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 description of objects in the file will be read at the start of *xfig*.

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.x.org* in **/contrib/applications/drawing_tools/xfig**.

The *TransFig* package is used when printing or exporting the output from *xfig*. It 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.

PostScript — *fig2dev –L ps* produces an *Encapsulated PostScript* output.

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

–L[**andscape**]
: 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.

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

–bg *color*
: Use *color* as the background color for the canvas and buttons.

–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.

–de[**bug**]
: Turn on debugging mode. Prints various debugging messages like font names etc.

–do[**ntswitchcmap**]
: Prevents xfig from switching to a private colormap if there aren't enough colors available in the default colormap. See also **–maximagecolors.**

–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 (PS part)
pstex_t	Combined PS/LaTeX (LaTeX part)
textyl	Textyl special commands
tpic	TPIC
pic	PIC
xbm	X11 Bitmap
xpm	X11 Pixmap (XPM3 package)
gif	GIF

–fg *color*
Use *color* as the foreground color and default color for objects.

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

–geom[**etry**] *W*x*H*+*X*+*Y*
Specifies the geometry for Fig application.

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

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

–ma[**ximagecolors**] *numcols*
Limit the number of colors used for EPS, GIF or XPM images to *numcols.*

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

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.

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

–inv[**erse**]
Use inverse video (white on black).

–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.

–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.

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

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

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

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

–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.

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

–sh[**owallbuttons**]
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.

–sp[**ecialtext**]
Start *xfig* with the *special text* mode for text objects.

–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).

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

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

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

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

–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.

–te[**xtoutline**]
Specifies that *xfig* will draw a red (on color machines) outline of the ‘‘actual’’ bounding box of text objects. This is not very useful anymore. In the past it was useful to show you the outline of rotated text since *xfig* didn’t display rotated text then.

–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.

GRAPHICAL OBJECTS

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

DISPLAY WINDOWS

Ten regions comprise the display area of *xfig*: the command region, top ruler, side ruler, drawing mode region, editing mode region, filename region, message region, mouse function indicator region and canvas region, and indicator region with buttons to set and show current line thickness, line style, color, area-fill gray color and several other settings. (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 window (default: left).

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.

Delete ALL
Delete all objects from the canvas window (may be undone). The accelerator <*Meta*>*d* will also perform this function.

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 (at its original position). 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.
Mouse button 1 or <*Meta*>*f* pops up a panel which contains several file-related functions:

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.

(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 *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 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.

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.

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 Read
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 shown on the canvas. 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%.

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. *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 when output is directed to a file. The default is *PostScript*. The figure may be saved as an X11 bitmap by choosing *X11 Bitmap* as the output language. The bitmap(pixmap) is created from the figure, the size of which is determined by the enclosing rectangle of all the figure plus a small border. The figure may also be saved as an color X11 pixmap (using the XPM3 package) by choosing *X11 Pixmap* as the output language. Finally, the figure may be saved as a *GIF* file. The pixmap is created from the figure, the size of which is determined by the enclosing rectangle of all the figure plus a small border.

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.

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*.

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. 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.

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 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 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.

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 (2mm in metric mode), 1/4 inch (5mm) or 1/2 inch (10mm). 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.
NOTE: The *undo* command will only undo the last of the objects created.

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.
NOTE: The *undo* command will only undo the last of the objects created.

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. 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, this mode only works 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 horizonaal 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:

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, dashed and dotted. 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*, *SPLINE* or *OPEN ARC* objects.

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

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* and *Special* attributes of text objects are used with figures that will be incorporated into *LaTeX*. Please see the documentation for *LaTeX* for further information. The default for the *Hidden* flag is *off*. 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. To create a single point using the *POLYLINE* button, press and release mouse button 2. 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.

PICTURE OBJECT (PIC)
This has been changed from the previous (2.1) version to be more generic, allowing GIF files, X11 bitmap (monochrome) files and X11 pixmap (XPM3) color files in addition to Encapsulated PostScript files to be imported. In the future, more formats will be included. 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.

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 "gif8" and "pbmraw" drivers. The pbm driver is used when you run xfig on a monochrome display and the gif8 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 -maximagecolors). 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. 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.

INTERPOLATED SPLINE
Create (cubic spline) spline objects. Enter control vectors in the same way as for creation of a *POLYLINE* object. At least three points (two control vectors) must be entered. The spline will pass through the entered points.

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.

POLYGON
Same as *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.

CLOSED INTERPOLATED SPLINE
Create closed or periodic splines. The function is similar to *POLYGON* except that a closed interpolated spline is drawn. The spline will pass through the points (knots).

CLOSED SPLINE
Create closed or periodic spline objects. The function is similar to *POLYGON* except that a closed spline will be drawn instead of polygon. The entered points are just control points; i.e. the spline will not pass any of these points.

SPLINE Create (quadratic spline) spline objects. Enter control vectors in the same way as for creation of a *POLYLINE* object. At least three points (two control vectors) must be entered. The spline will only pass through the two end points.

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 DEL or ^H (backspace) will delete a character, while a ^X will erase the entire line. Finish 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 characters may be entered using the meta (compose) key. For example, to create an ‘‘a umlaut’’, hold down the meta key while pressing the letter ‘‘a’’, then press " (quote). To create a ‘‘c cedilla’’, use <meta>c followed by comma. The following is a list of all special characters available using the meta key:

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
\\ acute
** 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
I^ I accent circumflex
I" I accent dieresis
i‘ i accent grave
i’ i accent acute
i^ 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.

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 to allow manipulation of its 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 (although you will not see the tags until you change to the *GLUE* mode). You can use this feature to easily alter the objects within a compound.

SCALE OBJECT
Any object may be scaled. If mouse button 1 is pressed on a *BOX* or *ARC-BOX* object, then that object will be scaled proportionally to its aspect ratio. If mouse button 2 is pressed on any object, that object will be scaled up or down about its center. 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.

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*.

ADD POINTS
Add points to *POLYLINE*, *POLYGON*, *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.

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*, *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 AsciiTextWidgets 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).

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	•							•	

∗ Encapsulated PostScript picture objects don't use any of the above attributes. The PostScript image is self-defined. However, X11 bitmap picture objects use the pen color for coloring the bitmap image.

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 to any angle and will be displayed at any angle now. Older versions of *xfig* (before 2.1.8) could only display horizontal and vertical text (2.1.7) or horizontal only (before 2.1.7).

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 <–> POLYLINE
Turn *POLYGON* into a *CLOSED INTERPOLATED SPLINE* object, or turn *POLYLINE* into a *INTERPOLATED SPLINE* object.

ADD/DELETE ARROWS
Add or delete arrow heads of *OPEN ARC*, *POLYLINE* or *SPLINE* 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 modified using the popup edit 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 DEFAULTS

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

Name	Class	Type	Default	Command-line equivalent
justify	Justify	boolean	false	–left (false), –right (true)
landscape	Orientation	boolean	true	–Landscape, –Portrait
but_per_row	But_per_row	int	2	–but_per_row
pwidth	Width	float	10(8)	–pwidth
pheight	Height	float	8(9.5)	–pheight
trackCursor	Track	boolean	on	–track, –notrack
inches	Inches	boolean	true	–inches, –imperial, –centimeters, –metric
reverseVideo	ReverseVideo	boolean	off	–inverse
debug	Debug	boolean	off	–debug
latexfonts	Latexfonts	boolean	off	–latexfonts
normalFont	Font	string	6x13	–normal
boldFont	Font	string	8x13bold	–bold

buttonFont	Font	string	6x13	–button
startfontsize	StartFontSize	float	12	–startfontsize
startpsFont	StartpsFont	string	Times–Roman	–startpsFont
startlatexFont	StartlatexFont	string	Default	–startlatexFont
showallbuttons	ShowAllButtons	boolean	false	–showallbuttons
internalborderwidth	InternalBorderWidth	integer	1	–internalBW
starttextstep	startTextStep	float	1.2	–starttextstep
startfillstyle	startFillStyle	integer	0	–startfillstyle
startlinewidth	startLineWidth	integer	1	–startlinewidth
startgridmode	startGridMode	integer	0	–startgridmode
scalablefonts	ScalableFonts	boolean	true	–scalablefonts
specialtext	SpecialText	boolean	false	–specialtext
monochrome	Monochrome	boolean	false	–monochrome
keyFile	KeyFile	string	CompKeyDB	–keyFile
exportLanguage	ExportLanguage	string	eps	–exportLanguage
flushleft	FlushLeft	boolean	false	–flushleft
textoutline	TextOutline	boolean	false	–textoutline
userscale	UserScale	float	1.0	–userscale
userunit	UserUnit	string	in(cm)	–userunit
dont_switch_cmap	Dont_switch_cmap	boolean	false	–dontswitchcmap
max_image_colors	Max_image_colors	integer	100	–maximagecolors

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>d	Delete all objects from canvas
	<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 dirctory
	<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 spline
<None>s	Draw open 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
<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
<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  delete_all
                        Command  orient
                        Command  undo
```

```
                Command  redraw
                Command  paste
                Command  file
                Command  export
                Command  print
        Form msg_form
                Text  message
                Label  file_name
        Label  mouse_panel
        Box  mode_panel
                Label  label
                Command  button (one for each of the 16 drawing mode buttons)
                Label  label
                Command  button (one for each of the 18 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
        Form  file_panel
                Label  file_status
                Label  num_objects
                Label  cur_file_label
                Text  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
                    Viewport  dirvport
                              Core  clip
                              Scrollbar  vertical
                              List  dir_list_panel
                    Command  rescan
                    Command  cancel
                    Command  save
                    Command  load
                    Command  merge
TransientShell  export_menu
          Form  export_panel
                    Label  mag_label
                    Text  magnification
                    Label  orient_label
                    MenuButton  orientation
                              SimpleMenu  menu
                                        SmeBSB  portrait
                                        SmeBSB  landscape
                    Label  just_label
                    MenuButton  justify
                              SimpleMenu  menu
                                        SmeBSB  Flush left
                                        SmeBSB  Centered
                    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 (PS part)
                                        SmeBSB  Combined PS/LaTeX (LaTeX part)
                                        SmeBSB  Textyl \special commands
                                        SmeBSB  TPIC
                                        SmeBSB  PIC
                                        SmeBSB  X11 Bitmap
                                        SmeBSB  X11 Pixmap
```

```
                                SmeBSB  GIF
                    Label  def_file_label
                    Label  def_file_name
                    Label  out_file_name
                    Text  file
                    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
                    Viewport  dirvport
                              Core  clip
                              Scrollbar  vertical
                              List  dir_list_panel
                    Command  rescan
                    Command  cancel
                    Command  export

TransientShell  print_menu
          Form  print_panel
                    Label  printer_image
                    Label  mag_label
                    Text  magnification
                    Label  orient_label
                    MenuButton  landscape
                              SimpleMenu  menu
                                        SmeBSB  portrait
                                        SmeBSB  landscape
                    Label  just_label
                    MenuButton  justify
                              SimpleMenu  menu
                                        SmeBSB  flush left
                                        SmeBSB  centered
                    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
          Form  file_msg_panel
                    Text  file_msg_win
                    Command  dismiss
```

```
        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  1.0
                Command  cancel
                Command  set
    Popup color panel:
        TransientShell  set_indicator_panel
            Form  form
                Label  Colors
                Command  cancel
                Command  set_color_ok
                Form  mixedForm (for Pen Color)
                    Toggle  mixedEdit
                    Core  mixedColor
                    Text  tripleValue
                Form  mixedForm (for Fill Color)
                    Toggle  mixedEdit
                    Core  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 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

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

TransientShell edit_panel
Form form
Label POLYLINE:ArcBox
Label image
Command done
Command apply
Command cancel
Label
Label Width =
Text Width =
Label Border color =
MenuButton colors
SimpleMenu menu
SmeBSB Black
SmeBSB Blue
SmeBSB Green
SmeBSB Cyan
SmeBSB Red
SmeBSB Magenta
SmeBSB Yellow
SmeBSB White
SmeBSB Default
Label Fill color =
MenuButton colors
SimpleMenu menu
SmeBSB Black
SmeBSB Blue
SmeBSB Green
SmeBSB Cyan
SmeBSB Red
SmeBSB Magenta
SmeBSB Yellow

SmeBSB White
SmeBSB Default
Label Depth =
Text Depth =
Label Fill style =
MenuButton No fill
SimpleMenu menu
SmeBSB No fill
SmeBSB Filled
Label Fill intensity % =
Text Fill intensity % =
Label Line style =
MenuButton Solid Line
SimpleMenu menu
SmeBSB Solid Line
SmeBSB Dashed Line
SmeBSB Dotted Line
Label Dash length/Dot gap =
Text Dash length/Dot gap =
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
Label Radius =
Text Radius =

BUGS and RESTRICTIONS

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

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.

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*.

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@ozemail.com.au)
[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)

Version 3.1:

The only difference from version 3.0 to 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).

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