# Choosing and Setting Up your Embosser

Presented by Matthew Horspool for the Braillists Foundation, Tuesday 18 January 2022 at 7:30 PM

## Session Outline

In part 1, we will cover:

* The purpose and function of an embosser and why you might want one
* Different types of embosser
* Different types of paper
* Connectivity options
* The user interface
* The role of translation software

In part 2, we will cover:

* Drivers and auxiliary software
* The importance of the transport lock
* Setting paper size and margins
* Trouble shooting tips
* Sources of help with the cost of purchasing an embosser

## What is an Embosser and Who are they For?

An embosser is essentially a printer but, instead of using ink or toner, it electronically punches dots into paper. It therefore has two established uses:

* To produce braille
* To produce tactile graphics

There are several groups of people who might benefit from having access to an embosser:

* Sighted friends, family and colleagues who have little or no knowledge of braille, but who need to produce it for a blind person
* Individual blind people who frequently need to produce braille for themselves, e.g. to participate effectively in work, study or a hobby
* Parents, teachers and support assistants of blind children
* Professional braille transcribers and producers

You may be able to access an embosser without owning one, e.g. through your local resource centre for the blind, church, library, school etc.

## Graphics Embossers Explained

Graphics are produced by making the spacing between all dots uniform, I.E. eliminating the horizontal space between braille cells and the vertical space between braille lines. Thus, virtually all embossers can perform both functions in practice. However, it is helpful to think of them as separate machines when deciding which embosser to purchase, as embossers which are optimised for tactile graphics tend to produce smaller dots than embossers optimised for braille. The reasoning for this is as follows:

* The relatively large, proud nature of typical braille dots makes them pleasant to read, but restricts the resolution of tactile graphics, with spacing lower than 2 mm between dots risking tearing of the paper.
* The smaller dots produced by graphics embossers allow much narrower spacing between dots without risk of tearing the paper. They also allow dots at multiple heights. However, these dots feel spikey or watery when used for braille and are hence less pleasant to read.

The extra precision involved in producing tactile graphics may also make graphics embossers more expensive than braille ones.

The most well-known manufacturer of graphics embossers is ViewPlus technologies, with brands such as Tiger, Embraille, Emprint and SpotDot. The Irie BrailleTrac and BrailleSheet also fall into this category.

## Types of Braille Embosser

Broadly speaking, there are two types of braille embosser:

* Domestic (up to £5000): the most common manufacturers are Index Braille and Enabling Technologies. Thiel embossers are no longer in production, but also fall into this category. They are typically designed to sit on a tabletop and can emboss at a rate of up to 120 Characters Per Second (CPS), or 360 Pages Per Hour (PPH). They are generally noisy, but dedicated insulating cabinets are available separately, and contain only one print head.
* Commercial (over £5000 and often as high as £50000): although Index and Enabling manufacture embossers at the lower end of this type, typical manufacturers are Braillo or NV Interpoint. They can emboss at rates of up to 900 PPH and are generally self-contained, with insulation built in. They may have multiple print heads, with the ability to operate at a slower speed with one or more print heads missing. They may also include extra features such as automatic separation of sheets and built-in collating and binding.

Some electronic brailler devices also function as embossers. For example, the Mountbatten Brailler, the Cosmo, and the 6dot Braille Label Maker. However, this is usually considered an auxiliary function and, whilst it may be useful for the occasional small embossing job, it will quickly become unsustainable for regular embossing as sheets will need to be fed through individually and the speed of embossing will be slower.

## Types of Paper

Embossers can typically accept one (or, in rare cases, two) of three types of paper:

* Cut sheet or single sheet: as the name suggests, this refers to individually cut sheets of paper such as you would find in any office supply store (albeit thicker). Few if any commercial embossers accept this type of paper. Domestic embossers which accept it are usually fairly reliable, although it is always worth paying a certain amount of attention to ensure that sheets are pulled through correctly and only one sheet is pulled through at a time. Furthermore, most embossers which accept cut sheet paper can only store about 50 sheets at a time, so frequent re-stocking of paper is required for long production runs.
* Tractor fed: this refers to paper with sprocket holes at half inch intervals down each side (which may or may not be removable). The paper is continuous, but perforated at the end of each sheet, so it is distributed in stacks usually of 500 or 1000 sheets. A number of both domestic and commercial embossers can accept this type of paper. It is extremely reliable and it is not usually necessary to supervise the embossing or frequently change paper. The downside, however, is that paper will need to be torn into individual sheets after embossing, and sprocket holes may need to be removed.
* Continuous roll: as the name suggests, this is quite literally a cylindrical role of paper, usually about a half a metre tall. Such rolls usually divide into several thousand sheets and are only used in commercial embossers. The advantage of this method is that the size of the sheet can be determined by the embosser, as they are cut by the embosser as it finishes each page. They also require even less replacement than tractor fed paper, ideal in environments which emboss several hundred volumes per day.

Braille paper in the UK is typically specified by weight, e.g. most tractor fed paper is 135 GSM (g/m² or grams per square metre). This is a good starting point, but there are other considerations which are generally not specified, for instance the coating of the paper and the direction of the grain. For braille embossers, the most important factor is how much dust is generated as the holes are punched, but it is not possible to determine this from the commonly available specifications.

It is a good idea to request samples of braille paper from various suppliers before deciding which supplier to purchase from, and assess for yourself how pleasant the braille is to read and how well the dots remain on the paper after transportation and repeated reading.

## Other Considerations

* Single or double sided: most embossers nowadays are double sided, but can be set to emboss single sided if desired. Aside from cost, there is little advantage of purchasing a purely single sided embosser nowadays.
* Connectivity: most modern embossers are equipped with at least a USB port. Many also have an Ethernet port. Some also have legacy connectivity options, such as an RS232 (serial) or LPT (parallel) port, or modern connectivity options such as wi-fi or Bluetooth, or even the ability to connect USB peripheral devices directly. It is important to choose an embosser which meets your needs in this respect. However, it is often still possible to retrofit newer connectivity to an older unit. For example, if you are purchasing a second-hand embosser without a USB port, it can be used in conjunction with a serial to USB converter.
* User interface: virtually all embossers have some sort of built-in user interface or menu system. Sadly, not all of them are accessible. This is particularly true in the commercial embosser market. That said, it may be possible to account for this to some extent using, e.g. network connectivity or escape sequences in BRF files.

## The Role of Translation Software

As discussed in "What is a BRF File and Why would you Want One?" documents are typically written in "print" – in other words, letter-for-letter, often with print font and style information included. Before the document can be embossed, it needs to be converted into a braille format. This is the point at which decisions and alterations can be made such as:

* The braille code (UEB, British Braille, EBAE etc)
* The braille grade (contracted or uncontracted)
* How print conventions with no direct braille equivalent should be handled, e.g. text in an alternative colour
* How headings, tables, lists and other stylistic devices should be treated
* The inclusion of braille page numbers, and whether print page numbers should also be included
* Creating a contents page, or updating the existing contents page to properly reflect braille page numbers
* Whether graphics should be drawn, described, omitted etc

Until recently, braille embossers were not capable of undertaking any of these functions, and the entire process needed to be undertaken by specialist software such as the Duxbury Braille Translator, BrailleBlaster, Braille2000 or EasyConverter. Other software which historically fell into this category, but which appears to be no longer in development, includes BrailleMaker, WinBraille, NFBTrans and Cipher.

More recent braille embossers, particularly domestic ones, do include rudimentary translation engines on-board. If a well-structured Word document is sent to, say, an Index embosser via Index Direct Braille, the embosser will produce braille in the desired code and grade at a standard sufficient for casual use. However, there is little to no ability to control the finer aspects of style and layout. Editing is possible via the on-board braille app if the embosser is connected to a network, but this is a very manual process.

It is therefore still highly recommended to control all embossers through translation software, even if the embosser is equipped with its own rudimentary translation engine.

## A Note About Drivers

Embossers are not usually plug and play. You will most likely need to install a driver from the manufacturer before the computer will properly interface with it, especially when connecting via USB.

Index embosser drivers are not currently signed. Therefore, when installing them, Windows will prompt that there is a security concern and ask if you would like to proceed anyway. It is perfectly safe to answer yes to this prompt.

The driver for ViewPlus embossers makes many embosser settings available via printer properties. This is not necessarily the case for all embossers and is definitely not the case for Index.

The manufacturer may make further software available in addition to the driver. For example, there may be a tool to configure the embosser or transfer files to it, either for direct embossing or firmware updating. It is up to you whether you install this software. The embosser should work well enough without it, but you may find the additional functionality useful.

## The Importance of the Transport Lock

One of the core components of a braille embosser is its embossing head, which moves from left to right across the page. It is connected to the embosser in such a way as to enable this movement to take place, but this has the disadvantage of not preventing the head from moving as the embosser is moved, especially if it is not carried flat. To account for this, an embosser should always be transported with a solid metal bar through the outer casing of the embosser and the embossing head so that, in effect, the head is permanently caught on the bar and prevented from moving until the bar is removed.

Failure to remove the transport locking bar before use of the embosser will prevent braille from being embossed across the full width of the page and, in doing so, subject the motors which move the embossing head to serious stress, which may in turn cause these motors to fail.

Failure to replace the transport locking bar before moving the embosser will cause the embossing head to move rapidly from one side of the embosser to the other if the embosser is subjected to shock or sudden movement. This could cause damage to the head itself, its cables, its motors, or cause the head to become dislodged.

It is important that the head is positioned correctly before the locking bar is inserted, otherwise the bar may not in fact be inserted through the head and the head may still be able to move freely. At minimum, this can be achieved by gently tilting the embosser from side to side until the hole in the head lines up with the hole on the outer casing. However, most embossers will have a firmware feature to position the head correctly, and use of this feature would be more fool-proof.

## Setting Paper Sizes and Margins

This can sometimes be handled automatically by the translation software, discussed in more detail later. However, for best results, it is a good idea for paper settings to be configured on the embosser itself, and for these settings to match or exceed the settings within the translation software.

There are three considerations here:

* The physical length and width of a sheet of paper, in inches or millimetres
* The logical length and width of the sheet, measured in lines per page and characters per line
* The top/bottom and left/right margins, measured in lines and characters respectively

Unfortunately, there are no clear standards which specify the relationships between these measurements. Embossers will impose maximums, but even these will differ between manufacturers and models. For tractor fed paper, there is also disagreement between embossers as to whether the physical width of the paper is inclusive or exclusive of sprocket holes.

For example, Index Basic embossers up to including V3 impose quite wide left and right margins, but very narrow top and bottom margins, so the maximum logical dimensions of a 12 inch square sheet are 30 lines per page and 42 characters per line. However, V4 and above impose a less restrictive left and right margin and a more restrictive top and bottom margin, so the maximum logical dimensions are 29 lines per page and 46 characters per line.

When producing braille which is not intended to have a short shelf-life, the one thing which can usually be agreed upon is that it is a good idea to set logical dimensions which are less than the maximums.

A top and bottom margin of 1, and a left and right margin of 3, is usually sound unless the embosser itself imposes a wide margin to begin with, in which case these numbers may be less. However, if the logical page is smaller than the allowances of these margins, more generous margins will be necessary.

It is usually necessary to adjust at least the top and left margins in order to centralise braille on the page. For example, if the embossers' maximum is 29 lines per page and 46 characters per line, but you wish your page to be 27 lines per page and 40 characters per line, failure to set to top margin to 1 and the left margin to 3 will effectively result in a bottom margin of 2 and a right margin of 6 or, in other words, the braille being skewed towards the top left of the page.

However, it is not usually necessary to set the right margin to 3 and the bottom margin to 1. Strictly speaking this would result in a page of 28 lines per page and 43 characters per line, and introduce the potential for braille to be skewed towards the bottom right, but if the translation software never outputs more than 27 lines per page and 40 characters per line, this potential will never actually be realised. If the braille file is generated manually, the extra allowance at the right and the bottom will account for the possibility of a line or a page accidentally being created too long.

Note that the left margin usually refers to the margin on the left of the sheet, not the left of the page, and likewise for the right margin. In other words, for the back side of a double sided sheet, the left margin will usually in fact occur on the right and vice-versa. However, you should emboss a test page to verify that this is in fact the case with your particular embosser. If it is not, the role of the right margin is more critical.

N.B. beware of doubling margins if they are set on both the embosser and in the translation software. In many cases (though not all), the translation software communicates margins to the embosser by inserting the requisite number of blank lines and spaces. Thus, if there is a top margin of 1 set on the embosser and a further top margin of 1 set in the translation software, a top margin of 2 may in fact occur as the embosser first leaves its own margin, and then responds to the blank line from the translation software.

If there is any doubt about paper size, it is always preferable for the embosser's logical dimensions to exceed those of the translation software. The worst outcome in this scenario is braille being skewed towards the top left, as discussed above.

If the reverse is true, and the logical dimensions in the translation software exceed those on the embosser, the embosser will need to take a new line or a new page ahead of the translation software, and will then take a second new line or new page when the translation software instructs it. Typical manifestations of this behaviour include pages containing an alternating pattern of long and short lines, pages where page numbers drift up or down the page, or an alternating pattern of full and half pages.

### Important Information About Duxbury

Unlike other translation software, Duxbury attempts to transmit paper size and margin parameters to the embosser before embossing commences, using escape sequences. This will cause Duxbury's parameters to override those stored in the embosser. This usually has the effect of generating good output for that document and alleviating the risk of doubling margins, and if you are embossing exclusively from Duxbury this behaviour should not be a cause for concern.

However, it is likely that the embosser will not restore the parameters to their previous state once the document has finished embossing. If you are embossing from multiple sources, you should therefore take extra care after embossing from Duxbury to ensure that the parameters are still correct on the embosser before embossing from elsewhere.

There are two things you can do to help to account for this:

* If your embosser has multiple "setups", "profiles", "layouts" etc, activate a disused one when embossing from Duxbury
* If there is not a disused setup/profile/layout etc, configure Duxbury not to transmit paper size and margin parameters

This is achieved via the "Global"/"Embosser Setup ..." dialog, when either creating a new embosser or modifying an existing one. On the "General" tab, set the "Embosser Model" to "Generic" or "Generic Interpoint", irrespective of the model of embosser actually in use. Provided the correct printer is specified in the "Output Options", the data will still be sent to the embosser, but without paper size and margin parameters.

## Top of Form

This is sometimes called "First Line Offset", and is often considered part of the paper size parameters, but this is not strictly the case.

The setting refers to the distance between the top of the page and the first braille line, measured in millimetres, but it is a mechanical parameter rather than a logical one and therefore has no bearing on the remainder of the page.

For example, if the imposed maximum number of lines per page is 29 and the top margin is set to 1, the maximum should reduce to 28. However, if the top of form is increased, the maximum will remain at 29. This could result in text dropping off the end of the page if the top of form is set too generously.

The principal reason for needing to adjust top of form is if the paper sensor is not correctly detecting the start of the sheet. In normal operation, this setting should be left alone.

## What to do if the Embosser Won't Emboss

There are a few potential causes:

* The file has been sent to the wrong printer in Windows: check under Embosser Settings or similar in your translation software to ensure that the correct print device is selected.
* The embosser is offline: press the online button or similar.
* The embosser is out of paper or there is a paper jam: rectify the problem and try embossing again. If the embosser reports a paper jam or that it is out of paper, but in fact this is not the case, there is most likely a problem with the paper sensor. Ideally you would replace the sensor in this instance, but in the meantime there may be a way to disable it – consult the manual for your embosser.
* The embosser is not responding: it is unclear exactly why this happens. Sometimes, sending a blank file will be sufficient to "nudge" the embosser into working again. If this does not work, power it off and on again, or disconnect and reconnect the USB cable if connected via USB.
* There are multiple instances of the embosser under print devices and the driver is associated with another instance, or the driver has become disassociated altogether: power off the embosser, delete all of the relevant print devices from Windows, and power on the embosser again. Windows should detect the driver automatically and re-add a single instance of the print device. You will need to re-send the file to this new device, but at this point embossing should commence.

If none of these suggestions resolves the issue, please contact the technical support department of your embosser manufacturer or distributor.

## Sources of Help with the Cost of Purchasing an Embosser

An Index Basic D embosser, which is a very common domestic braille embosser in the UK, costs £2650.00 excluding VAT. Few if any embossers are cheaper than this, and many are more expensive. Furthermore, the cost of the bespoke acoustic cabinet for the Basic D is a further £1050.00 also excluding VAT.

An domestic embosser should typically last 15-20 years but, nonetheless, it is a significant up-front investment. However, the cost may be wholly or partly subsidised in certain cases:

* If you are eligible for Access to Work and an embosser would help you in the workplace, an assessor will usually recommend one unless it is integral to the needs of the business (e.g. an embosser is not likely to be approved by Access to Work if you are working as a braille transcriber).
* RNIB has a grants programme which funds items of assistive technology: [www.rnib.org.uk/information-everyday-living-benefits-and-concessions-grants/grants-rnib](http://www.rnib.org.uk/information-everyday-living-benefits-and-concessions-grants/grants-rnib)
* Your local Adult Social Care service may authorise a Direct Payment if the embosser is for personal use.
* If there is a charity specialising in your eye condition, ask them whether they have a grants programme. Examples include MACS (Microphthalmia, Anophthalmia and Coloboma Support), The Macular Society and Retina UK.
* If you are a young person (up to and including 29 years old), support may be available through VICTA ([www.victa.org.uk](http://www.victa.org.uk)) and/or Look ([www.look-uk.org](http://www.look-uk.org))