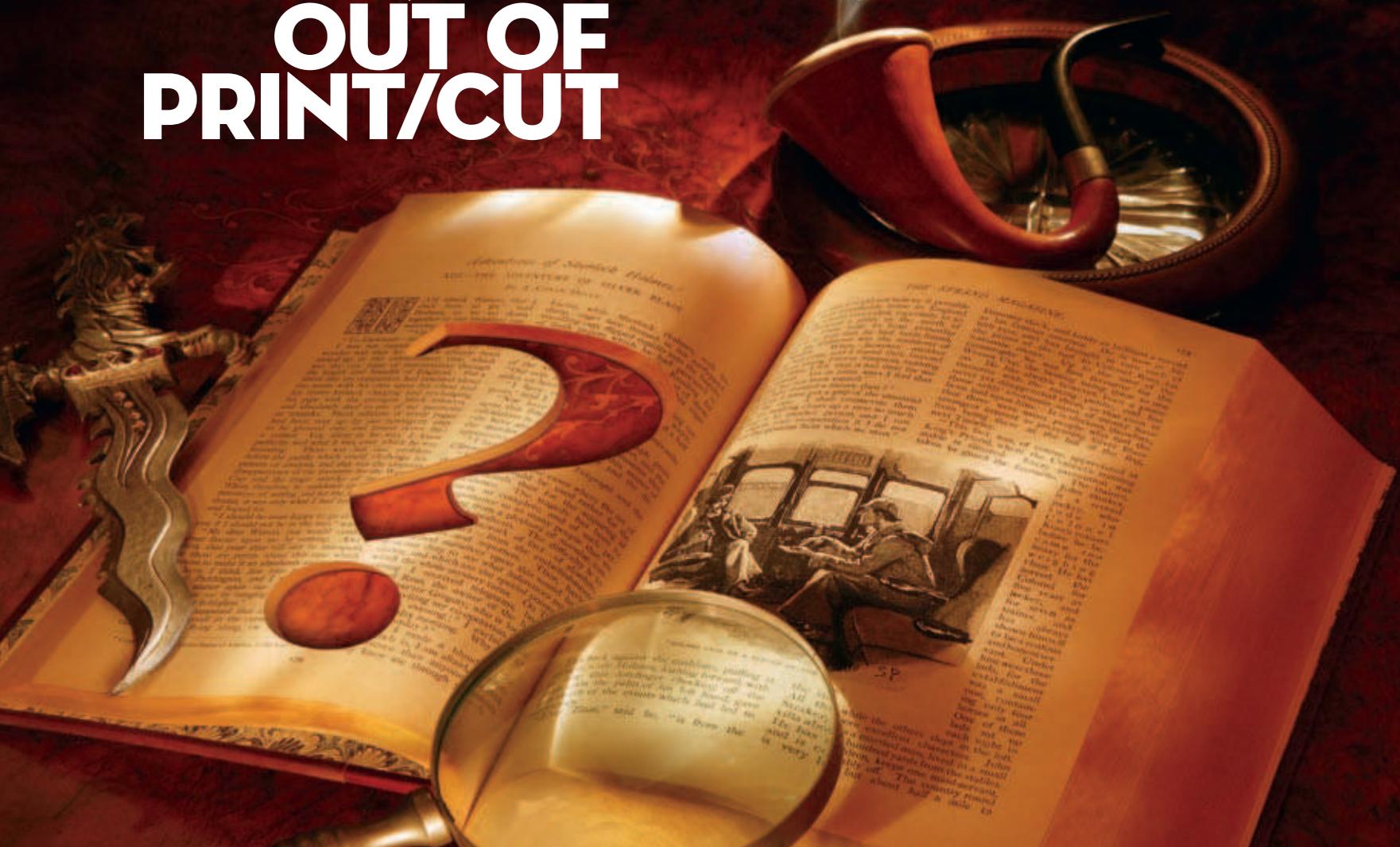


TAKING THE MYSTERY OUT OF PRINT/CUT



CLUES TO MAKING THE MOST OF INTEGRATED PRINT/CUT TECHNOLOGY





ROLAND UNIVERSITY PRESS



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THE GAME IS AFOOT!

**IN WHICH WE LAUNCH OUR INVESTIGATION OF
THE MYSTERIOUS BUSINESS OF PRINT/CUT PRODUCTION**



He picked up the thing, and gazed upon it in the peculiar introspective fashion which was characteristic of him. After a moment of silent contemplation, he ran his finger along it. Then, turning his features, if not his full attention, towards me, he remarked “Well Watson, what can you gather from an inspection of this item?”

“I can deduce nothing,” said I.

“On the contrary, Watson, you can deduce everything. You fail, however, to reason from what you see. You are far too timid in drawing your inferences.”

“Timid or not, I am at a loss. Tell me what it is that you can so readily infer from this work of art?”

For an answer, Holmes took the object from my hands and held his glass inches above the surface. He urged me to move in for closer inspection.

“I am Sherlock Holmes,” the great detective once remarked.

“It is my business to know.” At Roland, it’s our business to know digital print/cut. For the past decade, we’ve been leading the way with our award-winning legacy of ground-breaking digital devices, combining the finest printing technology with precise, unattended contour cutting.

And since we wrote the book on print/cut, we’ve decided to share it with you. Because the more you know, the more successful we’ll both be. The following pages break down several print/cut workflows that will boost your shop’s productivity, saving you time and money, and perhaps even open your eyes to some new business possibilities. You’ll learn special tips and tricks from experts in the field and get a sneak peek into their production environment.

UNLOCK THE MYSTERY

The greatest ongoing mystery of all time can be summed up in five short words: “How did they do that?” (or its close companion “Why can’t I do that?”) As graphic professionals, we’ve all stared in



fascination at a particularly striking image and tried to figure out exactly how it was produced.

In the past, the answer was often a complicated journey involving multiple, time-consuming processes that included hand painting, airbrushing, layered vinyl applications, masking, weeding and mounting frustration. Today, integrated digital print/cut technology has changed everything. Large, colorful signs are printed and cut in one seamless step. Simulated chrome, beveled edges and color blends that once needed to be produced over and over by hand can now be created once and reproduced quickly and easily any number of times.

WHAT CAN YOU DO WITH PRINT/CUT?

Perhaps a better question would be “What CAN'T you do with print/cut technology?” Print/cut is perfect for creating colorful decals and labels, banners, posters, vehicle and floor graphics, apparel decoration and just about any sign imaginable. With the advances being made every day in print/cut materials and

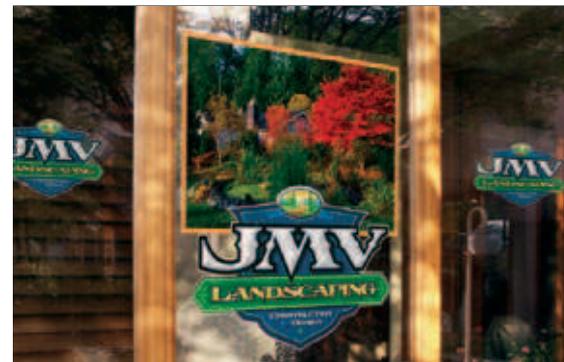


technology, the number of possible applications is expanding at a stunning rate. If you're not on the print/cut train, you're being left at the station.

BE MORE PRODUCTIVE THAN EVER

Vinyl isn't the only thing being cut by digital printer/cutters. Wasted time is being slashed. By eliminating hand processes and merging the tasks of multiple machines into a single unattended device, productivity explodes. Now you can take the same graphic and re-purpose it over and over again to a wide variety of applications and materials. The integrated technology makes it all possible.

Want to learn more? Dig into this book and discover the secrets. There is, after all is said and done, no great mystery to success.



A dark green tweed hat with a ribbon and a brass pocket watch on a red textured background.

IT'S ELEMENTARY

**IN WHICH WE DISCOVER THE
FUNDAMENTALS OF PRINT/CUT PRODUCTION**



Clearing my throat a bit too dryly, I took the object from his extended hand. The design was printed in startling detail and vibrant color. Most baffling of all, the letters were cut out precisely along their stroked edges, with no hint of misregistration. “Such precision is not possible by human hand,” said I, handing it back to my friend. “The cutting is perfection itself.”

“Is it possible that even now you are unable to see how they are attained?”

“I have no doubt that I am very stupid; but I must confess that I am unable to follow you. How can the design be outlined so precisely? Surely it must take hours upon hours to achieve such remarkable accuracy.”

He smiled at once. “For you, and perhaps even myself. But not for Roland.”

“Roland?” I repeated hollowly. “Who the devil is this miracle artisan Roland?”

The pursuit of any mystery begins with a solid understanding of the facts. You must gather all of the available information and make yourself readily familiar with it before you can even begin to pursue a reasonable solution. This discovery of the facts is what Chapter One of a mystery is for...and there's a good reason it comes at the front of the book. The rest of the tale rarely makes much sense without it.

WHAT'S IN THIS SECTION?

In this section, we begin our investigation with an introduction to the elementary aspects of print/cut production. Here you'll discover step-by-step breakdowns of the most common workflows used in print/cut jobs, see how to set up a digital file for print/cut production, and gain an understanding of the choices in media and inks used in digital printing and cutting.

We'll start at the very beginning. A very good place to start.



KNOW YOUR MODUS OPERANDI

THE BASIC WORKFLOWS OF PRINT/CUT PRODUCTION

PICK YOUR SOLUTION FIRST

Nothing is as complicated as it seems at first glance. The final solution to even the most complex mystery is usually right under your nose from the beginning. You simply have to avoid the dead ends, red herrings and wild goose chases that can lead you in a thousand fruitless directions.

It's no different with print/cut production. The solution to a challenging process that can often become wildly complex and time-consuming is deceptively simple.

Integrated printer/cutters provide unattended printing and contour cutting on a single device. With their integrated design, printer/cutters streamline the production process, improve accuracy, and nearly eliminate the need to reload and reposition graphics, saving untold man hours and reducing costly mistakes.

As Holmes would say, "Why look for two solutions, when one will do quite nicely?"



FIGURE 1



FIGURE 2



FIGURE 3

PRINT/CUT WORKFLOW

An integrated Print/Cut Workflow solves the print/cut mystery in simple steps. Open a digital file and set cut paths in the software. Then send the graphic to the printer/cutter, where it is automatically printed and contour cut. Graphics come out ready to sell or weed and apply.

1. Set up your artwork with print data and cut paths. (Fig. 1)
To assure full bleed on your image, you may add a 1 pt. bleed to the outside edges of your design.
2. Send the artwork to the print/cut device for printing and cutting in a single step. (Fig. 2)
3. Weed excess vinyl from the graphic and apply. (Fig. 3)

“The time savings is enormous and the profit potential is unreal,” says Dan Antonelli of Graphic D-Signs. “The first print out of our Roland machine was right on the money. The possibilities were flying around in my head... labels, packaging, truck graphics, see-through window lettering. All at photo-quality resolution.”



PRINT/LAMINATE/CUT WORKFLOW

For jobs requiring extra durability, use overlamine films. In this Print/Laminate/Cut workflow, printed graphics will be removed from the printer/cutter, laminated and reloaded for cutting. This two-step process is best performed with an integrated printer/cutter. A single device will more easily achieve proper registration and turn out cut lines with more precision.

1. Set up your artwork with print data and cut paths.
Once again, to assure full bleed on your image, you may add a 1 pt. bleed to the outside edges of your design.
2. Send the artwork to the printer/cutter for PRINT ONLY with Quadralign™ optical registration marks added. (Fig. 4)
3. Remove the printed graphic from the printer/cutter.
Apply a laminate film to the printed graphic. (Fig. 5)
4. Reload the laminated print into the printer/cutter. (Fig. 6)
Automatically align registration marks with Quadralign. (Fig. 7)
5. Send CUT information only to contour-cut the graphics.
The optical registration system automatically realigns the



FIGURE 4

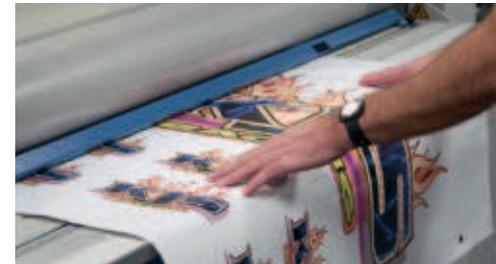


FIGURE 5



FIGURE 6



cutting path and compensates for any skew and distortion which may occur during lamination.

6. Weed excess vinyl from the graphic. (Fig. 8)
7. Apply transfer tape and install. (Fig. 9)

PRINT/CUT/CLEARCOAT WORKFLOW

Adding liquid clearcoating provides short-term sun, moisture and abrasion protection. Liquid clearcoats are often used on vehicle graphics to take the abuse of car washing, scuffing, and daily wear and tear. For a Print/Cut/Clearcoat workflow, see page 27.

PRINT/CUT/LAMINATE/CUT WORKFLOW

Some applications require different cut lines for the printed vinyl graphic and the laminate which protects it. This allows you to have laminated “windows” cut out of the graphic, or to have laminate material extend beyond the perimeter of the graphic, allowing it to be applied without the use of edge tape. To create these applications, you will print once and cut twice, using a Print/Cut/Laminate/Cut workflow. See page 33 for details.



FIGURE 7



FIGURE 8



FIGURE 9



LEAVING A TRAIL TO FOLLOW

SETTING UP A FILE FOR PRINT/CUT PRODUCTION

The best print/cut files begin with a great piece of art. It can be anything from a simple logo to a complex combination of photography and type. It can be 1/2" tall or 30 feet wide. It should have personality, color, detail, and most important, a definitive shape that takes advantage of the impact of print/cut production.

To turn your art into a print/cut graphic, you'll add a spot-color Cutting Path that tells the RIP or device driver exactly where you want your final cut lines. There are some specific guidelines you need to follow in order to make sure that the driver recognizes your cut path and accurately processes it.

WHAT PROGRAMS TO USE

For best results, most print/cut pros recommend vector-based graphics programs such as Adobe® Illustrator® and CorelDraw®. The biggest advantage of vector artwork is that it is resolution independent, so graphics can be reprinted at virtually any size. You may think you're only doing a t-shirt design, but the client may love it so much they want to put it on their truck next month.



THE BASIC SETUP OF A PRINT/CUT FILE

1. **Create your original artwork.** It may be a vector image, or a combination of vector and bit-mapped elements. (Fig. 1)
If there are bit-mapped images included in the file, be sure to build the file at the proper size and resolution for your final desired output (see page 19 for guidelines).
2. **Define the final cutting path.** Create a path that defines the exact shape where you want all cuts to occur, including the perimeter contour cut and any cutouts within the graphic. (Fig. 2)
3. **Apply a Spot Color to the path.** This is the most important step. In order for the RIP software to recognize this as a cutting path and not a shape to be printed, you need to create a Spot Color swatch called “CutContour” (Fig. 3) and apply it to your cutting path. (For details, see page 17)

Once you’ve applied the “CutContour” spot color to your image, the cut path line will appear as a colored line on your screen. Don’t worry. When you send the file to a Roland

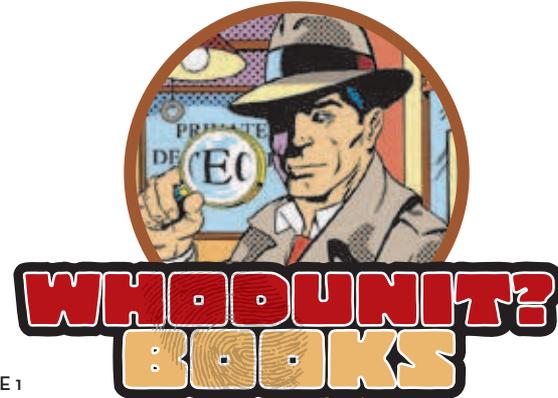


FIGURE 1

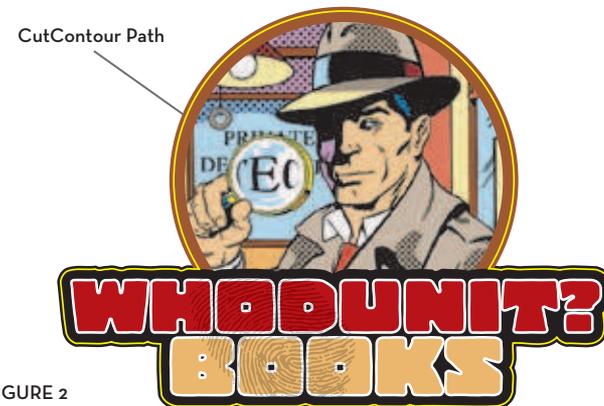


FIGURE 2

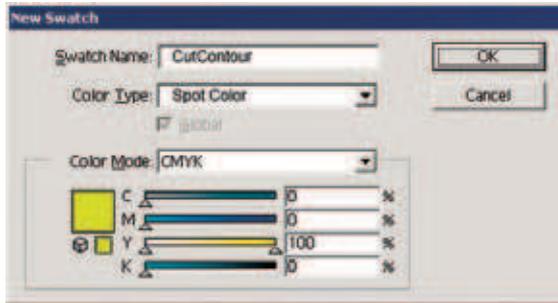


FIGURE 3



FIGURE 4

- printer/cutter, the RIP will replace this color with “marching ants” along the cut path, and it will not appear on the print.
4. **Add a bleed to your image.** To avoid white hairlines and ensure a clean edge to your final print/cut graphic, you may add a bleed to the outside edges of your artwork. (Fig. 4) Anything from a 1 pt – 3 pt line works very well.
 5. **Save your artwork.** When finished, save as a .ps, .eps, or .prn file.

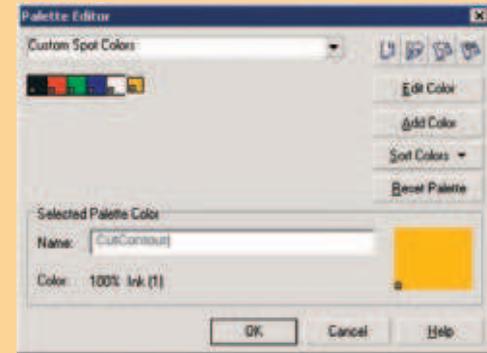
COLOR MODE

It's always best to work on digital print projects in the RGB color mode, rather than CMYK. Your digital printer is capable of printing a much larger gamut of colors than that available in the CMYK mode, so creating your file in RGB and leaving it in that color space allows you to take full advantage of the color gamut of the printer. Working in RGB also reduces overall file size by up to 25% over CMYK. Do not create images in LAB or Indexed Color. Convert any images in these modes to RGB before beginning production.



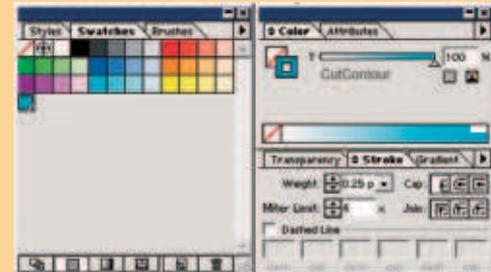
CREATING A CUTCONTOUR SWATCH IN CORELDRAW®

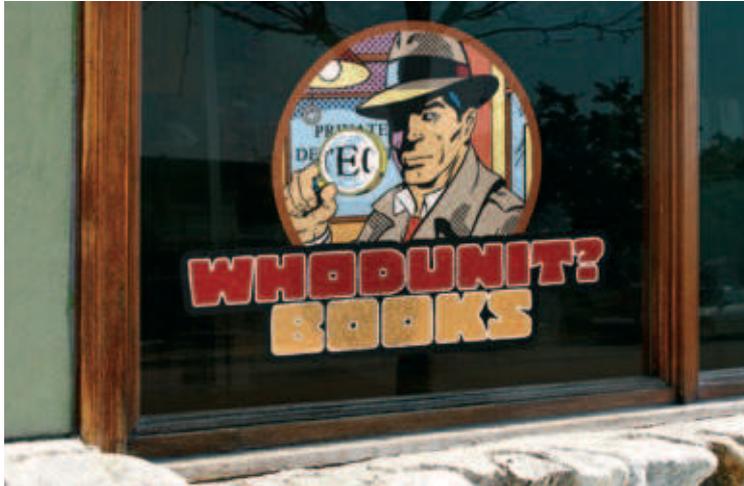
1. Click on **Tools** and select **Palette Editor**.
2. From the drop down menu select **Custom Spot Color**.
3. To create a new Spot Color, click on **Add Color**.
4. In the Select Color window, click on **Mixers**.
5. Select any color you want from the color wheel. Click on **Add to Palette**.
6. Change the name of the Selected Palette Color to **CutContour**, click on **OK**.
For the RIP to recognize the Cutting Path, the name must be CutContour, spelled exactly as it appears.
7. To apply the CutContour spot color to your artwork, click on the **Outline Pen**.
8. Select the CutContour spot color. Width should be set to **Hairline**.



CREATING A CUTCONTOUR SWATCH IN ILLUSTRATOR®

1. Click on **Window**, select **Show Swatches**. Click right arrow, select **New Swatch**.
2. The Swatch name must be **CutContour**. The Color type must be **Spot Color**.
3. The color values for the swatch may be set to any you choose.
4. From the **Stroke** tab, use the following settings: Weight .25; Miter limit 1;
Transparency: Normal Opacity at 100%.





WORKING WITH A PHOTOSHOP FILE

In addition to working with photos, many artists use Adobe® Photoshop® to add photorealistic “airbrushing” and 3D effects to images originally created as vector art. But be careful. Once the file is brought into Photoshop, you are limiting your image resolution. Be sure to make the file as large as you think you may ever need it. This can mean a great looking image, but the price tag can be a huge graphic file.

Once you have worked on the image in Photoshop, you’ll need to bring it back into a vector program to add your Cutting Path.

You may receive a customer’s logo as a flat jpeg or tiff file and need to create your own cutting path. While you can always open the file in your vector-based program and create the path by hand, you may want to try the following shortcut:

1. Open the file in Photoshop.
2. Use the **Magic Wand** or **Magnetic Lasso Tool** to select all of the negative space around the logo.
3. Choose **Select, Inverse**. Now your selection represents the outer perimeter of the logo itself.
4. In the **Paths** palette, choose **Make Work Path**. This creates a path that follows the contours of your logo. Save this path.
5. Use the selection tool to copy the path to the clipboard.
6. With the tool still on the clipboard, open the logo file in your vector-based program. Paste in the path.
7. Use pen tools to fine-tune the path. Color the stroke with the Spot Color called **CutContour**. Save file as an .eps.



IMAGE RESOLUTION

If you're working with a vector image, resolution is not an issue. It can be re-purposed to any size and print setting with no impact on image quality. For bit-mapped images, however, the resolution of the original file determines the limits on the final print size and quality. You need to consider the final use of the graphic, and whether it may be re-purposed later, when creating a bit-mapped file. As a general rule, your image resolution in pixels-per-inch (ppi) should be about 1/4 your desired dots-per-inch print resolution (dpi). For example, if you plan to print at 720 dpi, your image file should be built at 180 ppi at actual size. Another way to determine the appropriate resolution is to consider viewing distance, as the following chart illustrates.

VIEWING DISTANCE AND IMAGE RESOLUTION

Distance	Resolution
Less than 1 ft	180 ppi
1 to 4 ft	150 ppi
5 to 9 ft	100 ppi
Over 10 ft	50 ppi

WHAT HAPPENS IN THE RIP

Once your print/cut graphic is built, your Roland RIP software (COLORIP® or VersaWorks™) will provide you with a multitude of options for working with that graphic. Most importantly, your RIP will recognize the CutContour spot color and convert anything it is applied to from a printing path to a cutting path.

You may use the RIP software to resize, mirror, or tile the graphic, to print/cut any number of multiples of the graphic, or to nest several jobs together. If you're printing multiple images using the Auto-Nesting or Manual Print Layout features, the cutting path will be correctly duplicated and registered for every copy.

You will use your RIP software to define the resolution and print quality of your finished print. Your RIP software contains a complete spectrum of predefined color profiles designed to produce the best possible results by adjusting the number and placement of ink droplets to precisely coordinate with the media and resolution being used on the job.



THE TOOLS OF THE TRADE

INVESTIGATING THE CHOICES IN PRINT/CUT MEDIA AND INKS

If you hand Mr. Holmes a battered hat found at the scene of a crime, he will peer at it for an instant before rattling off the country of the fabric's origin, the year the hat was purchased, and the brand of tobacco favored by the haberdasher who sold it.

Likewise, if an experienced print/cut pro takes a look at a finished graphic, he'll quickly analyze the specific types of inks and media used to produce it. That's because an understanding of the media and inks used in print/cut production are the keys to unlocking the mystery of consistently superior results.

A LIBERAL MEDIA EDUCATION

The majority of digital print/cut graphics are printed on adhesive-backed vinyl. Traditionally, there have been two primary types of vinyls used: cast and calendered.

Cast vinyls are very dimensionally stable and offer excellent durability. They are generally more opaque than calendered vinyls, but are also more expensive. Cast vinyls are conformable and tear-



resistant so they are ideal for a wide variety of durable graphics. Many cast vinyls offer sophisticated adhesive systems, which makes them the preferred choice for fleet and vehicle graphics.

Calendered vinyls are generally less expensive than cast vinyls, but they are also less durable, less dimensionally stable and less conformable. They are ideally suited to outdoor promotional graphics, especially those applied to flat or simply curved surfaces.



COATED AND UNCOATED MEDIA

Most adhesive-back digital print materials, including paper and polyester, come in both coated and uncoated versions. Coated media has been designed primarily for water-based inks, including pigment inks. There are a wide variety of types, and many work with mild solvent inks as well. The limiting factor is that coated media is much more susceptible to abrasion and chemicals than uncoated media, and generally requires an overlamine film to properly protect the image. Additionally, coated vinyl is not recommended for true fleet applications with complex curves, rivets and indentations.

Uncoated media are a great option for mild solvent ink printing, especially for print/cut graphics and certainly for all types of fleet and vehicle graphics. Uncoated media are generally less expensive and can be finished with either liquid clear coating or overlamine films. There are a wide range of cast and calendered vinyls that offer excellent print results for a fraction of the cost of coated media.



HEAT TRANSFER MATERIAL

There are many types of print/cut heat transfer material for garment applications. The Roland branded PCM-HTM Opaque Heat Transfer Material is unique in that it prints and cuts as easily as vinyl and transfers to a garment in less than 10 seconds. Bright, colorful images printed with pigment, mild solvent or even sublimation ink can be transferred to cotton or cotton blends using a standard heat press.

UNDERSTANDING INK TYPES

There are a wide variety of ink types on the market today, but they generally fall into two categories: water-based or solvent-based inks.

Water-based inks include both dye-based and pigment-based inks. Dye inks offer excellent color gamut but generally very short-term longevity, especially outdoors. Pigment inks offer good color gamut and density and excellent longevity both indoors and out; as long as 130 years indoors and over 4 years outdoors (with lamination). Generally the limiting factor with water-based inks is the need for coated media (see Coated And Uncoated Media, page 21).

Within solvent-based inks, there are mild solvents and standard or hotter solvent ink types. Mild solvent inks offer a good color gamut, along with the bonus of printing on coated and uncoated media. Mild solvent inks last up to 3 years outdoors without lamination or 5 years outdoors with lamination. Additionally,



sheet and transfer into the surface of a second substrate using a heat press. These inks are used for a variety of applications including fabric banners, sports jerseys, and specialty items such as mugs and license plate frames.

mild solvent inks are environmentally friendly and typically do not require any special handling or additional ventilation. Hotter solvent inks print very well on uncoated media, but they require special handling and ventilation equipment.

Sublimation inks are a special category of water-based inks. They are heat activated and are designed to print onto a carrier



KILLER TIPS AND TECHNIQUES

**IN WHICH REAL WORLD EXPERTS REVEAL THE
HIDDEN SECRETS OF INTEGRATED PRINT/CUT SUCCESS**



Sherlock Holmes laughed. “Not who, precisely, but what!” He showed me again the decorative letters with their gradients and precisely stroked edges.

“Notice the dots used to create this image, they vary in size from one part of the image to the next. Subtle colors can be made only by the use of variable dots such as these.”

“Yes, variable dots, of course. I see,” said I, not seeing at all. “How were such dots created?”

“By Roland, of course!” With growing excitement, Holmes clapped his hat upon his head. “Come with me my dear Watson, and I will show you such a demonstration of innovative engineering the likes of which you have never seen.”

“Engineering? What have trains got to do with this case?” I gasped, pulling on my coat and dashing to keep up with the long strides of my rapidly departing companion.

The facts of the case are laid out in the safe confines of the drawing room. Now it's time for the dangerous business of going out into the real world. That's where the obstacles will arise, the most telling clues will be uncovered, and where the the solution will ultimately be revealed.

WHAT'S IN THIS SECTION?

In this section, we present a comprehensive collection of real world expertise...step-by-step techniques from savvy artists and professionals who make their living every day with digital printing and cutting. You'll hear from Mike Richford about adding durability to your work with lamination and clear coating. Skip Grant goes into exacting detail about digital production of decals and labels. Dan Antonelli shows you how to produce digital apparel graphics. And vehicle graphic gurus Jim Conquest and Jay Lansburg share their favorite tips and techniques.

Welcome to their world.



THE CASE CALLS FOR FURTHER PROTECTION

USING LIQUID CLEARCOATS AND FILM LAMINATES FOR ADDED DURABILITY

“People like to touch,” says Mike Richford of Design Air. “In my line of work, people can’t just look at things. It’s human nature. They say wow and put their hands all over it. Durability is critical.” An artist by nature and a product of the digital age, Richford uses digital print/cut technology to produce durable powerboat and marine graphics. “When I’m done, people don’t know if my graphics are airbrushed art or printed vinyl,” says Richford. “They look that good!”

Once his graphics are printed and cut, he adds an extra level of protection against abrasion, moisture and UV light with liquid clearcoating or overlamine films.

DRY TIME, CURE TIME

“Dry time” and “cure time” are not the same measure. The first is the time it takes for inks to feel dry to the touch—for which most inkjet media, when properly profiled, happens in minutes. Cure time, on the other hand, is the time it takes for the ink to outgas, and is dependent on the media being used and environmental



conditions. Mike generally lets the ink sit for a few hours before clearcoating his graphics to ensure proper curing of the ink and to prevent any runs or smears.

WORKING WITH LIQUID CLEARCOATING

For the majority of his graphics, Mike Richford uses a liquid clearcoat. Once his graphics are properly cured, he applies the clearcoat BEFORE weeding the graphic.

For basic protection, follow the Print/Cut/Clearcoat workflow:

1. Setup your artwork with print data and cut paths. (Fig. 1)
2. Send the artwork to the print/cut device for printing and cutting in a single, unattended step.
3. Remove the graphic and spray it with a UV clearcoat. It is best to apply two light coats rather than a single heavy coat. This avoids runs and tackiness. (Fig. 2)
4. Weed unwanted vinyl from the graphic while it's still wet. (Fig. 3) Allowing clearcoat to dry can make the cut edges



FIGURE 1



FIGURE 2



FIGURE 3



FIGURE 4



FIGURE 5

- meld together if the spray has been applied too heavily. If the graphic is weeded prior to coating, the clearcoat can create an undesirable raindrop effect on the liner, which can be messy when trying to apply transfer tape. (Fig. 4)
5. If time permits, allow the coated graphic to dry overnight. Apply transfer tape and install. (Fig. 5)

For mild-solvent inks, be sure to select a solvent-based liquid laminate designed for inkjet prints. There are several popular brands available. Aerosol cans are convenient for smaller graphics. Quart sizes of the same products allow you to spray larger graphics with a detail gun.

“I use an automotive clear,” Richford says. “It’s a catalyzed urethane, so it’s incredibly tough. The graphic will actually pull apart before you can scratch the print off.”

For water-based pigment inks with coated media, choose a water-based liquid laminate designed for inkjet prints. It is



important to note that solvent-based laminates can crack and yellow when used with water-based inks and coated media.

WORKING WITH OVERLAMINATE FILMS

Overlamine films are often necessary on graphics requiring outdoor durability of greater than a year, or for applications that must withstand harsh environments, like vehicle and floor graphics. The films provide a variety of finishes and allow for easier cleaning of the graphic.

An integrated printer/cutter will more easily achieve proper registration and turn out cut lines with more precision than a two-device solution.

1. Setup your artwork with print data and cut paths.
2. Send the artwork to the print/cut device for PRINTING ONLY with Quadralign registration marks added. (Fig. 1)
3. Remove the printed graphic from the printer/cutter. Apply a laminate film. (Fig. 2)



FIGURE 1

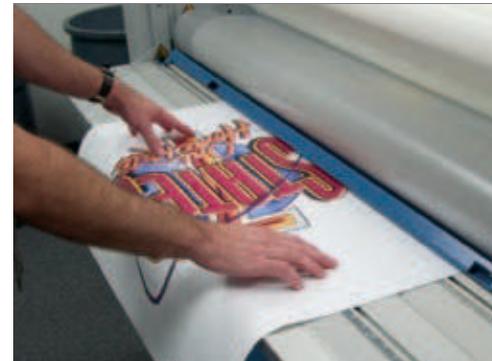


FIGURE 2



FIGURE 3

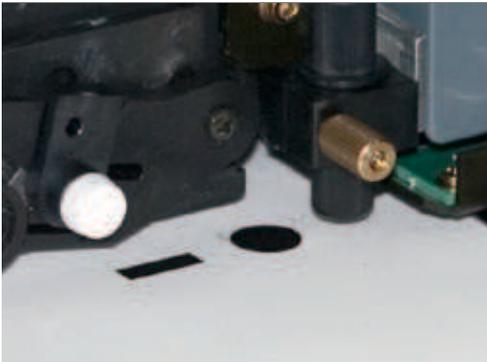


FIGURE 4

4. Reload the laminated print into the printer/cutter. (Fig. 3)
Align the optical registration marks with Quadralign. (Fig. 4)
5. Send CUT ONLY information to contour cut the graphics.
The optical registration system automatically realigns the cutting path and compensates for skew and distortion.
6. Weed excess vinyl from the graphic. (Fig. 5)
7. Apply transfer tape and install.

There are many different types of overlamine films, but they generally fall into two categories: pressure-sensitive adhesive (cold) or thermal adhesive (hot). For print/cut applications using adhesive-backed vinyl, pressure-sensitive films are always recommended. Thermal films will stretch and potentially harm the printed vinyl graphic.

Vinyl (PVC) generally has more flexibility than other types of laminate films such as polyester or polypropylene. Cast vinyl is the best type as it is relatively thin and maintains its shape over time. This thin gage is necessary for conforming to the complex



curves, rivets and indentations that you would find on vehicle graphics.

EDGE SEALING

Edge sealing helps protect graphics against moisture, dirt, oils and edge lift. The type of edge seal used will vary depending on the technology used for the graphic and its ultimate use. Edge sealing is required for water-based prints on coated media, but is optional with solvent prints on uncoated media.

Types of edge seal include:

1. An overlapping edge of overlamine film to seal the graphic. (Fig. 6) Use the Print/Cut/Laminate/Cut workflow described on pages 33-35.
2. Edge seal tape
3. Edge seal liquid (not for water-based inks and coated media)



FIGURE 5



FIGURE 6



UPON CLOSER INSPECTION

THE SCIENCE OF DIGITAL LABEL PRINTING

A certain Baker Street detective always believed that the best way to solve a mystery was the application of the scientific method. In Saratoga Springs, NY, Skip Grant of Grant Graphics has refined label making to an exact science. He produces labels, custom contour-cut decals, graphic overlays, industrial markings, serial-numbered decals, sports logos and domed labels. He does all that with a pair of Roland SOLJET printer/cutters.

Rapid advances in digital print/cut technology are transforming the business of label and decal printing. Digital printing allows you to easily incorporate color matching, variable data and multiple layout variations. Short runs become cost-effective, and even one-ups and initial proofs are production quality.

“Without integrated print/cut technology, our digital label-printing department would be out of business,” says Grant. “It allows us to create high-quality digital labels and decals of any size, shape, color and quantity without needing to get a die made.”



Depending on the complexity of the job, Grant uses one of five different print/cut workflows.

BASIC SCIENCE: SIMPLE PRINT & CUT

For basic label and decal jobs, Grant uses a simple Print/Cut workflow. For more details about this workflow, see page 11.

ADD DURABILITY WITH LAMINATION

For jobs requiring extra durability, a Print/Laminate/Cut workflow is used. He prints the job with optical registration marks, removes it for lamination, and reloads for automatically-aligned contour cutting. See page 12 for workflow details.

CREATE A GRAPHIC WITH CUTOUTS AND WINDOWS

The ability to accurately print, laminate and reload for contour cutting opens up the possibilities for all kinds of complex and detailed label applications, including graphic overlays with cutouts and windows. These can be used for instrumentation panels, packaging, and many more applications.

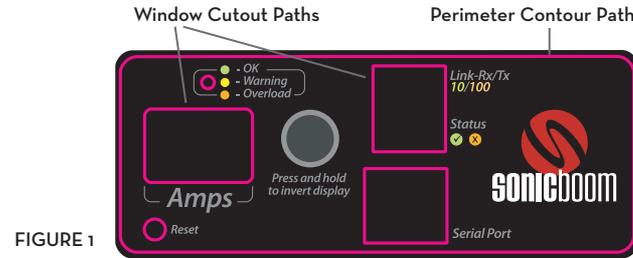


FIGURE 1

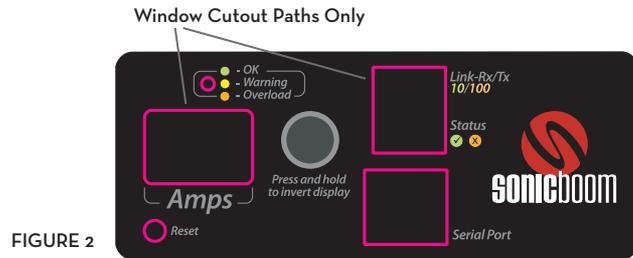


FIGURE 2

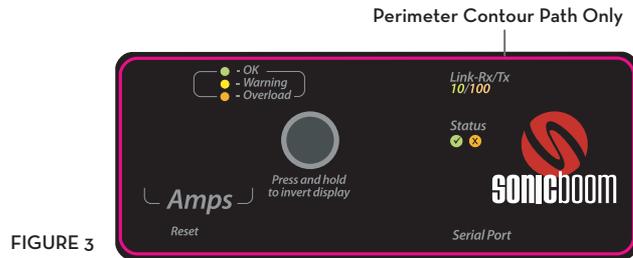


FIGURE 3



FIGURE 4



FIGURE 5



FIGURE 6

To create these overlays, you're going to print once and cut twice using a Print/Cut/Laminate/Cut workflow. First, you'll print the graphic and cut the windows, and then you'll make a different cut in the laminate, making the final contour edge cut.

1. Set up the vector artwork on screen with two sets of cut paths. (Fig. 1, previous page) The first set of paths represent the WINDOW CUTOUT vectors. These are the paths that will be cut through the printed vinyl, but not the overlamine - creating a 'window'. The second cut path defines the ultimate finish CONTOUR CUT through the laminate and vinyl.
2. Using the clipboard, cut away the paths that represent the finish cut through the laminate vinyl.
3. Save the file (with the window-cutout paths in place) as your first .eps file. (Fig. 2, previous page)
4. Paste back the CONTOUR-CUT vectors. Remove the WINDOW CUTOUT vectors. Re-save as a second .eps file. This file contains the shapes that get cut all the way



FIGURE 7



FIGURE 8

5. Print and cut the first file with Quadralign optical registration marks.
6. Weed away the vinyl where the windows will be. (Fig. 4)
7. Laminate the graphic with pressure sensitive vinyl or polycarbonate film. (Fig. 5)
8. Reload onto the print/cut device and align cropmarks with Quadralign. (Fig. 6)
9. Send CUT information for the second .eps file. This will cut all of the desired contours and cutouts through both the vinyl and laminate.
10. Weed the graphic (Fig. 7) to reveal finished decal with laminated windows. (Fig. 8)

“People struggle with Lexan® panels and overlays,” says Grant. “An accurate print/cut device is extremely versatile in managing print and die-cut components done digitally! A solid understanding of the workflow allows you to do these en masse, with precision and confidence. Get good at it - it’s worth it!”



CREATE INSIDE WINDOW GRAPHICS WITH POP

How do you make a decal applied on the inside of glass really jump out through the other side? Grant uses the old “Reverse Print With White Backer” trick. He prints the graphic in reverse on clear, laminates with white vinyl as a backer, then cuts from the registration dots from the original ‘clear layer’. This creates a reverse print decal for the inside of the glass that is backed with white to make colors bright and vibrant.

“Decals for the inside of glass can look far better with this trick,” says Grant. “Instead of just printing reverse on clear, which looks washed out, we back it with white to make the colors vibrant and readable!”

1. Save the graphic along with cut path as an .eps file.
2. PRINT ONLY in reverse (mirrored) onto clear vinyl with Quadralign optical registration marks added. (Fig. 1) Be sure to disable cutting so it prints, but does not cut!
3. Remove printed graphic from the print/cut device.



FIGURE 1



FIGURE 2



FIGURE 3



4. Cut a white sheet of vinyl to laminate over the clear. Cut it down to a size so that as you laminate over the clear print, it completely covers the graphic, but does not cover the optical registration marks originally printed onto the clear vinyl. (Fig. 2)
5. Laminate the white vinyl onto the clear vinyl, leaving the optical registration marks exposed.
6. Reload the laminated print into the print/cut device. Align the optical registration marks with Quadralign. (Fig. 3)
7. Send CUT ONLY information to cut the decal contour through both the white and clear vinyls.
8. Weed finished print/cut graphic. (Fig. 4)
9. Install finished graphic on the inside of window. (Fig. 5)



FIGURE 4



FIGURE 5



TWO-SIDED DECALS WITH TWO DIFFERENT STORIES

Grant also produces decals for the inside of glass with different text on each side. “This is definitely an advanced trick that you can master with a little practice,” said Grant. “You may not want to do thousands this way, but short runs are just fine!”

1. Start by laying out the first side. Include your contour cut. Add an outside rectangular box with a thin black outline and no fill. (This is to help register the two sides later on.)
2. COPY the entire graphic and box and PASTE it side by side. If different text is desired on one side, change the text, but make sure it remains within the same overall contour-cut shape.
3. Select the graphic which will be viewed through the front of the window. MIRROR this graphic, including the rectangular border which surrounds it. (Fig. 1) Save this reversed image only as a new file with a name such as DecalREV.eps.
4. Save the other – right-reading – graphic as a new file with a different name (i.e. DecalWHITE.eps).



FIGURE 1



FIGURE 2



FIGURE 3



FIGURE 4



FIGURE 5



FIGURE 6

5. Send the reversed file to PRINT ONLY on clear vinyl. (Fig. 2) Take the print out of the print/cut device.
6. Put in light-blocking white vinyl and PRINT ONLY the right-reading file with Quadralign crop marks. Do not cut. Remember to use the same step and repeat structure if you are doing multiples. The cut info for this job is in the cutting queue waiting for you to get it later. Take the print out of the print/cut device.
7. On a worktable or lightbox, lay the white vinyl printed side down. Position the clear vinyl print side down on top of the white. Match up the rectangles and use transfer tape to hinge it in position. (Fig. 3) The printed side of your clear vinyl should be facing the backing of the white vinyl.
8. Carefully peel back (Fig. 4) and trim (Fig. 5) the backing paper from the white vinyl only. Be sure to trim the backing outside of the finished contour-cut area, but leave enough white vinyl to allow you to hinge the graphic.
9. Laminate the white to the clear. (Fig. 6)
10. Put the piece back into the machine and have Quadralign



automatically realign the optical registration points on the white vinyl print. (Fig. 7)

11. SEND cut only for the white vinyl file. Remember to set your cut depth deep enough to cut through both layers.
12. Weed the finished graphic. Voila! You now have REALLY COOL double-sided decals! (Fig. 8)
13. Apply to the inside of a window, with the clear side facing out. (Fig. 9)



FIGURE 7



FIGURE 8

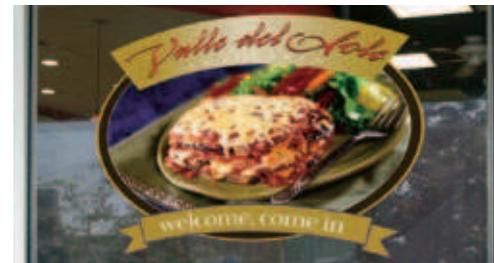


FIGURE 9



DRESSED TO KILL

PRODUCING CUSTOM APPAREL WITH YOUR DIGITAL PRINTER/CUTTER

Dan Antonelli of Graphic D-Signs specializes in killer graphics. Custom logos and truck lettering that scream with color and dimension. When he first got his Roland printer/cutter, he was only interested in using it to create signs and vehicle graphics. He knew it could produce heat transfers, but he had never really considered using it for short-run custom apparel.

For years, customers had often asked if he did screenprinting, and he always turned the work away. But he discovered that digital print technology gave him the ability to offer small quantity, full color t-shirts and apparel...at a profit! It was an ideal new product line for clients who loved the logos and custom lettering Antonelli had created and wanted to order a handful of t-shirts.

At first Dan worried about color. Would the color on the monitor match the output, or would he have to spend weeks calibrating the machine to death? All that changed when he put it to the test. "The first prints off the machine were right on the money," he says. And Dan Antonelli had a new product line.



GETTING STARTED

If you're already using digital print/cut technology, it's easy to get started in the custom apparel market. One of the biggest selling points is the full-color printing capabilities.

With digital printing you're not limited by spot colors, so you are free to include as much detail as you want in a design. You can use the same image files created for other digital printing projects without having to reconstruct them for screenprinting. There are no screen charges or setup fees, so pricing is competitive on full-color short-run work. You also have the benefit of true photo-realistic printing. The ability to contour cut avoids the "square-block" look and avoids unnecessary background.

All you need to get started is your printer/cutter and specialized media called Heat Transfer Material (HTM). HTM is specifically designed for inkjet transfers to cotton or cotton blend garments, which makes it ideal for t-shirts, sweatshirts, bags, hats and other fabric items. HTM is an opaque media, which means you

can use it on dark garments as well as light ones. It works with a wide variety of ink types including pigment and mild solvent inks. HTM prints and cuts very well and delivers outstanding color saturation.

Antonelli recommends getting started by finding a good wholesale apparel supplier. They'll usually have a catalog you can use to help clients select the right garments for their job. "You should probably get a heat press, as well," he says. "I've tried using an iron, but that didn't work very well."

Dan Antonelli (Graphic D-Signs Inc) writes for SignCraft Magazine.



FIGURE 1



FIGURE 2



FIGURE 3

PRODUCING CUSTOM APPAREL DECORATION

To create custom apparel with your inkjet printer/cutter and Heat Transfer Material, use the following workflow:

1. Setup your artwork with print data and cut paths.
2. Send the artwork to the print/cut device for printing and cutting on Heat Transfer Material (HTM). (Fig. 1) Be sure to use the appropriate color-management profiles for HTM media. The colors of the printed image will appear somewhat subdued on the media, but will appear fully saturated upon transfer.
3. Weed excess vinyl away from the graphic. (Fig. 2)
4. Clean your blank garment with a lint roller or brush. This will pick up any loose materials or fibers that can cause discoloration and spotting when the garment is heat pressed.
5. Preheat the heat press to the recommended temperature setting, typically 325 degrees F. (Fig. 3) Place the garment flat on the press and briefly prepress the area where you want to apply the transfer to smooth away any wrinkles.

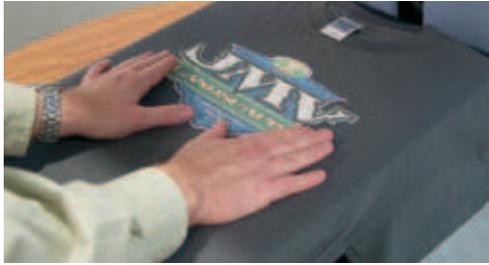


FIGURE 4



FIGURE 5



FIGURE 6

6. Position the freshly printed and cut image on top of the garment. (Fig. 4) If you have a lot of small lettering, you can use transfer tape. Place a Teflon® release sheet or silicon release paper over the graphic. (Fig. 5)
7. Press the image and the garment according to the recommended time and temperature settings (typically 325 degrees F for approximately 10 seconds). Using the correct time and temperature settings are critical for a successful heat transfer.
8. Carefully remove the release sheet (Fig. 6) to reveal a bright and durable finished product.

That's all there is to it. In no time, you'll be producing custom color apparel that knocks 'em dead.



THE FINAL SECRETS REVEALED

PARTING TIPS FROM A PAIR OF VEHICLE GRAPHIC GURUS

After building race engines and even taking a few victory laps himself, Jim Conquest became one of the first graphics pros to buy a printer/cutter. His shop, *Imagine It Graphics*, began 10 years ago by producing name decals on motorcycle helmets. When Conquest watched an introductory video for CorelDRAW®, he saw unlimited potential for computerized signmaking.

“For years now, I have produced more full-color jobs with a printer/cutter than regular cut vinyl jobs,” says Conquest. “I print and cut between 20-50 yards of vinyl every week.” Today, Conquest owns three printer/cutters. He cranks out full-color, durable graphics for race cars, motorcycles, mountain bikes, trailers, watercraft and everything else you slap vinyl on... and even a few things you normally wouldn’t.

Conquest is a big believer in integrated printer/cutters. “The ability to print and cut unattended gives me a huge advantage. I crank out vehicle graphics on my lunch breaks. Sometimes I even let the device work after hours, while I’m at home sleeping.”



JIM'S QUICK TIPS AND TECHNIQUES

Jim Conquest offers the following tips and techniques to anyone trying to keep a print/cut business running smoothly:

CONSTANTS ELIMINATE HEADACHES

“Want to drive yourself crazy? Spend every day trying to decide which settings, media, inks and techniques to use on each job. Instead of this, develop a set of constants that you know delivers consistently good results, and stick with it. This includes your inksets, your media, your color profiles and a lot more.”



THE RIGHT PROFILE IS CRITICAL FOR GOOD COLOR

“Since every media reacts differently to the ink your printer is laying down, using the right color profile is critical to ensuring quality results. The engineers have spent a lot of time working with inks and media to get the best combinations, and I’ve found that 95% of the time these profiles produce the best possible results. Just make sure you’ve downloaded the latest and greatest versions of these profiles.”



“For each media, there are profiles for the various print quality settings, and you’ll want to make sure you choose the profile that matches the print quality you’ve selected for the job.”

DON'T TRY TO OUT TWEAK THE ENGINEERS

“As I’ve said, the engineers have done a ton of work tweaking their profiles and device settings to get them to work just right together. Still, there are a lot of people out there that try to out tweak the engineers, creating their own expert color profiles and obsessively adjusting complex settings like media feed calibration. If this is how you want to spend your time, go for it. But the last time I checked, no customer was ever paying me for media feed calibration time.”

STICK WITH RELIABLE MEDIA

“No pun intended. I’m not talking about adhesion here. A lot of people in the sign business are so penny driven, they’ll use whatever media they can find the cheapest. The results can be really costly in the long run: lost time trying to dial in color and

get the material to print decently, and even lost clients when the quality is subpar. Zero in on a handful of media that you can count on – good profiles, good color, good handling – and stick with them. It’s more cost-effective in the long run.”

DO AN ENVIRONMENTAL MATCH

“Humidity and environmental conditions can make a difference in the way every media prints and cuts on a given day. Always do an environmental match when you change material. You get truer registration. It’s a simple, automated feature in the device menu, and well worth the time it takes to push a button.”

KEEP YOUR CUTTING AREA CONFINED

“If you’re printing multiple graphics with multiple cuts, try to make your overall material area smaller. Don’t try to print 200 inches of material and try to register it from top to bottom. If possible, break up production into smaller lots. If you need 400 decals, print and cut 8 sets of 50. Registration over this smaller area will be easier to maintain, even with material distortion.”



TURN TO YOUR PEERS

“Want to get feedback from somebody facing the same daily real world challenges you are? Look for User Forums on the manufacturer’s web site. They’re full of great information you simply won’t find anywhere else. Everything from emergency workarounds to tips on supplies and equipment. Ask a question, and you’ll get back answers from others like yourself, eager to help. Manufacturer’s tech support is very important, but if you need help getting out of a black hole at 2 am, User Forums are a great place to start seeking the light. If you have a chance, you should also attend a workshop such as Roland University.”

SPOT COLOR MATCHING MADE EASY

“When you are talking about spot color management, there are two challenges to consider: identifying specific customer spot colors and reproducing them accurately. Roland Color is a color matching system for digital printing that fully addresses both sides of this equation. With Roland Color, you can produce highly customized spot color charts, swatch books, and peel-and-stick

swatch sheets on your own media using your own Roland printer or printer/cutter. These reference tools can be reviewed with your customer to choose the color that matches what they want. Once you and your customer agree on the desired color, you can then print that color with 100 percent accuracy every time using your Roland inkjet.”

DON’T BE AFRAID

“The best way to learn is just to get in there and do it. Don’t be afraid to experiment a little to learn new techniques. And don’t be afraid to waste some material to practice installation methods. It may save you a ton of printed material down the road. There is no magic pill. Just get in there and work with it.”

FINAL THOUGHTS

Last but not least, Jim says “If you love what you do, then there’s never a dull day. It’s a blast to get up in the morning. I love this stuff!”



JAY LANSBURG, DIGITAL REVOLUTIONARY

Jay Lansburg of Automic Designs in Buena Park CA, has been specializing in vehicle art since the mid 70's. While he used to either hand paint or layer vinyl to create his graphics, he now believes that inkjet printing is the key to making money in the sign business. "Our industry is on the verge of its next revolution," he says, "A sort of second revolution that is going to change the way we make signs...not dissimilar to the way vinyl plotters changed the face of the industry 20 years ago!"



"In the last year since I've had the SOLJET printer cutter, I've seen it take on a life of its own. There's nothing my Roland can't do! The printer/cutter grew in strength and power and ability and intelligence until it swallowed up my vinyl cutter, my thermal printer, my airbrush and, I think, my dog. It's now the focal point of my business, running everyday, and even sometimes at night, while I'm at home."



"All things considered," says Lansburg, "Every shop should have a digital color device, or you will wither slowly, painfully away."



JAY'S "THINGS TO LOOK FOR"

Jay offers some additional "dogmatic rhetoric to ponder" in regards to the digital print/cut revolution:

DON'T DRINK THE INK

"A solvent ink-based machine is the only kind a sign person should be considering, since these inks are the key to outdoor durability. Most important to me is if the ink stinks. New generation, mild solvent inks do not require a dedicated ventilation system, and can be almost odorless. If the machine you're viewing puts out strong odors, or if the guy trying to sell you the printer emits strong odors, I say walk away."

"Longevity is not the only reason to consider solvent inks. Large format printers have previously required expensive coated vinyls. Solvent inks, will, for the most part, allow you to print on your favorite, regular old vinyl or other media, lowering the print cost, and letting you use the quality materials your clients so richly deserve."



QUARTER MILE IN UNDER 10?

"Initially, I believed that print speeds would not be much of an issue in my shop. But it can become an issue when you have a large print or multiple graphics to produce. Remember though, that manufacturers usually base their speed ratings on low-res settings...a setting you may never use."



DOES IT DICE AND SLICE?

“A digital printer doesn’t have to chop onions or slice julienne style fries, but can it cut vinyl? For me this is a big deal. After I print a graphic on vinyl, my Roland automatically cuts it out in either a perimeter contour cut, or in intricate detail if I so desire.”

I NEED MORE SUPPORT

“Big time important here: these machines are way more complex than your vinyl cutter. Digital printers will require some periodic maintenance work, so if you’re considering a machine manufactured in a place you’ve never heard of, you really better check into their support network. In fact, wisely investing in a digital printer may be more a matter of having a support/service team available, than simply who offers the best price.”

I GOT IT COVERED

“You’ll want to laminate or clear coat almost everything that you produce. We spray a lot of our prints using One Shot Speed Dry UV Clear. The available aerosol is easy and quick for small prints,

but you need to spray it from a touch-up can for larger prints.

Lamination machines are an excellent solution, though they can be pricey. Right now, we use a low-tech hand-cranked laminator. It gets the job done, but I’ll eventually have to step up to a larger, electronic laminator.”

FINAL THOUGHTS

“With the latest generation of solvent inks, vibrant colors in high resolution is a reality. And outdoor? You betcha! Is getting one going to cost you some money? Sure. Can one of these printers make you some moola? Oh yeah!”

Jay Lansburg (Automic Designs) writes for Sign Business Magazine.



PHOTO GALLERY

IN WHICH WE CONCLUDE OUR
EXAMINATION OF DIGITAL PRINT/CUT



We stood before a great device nearly the arm-span of two men across. As we watched, a metal box traversed back and forth, laying down row upon row of brilliant images on a continuous roll of white material. After a few minutes this activity ceased, and the device fell into restful silence.

“Yes, I see,” said I impatiently. “And now some clever craftsman shall take this artwork off the device and begin cutting out the designs. But it still doesn’t answer the great mystery...how does he do it so precisely?”

My friend merely smiled. I was about to inform him that such smugness was the worst form of vanity, when suddenly the great device emitted a whirring noise and began again to move. Quick as a flash, a hidden blade of some kind retraced the entire landscape of the print, precisely cutting every shape and contour. “Great Scot,” exclaimed I. “It’s been cut!”

Holmes deftly removed one of the graphics. “To be more precise, my friend,” said Holmes, “It’s been print and cut.”



Cedar Point is an enormous, 365-acre amusement park with roller coasters, restaurants, live shows, hotels, miniature golf courses and a water park. “From restaurant signs to roller coaster decals, we fill the entire park with all types of bright, durable Roland print/cut graphics that burst with color,” says Brian Kniceley. “Millennium Force travels 300 feet up and 93 mph hundreds of times a day. Imagine the amount of dirt, sand, and flying insects the prints encounter! They have proved extremely durable.”

BRIAN KNICELEY, CEDAR POINT



After years of layering cut vinyl to create colorful vehicle graphics, Dan Antonelli now creates amazing truck lettering effects with digital printing. “A single layer of vinyl from my Roland VersaCMM replaces three or four I used to need to produce certain effects,” says Antonelli. In this logo, Antonelli created a chrome-looking effect with process blue and white on one side and white to gray to black on the darker side.

DAN ANTONELLI, GRAPHIC D-SIGNS, INC.

This attention-getting Mini Cooper was customized by Promos in Motion. After Jay Topping painted it, he installed print and cut graphics with a printer/cutter. He then clear coated the entire vehicle. “We have lots of great equipment, but for the Mini graphics and many others, we could not have got the job done without the Roland,” says Jay. “In the past, we would have had to send out to other shops for digital printing. Now, we do it ourselves.”

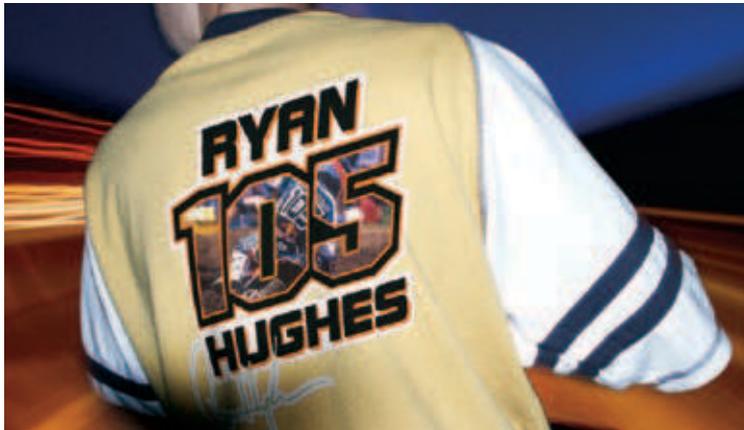
JAY TOPPING, PROMOS IN MOTION





Champion Racing uses a Roland SOLJET printer/cutter to print and cut graphics for its twin-turbo Audi RS-6. The race car has a history of success, taking the checkered flag four times in the past year. The ability to use the same device for both print/cut graphics and as a standalone vinyl cutter make it especially valuable to the team. “Just like our championship winning Audi RS-6, our Roland SOLJET delivers the “wow” factor every time out.”

MIKE PETERS, CHAMPION RACING



No matter where his graphic journeys take him, Jim Conquest remains heavily involved with his first love – all aspects of racing and team design. His racing graphics are anything but static. He starts with strong, clean lines and then piles on the visual excitement. In this bold custom apparel design, he takes full advantage of the ability to include high-resolution photography on Roland HTM heat transfer material.

JIM CONQUEST, IMAGINE IT GRAPHICS



There are subtle details in this design that are only practical when printing digital graphics. For the outline on Carpet Cleaning and the faint drop shadow, it would be too time consuming to layer cut vinyl. Antonelli added the black inline shade to the main lettering and used the pinstriped panel to add depth.

DAN ANTONELLI, GRAPHIC D-SIGNS, INC.



“We produce all our vinyl graphics on our Roland printer/cutter,” says Larry Staudenmeyer of the Graphics Company. Today, their fleet includes 34-foot Factory 2 Eliminator Boats. “Whether it’s layered vinyl or photorealistic graphics, the Roland does a great job. Our offshore racing clients love its crisp colors and incredible durability. Blasting through salt water at over 130 mph, these graphics are as tough as they come.”

KIM AND LARRY STAUDENMEYER, THE GRAPHICS COMPANY



Contour cut floor graphics are a real traffic stopper. This is a job you just couldn't produce with any other method. Best of all, with digital print/cut production, it's really easy to resize this graphic to fit specific space requirements in different locations. Floor graphics take a lot of abuse, so they have to be incredibly durable. Make sure you apply a quality laminate such as Roland Floor Marking Film for protection.

JAMIE MCMONIGLE, MCMONIGLE AND ASSOCIATES

The beauty of this graphic is the ease of production. Instead of layering cut vinyls, this entire piece is a single print/cut graphic. The real trick was a precise match on the car's paint color for the inside of the lettering. A digital picture of the vehicle's side panel was loaded into the computer and sampled. A test swatch of the color was then sent to the Roland SOLJET for tweaking. The color of the first test was dead perfect. Now, that's color fusion.

ROBERT WILSON, MODERN IMAGE





Created from scratch, Fence-It shows off some of Antonelli's favorite techniques for inset shading. He outlined the letters in red, added a heavier black outline and then outlined it again in red. The second red outline holds the design on the dark truck. The white highlight on the left side of each letter gives added dimension. To create the grass, Antonelli simply scribbled a few lines.

DAN ANTONELLI, GRAPHIC D-SIGNS, INC.

Digital print/cut was used throughout the development of this new line of packaging for fresh sushi products. Concepts were presented to the client as labels applied directly to their actual product trays. The printing accurately captured every detail of the designs, including small reversed type. Design revisions could be tested for size before incurring the expense of a die from a label-printing firm. And when the customer needed 200 labels for a holiday showcase before the labels had gone into production, we produced them on our Roland.

JAMIE MCMONIGLE, MCMONIGLE AND ASSOCIATES



A TRAIL MARKED BY INNOVATION

Over the past two decades, many things have changed at Roland DGA. We've gone from pen plotters to vinyl cutters to wide format inkjets. Digital technology has steadily taken over and improved almost every aspect of the graphics industry.

Yet, during all those years of change, one thing has remained constant – Roland innovation. Our products have continually opened up new business opportunities for graphics pros around the world and solidified our reputation for quality and reliability.

Ten years ago, our PNC-5000 became the world's first print/cut device for vinyl. Today, thousands of signmakers are turning out labels, decals, signs, apparel, floor and vehicle graphics, POP, awards, and countless other profitable graphics with our integrated devices.

Consistently high-quality printing is achieved by utilizing media, ink and profiles that have been carefully matched to the printer. At Roland, we offer more substrate choices than any other manufacturer. To learn more, please visit www.rolanddga.com/media.

**CASE
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