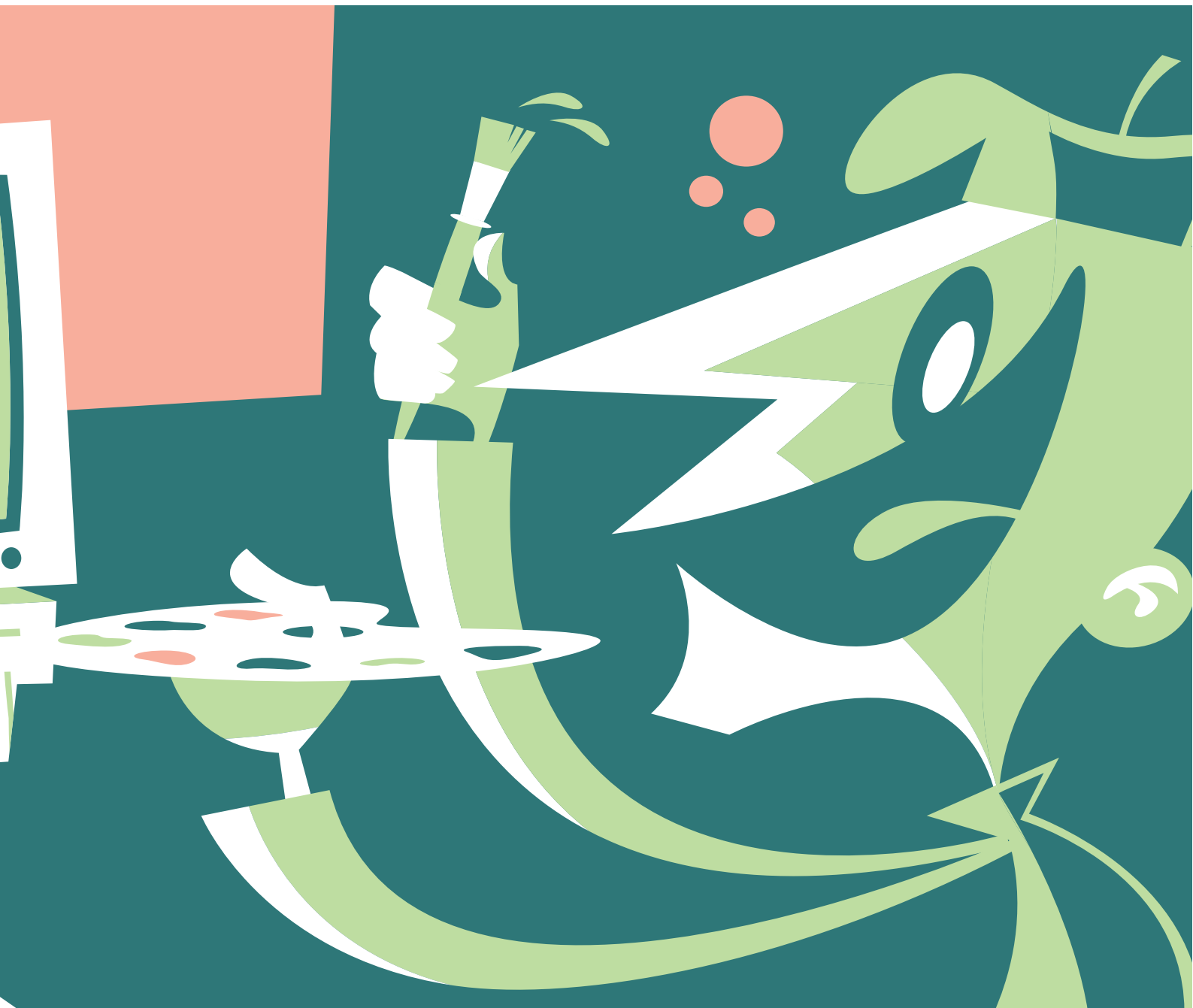


# Art of the matter



SEVEN GENERAL ILLUSTRATION  
PACKAGES ARE LAID **ON THE**  
**DRAWING BOARD** AND  
ASSESSED BY TIM NOTT.  
HE GETS TECHNICAL, TOO.

**U**NLIKE IMAGE-processing applications such as Photoshop, which deal mainly with photographic images (or bitmaps) on a per-pixel basis, drawing software deals with vector objects — shapes that are mathematically defined and are independent of the background. They are always editable, unlike parts of a photo or paintbrush strokes that are “stuck down” on the electronic canvas. They are

also device independent, which means they always appear according to the best quality of the output device, be it a VGA monitor or a 2400dpi imagesetter, and can be enlarged without looking jagged or pixellated. Recently, however, the distinction has become blurred, as many image-processing applications support “floating” objects, and most drawing applications can not only include bitmaps, but apply basic image processing to them in-place. Vector drawing software is used for everything from advertisement and packaging design (it’s particularly good at creating special effects with text) to technical drawing. In this feature we look at seven general illustration packages, ranging in price from under £40 to over £400. Most come with a bundle of resources that include ready-made clip-art images and a selection of fonts. We also have two special sections on technical drawing or CAD (computer aided design) and flowcharting, featuring eight more products. ♦

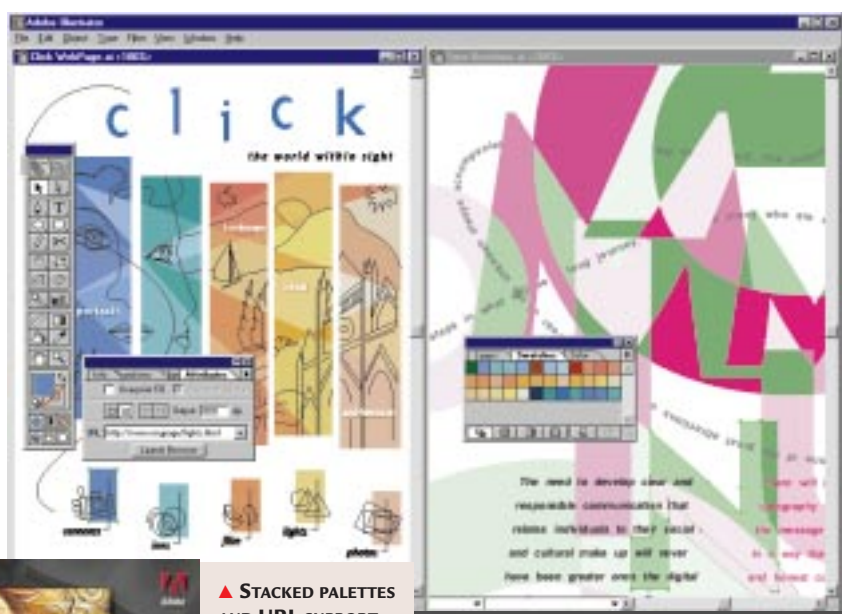
# Adobe Illustrator 7.01

The graphic designer's **old favourite** is making a difficult adjustment to life on the PC.

For a long time Adobe Illustrator running on the Apple Macintosh was the definitive vector drawing application, and its Botticelli Venus logo inspired a generation of graphic artists. Eventually it was ported to the Windows platform, but development of the PC version lagged behind that of its Mac counterpart until last year, when the 32-bit version 7 appeared. It represented a great leap forward, both in features and in interface design, and this version embraces some of the Windows 95 look-and-feel. There are, at last, proper right-mouse-button context menus, but we're still waiting for such essentials as a standard windows button bar with the normal save, open, undo, clipboard and other common commands. A vast improvement is that the old menu/dialog box method of editing object attributes has at last been replaced by Photoshop-style modeless (open all the time) palettes.

Practically all the settings you could want are accessible from these — text, lines, fills and layers. The palettes can be shrunk into their own title bars and stacked together, so one palette can contain tabs for, say, colour swatches, colour gradients and the colour mixer.

The **swatches palette** is particularly effective. Although you can apply colours straight from the mixer, if you drag them into the swatches palette first you have much better management and can make global changes to all instances of a colour and its tints in a drawing. This palette can also be used to store gradients and pattern fills; you are limited to radial and linear gradients, but these can be multi-coloured. There is an interactive gradient tool, but it can only be used to modify existing fills, not to create new ones. Text-tweaking, though improved, is similarly limited. You can flow text into containers to give shaped paragraphs and you can align it to a curved path, but there are no facilities for distorting the envelope of text, nor



▲ **STACKED PALETTES AND URL SUPPORT IN ILLUSTRATOR**  
 ◀ **ILLUSTRATOR COMES WITH AN INSPIRING COLLECTION OF TOURS, TUTORIALS AND SLIDE SHOWS**

any special effects such as 3D extrusions. The drawing tools, are, as ever, precise and delicate, with support for pressure-sensitive devices to create calligraphic strokes. There are some awkward corners. For example, moving, resizing or rotating objects requires separate trips to the toolbar, rather than the one-stop arrow tool approach of Corel and others. But for ultra-precise placement there is a Transform palette that accepts numeric input for size, place and angle.

**Like most other Adobe applications,** Illustrator supports plug-ins — Adobe or third-party add-ons. Those shipped with the product include special tools for distorting objects with scribble, twirl and other effects, as well as a knife tool for slicing objects, a drop shadow effect and many practical utilities such as those for creating crop-marks or converting colours. In addition, Illustrator supports Photoshop plug-ins for in-place use on imported bitmapped images. Here you have an impressive range of filters, from simple colour control to fancy effects

such as radial blur and neon glow. Professional colour support is excellent, with standard libraries, separations and hardware profiles.

There isn't a great deal here for web designers but you do have the option of attaching URLs to objects, then exporting the picture as a GIF image map. But you'll need additional software to create a web page. On a brighter note, you can save Illustrator files directly into PDF format where they can be read with the (free) Acrobat viewer.

Finally, you get 302 fonts (only in PostScript format) but the clip-art consists mostly of copyrighted sample files. A second CD-ROM contains a well-produced collection of tours, tutorials and slide shows.

## PCW DETAILS



**Price** £351.32 (£298.99 ex VAT)

**Contact** Adobe 0181 606 4000

**www.adobe.com**

**System Requirements** Windows 95 or NT4.

**Good Points** Interface has greatly improved since version 4.1.

**Bad Points** Lags behind the competition's feature lists and performs slowly.

**Conclusion** The least compelling of the high-enders.

# Corel Draw 8

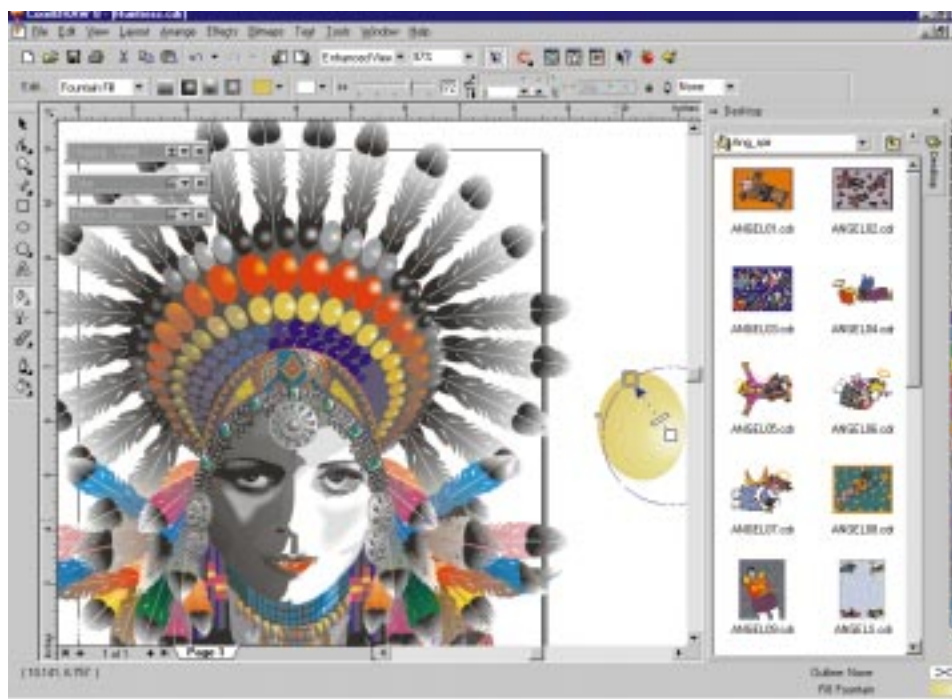


A confusing interface can't mask the **numerous abilities** of this veteran package.

When Corel Draw first appeared in 1989, running under what was then an obscure graphical user interface called Windows 286, it was the first program of its kind on the PC. At the time of writing, a Mac version is imminent. Since its pioneering use of CD-ROM as an installation medium with version 3, Corel has always offered an abundant package. This time we have three CD-ROMs, encompassing the eponymous drawing package, the PhotoPaint image processor and Dream 3D as the main components. There are numerous extras and utilities covering hardware colour management, bitmap tracing, optical character recognition, scripting, texture creation, font and media management, screen capture and a variety of third-party plug-ins. Finally, there are more than 40,000 clip-art items, photo-images and other objects, and 1000 fonts in both TrueType and PostScript flavours.

**For the sake of simplicity** I shall confine my attention to Draw. The executable runs to over 11Mb of code (it still loads in a third of the time of the 4.5Mb Illustrator) and a lot is new. First, there has been a general overhaul of the interface. Some of the changes, such as the Office 97 flat-button look, are merely cosmetic, but others are more far-reaching. Corel has long had roll-ups — floating palettes like Illustrator's that provide modeless access to options and attributes. They can save space by rolling-up into their own title bars, but they don't have the stacking capabilities of Illustrator or Freehand.

Corel has attempted to rectify this shortcoming with "dockers" for access to things such as view management, styles, clip-art and symbols. These stack into tabbed pages, and can also be docked at the side of the screen — the image area is automatically resized, so they are never in



▲ **DRAWING A BEAD: INTERACTIVE FILLS IN ACTION**

the way. In practice, however, it can be difficult to arrange the dockers as you want and they often end up taking a ridiculously large amount of precious screen space. One docker that certainly earns its keep is the scrapbook. This serves as a thumbnail browser, not just for the vast clip-art collection but for any files on your hard disk or network. It also doubles as a storage area for scraps of artwork and favourite fill and line styles. Another docker provides HTML-based hands-on tutorials. These, however, will disappoint many learners, as several of the "cool effects" seem to miss out several essential steps.

**One very productive feature** is smart selection. Having drawn a rectangle, say, you can immediately edit it by clicking on a handle without having to change to the selection arrow tool; clicking elsewhere carries on drawing rectangles. It saves tremendous mouse mileage. Another improvement is the way you select from overlapping objects. This was always something of a nightmare, but now Alt+ clicking drills down through the stacked objects, selecting each in turn. The killer features introduced in version 7

were the interactive tools with which you could create gradients and shaded transparency by manipulating handles and dropping colours directly onto objects, instead of using dialogues. Version 8 goes further, with direct manipulation of text envelopes, 3D extrusions, blends, shadows and a fascinating distortion tool.

For web design Corel outclasses the competition once again. You can output directly to HTML or Corel's enhanced Barista. There's shortcut access to FTP sites from the scrapbook, support for Java scripts, and a clever "Make HTML compatible" feature which adjusts layouts and formatting likely to cause problems with web browsers. ◇

## PCW DETAILS

★★★★★

**Price** £464.13 (£395 ex VAT)

**Contact** Corel 0800 581028

[www.corel.com](http://www.corel.com)

**System Requirements** Windows 95 or NT4.

**Good Points** Huge feature list, vast resources and some genuine productivity enhancements.

**Bad points** A crowded and obtrusive interface.

**Conclusion** Not a great vintage for Corel, but still comfortably out-features the opposition.



# Macromedia Freehand 8

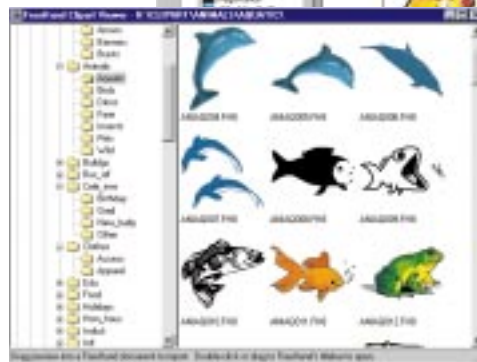
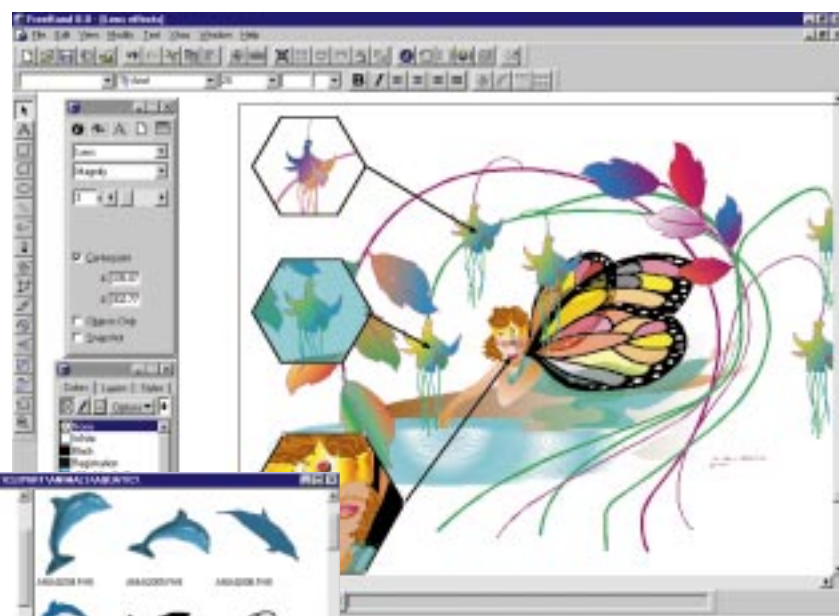


Not always friendly, but Mac and PC versions offer a host of features for the professional.

**D**eveloped by Altsys for Aldus, Freehand started its career as a Mac application. When Aldus merged with Adobe, the owner of Illustrator, the product reverted to Altsys and was promptly snapped up by Macromedia, noted at the time for its multimedia authoring and 3D modelling software. Unlike Illustrator, Freehand comes with PC and Mac versions in the same box. For an extra £100, the Design in Motion suite adds Flash2 and Insta.HTML. Flash2 is a vector-based web animation program which can either function as a standalone or from key frames created in Freehand. Insta.HTML adds HTML export to Freehand's capabilities. Both versions include a 10,000-piece clip-art library, with an excellent browser, and 500 fonts are supplied in both PostScript Type 1 and TrueType. Freehand is aimed squarely at design professionals. It is not bulging with user-friendliness, but you do get a selection of templates

and wizards to get you started. The interface is comparatively uncluttered, with a series of floating palettes and Inspectors which provide one-stop modeless attribute settings. They work in a very similar way to Illustrator's palettes, in that you can drag tabbed pages in and out of them. You can also customise the toolbars and shortcut-key settings.

**Productivity leaps ahead** of Illustrator, with interactive transform handles as in Corel; no longer do you have to traipse to and from the toolbox to rotate, resize or move objects. A new fast mode speeds up screen redraws dramatically at the expense of display detail. It doesn't affect the print quality, and you can drop back into preview mode at will. The freeform tool is a valuable addition. Though all drawing software will let you node-edit the outline of shapes, this takes a more plastic approach, and you can push and pull at a shape as if it were made of clay. Holding down the arrow keys changes the size of the pusher, with more precise



▲ **FREEHAND'S NEW LENS EFFECTS. FROM TOP: INVERT, TRANSPARENCY AND MAGNIFY**  
◀ **FREEHAND INCLUDES AN EXCELLENT CLIP-ART BROWSER**

There are also Xtras for drawing spirals, 3D rotation effects and shadows, for cutting or joining objects, and more. Though Freehand

control available by double-clicking the tool button. Another neat trick is the way blends, a succession of intermediate objects created from start and end objects, can be released to layers as a simple animation.

Lenses are another new drawing feature. By giving a shape a lens fill you can lighten, darken, magnify, invert or render monochrome whatever lies beneath it. A particularly useful touch is that you can separate the lens from its target by moving the centrepoint. Hence you could, for example, create an enlarged detail of a drawing alongside the main view. Lenses can also be given a transparent fill, but unlike those in Corel, this can't be graduated, so subtleties such as the shading in the tutorial wineglass project have a flat look.

**Macromedia has added "Xtras"** to the core product. The most unusual is the graphic hose which lets you spray the screen with a variety of predefined objects, such as leaves, in an adjustably random assortment of sizes and angles.

lacks the in-place image processing of its rivals, it has a useful eyedropper tool for extracting colours from imported bitmaps into the main palette.

Despite the customisable interface, it seems impossible to integrate the Xtras into more relevant toolbars. We couldn't, for example, get the hose or drop shadow tools out of the Xtra tools palette into the main toolbox. ⚡

## PCW DETAILS



**Price** £327.82 (£278.99 ex VAT);  
Design in Motion Suite, £445.32 (378.99 ex VAT)

**Contact** Macromedia 01344 458600  
[www.macromedia.com](http://www.macromedia.com)

**System Requirements** Windows 95, Windows NT, Mac.

**Good Points** New lenses and creative effects, with web extras in the Suite version.

**Bad Points** The Xtras could be better integrated, and it doesn't match Corel's feature list.

**Conclusion** Much the better of the two Mac-originated stalwarts.

# Metacreation's Expression

Vector technology **with a difference**: an impressive 'stroke' palette for enhanced creativity.



Created by Fractal Design, the people who pioneered Natural Media with Painter, and now part of Metacreation's Corporation, Expression is a drawing application that thinks it's a painting program. Unusually, you don't get any fonts or clip-art with the package, but in fairness it isn't really intended as a one-stop solution to your drawing needs. When you run the program, it looks like most other drawing applications. It has a toolbar for creating the usual lines, text and other shapes; the usual transformation tools for rotation and resizing; tabbed palettes for controlling the fill and stroke; and further palettes for mixing colour and defining gradients.

**What sets this application apart,** however, is the stroke warehouse palette. Those who have used Painter (and most bitmap-editing software) will be familiar with natural media brushes that can simulate the grainy effect of charcoal, or the way watercolours bleed and oils mingle. This is all done with clever use of bitmap technology; once a stroke is laid down, it can't be edited. Expression brings something similar to vector technology. Each stroke in the warehouse palette is a complex vector object in its own right — a picture, if you like. When you use a stroke to draw with, although you may be using



▲▲ THESE PAINTERLY BRUSH STROKES ARE ACTUALLY VECTOR OBJECTS  
▲ CREATING YOUR OWN STROKES IN EXPRESSION

a conventional line, shape or freehand tool, what you are actually constructing is the skeleton of a stroke. This skeleton remains an independent object (seen in non-printing red), just as any other vector, and can be resized, moved and node-edited as normal. Fleshing out the skeleton is the stroke itself, which, depending on the stroke properties, can behave in a number of ways.

**The easiest way to explain** this rather strange concept is by example. Select the thick soft oil stroke, and you'll get a stroke of even width with rather jagged ends. The colour will vary across the stroke, in shades of the current active line colour. Select the pointed soft stroke and you'll get a multi-shaded tapering effect.

You can add further variety by specifying the width of a stroke and adding shear or twist effects. And since a stroke is a vector object in its own right, it doesn't have to be brush-like. You can "paint" with any drawing — an arrow, a leaf, or even a fish. Expression comes with 500 predefined strokes, but you can create your own. You use the normal tools, then with the stroke definition tool, draw a marquee around the objects. This puts them into a new stroke definition window, and you then have a number of options. For example, you can anchor regions of the stroke: these won't be stretched proportionally, so you could preserve the size of the head and tail of an arrow or snake. Only the unanchored

middle portion will be stretched when used. Another possibility is to make a stroke repeating in the same proportions. So instead of, say, one long thin fish, you'll get a succession of small ones. Use it with a flower and the rectangle tool and you'll get a border of blossoms. Finally, there's an option to create multi-view strokes. This combines different edited versions of the same

objects as frames of a single stroke. You can paint with different shaped or coloured versions of the same object; so, in a few brush strokes you could create a shoal of varied fish. As a final touch, not only do the stroke thumbnails animate in the warehouse palette, but multi-view strokes can be exported as standalone AVI animations. ◇

## PCW DETAILS

★★★★★

**Price** £175.07 (£148.99 ex VAT)

**Contact** Computers Unlimited  
0181 200 8282 [www.metacreation.com](http://www.metacreation.com)

**System Requirements** Windows 95.

**Good Points** *Wonderfully creative, and now more sensibly priced.*

**Bad Points** *Not intended as a drawing all-rounder.*

**Conclusion** *An excellent addition for the professional artist*



# GSP Designworks 3.5

Some **surprisingly powerful** features in a professional but budget-priced package.

The CD-ROM gives you a choice of English, French or German versions. It also includes version 3 of the product, which runs under Windows 3.1, as well as 1200 clip-art pictures and 54 fonts, together with clip-art and photo browsers, a keypad utility for inserting symbols, a font manager and a screen capture utility. The interface is refreshingly simple, with the basic drawing tools to the left and commands at the top. The colour palette is at the bottom, and at screen right are a series of quick transform tools that, for example, will rotate or resize an object in preset

▲ **DESIGNWORKS' NAMED STYLES AND MULTIPLE DRAWINGS**



steps. The toolbars can be set to float free, expanded to show all possible tools or contracted to show the essentials. Instead of wizards, Designworks has PagePilots. Although these are limited to cards, certificates and logos, further assistance is on hand to help you complete the project via the cue cards

Despite the budget price, this package boasts some professional features, such as Pantone libraries, colour separations and up to 200 layers. There are facilities to save named line and fill styles, and the colour palette offers the same facility as the high-end packages to globally change a colour and

all its tints. Typographic control is generally good. The small collection of fonts are own-brand and the clip-art library isn't of brilliant quality — the CGM format doesn't permit fine editing of the images. On the other hand, unlike PagePlus, the program lets you have more than one drawing open at a time.

## PCW DETAILS

★★★★

**Price** £39.95 (£33.61 ex VAT)

**Contact** GSP 01480 496575

[www.gspltd.co.uk](http://www.gspltd.co.uk)

**System Requirements** Windows 95, Windows 3.1.

**Good Points** Easy to use, but with some surprisingly powerful features.

**Bad Points** Meagre and poor-quality selection of fonts and clip-art.

**Conclusion** A budget application more suited to the serious artist than to those wanting instant results.

# Micrografx Windows Draw 6 Premier Edition Print Studio



Great **value for money** for both novices and power users.

There's a lot in this box, with 200 quality fonts, 20,000 pieces of clip-art (together with a Media Manager), as well as a well-featured image processor and 3D effects applications. Instant 3-D is a very easy way of creating 3D effects from text or the supplied object library. However, you can't create your own objects or have more than one in the same scene.

The emphasis in Draw is very much on ease of use, with wizards available to tackle everything from setting up the sheet size to creating ready-made projects. A further helpful innovation in this version is the visual toolbar, which combines the functions of a help panel with a conventional toolbar. You can access practically any command

from here, without ever having to visit the menus. The third contender in the make-it-easy stakes is the style gallery. This lists a huge range of preset options and effects, including text styles, fills, outlines, shadows, and so on, all presented as thumbnail samples. Experienced users can adopt a more conventional interface. They will discover an impressive set of power features. There's a full range of drawing tools, including predrawn shapes and smart connector lines that stay attached when the connected objects are moved around. There's also good web support, and you can input HTML code directly. Finally, there's a toe-curlingly awful multimedia demo that doesn't do the product any justice at all.

▲ **THE VISUAL TOOLBAR AND STYLE GALLERY MAKE LIFE EASIER**



## PCW DETAILS

★★★★★

**Price** £49.95 (£42.51 ex VAT)

**Contact** Micrografx 01483 747526

[www.micrografx.com](http://www.micrografx.com)

**System Requirements** Windows 95.

**Good Points** Easy to use for the beginner, but plenty for the power user too.

**Bad Points** Avoid the demo tour.

**Conclusion** Absolutely brilliant value for money.

# Serif Draw Plus 3

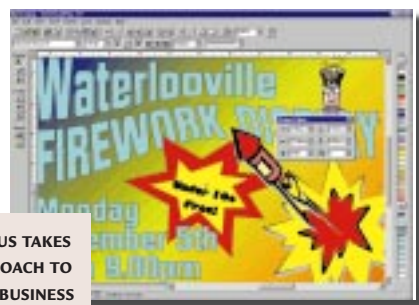
An easy-to-use package with plenty of **drawing power**.

**S**erif applies the Corel approach to the lower end of the market, offering plenty of value. As well as the drawing program there is an applet that offers in-place image processing, a clip-art browser, 400 fonts and more than 18,000 clip-art and photo images. There's both printed and electronic documentation, and templates cover everything from greetings cards to employment resumés.

**The interface is simple** and uncluttered, with a MS Office look. Left is a simple set of drawing tools, which expand to give quick shapes such as stars, spirals and speech bubbles. The colour palette at the right has two useful touches: a sub-palette of ten shades of the selected colour is shown, and the main palette can contain gradients as well as flat fills. At the bottom of the screen are the navigation controls, with

toolbars above for performing the standard Windows operations, rotating and stacking objects, and specifying fonts and line attributes. There's abundant help, with wizards everywhere and plenty of pop-up hint panels. All these aids can be turned off as you grow more confident. More unusual wizards are available to create borders, backgrounds, watermarks and even cartoon faces. The templates tend to the bright and brash, rather than the award-winning. The fonts are own-brand and as the clip-art is in WMF format, you can't really edit it: circles, for example, are composed of many short, straight line segments. Despite these limitations there is still plenty of drawing power for the more ambitious user, with layers, multicolour fills, blends, and envelope editing. Although version 4 wasn't available at the time of writing, we are

▲ **DRAWPLUS TAKES A FUN APPROACH TO HOME AND BUSINESS ARTWORK**



promised a tabbed studio that holds fill, line and font styles for drag-and-drop formatting; anti-aliased display; transparency; more fills; easier curve editing; and output of animated and transparent GIFs.

## PCW DETAILS

★★★★

**Price** £39.95 (£34 ex VAT)

**Contact** Serif 0800 376 7070

**www.serif.com**

**System Requirements** Windows 95.

**Good Points** Easy to use and excellent value.

**Bad Points** Poor-quality clip-art and fonts.

**Conclusion** Wait for imminent version 4 before buying.

# Editor's Choice



How the winners and runners-up qualified for their **PCW awards**.

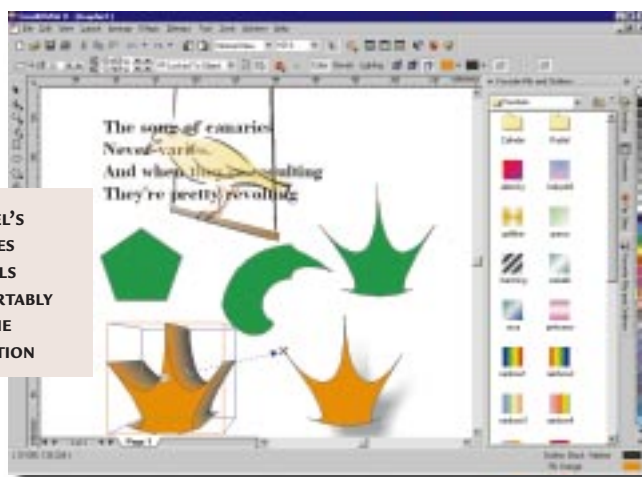
**A**t the high end, Corel Draw 8 comfortably beats the opposition, both in terms of features and value. Features such as graduated transparency and a huge range of fills are unmatched elsewhere. The workspace is sometimes unpleasantly crowded, but the dockers are a step in the right direction. The interactive controls are far speedier and more intuitive than the old dialogue-based methods, and minor enhancements such as automatic selection are genuine time-savers. Adding to this the huge range of fonts, quality artwork and other extras makes it unbeatable, and our Editor's Choice.

**We have two Highly Commended** awards to dispense, one for the high-end runner up and one for the best of the budget applications. Compatibility is an important issue, and whereas Corel 8 was, at time of writing, about to be

launched for the Mac, both Illustrator and Freehand are long-established on both platforms. Of these two, Macromedia Freehand comfortably outperforms its rival, as well as offering more in terms of resources. It easily wins the first of our Highly Commended awards.

Competition is hot at the lower end of the market, with both Serif DrawPlus and GSP DesignWorks offering a great deal at a rock-bottom price. However, for an extra £10, Micrografx Windows Draw 6 Premier Edition Print Studio

► **COREL'S FEATURES AND FILLS COMFORTABLY BEAT THE OPPOSITION**



offers greater ease of use than either, more features for the power user, and higher quality fonts, clip-art and templates. The extra image processing and 3D applications are another advantage. So it wins our second Highly Commended award. ➡

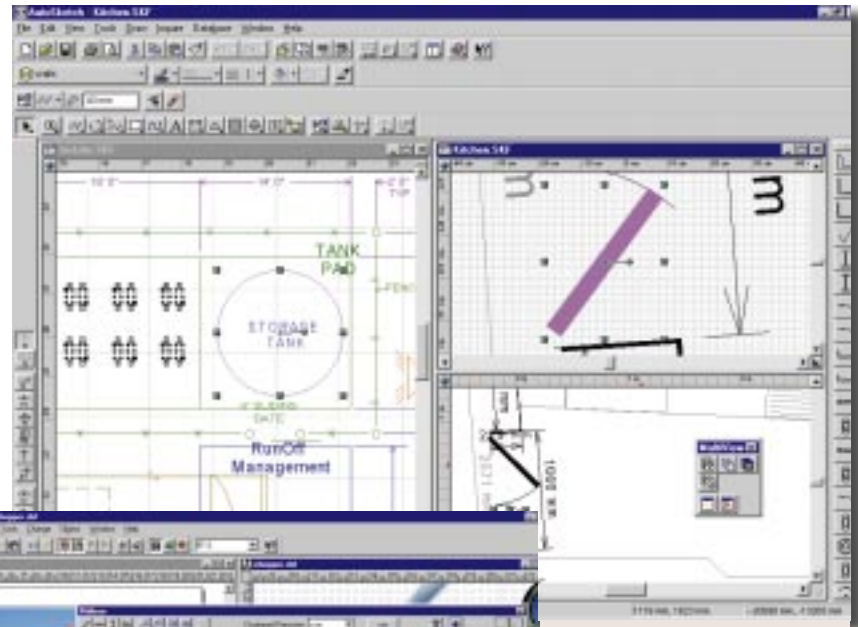


# Technically speaking

Take that, you CAD! Here's a round-up of some of the best **technical drawing** packages around.

**T**echnical drawing, as practised by engineers and architects, has to meet an entirely different set of criteria. CAD packages usually offer fewer fills, blends and fancy artistic effects, but more precision and drawing aids. The contrast is much the same as in manual drawing, for which the artist relies on the eye and the draftsman on the compass, rule and T-square. CAD software, therefore, usually provides several ways of creating an object. A circle, for example, can be defined by its centre and radius, or diameter, or a tangent and radius, or two tangents or three points, each being appropriate to different situations. It's also essential that it should be easy to input points precisely, either by specifying numeric co-ordinates or by snapping to existing objects such as the ends or midpoints of a line, the centre, quadrant or tangent of a circle, the intersection of two lines, and so on. Layers, which were first seen in CAD but are now commonplace in illustration software, are another essential. They enable the draftsman to hide unnecessary detail — for example, to take off the roof of a house to work on the detail inside. They can also serve to create multiple versions of the same drawing — for example, a house plan with layers for the bricklayers, carpenters, electricians and plumbers. Clip-art, in the CAD world, is replaced by symbol libraries of objects that will be used over and over again, such as nuts and bolts or doors and windows.

**For 3D modelling** the situation becomes more complicated. Accuracy is vital, and the user needs to be able to view the model from different angles, not just in simple plan view. You also have to be able to construct 3D objects. At the simplest level, a line can be given height, usually (and rather confusingly) known as thickness. A line with a width of 100mm and a thickness of 2500mm, for instance, will appear as a solid wall when seen in isometric view. Next come



▲ **AUTOSKETCH (FORMERLY DRAFIX):** GOOD FOR BEGINNER  
 ◀ **MICROGRAFX DESIGNER** IS AIMED MORE AT TECHNICAL ILLUSTRATION THAN CAD

3D primitives — simple shapes such as boxes, spheres and cones. After that come solids and surface created by manipulating 2D objects: a cylinder, for example, can be created either by extruding a circle along its axis or by rotating (or sweeping) a rectangle around one edge. More complex surfaces can be generated by creating smooth “meshes” between curves — rather like stretching a rubber sheet over a wire frame. More powerful 3D CAD software will incorporate Boolean operations: in other words, add or subtract 3D shapes. If you want to show a hole drilled in a block, for example, the simplest way is to draw the block, draw a cylinder passing through it, then subtract the cylinder from the block to create the hole. Another asset is the facility for user co-ordinate systems (UCS). Defining a UCS is rather like placing the drawing

sheet anywhere, and at any angle, in the model. So, for example, if you want to draw a skylight in a pitched roof, you can actually work on the roof rather than have to do the awkward arithmetic of

calculating the distance and angles from the ground plane. Having created a wireframe 3D model, it is important to be able to visualise the finished product. At the simplest level, the software should be able to remove hidden lines, such as the back edges of a box. Shading will let you assign colour to surfaces and specify light sources and a view point. Rendering will allow the mapping of textures, such as brick or steel, to each surface, and generate realistic reflections, shadows and highlights.

**Much CAD work is repetitive** or specialised, and much can be done to automate productivity. This can be in the form of a simple, recordable macro system, but more advanced systems will allow third-party development in other languages such as Lisp or Visual Basic. High-end dedicated CAD software such

as AutoCAD or Microstation can cost several thousand pounds, but we've rounded up some cheaper products. For simple 2D work, Autosketch 5 (formerly Drafix) provides a good entry point for beginners, and has the added bonus that it supports non-graphic data that can be

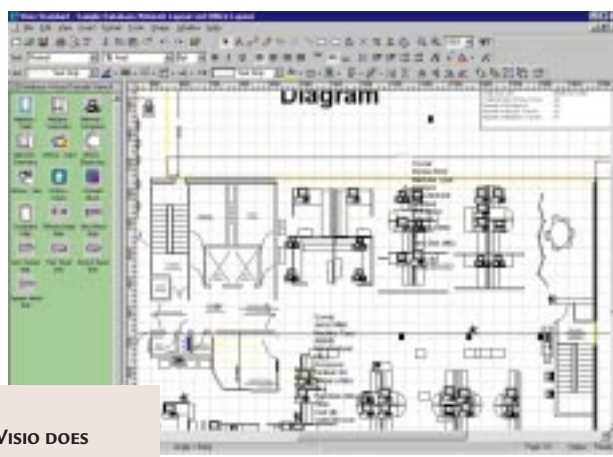
exported to a spreadsheet or database. Micrografx Designer sits rather uneasily between the artistic and technical camps. It is available only as part of a graphics suite, but you get Flowcharter (*below*) in the bundle. If AutoCAD compatibility is important, then AutoCAD LT uses the

same file format and interface, and can view (but not create) 3D models. Intellicad is a file-compatible near-clone of LT, but offers 3D drawing as well. For low-cost 3D work DesignCAD 97 is an excellent introduction, as is the latest version of TurboCad. □

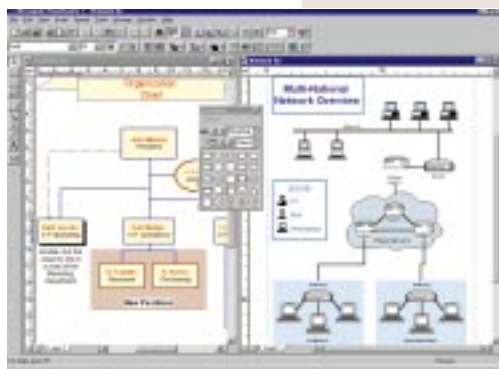
PRODUCT	AUTOSKETCH 5	AUTOCAD LT 97	DESIGNCAD 97	DESIGNER 7	INTELLICAD	TURBOCAD 5	TURBOCAD PROF
CONTACT	AUTODESK	AUTODESK	BVG	MICROGRAFX	VISIO INT'L	IMSI	IMSI
Tel No	01483 303322	01483 303322	01874 611633	01483 747526	01372 227900	0181 581 2000	0181 581 2000
URL	<a href="http://www.drafix.com">www.drafix.com</a>	<a href="http://www.autodesk.co.uk">www.autodesk.co.uk</a>	<a href="http://www.viagrafix.com">www.viagrafix.com</a>	<a href="http://www.micrografx.com">www.micrografx.com</a>	<a href="http://www.visio.com">www.visio.com</a>	<a href="http://www.imsiuk.co.uk">www.imsiuk.co.uk</a>	<a href="http://www.imsiuk.co.uk">www.imsiuk.co.uk</a>
Price inc VAT	£116.32	£699.12	£176.19	£292.57	£292.57	£116.32	£270.25
Numeric input	✓	✓	✓	✓	✓	✓	✓
Object snaps	✓	✓	✓	✗	✓	✓	✓
3D viewing	✗	✓	✓	✗	✓	✓	✓
3D creation	✗	✗	✓	✗	✓	✓	✓
Full AutoCAD compatibility	✗	✓	✗	✗	✓	✗	✗
Boolean operations	✗	✗	✓	✗	✗	✓	✓
Development tools	✗	✓	✓	✗	✓	✗	✓
UCS	✗	✗	✓	✗	✓	✓	✓
Rendering	✗	✗	✓	✗	✓	✓	✓

## Going with the flow

Diagrams, rather than drawings, are the end product of flowcharting. The two applications featured here, Visio and Micrografx Flowcharter, can be used to create all sorts of business diagrams, including timelines, process maps, network diagrams, organisational charts and more. Both work by dragging and dropping smart shapes from a library palette onto a grid. The shapes resize without distorting, and have placeholders that automatically format their text labels to suit. Smart connector lines stay attached to the shapes when they are moved about. Users can create shapes and add data attributes or hyperlinks, and even program them to carry out actions or make decisions. Flowcharter's CoolSheets provide templates and its Living Flowcharts can route user input through a decision-making tree. Visio also bills itself as a general-purpose drawing tool for maps, floor plans and other simple drawings. For example, Visio's boundary line shape displays the length and angle alongside the line, and the filing cabinet shape has a drawer that opens to check for clearance in an office plan. Both products are open to development, with support for Visual Basic, and can be linked to databases.



▲ VISIO DOES FLOORPLANS AS WELL AS CHARTS  
▼ FLOWCHARTER'S SHAPES CAN CARRY HYPERLINKS



### PCW DETAILS

#### Flowcharter 7

**Price** £199 (ex VAT); Graphics Suite 2 Enterprise Edition includes Designer, Picture Publisher and Simply 3D for £248.99 (ex VAT)  
**Contact** Micrografx 01483 747526  
[www.micrografx.com](http://www.micrografx.com)

### PCW DETAILS

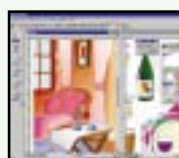
#### Visio 5

**Price** Standard version £98.99 (ex VAT); Prof. and technical versions £248.99 (ex VAT)  
**Contact** Visio International 01372 227900  
[www.visio.com](http://www.visio.com)

# Table of features



PRODUCT	ILLUSTRATOR 7	COREL DRAW 8	FREEHAND 8	EXPRESSION
CONTACT	ADOBE	COREL	MACROMEDIA	COMPUTERS UNLIMITED
Tel No	0181 606 4000	0800 581028	01344 458600	0181 200 8282
URL	<a href="http://www.adobe.com">www.adobe.com</a>	<a href="http://www.corel.com">www.corel.com</a>	<a href="http://www.macromedia.com">www.macromedia.com</a>	<a href="http://www.metacreations.com">www.metacreations.com</a>
Price inc. VAT	£351.32	£464.13	£327.82	£175.07
Integrated browser	x	✓	✓	x
Colour separations	✓	✓	✓	x
Colour libraries	7	11	18	x
Colour group management	✓	✓	✓	x
Colour hardware matching	✓	✓	✓	x
Multiple pages	✓	✓	✓	x
Pressure-sensitive pen support	✓	✓	✓	✓
Scripting	x	✓	✓	x
Transparency	x	✓	✓	✓
HTML output	x	✓	Extra	x
In-place image processing	✓	✓	✓	✓
Fonts	302	1,000	500	0
Clip-art	1,000	40,000	10,000	0



PRODUCT	DESIGNWORKS 3.5	WINDOWS DRAW 6	DRAWPLUS 3
CONTACT	GSP	MICROGRAFX	SERIF
Tel No	01480 496575	01483 747526	0800 376 7070
URL	<a href="http://www.gspltd.co.uk">www.gspltd.co.uk</a>	<a href="http://www.micrografx.com">www.micrografx.com</a>	<a href="http://www.serif.com">www.serif.com</a>
Price inc. VAT	£39.95	£49.95	£39.95
Integrated browser	✓	✓	✓
Colour separations	✓	x	x
Colour libraries	4	x	x
Colour group management	✓	x	x
Colour hardware matching	x	x	x
Multiple pages	x	x	x
Pressure-sensitive pen support	x	x	x
Scripting	x	x	x
Transparency	x	x	x
HTML output	x	✓	x
In-place image processing	x	✓	✓
Fonts	54	250	400
Clip-art	1,200	20,000	18,500