Roland SG-540

OVERVIEW

The SG3-540 is a print and cut machine capable of working with a wide variety of materials - it can produce professional-level graphics on a wide variety of sheet materials. The VersaWorks software used to prepare and send print jobs will work with several formats, but all files must be set to the CMYK color style in order to print correctly.

SOFTWARE/HARDWARE

VersaWorks

Roland's configuration and control software - all jobs must be loaded into VersaWorks queues in order to be printed.

TERMINOLOGY

EPS

Encapsulated **P**ost**S**cript - most-preferred file format for print jobs on the SG3-540, can incorporate both vector and pixel format art.

PDF

Second-most preferred file format for print jobs on the SG3-540, can incorporate both vector and pixel format art.

CMYK

"**C**yan, **M**agenta, **Y**ellow, **B**lack" - color format used by professional-grade printers, allows for richer and more varied tones than RGB. All files must be set to CMYK color scheme before printing.

MATERIALS

Available materials for usage on this machine are:

1. Matte white adhesive vinyl
2. Clear static cling vinyl
3. Printable heat transfer vinyl
4. Backlit PET film
5. Soft poly woven banner
6. Outdoor glossy vinyl banner

THERE ARE NO BYO MATERIALS ON THE ROLAND SG3-540. ONLY FABLAB-SUPPLIED MATERIAL MAY BE USED.

Using leftover scraps is also discouraged due to the risks of contaminating the print heads. Dust/grit will ruin them immediately, and they are $2000 apiece for replacements.

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FILE PREP
1. Open file in Illustrator
2. Go to File > Document Color Mode, then select "CMYK Color"
3. Select any lines you wish to cut along, and set their stroke width to 0.001 point.
4. Set the lines' fill color to Transparent, and the Stroke color to the Roland swatch labeled "CutContour".
5. Save a copy of the file in EPS format.

Powering On
The SG3-540 is always powered(and should NEVER be unplugged), but will go into sleep mode after a period of inactivity.

To wake it up, tap the screen two or three times. The screen will blink as the printer comes out of sleep mode and opens the main menu.

Loading/Unloading Materials

ONLY STAFF MEMBERS MAY LOAD/UNLOAD/SET UP MATERIALS

Before running any jobs, the material must be loaded into the SG3-540 first. This is very similar to how material is loaded on the GX-300 vinyl cutter, but with a few key differences.

Unloading Existing Material
1. Get a second employee and gently move the printer out from the wall and make space to work
2. Go around the back of the printer, and lift the loading lever up to release the pinch rollers.
3. Re-roll the print media tightly and evenly back together, then put the velcro bands back on to keep it from unrolling
4. Release the bottom clip on one side's Media Holder, support the roll with one hand(arm for heavier materials, get your partner's help if the roll is too heavy to handle comfortably), and gently remove the Media Holder from the roll.
5. Move the Media Holder off the side with the other hand.
6. Lay the roll down gently on that side's Media Stay.
7. Repeat the process for the other Media Holder - do NOT let the rolls drop, they will be damaged.
8. Place the material's pole through the center, and lift the roll off the Media Stays with your partner's help.
9. Place material back in its spot on the wall rack.
    - The heaviest material goes on the lowest spot, second-heaviest on the second-lowest spot, etc.

Loading Material
1. Get a second employee and gently move the printer out from the wall and make space to work.
2. Move the Media Holders out to the sides and move the Media Stays in place to support the material roll.
3. With your partner's help, lift the desired material off the wall rack and place it onto the Media Stays.

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4. Place the pole back into its spot on the rack.
5. Lift one end of the roll up and gently insert the Media Holder into it, then lock the bottom clip on the Media Holder.
6. Lift the other end of the roll up and gently insert the second Media Holder into it, then lock the bottom clip of the Media Holder.
7. Check the position of the material edge vs the white indicator arrows on the left side of the back of the machine - the roll's edges should be inside a pair of right- and left-pointing arrows
   - Different widths of material will use different arrow pairs
   - Move the roll by unclipping both Media Holders and **pushing** - NOT PULLING - on them to shift the roll's position, then locking both clips again to secure.
8. Rotate the roll until the material edge is pointing down to prevent unraveling.
9. Undo the velcro straps on the material and place them back on the empty pole.
10. Lift the loading lever up(if necessary) and gently feed the material through the machine until it beeps once, then beeps again and turns on the vacuum helper.
11. Adjust the positions of the Pinch Rollers as necessary
    - For full-width rolls, use all pinch rollers
    - For partial-width rolls, use as many pinch rollers as necessary to divide the material into halves or quarters
    - Shift any unused Pinch Rollers onto a non-marked area so they will remain unlocked
12. Pull the material gently through the machine until it is taught and a short length has come off the roll.
13. Lower the loading lever and lock the Pinch Rollers in place.
14. Gently slide the Media Clamps over the edges of the material until flush.
    - Don't forget to do this, or the printer will not recognize the material is loaded when calibrating.

Printer Material Setup

1. Touch the "Setup" button, then select the material being loaded.
2. Press the "Next" button.
3. You will be prompted whether or not to use the take-up unit
   - Most all jobs will not require the take-up unit: if you are unsure select "Do Not Use Take-Up Unit" and press the "Start Setup" button
   - If you are doing a very long job(this will typically be banners), select "Use Take-Up Unit" and press the "Start Setup" button
4. The printer will perform its calibration routine and scan for the white bars on the Media Clamps. Once completed, the screen will display the message "Output Possible"
5. Press the "Move" button, then use the up arrow to rewind the material backwards until it stops.
6. Press the "Set Base Point Here" to set the home point for the print job.
   - Forgetting to do this wastes a lot of material, the printer does not find the edge on its own during material setup

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Setting up a Print Job

1. Open VersaWorks and select the queue that matches the material you have loaded.
2. Drag-and-drop the desired file into the queue.
   - If more than one file is desired, add them all, highlight, and click the Nest button along the bottom row
3. Double-click the file to open up the job's(or nested jobs') settings.
4. In the "Layout" options, click the "Get Media Width" button to load the correct size of the roll.
5. Look through the following option sections(explained in detail Cut Controls Cut Controls Cut Controls below) to set up the basics for your print job:
   - Layout
   - Quality
   - Cut Controls
   - Printer Controls

Layout

The Layout options allow you to scale, reposition, do basic tiling, and rotate the job.

Scaling

Scaling works by percentage of the original size, i.e. 100% = original image file dimenions. You cannot scale independently in the X and Y directions, it will only scale proportionally.

Set either the desired percentage or the actual width/length desired, "Fit to Media Size" will scale the image to fit the entire printable area in terms of width.

Position

Position options allow you to offset the image location on the roll, or use the "Center on Media" option to shift the image to dead center.

You can also click and drag the image around in the preview pane.

Print Properties

Increase the "Copies" number to have Versaworks do basic tiling across the width and length. The "Tile Spacing" options allow for 3 different styles of control over how the tiling pattern looks. Adjust the "Spacing" values to change how closely images will be nested together depending on the selected option.

Quality

The Quality options allow you to set the general quality of the print, number of print head passes, half-tone style, and the desired Color Management Profile for your job.

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Print Quality

This section changes depending on the media being used - most have the standard 3 options (High Quality, Standard, Speed), but some have a single option. There is a rough time estimate next to each option.

Mode

This section will also have differing options depending on the material being used(some also only have 1 option). There is normally at least a 10P and 12P option, the "##P" value indicates how many passes the print head makes when printing. More passes = finer detail, but longer time required.

Halftone

The "Error Diffusion" is set as default and is, in general, the best option to use. Changing to "Dither" will result in faster processing but at the cost of less possible detail.

Color Management

The "True Rich Color 3" is set as default, refer to examples to see the practical differences between color management profiles on each type of media.

Cut Controls

Cutting Options

Allows the user to set which type of operation mode to process the image in. Available options are "Print and Cut", "Cut and Print", "Print Only", and "Cut Only".

- Print and Cut: Prints job and then processes cut paths.
- Cut and Print: Processes cut paths, then print job. Useful for delicate materials that can be stretched or have the colors damaged by cutting
- Print Only: Only prints job, recommended for use with non-adhesive materials(banners, PET film, etc) and jobs that need to be post-processed before cutting(in conjunction with enabling Crop Marks)
- Cut Only: Only processes cut paths. Must be used in conjunction with pre-printed Crop Marks so the printer can detect skew and realign the cut paths appropriately

Cut Image Boundaries: Versaworks will automatically detect the extents of the image and generate a rectangular cut path around it.

Return to Original After Print/Cut: Will reel all printed material backwards after printing or cutting said job. Default is Disabled.

Cut Passes: This has been preconfigured, please **do not alter**. If problems are encountered please lodge a service ticket in FabApp.

Cutting Conditions settings: These have been preconfigured, please **do not alter**. If problems are encountered please lodge a service ticket in FabApp.

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Perforated Cut Controls: The Roland SG3-540 is capable of cutting perforations around the boundaries of an image. However, **this is very touchy and will ruin the whole job if anything goes wrong**, so **we are intentionally not supporting it** as normal procedure. If a learner wants to use it anyways it is on them: if the job is ruined from attempting perforated cutting, they are still liable for paying as if it had come out perfectly.

Execute Prefeed Operation: This slowly pulls all necessary material off the roll before beginning the print job. Default is enabled, it is recommended to leave this enabled on almost all jobs. Refer to print media examples for any exceptions.

Printer Controls

This section allows control of options relating to printer behavior and media settings. The only option that should be changed is the Sheet Cut option, **all others are pre-configured and should not be altered whatsoever**.

Cut Sheet After Output
        Instructs the printer to perform the Sheet Cut function immediately after the job has finished printing. Has 2 options, Sheet Cutting and Perforated Sheet Cutting.

Warning: Do not use this option when printing with Crop Marks - it cuts things too short and re-alignment will fail later, Never use Perforated Sheet Cut,   Default value is Disabled.

Advanced Options

Versaworks allow for things like color correction/matching, various types of trim/crop/alignment marks, and a variety of other production-oriented options.

Mark
        Margin, Trim, and FOTOBA Cutlines can be automatically generated and placed around jobs. Roland-specific "Crop Marks" can be enabled and placed around whole jobs, rows in a tiled job, and each item in a tiled job. If needed, "For Each Data Entry" is recommended to ensure maximum fidelity.

Other Available Options
        Press F1 on the keyboard and reference the Roland Help Center, it explains each option clearly and in-depth.

Dispatching Print Jobs

Once all the print options have been set, drag-and-drop the filename into the RIP(Raster Image Processor) Queue above the Material Queues, or select it and click the RIP button(two arrows chasing each other) button along the bottom. Versaworks will translate the image and options into raw print data, displaying a checkmark icon next to the file when complete.

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Once the RIP process has been completed and you are ready to print, drag the file into the Print Queue on top or select and click the Print button(printer icon) along the bottom.

Confirm how many copies you want to make, then click OK to dispatch to the printer and begin the job.

After Job Completion

After the job completes, use the Sheet Cutting menu on the printer to cut off the job and remove from the printer.

To do so:

1. Press the Move button and use the up/down arrows to feed out/pull back in material until satisfied.
2. Press the "Set Base Point Here" button
   - If you don't do this, the printer will move back to the predefined base point that is set after the job completes.
   - When sheet cutting a job that employs Crop Marks, **make sure there is at least 4 inches of material** between the last crop mark and the desired sheet-cutting location before setting the Base Point. Any less and the material will feed out of the rollers completely when realigning itself and be unable to finish the cut step.
3. Press the Sheet Cut button to slice off the material
4. Do not pull the job out, allow the printer to push the cut pieces of material out on its own until gravity takes over.
5. Gently finish pulling the material down and out of the printer.

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Printing and Cutting As Seperate Operations

To print out a job, remove for post-processing, and perform cut operations later, follow these steps:

Printing

1. Prep file for desired cut locations and load into the desired queue.
2. Click the gear icon on the queue's tab and open up the master settings.
3. Navigate to "Cut Controls" > "Cutting Options", and set the mode to "Print Only".
4. Navigate to "Marks", enable Crop Marks, and set to "Each Data Entry".
5. Click OK to apply settings, confirm OK when asked to save the settings.
6. Proceed as normal and set the individual job options
   - Double-check the mode and Crop Marks options are still set to "Print Only" and "Each Data Entry".
7. Print the job.
8. When job is finished, use the Move menu on the front panel and feed out an additional 4" of material, then press the "Set Base Point" button.
9. Sheet cut the material like normal.
10. Reset print mode and Crop Marks options back to normal in the queue master settings(Rebooting the PC is fine as well).

Cutting

1. Load the pre-printed material back into the printer and set up like normal.
2. Load the same file that was printed earlier into the appropriate queue.
3. Click the gear icon on the queue's tab and open up the master settings.
4. Navigate to "Cut Controls" > "Cutting Options", and set the mode to "Cut Only".
5. Click OK to apply settings, confirm OK when asked to save the settings.
6. Proceed as normal and set the individual job options
   - Double-check the mode is still set to "Cut Only"
   - Double-check the red dotted cut lines are where they are intended to be in the preview
7. Use the Print button to begin cutting, or drag the job directly to the Print queue to begin cutting.
8. Reset the print mode back to normal in the queue master settings(Rebooting the PC is fine as well).
9. Unload the material from the printer.

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