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Introduction

This is not your typical ePaper, booklet or white paper on a fast growing and rapidly changing garment decorating technology. But, rather this is an evolving body of information from the industry that will provide a solid foundation of knowledge for someone who is contemplating bringing direct-to-garment (dtg) printing into their business. All I did was compile this information and links to other sites into what I call an i-Paper (AKA an Industry Paper).

Throughout this i-Paper, you will see what I refer to as “Cannons.” Cannons in both the religious or legal fields stand for a significant rule or a law – one that should be taken with great importance. After speaking with hundreds of current and prospective dtg owners, I have come to the consensus that there are 10 Cannons for dtg Printing. These cannons will be written in callout boxes throughout this document to make sure you don’t miss them. The first one is listed below.

**Cannon #1:** There is no single source of information that covers all dtg printing. This technology or process is evolving every day and new things are created by more than just the manufacturers of these printers.

I firmly believe that there is no single source of information for a decorating method that is so early in the developmental stage of a technology’s life. The information that you are about to read comes from the collective experiences of some of the early direct-to-garment (dtg) users, distributors and manufacturers. Most of this information is documented throughout several different industry forums (although usually buried deep into different boards and posts) and I have provided you links to these posts for you to continue your education. All hyperlinks in this document are to websites that anyone can freely read without having to be a registered user.

If you would like to add to this collection of information, please follow the links to the posts on the industry forums and post your thoughts there. This way the information will continue to grow through the forums that have more exposure potential than I could ever expect this i-Paper to receive. Since there are outside links to web pages that are beyond my control, some links may no longer point to a valid or correct page over time. If you come across an invalid link, please send an email to mark@dmscentral.com.

I hope you find this i-Paper educational and beneficial in your decision making process.

Sincerely,

Mark E. Bagley, Esq,
Digital Consultant
Digital Marketing Solutions - [www.dmscentral.com](http://www.dmscentral.com)
What is direct-to-garment (dtg) printing?

The Decorated Apparel Industry was taken by storm in late 2004 when some of the first commercial based direct-to-garment printers were released. Before you can truly understand why dtg printing has become so popular, you will need to understand some background history. For years, if you wanted to print a couple of cotton shirts you would use either digital transfer paper or try to screen print the order. Both of these decorating methods have their positives, but they also come with negatives.

Digital transfers allow you to create as little as a one-off shirt via a standard desktop inkjet or laser printer. The cost to make a single transfer can range from $0.50 to $2.50 depending on what ink and paper is used by your printer. However, the transfer paper is covered with a polymer (AKA adhesive) that glues the ink to the top of the shirt. The polymer typically will leave a hand where it is applied and can discolor the shirt or create a window around your graphic. New transfer papers have been released that either minimize the window or use a 2-step process to eliminate the window completely.

Screen printing has traditionally been the decorating method of choice for most of the apparel that you see in retail stores. With screen printing, ink is only dropped down on garment where the design is. Thus, eliminating the undesirable window that can occur with some digital transfer paper. However, a graphic must be separated (the process that breaks the down graphic into the different colors needed to print it), a screen must be burned for each color and it requires a screen printing press to be setup. This can become a very time consuming and expensive process when you only need a few shirts. Commonly referred to as a short run, which can be as low as 1 shirt to as many as 48 depending on the size of the shop, the cost per a screen printed shirt could easily be more than what your customer is willing to pay for.

With the changes in fashion leaning more toward short-run, limited edition personalized garments, the need for a high quality solution grew. Of course, apparel decorators are never satisfied with the concept that things are never going to get any better. Manufacturers and distributors continued to push the boundaries by finding cheaper and faster ways to screen print or to creating better inkjet transfers papers with less hand or feel to them. But the introduction of dtg printing allowed us to take the positive aspects of both inkjet transfers and screen printing in a solution that could be done in a compact space.

The concept of dtg printing is basically using a digital printer to lay down a textile water-based ink that has chemical binders that allow the ink to remain on the garment without a polymer being applied to the top of the shirt like a transfer. The ink is then cured to the garment using either a heat press or a textile conveyor dryer. On average, an apparel decorator can take the artwork from a customer, put it on to a garment and get paid by the customer in under 10 minutes. With some modification to the artwork, the decorator can personalize the next garment with a name, number(s) or different colors and produce another custom garment in minutes. That is the beauty of dtg printing – short run, personalized garments in the matter of minutes.
The History of dtg Printing

Although dtg printing is a relatively new technology for the Decorated Apparel Industry, it is something that has been experimented with for well over a decade. Some may argue that one party or another was the first to come up with the concept. But one of the earliest articles written about an actual working dtg printer I have found was done by The Press in April 1997. Click here to read the article. The Revolution printer, developed by Digital Imaging Systems, was first shown in March 1996 at the Tampa ISS Show. In 1998, Matthew Rhome (one of the founders of Digital Imaging Systems) joined Brother International to develop a proprietary dtg printer. Brother USA began beta testing its dtg machines back in late 2003 and was first shown at the Atlantic City ISS Show in 2005. Around the time of the SGIA Show in 2004, U.S. Screen Printing Institute (now called U.S. Screen Print & Inkjet Technology) released the Fast T-Jet. Shortly after that, other machines entered the market and setup distributors in the United States. Now there are dtg manufacturers and/or distributors in countries in Europe, Asia, South America, Australia and Africa that I am aware of.

Below are links to some videos of the popular brands of dtg machines (this is not a complete list):

- Anajet
- Brother
- BusJet
- Direct Advantage
- DTG
- Fast T-Jet ©
- Flexi-Jet
- Kornit
- M&R iDot
- Mimaki

For a more detailed list of dtg machines (although it is not a complete list because there are so many new machines), click here.

Over the years, a couple of different patents have been filed regarding dtg printing. Below are links to the patents that are registered by the United States Patent and Trademark Office that I am aware of:

1. Digital Imaging Systems Patent
2. Kornit DOG Patent
Comparing dtg Printing to Other Decorating Applications

**Cannon #2:** Each decorator should have a basic understanding of all the different decorating methods in order to determine which methods are appropriate for fulfilling the job and which ones will be the most profitable.

The most successful apparel decorators are the ones that understand the basics of each decorating method and when to use the correct application to get the best quality garment at the highest profit. To do this, the decorator needs to know what the strengths and limitations of each decorating method are. Thus the decorator needs to know the process for each method and the approximate cost for decorating the garment.

It is important to understand that I do not advocate that every decorator attempt to have the capability to do all types of decorating in-house. A new decorator should become thoroughly knowledgeable in his/ her core decorating method before looking at expanding into a new decorating method. However, I do recommend that decorators network amongst their peers to create an outsourcing partnership. This way, the decorator can become a one-stop shop for their customers to get items decorated using different methods. Once a decorator has enough business to justify the expansion of into a new decorating method, then explore in detail the process and equipment before investing.

**BUSINESS TIP:** It would be wise to develop a close relationship with the other decorator you outsource with and create a mutual agreement not to go after each other’s customers. Most contract decorators will already have this policy in place.

When you as the decorator begins the process of comparing which of the different methods you should consider when pricing a job, there are some questions that should be answered to determine which method(s) are even appropriate for this job. Here are some of the questions:

1. What type of fabric is the design going on to? Cotton, 50 / 50, Polyester, Nylon,...?
2. What color is the fabric? Light vs. Dark fabric?
3. What type of graphic format is the design in? Photograph, Vector or Raster?
4. What quantities does the customer want? 1, 6, 24, 48, 144,...?
5. How fast does the job need to be done in? Today, Couple of Days, Week,...?

The best way to illustrate the importance of these questions is to use a couple of examples as listed below.

**Customer #1:** Customer would like 12 ash colored, cotton shirts with a design on the front center that is a photograph of a family reunion picture. The job needs to be finished in 24 hours.

Since we are working with cotton fabric, we will eliminate sublimation. Because the shirt is a light
color (ash) and the graphic is a photograph, the best options are heat transfers or dtg printing for a short run. Both dtg printing and heat transfers can be done in a short period of time. So either option will be appropriate.

**Customer #2:** Customer needs 6 yellow colored workout shirts (like Under Armor©) for his intramural tennis team that has left chest design. The customer needs the shirts in 3 days.

Since the workout shirts are polyester, the best decorating method is sublimation – which is ideal for short runs. It is important to understand that the lightest color in the graphic must be darker than the yellow color in the fabric or the color reproduction will not be accurate. Since sublimation is a digital printing method that allows you to create sublimation transfers in a matter of minutes, the time frame for completing this job is not an issue.

**Customer #3:** Customer wants 48 black colored cotton shirts with two vector designs (left chest and center back). The customer would like to pick the shirts up in a week.

Based on the quantities and the dark fabric, the two best options would be either plastisol transfers (which most of the time is outsourced) or screen printing. The time frame in this example is something that could be a factor depending on what the schedule of the outsource screen printer is and/or the necessary production / shipping times to get custom plastisol transfers made.

Please go to [Page 7](#) of this document to find a detail chart explaining some the different decorating methods.

Below are some links to posts that talk about comparing dtg printing to other decorating methods:

- Highlights of pros / cons of several decorating methods - [http://www.t-shirtforums.com/general-t-shirt-selling-discussion/t37985.html](http://www.t-shirtforums.com/general-t-shirt-selling-discussion/t37985.html)
- Comparing plastisol to screen printing - [http://www.t-shirtforums.com/general-t-shirt-selling-discussion/t40018.html](http://www.t-shirtforums.com/general-t-shirt-selling-discussion/t40018.html)

**NOTE ON COVER:** The cover to this document was created specifically with the letters of the title done in different font styles because it would be difficult to screen print, but would be very easy to dtg print it. This is just another example as to why it becomes important to understand the process of each decorating method. To download the free font styles used, click on this link - [http://www.greatdanegraphics.com/store/index.php?option=com_content&amp;task=view&amp;id=65&amp;Itemid=52](http://www.greatdanegraphics.com/store/index.php?option=com_content&amp;task=view&amp;id=65&amp;Itemid=52).
Below is a chart that highlights some of the key things about each decorating method.

<table>
<thead>
<tr>
<th></th>
<th>Inkjet / Laser Transfers</th>
<th>Sublimation Transfers</th>
<th>Plastisol Transfers</th>
<th>Screen Printing</th>
<th>Direct-to-Garment Heat Applied Vinyl / Film</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Fabric</strong></td>
<td>All Types of Fabric</td>
<td>Primarily Polyester (exceptions)</td>
<td>All Types of Fabric</td>
<td>All Types of Fabric</td>
<td>Cotton &amp; Natural Fabrics All Types of Fabric &amp; Other Items</td>
</tr>
<tr>
<td><strong>Hard Substrates</strong></td>
<td>Not Good</td>
<td>Ideal (coating needed)</td>
<td>Not Good</td>
<td>Not Good</td>
<td>Ornamental Only Not Good</td>
</tr>
<tr>
<td><strong>Color of Medium</strong></td>
<td>All Colors (Light &amp; Dark Paper)</td>
<td>Light Colors (Design must be darker)</td>
<td>All Colors (Darks use a Underbase)</td>
<td>All Colors (Darks use a Underbase)</td>
<td>All Colors</td>
</tr>
<tr>
<td><strong>Digital Photos</strong></td>
<td>Ideal</td>
<td>Ideal</td>
<td>Not Good</td>
<td>Not Good</td>
<td>Ideal Not Good</td>
</tr>
<tr>
<td><strong># of Colors</strong></td>
<td>Does not Matter</td>
<td>Does not Matter</td>
<td>Affects Pricing</td>
<td>Affects Pricing</td>
<td>Does not Matter Affects Pricing</td>
</tr>
<tr>
<td><strong>Excess Items Beyond Design</strong></td>
<td>Leaves Window unless Print-Cut</td>
<td>Only Ink Goes Down</td>
<td>Only Ink Goes Down</td>
<td>Only Ink Goes Down</td>
<td>Only Ink Goes Down Must weed the design</td>
</tr>
<tr>
<td><strong>One-Offs</strong></td>
<td>Ideal</td>
<td>Ideal</td>
<td>Not Good</td>
<td>Not Good</td>
<td>Ideal Ideal</td>
</tr>
<tr>
<td><strong>Short Runs</strong></td>
<td>Ideal</td>
<td>Ideal</td>
<td>Depends on # of Colors</td>
<td>Depends on # of Colors</td>
<td>Ideal Good</td>
</tr>
<tr>
<td><strong>Long Runs</strong></td>
<td>Okay</td>
<td>Okay</td>
<td>Fair at Best</td>
<td>Ideal</td>
<td>Not Ideal Not Ideal</td>
</tr>
<tr>
<td><strong>Setup Time Required</strong></td>
<td>Minimal Time</td>
<td>Minimal Time</td>
<td>Usually Outsourced</td>
<td>Extensive Process</td>
<td>Minimal Time Minimal Time</td>
</tr>
<tr>
<td><strong>Per Item Est. Production Time</strong></td>
<td>1 to 3 minutes</td>
<td>1 to 8 minutes (time varies on substrate)</td>
<td>Less than 1 minute</td>
<td>Less than 1 minute</td>
<td>1 to 8 minutes Depends on the amount of weeding</td>
</tr>
</tbody>
</table>

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Is dtg Right for My Business?

**Cannon #3:** *Every decorator should have a business plan and periodically update the business plan to adjust for changes in the market and for new decorating methods. dtg printing is not right for every company.*

Based on the capital investment needed to purchase a commercial-grade dtg printer, it is very important for every prospective dtg owner to write up a thorough business plan before getting into the dtg printing side of the business. The bottom line is not all businesses are designed for dtg printing. You should take a look at several key things in your business like (but not limited to) the following:

- What is your current target market and what are their needs?
- Of the things you currently do, what can be improved upon and what is missing?
- What is the competition doing in your market – whether it is locally or via the internet?

Here are some links to different sites that have some helpful information on how to write a business plan.

- [http://www.score.org/business_toolbox.html](http://www.score.org/business_toolbox.html)

Although there is no hard-fast rule as to what type of company or target markets dtg printing will work best with, there are some common factors that have been shown to help existing dtg printing companies achieve success. Here is a short list of them:

- A retail store that caters to the one-offs or impulse buys
- A screen printing company that needs to produce samples to attract new customers
- An embroiderer that is looking to do t-shirt printing in-house for existing customers
- An online personalization website that sales shirts created by customers (i.e. Café Press, Zazzle,...)
- An company that sells custom items at events (i.e. fairs, tournaments, trade shows, meetings,...)


Just to show you that dtg printing is not for all business models, here is a link to a post where I recommend to a company not to go with dtg printing, as it did not fit their business model -[http://www.t-shirtforums.com/member-introductions/t40877.html](http://www.t-shirtforums.com/member-introductions/t40877.html).

One of the most often asked questions about dtg printing is what type of money can be made. There is no absolute answer to this question because it depends on several variables (i.e. your target market, the demand or need for custom shirts, the quantity of shirts ordered, the uniqueness of the design(s), the production rate to produce an item, whether a dtg machine will lead to getting other jobs – see the section **When NOT to Use a dtg Machine**, ...). It is important to understand that one-offs or short-runs need to be charged at a higher rate than...
what a longer run printed by screen printing. From the companies I have consulted with, I have found it difficult for screen printers to understand this concept fully because they are traditionally used to selling long-run jobs at $3.00 to $6.00 per shirt range. Any type of digital decorating (dye sublimation, inkjet transfer or dtg) needs to be priced differently than screen printing because digital decorating is commonly used for one-offs or short runs. I have found it helpful to use the spreadsheet on this link to show what type of profit can be made based on the price charged and the quantity being printed - [http://www.inkjetgarmentprinters.com/forums/topic-1010.html](http://www.inkjetgarmentprinters.com/forums/topic-1010.html)

**BUSINESS TIP:** Notice, the most profitable dtg printing runs are between 4-6 garments used in this example. This is because of the time it takes to setup a design in the dtg software and prepare it for being printing.

As part of the business plan process, you should know what the return-on-investment (ROI) is going be for the dtg printer you plan to purchase. To determine the ROI of a dtg printer, the you should know both the imprintable costs (i.e. cost of the garment or imprintable, the ink cost, the pretreatment cost if necessary, ...) and the machine / labor cost (i.e. the labor cost for printing the imprintable, the maintenance cost for the machine, cost of electric,...). Once you have this information, there is a useful spreadsheet located at [http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=1742](http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=1742) that will help determine what the ROI is for the dtg printers you are looking at.

Here is a link to a post on a forum that ask why some dtg owners purchased their machine - [http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t41520.html](http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t41520.html). Do your research and you will find the correct dtg printer for your business’ needs.
When NOT to Use a dtg Printer!

Okay, let’s say you make the investment into purchasing a dtg printer and want to start making money with it. A common mistake is to think you have to use the machine to help get your ROI back from it. Simply put, a dtg printer is a tool to help satisfy customers by fulfilling some jobs using it and getting other jobs that will be done with another decorating method that ultimately puts money in your bank account. A smart decorator will know what the break-evens are for doing a job in one decorating method compared to another. See Cannon #2 in this i-Paper. Thus, the decorator will know which type of decorating method will yield the greatest profit.

Most of the time, the two other decorating methods that are comparable in quality to dtg printing are screen printing and plastisol transfers (which is screen printing ink on to a special release paper). I highly recommend to all decorators to network with other decorators to create outsourcing partners that will allow you to fulfill all types of jobs for your customers. Most customers would prefer to deal with one source for all their personalized imprints. By creating outsourcing partners, you have the ability to fulfill all types of orders without having to invest and learn all of these methods. Look in the phone book for companies that do screen printing to find a screen printer close to you. For plastisol transfers, here is a link to post that has a list of companies that print plastisol transfers for decorators - [http://www.t-shirtforums.com/heat-press-heat-transfers/t3560.html](http://www.t-shirtforums.com/heat-press-heat-transfers/t3560.html).

It is also important to understand that your (or an employee’s) time needs to be factored into the decision process of whether to use a dtg printer or outsource the job, especially with dark garments. Thus, it is important to factor in the time required of the decorator for each decorating method. For example, most plastisol transfers take around 10 seconds to heat press to the garment. However, the average production time to receive the plastisol transfers can range from 5 to 9 days depending on shipping time. Outsourcing a job to a screen printer takes very little time of the decorator, but the job will be completed based on the schedule of the screen printer. With a dtg printer, light color garments can be printed rather fast and the number of colors don’t make a difference. However, dark color garments will need to be pretreated before a white underbase is dropped down and will need a minimum of two passes. So the time necessary to print a dark garment with a dtg printer is substantial. You should time how long it takes you to print a dark garment on the different dtg printers you are considering for your shop. Please don’t rely on the times given by any manufacturer or distributor as they will not be the one running the printer in your shop.

**PRINTING TIP:** There are two key things that you should take into consideration and speak with your customer about before considering what type of decorating method can be used: (1) the hand (i.e. feel) of the design on the shirt desired and (2) the type of graphic being printed – vector, raster and photograph.

Below are a couple of examples of the though process of how you should explore the pros and cons of other decorating methods:
Example #1: Customer wants a 6-color vector logo (8” x 8”) on the back of the dark shirt and a 3” x 3” left chest logo on the front of the shirt. Total order is for 24 shirts. Customer needs the order done in 10 days.

The first thing to consider in this example is the color of garment – black. Printing a black garment via a dtg printer can be challenging, time consuming and expensive for medium runs (24 + shirts) and long runs (144+ shirts). For this case, you may want to look at getting the job done with a plastisol transfer. Because of the low quantity of shirts, this is probably not a job an outsourced screen printer will want to do for the same cost that you could probably get for a plastisol transfer.

PRINTING TIP: For short-run, high number of colors in a design...you might want to consider a 4-color process plastisol transfer. This way, the number of colors in a design will not affect the price of the plastisol transfer. Here is a link to one company that provides this service - http://www.transferfreedom.com/freedompricing.cfm. You may also want to look at ganging designs up on a larger sheet to save some money.

Example #2: Customer wants a 1-color (Black) vector design (12” x 5”) on to a gray shirt on the front chest of the shirt. Total order is for 144 shirts. Customer needs the order done in 1 week.

The keys to this example are it is a 1-color design and the quantity (i.e. 144 shirts). This design could be done the most effective way via screen printing since the number of colors is low and the quantity of the shirts is high. This is when you will want to use an outsourcing partner that does screen printing to make the most profit. In addition, this will allow you to work on other jobs or marketing the dtg printing services.

BUSINESS TIP: This job could also be done using heat applied film and a vinyl cutter. For more information on this process, click on this link - http://www.t-shirtforums.com/vinyl-cutters-plotters-transfers/

Example #3: Customer wants 16 memorial shirts for a funeral that is going to happen in 2 days. The design the decorator is given is 12” x 14” and is to go on a white shirt, but the sizes of the shirt range from small to XL.

The keys to this example are the graphic is a photograph and the time frame for the order to be fulfilled. It is very difficult to get a photo realistic quality print on a screen print press or even have it done by a plastisol transfer. This was the primary reason for digital decorating coming about. This job will need to be done either using a digital transfer or dtg printer. Because the customer wants it the design on a white shirt, the job can be done either method. With a short timeframe to produce the job, the decorator most likely does not have time to get plastisol transfers made or outsource to a screen printing no matter what type of design it is. Thus, dtg printing is one of the preferred methods.
Dissecting the Main Components of a dtg Printer

**Cannon #4:** Each dtg owner needs to be familiar with all the major components of a dtg printer to help with diagnosing technical support problems.

Before investing in a dtg printer, you should be familiar with integral parts that are commonly found in most dtg printers. This knowledge will be integral in decreasing the amount of downtime one might experience with their dtg printer. Unfortunately, most people are not familiar with terms like the capping station and probably can’t even point one out, even though almost every inkjet printer has one. So, for the purpose of this i-Paper... I will compare the main components of a dtg printer to that of a car – which is something that most people are more familiar with.

**MAINTENANCE WARNING:** Periodically through this section, you will see pictures of the different components from actual dtg printers. These pictures are only used for illustration purposes and were supplied by actual dtg owners. For more detailed information about each of these components, please contact the manufacturers of the dtg printers.

*The Engine - the Print Carriage & Print Head*

The Print Carriage is the housing that contains the Print Head, Ink Cartridges and Dampers (if there are any). The Print Carriage receives data from the motherboard, makes contact with the ink cartridges and tells the print head when to fire drops of ink out of the nozzles.

Most dtg printers use a piezo print head to lay down the ink on to the imprintable. Without going into the technical terms or process, a piezo print head uses electronic pulses to fire ink down on the garment or imprintable. Although all the print heads do basically the same thing, some of the print heads will have different internal parts – like dampers. Dampers are small ink reservoirs that have a filter inside them and their primary purpose is to make sure that the print head is always full of ink. It is important to understand how the print head operates in order to perform technical support when the designs are not printing properly.
MAINTENANCE WARNING: There are several posts in the forums to how some people have removed clogs in the print head. I highly recommend that you speak with the manufacturer before trying any of these methods. The print head is the most expensive consumable part on your printer and you want to be careful when cleaning it.

Some dtg printers will have more than one print head. If this is the case for your dtg printer, you should also know that there might be more maintenance / technical support issues that will need to be addressed. You will also want to know what the cost per a replacement print head as well.

The Steering Wheel – The Encoder Strip

The encoder strip is clear plastic strip located behind the Printer Carriage and actually runs behind and thru the Printer Carriage. The encoder strip has little thin vertical lines on it. There is also an electronic eye behind the Printer Carriage that reads the lines and counts them to determine the location of the Printer Carriage on the Carriage Shaft.

MAINTENANCE WARNING: Some of the simplest errors and misprints are because the encoder strip is dirty. Ask the manufacturer for the recommendation on how to clean the encoder strip.

The Carburetor / Oil Filter - The Maintenance / Capping Station

The maintenance station (which also contains the capping station) is where the print head is docked when it is not printing and when the printer is performing any maintenance procedures. The maintenance station is made up of two key items: the wiper blade and the capping station. The wiper blade is used to wipe the bottom of the print head as it leaves the maintenance station to begin printing. The capping station is a rectangular flat sponge / filter surrounded by a raised gasket. When the print head is in the parked or non-printing position, the gasket presses against the print head - sealing the print head to prevent the nozzles from drying out due to exposure to air. The capping station is also an integral part of the cleaning procedures the printer will do – either manually controlled by the user or automatically done by the firmware. The sponge or filter in the
capping station is a porous material that is connected to a small evacuation pump. During a cleaning cycle, ink is pulled or printed out of the print head and drains into the sponge.

**MAINTENANCE WARNING:** Ink build up on wiper blade, gaskets or sponge can lead to excess ink getting on the bottom of the print head and transferring to the shirt. In addition, ink build up on the gaskets or sponge may prevent the print head from making a complete seal during non-printing functions and allow the nozzles to dry out.

*The Axles – The Carriage Shaft*

The carriage shaft is the solid bar that the print carriage travels back and forth on. The carriage shaft is covered with a thin layer of lubricant to allow the print carriage to easily travel across it.

**Car’s Electrical System – The Motherboard**

The motherboard is basically the CPU (central processing unit) for the dtg printer. The motherboard holds the computer boards that process the information from the RIP / print driver or the printer’s control panel and controls the printer’s operating features. To locate the motherboard, follow the internal printer cables until they lead you to a circuit board.

**MAINTENANCE WARNING:** Most dtg manufactures will usually try to hide the motherboard to prevent it from accidently being damaged. Definitely be careful when performing maintenance around the
motherboard. If you notice any signs of burnt cables (i.e. black spots), you might need to replace your motherboard. Please call your manufacturer if you have any questions about the motherboard.

*The Gas, Gas Lines & Gas Tank – The Ink Delivery System (Ink, Cartridges / Bottles, Ink Lines & Dampers)*

The ink delivery system is an integral part to any dtg printer. The ink delivery system is made up of the specially formulate water-based dtg ink, the ink lines and the ink reservoir – whether it is an open ink system (bulk refill system) or a closed ink system (cartridge based system) which will be discussed in more detail through this document. Most dtg manufacturers will try to minimize the length and the number of turns the ink will have to travel before it makes it to the print head. As previously mentioned, the dampers are small ink reservoirs that are right above the print head and their primary job is to make sure the print head always has ink in it.

**Kornit 932 NDS Ink Bottles**

**Anajet FP-125 Ink Cartridge**

**Fast T-Jet2 Ink Lines**

*Provided by: ContractDTG.com*  
*Provided by: Anonymous Owner*  
*Provided by: AsSeenOnMe.com*

**MAINTENANCE WARNING:** When printing with white ink, make sure that you keep the ink flowing through the machine. Most dtg manufacturers will have you agitate the ink by shaking the cartridge or bottle periodically. But the best way to keep the ink flowing in the ink lines or print head is to actually run prints through the printer. You can either run a print every day or two to keep the ink flowing or you will have to run head cleanings to clear any blocked channels.

There is a third party software maintenance program called Printer Jockey ([www.printerjockey.com](http://www.printerjockey.com)) that will allow a dtg owner to run a channel flush on just the clogged channel(s). You can also control the strength or power of the flush if some channels are only partially clogged as well. This will allow you to save money in not flushing the channels that are not clogged when you run a standard head clean.

**The Transmission – The Belt or Screw Drive**

A dtg printer will use electronic pulses to control either a belt or screw drive to move the platen or printer. Both options are viable means for moving the necessary item (i.e. the platen or the printer). If the dtg printer uses a belt drive, make sure that the belt is pre-stretched or has a teflon coating on it minimize any stretching that will...
typically occur to a belt drive over time. If it uses a screw driver, make sure you ask whether there is any
maintenance or lubrication need to be done to it.

Anajet FP-125

Provided by: Anonymous Owner

Flexi-Jet

Provided by: Dan

Brother GT-541 Belt Drive

Provided by: Stylish Designs

The Frame – The Rails

Whether the dtg printer has the platen move under the print head or the printer moves over a stationary platen,
it uses rails to keep the moving part aligned with the stationary part in a similar fashion of how trains run on
railroad tracks. These rails can either be a draw slider type or a solid shaft using a linear bearing system. A draw
slider type rail has channels that the part slides forward and back like a kitchen cabinet drawer. A solid shaft /
linear bearing system transfers the majority of the weight to the bearings and puts less stress on the motor that
drives the movable part.

Brother GT-541 (Solid Rails)

Provided by: Stylish Designs

Flexi-Jet (Slide Rails)

Provided by: Dan

DTG HM1 Kiosk (Solid Rails)

Provided by: Bright Little Beginnings

MAINTENANCE WARNING: Some dtg printers require you to keep the rails lubricated. Contact your
manufacturer to determine what maintenance, if any, is necessary for the rails.

The Seats – The Platen

The platen is the apparatus that is used to secure the garment or imprintable during the printing process. Some
dtg printers will use a hoop ring (similar to embroidery) or two rubber gaskets below the platen to secure the
item to the platen. Other dtg printers will dress the platen (similar to screen printing) and use the weight of the garment to keep it flat.

**PRODUCTION TIP:** I recommend pre-pressing your garment to remove any wrinkles and mat down the fibers of the garment.

There are several types of platens depending on what item you are trying to print. Most dtg printers will come with an Adult platen that will vary in size depending on your printer. Here are some links to different platens for some of the dtg printers:


**The Driver – The RIP or the Print Drive**

Just like any other printer, a dtg printer uses either a print driver or a RIP to convert the design into a formatted file that the printer can read. Most CMYK Only printers will use just a print driver. However, a CMYK+White Ink printer will have a RIP software to help process the white ink underbase layers. Both type of software are fine, but in most cases a RIP will provide the operator more control over the colors and ink being printed.
BUSINESS TIP: You will want to pay close attention to the software for all the dtg printers you are considering as there are very simple ones and there are complex ones. Depending on the operator’s graphic software experience and willingness to learn, you will want to choose the software that works best for your business.

There are two types of RIP software programs: print-to RIP and print-from RIP. The main differences between the RIPS are a print-to RIP will allow you to print directly from a graphic software (i.e. Photoshop, CorelDraw,….) and a print-from RIP requires the graphic software to be loaded into the RIP before printing it. Make sure that there is adequate information (whether written or videos) on how to use the different features of the RIP. Very few people are able to fully understand a RIP and its features during a training class. For more information on RIP software, please read the section on Becoming a Master of Your Software.
Matching a dtg Printer with Your Business.

Cannon #5: Not all dtg machines will be right for your business. Do your homework to find the best dtg printer that fits the needs of your business plan. Don’t believe any sales or marketing figures – do the tests yourself and speak to current owners.

One of the first questions that should come to your mind is “what dtg printer is going to be right for my business”. The key to this question is the “my business” phrase. Not all dtg printers are necessarily a good fit for your business. Thus, it is important that you create a list of dtg printers that match up with the business plan you created earlier in this i-Paper. Below are some of questions that will help you begin this process.

1. What is the typical size of the graphics you are currently printing or want to print?

   The size of the prints you want to do can dictate the size of the dtg printer you need. Based on my research, the average print is 12” wide or less. But, there are some businesses and target markets that need a larger print size. So, make sure that the dtg printers you are looking at give you the printable width of your designs and that your target market wants.

2. Who is going to run the printer? What level of experience do they have with graphic software? How much time are they willing to put into learning?

   The skill level of the operator (or the willingness to learn) is going to be the key to getting high quality prints on almost every dtg printer. However, some printers are easier to use than others. Don’t be fooled… no dtg printer is as simple as click one button and the print comes out awesome every time. Find a printer and software program that matches the skill sets of the operator.

3. Do you have to print on to dark garments?

   You can breakdown all the dtg printers into three different categories: CMYK only printing, White Ink Ready and CMYK + White Ink printing. The CMYK only printers will only allow you print on garments that are lighter than the colors in your design to keep your colors accurate. Most CMYK only printers are not designed to print white ink or will require some type of an upgrade. The White Ink Ready printers have the capability of printing white ink, but currently are not for one reason or another. A CMYK + White Ink printer means that the printer is currently printing white ink. Remember, most CMYK + White Ink printers can be figured into a Dual CMYK mode as well for those that don’t want to print white ink at the current time. A CMYK + White Ink printer can also be configured with just CMYK ink and cleaning cartridges.

T-Jet Blazer Express
(CMYK + Cleaning Cartridges)

Provided by: Thunder Sports
Determine what type of printer you need based on what colors of garments your target market wants and the colors in your designs.

4. **What is more important to you – lower cost per print (bulk ink systems) vs. less maintenance (closed ink systems)?**

   There are two types of ink delivery systems for dtg printers: bulk ink (i.e. open system) and cartridge ink (i.e. closed ink). The bulk ink systems provide you bottles of ink (usually ranging from 100 ML to 1 Liter in size) that are used to fill up either a reservoir or refillable cartridges. The bulk ink system tends to have a cheaper cost per print (because it is cheaper to put ink just into a bottle), but opens the door to allowing air, dust or other containments into the ink delivery system. A closed ink system uses sealed cartridges that remove the potential of containments from getting into the ink delivery system. Running a closed ink system has proven in several different types of printing (large format, sublimation, dtg,...) to have less maintenance issues with the printer. However, the cost per a print is more expensive because of the cost associated with the process of cartridging the ink. Here is a post that talks specifically about the challenges with a bulk ink system and air bubbles - [http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=3032](http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=3032). If you would like to figure out the differences in cost, check this link out - [http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=1398](http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=1398).

5. **Is the Printer going to be stationary or will it need to be portable?**

   If you plan on taking your printer to do onsite event production, you will want to have a printer that is portable and easy to move. Make sure you know the steps necessary to take in order to make the printer movable. Some printers will require you to lock down the print head or remove the inks from the ink lines. Figure out how long it takes to do this process and what the cost is associated with this. You may also find out it is easier to move a dtg printer that uses a closed ink system compared to a bulk ink system.

   **PRINTING TIP:** Any dtg printer will react to changes in the environment. Taking a dtg printer to a place that has a lot of dust or dramatic changes in the humidity / temperature will provide you challenges in printing. You may want to have a digital thermostat (with a humidity gauge) and a small humidifier if you are going to print in an area that has low humidity to prevent the nozzles from clogging up.

Answer these questions and go to the dtg manufacturer’s website or industry forums to begin your research on which dtg printers has the potential of matching up with your business’ needs. Once you have narrowed down the list to a manageable number, you will need to get in-depth information about all the potential machines. Here is a link to a checklist that will help you get started in this process - [http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=1539](http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=1539).
**Kick the Tires, Take a Test Ride**

First and foremost, *don’t ever purchase a dtg printer without first seeing how it works in detail first hand* - whether you go to a trade show, a distributor’s show room or to another dtg owner’s shop. The main purpose of seeing the dtg printer in person is to see all the necessary steps needed to print a shirt. Contrary to some rumors, running a dtg printer is not as simple as pressing the print button. Ask to see how to do the following:

- Steps need to prepare the machine for printing and the necessary maintenance procedures.
- All the necessary steps to prepare and send the graphic to the dtg printer.
- The steps to pretreating a garment if necessary.
- How to load a garment on the platen.
- How to cure the garment for the best wash capability.

Don’t be satisfied with having a manufacturer or distributor send you a sample print. Make sure that you know each step of the process before investing in a dtg printer.

**Get YOUR Graphic Printed**

Whether you go to a trade show or a show room, make sure you bring a couple of your graphics on a USB memory stick or on a CD-ROM disk. This way you can see exactly how the operator will adjust your graphic to get the best looking print. Have your graphics saved in multiple formats (PSD, CDR, TIFF,...) just in case the computer that is running the dtg printer does not have the same graphic software program. The best graphic is one that contains a lot of different colors and that is symmetrical in design. This way you can cut the design in half to wash one side and keep the other side as a control sample to compare the colors.

NOTE: If you plan on going to a trade show to get your designs printed, I strongly recommend you setting up appointments with the different exhibitors that you are interested in purchasing a machine from. Let the exhibitors know upfront that you are planning on bringing your own graphics to print so there are no surprises. This will also allow the exhibitor to plan their booth schedule around to adequately provide you with the time needed to print your design and answer your questions.

For those people that don’t have their own designs yet, here are links to a couple of files that can be used:


**Do Some Reference Checks**

Treat your purchase of a dtg printer like you would if you were hiring a new employee. Most dtg manufactures will provide you with the contact information for one of its customers that own the same dtg printer for you to have a peer-to-peer conversation. Not all printers from the same manufacturer operate the same way. So make sure you can speak with someone with the same type printer. Also use the different industry forums to contact other dtg owners on your own to get their take on the same model printer. Remember to take notes on each conversation and compare one conversation to another to see if there is a general consensus.
Understand the Support & Warranty Programs

One of the most overlooked factors when looking at which dtg printer to buy are the Support and Warranty Programs. Make sure that you get a written copy, whether on paper or in an email, of the Support and Warranty programs that each printer offers. Please do not just rely on a verbal conversation with a sales person.

Almost every dtg owner that I have talked to has needed some type of technical support at one point or another. Just like some people learn in school differently, people need to have a different level of technical support. dtg Manufacturers can provide support in any one of the following ways: email, telephone, online user forum, videos and onsite services. You will need to determine what methods are the best methods for providing technical support for your business and find a dtg manufacturer that offers that type of support.

**BUSINESS TIP:** Every dtg owner should understand that there are times when a technical support person can’t immediately be reached by phone and in some cases are in a different time zone. Having either the dtg manufacturer or distributor close to you can definitely be a benefit. Otherwise, network with other dtg owners in your area or via an online user forum that might be able to assist you.

Some of the dtg manufacturers either offer training at their facilities or a distributor’s facility for new customers. I recommend to any company that is going to purchase a dtg printer to go to this training – whether it cost money or is free. The information that you can learn at this type of training can save you hours of headaches and potential prevent you from having to spend additional money replacing parts on your printer. If no training is offered at a central location or a place convenient for you, ask to see how much it would cost to have someone do the training at your place of business. Here are some posts about training classes:


There are some key things that you should be aware of when looking at the warranty programs for the different dtg printers. Most dtg manufacturers will warranty most of the parts of the printer for some period of time. Some manufacturers will even offer an exchange program that will allow you to switch out a non-working dtg printer with one from the manufacturer. Whatever the warranty program is, make sure you thoroughly understand what is covered under the warranty and for how long. In addition, know what if any events could cause your warranty to be voided.

**MAINTENANCE WARNING:** Don’t be surprised if the print head(s) are excluded from the warranty. The print heads are a consumable part that needs to be handled with care. A head strike or failure to perform the appropriate maintenance can cause damage to a print head that would require it to be replaced.
**Understanding dtg Inks**

The most controversial part to dtg printing is the chemistry involved with the ink and pretreatment. Over the past couple of years, the advancements in the ink and pretreatment have occurred at a rapid pace. Additionally, the ink manufacturers are continuing to work on improving the color, maximizing the wash fastness and making it easier to work with the inks.

**Cannon #6:** Find a set of dtg inks that work best for your printer and stick with it. It is expensive and time consuming to switch out different ink sets – not to mention redoing all of your wash tests. When you do switch ink sets, make sure you update your profiles.

dtg inks are transparent in nature like most regular desktop inks, heat transfer inks, sublimation inks and solvent inks. This means that if you want accurate color reproduction, you will want to print on to a white substrate or background. Otherwise, the color of the garment or substrate will show through the transparent inks and alter the colors of the graphic or artwork. The only exception to this is the white ink used by dtg printers. The white ink contains titanium dioxide ($\text{TiO}_2$) particles that reflect light and will allow you to print an opaque white underbase layer on to dark garments or substrates. $\text{TiO}_2$ is a chemical compound that is used in several things like white icing for cakes. For more weird, but fun information on $\text{TiO}_2$, check this link out - [http://www.screenprintinguniversity.com/forums/viewtopic.php?t=3926](http://www.screenprintinguniversity.com/forums/viewtopic.php?t=3926). For more information as to when you will want to print a white underbase layer, check this link out - [http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=3123](http://www.inkjetgarmentprinters.com/forums/viewtopic.php?t=3123).

**BUSINESS TIP:** You will want to check with your local government agency to see what rules apply to your business. One of these rules is most likely to keep Material Safety Data Sheets (MSDS) on hand for all chemicals (i.e. ink, pretreatment,...) used in the shop. The MSDS sheet will note several key things like any potentially hazardous chemicals, what to do in case the chemical is inhaled or digested, the contact information for the manufacturer and so on. You can get these MSDS sheets from your distributor or dtg manufacturer. I recommend you keep the MSDS sheets in a 3-ring binder that is stored in a visible location. Here is a link to a post on more information about MSDS sheets - [http://www.screenprintinguniversity.com/forums/viewtopic.php?t=4336](http://www.screenprintinguniversity.com/forums/viewtopic.php?t=4336).

**What can dtg Inks be Printed On?**

If you walk a trade show or go into a show room, you are bound to see non-garment items that have been decorated using a dtg printer. So, the question of what types of items can I use dtg inks on always comes up and the answer is – it depends on what the item is and what it’s going to be used for. dtg inks are specifically manufactured to bind with natural fabrics (i.e. cotton, bamboo,...). However, you can print on to synthetic fabrics (i.e. 50/50, polyester,...) and hard substrates (ceramic tile, wood,...) with some additional steps. However, knowing what the item is going to be used for will help to determine whether dtg ink is appropriate. If
the item is not going to be cleaned (whether by a washing machine, by hand or by nature – i.e. rain), then there is a higher chance that the ink will remain on it for a limited time.

PRINTING TIP: Some non-natural fabrics will require you to lay down either pretreatment or an inkjet receptive coating (IRC) before you print on them to prevent the ink from bleeding. You might also want to adjust the ink density levels as well.

Below are some links to posts that talk about printing on to synthetic fabric and hard substrates using dtg inks:


The Dark Secret: The Art of Pretreatment

When you use a dtg printer to decorate a dark garment, you will want to create a white underbase first and then print the CMYK colors directly over the white underbase. The white underbase will block the color of the garment from altering the CMYK colors of the graphic. However, we need to make sure that the white underbase remains on top of the shirt fibers to properly block the dark garment color from coming through the underbase. To do this, we will spray or coat the shirt with an adhesive-like substance called pretreatment. The pretreatment allows the white ink to remain on the top of the garment fibers and also helps bind the white ink to the garment’s fabric. Think about pretreating a shirt in a similar fashion as you would put primer on the walls in your house before you paint them. In fact, water-based primers like Killz at your local paint store is an IRC coating that was discussed above and can be used for printing on to hard substrates.

Most of the challenges for a new dtg owner is knowing how to properly apply the pretreatment to the garment. A lot of these problems arise because there is no single best way to pretreat a shirt. You can go to different dtg manufacturers and get completely different processes. In addition, the pretreatment process will change depending on the type of fabric (i.e. cotton, 50/50, polyester,...) and the color of the fabric (black, red, white,...). I believe the best approach for new owners is to try several different methods and perform their own wash tests to see which process works the best for them. Most dtg manufacturers and distributors are recommending to new owners to expect to practice on approximately 72 shirts before they become proficient in the process. Ask your dtg manufacturer what pretreatment steps they recommend and below are some links to other dtg owners methods:

PRINTING TIP: When conducting your own pretreating and wash tests, I recommend you keep a log of all the settings used on that sample, including, but not limited to: % of pretreatment, % of distilled water, time / temperature / pressure for curing the pretreatment, settings for both the white underbase and CMYK layers of ink and the time / temperature / pressure for curing the ink. Identify each shirt in your log by putting a mark on the tag of the shirt or write on the shirt with a permanent marker. You will want to use both sides of the shirt as well. This way you can refer back to the log to determine what the exact settings gave you the best results. You will also want to do these tests on different types of fabric and different colors.

In addition, some dtg owners are now using either a special type of pretreatment or water-down pretreatment on light colored garments or substrates to get brighter colors and better wash fastness. For more information about this, click on this link - http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t40611.html.

Recently, some of the dtg manufacturers have begun developing and selling of automatic pretreatment machines to make the process of pretreating more of a science, rather than an art. These machines are rather new and probably need to have more production-type testing done to them. However if you would like more information on them, click on the links below:

- http://boards.screenprinters.net/viewthread/90/329770

Curing dtg Inks – Heat Press vs. Conveyor Dryer

In order to ensure that dtg inks will remain on the garment, you will need to cure the inks by either a heat press or a textile conveyor dryer. Due to the size and electrical requirements of textile conveyor dryers, most dtg owners use heat presses to cure their prints. However, prints from the Kornit dtg printer need to go through a special type of conveyor dryer that has forced air to cure the prints because of how much more pretreatment and ink that is dropped down by this dtg printer. Some dtg owners have found it easy to run CMYK prints through a conveyor dryer, but have not received the same wash test results with dark garments. Most people believe that they white ink running through the smaller dtg printers needs the pressure from the heat press to properly cure it.
Click on this link for more details about using a conveyor dryer to cure dtg inks - http://www.screenprintinguniversity.com/forums/viewtopic.php?t=3836. However, new dtg inks are being released into the market and new wash tests will need to be performed to determine if better results are achievable for dark garment prints.

PRINTING TIP: Some dtg owners prefer to float the heating element over the top of a dark garment print to spot cure it before closing the press. You may want to put either wax paper, parchment paper or silicone paper over any dark garment print to help prevent excess ink from transferring to either your heating element or your Teflon sheet. Each type of paper might leave a different effect on the print.

Some features to look at when deciding which heat press to purchase for curing your dtg prints are the following:

- **Which style of a heat press fits your business best? Clamshell, Swing Away or Draw Press?**
  Here is a link to a video that explains the advantages and disadvantages of each type of heat press - http://www.t-shirtforums.com/t-shirt-articles/t11246.html.

- **Does the heat press have a digital temperature gauge and digital timer?**
  Most commercial grade heat presses contain both of these features. In order to make sure that your Properly cure the dtg prints time after time, you will want to be able to set the temperature on the heat press the same every time and cure the prints for the same amount of time. Slight changes to either of these settings can have an effect on your wash test.

- **Do you want the auto open feature that automatically opens the heat press when the timer expires?**
  A lot of dtg owners like this feature as it allows them to do other tasks while the heat press is closed and not have to worry about forgetting to open the press – which will scorch and ruin the shirt. This feature is available on some clamshell presses and most automatic heat presses. Here are some links to see this feature in action:
  - http://www.youtube.com/watch?v=nWavfJKfVVM
  - http://www.youtube.com/watch?v=ysJ2q7NZ4KE

- **NEW FEATURES: Digital Pressure Gauge and Dual Timer Feature.**
Hotronix, one of the leading manufacturers of heat presses, just released a digital pressure gauge and dual timer feature. The digital pressure gauge will help eliminate the differences between what two people would consider light pressure. To much pressure on dark garment prints and you could drive the white underbase into the fibers of the shirt allowing the shirt color to alter the colors in the graphic. The dual timer feature will allow you to have preset times for both the prepress and curing processes. For more information, visit Hotronix’s website at www.hotronix.com.

Should you decide to purchase a textile conveyor dryer, you will want to make sure that it has the ability to cure water-based inks by using a forced air / ventilation system. This will help evaporate and remove from the dryer’s heating chamber the moisture from the water-based dtg inks. You will also need to be able to control the belt speed and the height of the heating element to get the optimal results. For more information on using a conveyor dryer for curing dtg prints, click on these links:

**Hix Corp Dryer**

**Interchange MD-8 Dryer (with Return Belt)**

Provided by: ContractDTG.com

Taken at the Atlantic City ISS Show

**Does the Shirt Matter?**

The fabric of the garment or substrate (i.e. canvas) does / will make a significant difference on how well the ink will last on the substrate. The binders in the dtg inks will adhere better to some types of cotton better than others. In addition, some shirts have less fibrillation (i.e. the fibers of the shirt don’t get as frayed) and are above to hold the design on the shirt without it getting fuzzy. Below are links to some posts that discuss which shirts current dtg owners have received good results with. However, I recommend you do your own wash tests on different fabrics and from different manufacturers.

Making Color a Partner in Your Business

Almost everyone that has done digital printing has come across something that was challenging to print the same way as it looks on a monitor or a printed sample. It becomes even more challenging when your customer wants to hit a specific color. To really understand color, you will need to understand some of the basics of color and what color management is. But there is no real way to thoroughly cover color management in this document. For detailed information about color, please attend a seminar at one of the industry’s trade shows or check out some of the links below:

- SGIA Webinars - http://www.sgia.org/events/sgia_calendar.cfm

General Color Information

Before we get started, here are the definitions to some of the key color terms you will hear:

- ** ICC** – abbreviation for the International Color Consortium (www.color.org), which is a group dedicated to creating a standard for color profiling in the graphic industry. ICM is the Microsoft’s version and ColorSync is the Apple version of ICC. You will see these abbreviations used when talking about a specific profile.

- **Profile** – is a text file that describes the color capability of a specific device (i.e. dtg printer). A profile is created using a specific printer, ink set and imitable. What a profile does is allows your dtg printer to recreate the color values in your graphic accurately.

- **Rendering Intent** – a conversion process that takes the out-of-gamut color values in your graphic and converts it to a printable color. There are four different rendering intents: perceptual, saturation, absolute and relative colormetric. For more information on how each of these rendering intents can have on color, click on this link – www.multirip.com/rendering_intent.pdf.

- **Color Gamut** – is the range of color that device can capture or reproduce (i.e. print). Each device will have its own unique gamut and this is why each profile is specific to a printer model. In addition, some environmental factors can play a role with the gamut of your printer as well.

- **Color Mode** – is the color environment that the graphic was created in – (i.e. RGB, CMYK, LAB,...).

- **Source Profile** – is the color and image profile for the different color modes. Examples of source profiles are sRGB, Adobe RGB, ColorMatch RGB, NTSC (1953), SWOT and others.

One of the best working definitions of color I have heard came from an SGIA webinar stating it is the result formed between the interaction between a light source, an object and the viewer. Within the human eye, we can see millions if not billions of different colors. A standard RGB monitor can usually produce around 16 million colors. However, a CMYK printing process can only reproduce between 20,000 to 30,000 colors depending on the calibration, dots and halftones used.
PRINTING TIP: Since the CMYK gamut is the smallest in size, you will want to develop all of your graphics in RGB mode and then use the appropriate profile to convert the RGB color values into a CMYK value. This is a general rule for all types of digital printing.

There are three dimensions of color that you should know about in order to tweak graphics to for the best prints: hue, saturation and lightness. The hue is the word used to describe the spectrum color of an item (i.e. red, blue, pink, yellow, green,…). Saturation is how vivid or dull the color seems to be. The lightness refers to the brightness or darkness characteristic of the color. By adjust any one or all of these settings in your graphic software program, you are able to adjust the colors for optimal printing.

PRINTING TIP: The best way to truly understand how these three dimensions of color will affect your graphics is to practice with a small test graphic. Adjust one of the settings at a time so you can see the effects it will have on your graphic. You might want to try both a vector and raster test graphic.

dtg Specific Color Management

Cannon #7: Set up Color Management policies for your business that will allow you to accurately reproduce colors and satisfy your customer’s expectation. This will require you to become proficient at both your graphic software and printing software programs.

What you, as a new dtg owner, need to do is install color management policies in your business that will allow you to match the customer’s color expectation with the output of your dtg printer. One of the first things I would recommend you doing is printing a color chart out on different substrates and colors. The color charts will help your client understand the colors achievable from your dtg printer and will show how colors can be affected if you don’t use a white ink underbase on a color garment. Some dtg printers come with a built-in color charts in their printing software, but for those dtg printers that don’t have color charts…click on this link to download these two Color Charts packages – that contain a 510 color chart (size 8.5” x 11”), 2040 color chart (size 11” x 17”), a PDF of RGB Values and a corresponding color swatch / palette - www.multirip.com/colormanagement1.html.

PRINTING TIP: When you print your color charts, make sure that you know exactly what settings you used in your printing software so you can accurately reproduce the same colors when you go to reproduce the customer’s artwork. You will probably want to get the customer to select the color on your color chart or compare it to a printed sample from the customer.

In the section Becoming a Master of Your Software in this i-Paper, we discuss the need for mastering both your graphics and printing software programs. Almost all graphic software programs allow you to adjust some color settings (i.e. mode, embedded profiles, rendering intent,…). Some dtg manufacturers will have you turn off the color management engine in you graphic program and allow the printing software program (i.e. the print driver or RIP) to handle the color value conversions. Please make sure that you speak with your dtg manufacturer or distributor to make sure that you know the appropriate color management settings to get the best colors.


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The Commitment to Maintenance

**Cannon #8:** A dtg owner can dramatically minimize the amount of downtime the printer has by regularly using the printer and doing simple maintenance. Less than 10 minutes a day can save hours of time later on – usually when you need the printer the most.

By now, any prospective dtg buyer can easily find information on the internet that talks about the problems some people have had with dtg printers. Some of these problems relate to issues with the printer not performing correctly and most of the manufacturers have worked to correct these problems. However, there are a large number of problems that relate specifically to the owner not performing the proper maintenance on the machine. Little things like dust and lint can cause problems with the way a dtg printer will perform. So I can’t urge you enough as a new dtg owner to make sure that you know exactly what the maintenance procedures are and that they are done on a regular basis.

**Ink – Use It or Lose It**

The general rule for most dtg printers is “Let it is and it will clog.” With any Epson-based dtg printer, the particles that make up the dtg inks are much larger than the particles of ink that the printer was designed for. Thus if the printer sits idle for a couple of days, you may get a clog in the ink lines and/or the print head. Thus, it is important to keep the ink flowing through the lines and print head in order to prevent wasting the ink during a cleaning cycle. In addition, most dtg manufacturers recommend that you agitate the white ink to keep the TiO2 from settling to the bottom of the container. This includes the ink in your bulk feed system or cartridges – as well as the ink you have in inventory.

**PRINTING TIP:** I recommend you print one sample every business day at a minimum to help keep the ink in the lines and the print head moving properly. By printing a sample, you create marketing material to help promote the fact that your business can now produce short-run decorated apparel. Otherwise, you will probably land up wasting as much ink running head cleanings to remove the blockage.

**MAINTENANCE TIP:** As previously mentioned, there is a software program called Printer Jockey ([www.printerjockey.com](http://www.printerjockey.com)) that provides you the ability to flush a single channel of ink that a nozzle check shows is clogged. This will save you the ink that is used by running a head cleaning on the channels of ink that are not clogged. For videos on this software, please click on this link - [http://www.youtube.com/view_play_list?p=14F0462969688F11](http://www.youtube.com/view_play_list?p=14F0462969688F11).

Here are some links that talk more about why head clogs occur and how much ink is used during the cleaning cycles:

Create a Log to Track Maintenance

Each dtg manufacturer should be able to provide you with a written list of what items need to be cleaned / maintained on a regular basis. Usually this information can be found in an Owner’s Manual or on a user forum. I recommend you create a schedule / signature log that requires the operator to sign off that the scheduled maintenance was done. This log should have the daily, weekly and monthly maintenance procedures listed out and a place where someone can sign/date showing it was done. This will help keep your business on track with keeping your machine in top printing shape. In some cases, you will even find other users have created their own maintenance procedures that go beyond what the manufacturer recommends. Here is an example of a post like this - [http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t32835.html](http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t32835.html).

Some dtg manufacturers have started incorporating some features into the dtg printers that help with the maintenance procedures. For example, some dtg printers now have buttons on the side of the printer that allow you to run a cleaning cycle with the push of one button or where you can set it to run an automatic cleaning cycle every so many of hours / days. Other printers have added features like an ink agitator to help prevent the ink from settling. Just make sure that you understand any cost associated with running these auto features (i.e. ink used during an auto cleaning cycle) and incorporate this into your pricing structure.

Common Maintenance Procedures

Below are some of the common maintenance procedures that are typically done to most dtg printers. It is important that all dtg owners follow the instructions and recommendations of their dtg manufacturer as each printer might have some unique differences.

Maintenance To Do List:
- Clean the maintenance station and wiper blade with cleaning solution.
- Use a cleaning swab to wipe around the nozzle plate under the print head. Do not wipe over the nozzles of the print head.
- Clean both sides of the encoder strip with a lint-free pad
- Make sure that any items (i.e. rails,...) that need to be lubricated are done so on a regular basis.
- Check to make sure that the waste bottle is not full.
- Wipe up any ink splatter on the inside of the printer.

Here is a link to post that goes over some of the things a dtg owner should think about when it comes to maintenance - [http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t41796.html](http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t41796.html).

Advanced Maintenance Procedures

Throughout the internet, you will find information about how some dtg owners have been able to do some unique cleaning methods (i.e. soaking a print head, putting dampers through an ultra sonic cleaning,...) to get their machine working properly. I strongly encourage you speak with your dtg manufacturer first to make sure...
that you don’t cause additional harm to your dtg printer before trying any advanced maintenance procedures. Here is a link to a post that talks about some of these procedures - [http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t25918.html](http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t25918.html).

**Your Environment Matters**

When using a dtg printer, you should understand that your environmental elements (i.e. temperature, humidity,...) can play a role in how your printer performs. For example, shops with low temperatures or low humidity might experience more clogged nozzles. Also, areas that have a high level of dust will tend to receive a higher amount of errors associated with a dirty encoder strip. If you plan on taking your printer on the road to do event production, you will want to check out the weather forecast in advance and prepare for the climate at that location.

**MAINTENANCE TIP:** A good trick to help keeping the nozzles in the print head from drying up at night is to put a damp towel under the platen, load the platen directly below the print head and place a low-nap or lint-free towel covering up the top of the printer / platen. This will create a closed in area of humidity below the print head and will keep the nozzles moist.

I recommend that every dtg owner have a small digital temperature gauge to keep track of these items. Most dtg printers will operate efficiently when there is approximately 50% humidity. Some shops may need to purchase a small humidifier to compensate for low humidity levels – especially during the winter months when heaters are used. Please contact your dtg manufacturer for the recommended level of humidity for your specific printer. Here are a couple of links to posts that talk about how the environment has affected some printers:

Become a Master of Your Software

In the printing industry, there is an old saying – “Garbage In, Garbage Out”. This statement refers to know matter how good your printer, inks and media are...you have to have good graphics to make good prints. In order to get good graphics, you have to know how to use both your graphic software program (i.e. Photoshop, CorelDraw, Illustrator,...) and the printing software (i.e. Print Driver or RIP software).

Cannon #9: Any potential dtg owner needs to invest some time into learning both their graphic software program(s) and the printing software if they expect to achieve the highest quality prints.

Graphic Software

Most people that are looking at buying a dtg printer have little to no experience or knowledge about graphic software programs. You will find a lot of posts that talk about how some people prefer one software program over the next. Below are a couple of posts that compare the different graphic software programs:

http://www.t-shirtforums.com/graphics-design-help/t38966.html
http://www.t-shirtforums.com/graphics-design-help/t22290.html

With the growth in desktop publishing, I believe that all dtg owners should have at least one vector and one raster graphic software program to handle the different types of files a customer will give to you. Both types of files have their advantages and disadvantages when it comes to printing with a dtg printer. Here is a link that talks about both of these types of graphics - http://www.t-shirtforums.com/graphics-design-help/t44020.html.

PRINTING TIP: With most dtg printers, it is typically easier to hide banding when you print a raster graphic compared to a vector graphic due to the fact that banding is more noticeable when printing solid areas of the same color. However, a vector file allows you to enlarge a graphic without pixelating it (i.e. making the graphic blurry). You can also convert a raster graphic into a vector graphic. Here is a post that provides you different options for doing this - http://www.t-shirtforums.com/graphics-design-help/t40258.html

Raster Graphic

Vector Graphic

Provided by: Great Dane Graphics
I strongly recommend any new / novice user getting some graphic software training. Training is typically done at an industry trade show, community / local college, online and other ways (i.e. CDs / DVDs). Here are some links to some websites that offer either online training or training CDs.

- [www.greatdanegraphics.com](http://www.greatdanegraphics.com)
- [www.d2slearning.com](http://www.d2slearning.com)
- [www.lynda.com](http://www.lynda.com)
- [www.advancedartist.com](http://www.advancedartist.com)
- [www.coreldrawunleashed.com](http://www.coreldrawunleashed.com)
- [www.garmentgraphicsnetwork.com](http://www.garmentgraphicsnetwork.com)

As far as printing software, there are three types: Print Driver, Print-To RIP & Print-From RIP.

### A Little Background about RIPs (Raster Image Processors)

The RIP has its roots in the Pre-Press industry. Back in the 80's Adobe Systems introduced the PostScript page-description language. This language became the defacto standard for DTP (Desk Top Publishing) and professional printing. This very powerful computer language required a computer & software to interpret it into it's binary representation (millions of little dots). This computer/software combination was named the Raster Image Processor... aka, the RIP. As PCs became faster, the need for having a separate computer to interpret the PostScript language, normally housed inside the printer itself, disappeared. The RIP software could now run right on the host computer. And thus the "Software RIP" was born. All RIPs for direct-to-garment are software RIPs.

### The Difference Between A RIP and a "Printing Utility" or Print Driver

All direct-to-garment printers include software to drive it. Some of these software packages can only open raster files (JPG, PSD, TIFF, etc.) and thus are simply "Printing Utilities" and not truly a RIP. A print driver is similar to the basic software you would get with your standard desktop printer. You will find some simple selections (i.e. draft, enhanced, photo,...) to choose from that will allow you to adjust your print settings. An example of a dtg printer that uses a print driver is the Brother GT-541. For a software package to be a true RIP, it must be able to rasterize page description languages like PostScript or PDF. If it only handles raster files, it is a "printing utility", not a RIP. You might be asking... So? Well, the answer is two words: Print Quality. When you have a professional rasterizer (a true RIP), you'll get better output, smoother blends, better font reproduction, better color matching, better image-size interpolation, etc.

Although a RIP is not as important in a CMYK-only setup, it is indispensable in a CMYK+White ink or dual-CMYK setup. In general, a RIP software allows you more control over the colors of the graphic used by the printer by allowing for choices like: RGB / CMYK Color Source Profile, Resolution, Uni-Directional vs. Bi-Directional printing, assigning ICC / ICM profiles and more. RIPs will also help with creating the underbase layer when printing white ink. A print-to RIP allows the user to print directly from a graphic software program. Examples of dtg printers using a print-to RIP are DTG, Flexi-Jet, Direct Advantage lines of dtg printers. A print-from RIP requires that the design to be saved in the graphic software program and then brought into the print-from RIP application. Examples of dtg printers using a print-from RIP are the T-Jet and Anajet lines of dtg printers.
BUSINESS TIP: If you are a MAC user, confirm with the dtg manufacturer that the print driver or RIP will work in conjunction with your MAC computer in advance. Otherwise, you will probably want a dedicated Windows computer to drive your dtg printer.

PRINTING TIP: When printing on to any type of fabric, your graphic should not be over 200 DPI in resolution as the fabric will not be able to hold a higher resolution. Printing at a higher resolution most likely is a waste of ink and may cause ink to puddle on the fabric.

**White Ink Printing**

One of the most challenging aspects of direct-to-garment printing is white ink support. When selecting a direct-to-garment system, it is very important to select one which has a powerful white-ink solution. Some systems boast about the "simplicity" of their software. Simplicity is great. Automatic-white-layer generation is done by several software packages. But believe me, if it ONLY has automatic modes, it will fall short in real-world production. If you haven't done so yourself, ask an experienced screen printer what the steps are for printing using white ink. Knowledge is required. Ultimately, you'll have to have at least the basic understanding of traditional white-ink printing. Your software package must, in addition to automatic features, have the ability to let you "take the wheel" and define the color layers in the application (Corel, Photoshop etc.) exactly as a screen printer would. The RIP (and it should be a true RIP) should be able to handle "most" jobs with its automatic white-generation but it must have manual white ink modes to cover the small percentage of jobs where more is needed. By the same token, the software should not "make you" do everything yourself. It should be smart enough to automatically handle most white-ink requirements with minimal work.

Ultimately, current users of a product are the best source of information concerning the ease of use and power of the software. Do your homework. Ask questions. Some sales folks will tend to try and "play-down" the importance of the software. Don't let them! "It does that" is not enough of an answer. Find out the "how" part... then pick the one that suits you best.

Here are some other key posts on graphic programs and printer software programs in the industry:

- Videos on MultiRIP GP - [http://www.youtube.com/view_play_list?p=580C0ADBEAF1DA4A](http://www.youtube.com/view_play_list?p=580C0ADBEAF1DA4A)
**Besides Apparel, What Else is There?**

Although you will see these printers advertised as direct-to-garment or dtg printers, it is beneficial to understand that they can be used to print on to other substrates or medium. As long as an item is able to pass through the slot under the print head carriage, you will have the “potential” of printing on it. Please notice that I said potential. As mentioned earlier in this document, dtg inks will typically adhere to natural fibers (i.e. like cotton or bamboo). However, you may have to ability to print on to other types of fabric and even hard substrates using a dtg printer. Although I don’t recommend it, some people have had limited success printing on to synthetic fabrics (i.e. polyester, nylon,…) using a pretreatment solution. There are a significant amount of people that have had success using dtg inks to print on to hard substrates by first applying an inkjet receptive coating (IRC) and a clear top coat to seal the ink to the hard substrate. In cases where the item will receive direct sunlight, a clear UV protective coat will be needed.

**PRINTING TIP:** Any time you attempt to print on to hard substrates or a non-garment item (i.e. canvas), you will want to start off by decreasing your ink density since the item will not be absorbing as much ink as a standard shirt would.

I do want to caution any dtg owner from taking the focus of what these dtg printers are designed for. Extra money can be earned by printing on to other items, but it is going to take some trial and error to do this. The cost and time associated with this can add up over time if you are not careful.

Here are some links to posts that show pictures of items besides apparel that have been printed using a dtg printer:

The Business Side of dtg Printing

dtg printing is a great new decorating method that can open the door for more companies getting into the decorated apparel industry. However, don’t be fooled… it is still a business and needs to be run like one. Thus, you need to go back to your business plan that you wrote to look at how you are going to market this new decorating method and to whom. In addition, you will need to do some research as to what your costs are going to be and what the appropriate selling price should be in your market.

A Target Market – Establish One!

One of the early mistakes a company can make is that they don’t establish what the target market is. Instead, they say that they will sell to any type of company or individual. Making a statement like this is a business policy - not a marketing strategy. We all have some things we like to do, activities that we participate in or groups that we associate with. These are things that will help you create a target market to help you focus your marketing and sales effort on. I have found over the years that if your target market is an area of interest for you, you will be more in touch with what the wants and needs of the target market really are. Also, look at your local geographical area for target markets as well (i.e. schools, tourism,…).

BUSINESS TIP: Your target market is most likely going to change over time. Make sure that you go back and look at your business plan at least once every year and make changes to it. A business plan should be a living document. By reevaluating your business plan periodically, you will remain focused on your goals and provide your company a better opportunity for success.

Create Marketing & Sales Strategies

The marketing strategy for how to promote this new decorating method will vary depending on whether your company is a brand new company or an established decorating company. New decorators will find that they are probably going to be better off focusing their efforts on their target market. However, an established company may find it more profitable to promote this new service to existing customers. The old saying “it is easier to sell something new to an existing customer compared to finding a new customer” is true. Take advantage of any existing relationships you have as studies have proven that people are more likely to buy from someone that they have an existing relationship with.

dtg printing has allowed decorators to do more onsite or event production of custom, one-off items. So, many of the dtg owners have taken their dtg printers to fairs, art shows, tournaments and receptions. Event production usually generates higher profit margins because of the customer’s desire to take the item home with them. However, you will want to check with the dtg manufacturer to determine if the machine is recommended for mobile printing and what the steps need to be done to transport the machine.

Price It Right – Set Your Pricing Strategy

One of the basic principles or keys to success in the restaurant industry is “location, location, location”. Most people think this a rule that basically applies to restaurants, gas stations, retail shops and similar businesses.
However, this principle also applies to the pricing strategy of any type of apparel decoration. The geographical and economic conditions of your target market will dictate how much you can charge for an item. Before you even begin to think about your pricing strategy, you need to know what your competition is charging. Do some research on the internet for both local and national printers to see what they charge. It is my opinion that it is much easier to start with a slightly higher price and provide a discount compared to raising prices later on.

When looking at pricing for a dtg print, it is important to understand how it differs from traditional screen printing. The cost per a print for screen printing is primarily based on the number of colors needed to print the design. The size of the design is not as important as the number of colors. However in dtg printing, the size of the design is the key factor in pricing and the number of colors is not a key factor. This is why digital printing is perfect for doing short-runs with a large number of colors in it.

You will also want to take into consideration the cost associated with printing a job when you are developing a price. Some costs to think about are the ink, pretreatment (if necessary), garment / imprintable, labor, electricity, shipping costs (to get the blank imprintables and your machines consumables) and the machine payment. Some RIPs and printer drivers will have built-in ink calculators that will tell you either the amount of ink used or the currency amount of the ink used for that design. Use this information to help establish the price you charge.

**BUSINESS TIP:** If your software allows you to plug in the monetary cost for you to purchase the dtg ink, I encourage you to multiple this number by 1.2 to 1.5 to cover additional costs that will not show up in the calculations for your ink calculator. Examples of this additional cost are when running a nozzle check, head cleaning and the periodic cleanings that are built into the firmware of the printer; as well as the shipping costs of the ink.

I will point out that developing a pricing strategy for screen printing is very much different than what you would do for dtg printing. Here are links to some posts that talk about differentiating dtg printing from screen printing:


**Artwork Design – Charge for It**

*Cannon #10:* When it comes to artwork, charge for it! The artwork and computer side of dtg printing can be just as time consuming as the printing process. So charge your customer for the work spent on getting the artwork production-ready.

Most new decorators tend to under estimate the time it takes to get artwork production-ready. For a dtg
printer, it is important to thoroughly understand your printer software (RIP or driver) for knowing which setting(s) will give you the best looking print. Sometimes you will be able to simple put the artwork into your graphic software program or printer software and print it with no problems. Other times you will have to manipulate the artwork or possibly even recreate it. You need to take into consideration the time needed to get the artwork production-ready and charge the customer for this time.

**PRINTING TIP:** If a customer gives you a low resolution or small size graphic and wants you to print it, you might want to look at using the onOne Software called Genuine Fractals - [http://www.ononesoftware.com/detail.php?prodLine_id=2](http://www.ononesoftware.com/detail.php?prodLine_id=2). This software will allow you to increase the size of the graphic up to 1000% and still keep the detail in the graphic. onOne Software also has other things like PhotoFrame, MaskPro and more.

**Art Approval – Get it Signed**

Most established shops, no matter what decorating method is used, will have an artwork approval form that illustrates the item being decorated, the artwork and the proper location. The customer will be asked to review the illustration to make sure the colors are correct, all text is spelled correctly and the artwork is in the proper location. By getting the customer to sign off on this, you will pass the ownership of any mistakes to the customer if the final output matches the approval form.

**PRINTING TIP:** There is a great FREE plug-in for the Corel software called the Comp Generator from AdvancedArtist.com - [http://www.t-shirtforums.com/graphics-design-help/t11670.html](http://www.t-shirtforums.com/graphics-design-help/t11670.html). This program will take your design and drop it on to an illustrated form where you can select the type of shirt you want it to go on to. You can also customize the form with your company’s information and add a signature line for the customer to sign. If you use Corel, this is something you should definitely check out.

With any type of digital printing, it might be challenging to know exactly the colors that are on your screen are correct because the graphic may look different from one monitor to another. If possible, ask the customer to provide you a printed sample (whether it is from their letterhead, business card, brochure, printed shirt sample,...) so that you have something to match your output with. For color-specific jobs, you may want to get a pantone chart and have the customer tell you the pantone numbers for each color. Here is a link to a post that goes over the reasons for these extra steps - [http://www.t-shirtforums.com/general-t-shirt-selling-discussion/t35667.html](http://www.t-shirtforums.com/general-t-shirt-selling-discussion/t35667.html). Just remember what we talked about in [Making Color a Partner in Your Business](#) section.

**Sample Policy – Create One Before It Cost You!**
Once you begin to let your customers know that you can print short-runs, you will most likely going to get requests for doing samples or test shirts with the promise of getting a much larger order later on. Sometimes the larger orders come in, but a lot of times the order does not come in. However, you need to be compensated for the time and cost associated with printing the test shirt. Each dtg owner should have a standard policy on how to handle these types of request. Here is a link to a good post that talks about how some dtg owners handle these types of requests - http://www.screenprintinguniversity.com/forums/viewtopic.php?t=4348.
The Digital Concept Shop – Designed for Short Runs

One of the projects that I have worked on over the past couple of years with some decorators and distributors is what I call the “Digital Concept Shop.” As previously mentioned, most decorators want to be a complete service provider for their customers. The idea behind the Digital Concept Shop is to provide a decorator the ability to produce sample designs and fulfill short run orders using several different decorating methods on several different types of substrates in a small space – basically a 10’ x 10’ space. The Digital Concept Shop contains the following pieces of equipment:

**dtg Printer of Your Choice**

As thoroughly discussed in this i-Paper, the dtg printer will be used to print on to natural fabric items. You will just need to determine which type of dtg printer will work best for your business.

**Dual Purpose, Hybrid Printer (½ Sublimation & ½ Heat Transfer Printer)**

A hybrid printer allows you to put two different types of ink (sublimation and heat transfer inks) into one 8-channel Epson printer. The sublimation ink will allow you to print both light colored polyester fabrics and hard substrates that are coated for sublimation. The heat transfer ink will allow you print on to different types of transfer papers to go on to both light and dark colored garments – as well as almost any type of fabric. For more information on this type of printer, click on this link - [http://www.t-shirtforums.com/dye-sublimation/t24972.html](http://www.t-shirtforums.com/dye-sublimation/t24972.html)

**Optical Registration Vinyl Cutter / Plotter**

This type of vinyl cutter will allow you to cut all types of heat applied garment vinyl, window clings, inkjet transfers and most types of sign vinyl. The optical registration feature allows the cutter to know the exact placement of your graphic for a print-cut application. For more information on this type of cutter, click on this link - [http://www.t-shirtforums.com/vinyl-cutters-plotters-transfers/t20425.html#post139532](http://www.t-shirtforums.com/vinyl-cutters-plotters-transfers/t20425.html#post139532).

**Desktop Engraver**

A desktop engraver will allow you to create signs, name plates, awards, gifts and more. One of the new features of some engravers is having the ability to create rhinestone / stud templates for decorating fabric as well. For more information on what a desktop engraver can do, take a look at this link - [http://www.rolanddga.com/asd/products/engravers/EGX350/](http://www.rolanddga.com/asd/products/engravers/EGX350/).
**Heat Press**

The heat press is used to cure the ink, vinyl, transfer paper and rhinestones to the imprints. See the area on [heat presses](#) of this i-Paper for more information and links to additional information on heat presses.

I do want to provide one warning to a new decorator wanting to start a shop like this. Before you invest in all this equipment, you will want to make sure that the company or companies that you purchase the equipment from will train and support you on it. I also recommend to new decorators to build the Digital Concept Shop in steps to allow you ample amount of time to learn how to properly run each type of equipment.

The two other types of machines that you will periodically see in shops with dtg printers are a large format printer and an embroidery machine. A large format printer will allow the decorator to print on banner and sign materials using either a solvent or eco-solvent ink. The embroidery machine will use thread, instead of ink, to decorate apparel or non-wearables (i.e. bags, dog collars,...). Embroidery does have some limitations as to having the ability to recreate an image with the same detail that a printer can do. For more information on these other type of equipment, visit a trade show, read an industry publication or contact distributors for this type of equipment directly.

**Roland VersaCamm SP-300V**

**Brother Embroidery Machine**

Provided By: Jack Print and Designs  
Provided By: Stylish Designs

Here is a link to a post to as to some of the things people have done with a Roland VersaCamm print-cut system - [http://www.t-shirtforums.com/vinyl-signs-decals/t40586.html](http://www.t-shirtforums.com/vinyl-signs-decals/t40586.html).
Appendix A: Key Industry Posts

Below is a list of links to other industry posts that I feel contain good information that either a prospective or current dtg owner might be interested in.

- Before you get into dtg, things you should know - [http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t45383.html](http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t45383.html)
- To Lease or Not?  
- Examples of what a Versacamm printer (printer / cutter all-in-one) can do - [http://www.t-shirtforums.com/vinyl-signs-decals/t40586.html](http://www.t-shirtforums.com/vinyl-signs-decals/t40586.html)
- How does dtg differ than other decorating methods for printing in non-traditional locations:
- What is a good retail price for dtg prints - http://www.t-shirtforums.com/direct-garment-dtg-inkjet-printing/t45319.html
Appendix B: Comments from Current and Prospective dtg Owners

Below are some comments from other people inside the Decorated Apparel industry that work with dtg printing.

**Dane @ Great Dane Graphics**

“One of the great things about printing digitally vs. screen printing is how easy it is to do once the design is complete. Sure you might have to run your image through a rip software but it's still almost, File>Print!

Some things to consider when designing for digital is to use color and texture to create interest. Remember you don't need to print simple clip art anymore. Think of this differently than screen printing. Most screen printers want to print as few colors as possible because of the effort you have to go through printing films, burning screens etc. So the more colors you have, the more time it takes to set up and print.

With digital printing you have the capability to print full color right now. So why wouldn't you? Go ahead and wow your customers with a bright vibrant full color image. They will be happier with the finished product, and so will you. Once you start doing this type of printing and get comfortable creating art this way you will find more ways to make more money using the same idea. You can take the same image you just created for your direct to garment printer and use it for dye-sublimation. So you can put that image on mugs and mouse pads etc. with very little effort and expense.

Another thing to think about when creating your art and why you would want to use color and texture is this type of art will camouflage most print head imperfections and banding from your printer. If your printer has a nozzle or two drop out you wont notice the streaking or banding as much. If you print simple flat vector clip art with smooth solid color these imperfections will "scream" out at you!

So start using those Photoshop layer styles and create some killer looking designs today!”

**Bobbie @ Bright Light Beginnings**

“The purchase of my dtg printer has opened so many new doors for me in my business. It has given me the opportunity to take on contract printing of small orders and short turn around orders. When I was using heat transfers, I could not get a good quality product to sell to my customers and even though they were happy with the product I was not. I didn't know how to screen print and did not have the room for such a setup. I started seeing something called direct to garment printing and decided I needed to find out more about this. It was the perfect answer for me and my business although it might not be for everyone. I think the important thing is to make sure it fits your business model. Mine was printing on demand custom designs for 1 or 2 garments from my web-store, fulfilling small run orders and being able to print a quality product for the consumer. It is a great machine for small runs and short turn
around. As long as you do thorough research and learn everything you can before you purchase, and make sure your business model supports it, it is a really great business solution. Take advantage of all of the information that is out there, as time goes on and the industry matures there is more information becoming available such as this ebook.”

**Annette @ Sew Much Stuff**

“For anyone wanting to jump into the DTG market, I would recommend visiting the trade shows to watch the vendors print. I would recommend taking your file on a USB jump drive and asking the vendor to print it. This way you see the RAW files being transformed before your eyes. Remember the files being printed at the shows have usually been tweaked for the shows. If a vendor will print your file, you see what kind of software you need and what hoops you have to go thru to print. I would lean toward a vendor that takes your file and prints it. They apparently have nothing to loose. You like it or you don’t. Beware of the "we will take your file back to the office and send you as sample later" answer. To make an educated decision on purchasing a DTG, talk to other owners. Get the good and the bad. Before you make the jump, be sure you are pretty computer savvy as most of the time it is not plug and play. Remember Windows.... how many times have you plugged but not played. :-) If you are a Mac user, insure the drivers for that printer are available or be prepared to use Windows to run your DTG. White ink for the average shop has not been perfected without "jumping thru hoops" to make a shirt print. If you plan on doing one off's or multiple color jobs this is the way to go. Build your customer base and drive them to the DTG method. When you say there are no screen charges, and you can have as many colors as you want for the same price, that gets customers attention. Ready art is always a hassle but it can be a lot easier than trying to take a 3D picture and screen printing it for 12 shirts. There is a target market out there, you just have to guide your customer to make DTG the target.”

**Brian @ InkjetGarmentPrinters.com**

“Inkjet garment printing is NOT a substitute for screen printing but another form of decorating garments designed to give the apparel decorator more options. Besides being one of the fastest growing segments of decorating, it can also be one of the most profitable and fun. Use DTG to allow your creativity to run wild!”

**Ian (Zoom Monster)**

“I get a lot of calls and e-mails asking me about what is the best printer. My answer to most people is that the service you get from your dealer will bring more value to your business than choosing any particular brand of printer. Of course you need to find a printer that will meet the needs of what you’re trying to do. Don't try to "lowball" the price that you spend. All the major printers are very capable machines and can make you money if you're willing to learn the ins and outs of this thing called direct to garment. Most of all, do your research. Join on-line discussions, go to trade shows. Talk to people who are successful in using their machines. Listen closely for pitfalls or bad experiences people have with a machine or service department. Find out about the service "after the sale". If you live in an area where a specific company can give you hands on service, consider strongly going with that machine/distributor. Find the people who will help you go into business.....not just supply you with a printer. Find out about the costs of supplies
that you will be using. Get the training. Budget time and money up front to properly learn this craft. There will be certain aspects that you will not learn overnight. I would tell most people learn to print light garments first, but also experiment and charge enough for more difficult jobs, especially in the beginning....because you are going to use material (ink and shirts) learning to get good results. Be meticulous in keeping records on what brings success. Verify amounts of ink and costs/time factors. This will allow you to make money and to know when you are not... so that you can change your parameters and adjust your path. Learn what artwork is good for printing and what you need to do to marginal art to make it work for your clients. Don't be afraid to charge a fair price, and also know your process so that you can sell the benefits of Direct to Garment printing."

Michele @ SuperTPrinting.com

“DTG printing is optimal for single machine shops. The flexibility to print fabrics, pre-stretched canvass, porous stone, and (with an IRC) many solid substrates, allows one to run a full service shop with minimal space investment. The freedom of creativity and profit margins are excellent. We chose a machine based on maximum options for depth, length, and width of substrates.”