

# Clearly a Cut Above

**Taking advantage of computerized cutting systems can be a very worthwhile investment.**

BY DAVE KING



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*1983 and has worked with a number of major manufacturers to help develop new and better technologies. In addition to writing for Digital Graphics magazine, Dave often presents seminars at The Sign Business & Digital Graphics Shows. He has also produced Inkjet Printing, Laminating and Mounting, an educational video for the Video Classroom series.*

The introduction of flatbed printers a few years ago sparked the rise of computerized routers/cutters, with applications within the large-format digital graphics market. Of course, computerized routers, or digital dye-cutters as they are sometimes called, have been around for awhile, but these machines have a great return on investment and are a real life-saver if you're using a UV-curing flatbed printer.

UV-curing flatbed printing poses something of a problem with traditional finishing techniques because the ink tends to be a little soft when an item is first printed. Cutting freshly printed UV-cured images from full sheets with a panel saw or hand saw can often result in a scratched or chipped edge finish. Each machine and ink is different and all surfaces take inks differently, but there's no sense in taking a chance on damaging the print. So, the best choice is a computerized router/cutter that will take your printed sheets and cut them out for you with extremely nice edges.

But more important than the nice finish, the bottom line with these machines is that they can save you a ton of money on fin-

ishing labor costs. When we purchased our UV-curing flatbed printing system and computerized flatbed cutter we grew our business significantly.

## **CUTTING FOR DIFFERENT OUTPUT**

We have several different kinds of printing systems in my shop, including a photo imager, a solvent printer and a UV-curing flatbed printer. Before we purchased our computerized Zünd i-cut 3000 digital die cutter, we had to keep tons of pre-cut boards on hand for one of our largest clients. At one point, we had more than 25 different sizes of boards, but to make it more difficult, we had to keep cutting down larger boards to make the smaller ones that we needed for specific orders.

The inventory tracking alone was a huge pain, and we would have pallets of custom boards everywhere. An order would come

in for 12" x 16" easel-back prints and we'd hand-mount each print one at a time to the pre-cut board. An order of 1,200 pieces would take five people five hours (25 man hours) to produce.

With the computerized router/cutter we now take our Durst Lambda photo imager prints, with the Onyx workflow software, and send over 46" x 84" sections on the rolls of Lambda paper. Then we run the rolls through the laminator and add adhesive to the roll. Next, we cut out the 46" x 84" sections that have many prints up on the sheet. One person mounts the full sheets of prints to the full boards. Then the boards are cut very quickly on the computerized router/cutter. We now do 1,200 units with two people in three hours (six man hours). The labor savings on this job alone is \$360 each time the job is run. Yearly savings for this client is at \$9,600. That's significant!



Cutting out guitars by the dozen is a snap if you have the right equipment. A good digital dye cutter, coupled with a flatbed printer, is an unbeatable combination.

## Automated Finishing



Look for a machine with a cutting head that houses two tools. That way you can switch very quickly between commonly used tools. This head features two cutting tools, but no routing tool.

Computerized router/cutters come with different tools, such as the drop-and-cut blade, kiss-cut and saber-cut tools, and a router tool.



Printing directly to a semi-rigid substrate such as Stoplight and then cutting images automatically can save tons of labor costs. Here is where the high-speed cutting feature comes in handy.

This has become standard procedure. All jobs that can be cut on the cutter get cut on the cutter. That's not quite true. Really small orders are still cut by hand (panel saw to cut the board). The next major feature for our sales people is that they can now sell custom cutting on all our machines. We do jobs on the Lambda that are die cut out of everything from DiBond to 1" Gator.



Next is the solvent printer department. We are now doing a job calling for 12,000 30" x 20" die-cut stickers for a large client. The job would not have been possible without the computerized router/cutter. Profit on this job is \$23,000. These kinds of jobs are now very common for our shop. Estimated profit for the year due to this cutter is more than \$100,000.

Finally, there's the UV-curing flatbed system. Don't purchase one of these printers without getting a cutter to go with it. That would be like buying a candle-making machine and not getting the wicks.

### DESIRABLE FEATURES

Computerized router/cutters come with different tools. The router tool works great for cutting Sintra, Lexan and DiBond. The drop-and-cut blade is for 20-mil product. Kiss-cut and saber-cut tools work great with foam boards. Most of our cutting is done with two tools: the router and the drop-and-cut blade. If your shop is like mine, look for a machine that houses both tools in the head of the cutter.

Look for a cutter that can cut a full 48" wide. If you use a lot of DiBond and Lexan, a 60" cutting width might be better. Ideally, the printer should be matched to the cutter in terms of bed size. An 80" wide printer would match well with an 80" wide cutter, but this size machine costs around \$170,000. For cutting banners and other rolled materials, it would be nice to have a cutter that can handle roll-fed material as well.

A high-speed router is ideal for cutting hard materials such as DiBond, Lexan, PETG, etc. A slower cutter would cause a bottleneck when working with these hard materials. If a printer can print a 5' x 10' sheet of DiBond in 10 minutes, then the cutter should be able to cut it in 10 minutes. We learned the hard way with this, but then upgraded to the new, more powerful router.

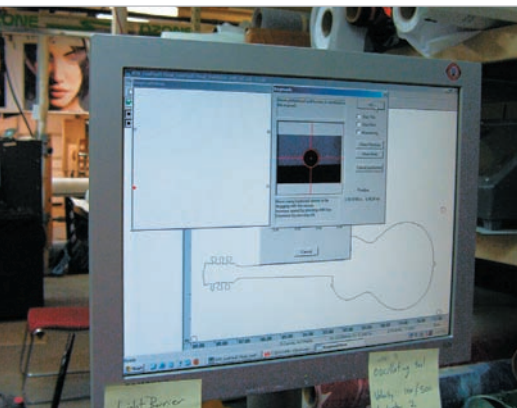
Look for a machine with an automatic depth sensor feature. I think this is crucial. We started without one so we had to set up the cutter for the proper depth for every single job. Not horrible, but every time we made a mistake with this system, we cut up the cutter's feed belt and had to replace it. Ouch, those belts are expensive!



## Automated Finishing

### NEW WORKFLOW

We've found that the best workflow is to have the same person who prepares the files for the RIP and for printing also be in charge of setting up a 5th plate with the vector line art for the cutter. He simply sends the whole file to the RIP, and then the RIP separates the CMYK plate for the printer, and the 5th plate for the cutter. This



Here you can see the i-cut software allowing the operator to control the exact placement of the registration dots.

provides for a fast and easy workflow. Ideally, the RIP outputs a standard EPS vector file for the cutter, so changes to the file can be made at the cutter (but not with proportional files).

If multiple shifts work with the cutter, see if the RIP can output a bar code for the cutter

to read. This is particularly helpful when multiple departments are creating graphics for the cutter. A bar code prevents picking the wrong file (easy to do). If a wrong file is selected, it won't be known until it's too late and the cutter just starts cutting. I had a graphic that I put into the cutter and when it starting cutting, it was upside down, so I got a pile of waste!

**Here is a chart comparing manual labor with a computerized router/cutter**

MANUAL LABOR	COMPUTERIZED ROUTER/CUTTER
\$17 per hour each plus benefits	Works for 120 volts
Vacations days	Does not take vacations
3-4 Sick days per year	Never gets sick
Overtime (1.5x cost)	Never gets overtime pay
Good days and bad days!	Never has bad days!
<b>Cost based on 8 hour days:</b>	<b>Cost based on 8 hour days:</b>
Per Month: \$13,600	Per Month: \$1,890 (\$11 per hour) to \$3,950 (\$23 per hour)
Per Year: \$163,200	Per Year: \$22,680-\$47,400
For 3 Years: \$489,600	For 3 Years: \$68,040 to \$142,200 (4th year is FREE!)

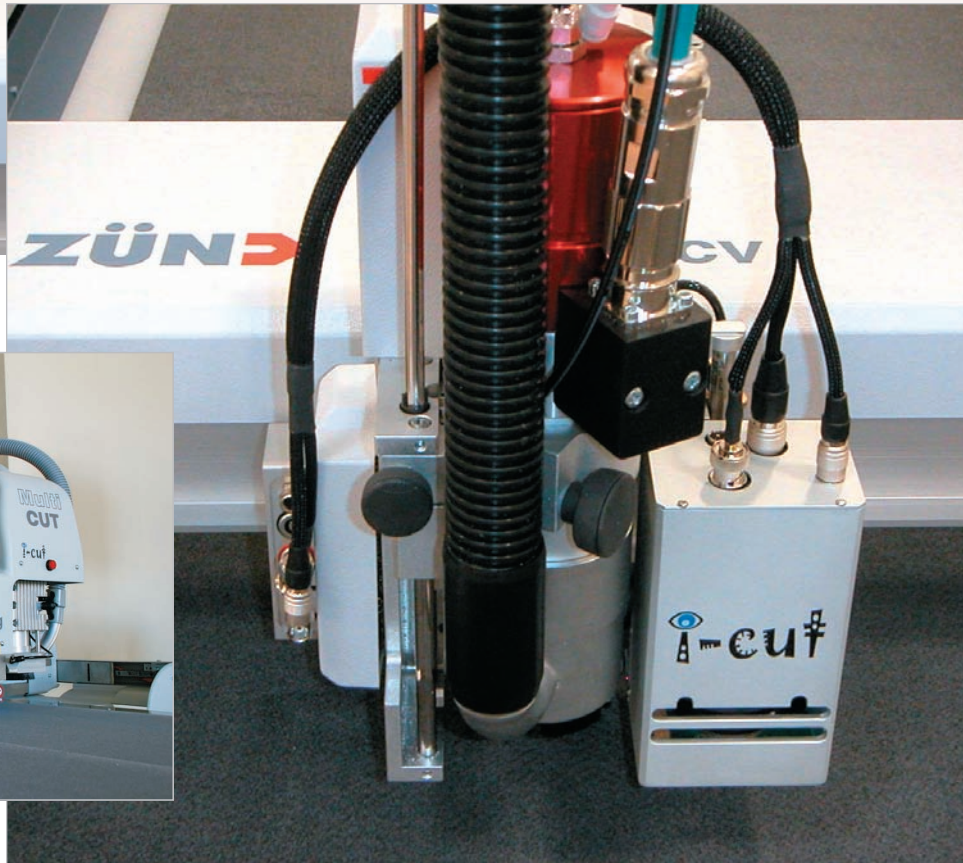
**Here are some companies that offer various flatbed computerized router/cutters.**

COMPANY	PRODUCT	WEBSITE
XYZ Solutions	CNC routers	www.xyz.com
Computerized Cutters	Accu-Cut	www.computerizedcutters.com
Esko Graphics	Kongsberg i-XL (with MultiCut toolhead and i-cut)	www.esko-graphics.com
Gerber	Saber Series	www.gspinc.com
MultiCam	5000 Series	www.multicam.com
Mikkelsen Graphic Engineering (MGE) (supports Zünd and Kongsberg cutters)	i-cut vision control system, i-script software	www.mge-us.com
Zünd	Zünd cutters (with i-cut)	www.zund.com
ShopBot	PRT Alpha	www.shopbottools.com
Techno Inc.	PC/LC/RG Series	www.techno-isel.com
Vision CES	2424/2428 CNC	www.visionengravers.com

### MONEY THOUGHTS

Expect to pay from \$40,000 to \$170,000 for a computerized router/cutter. When testing these machines we found the statement, "you get what you pay for," to be especially true. The tools wear out and break, so make sure you purchase *quality*. For example, two different knives are available for cutting 20-mil material — one is \$9 and the other is \$30 — trust me, the \$30 is *worth* it. Here's a tip: the money saved by buying a low-speed router tool will soon be lost by burning through a lot of router bits when you need to handle harder materials.

After you have the computerized router/cutter up and running, you will wonder how you ever did without it. Your sales people will now be able to say *YES!* to just about any job. Your throughput will increase, but your employee labor costs will not.



The Kongsberg MultiCut toolhead features a routing tool and a cutting tool, and also does automatic leveling.

The Zünd unit is also available with a router-only head.



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