# Australian Braille Authority Workshop

# Tactual Graphics Production:

# What, Why, When and How?

# Perth: 30th April 2012

Following are notes from the discussion at the abovementioned workshop with additional information added to add clarification.

They are by no means exhaustive or complete in their information, but act as a starting point to understanding the "What, Why, When and How" of Tactual Graphics.

# WHAT (ARE TACTILE GRAPHICS?)

1. Tactile graphics are pictures/drawings readable by touch.
2. "... tactile graphics do not represent a direct equivalent of the printed image as Braille does for printed text. Except in the most simple of cases, a straight conversion of a printed graphic to a tactile relief does not serve any useful purpose" (Herring, 2008).
3. "Tactile graphics are not mere transcriptions of print illustrations or raised versions of a print graphic; they are the transformed representations of images that are adapted for the sense of touch" (BANA/CBA, 2010).
4. The purpose of tactile graphics varies according to context. What is the purpose of the print graphic? What is the purpose of the tactile graphic? These may not necessarily be the same.

# WHY? (HAVE TACTILE GRAPHICS)

1. DDA: Students should be treated on the same basis as regular students.
2. Students deserve the same opportunity as sighted students.
3. Students should make their own decisions as to the relevance or not of the graphic.
4. Interact with the visual world. Ability to participate fully with sighted peers around them.
5. Making reading more fun.
6. Stimulation for the reader.
7. Understanding visual presentation.
8. Some information can only be presented graphically, however a tactile graphic is not always the best representation of a drawing.

# WHEN? (FROM WHAT AGE?)

1. Early introduction to tactile graphics is very important.
2. "... that a common, systemic approach to teaching graphical understanding should be undertaken at as early an age as possible" (Herring, 2008).
3. "Tactile graphics, in combination with 3-dimensional models, need to be introduced early in the process of learning Braille. The ability to read graphics will be required for the understanding of concepts such as diagrams, graphics, and maps, and to be able to participate in standardized testing." (BANA/CBA, 2010)

# HOW? (ARE THEY PRODUCED)

1. Some questions to start with. Purpose? Is it a one off, single use for a person? Is it a library production? Is it for the general public? What is the age/ability of the intended reader? What equipment/materials does the producing body have access to?
2. "Unfortunately, many tactile graphics are produced by recreating the print version in a raised form without considering the meaningfulness of relevance to the reader" (Herring, 2008).

## DESIGN CONSIDERATIONS

1. A tactile graphic is a representation of a print graphic designed in a manner that is the most meaningful to the reader. It is not an exact reproduction.
2. Cost and time must not be the primary considerations when determining the method of production to be used. Choose the most effective production medium for each graphic.
3. The age and experience of the reader must be considered when designing a tactile graphic.
4. Considerations need to be given in relation to scales and scaling in relation to lines to be measured, maps, grids, plans etc.
5. Consideration needs to be given to whether measurements need to be taken from the tactile graphic, eg an angle or length of line, and whether any binding will inhibit the use of a protractor, ruler etc.
6. Use of keys
7. Position of the graphic in context of the surrounding relevant text.
8. Design may be determined by what production methods you have access to.

## WHAT PRODUCTION METHOD WILL YOU USE?

### CUSTOMISED: (Master or single use, no electronic copy)

Master designed to be given to the student/reader for single use, or a thermoform copy made (see below).

#### Advantages:

* No reproduction required
* Good discriminatory texture
* Can be quick and individualized
* Minimum need for specialized equipment.

#### Disadvantages:

* Durability poor
* Additional copies not available unless access to thermoform.

#### Production Materials and Equipment:

* Perkins brailler
* Tracing wheels (spur wheels)
* Slate (hand-frame) & stylus for labelling
* textures: rice, wallpaper, sand paper, sand, spaghetti, fettuccini, noodles, ripple cardboard, lentils, puff ink/paint etc
* Fablon (velvet feel "contact"), use in shredder for lines, hole punch for dots. Craft punches for stars, etc, string
* Slit tape
* light box

### VACUUM FORM (THERMOFORM):

When creating graphics to be vacuumed formed, a hard copy master is created using production methods such as tooling, collage, foil, or sculpture. The heating component and vacuum pump of the vacuum-form machine mould a plastic sheet Braillon (thermoform sheet) to the shape of a hard copy master. This process forms a plastic duplicated copy while retaining the master for future use.

* Perkins brailler
* Collage tooling
* Foil method
* Braillon sheets (plastic sheet for the copy)
* Thermoform machine
* www.americanthermoform.com for information on machines and purchase of Brailon® plastic sheets. [They also stock Braillabels® (single sheet) and Embossables® (continuous form for embossers) braille label].
* Cost: Cost of materials to make master, Brailon is about 15 cents a sheet (depending on exchange rate)

#### Advantages:

* Research indicates that vacuum-form graphics generally provide a higher level of readability than other techniques.
* Multiple copies
* Durable
* Greater variety of textures available.

#### Disadvantages:

* Slow to produce the master
* Slow to produce a copy
* Repetitive (for recurring graphics)
* Expensive in terms of human resources. (human resources and consumables/Braillon)
* Storage
* Sensitive to heat.
* OH&S with heat, repetition and ventilation
* Cannot be archived on computer, can't be shared easily between organizations. No disaster recovery
* Sticky fingers

### MICROCAPSULE WITH CAD SOFTWARE

#### Software

* Adobe Illustrator
* CorelDRAW
* MS Publisher
* MS Word
* Braille Fonts
* Braille Kiama: 26 Bold (free)
* Duxbury font: (free)
* Braille29: (from ViewPlus for Tiger embosser)
* http://www.tsbvi.edu/resources/1087-download-braille-and-asl-specialty-fonts gives a list of fonts and where they can be downloaded
* There is also an RNIB braille font, link to which can be found on the Zychem website below.
* Test braille fonts carefully before using. Ensure that the font used matches a readable size. Test the raised font against a handframe firstly, then with a touch reader to ensure readability.

#### Reproduction:

Microcapsule graphics are tactile graphics that are produced on special paper also known as Minolta, Micropearl, Zy-Tex, Swell paper, Flexi-paper, Puff paper, or Stereocopy paper.

Use either a printer or photocopier to print onto the paper. This needs to be carbon based. Most laser printers/photocopiers work ok.

The fuser heats the paper and the printed material is raised. This is often called a stereocopier, some brands being Minolta, PIAF, and a new brand from Zychem.

#### Advantages:

1. Relatively quick using various computer graphic elements
2. Can be edited and reproduced easily
3. Low vision students/dual media may appreciate the black outline coupled with the tactile
4. Stored electronically
5. Easier for sighted person to identify graphic
6. Can be edited with carbon based felt-tip pen

#### Disadvantages:

* The black images used on microcapsule paper must be carbon-based to develop. Some photocopiers, printers, and a few felt-tipped pens use carbon in their ink.
* Expensive to reproduce. (about $1.50 per sheet)
* Stereo paper is photographic paper and can “go off”. (Needs to be stored in a cool dark place)
* Heating process needs to be consistent
* Various sizes of swell paper available don't fit all machines
* Care with photocopier is essential, can damage the drum if a jam occurs.
* Limited texture choices
* Chemicals in paper, Ventilation important.

### EMBOSSED GRAPHICS 1

#### Reproduction:

* PictureBraille (Everest Embosser), used the same size dot as braille but embossed very close together to make drawing
* QuickTac, same as PictureBraille

#### Advantages:

1. File is embedded into the Duxbury file and embossed with the text
2. Quick to produce
3. Electronic file storage
4. Cheap to reproduce, just the cost of standard braille paper.

#### Disadvantages:

1. Limited variations in texture.
2. Embosser produced graphics can have a stepped effect as dots change direction through 90 degrees.

### EMBOSSED GRAPHICS 2

The following embossers are able to produce higher resolution graphics than the Everest.

* Tiger Embosser from ViewPlus. Prints what is on the screen in a graphical format with a high resolution. Height of dots vary according to the colour of the original graphic. ie black produces higher dots than grey. This gives a greater variation of textures than the Everest. Braille labels are entered using the braille29 font; the braille readable but not as good a quality as braille produced on the Everest or Juliet or other standard embossers. Note that the original model has been discontinued, and new models are now available; no information on their quality. Cannot be embedded within Duxbury as can those in Embossed Graphics 1. www.viewplus.com
* Phoenix Embosser from Enabling Technologies. Has a resolution of 25 DPI. Not seen actually working. Does not appear to have the ability to produce "shading" with lower height dots as the Tiger does, but does use a standard head for producing the braille for labelling. Not sure if can be embedded in Duxbury, but has its own software. www.brailler.com

# REFERENCES:

Braille Authority of North America (BANA) and the Canadian Braille Authority (CBA) (2010), *Guidelines and Standards For Tactile Graphics.* http://www.brailleauthority.org/tg/index.html with links to both web and PDF versions of the manual. [Note that this manual has been written according to the formatting standards of both USA and Canada, some of which are not relevant for Australia. It also uses the Nemeth braille code for much of the labelling of mathematical diagrams. Be wary of using this as a prescriptive document. Rather use it as a resource which gives some excellent examples of how to adapt various illustrations and drawings into a tactile representation.

Herring, Nigel (2008), *Considerations for Embosser Produced Tactile Graphics.* See websites below for link to the whole paper.

# ONLINE RESOURCES

The following list of websites is not exhaustive. They were simply found with Google search. Use them with discretion, remembering overseas sites may not have labels in UEB, but they are useful for research when developing your own tactile skills.

http://www.pentronics.com.au/index\_files/PictureBraille.htm. Information about PictureBraille software, links to demonstration download, free braille graphics as well as the full article by Nigel Herring.

www.tactilegraphics.org

http://www.nbp.org/ic/nbp/braille/eb/eb\_tactile.html

http://www.tsbvi.edu/math/3189-tactile-graphics-resources

www.tactilelibrary.com

http://www.aph.org/tgil/

http://www.icevi.org/publications/icevix/wshops/0352.html

http://www.rnib.org.uk/professionals/accessibleinformation/accessibleformats/accessibleimages/tactilegraphics/Pages/tactile\_graphics.aspx