



# ELPHANTS ROCKET ALPS WINDOWS UTILITY MANUAL

English V1.0

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Covering all ALPS, OKI and Printiva Printers

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## 2 Introduction

This utility was first developed by myself in order to better facilitate my own personal printing needs for decals. I had many problems with the ALPS drivers like forgetting to set the overlay mode on or forgetting which layer I was on during a complicated print job. Even when using a print queue, guaranteeing good repeatable decal results always took me some time.

In addition, I hated all of the work needed to generate print layers for the artwork. It seemed to me that why could not the information needed to print a specific layer come from the complete image itself and that some logic applied to image could then extract that information needed to print a layer.

Basically, this is how the utility works. An image is loaded, rules are then applied on a per layer basis to the image in order to extract the layer information and an ink color per layer is chosen. Once all the layers for a decal set are complete, the data can then be saved to a Control File which contains all of the information necessary to print this decal set.

Since all of the information is stored in a single Control File, then the workflow process becomes simple and repeatable and eliminates the need for a print queue. No more forgetting to check the overlay mode or set the correct DPI or similar.

Another plus of the utility is that there is no need for using a layer-based tool like Corel Draw in order to design artwork. Artwork can be generated using Paint, Visio or many other standard platforms which run under Windows 10 and 11 and some tools even have no user cost like Paint.

Several years ago, Elephants Rocket started supporting the utility and has had a lot of input on what the utility should offer for features. There is even a special Japanese version of the tool which was modified by Gernot Hassenpflug and uses Japanese wording.

### Utility Highlights

- Works with all 64-bit Windows versions including 7, 8 10 and 11.
- Can print job by simply loading premade Control File and clicking on the print button
- Can set Image layup and number of copies
- CMYK dithering supports multiple algorithms and can easily be mixed with spot
- Supports all ALPS MD printers
- Elephants Rocket ink support with user settable ink bar code numbers
- Elephants Rocket pause workflow for swapping out ink cartridges
- Bad head element correction
- Error handling for ink empty
- Gold Foil/Silver foil support for 5k printers
- Curl correction always shut off

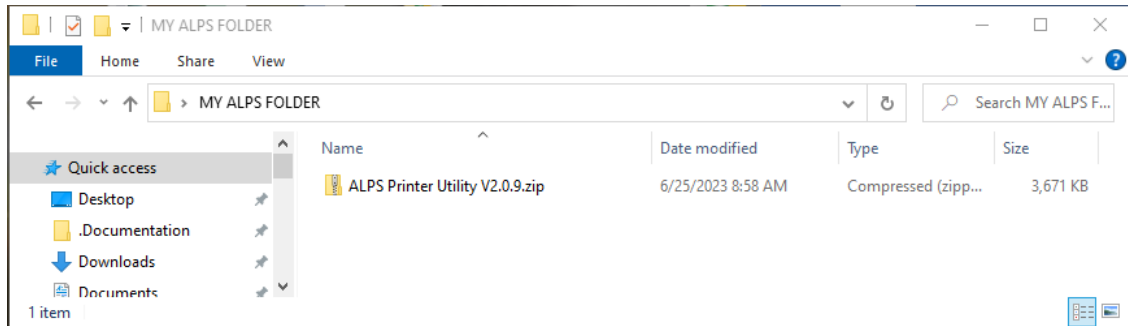
### 3 Acronyms and Definitions

Control File	A file which contains all data necessary to perform an entire print job
Image	Another word for artwork
Stack-up	Reference to the order and set of layers that make up a print job
RGB	Red, Green and Blue
CMYK	Cyan Magenta Yellow and K(Black)
DPI or dpi	Dots Per Inch
B&W	Black and White
GUI	Graphical User Interface
Dither	Pixel modulation in order to attain lighter colors than the ink
Halftone	Same as dither

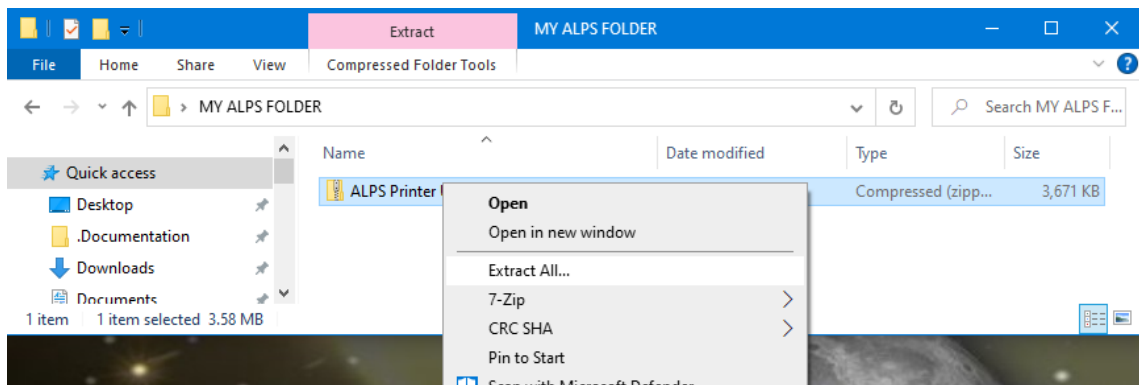
## 4 Getting Started

### 4.1 Installing the software

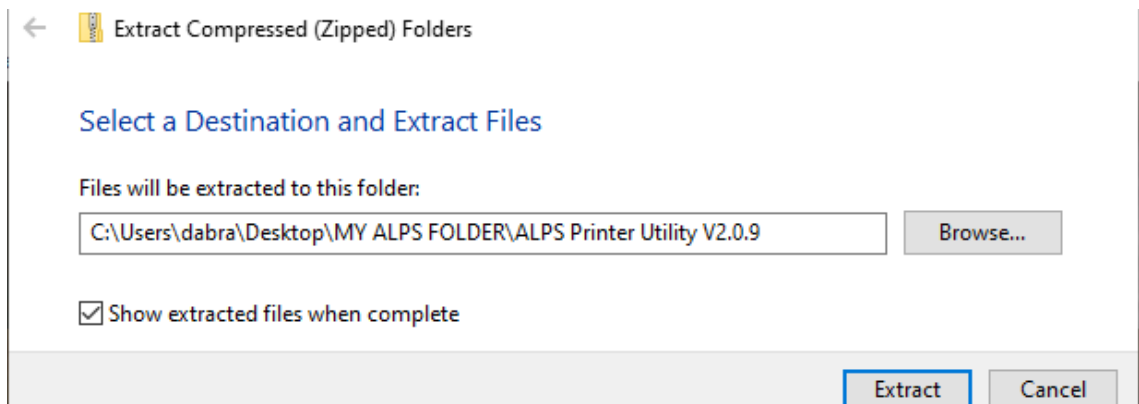
There is no automated install procedure for the ALPS utility so instead the files and folders must be manually brought onto and un-zipped on your Windows computer. First make a directory where you want the files to be stored. In this example, the directory name is MY ALPS FOLDER. Once this is done, copy the ALPS printer utility zip file into the folder as in the picture below. Your ALPS printer version maybe different then what is shown below.



Next, unzip the zip file. Do this by right clicking on the zip file and choosing Extract All.



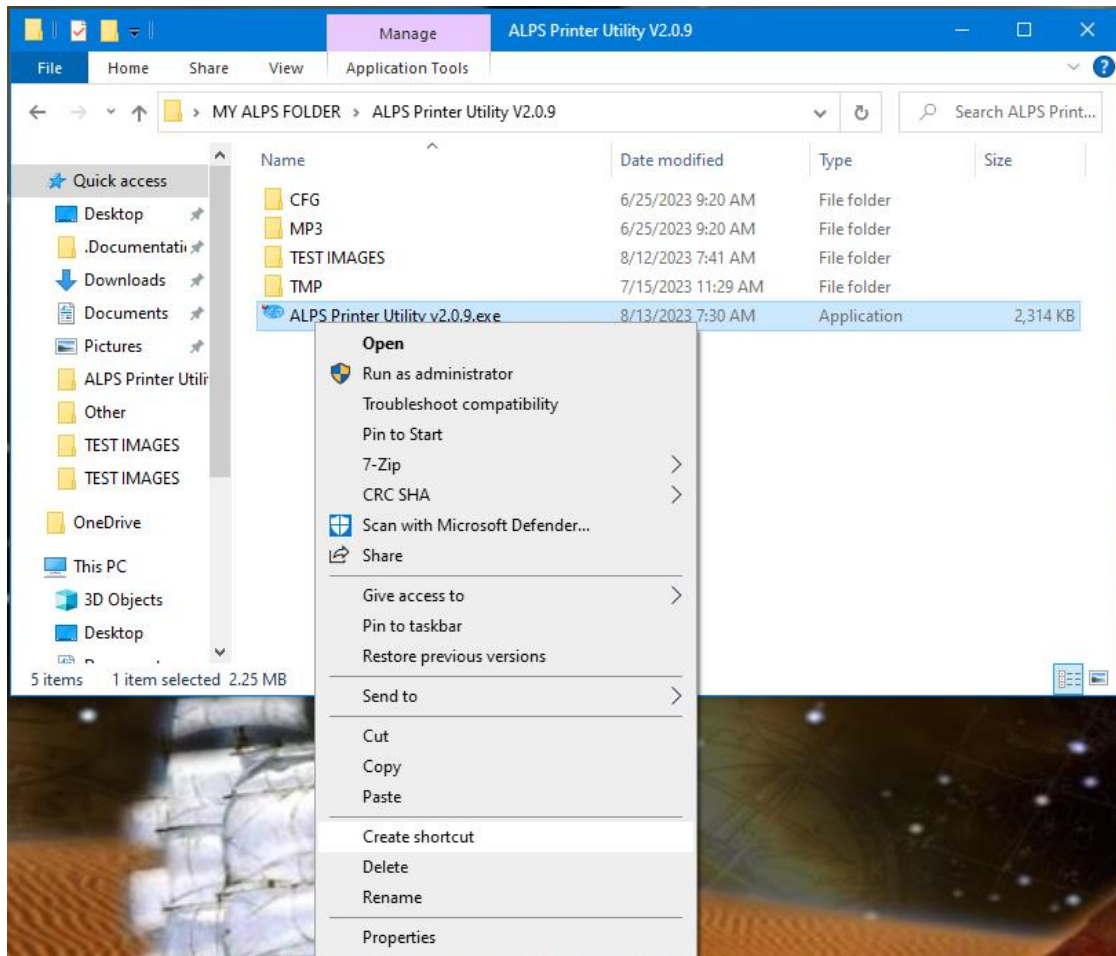
A popup window will appear asking you where you want the files to be extracted to. In most all cases, the choice which appears is best and is in the same directory you made earlier. Click on Extract and let Windows extract the files and folders from the zip file.



Once the files and folders have been extracted, a popup window will appear showing the files and folders that were installed as in the picture below. DO NOT change or move these folders.

- The CFG folder contains information on language support, Special ink support from Elephants Rocket and bad pixel correction information.
- The MP3 folder contains audio files used in the printer utility.
- The TMP folder contains current print and debug information.
- The TEST IMAGES folder contains test images and control files along with examples

If you want to create a desktop shortcut then right click on the exe file and select Create shortcut. This will then make a shortcut file in the same directory as the exe file. Move this shortcut file to the desktop.



You can now run the ALPS printer utility by clicking on the desktop shortcut



## 4.2 Connecting to the ALPS printer utility

### 4.2.1 ALPS MD models supported for printing via USB to parallel printer port adapter.

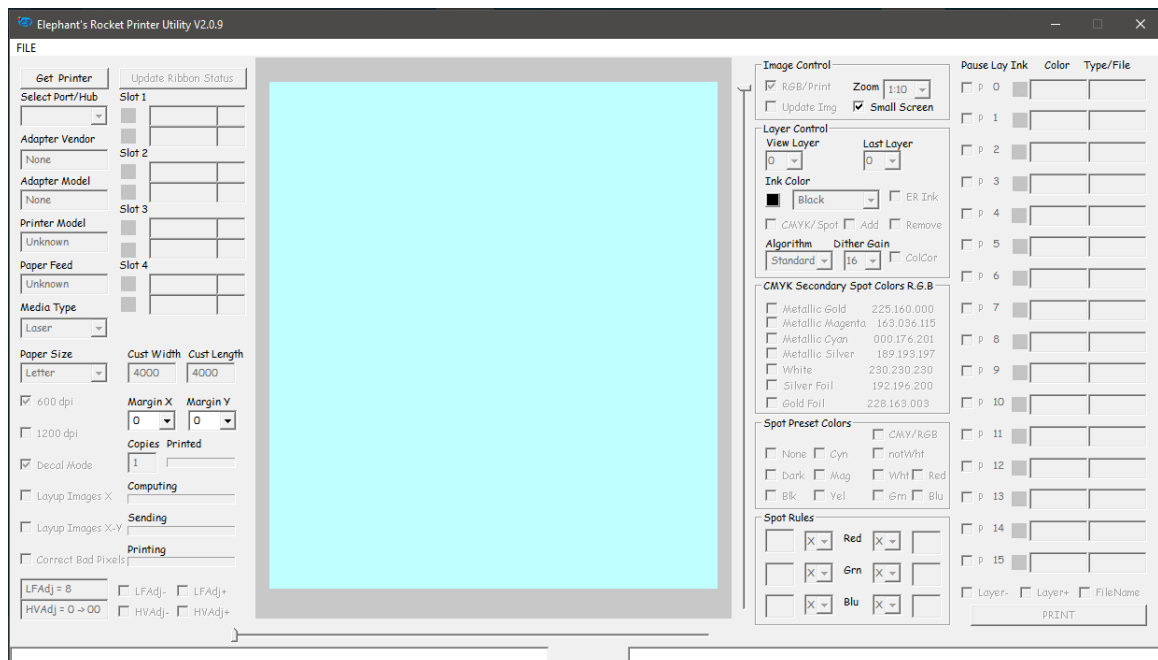
- MD 2000
- MD 2010
- MD 4000
- MD 2030
- MD 1000
- MD 1300
- MD 1500
- MD 5000/T-03, MD 5000/T-04, DP 5000/T-03, DP 5000/T-04
- MD 5500/T-03, MD 5500/T-04

Connect power to your ALPS MD printer and connect a USB to Centronics parallel port printer adapter between the printer and the computer. Below is a list of adapters which are supported by the ALPS printer utility.

### 4.2.2 Table of supported USB to Centronics parallel printer port adapters.

VENDOR	MODEL	VID	PID	COMMENTS
ALPS	MD 5500	044E	2002	
ALPS	ALPS DONGLE	05AB	2002	
BELKIN	F5U002	050D	0002	
PROLIFIC	PL2305	067B	2305	
WINCHIPHD	CH34X	4348	5584	
ELECOM	UCPGT UCPBB UCP5GT	056E	5002	
COREGA	CG-UPRCBLD180	07AA	0026	
PIXECABLE	PIXELA	06B8	1002	
SANWA	USB-CVPR	0557	2006	

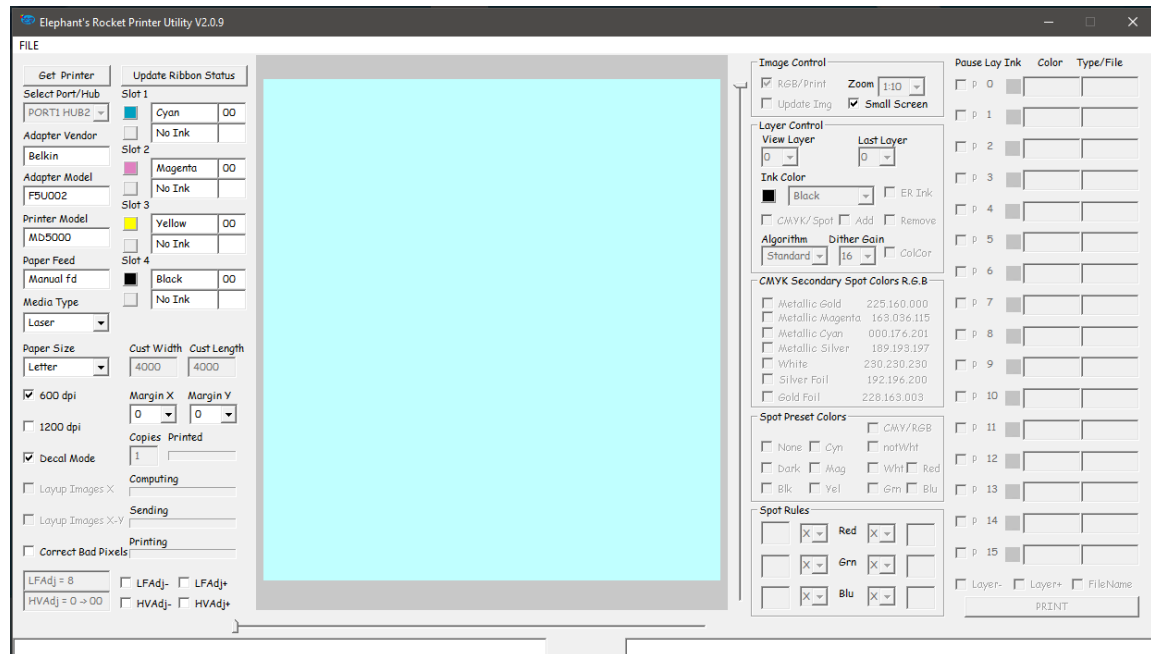
Power on the printer and start the ALPS printer utility. After the introduction, click on continue



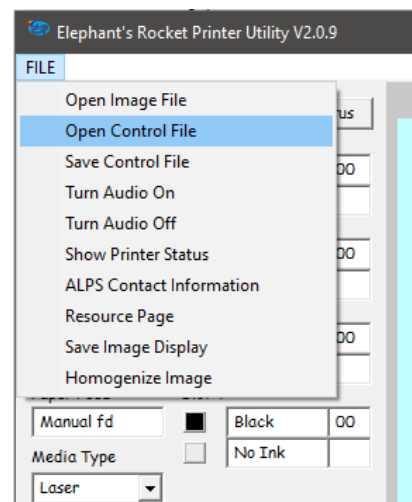
Click on the Get Printer button and you should hear the printer utility narrate what it is doing along with what printer it finds connected to the USB parallel port adapter.

If you have an MD5000 or MD5500, then you may have noticed that the grey around the print window is now reduced. This is because the margins of the MD 5x00 printers are smaller than that of all of the other MD printers.

Items such as margins, ink support and page size are all automatically controlled by the utility.



### 4.3 Print Utility Test Page



Next, print a premade test page.

Click on FILE and choose Open Control File.

Navigate to the TEST IMAGES directory.

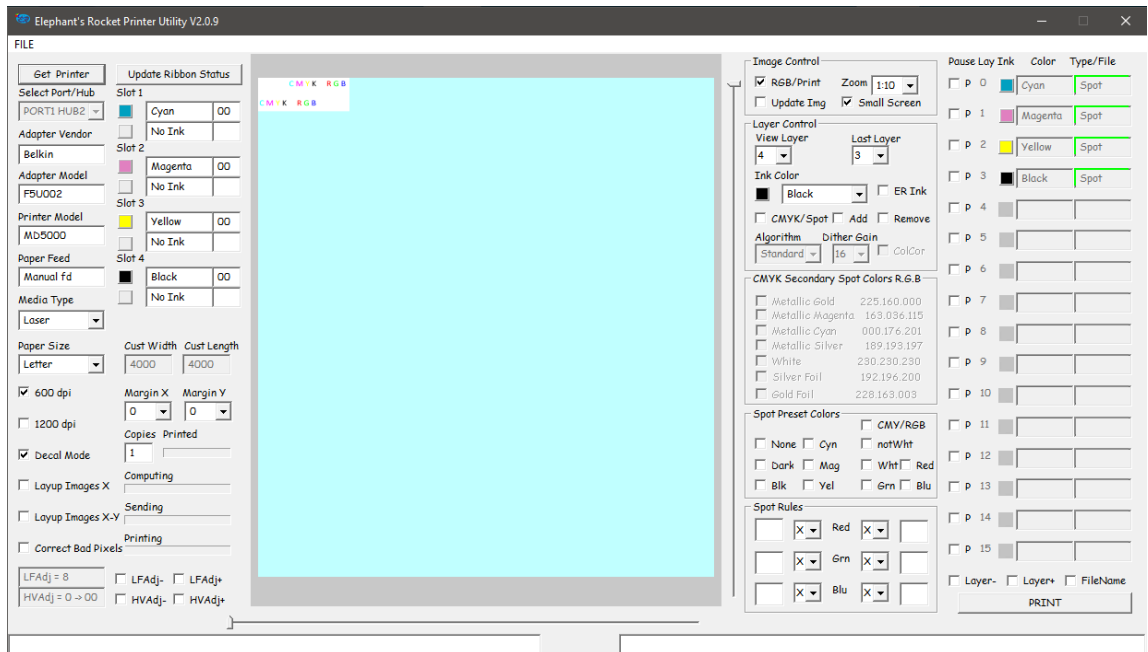
Choose the file CMYKRGB.ctl and then click on Open

This file has the letters CMYKRGB set with colors CMYK C=Cyan, M=Magenta, Y=Yellow and K=Black along with RGB R=Red, G=Green and B=Blue.

Set the Auto/Manual switch on the printer to Manual

Ensure that all four CMYK inks are in the printer and that paper is loaded

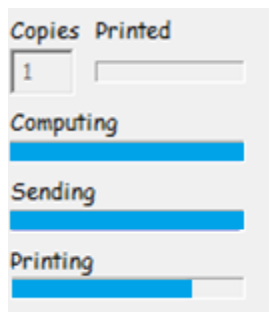
The utility screen should now look something like this.



Click on the PRINT button and the printer will then print the colored letters.

Press the ready/Insert button on the printer when prompted and click ok

#### 4.4 Print Progress Bars



Printed indicates the progress for the number of pages being printed

Computing indicates the progress of computing image data to layer data

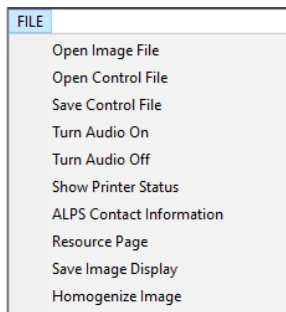
Sending indicates the progress of transferring layer data to the printer

Printing indicates the progress of the printing process. This progress bar cycles through 0 to 100 percent many times until the print job is complete

That is all there is to it and the letters are printed in their respective color. This is how the utility is meant to operate. Printing basically consists of loading a premade control file and then printing it. This way there is no need for print queues or spoolers and there is no longer any worries about forgetting to check the overlay box or forgetting which layer was just sent to the spooler.

## 5 FILE

### 5.1 Menu Selections



At the top left of the utility, there is the FILE menu caption. When clicked on, a menu of choices will appear as in the picture to the left.

The selections offer a variety of user controls as well as some helpful tools, websites and contact information.

These selections are described in the next paragraphs

### 5.2 Open Image File

This menu choice is used for loading an image which in turn the user can then create layer print information. The file types supported by the utility are \*.bmp, \*.jpg, \*.png \*.tig, \*.gif. The utility internally converts all images to the bmp format.

### 5.3 Open Control File

A control file is a file which contains all the necessary logic and layer information needed for printing a specific print job. The file extension for the control file is \*.ctl. The control file may use multiple images and can carry up to 32 print layers of information which are numbered 0 to 31. There can be only one CMYK selection per control file.

### 5.4 Save Control File

This selection is used for saving the control file. Artwork images and control files and the utility should all be on the same computer storage drive. By doing this control files can then be shared from one computer to another as long as the folder hierarchy and folder names remain exactly the same. If files are loaded from a different drive, then a warning will appear in that the control file is not portable.

### 5.5 Turn Audio On

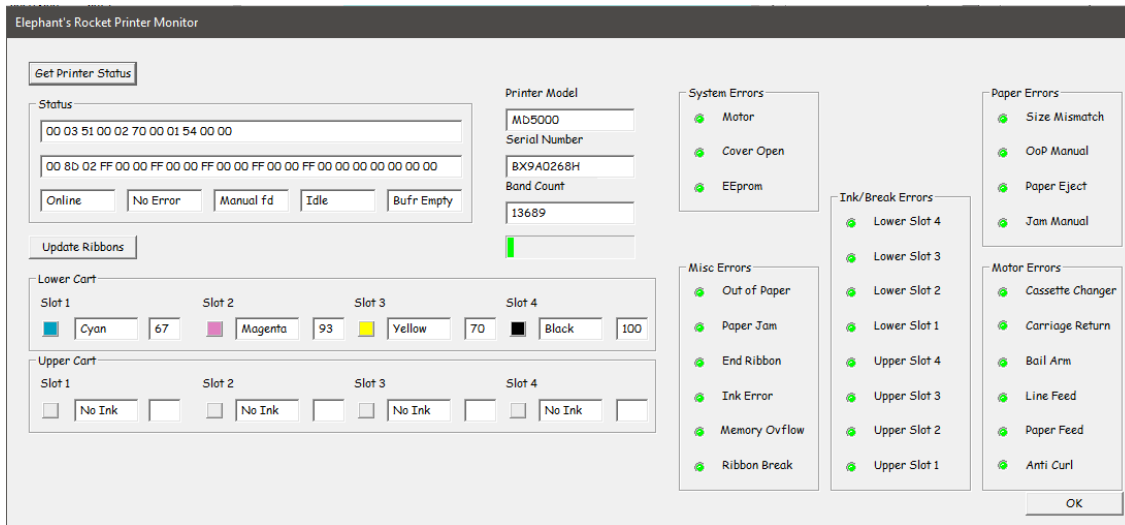
This enables the utility narration.

### 5.6 Turn Audio Off

This disables the utility narration.

### 5.7 Show Printer Status

This selection spawns a printer status popup window. The status window contains printer information like serial number and band count along with the status of inks in the printer and a list of errors. In order to see the printer status, click on the Get Printer Status button and this will then get the current printer status as shown in the picture below.



The ribbon or ink status can be updated by pressing Update Ribbons button. The process of finding the amount of ink in a cartridge waists ink and so should therefore only be done for good reason. I rewind the inks after running Update Ribbons.

The Get Printer Status will have to be pressed again once the printer finishes updating the ink status.

## 5.8 ALPS Contact Information

This selection contains contact information for Elephants Rocket and contains links to their website. Elephants Rocket supplies and refurbishes printers along with offering a wide variety of inks and ink colors for the printers.

## 5.9 Resource Page

This selection contains several websites in which ALPS printers are used.

## 5.10 Save Image Display

This selection is a tool and is used for sending debug information back to the code developer in case a problem is discovered. The user need not ever use this selection.

## 5.11 Homogenize Image

This selection is a tool for generating pure color image data from any image. This tool is a useful helper for generating artwork directly from say loading an image from the internet. A pure color is defined in RGB codes in the table below and is needed for simple color extraction which is then used to create print layer information.

Color	Red (Hex)	Green (Hex)	Blue (Hex)	Red (Decimal)	Green (Decimal)	Blue (Decimal)
White	FF	FF	FF	255	255	255
Black	0	0	0	0	0	0
Red	FF	0	0	255	0	0
Green	0	FF	0	0	255	0
Blue	0	0	FF	0	0	255
Magenta	FF	0	FF	255	0	255
Yellow	FF	FF	0	255	255	0

Cyan	0	FF	FF	0	255	255
Dark Red	80	0	0	128	0	0
Dark Green	0	80	0	0	128	0
Dark Blue	0	0	80	0	0	128
Dark Magenta	80	0	80	128	0	128
Dark Yellow	80	80	0	128	128	0
Dark Cyan	0	80	80	0	128	128

The tool reads the RGB data and quantizes the output pixel data to the nearest pure color. This is useful in situations where color values may have been dithered like on the edges of text or lines. This dithering can also occur when resizing an image. In these cases, these dithered pixels if not in the correct range described below will be removed. The user can then edit the image output and correct individual pixels saving much time versus generating the entire artwork from scratch.

The RGB component for the six colors RGBCMY needs to be above C0 hex or 192 decimal for the bright color. In the case of a dark color, the six colors of the RGBCMY value needs to be in the range of 40 to C0 hex or 64 to 192 decimal.

In the case of a \*.png file, the transparency bit if set will convert that pixels color to an RGB value of FFFFC0 which is light blue and is the same color as the background of the page in the utility. This was done for easy separation of white and not white colors. It also make the utility page look like a blue decal sheet.

## 6 Print Control

The utility allows for many print control settings which facilitates a wide variety of print combinations and features. The utility also allows a mix and match of settings within a single Control File print thus expanding the printing possibilities. For example, a user may load an image with 600 DPI and print several spot layers, then load a different image with 1200 DPI and print several more spot layers including ink specials like metallics and finally load a third image in CMYK mode and print that.

- Layup Images duplicates images
- LFAdj compensates for any head overlap or gap in the paper feed direction
- 600/1200 DPI print resolution
- Margin setting removes image margin from being loaded
- CMYK/Spot choice of printing modes
- CMYK algorithm, dither, and color settings
- Pause per layer for swapping ink cartridges
- HVAdj for controlling better ink adhesion
- Spot Preset Colors for simple color separation for layer information generation

### 6.1 Print Control Settings

The table below indicates how a user selected print function applies to the following

- Per Loaded Control File - Selection applies to all layers in Control File
- Per Loaded Image - Selection applies to only those layers specific to a loaded image
- Per Print Layer - Selection applies to an individual print layer

Function	Per Loaded Control File	Per Loaded Image	Per Print Layer
Decal Mode	√		
Layup Images X	√		
Layup Images X-Y	√		
LFAdj (Line Feed Adjust)	√		
Bad Pixel Correction	√		
Copies	√		
600/1200 DPI (X Resolution)		√	
Margin X		√	
Margin Y		√	
CMYK/Spot		√ *	√ **
Algorithm/Dither Gain		√ *	
ColCor – Color Correction		√ *	
CMYK Secondary Spot Colors		√ *	
Ink Color		√ *	√ **
Pause			√
HVAdj (Head Voltage Adjust)			√
Spot Preset Colors/Spot Rules			√

\* If the CMYK mode is selected, then four print layers are generated - one layer for each of the CMYK colors. The CMYK dither Algorithm, Dither Gain and ColCor (Color Correction) will apply to these four layers. Additional Secondary Spot Colors may also apply and will add extra layers one for each of the spot colors selected.

\*\* If the Spot mode is selected, then Spot Preset Colors or Spot Rules will apply. The user can then choose any of the ink colors and any selection of the Spot Preset Colors or Spot Rules for each layer. The maximum number of layers is limited to 32.

## 6.2 600/1200 DPI (X Resolution)

The utility supports both 600 DPI (Dots Per Inch) and 1200 DPI print resolutions in the X direction – the direction of the print head sweep. The desired DPI value needs to be selected before an image is loaded. Any print layers generated from the loaded image will have the same DPI.

The user can then change the DPI and load another image and continue to make additional print layers. Any print layers generated from this loaded image will have the same new DPI value.

The DPI on a per image basis will be saved into a Control File when a Control File is saved.

## 6.3 Decal Mode

Decal mode has to do with the Auto/Manual switch and the feed mode used by the printer. Printers without an Auto/Manual switch have the decal mode unchecked and disabled and the Paper Feed text box set to “Unavailable”. These printers are the MD2000, MD2010, MD2030 and MD4000.

For 1k and 5k printers with the Auto/Manual switch, the decal mode is available and the Paper Feed text box indicates either “Manual fd” or “Auto fd” depending on the Auto/Manual switch setting. If Decal mode is checked, then the printer Auto/Manual switch needs to set to the manual position.

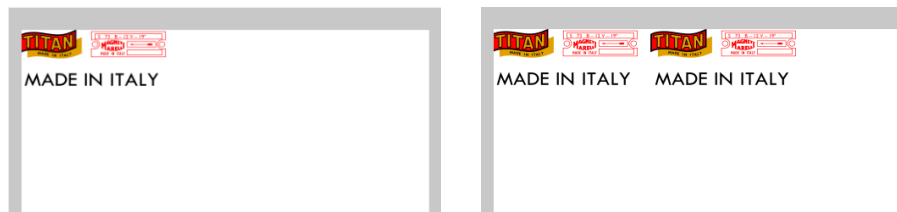
The following table indicates the printer mode as a function of printer and Auto/Manual switch setting.

Printer	Decal mode	Auto/Manual Switch	Print Mode
MD2000, MD2010, MD2030	Off	N/A	Page Feed Manual Off
MD4000	Off	N/A	Page Feed Manual Off
MD1000, MD1300, MD1500	Checked	Manual	Page Feed Manual On
	Un-Checked	Either setting	Page Feed Manual Off
MD5000, MD5500	Checked	Manual	Page Feed Manual On
	Un-Checked	Either setting	Page Feed Manual Off

## 6.4 Layup Images X

The Layup Images X check box allows the image artwork to be duplicated in the X direction which is the direction of the print head sweep across the page. This is useful for printing several copies of an item on the same page without having to change any artwork. The utility determines how many images can be duplicated and if any duplicated image cannot fit within the page boundary, then that split image will not be duplicated. The utility will also provide spacing between the images.

The pictures below show the loaded image without and with Layup Images X



If multiple images are loaded for the artwork, then the duplication rules in X are based upon the image which was loaded which has the maximum size in the X direction.

## 6.5 Layup Images X-Y



The Layup Images X-Y is similar to Layup Images X, but this check box performs the duplication in both the X and Y directions.

The Y direction is the direction of the paper feed. The pictures to the left shows the loaded image without and with Layup Images X-Y

If multiple images are loaded for the artwork, then the duplication rules in X are based upon the image which was loaded which has the maximum size in the X direction and the duplication rules in Y are based upon the image which was loaded which has the maximum size in the Y direction.

## 6.6 Margin X

The Margin X is implemented using a drop down list whose choices are from 0 to 600 in steps of 50. The Margin X like DPI works on the loaded image and the number represents how many image pixels in X will be discarded starting from the left of the image.

The desired Margin X value needs to be selected before an image is loaded. Any print layers generated from the loaded image will have the same Margin X.

## 6.7 Margin Y

The Margin Y is just like Margin X but discards starting from the top of the image.

The desired Margin Y value needs to be selected before an image is loaded. Any print layers generated from the loaded image will have the same Margin Y.

## 6.8 Number of Copies

The number of copies is straight forward and is the number of copies you wish to print. Enter the number of copies to print from 1 to 99. If the number is too large, the utility will force the number back to 1.

Setting the number of copies above 1 should only be used when the Control File for the artwork to be printed has been checked and tested first, otherwise ink can be wasted if one finds a problem with one or more of the layers.

The number of copies is not saved in a Control File

## 6.9 LFAdj (Line Feed Adjust)

The LFAdj setting controls the fine separation of the head location in the Y direction (the paper feed direction) between sequential passes of the head. Ideally this number is set to zero indicating that there is no gap or overlap in the printing of ink between sequential passes of the head. However, due to gear wearing, swapped parts or other reasons the user may need a value here because of a gap or overlap in the ink being printed between sequential passes of the head.

The LFAAdj setting is printer specific and applies to the entire page and all layers being printed. The LFAAdj setting is saved in the config.dat file, so be aware that this value may need to change when using a different printer than the one which is currently being used.

The LFAAdj setting can be changed by clicking on the LFAAdj+ or LFAAdj- boxes. Clicking on the LFAAdj+ box increases the LFAAdj number and clicking on LFAAdj- box decreases the LFAAdj number. The current LFAAdj value appears in the text box to the left after the equals sign. The maximum value is 10 and the minimum value is -10.

The current LFAAdj setting will be saved into the config.dat file when the LFAAdj+ or LFAAdj- boxes are changed. A positive LFAAdj increases the band to band spacing and is used when the case of LFAAdj being 0 the inks overlap band to band. A negative LFAAdj decreases the band to band spacing and is used when the case of LFAAdj being 0 the inks have a gap band to band.

## 6.10 HVAdj (Head Voltage Adjust)

The HVAdj setting controls the fine additional voltage supplied to the head. Adding voltage to the head increases the power delivered to the ink and can help printers with ink adhesion issues.

The HVAdj setting is printer specific and applies only to the current layer being printed. The HVAdj setting is saved in the control file for every layer. Be aware that these value may need to change when loading a control file which was generated using a different printer than the one which is currently being used.

The HVAdj setting can be changed by clicking on the HVAdj+ or HVAdj- boxes. Clicking on the HVAdj+ box increases the HVAdj number and clicking on HVAdj- box decreases the HVAdj number. The current HVAdj value appears in the text box to the left after the equals sign. The maximum value is 10 and the minimum value is -10.

The current HVAdj layer settings will be saved into a Control File when the Control File is saved.

## 6.11 Correct Bad Pixels

The Correct Bad Pixels check box does what it says if checked in that the utility will adjust the printing process in order to write those bad pixel elements using different head elements. In order to do this, a second pass of the entire print stack-up is needed.

### 6.11.1 BadPixel.dat File

The utility uses the "BadPixel.dat" file for storing the bad pixel configuration parameters. This is a simple text file and the filename and location of the file must remain the same for the utility to work correctly. The utility loads the file and correction parameters at powerup. A content of a typical "BadPixel.dat" is as follows

```
BADPIXEL      199
BADPIXEL      200
LFPIXAMOUNT    2
LFMOTAMOUNT  -28
LFPIXERROR     9
PIXELOFF       199
PIXELOFF       200
CALPIXOFF
```

Valid Keywords (keywords are not case sensitive)

BADPIXEL, PIXELOFF, LFPIXAMOUNT, LFMOTAMOUNT, LFPIXERROR, CALPIXOFF, CALPIXELON

BADPIXEL is the absolute location of the bad head elements which are to be corrected for. This number ranges from 0 (the first element) to 235 (the last element).

PIXELOFF is the absolute location of the bad head elements which can be forced off. Some bad pixels can still print a little ink. Turning these pixels off ensures that no ink is printed for the selected elements. This number ranges from 0 (the first element) to 235 (the last element).

LFPIXAMOUNT is the number of absolute pixels on the head element to shift for each head pass. This number is chosen by the user and should be at least the number of contiguous bad pixels.

LFMOTAMOUNT is the line feed motor amount which roughly equals the LFPIXAMOUNT in pixels. From the data above, a LFMOTAMOUNT of -28 roughly equals 2 head pixels - so a 1 pixel shift in the head roughly equals a LFMOTAMOUNT of -14. This number is printer dependent and needs to be tuned for the best correction.

LFPIXERROR is a fine slope correction and is the number of pixels slipped at the 10<sup>th</sup> band printed. From the data above, 9 lines were slipped after 10 bands. This number needs to be tuned for best correction.

CALPIXON will draw a horizontal line at 500 pixels in length where a corrected pixel will occur. This flag is used when calibrating the bad pixels of a printer.

CALPIXOFF disables the CALPIXON. CALPIXOFF should be used when the pixel calibration is complete as in the example above.

#### 6.11.2 About the Correction

Pixel correction shifts the image data down by one band or 236 pixels. This is done because the printer uses different band offsets for each ink color and so by shifting up, the correction becomes a little easier to implement.

The bad pixel correction works by first printing an ink color as-is but shifted down on the page, and which will have ink gaps where the bad pixels are. The utility then reprints this ink color but starts with a line feed offset of LFMOTAMOUNT and then prints only the bad pixels shifted up by LFPIXAMOUNT. In short, the LFMOTAMOUNT of -28 brought the head down by about 2 pixels, and the data to print is shifted up by LFPIXAMOUNT or 2 pixels ending up with the first gap being corrected for.

The actual pixel offset for each subsequent pass of the head changes because of the LFMOTAMOUNT and thus so do the head elements used for correction. This way, the elements used for correction are spread out across the head.

From the data above, the 1<sup>st</sup> band printed uses head pixels 201 and 202 plus  $1 * \text{LFPIXERROR} / 10$  or 0 resulting in head pixels 201 and 202 being used. The second band printed uses head pixels 203 and 204 plus  $2 * \text{LFPIXERROR} / 10$  or 1 resulting in head pixels 204 and 205 being used. For each head pass another LFPIXAMOUNT is added along with another LFPIXERROR/10 value.

#### 6.11.3 Calibration

The following steps will help identify how to calibrate the bad pixel correction.

1. From the TEST IMAGES directory, open the Find Head No Correct.ctl control file and print it. Then using a microscope, find out and write down which pixels are missing using the scale to the left as the pixel reference.
2. Open the BadPixel.dat file and enter the bad pixels and then save the file.

Set the following

BADPIXEL	"your bad pixel number 1"
BADPIXEL	"your bad pixel number 2" and so on
LFPIXAMOUNT	0
LFMOTAMOUNT	0
LFPIXERROR	0
CALPIXON	

- From the TEST IMAGES directory, open the Find Head Correct.ctl control file. Check the Correct Bad Pixels checkbox and print. If you see horizontal lines extending out 500 pixels, then you have a BADPIXEL number which is not correct. Use the pixel scale to the left of the printed page and go back and update the BadPixel.dat file so that all of the bad pixels in the list are correct and that no lines extend out 500 pixels horizontally.
- Once this is complete, then open the BadPixel.dat file and set LFPIXAMOUNT and LFMOTAMOUNT as below as a starting point and then save the file.

Set the following

BADPIXEL	"your bad pixel number 1"
BADPIXEL	"your bad pixel number 2" and so on
LFPIXAMOUNT	2 (set to at least the number of contiguous bad pixels)
LFMOTAMOUNT	-24
LFPIXERROR	0
CALPIXON	

- From the TEST IMAGES directory, open the Find Head Correct.ctl control file. Check the Correct Bad Pixels checkbox and print. Now you should see horizontal lines extending out 500 pixels roughly located where the bad pixel gaps are. Only focus on the second band printed (B2 on the printed page) and now adjust the LFMOTAMOUNT in the BadPixel.dat file and reprint until the 500 pixel horizontal line best fits in between the bad pixel gaps. If the line filling the bad pixel gaps is far too small, then maybe not all of the bad pixels are listed in the BadPixel.dat file so go back to steps 1 or 2.
- Once the first band bad pixels gaps are filled in well, then the next thing to do is to correct for the slope of the correction. Using a microscope, look at the 10<sup>th</sup> band printed (B10 on the printed page) and count the pixels in between the bottom of the 500 pixel horizontal line and the bottom of the bad pixel gap.
- Open BadPixel.dat file and set the LFPIXERROR below and then save the file.

Set the following

BADPIXEL	"your bad pixel number 1"
BADPIXEL	"your bad pixel number 2" and so on
LFPIXAMOUNT	2 (actual number of contiguous bad pixels)
LFMOTAMOUNT	-22 (actual number from step 5)
LFPIXERROR	7 (actual number obtained from step 6)
CALPIXON	

- From the TEST IMAGES directory, open the Find Head Correct.ctl control file. Check the Correct Bad Pixels checkbox and print. Focus on the 10<sup>th</sup> or higher band printed and adjust

the LFPIXERROR in the BadPixel.dat file and reprint until the 500 pixel horizontal line best fits in between the bad pixel gaps at the 10<sup>th</sup> or higher bands.

9. The correction is now complete. Open the BadPixel.dat file and change CALPIXON to CALPIXOFF. The bad pixels can also be forced off now using the PIXELOFF command. Once complete with editing then save the file. The 500 pixel lines will now be replaced with actual print data.

One may want to add a bad pixel in the BadPixel.dat file before and after the real bad pixels. This will help blend the gap between a bad pixel a little better. See the example parameters below.

BADPIXEL	198
BADPIXEL	199
BADPIXEL	200
BADPIXEL	201
PIXELOFF	199
PIXELOFF	200
LFPIXAMOUNT	2
LFMOTAMOUNT	-31
LFPIXERROR	9
CALPIXOFF	

#### 6.11.4 Limits Checked

0	<=	BADPIXEL	<=	235
0	<=	PIXELOFF	<=	235
0	<=	LFPIXAMOUNT	<	10
-100	<	LFMOTAMOUNT	<=	0
-20	<	LFPIXERROR	<	20

## 7 Image Control

The section deals with the image window in the middle of the utility and indicates how and what data will appear in that window. Unlike the ALPS driver, in the RGB mode this utility portrays the image as an RGB image and to how it will appear for printing. If in Spot print mode, then the image colors will appear true and solid whereas if the CMYK print mode was chosen, then the image colors will be dithered in the same way the final print will be dithered.

in the Print mode, the image will be a black and white representation of what pixels will be printed where the black pixels are the ones which will print. This mode is useful for checking a Control File for sanity.

The controls for the image are as follows

- RGB/Print mode box selects RGB color representation or Print mode B&W pixel layer print
- Zoom changes the aspect ratio of the displayed image
- Vertical Slider Bar moves the image up and down in the window
- Horizontal Slider Bar moves the image left and right in the window

Paper margins are shown in the image area by a dark grey color. Each printer type has specific margins, and the utility displays them correctly based upon the printer type found by the utility and the paper size.

### 7.1 RGB/Print

This checkbox controls what is displayed in the image display area. If RGB/Print is checked, then this selects RGB mode and the image area will display the loaded image with RGB colors. If the View Layer has CMYK/Spot checked, then the print mode is CMYK dithering instead of Spot, and the RGB image will be dithered better indicating how the printed image will appear.

The image to the right shows what the Image display area may look like with the RGB/Print box checked and the CMYK/Spot box also checked. In this case, RGB image area is selected, and print dithering is also selected. The image zoom is 1:1.



If the RGB/Print is not checked, then this selects Print mode and the image display area will indicate which pixels will be printed for the layer selected by View Layer.

The image to the right shows what the Image display area may look like with the RGB/Print box not checked and the CMYK/Spot box checked. In this case, Print image area is selected, and print dithering is also selected. The image zoom is 1:1. The layer selected was the yellow ink component of CMYK.



If the CMYK/Spot is not checked, then there is no dithering and both the RGB image and the Print image will appear with true and solid colors.

## 7.2 Zoom

The Zoom feature changes the aspect ratio of the image shown in the image window.

The Zoom is implemented using a drop down list whose choices are as follows

- 1:1 selects one image pixel equals one print pixel
- 1:2 selects one image pixel equals two print pixels
- 1:5 selects one image pixel equals five print pixels
- 1:10 or 1:9 selects one image pixel equals ten or nine print pixels

If small screen is checked, then the maximum aspect ratio is 1:10, and if small screen is not checked then the maximum aspect ratio is 1:9.

## 7.3 Update Image

This checkbox forces a recalculation and update of the image. Not all actions in the GUI update the image. This checkbox can then be used to force an image update if needed.

## 7.4 Small Screen

Some older computers with lower resolution may display the image area window differently and smaller. The image area window is the large white area surrounded by grey in the center of the utility screen. If this window appears too small, then you can try clicking on the Small Screen checkbox which will make the window display area larger.

This checkbox is one time only, and the utility will have to be restarted to revert back to the original image area window size setting,

If the page area window interferes with the text on the right, then do not use this mode and exit utility.

The Small Screen setting is not saved.

## 7.5 Vertical Slider Bar

The vertical slider appears to the right of the image area and controls the image position in the up to down direction. If the image fully fits in the image window, then the slider bar will do nothing.

## 7.6 Horizontal Slider bar

The horizontal slider appears to the bottom of the image area and controls the image position in the left to right direction. If the image fully fits in the image window, then the slider bar will do nothing.

## 8 Spot and CMYK Control

### 8.1 CMYK/Spot Modes

The CMYK/Spot checkbox selects between the CMYK and Spot modes of printing. If the CMYK/Spot checkbox is checked, then image dithering is used in order to try to match the colors of the image. This mode of printing is used for picture type images which have a large dynamic range of colors and not so much for decals because the dithering which generates the large range of colors lowers the print resolution.

If the CMYK/Spot checkbox is not checked on the other hand, then Spot print mode is used. The Spot printing mode is one to one meaning that one image pixel equals one headprint pixel and no dithering is used. This mode of printing is used for decals because it maintains the full printer resolution. Different colors are then generated by writing over other colors like yellow over magenta resulting in red or by using a wide variety of special inks from Elephants Rocket.

Using CMYK and Spot can be mixed within in a single print job. The CMYK/Spot mode is saved on a per layer basis in the Control File.

#### 8.1.1 Spot Mode

If in the Spot mode, then the Spot Preset Colors and Spot Rules panes will be active and the CMYK Secondary Spot Colors R.G.B pane will be inactive. This is the mode that should be used for making high resolution decals.

The Spot Preset Colors and Spot Rules panes are used to generate rules for extracting color information from the image in order to make a print layer for the Control File.

#### 8.1.2 CMYK Mode

If in the CMYK mode, then the CMYK Secondary Spot Colors R.G.B pane will be active and the Spot Preset Colors and Spot Rules panes will be inactive.

The CMYK Secondary Spot Colors R.G.B pane is used for printing special inks like metallic silver or gold during the CMYK print phase. Secondary Spot Colors was a feature of the old ALPS driver and is maintained in this utility.

##### 8.1.2.1 Algorithm

The CMYK dither Algorithm is used generate a larger dynamic range of colors as compared to the basic range of CMYK colors. This increased range is achieved through dithering which is done by adding blank pixels in between printed pixels. By adding these blank pixels in between, the overall intensity of the printed ink color is reduced, but at the sacrifice of resolution.

The CMYK dither Algorithm is implemented as a dropdown list. The options are

- Standard which is the Linux version of the ALPS driver and is angled dot line based
- Model which has limited color range but has a small dither pattern
- Steinberg which has a good color representation and wormy type dither
- Atkinson which has a good color representation and different wormy type dither

The Algorithm selection is stored in the Control File.

### 8.1.2.2 Dither Gain

The Dither Gain changes the gain of the algorithm and makes the image appear darker or lighter. The gain works somewhat like contrast does. The Dither Gain is only settable when the Algorithm is either Steinberg and Atkinson.

The Dither Gain value is stored in the Control File.

### 8.1.2.3 ColCor (Color Correction)

The ColCor is a color correction algorithm which can be used to better match the actual printed image to the image which appears on the screen. The color correction is derived from Linux ALPS driver.

The ColCor selection is stored in the Control File.

## 8.2 Ink Color

The ink color is implemented as a dropdown list and contains all of ink colors supported by the utility. The photo-realistic mode is not supported by the utility so photo color inks are also not supported by the utility.

The utility determines which inks are supported by which printers and will block invalid inks from being selected. For example, the opaque white will only be allowed on an MD5500 printer.

The ink color is stored on a per layer basis in the Control File.

## 8.3 ER Ink Checkbox

If the ER Ink checkbox is selected, then the Ink Color dropdown list becomes populated with the list of Elephants Rocket inks.

If the language is set to English, then the list of Elephants Rocket inks is generated from the "ERInks.dat" file which is located in the CFG directory. The filename and location of the file must not be changed. This file is loaded when the utility is started. There can be up to 32 Elephants Rocket inks listed in the file. If the language is set to Japanese, then the JERInks.dat file is used. With either file – do not change the order of the colors as this order directly relates to the ink color icon.

The ERInks.dat file content appears something like this

; dropdown	short name	ink label code
;		
Pastel-White	PaWhite	0
Ice-Gray	IceGray	3
Light-Gray	LhtGray	1
Mid-Gray	MidGray	2

The left column indicates what will appear in the Ink Color dropdown list.

The middle column indicates the wording that will appear in the stack-up list to the right of the utility.

The right column is an entry for how that color ink is actually labelled.

Elephants Rocket delivers all of their ink colors with the black label ink code 0. Changing the label to another value maybe beneficial and can reduce the number of pauses in the print process when multiple special color inks are used.

The ER Ink is stored on a per layer basis in the Control File.

## 8.4 View Layer

The View Layer is used to change the layer for viewing. Changing the viewing layer really only make sense when reviewing what will be printed by having the RGB/Print unchecked and then sequentially going through the layers.

Changing the viewing layer also make sense when looking at how the image may appear after printing by having the CMYK/Spot checked and then looking at the image with the View Layers set to one of the CMYK layers.

## 8.5 Last Layer

This indicates what the last layer is and need no selection. The utility automatically generates this as the layer information is being generated.

The Last Layer is stored in the Control File.

## 8.6 Add

### 8.6.1 Add in Spot Mode

In Spot mode, the rules for the desired layer need to be done first by checking boxes in the Spot Preset Colors pane or by entering numbers and selections in the Spot Rules pane. Conformation for what will be printed on the desired layer can be seen in the image if the RGB/Print box is unchecked.

Once the rules for the desired layer are complete, then the ink color needs to be chosen using the Ink Color drop down and the ER Inks checkbox if using special inks.

Once complete, the Add checkbox can then be checked and this will enter the layer into the print stack-up being generated.

The results of the added layer will appear to the right of the utility in stack up display

### 8.6.2 Add in CMYK Mode

In CMYK mode, the rules for the desired layer need to be done first by selecting the Algorithm type, along with the dither Gain and ColCor (Color Correction) if needed and when available.

Next, all desired Secondary Spot Colors need to be chosen.

Once complete, the Add checkbox can then be checked and this will enter all of the layer information into the print stack-up being generated. The number of layers added will be four plus the number of Secondary Spot Colors boxes that are checked.

Only one CMYK set of layers can be added to the print stack-up being generated.

## 8.7 Remove

Remove will remove layers starting with the layer shown in the View Layer dropdown list up to the number of layers shown in the Last Layer dropdown list.

## 8.8 CMYK Secondary Spot Colors

This utility contains the ability to print spot colors when printing in the CMYK mode. The CMYK mode must be active first in order to select any of the secondary ink spot color.

The checkboxes select which ink colors are to be used when printing in the CMYK mode and the mechanism to print the ink works the same as the original ALPS PC driver. To print a spot ink color, then that ink color must be checked, and if the RGB print data matches the ink RGB color listed to the right of the box, then that spot ink will be printed.

For example, if metallic magenta is selected, then when the image RGB pixel data equals 163.036.115 (red 163, green 36, blue 115) then that pixel will be printed with metallic magenta.

The following ink colors are supported

- Metallic Gold
- Metallic Magenta
- Metallic Cyan
- Metallic Silver
- White (ALPs 1K and 5K printers)
- Silver Foil (ALPs 5K printers)
- Gold Foil (ALPs 5K printers)

## 8.9 Spot Preset Colors

The Spot Preset Colors check boxes can be used as an easy way to separate ink layer data from image data in order to create ink print layers.

### 8.9.1 CMY/RGB Checkbox

The CMY/RGB check box selects which color palette is used for running the extraction process. If CMY/RGB is checked, then the CMYK palette is used. If CMY/RGB is not checked, the RGB palette is used.

As an example, if one extracts yellow and CMY/RGB is unchecked, then the RGB palette is used and only yellow regions of the image as seen as yellow will be selected. However, if CMY/RGB is checked, then the image is first converted to CMYK space and the yellow regions seen as yellow, red and green will be selected. This type of extraction is helpful for ink over ink coloring in order to make other colors. Remember red = yellow + magenta and green = yellow + cyan.

The following presets are available

- notWht selects non-white (RGB 255.255.255) regions. This is useful for backgrounds.
- Wht selects white regions.
- Blk, black
- Red
- Grn, green
- Blu, blue
- Cyn, cyan
- Mag, magenta
- Yel, yellow
- Dark selects a dark range of the checked color
- None

## 8.10 Spot Rules

Sometimes using the Spot Preset Colors is not enough of a discriminator for separating out data from an image in order to generate a print layer. In these cases, the Spot Rules can be used instead.

Spot Rules

50	=	Red	X	
60	=	Grn	X	
70	=	Blu	X	

Enter numbers in the boxes and use the dropdowns to select the operations.

An X indicates Don't Care.

In the example to the left, the print logic will be true when the image pixels red component equals 50, the green equals 60 and the blue equals 70.

Spot Rules

	X	Red	<	200
55	=	Grn	X	
56	<	Blu	<	78

The print logic for the example to the left will be true when the image pixel meets the following criteria.

Red component is less than 200.

The Green component equals 55.

The blue component is greater than 56 and less than 78.

Spot Rules

50	<	Red	X	
	X	Grn	X	
	X	Blu	X	

The print logic for the example to the left will be true when the image pixel meets the following criteria.

Red component is greater than 50.

The Green component can be any value.

The blue component can be any value.

## 9 Generating Simple Control File

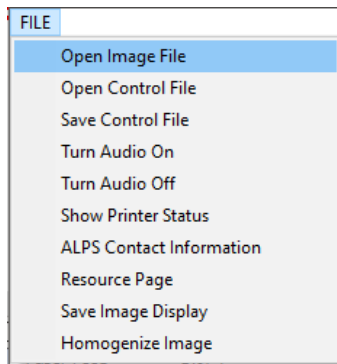
### 9.1 Supported Image Formats

The utility supports the following image file extensions for loading artwork.

- BMP 8, 16 and 24 bit color
- JPG
- PNG
- TIF
- GIF

### 9.2 Single Image File Spot Printing

The utility was designed so that the user can load a single image and then use the utility to create the layers needed for the specific type of printing. This is a little different use model than with using the ALPS printer driver, but it saves time and lessens mistakes. The layer and ink color information can also be saved to a control file which then can be loaded and printed.



We will start with a simple example. Click on FILE and choose Open Image File and select ALPS small.bmp from the TEST IMAGES directory.

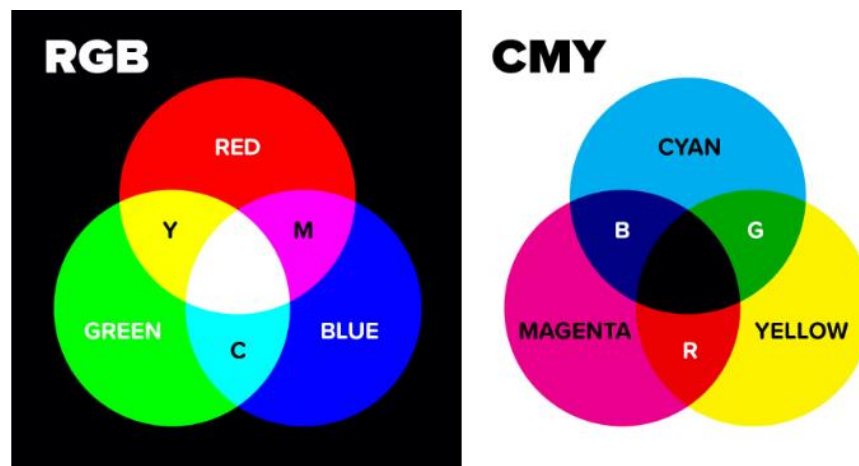
This file is the ALPS logo, but very small 100 x 100 pixels. The image is small, so change the Zoom from 1:10 to 1:1. Now the print pixel size equals the image pixel size.

We then want to create the layers needed and then print the logo.

#### 9.2.1 CMYK and RGB

We need to know a little about the inks first in order to print this logo using the standard CMYK inks. Elephants Rocket offers a wide variety of special ink colors like Emerald green and Pumkin orange and how to use these types of special inks is described later in this document.

The ALPS logo is made up of colors red, blue, green, yellow and black. Only the yellow and black are basic colors within the CMYK palette so the other colors red, blue and green need to be made from the CMYK ink colors.



The RGB palette is used for light source devices like monitors whereas the CMY palette is used for printing with ink devices. The pictures above show how CMY can be made from RGB and how RGB can be made from CMY. Since we are printing using CMYK inks then we shall use the latter conversion.

Here are the color combinations we need for the ALPS logo

Yellow	=	Yellow
Red	=	Magenta + Yellow
Green	=	Cyan + Yellow
Blue	=	Cyan + Magenta
Black	=	Black

### 9.2.2 Simple Image Layer Creation

We can print this logo using spot colors in four layers. One yellow, one magenta, one cyan and one black. In order to this, we need to be able to extract unique colors from the ALPS logo image and then assign ink colors to these extractions.

The utility provides these features allowing the user to create layers using one single image instead of having to use four separate images.

Uncheck the RGB/Print box – This now changes the image display from an RGB image to a map of what pixels will be printed.

STEP 1) First extract the yellow components from the ALPS logo and assign the ink color yellow.

In Spot Preset Colors - Set the Yel check box, this selects yellow for extraction

In Spot Rules - The CMY box should be checked, this extracts from CYM instead of RGB palette



Look at the image in the image window. You should see the three regions of black as in the picture to the left.

The black indicates which pixels will be printed

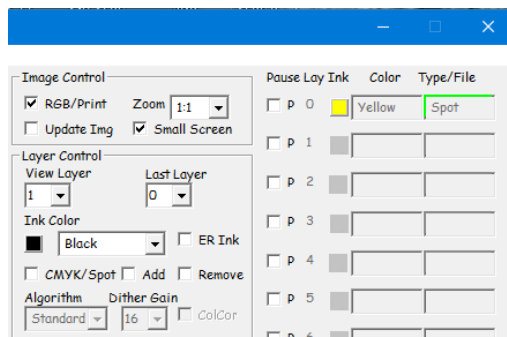
The left triangle is the yellow component of green, the blob to the left is the yellow component of red and finally the right triangle is just pure yellow.

STEP 2) Next, indicate we want to use yellow ink for this layer

In Layer Control - Select Yellow from the Ink Color dropdown list

STEP 3) Next, indicate that we are done with this layer

In Layer Control – Check the Add checkbox



Once the Add checkbox was clicked, the View Layer in Layer Control automatically changes to 1.

The layer print stack up display should look like the picture to the left. The green around the word Spot indicates that there is useful information to be printed. If this color is red, then there is probably a problem with the layer information.

**STEP 4) Next, extract the magenta components**

In Spot Preset Colors - Set the Mag check box, this selects magenta for extraction

In Spot Rules - The CMY box should be checked, this extracts from CYM instead of RGB palette

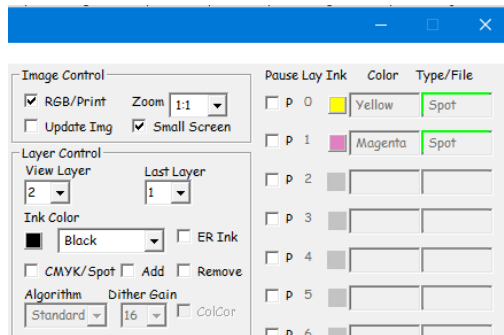
There should be two blobs and no triangles in the image display

**STEP 5) Next, indicate we want to use magenta ink for this layer**

In Layer Control - Select Magenta from the Ink Color dropdown list

**STEP 6) Next, indicate that we are done with this layer**

In Layer Control – Check the Add checkbox



Once the Add checkbox was clicked, the View Layer in Layer Control automatically changes to 2.

The layer print stack up display should look like the picture to the left. The green around the word Spot indicates that there is useful information to be printed. If this color is red, then there is probably a problem with the layer like no pixels being black.

**STEP 7) Next, extract the cyan components**

In Spot Preset Colors - Set the Cyn check box, this selects cyan for extraction

In Spot Rules - The CMY box should be checked, this extracts from CYM instead of RGB palette

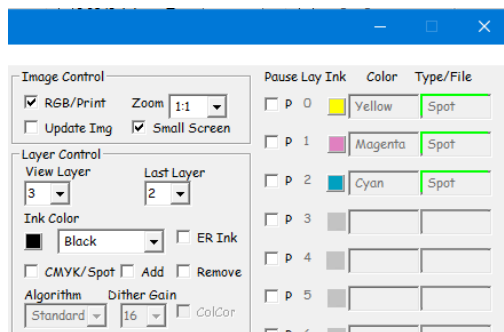
There should be one triangle to the left and on larger curved triangle to the right in the image display

**STEP 8) Next, indicate we want to use cyan ink for this layer**

In Layer Control - Select Cyan from the Ink Color dropdown list

**STEP 9) Next, indicate that we are done with this layer**

In Layer Control – Check the Add checkbox



Once the Add checkbox was clicked, the View Layer in Layer Control automatically changes to 3.

The print stack up display should look like the picture to the left. The green color around the word Spot indicates that there is useful information to be printed. If this color is red, then there is probably a problem with the layer like all pixels being black.

**STEP 10) Next, extract the black components**

In Spot Preset Colors - Set the Blk check box, this selects cyan for extraction

In Spot Rules - The CMY box should be checked, this extracts from CYM instead of RGB palette

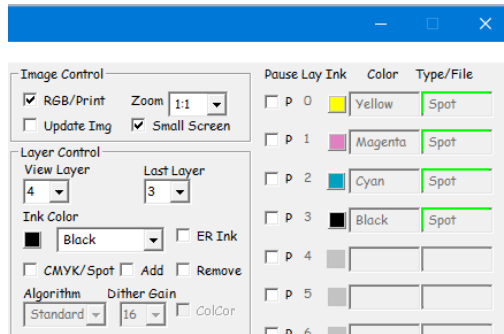
There should only be the letters TM in the image display

**STEP 11) Next, indicate we want to use black ink for this layer**

In Layer Control - Select Black from the Ink Color dropdown list

STEP 12) Next, indicate that we are done with this layer

In Layer Control – Check the Add checkbox



Once the Add checkbox was clicked, the View Layer in Layer Control automatically changes to 4.

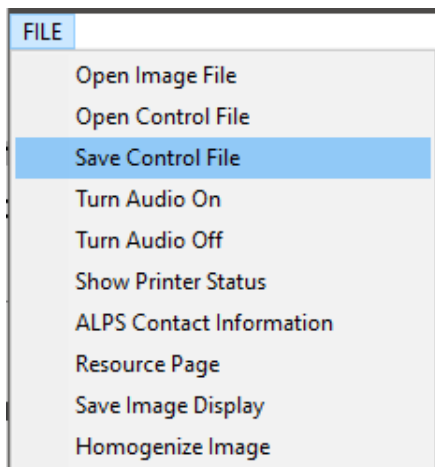
The print stack up display should look like the picture to the left. The green color around the word Spot indicates that there is useful information to be printed. If this color is red, then there is probably a problem with the layer information.

### 9.2.3 Simple Image Saving Control File

At this point we have all of the information we need in order to print the Alps logo. We can decide to print the ALPs logo now or we can save this layer information in a control file. Saving the information in a control file allows us to retrieve the information at any time and then print using only one button click. This load and print feature is truly the benefit of this utility.

What gets saved

- The rules for color extraction
- Number of layers
- Spot/CMYK information
- Print size
- Margin size
- Resolution
- Head voltage adjust
- Ink swap pause



Use the FILE dropdown at the top left of the utility and select Save Control File

A save popup box will appear

Overwrite the default test \*.ctl in the File name: text box and enter the filename 'Alps logo.ctl' in the File name: text box

Click Save at bottom right of the popup box

This saves the control file

### 9.2.4 Simple Image Loading Control File

Now that we have saved a control file for the Alps logo, let us load and use that control file for printing the Alps logo.

## 10 Layer Stackup

### 10.1 General

The Layer stackup appears to the far right of the utility screen and contains useful information for visualizing the current control file or print job.

### 10.2 Pause Checkbox

The pause checkbox is used to pause the printer in order to swap out ink cartridges. This feature becomes useful when different ink colors share the same barcode numbers because of relabeling or because they are some of the special ink colors from elephants Rocket. The special ink colors offered by Elephants Rocket come with the barcode of 0 which is the same as the standard black ink.

### 10.3 Lay

This is simply the layer number index ranging from 0 to 31.

### 10.4 Ink

This is a color representation of the ink color which will be used for the layer.

### 10.5 Color

This is the short name of the color being used. For elephants Rocket Inks, this is the second column of data in the ERInks.dat or JERInks.dat file.

### 10.6 Type/File

This is the type of printing for the layer or is the filename depending on the filename checkbox. The type of printing for the layer is one of the following:

Spot	High resolution pixel by pixel printed layer
CMYK	Dithered pixel printing in order to attain a wider range of colors
CSpot	Special ink color spot layer printed in the CMYK mode

### 10.7 Layer— Checkbox

This checkbox lowers the range of layers displayed from 16 – 31 to 0 – 15.

### 10.8 Layer+ Checkbox

This checkbox increases the range of layers displayed from 0 – 15 to 16 – 31.

### 10.9 Filename Checkbox

This checkbox changes the Type/File display from type to filename.

## 11 Printing

### 11.1 Layer Reviewing

Before printing, there are a few items that the user should check in order to correct for any unforeseen issues.

Look at the layer stack up to the right of the utility screen and check the following. This only needs to be done once for each new control file generated.

- Are there any red boxes around the word Spot or CMYK  
If so, there is probably bad or no information to be printed on that layer.  
Uncheck RGB/Print and change the View Layer to the problem layer.  
Do the black pixels in the image area represent what you want to print?
- Are the ink colors correct?
- Go through each layer by changing the View Layer and see if the black pixels in the image area represent what you want to print for the selected color of ink.

## 12 Appendix A Printer and Ink Information

### 12.1 Elephants Rocket Special Color Inks

Elephants Rocket offers a wide variety of special ink colors for the ultimate in decal making. These inks should be used with the printing resolution set at 1200 dpi for the best ink adhesion.

Ink	Single	3-Pack
Pastel White	ZK-MDC-PWMR	ZK-MDC-PWM3
Ice Grey	ZK-MDC-IGMR	ZK-MDC-IGM3
Light Grey	ZK-MDC-LGMR	ZK-MDC-LGM3
Mid Grey	ZK-MDC-MGMR	ZK-MDC-MGM3
Cream	ZK-MDC-CRMR	ZK-MDC-CRM3
Camel	ZK-MDC-CMMR	ZK-MDC-CMM3
Brown	ZK-MDC-BRMR	ZK-MDC-BRM3
Sunflower	ZK-MDC-SFMR	ZK-MDC-SFM3
Pumpkin	ZK-MDC-PKMR	ZK-MDC-PKM3
Orange	ZK-MDC-ORMR	ZK-MDC-ORM3
Pink	ZK-MDC-PIMR	ZK-MDC-PIM3
Red	ZK-MDC-RDMR	ZK-MDC-RDM3
Wine	ZK-MDC-WIMR	ZK-MDC-WIM3
Lime	ZK-MDC-LMMR	ZK-MDC-LMM3
Emerald	ZK-MDC-EMMR	ZK-MDC-EMM3
Green	ZK-MDC-GNMR	ZK-MDC-GNM3
Blue Green	ZK-MDC-BGMR	ZK-MDC-BGM3
Aqua	ZK-MDC-AAMR	ZK-MDC-AAM3
Purple	ZK-MDC-PPMR	ZK-MDC-PPM3
Dark	ZK-MDC-DKMR	ZK-MDC-DKM3

### 12.2 Printer Type and Native Ink Support

Inks highlighted in green are available at Elephants Rocket

Ink	MD-2000S/J	MD-2010S/J	MD-2300S/J	MD-4000S/J	MD-1000J/D	MD-1500J/D	MD-1300J/D	MD-5500	MD-5500
MDC-FLCC Cyan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MDC-FLCM Magenta	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MDC-FLCY Yellow	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MDC-FLML Multi-color	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
MDC-FLCK Black	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MDC-ECBK Econo Black	No	No	No	No	No	No	No	Yes	Yes
MDC-SCWH Special (Spot) White	No	No	No	No	Yes	Yes	Yes	Yes	Yes

Ink	MD-2000S/J	MD-2010S/J	MD-2300S/J	MD-4000S/J	MD-1000J/D	MD-1500J/D	MD-1300J/D	MD-5500	MD-5500
MDC-OPWH Opaque (Base) White	No	No	No	No	No	No	No	No	Yes
MDC-METG Metallic Gold	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MDC-METS Metallic Silver	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MDC-METR Metallic Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MDC-METB Metallic Blue	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MDC-FMEG Foil Gold	No	No	No	No	No	No	No	Yes	Yes
MDC-FMES Foil Silver	No	No	No	No	No	No	No	Yes	Yes
MDC-FLCG Glossy (Finish I)	No	No	No	No	Yes	Yes	Yes	Yes	Yes
MDC-FRVG Finish II	No	No	No	No	No	No	No	Yes	Yes
MDC-PREP VPhoto Primer / MF Ink	No	No	No	No	No	No	No	Yes	Yes
MDC-LBFK Labeca FREE Black	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
MDC-LBFR Labeca FREE Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
MDC-LBFB Labeca FREE Blue	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
MDC-OHPC Transparency Cyan	Yes	No	No	No	No	No	No	No	No
MDC-OHPM Transparency Magenta	Yes	No	No	No	No	No	No	No	No
MDC-OHPY Transparency Yellow	Yes	No	No	No	No	No	No	No	No

## 12.3 Ink Names and Barcodes

Inks highlighted in green are available at Elephants Rocket

Product Code	Common Name	Barcode
MDC-FLCK	Black	0
MDC-FLCY	Yellow	1
MDC-FLCM	Magenta	2
MDC-FLCC	Cyan	3
MDC-FLML	Multi-color	4
MDC-FMEG	Foil Gold	5
MDC-FMES	Foil Silver	6
MDC-OPWH	Opaque (Base) White	7
MDC-METG	Metallic Gold	8

Product Code	Common Name	Barcode
MDC-METR	Metallic Red	9
MDC-METB	Metallic Blue	10
MDC-METS	Metallic Silver	11
MDC-OHPY	Transparency Yellow	13
MDC-OHPM	Transparency Magenta	14
MDC-OHPC	Transparency Cyan	15
MDC-SCWH	Special (Spot) White	16
MDC-FLCG	Glossy (Finish I)	17
MDC-PREP	VPhoto Primer / MF Ink	18
MDC-FRVG	Finish II	19
MDC-ECBK	Econo Black	23
MDC-DSCY	Photo Yellow	25
MDC-DSCM	Photo Magenta	26
MDC-DSCC	Photo Cyan	27
MDC-DSCO	Photo Overcoat	28
MDC-DSCG	Photo Gloss (MD-2300)	28 (same code)
MDC-DSCF	Photo Gloss	30