

CAD SOFTWARE

VariCAD 2005

Its version numbers are now date-based – but has anything else changed, asks **Nick Veitch?**

KEY STUFF

Accomplished CAD software intended for engineering use. Other Linux CAD software includes *Qcad*, *CYCAS*, *OCTREE* and others.

- **DEVELOPER** VariCAD
- **WEB** www.varicad.com
- **PRICE** \$399



Computer-aided design has been around for longer than home computing, back when it was the exclusive domain of VAX and Prime mainframes and involved arcane sequences of three-letter commands entered on a dumb terminal. In some ways, not a lot in CAD has changed.

Being the natural successor to those old-school Unix-running CAD mainframes, it isn't surprising that Linux has a few CAD variants. However, with a few exceptions, these are mostly mired in the *Motif*-driven past, with only a cursory nod towards new user-interface conventions such as dialogs, icons with more than one colour, or even mice.

VariCAD is one of the exceptions. Since we first covered it back in 2001, the software has managed to stay at the forefront of Linux CAD software, particularly for mechanical engineering, by pioneering new features and functionality while retaining a useable interface. Version 2005 (previous release: 9.0-2.3) should keep it there, even though the team seem to have lost some of their drive for innovation.

Drawing tools

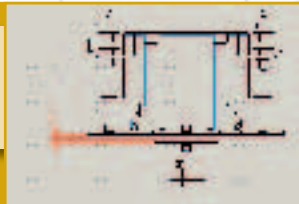
First, we must make clear that *VariCAD* is more than just a CAD package. For a start, it is equally at home with 2D or 3D work, so it is actually more like two CAD packages in one.

FEATURES AT A GLANCE

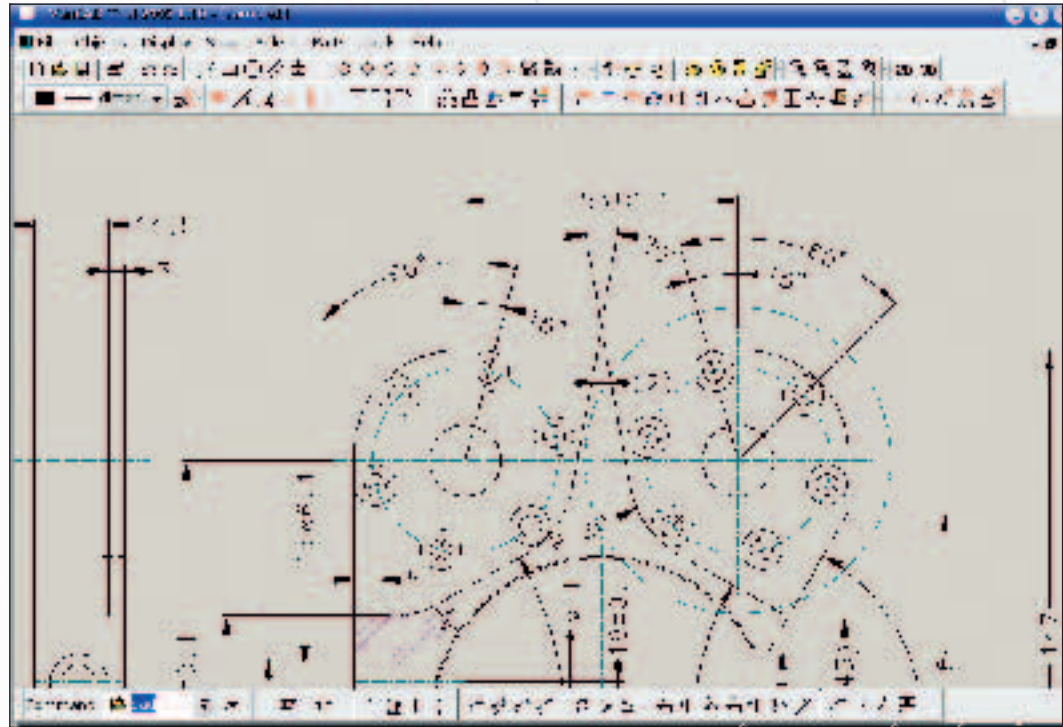
Generate a Bill of Materials and check your parts shopping list.



Smooth and easy 3D to 2D conversions save time.



A quick calculation yields the surface area of any solid.



DWG, DXF and 2D IGES files are handled very well, but you need to use the DWB format for 3D.

On the 2D side of things, a grid-based drawing system lets you lay down different types of line and transform them using tools ranging from the simple Copy to complicated Scale and Rotate. Drawings can then

with cutters, milling operations or Boolean functions. Operations are carried out through a series of context-sensitive menus and measurements that are based on a number of 'snap' paradigms, where

electrical symbols, while both 2D and 3D drawings can use a huge number of fasteners, washers, splines and metal profiles, and a few more esoteric items besides.

You need never again draw an M8 screw – just select it from the Parts menu, enter a length and it appears by magic. Hurrah!

File formats

The software can import DXF, DWG and IGES files for 2D objects. DXF is really the *lingua franca* of CAD drawings, but DWG is used extensively by the sector-leading, proprietary *AutoCAD*, so it's also commonly encountered – *VariCAD* has been updated to support the latest revision of the DWG format.

The IGES format is more often used to save 3D data these days, but sadly *VariCAD* only supports 2D

“A WELL-DESIGNED SOFTWARE TOOL THAT KNOWS ITS USERS’ NEEDS.”

be labelled, dimensioned, shaded, scaled and output in a variety of suitable forms.

For 3D work, you can choose to create objects from simple three-dimensional primitives. Enter the measurements of a cube, sphere or other simple object, then get to work

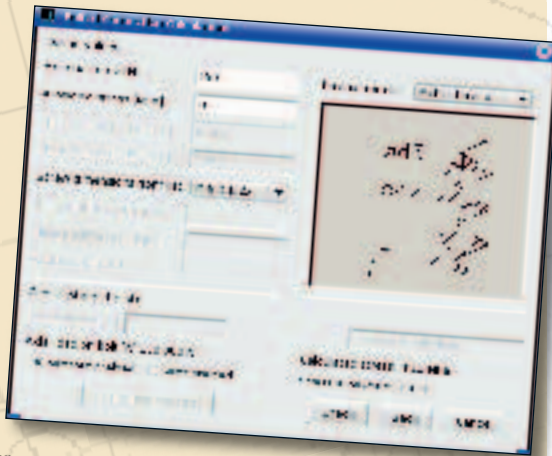
you target the centre of a piece of work or the midpoint of one edge for example, as well as the old standby of absolute measurements.

One of the most powerful features of the software is the extensive library of pre-drawn symbols and objects. The 2D symbols include welding and

CALCULATIONS

One of this software's more impressive features is the automatic design service offered by *VariCAD's* calculation tools. For a number of structural and mechanical problems, the software solvers will work out the acceptable solutions for the data you enter.

These are never going to take the place of a real design engineer, but for checking that your own solutions are in bounds, or knocking together a quick working drawing based on known data, they can be a real time-saver.



The tools themselves cover reasonably simple stuff like beam loading and strength of fixings and horribly complicated calculations for power transmission through gears. These are almost worth the asking price alone.

information saved in this format – if you want to load 3D views, you can do so only with the application's own DWB format. You can, however, export your 3D objects in IGES format for other applications that do support it.

Dimensional shift

One of *VariCAD's* more elegant features is the ability to create objects in 3D and convert them to 2D at a later stage. There is greater demand these days for 3D visualisations, and it has to be said that modern engineers tend to be trained with 3D from the start. But 2D plans are still required for various reasons, not least of which is making the parts.

When you export the 3D model to a 2D view you can select traditional orthogonal projections or create a 2D view of the object from any angle, which is useful for visualisation. This is one of the areas of the software that has been improved greatly over previous versions in terms of speed and ease of use.

The exported view of the model includes hidden lines and tangents if required, but you will have to supply your own dimensioning (which to be honest, a human will probably do better than any software). It is also possible to do the reverse – profiles

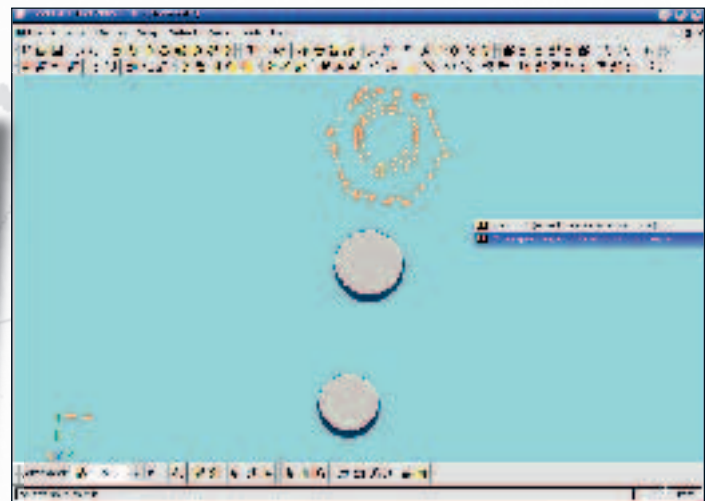
created in the 2D view can be extruded or revolved at any time to create a 3D model.

Neat stuff

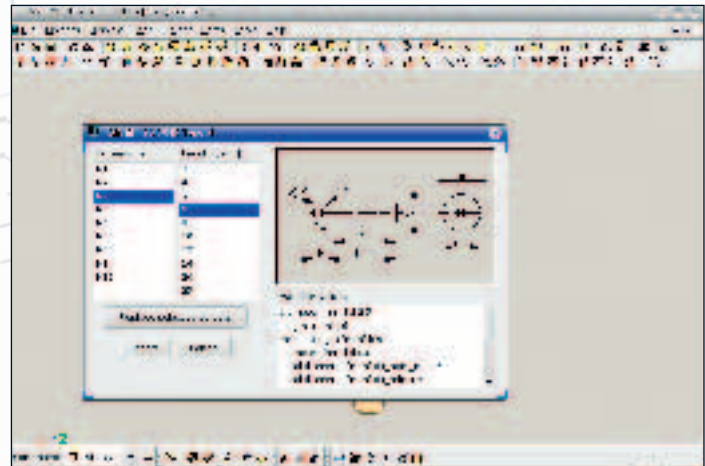
Building on its solid CAD base, *VariCAD* adds tons of useful extras which, as we've hinted, turn it from a competent design tool into a mechanical engineering *tour de force*. For professional design, for example, each component can be given a multitude of properties (material, finish, source, cost and so on) to form a Bill Of Materials. Because designs can be further subdivided, it's easy to lose sight of costs and requirements as the project expands. As long as everything has been given properties though, the Bill Of Material functions can extract the data and summarise it neatly.

One of the common mistakes people make when using 3D design is to create overlapping parts, or parts where the fit is so tight that in the real world the project just couldn't be built. *VariCAD* provides a neat tool that checks for this sort of condition – just another feature from a well-designed software tool that knows the needs of its users.

While *VariCAD* is still, in our opinion, the most advanced CAD



The Cutting tool can be used intelligently – here, the lower hole has been cut using a bolt as a straight cutter, but choosing the Corresponding Modification feature creates a larger hole to allow for the thread and part clearance.



The 3D view has been improved greatly in terms of speed and accuracy – shame we couldn't have some new demo objects though!

software available for Linux, it hasn't really changed greatly. In the last two years, the 3D engine has been improved significantly, but there have been no major feature additions or evolutions.

Baby, not giant, steps

The user interface is still pretty much as it was, and while it will feel very familiar to anyone with experience of CAD software, little has been done to move the design on.

VariCAD is still the best, and the upgrade is worthwhile if you rely on the 3D views or need compatibility with the latest *AutoCAD* files. **LXF**

SUITS YOU

VariCAD is tested and working on the following Linux systems:

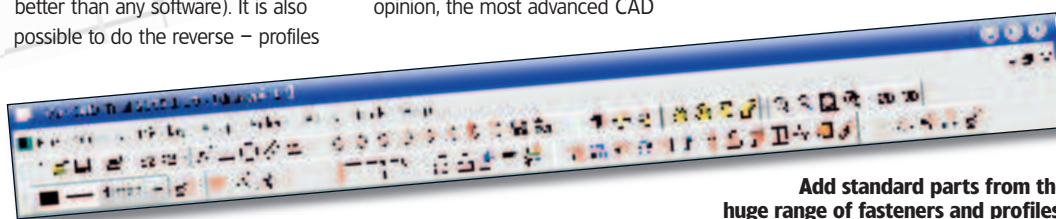
- Debian
- Fedora Core 3 and 4
- Mandrake 10.1
- Mandriva LE 2005
- RHEL 3 and 4
- SUSE 9.x
- A Windows version of the software is also available.

LINUX FORMAT VERDICT

FEATURES	8/10
PERFORMANCE	6/10
EASE OF USE	6/10
VALUE FOR MONEY	7/10

A classy package with solid 2D and 3D support, but no new exciting additions.

RATING 7/10



Add standard parts from the huge range of fasteners and profiles.