e6 User Guide

CADlink Technology Corp.
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INTRODUCTION

WELCOME TO ENGRAVELAB!

Thank you for choosing EngraveLab. This user guide is intended to help orientate the novice user toward what is a versatile engraving design package. Be warned that this package is feature rich, since new features have been routinely added to improve the utility of the software to our customers. We invite you to experiment with new designs, and we welcome your comments about the software, our company, or the services that you have received.

FOR THE RECORD

For the record, and to enable us to better assist you, please make note of your serial number, the modules you have purchased, as well as the passwords below.

Serial Number	
Password	
Modules	

Contact CADlink

Contact CADlink at the following numbers:

North and South America	Phone:	(613) 247-0850
	Fax:	(613) 247-1488
	Internet:	www.cadlink.com
United Kingdom	Contact your local dealer:	

or

	E-mail:	uksales@cadlink.com
	E-mail:	uktech@cadlink.com
	Internet:	www.cadlink.co.uk

INCLUDED WITH ENGRAVELAB

This EngraveLab User Guide contains an overview of the features, and a summary of files and applications on the CD-ROM included with all versions of this product. In addition, we ask that you perform registration of your package, such that we may better customize our technical support to your needs.

Registration includes:

➢ Software updates

➢ Special pricing on upgrades

➢ Special pricing on other CADlink products

The EngraveLab package includes:

➢ EngraveLab CD-ROM

➢ EngraveLab User Guide

➢ License disk (3.5")

➢ A security device (dongle)

❯   Font Library and Poster,

❯   Fonts and Sign Clip-Art CD-ROM

Regardless of whether you are a new user, or you are upgrading from a previous version of EngraveLab, please peruse the contents of this guide.

SYSTEM REQUIREMENTS

The following system configuration is required as a minimum for operating EngraveLab:

❯   a PC Pentium II with hard disk

❯   32 MB of RAM (more memory will improve performance)

❯   Microsoft Windows 98, ME, NT 4.0, or 2000

❯   a graphics monitor (VGA or higher)

❯   a mouse or tablet

❯   about 150 MB of free hard disk space is required for a full installation

Some features require access to the Internet through a service provider (a separate fee may be required). If this is the case, then at least a 14,400 or higher-baud modem will be required for Internet access. However, please note that there are a variety of services available for accessing the Internet, and the hardware requirements will vary according to your chosen service provider.

It is highly recommended that the system contain a math coprocessor, and be equipped with at least a 5 GB hard disk and 64 MB of RAM to operate Windows at a reasonable speed with EngraveLab. In addition, a video system supporting 800 by 600 screen resolution and 256 colors or greater is recommended.

SECURITY DEVICE

EngraveLab is provided with a software protection device (a "dongle") to prevent unauthorized use or pirating of the software. There are two types of dongles available, as either a USB plug, or a sealed parallel plug. In either case, the dongle is visible to EngraveLab, yet remains transparent to other applications.

USB Port Dongle

The **USB Port Dongle** is a sealed plug that may be attached to a computer that supports Universal Serial Bus (USB) peripherals. The benefit of USB connectors is that new hardware may be connected to the computer without causing hardware conflicts. Also, USB connectors are "hot-pluggable," which means that the connection may be made without requiring the computer to be rebooted.

However, though USB connectors are "hot-pluggable," do not connect the EngraveLab USB dongle until after the installation of EngraveLab. If the dongle is connected before the EngraveLab installation, then the following sequence is possible:

1)   Window will attempt to locate drivers for the USB dongle.

2)   Windows will query the user for a location from which to load the drivers.

3)   Not knowing where the drivers are, the user is likely to click Cancel on the query dialog.

4)   Windows will then install default drivers for the dongle, and Windows will thereafter list the dongle as an unknown device.

5)   At this point, even if EngraveLab is installed, the drivers for the dongle will not be installed because Windows "recognizes" the dongle as an "unknown device."

Since the correct drivers for the dongle were not installed, EngraveLab will not operate because it is unable to interact with the dongle. In the eventuality that the USB dongle was connected prior to installing EngraveLab, then the following must be done:

    a)   Disconnect the USB dongle.

    b)   Continue with the EngraveLab installation.

    c)   After installation, open the **Control Panel** from the **Start** menu.

    d)   On the **Control Panel**, double-click the **Devices** icon.

    e)   A list of devices will be displayed. Locate the device that is identified as an unknown device, and choose to delete it.

    f)   Close the **Control Panel** and associated dialogs.

    g)   Now connect the USB dongle to the computer, and the proper drivers will be automatically installed.

Parallel Port Dongle

The **Parallel Port Dongle** is a sealed parallel plug that allows a pass-through for other parallel devices, such as printers and plotters. To avoid static discharge, be certain to turn off the computer and ground yourself. Grounding is performed by touching the metal casing of the computer, prior to plugging in the dongle.

Notes about attaching the dongle are:

➢   The security device should be placed into the LPT/printer port.

➢   The printer port is a 25-hole female port.

➢   Place the dongle, by the 25-pin male end, into the port.

➢   The other side of the dongle is a 25-hole female port, which allows other parallel devices to be installed in a daisy chain manner.

> *Note:* The serial (or COM) port may be the same size as a parallel port, but the serial port is visible as a male port on the computer. This may cause confusion, since there is a possibility of reversing the dongle and plugging it into the serial port by mistake.

The output device and dongle do **NOT** have to be plugged into the same port. For example, if the output device is connected to a USB port, the parallel port dongle may still be connected to the parallel port.

If using a switch box that has multiple parallel devices, then first place the dongle on the parallel port, and afterwards connect the remaining cabling to the dongle. The length of parallel cable will determine its reliability for carrying signals. If the length of parallel cable exceeds ten feet, then the stability of the signal will degrade sharply. Combinations of switchboxes and parallel cables may exceed this limit, thereby causing dongle errors.

In the case that the output device is connected to the back of the dongle, there is no change in how the printer must be turned on. If output device had been required to be turned on prior to the computer, then using a dongle will not change this fact.

Certain output devices that can cause problems with the dongle. In the case of a plotter, there may be a setting on the plotter that requires disabling. However, a plotter may require a second, separate parallel port for the dongle.

Error Locating Security Device Messages

The error message 'Error locating Security Device xxxxxxxxxx' where xxx is a series of numbers that alerts EngraveLab into thinking that the security device is installed and/or the passwords are installed incorrectly. Ensure that the installed passwords match up with the dongle number. If they do, contact technical support for further details. If not, re-enter the proper password.

The error message 'Error with last password' indicates that the password was typed into EngraveLab incorrectly. The most common mistakes are entering vowels (use the number 0, not the letter O), or putting spaces between passwords. If everything looks exactly as on the password sheet, contact technical support to help fix the problem.

The message 'Error Locating Security Device 1' indicates that EngraveLab has attempted to read the security device and has gotten an incorrect value back. This means that the device is either not present or another piece of hardware/software is

interfering. If EngraveLab stopped working after installing new hardware/software, it is likely that the new device is attempting to use a resource that the EngraveLab security device requires. Remove the new hardware/software and try EngraveLab again -- if it works, contact the manufacturer of the new hardware/software to see what changes can be made to the new item. If nothing can be done, confirm the default settings (e.g., what port, IRQ, or memory address to use) and contact technical support. The most common hardware devices that interfere with the security device are network cards and sound cards.

A lightning strike or power surge can cause an unpredictable effect on electronics. Some users have had only certain circuit boards burn out during a lightning strike but other components fail. If the security device no longer seems to work and there has recently been a lightning strike, try to find another computer to test the software on — if it works on the other computer, then it is likely that the parallel port on the original computer has been damaged. If it does not work on the new computer, it is likely that the device is damaged and needs to be replaced.

LIMITED WARRANTY ON CADLINK PRODUCTS

CADlink warrants that the disk medium upon which the product is recorded, and any hardware accompanying said disk(s), shall be free from defects in materials and workmanship -- under normal use and service for a period of ninety (90) days from the date of delivery, as evidenced by a copy of the receipt.

CADlink's entire liability and exclusive remedy as to the disk(s) or hardware shall be at CADlink's option -- either (a) return of the purchase price, or (b) replacement of the disk(s) or hardware that do not meet CADlink's Limited Warranty. These must be returned to CADlink postage pre-paid with a copy of the receipt.

If failure of the disk(s) or hardware has resulted from accident, abuse or misapplication, CADlink shall have no responsibility to replace the disk(s) or hardware, the replacement will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer. Other then the above limited warranty, CADlink makes no other warranties whatsoever, either legal or conventional, express or implied, with respect to the licensed software and hardware. You are advised to test the licensed software thoroughly before relying on it. You assume the entire risk of using the licensed software. Because of the diversity of conditions and hardware under which the licensed software may be used, no warranty of merchantability or fitness for a particular purpose is given. Some regions do not allow the exclusion of implied warranties, so the above exclusion may not apply.

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INSTALLATION

The installation process will install all of the purchased modules and features. To install EngraveLab under Microsoft Windows 98, ME, NT 4.0, or 2000, first shut down all applications that may interfere with the installation process, such as virus protection programs. When ready to install EngraveLab, insert the EngraveLab CD-ROM into the CD drive.

> *Note:* When installing under Windows XP or 2000, please verify that you have administrative permissions. Otherwise, Windows will prevent the installation of the dongle support software.

When the EngraveLab CD is placed in the CD drive, most Windows configurations will automatically launch the setup program. If this is not the case, then open the **Control Panel** from the **Start** menu, and then use the "Add and Remove Programs" tool to install EngraveLab.
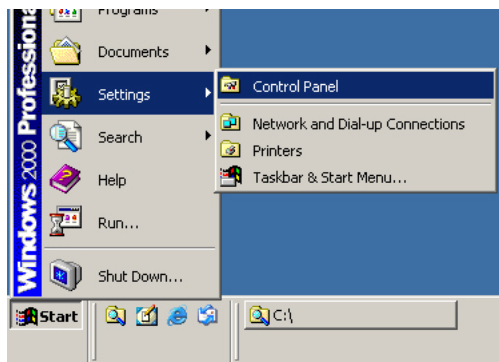
Once the installation process begins, please follow the instructions that are provided with each step of the installation.

Trial Periods

After the EngraveLab e6 installation has been completed, the full set of EngraveLab features will be available for a limited period of time. This is indicated by a warning dialog, which appears as follows:
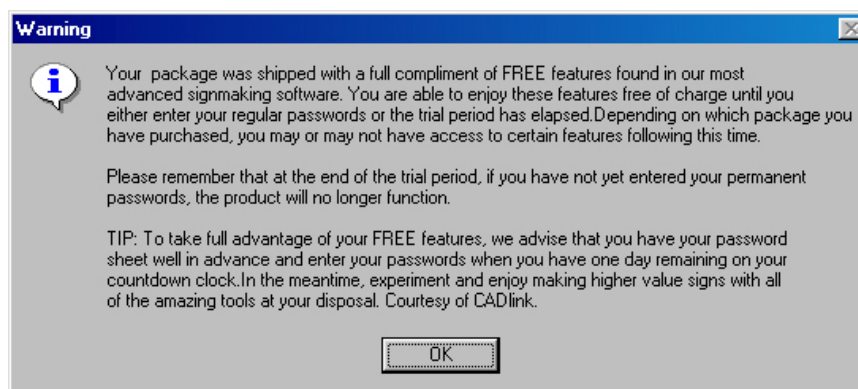

Though this dialog is expressed as a warning, it is actually more like a "Bonus Trial Period" alert. The trial period is useful as a means of helping users to recognize the features that they will need on a regular basis.

To end the trial period, use the password sheet to enter the permanent password. Under the **File** menu, choose the **Install Modules** item.

The **Passwords** dialog will open, and the permanent password may be entered. Please note that passwords do not contain vowels.
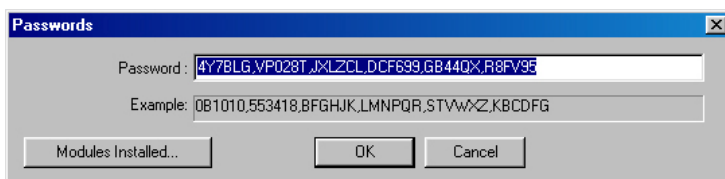
Once the permanent password is entered, EngraveLab will revert to the features that have been purchased. If there are additional features that should be purchased, then please contact either CADlink or an authorized CADlink dealer.

If the permanent password is not entered...

A typical trial period is 15 days. If the permanent password is not entered before the end of the trial period, then EngraveLab will cease to function, and it will not be possible to launch EngraveLab. However, a permanent password may still be entered by launching one of the EngraveLab demos.
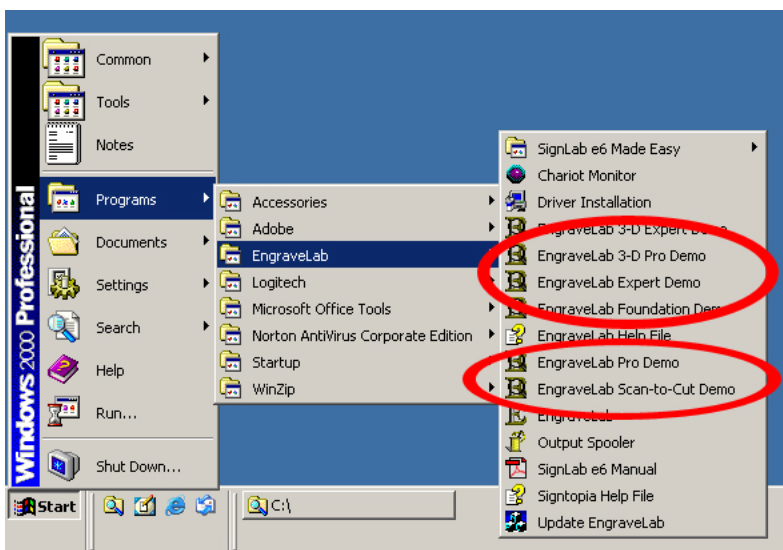
Once the demo has launched, choose **Install Modules** under the **File** menu. The permanent password may then be entered.

At this point, exit the demo, and then launch EngraveLab. EngraveLab will become active again, and the purchased features will be available.

Verifying that the dongle is okay

After EngraveLab has been installed, there may be concern that the dongle is operating correctly. As a means of checking the dongle, choose **About EngraveLab** from the **Help** menu.
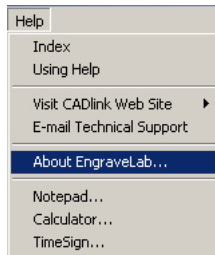
The **About EngraveLab** dialog will open. As part of the serial number, the third value should be zero. This indicates that the dongle has been detected, and that it appears to be functioning normally.
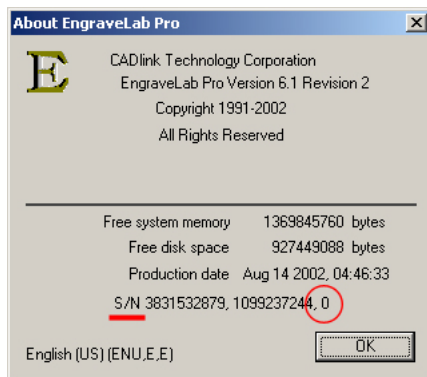
Patches

A patch is a minor software update or enhancement to your EngraveLab e6 package. If your EngraveLab package is working fine, then it is likely that you do not require to execute a patch. As a general rule, a patch should be obtained when:

1) You are experiencing a specific problem when using EngraveLab
2) Our CADlink technical support staff have diagnosed the problem and have confirmed that the problem would be fixed by installing the patch

A patch file may be downloaded from the CADlink web site, or the **Update EngraveLab e6** utility may be accessed from the **Start** menu. However, please verify that EngraveLab has been shut down prior to running the patch.
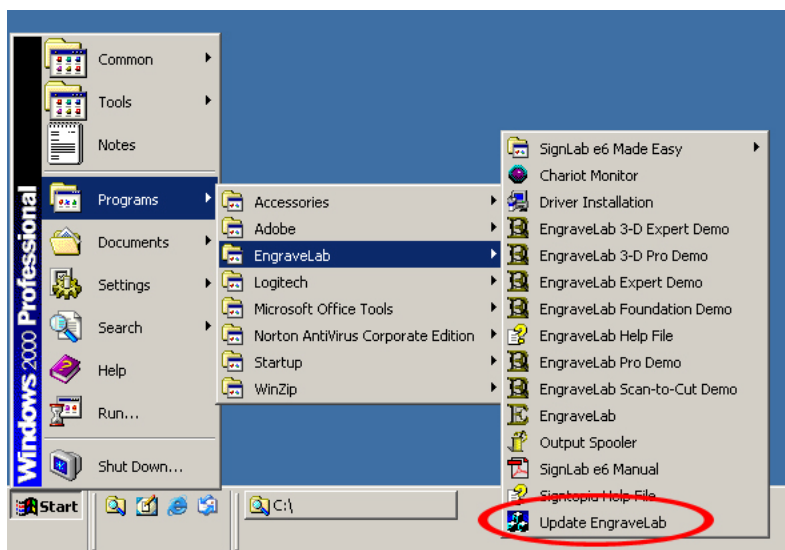
Once the update process begins, please follow the instructions that are provided with each step of the installation. However, if the update is being downloaded from the CADlink web site, then please verify that the necessary Internet connection is active.
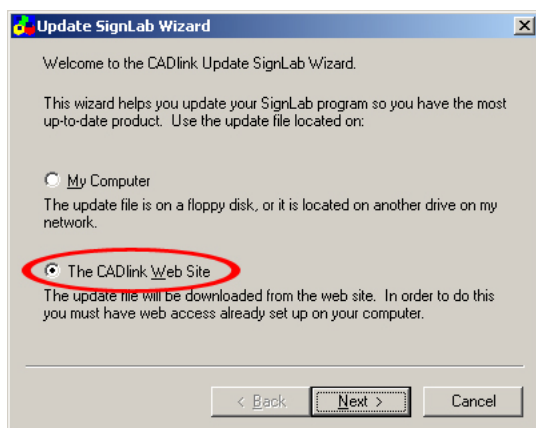
Installing a patch manually

Patch files may also be obtained from the CADlink web site, at http://www.cadlink.com. However, please take care to review the instructions that are provided with each patch file. Using the wrong patch will install files that are incompatible with your version of EngraveLab, which will produce unpredictable results.

Maintenance Releases

A maintenance release is a revised version of your EngraveLab e6 package, which is made available when there have been numerous minor fixes and product enhancements. Typically, the number of affected program files will exceed that of a 3.5" floppy disk, which requires that a new CD be created and delivered to you.

If your EngraveLab package is working fine, then it is likely that you do not require a maintenance release. As a general rule, a maintenance release should be obtained when:

1) You are experiencing a specific problem when using EngraveLab

2) Our CADlink technical support staff have diagnosed the problem and have confirmed that the problem would be fixed by installing the maintenance release

Once the maintenance CD is received, then you may proceed with its installation. However, please verify that EngraveLab has been shut down prior to the installation.

A maintenance release CD is a "full install" package that may be installed within the existing EngraveLab directory. However, if the existing EngraveLab directory has somehow developed corrupt files (i.e. bad hard drive sectors, virus activity, etc.), then it is best to uninstall and remove the existing installation, and then install the maintenance release.

During the installation, a query dialog will request the License Disk. If our support staff has issued a new license disk with the maintenance CD, then this disk supercedes the license disk that had been previously issued with your original EngraveLab package.
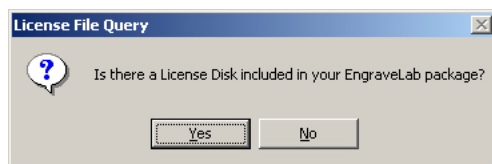
Installing a maintenance release manually

Though maintenance releases have a large file size, they are available for download from the CADlink web site, at http://www.cadlink.com. However, please take care to review the instructions that are provided with each maintenance release, since downloading and installing the incorrect maintenance release will produce unpredictable results. We wish to provide users with the flexibility to choose their desired download, whilst avoiding the difficulties of installing incorrect files.

Unless otherwise stated, the maintenance release download **DOES NOT** include printer drivers and printer support files. However, the instructions will indicate the additional files that should be downloaded and installed.

THE ENGRAVELAB E6 DESIGN ENVIRONMENT

Introduction

With the development of EngraveLab e6, CADlink has introduced many conveniences to the design environment, such that the controls are more intuitive, and workspace operations on shapes may be performed with greater speed and flexibility. Despite these improvements, an effort has been made to retain consistency in workspace layout, such that users of previous EngraveLab versions will have little difficulty in navigating and locating the features that they are accustomed to. For new EngraveLab users, the tools should be relatively self-explanatory, though this documentation is provided to elaborate upon some of the more sophisticated features.

Single-Layer Interface

EngraveLab has moved toward a "single-layer" interface, such that for the majority of tools and features, there will be no dialog that will open and wait for you to enter parameters before continuing. Instead, the SmartBar is used, which is a dockable toolbar located at the top of the workspace. As soon as you begin editing an operation on the workspace, the controls for that operation will be displayed on the SmartBar.
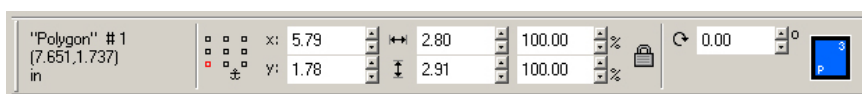
Hot Previews

Typically, editing the controls within the SmartBar will produce a "hot preview" of the workspace components, such that you will immediately see the results of your changes. Likewise, workspace handles will appear around the object being edited. Dragging the handles will modify the parameters of the operation, and such changes will also be immediately updated in the SmartBar. Using handles provide an advantage because you can visually edit an operation to your liking, as opposed to determining the correct SmartBar settings that you need. In addition, after using the handles, you can then use the SmartBar controls to set more precise values, as well as note the values that you found pleasing.
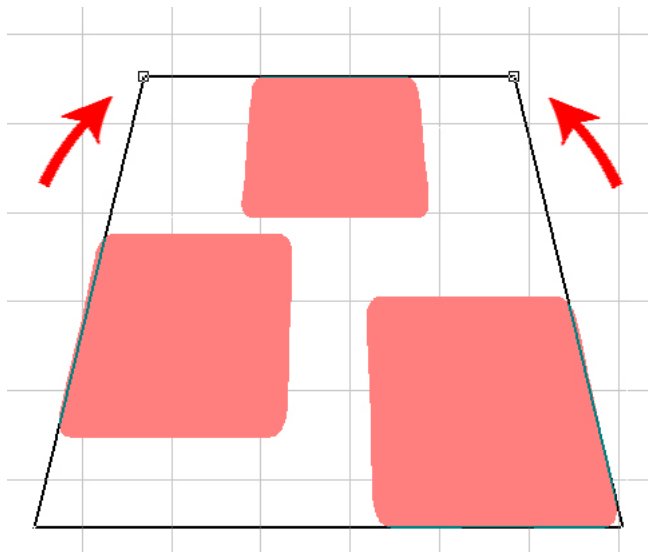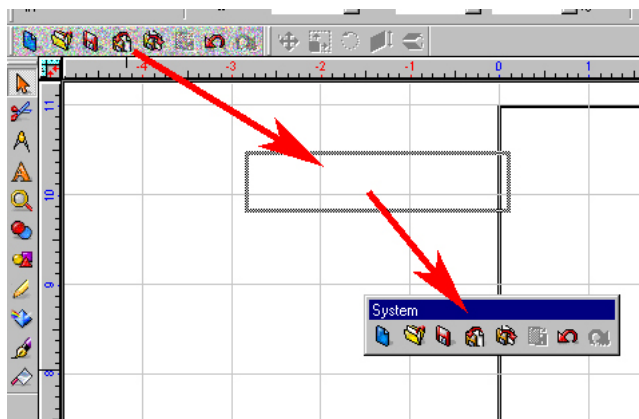
Dockable Toolbars

EngraveLab toolbars are dockable, which means that they can be affixed to any edge of the workspace (left, right, top, or bottom), as well as made to "float" over the workspace environment. The choice of where to place the toolbar depends on your personal preference.

When docked, each toolbar has a little "grip." When the mouse is used to drag the grip, the toolbar will become "floating," such that it can be placed anywhere on the workspace. To dock a floating toolbar, you can either drag it back to the edge of the workspace, or you can double-click the toolbar title. Similarly, double-clicking the grip of a docked toolbar will make it floating again.

As mentioned previously, the SmartBar is also a dockable toolbar. However, due to the number of possible controls that the SmartBar may contain, the SmartBar may only be docked on either the top or bottom of the workspace.

Dockable Color Palettes

By default, the Shop Palette is located at the bottom of the workspace. The Shop Palette is the main color palette for the workspace, which can be enhanced with gradient fill patterns and colors from manufacturer palettes. The Shop Palette is also dockable, such that it may be affixed to any edge of the workspace.
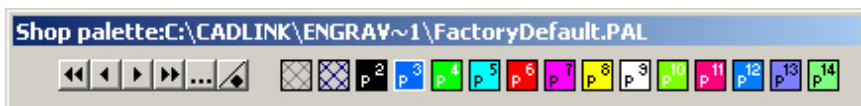
The color palette are also a convenient means of selecting shapes. By pressing the **[Shift]** key and <u>left</u>-clicking a **Shop Palette** color plate, all workspace shapes of that color will be added to the current selection. Indeed, this behavior is used throughout SignLab, as summarized in the following table:

Color Palette	How to select multiple shapes
Shop Palette	Shift-click a color plate
Job Palette	Shift-click a color plate
Sheet Layer Palette	Shift-click a layer plate

Similarly, by pressing the **[Shift]** key and <u>right</u>-clicking a **Shop Palette** color plate, all shapes with that stroke color will be added to the current selection.

Common SmartBar Buttons

Most of the SmartBar controls will be either buttons or edit fields that are used to set the parameters of a given operation. In most cases, these controls will be understandable according to the context, or the tooltip that appears over the control will explain its purpose. If there is any doubt, then pressing [F1] will display the context sensitive help for the tools that you are using.

In many cases, clicking within an empty portion of the workspace will finish the editing of an operation. However, depending on the type of operation being edited, the SmartBar may have one or more buttons that are used to modify how editing is finished. These buttons are Apply, Accept, Reset, Close, and Cancel. The availability of these buttons depends on the context, since the intention is to provide the most convenient controls for the given operation. For some operations, there may be both an Apply and Close button, whereas other operations will have none of these buttons.

Button	Description
Apply	Clicking the **Apply** button will update the workspace according to the edits made in the SmartBar, without leaving the editing mode of the given operation. Typically, the Apply button is used with operations that require significant mathematical calculations before updating the workspace can be performed.
Accept	The **Accept** button will typically appear when editing a previously created operation. After making edits to the SmartBar controls, clicking the Accept button is used to "fix" these edits. Otherwise, changes to the operation will be lost.
Reset	Some operations remember the initial state when editing that operation began. In this case, clicking the **Reset** button discard any edits and restore the initial state.
Close	Where the **Close** button is present in isolation, clicking Close will automatically keep any changes to the operation. However, if there is also an Apply button present, then the Apply button must be clicked to keep changes.
Cancel	Clicking the **Cancel** button will finish the editing the operation, but all edits will be lost.
None of these buttons	Where there is no **Apply, Accept, Close, or Cancel** button, any changes to the SmartBar controls will be automatically applied on the workspace. In addition, clicking within an empty portion of the workspace will finish editing the operation.

Dynamic Shape Creation

Suppose that you have multiple shapes on the workspace, and you have been editing an operation for one of the shapes. If you want to edit the same operation for another shape, then merely click the other shape. This is dynamic shape selection, which allows you to quickly change the focus of an operation "on the fly." There is no need to "click in empty space" to exit an operation, select another shape, and then start the operation again.

Another way to change the focus of an operation is to press the **[Tab]** key. Pressing the **[Tab]** key will advance the focus to the next shape on the workspace, whereas **[Shift + Tab]** will advance the focus in the opposite direction. The order of shapes is determined by which shapes had been created first, though this order may be modified by the Order of Workspace Objects tools.

When selecting shapes, holding the **[Shift]** key allows multiple shapes to be selected. However, when editing an operation for a shape, another shape can be included with that operation by performing a **[Shift + Click]** on that shape. Changes to the operation parameters will take effect for both shapes.

Similarly, you may also **[Control + Click]** another shape, which will automatically apply the current operation to that shape.

WORKING WITH SHAPES – BASICS

SELECTING A SHAPE

To select a shape, click within the fill area the shape. Selection handles will appear about the shape to indicate that it is selected.


Unselected object   **Selected object**
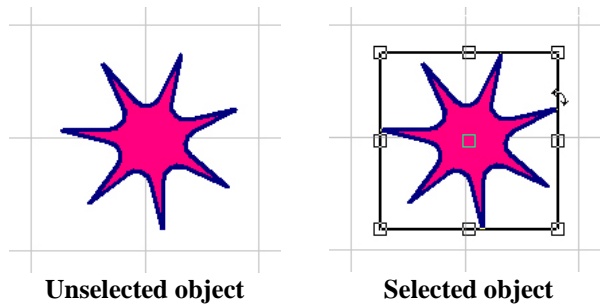
Note: If the **[ALT]** key is used as a modifier key, then a shape will only become selected by clicking along the shape contour. This is a useful means of differentiating from between several clustered shapes.

When a shape is selected, its properties may be edited from the SmartBar. By default, the contour of a selected shape will be highlighted, so as to improve the ease of working with small or complex objects. If the highlight border needs adjusting, then changes to the highlight appearance may be made in the **Selection Tool Settings** dialog.

Handles will appear about a selected shape, which may be used to adjust the shape by clicking and dragging a given handle. Handles are also known as Control Nubs, and the available nubs are:

➢ Center Nub
➢ Corner Nub
➢ Edge Nub
➢ Rotate Nub

The following diagram indicates where these nubs are typically placed about the boundary of a shape:
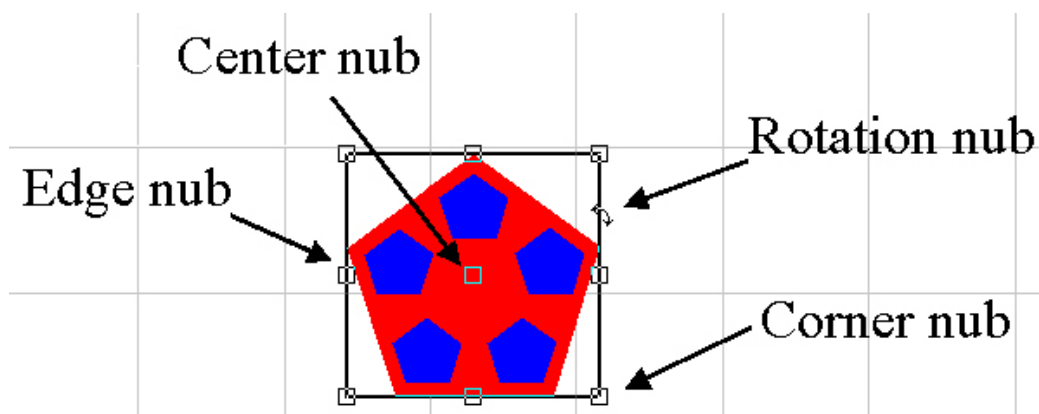
Center Nub

The **Center Nub** is used drag the position of a shape, which is equivalent to the **Move** command (**Layout** menu).

➢ Hold the cursor over the Center Nub until the cursor changes into a crosshair icon.

➢ With the crosshair icon, click and drag the shape.

➢ When the shape is in the correct position, release the mouse button.

When dragging a shape, the **[Control]** key may be held to constrain the shape either vertically or horizontally.

> *Nudge comment:* When selected, the cursor keys may be used to "nudge" the object. The object will nudges one-pixel in the given direction, though holding the **[Shift]** key will perform a five-pixel nudge.

Corner Nub

The **Corner Nub** is used to scale a shape, while also maintaining the aspect ratio of the original shape.

➢ Hold the cursor over a Corner Nub until the cursor changes into a bi-directional cursor.

➢ With the bi-directional cursor, click and drag to scale the shape.

➢ When the correct scaling is achieved, release the mouse button.

When scaling a shape, the **[Shift]** key may be held to prevent the aspect ratio from being maintained. Also, the **[Control]** key may be held to constrain the object to multiples of its original size (double-size, triple-size, etc.).

Edge Nub

The **Edge Nub** is used to resize a shape either horizontally or vertically.

➢ Hold the cursor over an Edge Nub until the cursor changes into a bi-directional cursor.
➢ With the bi-directional cursor, click and drag to resize the shape.
➢ When the correct size is achieved, release the mouse button.

When resizing a shape, the **[Shift]** key may be used as follows:

|	
Shift + Left nub	Change width of object, though maintain constant vertical axis of object
Shift + Top nub	Change height of object, though maintain constant horizontal axis of object
Shift + Bottom nub	Maintain proportional width and height
Shift + Right nub	Maintain proportional width and height

Rotate Nub

The **Rotate Nub** is used to adjust the orientation of the shape.

➢ Hold the cursor over the Rotate Nub.
➢ Click and drag the Rotate Nub. The bounding box of the shape will be rotated to match the mouse movements.
➢ When the correct rotation is achieved, release the mouse button.

EDIT MODE

Double-clicking a parametric object will enter a special editing mode. The contour of the object may then be modified by clicking and dragging the nubs of the object. In some cases, the editing nubs behave similarly to the nubs that appear on a selected object. However, the precise usage of nubs when editing will depend upon the type of object. For instance, compare double-clicking a rectangle shape with that of a circle shape.
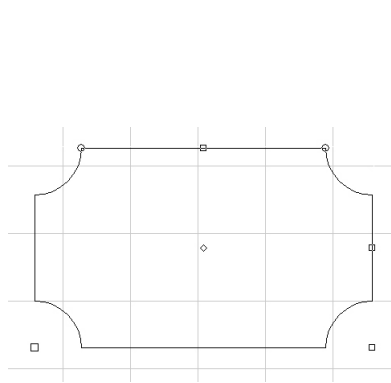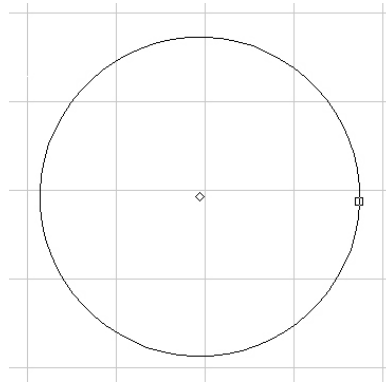

Editing a rectangle   **Editing a circle**

When editing a rectangle, the available nubs are at the corner, edge and center of the shape outline. Notice that though no rotation nub is present, additional nubs exist for rounding the corners of the rectangle. When editing a circle, only a center nub and "radius" nub exist. These nub differences between rectangles and circles are typical, so as to improve the variety of shape combinations.

Drag to form curve

Adjust shaft width

Adjust shaft length
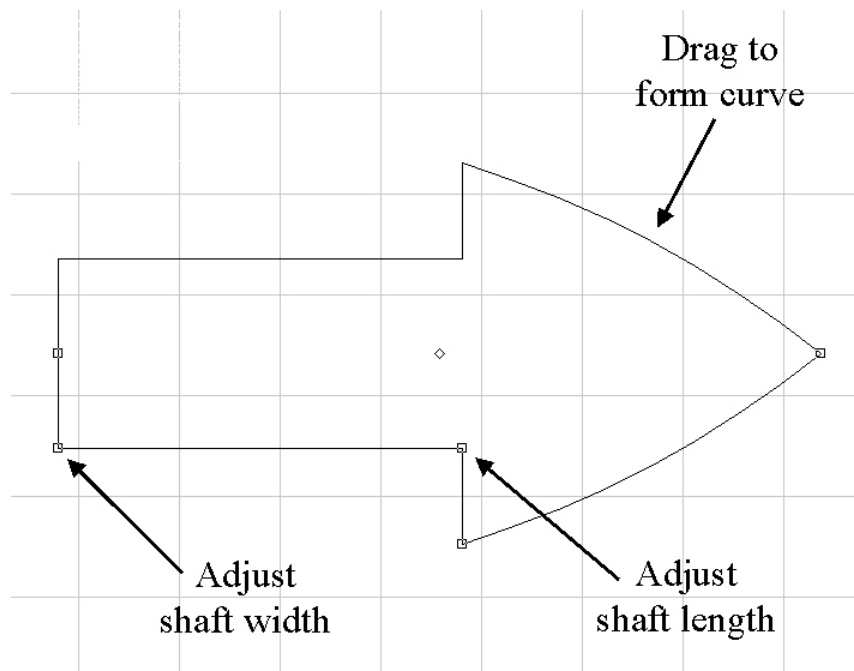
Editing an arrow

GENERAL NUB ACTIONS

Nudge

Objects may be moved one pixel at a time, which is termed a "nudge." For a selection, pressing the cursor keys will move the selection by one pixel. Holding **[Shift]** will move the selection by 5 pixels.

Shortcut to the Layout Menu

If the mouse cursor is over an object nub, then the right-mouse button will open the **Layout** context menu.

Move

Objects may be moved with respect to either their previous workspace coordinates, or the origin of the sign plate.

Size

Drag the nubs of the shape to resize. When dragging, note that the fixed nub is indicated in the SmartBar (turns red).

Rotate

Using the **Rotate** feature, objects may be rotated by dragging their corner nubs. By default, the Center of Rotation is placed at the center of the object, but the Center of Rotation can be changed by dragging it with the mouse. When rotating, the **Rotation Amount** may also be entered in the SmartBar.

Mirror

The **Mirror** feature creates a mirror image of the selected object. Mirror images may be created in either the vertical or horizontal plane.

Dragging either the side- or corner-nubs of an object may also be used to create a mirror image. However, the **[Control]** key must be pressed in order to constrain the object to its original dimensions.

OTHER SHAPE COMMANDS

Slant

The **Slant** feature skews or slants selected objects either horizontally or vertically.
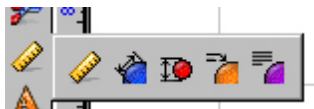
Grouping Objects

The **Group** and **Ungroup** commands may be used to organize collections of workspace objects.

Clear Transformations

The **Clear Transformations** feature removes all Move, Rotate, Size, and Slant transformations applied to workspace objects without reversing any edits made to the object. For example, a line of text can be rotated and then edited to include an extra letter. Clear Transformations will remove the rotation from the text while the extra letter remains a part.

MEASURING OBJECTS

The **Measure Tools** are used to label workspace dimensions, and to place notes about workspace objects.

The available tools are:

	Measurement	Measure the distance between two points by clicking on the workspace. The Desired Distance field may be set between these points, which causes the selected objects to be resized proportionally.
	Dimension	Create a measure of the distance between two workspace locations.
	Object Dimension	Create a measure of the height or width of the selected object.
	Arrow Draw	The Arrow Draw tool is used to annotate the workspace. For each arrow drawn, a note may be created. The arrow attributes (thickness, termination style) may be edited from the Dimensioning Setup dialog.
	Notes	Add descriptive notes to the workspace.

WORKING WITH SHAPES – ADVANCED

SELECTING SHAPES BY COLOR

By pressing the **[Shift]** key and <u>left</u>-clicking a **Shop Palette** color plate, all workspace shapes of that color will be added to the current selection. Indeed, this behavior is used throughout EngraveLab, as summarized in the following table:

Color Palette	How to select multiple shapes
Shop Palette	Shift-click a color plate
Job Palette	Shift-click a color plate
Sheet Layer Palette	Shift-click a layer plate

Similarly, by pressing the **[Shift]** key and <u>right</u>-clicking a **Shop Palette** color plate, all shapes with that stroke color will be added to the current selection.

SWEEP-SELECTING OBJECTS

Sweep-selecting is performed by clicking within an empty portion of the workspace and then dragging to form a bounding rectangle. This bounding rectangle is referred to as the "marquee selection." All objects enclosed by the marquee selection are considered to be "sweep-selected," which causes those objects to become the current selection.

When sweep-selecting objects, the following modifier keys may also be used:

When sweep-selecting…	Result
Press **[Shift]**	The objects will be added to the previous selection.
Press **[Control]**	The objects will become the current selection, and the current workspace operation will be applied to those objects.

SELECT BY SIZE

Workspace shapes may be selected according to their size. Under the **Edit** menu, choose **Select By Size** item, and the **Select by Size** controls will appear in the SmartBar.
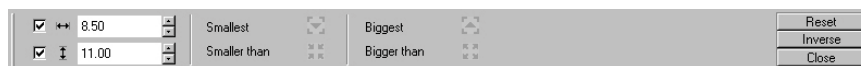
At the far-left of the SmartBar are the **Width** and **Height** parameters, which are used for comparison with shape dimensions. If a shape had been selected when choosing the **Select By Size** item, then the **Width** and **Height** fields will be set according to that shape. If no shape had been selected, then the **Width** and **Height** fields will be set according to the sign plate.

Next to the **Width** and **Height** parameters are checkboxes, which are used as follows:

Width	Height	Behavior
enabled	enabled	Both **Width** and **Height** fields are used when making comparisons. For example, if the **Smaller Than** button is clicked, then shapes will be selected only if both their widths **and** heights are less than the indicated **Width** and **Height**.
enabled	disabled	Only **Width** is used when making comparisons.
disabled	enabled	Only **Height** is used when making comparisons.
disabled	disabled	Disables both the **Smaller Than** and **Bigger Than** buttons.

Comparison buttons

The following buttons are used to choose the manner of comparison. These buttons use the **Width** and **Height** values as the basis for comparison. However, please note that the checkboxes next to the **Width** and **Height** fields are used to limit the comparisons.

[icon]	Smallest
[icon]	Biggest
[icon]	Smaller Than
[icon]	Bigger Than

Reset

Click the **Reset** button to clear the current selection. The **Width** and **Height** fields will be set to the sign plate dimensions.

Inverse

Click the **Inverse** button to perform an inverse selection. All the currently selected shapes be become deselected. The current selection will become all shapes that had not been selected.
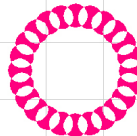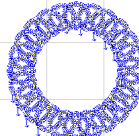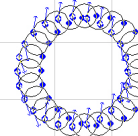
SELECT BY OPEN

Select all shapes that are open paths. This command is useful after performing tracing operations, or where the Ginsu Knife tool has been used to create open-path shapes.

PATH EDITING

A workspace object is composed of nodes that specify the contours of that object, otherwise known as the object path. If the object contour is complete with no breaks, then it will appear as a solid object on the workspace (assuming that **Show Fills** is active). However, a broken contour will appear as a dashed line.

Make Path	Combine a selection of multiple objects into a single path
Break Path	Revert a combined path of objects into individual paths for each object
Connect Path	For a broken contour, connect nodes to form a contiguous path
Reduce Nodes	Eliminate excessive nodes that may exist after tracing or scanning an object
Text to Graphics	Convert a text object into a path
Convert to Polygon	Substitute the object path with nodes used in polygon editing
Convert to Polyarc	Substitute the object path with nodes used in polyarc editing
Convert to Curves	Substitute the object path with equivalent Bezier curves (this improves the scaling of objects)
Close Graphics	Join the first and last nodes of a contiguous path

Twenty-four separate objects formed by the Array command	After applying the Make Path command	The resulting object is a polygon	After converting the object to a polyarc, notice that number of required nodes is reduced

OBJECT TYPES

With respect to workspace object types, there are three broad categories that determine how their nodes are edited. The distinction between each type is important because the editing tools are specialized for each object type.

Parametric	An object composed using the **Shapes** flyout tool. As explained in the introductory chapter, these objects have specialized editing handles that are used to adjust the object properties.
Polygon	An object composed of a combination of **corner**, **curve** and **tangent** nodes. These nodes can be created and edited manually. Please refer to the Polygon Editing section.
Polyarc	An object composed entirely of **curve** nodes. These nodes may also be created and edited manually. Please refer to the Polyarc Editing section.

For all object types, editing is performed by double-clicking the object.

Holding the **[Control]** key and double-clicking a Parametric object will render it into either a polyarc or polygon, depending on the **Polyarc / Polygon** setting in the **General Preferences** dialog.

Node Types

Node types determine how straight or curved a contour will appear. The three types of nodes are **Corner** nodes, **Curve** nodes, and **Tangent** nodes, which are defined as follows:

Corner Node	A node that is used to construct straight lines. Placing two Corner nodes on the workspace will create a straight line.
Curve Node	A node that is used to construct a curved contour.
Tangent Node	A node that is used to provide a smooth transition from a straight line to a curved line.

CREATING GRAPHIC ELEMENTS

The Parametric "instant shapes" are available from the **Shape Tools** flyout…

...whereas polygon and polyarc objects may be created and edited using the **Graphics Edit Tools** flyout tools.

	Node Edit Flyout tool
	Free Edit Flyout tool
	Arc Edit Flyout tool

Press [Space] to finish editing

When editing an object, the **Spacebar** may be pressed to finish editing. The current object properties will be set, EngraveLab will return to the Select state, and the edited object will become the current selection.

Ginsu Knife

The **Ginsu Knife** tools may be used to subdivide an object. These tools are available from the **Ginsu Knife Tools** flyout.

	Open path
	Close path

The **Open path** tool will leave the subdivided objects as open paths, whereas the **Close path** tool will create closed paths.

When a **Ginsu Knife** tool is chosen, click on the workspace to place one-or-more cutting nodes. The nodes will form a cutting lines. Where the selected object is intersected by a cutting line, click the Apply button to subdivide that object along the cutting line. For example, refer to the following screenshots:
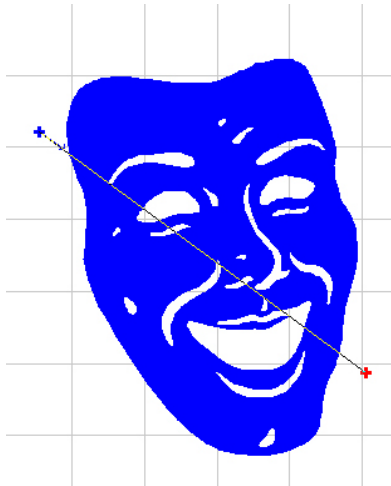
| Using the Ginsu Knife tool, one node was placed at the upper-left of the object, and the second node placed at the lower-right. A cutting line is formed between the two nodes. | After applying the Ginsu Knife operation, the object has been separated along the cutting line. |

Multiple objects may be part of the selection before applying the Ginsu Knife tool.

Polygon Editing

The **Node Edit Flyout** tool is used for creating and editing Polygons.

The **Arc Edit tool** will be active by default, and clicking on the workspace will create a node. As an alternative to clicking with the mouse, new nodes can be placed using the dialog bar edit fields. These fields are located at the top of the workspace, and the usage of each field depends on whether Polar or Rectangular coordinates are being used.

The **Arc Edit** controls are summarized as follows:

	Absolute Placement	New nodes will be placed with respect to the Plate Size origin.
	Relative Placement	New nodes will be placed with respect to the previously created node.
	Polar Coordinates	Polar Coordinates are used to place each new node. In this mode, the edit fields represent the Angle and Length of the new node position.
	Rectangular Coordinates	Rectangular Coordinates are used to place each new node. In this mode, the edit fields represent the X-coordinate and Y-coordinate of the new node position.

Arc Edit tool

The **Arc Edit** tool is used to create new nodes for an object. By default, clicking on the workspace will create a Corner node. By holding the right-mouse button, the **Node Palette** can be used to either change the type of node, or to edit the existing nodes.

Icon	Tool	Description
	Corner Node Tool	Change the currently-selected node into a Corner node, or specify that new nodes must be Corner-type.
	Join Tool	Join two selected nodes, or join the endpoints of a selected contour.
	Curve Node Tool	Change the currently-selected node into a Curve node, or specify that new nodes must be Curve-type.
	Toggle Rotation Tool	Toggle the direction of the selected contour between Clockwise and Counter-Clockwise.
	Set Start Point Tool	Set the start point at which routing or engraving this contour will begin.
	Trash Can Tool	Delete the selected nodes.
	Break Tool	Break the contour at the selected node.
	Tangent Node Tool	Change the currently-selected node into a Tangent node, or specify that new nodes must be Tangent-type.

Node Edit tool

Use the **Node Edit tool** to either drag or manipulate nodes. Clicking a node will select that node. Shift-clicking will add nodes to the current selection, and right-clicking will display the Node Palette.

When node editing a shape, clicking the fill region of another shape will switch node editing to the other shape. When node editing a shape that overlaps another shape, hold the **[ALT]** key to prevent the accidental selection of the underlying shape.

The following table summarizes the Hot Keys that may also be applied:

Hot Key	Function Name	Purpose
A	Add node	Create a node at the current cursor location.
C	Change node	Cycle the type of the selected node. The type will cycle through Corner, Curve, and Tangent type nodes.
R	Remove	Delete the selected node.
L	Locate origin	Set the grid origin to correspond to the selected node.
G	Grid dimensions	Resize the grid increments based on the distance between the selected node and the grid origin.
S	Snap to intersection	Move the selected node to the nearest grid intersection.
H	Snap to horizontal grid line	Move the selected node to the nearest horizontal grid line.
V	Snap to vertical grid line	Move the selected node to the nearest vertical grid line.
J	Join	Join the two selected nodes with a connecting line.
B	Break	Break the contour at the selected node.
D	Deselect	Clear the current node selection.
O	Create perfect circle	Based on existing nodes, transform an oval contour into a perfect circle. If necessary, nodes will be added to complete the circle.
T	Toggle start point	Set the start point at which routing or engraving this contour will begin.
K	(K)lick	Select the node under the mouse cursor.

Segment Edit tool

The **Segment Edit tool** is used to reshape a section of the contour to fit either a straight line, a corner, or a curve.

To define a segment, select the Segment Edit tool. Notice the small, red circle that now follows the contour of the object.
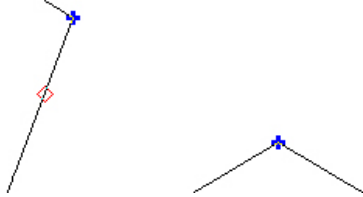
Moving the mouse will also move the circle. Click once to establish the start of a segment. Move the circle to the segment end and then click again. The segment is now defined.

Once the segment is defined, holding the right-mouse button will display the Segment Palette.

Choose a Segment Palette tool that will be applied to the current segment. The Segment Palette tools are described as follows:

Corner Segment Tool

Fit the segment to a corner. When this tool is selected, three handles appear that allow the corner to be adjusted. When adjustments are complete, click the Checkmark tool in the Edit Toolbox.
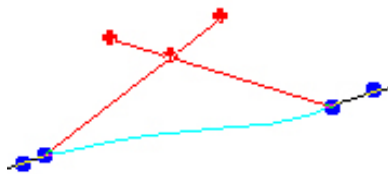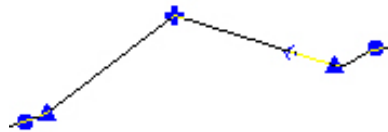
Editing the corner   After applying the corner

Arc Segment Tool

Fit the segment to an arc. When this tool is selected, two handles appear that allow the arc to be adjusted. When adjustments are complete, click the Checkmark tool in the Edit Toolbox.
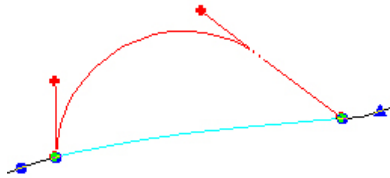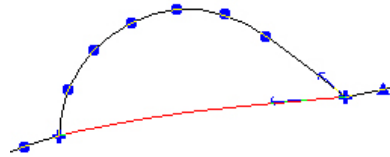
Editing the arc	After applying the arc

Line Segment Tool

Fit the segment to a line. When this tool is selected, the segment will be replaced with a straight line.

Guide Line Tool

Create a guide line that corresponds to the segment.

Trash Can Tool

Delete the segment. If the contour had previously been closed, then it will now be a broken contour.

Free Edit Flyout Tool

The **Free Edit Flyout t**ool is used to trace a polygon object by hand. Click and drag across the workspace to draw the object. Release the mouse button to create the object. If the start and end strokes are close in proximity, then a closed contour will be formed. Otherwise, either use the **Close Graphics** command from the **Arrange** menu to close the contour, or edit the contour using the **Node Edit** tool.

Polyarc Editing

The **Arc Edit Flyout** tool is used for creating and editing polyarcs.

The **Arc Edit** tool will be active by default, and clicking on the workspace will create a node. As an alternative to clicking with the mouse, new nodes can be placed using the SmartBar fields.

Snap To

As an aid for adding new nodes, the Snap To feature may be used. For more information about this feature, please refer to **Snapping Setup** in the next section.

	Toggle Snapping
	Snapping Setup

Placement of each node depends on whether Polar or Rectangular coordinates are being used. The placement controls are summarized as follows:

Absolute Placement

New nodes will be placed with respect to the Plate Size origin.

Relative Placement

New nodes will be placed with respect to the previously created node.

Polar Coordinates

Polar Coordinates are used to place each new node. In this mode, the first and second edit fields represent the Angle and Length of the new node position.

Rectangular Coordinates

Rectangular Coordinates are used to place each new node. In this mode, the first and second edit fields represent the X-coordinate and Y-coordinate of the new node position.

Arc Bulge Mode

In this mode, the third edit field will represent the bulge of the curved line segment. The bulge is used as follows:

1) Determine the mid-point of the line segment without a bulge.
2) From the mid-point, draw a perpendicular line that is equal in length to the bulge.
3) Using the end of the perpendicular line, construct the curved line segment.

Arc Radius Mode

In this mode, the third edit field will represent the radius of an imaginary circle. The new line segment will be drawn as if it had been traced along the circumference of the imaginary circle, while still connecting the two point that would have formed a straight line segment.

Arc Edit tool

The **Arc Edit** tool is used to create new nodes for an object. For polyarcs, clicking on the workspace will create a Curve node. When working on a polyarc object, two curve nodes will form a segment, and then the cursor may be used to drag the segment to form an arc.
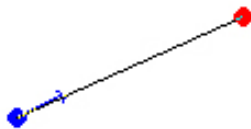
Straight line formed by two curve nodes	Drag line to form arc	Release cursor to create the arc
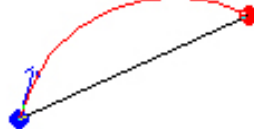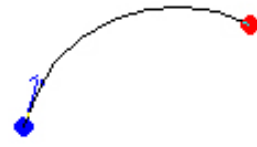
By holding the right-mouse button, the **Node Palette** can be used to edit the contour.

	Join Tool	Join two selected nodes, or join the endpoints of a selected contour.
	Toggle Rotation Tool	Toggle the direction of the selected contour between Clockwise and Counter-Clockwise.
	Set Start Point Tool	Set the start point at which routing or engraving this contour will begin.
	Trash Can Tool	Delete the selected nodes.
	Break Tool	Break the contour at the selected node.

Node Edit tool

Use the **Node Edit** tool to either drag or manipulate nodes. Clicking a node will select that node. Shift-clicking will add nodes to the current selection, and right-clicking will display the Node Palette.

When node editing a shape, clicking the fill region of another shape will switch node editing to the other shape. When node editing a shape that overlaps another shape, hold the **[ALT]** key to prevent the accidental selection of the underlying shape.

The following table summarizes the Hot Keys that may also be applied:

Hot Key	Function Name	Purpose
A	Add node	Create a node at the current cursor location.
R	Remove	Delete the selected node.
L	Locate origin	Set the grid origin to correspond to the selected node.
G	Grid dimensions	Resize the grid increments based on the distance between the selected node and the grid origin.
S	Snap to intersection	Move the selected node to the nearest grid intersection.
H	Snap to horizontal grid line	Move the selected node to the nearest horizontal grid line.
V	Snap to vertical grid line	Move the selected node to the nearest vertical grid line.
J	Join	Join the two selected nodes with a connecting line.
B	Break	Break the contour at the selected node.
T	Toggle start point	Set the start point at which routing or engraving this contour will begin.

Segment Edit tool

The **Segment Edit** tool has been discussed previously under the Polygon editing section.

Trim tool

The **Trim tool** will reduce the length of a line segment, such that it will intersect another line segment.
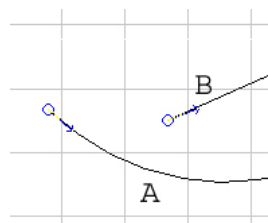
| **Click the Trim tool, click segment A, and then click segment B.** | **Segment A will be reduced in length, and it will be joined to segment B.** |
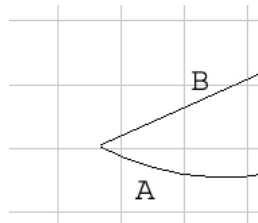
Extend tool

The **Extend tool** will increase the length of a line segment, such that it will project to intersect another line segment. Note that the projection can be to an "imaginary" intersection point. In the following example, segment B is extended to intersect with segment A.
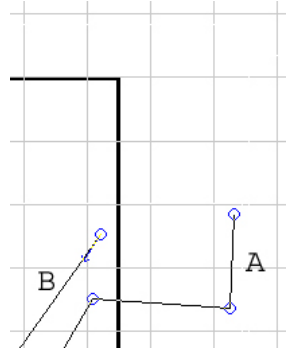
| **Click the Extend tool, click segment A, and then click segment B** | **Segment B will be projected to the imaginary intersection point formed with segment A.** |
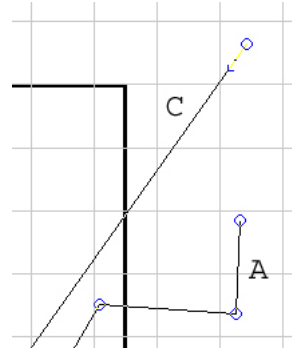
Divide tool

The **Divide tool** will subdivide a line segment with additional nodes. Click the required line segment, and the **Divide Segment** dialog will open.
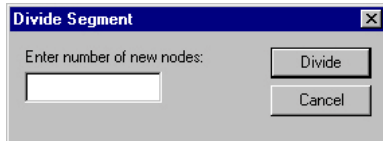
Specify the number of new nodes to insert, and then click the **Divide** button.

Delete tool

After activating the **Delete tool**, clicking on nodes or line segments will delete them.

Delete Segment tool

The **Delete Segment** tool is used to remove part of an object path. When active, a small, red circle will track the object path. Click once to set the segment beginning, and then click a second time to set the segment end. The segment will then be deleted.

Offset Arc tool

For a segment that has been selected using the **Segment Edit** tool, the **Offset Arc** tool will create a duplicate segment that is offset by the indicated amount.
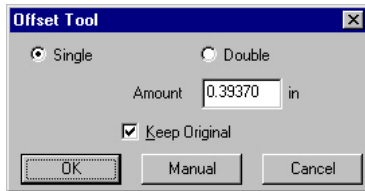
If **Double** offsets are created, then the offsets will be to either side of the original segment.

Snapping Setup

The **Snap To** tools are available when creating nodes in the polyarc editing mode. These tools will identify certain workspace coordinates, such as midpoints, intersection points, and the end of line segments. The mouse focus will then "snap" to the identified coordinate, and pressing the left-mouse button will create a new node at those coordinates.
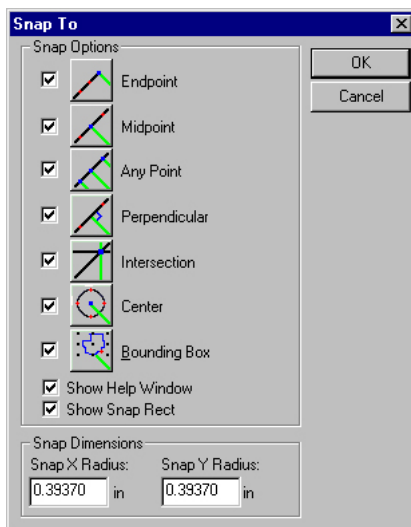
A "snap rectangle" is drawn about the cursor, which is used as a limit when identifying coordinates. For example, if a midpoint falls within the snap rectangle, then it will be identified as a valid coordinate for the focus.
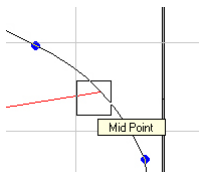
Snap Options

The **Snap Options** determine the valid workspace coordinates that will be identified when editing polyarc nodes. These options are as follows:

	Endpoint	Snap to the end of a segment, as identified by the existence of a node.
	Midpoint	Snap to the midpoint of a segment. This may be either a line or curve segment, as formed between two nodes.
	Any point	Snap to a point that is along a segment. This helps to place a node that is flush with the given segment.
	Perpendicular point	Snap to point so as to form a perpendicular line segment.
	Intersection point	Snap to intersection point that would be formed by extending two line segments.
	Center point	Snap to center of circle that would be formed by a curved segment.
	Bounding box point	Snap to one of the eight nubs (corner, sides, top or bottom) that form the bounding box of a given EngraveLab object.

Show Help Window

When this option is on, a tooltip will appear to help identify the coordinate that the Snap To tool has found.

Show Snap Rectangle

The **Show Snap Rectangle** option toggles the visibility of the snap rectangle. Though not visible, the bounds of the rectangle will still be used to identify valid workspace coordinates.

Snap Dimensions

The Snap X Radius and Snap Y Radius determine the width and height of the snap rectangle.

WELD TOOLS

The **Weld Tools** are used to bond overlapping shapes into a combined object.

| **Non-welded Lettering** | **Welded Lettering** |

The resulting object type will be either polyarc or polygon, depending on the **Polyarc / Polygon** setting of the **General Preferences** dialog.

The **Weld** tools are accessible through the **Weld Tools** flyout:
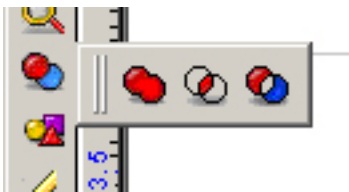
The available welds are:

 Fuse / Color Weld

 AND Weld

 XOR Weld

About Complex Welds

There is an upper limit for the number of nodes that can be processed during a weld. This limit is based on the amount of physical memory available.

If a weld is attempted and an error message is received (such as stack overflow), then break the welded objects into two portions before applying the weld. Doing this will reduce the number of nodes in each weld. Once each portion is welded, both portions can be welded into the final object.

Fuse / Color Weld

Fuse Weld

The **Fuse Weld** tool is used to merge selected objects of the same color layer into one combined object. This tool is useful when working with script fonts that have a "lead-in" and "lead-out" (kerning) on each character that overlaps the adjacent letter.

Unless the overlapping letters are welded, the letters will be cut with overlapped cutting lines. The **Fuse Weld** tool removes those overlaps to make script-lettering flow together as a single object.
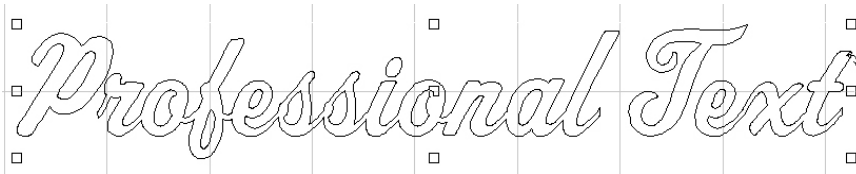
Note: Welding will automatically apply the **Text to Graphics** command (**Arrange** menu).

Color Weld

The **Color Weld** tool is used to delete overlapping sections between two different objects in separate color layers. Welding will reshape objects, such that underlying portions are removed.

The following image shows two objects with their fills turned off. With respect to their layer orders, the star is resting above the circle shape.
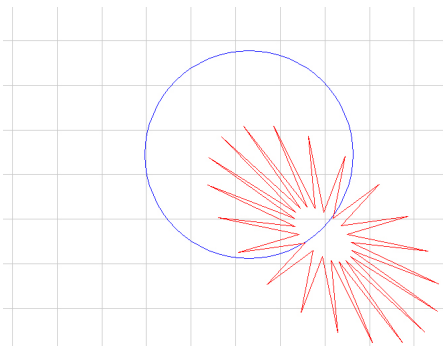
After the weld is applied, the star shape is unchanged, but the underlying circle shape has been modified.
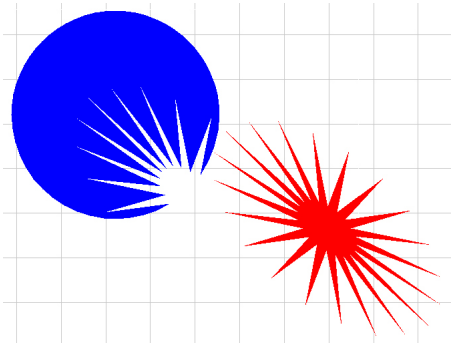
If an object has the same color as that of either the sign plate or workspace background, then that object will be discarded. A warning dialog will query for confirmation before discarding takes place.

Using Color Weld

The **Color Weld** feature can create some interesting visual effects, such as 'pinstripes' and 'knock-outs.' The following screen shots demonstrate pinstripes:
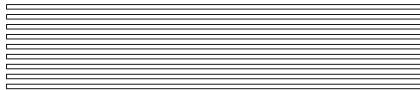
Two objects (the stripes have a hairline edge for clarity)

The two objects overlapped. Note the stripes are the same color as the sign plate or background.
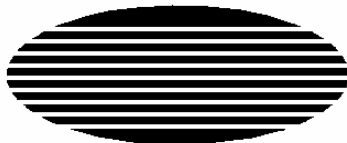
The result after color welding

AND Weld

The **AND** Weld will generate a combined object that is composed of only overlapping sections of the original objects.
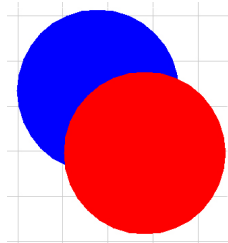
**Two objects prior to
weld**
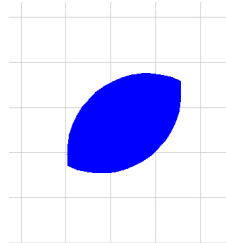
**Result of performing
AND weld**

The resulting object is defined by the area where the two circles overlap, and is the same color as the previously hidden portion.

The **AND** Weld tool is used for graphical effects such as fancy clipping as follows:

**Initially, a simple background pattern was
created. For the text object, both a Duplicate
and Outline were applied.**

Select the text object and pattern together.
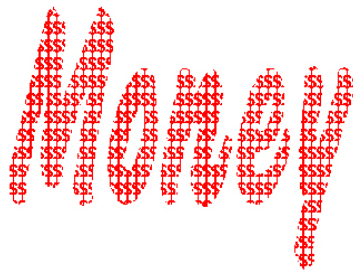
**Applying the AND weld produces an
interesting pattern.**

**The Duplicate and Outline that were created
earlier serve to enhance the effect.**

Note: Only two overlapping objects or group of objects can be welded at the same time. If there are three or more objects that overlap at the same location these must be organized into two groups before they can be welded.

XOR Weld

The **XOR Weld** (Exclusive-Or Weld) will produce an object that is composed only of sections that **did not** overlap in the original objects.
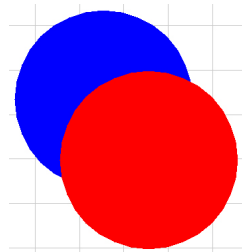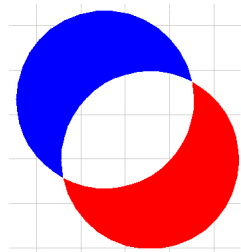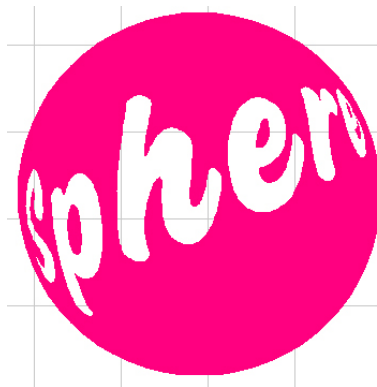

Two objects prior to weld   **Result of performing XOR weld**

The **XOR Weld** is useful for creating unique special effects:

Text is placed over a sphere   **Applying the XOR Weld produces this "punched out" result.**

Note: Only two overlapping objects or groups of objects can be welded at the same time. If there are three or more objects that overlap at the same location, they must be organized into two groups before they can be welded.

PARAMETRIC RULER AND DIAL

The Parametric Ruler and Dial are instant shapes that are available from the Shape Tools flyout.

The Parametric Ruler Shape

The **Parametric Ruler Shape** is an object that can be created on the workspace, much like a parametric circle or rectangle. Like other parametric shapes, the parametric ruler has handles that are used to adjust the ruler properties on the workspace, and additional SmartBar controls are also available.

To create a parametric ruler shape, choose the **Ruler** button from the **Shape Tools** flyout.

After choosing the **Ruler** button, click and drag within the workspace to form the initial coordinates, length, and angle of the ruler shape. The ruler will be automatically subdivided into equal sections, as indicated by the major ticks that are marked along the ruler.
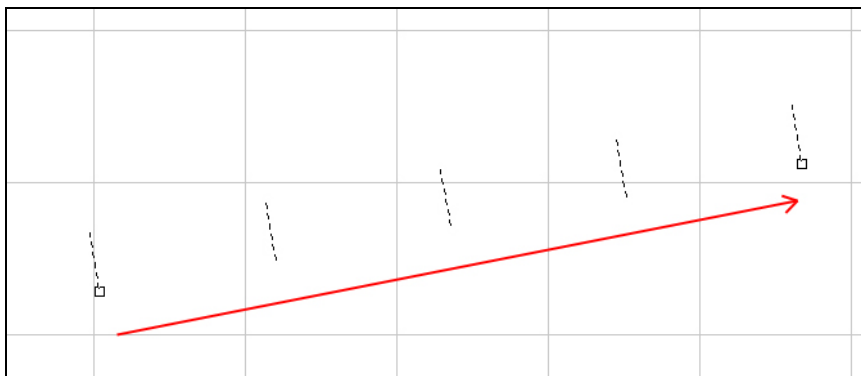
In the above screenshot, a basic ruler shape is shown that has no extra settings. This ruler shape is shown as having five "major ticks," which are drawn perpendicular to the ruler angle.
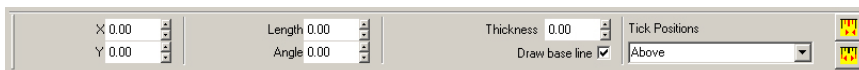
In contrast, the following screenshot shows the same ruler shape, except that labels, minor ticks, and a baseline have been added.
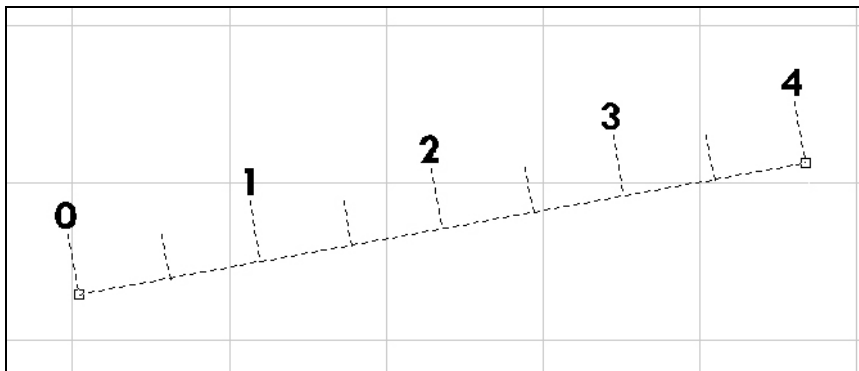
At each end of the ruler shape is a handle that is used to modify the placement of the ruler.
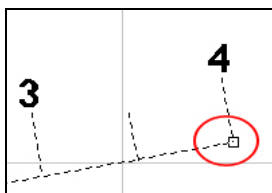
Edits to the ruler shape are displayed within the SmartBar.

The SmartBar controls are described as follows:

Coordinates of ruler shape

At the far-left of the SmartBar are the coordinates at which the ruler shape is placed on the workspace. With respect to these coordinates, the **Length** and **Angle** values are used to construct the ruler shape.

Length

The **Length** field indicates the physical length of the ruler shape on the workspace.

Angle

The **Angle** field indicates the rotation of the ruler. If the **Angle** is zero, then the ruler extends from left-to-right, starting from the ruler coordinates, and extending as far as the **Length** value.

Thickness

The **Thickness** field indicates the thickness of the ruler baseline and ticks. If the **Thickness** value is zero, then the ruler baseline and ticks will be drawn as hairlines.

Draw base line

If the **Draw base line** option is enabled, then the ticks will be connected ala a baseline. Disable this option to draw the ticks without a baseline.
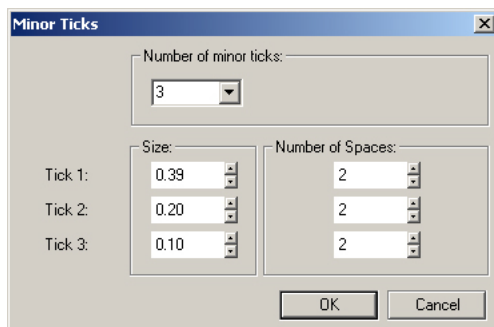
Tick Positions

The **Tick Positions** drop-list is used to choose the style of the ticks. The ticks may be place either Above, Below, or Centered on the baseline.

Minor tick marks

At the far-right of the SmartBar is the **Minor tick marks** button.

Click the **Minor tick marks** button to open the **Minor Ticks** dialog.

Up to three sets of minor ticks may be created. For example, suppose that the following settings are used to create one set of minor ticks:
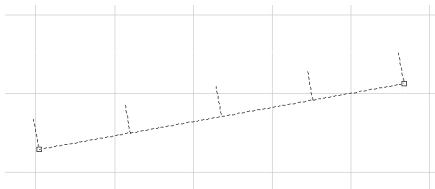
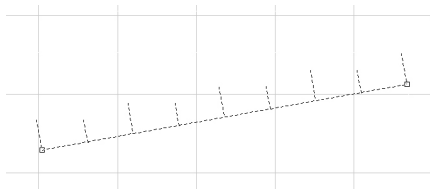|	
1	Number of minor ticks
0.30	Size of Tick 1
2	Number of spaces for Tick 1

The **Minor Ticks** dialog will appear as follows:

Click **OK** to accept the new settings, and the ruler shape will be updated on the workspace.

The basic ruler shape with no minor ticks. The ruler is subdivided into four sections.
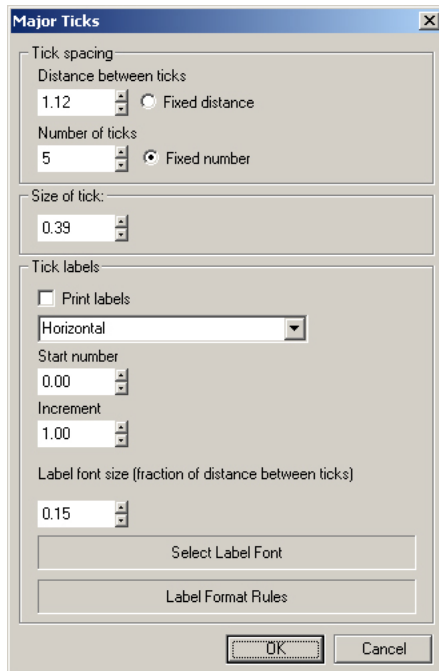
The same ruler shape, except that one set of minor ticks has been created. Each section has been subdivided into two sub-sections.

Labels and major ticks

At the far-right of the SmartBar is the **Labels and major ticks** button.

Click the **Labels and major ticks** button to open the **Major Ticks** dialog.

Tick spacing

If the **Fixed number** option is enabled, then the length of the ruler will be divided equally according to the **Number of ticks** setting. The length of each segment will depend upon the ruler length, as divided by the number of ticks.

If the **Fixed distance** option is enabled, then the distance between each tick will be set according to the **Distance between ticks** setting. On the workspace, major ticks will be created or removed to correspond to the ruler length.

Size of tick

Each tick is drawn perpendicular to the ruler length. The **Size of tick** field indicates the length of each major tick.

Tick labels

If the **Print labels** option is enabled, then each major tick will be numbered.

> *Note:* If a label font has not been selected, then the **Font Detective** dialog will open. When the desired label has been selected, click the **Select** button to close the **Font Detective**.

Label Orientation

Below the **Print labels** option, the drop-list indicates the **Orientation** of the labels. If printed **Horizontally**, then the labels are oriented with respect to the workspace x-axis. If printed "**On Ticks**," then the labels are oriented with respect to the ruler length.

Start Number and Increment

The **Start number** indicates the numeric value that is assigned to the first major tick. Each subsequent major tick will then be assigned a value according to the **Increment** value.

> *Note:* Values are rounded according to the label format. Please refer to the *Label Formatting Rules* section for more information.

Label font size

The size of the label font is expressed as a decimal percentage of the distance between each major tick. For example, a **Label font size** of 0.15 is equivalent to 15% of the distance between each major tick.

Select Label Font

To change the font of the labels, click the **Select Label** Font button. The **Font Detective** dialog will open. When the font is chosen, click the **Select** button to close the **Font Detective**.

Label Format Rules

To set the format of the labels, click the **Label Format Rules** button.

> *Note:* Please refer to the *Label Formatting Rules* section for more information.

The Parametric Dial Shape

The **Parametric Dial Shape** is similar to the parametric ruler shape. To create a parametric dial shape, choose the **Dial** button from the **Shape Tools** flyout.

After choosing the **Dial** button, click and drag within the workspace to form the initial coordinates and radius of the dial shape. The dial will be automatically subdivided into equal sections, as indicated by the major ticks that are marked along the dial.
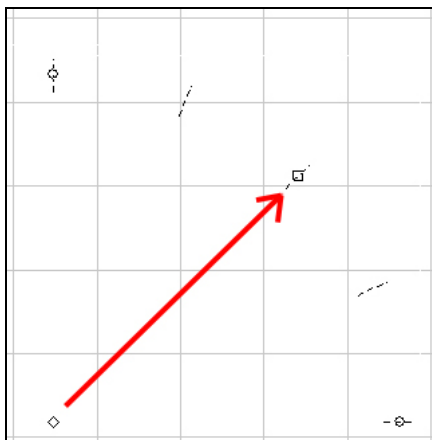

In the above screenshot, a basic dial shape is shown that has no extra settings. This dial shape is shown as having five "major ticks," which are drawn perpendicular to the dial path.

In contrast, the following screenshot shows the same dial shape, except that labels, minor ticks, and a baseline have been added.
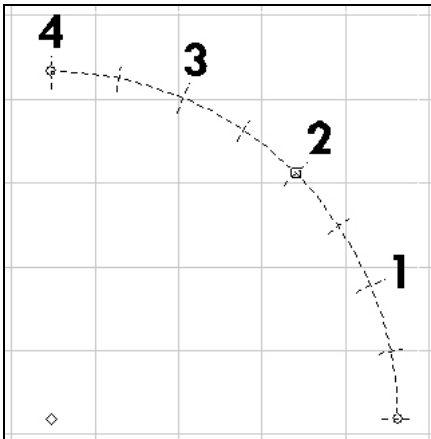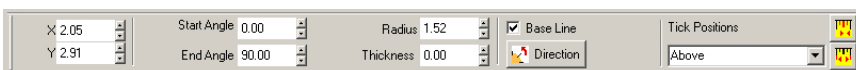

Workspace handles are placed about the dial shape, which may be used to modify the dial parameters.
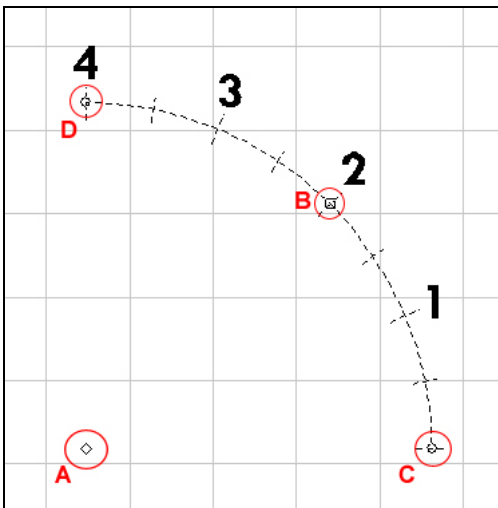
The dial handles are used to set the following dial parameters:

A	Coordinates
B	Radius
C	Start Angle
D	End Angle

Edits to the dial shape handles are displayed within the SmartBar.

Coordinates of the dial shape

At the far-left of the SmartBar are the coordinates at which the dial shape is placed on the workspace. With respect to these coordinates, the **Start Angle**, **End Angle**, and **Radius** are used to construct the dial shape.
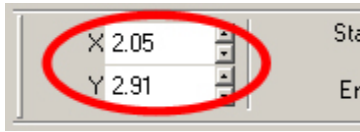
Start Angle and End Angle

The **Start Angle** and **End Angle** indicate the dial arc. By default, the dial will be drawn clockwise from the **Start Angle**, and it will terminate at the **End Angle**.

Radius

The **Radius** field indicates the size of a "circle," upon which the dial will modeled.

Thickness

The **Thickness** field indicates the thickness of the dial baseline and ticks. If the **Thickness** value is zero, then the dial baseline and ticks will be drawn as hairlines.

Direction

The **Direction** button toggles the dial orientation between **Clockwise** and **Counter-Clockwise**. Depending on the orientation, the dial will be formed between the **Start Angle** to the **End Angle**.
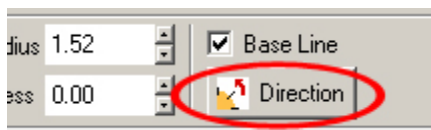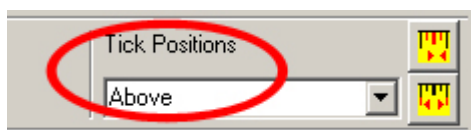

Draw base line

If the **Base line** option is enabled, then the ticks will be connected ala a baseline. Disable this option to draw the ticks without a baseline.

Tick Positions

The Tick Positions drop-list is used to choose the style of the ticks. The ticks may be place either Above, Below, or Centered on the baseline.
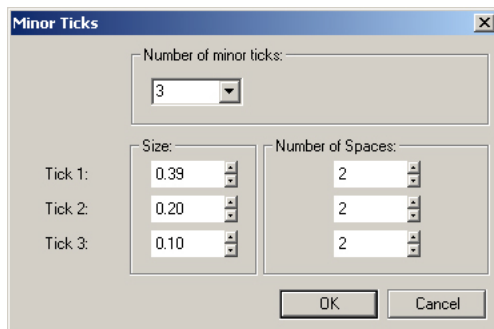
Minor tick marks

At the far-right of the SmartBar is the **Minor tick marks** button.
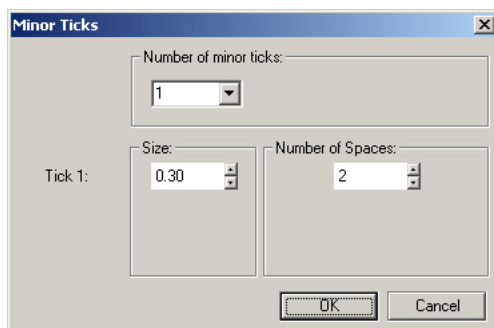

Click the **Minor tick marks** button to open the **Minor Ticks** dialog.

Up to three sets of minor ticks may be created. For example, suppose that the following settings are used to create one set of minor ticks:
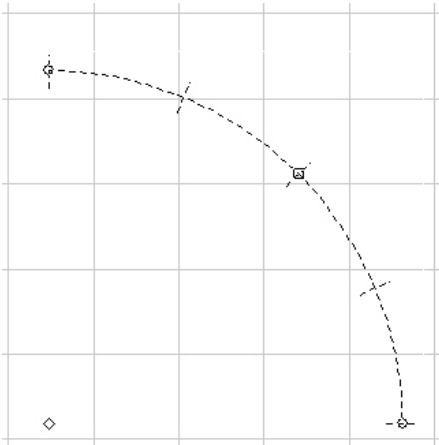
1	Number of minor ticks
0.30	Size of Tick 1
2	Number of spaces for Tick 1

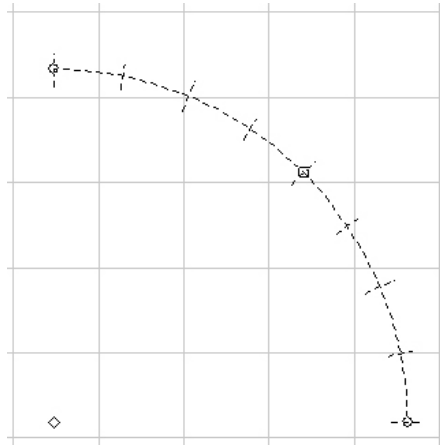The **Minor Ticks** dialog will appear as follows:

Click **OK** to accept the new settings, and the dial shape will be updated on the workspace.
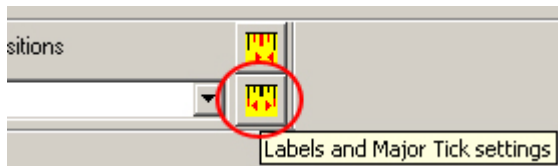

**The basic dial shape with no minor ticks. The dial is subdivided into four sections.**

The same dial shape, except that one set of minor ticks has been created. Each section has been subdivided into two sub-sections.

Labels and major ticks

At the far-right of the SmartBar is the **Labels and major ticks** button.

Click the **Labels and major ticks** button to open the **Major Ticks** dialog.
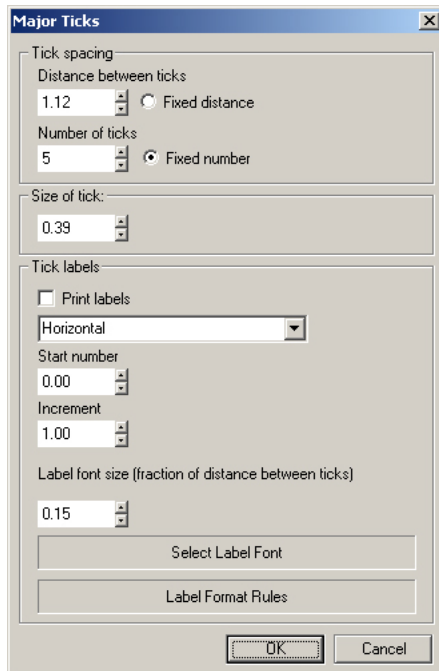
Tick spacing

If the **Fixed number** option is enabled, then the length of the dial will be divided equally according to the **Number of ticks** setting. The length of each segment will depend upon the dial arc, as divided by the number of ticks.

If the **Fixed distance** option is enabled, then the distance between each tick will be set according to the **Distance between ticks** setting. On the workspace, major ticks will be created or removed to correspond to the dial arc.

Size of tick

Each tick is drawn perpendicular to the dial arc. The **Size of tick** field indicates the length of each major tick.

Tick labels

If the **Print labels** option is enabled, then each major tick will be numbered.

> *Note:* If a label font has not been selected, then the **Font Detective** dialog will open. When the desired label has been selected, click the **Select** button to close the **Font Detective**.

Label Orientation

Below the **Print labels** option, the drop-list indicates the **Orientation** of the labels. If printed **Horizontal**, then the labels are oriented with respect to the workspace x-axis. If printed "**On Ticks**," then the labels are oriented with respect to the dial arc.

Start Number and Increment

The **Start number** indicates the numeric value that is assigned to the first major tick. Each subsequent major tick will then be assigned a value according to the **Increment** value.

> *Note:* Values are rounded according to the label format. Please refer to the *Label Formatting Rules* section for more information.

Label font size

The size of the label font is expressed as a decimal percentage of the distance between each major tick. For example, a **Label font size** of 0.15 is equivalent to 15% of the distance between each major tick.

Select Label Font

To change the font of the labels, click the **Select Label** Font button. The **Font Detective** dialog will open. When the font is chosen, click the **Select** button to close the **Font Detective**.

Label Format Rules

To set the format of the labels, click the **Label Format Rules** button.

> *Note:* Please refer to the *Label Formatting Rules* section for more information.

LABEL FORMATTING RULES

The **Label Format Rules** are used to define the appearance of labels on parametric ruler and parametric dial shapes. For either type of shape, the label format may be set on the **Major Ticks** dialog by clicking the **Label Format Rules** button. The following dialog will open:
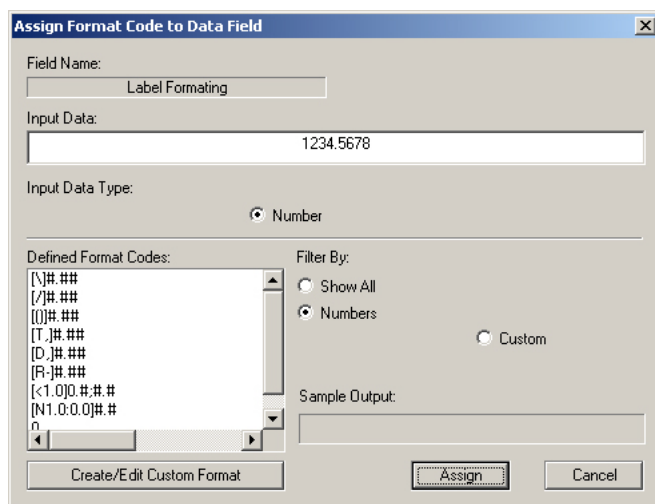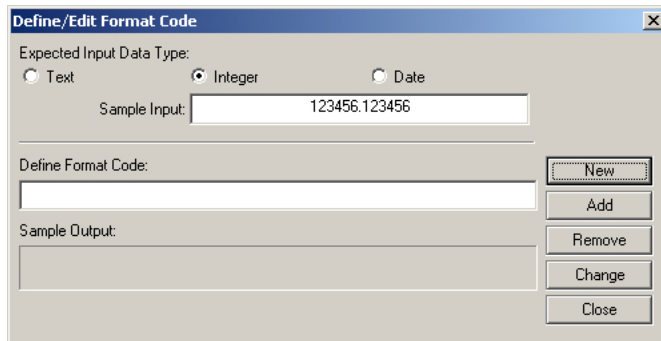

From the **Defined Format Codes** list, choose the formatting of the ruler or dial labels. When a format is clicked, the **Sample Output** field will display the results of applying that format to the **Input Data** field.

Enable the **Filter by Numbers** option to display formats that are useful for numeric values. Enable the **Custom** option to display only formats that you have created.

Creating a custom label format

Click the **Create/Edit Custom Format** button to create a custom format. The following dialog will open.

For the **Expected Input Data Type** options, choose the type of format. For numeric labels, choose **Integer**. The **Sample Input** field will be reset according to the chosen format.

In the **Define Format Code** field, enter the codes that will make up this custom label format. As edits are made to the **Define Format Code** field, the **Sample Output** field will display the result of applying the format to the **Sample Input** field.

Format Codes

The following is a list of format codes that may be entered in the **Define Format Code** field. More than one format code may be used, though an incorrect arrangement of codes will produce a nonsensical result.

Numeric Formatting

Numeric formatting is divided into three categories: Symbols, Flags, and Negative formats.

Symbols

There are several characters that are used to indicate a special purpose or symbol. These characters are summarized as follows.

#	The '#' (hash) symbol is used to display a significant digit. More than one '#' symbol may be placed to either the left or right of the decimal point.
0	The '0' (zero) symbol is used to display significant digits, though more than one '0' symbol may be used to create either leading or trailing zeroes.
****	The '\\' (backslash) symbol is referred to as an "escape" character, which is used to prevent a symbol from being interpreted as a formatting code. For example, the '#' is automatically interpreted to indicate a significant digit. But if the '#' is preceded by a backslash, ala "\\#", then the '#' will be printed as a normal character. The '\\' symbol may be used as an escape sequence for: '0' (zero), '#' (hash), '\\' (backslash), '[' (open square bracket), ']' (close square bracket), ';' (semicolon), and '-' (dash).

Several examples are provided here to help demonstrate how these symbols are used:

Sample Input	Define Format Code	Sample Output
123	#	123
123	#.#	123
123	#.00	123.00
123	0000.00	0123.00
123	\[0000\]	[0123]
123	\\\\#	\\123

Flags

Flags are special codes that are used to modify the label format. Flags are always placed between the square brackets '[' and ']'. The available flags are described as follows:

[Tc] This flag is used to insert a **thousands place** character. For example, the first thousands place character will be inserted at the fourth position left of the decimal point, and additional characters will be placed at each 3rd power of ten. The 'c' indicates the type of character to use as a separator. If 'c' is not specified, then a ' ' (space) character will be used as the thousands place character.

[Dc] This flag is used to indicate the decimal point that separates the whole part from the fractional part. By default, a '.' (period) will be used as the decimal point. If the [Dc] flag is used, then the 'c' indicates an alternative character to used as the decimal point.

[Rc] This flag indicates any rounding that should occur. If the [Rc] flag is not specified, then natural rounding will be used as default. However, the 'c' indicates alternative type of rounding. If 'c' is '-' (minus sign), then rounding down will always occur. If 'c' is '+' (plus sign), then rounding up will always occur.

[Ef] Indicates to use scientific notation to display value. The format f specified is a simple number format using 0 and # only. When E is specified, the number of 0's and #'s indicate the field length in the decimal part of the format code. This indicates the number of significant digits to display, and thus the amount of the exponential value to apply to use in the scientific notation.

[C] Conditional flag. C is of format [{<,<=,>,>=,<>}X] where X is a number. When defining the conditional flag, two sets of format code are given, separated by a semi-colon. The first code is used if the condition C is true, the second code is used if the condition C is false. If a second format code is not given, then if the number is false, an error will return.

[NX:Y] Range flag. The input value must fall between the values of X and Y where X > Y. If the value is not within this range, an error is returned.

Sample Input	Define Format Code	Sample Output
123456.123456	[T,]#	123,456
123456.123456	[D:]######	123456:123456
123456.123456	[R-]#.##	123456.12
123456.123456	[R+]:#.##	123456.13

Negative Formats

The following formats indicate how a negative value should be displayed:

[\]	Display the negative sign '-' to the left of the value.
[/]	Display the negative sign '-' to the right of the value.
[(]	Enclose the value with parentheses ( ).

Text Formatting

For text formatting, the '@' sign is an input string placeholder. Input text will be placed at the location specified by the '@' symbol. If the '@' symbol appears multiple times, then each '@' symbol will designate one word from the input string.

Flags

The following codes must be contained within square brackets [ ] for global formatting, and between braces { } for local formatting. All flags between braces apply to the '@' character that immediately follows the braces.

> *Note:* When inserting a string literal, the ", [, and] characters must be typed as escaped characters. This remains true for characters that are enclosed within double quotes.

Fx	Used to indicate the number of characters (x) to output. If x is either negative one (-1), or this flag is not specified, then all characters of the input text will be displayed.
P{l,r}:c	Padding (or trimming) that is applied to text. Use 'l' or 'r' to indicate either left or right padding. The 'c' indicates the number of characters used for padding. If 'c' is not specified, then there will be no characters for padding, but the text can be trimmed left or right.
U	Make all text upper-case
L	Make all text lower-case

Date Formatting

The following codes are used to apply date and time formatting:

D	Day as number of the month 1 – 31
DD	Day as number of the month 01 – 31
DDD	Day as short name Sun – Mon
DDDD	Day as long name Sunday – Monday
DDDDD	Day as number of the year 001 – 356

M	Month as number 1 – 12
MM	Month as number 01 – 12
MMM	Month as short name Jan – Dec
MMMM	Month as long name January – December

Y	Year as 2 digit number
YY	Year as 2 digit number
YYY	Year as 4 digit number
YYYY	Year as 4 digit number

h	Hour as 12 hour clock 1 – 12
hh	Hour as 24 hour clock 00 – 23

m	Minute as number 00 – 59
mm	Minute as number 00 – 59

s	Second as number 00 – 59
ss	Second as number 00 – 59

A	Show the AM/PM symbol

Note: A text literal that is within the date formatting must be enclosed with double quotes " ". This includes escape characters that use backslash.

PARAMETRIC WASP BARCODE

A barcode is an arrangement of vertical lines (of varying thickness and spacing) that form a machine-readable label. Depending on the type of barcode, the label can contain either numeric or alphanumeric data, which may then be scanned using a barcode reader.

1234567890

To create a parametric barcode shape, choose **WASP Barcode** from the **Shape Tools** flyout.

The barcode controls will become available within the SmartBar.

Bar Height

Specifies the height of the barcode shape, as expressed in current workspace units. The minimum bar height is 0.2 inches.

Bar Width

Specifies the width of a narrow bar (sometimes called the X dimension) in the current workspace units. The minimum bar width is 0.0075 inches.

The UPC/EAN/JAN barcode sizes are specified as a percentage of nominal rather than an actual bar width. Consequently, valid ranges for this field are 80 to 200 for the UPC/EAN/JAN symbologies.

Since the PostNet symbology is of a fixed width, this field is not used.

Bar Ratio

Specifies the wide-to-narrow bar ratio. For example, a **Bar Ratio** of 2.5:1 indicates that a wide bar is 2.5 times the width of a narrow bar.
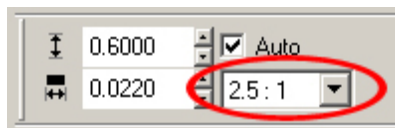
This parameter has a valid range from 2.0:1 to 3.0:1, and it is only used with the following barcode types: Code39, Interleaved 2 of 5, Codabar, and MSI.

Value

The **Value** field is used to type the barcode characters that will be encoded into the barcode. Please note that each type of barcode has its own rules concerning the entry of numbers, letters, and extended characters. Later this chapter, the *Barcode Symbology* section discusses each barcode type, including the valid characters. If an invalid character is typed and the **Apply** button clicked, then a warning dialog will prevent the barcode from being created.

For some barcode symbologies, only numeric or a limited selection of alphabetical characters are allowed. Some of the more flexible symbologies can encode the ASCII table (values 0-127), though only a few symbologies support the extended ASCII table (values 128-255). Where the barcode symbology supports encoding of the full ASCII character set, a special method of entering non-printing ASCII characters is required. Three such methods are available: 1) using the character picker on the SmartBar, 2) using a Tilde escape sequence, and 3) using the **[Alt]** key in combination with the numeric keypad. These two methods are discussed as follows:

SmartBar Character Picker

To the right of the **Value** field is the **Character Picker** button.
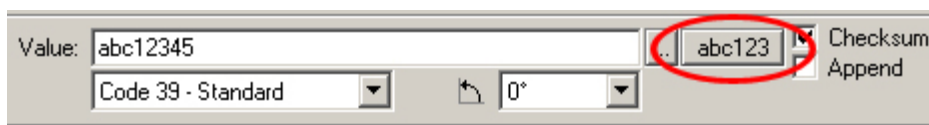
Click the **Character Picker** button to expand a pop-up list of all the valid characters for the chosen barcode symbology. Click a character within the pop-up list, and that character will be inserted into the **Value** field.

For some symbologies, the pop-up list displays non-printing characters as a Tilde Escape Sequence. The Tilde Escape Sequence is described within the following sub-section.

Tilde Escape Sequence

The **[Tilde]** character may be used to enter the ASCII value for a character that could not otherwise be entered within the **Barcode text** edit field. The **[Tilde]** key is located near the top-left of the keyboard, usually just below the **[Esc]** key, and to the left of the **[Number 1]** key. To create a **[Tilde]** character, press **[Shift + Tilde]**.

> *Note:* This documentation describes a standard QWERTY keyboard configuration. Where custom key assignments have been performed, please refer to the notes that were provided with the given keyboard.

Once the **[Tilde]** character (~) has been entered, type the three-digit value for the ASCII character. For example, type ~065 to create the letter 'A'. In ASCII code, the value 65 represents 'A', 66 represents 'B', 67 represents 'C', and so on. Likewise, a non-printing ASCII character value may be specified. However, please note that a three-digit value must follow the **[Tilde]** character. For this reason, a two-digit ASCII value like 67 must be padded with a zero (067).

For any tilde sequences within the **Barcode text** field, translation into ASCII will not occur until the **Apply** button has been clicked. Once the **Apply** button is clicked, each tilde sequence will be converted into its corresponding ASCII character, and then the **Barcode text** field will be encoded as barcode data.

Alt and the Numeric Keypad

As an alternative to entering a **[Tilde]** sequence, Windows provides a means of entering an ASCII value that will be immediately converted into its corresponding ASCII character. This provides the ability to enter values 128-255 (extended ASCII), which otherwise would not be accessible using a standard keyboard. Unfortunately, the disadvantage of this technique is that non-printing ASCII characters will be ignored (i.e. values 0-31).

To create an extended ASCII character:

1) Click within the **Barcode text** field to indicate where the character should be inserted.

2) For the numeric keypad of your keyboard, verify that **[Num Lock]** is enabled.

3) Press the **[Alt]** key, but do not release it yet.

4) Using the numeric keypad, type the <u>three-digit</u> value that corresponds to the desired ASCII character.

5) Release the **[Alt]** key.

The desired ASCII character will then be inserted within the **Barcode text** field. If the ASCII value is of a non-printing character (000-031), then no character will be inserted.

Barcode Symbology

Below the **Value** field, the drop-list is used to choose the barcode symbology that will be applied when encoding the characters. The choice of symbology determines both the available SmartBar controls, and the characters that may be entered within the **Value** field.

The barcode symbologies are discussed later in this section.

Caption Settings

To the right of the **Value** field, click the ellipsis button to open the **Barcode Caption Features** dialog.
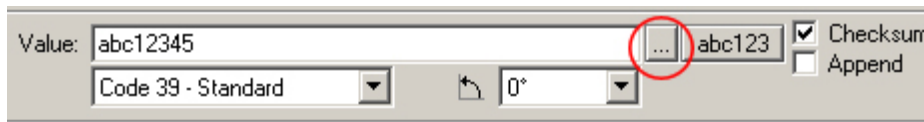
The **Barcode Caption Features** dialog is used to specify the font, point size, and style of the barcode caption.
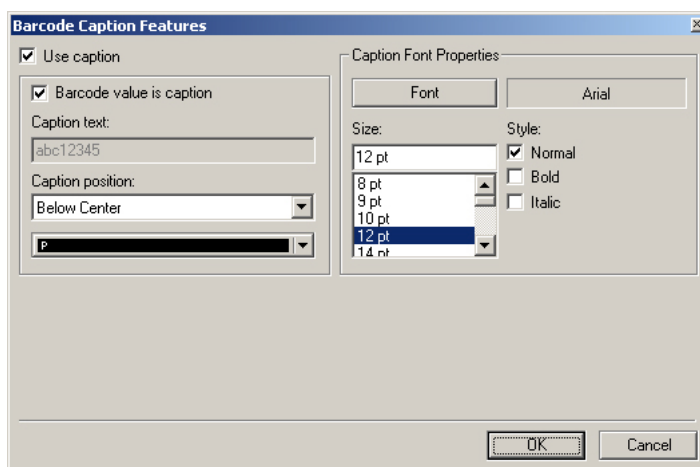
The **Caption position** indicates the placement of the caption with respect to the barcode. Please note that some barcode symbologies restrict the caption placement. As such, an invalid caption placement will be ignored.

Checksum

Specifies whether to calculate and apply a checksum character to the barcode. The checksum method depends upon the barcode type.

> *Note:* This option is only used for the following barcode types: Code39, Interleaved 2 of 5, Codabar, and MSI Plessey. For MSI Plessey, disabling this option indicates **one** modulo 10 check digit, and enabling this option indicates **two** modulo 10 check digits.

Append

Certain symbologies allows several individual barcodes to be concatenated into a single, long barcode. Each barcode is printed as per a regular barcode. However, when the barcodes are later scanned, the reader will recognize that the barcodes must be concatenated.

For example, suppose that three Code 128 barcodes (A, B, and C) must be concatenated. When creating barcode A, enable the **Append** option. When creating barcode B, enable the **Append** option as well. However, when creating barcode C, disable the **Append** option. Later, when these barcodes are being scanned, the following actions will occur:

➢ Barcode A will be identified as requiring concatenation with a subsequent barcode.

➢ Barcode B will be appended to Barcode A. However, Barcode B will also be identified as requiring concatenation with a subsequent barcode.

➢ Barcode C will be appended to Barcodes A and B. The barcode reader will recognize that no further barcodes need be appended.

➢ The result will consist of the concatenated data from barcodes A, B, and C.

To continue appending barcodes in this fashion, simply create more barcodes with the **Append** option enabled. For the last barcode in the sequence, disable the **Append** option.

Rotation

The **Rotation** drop-list is used to specify the bar code angle. The fixed angles are 0°, 90°, 180°, and 270°.

Barcode Symbologies

A barcode symbology is a set of rules for encoding data, such that a scanning device may use the same rules to extract the data. Depending upon the sophistication of the barcoding system, the data may describe a variety of details about the scanned item, or the data may simply be a lookup value for a database.

From the SmartBar, choose the **Barcode Symbology** from the drop-list.
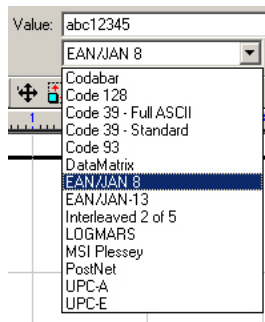
The available barcode symbologies are described in the following sections. However, it is beyond the scope of this documentation to provide specifications for each barcode symbology. Instead, there are standards agencies that will provide printed specifications for each barcode symbology. As a general rule, your client should indicate the barcode symbology that will be used, as well as any custom functionality (if any).

Codabar

Codabar is a variable-length symbology that is capable of encoding 16 characters within any length message. In addition to numeric values (0-9), the capital letters A through D are valid, as well as the following characters:

-	Dash
$	Dollar Sign
:	Colon
/	Forward Slash
.	Period
+	Plus Sign

Start/Stop Characters

The capital letters A through D are used as start and stop characters. For example, the string "A6479309B" indicates that 'A' is the start character, and 'B' is the stop character.

Checksum

If the **Checksum** option is enabled, then a modulo 16 check character will be used to enhance data security for Codabar barcode. The last digit of the barcode is assumed to be the check digit, and it is compared to a calculated check digit to verify the barcode.

Code 128

The Code 128 symbology can encode the ASCII character set (0-127). Code 128 is the most easily read code with the highest message integrity due to several separate message check routines.

Of all the common linear symbologies, Code 128 is the most flexible. It supports both alpha and numeric characters easily, has the highest number of characters per inch, and is variable length. Code 128 is usually one of the best choices when implementing a new symbology.

Code 39 - Standard

Code 39 is an alphanumeric symbology that can encode numbers (0-9), capital letters (A-Z), a space character (ASCII 32), and the following four special characters:

$	Dollar Sign
/	Forward Slash
+	Plus Sign
%	Percentage Sign

If lower-case letters (a-z) or other ASCII must be encoded, then please refer to **Code 39 – Full ASCII**, discussed in the next section.

Checksum

If the **Checksum** option is enabled, then a modulo 43 check character will be used to enhance data security for the Code 39 barcode. The last digit of the barcode is assumed to be the check digit, and it is compared to a calculated check digit to verify the barcode.

Code 39 – Full ASCII

The **Code 39 – Full ASCII** symbology is an enhancement upon **Code 39 – Standard**, where the four special characters are used to encode the ASCII character set (0-127). This is done by pairing one of the special characters ($, /, +, %) with a letter (A-Z). When the given pair of characters are scanned by a barcode reader, they will interpret the result as an ASCII character.

EngraveLab will automatically generate the necessary character pairs, based on the **Barcode text** that has been entered. For example, if lowercase 'a' is typed in the **Barcode text** field, then clicking **Apply** will cause the lowercase 'a' to be translated to "+A" within the barcode. A barcode reader will then interpret the "+A" as being a lowercase 'a'.

Code 93

Code 93 is an alphanumeric symbology that can encode the ASCII character set (0-127). Simply type the required ASCII characters within the **Barcode text** field.

Background

Like Code 39, the Code 93 symbology encodes numbers (0-9), capital letters (A-Z), a space character (ASCII 32), and the following four special characters:

$	Dollar Sign
/	Forward Slash
+	Plus Sign
%	Percentage Sign

However, Code 93 also uses four shift characters: [S1], [S2], [S3], and [S4]. These shift characters are used in combination with the basic Code 93 characters to encode the entire ASCII character set.

EngraveLab will automatically insert any shift characters that are necessary for the encoding. For example, if lowercase 'b' were typed in the **Barcode text** field, then clicking **Apply** will cause the lowercase 'b' to be translated to "[S4]B" within the barcode. A barcode reader will then interpret the "[S4]B" as being a lowercase 'b'.

DataMatrix

The DataMatrix symbology is a two-dimensional symbology, where data is encoded in both the horizontal and vertical planes. In contrast, a one-dimensional symbology, such as UPC-A, encodes data from left-to-right. Whereas reading the UPC barcode is performed using a linear barcode reader (such as a wand), the DataMatrix code requires a two-dimensional scanner.

The DataMatrix symbology can encode values 0-127 (ASCII character set), and values 128-255 (extended ASCII).

Entering Barcode Text

The data for a DataMatrix barcode must be read from a text file, where whitespace is considered to be the delimiter between each data element (whitespace characters are the space character, tab, and newline). From the SmartBar, click the ellipsis button that is next to the **Value** field.

The **Open** dialog may then be used to choose the text file that contains the barcode data. Choose the data file and click **Open**. The focus will return to the SmartBar, where the chosen filename will appear within the **Barcode text** field.
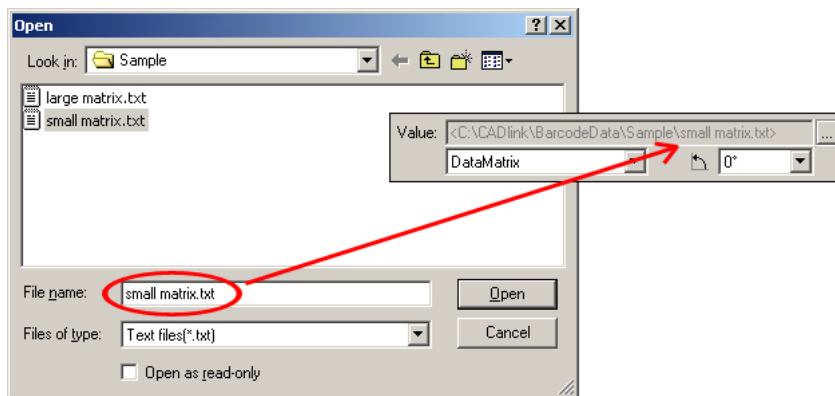
Click **Apply** to create the DataMatrix barcode. The shape will appear similar to the following.
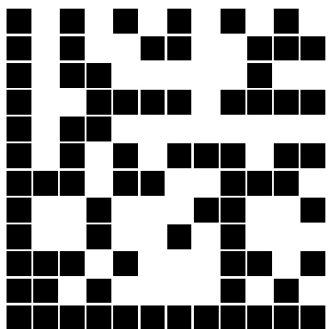
EAN/JAN-13

The abbreviation EAN/JAN refers to European Article Numbering/Japanese Article Numbering. The EAN-13 symbology is a superset of the UPC-A symbology that is used in North America. The EAN-13 symbology was implemented because the UPC-A symbology was insufficient for international use.

Like UPC-A, the EAN-13 symbology contains a manufacturer code and a product code. However, where UPC-A encodes twelve digits, the EAN-13 symbology encodes a thirteenth digit. The thirteenth digit is used as part the number system to indicate the country or economic region that had assigned the manufacturer code (to a specific company).

The JAN-13 symbology is simply EAN-13, where the country code is 49.

> *Note:* Since EAN-13 is a superset of UPC-A and requires very little additional effort to handle than an UPC-A code, it is recommended that all new designs implement EAN-13 rather than UPC-A. Otherwise, the design will be restricted to the U.S. and Canada. In addition, the UCC Council has announced that as of January 1, 2005, all barcode systems in the U.S. and Canada must be able to handle EAN-13 barcodes, such that international manufacturers do not have to worry about printing a different barcode for products shipped to North America.

The nominal height for the EAN/JAN-13 bar code is one inch. The reduced size is 80% of the nominal size.

EAN/JAN-8

The abbreviation EAN/JAN refers to European Article Numbering/Japanese Article Numbering.

EAN-8 is the EAN equivalent of UPC-E in the sense that it provides a "short" barcode for small packages. However, unlike the EAN-13 compatibility with UPC-A, the EAN-8 symbology has no compatibility with UPC-E.

The JAN-8 symbology is simply EAN-8, where the country code is 49.

The nominal height for the EAN/JAN-8 barcode is one inch. The reduced size is 80% of the nominal size.

Interleaved 2 of 5

Interleaved 2 of 5 is a numeric (0-9) symbology that is typically used in industrial and warehousing applications.

Checksum

If the **Checksum** option is enabled, then a modulo 10 check character will be used to enhance data security for the Interleaved 2 of 5 barcode. When this option is enabled, the last digit of the barcode is assumed to be the check digit, and it is compared to a calculated check digit to verify the barcode.

LOGMARS

LOGMARS (Logistics Applications of Automated Marking and Reading Symbols) is a special application of Code 39 used by the U.S. Department of Defense. LOGMARS is an alphanumeric symbology that can encode numbers (0-9), capital letters (A-Z), a space character (ASCII 32), and the following four special characters:

$	Dollar Sign
/	Forward Slash
+	Plus Sign
%	Percentage Sign

For reference, the LOGMARS symbology is governed by Military Standard MIL-STD-1189B. The Modulus 43 check digit, optional with Code 39, is defined and recommended in this specification.

Checksum

If the **Checksum** option is enabled, then a modulo 43 check character will be used to enhance data security for the LOGMARS barcode. The last digit of the barcode is assumed to be the check digit, and it is compared to a calculated check digit to verify the barcode.

MSI Plessey

MSI Plessey is a variable length numeric (0-9) symbology that is used for retail inventory control.

Second Check Digit

A modulo 10 check digit calculation is always performed on the data string. Enabling the **Checksum** option will activate a second modulo 10 check digit, which will perform a check on the entire string, including the first check digit.

PostNet

PostNet is used by the United States Postal Service to encode mail. This symbology can encode either a standard 5-digit Zip Code, a Zip+4 code, or a full 11-point delivery point code. For example:

Postal Code	Example
5-digit Zip Code	64081
Zip+4	64081-2747
Full 11-point delivery point code	64081-2747-01

When entering values in the **Barcode text** field, the dash between values is optional. Dashes will not be encoded as part of the barcode data.

With respect to the "Delivery Point Code," the last two digits correspond to the last two digits of the street address of P.O. Box. For example, if the address were 401 SW Oldham Pkwy, then the delivery point code is "01."

Checksum

A checksum is always applied to the PostNet barcode.

Standard Code 39

Please refer to the **Code 39 – Standard** symbology, which is discussed earlier in this chapter.

UPC-A

The UPC-A (Universal Product Code-A) symbology encodes 12-digit numeric values, which are commonly used in North American retail labeling. The nominal height for the UPC-A bar code is one inch. The reduced size is 80% of the nominal size.

It is recommended that all new designs implement EAN-13 rather than UPC-A. Please refer to EAN/JAN-13 for more information.

UPC-E

The UPC-E (Universal Product Code-E) symbology is a compressed form of UPC-A. Both UPC-A and UPC-E encode 12-digit numeric values, but the UPC-E barcode is about half the size of an UPC-A barcode. Typically, the UPC-E barcode is used on small items, where an UPC-A barcode would not fit.

The nominal height for the UPC-E bar code is one inch. The reduced size is 80% of the nominal size.

PALETTES, STROKES AND FILLS

WORKING WITH THE COLOR PALETTES

The basic color palette is the Shop palette, which lists the color plates that are available for use on the workspace. The other palettes are designed as an aid for working with spot colors, particularly with respect to foils. By default, color palettes are docked at the edges of the EngraveLab workspace, as indicated in the following screenshot.
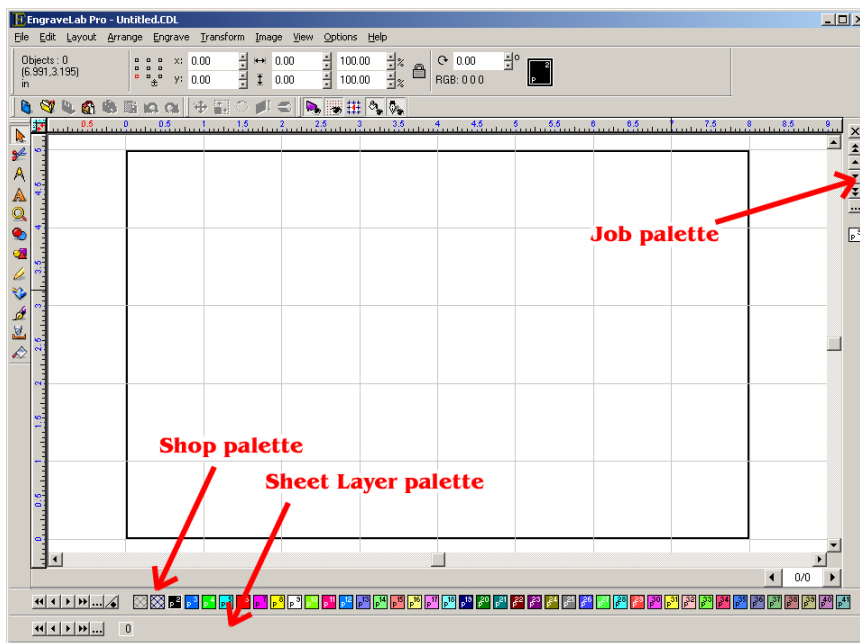
Though docked, a palette may be "undocked" by clicking-and-dragging the palette away from its docked position. The palette may then be said to be "floating" over the workspace. Alternatively, double-clicking a palette will toggle its position between docked and undocked.
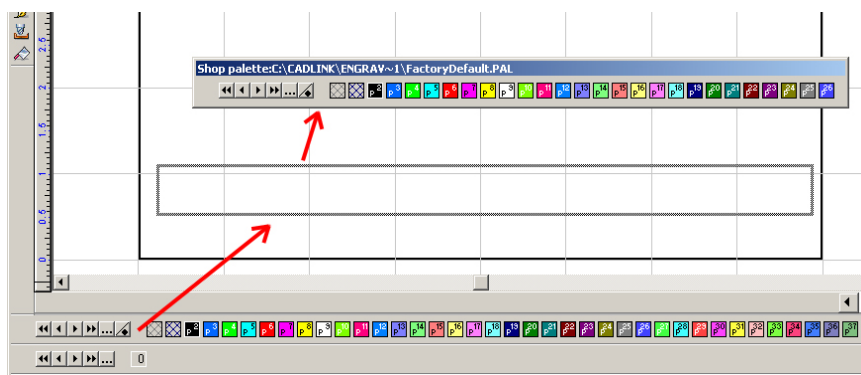
In addition, EngraveLab also has the functionality to open stand-alone **Manufacturer palettes**. Specific color plates may then be dragged from a manufacturer palette and added to the shop palette. In this manner, the Shop palette may be quickly customized to include the most frequently used color plates. Manufacturer palettes are discussed later in this chapter.

Shop palette

The default location of the **Shop palette** is along the bottom of the workspace, and it is commonly referred to as simply the **color palette**. The Shop palette contains all the color plates that are currently available for use on the workspace.

Left-clicking a color plate will set the default fill color for new shapes, as well as set the fill color of any currently selected shapes. To change a shape fill color without changing the default fill, color plates may be dragged-and-dropped onto a shape, as per the following steps:

1. Left-click and drag the color plate away from the shop palette.
2. As the cursor is moved, it will appear as if a small color plate were being dragged.
3. Hold the cursor over a workspace shape and release the mouse button.
4. The shape will now be assigned that color.

The following screenshots demonstrate this drag-and-drop operation:

| Click-and-drag a color plate | Dragging the plate | Release mouse button when cursor is over object |
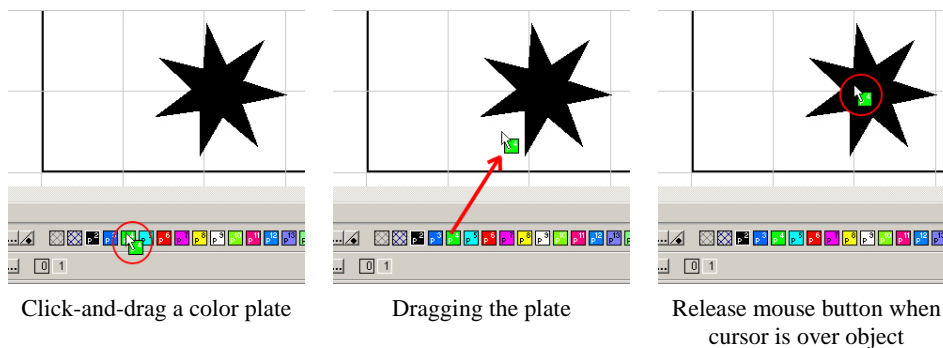
Changing the stroke color

Right-clicking a color plate will set the default line style color for new shapes, as well as set the line style color of any currently selected shapes. As with fill colors, color plates may be dragged-and-dropped onto the line style of a shape. When holding the color plate over the line style of a shape, the dragged color plate will appear to be hollow. This indicates that releasing the mouse button will change the line style color of the shape.

Dragging color plate. When over the shape line style, the plate appears hollow.

Release the mouse button, and the line style color is changed.
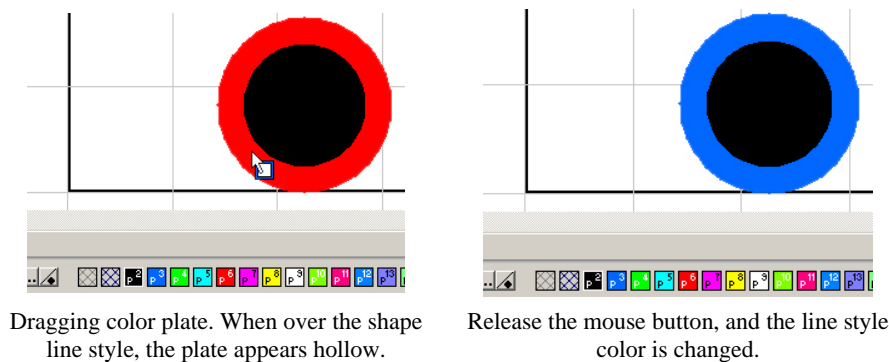
Note: By default, workspace shapes have no line style. For more information, please refer to the Line Style tool (later in this chapter).

Changing the order of color plates

To change the order of the color plates within the Shop palette, a given color may be dragged-and-dropped onto a different location of the palette. The color will be inserted at the new location, and colors to the right of that color will be shifted to the right.
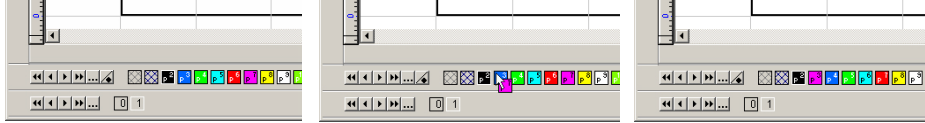
| Note the order of the color plates | Magenta plate is dragged-and-dropped into new location | Magenta plate is inserted in new location |

These basic rules for dragging-and-dropping plates also apply to the other color palettes. Special cases of this functionality will be discussed within the relevant sections.

Modifier Keys and Color Plates

When either left-clicking or right-clicking a color plate, additional functionality is available by holding the [Shift], [Control], or [Alt] keys. The following table summarizes these modifiers:

Action	Result
Left-click	Set fill color of current object
Right-click	Set line style color of current object
[Shift] + Left-click	Include all objects of that fill color in current selection
[Control] + Left-click	Disable the color plate. All objects with that fill color will appear as dashed outlines on the workspace.
[Alt] + Left-click	Disable all color plates, except for the plate that was clicked

For example, holding the **[Control]** key and clicking a palette color will toggle the "active" status of that color plate. Objects that have inactive colors will not be editable.

The Invisible Color Layer

At the far-left of the Shop palette is the **Invisible Color Layer**, which is used to indicate the absence of color for either an object fill or line style. The Invisible Layer may be applied to objects like a regular palette color.

When applied as a fill color, the object will be reduced to the sum of its thick line attributes, which is useful for creating cutting paths.

Where applied as a line style color, the object will effectively have no thick line attribute.

The Clear Color Layer

Next to the Invisible Layer is the **Clear Color Layer**. The Clear Color Layer is used to indicate that the shape will represent an area of the substrate that will not be applied with color. In effect, only the substrate color will be visible at that location.

The Line/Fill Selector Button

At the left of the Shop palette is the **Line/Fill Selector** button, which is used to toggle between **Fill** mode and **Line** mode.
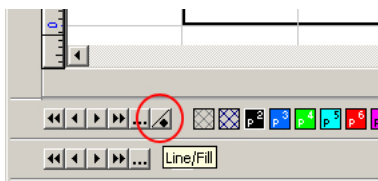
If the **Fill** mode is selected, then left-clicking a color plate will set the fill color of a selected shape, whereas right-clicking will set the line style color.

If the **Line** mode is selected, then left-clicking a color plate will set the line style color of a selected shape, whereas right-clicking will set the fill color.

This behavior is summarized in the following table:

Button	Mode	Left-click	Right-click
	Fill	Set the fill color	Set the line style color
	Line	Set the line style color	Set the fill color

The Halftone palette also has a **Line/Fill Selector** button, which operates in similar fashion for Knock Out, Overprint, Overlap, Primers and Halftones.

Color plate labels

Each plate on the **Shop Palette** is indexed according to the order of colors in the palette.
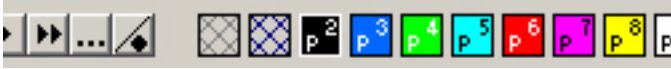
The visibility of these labels may be toggled using the **Show Layer Numbers** item from the palette context menu.
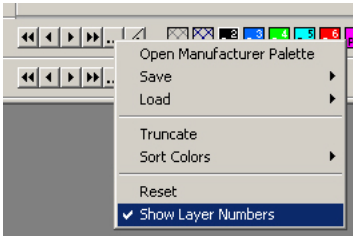
> *Note:* The display of color plate labels may also be toggled using the **Layers On / Off** option in the **General Preferences** dialog.

When an object is selected, its color plate is shown on the SmartBar, and the index number is visible within the plate.
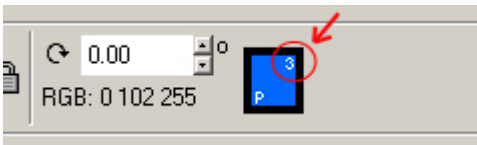
> *Note:* When cutting objects, the cutting sequence is determined by the database order. Exceptions to this order may be made by using the **Sort** dialog, or the **Cut by Color** feature.

In addition to the index, each plate displays a letter that identifies its color correction mode. The color correction will be applied when rendering the color. For more information, please refer to **"Editing a Color Plate,"** as discussed in the next section.

For the color correction mode, the possible letter designations are:

Letter	Name	Note
P	Process color	Use the Process option when process colors are being used (i.e. where CMYK colorants are combined to produce a given color).
S	Spot color	Use the Spot option where spot colors are being used (i.e. pure colorants are applied, rather than by combining proportions of CMYK). Foils are considered to be spot colors
C	Chart color	Use the Chart option where correction must be applied without affecting the hues.
A	Actual color	Use the color as it would appear without correction.

The letter designation is also visible from the SmartBar.
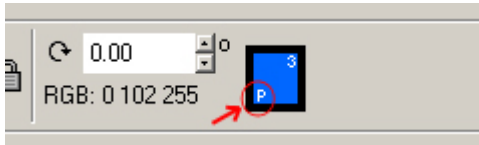
EDIT COLOR DIALOG

A color may be edited by double-clicking its color plate in the Shop Palette, which will open the **Edit Color** dialog.
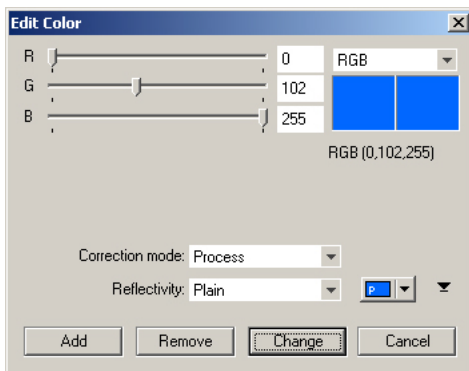
After edits have been made, clicking the **Add** button will create a new color plate. Alternatively, click the **Change** button to apply edits to the current color plate.

Color Models
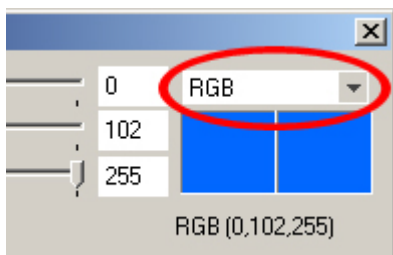
The **Color Model** may be chosen from the drop-list at the top-right corner of the **Edit Color** dialog. The choice of **Color Model** will determine the colorants used to define the color, as follows:

RGB

Red, Green and Blue (RGB) is commonly used in additive color mixing. For example, a computer monitor is designed to emit red, green and blue (RGB) light, which combines to form the desired color.

CMY

Cyan, Magenta, and Yellow (CMY) is commonly used in subtractive color mixing. This sort of mixing works on the principle that an external light source will be required to view the image, such as an image on a white sheet of paper.

CMYK

> **Cyan, Magenta, Yellow, and Black (CMYK)** is an extension of the CMY model, where it is observed that three equal portions of CMY colorants may be replaced with a single portion of **Black (K)** colorant.

HLS

> The **Hue, Lightness and Saturation (HLS)** model identifies colors according to the following parameters:

> - ➢ **Hue** is the visual perception of a specific color, such as red, yellow, violet, or yellow-brown.
> - ➢ **Lightness** is the appearance of a color in terms of how white or black it appears.
> - ➢ **Saturation** is the perceived richness of a color in consideration of its intensity. For example, as a color falls under increasing levels of shadow, the color appears darker, even though its saturation remains constant.

Color Sliders

The available **Color Sliders** will correspond to the chosen **Color Model**.

As the slider controls are used to modify the color attributes, the color preview will be shown next to the original color.
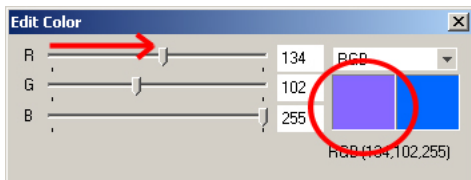
Below the color preview, the RGB equivalent of the color will be displayed. This is useful where the **Color Model** has been set to CMY, CMYK, or HLS.
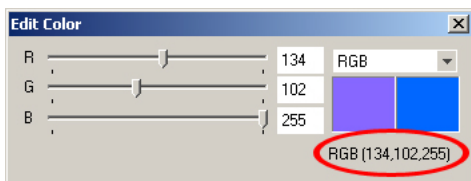
Correction Mode

Color correction refers to the use of color profiles that compensate for output differences that may occur due to a number of factors, such as the ink quality or the type of media. If no correction is applied, then the appearance of rendered colors may not be as expected. The following **Correction mode** options are available:

Process	Use the Process option when process colors are being used (i.e. where CMYK colorants are combined to produce a given color).
Chart	Use the Chart option where correction must be applied without affecting the hues.
Spot	Use the Spot option where spot or foil colors are being used (i.e. pure colorants are applied, rather than by combining proportions of CMYK).
Actual	Use the color as it would appear without correction.

Reflectivity

The **Reflectivity** can be described as being either Plain, Reflective, or Metallic. This setting is used to describe the type of vinyl that is being cut. Also, some spot colors may be described as being either reflective or metallic.

Additional Color Info

The additional information fields are used to indicate vendor-specific details about the colorant. These fields are accessed in the **Edit Color** dialog by clicking the **Expand** button.
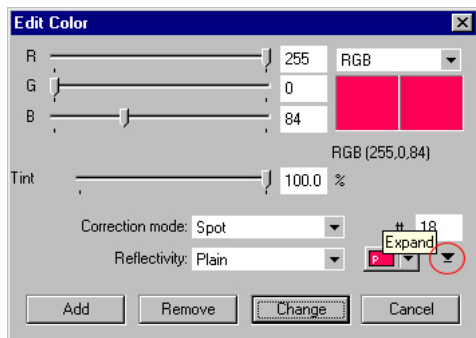
The additional information fields are used to indicate vendor-specific details about the colorant.
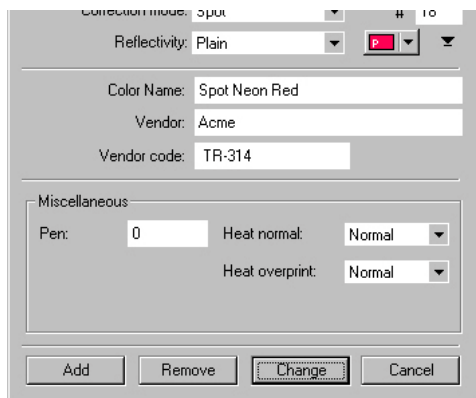
Spot color name

For identification purposes, note that a **Color Name** must be specified for spot (foil) colors.

Pen setting

Where multiple pens are available, the **Pen** field is used to indicate the index position that should be used with the given color.

Foil heat setting

The **Heat normal** and **Heat overprint** settings are used to specify the temperature at which an individual foil will be applied. The **Heat normal** setting is used when rendering shapes that have either the **Knock Out** or **Overlap** property. The **Heat overprint** setting is used for shapes that have the **Overprint** property.

> *Note:* Depending on the printer manufacturer, it may not be possible to vary the application temperature.

For more information about heat settings, please refer to **Heat Settings** under the **Global Overrides** tab.

SHOP PALETTE CONTEXT MENU

With the exception of the Manufacturer palettes, all of the color palettes have context menus that are accessed by right-clicking within the bounds of the palette. The context menus may also be accessed by clicking the context menu buttons that are on each palette.
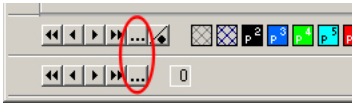
The context menu for the Shop palette appears as follows. The available menu items are described in the following sections.
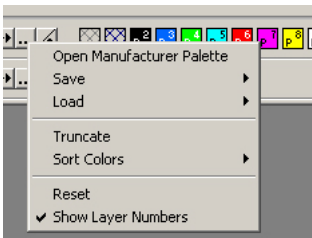
Open Manufacturer Palette

The manufacturer palettes are composed of commonly used color plates, which are stored in a Palette (.PAL) file format. More than one manufacturer palette may be open at once, and colors from different palettes may be applied to the workspace objects.

Color plates may be dragged from the manufacturer palette and "dropped" onto workspace objects. In so doing, the dragged color will be added as a new color plate at the far-right of the Shop palette. If the manufacturer palette is later closed, then the added color will remain as part of the Shop palette, which is then saved with the workspace file.

Color plates from a manufacturer palette may also be dropped onto the Shop palette, which will add a new color plate for that color at the far-right of the Shop palette.

Save

The Save flyout has two items: **Save As** and **Save default on exit**.
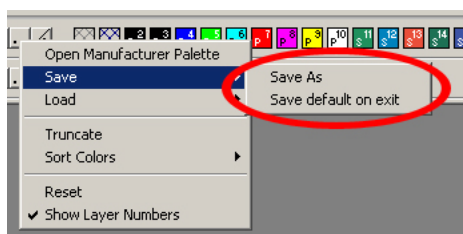
After a custom palette has been prepared with frequently used color plates, use the **Save As** item to save the palette for later use.

The **Save As** command it used to save the current Shop palette settings as a new Palette (.PAL) file. Typically, saving the Shop palette is desirable after it has been customized with commonly used color plates. The saved palette may then be opened like a manufacturer palette, or it may be set as the default palette that is loaded with each new EngraveLab workspace.

If the **Save default on exit** item is enabled (a checkmark should appear next to the item), then all changes to the Shop palette will be saved when EngraveLab is shut down. For example, choosing Exit from the File menu will cause the palette settings to be saved.

> *Note:* Creating a new EngraveLab workspace will not cause the palette settings to be saved. Instead, use the **Save As** command to save such settings before creating a new workspace.

Load

The Load flyout has four items: **New**, **Merge**, **Set default**, and **Load default at startup**.
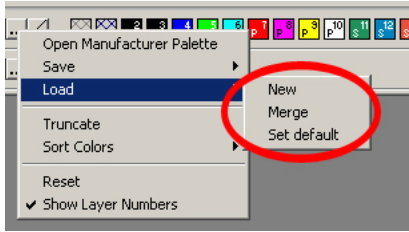
The **New** item is used to load a Palette file (.PAL), which will replace the current Shop palette configuration.

The **Merge** item is used to select an existing Palette (.PAL) file, which is then appended to the Shop palette. Use this command to combine the color plates of two-or-more commonly used palettes.

When EngraveLab is launched, a standard palette is loaded that has a selection of commonly used process colors. Use the **Set default** item to specify an alternate palette that should be loaded instead of the standard palette. For example, the default may be set to a custom palette that was previously saved.

> *Note:* After installation, EngraveLab will use the "Factory Default.pal" file.

Truncate

The **Truncate** command will remove all color plates that are to the right of the currently selected color plate, with the exception of any colors that are currently being used on the workspace.

Sort Colors

The **Sort Colors** flyout is used to rearrange the Shop palette color plates.
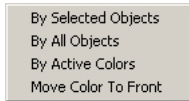
By selected objects	For the given selection of objects, their color plates will be shifted to the left of the Shop palette.
By all objects	Colors that are currently being used on the workspace will be shifted to the left of the Shop palette.
By active colors	Inactive colors are shifted to the right of the Shop palette.
Move Color To Front	Select from list of color plates that has been arranged alphabetically. The selected color is moved to the front of the Shop palette.

Reset

The **Reset** option will reload the Shop palette, discarding any changes that may have been made to the color plates. The standard Shop palette will be loaded, unless it has been specified that a default palette should be loaded (see **Load default at startup**, earlier in this section).

By using the **Reset** option, the original palette colors may be restored without deleting the objects that are currently on the workspace.

Show Layer Numbers

The **Layer Numbers** refer to the Shop palette color plates, where each color plate is assigned both an index number, as well as a letter designation that indicates the correction mode for that color. If the **Layer Numbers** option is set to **Off**, then the index numbers and letter designations are hidden.

SHEET LAYER PALETTE

The workspace area is a visual display of the shapes and text that have been prepared for printing and/or cutting. A **Sheet Layer** is a subset of the workspace, where EngraveLab can maintain multiple sheet layers within the same workspace. If only one layer exists, then all shapes and text will belong to that layer. Where more than one sheet layer is available, shapes and text may belong to different layers.

When sending output to a device, a given layer may be specified, such that only the objects on that layer are output.

Placing objects on layers

By default, shapes are placed on sheet layer 0 (zero). The following screen shot shows a workspace where there are three layers present.
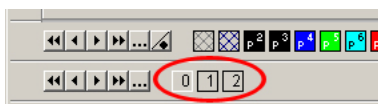
For selected objects, clicking a layer plate will place those objects on the layer. Alternatively, an object may be assigned to a layer as follows:

1. Left-click and drag the layer plate away from the Sheet layer palette
2. A small square will appear to be dragged by the cursor
3. Hold the dragged square over a workspace shape, and then release the mouse button
4. That shape will now belong to the given layer

| Click-and-drag a plate from the sheet layer palette | Dragging the plate | Hold plate over workspace object and release mouse button |
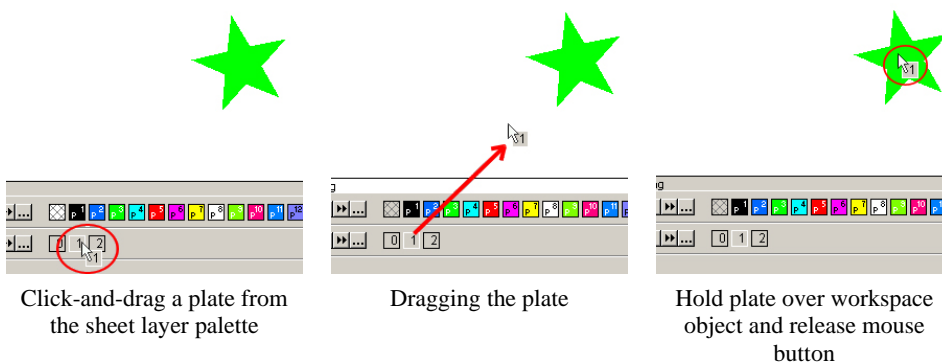
Selecting All Shapes on a Layer

All shapes on a given sheet layer may be selected by holding the **[Shift]** key and left-clicking the layer plate. The shapes will be added to the current selection.

Disabling Sheet Layers

A sheet layer may be disabled by holding the **[Control]** key and left-clicking the layer. The layer plate will be superimposed with a hatch pattern, and all objects on that layer will become hidden on the workspace.
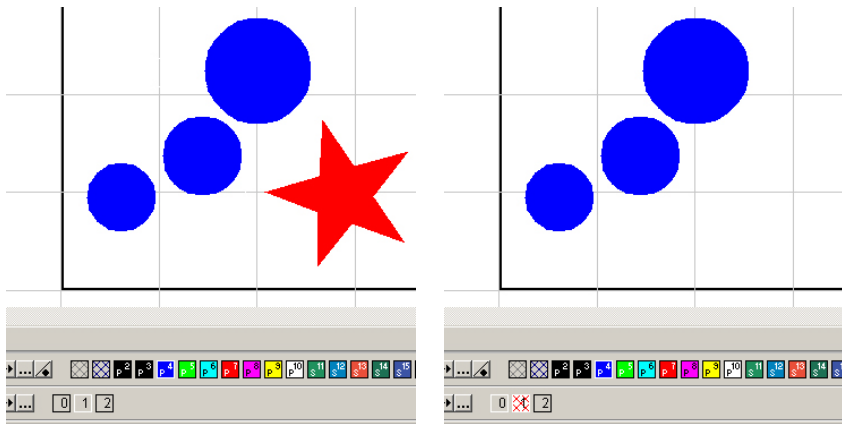
A star on layer 1, and three circles on layer 2.

After Control-clicking the layer 1 plate, the layer becomes disabled. Notice that the star is no longer visible.

For a disabled sheet layer, holding the **[Control]** key and left-clicking that layer will enable it again.

Sheet Layer Properties

The properties for a sheet layer may be edited by double-clicking the sheet layer plate. The **Sheet Layer** dialog will open.
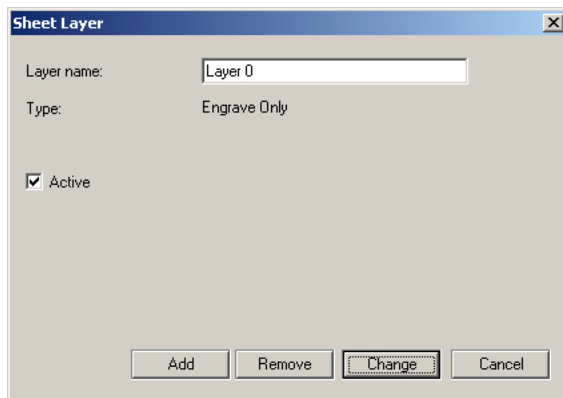
Active

The **Active** option specifies whether this sheet layer is enabled or disabled. This option is an alternative to Control-clicking the layer, as described in the previous section.

Type

The Type of layer is "Engrave Only."

Highlight selected objects

For shapes that are on a "Engrave Only" layer, those shapes will be given a **red** highlight. These highlights are intended as a quick visual cue to confirm the nature of a given shape. However, to enable or disable these highlights, use the **"Highlight selected objects"** option on the **Selection Settings** dialog.
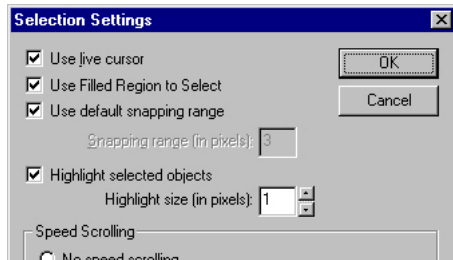
JOB PALETTE

By default, the Job palette shows the **Color view**, which lists all the color plates, primer colors and halftones that are currently in use on the workspace.
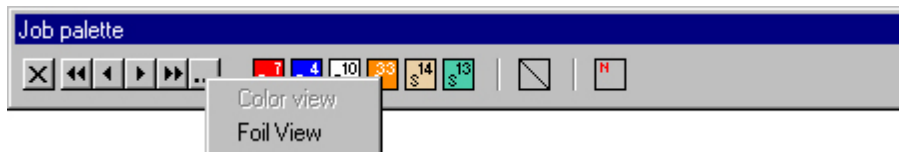
Using the context menu, selecting the **Foil view** will display only the spot colors that are currently in use on the workspace. This serves as a quick summary of the foils that will be used when rendering the job.

LINE STYLE TOOL

The **Line Style** tool is used to apply a "thick line" effect to workspace shapes.

When a shape is selected, the color of its line style is visible in the SmartBar. For example, the following screenshot of the SmartBar shows that the current fill color is blue (process color plate 2). The red outline around the blue square indicates that the line style color is red.
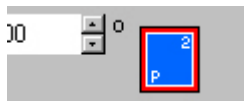
To change the line style color for a shape, right-click a color plate in the Shop palette.

> *Note:* For more information about changing colors, refer to the Shop palette, described earlier in this chapter.

In cases where workspace shapes should have thick line styles, but none are visible, verify that the **Show Line Style** option is active (under the **View** menu).
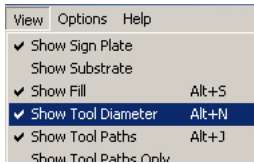
To add a line style to a selected shape, choose **Line Style** from the **Stroke and Fill Tools** flyout.

At the far-left of the SmartBar, the type of line style may then be selected. The available line styles are summarized as follows:

Button	Line Style	Comment
	No line	Removes any previously applied line style.
	Hairline	Creates a 1-pixel wide line. This line cannot be cut, but it may be applied as a line stroke.
	Thick Line	This is initially zero, so the line will not be visible until the Thickness field is incremented.

At the far-right of the SmartBar, the color picker may be used to select the line style color. In addition, left-clicking a Shop palette color will also change the line style color.

For the Thick Line attribute, parameters of the line may be set from the SmartBar.

Line Above

By default, a thick line will actually overlap the contour of the shape. If the **Line In Front** option is enabled, then the line style will partially obscure the shape. Alternatively, 0the **Line Behind** option will cause the line style to be partially obscured by the shape.

	Line In Front	The line style will appear as if it were above the shape.
	Line Behind	The line style will appear as if it were below the shape.
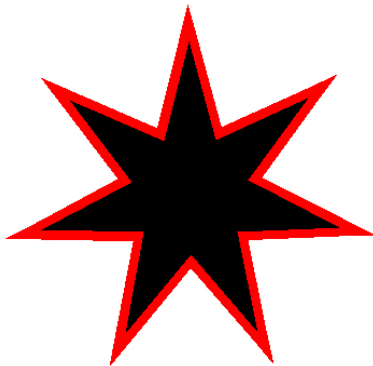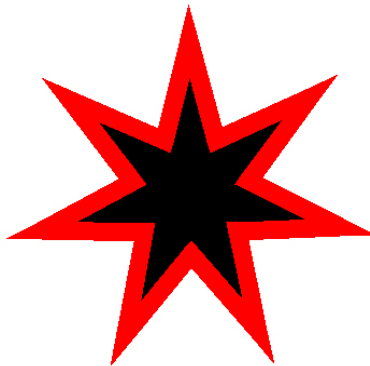
Star with line behind the shape. | Star with line in front. Note that the star shape is partially obscured by the line style.

End Styles

There are three different line styles, which are used to modify the termination of open paths:

	Butt End cap	The line style will extend only to the end of the open path.
	Extended End cap	Create square end caps as terminators for an open path.
	Round End cap	Perform rounding of open paths.

Corner Styles

There are three corner styles:

	Sharp corner	Corners retain sharp angles as per the base object.
	Round corner	Corners are rounded.
	Mitre corner	For a sharp corner of the original object, the corner formed by the line style may be quite steep. Use the **Mitre Amount** to clip the line style according to a percentage of the line thickness.
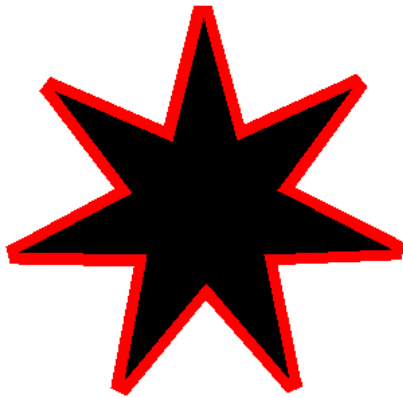
Star with line behind the shape. The Mitre Amount has bee set to 100% of the line thickness.

Cutting Thick Lines

When a shape with a thick line style is sent to be cut, the shape is effectively rendered as two objects (the shape as it is without a line style, and the line style itself). As such, there are two methods in which the shape and line style may be cut:

➢ Both the shape and its thick line style may be cut as separate objects, such that the original contour of the shape is not changed. This is useful because it helps to eliminate registration problems that might occur.

➢ Cut the thick line as shown, but only cut the shape where it is not obscured by the thick line. However, if the line style is "in front" of the shape, then there is a risk of a registration error (i.e. where the shape does not line up precisely with the line style).

When jobs are sent for cutting, the presence of thick lines will open the following prompt:
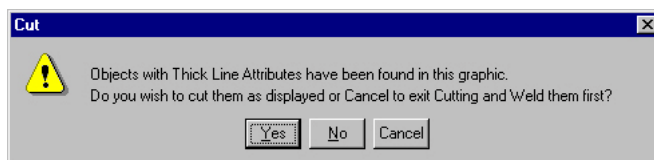
Select **Yes** to cut the thick lines without diminishing the size of the original contour.

Select **No** to send the job, though thick lines will ignored.

If **Cancel** is selected, then EngraveLab will return to the select state. At this point, it is possible to select the shape and perform a weld operation, which will convert the thick line style into a shape that is separate from the original shape.

ENGRAVELAB WORKSPACE

WORKSPACE ELEMENTS

The EngraveLab workspace is arranged to simulate a working area, where the sign plate can be set as a visual cue of the available space for the sign or cutting area.
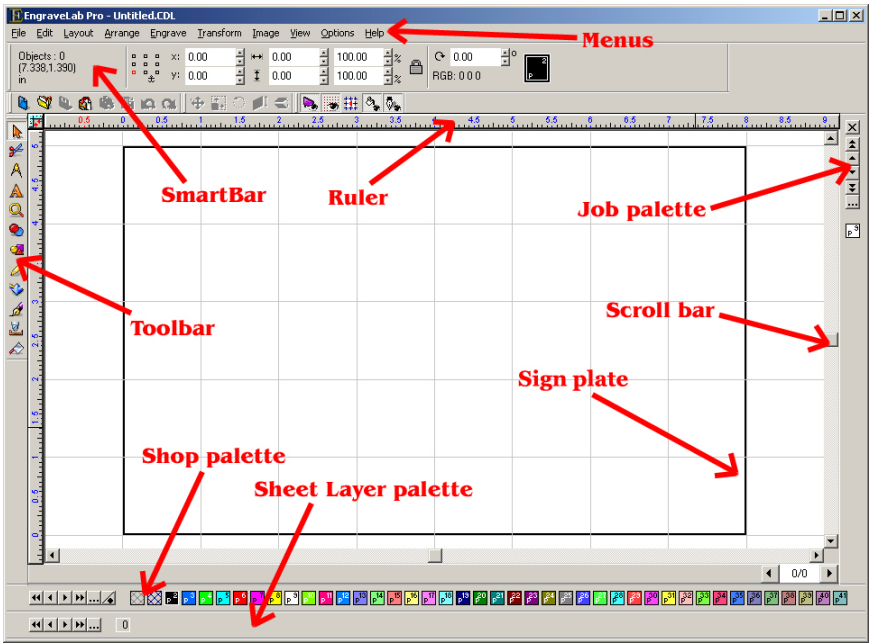
The basic display of workspace objects may be modified from the **View** menu.
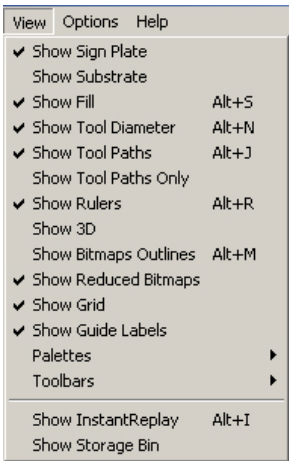
The View menu items are summarized as follows:

Show Sign Plate	Show an outline that visually represents the dimensions over which the cutting tool will have free range.
Show Substrate	Set the sign plate color according to the substrate color, as indicated by the currently selected Sheet Layer plate. When the Show Substrate option becomes disabled, the sign plate color will be reset to white.
Show Fill	Toggle the use of wireframes to improve the screen refresh time.
Show Tool Diameter	For a shape that has been applied with a tool path, toggle the display of the tool diameter. Also toggles the display of line styles.
Show Tool Paths	For a shape that has been applied with a tool path, toggle display of the tool movements.
Show Tool Paths Only	Hide all workspace objects except for tool paths.
Show Rulers	Toggle the display of workspace rulers.
Show 3D	Simulate cutting depth by creating an on-screen 3D effect. Please refer to following section for more information.
Show Bitmap Outlines	Display outlines in place of bitmaps in order to improve the screen refresh time.
Show Reduced Bitmaps	For display purposes only, reduce the color depth and resolution of bitmaps. This will improve the screen refresh time.
Show Grid	Toggle the display of grid lines.
Show Guide Labels	Toggle the display of guideline labels.
Palettes	Choose the color palettes that are visible.
Toolbars	Choose the custom toolbars that are visible.
Show InstantReplay	Show the InstantReplay window.
Show Storage Bin	Show the Storage Bin window.

Show 3D

The **Show 3D** option applies to any shape that has been applied with a tool path, where the effect of a 3D tool depth will be created on the workspace. To use **Show 3D**, the **Show Tool Paths** option must also be enabled.

When a tool path is selected, the **Depth** field will be displayed at the far-right of the SmartBar.
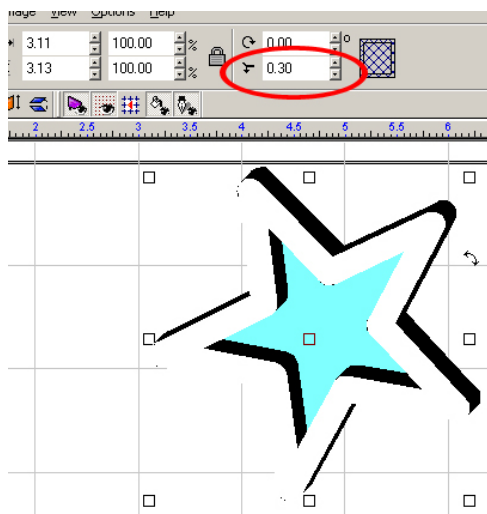
PLATE SIZE

The plate size is a visual representation of the area that is available for printing and/or cutting. The **Plate Size** dialog is used to customize the dimensions and orientation of the sign plate. In this fashion, the spatial arrangement of workspace objects may be verified prior to beginning a print or cut job.

The **Plate Size** dialog is accessed by choosing **Plate Size** under the **Layout** menu.
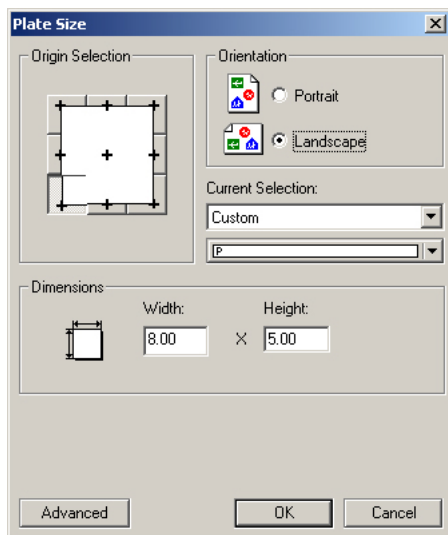
Origin Selection

The **Origin Selection** is used to indicate the zero position of the sign plate. By default, the zero position is set to the lower-left corner of the plate.

Orientation

The **Orientation** refers to the rotation of the plate size (i.e. the document orientation). This **Orientation** is independent of the page size orientation that is used when printing.

Current Selection

The **Current Selection** drop-list is used to choose the size (width by height) of the sign plate. If the **Custom** size is chosen, then the **Width** and **Height** fields may be entered.

Below the drop-list is the default color of the sign plate. When a new workspace is created, the sign plate will default to this color.
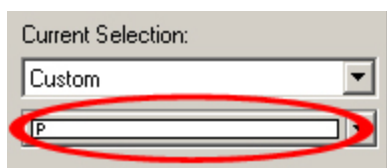
> *Note:* When the **Show Substrate** option is disabled, the sign plate will default to white instead of using the default **Plate Size** dialog setting. This is a special case that is intended to prevent potential confusion when working with substrate colors.

Dimensions

Displays the current dimensions of the sign plate. If the **Landscape** option is enabled, then these values will be swapped (i.e. height by width).

Advanced Settings

Click the **Advanced** button to toggle the display of advanced plate size controls. These controls are used to create a plate size that can be added to the **Current Selection** drop-list.
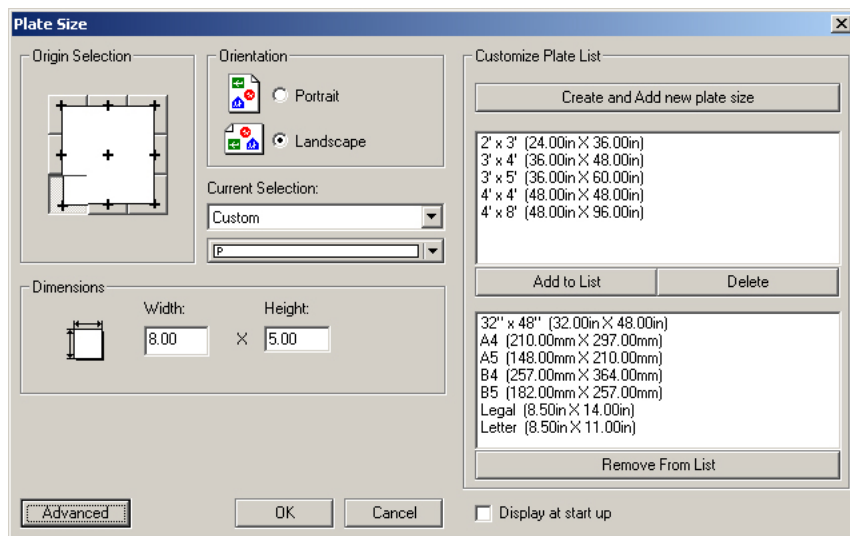
The advanced controls have two lists of plate sizes. The top list contains plate sizes that have yet to be added to the **Current Selection** drop-list. The bottom list contains plate sizes that are available in the **Current Selection** drop-list.

Create and add new plate size

If the "**Create and add new plate size**" button is clicked, then the advanced plate size controls will be temporarily replaced with controls for entering the new plate size.

After entering the **Name**, **Width**, **Height**, and **Units** for the new plate size, click the **Add New Plate** button. The plate size will be added to the bottom list of plate sizes (i.e. it will be available from the **Current Selection** drop-list.
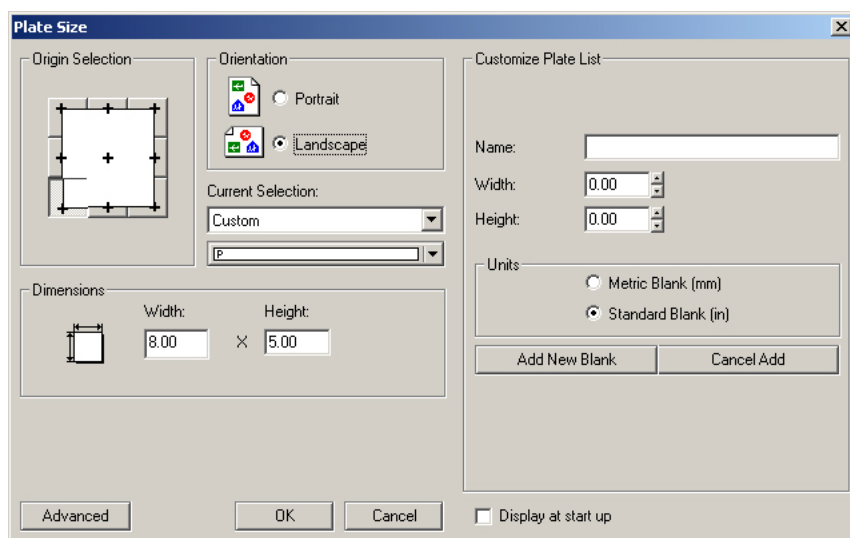
Add to List

For a selected plate size in the top list, click the **Add to List** button to include the plate size in the bottom list (i.e. add the plate size to the **Current Selection** drop-list).

Delete

For a selected plate size in the top list, click the **Delete** button to remove the plate size.

Remove From List

For a selected plate size in the bottom list, click the **Remove From List** button to remove the plate size (i.e. remove it from the **Current Selection** drop-list). However, the plate size will remain available in the top list.

Display at start up

If the **Display at start up** option is enabled, then the **Plate Size** dialog will open when a new workspace is created.

SIGN PLATE OBJECT

The **Sign Plate Object** menu item will create a shape that has the same dimensions and coordinates as the plate size. The newly created shape will be placed at the bottom layer order, such that is will appear under other workspace shapes.

ZOOM TOOLS

By pressing the **F8** function key, the current workspace view will return to the sign plate. The zoom functions are summarized as follows:

🔍	**Zoom In**	[F5]	Focus on marquee drawn by cursor. Right-click to zoom out.
🔍	**Zoom Out**	[F6]	Display more area of the workspace.
	Zoom In	[Shift+F6]	Alternative method to focus on workspace area.
🔍	**Zoom to Selected Object**	[F7]	Fit the viewing area to the selected objects. If no objects are selected, then fit to all objects.
🔍	**Zoom to Plate**	[F8]	Fit the viewing area to the sign plate.
🔍	**Zoom to Previous View**	[F9]	Toggle between the current and previous zoom levels.

ORDER OF WORKSPACE OBJECTS

Though objects are usually edited in terms of their width and height, workspace objects also have a layering order that determines whether an object will appear to be on top of another object. The order of individual objects may be modified using the following commands:

To Front	[Ctrl + F]	Position the selected object before all other objects
To Back	[Ctrl + B]	Position the selected object behind all other objects
Forward	[Ctrl + U]	Increase the relative position of the object
Backward	[Ctrl + L]	Decrease the relative position of the object
Reverse	[Ctrl + M]	Invert the relative order for a group of selected objects
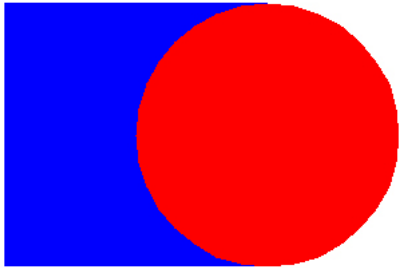
Circle has a **higher** layer order than the square
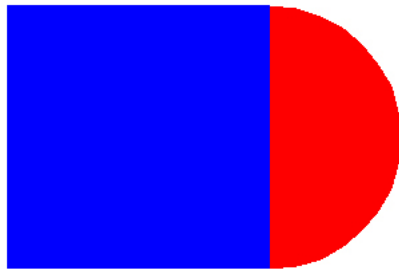
Circle has a **lower** layer order than the square

CUSTOM TOOLBARS

Toolbars may be customized by right-clicking any of the toolbars. These customize controls are also available from the **Toolbars** flyout (**View** menu).
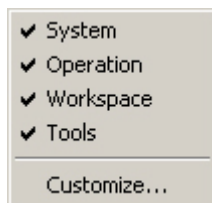
Customize

When a new toolbar has been created, the **Customize Toolbar** dialog is used to add, remove and rearrange the available commands.
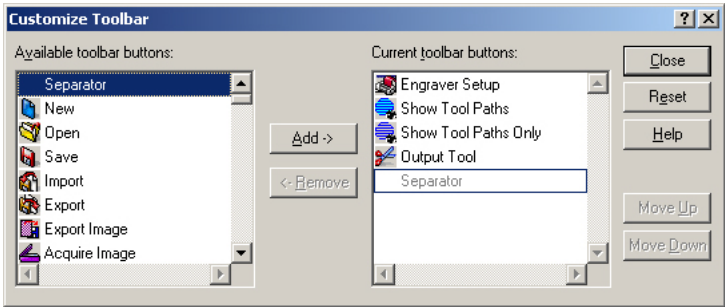
The **Customize Toolbar** controls are described as follows:

Available Toolbar Buttons	This list displays the buttons that are not currently on the **Customizable Tool Palette**. To add a button to the palette, first select the button from this list, and then click the **Add** button.
Add	To add a button to the Customizable Tool Palette, select a button from the "Available toolbar buttons" list, and then click the **Add** button.
Current Toolbar Buttons	This list displays the buttons that are currently on the Customizable Tool Palette. To remove a button from this list, first select the button from this list, and then click the **Remove** button.
Remove	To remove a button from the **Customizable Tool Palette**, select a button from the "Current toolbar buttons" list, and then click the **Remove** button.
Close	Click the **Close** button to exit the **Customize Toolbar** dialog.
Reset	The Reset button returns the **Customizable Tool Palette** to the settings that were in effect when the **Customize Toolbar** dialog was opened.
Help	Press the **Help** button to access the On-line Help.
Move Up	To increase the priority of a button, first select that button in the "Toolbar buttons" list, and then click the **Move Up** button.
Move Down	To decrease the priority of a button, first select that button in the "Toolbar buttons" list, and then click the **Move Down** button.

SMARTBAR CONTROLS

By default, the **SmartBar** is docked at the top of the workspace, where it displays information about the currently selected objects.
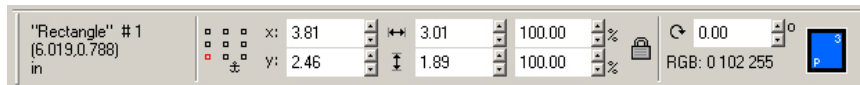
Objects Selected

The selected object is listed at the far-left of the SmartBar. If only one object is selected, then the object type will be listed, as well as the layer upon which it exists.
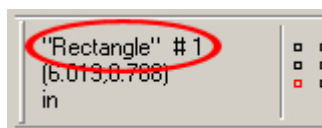
If several objects are selected, then the number of objects will be displayed.

Object Anchors

As discussed earlier, selected objects have nine square nubs that are used for moving, scaling and resizing. These nubs are also represented in the SmartBar:
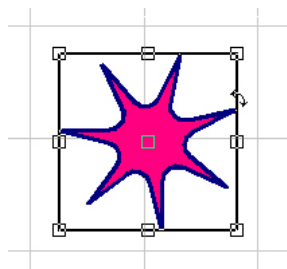
Selected object   **Anchor controls**

The highlighted nub in the SmartBar indicates the coordinates of that object on the workspace. For example, clicking the lower-left nub in the SmartBar will indicate that objects should be resized with respect to their lower-left corners.

If the anchor nub is clicked in the SmartBar, then a small, "anchor" icon will appear with selected objects. Though the mouse can drag the anchor to a new location, the anchor is intended to be used with the coordinate fields on the SmartBar. By entering new coordinates on the SmartBar, the anchor will move to the new location, and the selected object will move with respect to the anchor.

As an example, suppose that an intricate image contains a component that must be placed at an exact location of the workspace. Therefore, place the anchor on top of that component. Changing the coordinates on the SmartBar will then place the image correctly.

X & Y Coordinates of Mouse/Cursor

Below the Objects Selected field, the X and Y coordinates of the cursor are displayed, as well as the current units of measurement that are being used on the workspace.
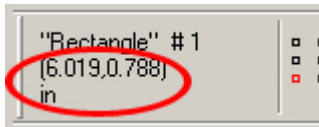
Object Coordinates

The X and Y fields display the coordinates of the selected object.
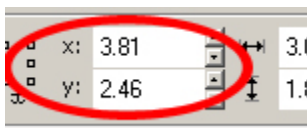
These coordinates may be changed by either dragging the object with the mouse, or by entering a new value in one of the fields. If entering new data in a field, then the data will not be accepted until the Enter key is pressed.

Object Width and Height

The Width and Height fields display the size of the selected object.
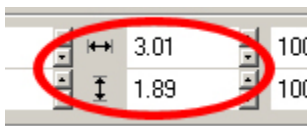
These dimensions may be changed by either resizing the object with the mouse, or by entering a new value in one of the fields. If entering new data in a field, then the data will not be accepted until the Enter key is pressed.

Object Scale

The Object Scale fields are used to resize the object as a percentage of its original dimensions.
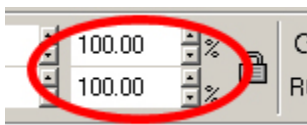
The Object Scale arrows will resize the object in 5% increments. Alternatively, the scale may be changed by entering a new value in one of the fields. If entering new data in a field, then the data will not be accepted until the Enter key is pressed.

Aspect Ratio

When an object is either resized or scaled, the Aspect Ratio button may be maintained by activating this button:
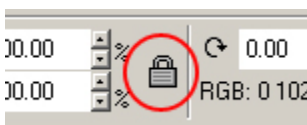
Rotation

The Rotation field indicates the degrees through which the object will be rotated.
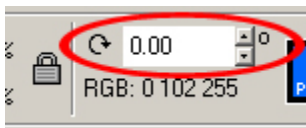
The Rotation arrows will rotate the object in 15 degree increments. Alternatively, the rotation may be changed by entering a new value in the field. If entering new data in the field, then the data will not be accepted until the Enter key is pressed.

Object Color

At the far-right of the SmartBar, the fill and stroke color for the selected object is displayed. If no object is selected, then the default fill and stroke colors are displayed.
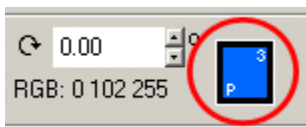
SCROLLING AND PANNING

The scroll bars along the vertical edge and along the bottom of the screen allow for viewing sections of the graphic not currently in the viewing window.

Vertical/Horizontal Scroll Bars

Scroll Bars are used to scroll the current viewing window to view another part of the image on-screen. This is very useful when using a zoomed-in view of the image.

Scroll Bar Arrows

Clicking on a scroll arrow causes the viewing window to move in the direction indicated by the arrow. This will have the appearance of moving the graphic in the opposite direction a short distance. This distance is approximately 1/10 the width or height of the view screen, depending on whether you are moving the view screen vertically or horizontally.

> *Keyboard Shortcut:* Press the **[Control]** key and the appropriate arrow key to move the view screen as a scroll arrow was pressed.

Scroll Bar Elevators

Clicking on a Scroll Elevator causes the viewing window to move in the appropriate direction a large distance. The distance moved is approximately equal to 1/3 the width or height of your view screen, depending on whether you are moving your view vertically or horizontally.

> *Keyboard Shortcut:* Press the **[Control + Shift]** keys, and the appropriate arrow key simultaneously to cause the view screen to behave as if a scroll arrow was pressed.

Scroll Bar Thumb

Dragging a scroll bar thumb within the scroll bar causes the viewing window to move in the direction of the thumb in very large movements. How far the view screen actually moves depends on how far the thumb is moved within the scroll bars. When deciding how far to drag the scroll thumb, be aware that the ends of the scroll bar represent the outer edges of the file on screen.

GUIDELINES

A guide is a vertical or horizontal reference that is used for placing objects. To create a guideline, right-click on the desired ruler location. Objects will then "snap" to the location as they pass over the guideline.

Note: As many as sixty guidelines in either direction can be displayed on the screen.

Guidelines may be edited by either right-clicking the workspace, or accessing the **Guides** flyout (**Options** menu).

As an example, the following steps will create a guideline between two points:

1. Right-click the workspace to open the **Edit Guides** dialog
2. Set the guideline orientation to diagonal
3. Choose **"2 points"** from the drop-down list
4. Set the coordinates for both **Point 1** and **Point 2**
5. Click the **Add** button

The resulting guideline will pass through the indicated points.
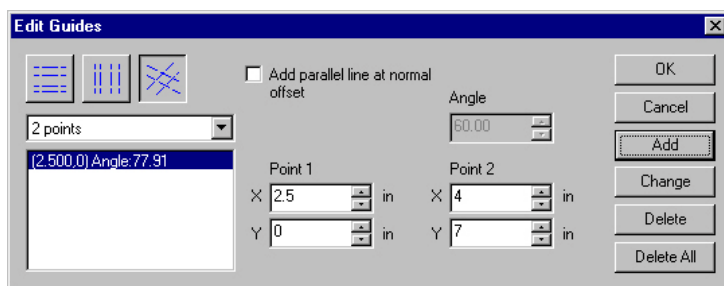
From the workspace, the following commands may be used:

➢ Hold the **[Control]** key to constrain the guideline to the nearest ruler increment.
➢ To place guidelines on the bounds of an object, hold the **[Shift]** key while clicking one of the object nubs.
➢ Guidelines may be created for nodes when node editing either polyarc or polygon objects.
➢ To remove a guideline, hold the **[Shift]** key while right-clicking the guideline.

ALIGN PALETTE

Holding the **[Control]** key while right-clicking on the workspace will display the **Align Palette**, which provides tools for aligning objects with respect to the grid lines. Typically, these tools are applied to an object nub, though they may also be used when node editing.

	Set Origin	Set the grid origin to selected location.
	Resize grid	Resize the grid increments based on the distance between the selected location and the grid origin.
	Snap to Grid Intersection	Move the object, such that the nub is at the nearest grid intersection.
	Snap Vertically	Move the object, such that the nub is at the nearest horizontal grid line.
	Snap Horizontally	Move the object, such that the nub is at the nearest vertical grid line.

If necessary, the origin may be reset by choosing **Reset Origin** from the **Options** menu.
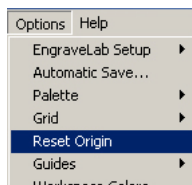
The **Grid Size** may also be set from the **General Preferences** dialog.

WORKSPACE OPTIONS

All the preferences settings for the EngraveLab workspace are available from the **Options** menu.
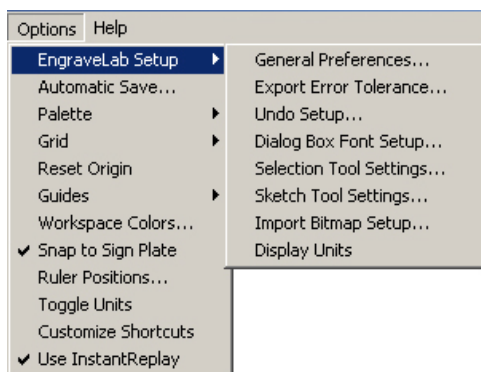
General Preferences

The **General Preferences** dialog contains basic workspace settings that are generally common to all features.
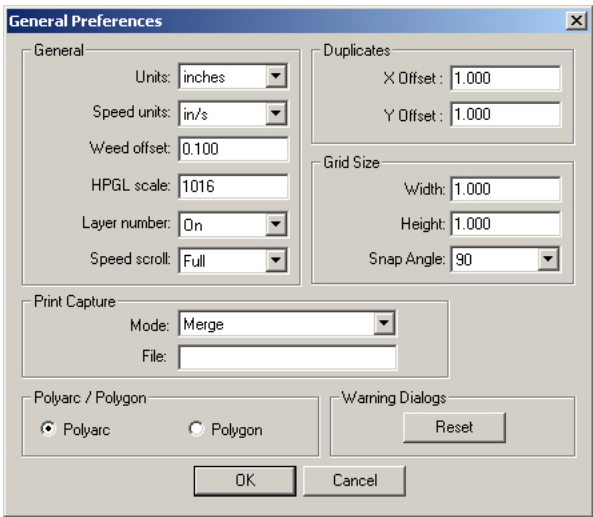
General

Units

Unless otherwise specified, the **Units** set here will be used throughout the EngraveLab workspace and features. Clicking on the workspace rulers may also be used to change the units.

Speed Units

If the **Engraving** module is installed, then the **Speed Units** are used to specify feed and plunge rates for tool paths.

HPGL Scale

Set the **HPGL Scale** to the desired plotter resolution. In the majority of cases, the required setting will be 1016. However, consult the manufacturer specifications to verify the required value.

Layer Number.

The **Layer Number** toggles the display of color plate numbers.

Speed Scroll

If **Speed Scroll** is active, then dragging over the workspace edges will scroll the workspace.

Off	Disable speed scrolling
Object Move	Only perform speed scrolling when dragging an object.
Full	Perform speed scrolling when dragging an object, or when dragging a marquee.

Duplicates

When using the **Duplicate** command (**Edit** menu), the **Offsets** specified here will be used to place the new object with respect to the original.

Grid Size

The grid dimensions are set here. The **Snap Angle** is used when the **[Control]** is held during certain operations, such as when editing line segments and corners.

Print Capture

The **Print Capture** function is used to import output files from third party applications into EngraveLab. Output files are originally intended for an output device such as a printer or plotter, and are created in the third party software by printing or plotting to file, rather than exporting, as some software packages have no facility to export files. There are two options that must be set in order for Print Capture to work properly.

Mode

This option determines whether a file captured using Print Capture will replace the existing file on the EngraveLab view screen as a New File, or be Merged with the existing file on screen.

File

The File option specifies the path or destination and name of the file being printed or plotted from a third party application. The entry in this box will assume the EngraveLab directory if none is specified. To use Print Capture, the third party software must be configured to print to a PostScript printer, or plot to a HPGL plotter. The output of this driver must be sent to file.

> *Note:* It is important to use an .EPS extension for the PostScript files and a .PLT extension for HPGL plot files. Without the proper extension, EngraveLab will not recognize the file format.

Polyarc / Polygon

The **Polyarc/Polygon** setting indicates the type of shape that is produced by certain features, such as welds, shadows, or outlines

Warning Dialogs

Throughout EngraveLab, warning dialogs are used to allow a new user to consider pertinent details before continuing with an operation. As a user becomes more proficient with a given operation, that user may choose to disregard further warning dialog for that operation. A warning dialog may be disregarded by clicking its "Do not show this dialog box in the future" option. However, if another new user begins to use EngraveLab, the **Reset** button will force all warning dialogs to be shown during operations.
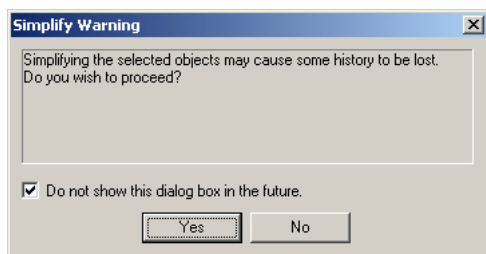
Other Options and Preferences

The following sections describe options for which their purpose may not be readily apparent.

Export Error Tolerance

When exporting a file from EngraveLab, the resulting file sometimes contains a very large number of nodes. This is especially true of artwork that was originally imported from another software. As a solution, EngraveLab files can be exported using a certain tolerance level. This will make the exported artwork smoother, as well as substantially reduce the number of required nodes.
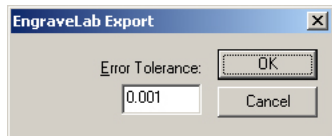
The Error Tolerance is specified in the current workspace units. We caution against a high Error Tolerance value, since this may introduce distortions of the exported objects. Generally, the default values (0.001 or 1/1,000 of an inch) will work very well with most files.

Undo Setup

The **Undo Setup** dialog is used to limit the resources that are used for storing Undo operations. Limiting the resources can prevent the loss of system performance that could occur when large quantities of image data are on the Undo stack.
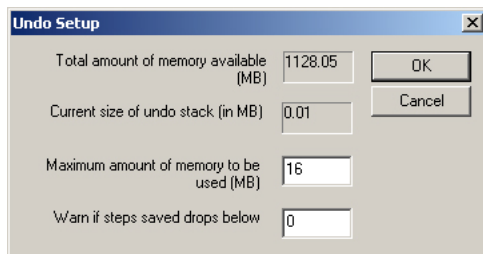
Dialog Box Font Setup

The **Font Settings** dialog is used to specify the font type and point size that are used in EngraveLab dialog boxes.
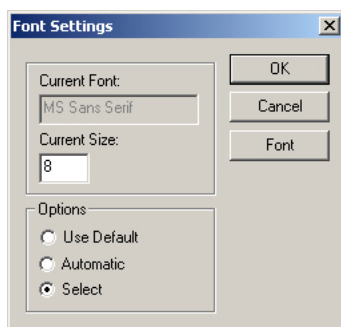
Use Default	Indicates that the standard Windows font should be used.
Automatic	Chooses the most appropriate font to be used.
Select	Enables the dialog font to be chosen.

Selection Tool Settings

The **Selection Settings** determine the workspace behavior when shapes are selected and moved using the cursor.
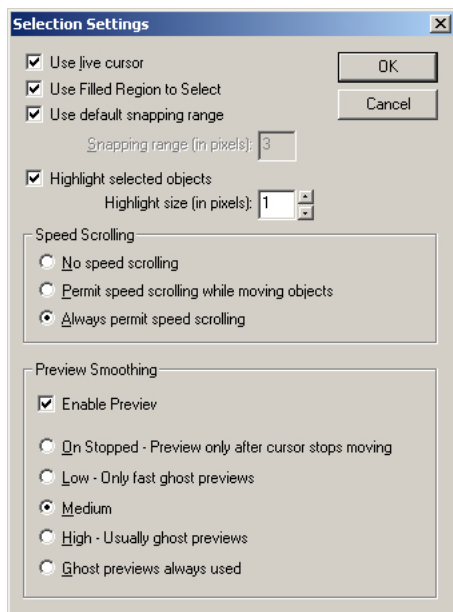
Use Live Cursor

The **Live Cursor** will recognize when it passes over an object. Note that EngraveLab must be restarted for changes to this option to take effect.

Use Live Cursor (off)	**Use Live Cursor (on)**
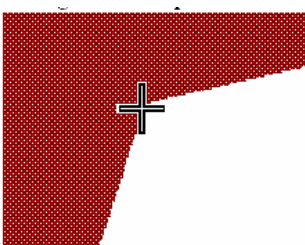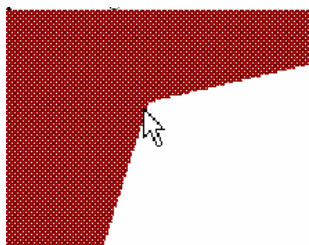
Use Filled Region to Select

By default, clicking within the filled region of a shape will cause that shape to become selected. However, this may not be desirable where a complex workspace has multiple overlapping shapes. If the **"Use Filled Region to Select"** option is disabled, then a shape may then only be selected by clicking the edge of that shape.

Use default snapping range

The **Snapping Range** determines how close a mouse click must be before it snaps to the nearest grid or line. The default range is three pixels, though a custom range may be set.

Highlight selected objects

The **Highlight selected objects** option is used to draw a Highlight Border around selected objects. The **Highlight size** field may be used to make the highlight more prominent.

Speed Scrolling

If **Speed Scrolling** is active, then dragging off the edges of the workspace will cause the workspace to scroll.

Preview Smoothing

When a workspace object is being dragged, an image or "ghost" of the object is typically shown. In cases where the object is extraordinarily large or complex, only the bounding box for the object will be shown.

The **Preview Smoothing** option may be used to modify whether bounding boxes or ghost preview are shown. However, note that creating a ghost preview for large objects may impact the responsiveness when dragging the object.

Sketching Tool Settings

The **Sketch Tool Settings** are used with the Graphic Creation tools, as well as for editing vector graphics.
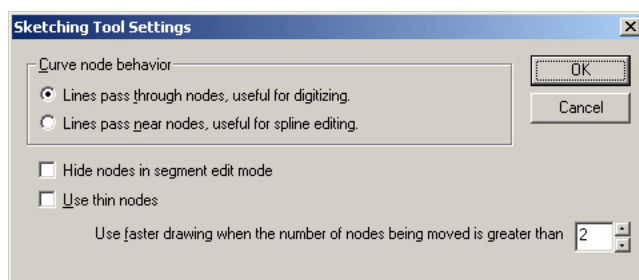
Lines pass through nodes as stated will cause the lines to pass directly through the center of a given node. Lines pass near nodes will cause the line to pass near but not touching or over the node. Note that EngraveLab must be restarted for changes to take effect.
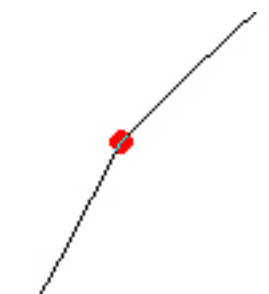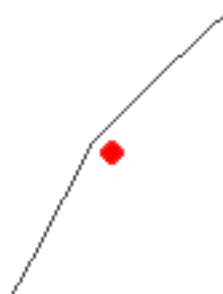
Lines pass through nodes   **Lines pass near nodes**

Import Bitmap Setup

When importing a monochrome bitmap, the **Bitmap Import Colors Settings** dialog will specify the **Foreground** and **Background** colors of the bitmap.
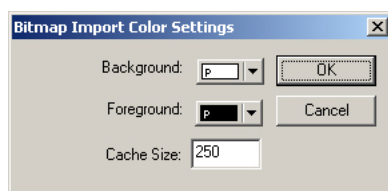
Display Units Dialog

The **Toggle Units** dialog specifies the units and precision that are displayed for workspace controls.
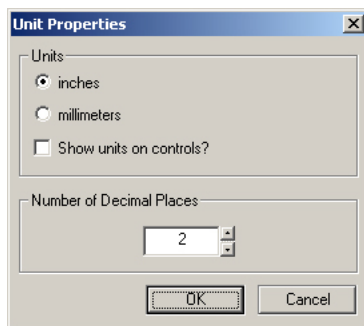
If **Show units on controls** is enabled, then the current units will be displayed within edit fields, such as on the SmartBar.
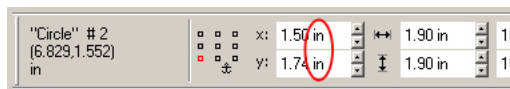
Automatic Saves

The **Automatic Save** feature is used to store the current workspace at preset intervals. This protects against the loss of work due to system failure, such as Microsoft Windows generating an unrecoverable error.

The preferred settings are to **enable** Automatic Save and set the **Time between saves** to a reasonable value. By doing so, the work will be saved periodically in event of a system failure.
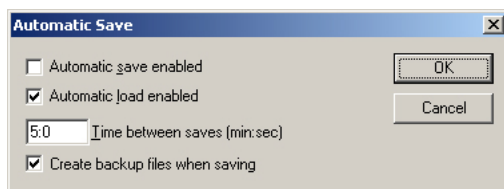
If a system failure does occur, then restarting EngraveLab will restore the workspace.

The amount of work recovered will depend on the **Time Between Saves** setting. If the time interval is too large, then a significant amount of work could be potentially lost when a system failure occurs. However, setting a time interval that is too small will cause EngraveLab to frequently interrupt your work when performing automatic saves.

Automatic Load Enabled

Automatic Load is only valid when the **Automatic save** option is also enabled. When active, restarting EngraveLab will automatically restore the last workspace that had been stored by the Automatic Save option.

This feature is useful where EngraveLab had been shut down using the **Exit** command (**File** menu), but the user had neglected to save the workspace.
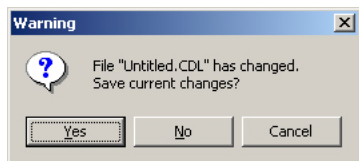
When prompted to save, **No** was clicked, and several minutes of editing were lost. However, if the Automatic Load option is enabled, then the lost work will be reloaded when EngraveLab is restarted. At this point, the workspace should be immediately saved to ensure that the data is not lost.

As discussed with Automatic Save, the amount of data recovered depends upon the **Time between saves** setting.

Create Backup Files When Saving

When the Save or Save as commands are used, the backup (.BAK) file will also be created. The backup file will have the same preface name as the workspace (.CDL) file, and it will be stored in the same directory.

> *Note:* Back up files are a good safety measure against losing work. However, old backup files must be periodically purged from the system, since they can potentially consume tremendous amounts of hard disk space.

Snap To Sign Plate

When **Snap To Sign Plate** is enabled, shapes that are dragged to within six pixels of the sign plate will snap to the sign plate edge.

PRINTING

PRINT COMMAND

The **Print** option sends the current drawing on the screen to a Windows supported printer. Clicking the **Print** command will open the **Print** dialog:
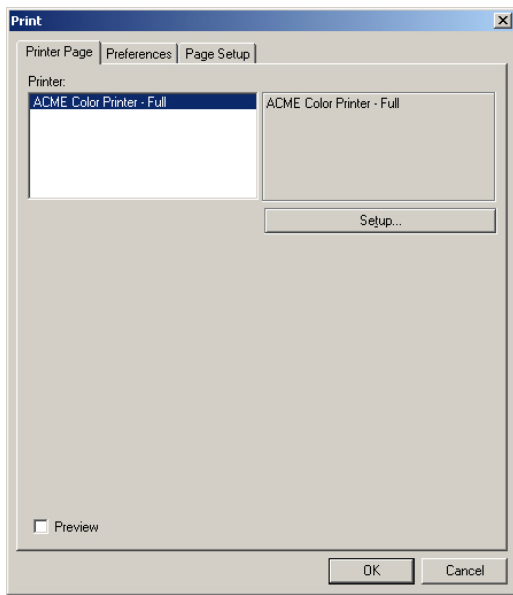
Printer Page tab

Within the Printer Page tab are options to select the Printer, Preview, and Setup.

Printer

The current printer selected will be shown directly under the title of the **Select Printer Options** dialog. A list of available printers is shown inside the **Printer** list box, which correspond to the drivers that have been currently set up using the Control Panel. Click on the required printer to select it.

> *Note:* If a printer is not displayed in the printer list, the printer driver must be loaded using the Windows Control Panel.

Preview

When the **Preview** option is checked and **OK** is selected from the **Printer Page** tab, the Print Preview screen appears. The objects to be printed are displayed on screen along with the default tiling lines in place. Adjust the tiles where necessary, and select **Print** to begin printing. Select **Cancel** to abort the print job
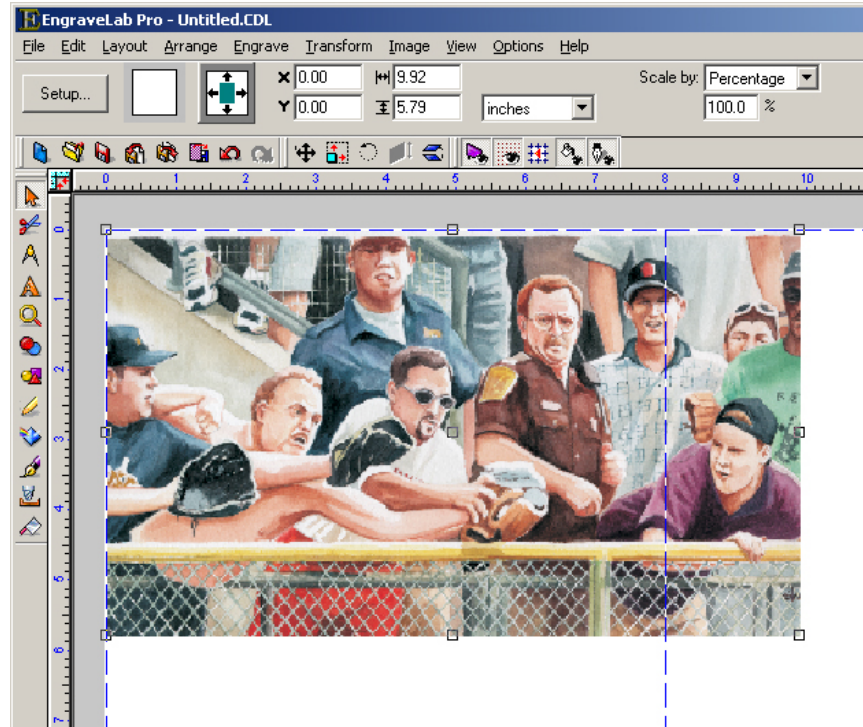
Note: On the Preferences tab of the Print dialog, if the print mode is set to Plate Size, then the preview will identify the sign plate as the object to be printed. This can be disconcerting when scaling because the nubs will be arranged about the sign plate instead of the image. To eliminate confusion, the *Include Edge of Sign Plate* (also available on the Preferences tab) can be activated to reveal the sign plate boundaries.

During print preview, the SmartBar is used to adjust the preview settings.

Clicking the Setup button will return to the Print dialog. In addition, information is displayed about the image and/or tiles of the image, including:

➢ the position of the object relative to the edge of the page

➢ the size of the selected objects to be printed

➢ the unit of measurement of scale for relative sizing on screen

➢ the percentage or ratio by which to scale the objects

➢ the number of tile rows and columns (for reference only)

Align Images tool

Use the Align Images tool to adjust the placement of the image upon the page, such as centering the image.

Fit To Page tool

The Fit To Page tool will recalculate the image size, so as to maximize the image upon the page. The aspect ratio of the image will be preserved.

Zoom tools
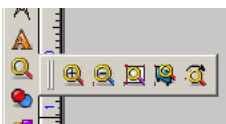
The only other active tools available within the Print Preview window are the Zoom tools. They function in the same manner as upon the EngraveLab workspace.

Moving Objects Within the Tiles

Objects can be moved to avoid breaking up intricate work (e.g., small text) by simply dragging the objects up or down with the cursor. However, there is a maximum tile size based on the paper size used by the printer. If the paper size is exceeded, a new tile automatically appears where required.
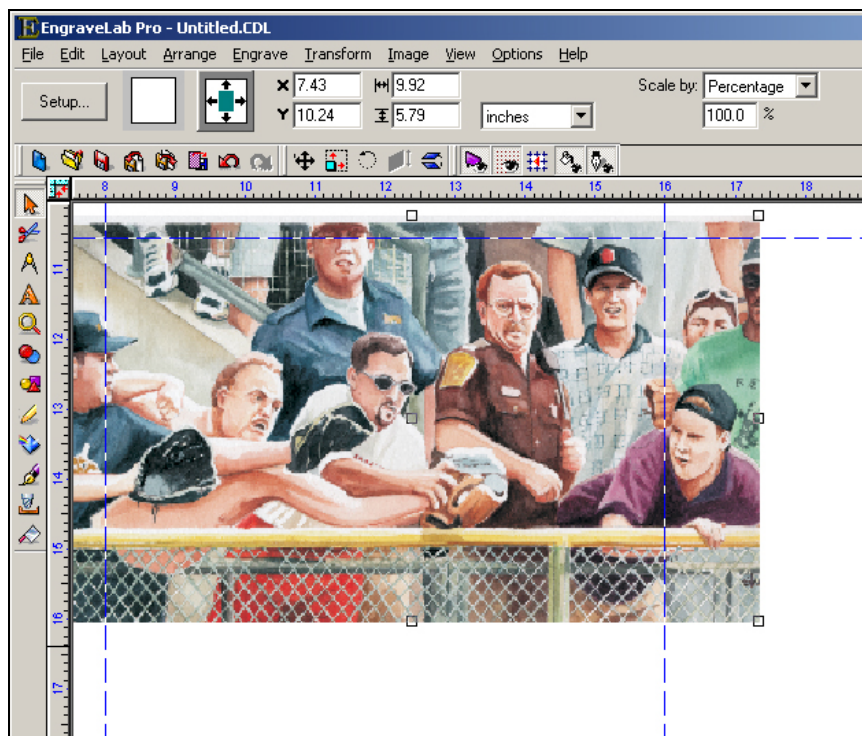
Scaling the Objects to be Printed

The objects in the Preview screen can be scaled up or down in size to adjust the number of tiles required to print the entire image. To resize the objects:

➢ Pass the cursor over one of the corner nubs

➢ When the cursor changes to a bi-directional arrow, click and drag the nub to either enlarge or reduce the size of the objects

When objects are resized in this manner, then all of the tiles are re-activated.
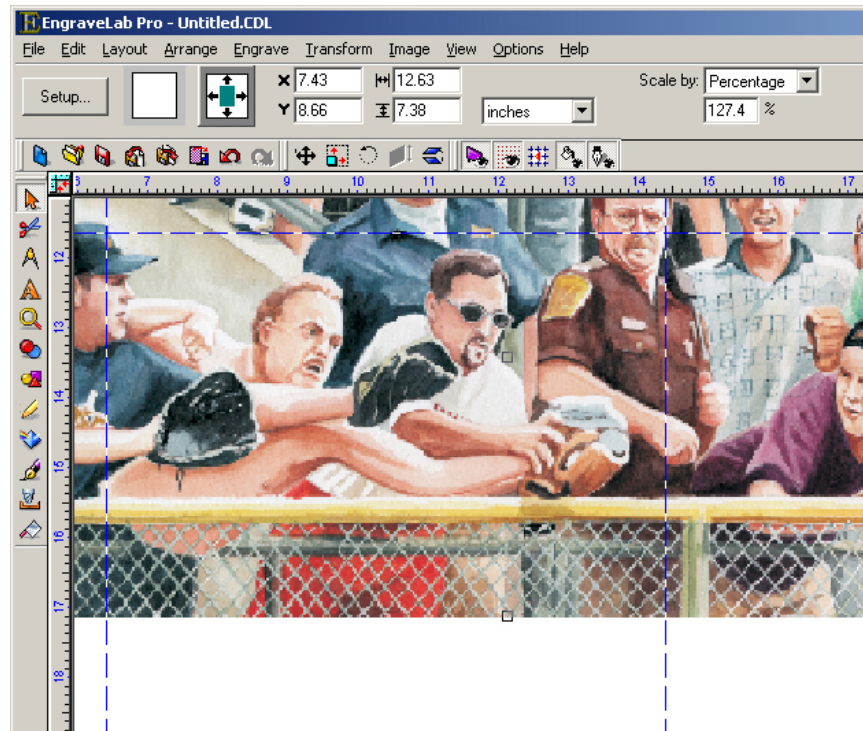
Activating and De-Activating Tiles

Once the objects have been positioned, any of the resulting tiles may be printed. Only activated tiles are printed. Tiles that are de-activated are set to gray, though a blue outline will remain to signify the inactive tile boundaries. Clicking within the tile boundary re-activates the tile.
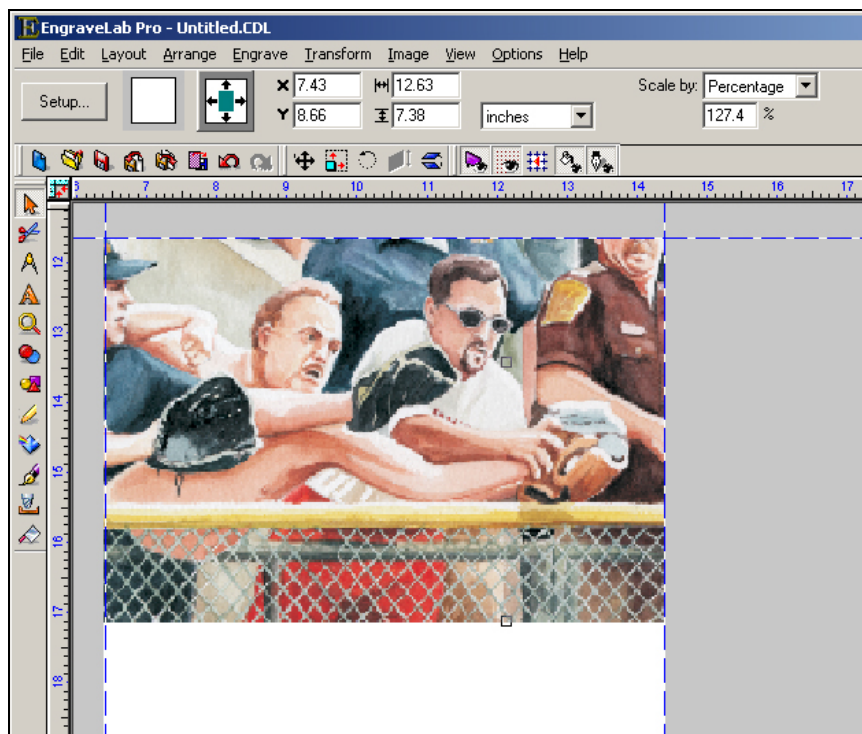
Two comments about activating tiles are that:

➢ Overlapping sections are displayed, but cannot be selected.

➢ Right-clicking within a tile will display the outer region of the tile.

Setup

From the Printer Page tab, clicking the Setup button will open the **Properties** dialog for the selected printer. The layout of the **Properties** dialog will depend upon the version of Microsoft Windows being used.

Changes made to the **Properties** dialog, as well as all controls that are accessed though the **Properties** dialog, are system-wide. All changes will be applied to the Windows Print Driver for the selected printer. Therefore, changes made here will be in effect for other Windows applications.

Preferences tab

Within the **Preferences** tab are options to select the number of Copies, as well as the option to Fit to Printer and to Print Badges.
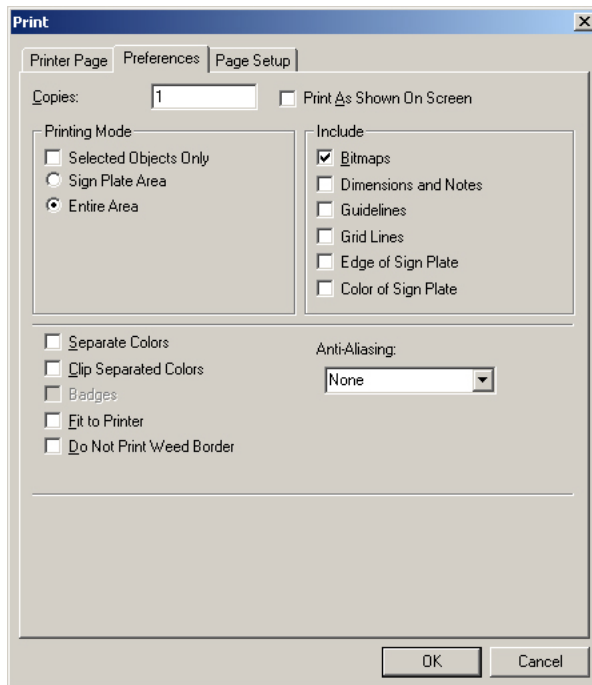
Copies

This entry box is used to specify the number of copies to be printed. This box is edited by sweep-selecting the entry and typing in a new number. By default, the entry in this box is "1".
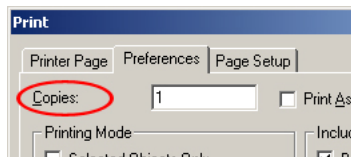
Print As Shown On Screen

This option prints the image as it is shown on screen. Functionally, this option allows printing the image either:

➢ as wire frames (no fills) if Show Fill is turned off

➢ without thick lines if Show Line Style is turned off

Printing Mode

Specify the images to be printed according to the following options:

Selected Objects Only	Print only those objects that are currently selected.
Sign Plate Area	Print everything that is within the confines of the sign plate. Any objects outside the sign plate are not printed. Note that objects that are partially on the sign plate will be printed accordingly.
Entire Area	Print everything within the open workspace, which comprises all objects both inside and outside the confines of the sign plate.

Include Bitmaps

Select this option to print bitmap files from EngraveLab (i.e., *.BMP, *.PCX, or *.TIF files).

Include Dimensions and Notes

This option prints any dimensions created in the file. Dimensions include any size notations or notes generated using the Dimensioning tools from the Measure tool in the tool bar.

Include Guidelines

With this option selected any Guides placed on screen will be printed along with the Guide Labels. The Guides must be set as visible in order to be printed.

Include Grid Lines

With this option selected, the Grid placed on screen will be printed. The Grid must be set as visible in order to be printed, and will be printed as set to view (i.e. the **Show Grid as Lines** option).

Include Edge of Sign Plate

With this option selected, the sign plate edges will be printed. The sign plate must be set as visible in order to be printed.

Include Color of Sign Plate

With this option selected, the sign plate color will be printed. The sign plate must be set as visible in order to be printed.

Separate Colors

Selecting this option causes EngraveLab to print colored objects on the screen one color at a time.

Clip Separated Colors

This option clips the separate colors when cutting.

Badges

Using the **Badges** option, multiple pages may be printed in one sitting. This option is only available if the **Badges** features has been used to create a multi-page file.

Fit to Printer

For the currently loaded printer sheet, this option will adjust the image to fill the sheet.

Anti-Aliasing

Anti-Aliasing is the smoothing of the jagged, "stair stepping" appearance that can appear in low-resolution drafts. Anti-aliasing is achieved by blurring the color of adjoining pixels to improve the transition between light and dark pixels.

The available Anti-Aliasing options are None, Coarse, Medium, and Fine. A setting of Fine will produce the highest quality smoothing, though this will incur slower printing.

Note: Anti-Aliasing should be used for dye-sublimation printing only – NOT wax, resin, or wax/resin.

Page Setup tab
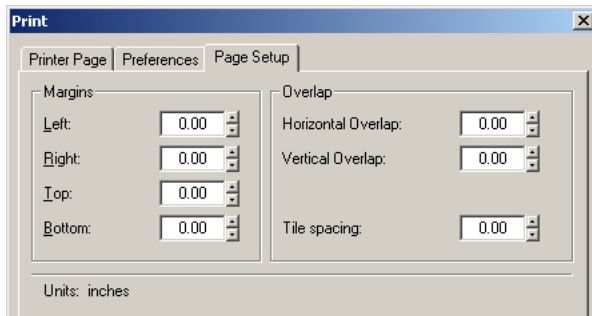
Margins

Some printer drivers do not account for the non-printable areas, or margins of the page. In those cases, EngraveLab provides for the margin settings, by accessing the Margins tab. Enter margin specifications in the entry boxes in this dialog box as required.

Overlap

The Overlap options permit establishing settings for tiling large printed images. If the file to be printed is too large for the printable area, use the Overlap options to set the Horizontal and Vertical Tile Overlaps as well as the Tile spacing.

Horizontal and Vertical Overlap

These options specify the amount of overprint each tile will contain. Each tile actually ends with the beginning portion of the next tile. For example, if an overlap of a half-inch is set the last half-inch of a given tile will be identical to the first half inch of the proceeding tile. This function is useful for particularly intricate graphics, as it provides a guide for laying the pieces of the printed file together. Each of the Horizontal and Vertical options can be set individually.

Spacing

The Spacing setting is used to specify the amount of material to be left blank between tiles when printing a job.

Units

The Units of measurement are displayed for reference only, the unit of measurement cannot be changed from the Print window.

CUTTING AND PLOTTING

ENGRAVING WORKSPACE OBJECTS

This chapter discusses the **Engrave** menu commands, which includes controls for configuring most routers and engravers (**Engraving Defaults**).
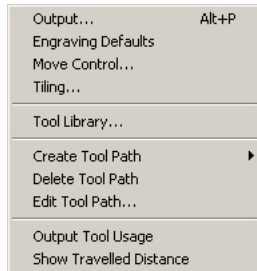
Before beginning a job, please note that newly created shapes **do not** automatically have cutting paths applied to them. Instead, a selected shape may be applied with a tool path from the **Create Tool Path** flyout. The **Output** command may then be used to activate the Engrave Preview mode, whereupon cutting data may be output to the given device.

As an alternative to the **Output** command, the **Output Tool** on the **Tools** toolbar will also activate the Engrave Preview mode.

Note: Prior to generating output, the correct driver must be installed for the make and model of the device being used. See the **Install Drivers** command under the **File** menu to determine if the correct driver has been installed.

CREATING TOOL PATHS

Tool paths are special cutting/engraving/plotting operations that are applied to workspace shapes. In addition to being a visual workspace description of the tool movements, each tool path contains specific information about its cutting parameters, such as cutting depth and bit type.

By default, newly created workspace shapes **do not** have cutting paths. Instead, apply a cutting path to a selected shape by choosing from the **Create Tool Path** flyout (**Engrave** menu).
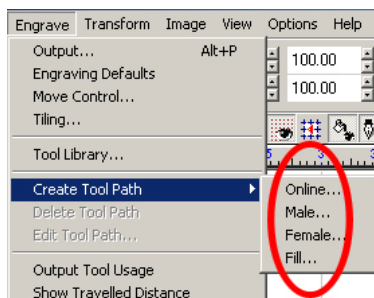
These tool paths are arranged into the following classifications: Online, Male, Female, Fill, and Drill. Though these tools are accessible from the **Engrave** menu, and they are also accessible from the **Tool Path Tools** flyout. Please note that the **Drill** tool is only available from this flyout.

For the tools chosen from the **Engrave** menu, the setup dialog will always open. However, when choosing a tool from the **Tool Path Tools** flyout, right-clicking will always open its setup dialog, whereas left-clicking will assume that the previously used settings should be used. The exception to this interface behavior is the **Drill** tool, which is discussed later.

Delete Tool Path

For a shape that has been applied with a tool path, select that shape and choose the **Edit Tool Path** item. The tool path will be deleted.

Edit Tool Path

For a shape that has been applied with a tool path, select that shape and choose the **Edit Tool Path** item. The setup dialog will open for the given tool path.

Online

Defines a basic cutting path for which the tool will follow the edge of a designated shape. The resulting cut will have an offset of zero. The **Online** tool path is often used to trace shapes in artwork without filling the shapes with an engrave pattern.
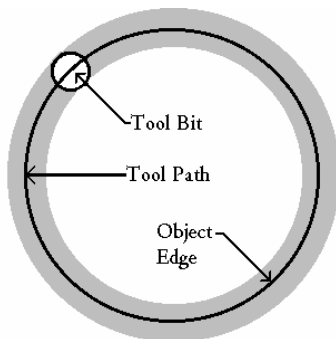
The **Online** setup dialog appears as follows:
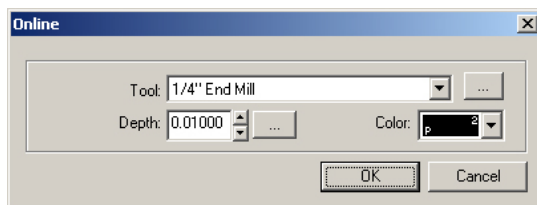
Tool

Use the **Tool** drop-list to set the tool that will be used to cut the shape. To the right of the **Tool** drop-list, the ellipsis button is a shortcut to the **Tool Library** dialog, which was discussed earlier in this chapter.

Depth

Set the maximum cutting **Depth**. To the right of the **Depth** field, the ellipsis button may be clicked to open the **Engrave Parameters** dialog (discussed later in the **Drill** tool section).

Color

Specify the **Shop Palette** color layer to which this tool path will be assigned.

There is an EngraveLab feature that allows all objects on a color layer to be disabled. For example, an organized design will have tool paths arranged on different color layers, which allows a specific group of tool paths to be hidden by disabling their color layer. For more information about disabling color layers, please refer to *Inactive Color Layers* in the index.

Male

Defines a basic cutting path on a selected shape, such that the resulting cut shape will fit within a corresponding female shape. The tool path will fall to the outside of the shape contour, such that the offset equals one-half of the bit width. The **Male** tool path is typically used to cut shapes out of a material.
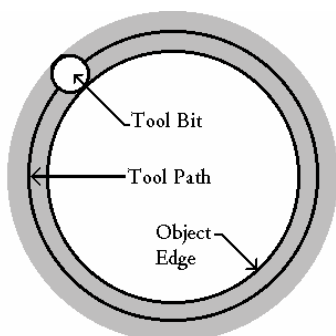
For example, consider a polygon shape that is cut using a **Male** tool path. Suppose that the same polygon shape is also used to a **Female** tool path within a larger, supporting piece. The male cut can then be fit within the inner contour of the female cut.

The **Male** setup dialog appears as follows:
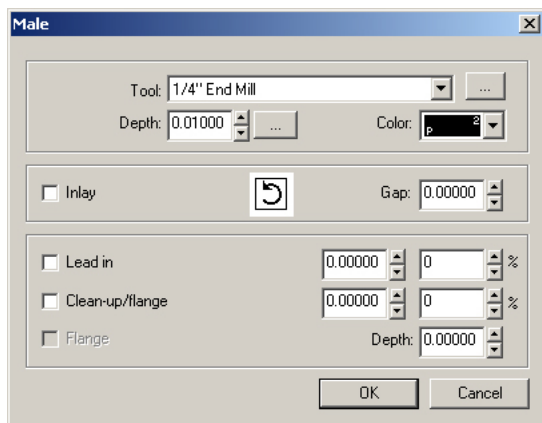
Tool, Depth, and Color

For a description of these fields, please refer to the **Online** tool path descriptions.

Inlay

Though a tool bit can cut an outer-corner effectively, the tool bit diameter can cause an inner-corner to be rounded. This is especially a problem when shapes are intended to be flush, such as when using a shape to produce both male and female cuts.
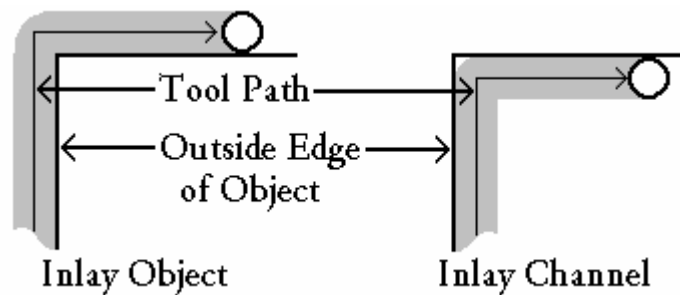
Compare how the path is cut for outer- and inner-corners. Due to the tool
diameter, the inner-corner (Inlay Channel) will be rounded.

For two pieces that must be flush, enable the **Inlay** option to cause both the outer- and inner-corners to cut with rounded corners. The resulting pieces with then fit.

Gap

The **Gap** value is the size for the inlay.

Clockwise / Counter-Clockwise

The tool bit spins with a clockwise rotation. However, the cutting of the bit should always be in the direction that the tool is traveling, such that a smooth-edged cut is produced. In the following diagram, the tool bit is following the outer-contour of the shape in a clockwise direction. Notice how the spinning action of the tool is in the same direction as the tool direction.
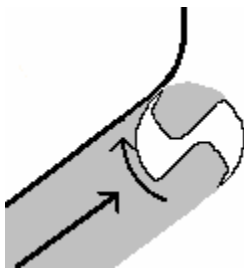
As a specific rule, a **Female** tool path should cut the contour in a clockwise direction, and a **Male** tool path should cut the contour in a counter-clockwise direction. To toggle the direction, click the **Clockwise / Counter-Clockwise** button.

$\circlearrowright$	Cut the shape contour in a <u>clockwise</u> direction.
$\circlearrowleft$	Cut the shape contour in a <u>counter-clockwise</u> direction.

As an example, inspect the following donut shape. The donut shape must be cut along both an inner- and outer-contour. Try to visualize the spinning tool as it follows the donut shape contours.

Donut shape being cut along both inner- and outer-contour. The inner-contour is like a Female tool path, where the contour should be cut in a clockwise direction. The outer-contour is like a Male tool path, where the contour should be cut in a counter-clockwise direction. In both cases, the tool bit is spinning with clockwise rotation.
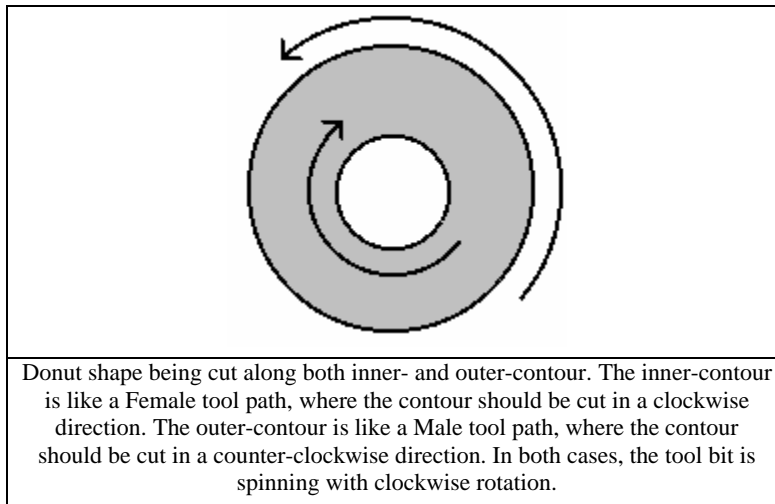
An **Online** tool path does not provide an option for setting the **Clockwise / Counter-Clockwise** direction. Instead, the **Online** tool path will simply use the most recent setting.

Lead In

A **Lead In** is an additional portion added to the start of the tool path before the shape contour is cut. In this fashion, the **Lead In** prevents distortions to the shape contour that could have been caused by the tool bit as it plunged into the material.

The shape and position of the **Lead In** are governed by the following rules:

> ➢ Lead Ins are only applied to paths that define the edge of the object being routed (i.e. they are not applied to fill strokes)
> ➢ When performing an outside rout, the Lead In will be added from the outside of the shape
> ➢ When performing an inside rout, the Lead In occurs from inside the shape
> ➢ If the first contour edge being cut is a straight line, then the Lead In will also be straight
> ➢ If the first contour being cut is a curve, then the lead in will be curved
> ➢ If a Lead In is specified but will not fit within a given shape, or will not fit without making contact with any other shape to be routed, then the Lead In will not occur

> *Note:* When a **Lead In** is specified, the **Bridge** function is disabled.

Clean-Up/Flange

When cutting an object to a deep, final depth, there is an advantage to using several cut passes at progressively deeper cut settings. Multiple passes are used to avoid burning the material or stressing the bit, to ensure that the corners being cut are sharp, and to reduce the amount of time required to complete the cutting process. However, multiple passes often leave a "stepped" appearance to the finished object, usually because of a progressively worn bit, or minute shifts in the material.
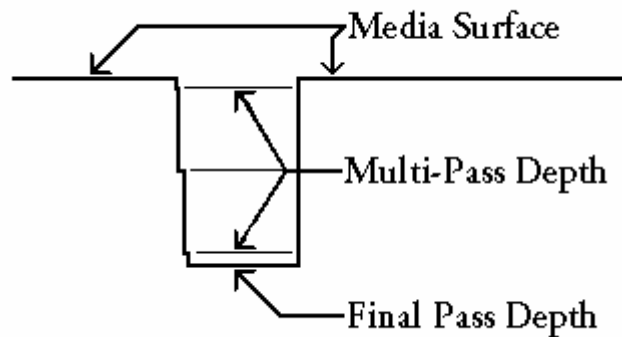
A **Clean Up** pass is used to finish the job by tracing the edge of the object, such that a consistently smooth surface will result.
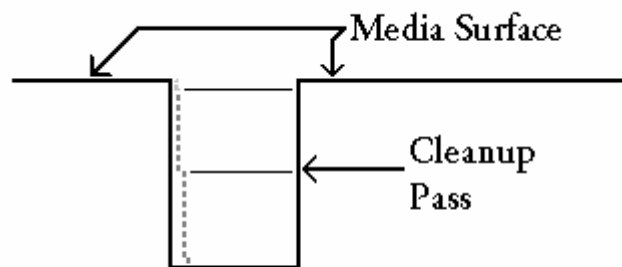
Specify the offset for the clean-up pass in the edit field. Specifying a positive value will cause the tool bit to cut along a path nearer to the object being cut than the regular tool path, while a negative offset will cause the tool bit to step away from the object (i.e., create a Flange).

> *Note:* Under some circumstances, you may wish to specify an additional depth for your cleanup pass. This can be particularly useful for generating a glue channel underneath an inlaid object which is to be set flush with the surface of the sign substrate.

Flange

The **Flange** option only become active when the **Clean Up/Flange** option is enabled.

The **Flange** controls are used to define how a "tab" (also known as a "shoulder") is applied to a piece that is being cut. The flange is added to either the male and/or the female fitted pieces to prevent the male piece from falling through its mating female piece as shown below.
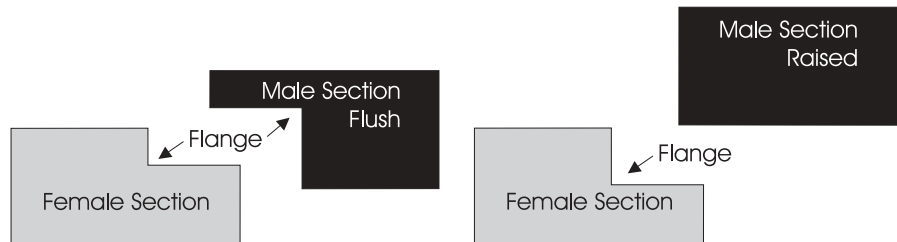
Female

Defines a series of cutting paths on a designated shape, such that the resulting cut shape may contain a corresponding male shape.

For example, consider a polygon shape that is cut using a **Male** tool path, thereby producing a male cut. Suppose then that the same polygon shape is cut using a **Female** tool path, thereby producing a female cut. The male cut will then fit within the inner contour of the female cut.
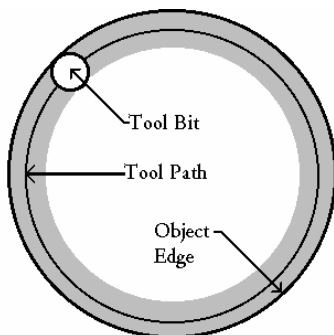
The tool path will fall inside of the shape, with an offset equal to one-half the width of the tool bit. The Female tool path is typically used when filling or cutting out a shape.

The **Female** setup dialog is as follows. For an explanation of these controls, please refer to the **Male** tool path descriptions.
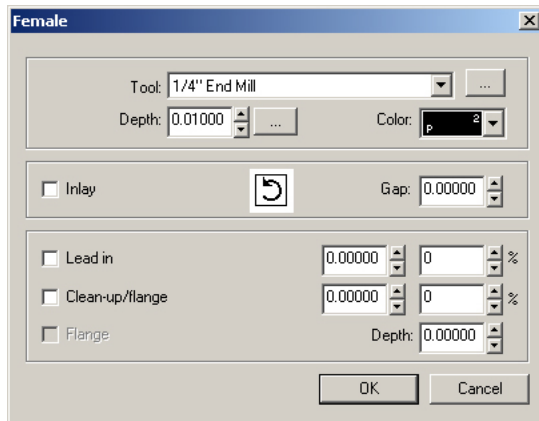
Fill

Defines a series of cutting paths designed to remove material from inside a selected shape. The **Fill** setup dialog appears as follows.
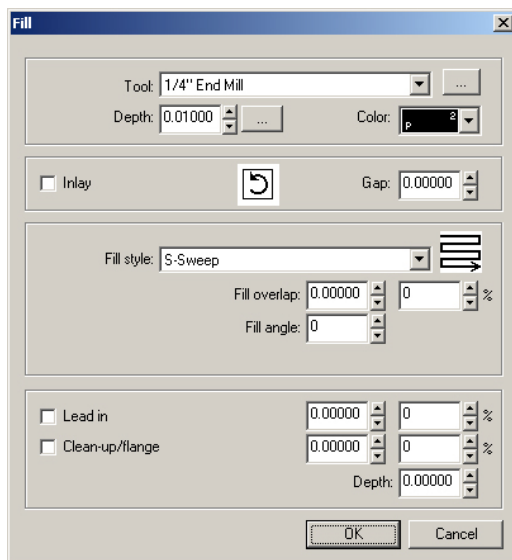
Note about filling nested shapes

Note that when simply placing one object within another, a fill operation will engrave the outer object without consideration of the inner object. The correct technique is to combine two such objects into a single path, and then the fill tool path operation may be applied. The following steps show how this is done:

1) Assume that a logo must be placed within a star shape, all of which must then be filled without losing the logo.

2) Create the text for the logo. With the text selected, choose **Text to Graphics** from the **Arrange** menu. This will convert the logo into a graphic that can be routed.

3) Create a star shape that is large enough to contain the logo, and then center the logo within the star.

4) Select both the star and the logo, and then choose **Make Path** from the **Arrange** menu. Both objects will now have been combined into a single object.

5) Apply a **Fill** operation to the combined object. The result will be a filled star shape that correctly retains the logo that was placed within it.

The Fill Controls

For much of the **Fill** dialog controls, please refer to the **Male** tool path descriptions. The Fill-specific controls are described as follows:

Fill Styles

The choices of **Fill style** are as follows:

None

None indicates that there is no fill style. The edges of objects will be traced, but no fill will occur.

S-Sweep

The **S-Sweep** style will generate a series of fill lines that are similar to the Line Sweep fill, except that the line paths are joined wherever possible. This is a relatively quick fill, since the number of lift and drop movements is minimized.

The S-Sweep (nose cone) is similar to S-Sweep, except that this option is more appropriate for machines that use a floating nose cone to control depth.

Line Sweep

The **Line Sweep** style will generate a series of separate and discrete fill lines. This fill pattern is designed for those machines that have a short maximum path length, which requires short fill paths. The disadvantage is that the cutting head lifts and drops for each fill path, which increases the amount of time required to fill the given object.

Spiral

The **Spiral** style will trace around the edge of a given object and then cut the fill area on the same pass. This is a fairly traditional style that reduces the lift and drop movements of the tool. However, this style may not be suitable for machines that either require a short tool path, or that use a floating nose cone to control depth.

The **Spiral (corner fill)** style is more thorough at hogging than the **Spiral** style, since **Spiral** passes are repeated for each corner of the object.

Reverse Spiral

The **Reverse Spiral** style will cut outward from the center of the object until the edge of the object is traced. Because cutting occurs from the center of the object outward, this style is well suited for machines that use a floating nose cone to control depth. Another benefit is that the edge of the object is cut last, which results in a cleaner edge cut.

The **Reverse Spiral (corner fill)** style is more thorough at hogging than the **Reverse Spiral** style, since **Reverse Spiral** passes are repeated for each corner of the object.

Island

The **Island** style is similar to the Spiral style, except in that discreet paths begin at the edge of the object and then work toward the center. Use this style to create a spiral-like fill when the machine does not support long tool paths. A tool lift and drop is generated for each pass, which implies that this style requires more time than an equivalent spiral style.

Reverse Island

The **Reverse Island** style is similar in effect to **Reverse Spiral**, except that paths are cut from the center in progressively wider paths. This style is suited for a machine that requires short tool paths, and which is fitted with a floating nose cone. Another benefit is that the edges of the object is cut last, which results in a cleaner edge cut. A tool lift and drop is generated for each pass, which implies that this style requires more time than an equivalent **Reverse Spiral** style.

Fill Parameters

The fill parameters are described as follows. The available parameters will depend on the type of fill being routed.

Overlap %

Overlap % is the percentage amount that each successive hogging pass should overlap the previous pass. Overlap is used to ensure that all material is removed between contiguous passes of the tool. The overlap is expressed as a percentage of the tool diameter.
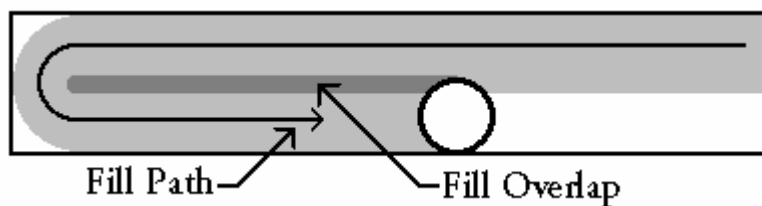
Angle

Angle is used to specify the angle of fill strokes when hogging out the material with parallel passes of the tool. The angle of zero degrees corresponds to the x-axis.
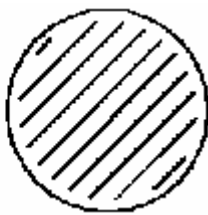
Fill Angle 0°   Fill Angle 45°

Specify an angle when cutting artwork that leans in a specific direction. Proper setting of the angle can result in significant reductions in production times.
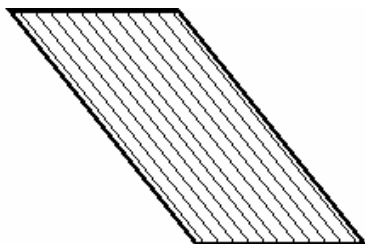
Drill

The **Drill** tool is used to place drill points upon the workspace. Simply left-click on the workspace to place a drill point. For a selected drill point, its **Depth** is editable from the SmartBar.
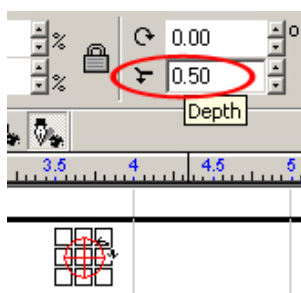
To specify multiple passes for a selected drill point, choose **Edit Tool Path** from the **Engrave** menu, and the **Engrave parameters** dialog will open. Set the desired **Depth per pass**, and EngraveLab will calculate the number of passes that will be performed. Alternatively, set the number of **Passes**, and the **Depth per pass** will be calculated.
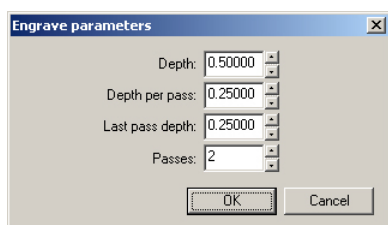
ENGRAVE PREVIEW

The Engrave Preview mode will display the workspace shapes as they will be cut upon the material. The SmartBar displays the current cut settings, as per the **Engraving Defaults** item under the **Engrave** menu. The **Engrave Manager** toolbar provides additional functions that can be applied to the job before cutting.

Except where noted, any settings made using the SmartBar controls or the **Engrave Manager** toolbar will not change the default values. Instead, such changes will only apply to the current job.
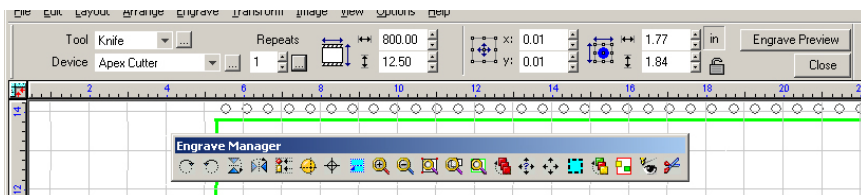
Note: In order to perform **Plotter Jog** operations, registration marks must be included as part of the job.

A convenient cutting feature is that only those objects with currently active colors will be cut. This allows for the cutting of specific workspace objects, while leaving other objects uncut. For more information about active and inactive colors, please refer to the Shop Palette descriptions.

Assuming that all the SmartBar and **Engrave Manager** settings are correct, the job may then be sent for cutting. To begin sending the job, click the **Engrave** button that is at the far-right of the **Engrave Manager** toolbar:
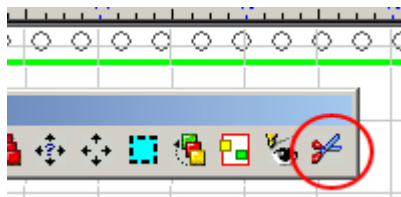
SmartBar Preview Controls

When first entering the Engrave Preview mode, the SmartBar settings will indicate the current default settings. Except where noted, changes to the SmartBar controls will apply to the current job, and leaving the Engrave Preview mode will cause such changes to be lost.
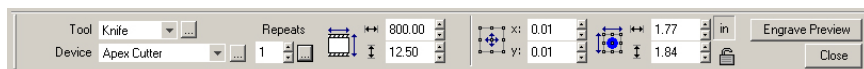
Device

The **Device** drop-list indicates where the cutting data will be sent.
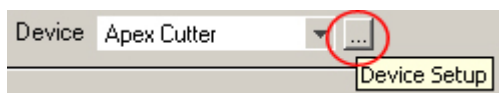
To the right of the drop-list, clicking the **Device Setup** button will open the **Engraver Setup** dialog. Edits to the **Engraver Setup** dialog will be saved as changes to the default settings.

Note: The **Engraver Setup** dialog is discussed later in this chapter.

Tool

The **Tool** drop-list indicates the available tools for the currently selected device.

To the right of the drop-list, clicking the **Tool Setup** button will open the **Move Control** dialog. The **Move Control** dialog is used to adjust the driver options for the given cutter. Edits to the **Move Control** dialog will be saved as changes to the default settings.

> *Note:* The **Move Control** dialog is discussed later under the *Engraving Defaults* section.

Repeats Setup

Indicates multiple copies of the current workspace shapes. Clicking the **Repeats Setup** button will open the **Repeats** dialog.
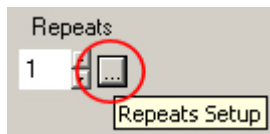
Media Size

The **Media Size** indicates the available cutting area of the machine. By default, these values are taken from the **Engraver Setup** dialog.
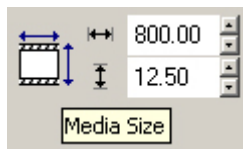
Position

The **Position** indicates the coordinates of the shapes on the media. Initially, the objects can only be moved as a group. However, if the shapes are nested, then individual shapes may be selected and moved.
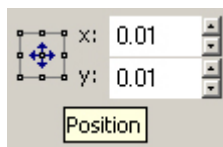
Size

The **Size** indicates the width and height of the shapes on the media. Initially, the shapes are moved as a group. However, if the shapes are nested, then individual shapes may be selected, and the **Size** fields will apply to the currently selected object.
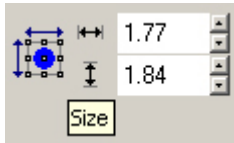
When scaling by a fixed percentage, the **Proportional Scaling** button may be clicked to lock the aspect ratio.

Engrave Preview

At the far-right of the SmartBar is the **Engrave Preview** button. Clicking the **Engrave Preview** button will toggle the **Tile Preview**, which shows how tiles will be rendered upon the media.

Tiles will be stacked in an attempt to reduce wasted media. However, individual tiles may be selected and moved. Clicking the **Engrave Now** button will send the job to the cutter.

Clicking the **Tile Preview** button will return to the **Engrave Preview** mode.

Engrave Manager

The Engrave Manager provides additional commands that may be applied to the job.
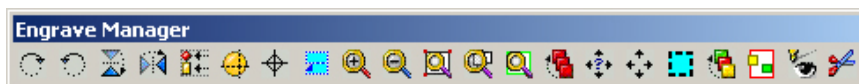
Rotation

Rotate the shapes by either 90 or –90 degrees. Perform a rotation to help minimize wasted material.

Mirror

Mirror the shapes either vertically or horizontally. Typically, mirror is used where the media is to be reverse-applied, such as the inside of a window pane.

Nesting

Opens the **Nesting** dialog. Nesting will rearrange the layout of shapes on the media, so as to minimize wasted material.
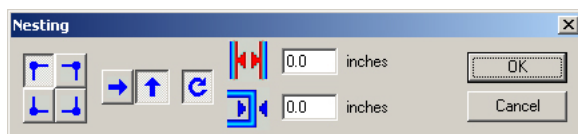
Note: The Nesting controls are described under *Advanced Cutting and Plotting*.

Tiling

Workspace shapes may be organized into tiles, which is a useful method of sub-dividing the job into manageable sections. In addition, the amount of wasted material may be reduced by "stacking" tiles on the media.

Note: For more information about tiling, please refer to the *Advanced Cutting and Plotting* chapter.

Registration Marks

On the **Engrave Manager** toolbar, left-clicking the **Registration Marks** button will open the **Registration Marks** popup. Click the style of registration marks that are required, and the registration marks will be placed about the workspace shapes.

To set the default locations of the registration marks, right-click the **Registration Marks** button. The **Registration Mark Setting** dialog will open, which may be used to indicate the default **Positions**, **Size** and **Offset** of the registration marks.
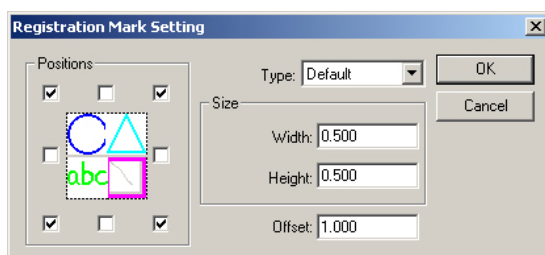
Note: For more information about registration marks, please refer to the *Advanced Cutting and Plotting* chapter.

Weed

Left-clicking the **Weed** button will activate the weed border, and the preview will show the border that is created around the shapes.

The **Weed offset** value from the **General Preferences** dialog will be used. To use a different **Weed offset** value, right-click the **Weed** button, and the **Weed Setup** dialog will open. Changing the **Weed offset** value will apply to the current job being cut, but the default value will not be changed.
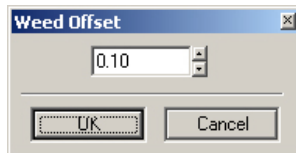
> *Note:* For more information about creating weed lines, please refer to the *Advanced Cutting and Plotting* chapter.

Zoom

The Zoom tools are used to change the perspective of the shapes being previewed. In addition to these buttons, the keyboard shortcuts may also be used.

Sort

Sort settings may be applied to any non-routing object. Clicking the **Sort** button will open the **Sort** dialog.

> *Note:* The Sort dialog settings are described under the next section, Engraving Defaults.

Poll Plotter

Where supported, query the plotter for information about the dimensions (Width and Height) that are available for output.

Enable Jogging

EngraveLab supports Plotter Jog functionality. When the **Enable Jogging** button is clicked, the **Jog Modes** dialog will query for the type of jogging that is required.
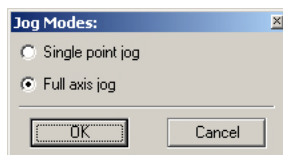
To use **Single point jog**, there must be <u>one</u> registration mark on the workspace. With the **Single point jog** option enabled, starting a job will position the tool at the registration mark, and the job will then proceed as if the registration mark were the origin. However, the **Single point jog** feature is supported by a relatively few number of cutters.

For most cutters, the **Full axis jog** will be used, which is discussed within the *Advanced Cutting and Plotting* chapter.

Pounce

During the cutting or plotting job, the **Pounce** setting may be used to create shapes that have either a perforated or broken line pattern. This pattern is created by lifting and lowering the tool during the job.

If the **Pounce** button is depressed, then pounce is enabled. Right-click the **Pounce** button to edit the pounce defaults.
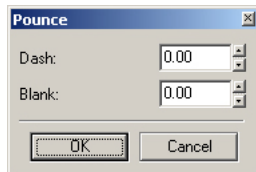
The **Dash** field indicates the length of the perforation or drawn line. The **Plate** field indicates the spacing between each perforation or line.

Filter by color

Use the **Filter By Color** option to send only one color layer as output to the cutter. When enabled, the **Filter By Color** dialog will open.

Clicking the **Filter Layer** color picker will display all the color layers that have been assigned to shapes on the current workspace. Choose the color that will be output and click the **Select** button. The preview will display all shapes of the indicated color.

If the **Filter Registration Marks** option is enabled, than both registration marks and "locked" objects to be cut with all layers.

Note: If any thick lines are present in the drawing, then their colors will appear within the **Filter Layer** color picker.

Selection mode

The **Selection mode** determines which parts of the workspace should be sent as output. If the Selection mode is **Page**, then all shapes on the given sheet layer will be valid for output. If then Selection mode is **Sign Plate**, then only shapes that are on the sign plate will be valid for output.

The engrave preview will only display shapes that are valid for output, as per the Selection mode.

Banner Fill

Usually, tool paths will be applied to workspace shapes prior to entering the cut preview state. However, the **Banner Fill** button may be used to apply a default fill, such as a thick pen fill.

After a default fill has been applied, the cut preview will show the path that will be used to fill the shape. If the path is not visible, then verify that the **Show Tool Diameter** item (**View** menu) is unchecked.
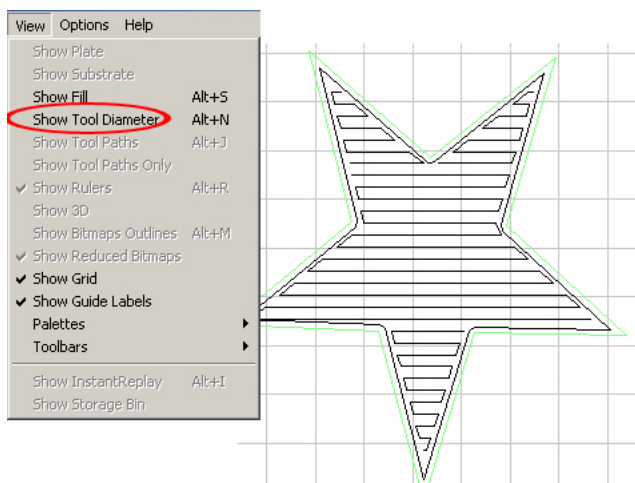
Right-click the **Banner Fill** button to open the **Fill** dialog. These settings are used to customize the banner fill settings.
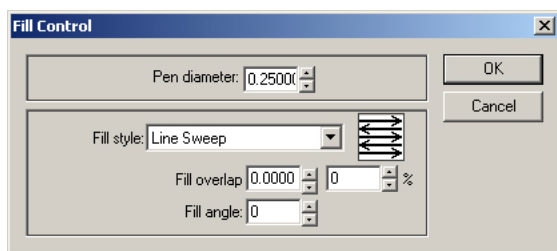
The **None** fill style indicates that there is no fill style. The edges of objects will be traced, but no fill will occur.

The **S-Sweep** fill style will generate a series of fill lines that are similar to the **Line Sweep** fill, except that the line paths are joined wherever possible. This is a relatively quick fill, since the number of lift and drop movements are minimized.

The **Line Sweep** fill style will generate a series of separate and discrete fill lines. This fill pattern is designed for those devices that have a short maximum path length, which requires short fill paths. The disadvantage is that the cutting head lifts and drops for each fill path, which increases the amount of time required to fill the given object.

The **Fill overlap** field indicates the amount that each successive pass should overlap the previous pass. This overlap is used to ensure that there are no gaps between contiguous passes of the pen. The overlap is expressed as either a fixed value (in the current workspace units), or a percentage of the **Pen diameter**.

The **Angle** field indicates the angle of pen strokes as objects are filled. An angle of zero degrees corresponds to the x-axis. When working with an object that "leans" in a given direction, proper setting of the **Angle** can result in significant reductions of production time.
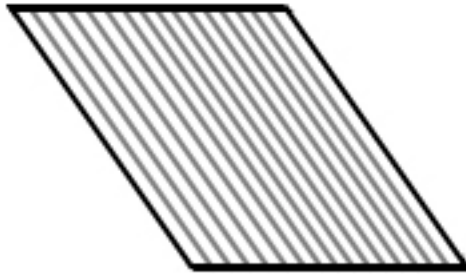
Output

Begin sending the job to the plotter/cutter device.

ENGRAVING DEFAULTS

The **Engraving Defaults** are used to configure the given device that will be used for cutting or plotting. These defaults will be used during the Engrave Preview mode, though most settings may be overridden on a per job basis.

To edit the cutter defaults, choose **Engraving Defaults** under the **Engrave** menu. The **Output** dialog will open.
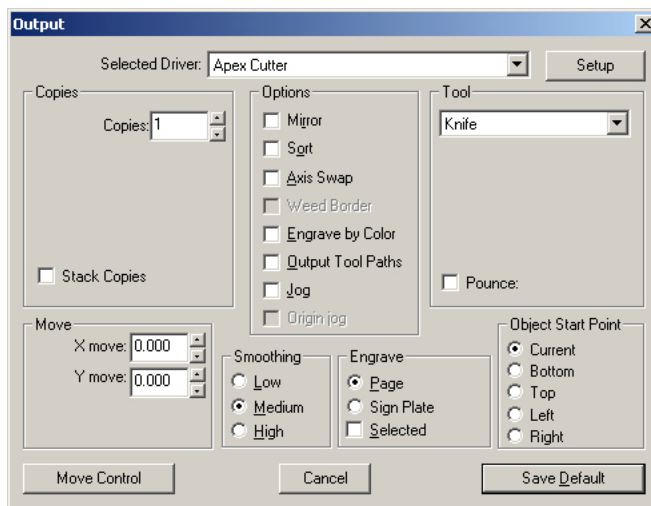
The **Output** dialog controls are described here. In some cases, it may be necessary to refer to the *Advanced Cutting and Plotting* chapter.

Copies

Where more than one copy is being cut, the distance between jobs may be specified. The **Xspace** represents the space between jobs cut side-by-side. If **Stack Copies** is enabled, then the **YSpace** represents the space between jobs above one-another. The distance is measured in current workspace units.
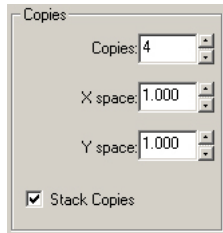
Options

This section is used to take advantage of some of the advanced features available with the EngraveLab cutting routines.
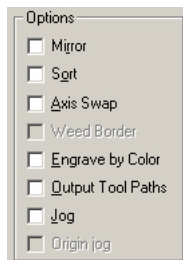
Mirror

Plot a mirror image of the job. This is used for a graphic that is to be reverse-applied, such as cutting from the inside of glass.

Sort

The Sort option is used to optimize cutting for a number of different situations, depending on the current needs and the modules installed with EngraveLab. Depending on the type of work being done, there are two possible ways in which the Sort option will operate.

➢ **Case 1:** In the Output dialog, the Output Tool Paths option is active, and then the Sort option is activated. This will indicate that prior to beginning any engraving job that the Sort Tool Paths dialog will be used to customize the priority by which tool paths should be routed.

➢ **Case 2:** In the Output dialog, the Output Tool Paths option is inactive, and then the Sort option is activated. Immediately, the Sort dialog will open, so that non-routing objects may be cut in a specified order.

The Sort Tool Paths dialog

The settings of the Sort Tool Paths dialog apply to any routing or engraving object. This dialog will only open if the Output Tool Paths option (Output dialog) for the current driver is active, and the Sort option is also active. The dialog will appear prior to starting any routing or engraving job.
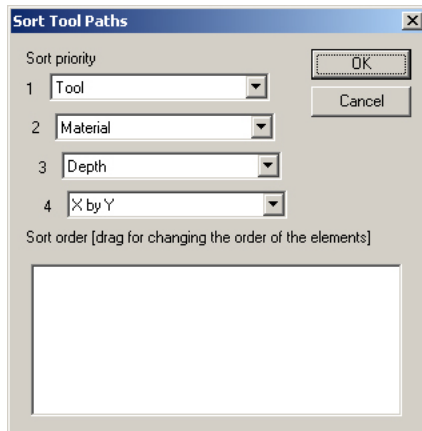
Sort priority is used to indicate an order in which tool paths will be routed. There are four drop-down fields, each of which may potentially be set to one of the following: Tool, Material, Depth, X by Y, Y by X, Nearest, and Current. The Sort priority fields are numbered, with field number one being of higher priority than number two, and so on. Depending on the selection within the currently active Sort priority field, the Sort order list will allow additional customization. List here are how the Sort order list is used with each type of sort priority.

➢ **Tool priority** will cause all the tools in the current job to be listed. The list of tools is itself ordered by the sequence in which the tools will be used. To adjust this order, use the mouse button to drag the tools within the list. A tool may also be deleted from this list by selecting it and pressing the Delete key, which prevents the tool from being used in the current job.

> *Note:* When a tool is selected, the Turret field will become active, which is used to adjust the Turret Number that has been assigned to this tool.

➢ **Material priority** will cause all the different materials in the current job to be listed. The list of materials is itself ordered by the sequence in which the material will be routed. To adjust this order, use the mouse button to drag the tools within the list.

➢ **Depth priority** will cause two further options to be listed: "Cut The Deepest Last" and "Cut The Deepest First." The first option will give priority to shallow cuts, after which the deeper cuts will be completed. To reverse this priority, use the mouse button to drag the "Cut The Deepest First" option to the top position.

➢ **X by Y priority** will cause objects to be routed according to their placements from left-to-right within the workspace.

➢ **Y by X priority** will cause objects to be routed according to their placements from bottom-to-top within the workspace.

➢ **Nearest priority** can be set to either "Cut in user selected order" or "Nearest to (X,Y)", where X and Y represent a workspace location based on the existing objects.

➢ **Current priority** is used to that objects be cut according to their user defined order, as set by the Start Sequence command under the Layout menu.

The Sort dialog

The settings of this dialog apply to any non-engraving object. This dialog will only become active when the Output Tool Paths option (Output dialog) for the current driver is inactive, and the Sort option is then selected. In this case, the Sort dialog will appear immediately upon selecting the Sort option.
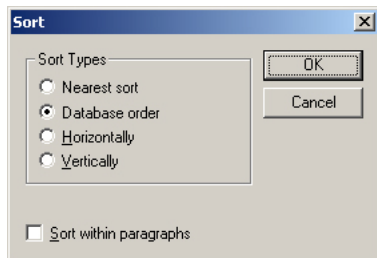
> ➢ **Nearest Sort** forces EngraveLab to sort the objects that are closest to each other and cut them first. For example, two objects that are one inch apart will be cut in the same pass, whereas objects that are five inches apart will be cut separately.

> ➢ **Database Order** sort is the EngraveLab default for cutting, which forces objects to be cut according to their layering order. Layering order indicates the ranking of screen objects as they overlap one another on-screen. For example, an object that has a high layering order will appear to be "on top" of other objects. To adjust the Database Order, refer to the "To Front" and "To Back" commands that are available under the **Arrange** menu.

> ➢ **Horizontally** sorting causes EngraveLab to cut objects as they appear in the graphic from left to right. EngraveLab will cut those objects whose extreme left edges are farthest right first, and then cut those whose left edges are farthest left last. This sort order is most useful when cutting a long file on a friction-fed plotter, as it reduces the required amount of travel back and forth along the length of the vinyl.

> ➢ **Vertically** sorting causes EngraveLab to first cut objects whose extreme upper edges are lowest along the Y-axis. The higher on the Y-axis the object appears, the further in the order it will be cut.

> ➢ Normally, a paragraph of text will be considered as a single object that is assigned its own sort priority. The **Sort within paragraph** option will cause each distinct letter to be assigned its own position in the sort order. For example, if two paragraphs of text, one above the other, are then sorted horizontally, then the sort order will proceed with the first letters of each paragraph, followed by the second letters, and so on. This has the benefit of reducing the back-and-forth motion of the cutter.

Axis Swap

Enabling this option will rotate the axis by ninety degrees (90°) counter-clockwise (CCW). This is a convenient way to save vinyl, especially when cutting long strings of single line text.

Weed Border

If the **Weed Border** option is enabled, then the **Weed** button will be automatically enabled during the Cut Preview mode.

Engrave by Color

If this option is enabled, then entering the Cut Preview mode will automatically open the **Filter By Color** dialog.

Output Tool Paths

Enabling this option will open the **Tool Path Options** dialog. The **Output Tool Paths** option is used to output tool paths that have been applied to workspace shapes. The **Engrave Default Tool Path** option will create a default tool path for all workspace shapes.

If the **Engrave Default Tool Path** option is enabled, then clicking the **Edit Default Tool Path** button will open the **Fill** dialog. The **Fill** dialog indicates the parameters of the default tool path.
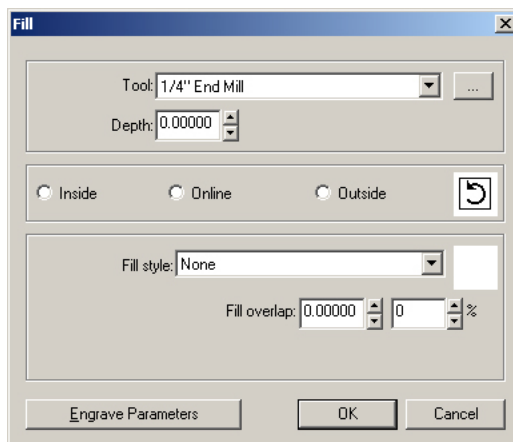
➤ **Tool** lists all the available tools in the Tool Library, including the current selection. New tools may be added by clicking the ellipse button, which will open the **Tools Library** dialog.

➤ **Depth** indicates the overall vertical movement of the tool into the material in relation to the surface of the material.

➤ **Inside** indicates that the tool must cut the object along the interior of the object at a distance equal to one-half the tool diameter. This option is equivalent to cutting a Female tool path.

➤ **Online** indicates that the tool must cut along the object contour. There is no deviation of the tool from the object contour, and this option is equivalent to cutting an Online tool path.

➤ **Outside** indicates that the tool must cut the object along the exterior of the object at a distance equal to one-half the tool diameter. This option is equivalent to cutting a Male tool path.

➤ **Tool rotation** is counter-clockwise. Click this button to toggle tool rotation between clockwise and counter-clockwise rotation.

➤ **Fill style** allows the selection of a variety of style or patterns that the tool can follow during the hogging operation. The available styles are None, S-Sweep, Line Sweep, Spiral, Reverse Spiral, Island, and Reverse Island.

> ➢ **Fill overlap** indicates the amount by which each successive hogging pass should overlap the previous pass. Overlap is used to ensure that all material is removed between contiguous passes of the tool. The overlap is expressed as a percentage of the tool diameter.

> ➢ The **Engrave Parameters** button opens the **Engrave parameters** dialog, which is used to control the number of passes that must occur before the full depth is cut out.
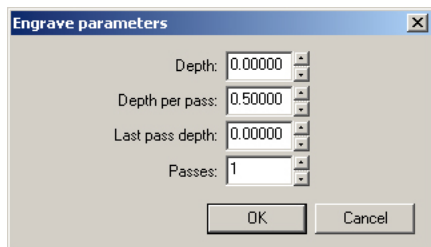
Jog

If the **Jog** option is enabled, then the **Enable Jogging** button will be automatically enabled during the Engrave Preview mode.

Origin Jog

The **Origin Jog** feature is supported by a relatively few number of cutters.

To use **Origin Jog**, there must be <u>one</u> registration mark on the workspace. When the **Origin Jog** option is enabled, starting a job will position the tool at the registration mark, and the job will then proceed as if the registration mark were the origin.

Tool

The **Tool** section is used to define the tool parameters for the present cut or plot.
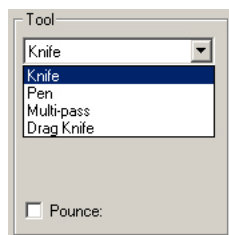
This list box contains a complete list of all tools available for the specified driver. Examples of these tools include:

Air Brush	Both Spindles	Drill
Drag Knife	Knife	Engraver
Left Spindle	Manual depth	Multi-pass
Multi-pass depth	No depth	Pen
Pounce	Pounce Wheel	Racer Blade
Right Spindle	Router	Single-pass depth
Spindle off	Trailing Blade	

Depending on the currently installed driver, only a limited selection of these tools may be available in the list. For the cut or plot job, select the appropriate tool from the list.

Trailing or Drag Knife

Select the Trailing or Drag Knife tools if:

> 1. There is a CADlink Racer Blade tool in the Gerber tool holder.
>
> 2. The plotter is equipped with a Trailing Blade or Drag Knife.

Choosing this tool invokes a routine that allows for the movement of the knife-edge, which is offset from the center of the tool. Without this routine, the objects would not be cut properly, and corners would not be cut sharp. However, be aware that most cutters that support a Drag Knife also have their own routines that compensate. In light of this fact, never set Drag Knife mode for both the cutter and EngraveLab, as this will result in a poor quality cut.

Pounce

During the cutting or plotting job, the **Pounce** setting may be used to create objects with either a perforated or broken line pattern. This pattern is created by lifting and lowering the tool during the job.
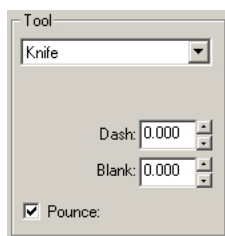
Select the **Pounce** option to activate the **Dash** and **Blank** fields. The **Dash** field indicates the length of the perforation or drawn line. The **Blank** field indicates the spacing between each perforation or line.

Move

This section specifies where the cutter will begin to plot on the X- and Y-axis. By default, the plotter will normally begin cutting a graphic file at the lower left-hand corner of the vinyl. The current unit of measurement will be used when setting these fields.
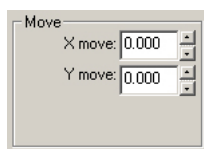
Xmove	Movement along the length of the vinyl (the X-axis).
Ymove	Use this field to adjust the origin for plotting across the width of the vinyl (the Y-axis). This feature is particularly useful when cutting an "upper" section of some used vinyl.

Smoothing

Smoothing refers to the number of vectors or arcs that are used to represent the actual curves when cutting. A higher smoothing setting will increase the number of vectors that represent a curve, thereby producing a smoother appearance to the finished work. The consequence of higher smoothing is that the greater amount of cutting data requires a corresponding amount of computation, which increases the time to complete a given job.
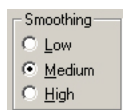
Low	Results in a faster cut, though perhaps at the cost of some drawing resolution.
Medium	Results in a marginally slower cut, but a reasonable amount of smoothing is applied. This is an optimal setting that is recommended for most cutting operations.
High	Applies a maximum amount of smoothing to the original drawing. Cutting will be slow, but accurate.

Engrave

The **Engrave** section determines which parts of the workspace are going to be output.
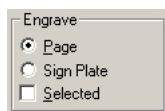
Page	Plot all objects on all active layers of the workspace. Objects will be shifted from the lower left of the page.
Window	Cut all objects in active layers that are currently visible on the workspace. If an object is only partially visible, only the visible portion will be cut. Objects will be shifted from the lower left of the page.
Sign Plate	Cut only those objects that appear on the sign plate. Objects that are partially on the sign plate will be partially cut.
Selected	Only selected objects will be cut. The Selected option is applied in addition to the other Machining settings.

Object Start Point

As each object is cut, the position at which cutting begins may be specified here. Setting this option is used to introduce consistency in tool movements as each shape is cut.
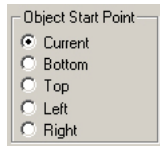
Current	This is the usual default, which uses the mouse click positions when the object was originally constructed.
Bottom	Use the lowest point on each object as a starting point.
Top	Use the highest point on each object as a starting point.
Left	Use the left-most point on each object as a starting point.
Right	Use the right-most point on each object as a starting point.

ENGRAVER SETUP

The **Engraver Setup** dialog is used to configure how a specific model of plotter or cutter is driven. This dialog is opened by choosing **Setup** from the **Output** dialog.
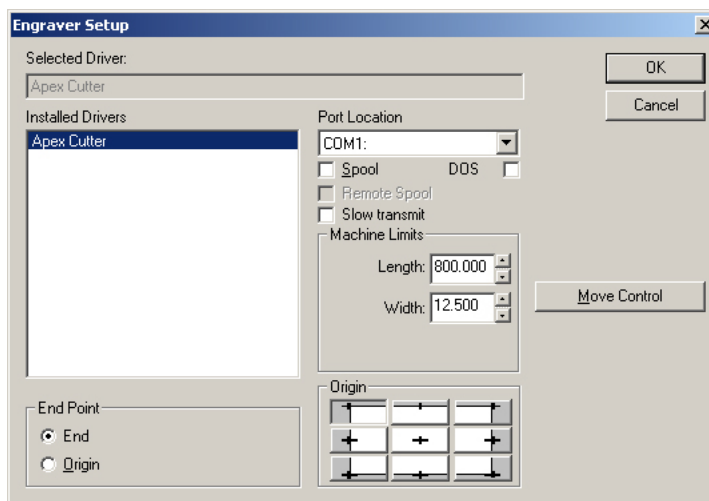
Port Location

This drop down menu is used to specify the port through which the plotter is connected. To select a port, click on the required choice. There are several types of port available:

Serial ports are known as COMM Ports, and vice-versa. These are the recommended type of port to use. The serial port has several features which make it the best choice, including the fact that it is designed to handle bi-directional communications (i.e., it allows the computer to communicate with the device, while also allowing the device to communicate with the computer at the same time). To use the serial port to drive the plotter, set up the serial port properly from within Windows Control Panel. For more information, consult the plotter manual.

LPT Ports, or parallel ports are essentially printer ports. They will often work with a given plotter or cutter, but, unless there is some compelling reason to use an LPT port, a serial port is always a better choice.

File, redirects the plot data to a file on the hard disk.

Spool

Activating the **Spool** option will cause all output, regardless of the port, to be processed by the EngraveLab Output Spooler. The Output Spooler is optimized for transmitting data that matches the specific requirements of the given router, engraver, or plotter. Sending simultaneous jobs to multiple output devices is supported, and once a job is sent, EngraveLab is free to continue editing other workspace projects.

> *Note:* The Output Spooler is described more fully later in this section.

Remote Spool

If the **Spool** option has been enabled, then the **Remote Spool** option will become available. The Remote Spool option is used to plot files across a network to a device that is attached on a different computer from the design station

> *Note:* Please refer to the Output Spooler section for detailed instructions about how to plot files across a network.

Slow transmit

Normally, the **Slow transmit** option need not be enabled, since it will significantly increase the transmission time of data sent to a device.

For devices that are connected via the parallel (LPT) port, the **Slow transmit** option will activate additional transmission checks to confirm that data is being received correctly. The **Slow transmit** option is only necessary where the device cannot process the high rate of data from the parallel port.

Machine Limits

These dimensions represent the range of motion over which the tool movements are restricted during the job. Set these values to correspond with the physical limits of the router, engraver or plotter that is being used. For example, a fifteen inch plotter cannot accommodate a thirty inch wide roll of vinyl. When setting these size options, consult your operator manual for any special setting requirements. When using plotters, be aware of two important facts:

1) The ability to accept a given width of vinyl does not imply that the device is capable of cutting across the full width. The effective width of plotters is typically at least one inch narrower than the vinyl width it can accommodate, and the plotter manual must be consulted for exact maximum-width dimensions.

2) Some plotters will reset or stall when the maximum length is exceeded during a job. To be cautious, the maximum length setting should always be at least one-half inch (12mm) less than the maximum settings that are suggested by the plotter manufacturer. Consult the plotter manual for exact maximum length dimensions.

The **Length** and **Width** dimensions set the default size of the tiling lines.

End Point

This option determines the final resting position of the tool after drawing or cutting an image. It can be set to End or Origin. The End option causes the cutter, upon finishing a given cut, to come to rest at the origin of the next section of vinyl to be cut (the extreme lower right of the job just finished). Choose Origin to cause the cutting head to return to the origin of the cut just completed. An exception to this rule is when the plotting area is tiled, in which case the tool will return to the origin of the last tile cut.

Origin

This option determines the location of the plotter **Origin**. Options include Upper Left, Center, or Lower Left.

Set Path

This option is only available when the **Port** selection is "File." Clicking the **Set Path** button is used to specify the path and filename to which output will saved.
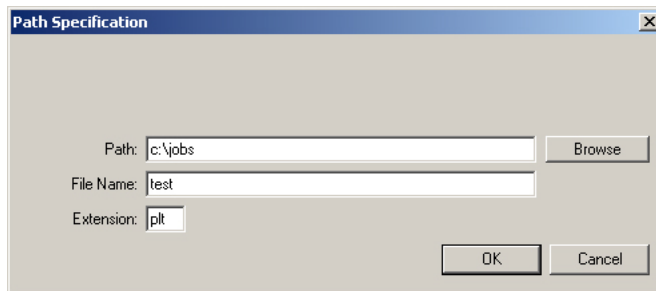
Use a meaningful extension, such as PRN, PS, or PLT.

Get Page Size

Selecting the **Get Page Size** button causes EngraveLab to communicate with the plotter and determine the page size set for the plotter. This option is not available with all plotters.

Plotter ID

Selecting the **Plotter ID** button causes EngraveLab to communicate with the plotter and determines the identity set for the plotter. This option is not available with all plotters.

Notes

Clicking the **Notes** button will display device specific information. Important configuration information is displayed here.

Move Control

Each engraver has driver options that control the movement of the tool head. The **Move Control** dialog is used to adjust these options according to the currently active driver, and the dialog fields will change to represent the options that are actually available for the driver. As an example, the Apex Cutter driver will cause the **Move Control** dialog to appear as follows:
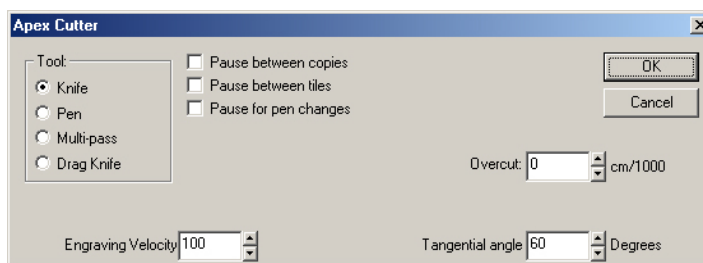
For a given plotter, consult its manual for full details about how each of the **Move Control** fields are used.

TOOL LIBRARY

The **Tool Library** is used for organizing pre-defined sets of tools that will be used with the connected engraver. As new engraving paths are created, tools may be selected from the library instead of setting new tool parameters. The **Tool Library** dialog is opened from the **Engrave** menu.
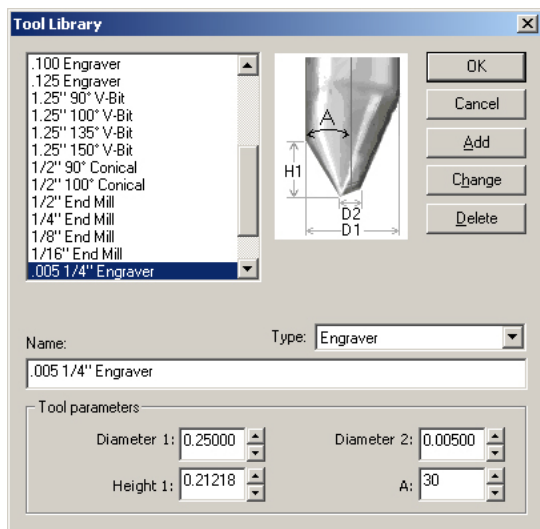
The available tools will be listed at the top-left of the dialog. When a given tool is selected, a diagram that illustrates the tool type parameters will be displayed to the right of the list.

Type

This list box includes all of the available tool types. The **Types** of tools available for use with EngraveLab are End Mill, V-bit, Conical, Double Conical, Round, Round bottom, Flat bottom, and Engraver. This list cannot be edited or added to. The following diagrams describe the relevant dimensions of the each tool type.
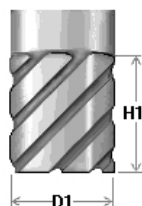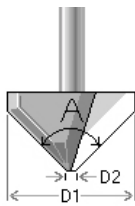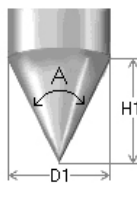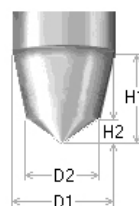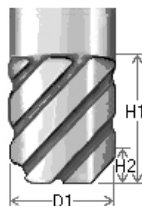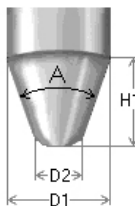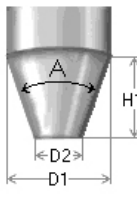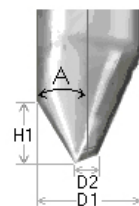
| **End Mill** | **V-Bit** | **Conical** | **Double Conical** |

| **Round** | **Round Bottom** | **Flat Bottom** | **Engraver** |

Tool Parameters

At the bottom of the dialog, the **Tool parameter** values will be displayed for the selected tool. Some bits have irregular parameters, such that they have either two diameters and/or two height values.

Diameter 1, Diameter 2

The **Diameter** settings can be edited to within 1/1000th of a measurement unit. **Diameter 1** is the total width value for any given bit, and if there are two width values, then **Diameter 1** will always be the greater value. **Diameter 2** is the end width value for any given bit.
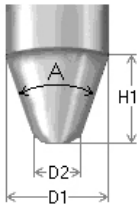
Height 1, Height 2

The **Height** scroll boxes can be edited to within 1/1000th of a measurement unit. **Height 1** is the total height value for any given bit, and if there are two height values, then **Height 1** will always be the greater value. **Height 2** is the point height value for any given bit.
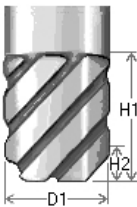
Add

To create a new tool, choose a similar tool from the list, and then set the parameters of the new tool. Type a unique **Name** for the new tool, and then click the **Add** button.

Change

To edit an existing tool, select that tool from the list, set the new parameters for that tool, and then click **Change** to accept the parameters.

Delete

To remove an existing tool, choose that tool from the list and click the **Delete** button.

OUTPUT TOOL USAGE

Output Tool Usage is an estimation tool that collects statistical information about the performance of the tools being used in cutting or plotting. A variety of data is gathered about each tool, such as the overall distance traveled, the number of jobs completed, and the date of the last tool change. Using this data, comparisons between successive tools may be used to make an informative decision about when tools are likely to decline significantly in performance. Tools may then be replaced in advance of this decline, thereby preventing materials from being wasted by an old tool.

Under the **Engrave** menu, selecting the **Output Tool Usage** item will open the **Tool Tracking** dialog. Tracking will be set for the current device that is set in the **Engraving Defaults**, though other tools may be chosen.

Show Traveled Distance

If the **Show Traveled Distance** option is enabled, then after each cut job, a dialog will state the total distance that the tool moved during the job.

Estimate time for current job

After this option is first enabled, the next job that you complete will require that you record the approximate time to complete the job. Before the job begins, the Estimated Time dialog will open. This is simply a reminder that you need to record the cutting time.
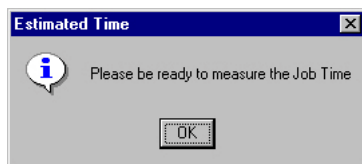
Once you click **OK**, the job will continue as expected. After the job is complete, you will be asked to enter the time that was expended in completing the job.
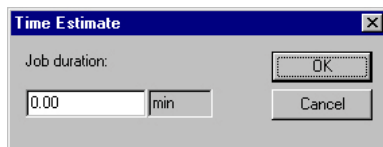
If the estimated time must be updated later, then return to the **Tool Tracking** dialog and click the **Setup Machine Time** button. For the next job that is performed, you will be asked to estimate the job time again.

Once a time estimate has been set, use the **Show Traveled Distance** item (**Engrave** menu) to display the time that will be required the current workspace design. By using this estimate, you can better manage your own time, since you will be able to work on other tasks and return when the current job is complete.

History of Tool Changes

Tools are indexed in sequence, from the first tool that statistics were ever gathered for, to the tool that is currently loaded into the machine.

Whenever a tool is changed, click the **Replace Tool** to indicate that statistics are being collected for a new tools. The **Replacement number** will automatically increment, and the statistics fields (Days used, Jobs done, etc.) will be reset.

The replacement number indicates the tools for which statistics are available. The scroll arrows can be used to navigate through all the previously used tools.

Reminders

The **Reminders** are used to prompt when a tool should be changed. Reminders may be set to occur after the number of days used, the number of jobs done, the total distance traveled, as well as the total time expended as the tool was in use.

Click the **Set Milestones** button to specify the parameters for a given reminder.

During the regular process of cutting or plotting a job, if a milestone is encountered, then a warning dialog will prompt you before the job occurs.
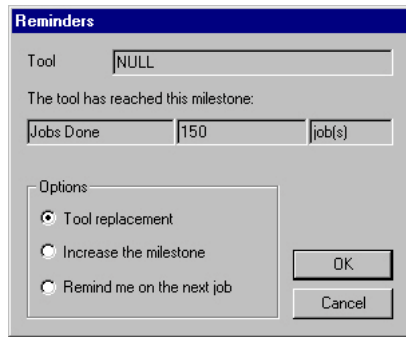
In cases where the tool must be replaced:

1) Replace the tool

2) In the **Reminders** dialog, click the **Tool replacement** option

3) Click **OK** to close the Reminders dialog

By doing this, the **Replacement number** will be automatically incremented in the **Tool Tracking** dialog, and the job will proceed using the new tool. Statistics will be collected for this new tool.

OUTPUT SPOOLER

The **Output Spooler** is a stand-alone application that is designed to make routing and engraving more efficient. The Output Spooler operates in the background independently of EngraveLab, which allows new projects to be edited while waiting for the current job to finish. Additionally, Output Spooler allows cutting to machines on different ports simultaneously. Use the Output Spooler to send ASCII files from sources other than EngraveLab.

If a device requires non-standard handshaking or data-encryption like those from Anagraph or Gerber, the Output Spooler is of particular value, since it will allow for spooling of jobs to these devices. The drivers for these devices do not support the use of third party plot caching programs such as the Windows Print Manager.

Using The Output Spooler In EngraveLab

The Output Spooler is enabled from the **Engraver Setup** dialog.
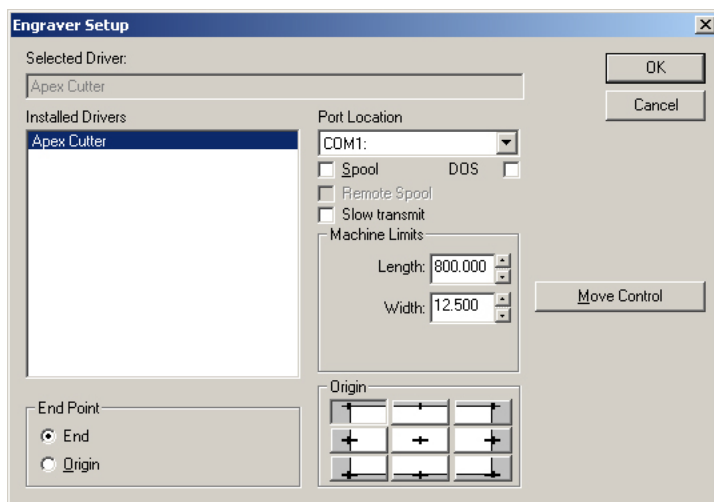
Set the **Engraver Setup** parameters as per normal for the given device. Once the parameters are set, enabled the Spool checkbox:
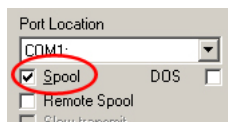
Now that the Spool option is active for the given device, data sent to this device will be processed by the Output Spooler, thereby freeing EngraveLab for other jobs.

The Output Spooler can also be run by itself. For more information on this mode of operation, see the section entitled "The Output Spooler As A Stand Alone Program."

Spooler Controls

When a job managed by the Output Spooler begins, the Output Spooler will appear as a minimized application. When maximized, the Output Spooler window appears as follows:
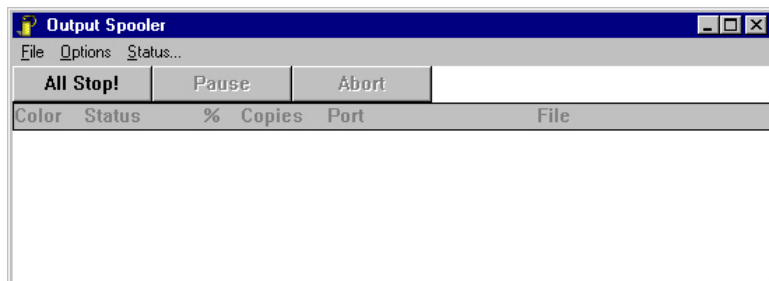
Job Queue

Within the Output Spooler window, the status of each job is displayed in a queue:

Color	Status	%	Copies	Port	File

The order, from top to bottom, indicates the priority in which jobs will be completed. The order may be modified by dragging an inactive job to a different row in the queue.

The status fields are described as follows:

Color

Indicates the color currently being plotted if the Engrave by Color option is used. When cutting by color, each color corresponds to a separate job, which allows jobs to be sorted by color.

Status

This column indicates the current status of each print job. Possible types of status are:

Receiving: Indicates that the Output Spooler is currently receiving a new job from EngraveLab

Ready: Indicates that the selected job has been completely received and is ready to be cut. To begin sending this job, select it and press the Start button. This status will only appears when "Auto Start" is not selected under the Options menu.

Pending: Indicates that the selected file has been added to the queue, but is not yet sending because the required port is busy. This is different from the Ready status, since a Pending file is automatically sent to the output device as soon as device becomes free, whereas a Ready job must be manually started.

Sending: Indicates that the job is being sent through the port to the device.

Paused: Indicates that the job has been paused either by pressing the Pause button, or from a pause command in the file (such as for a manual tool change).

Done: Indicates that the entire file has been sent to the device. The job may be either deleted, or saved for later spooling.

% -- Percent Complete

Indicates the percentage of job that has been completed.

Copies

Indicates the number of copies remaining to be sent to the device.

Port

Indicates the port through which data will be sent.

File

If EngraveLab began the job, then this parameter indicates the name of the EngraveLab CDL file associated with the job. Otherwise, this parameter will display the DOS filename that was manually opened for spooling.

Device

Displays the name of the output device as selected in the Engraver Setup dialog.

Job Control Buttons

| Continue | Start | Delete |

Above the Job Queue are several context-sensitive buttons for controlling the spooling process. The possible button are described as follow:

All Stop	Stops all jobs. Data transfer from Output Spooler to the ports is halted, pending further instructions. Note that devices may appear to be continuing because they maintain a buffer of data.
Continue	Send output to ports that had been interrupted by the All Stop command.
Pause	Stop the selected job.
Resume	Send output to the port that had been interrupted by the Pause command.
Abort	Abort the selected job.
Delete	Remove the selected job from the queue.
Start	Send the selected job data to its designated port.

OUTPUT SPOOLER AS A STAND ALONE APPLICATION

The **Output Spooler** can be launched independently of EngraveLab and utilized to manage plotting, routing and engraving jobs. Jobs can be managed simultaneously between multiple devices on separate ports.

File Menu

The **File** menu commands are used to open files and designate ports for sending output.

```
Open...
Save As...
Set Default Port...
Set Spool Dir...
Refresh

Exit

About...
```
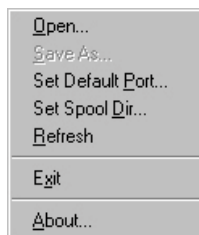
Open

Selecting this option brings up the Open a Spool File dialog box.
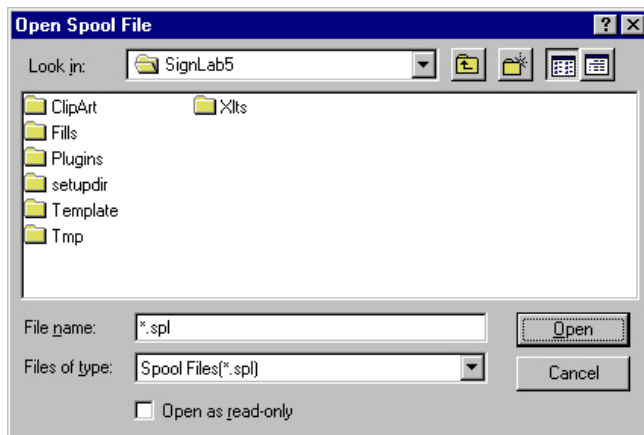
Spool files (.SPL) are used to store EngraveLab jobs. Choose the EngraveLab file and click the Open button. If the opened file is not a EngraveLab type, then the port for sending the file will need to be specified.

Save As

This option allows for saving the currently selected job as a spool (*.SPL) file through the following dialog box.
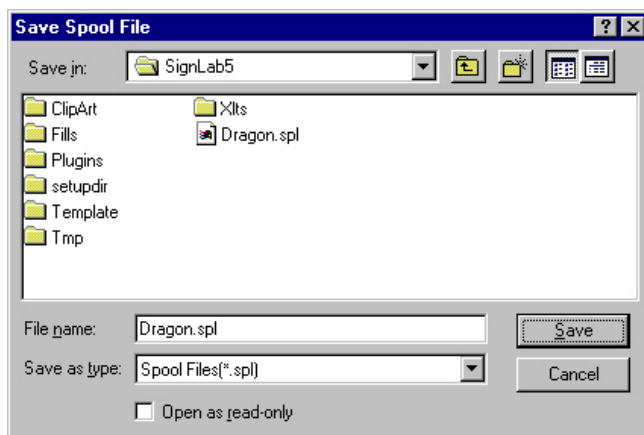
A spool file is a file containing the commands necessary to make the output device cut/rout/print an image or file. The Save Spool File is a standard Windows dialog box, with the ability to change drives, directories, and file types. When saving a file as a spool file, it should be noted that spool files often require more disk space than standard application files.

Set Default Port

Use the Port dialog to set the default port that jobs will be sent to.
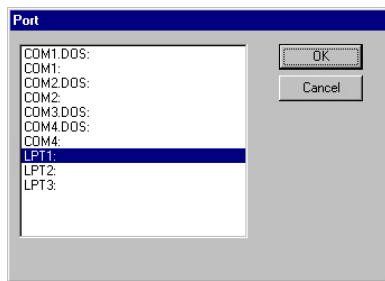
Set Spool Directory

The data for jobs may be stored to file and then sent to the device at a later time. The Spool Directory dialog is used to set the default directory to which job files will be saved.
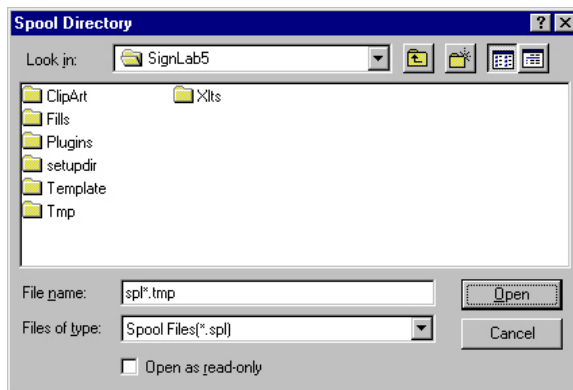
Refresh

The Refresh command forces the Output Spooler to update the status of all pending jobs.

Options Menu

The **Options** menu controls how jobs are processed.
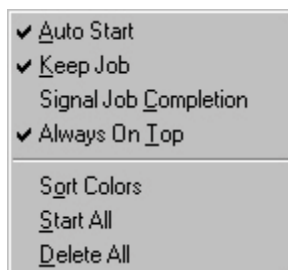
Auto Start

If the **Auto Start** option is active, then jobs will commence as soon as they are received by the Output Spooler. Otherwise, jobs will be paused until they are started manually.

Keep Job

If the **Keep Job** option is active, then jobs will remain listed in the Output Spooler window after they have been completed. Depending on requirements, jobs may then be either saved or discarded.

Signal Job Completion

If the **Signal Job Completion** option is active, then a popup dialog will appear as each job is completed. This feature is most useful when cutting by colors.
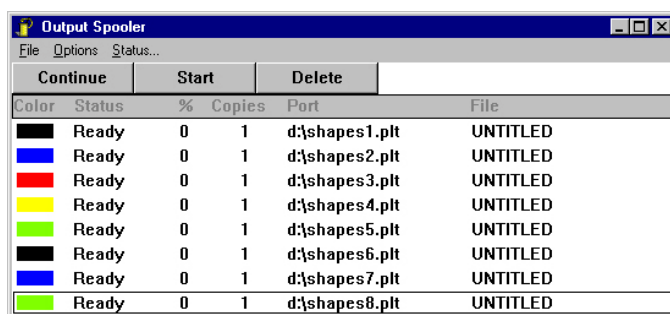
Always On Top

If the **Always On Top** option is active, then the Output Spooler window will visible over all other windows. When this option is activated, the Output Spooler will be shifted to the lower-right of the screen by default.

Sort Colors
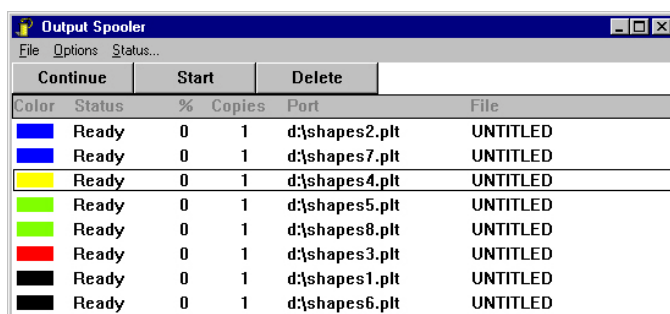
When cutting by color on a plotter, the Sort Colors feature is used to group jobs according to the color of vinyl required. This minimizes the number of times that the plotter must be loaded with a different color of vinyl.

As an example, the following image of the Output Spooler shows several jobs that are differentiated by the color being used. But the jobs are ordered according to when they were received by the Output Spooler.

From the Options menu, the Sort Colors option was chosen. The jobs have now been sorted according to their individual colors, as the following screen shot shows:

Start All

The Start All command will initiate all jobs, causing Output Spooler to begin sending each job to its indicated port.

Delete All

The Delete All command will clear all jobs from the Output Spooler queue.

Status Menu

The **Status** menu item opens the **Job Status** dialog:
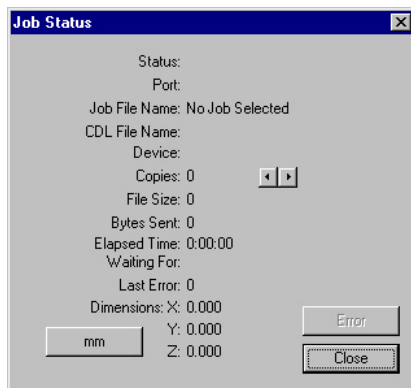
This Job Status dialog provides the following information about the current job.

Status

This field displays the current status of the file. This status corresponds to the Status field on the Output Spooler queue.

Port

This field displays the port through which the file is being sent.

Job Filename

This field displays the name and path (drives and sub-directories) of the source spool file. This is the name of the file as it was generated on disk.

CDL Filename

This field displays the name of the CDL file from which the output file originated. If EngraveLab did not generate the file, then this field will be blank.

Device

This field displays the name of the device to which the output file is being sent. This is the same as the Device field in the main Output Spooler window.

Copies

This field displays the number of copies of the file to be sent to the port. The arrow buttons ◀ ▶ to the right of this field can be used to increase or decrease the number of copies.

File Size

This field displays the size of the file being sent.

Bytes Sent

This field displays the number of bytes sent to the port.

Elapsed Time

This field displays the amount of time that has elapsed since the Output Spooler began sending the job to the output device.

Waiting For

This field is used when Output Spooler is waiting for a of signal from the output device. If the spooler is waiting, then this field will display the anticipated signal.

Last Error

If Output Spooler receives an error message from the device, then the numeric code for this error will be displayed in the Last Error field. The term "error message" is a misnomer because it can also refer to messages that indicate that output is being processed normally.

To view a description of the error message, click the Error button.

Dimensions

This field displays the physical dimensions of the job.

Under the Dimensions field is a button that indicates the units of measurement. Clicking this button will toggle the units between inches, millimeters, and centimeters.

A Note About Multiple Copies

From the Output dialog in EngraveLab, it is possible to set more than one copy to be sent to the Output Spooler. However, the job will arrive at the Output Spooler as a single job, but with instructions to cut the file multiple times. As a result, the Output Spooler must be told to repeat a job by pressing the Start button.

The exception to this is when the stack command is used in the EngraveLab **Output** dialog. When specifying that multiple cuts are to be stacked, the entire file, including all copies and stack information will be sent as a single file. For example, a job with six copies stacked will always yield six copies stacked when the Start button is pressed in the Output Spooler.

REMOTE SPOOLING

Remote spooling is a process by which data is sent to a device that resides on a computer other than the one that is running EngraveLab. The Spooler program resides on a remote computer connected to a network. Several remote machines may be addressed by having multiple device drivers installed and their remote spool file directory set to the same directory that the remote spooler is using to pick up spool files.

Using the Remote Spooling Feature

To use the Remote Spooling Feature, both the remote and local computers must be prepared. Each is discussed in the following sections.

The Remote Computer

The Remote Computer will be the computer that receives the cutting data, and which has an attached device that will render the data. To prepare the Remote Computer for receiving cutting data, follow these steps:

1) On the Local Computer (the one which EngraveLab has been installed), search the EngraveLab directory for an executable file called "spooler.exe".

2) Copy this executable onto a floppy disk.

3) Using the floppy disk, copy the executable onto the Remote Computer.

4) From the **Start** menu on the Remote Computer, choose the **Run** command to execute "spooler.exe".

5) The **Output Spooler** application will open.

6) From the **File** menu, choose **Set Spool Dir** and set the common directory to which files will be stored for spooling.

7) From the **File** menu, choose **Set Default Port** and set the port to correspond to where the device is connected on the Remote Computer.

8) From the **Options** menu, verify that the **Auto Start** option is active.

The Local Computer

The Local Computer will be the design computer that has been installed with EngraveLab. In EngraveLab, remote spooling is enabled from the **Engraver Setup** dialog.

1) Under the **Engrave** menu, choose **Engraver Setup**. The **Engraver Setup** dialog will open:
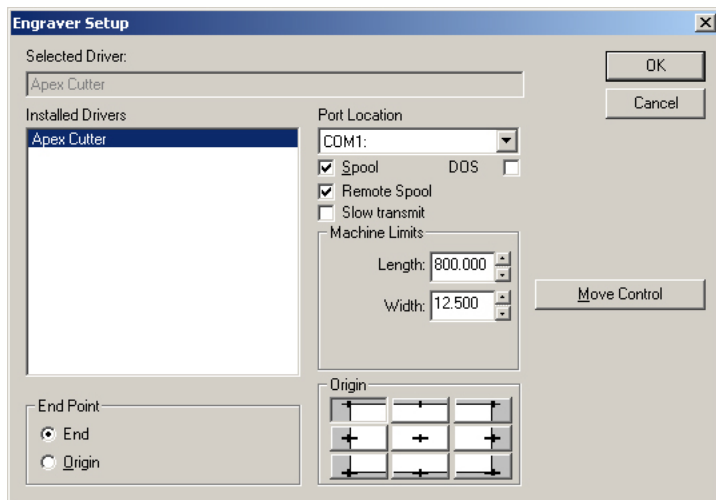
2) On the **Engraver Setup** dialog, select the **Remote Spool** option.

3) The **Browse for Folder** dialog will open.
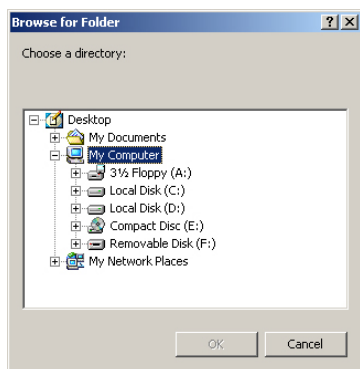
4) Using the **Browse for Folder** dialog, locate the Remote Computer on the network. Then open the Spool Directory that was chosen in step (6) when setting up the Remote Computer.

5) Click **OK** to accept this spool directory.

6) In the **Engraver Setup** dialog, click **OK** to accept the remote spool.

At this point, both the Local and Remote computers are configured to funnel cutting data to the device that is connected to the Remote Computer.

Furthermore

With the Local and Remote computers connected over a network, the Spooling directory can actually be placed on either machine. Where the Spooling directory is placed has advantages and risks, which are summarized as follows:

➢   If the Spooling directory is on the Local Computer, then the cutting process will begin marginally faster over a network. However, a network failure would interrupt data being sent to the device.

➢   If the Spooling directory is on the Remote Computer, a network failure would not interfere with data being sent to the device. However, the Local Computer must have the proper read and write permissions for the Spooling directory.

ADVANCED CUTTING AND PLOTTING

CLIPPING AND CLIPPING CLEAR

The **Clipping** feature is used to designate an object to be a "window" through which other objects are viewed. Of a group of selected objects, the object with the highest layer order will become the window.

The **Clipping Clear** command will remove the Clipping operation.

Though the result of the Clipping operation will group the objects, the **Ungroup** command may be used to separate the object. The individual objects may then repositioned.

Clipping Bitmap Images to Text

The **Clipping** tool may be used to clip a bitmap image to a text shape, as per the following steps:

➢ Under the **File** menu, the **Import** command may be used to load a bitmap. As an alternative, a bitmap file may be dragged-and-dropped onto the EngraveLab workspace.

➢ Using the **Text Compose** tool, create a text shape that will fit over the bitmap.

➢ Position the text over the bitmap. If the text is being hidden behind the bitmap, then select the text and choose the **To Front** command from the **Arrange** menu.
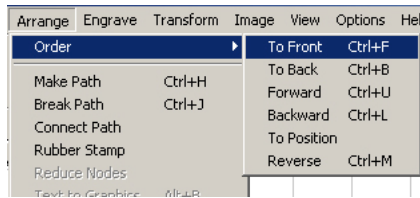
➢ In our example, the text shape now appears on top of the bitmap pattern.

➢ With both the text and bitmap selected, choose **Clipping** from the **Arrange** menu. The bitmap will then appear clipped to the overlying text.

Clipping Bitmap Images

The background area of a bitmap may be clipped by using the AccuScan tool. For example, consider the following bitmap pattern that has been imported into EngraveLab:
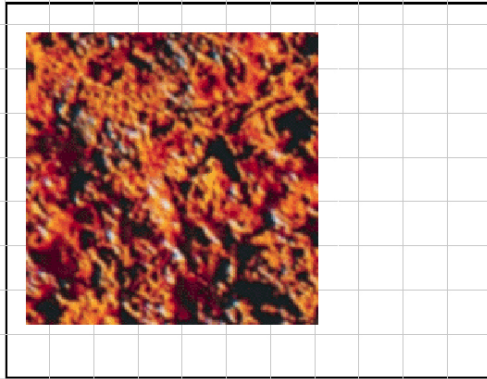
➢ Double-clicking the bitmap will activate the AccuScan editing mode, and various AccuScan tools will appear in the SmartBar. At the far-left of the SmartBar are tools for selecting portions of the bitmap.
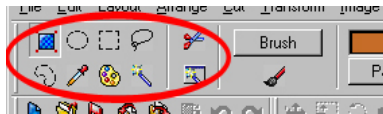
➢ The AccuScan chapter summarizes how these tools are used, but for this example we will use the **Ellipse Select** tool.

➢ Click the **Ellipse Select** tool, and then draw an ellipse pattern on the bitmap. A thin outline will be drawn to show the current selection.

➢ Now click the **Clip Region** button on the SmartBar.
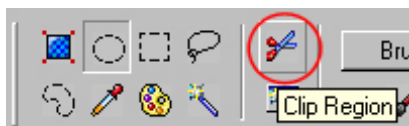
The bitmap will be trimmed according to the ellipse selection that had been previously made.
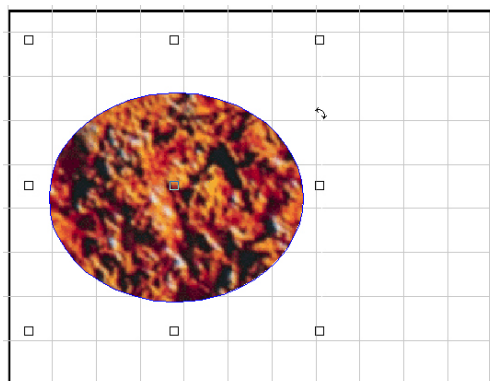
When drawing a selection, holding the **[Shift]** key will add to the current selection. Similarly, holding the **[Control]** key will subtract from the current selection.

WEED AND POWER WEED

After cutting a vinyl shape, the shape must be peeled away from its backing. However, problems may occur when the shape doesn't pull away easily from the surrounding vinyl, in which case stretching of the vinyl may occur. To avoid stretched vinyl, a weed border may be created, which is essentially an extra rectangular cut around the shape. Once cutting is done, the rectangular cut may be peeled away first, followed by the inner shape.

Weed Border

To create a rectangular cut around the selected shapes, choose **Weed Border** from the **Shape Tools** flyout.

In the SmartBar, the **Border Offset** value indicates the distance that will be maintained between the shapes and the weed border.

> *Note:* The default **Weed Offset** value is set on the **General Preferences** dialog. The terms Weed Offset and Border Offset are used interchangeably.

Power Weed

A power weed is like a weed border, except that mid-weed lines (horizontal and vertical) may also be created. These mid-weed lines will improve the ease of pulling the finished vinyl from its backing, especially where text shapes are being cut.

To apply a power weed to selected shapes, choose **Power Weed** from the **Shape Tools** flyout.
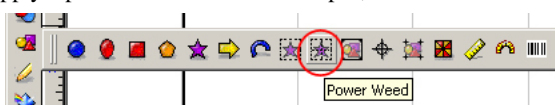
As with the weed border, the **Border Offset** value indicates the distance that will be maintained between the shapes and the border.

To create a horizontal mid-weed line, hold the cursor over the bottom edge of the weed border. When the cursor appears as an up/down bi-directional arrow, left-click and drag to form the weed line. Similarly, a vertical mid-weed line is created by dragging from the left edge of the weed border.
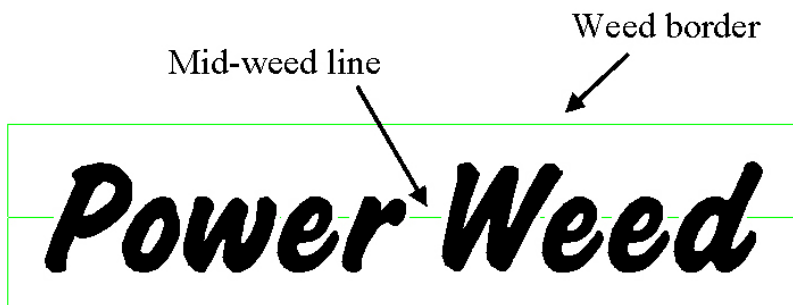
In the SmartBar, the **Line Overlap** indicates how close the mid-weed lines will cut towards the shapes. A **Line Overlap** of zero will cause the weed lines to cut flush with the shapes, whereas a negative value will leave a gap between the weed lines and the shapes.

> *Note:* Any part of the design that is bisected by the weed is left uncut.

Weed Border in Engrave Preview

A weed border may be added during the Engrave Preview mode. The **Weed** button is available on the **Engrave Manager** toolbar.
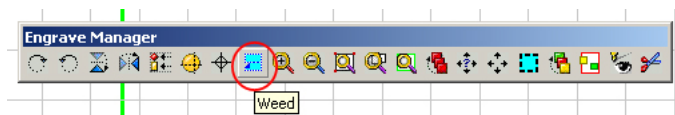
Left-clicking the **Weed** button will activate the weed border, and the preview will show the border that is created about the shapes.

The **Weed offset** value from the **General Preferences** dialog will be used. To use a different **Weed offset** value, right-click the **Weed** button, and the **Weed Setup** dialog will open. Changing the **Weed offset** value will apply to the current job being cut, but the default value will not be changed.

NESTING

The **Nesting** feature rearranges objects on the cutting material with the purpose of minimizing wasted material. Objects can be flipped and grouped on the plate size, as well as rotated to achieve an optimum usage of the cutting material.

To nest the individual letters of a sentence, the **Text to Graphics** command must first be used. Otherwise, the sentence as a whole will be nested, without having rearranged the individual letters.

To use nesting, select the objects that will be cut, and then choose **Nesting** from the **Arrange** menu. The **Nesting** dialog will open.
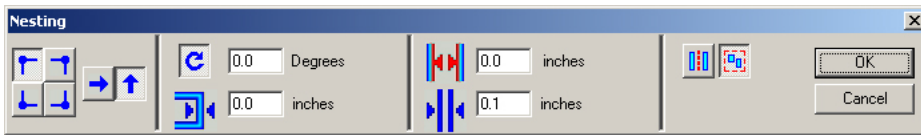
If **Nesting** is activated during the Engrave Preview mode, then an abridged version of the **Nesting** dialog will be available. However, the available controls are used in the same fashion as on the full Nesting dialog.

The Nesting dialog controls are described as follows:

Specify Corners

Choose the corner from which rearranged objects will be placed. Nesting will begin in that corner and expand across the sign plate.

Directions

Choose the direction in which rearranged objects will be spread across the sign plate. The available choices are horizontally and vertically.

Rotation
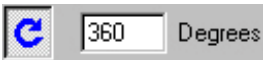
Objects may be rotated as well as rearranged. Select the **Allow Increment Rotation** button to activate the rotation capability. Objects will then be stepped through 360 degrees of rotation in order to find the optimum rotation. The **Increment Angle** field will indicate the amount of rotation that will occur for each step. For example, if the Increment Angle were 20 degrees, then objects will be rotated as many as 18 times in an attempt to find the optimum rotation for each object.

Nesting Border
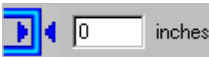
By default, objects will be nested to the very edge of the plate size. Use the **Nesting Border** field to indicate a minimum distance that must be maintained between nested objects and the edge of the plate size.

Clearance Between Objects
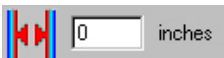
By default, nested objects will be placed in tight proximity to one-another. Use the **Clearance Between Objects** field to specify a minimum distance that must be maintained between objects.

Error Factor of Clearance
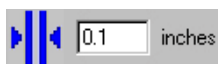
During the nesting process, approximations are made that are based partly on the magnitude of the objects being nested. Setting a small Error Factor will produce more consistent spacing between the objects, but at a cost of more processing time. The following chart provides suggested Error Factor values, which are qualified by the broad categories of Fine, Medium, and Coarse. The table is based on the average dimension of the objects that are being nested.

Average Object Dimension	Fine	Medium	Coarse
0 < Dimension < 100	0.1	0.2	0.5
100 < Dimension < 1000	0.2	0.5	1.0
1000 < Dimension < 3000	0.5	1.0	2.0
Dimension > 3000	1.0	2.0	5.0

Allow Mirrored Parts

In addition to rearranging and rotating objects, the Nesting feature can also flip objects to improve the final placement of objects. Select the **Allow Mirrored Parts** button to allow objects to be flipped.

Keep Groups Intact

Unless this option is active, then grouped objects will be separated during the nesting process. Allowing objects to be separated is useful when the final arrangement of cut shapes is unimportant, though the configuration of objects is somewhat awkward for ungrouping.

REGISTRATION MARKS

Registration marks are placed on the workspace to aid in arranging color layers, such as when producing a full color lay up. Registration marks can be cut or printed as part of the overall graphic. However, operations like scaling may not be applied to registration marks.

Where a graphic is to be printed and then cut on a stand-alone cutting device, registration marks are needed to ensure that the media is correctly aligned. For more information about the usage of registration marks, please refer to **Plotter Jog** in the following section.

Filtering Registration Marks

There may be situations wherein it is not desirable to print or cut registration marks for all color layers. Whenever the **Filter by Color** dialog is used, disabling the **Filter Registration Marks** option will cause current registration marks to **not** be included with the output.
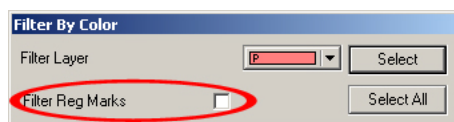
To later include existing registration marks again, open the **Filter By Color** dialog and enable the **Filter Registration Marks** option.

Registration Mark tool

To create a single registration mark on the workspace, choose **Registration Mark** from the **Shape Tools** flyout.

Different registration marks styles may be chosen from the SmartBar. At the far-right of the SmartBar, the dimensions of the registration marks may be set.

Create registration marks by clicking on the workspace. When finished creating registration marks, pressing Spacebar will return EngraveLab to the Select mode. Individual registration marks may then be selected, and their positions may be precisely set using the horizontal and vertical position fields in the SmartBar.

Multi-Registration Marks

To create a set of registration marks for the currently selected shapes, choose **Multi-Registration Marks** from the **Shape Tools** flyout.

As when creating a single registration mark, the style may be chosen from the SmartBar. The **Offset** amount indicates a rectangular distance about the shapes, along which the registration marks will be placed. Up to eight registration marks may be placed, as indicated by the **Positions** checkboxes.
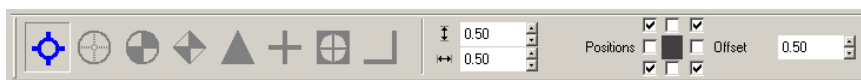
Adding Registration Marks during Engrave Preview

During the Engrave Preview mode, registration marks may be added using the **Registration Marks** button on the **Engrave Manager**.
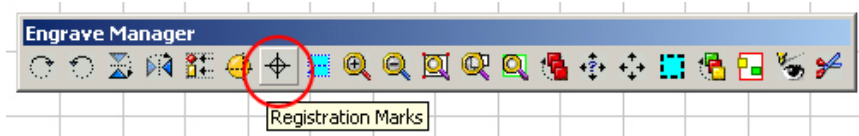
When the **Registration Marks** button is right-clicked, the **Registration Mark Setting** dialog will open. This dialog may be used to set the positions, size and offset of the registration marks, as described in the previous section under **Multi-Registration Marks**.
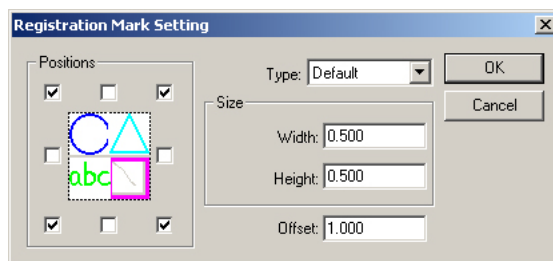
Click **OK** to save the settings, and the **Registration Mark Setting** dialog will be closed. On the **Engrave Manager** toolbar, the **Registration Marks** button may be left-clicked, which will cause the **Registration Marks** popup will appear. The popup may be used to select the style of registration marks.

When the style is selected, the registration marks will be placed about the workspace shapes.
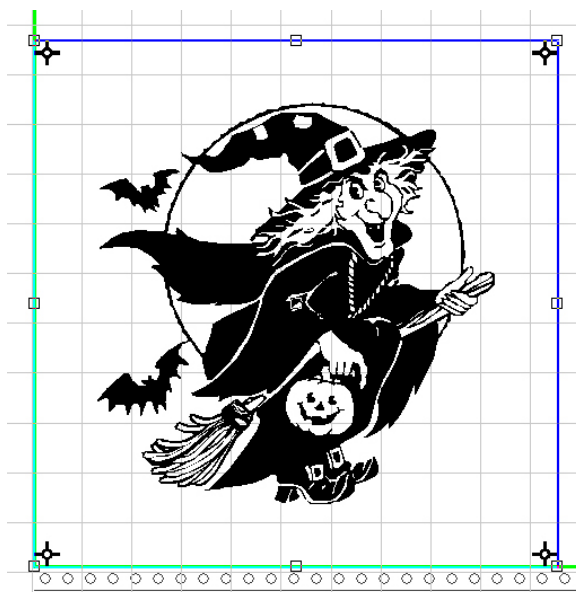
PLOTTER JOG

EngraveLab supports Plotter Jog. This feature is designed to reduce waste material by cutting new objects in unused sections of a vinyl sheet. Objects may be placed precisely into areas of vinyl that were left unused by a previous job. Additionally, elements of a current job can be placed into different sections of the same vinyl for optimum use of space.

In order to perform Plotter Jog, it is necessary that **Registration Marks** be included as part of the job. Registration marks are discussed in the previous section.

Enabling Plotter Jog

To enable jogging by default, choose **Engraving Defaults** under the **Engrave** menu. The **Output** dialog will open, and the **Jog** option may be enabled for the given device.
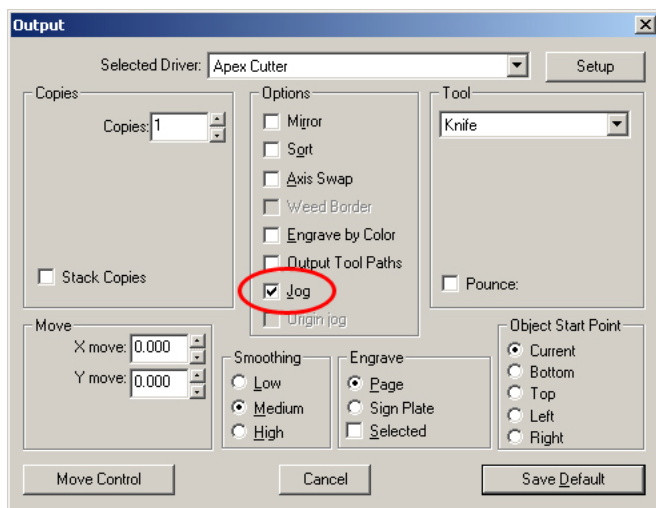
If jogging is not enabled by default, then it may be activated during the Engrave Preview by clicking the **Enable Jogging** button.
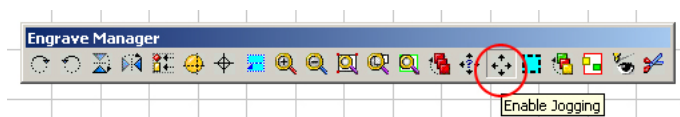
> *Note:* If jogging has been enabled by default, then the preview modes will show the **Enable Jogging** button as depressed.

Jogging Controls

When a job is sent for plotting, the **Jog** dialog will open.
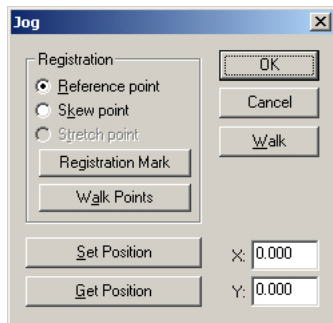
When using vinyl scraps from a previous job, move the artwork origin to fit into the specific area. For example, if the leftover material is oddly shaped...

...then shift the artwork origin to fit the remaining material.

While this task can be accomplished by setting an X- and Y-move from within the **Jog** dialog, jogging the plotter head offers a more precise setting. This is because the head of the cutter can be physically moved to the desired position before committing to the cut. Also, use the Jog option to change the angle of the baseline for a given cut.

Registration

The Registration options are used to set the Reference Point, Skew Point, and Stretch Point. Click the Walk Points button to alternate the plotter position between the different points.

If Registration Marks exist on the artwork, the Reference Points (described below) will be set to the Registration Marks.

Reference Point

The first step in jogging the plotter head is to set the Reference Point. This includes both defining a target point for the group of objects to be cut, and defining where on the material that point is to be placed.

To set the Reference Point, click Reference Point in the Registration area of the Jog dialog box. This setting enables of the Reference Point's target to be defined, as well as its actual position on the vinyl.

The next step in setting the Reference Point is to define the Reference Point's target on the graphic on screen. The default Reference Point is the origin of the artwork (i.e., lower left point). This point can be moved graphically on screen to suit specific needs. Move this Reference Point to anywhere on the artwork by clicking with the left mouse button at the desired position.
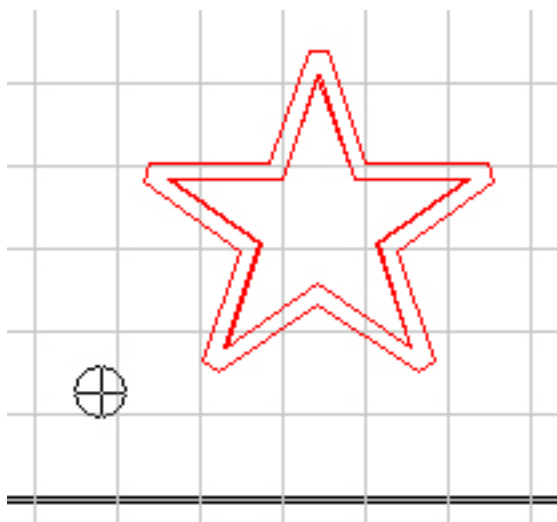
Once the Reference Point is set on the artwork, set the actual position on the vinyl for the Reference Point for cutting. This involves moving the head of the plotter to the point where the target should be placed. The plotter head may be moved in five ways:

1) Holding the right mouse button while moving the mouse.

2) Positioning the mouse and pressing the right mouse button.

3) Pressing the cursor keys (hold the Shift key to move the plotter head in larger increments).

4) Entering the coordinates manually.

5) Moving the plotter head with the plotter controls.

Skew Point

If there is only a Reference Point set, EngraveLab will cut the graphic with a horizontal baseline. Use a Skew Point to either cut a pre-printed piece of material accurately, or improve usage of the available vinyl by changing the angle of the baseline.

➢ The procedure for setting the Skew Point is identical to setting the Reference Point. Click on Skew Point in the Registration section of the Jog dialog box to begin.

Stretch Point

The Stretch Point is used to adjust the horizontal and/or vertical perspective of the graphic. This tool is used with printers that may resize the image during the print process, in which case a Stretch Point is required to cut a pre-printed piece of material accurately.

➢ The procedure for setting the Stretch Point is identical to setting the Reference and Skew Points. Click on Stretch Point in the Registration section of the Jog dialog box to begin.

Registration Mark

Pressing the Registration Mark button causes the plotter to move around to the next registration mark location on the vinyl, which is useful when Contour Cutting print jobs. The plotter head will remain in the up position during this movement. This feature is particularly useful to ensure that registration is accurate for contour cutting pre-printed graphics.

When the Registration Mark button is clicked, this will also change the currently selected registration mark on the workspace, which allows the registration mark to then be defined as either the origin, skew, or slant mark.

Walk Points

Pressing the Walk Points button causes the plotter to move through the Reference, Skew, and Stretch Points on the vinyl. The plotter head will remain in the up position during this movement. This feature is particularly useful to ensure that registration is accurate for contour cutting pre-printed graphics.

Set Position

The Set Position button (computer jogging) is used to define the origin coordinates.

Get Position

The Get Position button (machine jogging) is used to poll the plotter for the current coordinates of the tool.

Move The Cutting Head With The Mouse

To move the cutting head with the mouse, simply drag the target to the appropriate position using the right mouse button. Note that as the mouse moves, the cutting head of the plotter mimics the movements.

Guide the cutter to the position for the first reference point, and release the right mouse button when the plotter head is in position. The cutting head can also be moved by [Shift] clicking the right mouse button at the first reference point position.

To check the exact position of the pen or knife, the cutting head of the plotter can be dropped to the surface of the vinyl by pressing the [Page Down] key on the keyboard. To return the head to the up position, press the [Page Up] key.

Move The Cutting Head With The Keyboard

Moving the cutting head with the mouse is generally a coarse adjustment. To supplement this type of movement with a finer control, choose to direct the cutting head to the required position from the keyboard using the Left, Right, Up, and Down arrow keys. Click in the main EngraveLab view screen before using the cursor keys in order to activate this function. To increase the speed at which the cutting head is traveling, press and hold the [Shift] key while moving the head.

To check the exact position of the pen or knife, the cutting head of the plotter can be dropped to the surface of the vinyl by pressing the [Page Down] key on the keyboard. To return the head to the up position, press the [Page Up] key.

> *Note:* The arrow keys on the keyboard can only be used to move the cutting head to the position of the Target. The Target itself can only be moved using the mouse.

Move The Cutting Head To An Absolute Position

To move the cutting head with a very high degree of precision to an absolute position on the vinyl, type the required X-axis and Y-axis coordinates in the X and Y entry boxes to set the target position. Once the first target point is specified, press the **Set Position** button to lock in the coordinates. This button, available only in Remote Jog mode, will immediately move the plotter head to the position set in the X and Y boxes**.**

TILING

Workspace shapes may be organized into tiles, which is a useful method of sub-dividing the job into manageable sections. In addition, the amount of wasted material may be reduced by "stacking" tiles on the media.
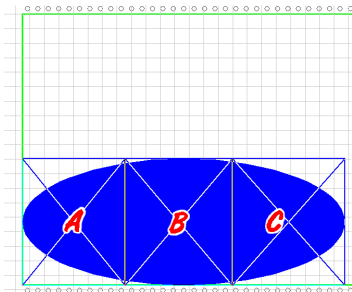
Large shape organized into three tiles. When printed from left-to-right, notice that half the material is wasted.
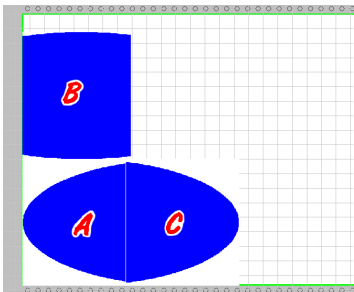
By stacking the tiles, wasted material may be reduced.

Default Tile Settings

The placement of tiles is performed during the **Engrave Preview** mode. Default tile settings are accessible through the **Tiling** dialog (**Engrave** menu).
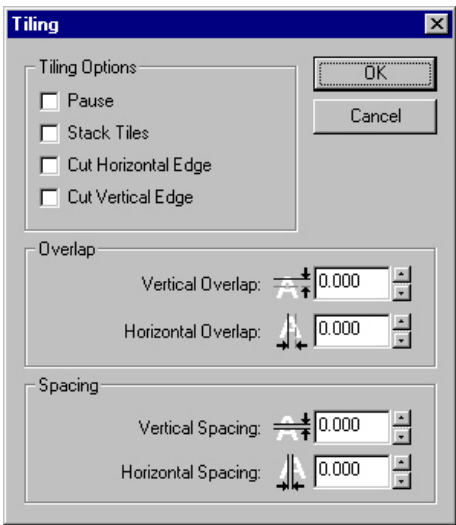
The **Tiling** dialog settings are described as follows:

Pause

This option stops the plotter between each tile. However, not all plotters can be paused between page boundaries. Page boundaries are set within the **Engraver Setup** dialog.

Stack Tiles

Tiles are created and arranged during the Engrave Preview mode. Enabling the **Stack Tiles** options will cause tiles to be automatically rearranged prior to output, such that material waste is reduced.

During the Engrave Preview mode, the arrangement of tiles may be previewed by clicking the **Tile Preview** button on the SmartBar. The button may be clicked again to return to the Engrave Preview mode.
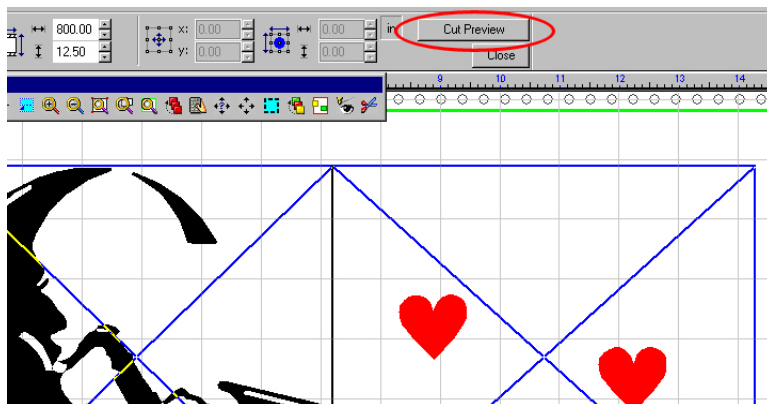
Cut Horizontal and Vertical Edges

These options are used to cut the edge between adjacent tiles, which is useful when overlapping adjacent tiles.

If the **Cut Vertical Edge** option is not used, then the plotter will automatically index past the page boundary without breaking the continuity of the cut.

> *Note:* If the **Horizontal Spacing** is zero, then do not use the **Cut Vertical Edge** option. By doing so, this will allow effective cutting of objects that are much larger than the maximum plotter page size.

Overlap

The **Overlap** specifies the amount of over-cut that each tile will contain, such that the end of each tile will include a portion of the adjacent tile. For example, consider a ½ inch overlap, where two tiles are being cut in sequence. In this case, the trailing ½ inch of the first tile will be identical to the leading ½ inch of the second tile.
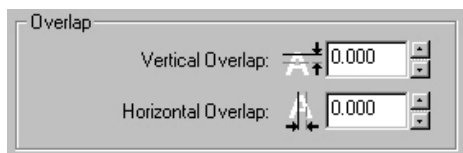
Overlapping adjacent tiles is beneficial when preventing gaps that may appear between panels due to material shrinkage.

Spacing

Spacing indicates the amount of material left uncut between tiles during the cutting job. Vertical spacing refers to tiles that are side-by-side. Horizontal spacing refers to tiles that are above one another on the sheet.
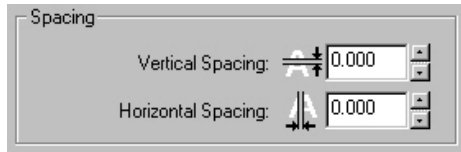
> **Note:** This Tiling box is the same box as where the tiling parameters for printing are specified. Therefore, the rules that are set regarding Tiling in this dialog box will also be applied to the Tiles generated when printing a file.

Creating tiles

Tiles can be created during the **Engrave Preview** mode. Tile editing is begun by clicking the **Tile** button.

By default, shapes will be placed upon a single, main tile. For example, consider the following screenshot of some shapes and text.
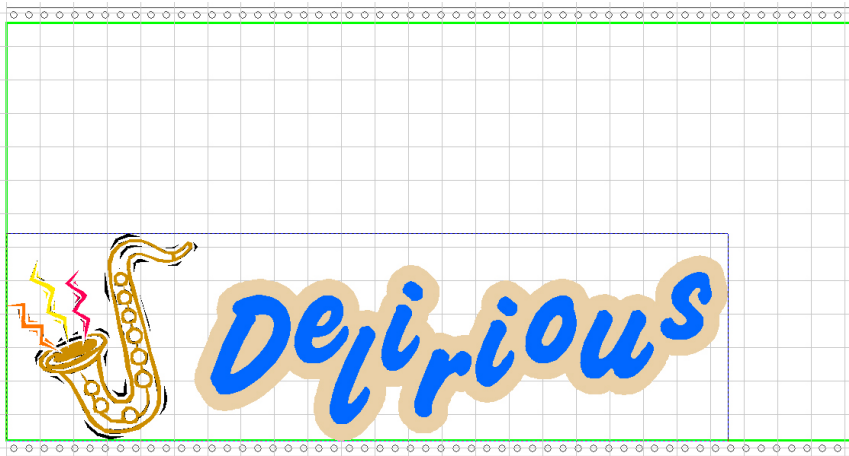
Horizontal Tiles

To create tiles horizontally, hold the cursor over the left edge of the main tile, such that a left/right bi-directional cursor appears.
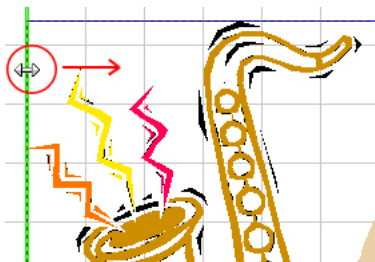
When the bi-directional cursor appears, left-click and drag the tile line, such that it subdivides the main tile. There will now be two tiles, which may be further subdivided to create more tiles. However, avoid dragging a tile line over a previously created tile line, since this will delete the previous tile line.

If a **Horizontal Overlap** amount has been set on the **Tiling** dialog, then the tiling line will be drawn "thick" indicate the overlap. Similarly, a **Vertical Overlap** amount will be shown when creating vertical tiles.
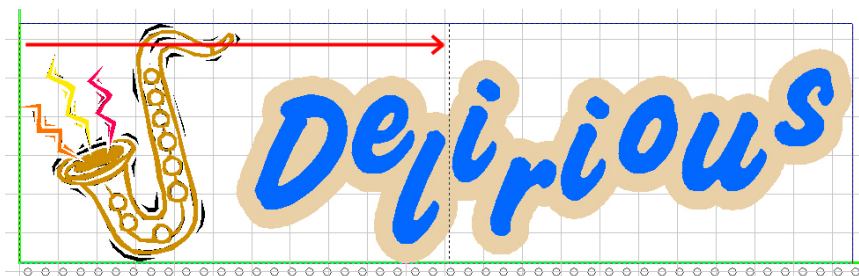
In the above screenshot, a tiling line has subdivided the main tile into two horizontal tiles. The SmartBar indicates that the **"Number of tiles"** is two. In addition, the **"Number of tiles on"** field indicates that both tiles are active.
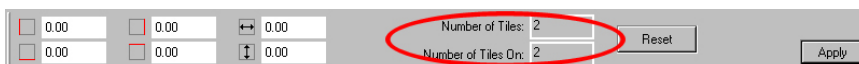
Vertical Tiles

To create vertical tiles, hold the cursor over the bottom edge of the main tile. An up/down bi-directional cursor will appear, which may be dragged to form a tile line.
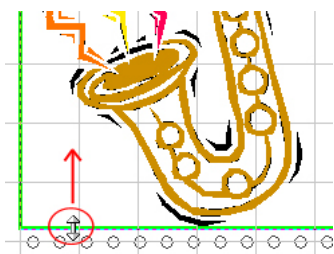
Selecting Tiles

By default, all tiles will be sent as output to the given device. However, if one-or-more tiles are selected, then only the selected tiles will be sent as output. For example, consider a design that has been arranged into four tiles.
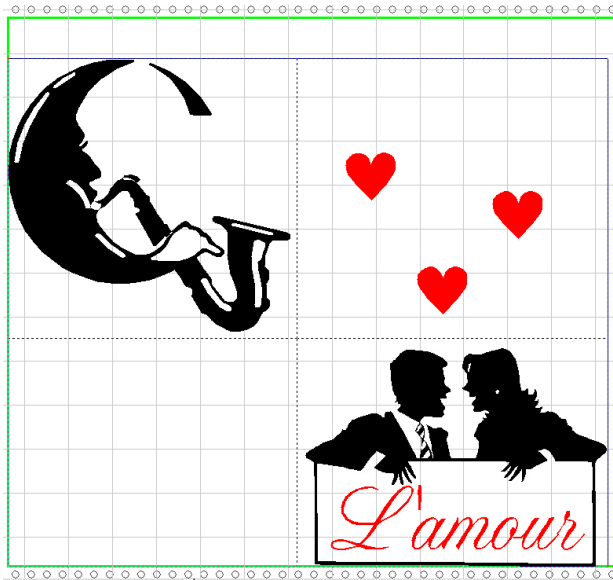
Clicking one of the tiles will cause it to be "crossed out." In the above screenshot, no tiles have been "crossed out," so it is assumed that all tiles should be sent as output. This is verified in the SmartBar, where the **"Number of tiles"** is four, and the **"Number of tiles on"** is also four.
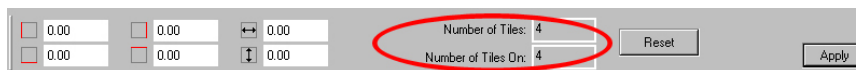
Now suppose that three of the tiles are clicked, such that they are crossed out. The tiles would appear as follows:
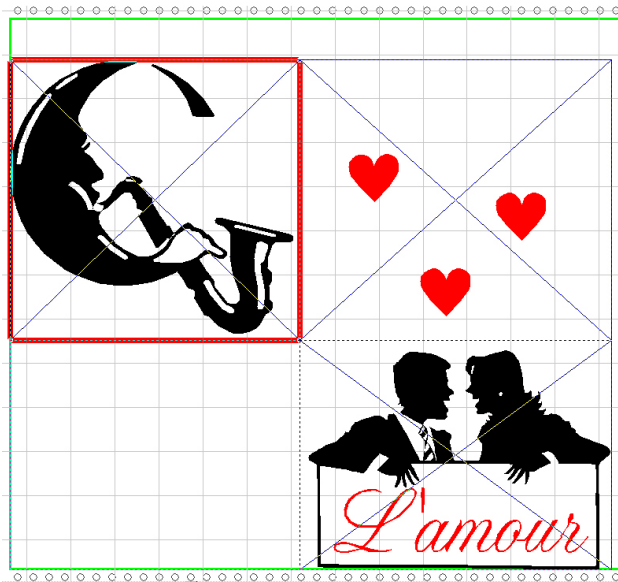
The bottom-left tile is not crossed out, so it will not be sent as output. As confirmation, the SmartBar indicates that the **"Number of tiles on"** is three.
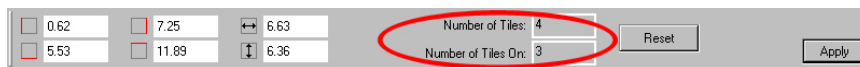
For the most recent tile that was clicked, the SmartBar displays the coordinates and dimensions of the tile. This information is displayed at the far-left of the SmartBar.

BADGES

The **Badges** feature creates a series of workspace objects based upon a basic design and data file. For each badge that is produced, the data file contains one set of text data that is applied to the template. For example, badges may be used to create nameplates for doors, identification cards for employees, or adhesive labels for schematics.

Note: For examples of settings up badges, please refer to the EngraveLab tutorials that are provided from the CADlink web site at http://www.cadlink.com.
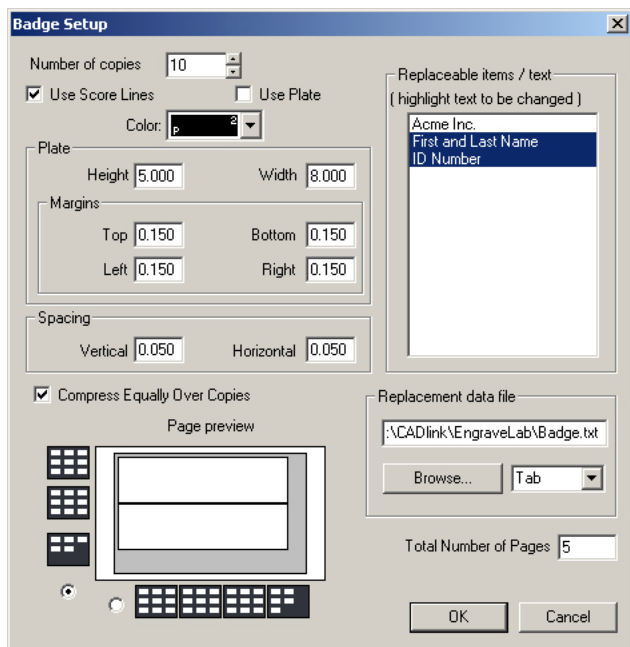
Number of copies

Specify the number of badges that will be created.

Use Score Lines

Score lines are inserted between each badge, so as to improve the ease of separating the badges after production. Use the **Color** field to set the score line color.

Use Plate

By default, badges are distributed to maximize usage of the plate size area. Activating the **Use Plate** option will force each badge to a single sign plate. Individual badges may then be printing according to their given page number.
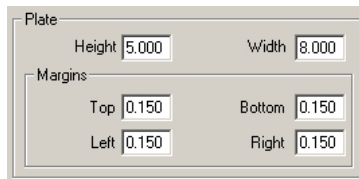
To view the resulting badges, use the **Paging Tool**.
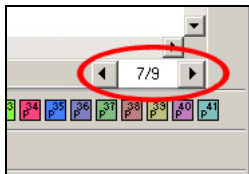
Note: For the **Use Plate** option to work, the **Margins** must all be cleared to zero.

Plate size and margins

Specify the Plate Size and its margins. If the Plate Size is equal to the badge size, then a single badge can be printed per plate.

Plate	
Height 5.000	Width 8.000
Margins	
Top 0.150	Bottom 0.150
Left 0.150	Right 0.150

Routing Or Engraving...

It is recommended that the **Height** and **Width** be set to the exact dimensions of the plate.

Rendering A Sign In Vinyl...
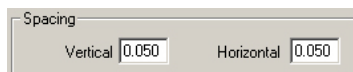
Set **Height** and **Width** to match the page size set for the plotter.

Margins

These margins are applied to the <u>cuttable</u> area of material, not necessarily the actual size. As mentioned previously, these margins must be cleared to zero when the **Use Plate** option is active.

Spacing

When spacing multiple badges per plate, the distance between each badge is indicated by the **Vertical** and **Horizontal** fields.

Spacing	
Vertical 0.050	Horizontal 0.050

Compress Equally Over Copies

For the text frame that is being used as a badge template, suppose that compression rules have been applied to the text frame. When replacement text is inserted during the badge creation process, the indicated compression rules will be applied to any badge text that exceeds the text frame. Since it is good practice to set the text frame equal in size to the badge, the text compression will consequently prevent the text from exceeding the badge dimensions.

If the **Compress Equally Over Copies** option is enabled, then all badges will be evaluated to determine the badge that requires the most text compression. All badges will then be applied with the same amount of text compression. Naturally, if no given badge had required text compression, then none of the badges text would be compressed.

Page Preview

The **Page Preview** controls are used to specify how multiple badges will be arranged upon the Sign Plate. If the **Use Plate** option is checked, then the badge dimensions will be set equal to the Sign Plate, and the preview will indicate that each badge fills the entire plate.
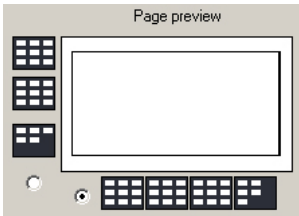
If the **Use Plate** option is unchecked, then multiple badges will be arranged either **Vertically** or **Horizontally**, depending on the chosen **Page preview** setting. For example, consider six-dozen badges that are arranged on a 6" by 10" plate. In this case, an entire plate was filled with badges, so the **Page preview** displays badges on the second plate. Notice that where the plate is not full, a grayed-out badge will be drawn to indicate that additional badges will fit on the plate.
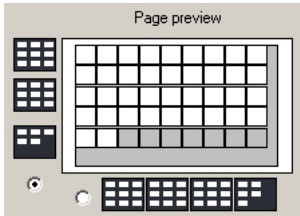
Badges arranged Vertically, from top-to-bottom.
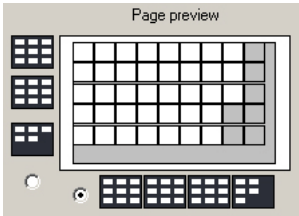
Badges arranged Horizontally, from left-to-right.

Total Number of Pages

Once the number of badges have been set, and the **Plate size and margins** have been specified, then the **Total Number of Pages** field will indicate how many "pages" will be filled with the resulting badges.
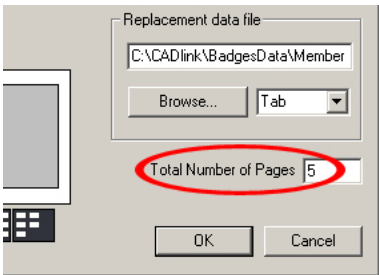
Replaceable Items

The **Replaceable Items** list displays all valid text objects for substitution. The text of each item will correspond to the text that had been entered on the workspace. Select the text objects that will undergo substitution.

> *Note:* The order of fields in the Replacement Data File should correspond to the order of text shapes on the EngraveLab workspace. This will allow the **Badge Setup** dialog to substitute text in the correct order.
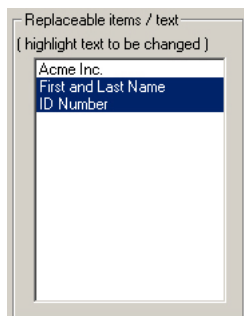
For text objects that are not selected, no substitution will take place.

Replacement Data File

The **Replacement Data File** contains the text that will be substituted for each badge.
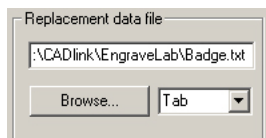
Any text editor may be used to create this file. Within the text file, each line represents a set of data for one badge. If the badge has multiple fields, then each field must be separated by a delimiting character, such as a comma, a space, or a tab character. For example, tab-delimited data might appear as the following:

Text Field 1   *<press Tab>*   *Text Field 2*   *<press Tab>*   *Text Field 3*

Next to the **Browse** button, the drop-down list may be used to choose the delimiting character that is used in the text file.

> *Note:* If there are more badges being created than there are sets of data, then the extra badges will be filled with empty data.

Text Substitution

From the **Badge Setup** dialog, press the **OK** button to continue. If one-or-more text fields were selected within the **Replaceable Items** list, then the **Text Substitution** dialog will open:
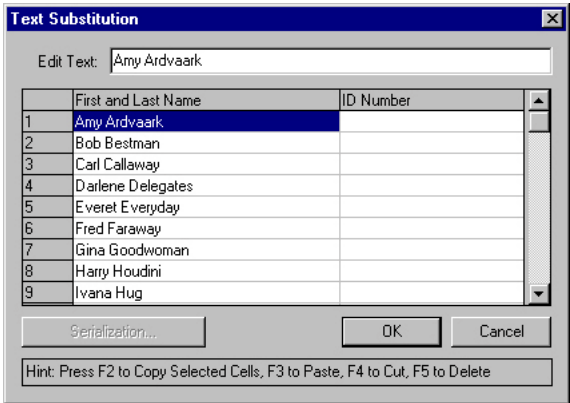
Each column represents one of the elements that was previously selected within the **Replaceable Items** list. If a **Replacement Data File** had been specified, then the column entries will be completed using the data from that file. For empty cells, select the given cell and type data within the **Edit Text** field.

Serialization

Badges may be indexed using the **Serialize** dialog. From the **Text Substitution** dialog, select the range of fields for which indexing will be set, and the **Serialization** button will become active. Only contiguous cells may be selected, and all selected cells must be within the same column. Note that an entire column may be selected by clicking the column header.

When the given cells are selected, click the **Serialization** button to open the **Serialize** dialog:
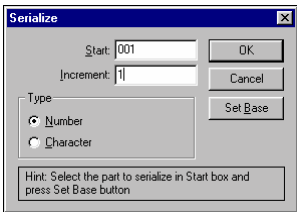
Start

The initial text data from which serialization will build an index for the badges. The value here may be either numeric, alphabetic, or alphanumeric.

Increment

This is the numeric value that must be added to the value used on the previous badge. In most cases, set this value to one.

> *Note:* For alphabetic series, the ASCII character set is used. If the badges have incremented through the entire ASCII character set, then subsequent badges will continue from the beginning of the set.

Type

Use the radio buttons to indicate whether the series is composed of numeric or alphabetic data.

Set Base

When serializing badge data, the value in the **Start** field is used as the base, to which the **Increment** is added for each subsequent badge. However, by using the mouse to select only part of the **Start** field data, then only the selection will be incremented. In this case, unselected portions remain constant. For example, suppose a series of booth labels must be created for a trade show.
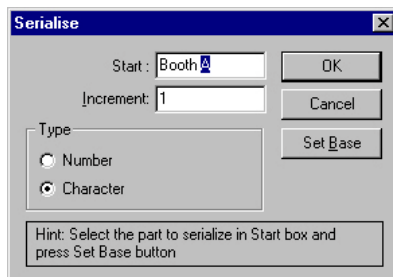
As in the screen shot, the value "Booth A" is entered. Using the mouse, only the "A" was highlighted, and then the **Set Base** button was clicked. This indicates that the word "Booth" will remain constant, while the highlighted portion will be incremented for each badge.

Click **OK** to close the **Serialize** dialog, and the **Text Substitution** dialog will be updated as follows:
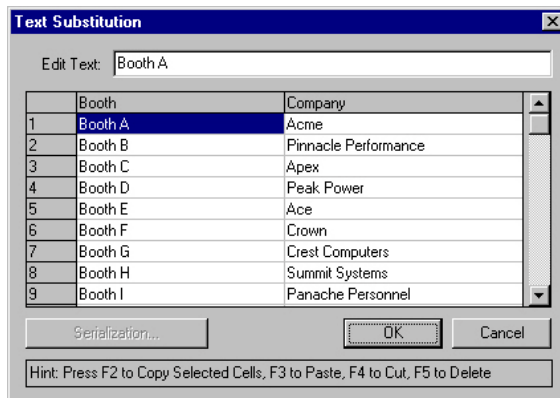
PRODUCTION TOOLS

Introduction

The **Production Tools** are signmaker tools that help manage and improve the signmaking process. Detailed information can be organized about each work assignment, and initial designs can be quickly previewed by customers. Customers may also request changes or additional info, and confirmation may be obtained prior to initiating a job.

JOB/COST NOTES

The **Job Notes Summary** dialog is used to record the relevant information about a given job. This information is stored with the workspace, so that it is always available for review. In addition, contact information that is stored here can be used to fill out wizard information when using the Generate Quote, Generate Proof, or Generate Portfolio commands.

Individual company records may be stored for later use, such that this information need not be specified more than once. In addition, job information may be indexed on a per company basis.

Checkboxes
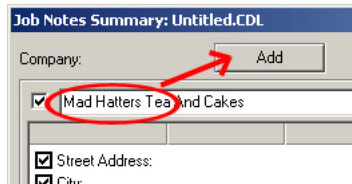
On the **Job Notes Summary** dialog, a checkbox is provided beside each field. If a given checkbox is disabled, then its field will not be included when printing the job/cost notes, nor when using the **E-Mail Preview** feature (**Web** menu). This is a useful means of preventing sensitive information from being included as part of the documentation.

> *Note:* Changes to these checkbox settings will be stored as part of the general EngraveLab settings, such that they will not be reset when a new EngraveLab session is started.

Company

The company for which the job is being designed. Either choose an existing company from the drop-list, or enter a new company name. If a new company name is entered, then the **Add** button must be clicked.
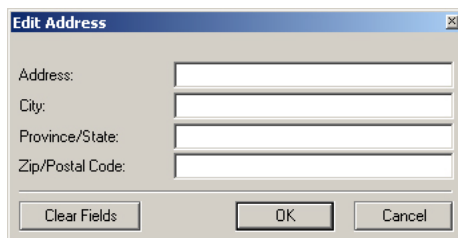
In some cases, a job request is made by an individual that does not belong to a company. This is not a problem, since their contact information may be entered as normal. However, enter their name as the "company" name as well, such that their record may be located in future jobs.

When a **Company** has been specified, then the **Job Ticket** field will become active.

Edit Address

Click the **Edit Address** button to specify the address information for the company.
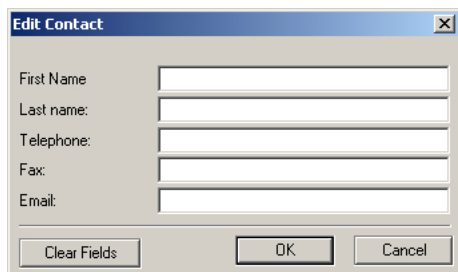
Edit Contact

Click the **Edit Contact** button to enter information about the company representative.

First and Last name

Enter the name of the person responsible for contracting and accepting the finished job.

Contact Information

Enter the Telephone number, Fax number and E-mail address for the contact person.

Job Ticket

The **Job Ticket** is the collection of design information about the current job. When a **Company** has been selected, the **Job #** field will become active. To maintain an inventory of jobs by number (or by any other alphanumeric code for filing purposes), enter the appropriate **Job #** code and then click the **Add** button.

The **Job #** will also displayed on the **Edit Job** dialog. If the Job # had not been entered on the **Job Notes Summary** dialog, then the **Job #** may be entered on the **Edit Job** dialog. In this case, the **Add** button must then be clicked on the **Job Notes Summary** dialog to confirm that the job is valid.

Edit Job

Click the **Edit Job** button to enter specific production information about for the **Job Ticket**.

Job #

The **Job #** field corresponds to the **Job Ticket** field on the **Job Notes Summary** dialog.

The **Job #** field only becomes active when a **Company** has been chosen. If an inventory number has already been entered in the **Job Ticket** field, then the **Job #** will be displayed as a static (non-editable) field.

Date

The **Date** field can be used to note the date the job was started or the order taken. Click the Date field to activate a calendar popup.

Material Type

Enter the type of material and quality of material that will be used for rendering or cutting.

Complexity

Many designers use a complexity rating in order to help set pricing on certain types of work. Rate each job for complexity and enter the complexity value in this field.

For Example, consider letter welding in conjunction with intricate weeding. A graphic using script lettering would require significantly more time than had a sans serif font been used. Therefore, using the script lettering would be deemed a more complex job.

Engraving Time

This box may be used to track the amount of time required to cut a given job, which can aid in calculating job costs. This is particularly useful for routing and engraving, where machine time is a billable expense. Values are entered manually, since there is no automatic time calculation available for this function. However, use TimeSign to record the time required to complete the job.

Production Time

Enter the required production time in this field. It may reflect the estimated time required for pricing purposes, or actual time required for job costing. Values are entered manually, there is no automatic time calculation available for this function.

Weeding Time

This field is designed to reflect the amount of time required to weed the current job. It is typically used either to note the estimated weeding time (for pricing purposes) or the actual weeding time (for reference in pricing future jobs). Values are entered manually, there is no automatic time calculation available for this function, however, it can be used in combination with TimeSign to calculate bill-able time accurately.

Travel Time

Enter the amount of time required to get to and from the current job site in this field. This feature can be particularly useful where travel time is a factor in the final cost of the sign.

Computer Time

Use this box to track the amount of computer time spent on a given job. This can be useful information when calculating the cost of a given job. Enter the value in this box manually, there is no automatic time calculation for this function.

Used in combination with TimeSign, available through the **Help** Menu, the **Computer Time** field can be a crucial aid in calculating bill-able time accurately.
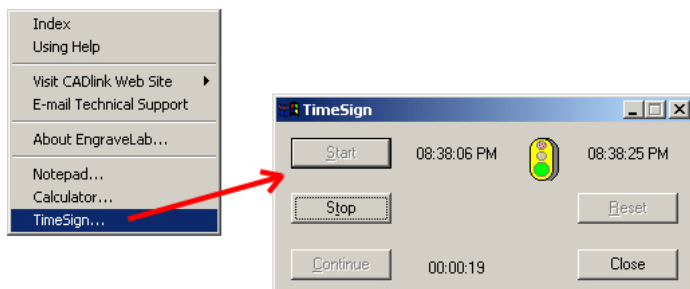
The **TimeSign** feature is discussed in the following section.

Printing Time

Enter the amount of time required to print the current job. This field is primarily designed as an aid for estimating or costing jobs which specify large-format digital printing, but is also useful for those jobs which require printed previews. It may be used to note estimated printing time for pricing, or actual printing time for job costing. Values are entered manually, there is no automatic time calculation available for this function, however, it can be used in combination with TimeSign to calculate bill-able time accurately.

Material Cost

Enter the actual or estimated cost of materials for the current job.

Labor Cost

Enter the cost of labor for the current job.

Selling Price

For future reference, and as an aid to job pricing and accounting, include the selling price of the current job in this space in the Job/Cost Notes dialog.

Delivery Date

Enter the due date scheduled for the current job.

Order Number

If Purchase Orders are required prior to starting a job, then enter the **Job** or **Customer Order** number.

Order Taken By

Enter the name or employee number of the person who took the order for the job. With more than one salesperson, attribute each job to a specific employee. This provides the ability to clarify details with the appropriate person on staff, or to track sales by employees.

Job Notes

A brief description of the job should be entered into this field. This will help identify a given job quickly and easily.

Material, Vinyl, Color Notes

Enter any additional notes that pertain to the manufacturer, vinyl, grade of materials, etc. used in the job. This facilitates repairs to, or reproduction of, the job in the future.

Set Default Database

When EngraveLab is installed, the **Job/Cost Notes** database is placed in the EngraveLab install directory. If there is a common database that must be used on a network, then click the Set Default Database button. A browse dialog will open, which allows you to choose the database file that must be used.

> *Note:* The database file may also be accessed through the Chariot Monitor application. Please refer to the **"Using SignLab with Signtopia"** document.

Printing the Job Report

Click the **Print** button to create a **Job Report** printout. Much of the **Job Report** fields correspond to fields on the **Job Notes Summary** dialog, though the printout also provides additional statistical information about the job.

Graphic Size:	Width: 519
Counts:	
Bitmaps:	0
Shapes:	62
Characters:	0
Colors:	14

Each count is automatically calculated and updated each time that the **Job Notes Summary** dialog is opened. The counts are described as follows:

Graphics Size

The **Graphics Size** indicates the finished size of the current job, including all elements of the job, except the Sign Blank Size.

Bitmaps

The **Bitmaps** count indicates the number of bitmaps currently contained in the job.

Shapes

The **Shapes** count indicates the number of polygon, polyarc, parametric, and other non-text objects contained in the current job. This count includes all text objects that have been converted to graphics.

Characters

The **Characters** count indicates the number of text characters contained in the current job – excluding both text objects that have been converted to graphics, and characters that are generated by the Dimensioning feature.

> *Note*: Any text character converted to graphics will be recognized as a graphic object and included within the **Shapes** count. This includes all text that has been transformed, welded, converted to graphics, or has had the path broken or the corners rounded. In all cases, a warning dialog will appear before the text is converted, unless the warning dialog had been previously disabled (see **General Preferences** dialog).

Colors

The **Colors** count indicates the number of colors used in the current job.

TIMESIGN

TimeSign is a timer application that tracks elapsed time during a job. The current system time is shown at the top-right of the dialog.
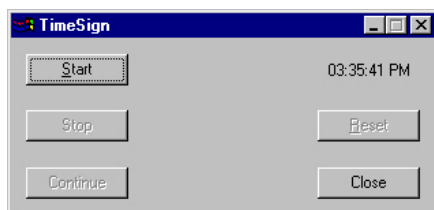
Start

Click the **Start** button to activate the stopwatch. Once activated, the Start time will appear beside the Start button. The traffic light icon will signal green to indicate that the timer is active.
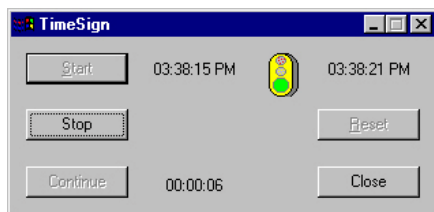
Stop

Click the **Stop** button to pause the timer. The time at which the Stop button was clicked will be displayed next to the Stop button. The traffic light icon will signal red to indicate that the timer has paused. The elapsed time is displayed at the bottom of the dialog box beside the Continue button.
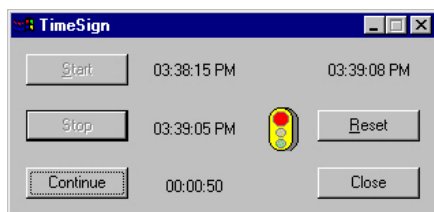
Continue

Elapsed time is displayed next to the **Continue** button. Click the **Continue** to recommence timing without resetting the elapsed time. For situations where the job is frequently interrupted, the Continue button is helpful for timing the total expended work.
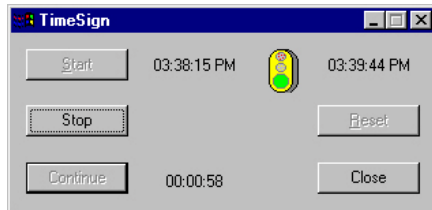
Reset

Clicking the **Reset** button will set the elapsed time to zero.
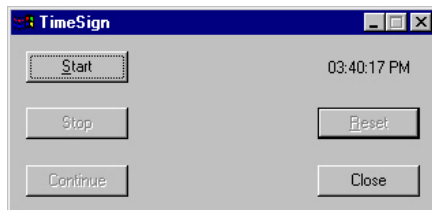
TEMPLATES

A **Template** operation is used to convert a **text object** into a variable workspace element, which is then saved with the workspace. Later, when the workspace is again loaded into EngraveLab, the text object will be converted into the type designated by the **Template** operation. For example, a template may be set to display the current date when the workspace is loaded.

When a text shape is selected, the **Templates** flyout may be accessed under the **Layout** menu.
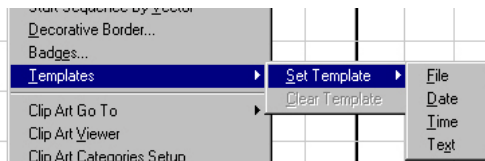
File

The **File Template** operation will cause the text object to be replaced with an imported data file, such as a company logo or other image. The original text object may be used to determine the size and placement of the imported file.

For a selected text object, choose **File** from the **Set Template** flyout. The **Template File** dialog will open.
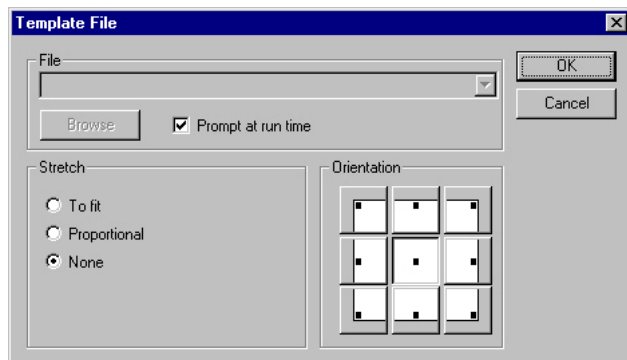
File / Prompt at Run Time

The file to be imported may be selected before saving the workspace, or the file may be chosen by the user when the workspace is loaded.

If the **"Prompt at run time"** option is disabled, then click the **Browse** button to choose the file that will be loaded.

If the **"Prompt at run time"** option is enabled, then the user will be queried for a file when EngraveLab workspace is opened.

Stretch

The **Stretch** options are used to determine the size and placement of the imported file.

The **To fit** option indicates that the width and height of the file will be set equal to the replaced text object, such that the entire text frame is filled. However, the aspect ratio of the imported file will not be maintained. This option assumes that the text object was originally set to the desired width and height of the anticipated file.

The **Proportional** option will scale the file to fill the text frame. Since the aspect ratio of the file is maintained, it is likely that not all of the text frame will be filled.

The **None** option will cause the file to be imported and placed at its full size. The file will be neither scaled nor resized.

Orientation

The **Orientation** is used to indicate where the file should be placed within the text frame. This option is relevant when the **Stretch** has been set to either **Proportional** or **None**.

Date

Create a text object and set it to the appropriate size for any artwork proofs. Select the text object and choose the **Date** option from the **Set Template** flyout. When the workspace is loaded, this text object will be replaced with the current date, as per the system clock of the workstation.

Time

Create a text object and set it to the appropriate size for any artwork proofs. Select the text object and choose the **Time** option from the **Set Template** flyout. When the workspace is loaded, this text object will be replaced with the current time, as per the system clock of the workstation.

Text

Create a text object and set it to the appropriate size for any artwork proofs. Select the text object and choose the **Time** option from the **Set Template** flyout. When the workspace is loaded, the user will be prompted for replacement text. The original text object will then be substituted with the replacement text.

> *Note:* The original text object will be used as part of the prompt for replacement text. Creating a meaningful text object will help as a reminder when the workspace is opened.

Clear Template

For a selected text object that has been previously applied with a **Template** operation, use the **Clear Template** command to remove the **Template** operation. The **Clear Template** command may not be applied to a group selection.

CLIP ART

EngraveLab is provided with a **Clip Art** viewer that is a quick means of browsing and selecting clip art. Either bitmap (.BMP) or CADlink Drawing files (.CDL) are valid formats that may be imported as clip art.

The **Clip Art** features are accessible under the **Layout** menu.
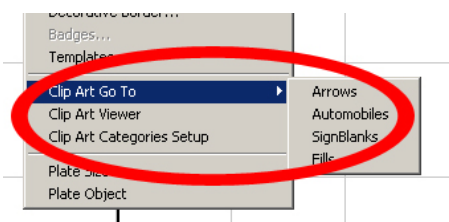
Clip Art Viewer

To browse for clip art, choose the **Clip Art Viewer** item under the **Layout** menu. The **ClipArt** dialog will open.
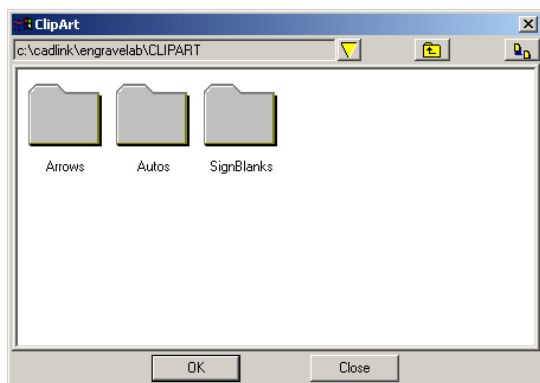
When EngraveLab was installed, an option was provided to install several clip art folders within the EngraveLab install directory. The **ClipArt** dialog may be used to navigate these clip art folders, as well as other clip art that are on the workstation.

Navigating the clip art folders

Double-clicking a folder will show the contents of that folder. To exit a folder, click the **Up One Level** button.

At the top-right of the dialog, the **View** button may be used to toggle between small and large previews of the clip art.

Opening the clip art

To open a clip art object, double-click its preview in the **ClipArt** dialog. Alternatively, drag-and-drop the preview onto the EngraveLab workspace. In either case, the EngraveLab cursor will become an angle bracket, which is used to position the clip art on the workspace.

Clip Art Go To

As a shortcut, the **Clip Art Go To** flyout lists folders that contain clipart. When a folder is selected from the flyout, the **ClipArt** dialog will open, and the contents of the folder will be displayed.

To edit the folders that are listed in the flyout, choose the **Clip Art Categories Setup** item under the **Layout** menu.

> *Note:* EngraveLab is installed with default folders for Arrows and Automobiles clip art, as well as bitmap fill patterns. Additional clip art is available on the *Fonts and Sign Clip-Art* CD.

OPERATIONS ON SHAPES

BASIC TOOLS FOR OPERATIONS

Cut and Paste

The basic **Copy** and **Paste** commands are typical of Windows applications:

Cut	[Ctrl + X]	Transfer the current object to the Windows clipboard.
Copy	[Ctrl + C]	Store the current object on the Windows clipboard.
Paste	[Ctrl + V]	Insert from the Windows clipboard to the EngraveLab workspace.
Clear	[Del]	Remove the selected object from the workspace.
Duplicate	[Ctrl + D]	Create a copy of the selected object. The offset for duplicates is set from the General Preferences dialog.

Note: Copying and pasting a shape will automatically simplify the pasted shape.

Undo and Redo Navigation

In addition to **Undo** and **Redo** commands, there are navigator windows for browsing multiple operations.

Undo	[Ctrl + Z]	Reverse the previous operation. When node editing, only five levels of Undo is permitted.
Redo	[Ctrl + Y]	Reverse the previously performed Undo operation.
Undo Navigator		Open navigator dialog for choosing point after which all operations will be reversed.
Redo Navigator		Open navigator dialog to choose Undo operations to be reversed.
Purge Undo		Remove all Undo and Redo information from memory, thereby freeing that memory for other uses.
Repeat	[Ctrl + R]	Apply the previously performed operation to the currently selected object.

Note: For advanced operation manipulation, please refer to the **InstantReplay** feature, which is discussed in the following section.

Locking workspace objects

Property locks are used to limit the types of operations that may be performed on workspace objects. Two types of restriction may be applied. An operation may be "locked," which prevents that operation from being modified for a given object. An operation may also be "restricted," which prevents the locked-status from being modified without authorization.

Simplifying Objects

As operations are applied to a shape, those operations are stored as part of the shape history. The **InstantReplay** feature displays this history as a list, where individual operations may be double-clicked and edited.

For a shape composed of many different operations, the **Simplify** command will incorporate these operations into the shape. Simplified operations will not be displayed in the Instant Replay window, nor will they be editable. This feature is useful for aggregating a shape before applying new operations to it.

For a shape that have been applied with a tool path, node editing the shape will automatically update the tool path to correspond with the new shape contour. However, applying the **Simplify** command to the object will break the association between the object and tool path, which will allow the object nodes to be edited without changing the tool path contour.

To simplify a selected shape, choose **Simplify** from the **Arrange** menu.

Simplify and Tool Paths

After a tool path is applied to a shape, suppose that the shape is then node edited. When node editing is complete, the corresponding tool path will be updated to maintain consistency with the new shape contour. However, applying the **Simplify** command to the object will break the association between the object and tool path, which will allow the object nodes to be edited without changing the tool path contour.

INSTANTREPLAY

The Instant Replay feature is a graphical interface for editing and reusing operations, where an operation is any transformation or special effect that can be applied to a EngraveLab shape. Use InstantReplay to edit or remove the operations that have been applied to a shape. When a set of operations has successfully achieved a desired effect, those operations may be stored and applied to new shapes in future EngraveLab sessions.

Using InstantReplay

Suppose that a couple of text shapes have been created on the workspace. Initially, no operations have been applied to these text shapes, so the InstantReplay window will indicate the basic operations that exist for all newly created shapes.
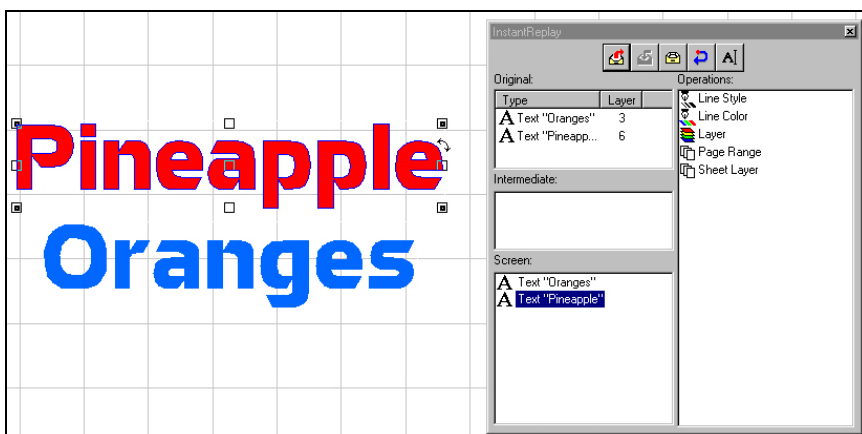
For the first text shapes, a transformation operation was performed, followed by a gradient fill. When the shape is selected, the InstantReplay window indicates that a "Special Fill" has been applied, as well as a Perspective Transformation.
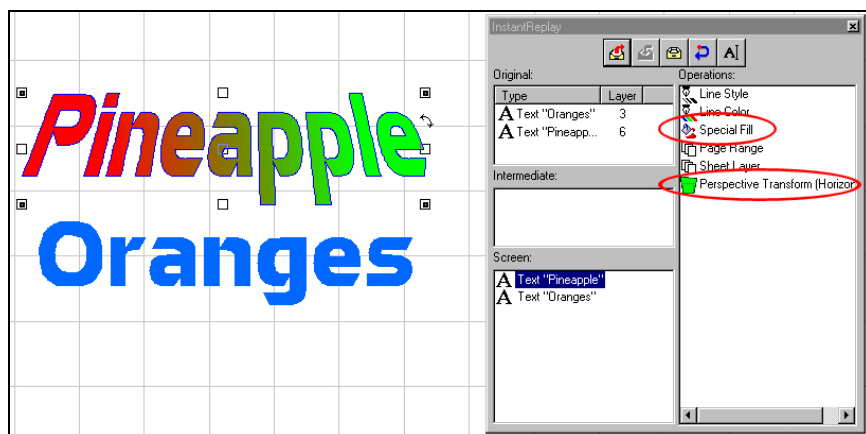
To use the same fill settings on the second text shape, click and drag the "Special Fill" from the InstantReplay window. Drag-and-drop the "Special Fill" onto the second text shape, and the fill will be applied.
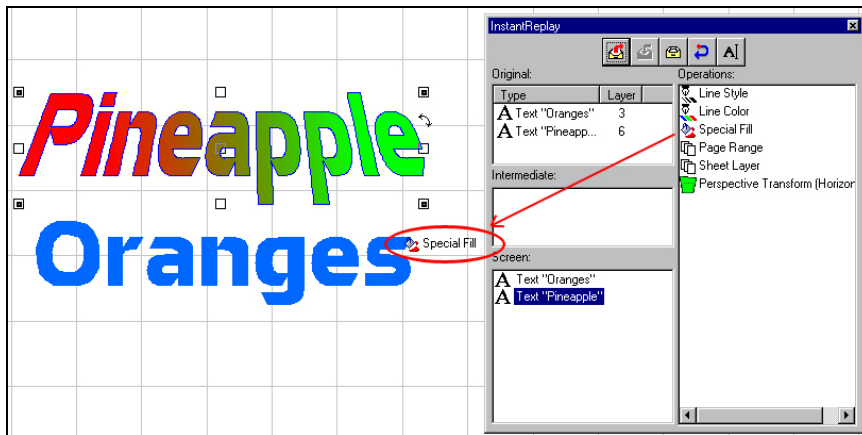
Similarly, drag-and-drop the "Perspective Transform" onto the second text shape.
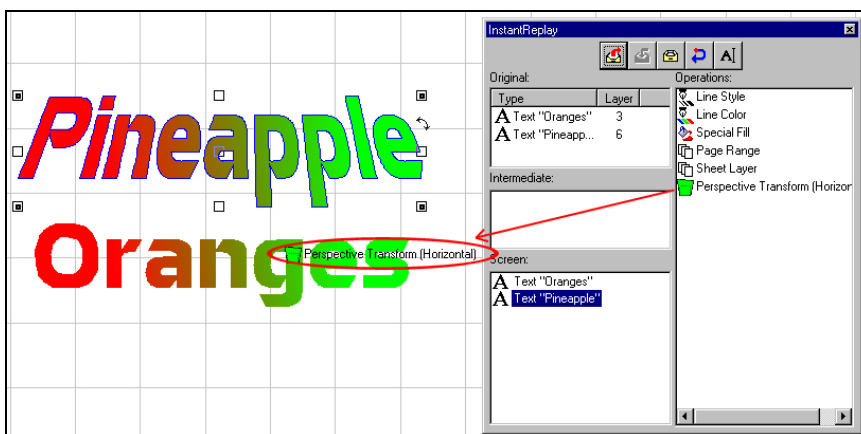
When the second text shape is selected, the InstantReplay window will show that both the Special Fill and Perspective Transform have been applied.
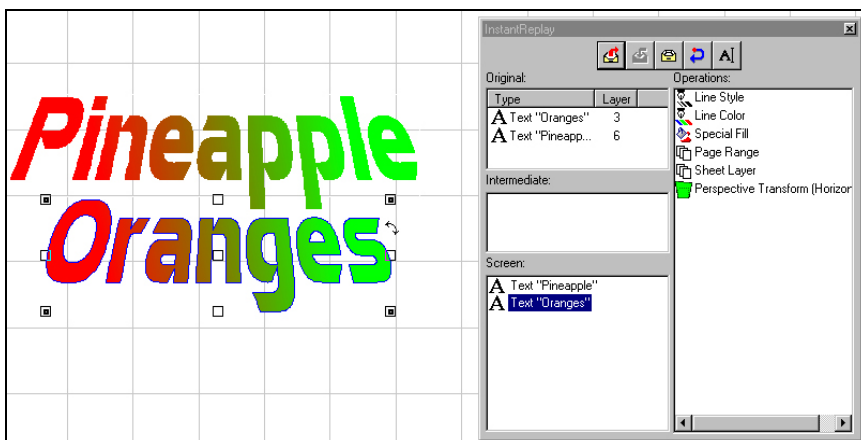
Using the Storage Bin

At the top of the InstantReplay window is the **Show Clipboard** button.
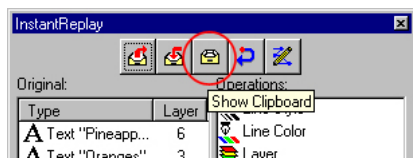
Clicking the **Show Clipboard** button will open the **Storage Bin** window. The **Storage Bin** is a convenient holding area for operations that you would like to reuse frequently.
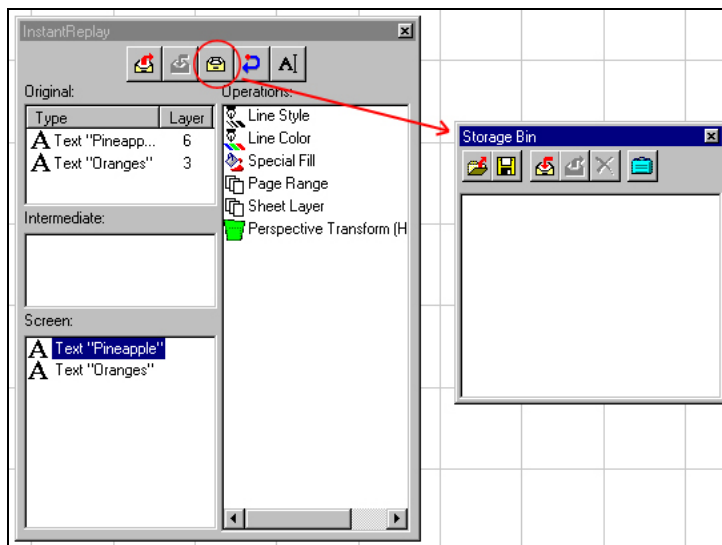
For a selected shape, operations may be dragged-and-dropped onto the **Storage Bin**. The operation will then be listed within the **Storage Bin**, regardless of the currently selected shape.
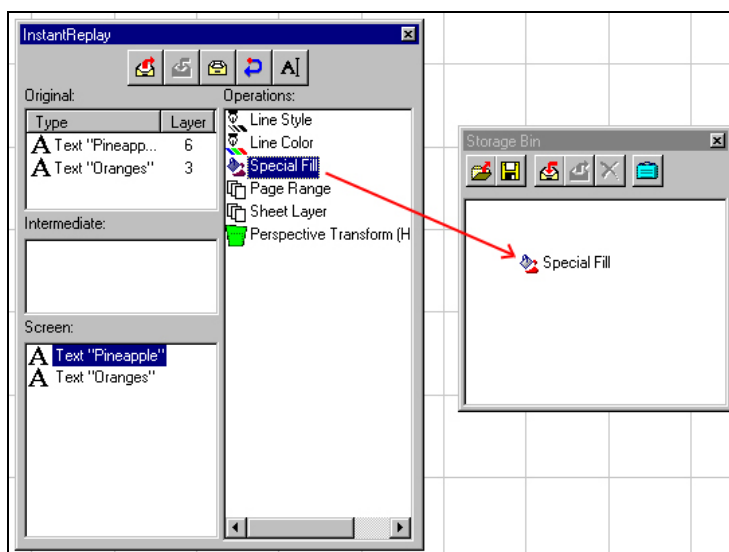
Suppose that the "Special Fill" and "Perspective Transform" operations from the previous section had been dragged into the **Storage Bin**. By then selecting both operations within the **Storage Bin**, those operations may be dragged-and-dropped onto another text shape.
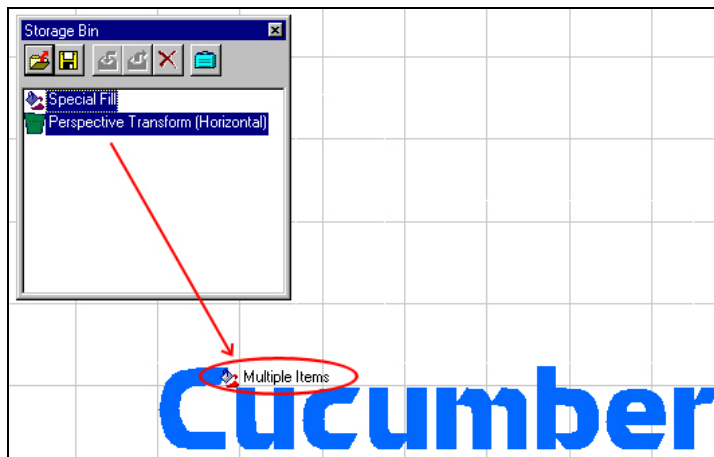
The text shape will then be applied with both operations.
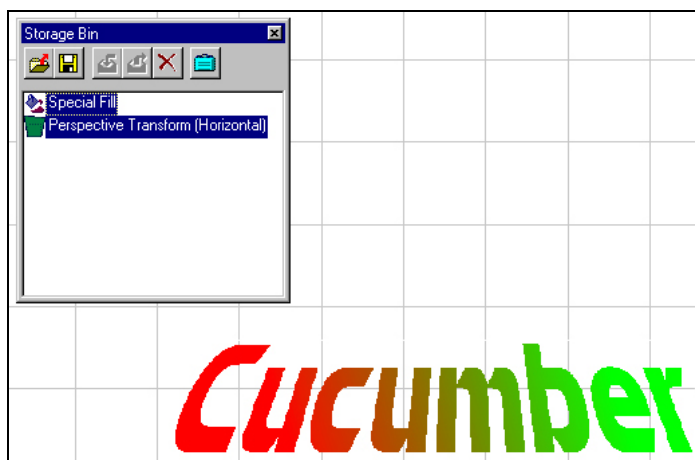
The Instant Replay Window

The **Instant Replay** window lists the operations that have been applied to the currently selected workspace shape. Individual operations may be edited, deleted, or copied to the **Storage Bin** for application to other shapes.

Dragging an operation within the list can change the order in which operations are calculated for a shape. Further, an operation can be dragged from either the **InstantReplay** or **Storage Bin** windows and dropped onto a workspace object.
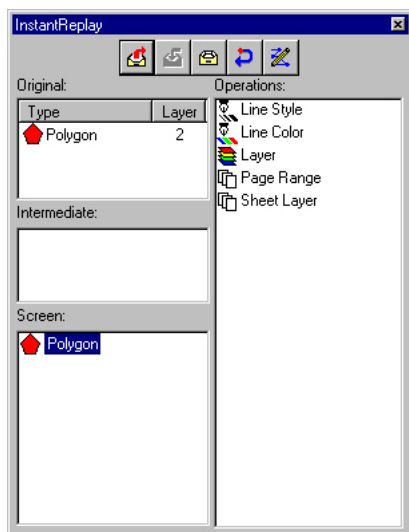
The basic operations for any shape are the **Line Style**, **Line Color**, **Layer**, **Page Range,** and **Sheet Layer**. These operations are considered to be elemental to any shape. Though these basic operations may be edited, neither deleting them nor combining them with other operations is permitted.

Editing an operation will activate the editing controls for that given operation.

	Copy to Clipboard	Use this button to copy the selected operations to the Clipboard. Note that the Storage Bin is used to display operations that have been copied to the Clipboard.
	Paste from Clipboard	Use this button to apply the selected Clipboard operations to the current shape. The Storage Bin is used to pre-select the desired operations for pasting.
	Show Clipboard	Use this button to show the Storage Bin, where all the operations from the Clipboard are listed. Pressing this button again will hide the Storage Bin.
	Simplify	Clicking the Simplify button will perform the same operation as choosing **Simplify** under the **Arrange** menu. Please refer to *Simplifying Objects*, discussed earlier this chapter.
	Edit	Edit the currently selected shape. If no objects are selected, then this button will not be visible.

Original List

The **Original List** contains references to the shapes prior to their operations being performed. The Type of each shape is displayed for reference, such as Text objects, Paths, Polygons, Polyarcs, Notes, Dimensions, and Bitmaps.

The **Layer** number indicates the color palette index that has been applied to the shape. By clicking the head of the Layer column, shapes may be ordered according to their palette number, which is a useful means of organizing related shapes.

Intermediate List

After applying certain operations, the original shape will no longer exist because it has been replaced by a new shape that represents the results of the operation. For example, applying an Outline will create a new shape that represents the outline, and unless the "Keep Original" option is used, the original shape will be deleted. The **Intermediate List is used to store a reference to such original shapes**, such that the operation may be edited.

Screen List

The **Screen List** displays all the screen shapes in terms of the types of objects that they represent. Click on a path type to isolate its shape from the surrounding graphics.

Operations List

For the selected shape, the operations that have been applied to this shape are listed here. The operations are listed in chronological order, though this order can be changed by dragging an operation with the mouse. To edit an operation, double-click the operation name.

Show Storage Bin

The **Storage Bin** is a convenient means of viewing and organizing the operations that have been copied to the **Clipboard**. With respect to Instant Replay, the Clipboard and the Storage Bin are synonymous.

Note: As well as using the Instant Replay buttons, drag-and-drop operations are permissible between the Instant Replay window and the Storage Bin.
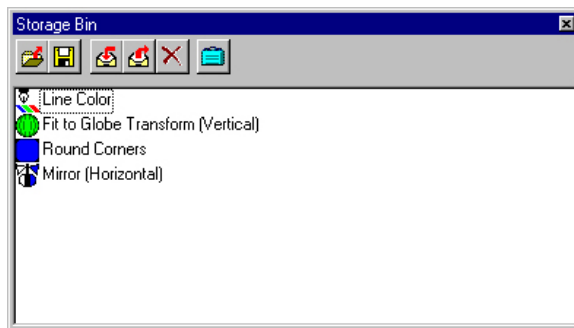
	Open File	Click this button to open a previously stored selection of operations.
	Save File	To save operations for later use, select the desired operations and click the Save File button. Files are stored in an .SBN (Storage Bin) format.
	Copy to Clipboard	For the currently selected shape, clicking this button will copy all of the shape operations to the Storage Bin.
	Paste from Clipboard	Click this button to apply operations from the Storage Bin to the currently selected shape. If no operations are selected, then the entire list of operations in the Storage Bin will be applied. Otherwise, use the mouse in combination with shift and control keys to select the operations that should be applied.
	Clear Clipboard	Click this button to delete the contents of the Clipboard and the Storage Bin listings.
	Combine Operations	Click this button to combine a selection of operations into a single operation. The combined operations will be named "Combination," but this name may be changed by double-clicking the combined operation. Once operations are combined, they can be selected and applied in the same manner as discrete operations.

DECORATIVE BORDER

The **Decorative Border** shape is used to enclose several workspace objects, as if they were placed within a frame. As an alternative to framing objects, the **Decorative Border** may also be positioned about the sign plate.
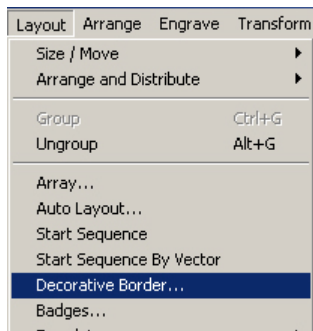
Activate Decorative Border from either the Layout menu...

...or the Shape Tools flyout.

For a selection of one-or-more shapes, the **Decorative Border** will be centered on the shapes, and the inner contour of the border will be set equal to the bounding box of the selection. The outer contour of the border will then be set according to the **Thickness of Border** field.

Tie Border To

When no shapes are selected, the SmartBar provides a **Tie Border To** option that is set to **"Plate"** by default. In this case, the **Decorative Border** will be centered on the sign plate, and the outer contour will be set equal to the dimensions of the sign plate. The inner contour of the border will then be set according to the **Thickness of Border** field.
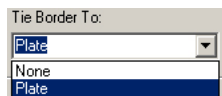
If the **Tie Border To** option is set as **"None,"** then the center nub may be dragged to change the coordinates of the **Decorative Border**.

Border Styles

There are four pre-defined decorative border styles, which may be chosen at the far-left of the SmartBar.
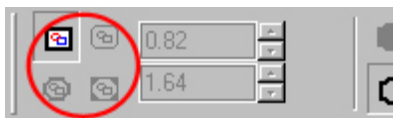
The available styles are as follows:

▣	**Square Border**
▣	**Rounded Border**
▣	**Notched Border**
▣	**Inside Notched Border**
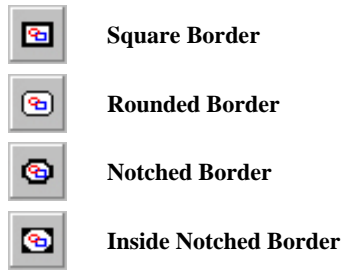
The choice of style will determine the SmartBar controls that are available, as well as the nubs that appear about the decorative border shape.

Decorative Border Nubs

Editing nubs about the decorative border shape may be used to adjust the inner and outer contours of the border. When editing a **"Single Path Border,"** nubs will only appear for the outer contour. When editing a **"Border with Thickness,"** nubs will appear for both the outer and inner contours.
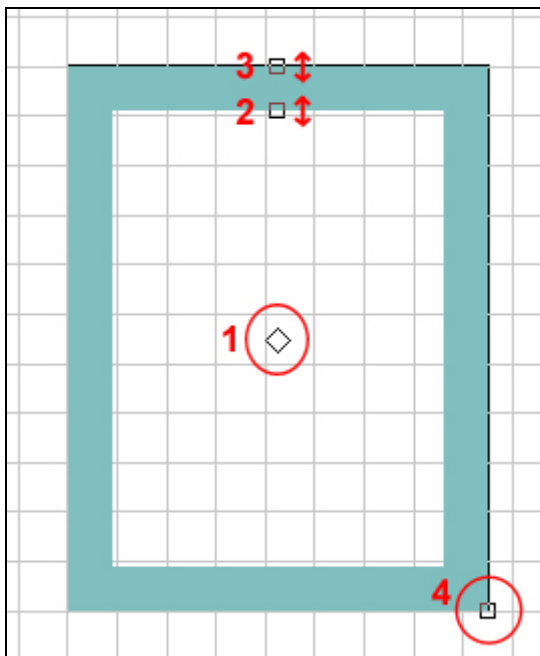
These editing nubs are summarized as follows:

Nub	Function
1	Adjust the workspace coordinates of the border. These coordinates may only be changed when the **Tie Border To** setting is **"None."**
2	Adjust the **Thickness of Border** value by varying the inner contour. Hold the **[Control]** key to maintain a constant thickness.
3	Adjust the **Thickness of Border** value by varying the outer contour.
4	Adjust the outer contour of the border, while maintaining a constant **Thickness of Border** value.

Corner Nubs

Except for the **Square Border** style, editing nubs are used to adjust the corners of the border. These nubs allow the outer corner radius to be adjusted independently of the inner corner radius.

Note: The **Inside Notched Border** style does not have corner nubs for the outer contour.

The following screenshot shows the editing nubs for the **Rounded Border** style. These nubs behave similarly for the **Notched Border** and **Inside Notched Border** styles.
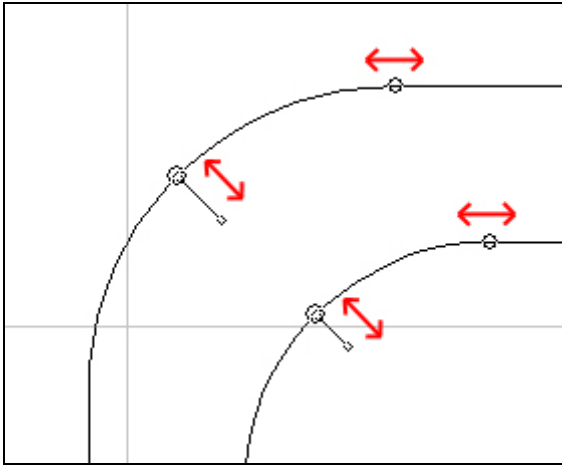
The values for the corner radius may also be set at the far-left of the SmartBar.

To the right of the corner radius fields, the **Radius Lock** and **Radius Unlock** buttons may be used to lock the outer radius to the inner radius. When locked, the **Outside corner radius** will be assigned the same value as the **Inside corner radius**.

SmartBar Controls

The available SmartBar controls will depend upon the style of border being edited. For a **Square Border** style placed upon the sign plate, the SmartBar controls will appear similar to the following:
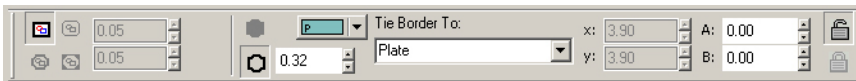
Inner Contour Option

If the **Single Path Border** style is selected, then the border shape will be a filled object with no inner contour. If the **Border with Thickness** style is selected, then additional nubs are available for editing the inner contour of the border.

Single Path Border

Border with Thickness

Thickness of Border

This field is only active when the **Border with Thickness** option has been selected.

For selected shapes, the **Thickness of Border** field is used to indicate the distance from the inner contour to the outer contour. If no shapes are selected, then the **Thickness of Border** field indicates the distance from the outer contour to the inner contour.

Width and Height

The **Width** and **Height** fields indicate the dimensions of the outer contour. If the **Tie Border To** setting is **"None,"** then the Width and Height fields will be editable.
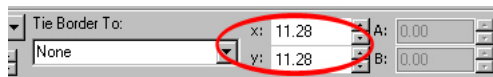
Horizontal and Vertical Offsets

For a border placed around one-or-more selected shapes, the inner contour of the border will be set equal to the bounding box of the shapes, and the outer contour will be set using the **Thickness of Border** field.

For a border placed with respect to the sign plate, the outer contour will be set equal to the dimensions of the sign plate. The inner contour is then set using the **Thickness of Border** field.

The **Horizontal and Vertical Offsets** are used to set the outer contour with respect to its initial dimensions. When adjusting these offsets, the **Thickness of Border** field will remain constant.
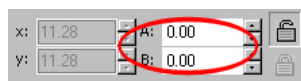
Lock Offset Values as Equal

At the far-right of the SmartBar, the **Horizontal and Vertical Offsets** may be locked as equal.
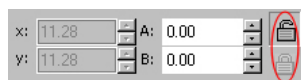
When locked, only one offset field will be active, and its value will be used for both offsets, as follows:

Unlock offset values

Lock offset values as equal

STENCIL TOOL

The **Stencil** tool is used to apply a clipping style to one-or-more selected shapes. The resulting stencil bands will be like "windows" through which the underlying shapes may be viewed.

For a given selection, choose **Stencil** from the **Shapes Tool** flyout.

The **Stencil** tools will appear in the SmartBar.
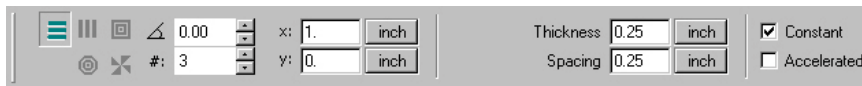
At the far-left of the SmartBar, the available styles of **Stencil** are:

Horizontal

Vertical

Square

Circular

Radial
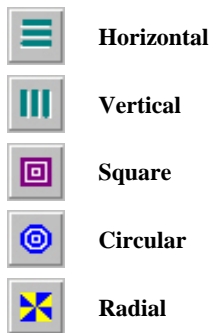
Stencil Handles

When editing the stencil, workspace handles will appear about the shape. The following screenshots show horizontal stencil bands that are being edited for a square shape. Similar handles will appear for other stencil styles.

Original object before applying stencil.

Editing horizontal stencil that has three repeats.
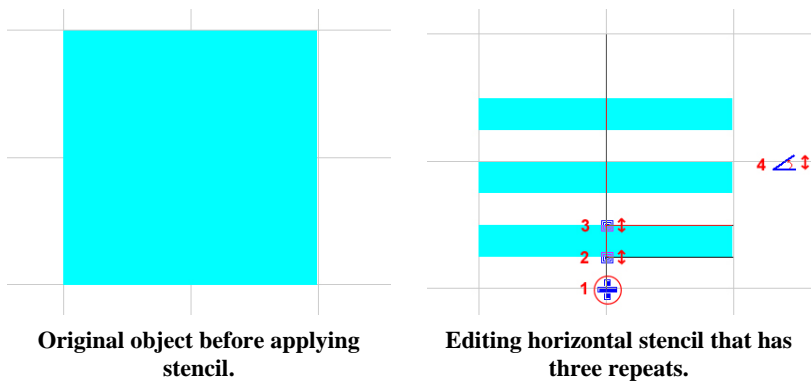
The function of each workspace handle is as follows:

Handle	Function
1	Adjust coordinates of the stencil
2	Adjust Spacing between each stencil line
3	Adjust Thickness of each stencil line
4	Adjust Angle of stencil

Angle

The **Angle** may be set from either the SmartBar or the workspace.

Angle field on SmartBar

Angle handle on workspace
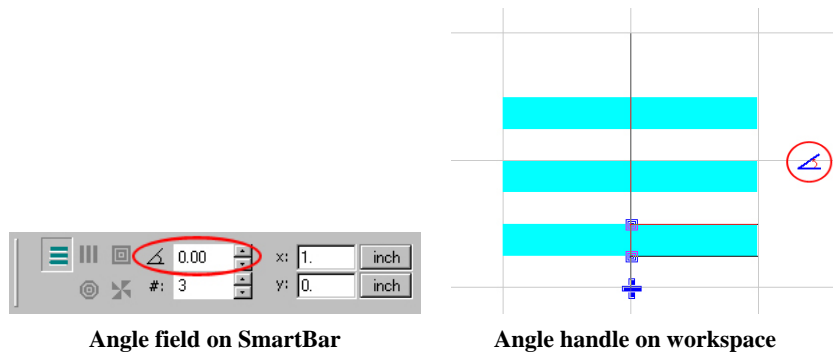
Repeats

The **Repeats** are set from the SmartBar. The number of repeats indicates the number of stencil lines that will be created.
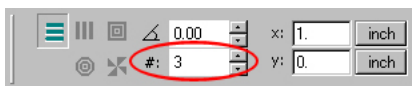
> *Note:* If there appear to be fewer stencil lines than indicated by the **Repeats** field, then it may be the case that there is a large distance between each stencil line. In this case, try reducing the **Spacing** value, or increase the shape size.

Stencil Origin

The **X** and **Y** fields indicate the origin coordinates for the stencil. These coordinate may be set from either the SmartBar, or the workspace.
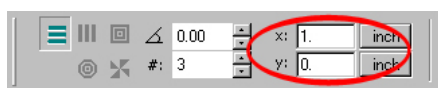
Coordinate fields on SmartBar   **Coordinates handle on workspace**
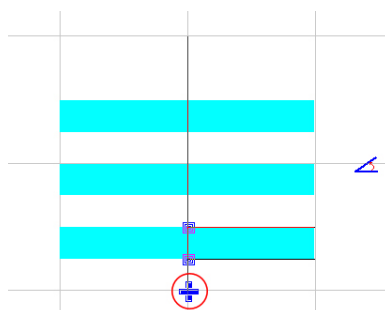
To the right of each **X** and **Y** field is a **Units** button that determines the units of the coordinates. By default, the current workspace units are used (in this example, inches are used). However, clicking either **Units** button will set the value as a percentage of the object size. For example, the following screenshot shows the stencil origin set at 50% of the width and height of a circle shape.
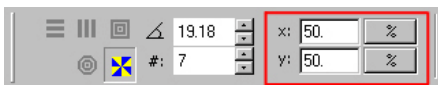
Radial stencil with seven repeats. The X and Y coordinate are set at 50% each, which centers the stencil on the shape.   **Circle with radial stencil preview. Note that the Coordinates handle is at center of the circle shape.**
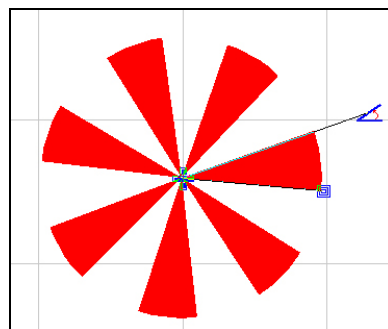
Thickness

The **Thickness** indicates the width of each stencil line. The **Thickness** may be set from either the SmartBar or the workspace.
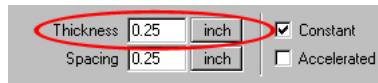
Thickness field on SmartBar   **Thickness handle on workspace**
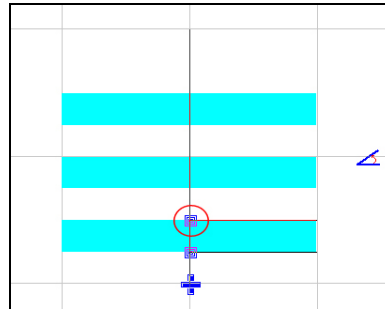
To the right of the **Thickness** field, the **Units** button may be clicked to express the thickness as a percentage of the object size.

Spacing

The **Spacing** indicates the distance between each stencil line. The **Spacing** may be set from either the SmartBar or the workspace.
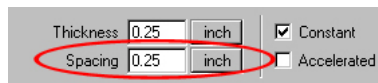
Spacing field on SmartBar   **Spacing handle on workspace**
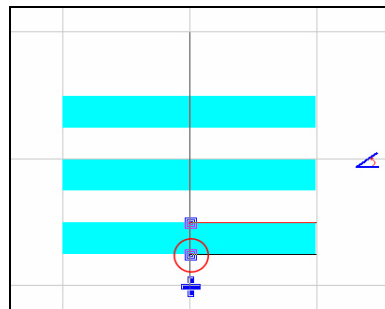
To the right of the **Spacing** field, the **Units** button may be clicked to express the spacing as a percentage of the object size.

Constant versus Accelerated Stencil

If the **Constant** option is selected, then there will be one handle each for Thickness and Spacing on the workspace.

If the **Accelerated** option is enabled, then additional red handles will appear over both the **Thickness** and **Spacing** handles. By adjusting these "acceleration" handles, the thickness and spacing of successive stencil bands may be made to "accelerate."

Note: The **Accelerated** option is not available for **Radial** nubs.

Workspace handles when the Constant option is enabled.

When the Accelerated option is enabled, there are additional red handles for the Thickness and Spacing handles.
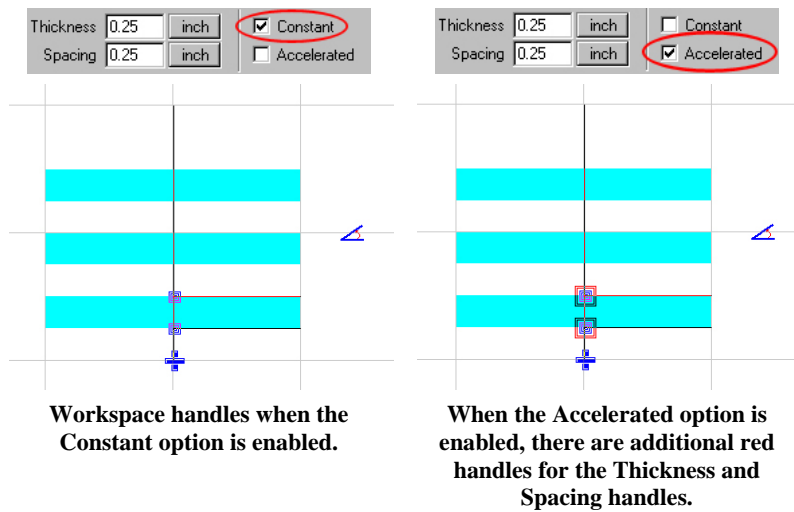
Editing a Stencil Using InstantReplay

Suppose that we have applied our horizontal stencil to a square shape, using three repeats. We later decide that a 25 degree angle should also be applied to the stencil. However, if we select the stencil object, we find that the original square shape and stencil are now part of a group, and that choosing the Stencil tool will merely attempt to apply a new stencil on top of the group.

As a solution, the InstantReplay feature may be used to edit the Stencil.

First, verify that the InstantReplay window is open, by enabling the **Show InstantReplay** item under the **View** menu.

Within the InstantReplay window, choose the **Group** object (**Screen** list). However, the **Operations** list will not provide access to the **Stencil** operation.
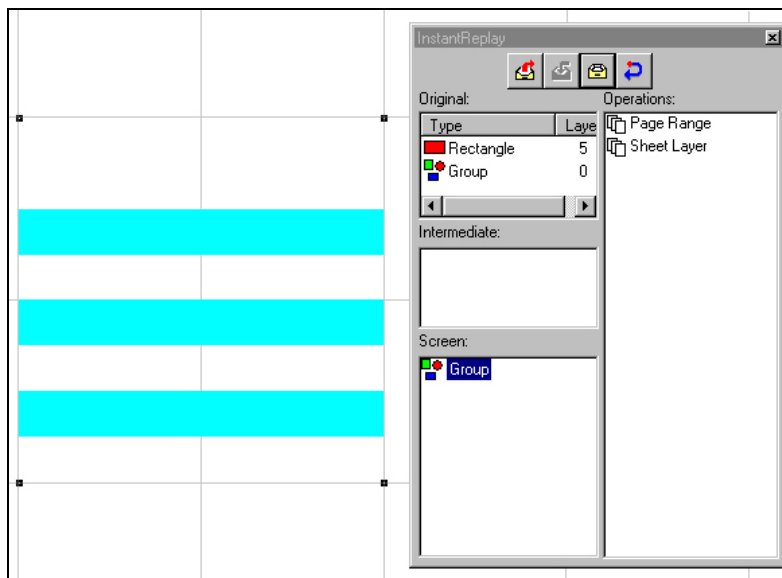
Instead, double-click the **Group** object to reveal that it is composed of a **Rectangle** shape and the **Stencil** shape. The **Rectangle** may then be selected to provide access to the **Stencil** operation.
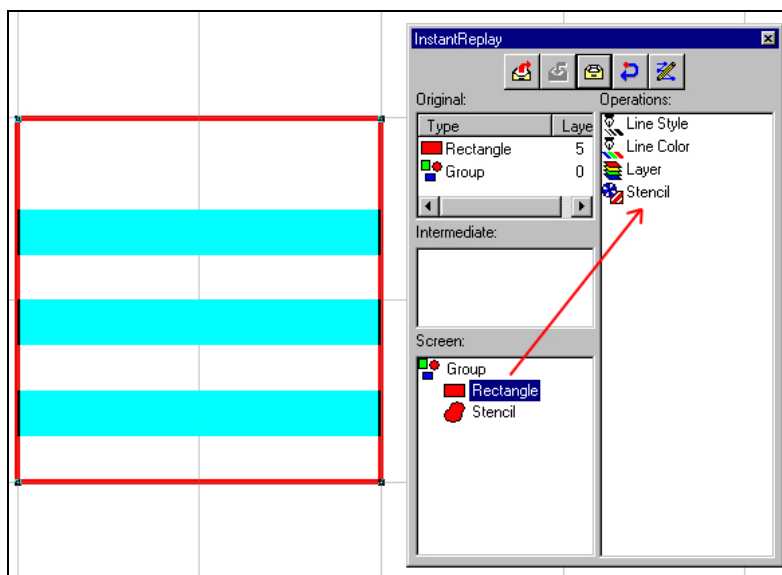
Within the **Operations** list, the **Stencil** operation may now be double-clicked to begin editing. The **Stencil** controls will appear within the SmartBar, and the **Angle** may be changed to 25 degrees.
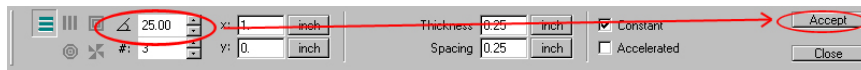
When finished editing the Stencil, click the **Accept** button to finish. The edited stencil will appear on the workspace.
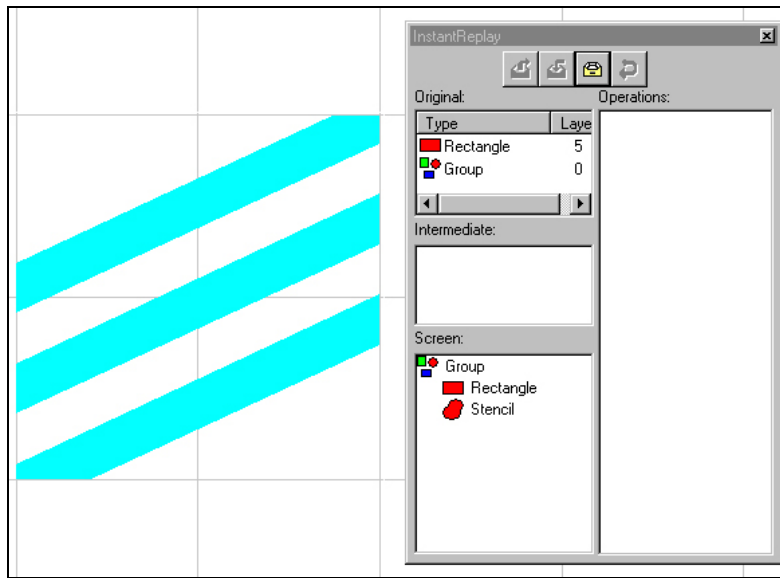
ARRAY

The **Array** feature is used to create patterns using selected shapes as a basis. Simple linear arrays are available, as well grid and circular arrays. The available styles are:

Vertical

Staggered

Horizontal

Grid

On arc

On arc with rotate
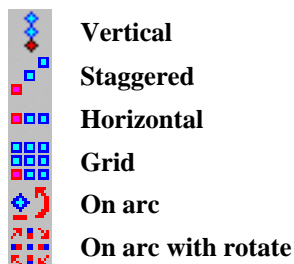
For object arrays that are on an arc, the range of angles over which the copies are spread must be specified.

ALIGNMENT

The **Alignment** feature is used to precisely arrange the workspace objects. Selected objects may be arranged according to:

	Align to plate	Objects are aligned relative to the sign plate.
	Align to grid	Objects are aligned relative the grid lines.
	Align to last object	For group selection, align the objects according to the last object in the group.
	Align to selected	For a group selection, align the objects according to the bounding box that is around the selection.

Text Options
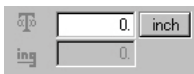
There are two additional tools for use when aligning text objects.

Treat Text Line as an Object

Ignore Descenders

Treat Text Line as an Object

This button is enabled when using equal vertical spacing. For a text object with multiple lines, depressing this button will align each line in isolation. If the button is not depressed, then text objects are aligned as a whole.

Three text objects, aligned from top to bottom. Note that the center text object has three lines.

By depressing the "**Treat Text Line as an Object**" button, alignment is applied to each line of text.

![ing] *Ignore Descenders*

This button is enabled when using equal horizontal spacing. Depressing this button will cause the descenders of text to be ignored, such that text is aligned with respect to the text baseline.

ALIGN

For the currently selected object, the **Align** command will automatically apply the previously used **Alignment** settings.

ALIGN TO BASELINE
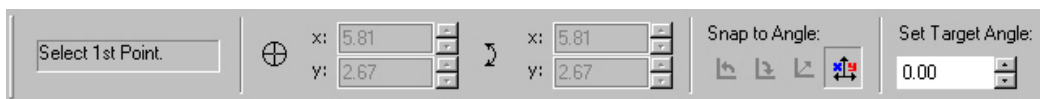
For images that are imported into EngraveLab, it may be the case that the objects are slightly misaligned with the sign plate. The Align to Baseline feature allows these objects to be aligned to either the horizontal or vertical plane. In addition, image can be aligned to a 45 degree angle, or a custom angle may be set.

Before performing the alignment, a line must be defined along the edge the image. To define this line, two points must be set. Clicking within the workspace will set the first point (the point of rotation), and a clicking again will set the second point (the snap point). When a snap angle is applied, the line will be aligned to match the indicated angle, and the image will remain aligned with the line.

START SEQUENCE

The Start Sequence command has two uses. The first use is to arrange the order in which objects are processed when drawing, cutting, plotting, routing, engraving, or printing. The second use is to arrange objects graphically on-screen. In either case, reordered objects will be placed with respect to the original layer of the first color selected (see **Order of workspace objects**).

Creating a sequence

To create a sequence for a collection of objects:

1. Select the first object of the collection.
2. From the Layout menu, choose Start Sequence.
3. Click each remaining object, one-by-one, until all the objects are included. As each object is included, a line is drawn from the previous object to the current object.
4. When finished selecting objects, click anywhere on the workspace that is empty of objects.

The objects will now be ordered according to the chosen sequence. Each successive object in the sequence will appear to be on top of the previous object in the sequence.

Alignment using start sequence

When arranging objects on-screen, repeat steps 1-3 using the Creating a sequence description. But instead of clicking empty space in step (4), right-click and drag over an area where the objects are to be arranged. As the mouse is dragged across the workspace, an outline of the shapes will appear, and a thin line between the shapes will indicate center alignment of each object.

This alignment can be adjusted as follows:

➢ Holding the **[Shift]** key will align the shapes according to their lower-left bounding box corner.

➢ Holding the **[Control]** key will constrain the objects either vertically or horizontally.

STRETCH

The **Stretch** feature is used to distort an object as if the object had elastic properties. Objects may be stretched in either an upward or rightward direction.

Note: Performing a stretch operation may not be initially successful for complex objects. To solve this, perform a series of smaller stretches until the amount of desired stretch is achieved.

Constant Stroke Stretching

For text objects, script fonts may be enhanced by stretching the text either horizontally or vertically, which will not distort the opposing strokes. For example, consider the follow text that uses an Ajax font:
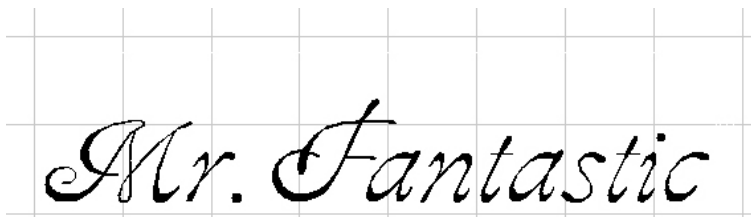
Here is the same text after performing a 60% vertical stretch:

TRANSFORMATIONS ON SHAPES

SPECIAL EFFECTS

Transformations and other special effects are generally accessible through the **Transform** and **Image** menus.

Note: The **Image** menu tools are discussed in the **Importing and Exporting** section.

Transform Menu

Outline...
Transformation
Fit Text To Arc
Fit Text to Path
Fit Object to Path
Metamorphosis...
Shadow
Round Corner
Fillet Round Corner
Render to Bitmap
Render Contour Bitmap

Image Menu

Image Size
Mode ▶
　　　RGB
　　　Grayscale
　　• 256 Indexed Color
　　　monochrome
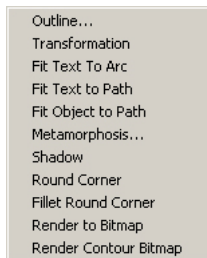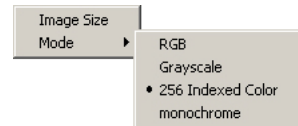
Outlines and Inlines

Outlines and **Inlines** are workspace objects that are calculated to follow the contour of a selected, base object, such as a star or rectangle. An Outline will typically be "outside" the base object, and an Inline will be "inside" the object.

Passes

Implement more than one Outline or Inline pass at a time to any selected objects by using this option. For example, use multiple passes to achieve special effects, such as ripples on a pond, by applying a multiple pass Outline to the selected object(s).
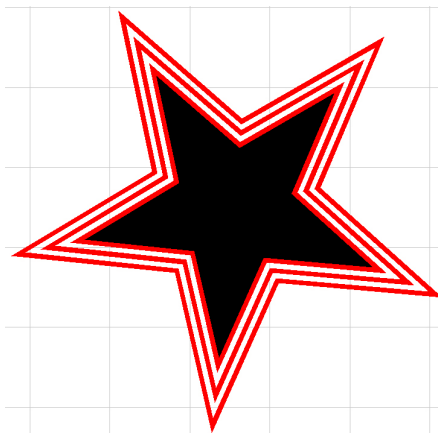
Star with five outline passes　　　　　**Star with four inline passes**
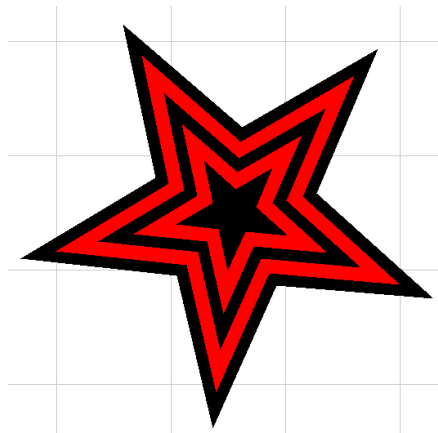
When a corner of an object is sharp, the resulting outline can extend well beyond the corner itself. Such corners may be clipped or rounded. The available options are as follows:

	Point	Allow sharp corners
	Clipped	Clip sharp corners as per the Miter Limit (see below)
	Round	Round sharp corners

Miter Limit

The **Miter Limit** is a distance that is expressed as a percentage of the outline or inline thickness.

For a sharp corner of the original object, the resulting outline corner may be quite steep. If the **Clipped** button is enabled, then the outline corner will be clipped as per the **Miter Limit**.
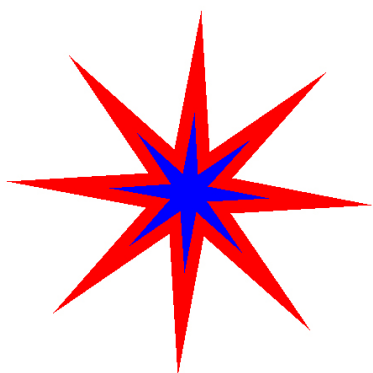
Outline with Point corners	**Outline with Clipped corners, where Miter Limit is 100%**
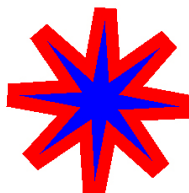
Only corners that are less than or equal to 90 degrees will be clipped.

Create Mask

Where several objects are selected, outlines will be created for each individual object. The Create Mask option will weld all the outlines into a single object.

Original two objects	**Editing an outline for both objects**	**The resulting outlines have been welded**

This mask creation process is particularly useful when you are laying a light-colored vinyl over a dark sign substrate, as it allows you to cut a single-piece mask of white to reduce the effect of the dark material.

Transformation

Transformations are used to apply special effects and distortions to selected objects and text.

Select the desired effect, and then drag the transformation handles to modify the effect. When adjustments are complete, click within an empty portion of the workspace to finish editing the transformation.

Adjusting the transformation handles

Prior to applying a transformation, the appearance of the distortion may be adjusted. Suppose that a **Fit to flag vertical distortion** is being applied to some text.

The placement of nodes varies according to the type of distortion that is being applied. In this **Fit to flag vertical** example, there is a single node that may be used to adjust the rise of the flag. As this node is adjusted, the outline of the distortion will show the final placement of the text.
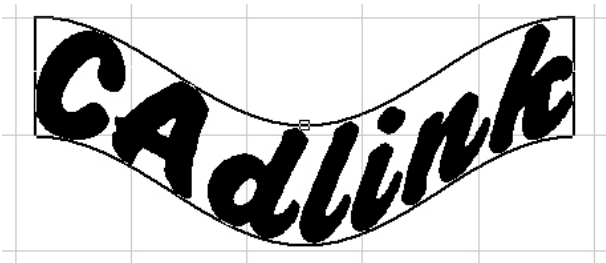
Other types of distortions are modified in a similar manner.

Fit Text to Arc

The **Fit Text to Arc** feature is used to position text as if it were being fit to a circle contour. The arc may be defined in terms of either the angle through which the arc subtends, or the radius of the "circle" upon which the text is being fit.

The SmartBar controls will appear similar to the following:
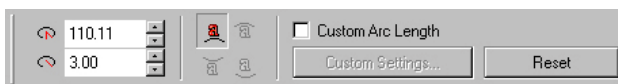
Arc Angle and Arc Radius

At the far-left of the SmartBar are the **Arc Angle** and **Arc Radius** controls. These controls are inter-dependent, such that changing one value will update the other.

The **Arc Angle** is the angle through which the text will be fit. For example, setting an angle of 180 degrees will cause the text to be fit over half of the circle circumference.

The **Arc Radius** is the radius of the circle upon which the text is being fit.

Arc Up setting

Enabling the **Arc Up** option will fit the text baseline along the circle contour, such that the text bows outward. In comparison, the **Align to Top** option will fit the text topline along the circle contour.
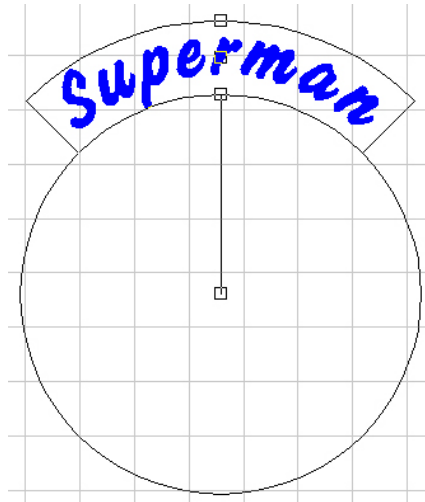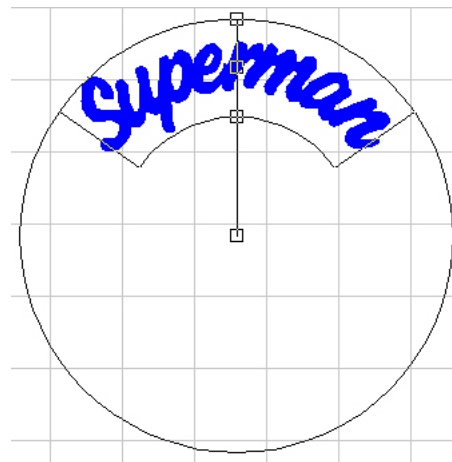
Arc Up setting   Align to Top setting

Arc Down setting

Enabling the **Arc Down** option will fit the text topline along the circle contour, such that the text bows inward. In comparison, the **Align to Baseline** option will fit the text baseline along the circle contour.
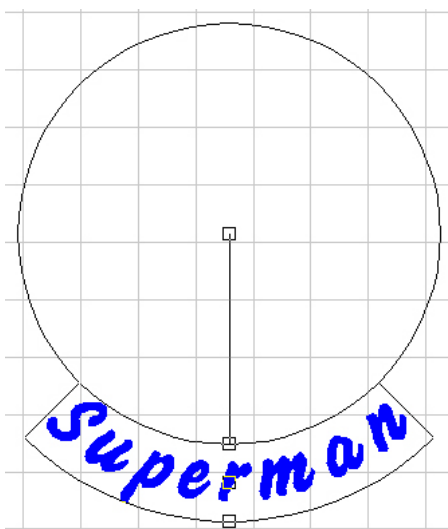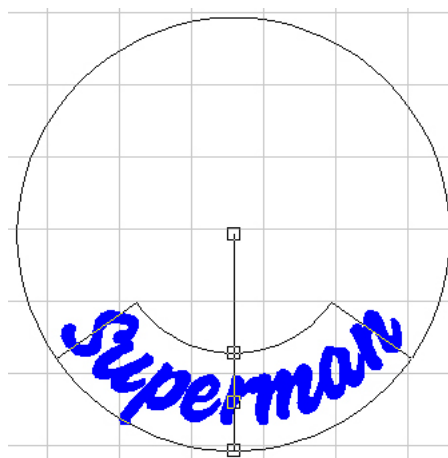
Arc Down setting   Align to Baseline setting

Rotating the text shape

When editing the Fit Text to Arc operation, handles appear about the text that allow the operation to be edited. In particular, there is a rotate nub that may be used to modify the text position along the circle contour.
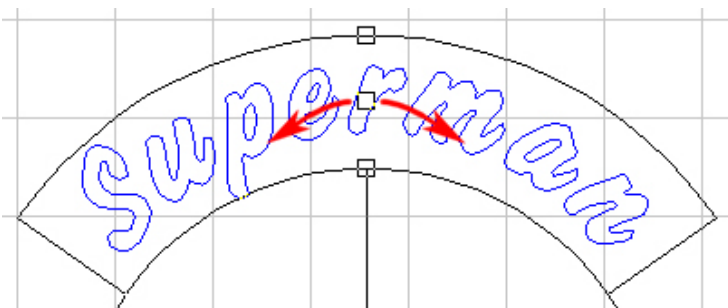
Adding text shapes to the arc

More than one text shape may be fitted to the same arc. For example, suppose that three text shapes have been created, and a **Fit Text to Path** operation is being edited for the first shape.
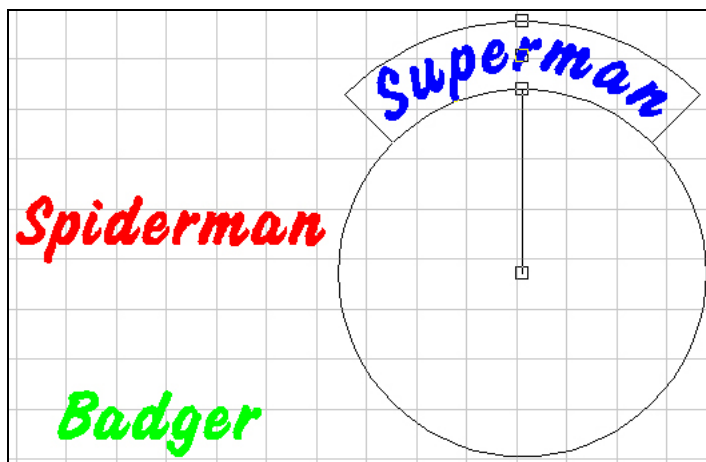
To a text shapes to the arc, press the **[Shift]** key and then click the second text shape. The added text shape will be placed on the arc, though rotated by 180 degrees with respect to the first text shape.
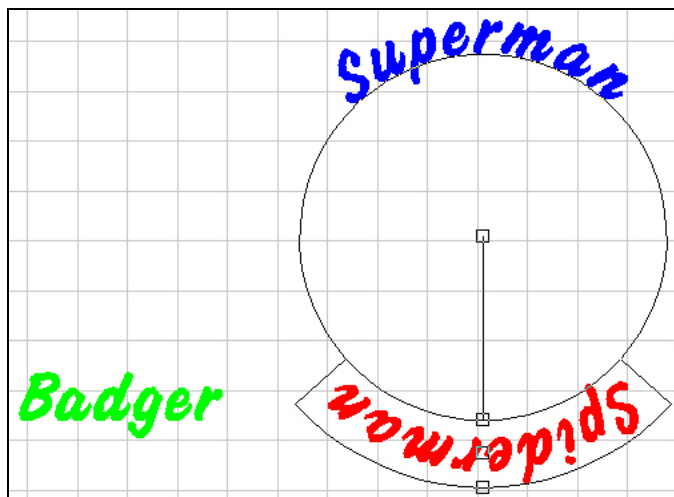
Then suppose that the rotate handle is used to reposition the second text shape, and then the third text shape is **[Shift]**-clicked. The third text shape will now be added to the arc, though rotated 180 degrees from the second shape.
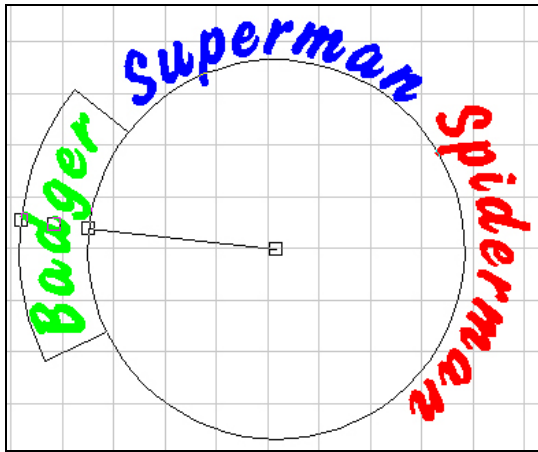
Setting the Custom Arc Length

Horizontal compression/expansion rules may be applied to the text shape. If the **Custom Arc Length** option is enabled, then extra compression/expansion handles will appear on the workspace preview.
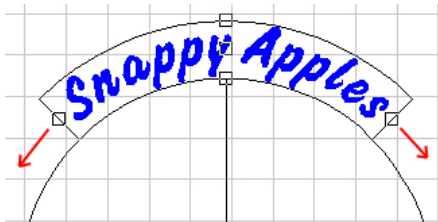
These handles may be used to either compress or expand the text frame, which is the bounds of the text shape. The text characters will be distributed within the text frame according the compression/expansion rules that have been set. To modify these rules, click the **Custom Settings** button to open the **Horizontal Compression** dialog.
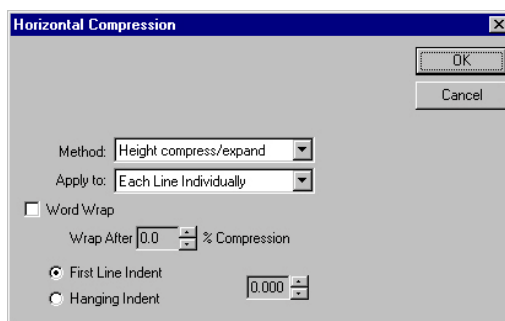
The controls in the **Horizontal Compression** dialog are the same as described in the Text Compose chapter, except that the **"Always compress or expand text to fit width"** option will remain enabled (though hidden).

There are four methods of either compressing or expanding the text:

Width	Constrain text by modifying the character width.
Height	Constrain text by modifying the character height.
Kerning	Constrain text by modifying the distance between characters.
Word Kerning	Constrain text by modifying the distance between words.

The **Word Wrap** option may also be enabled, such that multiple lines of text will wrap after the indicate amount of compression has occurred.

Setting Word Wrap

When fitting multiple lines of text to an arc, the text will be initially set to the arc as a group. However, click the **Word Wrap** button (SmartBar) to arrange the text shapes along the arc.
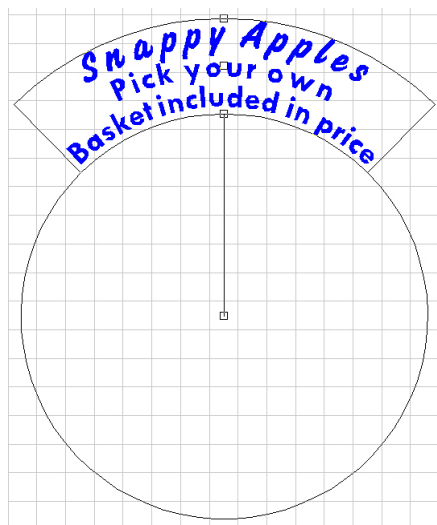
Initially, the multiple lines of text are set as a group.	**From the SmartBar, click the Word Wrap button to place each line of text as a separate shape.**
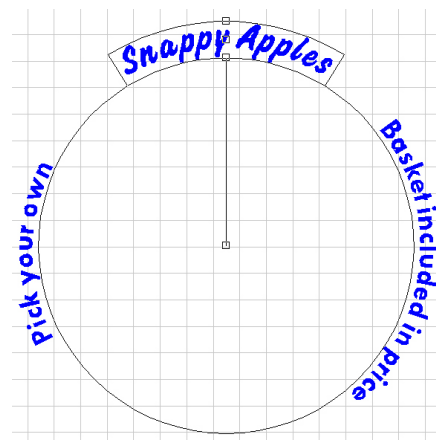
Fit Text to Path

Using a workspace object as a guide, the **Fit Text to Path** feature can position text along the object contour. The text can follow the path based on both direction and alignment, and can be set with respect to the text baseline.

When setting the SmartBar controls, the available controls will vary according to whether the object has an open or closed path.

Fitting text to a closed path

For a closed path, the text can be aligned the Top, Bottom, Left, Right of the path.

| **Aligned Top** | **Aligned Bottom** | **Aligned Left** | **Aligned Right** |
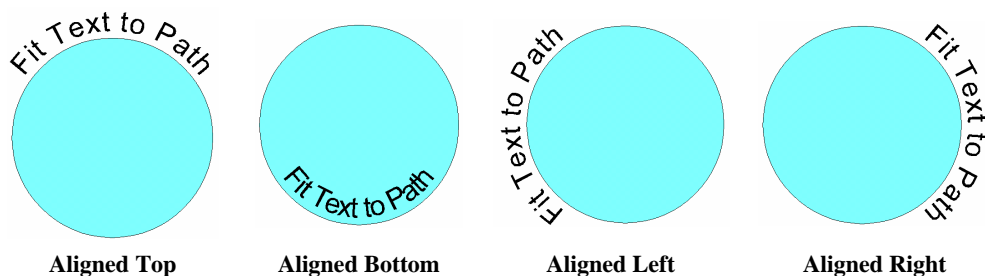
Fitting text to an open path

For an open path, the text can be left-, center-, right-aligned.

| **Aligned Left** | **Aligned Center** | **Aligned Right** |
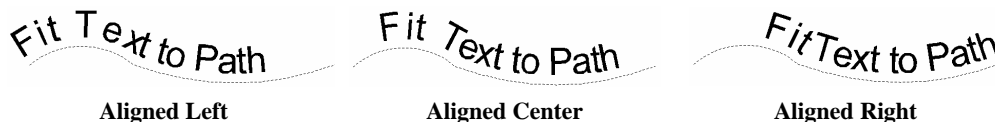
Fitting text to a starting position

For both open and closed paths, a custom starting position may be set along the object contour. To set a starting position, click the **User pick starting position** button in the SmartBar. At this point, clicking anywhere along the object contour will place a special start position handle, which appears as a tiny circle. Clicking the **Apply** button will show a preview of the text at that position.

Baseline Alignment

The text may also be positioned with respect to the text baseline.

Text Inside Path

Text On Path

Text Through Path

Text Outside Path
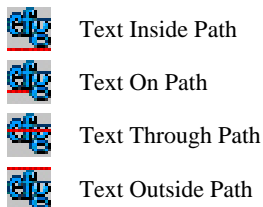
The **Baseline Alignment** is modified by the **Text to Path Distance** value. A value of zero indicates that the current setting should be used without modification. However, both negative and positive values may be applied here in the current workspace units.

Editing a previous Fit Text to Path operation

Suppose that a **Fit Text to Path** operation has been previously applied, where some text had been fit to a rectangle. Depending upon which shapes are selected, the **Fit Text to Path** operation may be used to either edit the existing operation, or to add more text shapes to the contour.

Case 1: Editing an existing Fit Text to Path operation

If both the text and rectangle shapes are selected, then choosing **Fit Text to Path** from the **Transform** menu will activate an editing mode for the existing **Fit Text to Path** operation. The SmartBar will have both **Apply** and **Accept** buttons. After editing the SmartBar settings, click the **Apply** button to update the workspace preview. However, when the SmartBar settings are correct, click the **Accept** button to save the settings. Otherwise, clicking the **Close** button will discard any edits.
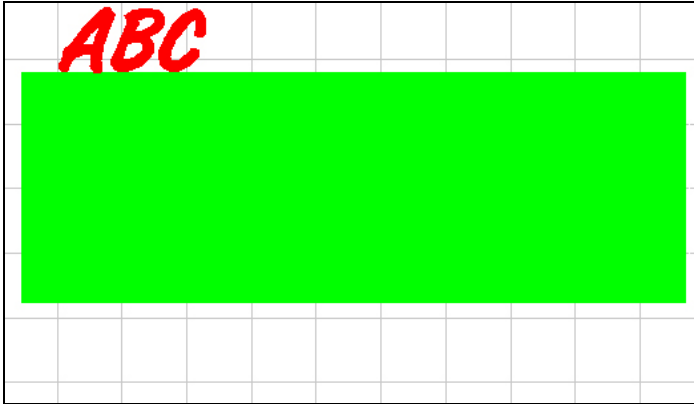
Case 2:Adding a new text shape to the contour

If only the rectangle shape were selected, then choosing **Fit Text to Path** from the **Transform** menu will allow a new text shape to be added to the contour. The SmartBar controls will appear normal for a **Fit Text to Path** operation, except that the **Apply** button will have been replaced with an **Add Text** button. Once the SmartBar controls are set for the **Fit Text to Path** operation, click the **Add Text** button to activate text editing mode. The new text shape may then be edited, and the text will added at the indicated location along the contour.
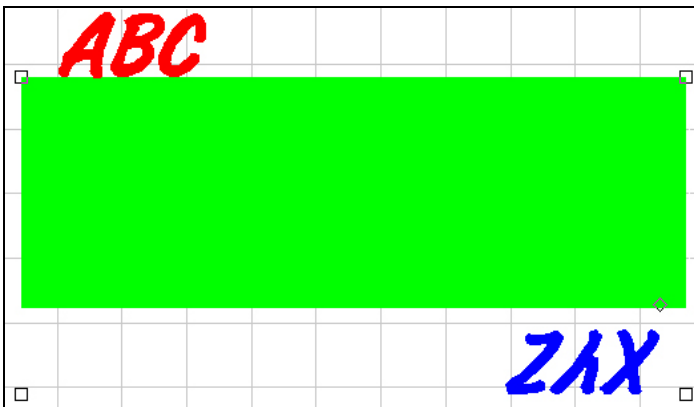
When the new text shape has been entered, click within an empty portion of the workspace to finish editing. The SmartBar will again display controls for the **Fit Text to Path** operation, and the location of the text along the contour may be edited. When editing is complete, either the **Apply** button may be clicked to begin editing a new text shape, or the **Close** button may be clicked to finish editing.

Case 3:Adding a separate text shape to the contour

Suppose the there is an existing text shape that must be added to the rectangle contour.
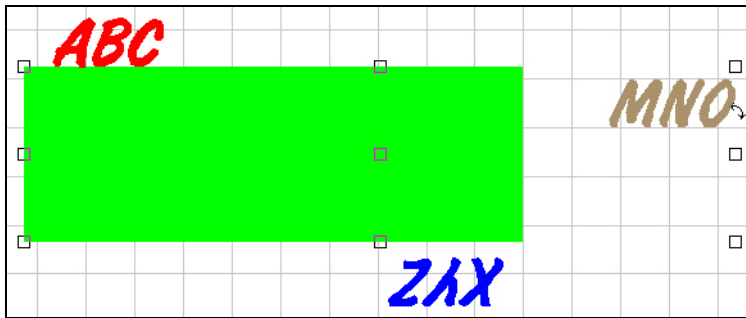
With both the new text shape and the rectangle shape selected, the **Fit Text to Path** item may be chosen from the **Transform** menu. The SmartBar controls may then be edited to position the text shape along the rectangle contour.
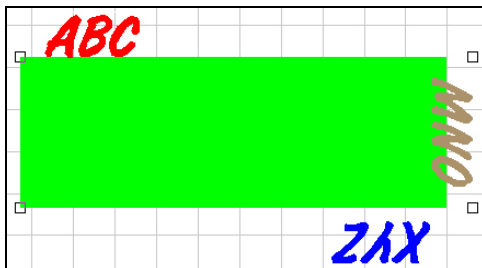
Fit Object to Path

To use the Fit Object to Path feature, two objects must be selected. The larger of the two objects will be considered to be the path.
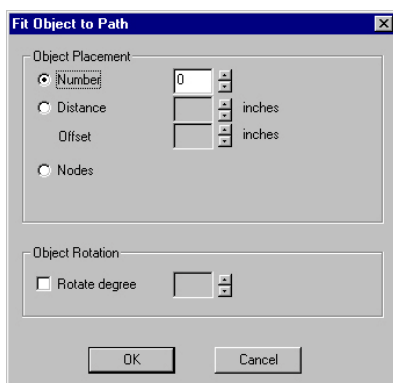
Depending on the settings, copies of the smaller object will be placed along the path of the larger object.

Number	Place the indicated number of smaller objects, spaced evenly along the path.
Distance	Place an object after the specified distance, and repeat until objects have been placed along the entire path. The Offset indicates an initial distance within which objects will not be placed along the contour.
Nodes	For every node of the path, place an object.

Metamorphosis

For two selected shapes, the **Metamorphosis** tool is used to create multiple intervening shapes that represent the transformations from the first shape to the second. The transformation takes into account the shape of the two original objects, their colors, and the colors of any thick lines that might have been applied to the objects.

Two text shapes, each assigned a different spot color.

After applying a Metamorphosis operation.
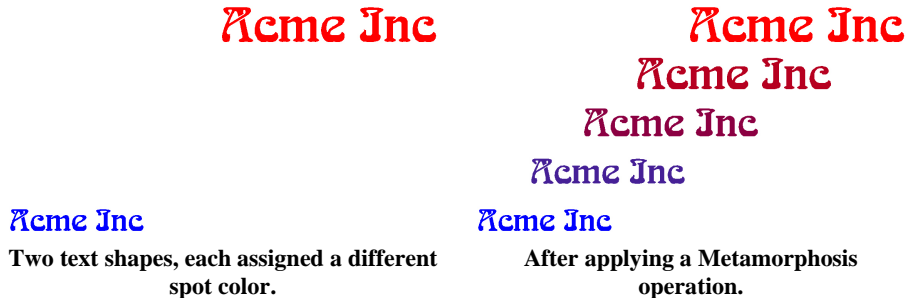
The Mode options determine how colors will be assigned to the intervening shapes.
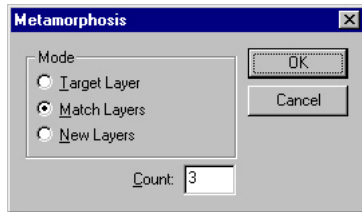
Target Layer

The **Target Layer** option causes intervening shapes to be assigned the currently selected color in the Shop Palette.

Match Layers

The **Match Layers** option causes the intervening shapes to be assigned transitional colors. These colors are selected according to the closest matches that are available in the Shop palette, regardless of the type of colors used for the original shapes. For example, even in cases where the original shape colors were spot colors, process colors may be assigned as transitional colors.

New Layers

The **New Layers** option causes the intervening shapes to be assigned transitional colors. These colors are selected according to the closest matches that are available in the Shop palette. If a given color does not exist within the Shop palette, then a new color plate will be created.

If the original two shapes had been assigned spot colors, then the transitional colors will be duotones of the original two spot colors.

Shadow

The **Shadow** option allows for creation of quick shadow effects with a minimum of effort.
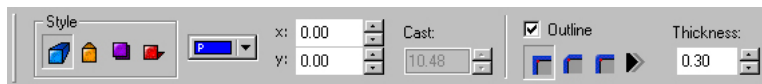
At the far-left of the SmartBar, the four available **Shadow** styles are Block, Perspective, Drop, and Cast.

	Block Shadow	The Block Shadow is used to give objects the perception of depth.
	Perspective Shadow	The Perspective Shadow is used to give objects the perception of distance.
	Drop Shadow	The Drop Shadow is similar to the Block Shadow, though the perceived space between the original shapes and their shadows is not filled.
	Cast Shadow	The Cast Shadow is used create the perception of a light source, such that the objects project a shadow as if onto a nearby surface.

When editing a shadow, handles will appear about the shape. Drag the handles to adjust the shadow settings. Changes to the shadow settings will be shown in the SmartBar.
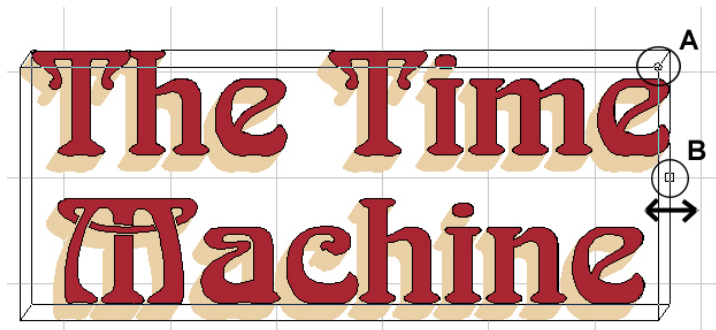
Shadow Coordinates

By default, the shadow is centered on the object at coordinates (0,0). These coordinates may be edited by dragging the round handle (handle 'A' in the above screenshot).
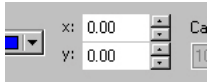
When creating a **Perspective Shadow**, handle 'A' will be used to adjust the **Cast** value. To adjust the coordinate values, a third handle will become available, as indicated by handle 'C' in the following screenshot.
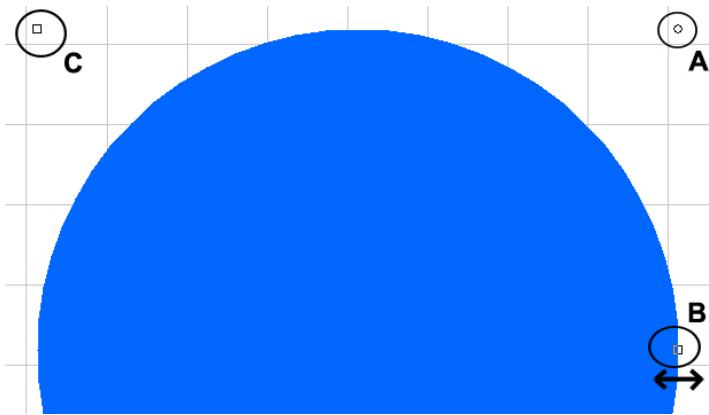
Cast Value

The **Perspective Shadow** style uses the **Cast** value (a percentage value) to adjust the shadow width, such that a perspective effect is created. If the **Cast** value is zero, then the shadow width will be equal to the object width. As the **Cast** value is increased, the shadow width will be decreased by that percentage.

For example, setting the **Cast** value to 50% will reduce the shadow width by 50% of the object width, which creates the perspective effect.
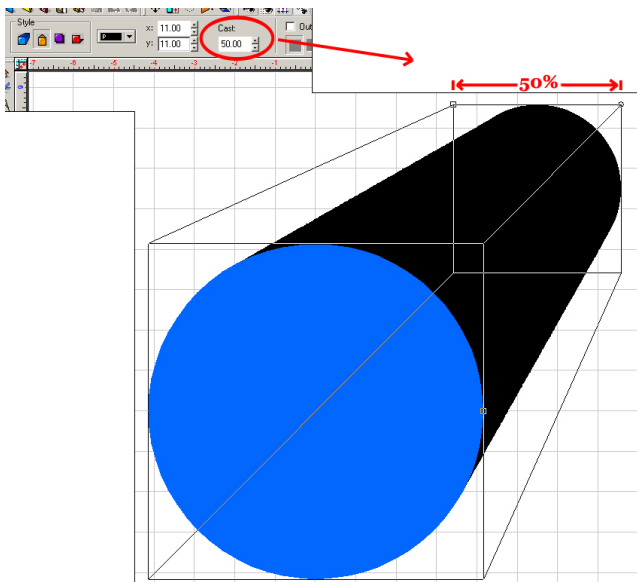
Similarly, setting a **Cast** value of 100% will reduce the shadow width by 100% of the object width, thereby extending the shadow effect to infinity.
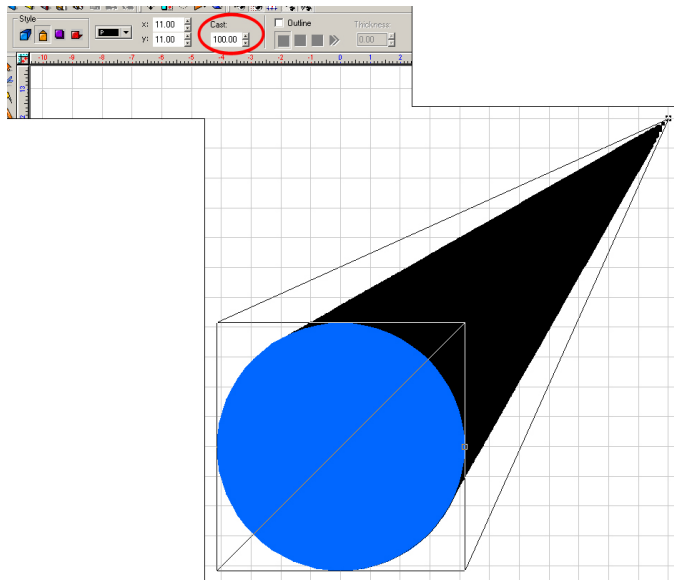
When the shadow has been extended to infinity, the coordinate handle will become inaccessible. This is a limitation caused by the fact that the shadow needs to be drawn "to infinity." However, the coordinates of the shadow may still be set from the SmartBar. Alternatively, use the SmartBar to reduce the **Cast** value by a few percent, such that the coordinate handle becomes available.

Shadow Outline

At the far-right of the SmartBar are the **Outline** settings. On the workspace, the outline **Thickness** may be dragged using the square handle (handle 'B' in the above screenshot).

If the **Outline** option is enabled, then an outline will be created for the object and shadow, as indicated by the **Thickness** value. The corners of the outline may be rounded, as follows:

	Point	Allow corners to remain sharp
	Mitre	Clip sharp corners instead of rounding
	Round	Round sharp corners

Relief Shadow

As an alternative to applying an outline to the object, enable the **Relief Shadow** button to create a gap between the object and shadow. The size of the gap is determined by the **Thickness** setting.
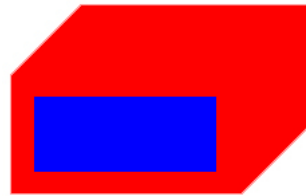
Shadow with outline	**Using a relief shadow**
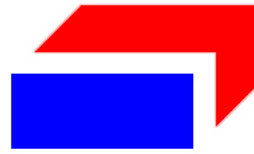
About the Minimum Shadow Hole

When creating a shadow for small letter shapes, it may be the case that the inner contours of the letters are being filled when the shadow operation is applied. This occurs for inner contours that are approximately 0.1 inches in diameter, such that very small "slivers" do not occur in the finished work.

If it is desired that such inner contours be retained, then scale the text by 100% prior to applying the shadow operation. After applying the shadow operation, the text and shadow may then be reduced by 100% to obtain the desired size.

Round Corner

Either the inner or outer corners of objects may be rounded. **Inside** corners are corners which face back into the body of the object, while **Outside** corners are corners which face away from the body of the object. For example:
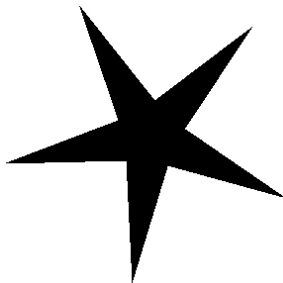
Original object	**Rounded outside corners**	**Rounded inside corners**
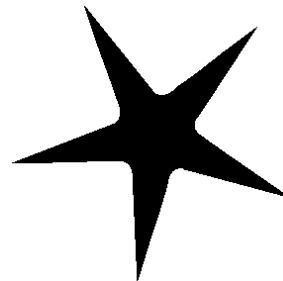
Using a circle as a model, rounding is performed by mapping each corner along the circumference of the circle. In this fashion, the amount of rounding is determined by the radius of the circle.
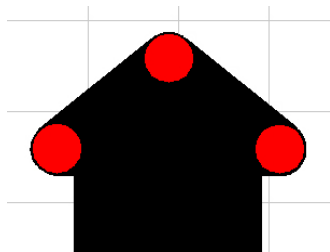
Rounding performed to an arrow shape. Note that the circles drawn here are for example only.

Fillet Round Corner

The **Fillet Round Corner** feature is similar to the **Round Corner** feature, except that rounding may be applied to individual corners.

For a selected shape, choose **Fillet Round Corner** from the **Transform** menu. The **Fillet Round Corner** controls will appear in the SmartBar.

For the selected shape, click the corner that will be rounded. From the SmartBar, the **Corner Radius** field may be used to adjust the amount of rounding.

To apply rounding to a different corner, simply select another corner of the shape, and then adjust the **Corner Radius** amount.

For example, two corners of the following pentagram have been applied with different amounts of rounding:
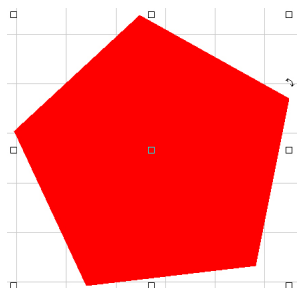
| Original pentagram. No corners are rounded. | After applying rounding to two corners. The lower-left corner has been clipped. |
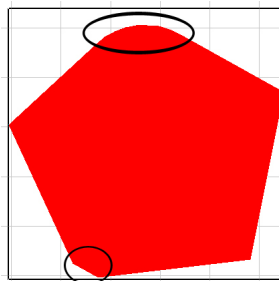
If the **Miter** option is enabled, then the corner will be clipped instead of rounded.

Render to Bitmap

The **Render To Bitmap** feature converts any selected vector or bitmap object. The possible color depths are as follows:

Color Depth	Description
Monochrome	Convert the selected objects to black and white bitmaps
16 gray levels	Convert the selected objects to gray scale bitmaps with 16 shades
256 gray levels	Converts the selected objects to gray scale bitmaps with 256 shades of gray
16 colors	Convert the selected objects to 4-bit color bitmaps with 16 colors
256 colors	Convert the selected objects to 8-bit color bitmaps with 256 colors
Full color	Convert the selected objects to 24-bit color bitmaps with millions of colors

The resolution of the bitmap is specified in Dots Per Inch (DPI). The default resolution is 72 dpi, though this may be changed manually.

Render Contour Bitmap

The **Render Contour Bitmap** feature is used to create three-dimensional chiseled or beveled patterns using process colors. When a shape varies in thickness, the effect will be adjusted to maintain consistent proportions throughout the shape.

When the **Render Contour Bitmap** command is chosen, the **Contour Bitmap** dialog will open. The **DPI** field indicates the "Dots Per Inch" of the bitmap that will be produced. A high **DPI** setting will produce a higher resolution bitmap (i.e. less aliasing), but a large file size will be required to store the bitmap.
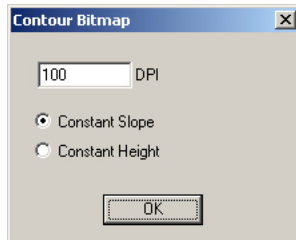
As a general rule, the bitmap DPI should be set at about 25% to 30% of the output device resolution, assuming that the bitmap is not being scaled. For example, if the output device has a resolution of 600 dpi, then the bitmap should be set from about 150 to 200 DPI.

The **Constant Slope** option will cause the chisel/bevel effect to reach its maximum height/depth at the same rate. For areas of the bitmap that have a short distance between the edge and center, the bitmap will tend to plateau. The **Constant Height** option will cause the chisel/bevel effect to dip/peak along the centerline of the shape.
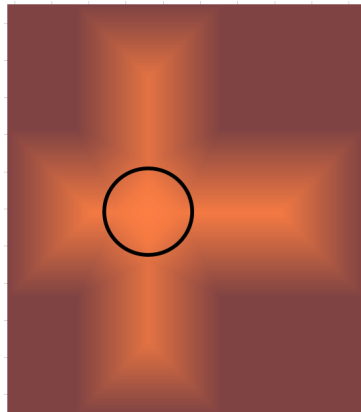
Using the Constant Slope setting, a plateau is produced at the intersection between two rectangles.
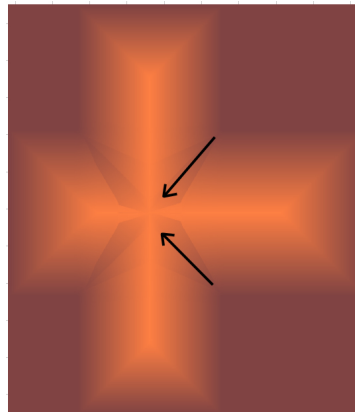
Using the Constant Height setting, the slopes are varied so that a peak is produced at the maximum height.

Clicking **OK** will close the **Contour Bitmap** dialog, and a preview of the bitmap will be displayed. At the far-left of the SmartBar will be a graph button, which may be clicked to open the **Tone Reproduction Curve** dialog.
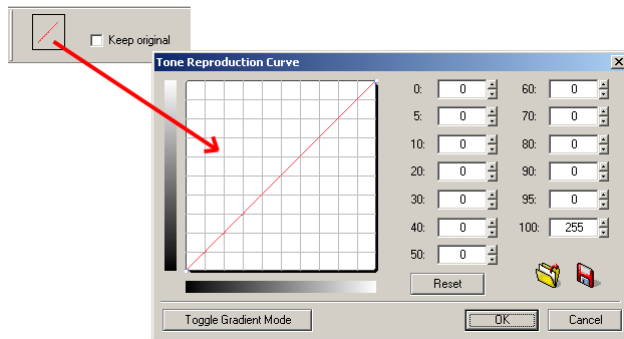
The **Tone Reproduction Curve** dialog is used to edit the distribution of tints in the chisel/bevel effect. By default, the curve will be a straight line from the bottom-left (100% tint) to the top-right (0% tint) of the graph.

Subdividing Shapes

Before converting a shape into a contour bitmap, the **Ginsu Knife** tool may be used to subdivide the shape.
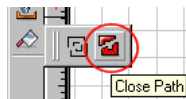
For example, suppose that the **Ginsu Knife** tool has been used to subdivide a rectangle shape into several small pieces. Using the **Select** tool, resize and nudge the pieces to create a small gap between each piece. When ready, select all of the pieces and apply a **Render Contour Bitmap** operation. A chisel/bevel effect will be created for each piece, which is then combined into the final bitmap.
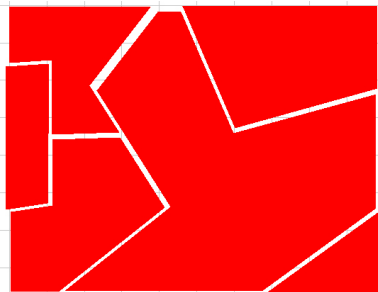
Rectangle shape that has been subdivided using the Ginsu Knife tool.

Select the pieces and apply a Render Contour Bitmap operation.

If a small gap is not created between the pieces, then the **Render Contour Bitmap** feature will create a bitmap that shows no separation between the adjoining shapes.

Clipping the edges of the bitmap

Once a contour bitmap has been created, the original shape may be used to clip the bitmap, as follows:

A) When editing the contour bitmap, enable the **Keep Original** option within the SmartBar.
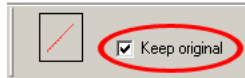
B) After clicking the **Apply** button and returning to the Select mode, the bitmap object will be "above" the original shape.

C) Click the bitmap, such that it becomes the current selection. Then choose the **To Back** command under the **Arrange** menu.
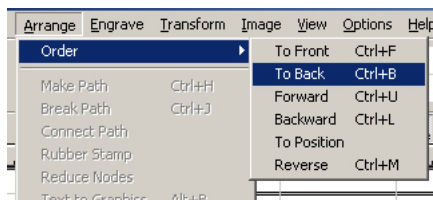
D) The bitmap will now be behind the original shape. Drag a selection marquee around both the bitmap and shape, such that they are both selected.

E) Under the **Arrange** menu, choose **Clipping** from the **Clipping** flyout.

The bitmap will now be clipped according to the contour of the original shape.

TEXT COMPOSITION

INTRODUCTION

The EngraveLab Text tools are designed to be highly configurable and include support for different font technologies, such as True Type and Adobe Type 1 fonts. Sophisticated controls are provided for kerning, scaling, spacing, positioning, slanting, and font editing. The following tools provide an effortless and powerful method to produce the most complex text passages.

In most cases, text will still be editable after it has been subjected to a transformation, such as fitting text to a path, a rotation, or an outline operation. If individual words or characters of a text object must be edited, then perform an **Ungroup** operation. However, once a text object has been Ungrouped, the characters will thereafter be treated as individual objects.

Some operations automatically apply the **Text to Graphics** operation, which will convert the text characters into individual graphic objects. If so, then these characters will no longer be editable as if they were text.

Creating text

To begin editing text, choose Text Compose from the Text Tools flyout.

Click on the workspace to place the editing point, or drag a text editing marquee. The **Edit Font** controls will appear within the SmartBar.
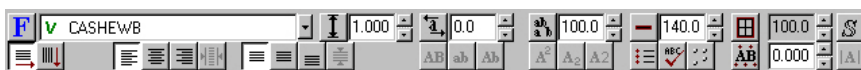
Choose the desired font from the drop-list. If a given font is not available from this list, then the **Install Font** command (**File** menu) may be required.

Installing Fonts

To install additional fonts, locate the **Install Fonts** command under the **File** menu. The **Install Fonts** dialog will open.
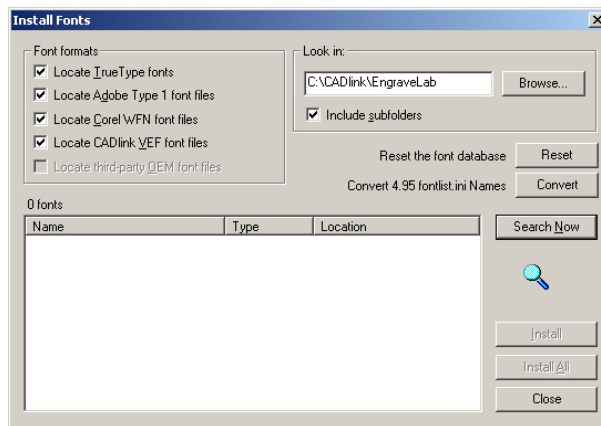
Specify the type of Font formats that are required, and browse to the directory in which the fonts are located. When ready, click the **Search Now** button to display the fonts that have been found. These fonts may then be installed individually, or the **Install All** button may be clicked. The fonts will then be registered for general EngraveLab use.

Be cautious of registering fonts on a CD, since this will require that the CD be inserted prior to beginning EngraveLab sessions.

Though not recommended for regular usage, the **Reset** button will remove all fonts from the database, except for CADlink VEF fonts. The **Reset** button is provided as a means of purging the database after perhaps years of adding fonts from different sources. This is a convenient means of reconciling perhaps hundreds of font references. The fonts may then be loaded again from a common folder.

Convert button

When composing text, many of the font names are abbreviations based on the old Windows filename restrictions (i.e. eight characters for the filename, with three characters for the filename extension). Unfortunately, these restrictions forced the usage of font names that were sometimes cryptic. To solve this problem, click the Convert button to replace the abbreviated font names with more meaningful names. These meaningful names will appear in the Font Type drop-list when composing text.

> *Note:* The list of font names that are substituted is contained within the fontlist.ini file, which is in the EngraveLab install directory.

Browsing Fonts

When in font edit mode, the available fonts may be browsed by clicking the **Font Detective** button.

The **Font Detective** dialog will open:
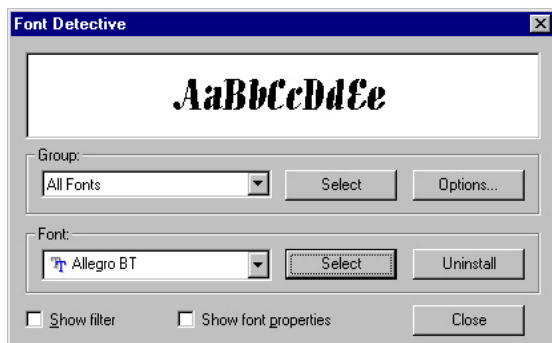
The **Font Detective** dialog provides visual browsing of the font database, and filters may be applied to narrow the search to specific styles of font. To display the characteristics of each font, click the **Show font properties** option.
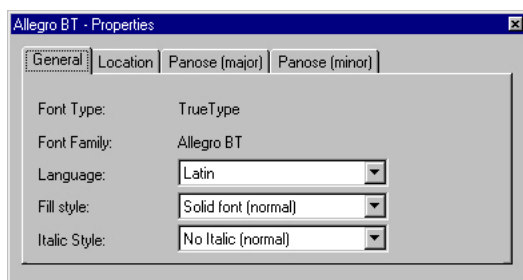
In addition to both general and location information about each font, **Panose** font information is displayed. **Panose** is a typeface matching system used to classify and/or match type styles.

By clicking the **Show filter** option, filter controls may be used in combination with Panose information to aid in browsing for specific typefaces.

For example, suppose that all Small Caps fonts must be located. Set the **Type** of font to "Decorative," and limit the **Range of characters** to "Small caps." By clicking the **Filter** button, the Font Detective will show all the available Small Caps fonts.
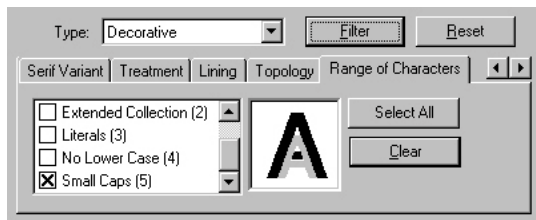
Picture Guide

When choosing which font attributes to filter, a picture guide is provided as a memory aid. Some examples are as follows:

 Display CADlink VEF fonts

 Display CADlink VEF fonts and TrueType fonts

 Display fonts that have open loop finials

 Display fonts with a high weight
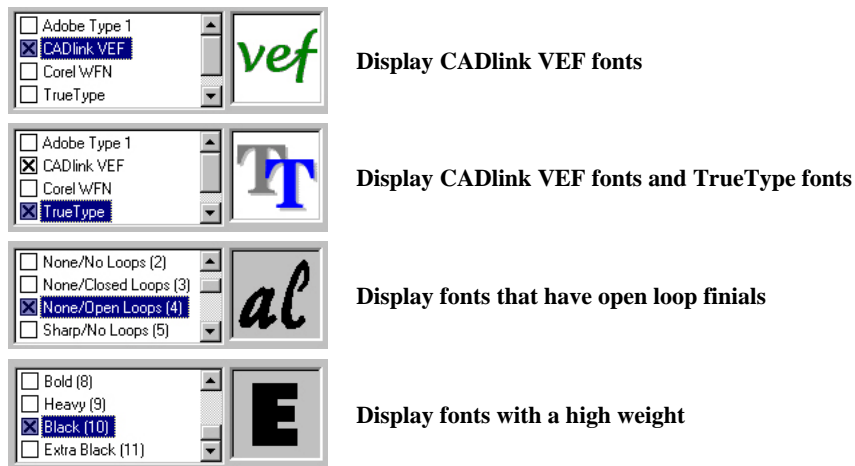
Displaying character sets

From the **Text Tools** flyout, right-clicking the **Text Compose** button will open the **Font Detective**. However, after selecting a given font, the workspace will be updated with a display of all the characters in that font.
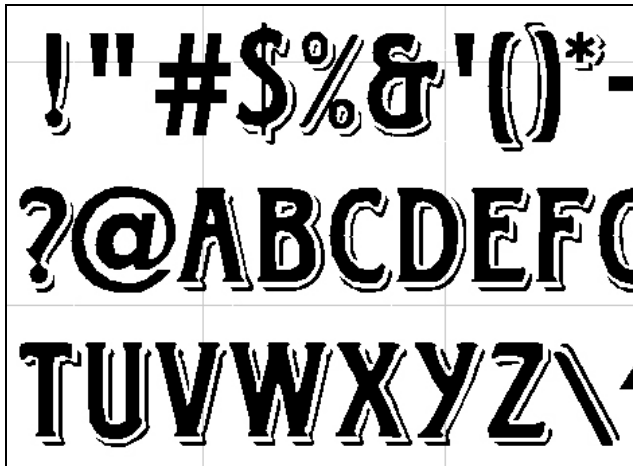
Text Attributes

General text attributes are described as follows:

Font Type, Size and Slant

| V CASHEWB ▾ | ↕ | 1.000 ▲▼ | 🔧 | 0.0 ▲▼ |

In addition to the Font Type and Size, the Slant value can tilt the text to either right or left. The Slant is expressed in degrees, which range from +15 (right) to -15 (left) degrees.

Slant of +15 degrees
Slant of -15 degrees

Text Orientation

Three methods of text orientation are available:

☰	**Horizontal Text**	Arrange text from left-to-right.
⫼	**Vertical Text**	Arrange text from top-to-bottom.
☰	**Arabic Text**	Arrange text from right-to-left.

Justification

The text justification controls are as follows:

▤	**Left Justify**
▤	**Center Justify**
▤	**Right Justify**
▌▤▐	**Horizontal Compression**
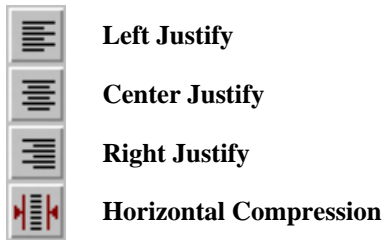
For advanced justification, click the **Horizontal Compression** button to modify how text is arranged to fit on a line. This command is only available when the text frame width is fixed. Using compression, text may be prevented from exceeding a set line length. Conversely, expansion may also be used to spread text over the entire line length. The **Word Wrap** can be set to occur after a specific amount of compression has occurred.
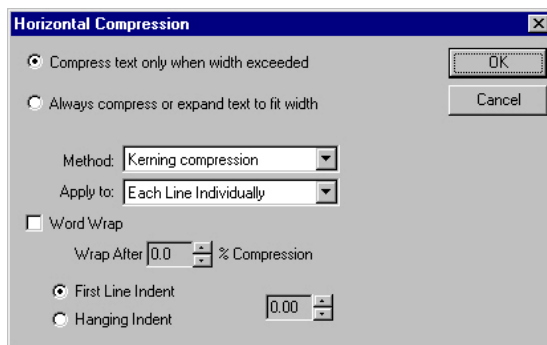
The available methods of compression and expansion are:

Width	Constrain text by modifying the character width.
Height	Constrain text by modifying the character height.
Kerning	Constrain text by modifying the distance between characters.
Word Kerning	Constrain text by modifying the distance between words.

Line Spacing

The following Line Spacing options are available:

☰	**Top Spacing**
☰	**Center Spacing**
☰	**Bottom Spacing**
☰	**Vertical Compression**
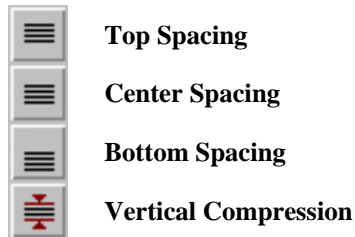
The **Vertical Compression** button may be clicked to specify how lines of text are arranged to with within a fixed text frame. This command is only available when the text frame height is fixed.

Vertical Compression

- ⦿ Compress text only when height exceeded   OK
- ○ Always compress or expand text to fit height   Cancel

Method: Line spacing compression ▼
Apply to: All lines ▼
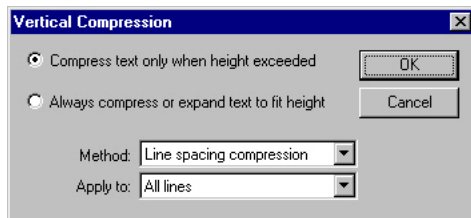
The available methods of compression and expansion are by:

➢ Character height, which constrains text by modifying the character height.

➢ Line spacing, which constrains text by modifying the spacing between lines of text.

> *Note:* If a given line of text contains a mix of character sizes, then vertical compression will be based on the height of the first character on that line.

Case Control

Case controls are applied to the currently selected text.

AB	**Upper Case**	Convert to upper case.
ab	**Lower Case**	Convert to lower case.
Ab	**Proper Name Case**	For each work, make the first letter upper-case, and the remaining letters lower-case.
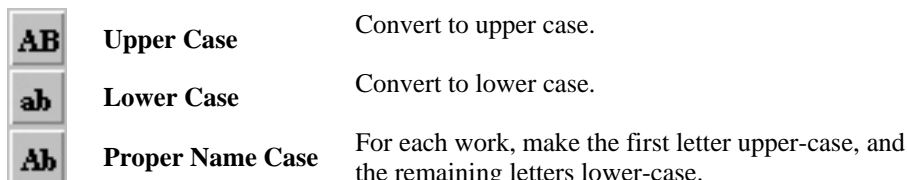
Character Placement

Use these controls to create superscripts and subscripts.

$\mathbf{A}^2$	**Superscript**	Create raised lettering.
$\mathbf{A}_2$	**Subscript**	Create lowered lettering.
$\mathbf{A}2$	**Unscript**	Remove superscripts and subscripts.

Either the Superscript or Subscript buttons may be right-clicked to customize the settings. The percentage by which to reduce the text size may be specified, as well as the amount that the text will be raised or lowered.
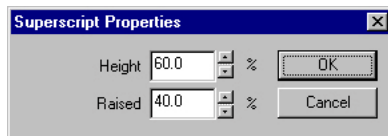
Line Properties
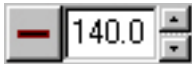
The field next to the **Line Properties** button is used to adjust the line spacing. This field is also accessible from the **Line Properties** dialog.

Clicking the **Line Properties** button opens the **Text Line Properties** dialog:
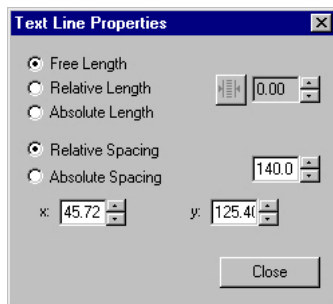
The **Free Length** option allows the line to run to its "natural" length, based on the height, width, and kerning settings. The **Relative Length** will resize the line to a percentage of its natural length. The **Absolute Length** will fix the line to a specific length.

The **Spacing** is used to determine the vertical distance between successive lines of text. A relative spacing is expressed as a percentage of the font height. Typically, a relative spacing of 150% is a reasonable default. An absolute spacing will maintain the set distance between successive lines, expressed in current workspace units.

The **X and Y** fields will position the line of text at specific coordinate with respect to the sign plate origin.

Frame Properties

The purpose of the text frame is to constrain text to the given height and width.
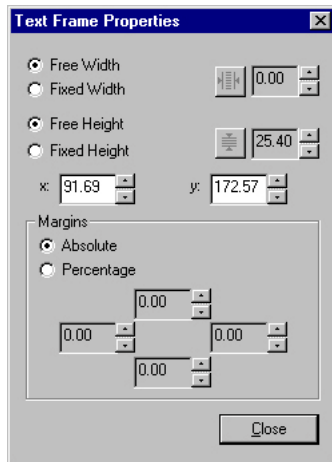
With respect to either **Free Width** or **Free Height**, the text will be set according to the height, width and kerning settings for the given font. Alternatively, fixed width or height may be set.

The **X and Y** fields are to position the line of text at specific coordinate with respect to the sign plate origin.

The text frame margins may be set in terms of absolute distances from the text frame edge, or by a percentage of the text frame size.

Line Compression

Next to the **Frame Properties** button is the **Line Compression** field. This field is used to compress a line width to a percentage of its original width. For example, enter 50 to compress the line to 50% of its original length.

Bullets

Clicking the **Bullets** button will place a bullet. To customize the shape of the bullet, right-click the **Bullets** button.
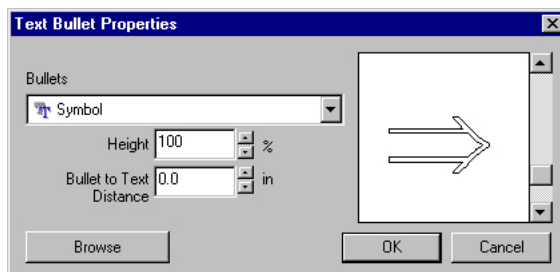
The bullet pattern may be chosen from any of the registered fonts. Click the **Browse** button to open the **Font Detective**, which is used to choose the font from which the bullet will be chosen. The font will then be available from the drop-list in the **Text Bullet Properties** dialog.

Spell Check

Click the **Spell Check** button, and the currently selected text will be checked. If no text is selected, then the entire text object will be checked.
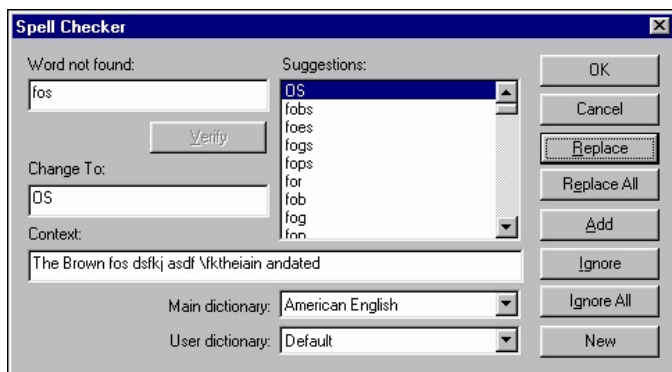
Default dictionaries for several languages are provided. The **Main dictionary** selection represents the active dictionary. In addition, a **User dictionary** may be created by clicking the **New** button.

When spell checking, both the Main and User dictionaries are used. If any new words are added, then the User dictionary will be used to store the new word. The Main dictionary will remain static.

Braille

The *Braille* module is used to create accurate, ADA-compliant Braille translations. The resulting Braille may then be rendered by means of either drilling, punching or photo-etching.

This operation of this feature is described in the **Braille** section, located later in this guide.

Style Painter

The **Style Painter** is used to copy text attributes from one text object to another. To copy attributes, select the text and click the **Style Painter** button. To paste these attributes, click the Style Painter button when there is no text selection.

A preview window will appear that previews how the current text object will appear. Using the mouse cursor, sweep-select the text that will be applied with the given attributes.

In addition, right-clicking the **Style Painter** button will open the **Text Style** dialog. This dialog is used to specify which text attributes will be copied.
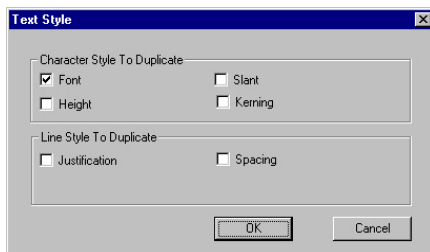
Character Width

The **Character Width** tool can apply compression to individual characters of a word. Right-clicking the **Proper Character Width** button opens the **Character Width Style** dialog.
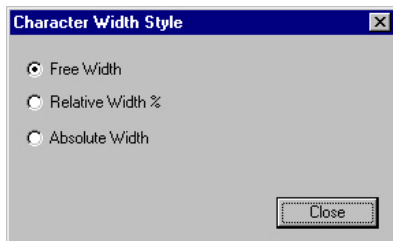
The dialog controls are summarized as follows:

Free Width	Maintain the characters at their original widths. This setting does not allow the Character Width to be adjusted.
Relative Width Percentage	Adjust the character width as a percentage of the original width.
Absolute Width	Adjust the character width to be a specific width.

TEXT KERNING

AUTO KERN

The **Auto Kern** command balances the white space between characters, such that a more pleasing arrangement of text is created.

The **Kern Percent** field is used to specify that a percentage of the regular kerning is to be applied. Reducing the percentage will decrease the space between characters, while increasing the percentage will move characters further apart.

Kerning of 115%
Kerning of 90%

The Auto Kern feature may be customized by right-clicking the **Auto Kern** button.
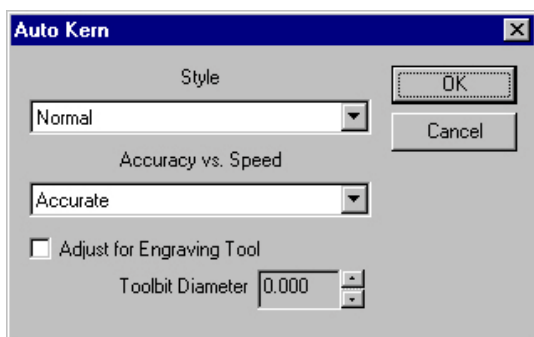
Kerning Styles

The available kerning styles are:

Normal	Balance the amount of white space, while maintaining a normal character spacing.
Wide	Insert approximately 20% extra white space between characters.
Narrow	Remove approximately 20% of white space between characters.
Touching	Arrange the characters so that their finials touch, yet do not overlap.
Overlap	Force adjacent characters to overlap by approximately 5%.

Accuracy versus Speed

Due to the number of calculations involved with finding the best kerning for a given pair of characters, it may be desirable to sacrifice some of the kerning accuracy in exchange for faster results. If so, then choose the **Fast** setting instead of **Accuracy**. The **Fast** setting will often produce acceptable results.

Auto Kern and Engraving Tools

When an engraving tool is to be used, set the **Toolbit Diameter** to ensure that kerning compensates for the bit size.

ON-SCREEN KERNING TOOL

The **On-Screen Kerning** feature is used to make manual adjustments to text using a special set of kerning nubs. The kerning nubs may be used to adjust inter-line spacing, line kerning, individual letter pair kerning, and the alignment skew of text.

On-Screen Kerning is accessible from the **Text Tools** flyout, as well as from the Text Compose toolbar. In addition, holding the **Control** key and double-clicking a text object will enter On-Screen Kerning mode.
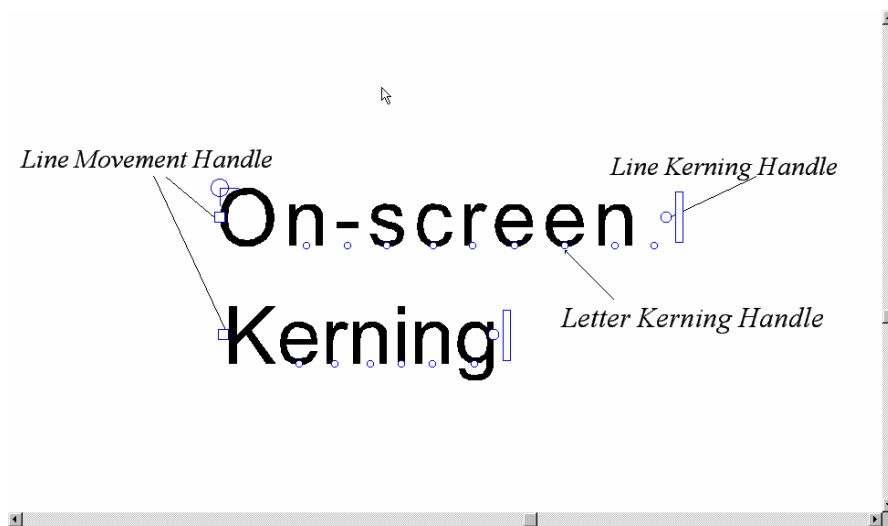
Kerning handles may be dragged using the mouse. In addition, by clicking on a handle, that handle will become selected. The cursor keys may then be used to move that handle by one pixel. Holding the **[Shift]** key will move a handle by five pixels.

The types of kerning handles are described as follows:

Line Movement Handle

Used to position the line of text. Holding the **[Control]** key may be used to constrain the movement of the line. Holding the **[Shift]** key will align all the text lines along a path between the current handle and the handle of the first line.

Line Kerning Handle

Used to adjust kerning for the current line. Holding the **[Control]** key will adjust the word kerning, while keeping the space between adjacent characters constant.

Letter Kerning Handle

Adjusts the kerning of characters that are opposite the **Line Kerning** handle.

TEXT AUTO LAYOUT

CREATING TEXT FRAMES

The **Auto Layout** feature is a convenient method of creating a text frame that is segmented into horizontal and vertical cells. Text and/or graphics may then be placed within each cell.

The **Text Edit** field may be used to enter text for a given field, and pressing the **Tab** key will advance the focus to the next cell. When entering text is complete, clicking the **Apply** button will open the **Font Detective**, which in this case will be used to select the font for the layout.

When working with the Auto Layout feature, the **Undo** function is temporarily disabled. As a result, be careful about using the delete function available in Auto Layout.

Note: The Auto Layout feature is part of the **Engraving** module.

Each cell is represented by a blue outline, and the active cell is indicated by a red outline.
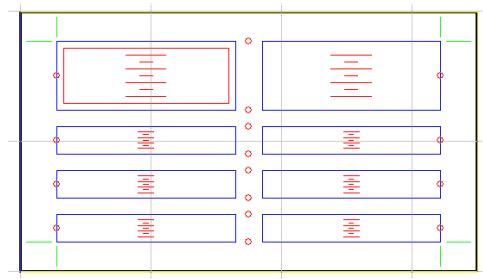
Created two columns and four rows of cells
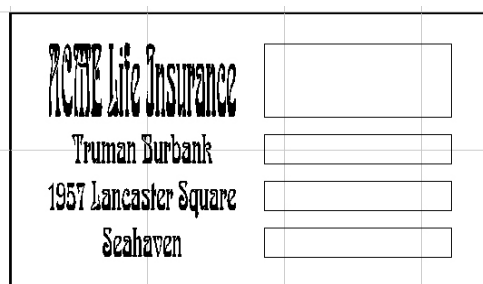
Result of entering text and clicking the Apply button

Layouts may be stored for later use. In this manner, a layout library can be made available for other projects. Layouts are customized as follows:

	Plate Parameters	Set the dimensions of the plate, as well as the initial number of rows for the layout.
	Advanced	Specify the margins around the plate, as well as the compression mode for the text.

The initial plate dimensions will be sized to the selected object. If no object is selected, then the sign plate dimensions will be used by default.

Formula

Offset	The Offset is expressed as a percentage of the overall plate height, and it is used to indicate the amount by which the bottom margin is larger than the top margin. A positive value will increase the bottom margin, whereas a negative value will increase the top margin.
Multiplier	Take the average inter-line spacing and increase it by the Multiplier. The result will determine the size of both the top and bottom margins.

Example	Offset	Multiplier	Result
1	0	2	Both top and bottom margins are equal in size, and they are each twice the average inter-line spacing.
2	10	2	The top and bottom margins are initially twice the average inter-line spacing. However, the bottom margin is larger than the top margin by ten percent of the plate height.
3	-20	1	The top and bottom margins are initially the same as the average inter-line spacing. However, the top margin is larger than the bottom margin by ten percent of the plate height.

AUTO LAYOUT CONTROLS

The general controls for Auto Layout are as follows:

Text Justification

Text justification may be defined according to individual cells.

Left Justify

Center Justify

Right Justify

Line and Cell Number

The Line and Cell Number fields are used to index the layout cells. These fields indicate the currently active cell.

Line and Cell Controls
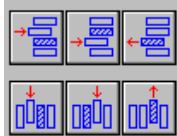
The Line and Cell controls are used to insert cells both horizontally and vertically. Cells may also be deleted.

Cell Behavior

The remaining edit fields are used to customize the cell behavior.

Percent and Absolute Spacing	Used to set the distance from the bottom of one cell and the top of the next.
Relative Line Height	When editing a layout is begun, all lines are considered to be at 100% height. The Relative Line Height field is used to set the selected cell to a percentage of this initial height, though in so doing the remaining lines will be changed in height. However, the remaining lines will still be considered to be at 100% height.
Absolute Line Height	Specify the height of the current line. Note that changing this value will affect the relative height value.
Percent Cell Spacing	For the current line, this field specifies the spacing between horizontal cells, expressed as a percentage of the cell widths.
Percent Kerning	Set the text kerning (space between characters) for the selected cell. This is expressed as a percentage of the normal kerning associated with the given font.

ADDITIONAL AUTO LAYOUT CONTROLS

For reference, the following diagram indicates common elements when editing the layout:
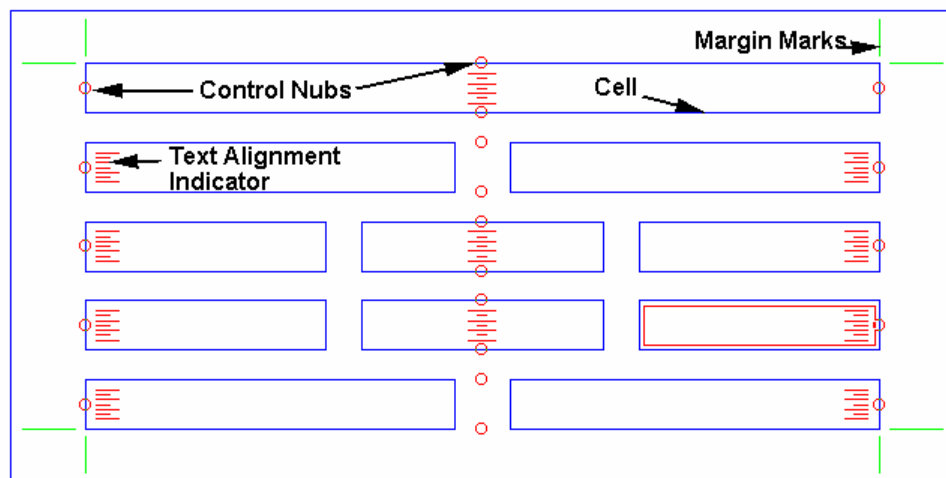
Note that:

➢ The plate outline is blue.

➢ The four margin marks (crop marks) are green.

➢ Control nubs are red, and each line has four of them. Control nubs are located at the right, left, top, and bottom edges of each line.

➢ The text alignment indicators are red, with each cell containing one indicator.

➢ The cell outlines are blue, with the selected cell denoted by a red frame within the outline.

When the Keyboard options:

➢ Pressing **[Enter]** after entering text in box adds an identical line of cells below the selected cell.

➢ Pressing **[Shift+Enter]** adds an identical cell to the selected line, and resizes the cells to fit the line.

➢ Pressing **[Tab]** shifts the focus into the next adjacent cell in the layout (moving from left to right, top to bottom).

➢ Pressing **[Shift+Tab]** shifts the focus to the previous adjacent cell in the layout (moving from right to left, bottom to top).

➢ Pressing the **[Up or Down Arrow]** on the keyboard move the focus to the cell before (UP), or after (Down) the currently selected cell.

Mouse Controls

Holding the **[Shift]** key when clicking either a cell will add a new cells. **Shift-clicking** either top or bottom control nubs will create a duplicate of the current line. In contrast, the **[Control]** key will remove cells and lines.

Dragging either left- or right-control nubs will adjust the margin for the given line. Holding the **[Control]** key will adjust left- and right-margins of the line equally.

CREATING AND EDITING FONTS

Introduction

EngraveLab can modify existing fonts, or create new ones from scanned, digitized, or hand-drawn objects on-screen. Regardless of whether the font is new or edited, it will always be saved in .VEF format, even if the original font had been stored in another format, such as True Type (TTY) Postscript (PFB).

Any workspace object can be converted into a font character. However, the object must be a single-path graphic. Imported or grouped objects must be welded and/or converted to a single path prior to creating a font version from those objects.

To import objects that have multiple paths, use the Make Path command to convert them into a single path. Also, the Text To Graphics command must also be applied.

EDITING FONTS – OVERVIEW

There are two functions that the **Font Editor** performs. The first is the editing of an existing fonts. The second it when a font is being created from scratch. In either case, the resulting font will be stored in a .VEF format. If the font was originally in .VEF format, then be aware that saving the font in its original name will overwrite the original font.

When editing fonts, it is important to understand how the placement of individual letters is accomplished. As a rule, each character's font metrics include two general types of information: (a) the shape and size of the character itself, and (b) its placement in relation to the other characters in the font.

The area that a character occupies can be thought of as being an enclosed box. The box is considered to have an x-axis, a y-axis, and an origin in the lower-left corner.

(0,0)
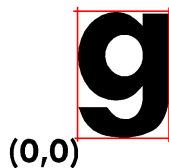
Such placement information is necessary to help arrange adjoining letters correctly, while also considering any possible descenders. The three primary adjustments are (i) the white space after the character, (ii) the character backspace, and (iii) the offset from the baseline.

➢ The white space after the character adjusts the right (or trailing) side of the bounding box

➢ The character backspace shifts the beginning of the character in relation to the left side of the bounding box

➢ The offset from baseline shifts the character above or below the bottom of the bounding box

Create / Edit Font Dialog

Choosing Edit Font from the Edit menu will open the Create / Edit Font dialog.
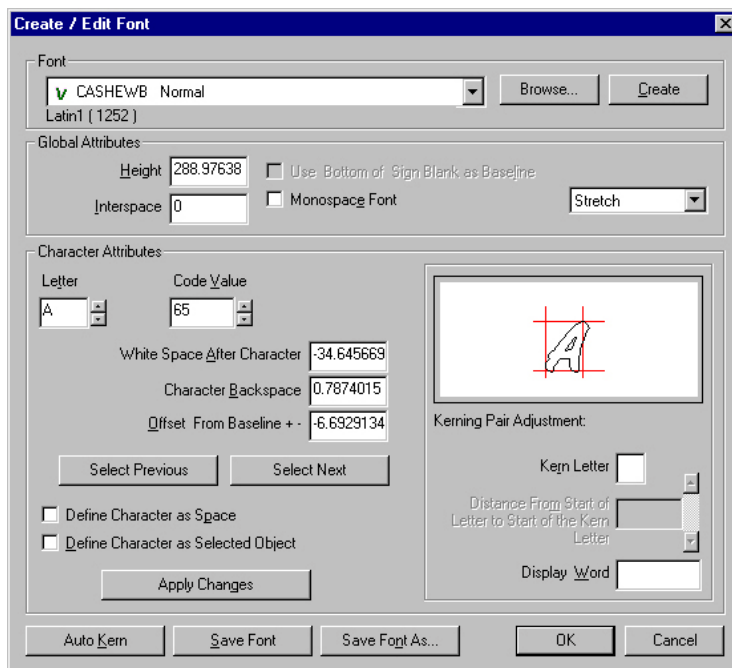
When editing a font, there are two broad classes of adjustment. **Global** adjustments are applied to all of the characters in a given font, whereas **Character** adjustments are specific to a single character within the font.

To create a new font, click the **Create** button. You may enter the name of your new font in the **Create New Font** dialog. After clicking **OK**, you will also be queried to save the font.
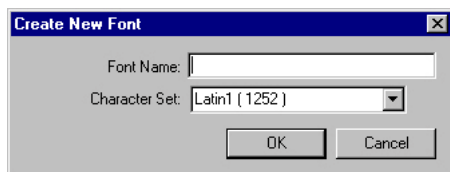
Note: As a precaution with .VEF fonts, use a Font Name that is different from the original font. Otherwise, the original font data will be overwritten.

Global Attributes

Adjustments to the Global Attributes are used to define the general appearance of a font. These adjustments will be applied to all the characters within the font.

Font Height

The Font Height defines the actual height of the font as it was created. When creating a new font, the height of a reference letter should be entered, so that the remaining characters can be sized correctly.

For example, suppose that an uppercase 'M' were chosen as the reference letter (this is a typical choice). For the Height field, you would measure the height of the 'M'.

It is very important to assign an appropriate height to a font being created. The height of a font is often based on the height of an uppercase M or H. The precise letter height will be used when creating a block-style font, whereas script fonts may require a more creative estimate of height. In the following example, notice how the script character is slightly taller than the non-script character.
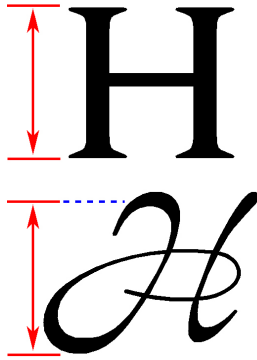
Interspace

We mentioned previously that characters are considered to be within an enclosed box. Interspace is the nominal amount of trailing white space that will provide a gap between the following letter. By modifying the Interspace, fonts can be given either a wide or narrow kerning, such that the characters appear either closer or further apart. For example, using a negative interspace value will create a condensed font.

Use Bottom of Sign Blank as Baseline

The space occupied by a given character has been described earlier as an enclosed box, and the bottom of this box is considered to be the baseline of the character. This baseline will determine the vertically position of the characters. When creating a new font, the vertical position of each character is defined in relation to the baseline. To the vertical position of the characters, either (i) manually adjust each of the characters using the Offset from Baseline (described later), or (ii) use the Use Bottom of Sign Blank As Baseline option.

For the second option, use the Align feature to arrange the characters along the bottom of the sign blank. Then return to the **Create / Edit Font** dialog and enable the "**Use Bottom of Sign Blank as Baseline**" option. EngraveLab will automatically perform the calculations, such that all the characters will be placed along a consistent baseline.

Monospace Font

The Monospace Font option converts the font to a fixed-width font, in which each character occupies the same amount of horizontal space regardless of its width — for example, the character 'i' taking as much width as an 'm'.

Stretch

The Stretch Font dialog is used to adjust the ratio between the font height and width, expressed as a percentage. A value less than 100 produces a font that is both short and wide, whereas a value greater than 100 produces a font that is both narrow and tall.
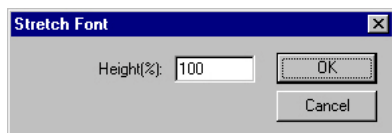
Slant

The Slant Font dialog is used to specify the slant degree for the font characters. A positive slant will create an Italic font, whereas a negative slant will create a "backhand" appearance.
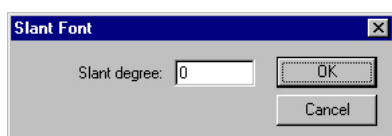
Character Attributes

Letter

This box is used to specify the character currently being operated upon. The edit box displays the actual character.

Code Value

For computers to recognize text characters, a numeric code value called the ANSI standard is used. This is a widely accepted standard that ensures that text data will be understandable between different models of computers. For a given font, there are 255 characters in the ANSI character set, which encompasses upper-case letters, lower-case letters, numbers, and (sometimes) special symbols.

Because some of these ANSI values are intended for communication protocols between devices, not all of the characters will be printable. For example, the first 31 characters are reserved for special command sequences that would be recognizable by a modem or printer, but which have no significance for our purposes of editing a font. However, it is sufficient for us to use the characters that are allocated for us to create normal, printable characters.

The following table indicates some sample values:

ANSI code value	Which we know as:	CASHEWB font	EMBASSY font
65	The letter 'A'	*A*	*A*
66	The letter 'B'	*B*	*B*

67	The letter 'C'	*C*	*C*
97	The letter 'a'	*a*	*a*
98	The letter 'b'	*b*	*b*
99	The letter 'c'	*c*	*c*
48	The number '0'	*0*	*0*
49	The number '1'	*1*	*1*
50	The number '2'	*2*	*2*
51	The number '3'	*3*	*3*

White Space After Character

This field is used to adjust the width of a character bounding box. In effect, this will increase the separation from the following character. Though this is similar to Interspace, keep in mind that this setting is applied on a per character basis, whereas Interspace is used to adjust the overall kerning of the font characters.
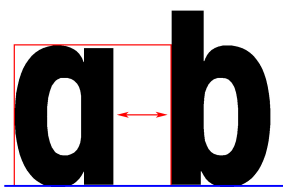
Character Backspace

Character Backspace is used to move the character with respect to its bounding box origin. In effect, this will place the character either further away, or closer to, the preceding character.
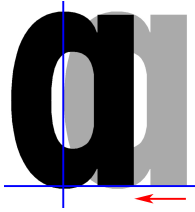
Offset from Baseline

The Offset From Baseline adjusts the vertical character placement with respect to the baseline.

For example, an uppercase H in a sans serif font will generally have an offset of 0 (no offset). This means that the bottom of the actual letter will be the same as the bottom of the letter's bounding box.
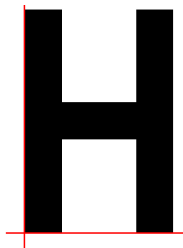
On the other hand, a lowercase 'g' will require a negative offset, so that its descender (the tail) will fall below the baseline.
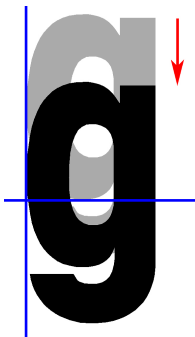
Select Previous and Select Next Buttons

Font characters can be designed on the EngraveLab workspace and then added to a new font. EngraveLab orders workspace objects according to the sequence in which they were created. Using the Select Previous and Select Next buttons, you may browse workspace objects without leaving the Create / Edit Font dialog. When the correct object is selected, click the Apply Changes button to create the character.

For example, suppose that you have created a new alphabet, such that you have objects for "A B C D E F..." etc. on the workspace. From the Create / Edit Font dialog, you would set the Code Value to 65, and then you would use the Select Next button to select the 'A' object on the workspace. At this point, clicking Apply Changes would create the new character. Then, you could increment the Code Value to 66, click the Select Next button to select the 'B' object, and click Apply Changes again. This process would be repeated for each character that you create for the font.

Define Character as Selected Object

When editing a font, select an object to be included in the font as a character. To designate a selected object as the current character, check this box.

Define Character as Space.

There is also a non-printing character that is often forgotten, but which must be present in a font: the space character. Without the space character, which appears when the space bar is pressed, there will be no spaces between the words created when composing text, so it is critical that a space character be included when generating a font.

There are two ways to create the space character:

1. To use an existing character, select a character that best represents an appropriate space, and enable the **Define Character As Space** option.

2. To create the space character using an object, exit the **Create / Edit Font** dialog and create an object that has an area that is appropriate for the font. Once the object is selected, open the **Create / Edit Font** dialog and enable the **Define Character As Space** option.

Apply Changes

Clicking Apply Changes will save the character information and begin editing another character. Note that the changes are not saved to disk until the font is saved using the **Save Font** or **Save Font As** button.

Display Box

This box displays the current information for the character being edited. It also displays the bounding box for the selected character (including a top line representing the font height) and the character's current placement within the box. When changes are made to the character, those changes are immediately reflected in the display box, but those changes are not permanent until the Save Font button is clicked.
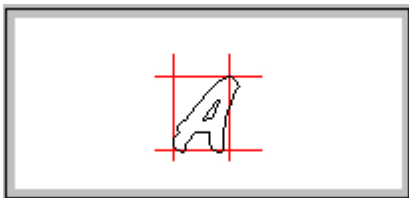
The Display Box will display kerning pairs, as well as words where necessary.

Kerning Pair Adjustment

The EngraveLab font maker provides the ability to adjust individual kerning pairs manually.

Kern Letter

The Kern Letter field indicates the character to be manually kerned in the trailing position, relative to the character currently being edited. The letter pair will then be displayed in the **Display Box**.

Distance From Start Of Letter To Start Of Kern Letter

Adjust the kerning white space between the current character and the kerning letter.
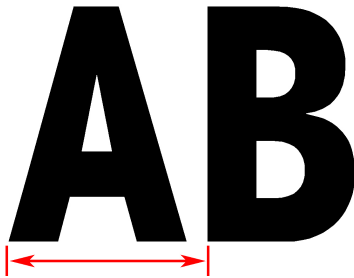
Specifically, this setting identifies the exact distance between the start points of the two characters. A larger number increases the space while a smaller figure reduces the space.

This setting is grayed out and unavailable unless a kern letter is selected to be paired with the current character.

Display Word

To examine the kerning set for a given letter in a realistic context, type a word containing the letter in the Display Word box. The word will be displayed in the Display Box.

Note: In order for the word to appear in the display box, it must contain the character currently being edited.

Auto Kern

This button opens the **Auto Kern** dialog box.
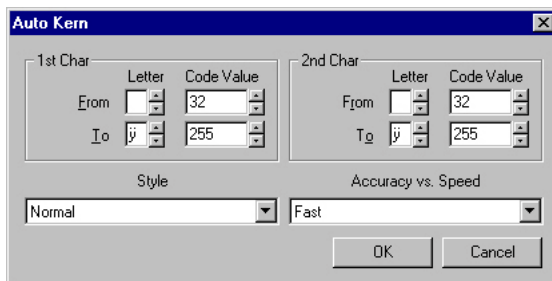
Auto Kern is used to automatically generate a kerning table for a given font. Kerning tables contain information about the spacing between pairs of characters.

Why Use Auto Kern?

The Auto Kern feature is similar to the Text On-Screen Kerning feature that is available from the Text Tools flyout. Once kerning information is created for a font, EngraveLab will simply duplicate the kerning table already defined.

Due to the time required to generate a kerning table on-the-fly, the main advantage of using Auto Kern at the font generation stage is that EngraveLab generates paragraphs of text very quickly when entered in Text Compose, since Auto Kern will not be used at that stage.

There are four settings that can be adjusted in order to generate a custom kerning table for a font.

1ˢᵗ Character

By definition, a kerning pair has a first (or leading) character and a second (or trailing) character. Use the two entry boxes to specify the range of characters (from first to last) to be set to Auto Kern in the first position. By default, EngraveLab will kern all 255 ANSI characters in the leading position.

2nd Character

Use these two entry boxes to specify the range of characters to be set to Auto Kern in the second position. By default, EngraveLab will Auto Kern all 255 ANSI characters in the trailing position.

Accuracy Vs. Speed

Auto Kern works by checking and adjusting the distances between a number of points along the height of letter pairs. From the **Accurate versus Speed** drop-list, there is a choice between **Accurate** and **Fast**, that provides the ability to draw a balance between speed and precision.

Using **Fast** will speed the kerning process by examining only a limited number of points.
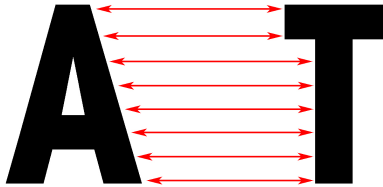
Using Accurate will result in kerning based on the examination of substantially more points.
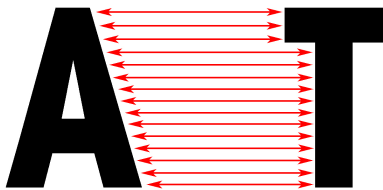
Style

Auto Kern can generate a font with one of five different kerning styles — Normal, Wide, Narrow, Touching, and Overlap.

- ➢ The **Normal** setting kerns the font normally, adding white space roughly in proportion to the width of the letter.
- ➢ The **Wide** setting kerns fonts at a rate of Normal kerning plus 20% (i.e., there is 20% more white space added between each letter).
- ➢ The **Narrow** option sets kerning at Normal kerning minus 20%.
- ➢ The **Touching** setting causes letters to touch, but not overlap.
- ➢ The **Overlap** setting causes letters to overlap each other by 5% of their Normal kerning.

Save Font

When editing a font, the new information is not written to the hard drive until actually told to save the font. Until then, the font is buffered. A buffered font is somewhat in limbo — it exists and is available to Text Compose, but it has not been committed to the hard drive. This means that the option to save or discard changes to the font before exiting EngraveLab is still available.

Saving a font means moving the information out of the buffer to the hard disk, thus making it permanently available. Any font saved is placed in the directory where the existing .VEF fonts are currently located.

Clicking on the Save Font button will result in the font being written to disk immediately. The alternative is that EngraveLab provides the option to save the font when issuing an exit command. If the font is not saved before exiting the Font Maker dialog box, a prompt to do so when either beginning a new session with the New command under the File menu, or exit EngraveLab.

Save Font As

The function of this button is very similar to the Save As command in the File menu. Specifically, it provides the opportunity to give an edited font a new name, and then save the font under a new name. This is particularly useful when creating a new font by editing an existing font, since it allows to save the changes under a new name without losing the original font information.

OK

Clicking **OK** will accept the current font changes and close the **Create / Edit Font** dialog.

It will not save the font or changes to individual characters, but will commit them to memory so that they can be saved later.

Font changes may be saved by (i) using the **Save Font** button in the **Create / Edit Font** dialog, (ii) using the **New** command under the **File** menu, or (iii) exiting EngraveLab. By not saving, font changes will be discarded when exiting EngraveLab.

BRAILLE

Introduction

The **Braille** module is used to create accurate, ADA-compliant Braille translations. The resulting Braille may then be rendered by means of either engraving, punching or photo-etching.

Braille cannot be modified using the Auto Kern feature. The Braille fonts are carefully constructed to meet the Federally-mandated ADA standard in the United States, and using any special kerning modes (Wide, Narrow, etc.) will cause the text to be non-standard.

Note: The Braille feature is included with the **Braille** module.

BRAILLE FONT TYPES

There are four types of CADlink VEF fonts that are used for generating Braille. The following chart indicates where each font is used:

Braille Rendering method	Braille font used
Engrave	brilbox.vef
Punch	brpunch.vef
Photo-resist	brilpho.vef
Pre-bled photo-resist	brilpho1.vef

CREATING BRAILLE

To avoid spelling errors, type the initial text using a non-Braille font, and then convert the text into Braille. The typical steps for creating Braille are as follows:

1) Choose **Text Compose** from the **Text Tools** flyout, and then click on the workspace to place the text. The **Text Compose** controls will be displayed within the SmartBar.
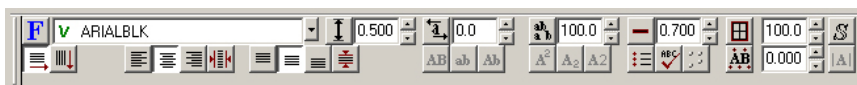
2) There are several Braille fonts provided with EngraveLab. To set the default Braille font, <u>right-click</u> the **Braille** button within the SmartBar.
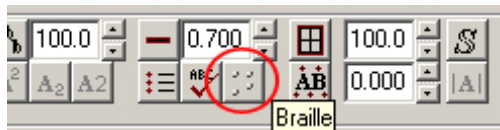
3)   The **Braille Properties** dialog will open.
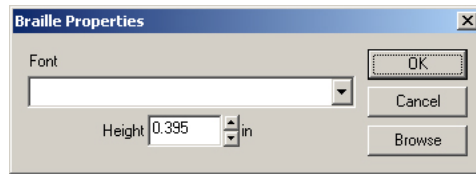
4)   Click the **Browse** button, and the **Font Detective** window will open.
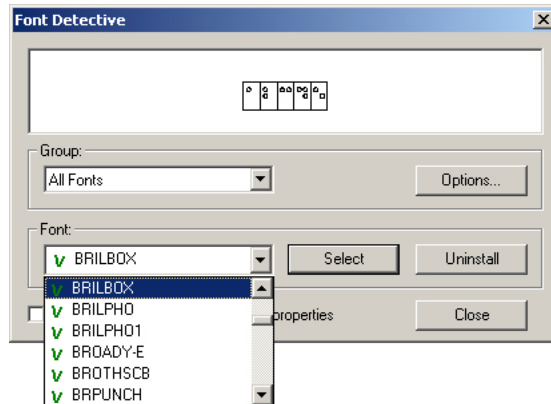
5)   From the **Font** drop-list, choose the Braille font that will be used. In this case, the brilbox.vef engraving font was chosen.

> *Note:* If the required Braille font is not available, then refer to the *Font Installation* section.

6)   Click the **Select** button to close the **Font Detective**, and the selected Braille font will become available within the **Braille Properties** dialog.
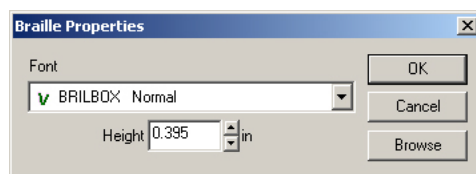
7)   Click **OK** to close the **Braille Properties** dialog.

8) The focus will return to the EngraveLab workspace. Type the text that must be converted into Braille.

9) Within the SmartBar, <u>left-click</u> the **Braille** button.

10) The text will be converted into Braille.
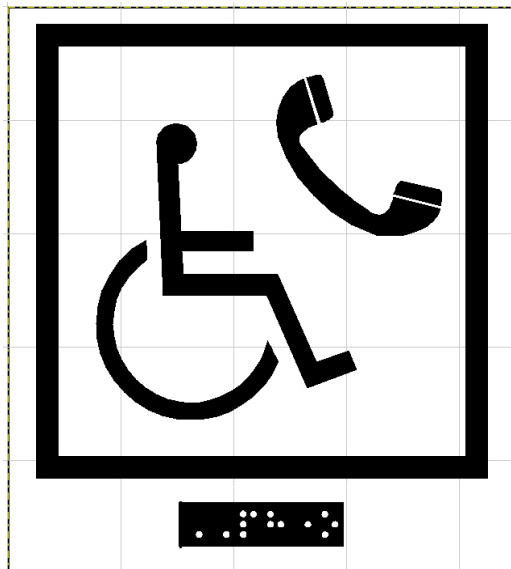
11) To finish text editing, click within an empty portion of the workspace. Note that the height of the Braille is automatically set to 0.395 in, as per the default setting within the **Braille Properties** dialog.
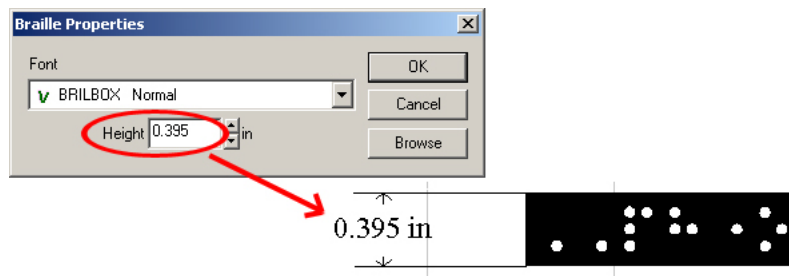
Braille Engrave

The **Braille Engrave** method is intended for use with a router or engraver. The characters consist of uniform rectangles, which are hollowed out to leave only the dots that distinguish the Braille characters. Use the *brilbox.vef* font when engraving Braille.

> *Note:* Engraving both Braille and regular text in the same engraving job is not supported. As an alternative, engrave the Braille as a single job, and then engrave the regular text as a follow-up job.

The following steps summarize how to configure a driver to engrave Braille. For a complete description of configuring the **Output** dialog, please refer to the *Cutting and Plotting* section.

➢ Under the **Engrave** menu, choose the **Engraving Defaults** item.

➢ The **Output** dialog will open.
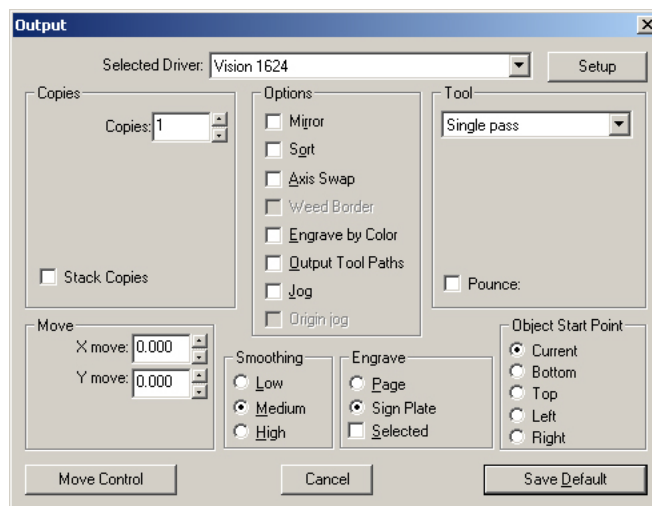
➢ Within the **Output** dialog, choose the **Selected Driver** from the drop-list. This example uses the *Vision 1624* driver.

➢ From the **Tool** drop-list, verify that the "Single pass" option is active.

➢ From the **Options** section, verify that the **Output Tool Paths** checkbox is off.

> ➢ Click the **Move Control** button. The **Move Control** dialog for the **Selected Driver** will open.
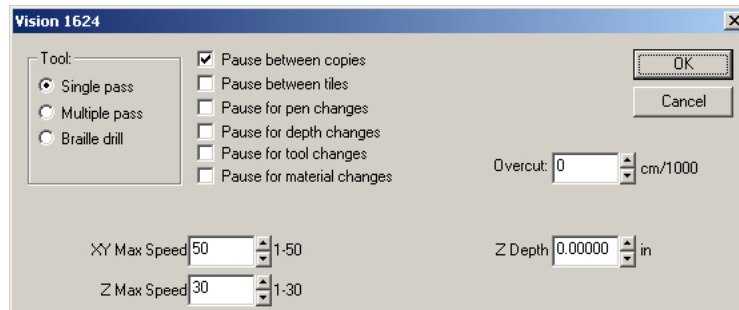
> ➢ From the **Tool** section, verify that the **Single Pass** option is selected.
> ➢ Set the other **Move Control** settings as required.
> ➢ Click **OK** to close the **Move Control** dialog. The settings will be automatically saved.
> ➢ Back in the **Output** dialog, click the **Save Default** button. The **Output** dialog will close, and the current driver settings will be stored for future sessions.

The **Output** dialog will close, and the driver is now configured to **engrave** Braille.

Braille Punch

The **Braille Punch** method uses a mechanical punch, where the Braille lettering is punched onto the underside of a plastic sheet. The Braille will then be readable on the topside of the plastic sheet. When the Braille is punched, the lettering is automatically mirrored, such that the topside of the plastic sheet will be readable. Use the *brpunch.vef* font when punching fonts.

The following steps summarize how to configure a driver to punch Braille. For a complete description of configuring the **Output** dialog, please refer to the *Cutting and Plotting* section.

> ➢ Under the **Engrave** menu, choose the **Engraving Setup** item. The **Output** dialog will open.
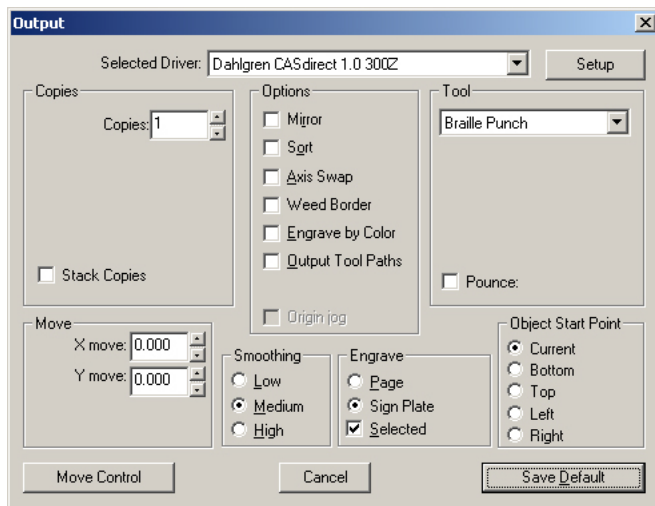
> ➢ Within the **Output** dialog, choose the **Selected Driver** from the drop-list. This example uses the *Dahlgren CASdirect 1.0/300Z* driver.
> ➢ From the **Tool** drop-list, verify that that the "Braille Punch" option is active.
> ➢ From the **Options** section, verify that the **Output Tool Paths** checkbox is off.
> ➢ Click the **Move Control** button. The **Move Control** dialog for the **Selected Driver** will open.
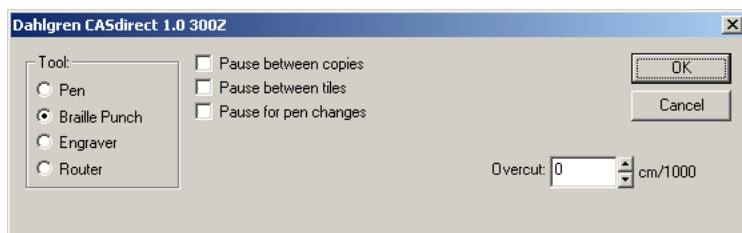
> ➢ From the **Tool** section, verify that the **Braille Punch** option is selected.
> ➢ Set the other **Move Control** settings as required.
> ➢ Click **OK** to close the **Move Control** dialog. The settings will automatically be saved.
> ➢ Back in the **Output** dialog, click the **Save Default** button. The **Output** dialog will close, and the current driver settings will be stored for future sessions.

The **Output** dialog will close, and the driver is now configured to **punch** Braille.

Braille Photo-Resist

The **Braille Photo-Resist** method is designed for printing onto a transparency. The transparency may then be used as a mask to expose photo-sensitive material to ultraviolet light, thereby constructing the dots that compose the Braille lettering. Use the *brilpho.vef* font for designing a transparency mask.

Braille Pre-Bled Photo-Resist

The **Braille Photo-Resist** method may in some cases produce dots that are larger than the acceptable standard for Braille lettering. The **Braille Pre-Bled Photo-Resist** method corrects this problem by resizing the *brilpho.vef* font to compensate for dot sizes that are too large. In this case, use the *brilpho1.vef* font for designing a transparency mask.

IMPORTING AND EXPORTING

Introduction

This chapter describes several means by which images and objects may be brought into the EngraveLab workspace. EngraveLab can import a wide variety of data types that can include raster, vector and combination files. Once imported, files may then be modified according to their type.

Raster, Vector and Combination Files

The term raster originates from the method by which television images are rendered as a series of horizontal scan lines. In rapid succession, these scan lines are traced from the top to bottom of the cathode-ray tube (CRT), such that a sequence of still pictures can create the illusion of movement. Similarly, some types of files are referred to as a "raster format" because the stored data is organized into a series of rows. Therefore, the size of a raster file depends on the width and height of the file, as well as the color depth.

A file that is "vector format" represents its contents in mathematical terms, such that components of the file are stored as vectors. The size of the file will depend upon the number of vectors, rather than the area that is "covered" by the components. Since a vector is a mathematical instruction for constructing a component, operations such as scaling will not compromise the quality of the file. In contrast, raster files can experience some degradation when scaled.

Combination files represent their data in both raster and vector formats. When the file is loaded, the raster and vector data are used to reconstruct the original image.

Cutting Files

Vector format files can be both cut and plotted by a device, whereas raster files cannot be cut. Raster files must first be converted into vector format, which the device will then be able to understand. Similarly, the raster component of combinations files would also require conversion.

Vectorization is the conversion of raster data into vector format. To do this, use the AccuScan or PrismScan features to vectorize the data. Once converted to vectors, EngraveLab can manipulate the vectors as per regular workspace objects.

IMAGE TOOLS

The **Image** menu contains tools that are used to modify imported bitmaps.
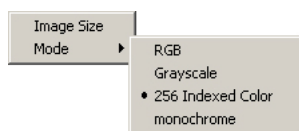
Image Size	For a selected bitmap, the pixel size, workspace size and resolution may be modified.
Mode	The Mode is the type of the selected bitmap. The four color modes are RGB (24-bit), Grayscale (256 levels), 256 Indexed Color, and Monochrome (black and white).

IMPORT

The **Import** command will load an existing file into the workspace. Unless the **Merge** option is active, the existing workspace objects will be deleted.

Filter Options

Clicking the **Filter** button will open the **Filter Options** dialog, which is used to customize the type of files that should be available when importing.
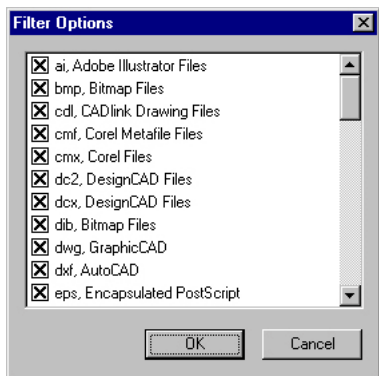
Bitmap Import Color Settings

By default, the **Background** and **Foreground** colors for bitmaps are white. These defaults may be modified by clicking the **Customize** button, which opens the **Bitmap Import Color Settings** dialog.
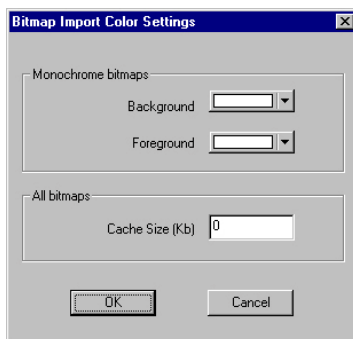
EXPORT

EngraveLab supports numerous file types for exporting. However, caution is required to prevent creating file objects that contain excessive numbers of nodes. This is especially true of artwork that was originally imported from other software. To overcome this problem, click the Customize button on the **Export File** dialog. The **Parameter Specification** dialog will open:
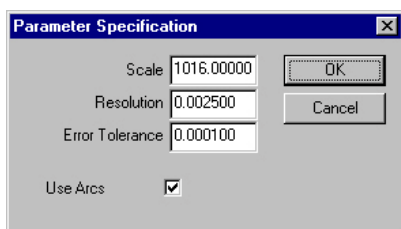
This dialog is used to substantially reduce the nodes of exported objects. If the default values are insufficient, then caution is urged against setting a high value for the Error Tolerance. As a rule, the default value (0.001 or 1/1,000 of an inch) will work very well with most files.

IMPORTING FROM CORELDRAW!^{TM}

Using CMF files

When EngraveLab is installed, and either of CorelDRAW!^{TM} versions 3, 4, or 5 has already been installed, EngraveLab will install an export filter into the CorelDRAW!^{TM} export menu. This custom export filter is optimized for file exchange between CorelDRAW!^{TM} and EngraveLab. The filter will appear in the CorelDRAW!^{TM} export menu as "Export To SignLab," and it will generate *.CMF files. This is the preferred method of file exchange for these versions of CorelDRAW!^{TM}.

> *Note:* The CMF filter is not available if CorelDRAW!^{TM} is running from the CD-ROM.

Using the Application Launcher

For CorelDRAW!^{TM} versions 5 through 10 inclusive, the Application Launcher may be used. On the Standard CorelDRAW!^{TM} toolbar, the "CorelDRAW to SignLab" option may be chosen from the Application Launcher.
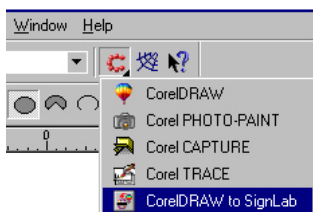
The focus will then switch to the EngraveLab workspace, where the exported object may then be placed on the sign plate.

Creating a "2signlab.csc" toolbar button

For versions of CorelDRAW!^{TM} versions 8 and 9, a toolbar button may be created by using the "2SignLab.CSC" file that is available from CADlink. The following steps describe how to create this toolbar button. Before following these steps, please verify that you have the "2SignLab.CSC" file. If this file was not installed with EngraveLab, then it is available as a download from the CADlink web site.

1) Using Windows Explorer, copy the "2SignLab.CSC" file into the following directory:

   C:\Program Files\Corel\Graphics9\Draw\Scripts\Scripts

   > *Note:* This is a default directory that would have been set up during the installation of CorelDRAW. If CorelDRAW has been installed to an alternative directory path, then place the "2SignLab.CSC" file in the appropriate sub-directory.

2) From within CorelDRAW, choose **Options** from the **Tools** menu. The **Options** dialog will open.
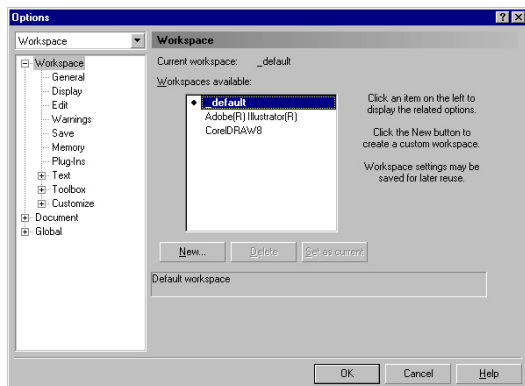
3) On the left-hand side of the **Options** dialog, expand the **Customize** item, and then choose the **Toolbars** option.

4) A list of **Commands** will appear in the center of the **Options** dialog.

5) Expand the **Application Scripts** item, and then choose the **"2signlab.csc"** option. To the right of the **Commands** list, a group of available icons will appear.

6) Click and drag the icon that will be used to represent the "2SignLab.csc" button.
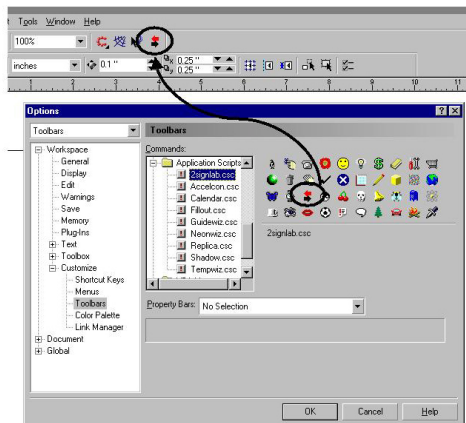
7) Drag the icon to the CorelDRAW toolbar where the new button will be placed. An insertion cursor will appear as you hold the icon over a given toolbar. In this example, the button was created on the Standard toolbar.

8) When the icon is in the desired toolbar position, release the mouse button. At this point, a toolbar button for the "2SignLab.CSC" file has been created.

9) Click the **OK** button to close the **Options** dialog.

As a test, create an object in CorelDRAW, select that object, and then click the "2SignLab.CSC" toolbar button. The focus will shift to EngraveLab, and the object will be placed on the sign plate.

LINKING TEXT AND IMAGES

Introduction

Microsoft OLE (Object Linking and Embedding) technology is designed to facilitate the sharing of text and graphics between Windows applications. For example, an editing area may be created within Application A, wherein objects from Application B may be created or modified.

Sharing between applications is commonly done by dragging a text or graphic object from one application to another. Simply select the object, left-click it and drag, and then release the object when it is over the other application window. After dragging an object, releasing the left-mouse button is referred to as "dropping" the object.

In addition to simply dragging-and-dropping an object, there are modifier keys that specify the operation that should be performed. The modifier keys are summarized as follows:

Modifier Keys	Action performed
[none]	Move object to the target application.
[Control]	Copy object to the target application.
[Control + Shift]	Create a link for the object in the target application.

Creating a linked object between two applications will allow either application to edit that object. Edits made in one application will be shown in the linked application, and vice-versa. However, note that the frequency of updates is determined by the operating system, so updates may not be immediate.

To create linked text within EngraveLab, suppose that a paragraph of text had been created within MSWord 97:

➢ Select the paragraph that will be linked.

➢ With the left-mouse button, click and drag the paragraph over to the EngraveLab workspace. However, do not release the mouse button.

➢ Press and hold both the **[Shift]** and **[Control]** keys. Notice that the mouse cursor will indicate an "insertion" arrow.

➢ While still holding the **[Shift]** and **[Control]** keys, release the left-mouse button. The link to the text will be created within the EngraveLab workspace.

In the above example, once the link has been established, any edits within MSWord would also be shown on the EngraveLab workspace.

> *Note:* Though Microsoft has specified a standard for OLE implementation, support of OLE functionality may not be available with certain applications. In some case, there is support for moving and copying objects, but not for creating links.

Links

Multiple objects may be linked into the EngraveLab workspace. To view the current links, choose the **Links** command (**Edit** menu).
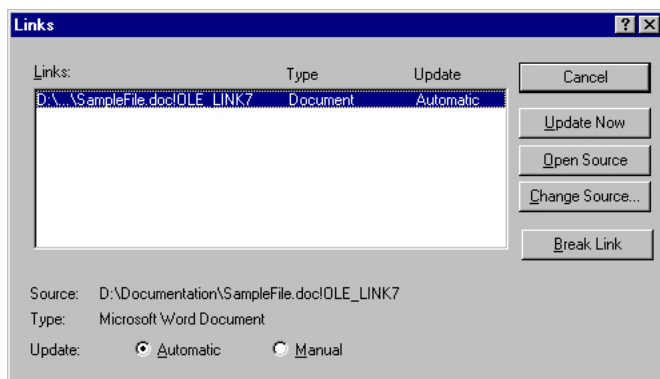
The following actions are available for the selected link:

Update Now	If edits have occurred in the linked file, then update this information on the EngraveLab workspace.
Open Source	Open the object in its associated application.
Change Source	Modify the link, such that it points to a different file. If the file is valid, then changing the type of file is acceptable.
Break Link	Remove the link that exists between the EngraveLab workspace and the original application. Edits within the application will no longer be shown within EngraveLab.

The **Update** options are Automatic and Manual. The Automatic option will refresh changes to linked objects periodically. The Manual option will require that the **Update Now** button be clicked before changes are shown.

Insert New Object

As an alternative to dragging-and-dropping, the **Insert New Object** command will link objects that are from another application. Either a previously created file may be used for linking, or a new object may be created within the EngraveLab workspace.
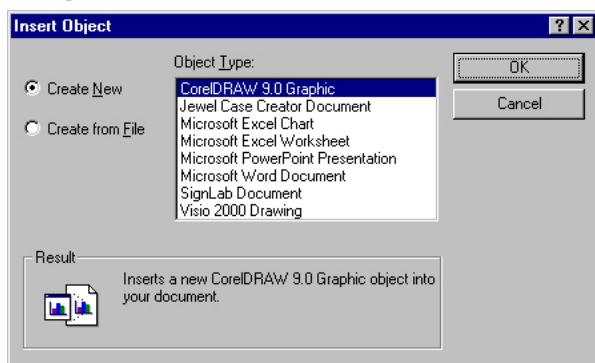
Editing Linked Objects

After an object has been inserted, it may be double-clicked to continue editing. In addition, selecting the object will activate the following **Edit** menu flyout commands:
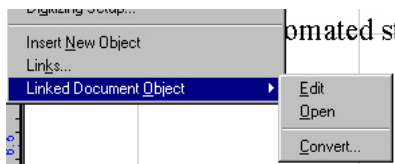
Edit	Edit the object within the EngraveLab workspace.
Open	Open the object within its associated application.
Convert	Convert the object type, such as from MSWord 97 into MSWord 2000. This command is provided in cases where objects from a previous release must be accessed.

Convert to EngraveLab Object

After an object has been inserted into the EngraveLab workspace from another application, this command will convert the object into an actually EngraveLab object. Once this conversion has been performed, there will be no method of editing the object in the original application.

If the object being converted is a text object, then the resulting EngraveLab object will be a text object. Otherwise, the converted object will be of either type polyarc or polygon, depending on the **Polyarc / Polygon** setting in the **General Preferences** dialog.

> *Note:* The result of the conversion will be grouped, though an Ungroup command [Alt + G] may be performed.

ACQUIRE IMAGE

The **Acquire Image** item provides access to the TWAIN support offered by EngraveLab. This support provides the ability to operate TWAIN-compliant scanners directly from within EngraveLab, without any intermediary software. To function properly, the scanner control software must be properly installed within Windows, and must be TWAIN-compliant.
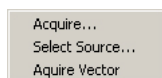
Acquire

This option calls the TWAIN-compliant software, initializes the scanner, and prepares the system to receive a scanned image. Upon exit from the scanning software, the acquired image will be imported into EngraveLab.

Select Source

This option provides the ability to choose the TWAIN input device that will acquire images.

If only one source (i.e., only one scanner and/or scanning software) is attached to the system, set this once. However, if more than one source of TWAIN-compliant input (i.e., both a flat bed scanner and a hand-held device) is attached, this feature provides the ability to choose between the devices to suit specific needs at any time. Select Source opens the Select Source dialog box:
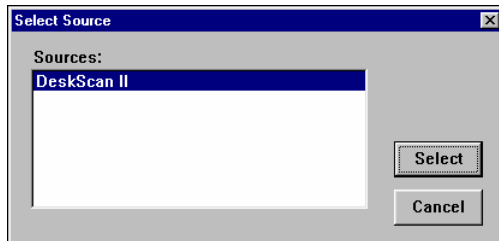
The **Sources** list is of all available TWAIN-compliant devices attached to the system. After choosing the source device, click the **Select** button.

Acquire Vector

Similar to the Acquire command, the Acquire Vector item will convert the scanned image into line art.

DIGITIZING SETUP

EngraveLab will interface cleanly with a digitizing tablet, and no other intermediary software drivers are required. However, verify that the tablet is correctly connected to the computer, as per the manufacturer instructions. Once connected, configure the tablet using the **Digitizing Tablet Setup** dialog.
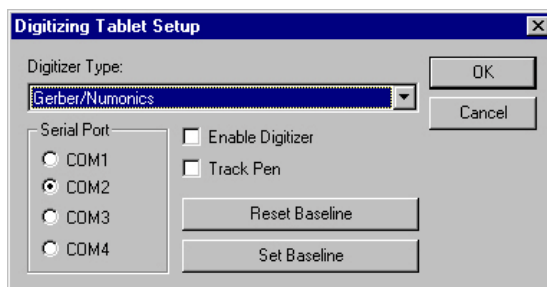
Enable Digitizer

This check box is used to enable and disable the digitizer. In order to reduce the load on the system, it is recommended that the digitizer be disabled when not in use. This will prevent EngraveLab from polling the tablet, and therefore free up system resources.

Track Pen

This check box is used to enable and disable the tracking of the digitizing pen. In order to reduce the load on the system, it is recommended that the digitizer be disabled when not in use. This will prevent EngraveLab from polling the tablet, and therefore free up system resources.

Reset Baseline

When starting a new drawing, or if the original angle and position of the tablet baseline need to be restored, select the Reset Baseline option. The baseline of the tablet will be reset to match that of the material. See Set Baseline below for more information regarding baselines.
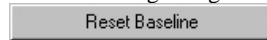
Reset Baseline

Set Baseline

The baseline of a drawing defines both the bottom of the artwork, as well as the angle of the horizontal axis.
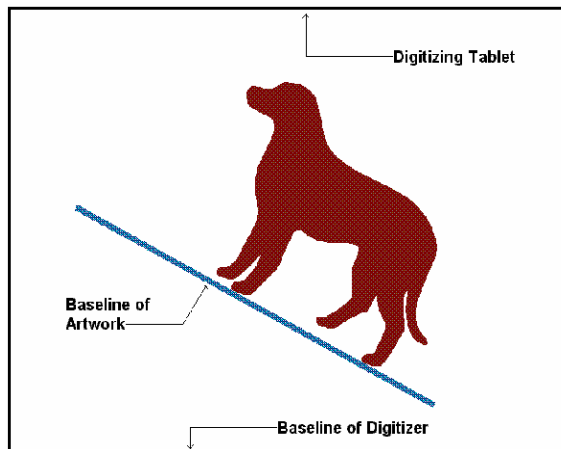
Typically, a digitizer designates the bottom of the tablet as the baseline, which EngraveLab will also use as a reference. Use the Set Baseline button to align the baseline with that of an artwork, rather than the tablet bottom. This avoids the requirement that the artwork be precisely aligned with the bottom of the tablet.
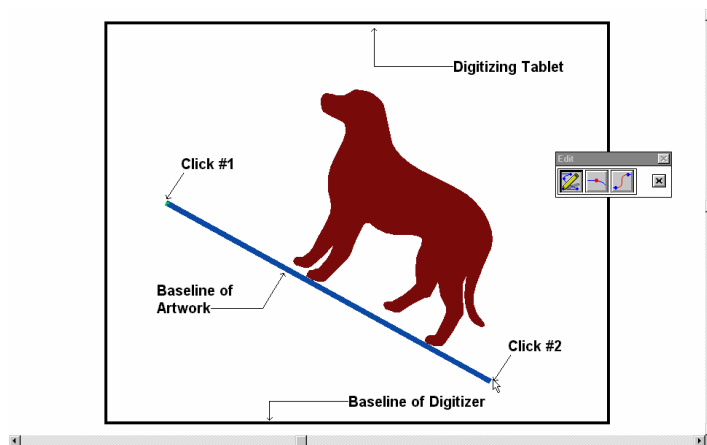
Using the Digitizer

EngraveLab responds predictably to the four buttons on a standard four-button puck.
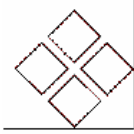
Button	Function	Description
Top	Corner node	Place corner node on workspace
Left	Curve node	Place curve node on workspace
Bottom	Tangent node	Place tangent node on workspace
Right	Finish	End and close contour, or create custom shapes. Double-clicking will close the contour.

The **Curve** nodes drawn by the digitizer are different from those drawn by the mouse in standard draw mode. Draw mode uses the nodes as control handles that pull at the curve as it is formed, while a curve drawn in digitizing mode will pass directly through the nodes as they are placed.

Button Combinations

Certain button combinations may be used to form basic shapes. Place two Corner nodes to form the opposite corners of a rectangle, and then double-click the Finish button to complete the rectangle. Similarly, place two Curve nodes to form the diameter of a circle, and then double-click the Finish button to complete the circle. In addition, placing three Curve nodes and then double-clicking the Finish button will fit a circle to the three nodes. If four or more Curve nodes are placed, then a circle will be created that best fits those nodes.

SCAN TOOLS – ACCUSCAN

ACCUSCAN

The **AccuScan** feature contains the tools required to convert a bitmap into a line-traced drawing format, which can then be cut by EngraveLab. In addition, **AccuScan** provides the necessary tools for manipulating bitmaps and combining them with other objects.

Though any color can be selected for the foreground and background of a bitmap, these descriptions assume that the foreground is black and that the background is white

To use **AccuScan**, select an imported bitmap and click the **AccuScan** tool. As an alternative, double-clicking a bitmap will also activate AccuScan. In either case, the AccuScan controls will become available in the dialog bar. However, note that only one bitmap can be edited at a time.

Apply AccuScan Tool
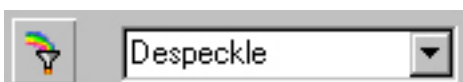
At the far-right of the AccuScan controls is the **Apply Filter** button. The filter will be applied to the entire bitmap, unless the selection tools have been used to isolate a portion of the bitmap. The types of filters that are available from the drop-list are discussed shortly.

Selection Tools

The following selection tools are available when preparing a bitmap for scanning:

	Whole Bitmap	Select the entire bitmap
	Ellipse Select	Select an oval area
	Rectangle Select	Select a rectangular area
	Draw Lasso	Select a freehand area
	Draw Select	Define an area that has an irregular shape.
	Eyedropper	Pinpoint a color in the bitmap.
	Palette	Select regions based on specific colors. Colors may be either added or subtracted from the current selection.
	Magic Wand	Select region based on similar colors. The Magic Wand setup may be used to customize what is considered to be "similar."

Modifier Keys

When creating a selection, the **[Shift]** key may be used to extend the previous selection. In addition, the **[Control]** key subtracts from the previous selection.

Bitmap Palette

The **Target** palette color is displayed above the **Palette** button. Double-click the **Target** color to add colors to the palette. The new color will not be added until used with either the **Brush** or **Fill** tools. New colors will be automatically appended to the end of the palette.

> *Note:* If there is not enough space in the palette for new colors, then refer to the **Merge Colors** feature.

Clicking the **Palette** button will display the current colors in the bitmap palette.

The **Image Palette** dialog may be used to select existing palette colors. For example, several of the colors may be clicked, which will cause them to be highlighted.
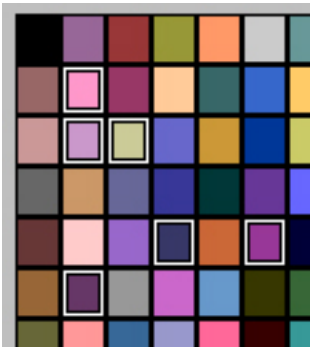
Clicking the **To Front** button will shift these colors to the start of the palette, whereas clicking the **To Back** button will shift these colors to the end of the palette.

In addition, the **Re-Order** button will sort the palette from most- to least-prevalent colors in the bitmap. All palette colors will be sorted, and no selection is required.

The **Custom** button may be used to add colors to the palette, though as mentioned previously, new colors will not be added until either the **Brush** or **Fill** tools are used with that color.

Manipulation Tools

The tools for manipulating a bitmap are as follows:

Brush Tool

The **Brush** tool uses the **Target** color to touch up the bitmap. There are several brush shapes available by clicking the **Brush Selection** button.
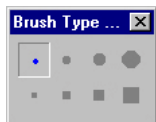
Move Region

The Copy tool may be used to accomplish one of two tasks, use it to move a selected area to another position within the bitmap, or use it to copy a selected area to another position.

Copy A Selection

To copy a selected area, click the **Move Region** button. The mouse cursor may then be used to drag the selection.

Move A Selection

To move a selected area, click the **Move Region** button, and then hold the **[Control]** key when dragging the selection. The area vacated by the selection will be filled with the Target color.

Crop Tool

The **Crop tool** removes all of the bitmap except for selected areas.

Fill Region

The **Fill Region** tool will fill a selected area with the **Target** color. To use this tool:

- ➢ Select a **Target** color by double-clicking one of the palette colors in the **Image Palette** dialog
- ➢ Select the area to be flooded using the selection tools
- ➢ Click the **Fill Region** button

Quarter Bitmap

The **Quarter Bitmap** button will reduce the resolution of the bitmap by 50% in terms of its width and height. Though the storage requirements for the bitmap will be reduced, the visual quality of the image may suffer.

Extended Information

Display information concerning the dimensions and resolution of the bitmap. Clicking the **Resample** button will perform the same function as the **Quarter Bitmap** command (discussed previously).

Merge Colors

The **Merge Colors** buttons performs two tasks:

➢ It removes all unused colors from the bitmap palette.

➢ It merges colors that are selected in the **Image Palette** dialog (opened by clicking the Palette button). These colors will be replaced with the current **Target** color.

Merge Cursor

Opening the **Image Palette** dialog also activates the **Merge Cursor**. Colors may then be merged on the bitmap as follows:

Click!   Drag!   Release!
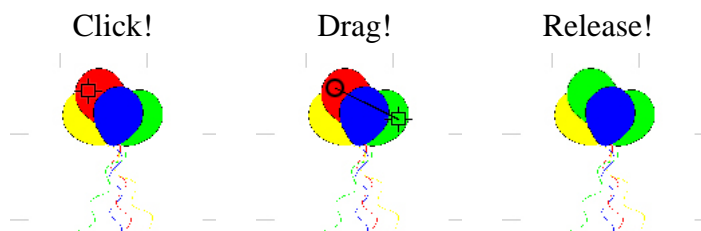
Wherever the mouse is released, the **Target** color will be set to the underlying color.

Using the **Merge Cursor**, Shift-clicking on the bitmap will add colors to the current selection. Selected colors will be highlighted in the **Image Palette** dialog. Similarly, Control-clicking will remove colors from the selection. When the selection is complete, click the **Merge Colors** button to set the selected colors to the **Target** color.

Double-clicking on the bitmap will set the **Target** color.

Posterize Region

Posterization is the process of generating a color palette for a bitmap where none exists, or expanding/reducing the size of the palette attached to a bitmap. Click the **Posterize Region** button to open the **Posterization** dialog, and choose the number of colors that will compose the resulting bitmap.
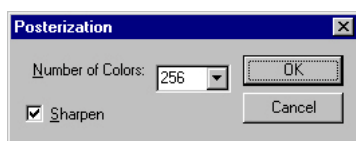
The **Sharpen** option indicates that the color boundary between objects in the bitmap are to be narrowed, which will create the impression of sharp edges for the objects.

Posterizing scanned images

Scanners often generate new colors at the edges where two colors meet in an original image. Scanners can also detect a range of a given colors that we perceive only one color , such as four similar shades of blue. To avoid eliminating essential colors during the posterization process, use either at least three more colors than can easily be counted in a bitmap, or 50% more colors than can easily be counted (whichever is **more**).

Bitmap Vectorization

The **Bitmap Vectorization** tools are used to trace the components of a bitmap and generate a corresponding sequence of vectors. These vectors may be then be edited and cut like regular workspace objects.

> Note: The **Vectorization** feature may only be applied to bitmaps of 8 bits or less (256 colors). However, **AccuScan** filters (discussed later) will produce 24-bit bitmaps. Therefore, if a filter has been applied to a bitmap, then the **Mode** of the bitmap must be reduced (**Image** menu) before tracing may occur.

The level of **Vectorization** detail is determined by the **Trace Setup** controls, which are located at the far-right of the **AccuScan** controls.
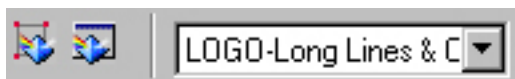
The **Vectorization** button will begin the process of generating the vectors, and the drop-list is available for selecting previous saved settings. Click the **Trace Setup** button to edit these settings, which will open the **Trace Setup** dialog.
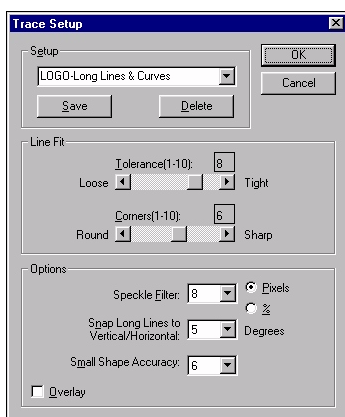
Line Fit

The **Line Fit** controls will determine how close the tracing will occur along the edges of scanned artwork. Careful settings can produce a high-quality trace from poor quality bitmaps.
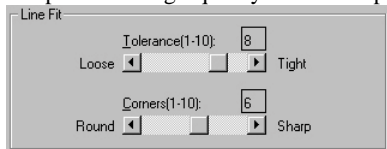
Tolerance

The Tolerance will indicate the precision with which edges are traced. A tight Tolerance will indicate that a high precision must be used.

➢ For a detailed bitmap, a tight Tolerance should be used (7 or greater).

➢ If the bitmap is of poor quality, or the bitmap has long, smooth edges, then a loose Tolerance should be used (3 or less). A loose Tolerance will avoid imperfections in the bitmap, though fine details may also be lost.

Corners

The **Corner** setting modifies corner recognition. In other words, this settings is used to help distinguish parts of the bitmap that represent a corner, versus parts that represent a tight curve.

> ➢ For angular bitmaps that are composed mostly of sharp corners, use a sharp Corners setting (7 or greater).

> ➢ For bitmaps that are composed mostly of curves, then use a round Corners setting (3 or less).

> ➢ For bitmaps that have a mixture of curves and sharp corners, use a moderate Corners setting (4 to 6).

Tracing Options

The **Tracing Options** set general rules that are applied to the trace.
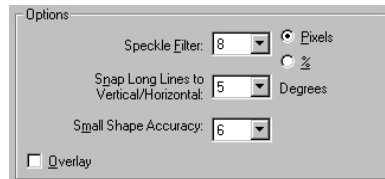
Speckle Filter

Bitmaps that are generated using a scanner can often contain undesirable speckles, which are typically caused by a scratched or dirty scanner bed. To ignore these imperfections, the **Speckle Filter** may be applied as part of the trace. However, be cautious of using a high setting, since small details may be potentially mistaken for speckles.

Set the **Speckle Filter** to the number of pixels that will be recognized as being a speckle. During the trace, only objects that are larger than the set value will be considered.

Speckles may also be recognized in terms of a percentage of the overall bitmap size. Setting the Speckle Filter to a percentage is useful when the bitmap is particularly dirty.

Snap Long Lines to Vertical/Horizontal

When using a scanner to create a bitmap, the original document may not be perfectly aligned on the scanner bed. As a result, lines that were intended to be precisely horizontal or vertical will be slightly incorrect.

The **"Snap long lines to vertical/horizontal"** setting can compensate for misalignment of the original document. For example, a setting of 5 degrees will correct lines that are "off" by that amount. If the **Degrees** can not be set high enough, then the document should be scanned again, or the bitmap can be rotated on the workspace.

Small Shape Accuracy

The effectiveness of the Line Fit settings may depend upon the relative size of the bitmap versus the component objects that make up the bitmap. For example, a small object may be considered as dirt when the bitmap is large. However, the same object will be more significant when the bitmap is small.

To use Small Shape Accuracy, assess the size ratio between the largest bitmaps objects versus the smallest. When the ratio appears large, set the accuracy to high (7-10). Where objects are similar in size, set the accuracy to low (Off-3).

Overlay

As part of the tracing, the bitmap is scanned in order to identify the component objects of the bitmap. The Overlay option is used to choose the style of scanning that is used: Traditional or Overlay.

Traditional Scanning Style

If the **Overlay** button is disabled, then the **Traditional scanning** style will be used, and each object will be identified as an independent part of the bitmap. For example, individual objects will be recognized as within a surrounding object.

Given this bitmap...	...the Traditional style would yield these objects.
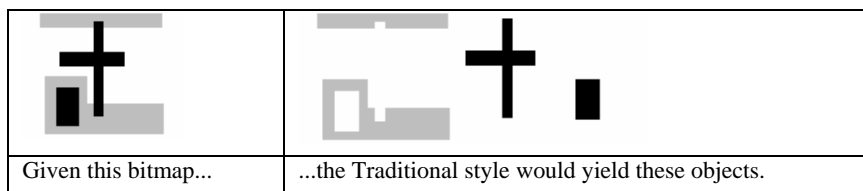
Overlay Scanning Style

Overlay scanning will create a mask for each palette color, and each mask will then be evaluated to help identify distinct objects.

Given this bitmap...	...the Overlay style would also yield these objects.
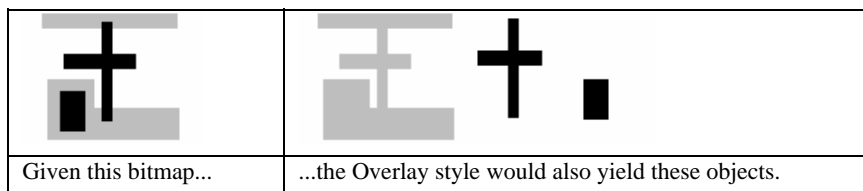
Since masks are evaluated according to the order of their colors in the bitmap palette, it is recommended that the **Re-Order** button first be used (**Image Palette** dialog) to signify the importance of the more frequently used bitmap colors.

Overlay tracing has the following benefits over Traditional tracing:

> ➢ Simpler objects are produced

> ➢ No overlap will occur between objects

However, objects are typically larger than where Traditional tracing had been used.

Filters
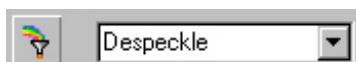
The **AccuScan** tool comes complete with advanced bitmap filters, which are designed for both color correction, as well as special effects.

Color Channel

Depending on the **Color Channel**, the filter can be applied to either all colors, or to individual color components (Red, Green, or Blue). Filtering individual colors may help correct an image, or provide a variety of possible special effects.
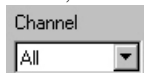
A Note About Colors and the Filters

Colors displayed on screen are created using a mixture of red, green, and blue channels (components). Each of these channels range from zero (no saturation) to 255 (complete saturation). As all three color channels approach values of 255, the displayed color becomes white, whereas channel values of zero will produce black.

The number of distinct colors available for a bitmap depends on the bit depth of the bitmap. Without elaborating on the mechanics of calculating the maximum number of palette colors, it is sufficient to use the following table as a guide.

Bit Depth	Number of Colors
1	2 (monochrome)
4	16
8	256
16	approximately 65,000
24	approximately 16.7 million (photographic quality)

Fundamentally, the bit depth is a measure of how much computer memory is required to store color information about each pixel in the bitmap, which is why a high color bitmap requires a large data file for storage.

AccuScan Filters

The AccuScan filters are described as follows:

Despeckle

The **Despeckle** filter deletes speckles, replacing them with an average color defined by the four pixels above, below, and beside the pixel being deleted. This filter is particularly useful before printing the image.

Sharpen

The boundary area where two objects meet in a bitmap is known as the Transition Boundary, and this boundary is usually several pixels wide. The **Sharpen** filter narrows the transition boundary, which creates the effect of sharpening the object edges.

This filter works well with simple, photographic bitmaps, provided that they are not continuous-tone. If the bitmap is continuous-tone, then a hand-drawn effect may be produced.

Sharpen More

Same as **Sharpen**, only more to a greater degree.

Edge Enhance

The **Edge Enhance** filter enhances the boundary between two objects, giving the impression of edges that separate the objects. This often works particularly well for focusing the edges of photographic or continuous-tone bitmaps.

Average

The **Average** filter blends each pixel with its adjacent pixels, which produces a soft-focus effect. However, this effect tends to significantly obscure object edges.

Blur

The **Blur** filter blends each pixel with its surrounding pixels, which creates a soft-focus effect. The Blur filter tends to obscure the edges of objects much less than the Average filter.

Emboss

The **Emboss** filter creates the impression of printing the bitmap onto gray paper with a relief effect (i.e., 3-Dimensional). This effect retains only part of the original bitmap color.

Invert

The **Invert** filter creates the impression like that of a photographic negative.

Brighten

If applied to a specific color channel, then the **Brighten** filter will lighten that color component of the bitmap. If all color channels are selected, then the entire bitmap will appear lighter in appearance. Applying the filter several times will produce a "bleached" appearance.

Darken

The **Darken** filter is used to reduce the strength of a given color channel. If applied to all color channels, then the bitmap will appear murky.

Bias

Applying the **Bias** filter to a single color channel will create a tinted effect. If this filter is applied to all color channels equally, then the effect is similar to Brighten.

Monochrome

The **Monochrome** filter will create a black-and-white by analyzing the relative strengths of each color channel. When applied, the **Monochrome Filter** dialog will appear.
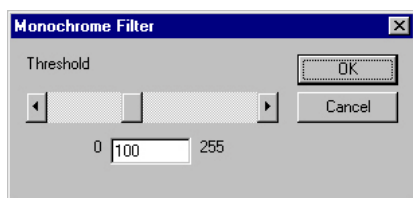
The **Threshold** value will be compared versus each color. Colors that fall below the threshold will become black, and those exceeding the threshold will become white. The most effective threshold value will depend upon the bitmap in question.

If applied to a single color channel, then that color will be evaluated in isolation versus the threshold value.

SCAN TOOLS – PHOTOMACHINE

PHOTOMACHINE

The **PhotoMachine** tools that are required to convert a bitmap into a line-traced drawing format that can be cut, routed, or engraved by EngraveLab.

PhotoMachine traces the selected object based on the selected style. For example, the **Image Cut** style will trace the lighter portions of the image with thin lines, whereas darker portions are traced with thick lines. Though the **Image Cut** style is strictly for use with cutters, advanced engraving options are available for use with cutters, routers, and engravers.

> Note: Under the **View** menu, there is a **Show Reduced Bitmaps** option, which can be used to improve screen refresh rates. When working with the Scan Tools, CADlink recommends that the **Show Reduced Bitmaps** option be active, so that large bitmaps may be redrawn quickly.

Band Settings

The number of bands used in the scan will determine the quantity of detail that will be extracted from the original image. For the band settings, the band width and the number of bands are interdependent. Changing one value will update the other value.
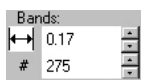
In addition, several of the other settings can be adjusted to modify the banding effects.

Style and Options

At the far-left of the Dialog Bar, the tracing styles are accessible from the drop-down list. Next to each list item is a visual representation of the style.
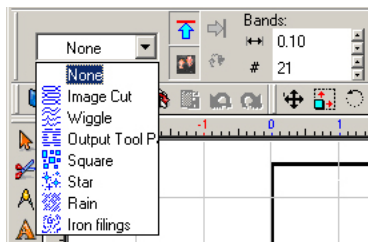
The available options vary according to the selected Style.

None

No style is applied and no **Options** are available. When the bitmap is photomachined, a grayscale bitmap will be produced.

ImageCut

This style is strictly for use with cutters.
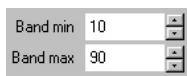
The **Image Cut** style options are:

Band Minimum	The minimum width of the bands for light areas, represented in terms of the Band Width. If the minimum is too low, then weeding the vinyl will be difficult because the strips will be too thin to handle.
Band Maximum	The maximum width of the bands for dark areas, represented in terms of the Band Width. If the maximum is too high, then weeding the vinyl will be difficult because little space will remain between bands.

Wiggle

For use with low-resolution engraving, this style creates a pattern that appears to wiggle across the image.

The **Wiggle** style options are:

1st gray limit	Any shade below this limit will have no wiggle, but will instead be represented as a straight line.
2nd gray limit	Any shade above this limit will have a "double-wiggle" applied.

When using **Wiggle** with a mechanical engraver, the recommendation is to set the 1st gray limit to zero, so as to limit the number of tool lifts. The 2nd gray limit should be set low, so as to achieve a good final image. Laser engravers can handle higher values for each limit.

Output Tool Paths

For use with low resolution engraving, creates a standard engraving pattern. There are no **Options** settings for this Style, though the **Double-density** appearance may be set.

Squares

This style is specifically for use with cutters. A pattern of variable-sized squares is used to depict the image. Smaller squares represent lighter shades of gray, and larger squares represent darker shades of gray.

The **Squares** style options are:

Minimum size	Sets the smallest possible size of the small squares (light gray objects) to a percentage value of the possible square size.
Maximum size	Sets the largest possible size of the large squares (dark gray objects) to a percentage value of the possible square size.

The farther apart these values are, the more detail is shown in the final image, however to large a difference can create one large black square.

Stars

This style is similar to the Squares style, except that star shapes are used instead of square shapes.

Rain

For use with laser-engravers, creates multiple lines for each pixel. The **Options** settings available with **Rain** are:

```
Density  2
Angle    45.00
```

The **Rain** style options are as follows:

Density	This field indicates the number of lines per pixel.
Angle	The angle to use when rendering the Rain lines.

Iron filings

This style is similar to **Rain**, though the **Angle** option is not present. Instead, all lines are created at random angles.

Appearance

The **Appearance** options effect how an image will appear after the PhotoMachine has been applied. The available options depend upon which style has been selected.

Negative and Positive Image

Either the **Negative** or **Positive** option will be used with each Style. The **Positive Image** setting will apply thin bands to dark colored areas, and wide bands to light colored areas.

The Negative Image will reverse the banding effect, such that wide bands are applied to light colored areas and thin bands are applied to dark colored areas.

Negative image

Positive image

Double Density

The Double Density option is available for the Engrave Style only. When the Double Density check box is activated, the frequency of the lines is doubled. This can be applied to both a Negative and a Positive image.

White Space

The White Space option is available for the Stars and Squares Styles. When the White Space check box is activated, all white areas are left blank with no Squares are Stars placed within. This can be applied to both Negative and Positive images and results in a cleaner image.

Orientation

The Orientation options are output device dependent. Check the device manual, regarding how the device relays the X and Y axes. In order to maintain a good quality cut, use the option that uses less movement of the device. Generally, the vertical option is more commonly used.

○ Horizontal
● Vertical
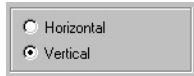
SCAN TOOLS – CENTERLINE TRACING

⬙ CENTERLINE TRACING

The CenterLine Tracing feature is available from the Scanning tools fly-out menu.

The CenterLine Tracing feature uses a *bitmap* to produce a CenterLine-traced drawing that can be cut, routed, or engraved by SignLab. This feature works best with larger size objects where v-bits and/or conical bits have an obvious effect. As a result this feature does not work as well with photographic images, in which case PhotoMachine would be a more effective tool.

When creating a CenterLine Tracing, select the object to be traced and choose the CenterLine option from the Scanning tools fly-out. The dockable toolbar will display the CenterLine tools.

Note: The CenterLine feature can only be applied to gray-scale images, color images must be resampled to gray-scale using the Render to Bitmap option available from the Transforms menu and explained in the Transformations chapter.

CenterLine Tracing Features

The CenterLine Tracing tools behave like the other bitmap editing tools available with EngraveLab (i.e., AccuScan).

Selection Tools

With CenterLine Tracing activated, there are eight different tools available from the Select Tool in the tool bar. These tools are designed to help define those areas to scan, and each is different from the others. These tools are described in detail in the AccuScan chapter earlier.

Manipulation Tools

There are several tools available within the CenterLine Tracing dialog box for manipulating a bitmap, allowing to prepare it for either routing or printing.

The Copy ▨ ,Crop 🔲 , Fill Region, Quarter Bitmap, Extended Information, Merge Colors, Brush and Brush Selection tools are all explained in detail in the AccuScan section.

CenterLine Tracing Settings

Pressing the CenterLine Tracing Settings button opens the CenterLine Tracing Setup dialog box.
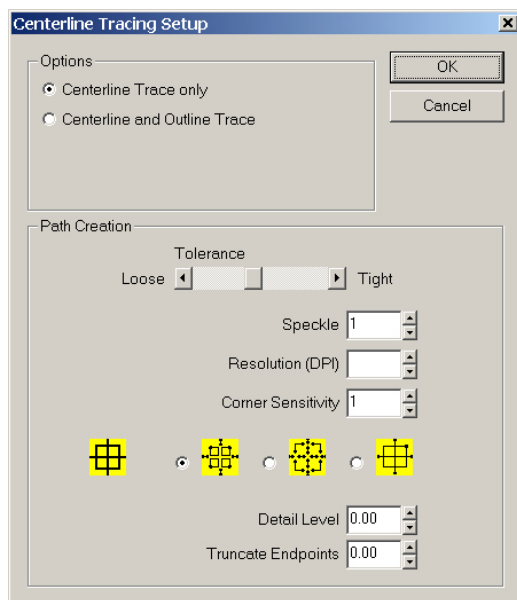
Options

There are two options for performing CenterLine Traces: CenterLine Trace only; and CenterLine and Outline Trace which traces the center of the image as well as tracing the Outlines of the image. Activating one Option de-activates the other Option.

Path Creation

The Path Creation contains various settings for creating the CenterLine path.

Tolerance

The Tolerance setting specifies how closely the CenterLine Trace follows the lines of an object in a bitmap. A loose setting will approximate an object's shape rather loosely, while a tight setting will follow the lines very precisely.

Tolerance should be set tight if a bitmap is very detailed and accurate. This allows for all of the fine detail to be traced. In general, the higher the detail, the higher the Tolerance setting.

The Tolerance should be set loose if a bitmap contains long smooth edges, or if it is of poor quality. This results in CenterLine Tracing ignoring small errors in the edges of the objects, but can also result in a loss of the finer details.

Speckle

Many bitmaps contain undesirable bits of dirt. These random spots of color usually appear due to a scratched or dirty scanner bed. The Speckle Filter allows for removal of these specks and creation of a cleaner finished product.

The speckle filter sets the threshold at which CenterLine Tracing recognizes a group of pixels as an object. Once the filter is set, an object must be larger than the set value in order to be traced during a scan. For example, if the Speckle Filter setting is four pixels, then objects must be five pixels or larger in order to be recognized as a true object, and therefore scanned.

> *Note:* While higher Speckle Filter settings result in fewer extraneous objects being traced, it may also result in the loss of smaller objects. Exercise caution when choosing an appropriate filter setting.

Resolution

As part of the CenterLine trace process, the original vector- or bitmap-based object undergoes rasterization to the set Resolution value, and then a trace is performed. The default value of 300 DPI (dots per inch) is adequate for most cases.

Corner Sensitivity

The Corner Sensitivity is used to differentiate a corner from a tight curve during the tracing operation. If an object contains sharp corners and is mostly angular, then set the Corner Sensitivity to high (7 or greater). If the object is composed mostly of curves, then set the Corner Sensitivity to low (3 or less). Moderate settings (4 to 6) work best for objects that are composed of a mix of corners and curves.

Path Type

There are three choices for the type of path for a CenterLine Trace:

Loops

The Loops path type traces the entire image as one object.

Individual Lines

The Individual Lines path type traces each line as a separate object.

Longest Lines

The Longest Lines path type selects continuous lines and traces each as an object.

Detail Level

The Detail Level setting controls CenterLine Tracing detail recognition ability.

If a bitmap contains a lot of detail, set the Detail Level to a higher value. If it a simple image, set the Detail Level lower. Moderate settings work best with images that include areas of high detail with areas of low detail.

Truncate Endpoints

The Truncate Endpoints setting controls the CenterLine Tracing corner and endpoint recognition ability. CenterLine Tracing uses this setting to determine which parts of a trace represent a corner/endpoint, and which parts represent a tight curve. CenterLine Tracing will place a buffer value so the engraver/router can have a smooth rise to the true endpoint of the image.

If a bitmap contains sharp corners, and is mostly angular with sharp endpoints, set Truncate Endpoint to a lower value. If it is mostly curves, set Truncate Endpoint to a higher value. These values are also dependent on the depth to which the image is being engraved. The following CenterLine Trace shows the difference between a high and low Truncate Endpoint values:
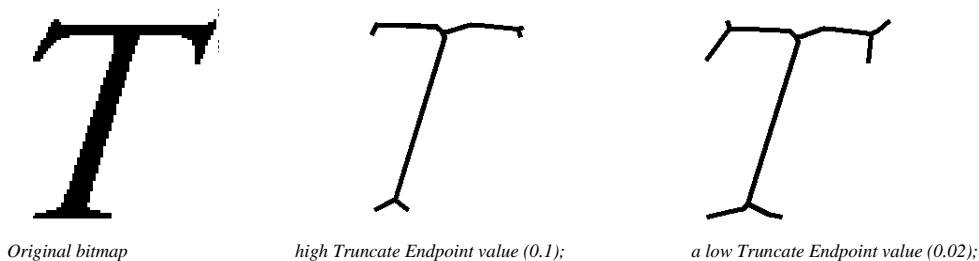
Original bitmap   *high Truncate Endpoint value (0.1);*   *a low Truncate Endpoint value (0.02);*

Applying CenterLine Tracing

Pressing the Vectorization button applies a CenterLine Trace to the selected object based on the settings provided.

Appendix A

Feature Lookup

Use the **Feature Lookup** to quickly locate a specific EngraveLab feature. Note that only menu items and Tools toolbar flyouts are referenced here.

FILE MENU

The **File** menu generally contains commands for loading and storing the EngraveLab workspace, importing and exporting image data, and printing both workspace and badge data.

New	Ctrl+N
Open...	Ctrl+O
Zoom Open	
Save	Ctrl+S
Save As...	
Import...	
Export...	
Edit Template...	
Export Image...	
Acquire Image	▶
Job/Cost Notes...	
Print...	Ctrl+P
Control Panel...	
Find file	
Install	▶
Exit	

Acquire...
Select Source...
Aquire Vector

Modules...
Drivers...
Fonts...
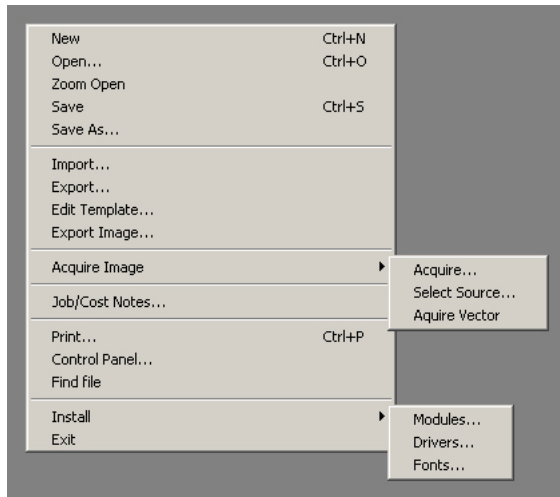
EDIT MENU

The **Edit** menu generally contains commands for selecting, editing, cutting, and pasting various EngraveLab objects upon the workspace.
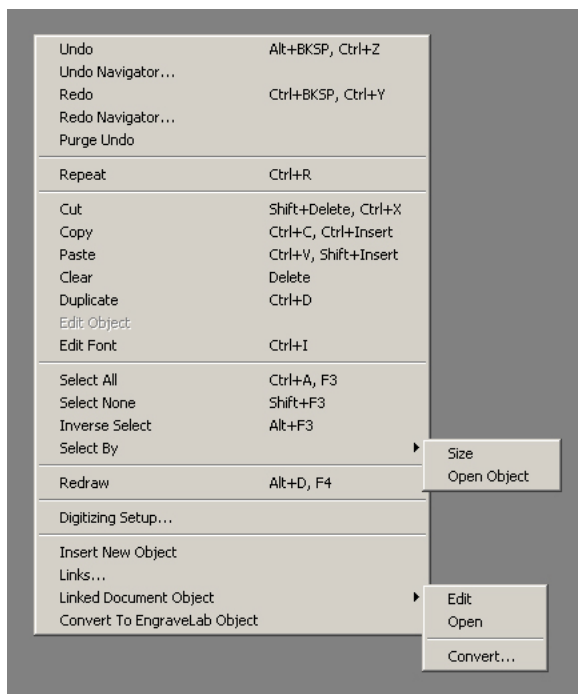
LAYOUT MENU

The **Layout** menu generally contains commands for manipulating both the alignment and appearance of EngraveLab objects.
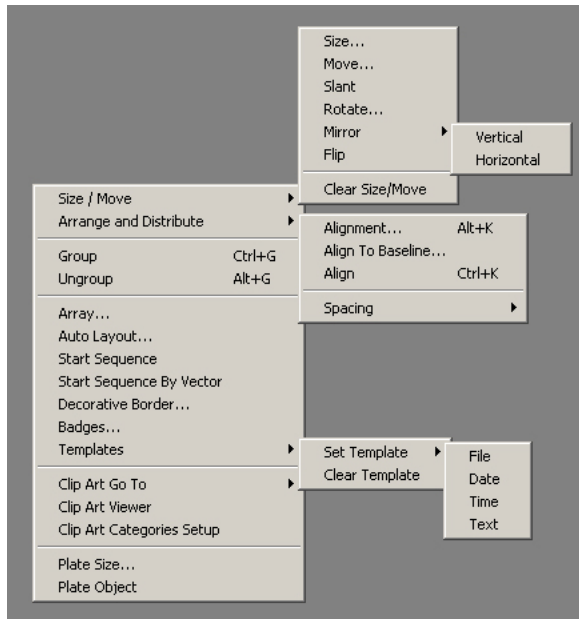
ARRANGE MENU

The **Arrange** menu generally contains commands to manipulate the priority and placement of EngraveLab objects.
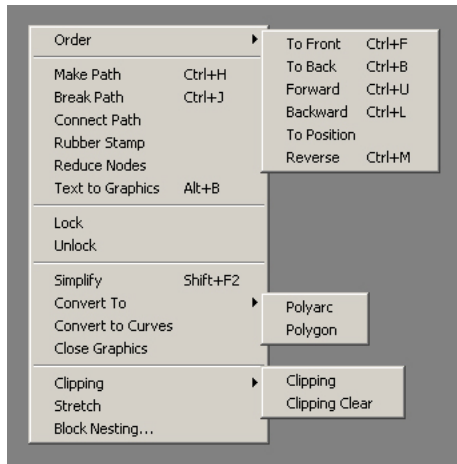
ENGRAVE MENU

The **Engrave** menu generally contains commands that will apply tool paths to EngraveLab objects, and simulate the final appearance once those paths are cut.
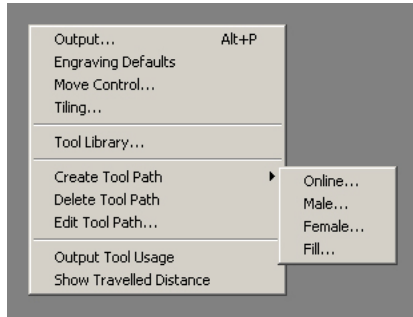
TRANSFORM MENU

The **Transform** menu generally contains commands that are used to apply a variety of special effects to EngraveLab objects.

Outline...
Transformation
Fit Text To Arc
Fit Text to Path
Fit Object to Path
Metamorphosis...
Shadow
Round Corner
Fillet Round Corner
Render to Bitmap
Render Contour Bitmap
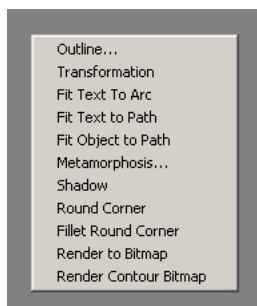
IMAGE MENU

The **Image** menu contains controls for editing images that are imported into EngraveLab.
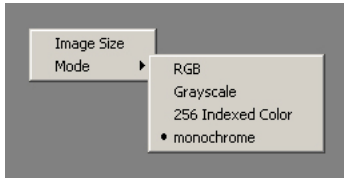
VIEW MENU

The **View** menu generally contains commands that are used to customize the appearance of the EngraveLab workspace.
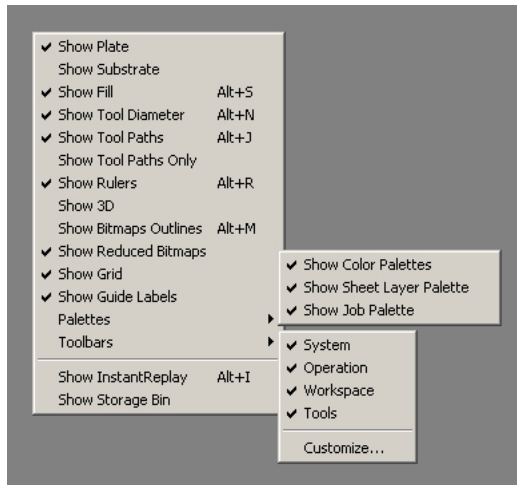
OPTIONS MENU

The **Options** menu generally contains commands that are used to customize the EngraveLab environment.
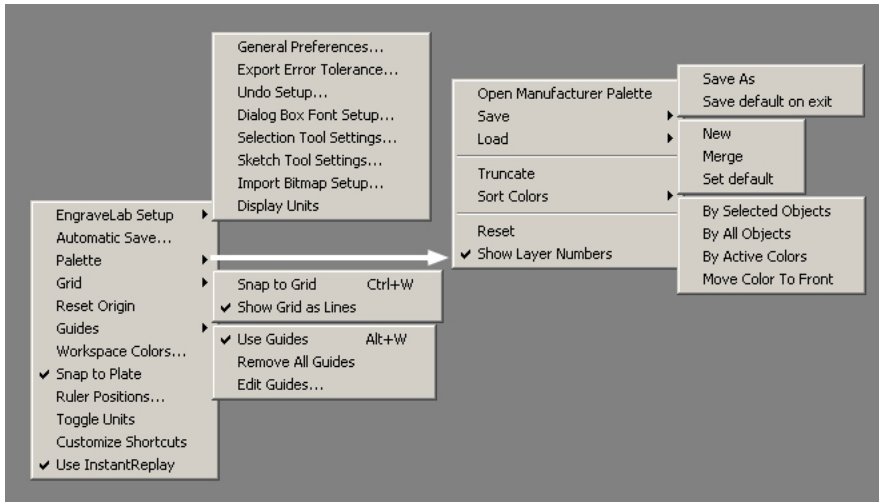
HELP MENU

The **Help** menu contains shortcuts that can be used to both determine how to best use a particular EngraveLab feature, and enable quick access to CADlink Technical Support.
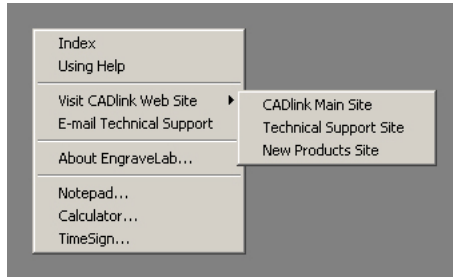
TOOL FLYOUTS

The **Tools** toolbar contains a selection of flyout controls for accessing EngraveLab features. This section quickly summarizes the commands that are available from each flyout. These commands are discussed in detail throughout this manual.

Select Tool

The Select Tool has no flyout tools.

Output Tool

The Output tool has no flyout tools.

Measure Tools

The Measure tool palette has five tools:

Measurement

Dimension

Object Dimension

Arrow Draw

Notes

Text Tools

The Text tools palette has three tools:

Text Compose

Text On-Screen Kerning

Text Auto Layout

Zoom Tools

The Zoom tools palette has five tools:

Zoom In

Zoom Out

Zoom to Selected Objects

Zoom to Plate

Zoom to Previous View

Weld Tools

The Weld tools palette has three tools:

Fuse Weld

AND Weld

XOR Weld

Shape Tools

The Shape tools palette has sixteen tools:

	Circle
	Ellipse
	Rectangle
	Polygon
	Star
	Arrow
	Fan
	Weed Border
	Power Weed
	Decorative Border
	Registration Mark
	Multi-Registration Mark
	Stencil
	Ruler
	Dial
	Barcode

Graphic Edit Tools

The Graphic Edit tools palette has three tools:

Node Edit

Free Edit

Arc Edit

Scan Tools

The Scan tools flyout has three tools:
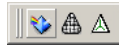
AccuScan

PhotoMachine

Center Line

Stroke and Fill Tools

The Stroke and Fill Tools flyout has a single tool:

Line Style

Tool Path Tools

The Tool Path Tools flyout has five tools:

Online

Male

Female

Fill

Drill

Ginsu Knife Tools

The Ginsu Knife tools flyout has two tools:

Open Path

Close Path

Appendix B

Hot Key Summary

The following is a summary of the hot keys that are available within EngraveLab. These shortcuts can be modified by choosing **Customize Shortcuts** from the **Options** menu.
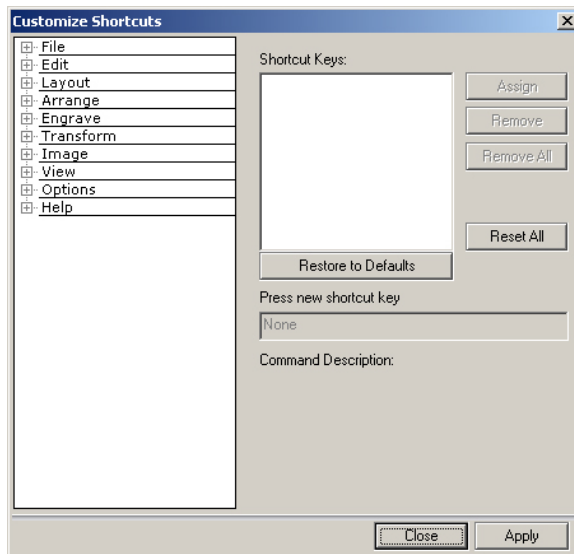
Generic Hot Keys

These Hot Keys have general application within EngraveLab:

[Arrow key]	Nudge selected object by one pixel
[Shift+arrow key]	Nudge selected object by five pixels
[Tab]	Change current focus to next object in sequence
[Shift+Tab]	Change current focus to previous object in sequence
[Spacebar]	Activate the Select tool
[Ctrl+Select tool]	Move/Draw/Edit/Select with horizontal and vertical constraint

Alignment Hot Keys

These Hot Keys apply alignment to the currently selected objects:

[Alt+1]	Horizontally align objects along left-edge of bounds
[Alt+2]	Horizontally center objects within bounds
[Alt+3]	Horizontally align objects along right-edge of bounds
[Alt+4]	Vertically align objects along top-edge of bounds
[Alt+5]	Vertically center objects within bounds
[Alt+6]	Vertically align objects along bottom-edge of bounds
[Alt+7]	Center objects both horizontally and vertically

Note: The bounds refer to the rectangular outline of each object.

File Menu Hot Keys

These Hot Keys enable access to the various File menu options:

[Ctrl+N]	New workspace
[Ctrl+O]	Open workspace
[Ctrl+S]	Save workspace
[Ctrl+P]	Print workspace objects

Edit Menu Hot Keys

These Hot Keys enable access to the various Edit menu options:

[Ctrl+Z]	Undo last command
[Ctrl+Y]	Redo last command
[Ctrl+R]	Repeat last command
[Ctrl+X]	Cut selected object
[Ctrl+C]	Copy selected object
[Ctrl+V]	Paste object
[Del]	Delete selected object
[Ctrl+D]	Duplicate selected object
[Ctrl+T]	Edit selected text
[Ctrl+E]	Edit selected object
[Ctrl+I]	Edit font of selected text
[F3] or [Ctrl+A]	Select all objects on workspace
[Shift+F3]	Deselect all objects
[Alt+F3]	Inverse the selection of objects
[Alt+D]	Refresh the workspace display

Layout Menu Hot Keys

These Hot Keys enable quick access to the Layout menu options:

[Alt+K]	Open the Alignment dialog
[Ctrl+K]	Apply the current Alignment dialog settings
[Ctrl+G]	Group the selected objects
[Alt+G]	Ungroup the selected objects

Arrange Menu Hot Keys

These Hot Keys enable quick access to the Arrange menu options:

[Ctrl+F]	Move the selected object to the top layer
[Ctrl+B]	Move the selected object to bottom-most layer
[Ctrl+U]	Move the selected object up by one layer
[Ctrl+L]	Move the selected object down by one layer
[Ctrl+M]	Reverse the layer order of the selected objects
[Ctrl+H]	Create a common path from the selected objects
[Ctrl+J]	Reverse the common path that had been applied to a group of selected objects
[Alt+B]	Convert the selected text to graphic objects
[Shift+F2]	Simplify the selected object

Engrave Menu Hot Keys

The Engrave menu has a single Hot Key:

[Alt+P]	Open the Engrave Preview plotting controls

View Menu Hot Keys

These Hot Keys enable quick access to the View menu options:

[Alt+S]	Toggle the display of object fills
[Alt+N]	Toggle the display of the tool diameter
[Alt+R]	Toggle the display of the ruler
[Alt+M]	Toggle the display of bitmaps
[Alt+I]	Toggle the display of the InstantReplay window

Options Menu Hot Keys

These Hot Keys enable quick access to the Options menu options:

[Ctrl+W]	Snap to grid
[Alt+W]	Use guides

Functions Keys

The function keys in EngraveLab operate as follows:

[F1]	Help
[F2]	Disable all Shop Palette color layers except the current target layer
[F3]	Select all objects
[F4]	Refresh the workspace
[F5]	Active the Zoom In tool
[F6]	Zoom out
[Shift+F6]	Zoom in
[F7]	Zoom to selected object
[F8]	Zoom to Sign Plate
[F9]	Toggle between current and previous zoom levels
[F10]	Select the menu bar
[F11]	Pan workspace toward current mouse position

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