Drawing Figures

Xfig, Inkscape, etc.

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1 Xfig

2 Xfig Demos

3 Inkscape

4 Inkscape Demo

Agenda

1 Xfig

2 Xfig Demos

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Xfig - main features

xfig - Facility for Interactive Generation of figures

Xfig features

- open source vector graphics editor
- runs under the X Window Systems on most UNIX-compatible platforms
- screen-oriented menu-driven tool
- saves figures in its native text-only fig format
- TransFig package is used when printing or exporting

Drawing figures

- using objects: circles, boxes, lines, poligons, text, etc.
- objects can be created, deleted, moved or modified
- for text, 35 fonts are available
- Attributes (e.g. colors, line styles) can be selected in various ways

Xfig - features

xfig - output, input, export

Xfig output

- print figures to a PostScript printer too
- convenient feature is the PSTEX or PDFTEX export format
  - allows integration of Xfig-generated images into LaTeX

Imports various files as images

- Raster formats: GIF, JPEG, PNG, TIFF, XBM, XPM, etc.
- Vector graphics formats: EPS, PostScript

Exports into various formats:

- Raster formats: GIF, JPEG, PNG, PPM, TIFF, etc.
- Vector graphics formats: EPS, SVG, PIC, MetaFont, EMF, Tk

Formats for printed documents:

- PostScript, PDF, HP-GL (printer control language HP plotters)

Xfig - menus, panels

main, drawing, editing, attributes, etc.

Main menue - general basic functions

- File: open, save file, print or export figures
- Edit: paste, search, settings
- View: portrait, lanscape, zoom in/out, show with options, etc.

Drawing Mode Panel:

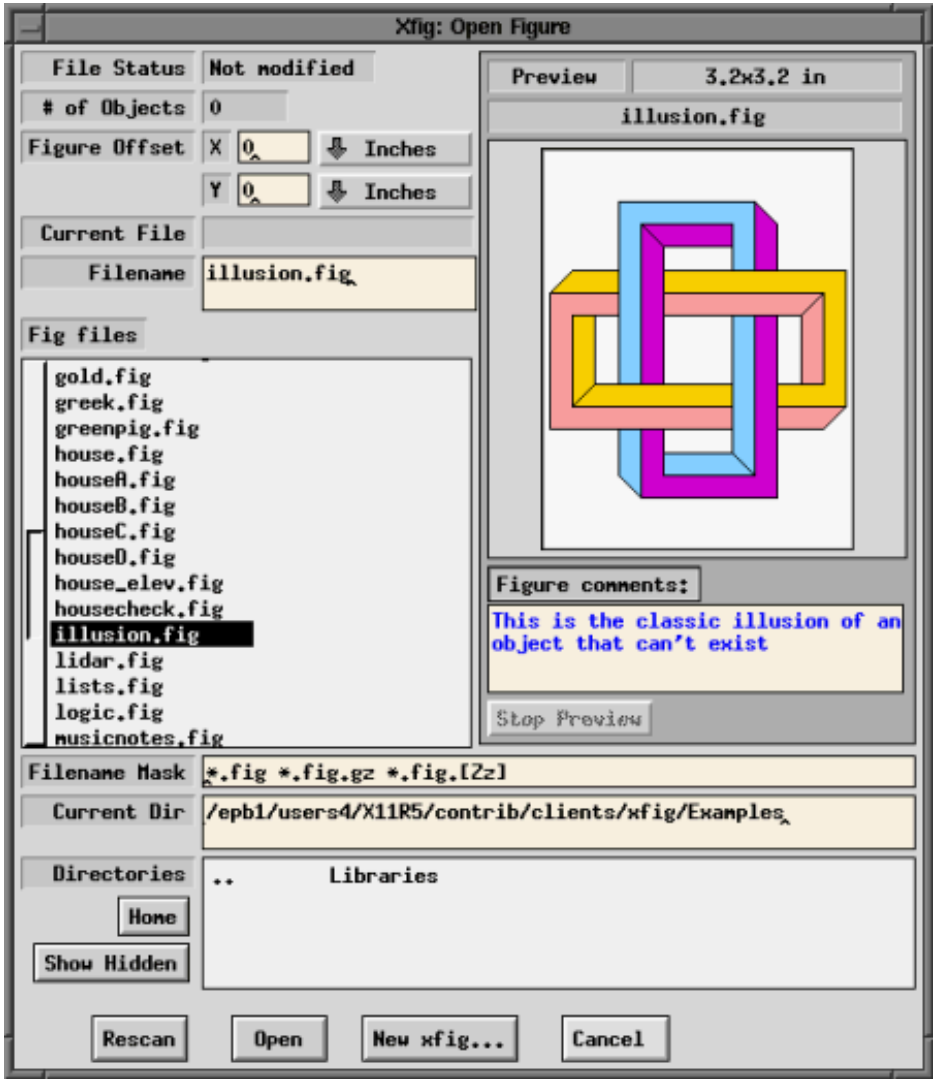
- buttons for drawing operations:
  - circle, box, polyline, text, etc.

Editing Mode Panel:

- buttons for editing operations;
  - move, copy, delete, scale, edit attributes, etc.

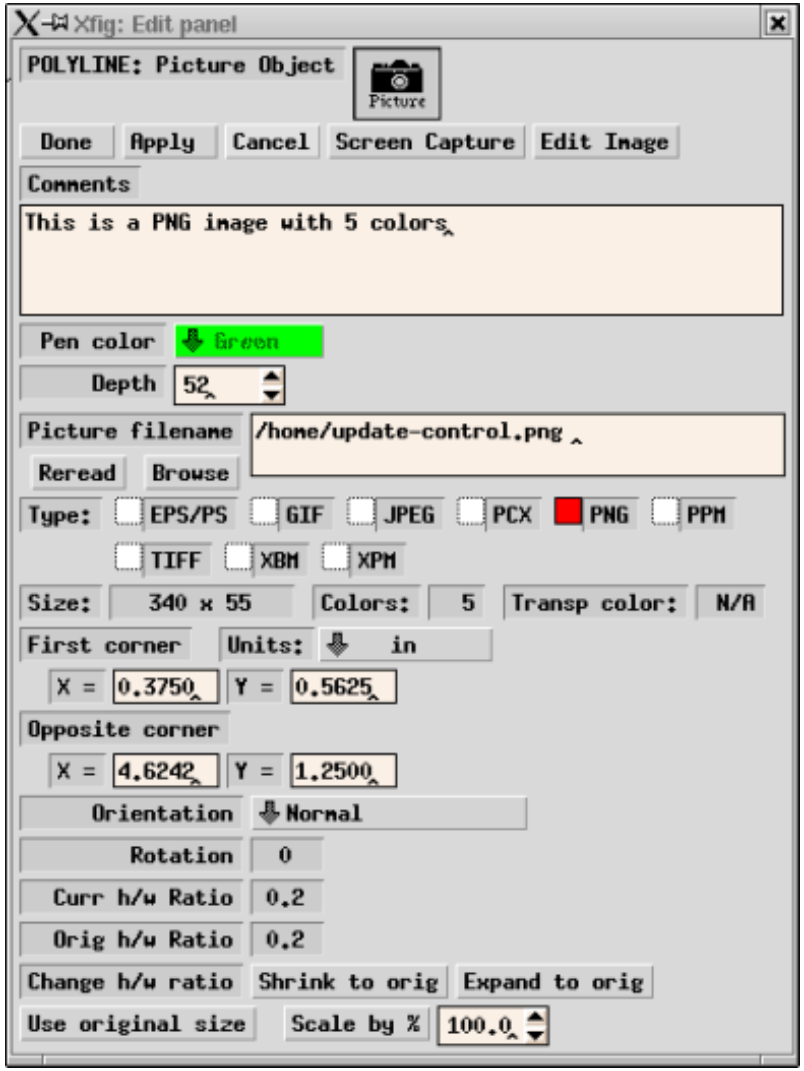
Xfig - Panels

Open file panel



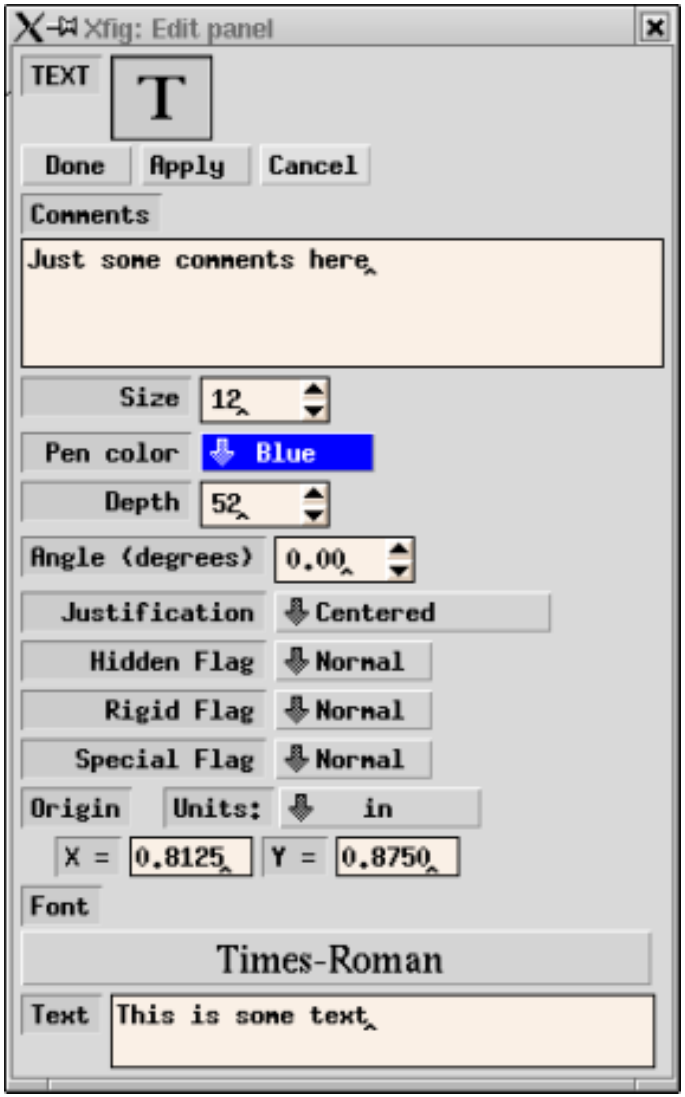
Xfig - Panels

Edit Picture



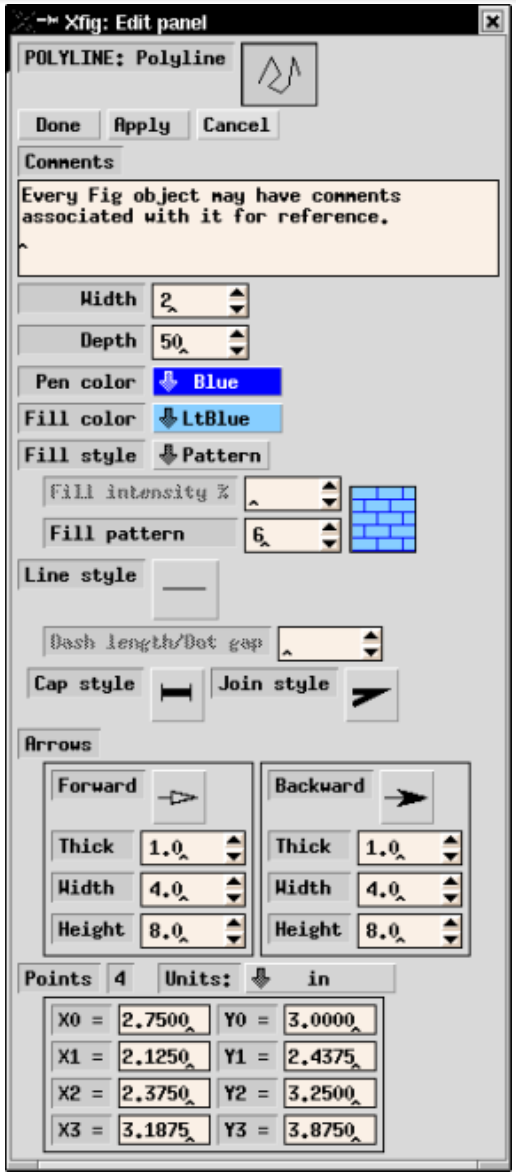
Xfig - Panels

Edit Text



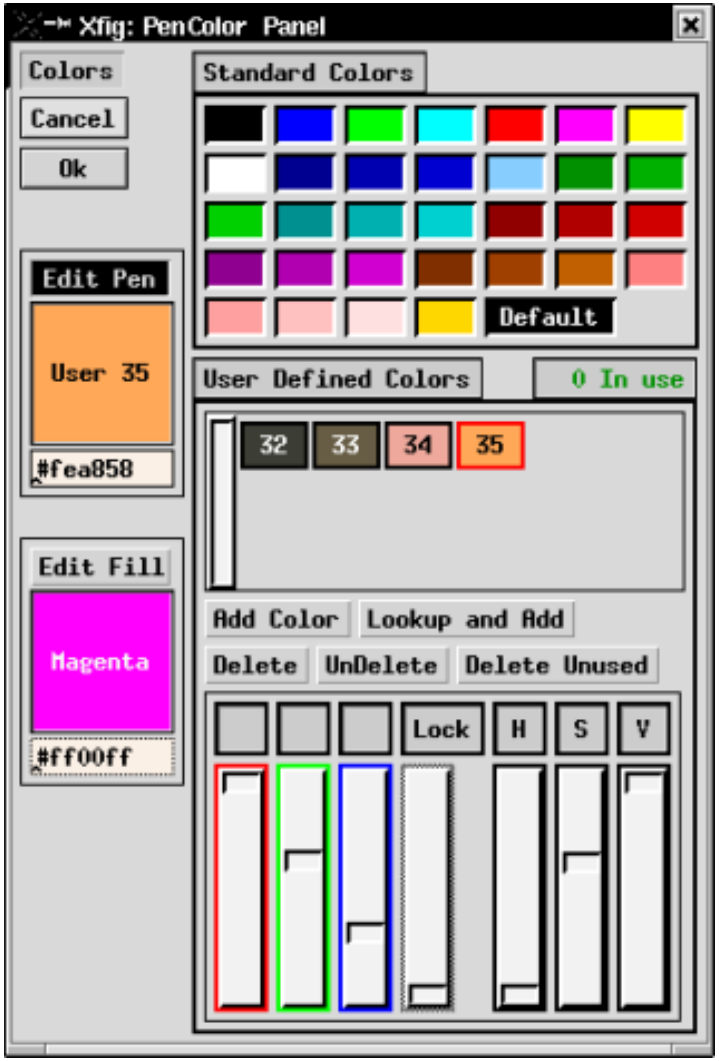
Xfig - Panels

Edit Polyline



Xfig - Panels

Color panel



Xfig - Panels

Attributes, Linux packages

Attribute Panel:

- buttons to set attributes of objects;
  - color, line width, line style, text font, text justification, etc.
  - buttons for global settings: zoom scale or grid mode.

Linux packages:

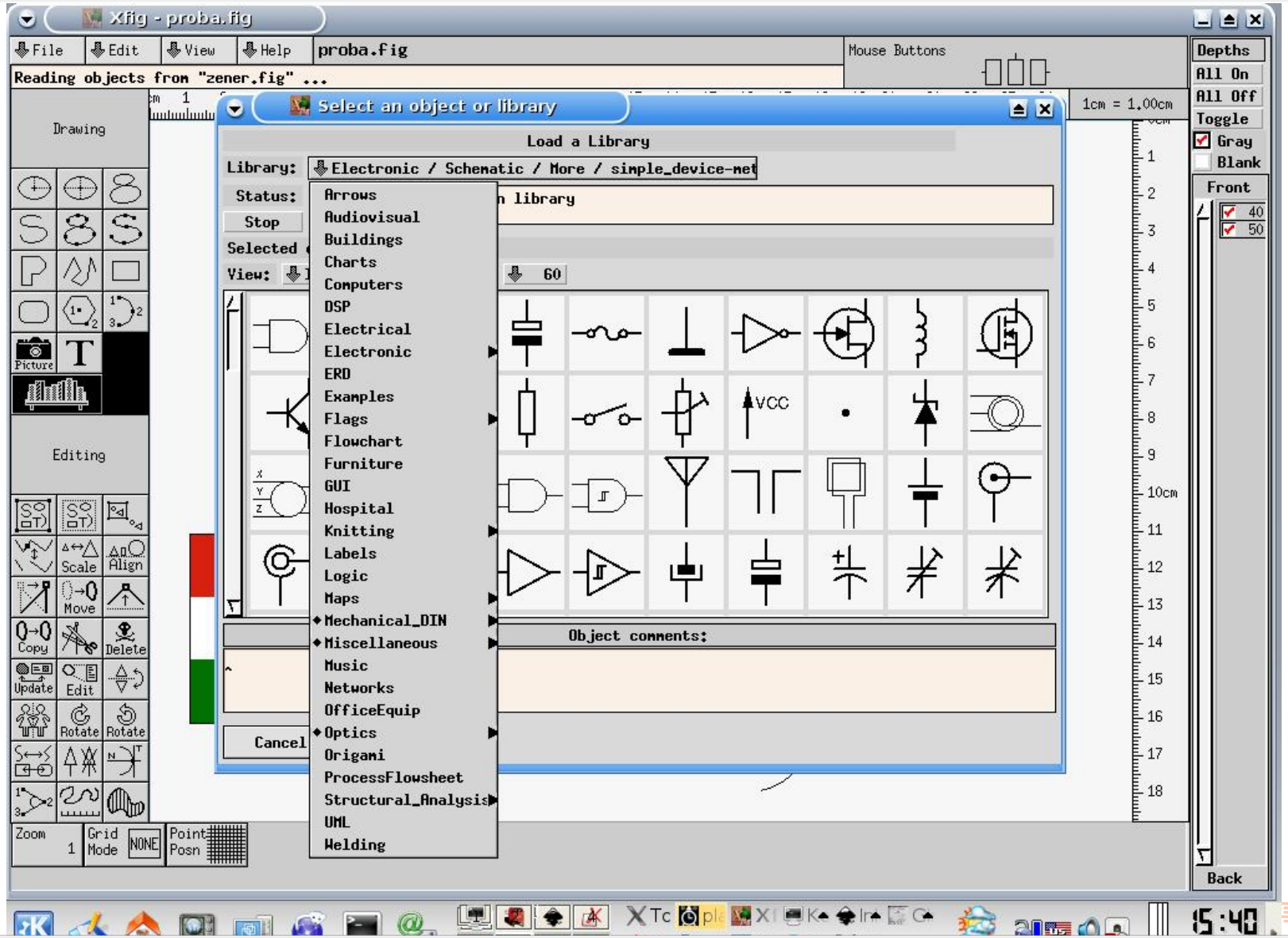
```
||/ Name           Version        Description
+++-==============-==============-============================================
ii  xfig           3.2.5-alpha5-9 Facility for Interactive Generation o
ii  xfig-doc       3.2.5-alpha5-9 XFig on-line documentation and exampl
ii  xfig-libs      3.2.5-alpha5-9 XFig image libraries and examples
```

Documentation

- /usr/share/doc/xfig/html/frm_introduction.html

Xfig - Libraries

xfig-libs package



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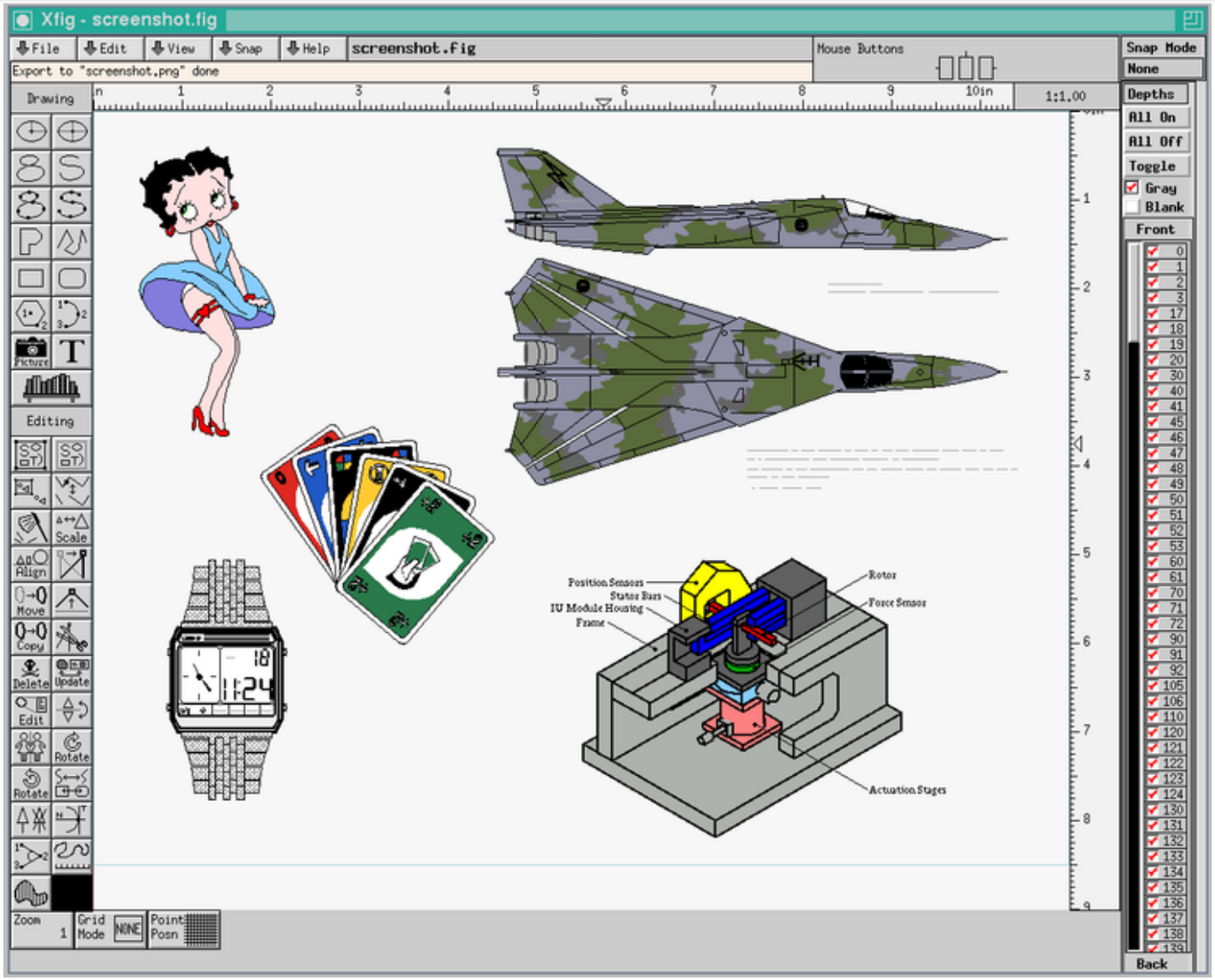
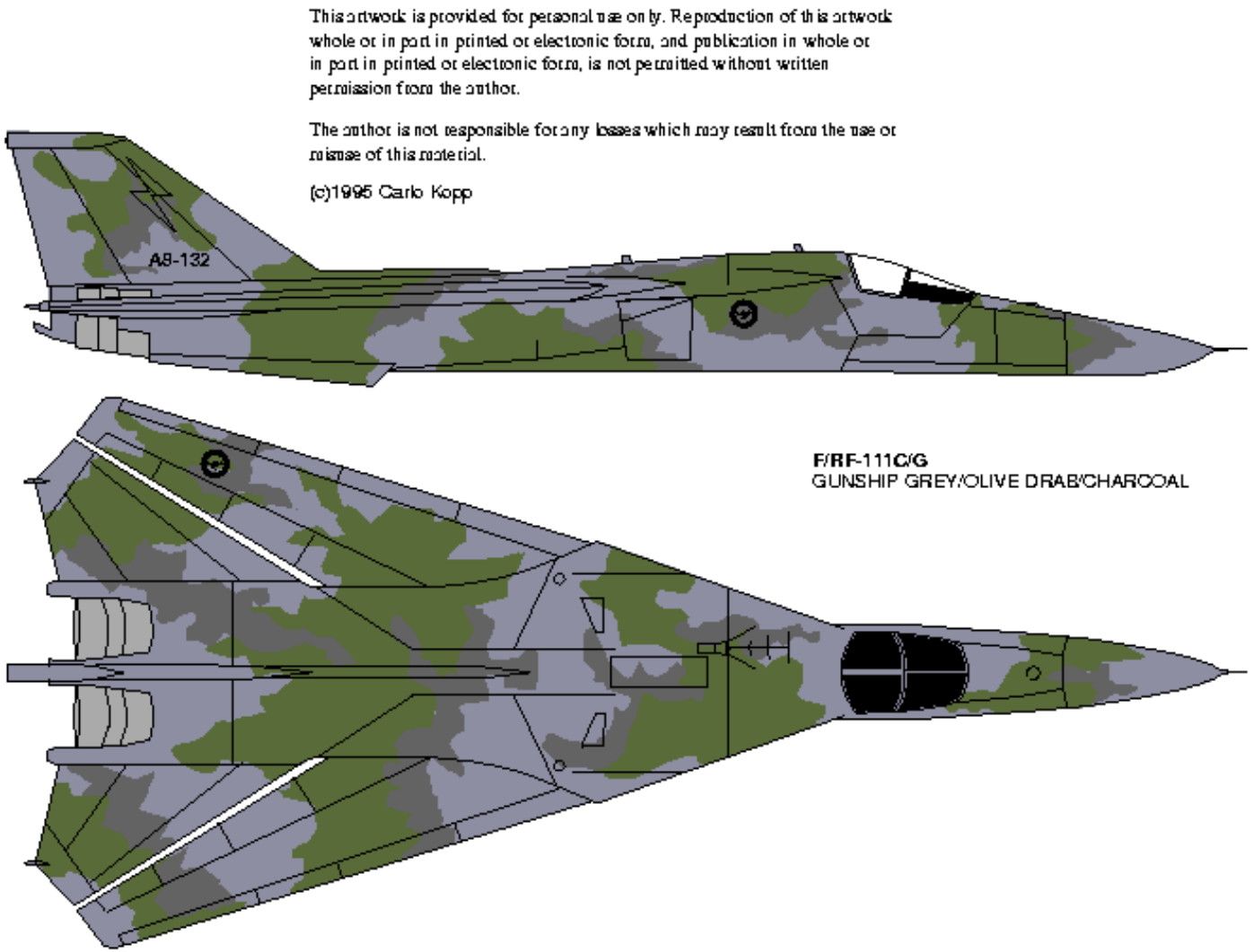
Xfig - demo graphics

Full screen demo objects



Xfig - demo graphics

Airplane

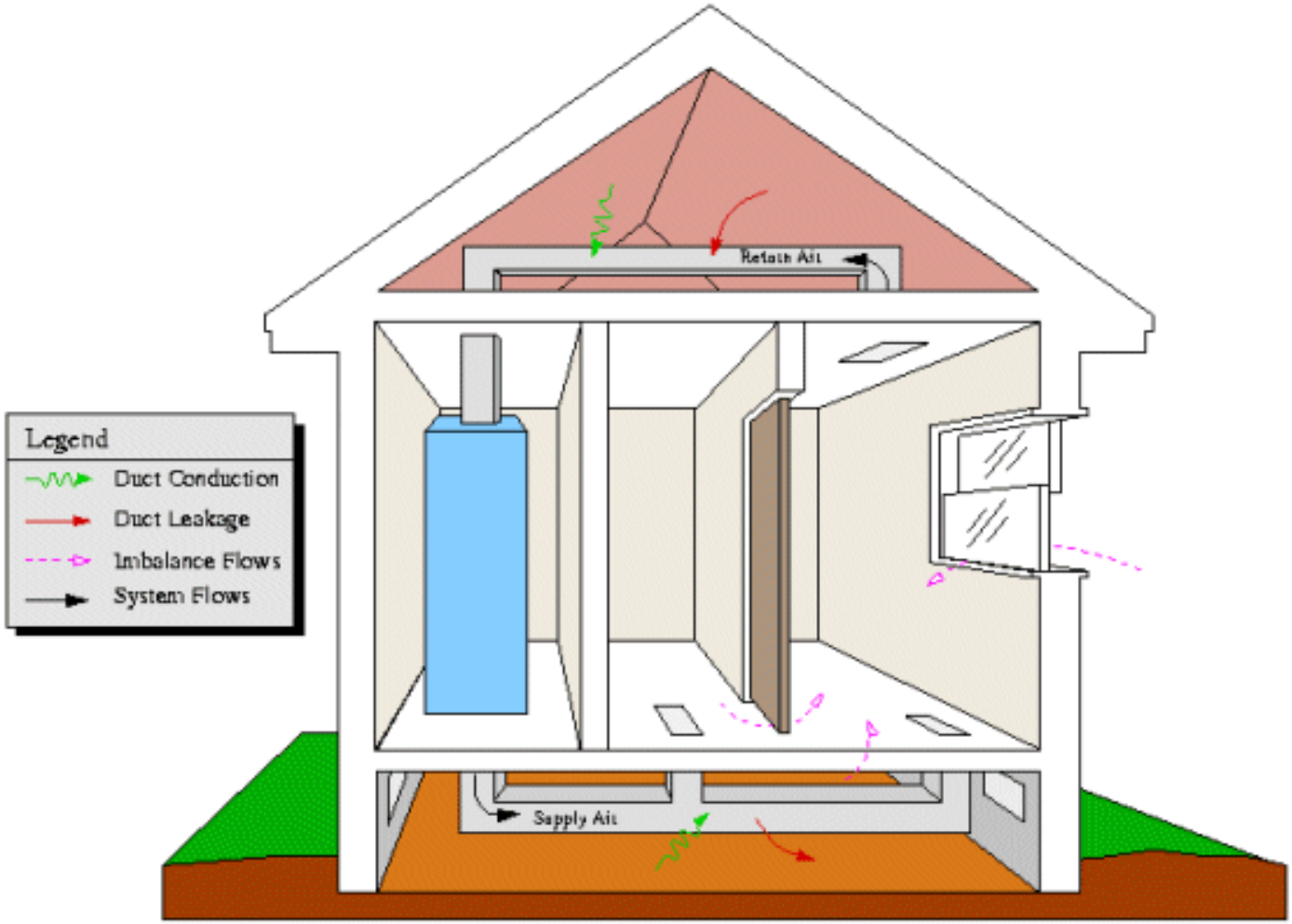


Xfig - demo graphics

Watch

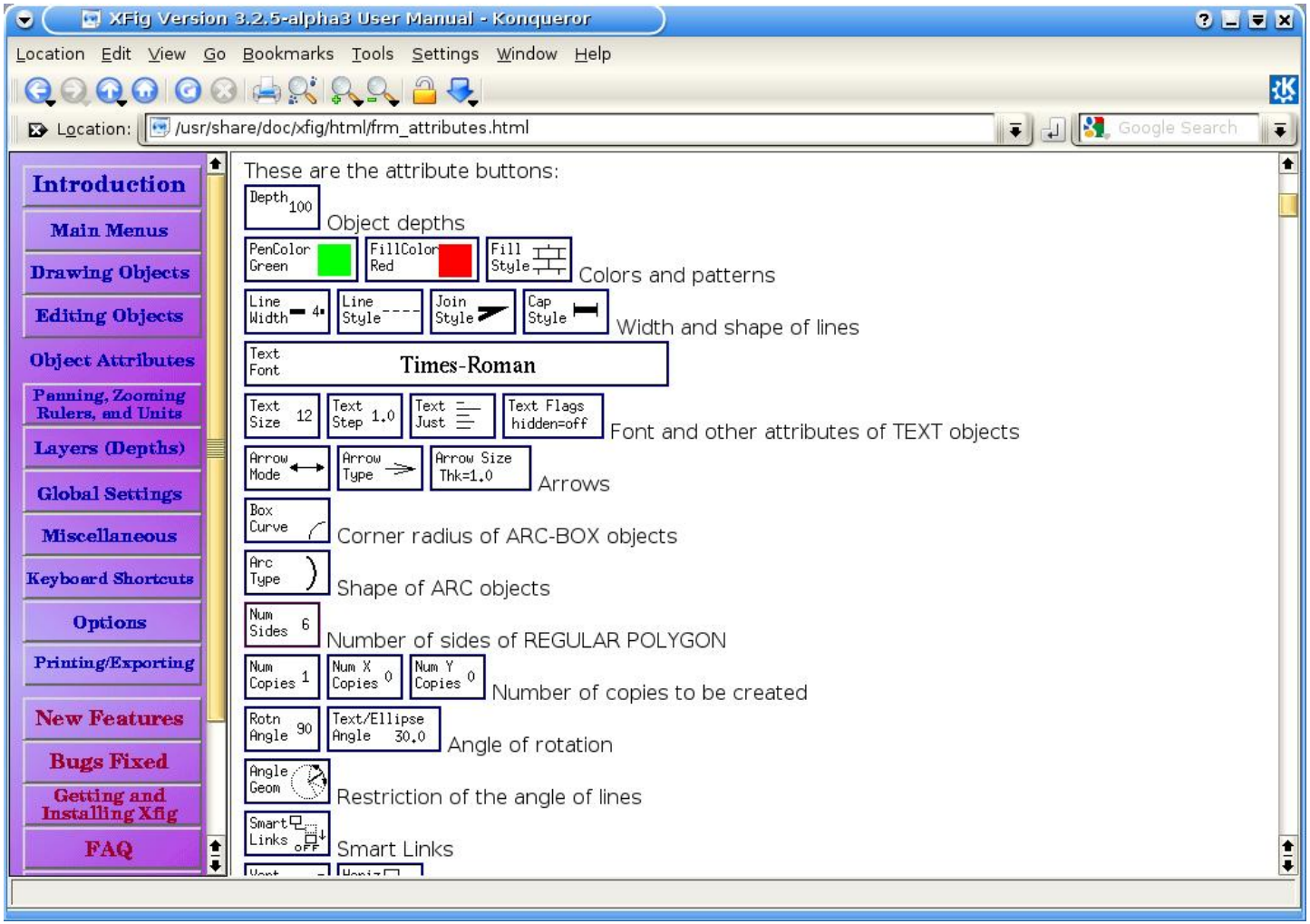
Xfig - demo graphics

3D-house



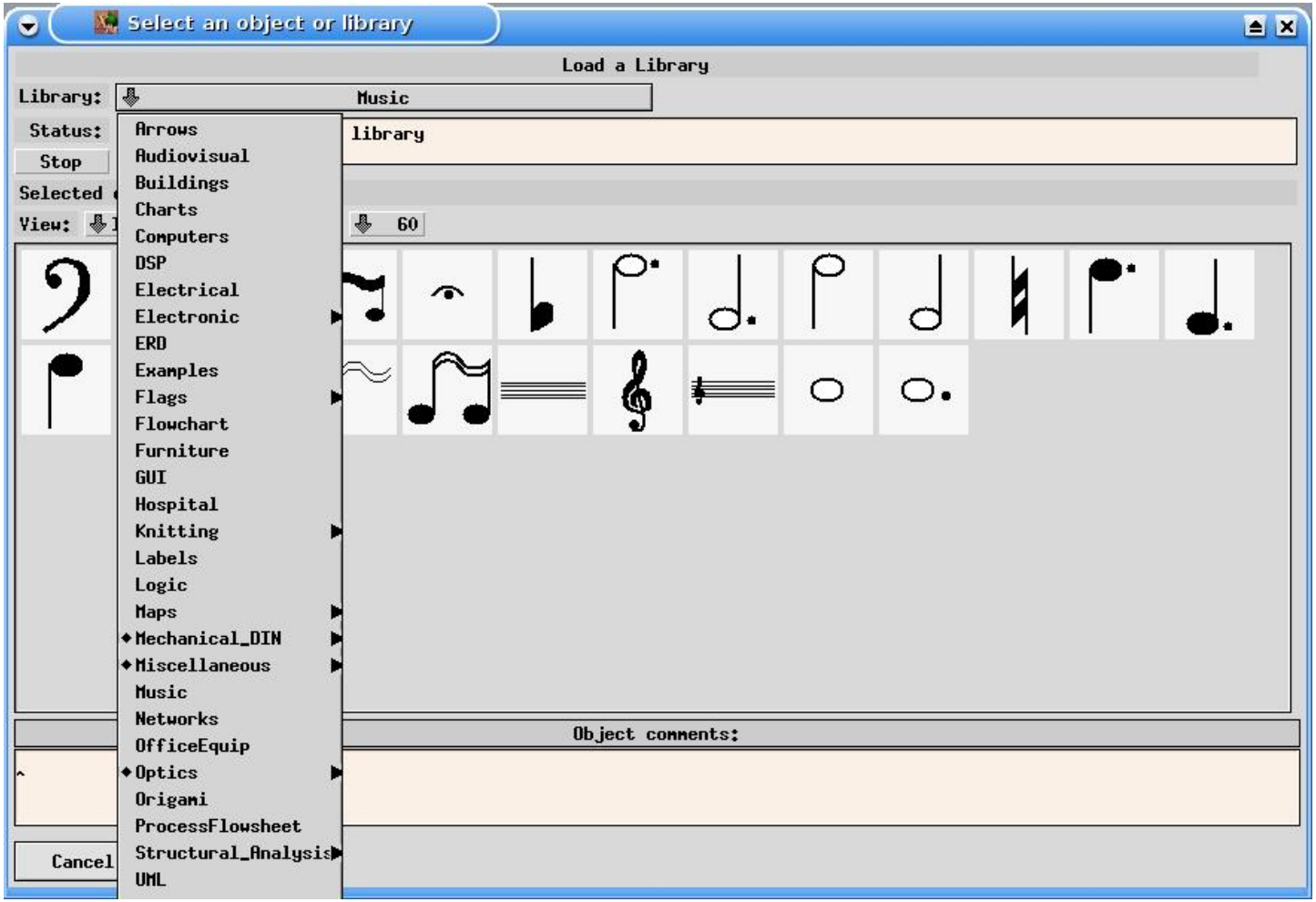
Xfig - demo graphics

Object types



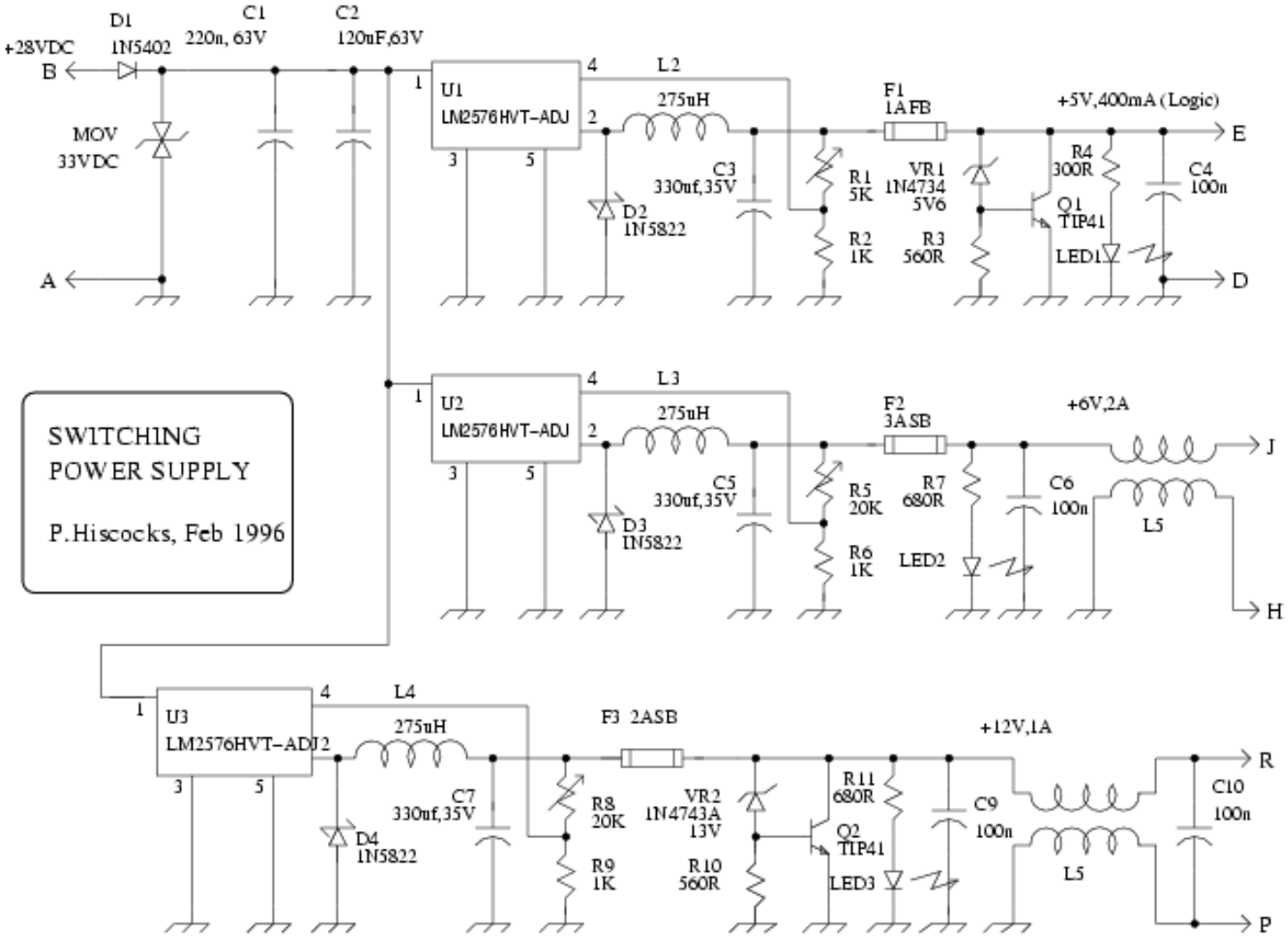
Xfig - demo graphics

Music symbols



Xfig - demo graphics

Power supply - from 1996



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Inkscape

Features

Basic characteristic

- is a vector graphics editor application,
  - similar to Adobe Illustrator, Corel Draw, Freehand
- it is a free software, licensed under the GNU GPL
- goal is to become a powerful graphics tool
  - fully compliant with the XML, SVG, and CSS standards
- is a cross-platform application, runs on:
  - Mac OS X (typically under X11)
  - Linux operating systems, Free-BSD operating system
  - Microsoft Windows
- implementation of SVG and CSS standards is incomplete
  - it does not yet support animation
- Inkscape has multi-lingual support
- As of 2010, Inkscape is under active development - with new features being added regularly.

Inkscape Objects

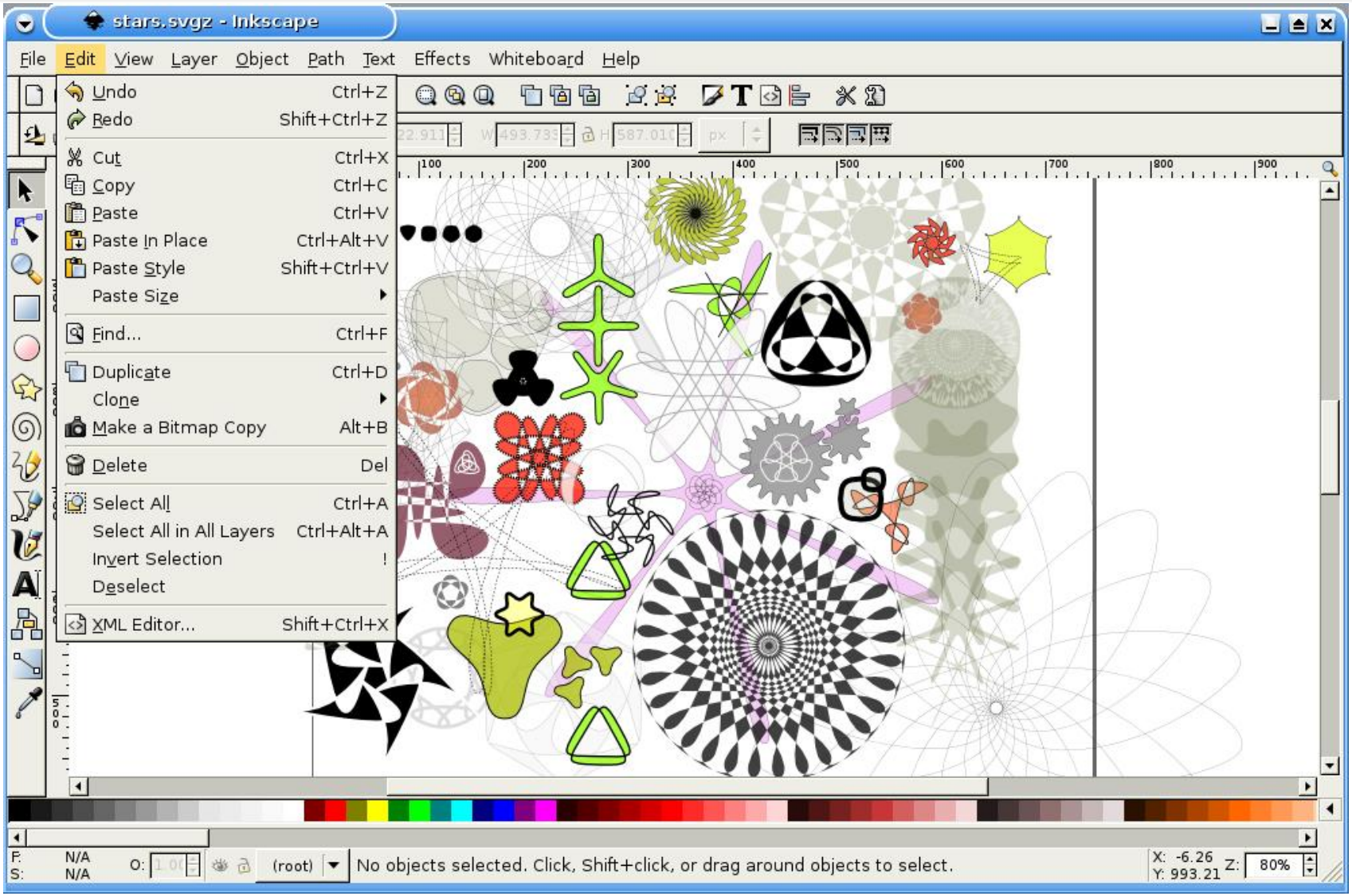
Basic object types

Object types

- Paths — made with the Pencil tool (allows freehand drawing)
- Splines - created by the the Pen tool (node by node)
- Rectangles — created using the Rectangle tool
  - Corners of rectangles can be rounded
- Ellipses — created using the Ellipse tool
  - Ellipses can be transformed into arcs and circle segments
- Stars/polygons — created using the Polygon tool
  - Multi-pointed stars can be used to emulate spirographs
- Text — created with the Text tool
  - text can use any of the system fonts
  - it can be easily converted to path
  - both regular and flowed text is supported
  - text objects can be arbitrarily transformed

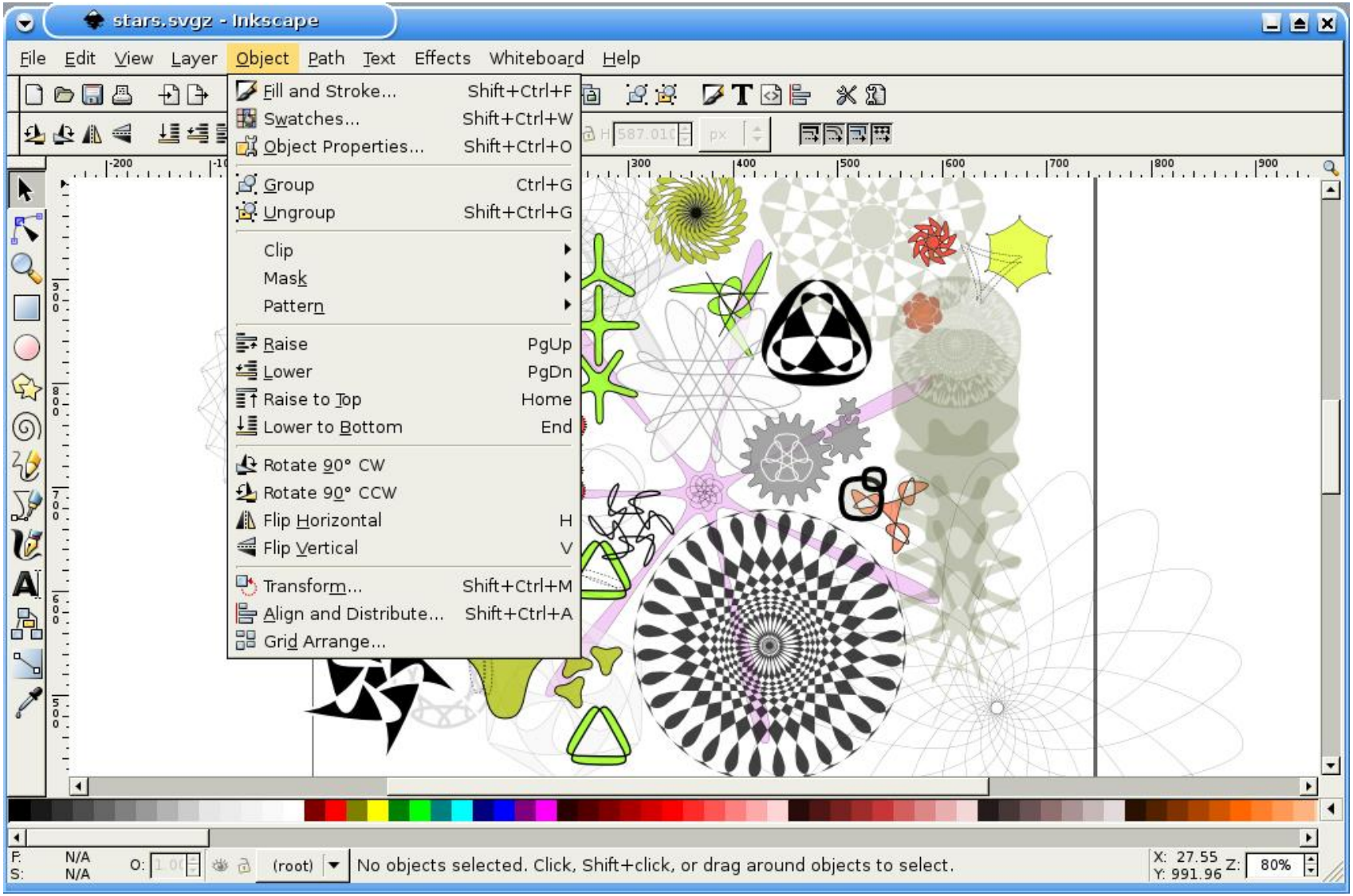
Inkscape - Edit

Edit menu



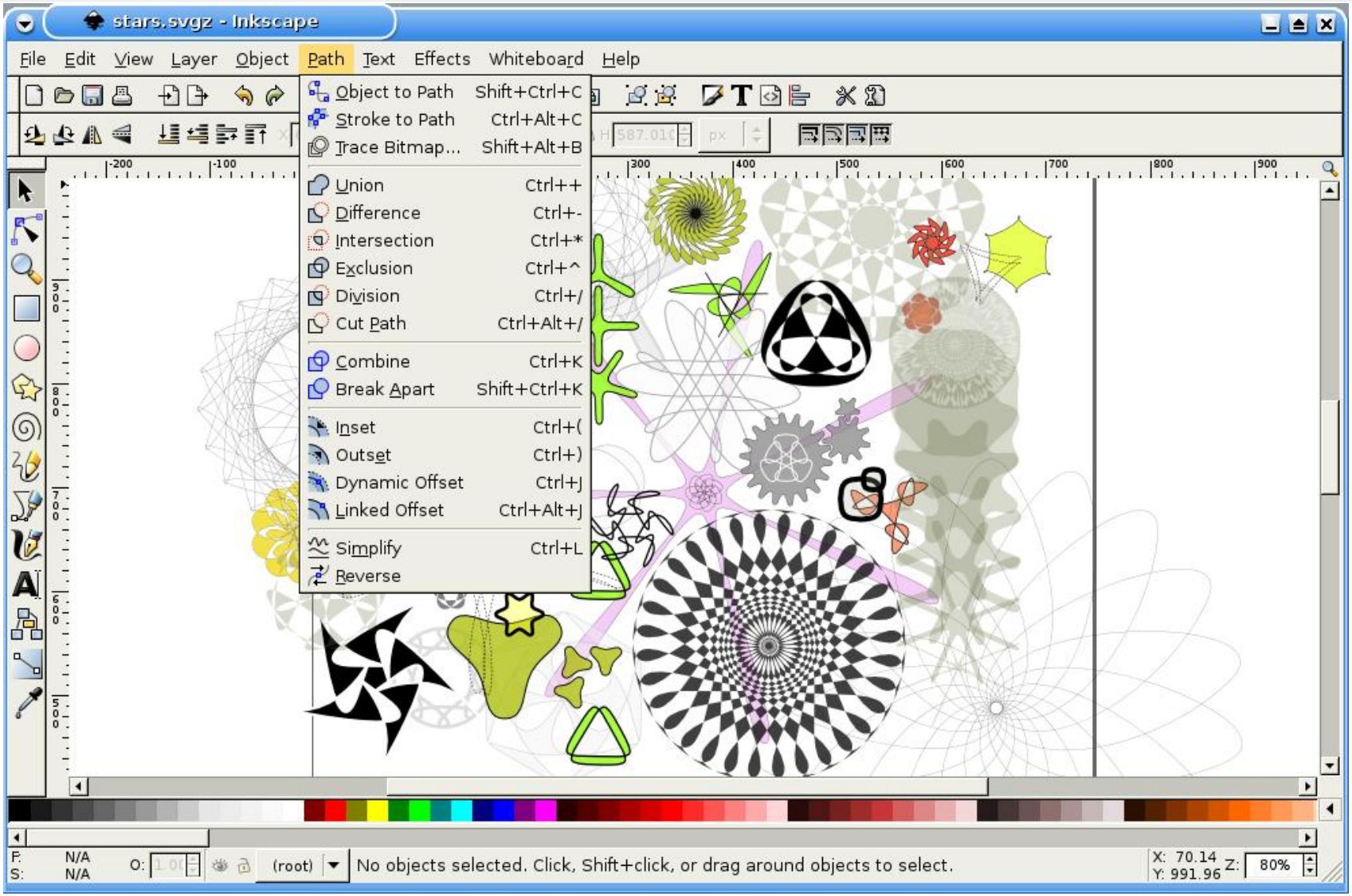
Inkscape - Object

Object menu



Inkscape - Path

Path Menu



Inkscape Objects

Basic object types

Object types

- Raster/bitmap images (import/export)
  - images are linked by default, but they can be embedded into the SVG
  - supported are PNG, JPEG and BMP images
- Clones — created using the Clone operation on existing objects
  - are verbatim copies of other objects
  - can have different transformations applied than the original object
  - are updated live whenever the original object changes
  - deleting the original object causes the clone to be "unlinked", it becomes a separate object
  - it is also possible to create chained clones i.e. clones of a clone, to an arbitrary depth

Inkscape Objects

Special object types

Special objects

- Spirals — created using the Spiral tool
  - they have configurable number of turns and convergence
- 3D Boxes — created using the 3D Box tool
  - have adjustable perspective and a configurable number of vanishing points
- can be used to assist perspective drawings
- 3D boxes are in fact groups of paths

Inkscape

Styling objects

Each shape in inkscape has several properties which determine its style

Styling objects

- Fill — can be a solid color, a linear gradient, a radial gradient, a pattern, or inherited from a parent object
  - The color selector has multiple color spaces available - all selected colors are currently converted to RGBA
  - All colors can have an alpha value specified
- Opacity - specifies alpha value for all fill colors
  - each object has a distinct opacity value which e.g. can be used to make groups transparent
- Filters
  - there is an easy-to-use slider for Gaussian blur for each object

The style is separate from the objects' shapes !

Inkscape

alpha compositing - alpha channel

alpha compositing

- is the process of combining an image with a background to create the appearance of partial transparency
- In a 2D image element which stores a color for each pixel, additional data is stored in the alpha channel
- alpha channel has a value between 0 and 1
  - 0 means that the pixel is transparent, it does not have any coverage information
  - 1 means that the pixel is opaque because the geometry completely overlapped the pixel
- example: in RGBA tuples, pixel value of (0.0, 0.5, 0.0, 0.5)
  - implies the pixel is half green and has 50
  - if color were fully green, its RGB would be (0, 1, 0)
  - pixel is using a premultiplied alpha, by alpha=0.5

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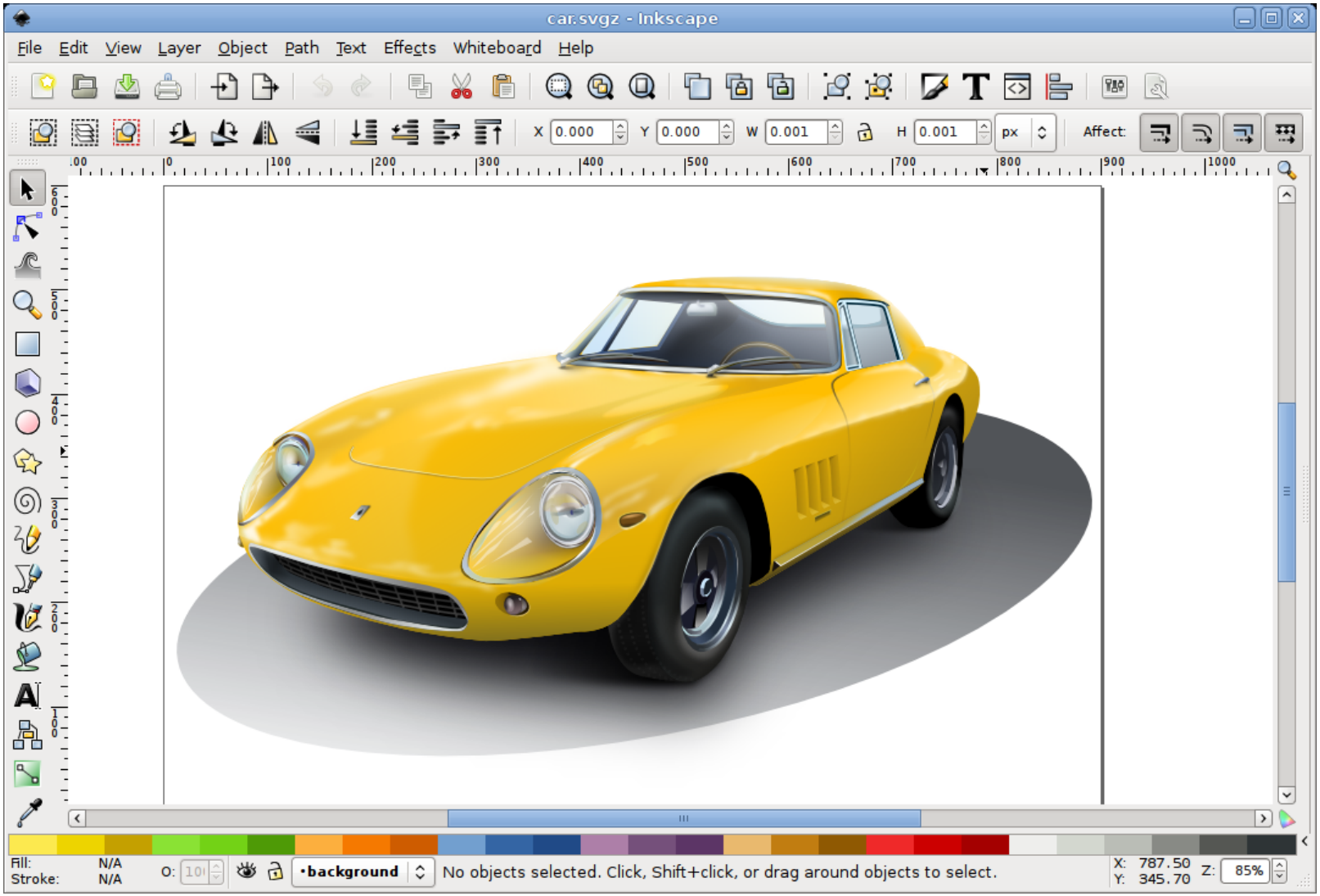
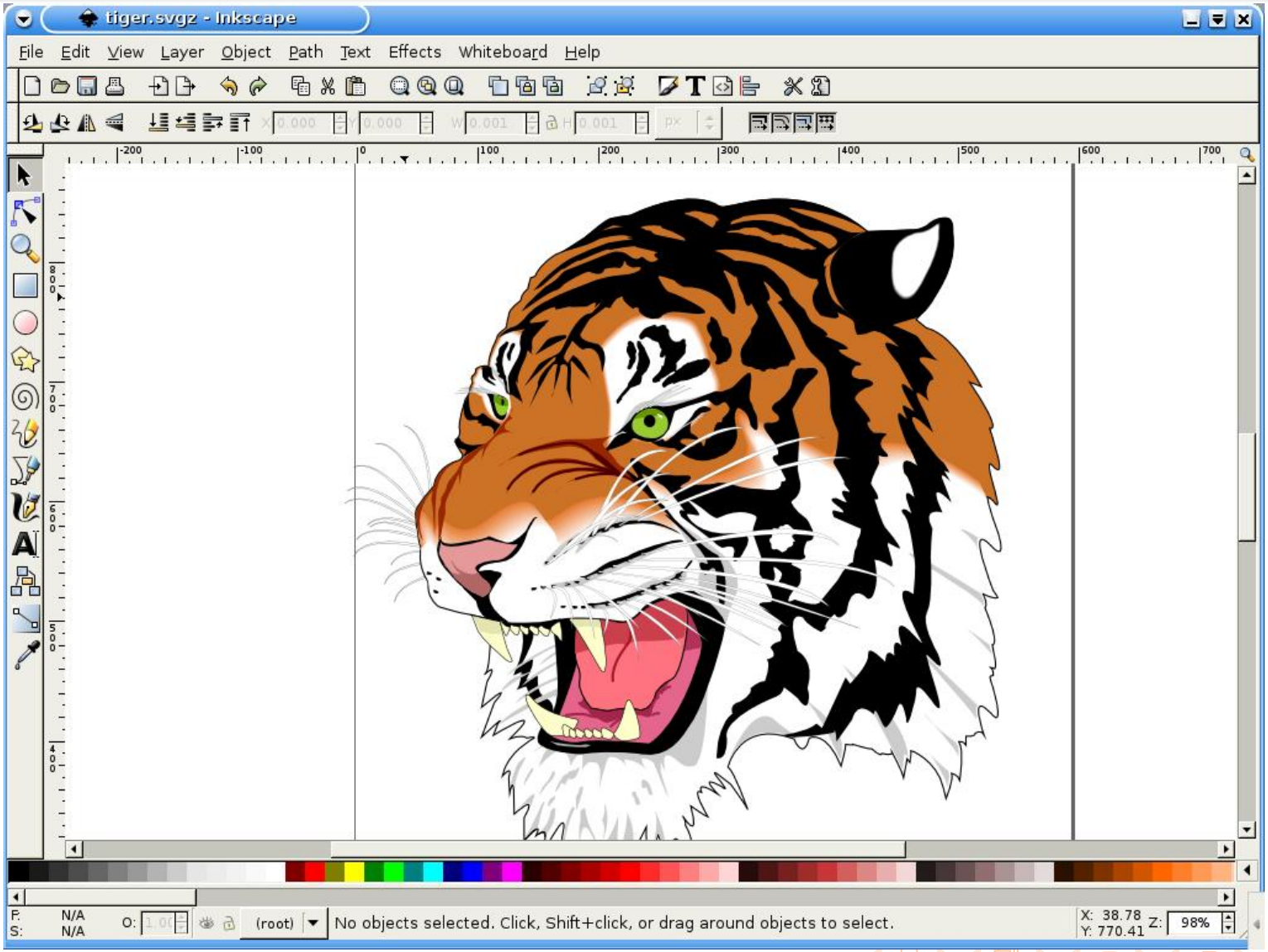
Inkscape - demo graphics

Car



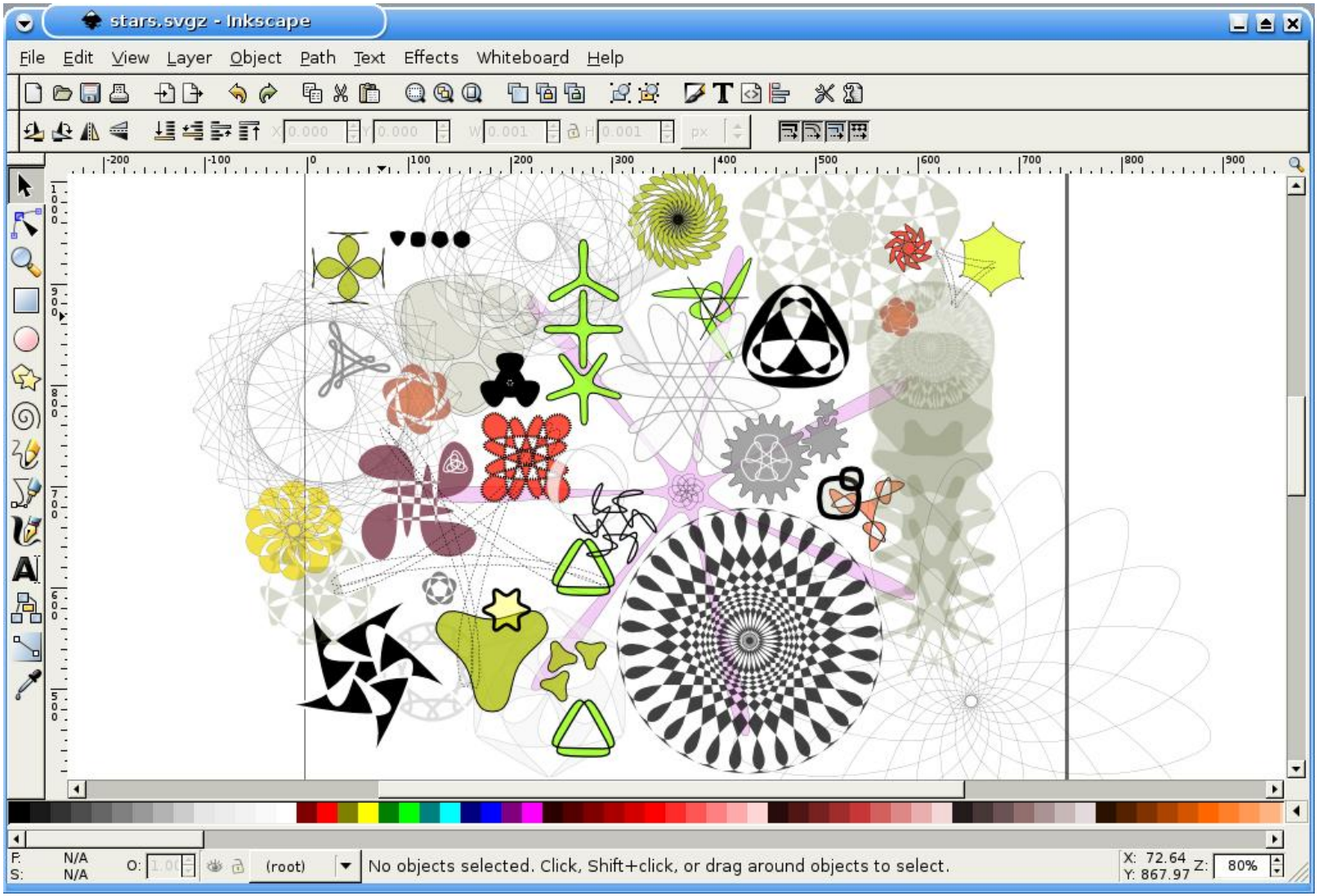
Inkscape - demo graphics

Tiger



Inkscape - demo graphics

Stars



Further information

Links

- For further information and details about the topic please check the listed links after the description of topic.

End of Basics of Drawing

Thanks for your attention !