LESSON 12:

ADA SIGN WITH BRAILLE

In this lesson we'll design an ADA (Americans with Disabilities Act) sign and in so doing, we'll learn how to work with Braille. Our finished design is shown in Figure 12-1.

(Note that the word "men" appears beneath the Braille at the bottom of the design. This text shows on-screen as a design aid, and it does *not* engrave.)

The concepts we'll learn are:

- Some basic requirements of ADA signage
- How to use GravoStyle's built-in library of symbols
- How to use GravoStyle's built-in text-to-Braille conversion capability
- How to design a job with more than one toolpath

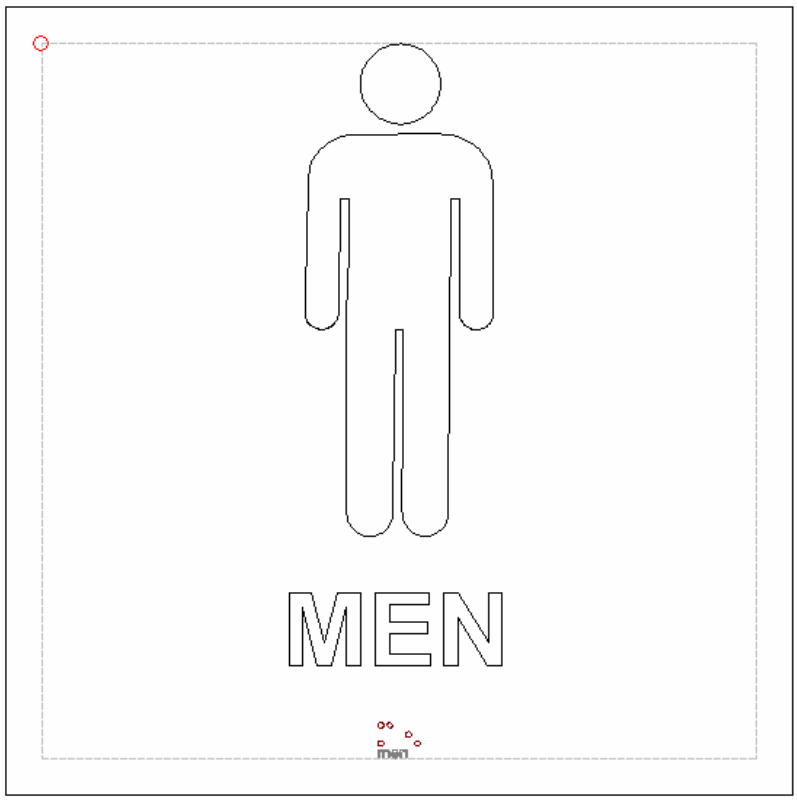

Figure 12-1 Finished ADA Sign Design

Our job's design specifications are:

- Filename: Lesson 12-ADA Sign with Braille.gnh
- Plate: 8" by 8" Gravo-Tac with a 3/8" border all around
- Text: Century 2 Line, 0.3 inches high

Our job plan is to:

- Open a new file in GravoStyle 5 and define the material size and border, then
- Enter the text ("MEN"), then
- Import the ADA symbol for "Men", then
- Enter the text that we want to be converted to Braille (again, "men"), then,
- Convert "men" to Braille, then,

- Properly position the three elements of our sign (the symbol, the word “MEN” and the Braille) on the material, then,
- Select the tool and the engraving technique to be used for the symbol and the text (“MEN”), then,
- Select the tool and the engraving technique to be used for the Braille, then,
- Send each toolpath to the table independently.

BASIC CONCEPTS IN THE CREATION OF ADA SIGNAGE

ADA signs have some special requirements. Among them are:

- The sign must have a standardized symbol. (Most of them are included in GravoStyle’s symbol library.)
- The sign must have vision-readable text that is raised in relief from the base surface of the sign. This text must be upper case with a sans serif font and the character heigh must be between 5/8” and 2 inches.
- The Braille portion of the sign must be Grade II Braille, that is, word-by-word. (Grade I Braille is letter-by-letter and is not used.)
- The Braille must consist on rounded dots, raised .025 to .037 inches above the base surface of the sign
- Raised portions of the sign, including the group of Braille dots, must be spaced 3/8 inch away from each other.

All three elements of our job will be raised. We’ll do the symbol and the text first, as one group. Here’s how we’ll proceed:

- We’ll use two pieces of Gravo-Tac material, each 8 by 8 inches. They’ll have contrasting colors and they’ll be sandwiched. The top piece will be 1/32” thick and will have an adhesive backing and it will be placed over the second piece, which will be 1/16” thick.
- We’ll cut through the top piece to fully outline the symbol and each letter of the text.
- We’ll then peel away the unwanted parts of the top piece to leave the symbol and the text as raised elements.
- We’ll drill appropriately sized holes to define the Braille dot-by-dot. The dots will be finish-detailed as a secondary post-engraving operation by pressing round balls into the holes.

Let's begin.

STEP 1: OPEN A NEW JOB AND SET THE MATERIAL DIMENSIONS

We'll open a new job and set its plate size to 8 inches by 8 inches with a 3/8 inch border all around.

STEP 2: ENTER THE VISUAL-READABLE TEXT

We'll select our font as Arial Bold, set the character height at .75 inches and type the word "MEN" in upper case. Our job will look as it appears in Figure 12-2.

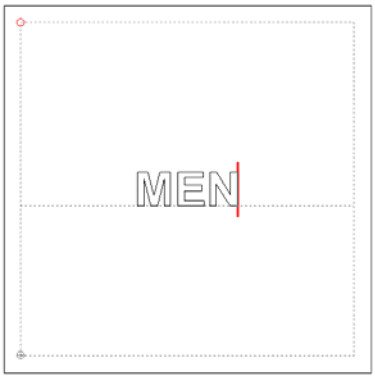

Figure 12-2 Text Entered

STEP 3: IMPORT THE SYMBOL

We'll locate the "Symbol library" tool on GravoStyle's left toolbar and click on it. The Symbols dialog window will open. We'll scroll down the category listings on the left side of the window until we find "PICTOGRAMS" and we'll click on it. We'll then scroll horizontally until we find "MEN.SYB" and double-click on that symbol to import it into our design (Figure 12-4).

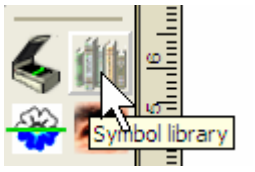

Figure 12-3

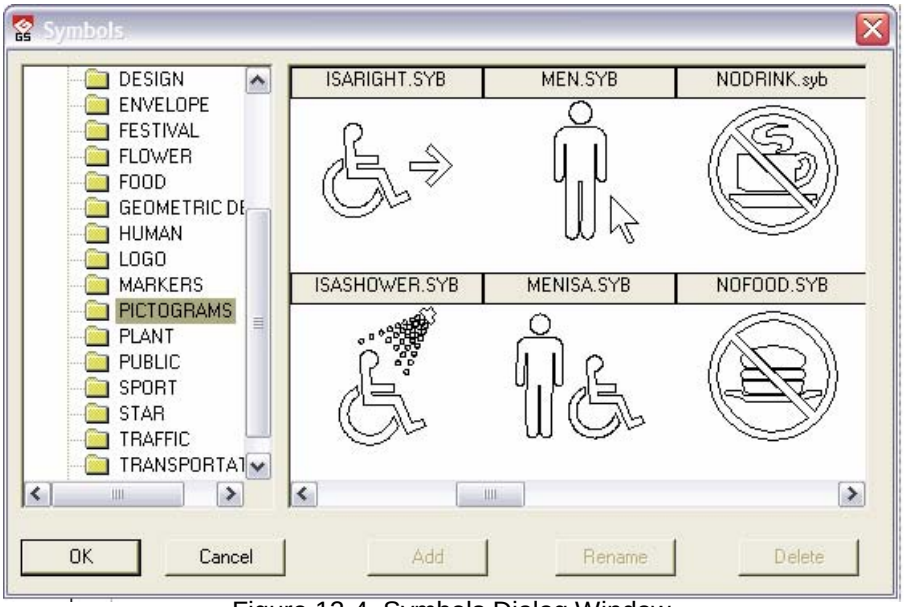

Figure 12-4 Symbols Dialog Window

We'll drag the symbol, if necessary, to position it anywhere within the borders of our job, and the job will now look as it's shown in Figure 12-5.

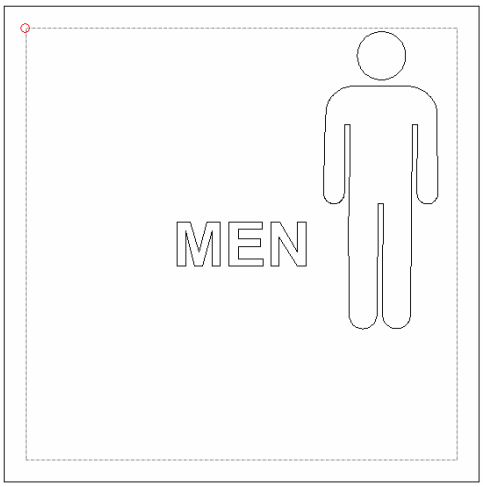

Figure 12-5 Symbol Imported

STEP 4: TYPE IN THE BRAILLE TEXT

We'll click on the "Free text" tool in GravoStyle's "Text tools" pallet. This will force us into the manual text mode. We'll then position the text cursor near the bottom of our plate, specify the Arial font (the character height will not matter at this point" and type in "men" in lower case.

Note that Braille II is always in lower case unless were typing in a name or proper noun, the first word of a complete sentence, and individual letter, initials, or an acronym.

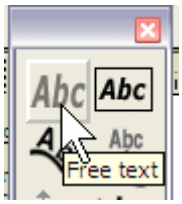

Figure 12-6

STEP 5: CONVERT TEXT TO BRAILLE

We'll make sure that our Braille text is selected, then we'll locate the "Braille" tool on the "Professional tools" tool pallet and click on it (Figure 12-8).

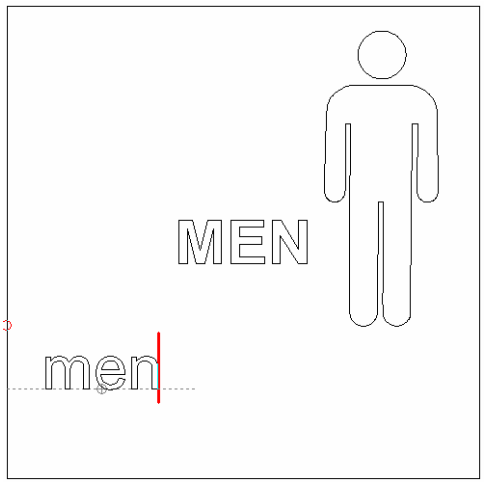

Figure 12-7 Braille Text Entered

Figure 12-8 Braille Tool

GravoStyle's "Braille Level 2" dialog window will open (Figure 12-9).

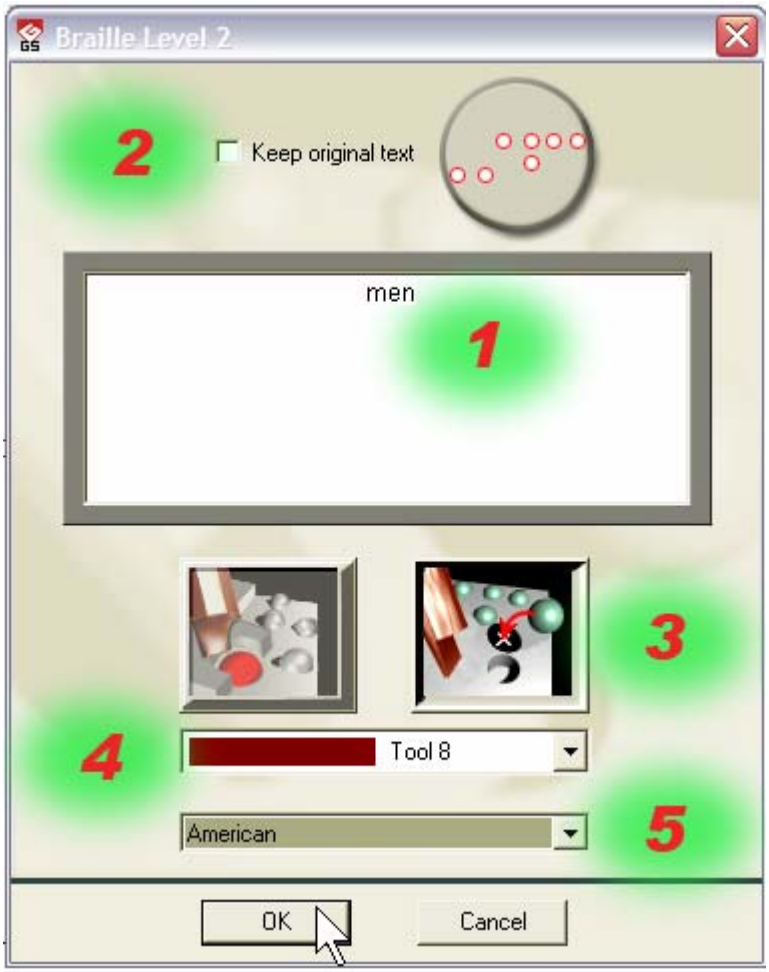

Figure 12-9 Braille Conversion Dialog Window

The features of the Braille dialog window are:

1. A text box. Our selected Braille text appears in this window, offering us both a confirmation and the ability to edit the text that will be converted to Braille II.
2. A check box which we can use to tell GravoStyle that we wish to keep the Braille text in our job as well as its conversion to Braille II.
3. Two pushbutton tools that let us specify which of two methods to use to produce our Braille. The older and less preferred method is to machine away the plate's surface. Leaving the raised dots in relief. This is much slower and less visually appealing than the second method, which is to drill holes for balls that will be pressed in later. We'll choose the second method by making sure that the *right* button is depressed.
4. The tool selection drop-down window. We'll accept the default of tool 8. (We'll define tool 8 later in the "Color" window on GravoStyle's left toolbar.)
5. A drop-down window where we can select from American, French or Spanish for our Braille. We'll make the appropriate selection.

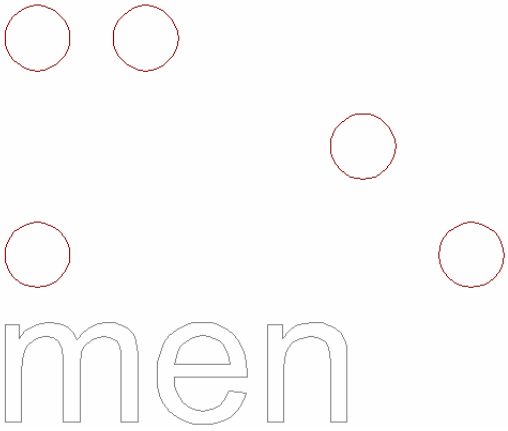

Figure 12-10 Text Converted to Braille

We're ready to convert the text. We'll click on the "OK" button in the "Braille Level II" window (Figure 12-9) and our converted Braille will appear in our design screen along with a *non-engraving* copy of the original text (Figure 12-10).

STEP 6: POSITION JOB ELEMENTS ON THE MATERIAL

We'll select the symbol of the man and click on the "Horizontal center" tool in GravoStyle's "Alignment tools" fly-out tool pallet (Figure 12-11). This will center the symbol left-to-right on the material. We'll then select the word "MEN", center it and finally center the Braille. Our job now appears as shown in Figure 12-12.

Why don't we just select them all and center them at the same time? Because if we did, we'd merely center the group horizontally and we wouldn't achieve what we wanted to do.

We'll now position the three elements of the job vertically. We'll select the Braille and move it to the bottom border by holding down the Control key while we drag it downward.

(The "Control" key constrains dragging to either purely vertical or purely horizontal movement. We could also use the down arrow key on the keyboard.)

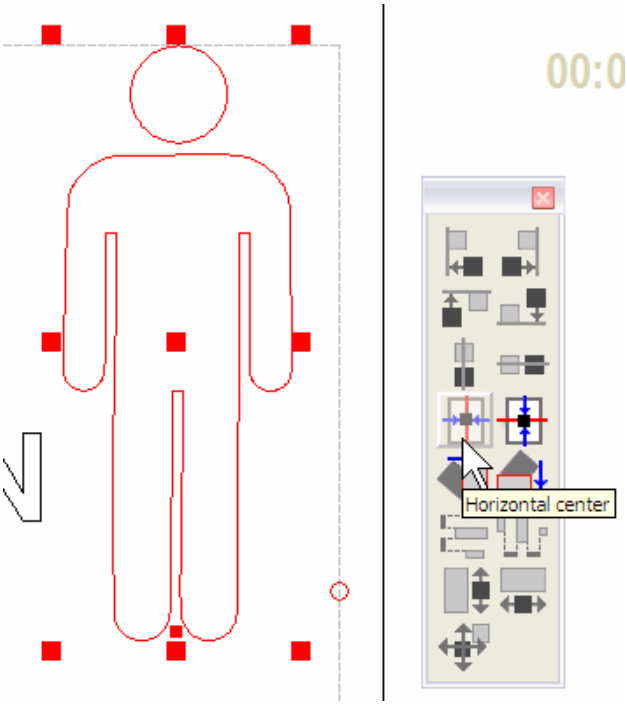

Figure 12-11 Horizontal Centering Tool

We'll next make sure that the symbol is against the top margin and we'll leave the word "MEN" where it is.

Now select all three elements of the job (Control-L) and we'll click on the "Alignment tools" icon on the left toolbar. We'll then find the "Vertical spacing" tool on the "Alignment tools" fly-out toolbar (Figure 12-13) and click on it.

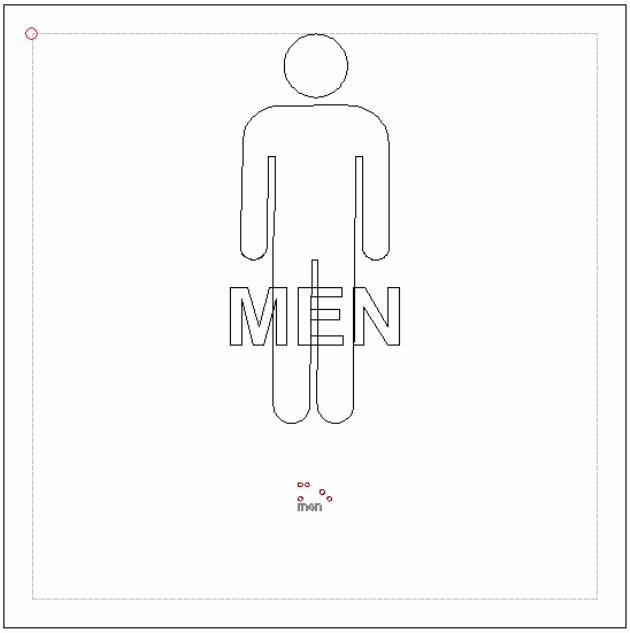

Figure 12-12 Job Elements Horizontally Centered

The “Vertically spacing” tool will use the top-most (the symbol) and the bottom-most (the Braille) parts of the selection as anchors and it will center all other elements in the selection (in our case, only one) so that there are equal spaces between all of them.

After we apply the “Vertical spacing” tool, our job will appear as it’s shown in Figure 12-1.

We’re finished with the design phase of the job; we have only to verify that we have at least 3/8” between the elements. If we do this with the “Measurement tools” on GravoStyle’s left toolbar, we’ll find that the spacing is more than ½ inch.

Remember to save your work at this point!

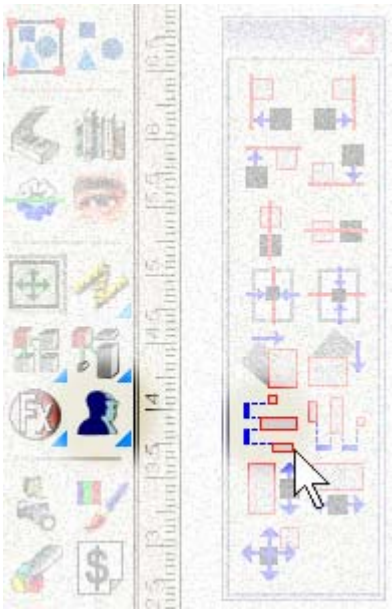

Figure 12-13
“Vertically spacing” Tool

STEP 7: SELECT THE TOOL AND ESTABLISH THE TOOLPATH FOR THE SYMBOL AND TEXT

Our next task is to establish the toolpath for the symbol and the text. Remember, we want to cut through the top layer of the Gravo-Tac sandwich, outlining both of these elements. We'll do this by clicking on GravoStyle's CAM tab, at the bottom of the left toolbar, to enter the Machining Module. There, we'll open the listing of "Available" toolpath types and make our selection "Cutting 2D" (Figure 2-14). We'll double-click on this choice and the "Cutting 2D" dialog window will open (Figure 12-15)

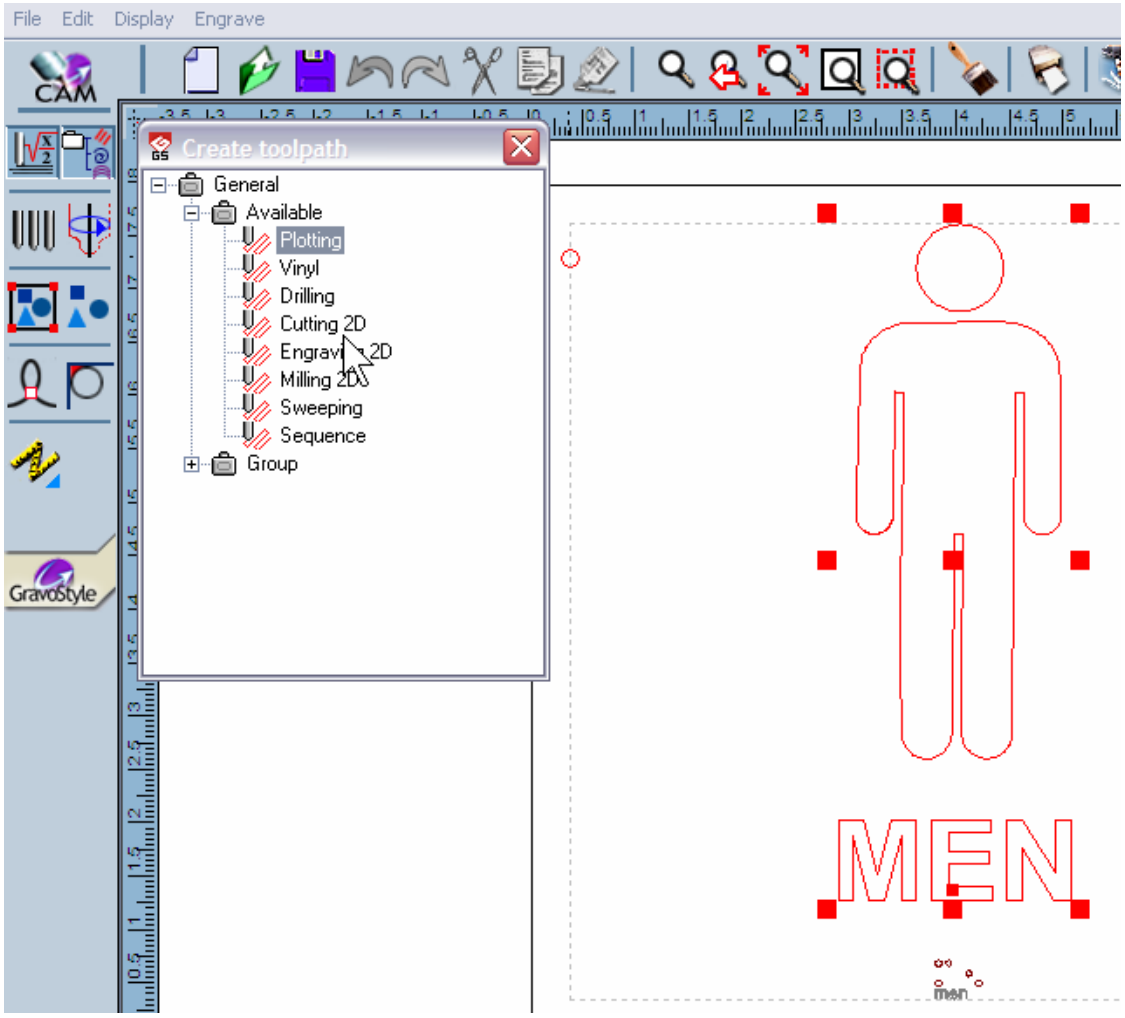

Figure 12-14 Selecting "Cutting 2D" as the Type of Toolpath

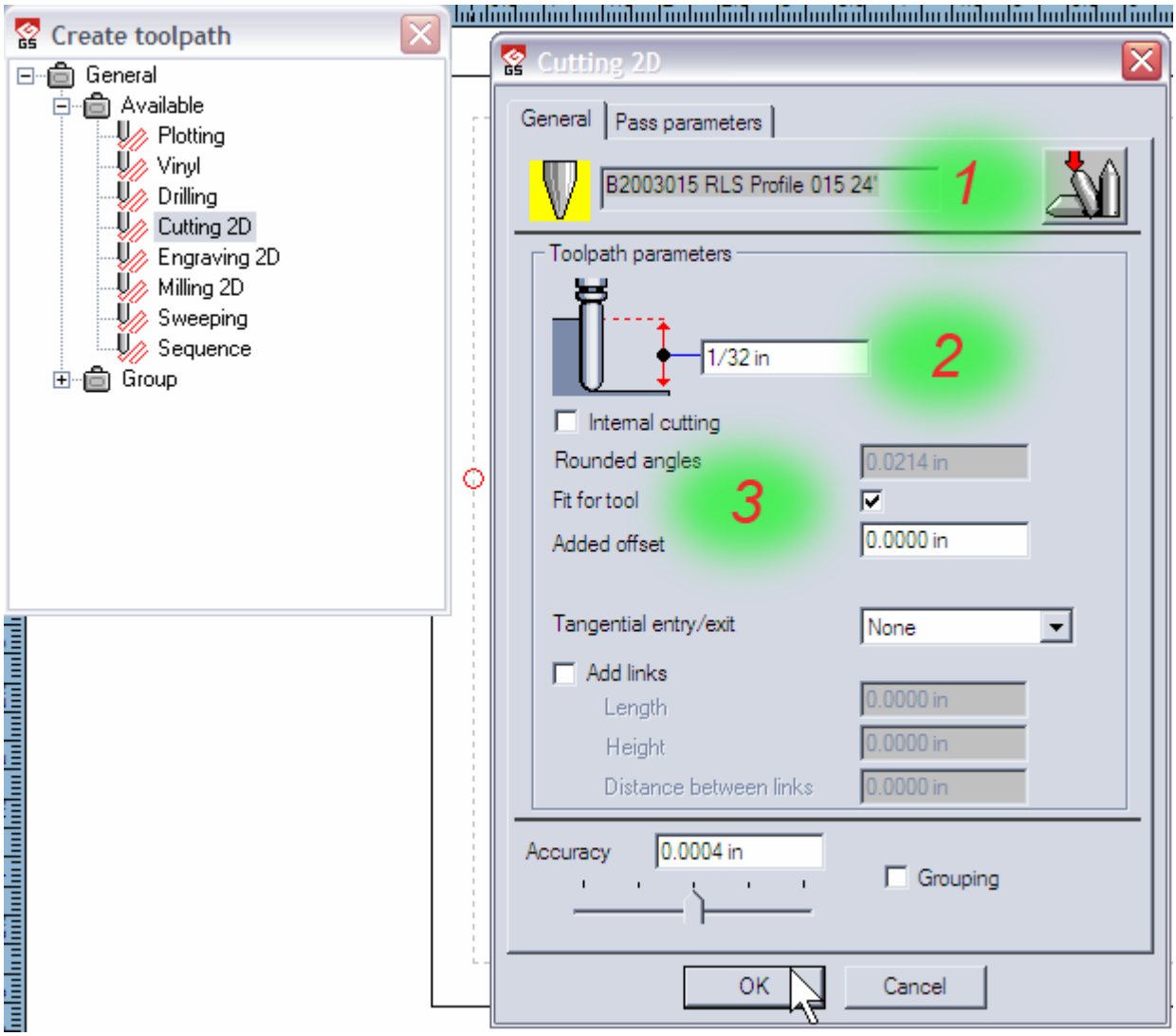

Figure 12-15 Cutting 2D Dialog Window

GravoStyle's "Cutting 2D" type of toolpath is designed to make it easy to engrave outlines around or, optionally, inside of contours while preserving the size of the contour. It does this by cutting not on the contour itself, but on an outlined path spaced away from the contour.

How far away? The Machining Module does the math for you to position the outline accurately, taking into account the tip angle of the chosen cutting tool, the depth of cut and the radius of the tool at that depth.

In Figure 12-15, we'll make just three settings in our dialog window:

1. We'll click on the tool selection button at the top right of the window to open our catalog of tools. Figure 12-15 shows our choice: B2003015 RLS Profile 015 24. This is a narrow tool with a small tip angle.

2. We've entered our cutting depth of 1/32 of an inch - the thickness of the top layer of our Gravo-Tac sandwich.

   Note that we can enter numbers directly as fractions in GravoStyle's dialog boxes. GravoStyle converts the entry to the correct decimal value when we accept the entries.

3. We've selected the check box for "Fit for tool". This instructs the Machining Module to calculate the toolpath such as to remain faithful to the boundaries of the original contours.

We'll click on "OK" to accept these entries, and our toolpath is generated.

We'll now look at the "Toolpath list" window at the right of the Machining Module's screen and click on the plus sign at the left of "Layer one". When we do, we'll see our toolpath listed as "Cutting 2D 002". We'll right click on the toolpath name to open its menu and double-click on "Simulation" (Figure 12-16).

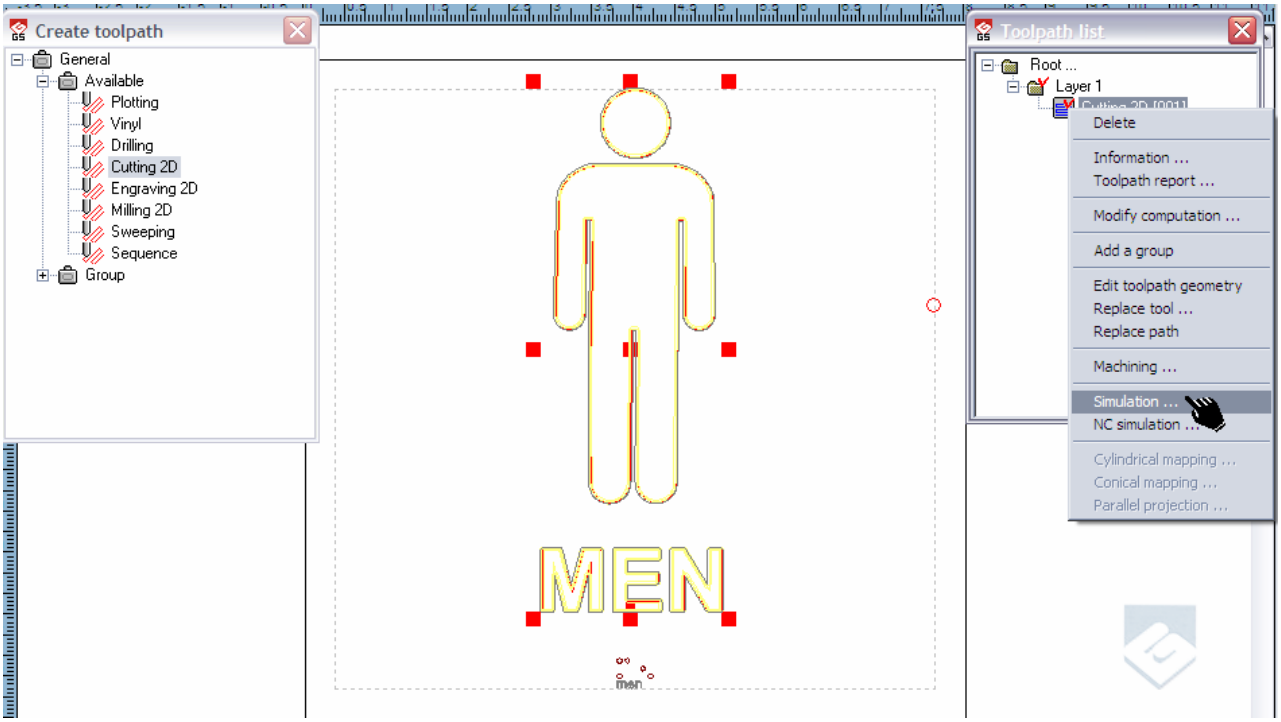

Figure 12-16 Selecting "Simulation"

The Machining Module's "Simulation" window will open to show us exactly how the outlines will be cut (Figure 12-17).

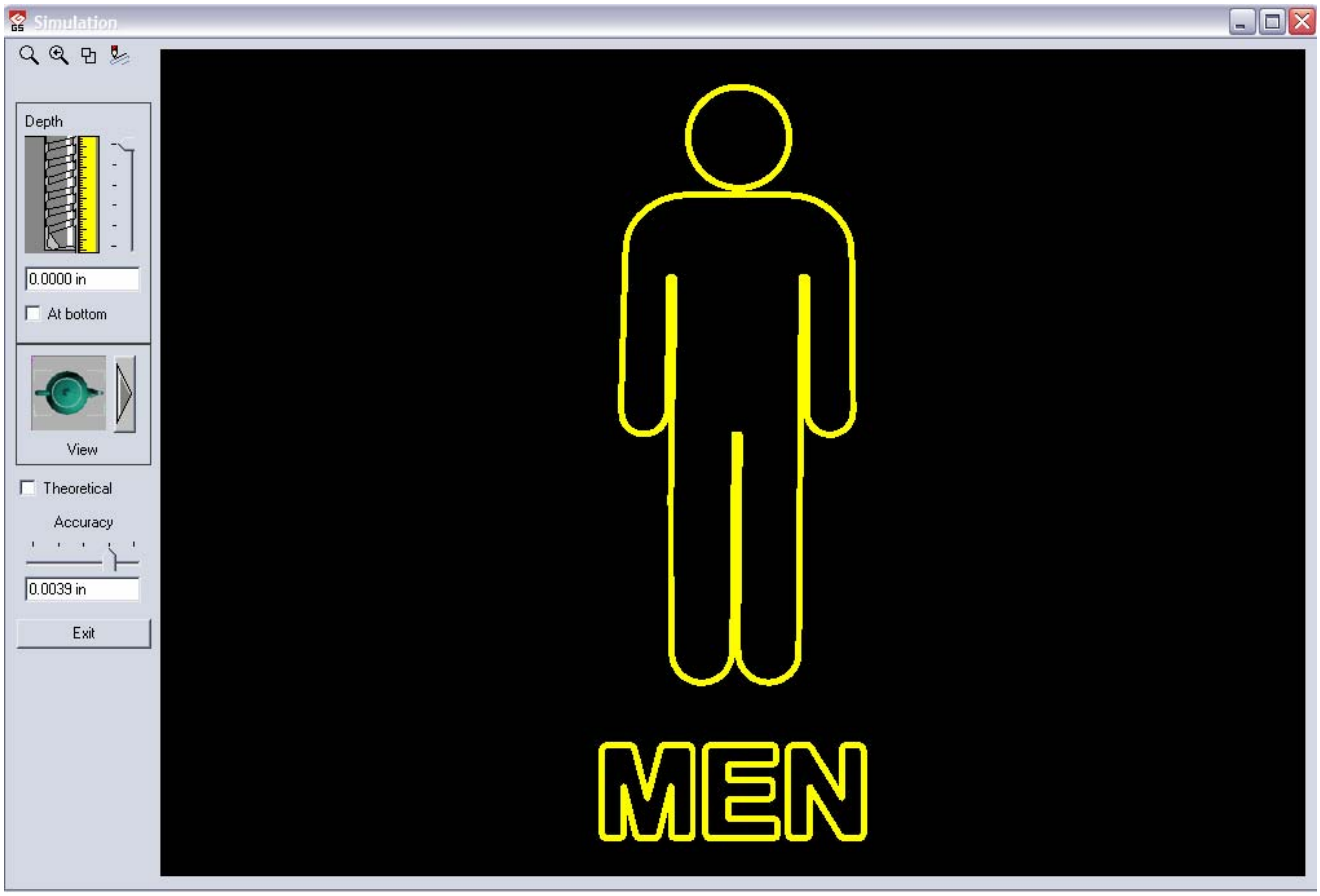

Figure 12-17 Simulation Window

Note that if we were doing a really critical job, we could click in the box labeled "Theoretical" on the left side of the Simulation window. The simulation view would then change to show any areas that the tool could not reach into by outlining them in red. Figure 12-18 shows this for the letter "M".

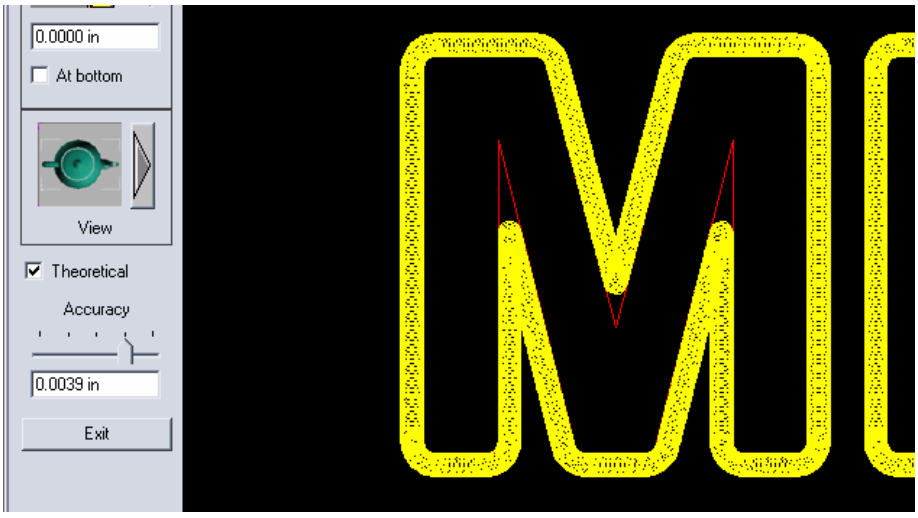

Figure 12-19 Areas Not Reachable by the Cutting Tool

STEP 8: SEND THE SYMBOL AND THE TEXT TO THE TABLE

We'll close the Preview window and click on the "Machining" icon on the top toolbar. Since we're doing this from the Machining Module and not from the "GravoStyle"-tabbed page, the Machining window that opens will look a little different than in previous lessons (Figure 12-19).

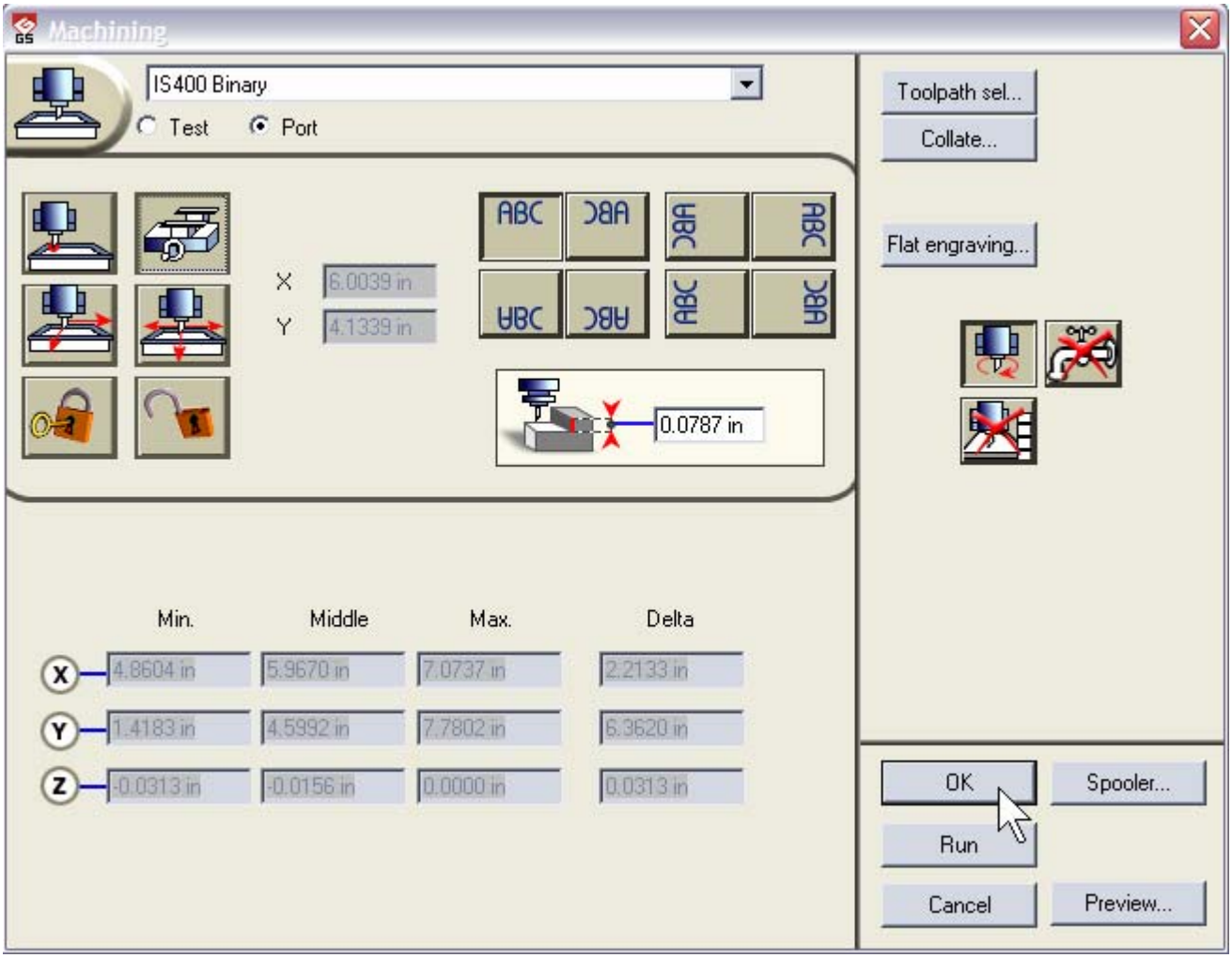

Figure 12-19 Machining Module's "Machining" Window

We'll make sure that our settings are correct and click on "OK" to make sure that the toolpath is saved with the job. We'll then click on "Run" to send the job to the table.

After the outlines are cut, remove the unwanted material from the top layer of Gravo-Tac as soon as possible. The longer we delay doing this, the more the adhesive will set, making the task increasingly more difficult.

STEP 9: DRILL THE HOLES FOR THE BRAILLE

We can drill the holes for the Braille from the “GravoStyle”-tabbed page. We’re in the Machining Module at this point, so we’ll click on the “GravoStyle” tab at the bottom of the left toolbar to get there.

We’ll now select the Braille only and click on the “Color” icon on the left toolbar. The “Machining tools” window will then open (Figure 12-20) and “Tool 8” will be highlighted. Remember that we accepted Tool 8, the default, in the “Braille Level 2” dialog window when we readied the text for conversion to Braille (Figure 12-9).

We’ll click on “Properties” to open the “Tool properties” window (Figure 12-21).

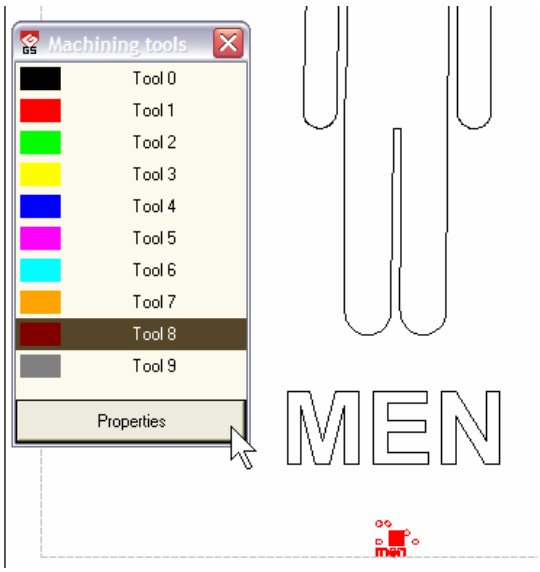

Figure 12-20 Machining Tools Dialog Window

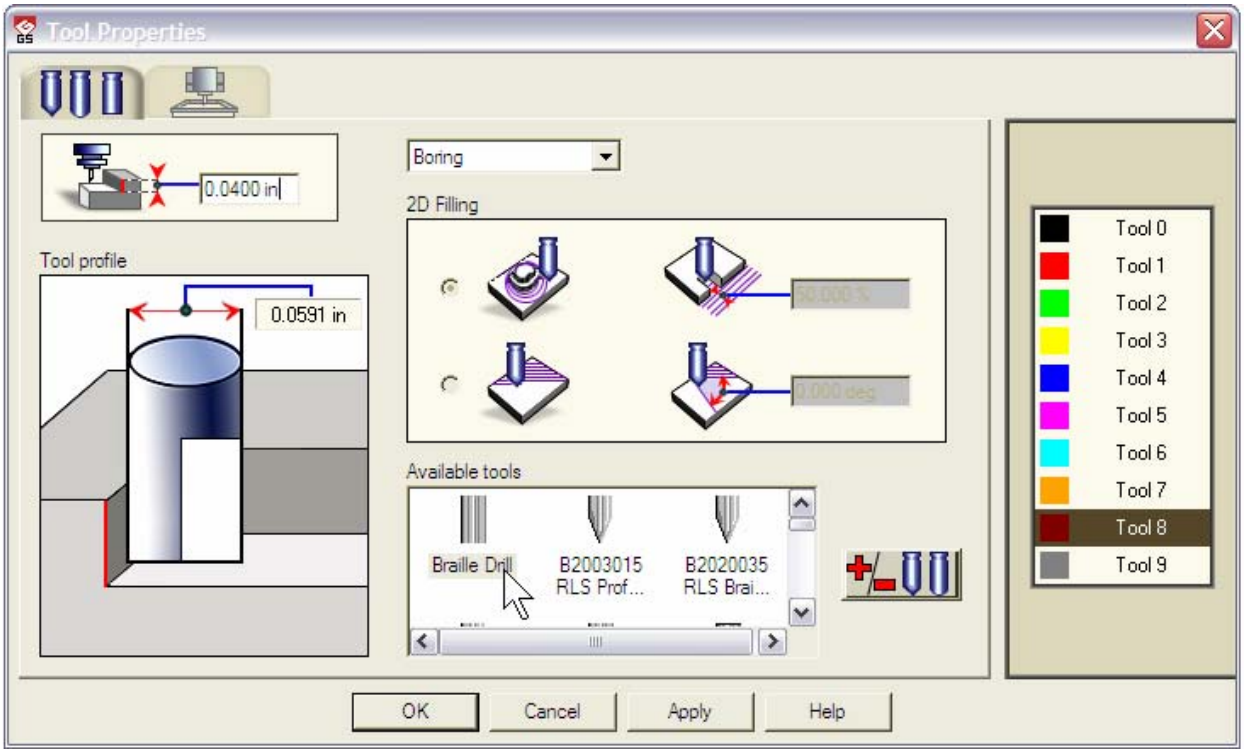

Figure 12-21 Tool Properties Window

There, we'll

- Select "Boring" as the type of engraving
- Set our cutting depth at 0.040 inches

And

- Select "Braille Drill" as our cutting tool

We have now only to send the Braille to the table. We'll leave the Braille selected and click on "Machining" on the top menu, make our settings and press "Run" to transmit the job.

WHAT WE'VE LEARNED

In this job we've learned:

- How to convert text to Braille
- How to position objects with equal spacing between them
- How to use the Machining Module to produce an outline cut
- How to use GravoStyle's Symbol Library
- How to enter fractions into GravoStyle's dialog boxes
- How to use the Machining Module's "Simulation" window to view areas that our chosen cutting tool can't reach.