

QCAD – CAD in two dimensions

VIRTUAL DRAWING BOARD

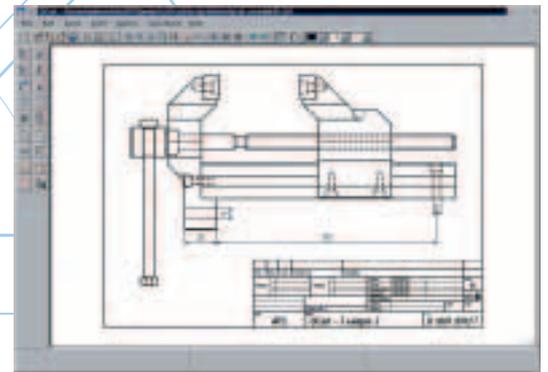
For ambitious hobby designers and students Qcad is a good introduction to the world of CAD. Ulrich Wolf takes a look at the capabilities of this free GPL CAD program

For the most part, professional CAD systems are not only extremely expensive but also so complicated that they can hardly be operated without some form of training. They offer a wide variety of functions, many of which are only really required by highly specialised professionals. Qcad is the exact opposite of such software packages: it's a 2D CAD program with relatively few functions, but those it has are well chosen and include all the most important features.

Qcad is included in almost every Linux distribution and can also be downloaded from the program's Web site. The program is also available under Windows as it uses the portable Qt-library. There is however a royalty licence cost for the Windows version.

rpm packages for dynamically linked libraries are available – naturally the source code of the current version is 1.4.7. If you still have Qt2.1 and don't want to go through a new compilation, you should install the binaries of version 1.4.4 – the function range is almost identical. An intensive revision and the leap to Qcad II are already planned.

Qcad's author, Andreas Mustun, also has a commercial package. The program, called



Qcad is a good introduction to CAD

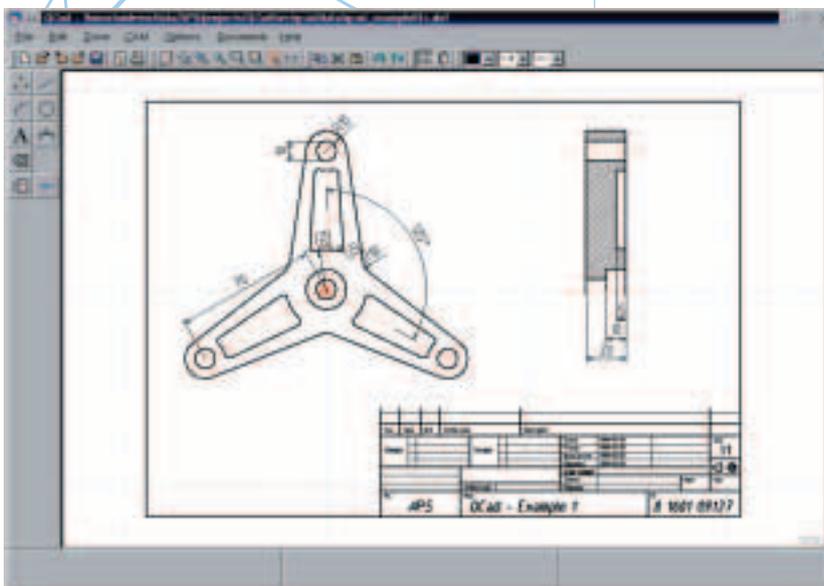
CAMExpert, is currently available for the commercial license fee of \$160. It essentially extends Qcad by offering you the possibility of creating NC programs for Computer Aided Manufacturing (CAM). It handles formats such as Gerber, G-code and HP/GL. Qcad itself, however, reads and writes DXF files and additionally exports in EPS. Qcad does not have its own proprietary format.

Those who are just finding their feet with CAD have it relatively easy with Qcad. The operation is self-explanatory and the interface is designed around accustomed standards. One small difference is found in the behaviour of the mouse: a right mouse click does not, as is normal, call up a context menu but instead concludes the current drawing operation. The absence of scroll bars also takes a while to get used to, though the Pan Zoom tool serves as a substitute for this.

One very positive note is the existence of a helpful user manual – something which is unfortunately not always a matter of course with Free software – though there are some points that are not described in as much detail as we might like. There's also no find function to help you locate the information you may need.

Whilst working, tool tips (or speech bubble help) assist in finding the functions covered by each icon. Qcad is also localised for numerous languages, including Japanese. The manual is currently available in English, French and German.

The program comes with a small library of



Qcad includes a small library of DXF examples

prefabricated items such as screws, frames and even a small Tux. The library is too small to be of any real use, however. In order for it to be useful, you must expand it with drawings created by yourself, – i.e. normal DXF files – or procure DXF files of standard parts from the manufacturer and integrate them into the library path.

Laying layers

As in all modern drawing and graphics programs, Qcad lets you create different layers, also referred to as folios. Graphic designers normally create a different layer for each new object. For architects and engineers however, it is sensible to divide up layers according to functional criteria. For example one layer might be used for the outlines, one for dimensions, and separate layers for frames, text, help lines and so on. This is also recommended, as Qcad has no separate function for help lines. It is practical to use one pre-defined line colour for each layer. Layers can be individually hidden and uncovered again; all elements of a layer can be selected and edited as one; and individual elements can be shifted from one layer to another.

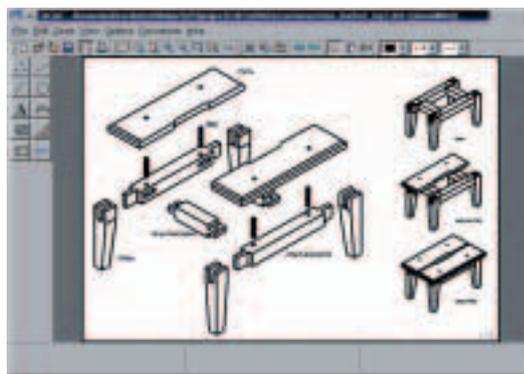
Working to measure

Qcad's dimensioning function leaves nothing to want: the units range from nanometers to light years, thus permitting the construction of small galaxies, should you wish. Diameters, radii and angles can be easily provided with dimensions, as can imaginary distances such as the distance between the centre points of drill holes. One great feature, oft absent in larger CAD packages, is that the dimensions are automatically changed when modifications are made to the drawing.

Although Qcad is not a parameter-based CAD program, it is nevertheless possible to stretch, squash or distort closed forms. In order to actually receive the desired results however, the operation's so-called point of reference must be selected very carefully. In all operations, whether it is drawing or editing forms, the multitude of supported "Snap Points" can prove very helpful. The cursor thereby automatically snaps to object or line intersections, centre points or similar prominent points.

The business of import/export

The author of Qcad didn't waste his time inventing his own format, and one can therefore assume the portable DXF format is sufficiently well supported. A 1.2 Mb file from an architect bureau caused only slight problems: the characters in some fonts were missing and the whole project, a very extensive building, was scaled down to the size of a postage stamp when opened. All the important information was however preserved, including each of the ten layers and their designations. The only unfortunate



Even complex drawings are not a problem for Qcad.

aspect was that the dimensions did not dynamically adapt to subsequent drawing changes. This actually seemed to be more a problem of the program from which the file was exported than a failing of Qcad. When importing directly from Autocad or other programs, the dimensions did adapt to changes, even if they were on other layers.

Weaknesses

95 per cent of the Qcad code comes from the main author Andreas Mustun. For this reason, the fact that some functions are still missing is only too easy to forgive. For example, there's not yet a function that allows the construction of ellipses – this must currently be done using curves with defined reference points. One option that is sorely missed is the ability to group unconnected elements at will. The export possibilities are also very limited. Qcad can only output files in the DXF and EPS formats. It's worth noting that all of these points are at the top of Andreas Mustun's To Do list.

Summary

3D design is a matter of experience and requires quite a different approach in planning to 2D design. On the other hand, those who merely want to switch from the drawing board or vector-based drawing programs to CAD will have their wishes satisfied with the free design environment of Qcad.

The program is extremely stable, sufficiently fast and can even handle larger files from foreign programs without a problem. At first glance the obvious lack of component libraries seems to be the largest disadvantage. There are however many manufacturers who make standard components of their products, such as screws and profiles, available as DXF files. This counteracts the problem of the small library to some extent.

Since the program is totally limited to two dimensions, it offers little help in the creation of different views of an object. If the user wants to implement complex projects, he or she should already be familiar with the methods of a technical designer or a draughtsman. The intuitive and easy to learn operation however makes it possible to concentrate fully on the construction of the project at hand.

One great feature is that the dimensions are automatically changed when modifications are made to the drawing

Description

Draw!

Process

View

Released

Source

Book

Pages

Scale

1:1

Info

Qcad and CAMExpert homepage
<http://www.ribbonsoft.com>