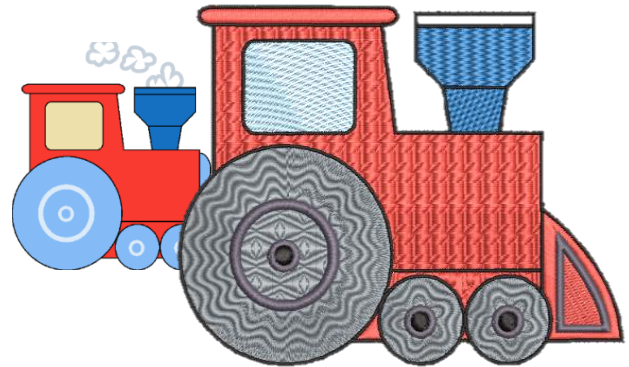# CHALLENGE 1 – AUTO-DIGITISING

Introduction

The BERNINA embroidery software supports the automatic and semi-automatic digitizing of both bitmap and vector images. The Auto-Digitize Toolbox provides tools for the automatic digitizing of prepared artwork and photos. With these tools, novice embroiders can create simple designs quite quickly and easily.

These Automatic digitizing tools can also help quickly digitize a motif for when you need to cost a design or logo for embroidery.

BERNINA Embroidery Software provides various tools with which to auto digitize Artwork.

Digitizing Methods

Different digitizing methods or 'tools' are suited to creating shapes or design elements. Digitizing methods divide broadly into two categories - **outline and fill**. Like drawing objects, embroidery objects have certain defining characteristics or 'properties' such as colour, size, position and so on. They also have properties unique to embroidery such as stitch type and density. The most important property for an embroidery object is its stitch type. Different stitch types are suited to different shapes.

- **Manually Digitize** -Trace shapes and lines over the artwork using the appropriate digitizing method to generate stitches.
- **Magic wand** – Click a shape in the Artwork and the Magic wand tool automatically adds stitches.
- **Auto digitize** – Select the image and the Auto-Digitize tool automatically determines the shapes and add stitches to digitize the design.
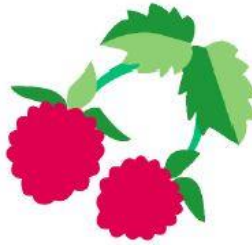
Choose Artwork

For both manual and automatic digitizing 'clean' images, sometimes referred to as 'Cartoons' work best. Such images have a limited number of solid colours which in turn have well defined outlines. If you are scanning images, make sure you scan them correctly for best results. Colour-in book images work well.

- Well defined – where each shape is made up of pixels of the same colour.
- Clearly blocked – where each shape is a stitchable size, at least 1sq mm.
- Save at a colour depth of at least 256 colours(8bit), or preferably millions of colours (16 bit)

Clean picture with well defined outlines.

Clean picture with well defined colour blocks.

Complex picture, needs editing to create clean colour blocks.

IMPORTANT:

As this challenge is all about Auto Digitizing, we will from now on only concentrate on features and functions to support the various methods of Auto-Digitizing.

Prepare Artwork

Watch this informative Video: Overview of Auto-digitizing Preparation Tools

Before applying automatic digitizing you will need to improve or 'clean up' the artwork. For both *Auto Digitize* and *Magic Wand* to work effectively, solid colour images are required. Improve artwork with bitmap editing tools in a graphics package or use the image processing tools provided in the BERNINA Software. In fact, the software will not let you apply Auto Digitize or Magic Wand until the image has been processed.

 New Icon in V9 Software

Use the *Prepare Bitmap* tool to prepare images for automatic digitizing. This function automatically flattens colours, sharpens outlines, and reduces 'noise'. Areas enclosed by a black outline are reduced to a single colour. This makes it easier for the software to recognize distinct areas in the artwork. These areas then become the embroidery of the finished design.

Outlined vs non-outlined images

Before preparing your image you need to know what type of image you are using. For the purpose of automatic digitizing there are two categories – **outlined and non-outlined.** These images require different methods of preparation.
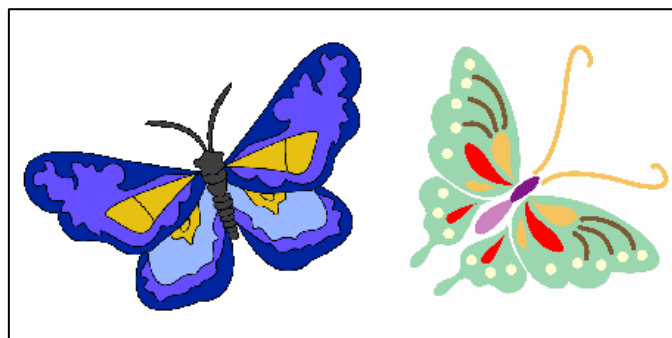

Image with outlines   **Image without outlines**

- **Image clean up** may involve any one or a combination of the following techniques.
  - ○ Reducing the number of colours

- ○ Adding or emphasizing outlines
- ○ Removing noise, dithering or anti-aliasing
- ○ Eliminating unnecessary detail
- ○ Cropping sections
- ○ Eliminating background

Watch this informative Video – Adjusting an image

(Note – CorelDRAW function only available in Designer Plus software)

Auto Digitize Embroidery

The software can automatically convert artwork to embroidery. Artwork is batch processed to create the many embroidery objects that make up a design. The software can recognize shapes in the artwork – bitmap and vector – and choose suitable stitch types to use. It can also determine stitch sequence based on closest join. The auto-digitizing tools become available when an image is selected. Only one image can be selected at a time.

Auto-digitizing tools accept artwork in either a raw or processed state. However, the quality of the resulting designs depends entirely on the type and quality of the original artwork. In order to make bitmap images more suitable for automatic digitizing, the software also provides image processing capabilities and links to graphics packages.

1. Instant Auto-Digitizing
Watch this informative Video – Instant Auto Digitize

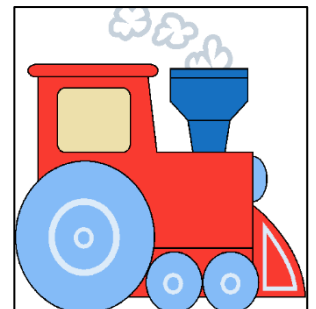|	
	Use Instant Auto-Digitizing to create embroidery designs directly from imported images using default settings.

Creating an embroidery design with the *Instant Auto-Digitize tool* is simply a matter of selecting the image you want to convert, and clicking the tool. This tool makes all the decisions for you, the colours, the sequence and the type of stitch. But the design can still be edited after the stitches are generated using the edit tools in the Software. Even if the image is not pre-processed with the image preparation tool, the *Instant Auto-Digitize tool* automatically processes and converts it.

- ➢ **Artwork to Use** – Choo-Choo (Artwork provided))
- ➢ **Auto Digitize Tool to use** – Instant Auto-Digitize Tool

TIP: After you have inserted your Artwork image and you cannot see the image, turn on Show Bitmap Artwork icon.
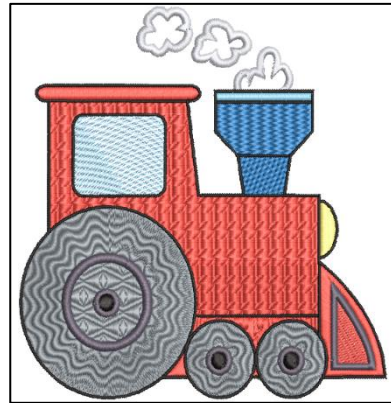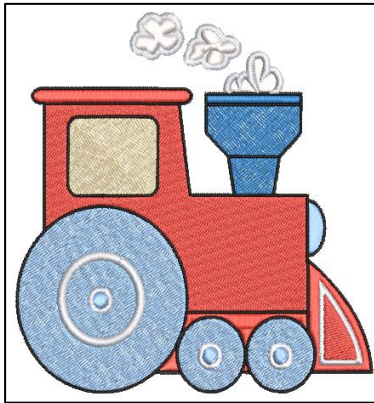
a. *Insert* the Artwork.
b. *Re-Size* the Artwork for its intended purpose.

Position X:	-61.34	mm	Width:	110.00	mm	100.00	%				
Position Y:	75.92	mm	Height:	117.51	mm	100.00	%				0

Set design size

c. Select the Artwork and Click on the *Instant Auto Digitize Tool*.
d. Once the design has been created, you can edit the final result using all the available techniques. Always remember to apply *underlay* and you may need to reshape some objects.
e. Delete your Artwork by selecting the sailboat in the *Colour film* and press *Delete.*

2. Auto-Digitizing

[Watch this informative Video – Auto Digitize an Image without Outlines](#)

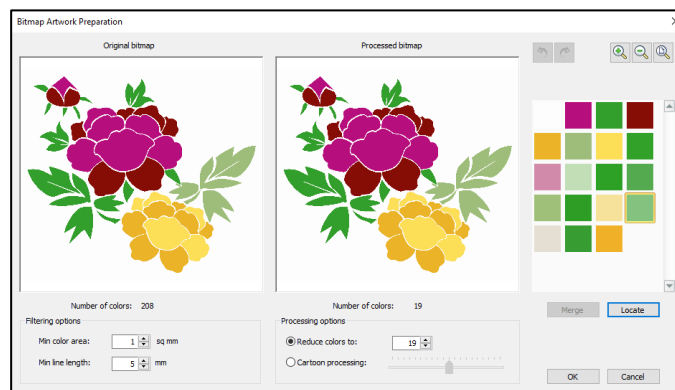*Use Auto-Digitize to create embroidery designs directly from imported images using conversion settings.*

For more control over object conversion, use the ***Auto-Digitize Tool.*** This tool can recognize shapes in artwork, bitmap or vector, and choose suitable stitch types to use. However, this tool does provide more control over the conversion settings. With Auto-Digitizing all stitches are the same step fill #1 with a 45° stitch angle or a satin stitch.

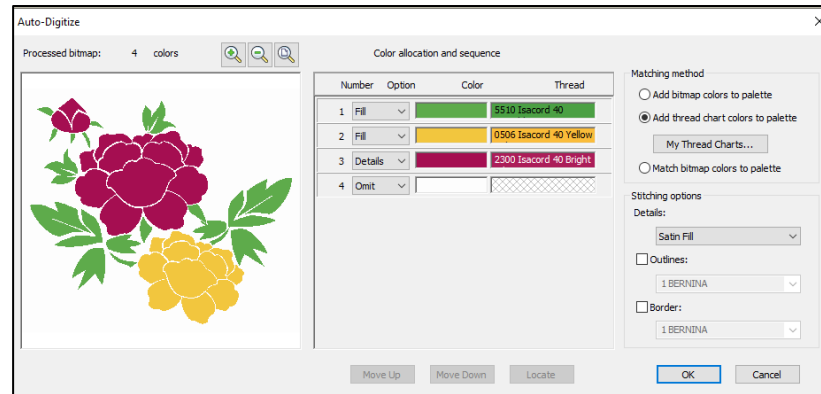**Note for Stitch Details:** Satin lines create an even satin stitch while Satin fill follows the shape of an object.

> ➢ **Artwork to Use** - A East_ 002jpg **(Artwork provided)**
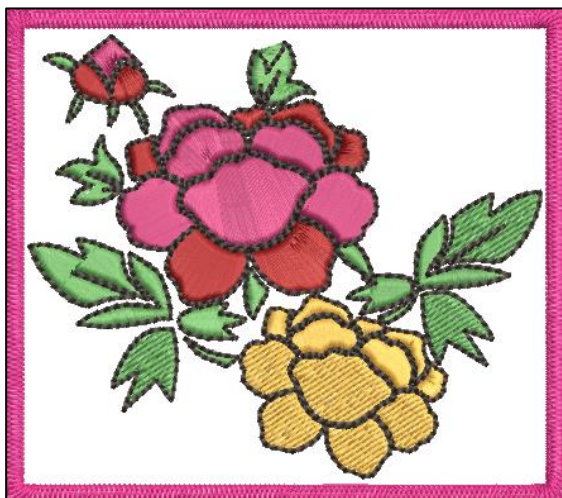> ➢ **Digitize Tool to Use –** Auto Digitize Tool

a. To use this feature, ***Insert Artwork*** and resize and crop the Artwork as required.

b. Select the image and click on ***Auto-Digitize.*** The ***Bitmap Artwork Preparation*** dialog box appears. This is where you can reduce the colours accordingly. Click ***OK.***

c. The *Auto Digitize* dialog box opens. In this dialog box you can change the type of stitch, add outlines, or a border. The stitch sequence can also be managed. You can also change the matching method. By default, image colours are matched to the nearest thread colours in the current design palette.

Pull Compensation is added to a design to counteract the pulling of the fabric as it is embroidered. A test stitch out is the true test of whether the pull compensation needs to be changed further. You may find that some of the nodes may need to be edited to create more overlap.

TIP:

You can edit the design in any way you wish and send the design to the machine for stitching.

Watch this informative Video – Auto Digitize an Image with Outlines

 Watch this informative Video – Auto Digitize an Outline design

3. Magic Wand

Watch this Informative Video – Magic Wand

The Magic Wand tools provide everything necessary to digitize shapes in bitmap images automatically without using manual digitizing methods. These tools are useful for quickly creating embroidery objects from scanned images without having to manually digitize shapes.

NB: It is easy with the Magic Wand tools to double-click and inadvertently create double layers of stitching. Check everything you do in the colour film and delete any unnecessary objects.

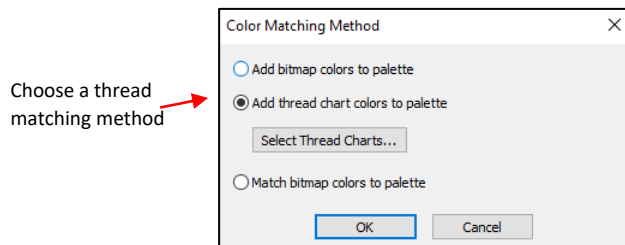|	***Magic Wand*** to digitize large artwork shapes with step fill, preserving any holes with in.
	Magic Wand Block Digitizing to digitize narrow column artwork shapes with satin stitch.
	Magic Wand Fill without Holes to digitize large artwork shapes with step fill, ignoring any holes within.
	Magic Wand Centreline to digitize centerlines in artwork with run stitching.
	Colour Matching Method to assign image colours to the colour palette, or automatically match them to actual threads.

To digitize shapes automatically……
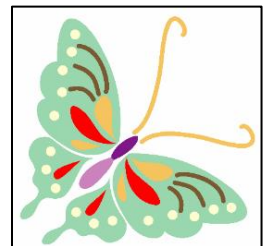
Scan or load the image you want to use.

Crop and size the image as required.

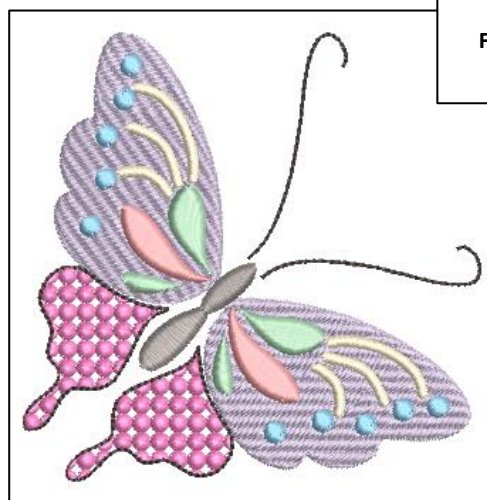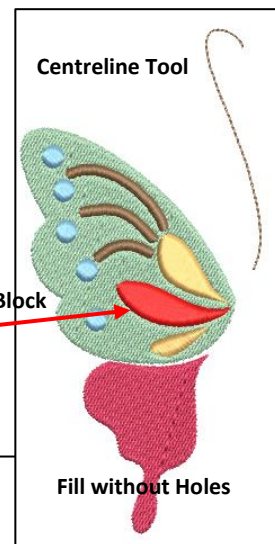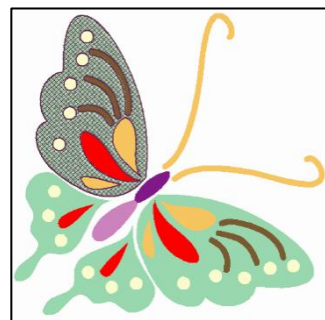Ensure ***Show Bitmap Artwork*** is toggled on.

Use ***Colour Matching Method*** to assign image colours to the colour palette for manual thread matching, or automatically match them to the current colour palette or current thread chart.

Choose a thread matching method →

> ➢ **Artwork to use -** A_East_006jpg **(Artwork provided)**

> ➢ **Digitise Tools to use -**   Magic Wand, Magic Wand Block Digitizing,
> Magic Wand Fill without holes
> Magic Wand Centreline.

a. **Insert** Artwork. Select the **Magic Wand** and click an area of the image as prompted. The software checks whether it has been processed and displays the Bitmap Artwork Preparation dialog box. Do the necessary adjustments.

b. With the Magic Wand still selected, hover the mouse pointer over an large area (Wings) of the image, as a guide a mesh appears, click to set. Stitches are generated according to current stitch settings.

c. Choose **Magic Wand** tools according to object shape. **Magic Wand Block Digitizing** is great for **Turning Satin**, which is suited to narrow columns.

d. Use the **Centreline** tool to digitize the finer details.

e. Use the **Fill without Holes** tool to ignore holes in shapes.

f. If you want to both fill and outline a shape, using the **Magic Wand** tool, left click for fills and right click for outlines.

g. Change thread colours and stitch type as required.

h. Use the **Colour Film** to place objects in the correct stitching order.

Centreline Tool

Magic Wand Block Digitizing

Fill without Holes

Video to watch - Magic wand Block Digitizing

Video to watch - Magic Wand Centreline

Video to watch - Magic Wand Fill without Holes

Converting Vector Artwork

Video to Watch – Converting Artwork to Embroidery

Special conversion tools in BERNINA Software automatically convert vector objects and text to embroidery or lettering objects. All vector drawings can be quickly and easily converted to embroidery designs. When creating embroidery object, the software determines optimum object and stitch types for given shapes. These can be modified as required. You can also convert embroidery designs or objects to vector objects.

> **Please Note:** Included artwork (clipart) and embroidery designs can only be used for personal use – i.e. they cannot be commercially sold in any form.
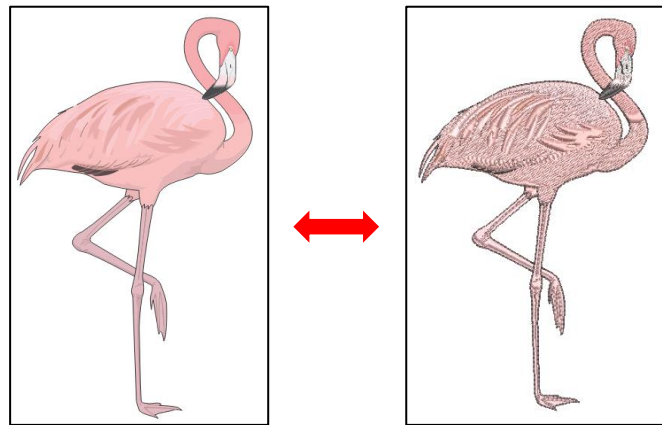>
> Changing the medium – i.e. clipart to embroidery or embroidery to clipart – does not remove copyright protection.

Use Artwork Canvas to import, edit or create vector artwork as a backdrop for embroidery digitizing, manual or automatic.
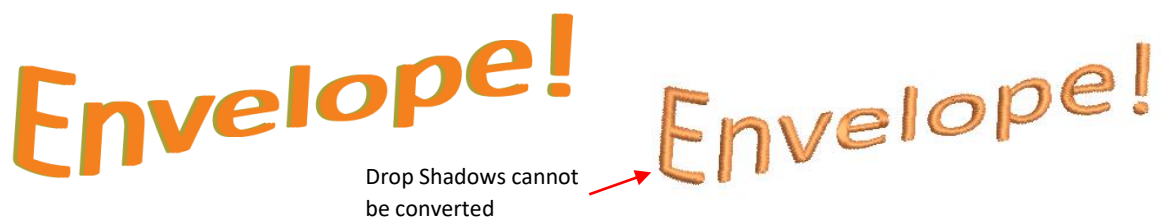
Use Embroidery Canvas to digitize and edit embroidery designs. Display embroidery as well as artwork. View designs realistically in 3D.

Conversion Limitations

There are limitations when converting some **CORELDRAW®** vectors to embroidery. You can also convert Lettering to embroidery from CORELDRAW. Special effects, such as drop shadow, contour and transparency, do not convert well as there is no equivalent embroidery effect.

Drop Shadows cannot be converted

If there is no embroidery equivalent, the object is converted with solid colours only.

You can edit the lettering in the Embroidery Canvas side of the Software as you wish after the conversion.

Convert Embroidery to Artwork

In the BERNINA Embroidery Software you can also convert embroidery objects to vectors and bitmap. Vectors can be saved and used in other applications. "Virtual embroidery" bitmaps can be used in design catalogues or sharing on social media.
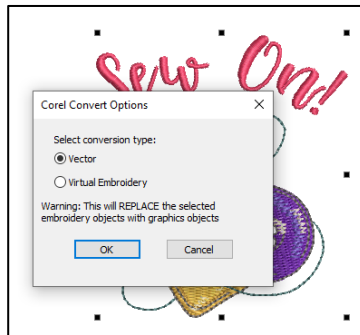
Use **Convert Embroidery to Artwork** to convert selected embroidery objects to vector or bitmap artwork.
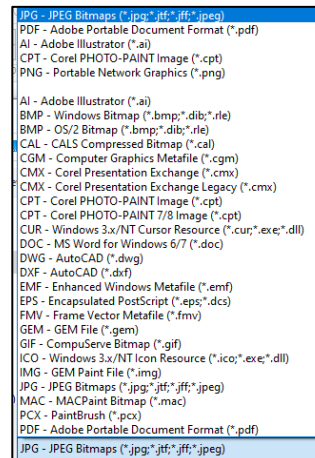
To Convert Embroidery to artwork

- ➢ Switch to **Embroidery Canvas**
- ➢ Insert the Embroidery Design and/or Lettering you wish to convert.
- ➢ Select the embroidery and/or lettering objects and click **Convert Embroidery to Artwork. The Convert Options** dialog box opens.

- ➢ Select the preferred conversion type – vector or virtual embroidery (bitmap). The software automatically switches to **Artwork Canvas** mode.

When **Vector** is selected, embroidery objects are converted to vector graphics. These can then be exported in any of the many vector or bitmap formats supported in **CorelDRAW®**

Vector

When **Virtual Embroidery** is selected, embroidery objects are converted in **Artistic View** to bitmap format. This can be saved as a separate file.
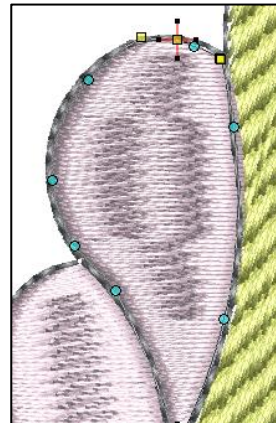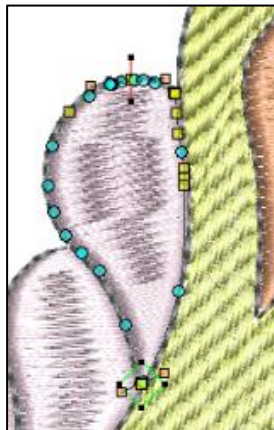
Virtual

Smooth Shapes

When doing auto-digitizing you might find that you need to do some "Fine Tuning" of certain objects within the design.

Like vector objects, embroidery objects contain reshape nodes on their outlines. Especially on shapes where the angle changes constantly, the software may insert hundreds of these reshape nodes, making reshaping difficult.

 Use **Reshape** to adjust object outlines, stitch angles, start and end points, curved lines etc.

> ➤ Select the object (or objects) to smooth. You can only smooth objects that have been ungrouped and selected.
> ➤ Click the Reshape Object icon. Reshape nodes display around the outline.
> ➤ Delete or add reshape nodes until you are happy with the result.

Object Smoothed

[Informative Video – Backing Up of your Designs](#)

Trust you have enjoyed this exercise and looking forward to your next challenge – **Photostitch and Photosnap**