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# Digital Vellum

Del Coates
*San Jose State University*, dcoates@delcoates.com

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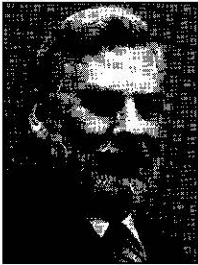
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# CAID Currents

## Digital Vellum

**By Del Coates, IDSA**
**CAID Editor**

Del Coates teaches industrial design and computer graphics in the Department of Art & Design at San Jose State University. He is also associate director of the CADRE Institute, which is devoted to computer graphics research and education.

Industrial designers walk a tightrope. Constraints of accuracy and refinement tug on one end of the balance bar, a need for conceptual freedom on the other. Even the least expensive CAD systems provide the former—it's hard not to create a straight line or a perfect circle with one. Software employing artificial intelligence technology, like Ashlar's Vellum and Graphsoft's MiniCAD, even anticipate the designer's intentions and automatically align one line perpendicularly to another, or with its midpoint. They can also align it with the center of a circle or a tangent.

But, not even the most expensive CAID system permits enough conceptual freedom for what might be called the "paper napkin" phase.

Given the choice between a sketchpad and a computer, most of us choose the old-fashioned medium. Not because we're old fashioned. Pen or pencil and paper just seem more appropriate, more friendly. They let us feel our way with soft, fuzzy lines while the concept remains vague and open to possibilities. Computers, always razor sharp and rational, nag. They compel us to think our way through, all the way.

So the typical CAID system keeps me on my toes, even during the earliest stages of a project when I really want to kick off my shoes, lean back and roam the conceptual landscape. New "pen" or "note pad" computers with flat-panel displays—that users can "write" or "draw" on directly with a special stylus—come close to fitting the bill.

Pen computer technology brings with it a host of new names and acronyms: Apple calls its forthcoming Newton a Personal Digital Assistant (PDA); others call theirs Personal Communicators, PIPs, or DTRs. In each case the user interface consists of an LCD display laminated over a data tablet. The user can select menus and icons by touching them with the stylus. When PEN, PENCIL, or BRUSH modes are selected, lines "flow" from the tip of the stylus just as they would from real drawing or writing instruments. The stylus can even act as an eraser.

Several products run IBM PC software under Microsoft's Windows for Pen operating system. So designers can already use such products as Corel DRAW, Adobe Illustrator and Fractal Design's Painter. Expect established CAD programs to be adapted, too. In fact, units employing Wacom's pressure-sensitive stylus, like Fujitsu's 325 Point, can now simulate a felt-tip pen whose stroke width varies with pressure if the application software supports the feature.

Ink Development Corp.'s sketching software for 386-based IBM-compatible pen computers offers selections for different pens (ball point, calligraphic, highlighter), pencils (hard or soft), pastels (with adjustable transparency) and erasers of various sizes and shapes. Users can also create custom tools and choose plain, ruled or graph-paper backgrounds.

The largest pen computers now available are a bit smaller than an 8.5" X 11" pad, and slightly more than an inch thick. I'd like a larger digital sketchpad, about the size of the 14" X 17" pads I normally use and no thicker. I could use it on my desk, drawing table or lap. The edges would be flush with the drawing surface so that, as with a paper pad, I could use a straight edge, ellipse template or French curve if I wanted to. Unlike a conventional pad, I could zoom in to concentrate on the smallest details.

We can expect special software modules called "agents" or "daemons" to actively assist designers. Ink Development's software already includes functions that guess some of the user's intentions, converting figures which closely approximate straight lines, circles, squares and polygons into their exact geometric equivalents. The software also converts handwriting to printed text.

Future digital sketchpads probably will go further still by providing ways for easily converting two-dimensional sketches into three-dimensional sketches which can be rotated and viewed in perspective, and edited from any viewpoint, before being downloaded to a more powerful CAID system on the desktop.

Goodbye napkin sketches! ■