or vertically constrained move, click mouse button 2 on the desired point and move either horizontally or vertically. Notice that once you choose the direction (horizontal or vertical), movement is constrained in that direction. If, after moving the mouse initially, it is moved in the other direction a greater distance than the current position of the mouse relative to the starting point, then that will be the new constraint direction. In other words if you first move the mouse *horizontally* one inch (say) then move it *vertically* 1.3 inches, the direction will switch to *vertical* until any *horizontal* motion exceeds 1.3 inches. When the object is positioned where desired, click mouse button 1 to place it if that button was used to start the move (unconstrained), or mouse button 2 (constrained) if that button was used.

ADD POINTS

Add points to *POLYLINE*, *POLYGON*, *OPEN SPLINE*, or *CLOSED SPLINE* objects (points of a *BOX* can not be added or deleted). Note that a *REGULAR POLYGON* is really an ordinary *POLYGON*, so adding points to this object is allowed and does NOT keep the polygon regular.

MODIFY SHAPE

This tool is activated by holding down the Control and Shift keys in any of the *EDIT* modes. Clicking on a control point of a spline object with mouse button 1 (resp. 3) decreases (resp. increases) the shape factor of the spline at this point, while clicking with mouse button 2 allows the user to cycle quickly between the three basic status of a control point (i.e. approximation, sharp interpolation, smooth interpolation).

MOVE Move object. Click mouse button 1 (unconstrained move) or mouse button 2 (constrained

move) on any corner marker of the object to be moved. The horizontal/vertical constrained movement (mouse button 2) works exactly as described for *MOVE POINT*.

COPY / CUT TO CUT BUFFER

Copy object to canvas or cut buffer. Click mouse button 1 (unconstrained copy) or mouse button 2 (constrained copy) on any corner marker of the object to be copied (for *CIRCLE* and *ELLIPSE* objects, mouse may also be clicked on their circumferences). The object will be duplicated and then moved exactly as in *MOVE*.

If the number of X or Y copies is non-zero (from the bottom panel) then that many copies will be made in each respective direction, spaced evenly by the amount of the distance the object is placed from the original object.

If mouse button 3 is clicked on an object, that object is copied to the cut buffer for pasting into this or another figure. The file used for the cut buffer is called **.xfig** in the user's *$HOME* directory. This allows a user to run two or more *xfig* processes and cut/paste objects between them. If there is no *$HOME*, a file is created in a temporary directory called **xfig***PID* where *PID* is the *xfig* process ID. The temporary directory used is specified in the environment variable *XFIGTMPDIR*. If that variable is empty or not set then **/tmp** is used.

DELETE POINTS

Delete points from *POLYLINE*, *POLYGON*, *OPEN SPLINE*, or *CLOSED SPLINE*. Objects (points of a *BOX* or *ARC-BOX* can not be added or deleted). Note that a *REGULAR POLYGON* is really an ordinary *POLYGON*, so deleting points from this object is allowed and does NOT keep the polygon regular.

DELETE

Click mouse button 1 on an object to delete the object. Delete a *region* of the canvas by clicking mouse button 2 and dragging the mouse to define an area of objects to delete. Clicking mouse button 3 on an object will copy the object to the cut buffer (see *COPY/CUT TO CUT BUFFER* above).

EDIT OBJECT

Edit settings for an existing object. Click mouse button 1 on the object and a pop-up menu will appear showing existing settings for the object. Some of the menu entries may be changed by typing new values in the appropriate windows. These are editable Ascii-TextWidgets and allow cut and paste. Others pop up a sub-menu of multiple choices when pressed and held. Yet others are buttons which toggle a setting on or off (e.g. arrow heads on lines). For the coordinates of an object's points, you may enter either Fig units (1/1200 inch) or inches or centimeters by following the value with an ''i'' or ''c'' respectively.

Press the ''done'' button to apply the changes to the object and finish. Press the ''apply'' button to apply the changes but keep the menu up for further changes. Press the ''cancel'' button to cancel the changes and pop down the menu.

The following table shows which settings are used for the different objects.

Object	Angle	Fill Style	Line Width	Line Style	Cap Style	Join Style	Box Curve	Pen Color	Fill Color	Radius
Arc		•	•	•	•			•	•	
Arc-Box		•	•	•			•	•	•	
Circle	•	•	•	•				•	•	•
Ellipse	•	•	•	•				•	•	•
PIC*								•		
Box		•	•	•		•		•	•	
Polygon		•	•	•		•		•	•	
Line		•	•	•	•	•		•	•	
Spline		•	•	•	•			•	•	
Text	•							•		

* Only the X11 bitmap picture type uses the pen color for coloring the bitmap image. The other picture types don't use any of these settings.

EDIT POINT

In the *EDIT OBJECT* mode, click on a control point of a spline with mouse button 3 to call the *EDIT POINT* window. Set the shape factor either with the scrollbar for arbitrary values, or with the buttons for preset values. Modifications are displayed interactively (the fill pattern, if any, will be temporally removed during the edition, to provide interactive rates).

UPDATE

By pressing mouse button 1 on an object, the current settings for the indicator buttons (line width, line style, area fill etc.) which have been selected for update are copied into that object. When *xfig* is started, all indicator buttons which are components of objects are selected for update. To unselect an indicator, click on the update button and click mouse button 1 on the small button in the upper-right corner of the indicator. When that indicator is selected the foreground color (default black) shows. When it is unselected the background color (default white) shows.

If mouse button 2 is clicked on an object, the settings in the object that are selected by the indicator buttons are copied into those indicator button settings. Thus, one may copy selected attributes of one object to another.

FLIP VERTICALLY

Flip the object up/down (mouse button 1) or copy the object and flip it (mouse button 2). Point to part of the object, click the appropriate button. That object will be flipped vertically about that point.

Optionally, mouse button 3 may be pressed on the canvas to set an anchor point about which the object will be flipped. A crosshair indicates the anchor point on the canvas. Pressing this button again will unset the anchor point.

FLIP HORIZONTALLY

Flip the object left/right (mouse button 1) or copy the object and flip it (mouse button 2).

Point to part of the object, click the appropriate button. That object will be flipped horizontally about that point.

Optionally, mouse button 3 may be pressed on the canvas to set an anchor point about which the object will be flipped. A crosshair indicates the anchor point on the canvas. Pressing this button again will unset the anchor point.

ROTATE CLOCKWISE

Rotate the object (mouse button 1) or copy and rotate it (mouse button 2) *–N* degrees (clockwise), where *N* is the amount set in the rotation indicator button. The object is rotated about the chosen point.

Optionally, mouse button 3 may be pressed on the canvas to set a rotation point about which the object will be rotated. A crosshair indicates the rotation point on the canvas. Pressing this button again will unset the rotation point.

Not all objects can be rotated, and not all can be rotated at arbitrary angles. For example, *BOX*, *ARC-BOX* and *PIC* objects may only be rotated by 90 degrees. Text objects may be rotated and to any angle.

ROTATE COUNTER-CLOCKWISE

Rotate the object (mouse button 1) or copy (mouse button 2) *+N* degrees (counter-clockwise), where *N* is the amount set in the rotation indicator button. The object is rotated about the chosen point.

Optionally, mouse button 3 may be pressed on the canvas to set a rotation point about which the object will be rotated. A crosshair indicates the rotation point on the canvas. Pressing this button again will unset the rotation point.

SPLINE <–> LINE

Click on mouse button 1 to cycle between polyline, open interpolated spline and open approximated spline when the selected object is open, or between polygon, closed interpolated spline and closed approximated spline when the selected object is closed.
Click on mouse button 3 to turn an open object (polyline or open spline) into its corresponding closed object (polygon or closed spline) and vice versa. The closed object is opened at the selected point.

ADD/DELETE ARROWS

Add or delete arrow heads of *OPEN SPLINE*, *POLYLINE* or *ARC* objects. Add an arrow head by clicking mouse button 1 on the endpoint of the object. Delete an arrow head by clicking mouse button 2 on the endpoint or arrow head. The length and thickness of the arrowheads may be set using the arrow size button in the indicator panel.

PANNING

The figure may be panned by clicking mouse button 1, 2 or 3 in the rulers. Clicking mouse button 1 in the top ruler will pan the image to the left by 1/2 inch (1cm in metric mode), adjusted for zoom factor. Clicking mouse button 3 in the top ruler will pan the image right by the same amount. By pressing and *holding* mouse button 2 the user may drag the ruler by the amount desired, thus panning the image by that amount.

If the Shift key is held down while panning the movement is five (5) times the normal rate.

The figure is panned up and down in the same way by clicking the mouse in the ruler on the right of the canvas.

If the Shift key is held down while panning the movement is five (5) times the normal rate.

The figure can be returned to its origin by clicking mouse button 1 in the units (e.g. *cm* or *in*) box.

The arrow keys may also be used to pan the image and the home key to return the figure to the origin. Also, pressing the Control Key and mouse button 2 will pan the figure to the origin.

X RESOURCES and DEFAULTS

The overall widget name(Class) is xfig(Fig). These resources correspond to the command line arguments:

Name	Class	Type	Default	Command-line equivalent
balloon_delay	Balloon_delay	integer	500msec	–balloon_delay
boldFont	Font	string	8x13bold	–bold
but_per_row	But_per_row	int	2	–but_per_row
buttonFont	Font	string	6x13	–button
canvasBackground	Background	string	white	–cbg
canvasForeground	Foreground	string	black	–cfg
debug	Debug	boolean	off	–debug
depth	Depth	integer	*	–depth
dont_switch_cmap	Dont_switch_cmap	boolean	false	–dontswitchcmap
exportLanguage	ExportLanguage	string	eps	–exportLanguage
flushleft	FlushLeft	boolean	false	–flushleft
image_editor	ImageEditor	string	xv	–image_editor
inches	Inches	boolean	true	–inches, –centimeters, –imperial, –metric
internalborderwidth	InternalBorderWidth	integer	1	–internalBW
justify	Justify	boolean	false	–left (false), –right (true)
keyFile	KeyFile	string	CompKeyDB	–keyFile
landscape	Orientation	boolean	true	–Landscape, –Portrait
latexfonts	Latexfonts	boolean	off	–latexfonts
library_dir	Directory	string	~/xfiglib	–library_dir
magnification	Magnification	float	100	–magnification
max_image_colors	Max_image_colors	integer	64	–max_image_colors
monochrome	Monochrome	boolean	false	–monochrome
multiple	Multiple	boolean	false	–multiple
normalFont	Font	string	6x13	–normal
page_size	Pagesize	string	Letter/A4	–page_size
pheight	Height	float	8(9.5)	–pheight
pwidth	Width	float	10(8)	–pwidth
rulerthick	RulerThick	integer	24	–rulerthick
scalablefonts	ScalableFonts	boolean	true	–scalablefonts
showallbuttons	ShowAllButtons	boolean	false	–showallbuttons
showballoons	ShowBalloons	boolean	true	–showballoons
showlengths	ShowLengths	boolean	false	–showlengths –dontshowballoons
single	Single	boolean	true	–single
specialtext	SpecialText	boolean	false	–specialtext
spellcheckcommand	spellCheckCommand	string	spell %s	–spellcheckcommand
startfillstyle	StartFillStyle	integer	0	–startfillstyle
startfontsize	StartFontSize	float	12	–startfontsize
startgridmode	StartGridMode	integer	0	–startgridmode
startlatexFont	StartlatexFont	string	Default	–startlatexFont
startlinewidth	StartLineWidth	integer	1	–startlinewidth
startposnmode	StartPosnMode	integer	1	–startposnmode

startpsFont	StartpsFont	string	Times–Roman	–startpsFont
starttextstep	StartTextStep	float	1.2	–starttextstep
trackCursor	Track	boolean	on	–track, –notrack
userscale	UserScale	float	1.0	–userscale
userunit	UserUnit	string	in(cm)	–userunit
visual	Visual	string	*	–visual
zoom	Zoom	float	1.0	–zoom

* Default visual and depth depend on the X server. Use *xdpyinfo* to see what visuals and depths are supported.

The following are the default keyboard accelerators as distributed in the **Fig.ad** app-defaults file:

(Context)	Keys	Function
(Main xfig panels)		
	<Meta>q	Quit xfig
	<Meta>n	make New drawing by deleting all objects from canvas
	<Meta>d	Delete all objects from canvas but keep current filename
	<Meta>u	Undo
	<Meta>r	Redraw
	<Ctrl>l	Redraw
	<Meta>t	pasTe xfig cutbuffer onto canvas
	<Meta>f	popup File menu
	<Meta>e	popup Export menu
	<Meta>p	popup Print menu
	<Meta>l	(re)Load figure from current file
	<Meta>s	Save figure to current file
(Popup units panel in corner of rulers)		
	<Meta>c	Cancel popup unit panel
	<Meta>s	Set units
(Popup file panel)		
	<Meta>r	Rescan current directory
	<Meta>c	Cancel
	<Meta>l	Load figure
	<Meta>s	Save figure
	<Meta>m	Merge read into current figure
(Popup export panel)		
	<Meta>r	Rescan current directory
	<Meta>c	Cancel
	<Meta>e	Export figure
(Popup print panel)		
	<Meta>c	Cancel
	<Meta>b	print to Batch file
	<Meta>p	Print to printer
	<Meta>x	clear batch file
(Canvas)		
	<None>c	Draw circle by radius
	<Shift>c	Draw circle by diameter
	<None>e	Draw ellipse by radius

<Shift>e	Draw ellipse by diameter
<Shift>s	Draw closed approximated spline
<None>s	Draw open approximated spline
<Shift>i	Draw closed interpolated spline
<None>i	Draw open interpolated spline
<None>p	Draw polygon
<None>l	Draw line
<None>b	Draw box
<Shift>b	Draw arcbox
<Shift>p	Draw regular polygon
<None>r	Draw arc
<Ctrl>p	Draw picture object
<None>t	Draw text
<None>g	Glue compound
<Shift>g	Break compound
<None>o	Open compound
<Shift>l	Place library object
<Ctrl>s	Scale object
<None>a	Align object in compound
<Shift>m	Move point
<None>m	Move object
<Ctrl>a	Add point to object
<Ctrl>c	Copy object
<Shift>d	Delete point from object
<None>d	Delete object
<None>u	Update object or indicator panel
<Ctrl>e	Edit object
<None>f	Flip object up/down
<Shift>f	Flip object left/right
<Ctrl>r	Rotate object clockwise
<Shift>r	Rotate object counter-clockwise
<None>v	Convert object to/from line/spline or box/arc-box
<Shift>a	Add/delete arrowhead

WIDGET TREE

Below is the widget structure of *xfig*. The widget class name is given first, followed by the widget instance name.

```
Fig  xfig
        Form  form
                Form  commands
                        Command  quit
                        Command  new
                        Command  orient
                        Command  undo
                        Command  redraw
                        Command  paste
                        Command  file
                        Command  export
                        Command  library
                        Command  print
                        MenuButton  help
```

```
                    SimpleMenu  menu
                        SmeBSB  Xfig Reference (HTML)
                        SmeBSB  How-To Guide (PDF)
                        SmeBSB  Man pages (PDF)
                        SmeBSB  About Xfig
            Form msg_form
                Text  message
                Label  file_name
                Toggle  balloon_toggle
            Label  mouse_panel
            Box  mode_panel
                Label  label
                Command  button (one for each of the 17 drawing mode buttons)
                Label  label
                Command  button (one for each of the 19 editing mode buttons)
            Label  topruler
            Label  canvas
            Label  unitbox
            Label  sideruler
            Box  upd_ctrl_form
                Label upd_ctrl_label
                Box  upd_ctrl_btns
                    Command  set_upd
                    Command  clr_upd
                    Command  tog_upd
            Viewport ind_panel
                Core  clip
                Scrollbar  horizontal
                Box  ind_box
                    Form  button_form (one for each of the 22 indicator buttons)
                        Command  button
                        Toggle  update (only those indicators that affect creation
                                        of objects have update toggles)
            TransientShell  ps_font_menu
                Box  menu
                    Form  ps_buttons
                        Command  cancel
                        Command  use_latex_fonts
                    Command  pane (one for each of the 35 PostScript font panes)
            TransientShell  latex_font_menu
                Box  menu
                    Form  latex_buttons
                        Command  cancel
                        Command  use_postscript_fonts
                    Command  pane (one for each of the 6 LaTeX font panes)
    TransientShell  file_menu
        VendorShellExt  shellext
        Form  file_panel
            Label  file_status_label
            Label  file_status
            Label  num_objects_label
            Label  num_objects
```

```
                Label  fig_offset_label
                Label  fig_offset_lbl_x
                Text  fig_offset_x
                MenuButton  Inches
                        SimpleMenu  menu
                                SmeBSB  Inches
                                SmeBSB  Centim.
                                SmeBSB  Fig Units
                Label  fig_offset_lbl_y
                Text  fig_offset_y
                MenuButton  Inches
                        SimpleMenu  menu
                                SmeBSB  Inches
                                SmeBSB  Centim.
                                SmeBSB  Fig Units
                Label  cur_file_label
                Label  cur_file_name
                Label  file_label
                Text  file_name
                Label file_alt_label
                Viewport  vport
                        Core  clip
                        Scrollbar  vertical
                        List  file_list_panel
                Label  mask_label
                Text  mask
                Label  dir_label
                Text  dir_name
                Label  dir_alt_label
                Command home
                Command hidden
                Viewport  dirvport
                        Core  clip
                        Scrollbar  vertical
                        List  dir_list_panel
                Form  preview_form
                        Label  preview_label
                        Label  preview_size
                        Label  preview_name
                        Label  preview_widget
                Command  rescan
                Command  cancel
                Command  save
                Command  load
                Command  merge
        TransientShell  export_menu
                VendorShellExt  shellext
                Form  export_panel
                        Label  mag_label
                        Box  spinner_box
                                Text  magnification
                                Box  spinner_frame
                                        Command  spinup
```

```
                Command spindown
Command fitpage
Label size_label
Label papersize_label
MenuButton papersize
        SimpleMenu menu
                SmeBSB Letter (8.5" x 11")
                SmeBSB Legal (8.5" x 14")
                SmeBSB Ledger ( 17" x 11")
                SmeBSB Tabloid ( 11" x 17")
                SmeBSB A (8.5" x 11")
                SmeBSB B ( 11" x 17")
                SmeBSB C ( 17" x 22")
                SmeBSB D ( 22" x 34")
                SmeBSB E ( 34" x 44")
                SmeBSB A4 (210mm x 297mm)
                SmeBSB A3 (297mm x 420mm)
                SmeBSB A2 (420mm x 594mm)
                SmeBSB A1 (594mm x 841mm)
                SmeBSB A0 (841mm x 1189mm)
                SmeBSB B5(JIS) (182mm x 257mm)
Label orient_label
MenuButton orientation
        SimpleMenu menu
                SmeBSB portrait
                SmeBSB landscape
Label just_label
MenuButton justify
        SimpleMenu menu
                SmeBSB Flush left
                SmeBSB Centered
Label multiple_label
MenuButton multiple_pages
        SimpleMenu menu
                SmeBSB Single
                SmeBSB Multiple
Label export_offset_label
Label export_offset_lbl_x
Text export_offset_x
MenuButton Inches
        SimpleMenu menu
                SmeBSB Inches
                SmeBSB Centim.
                SmeBSB Fig Units
Label export_offset_lbl_y
Text export_offset_y
MenuButton Inches
        SimpleMenu menu
                SmeBSB Inches
                SmeBSB Centim.
                SmeBSB Fig Units
Label lang_label
MenuButton language
```

```
                SimpleMenu  menu
                        SmeBSB  LaTeX box (figure boundary)
                        SmeBSB  LaTeX picture
                        SmeBSB  LaTeX picture + epic macros
                        SmeBSB  LaTeX picture + eepic macros
                        SmeBSB  LaTeX picture + eepicemu macros
                        SmeBSB  PiCTeX macros
                        SmeBSB  IBMGL (or HPGL)
                        SmeBSB  Encapsulated PostScript
                        SmeBSB  PostScript
                        SmeBSB  Combined PS/LaTeX (both parts)
                        SmeBSB  Textyl \special commands
                        SmeBSB  TPIC
                        SmeBSB  PIC
                        SmeBSB  MF  (MetaFont)
                        SmeBSB      ACAD (AutoCAD Slide)
                        SmeBSB  PCX  (PC Paintbrush)
                        SmeBSB  PNG
                        SmeBSB  GIF
                        SmeBSB  JPEG
                        SmeBSB  TIFF (no compression)
                        SmeBSB  TK
                        SmeBSB  X11 Bitmap (XBM)
                        SmeBSB  X11 Pixmap (XPM)
                        SmeBSB  Portable Pixmap (PPM)
        Label  transp_label
        MenuButton  transparent
                SimpleMenu  menu
                        SmeBSB  Background
                        SmeBSB  None
                        SmeLine  None
                        SmeBSB  Black
                        SmeBSB  Blue
                        SmeBSB  Green
                        SmeBSB  Cyan
                        [more colors here]
                        SmeBSB  Gold
                        SmeBSB  Default
        Label  quality_label
        Box  spinner_box
                Text quality_text
                Box spinner_frame
                        Command  spinup
                        Command  spindown
        Text  quality_text
        Label  def_file_label
        Label  def_file_name
        Label  out_file_name
        Text  file
        Label  file_alt_label
        Viewport  vport
                Core  clip
                Scrollbar  vertical
```

```
                    Scrollbar horizontal
                    List file_list_panel
                Label mask_label
                Text mask
                Label dir_label
                Text dir_name
                Label dir_alt_label
                Command home
                Command hidden
                Viewport dirvport
                    Core clip
                    Scrollbar vertical
                    List dir_list_panel
                Command rescan
                Command cancel
                Command export
    TransientShell print_menu
        VendorShellExt shellext
        Form print_panel
                Label printer_image
                Label print_label
                Label mag_label
                Box spinner_box
                    Text magnification
                    Box spinner_frame
                        Command spinup
                        Command spindown
                Command fitpage
                Label size_label
                Label papersize_label
                MenuButton papersize
                    SimpleMenu menu
                        SmeBSB Letter (8.5" x 11")
                        SmeBSB Legal (8.5" x 14")
                        SmeBSB Ledger ( 17" x 11")
                        SmeBSB Tabloid ( 11" x 17")
                        SmeBSB A (8.5" x 11")
                        SmeBSB B ( 11" x 17")
                        SmeBSB C ( 17" x 22")
                        SmeBSB D ( 22" x 34")
                        SmeBSB E ( 34" x 44")
                        SmeBSB A4 (210mm x 297mm)
                        SmeBSB A3 (297mm x 420mm)
                        SmeBSB A2 (420mm x 594mm)
                        SmeBSB A1 (594mm x 841mm)
                        SmeBSB A0 (841mm x 1189mm)
                        SmeBSB B5(JIS) (182mm x 257mm)
                Label orient_label
                MenuButton landscape
                    SimpleMenu menu
                        SmeBSB portrait
                        SmeBSB landscape
                Label just_label
```

```
                MenuButton  justify
                        SimpleMenu  menu
                                SmeBSB  Centered
                                SmeBSB  Flush left
                Label  multiple_label
                MenuButton  multiple_pages
                        SimpleMenu  menu
                                SmeBSB  Single
                                SmeBSB  Multiple
                Label  printer_label
                Text  printer
                Label  job_params_label
                Text  job_params
                Label  num_batch_label
                Label  num_batch
                Command  dismiss
                Command  print
                Command  print_batch
                Command  clear_batch
        TransientShell  file_msg
                VendorShellExt  shellext
                Form  file_msg_panel
                        Text  file_msg_win
                        Command  dismiss
                        Command  clear
        TransientShell  query_popup
                Form  query_form
                        Label  message
                        Command  yes
                        Command  no
                        Command  cancel
        TransientShell  set_unit_panel
                Form  form
                        Label        Unit/Scale settings
                        Label  Ruler Units  =
                        MenuButton  Imperial (in)
                                SimpleMenu  menu
                                        SmeBSB  Metric (cm)
                                        SmeBSB  Imperial (in)
                        Label  Figure units =
                        MenuButton  Ruler units
                                SimpleMenu  menu
                                        SmeBSB  Ruler units
                                        SmeBSB  User defined
                        Label  user_units
                        Text        Unit/Scale settings
                        Label  Figure scale =
                        MenuButton  User defined
                                SimpleMenu  menu
                                        SmeBSB  Unity
                                        SmeBSB  User defined
                        Label  scale_factor
```

```
                    Text  1.0000
                    Command  cancel
                    Command  set
Library panel:
        TransientShell  library_menu
                VendorShellExt  shellext
                Form  library_panel
                        Label  library_intro
                        Label  library_label
                        MenuButton  library
                                SimpleMenu  menu
                                        SmeBSB  Electrical - Physical
                                        SmeBSB  Electrical - Schematic
                                        SmeBSB  Logic
                                        SmeBSB  Flowchart
                                        [ one for each library ]
                        Label  status_label
                        Text  status
                        Label  cur_library_label
                        Label  cur_library)
                        Label  cur_lib_object_label
                        Label  cur_lib_object
                        Viewport  object_vport
                                Core  clip
                                List  object_list_panel
                                Scrollbar  horizontal
                                Scrollbar  vertical
                        Label  library_preview_label
                        Label  library_object_label
                        Label  library_preview_widget
                        Command  select
                        Command  cancel
Popup color panel:
        VendorShellExt  shellext
        TransientShell  set_indicator_panel
                Form  form
                        Label  Colors
                        Command  cancel
                        Command  set_color_ok
                        Form  mixedForm (for Pen Color)
                                Toggle  mixedEdit
                                Label  mixedColor
                                Text  tripleValue
                        Form  mixedForm (for Fill Color)
                                Toggle  mixedEdit
                                Label  mixedColor
                                Text  tripleValue
                        Label  stdLabel
                        Form  stdForm
                                Command  stdColor (one for each of 33 std colors)
                        Label  userLabel
                        Form  userForm
                                Viewport  userViewport
```

```
                    Core  clip
                    Scrollbar  horizontal
                    Box  userBox
                      Label  colorMemory (one for each user color)
                Command  addColor
                Command  delColor
                Command  lookupColor
                Command  undelColor
                Form  mixingForm
                    Label  redLocked
                    Label  greenLocked
                    Label  blueLocked
                    Label  lockedLabel
                    Scrollbar  redScroll
                    Scrollbar  greenScroll
                    Scrollbar  blueScroll
                    Scrollbar  lockedScroll
                    Label  hueLabel
                    Label  satLabel
                    Label  valLabel
                    Scrollbar  hueScroll
                    Scrollbar  satScroll
                    Scrollbar  valScroll
```

Close compound popup:

```
    TransientShell  close_compound_popup
        VendorShellExt  shellext
        Form  close_compound_form
            Command  close_compound
            Command  close_all_compounds

    TransientShell  cmd_balloon_popup
        VendorShellExt  shellext
        Box  box
            Label  l_label
            Label  r_label

    TransientShell  mode_balloon_popup
        VendorShellExt  shellext
        Box  box
            Label  label

    TransientShell  unit_balloon_popup
        VendorShellExt  shellext
        Box  box
            Label  label

    TransientShell  mouse_balloon_popup
        VendorShellExt  shellext
        Box  box
            Label  label

    TransientShell  toggle_balloon_popup
        VendorShellExt  shellext
        Box  box
            Label  label

    TransientShell  search_panel
```

```
        VendorShellExt  shellext
        Form  form
                Label  search_lab
                Text  search_text
                Toggle  case_sensitive
                Label  replace_lab
                Text  replace_text
                Command  dismiss
                Command  search
                Command  replace
                Command  spell_button
    TransientShell  found_text
        VendorShellExt  shellext
        Form  form
                Text  found_msg_win
                Command  dismiss
                Command  do_replace
                Command  dismiss
```

NOTE: The following is a *typical* popup edit panel (for *ARC-BOX*) The panel will be different for other objects.

```
    TransientShell  edit_panel
        VendorShellExt  shellext
        Form  form
                Label  POLYLINE:ArcBox
                Label  image
                Command  done
                Command  apply
                Command  cancel
                Label
                Label  Width
                Box  spinner_box
                        Text       Width
                        Box  spinner_frame
                                Command  spinup
                                Command  spindown
                Label       Depth
                Box  spinner_box
                        Text       Depth
                        Box  spinner_frame
                                Command  spinup
                                Command  spindown
                Label  Pen color
                MenuButton  pen_colors
                        SimpleMenu  menu
                                SmeBSB  Black
                                SmeBSB  Blue
                                SmeBSB  Green
                                SmeBSB  Cyan
                                SmeBSB  Red
                                SmeBSB  Magenta
                                SmeBSB  Yellow
                                SmeBSB  White
```

```
                    SmeBSB  Blue4
                    [22 more colors]
                    SmeBSB  Default
Label  Fill color
MenuButton  fill_colors
        SimpleMenu  menu
                    SmeBSB  Black
                    SmeBSB  Blue
                    SmeBSB  Green
                    SmeBSB  Cyan
                    SmeBSB  Red
                    SmeBSB  Magenta
                    SmeBSB  Yellow
                    SmeBSB  White
                    SmeBSB  Blue4
                    [22 more colors]
                    SmeBSB  Default
Label  Fill style
MenuButton  No fill
        SimpleMenu  menu
                    SmeBSB  No fill
                    SmeBSB  Filled
                    SmeBSB  Pattern
Label  Fill intensity %
Box  spinner_box
        Text  Fill intensity %
        Box  spinner_frame
                    Command  spinup
                    Command  spindown
Label  Fill pattern
Box  spinner_box
        Text  Fill pattern
        Box  spinner_frame
                    Command  spinup
                    Command  spindown
Label  Line style
MenuButton  Solid Line
        SimpleMenu  menu
                    SmeBSB  Solid Line
                    SmeBSB  Dashed Line
                    SmeBSB  Dotted Line
Label  Dash length/Dot gap
Box  spinner_box
        Text  Dash length/Dot gap
        Box  spinner_frame
                    Command  spinup
                    Command  spindown
Label  Corner Radius
Box  spinner_box
        Text  Corner Radius
        Box  spinner_frame
                    Command  spinup
                    Command  spindown
```

Label First Corner
Label First Corner
Text First Corner
Label First Corner
Text First Corner
Label Opposite Corner
Label Opposite Corner
Text Opposite Corner
Label Opposite Corner
Text Opposite Corner

Popup edit spline point panel:

TransientShell edit_spline_point_panel
VendorShellExt shellext
Form form
ScrollBar control_bar
Label Use scrollbar to modify tension
Command done
Command cancel
Command Approximated
Command Angular
Command Interpolated

The following is the widget structure for the popup browser available for the *Picture Object* edit popup.

TransientShell xfig_browse_menu
VendorShellExt shellext
Form browse_panel
Label file_label
Text file_name
Label file_alt_label
Viewport vport
Core clip
List file_list_panel
Scrollbar vertical
Scrollbar horizontal
Label mask_label
Text mask
Label dir_label
Text dir_name
Label dir_alt_label
Command home
Command hidden
Viewport dirvport
Core clip
List dir_list_panel
Command rescan
Command close
Command apply

BUGS and RESTRICTIONS

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

Because of the difference of some fonts in some X servers and the PostScript fonts on printers, text alignment can be problematic.

Not all operations employ smart redrawing of objects which are altered as a by product of the operation. You may need to use *Redraw* in these cases.

Some servers do not allow bitmaps/pixmaps taller than the screen height or wider than the screen width. That is why there is a limit on the width of the top ruler and height of the side ruler. If you need wider/taller rulers AND your server allows bigger pixmaps, you may define **MAX_TOPRULER_WD** and/or **MAX_SIDERULER_HT** in your Imakefile in the *DEFINES* line. For example, to have a maximum top ruler width of 1160 pixels, add **–DMAX_TOPRULER_WD=1160** to your *DEFINES* line in the Imakefile.

If the image is panned or the *xfig* window iconified and de-iconified during the middle of an operation (e.g. while drawing a line), the picture will be distorted. This can be corrected using *Redraw* after the operation is complete.

Corners of object scaled with point positioning in one of the grid modes will not always fall on the grid line, but to the closest pixel.

When zoomed very large, the length of dashes in dashed lines will top out at 255 pixels long. This is due to a restriction in X that the dash list is defined by char (255 pixels maximum for a dash). The figure will print correctly, however.

When you do a copy/rotate or array place when making multiple copies of objects, only the creation of the last object can be undone with the Undo button.

Modifications to text using the popup search/update/replace/spell check panel cannot be undone.

See the **README** file for troubleshooting.

SEE ALSO

Brian W. Kernighan *PIC — A Graphics Language for Typesetting User Manual*

fig2dev(1) (*TransFig* package)

gs(1) (*Ghostscript* PostScript previewer)

ACKNOWLEDGEMENT

Many thanks goes to Professor Donald E. Fussell who inspired the creation of this tool.

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FILES

CompKeyDB	Data base of compose (meta) key sequences for 8-bit characters. Must be installed in **$(XFIGLIBDIR)** with ''make install'', or may be specified with command line option **–keyFile** or X toolkit resource keyFile. See the *Imakefile*.
~/xfiglib	This file must be in the login directory of the user or must be a symbolic link to a file containing the library definitions. See "PLACE LIBRARY OBJECT" in the "EDITING MODE PANEL COMMAND DESCRIPTIONS" section for the format of this file.
Fig.ad and Fig-color.ad	Application defaults files which are automatically installed in the system app-defaults directory with the *make install* command.
Doc/FORMAT3.1	Description of Fig file format.
CHANGES	Description of bug fixes/new features.

AUTHORS

Many people have contributed to *xfig*. Here is a list of the people who have contributed the most (in chronological order):

Version 1:

Original author:
Supoj Sutanthavibul, University of Texas at Austin

The *LaTeX* line drawing modes were contributed by:
Frank Schmuck, Cornell University

Original X11 port by:
Ken Yap, Rochester

Variable window sizes, cleanup of X11 port, right hand side panel:
Dana Chee, Bellcore

Cleanup of color port to X11 by:
John T. Kohl, MIT

Version 2.0:

Area fill, multiple line thicknesses, multiple fonts and font sizes, bottom panel, line

style/thickness, (and anything else that wasn't written by the others) by:
Brian Smith
(standard disclaimer applies)
(bvsmith@lbl.gov)

Popup change-object menu by:
Jon Tombs
Frank Schmuck

Zooming and panning functions, shift key select mechanism by:
Dieter Pellkofer
Henning Spruth

Depth feature by:
Mike Lutz

Cut/Paste by:
Tom Tkacik

Version 2.1:

Indicator panel, file menu popup, print menu popup, panning with rulers, mouse function window, regular polygon, rubberbanding of circles/ellipses, filled splines on canvas, dashed/dotted splines on canvas, update button, arbitrary angle rotation of objects, alignment in compound, object scaling, constrained copy/move, corner markers for compound, context sensitive corner markers, smarter redraw, undo for compound and point move for boxes, cancel object creation, point positioning to three resolutions, *TransFig* scalable text, hidden text, special text, save of figure on crash by:

Paul King (king@cs.uq.oz.au)
with help from:
Brian Smith and Micah Beck (beck@cs.utk.edu)

Encapsulated *PostScript* importing by:
Brian Boyter

Pan/zoom with ctrl key/mouse by:
Henning Spruth

International characters by:
Herve Soulard

Directory Browser based on XDir by:
Win Treese, Digital Equipment Corporation

Rotated ellipses by:
James Tough, Dept. of Computer Science, Heriot-Watt University, Scotland

Rotated text from the *xvertext* package by:
Alan Richardson, Space Science Centre, School of MAPS, University of Sussex

Popup scale menu and dynamic switching between inches and cm by:

Paul King (king@cs.uq.oz.au)

Extensive man page formatting revisions by:
David W. Sanderson

Display Postscript code for IBM RS/6000 by:
Dave Hale (dhale@green.mines.colorado.edu)

Version 3.0:

New arrowhead types, separate pen/fill colors, new file protocol, more colors with extended color popup panel, new arc style, new fill patterns (bricks, etc), new line join and cap styles, export offset and file load offset, XPM import, XBM import and export (and anything else that wasn't written by the others) by:
Brian Smith
(Note: the color popup panel was based on *xcoloredit* by Richard Hesketh)

GIF output code by:
E. Chernyaev (chernaev@mx.decnet.ihep.su) *

GIF import code by:
David Koblas from the giftoppm part of the pbmplus package

XPM export code (using XPM3 libraries) by:
Karel van Houten (K.H.C.vanHouten@research.ptt.nl)

Higher figure resolution (1200dpi) by:
Ross Martin (martin@trcsun3.eas.asu.edu)

Color quantization using neural network by:
Anthony Dekker (dekker@ACM.org)
[NEUQUANT Neural-Net quantization algorithm by Anthony Dekker, 1994. See ''Kohonen neural networks for optimal colour quantization'' in ''Network: Computation in Neural Systems'' Vol. 5 (1994) pp 351-367. for a discussion of the algorithm.]

Floyd-Steinberg algorithm for dithering color images on monochrome displays lifted from the Pbmplus package by Jef Poskanser.

rotate/flip objects around/about selected anchor point and multiple copies of objects by:
Uwe Bonnes (bon@lte.e-technik.uni-erlangen.de)

Input tablet extension by:
Greg LaCoste (greg@seismo.do.usbr.gov)

Version 3.1:

The only difference between protocol version 3.0 and version 3.1 is that the position of the ''magnet'' has been shifted by 14 fig units. In the 2.1 and older versions of xfig the grid was in multiples of 5 fig units, but they were on intervals 4, 9, 14, 19, etc. When version 3.0 was created, coordinates were simply multiplied by the ratio of the resolutions (1200/80 = 15) so values like 4 became 60 instead of 74 ((4+1)*15 - 1).

The JPEG import/export code uses the Independent JPEG Group software (see jpeg/README for details)

Image browser, editor and screen capture features by:
Jim Daley (jdaley@cix.compulink.co.uk)

Version 3.2:

The changes to the version 3.2 file protocol are the addition of the paper size, print/export magnification, single/multiple page indicator and a transparent color name used for GIF export to the header of the file.
The other difference in the version 3.2 protocol is the mathematical model used for splines. The new version uses X-splines which allows the user to mix interpolation and approximation points in a same curve. More precisely, it means that an X-spline curve is neither an interpolated spline nor an approximated one, it is BOTH (the behaviour of each point is controlled by one single parameter called ''shape factor''). For additional information about X-splines, see:

''X-Splines: A Spline Model Designed for the End User''
by C. Blanc and C. Schlick, Proceedings of SIGGRAPH'95
http://dept-info.labri.u-bordeaux.fr/~schlick/DOC/sig1.html

Caveat: Because previous spline models (quadratic B-splines and Bezier with hidden points) are no longer supported, curves that are present in version 3.1 and older files are automatically converted to X-splines. This translation is only an approximation process. It means that the converted curves are not exactly the same as the original ones. Though they are usually very close, some hand-fitting may be needed in some pathological cases.

Inclusion of X–splines by:
Carole Blanc (blanc@labri.u–bordeaux.fr)
Christophe Schlick (schlick@labri.u–bordeaux.fr)
Note: the initial implementation was done by C. Feuille, S. Grosbois, L. Maziere and L. Minihot as a student practice (Universite Bordeaux, France).

Open/close compound feature written by
Bill Taylor (bill@mainstream.com)

Library feature written by
Stephane Mancini (mancini@elecsrv.enst.fr) (object preview by Brian V. Smith)

The library objects in the Electrical and Logic libraries were done by
Peter Hiscocks (phiscock@ee.ryerson.ca)

The library objects in the Computer, Networks, and Hospital-Equipment libraries were extracted from the clipart example files by
Bill Chimiak (chim@bgsm.edu)

Importing of Fig files as picture objects by
Georg Stemmer, with supervision and discussion by Ruediger Bess (bess@informatik.uni-erlangen.de)

NOTES

Many bug fixes/cleanups etc. by a host of faithful users

See the
CHANGES
file for all the credits

The
TransFig
package was written by Micah Beck and is maintained by Brian Smith