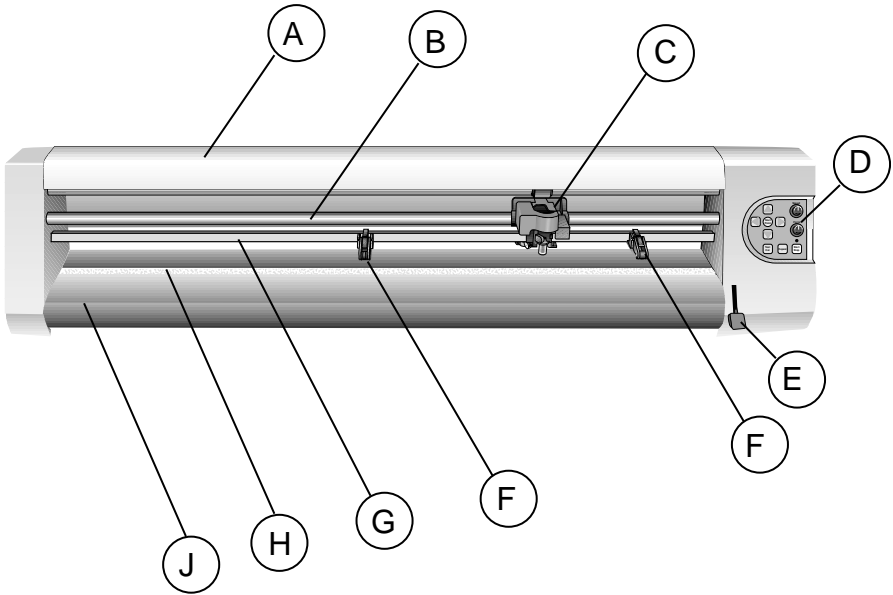


**HOW TO MAKE SIGNS WITH
YOUR**

**Ioline
Signcutter**

**Ioline Corporation
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Woodinville, WA 98072
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USA**

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- A. Dust Cover
- B. Traverse Rod
- C. Carriage & Knife Assembly
- D. Control Panel
- E. Pinch Wheel Lever
- F. Pinch Wheel
- G. Square Shaft
- H. Grit Shaft
- J. Platen

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YOUR SIGNMAKING SYSTEM

Congratulations on purchasing an Ioline signcutter. To make signs, you also need a computer with signmaking software. After you have used your signmaking software to create a sign, you will send the sign (as a plot file) to your Ioline signcutter. Your Signcutter will receive the plot file and cut the design.

- The design software, which helps you design graphics, must be loaded into the computer according to the instructions in the software box.
- The computer sends a plot file to the signcutter to cut your signs. The computer must be assembled and installed correctly before you connect it, by cable, to your signcutter.
- Your signcutter will cut the sign exactly as you have designed it. The sign will be cut from the material that you have loaded into your signcutter.
- There is also a specialized software program that comes with your signcutter called the **Ioline Control Center**. You can load this software utility into your computer and use it to control your signcutter's settings.

If you have any questions about your computer or your software, you will need to call your dealer.

SAFETY AND PRECAUTIONS

Please read these safety guidelines before beginning operation of your signcutter. Your signcutter is a production cutting machine with a very sharp blade. The parts can move quickly. Always observe the following safety precautions:

- Do not try to repair the machine yourself without factory authorization. Only qualified service personnel should attempt any disassembly, or access to internal components. If you need to make external mechanical adjustments, turn off your signcutter and disconnect it from all power sources (both the computer and the wall outlet).
- Be careful with your hair, jewelry, or loose clothing near the signcutter. They can become caught in the mechanical parts.
- Never move the carriage by hand. Use the keypad arrows and let the machine do it.
- Use caution when you are changing a blade. See the ROUTINE MAINTENANCE section of this User's Guide for the recommended procedure.
- Be careful when you handle signcutter blades. Although the blades are made of an extremely hard material, they are brittle and can easily break.
- Keep your hands away from the carriage when your signcutter is in operation. The carriage will automatically move to its right end position when you turn on the power.
- Be careful when you lift your signcutter. Hold the bottom surfaces of your signcutter to lift or move it.
- Keep your fingers away from the grit shaft when the signcutter is in operation.

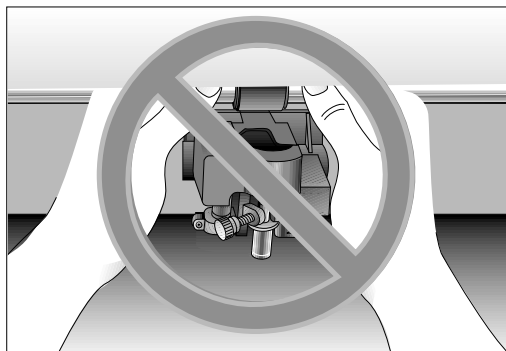


Figure 1. *Hands Off the Carriage while cutting!*

INSTALLATION

UNPACKING YOUR SIGNCUTTER

! Do not lift your signcutter by the plastic end covers, the dust cover, or the traverse rods. This may permanently damage your signcutter. Use the bottom surfaces of your signcutter to lift or move it.

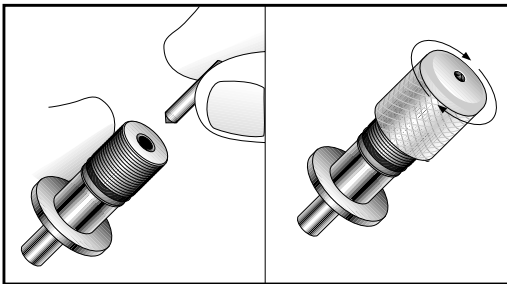
Carefully remove your signcutter from the box. This procedure requires two people. Put your signcutter on a flat surface, such as a table. There are four rubber feet mounted on the bottom of your signcutter to provide a stable base. Save all packing materials and the box. Check the packing list to ensure that you have all of the accessories.

INSTALLING A BLADE AND ADJUSTING THE FOOT

In your signcutter accessory kit you will find a blade and a knife assembly. The blades are sharp and brittle and the tips can chip or break. Be very careful when you handle the blades. To install a blade and adjust the foot:

! Do not use a hard surface to push the blade into the knife; doing so may damage the blade.

1. Remove the adjustable foot from the shank of the knife by unscrewing the foot (counterclockwise).
2. Slide the blade into the knife until you feel it lock in place. The blade should spin freely.
3. Reinstall the adjustable foot onto the knife shank. Screw the foot onto the shank (clockwise). Tighten the foot until the blade tip protrudes slightly, then back it off until the tip is barely exposed.



Figures 2 & 3. *Installing the Blade and Adjusting the Knife Foot*

INSTALLING THE KNIFE ASSEMBLY

1. Slip the knife flange into the corner of the slot in the carriage jaw.
2. Tighten the carriage thumb screw until the knife is secure in the jaw. Do not overtighten the thumb screw.

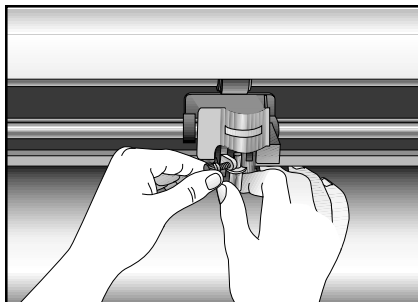


Figure 4. *Installing the Knife Assembly*

INSTALLING A PEN

Your signcutter features a universal jaw that can hold an ordinary ballpoint pen, a Hewlett Packard-style plotter pen, or any pen with a maximum barrel diameter of 7/8" (22mm).

1. Hold the pen in place against the side of the jaw and set its tip 1/8" (3mm) from the material surface. If you are using a Hewlett Packard-style plotter pen, slip the pen flange into the corner of the slot in the carriage jaw.
2. Gently tighten the carriage thumb screw until the pen is secure in the jaw. Do not overtighten the thumb screw.

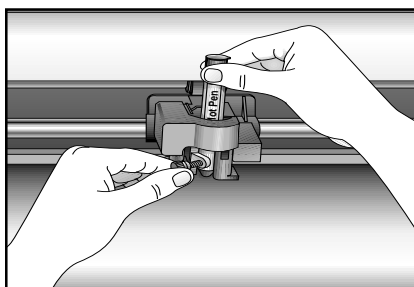


Figure 5. *Installing a Pen*

CONNECTING YOUR SIGNCUTTER TO YOUR COMPUTER

! Make sure your computer and your signcutter have the power turned off and are plugged into the same surge protector power strip!

Use the serial cable to connect the COM port on the back of your signcutter with the COM port on the back of your computer. The COM port on your signcutter is a receptacle for a 25 pin cable. If your computer has a 9 pin serial port, you will need an adapter. The 9 to 25 pin adapters are inexpensive and available at computer stores or can be ordered from Ioline.

Power On

Turn on your computer and your signcutter to make sure they work. The power switch is located next to the power cord on the back. The carriage will move when the power comes on. Keep your hands and loose clothing away from all moving parts of your signcutter. The red light on the front panel will come on.

LOADING AND ALIGNING THE MATERIAL

!If you are creating a sign with Auto Loop disabled, do not allow the material to become taut. Manually create and maintain a service loop in the rear.

To align a roll of material:

1. Lift the pinch wheels by raising the pinch wheel lever on the right side of your signcutter. Align the material in the center of the machine. Bring the material up and through the space under the pinch wheels.
2. Gently pull the material square and taut.
3. Position pinch wheels about one inch (2.5cm) from the edge of the material.
4. While maintaining the material square and taut, clamp the pinch wheels to the material by lowering the pinch wheel lever on the right side of your signcutter.
5. Check alignment by using the arrow keys to move the material forward and back. Observe the material's edge to make sure it is running straight.

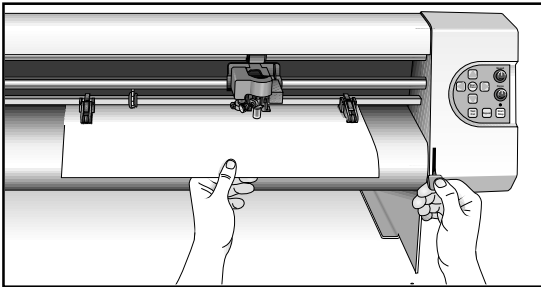


Figure 6. *Aligning and Squaring the Material*

! The material must be square and taut before you lower the pinch wheel lever.

When you send a plot with Auto Loop enabled, your signcutter will create a service loop. You can turn the Auto Loop feature on or off from the Control Center. If Auto Loop is off, you will have to manually pull enough material off the roll to create a service loop behind your signcutter.

**For those customers with the Optional Cradle,
refer to instructions in your accessory kit.**

OPERATION

FRONT PANEL CONTROLS

When the entire system is assembled, connected, and ready to go, take a few moments to familiarize yourself with the controls on the front panel. If you encounter a problem, simply stop and review all the steps to see if you have left something out. If you still have problems, refer to the **Troubleshooting** section.

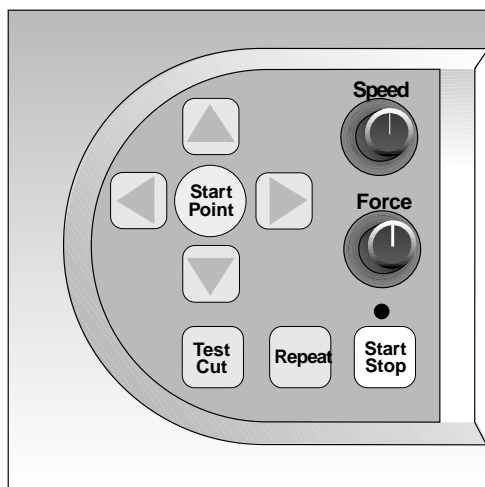


Figure 7. *The Signcutter Control Panel*

Start/Stop

The Start/Stop key connects or disconnects communication between your computer and the signcutter. You can use this key when testing or setting up your signcutter. If you press the Start/Stop key during signcutting the machine will stop. Then you can use the arrow keys to move the carriage to examine the test cut. When you press the Start/Stop key again, it will resume cutting exactly where it stopped.

START = green light = purple arrow keys inoperable, plotter online (ready to communicate with the computer)

STOP = red light = purple arrow keys operable, plotter off-line

Arrow Keys

First make sure your signcutter is in Stop mode and then use the Arrow keys to move the material back and forth or the carriage from side to side.

Start Point

The start point key sets the initial starting position for your graphic design. To begin, it is best to set a new start point before cutting each sign. If you do not set a new start point before sending a file to your signcutter, the signcutter will begin at a point determined by the previous plot file. Your software may give you the option of selecting this ending point. The signcutter will then treat the new file as a continuation of the previous plot. This will affect the Repeat function, refer to the **Repeat** section below. To set a new start point, make sure your signcutter is in **Stop** mode with the red light on. Use the **Arrow keys** to move the knife to the intended start point of your plot, then press the **Start Point key**. At this point you can send a plot file to your signcutter.

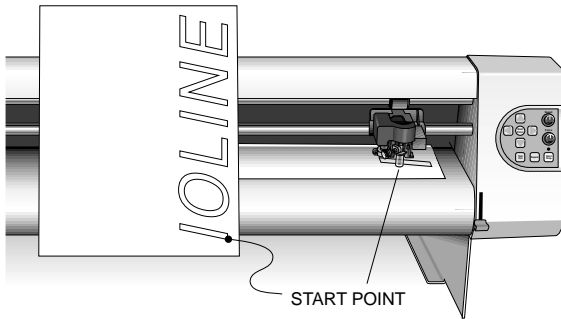


Figure 8. *Start Point*

Note: Signmaking software usually refers to the START POINT as “lower left” because it is the lower left corner of a completed sign. Because the plot is usually oriented as shown, it is physically on the right side of the signcutter.

Speed

You can set the speed by using the Speed knob on the front panel of your signcutter. Turn the Speed knob clockwise to increase the speed, or counter-clockwise to decrease the speed. Set the speed according to the type of material you are using. See the **Suggested Settings** section of this manual.

Force

You can adjust the force by using the Force knob on the front panel. Turn the Force knob clockwise to increase the force exerted by the blade. Adjust the force according to the type of material you are using, see the **Suggested Settings** section. You can select a Force setting range from 1 - 400 grams from the Control Center. The factory set Force range is 10 - 200 grams.

! Note: Using too much force can cause excessive drag on the material or cause the knife to cut through the backing.

Test Cut

You can make a test cut to determine if the blade is cutting properly. To make a test cut, follow this procedure:

1. Load material in your signcutter and position the knife over the material.
2. Check that the red light is on. You may need to press the Start/Stop key.
3. Press the Test Cut key. A small test pattern consisting of a circle within a square will be cut.
4. Successive test cuts will be automatically aligned side by side.
5. A more extensive test cut, 3.5" x 6.5", can be made by pressing the Repeat and Test Cut keys simultaneously.

Blade Adjustment - Adjustable Foot Knife:

1. Set Blade Exposure:
 - a. Start with the foot turned out so the blade is just even with the foot. Set the force knob at maximum. The first test cut should show little or no cutting because the blade is barely exposed.
 - b. Gradually adjust the foot upwards (clockwise) by about 1/8 turn for each successive cut. Continue until the cut weeds well and there is light scoring of the backing paper.
2. Set Force:
 - a. After the blade exposure is set, decrease the force slightly - about one division on the knob - and make another test cut.
 - b. Repeat test cuts with gradually decreasing force until the scoring of the backing paper decreases. Then move the force knob up to the previous setting. This gives just enough force to use the entire blade exposure.
3. Fine Tuning:

After following the Blade Exposure and Force Setting Procedures, you may get a slight improvement by slightly increasing the blade exposure (1/8) and slightly decreasing the force. Check the results using your own plot or the two-button test cut described above.

Repeat

You can generate one or more additional copies of the most recently created pattern or plot by pressing the Repeat key. To use the Repeat key, your signcutter must be in Stop mode with the red light on. If you want to start the cut in a new location, move the knife to a new position before you press the Repeat key. Different output results can occur depending on how the Repeat key is used:

1. Once the Start Point key has been pressed and another plot has begun, you can no longer repeat the previous plot.
2. If plot files have been sent without pressing Start Point between them, they will be stored in memory continuously, starting at the next location. This allows the user to treat multiple files as a single group. The Repeat key will then plot all files sent since the last start point.

3. If the file(s) sent exceed the capacity of the buffer, plotting continues and remaining information is written over the already-plotted information. This allows the plotter to handle files of limitless size. However the buffer no longer holds a complete file. Therefore the repeat function is disabled when the buffer overflows.

Note: If Start Point is not used between files, two possible unintended results can occur: if the combined plots don't exceed the buffer, repeat will cause them all to be replotted, or if the combined files exceed the buffer size, repeat will be disabled and there will be no response from pressing it.

CUTTING A SIGN

When you have completed a design using your signmaking software, it is time to send the plot file from your computer to your signcutter. Before you send the plot file to your signcutter, turn your signcutter on and load it with vinyl. Also set the Start Point. In most cases you will use your signmaking software to create a plot and then send the completed plot directly to your signcutter. You can do this from within your signmaking software. If you use this method, follow the instructions supplied with the signmaking software. You may choose to use the Ioline Control Center software to send a completed plot file to your signcutter. Open the Control Center program.

1. Select FILE.
2. Select SEND CUT FILE.
3. Enter the path and the name of the file that you want to send to your signcutter. For example, your path might be: C:\IOLINE*(filename)*.

Note: You can search by drive and directory to find and select a file.

Canceling Your Plot

If you want to cancel a plot after you've sent it to your signcutter from your signmaking software, refer to your signmaking software manual or consult your software dealer. If you sent the plot from Ioline's Control Center, you can cancel it in the following manner:

1. Press the Start/Stop key to place your signcutter in Stop mode, with the red light on.
2. From the Control Center screen, select ABORT.
3. Press the Start Point key to make your signcutter clear the plot data it has already received but has not yet cut.

CUTTING LONG SIGNS

To cut long signs it is necessary for the signcutter to be properly calibrated and to make sure the pinch wheels are correctly spaced. Additionally, some system settings must be adjusted to achieve the best results. Use the Ioline Control Center to make system changes. When cutting long signs, it becomes increasingly important for the material to be aligned properly and for the settings to be properly adjusted. These suggestions can help you produce fine quality long signs.

1. **A large clean area to work.** Sign shops can be “hostile” environments for modern electronics and computers. Make sure the carpet or floor is clean and clear of any obstacles. Pull your signcutter out from the wall so the material can move freely back and forth. It is crucial to have enough room to work.
2. **Use a Stand.** The use of a stand or cradle takes advantage of the signcutter’s platen design. When the material is draped over the platen it can benefit from the material’s natural tendency to curl downward.
3. **Build a Material Slide.** Cut two cardboard pieces the width of the stand large enough to lean against the signcutter’s stand legs. This prevents the material from going under the machine and getting buckled with material from the other side.
4. **Center the Material Roll.** Place the roll of material in the center of the material cradle or rollers. Make sure the roll is tightly wrapped and even along the sides.
5. **Load the Material Straight.** To properly load and use the material, we recommend two approaches. First, if you are using a new roll, the best method is (after completing Step 4) to simply bring the material up and through the space under the pinch wheels. Gently pull the material forward about two feet by grasping the center of the material. Clamp the pinch wheels by lowering the pinch wheel lever on the right side of your signcutter. Run the material using the up arrow keys about four feet to assure it runs straight.
Second, if your roll is very light or loose, the “typewriter” technique works well. Place the material roll on the cradle or support rollers, centering it behind the machine. Bring the material up and through the space under the pinch wheels. Pull about three feet (one meter) out from the roll. Let the material hang loose in front of the machine. Next, roll out a service loop of material behind the machine. Standing in front of the plotter, reach in and grab the service loop. Pull the material towards you, creating a loop. Pull the material tight and make certain the edges line up with the original piece you pulled through the pinch wheels of the machine. Now, clamp down the pinch wheel lever. Run the material using the up arrow keys about four feet to assure it runs straight.

6. **Lower Acceleration.** Using the Ioline Control Center program, set the acceleration to 0.5 g's or less. Lower acceleration will help with overall accuracy, especially in the transition between frames.
7. **Use Auto Loop.** Auto Loop will gently pull a set amount of material from the roll. This helps the material feed into the signcutter more accurately and keeps it from "jerking" from the roll. Auto Loop also helps to set up the grit track in the backing of the material, helping keep the material aligned. In the Ioline Control Center, you should turn Auto Loop ON and set the Loop Size to 15 inches. The panel size in the sign making software should be set to the same length as the Loop Size. Short panels ensure more accurate tracking.
8. **Speed.** Set the Speed knob to 50 percent or less. Moving the material at a slower speed helps to keep it more stable and prevents it from kinking or buckling.
9. **Force and Blade Depth.** Incorrect cutting force and blade depth can cause misalignment problems over the range of a long plot. If the force is too high, the material may skew. If the blade depth is set too deep, it could cut all the way through the material and cause the material to become jammed under the knife.
10. **Let your software help you.** Use the *automatic ordering* or *contour ordering* feature in your design software (some software programs automatically handle this process). In other words, reduce the number of back and forth and side to side movements the job has to endure before the file is completed. Why is this important? The paper or other type of backing (as well as the vinyl) gets weaker as the machine completes the job. The more complex the file, the more difficult the problem. The more the signmaker can do to control these variables, the better the results will be.
11. **Use the Paneling feature in your design software.** Paneling lets you restrict the length of any x-axis move. We suggest a panel size of 10 to 20 inches. With most signmaking software, the paneling feature allows you to place the panel between characters.

CUTTING SMALL CHARACTERS

For cutting small characters or intricate detail in various material, it is necessary for your signcutter to be calibrated properly and to make sure the pinch wheels are spaced correctly. Also, some of the system settings should be adjusted to achieve more accurate detailed cutting. This is done by making changes in the Ioline Control Center and by adjusting the dial controls on the front panel. The following is a list of adjustments that should be made:

1. **Lower Force.** The lowest knife force possible is the best for small, detailed cutting. Start by making test cuts with one quarter force. Gradually increase the force until the vinyl is completely cut.
2. **Slower Speed.** The speed knob should be set halfway or less.
3. **Foot Adjustment.** After setting the lowest cutting force, adjust the foot downward until the cut is not complete, then back it up just enough to get a complete cut. Since some force is applied to the foot, you may need to slightly increase cutting force. When the foot is adjusted properly, the blade tip should just cut through the material.
4. **Lower Acceleration.** When cutting Rubylith or Amberlith, the “acceleration” should be set to 0.1 g’s. For all other material the “acceleration” should be set to 0.5 g’s.
5. **Minimum Angle.** This is listed in the Control Center under the “blade steering arc” heading. The minimum angle should be set at 0 degrees.
6. **Overcut.** This should be set to 0 mils. If weeding becomes difficult at corners, increase overcut by one mil at a time until weeding is easier. If the material has incomplete cutting not at the corners, a little more force may be needed.
7. **Offset.** Usually the offset listed for the blade is used as the offset in the Control Center. For very small characters, tiny manufacturing variances among blades can make a difference. Check this by cutting small characters with sharp turns, i.e. the letter “N”. With our standard 45 degree, .015 inch offset blade, you can try several tests using different offset values, say 13, 14, 15, 16, and 17 mils, then pick the value with the sharpest, cleanest result.

HOW TO POUNCE*

Materials needed:

Pounce Paper - **Note:** We recommend using 20 lb. paper that lies flat.

Pounce Tool

Pounce Blade

1. Select **POUNCE** from the Control Center. The default setting for the Super 88 is **OFF**.
2. Set the **SPEED** knob to maximum.
3. Set the **ACCELERATION** to 1.0 g's. You may want to experiment with lower settings. Performance will vary with different paper.
4. Turn the **FORCE** knob to maximum (approximately 200 grams).

5. Install the pounce tool and blade the same as you would for a standard knife assembly.

Note: The single button Test Cut will not produce a pounce pattern when pounce is selected.

6. Load paper into the machine as usual. To use a roll of paper, slide it onto a roller as opposed to placing it on two rollers.
7. With the red light **ON**, press the **REPEAT** and **TEST CUT** keys at the same time to produce the Ioline logo as a test cut.
8. Increase or decrease the force on the Force Knob as needed for a complete puncture through the paper. If the pounce blade picks up the paper and jams, you may need to set the force and/or acceleration to lower settings.
9. The Pouncing feature allows the user to choose the length of the "cut" and the "blank" from the Ioline Control Center. Wider spacing can be appropriate for larger images.

* This feature is not available on all signcutter models.

STENCIL CUTTING*

Stencil material (Tag Board) is handled much the same as vinyl with the important exception of using much higher force.

1. Select **Tag Board Cutout** in the Ioline Control Center. This will ready your signcutter for Tag Board. A Tag Board Cut is intermittent - a long cut length followed by a short uncut segment. Default lengths are 2.0" cuts and 0.06" blanks.
2. Load the Tag Board into the signcutter as you would any other material. See **LOADING AND ALIGNING THE MATERIAL** - page 5.
3. Next perform the **Test Cut** procedure to establish blade exposure and force settings. Start with the Force knob at maximum (400 grams). Set the Speed at the halfway position. Check that the blade is just even with the foot opening so you will be approaching correct exposure from *too little*, with no chance of having *too much*, which could damage the blade.
4. The Red light must be ON. If not, press Start/Stop to turn it on.
5. Press Test Cut. The plotter will trace the test pattern. There will be little or no cutting if the initial foot adjustment was correct. Adjust the foot to expose a little more of the blade. Turn the foot about 1/8th turn upward (from left to right). Press Test Cut.
6. Continue increasing the blade exposure and making test cuts. When just enough blade is exposed, the test pattern will completely separate from the surrounding Tag Board.
7. Now perform the **Force Adjustment**. For 150 lb. Tag Board, cuts are generally made at or near maximum force (400 grams). You may use this procedure if you want to minimize force, or if you are using a more easily cut material. Turn the Force knob down slightly, about one mark, and repeat the test cut. If the test cut does not cut completely, full force should be used. If the test cut is complete, turn the force down again and repeat the test cut. Continue until the cut is incomplete. This indicates that there is not enough force to push the exposed blade fully into the Tag Board. At this point turn the force up one mark, which will be just enough.
8. **Verification.** Use the two button test cut to verify the adjustments and do any fine tuning. Press Test Cut and Repeat together. This will cause a 3.5" x 6.5" design to be cut, and will use the dashed-line pattern. If the pattern does not separate cleanly, try just a little more blade exposure and a slight increase in force.
9. **Adjusting the Cut Style.** The lengths of the cuts and blanks can be changed to your preference. See Ioline Control Center.

* This feature is not available on all signcutter models.

THE IOLINE CONTROL CENTER

The Ioline Control Center is a utility program that does three things:

- It allows adjustment of settings to tailor output from your computer.
- It allows you to send a completed plot file to your signcutter.
- It includes several diagnostic tests for troubleshooting.

Note: To avoid COM port conflicts, do not simultaneously run more than one application that will be communicating with the signcutter.

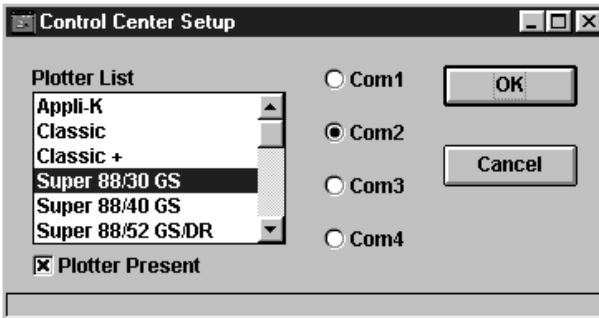


Figure 9. Control Center Setup Screen

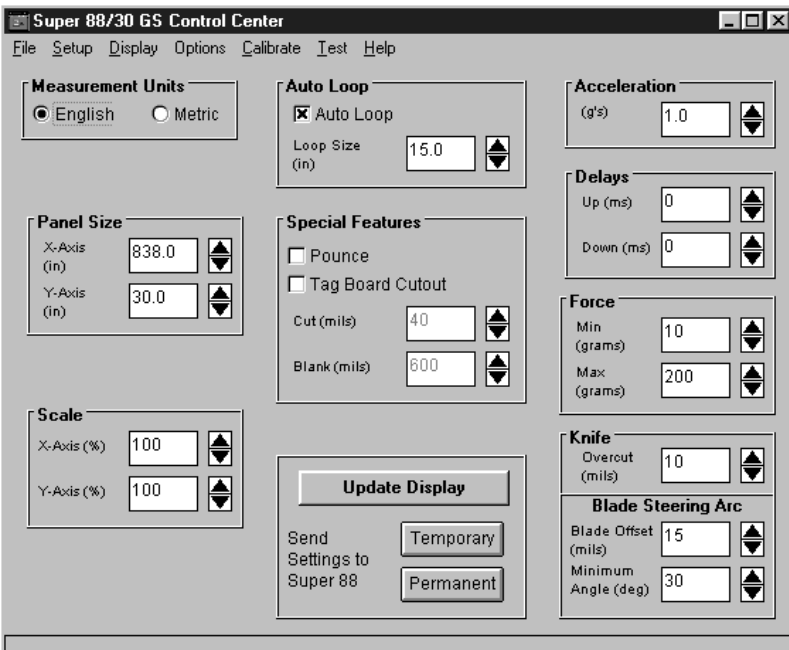


Figure 10. Control Center Main Menu (Super 88/30" Version Shown)

CHANGING YOUR SYSTEM SETTINGS

Note: Your signmaking software may be able to override the Control Center settings. Contact your software dealer if you have any questions. A variety of settings may be customized to fit your exact needs.

- Your signcutter must be in the Start mode when you change system settings. Press the Start/Stop key and make sure the green light is on before you change any settings.
- Look at the main menu. You can use this menu to change a variety of settings for your signcutter.
- The selected changes will be in effect only after one of the **Send Settings** buttons is pushed.

MENU BAR FEATURES

The Ioline Control Center provides comprehensive help files to explain the functions of the software options. Below is a brief summary of the items on the Menu bar.

File

Send Cut File	The user can send plot (.plt) files to the signcutter.
Open Settings File	Settings files can be accessed so the specific saved plotter configurations can be re-stored.
Save Settings As	Allows user to save settings files.
Exit	Exits the Control Center program.

Setup

Plotter Setup	Allows user to select the correct plotter model.
Com Port Setup	Allows user to select the communications port.

Display

Plotter Settings	Allows user to view current plotter settings.
Factory Defaults	Allows user to view and restore original factory settings.
ROM Version	Displays installed ROM version.
Memory Buffer Size	Displays installed memory buffer size.
Knife Status	Displays whether or not the knife is installed.

Options

Filtering	Allows user to toggle Filtering on and off.
Cornering	Allows user to select Cornering angle.
HPGL Setting	Allows user to select HGPL language.

Calibrate

Calibrate Plotter	Allows user to calibrate plotter.
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Test

Serial Test	Allows user to test serial communications.
Computer Port Test	Allows user to test computer port.
Plotter Port Test	Allows user to test plotter port.

Help

Contents	Lists comprehensive help files that describe menu options and plotter features.
About	Provides Control Center version information.

SCREEN MENU OPTIONS

English or Metric Measurement Units

You have a choice of using English or Metric settings.

Panel Size

The Panel Size is the maximum area your signcutter can cut. The factory set (and maximum) x-axis panel length is 838 inches long (2129 cm). The y-axis panel size is 24.0-49.2 inches (61-125 cm) depending on the model you have. The material moves along the x-axis; the carriage moves along the y-axis. Under normal circumstances, you will not have to adjust this setting.

Scale

The factory set scale is 100%. Your signcutter will produce a cut in the exact size of any plot file that you send. If you set the scale to 50%, your signcutter will produce a cut that is half the size of any plot file that you send. You can set the scale of your signcutter from 1% to 999%. **Note:** Both x and y axes are set independently.

Auto Loop

With Auto Loop enabled, your signcutter will create a service loop of material at the beginning of the plot, and whenever necessary during the cutting process. The factory setting is 15 inches (38.1 cm), but you can adjust the size of the loop. When cutting short pieces of vinyl, you will want to disable Auto Loop.

! If you are using a roll of media and have Auto Loop disabled, do not allow the material to become taut. Manually create and maintain a service loop in the rear.

Special Features

See the previous sections, *How to Pounce* and *Stencil Cutting*, for details on these features. Pouncing and stencil cutting are not available on all signcutter models.

Send Settings to Signcutter: Temporary

After you have changed any setting, you must send the changes to your signcutter. If you choose **Send Settings to Signcutter: Temporary**, all of the displayed settings will be used for the current session. When you turn off the signcutter, these settings will be lost and the previous permanent settings will be in effect when you turn on your signcutter again. If you change any settings, repeat the Test Cut procedure to see if they work.

Send Settings to Signcutter: Permanent

If you choose **Send Settings to Signcutter: Permanent** all of the displayed settings will be sent to your signcutter and they will be saved for all subsequent sessions, even after you turn off your signcutter.

Acceleration

The factory set acceleration is 1.0 g. The acceleration setting determines how quickly the blade will reach full speed when starting or ending a cut line. You can use the Control Center to change the setting within a range of 0.1 to 1.0 g's. For long or difficult plots, or when trying to achieve maximum accuracy, you should use lower acceleration settings.

Up/Down Delays

The factory set up and down delays are both 0 milliseconds (ms) or 0 thousandths of a second. The delay setting controls the amount of time, in milliseconds, the signcutter pauses after lifting or lowering the blade. Under normal circumstances, you will not have to adjust this setting.

Force

You can select the minimum and maximum force settings for the force control knob from 1 - 400 grams. The factory set minimum is 10 grams and the factory set maximum is 200 grams.

Blade Overcut

The factory set blade overcut is 10 mils. Blade overcut is the signcutters way of ensuring that each cut actually reaches the point where one cut line meets and slightly overlaps another cut line. Blade overcut is the distance the blade travels beyond the end of a cut. This ensures that all of the pieces of your sign will be cut completely, with no undercuts.

Blade Steering Arc

Blade Offset

The offset is nominally 15 mils (or 47 mils on some blades), but specific blades can vary within a tolerance. For close work, making some tiny test cuts at several settings, then picking the best one, can improve accuracy.

Minimum Angle

This is the minimum angle for which your signcutter blade will perform a blade steering arc. For a very tiny plot, a small or zero angle can be specified. For larger plots a greater angle of up to 45 degrees is best. The factory set value works well with most files. For small plots you may want to adjust this setting. See section on cutting small characters.

CALIBRATION

Over time, signcutters may experience differences in cutting or drawing accuracy in both x and y directions due to variations in the drive mechanism, material density, humidity, temperature, and other factors. Typically, the accuracy of a plot is within 0.2% overall. By using the calibration feature, you can adjust the variance to within 0.05%. **Note:** The Scale command operates independently of the calibration feature.

Here's how to calibrate your signcutter:

1. Select **CALIBRATE PLOTTER**
2. Select **CALIBRATE PLOT** to plot the factory stored calibration plot. Your material must be at least 42 x 22 inches. The signcutter will plot a box 40 in. (101cm) x 20 in. (50cm) (for Classic and Super 88/30) or a box 40 in. (101cm) x 28 in. (71cm) (for Super 88/40 and Super 88/52).
3. Precisely measure both x-axis and y-axis lines.
4. Enter the measured values and select **SET CALIBRATION**.
5. Your signcutter will now calibrate itself, and the new **CALIBRATION SETTING** will be displayed.
6. Click on done when you are finished.

BLANK

SUGGESTED SETTINGS

There are many variables that determine signcutter output quality. We recommend that you use low force and speed settings when you make your initial test cuts. Then you should gradually increase these settings until you find the best values for the material you are using. Refer to the Suggested Settings Table for settings on a variety of material. Remember that Force values are for starting reference only. Always start with the minimum force setting and increase the force until you see the result that you want. Force setting may vary due to manufacturer, color, age, and temperature of the material.

GUIDELINES FOR VARIOUS MATERIAL

Material	Thickness mils	Blade	Offset mils	Force grams
Amberlith™/Rubylith™	1	45°/15	15	30-60
Flock	15	Cobra	47	100-200
Polyester, Metalized	2	45°/15	15	100-140
Reflective, Engineering Grade	5	45°/15	15	240-250
Sandblast Mask	18 ¹	-	-	-
	31	Cobra	47	220-260
	36	Cobra	47	220-260
	40 ¹	-	-	-
Stencil, Lacquer Adhering	1	45°/15	47	80-100
Stencil, Vinyl	4	45°/15	15	200-220
Stencil, Water Soluble	1	45°/15	15	125-135
Vinyl, Calendered	3	45°/15	15	100-150
Vinyl, Cast 100-150		2	45°/15	15

¹These sandblasts typically have a thin backing which is designed for cutting by hand.

Speed ips	Acceleration g's	Min. Angle degrees	Overcut mils	Down Delay
med.	0.1	45°	0	0-50
min.	1	15°	10	0
max.	1	45°	10	0
min.	1	45°	10	0
-				
min.	1	15°	30	0
min.	1	15°	30	0
-				
max.	1	45°	10	0
min.	1	45°	10	0
med.	1	45°	10	0
med.-max.	1	45°	10	0
med.-max.	1	45°	10	0

NOTE: Settings should be adjusted for cutting small letters or intricate detail, refer to the section, **Cutting Small Characters.**

T E S T I N G

COMMUNICATIONS DIAGNOSTIC TESTING

There are three diagnostic tests that you can run from the Control Center. These tests are designed to help you determine if you are having a communication problem and to isolate where the problem is occurring.

To run two of these tests, you will have to connect the diagnostic module (available from your dealer) either to your computer's COM port or to your signcutter's COM port. The diagnostic module is a tool that you can use to determine if there is a problem with either COM port.

Serial Test

Run this test from your Control Center. You will not need to use the diagnostic module to run this test.

1. Connect one end of the serial cable to the COM port on your signcutter and the other end of the cable to your computer's COM port.
2. From the Control Center main menu, select TEST.
3. Select SERIAL TEST.
4. Turn on your signcutter while you hold down the Test Cut key on the keypad. Hold down the Test Cut key until your signcutter beeps and the light flashes three times.
5. Press the Start/Stop key on your signcutter and verify that the handshake line (CTS) displayed on your computer screen toggles ON/OFF. Leave the handshake line ON.
6. Press the Repeat key to switch your signcutter into ECHO mode. The green light will come on.
7. Press any key on your computer and verify that the character transmitted equals the character received. If your signcutter and your computer pass all of these tests, you should not have any problems producing accurate cuts from your plot files.
8. Select EXIT after you have completed the Serial Test.
9. Turn off your signcutter at the end of the test. This will exit the test mode.
10. If this test is successful, you do not need to perform the next two tests.

Testing Your Signcutter Port

Connect the diagnostic module directly to your signcutter COM port.

1. From the Control Center main menu, select TEST.
2. Select PLOTTER PORT TEST.
3. Turn on your signcutter while you hold down the Test Cut key on the keypad. Hold down the Test Cut key until your signcutter beeps and the light flashes three times.
4. Press any Arrow key on the signcutter keypad to transmit and receive characters. Verify that your signcutter beeps.
5. Turn off your signcutter at the end of the test. This will exit the test mode. If this test fails, the plotter port is faulty.

Testing Your Computer Port

Use the DOS MODE command to install the communications settings. For example, to setup COM port number two, type:

```
MODE COM2:96,N,8,1,P
```

For other COM ports substitute the appropriate number. Connect the diagnostic module directly to the COM port on your computer. If your computer's COM port has a nine pin connector, you will need to use a 9 pin to 25 pin adapter between the COM port and diagnostic module.

1. From the Control Center main menu, select TEST.
2. Select COMPUTER PORT TEST.
3. Verify that the COM port selected is the correct one. If it is not, select the proper COM Port.
4. Verify the CTS handshake line is on.
5. Press any key on the computer keyboard and verify that the character transmitted equals the character received.

TROUBLESHOOTING

If your system isn't working correctly, your first job is to figure out which component is causing the problem. The problem could be with your computer, your cable, your signmaking software, or with your signcutter.

First make sure the cable between the machines is connected correctly. Make sure the power is on.

If the problem is with your computer or your signmaking software, consult your computer or software manuals. If you still can't solve the problem, call the appropriate manufacturer or dealer.

If the problem is with your signcutter, consult the following Chart.

TROUBLESHOOTING CHART	
<i>If your cut doesn't start at the correct point on the material:</i>	
Possible Cause	Solution
The start point selected in your software is different than the one you selected on your plotter.	Select them so they coincide; usually lower-left (which is on the <u>right</u> side of your plotter - see Figure 8)
You haven't set the start point	Set the start point
<i>Pressing the Repeat key does not repeat the previous plot:</i>	
Possible Cause	Solution
Buffer Overflow: File size exceeds buffer size	See Operation chapter - Repeat section
<i>If you've sent a plot file, but nothing happens:</i>	
Possible Cause	Solution
Your signcutter is in Stop mode	Press the Start Point key to put your signcutter in Start mode
A communication problem	Perform the diagnostic tests Call your dealer
<i>If you've sent a plot file and the output is erratic:</i>	
Possible Cause	Solution
You've sent your plot file with the wrong plotter language setting	Make sure correct driver is selected
<i>If the blade tears the material or skips:</i>	
Possible Cause	Solution
The blade is dull or broken	Replace the blade
The blade force is set too low	Increase the blade force setting
Dirt or debris is stuck on the blade	Clean or replace the blade

TROUBLESHOOTING CHART

If the corners of the cuts are not completely meeting:

Possible Cause	Solution
The blade is dull or broken	Replace the blade
The material is slipping	Clean the grit shaft
The blade overcut value is set too low	Use a higher blade overcut value
The offset is incorrect	Refer to the Suggested Settings

If you have difficulty weeding the completed sign:

Possible Cause	Solution
The blade is dull or broken	Replace the blade
Not enough force	Increase the force setting
The blade overcut value is set too low value	Use a higher blade overcut value
The blade offset is incorrect	Refer to the Suggested Settings

Tracking errors:

Possible Cause	Solution
Pinch wheels are positioned on the smooth section of the grit shaft	Move the pinch wheels to a new location
Cutting force is set higher than necessary	Reduce the cutting force to minimize material flexure
Acceleration is set too high	Set the acceleration to .5g
Speed is set too high	Reduce the speed to one-half or less
The material is kinked as it accumulates in front or rear of the signcutter	Make sure the material remains smooth, taut, and square Allow enough room in the front and rear of the signcutter for the vinyl to move easily
Dirty grit shaft	Clean grit shaft See Routine Maintenance section

WHAT THE LIGHTS MEAN	
<i>If the front panel red light is blinking once:</i>	
Possible Cause	Solution
The grit shaft is jammed	Turn off your signcutter and clear away any debris or jammed material
<i>If the front panel green light is blinking once:</i>	
Possible Cause	Solution
The carriage of your signcutter is jammed	Turn off your signcutter and clear away any debris or jammed material
<i>If the front panel red light is blinking twice:</i>	
Possible Cause	Solution
Buffer overflow/communication problem	Perform the diagnostic tests Call your dealer
<i>If the front panel red and green lights are blinking alternately:</i>	
Possible Cause	Solution
Plotter language syntax error	Make sure the correct driver is selected
Bad or corrupted file	Recreate file

ROUTINE MAINTENANCE

Replacing the Blade

If you have used your signcutter for a while and suddenly you're not getting clean cuts, you may have a dull or broken blade. The tip of the blade is very fragile and can chip or break if you drop it. You may not be able to see if the blade is damaged, however a magnifying glass can be helpful. Refer to **Figure 3: Installing a Blade**, on page 3. To replace a blade:

Very carefully pull the old blade out of the knife and safely discard it. Whenever you install a new blade, repeat the Test Cut sequence before you produce any signs.

Cleaning the Grit Shaft

You will need to clean the grit shaft regularly to make sure your cut lines remain accurate. To clean the grit shaft:

1. Turn off your signcutter and disconnect the power cord.
2. Remove any accumulated dust and material residue from the grit shaft using a stiff bristle brush. **Do not use metal bristles as this will ruin the grit shaft.**
3. Reconnect the power cord and turn on your signcutter.

Do not use any cleaning agents or water as this will damage your machine.

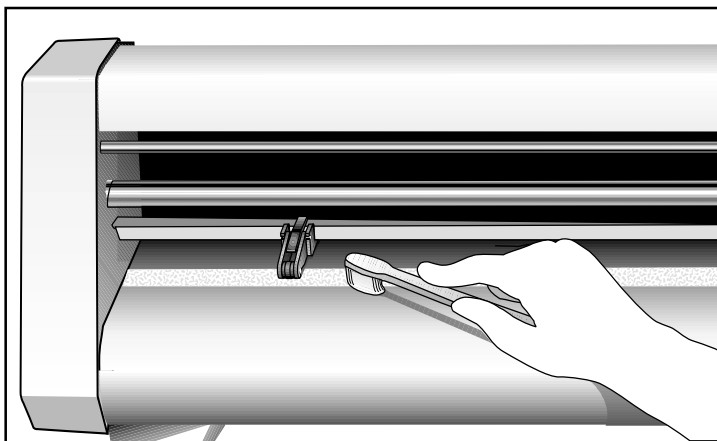


Figure 11. *Cleaning the grit shaft*

GLOSSARY

A

Acceleration - The force of a plotter's carriage head moving from a stopped position to its fastest linear (straight-line) speed. Measured in g's, it gives the zero-to-60 indication of plotter speed, but a better indication is throughput.

Arc - A line segment that is deflected at a certain angle to form a curve.

Axis - The geometric guidelines used to place a coordinate that determines knife paths for plotters.

B

Blade - Refers to the carbide steel cutting tool used by signcutting plotters. Blades come specified for different offsets and blade angles designed to be used with different materials.

Blade Angle - This is the minimum angle for which your machine will perform a blade steering arc. A blade steering arc is the arc followed by the center of the blade as it rotates around the (fixed) tip. This is used to align the blade in the direction of the next vector so it is ready to cut.

C

Calendered - Polyvinyl chloride (PVC) sheeting squeezed between a series of heated rollers to achieve a small enough thickness for cutting with a knife plotter. Calendered film is generally thicker and less expensive than cast vinyl, but it sometimes tends to shrink, or move back to its original thickness.

Cast - Polyvinyl chloride (PVC) sheeting formed by spreading a molten vinyl mixture on a carrier sheet or web, and then baking at high temperatures to remove solvents and fuse the remaining material into a film. Cast film is usually thinner and more expensive than calendered vinyl.

Coordinate - A point that can be referenced by its position on the X or Y axes of a signcutter. The use of line or arc segments to connect coordinates creates paths for knives to follow when cutting.

D

DM/PL - Programming instructions language used to connect a plotter with a computer. DM/PL is used in software drivers from some sign programs.

F

Filename extensions - In DOS and Windows based programs, the three letters after the period in a file name. With graphics files, the three letters denote a file type, such as the vector and bitmap based Encapsulated Postscript (EPS) and the vector based Hewlett Packard Graphics Language (PLT).

Flange - The projecting rim around the edge that holds the knife assembly to the tool carriage. The signcutter automatically recognizes the knife is installed and accounts for the blade offset.

Font - Refers to the style and width of a particular design of letters, numbers, and symbols, such as Helvetica Bold or Times Roman. Until the development of the computer and scalable fonts, references to fonts also included the size, such as 10 point.

Force - The downward pressure made by a signcutter on a blade tip to ease cutting through materials. Additional force can be added by adjusting the Control Center settings. Increasing the pressure aids in cutting thicker materials, such as sandblast mask and reflective film.

Friction feed - Process where the material is fed through a plotter by placing it between a motor-driven grit wheel and two tensioned pinch wheels.

G

Grit Shaft - The motor driven shaft that moves media through a friction feed plotter. The grit shaft has a rough surface that grips the material.

H

HPGL Setting - Your signmaker supports three industry standard plotter languages: HP-GL 7475, HP-GL 7596, and DM/PL. Most signmaking software uses DM/PL or HP-GL 7475 which have a lower left origin. DM/PL cannot be selected in the Control Center because the signcutter will automatically recognize it. HP-GL 7596 uses a center origin so plotting begins at the center of the intended cutting area.

I

Idler wheel - Removable wheels that help wider materials stay flat.

K

Knife bevel - Angle of the vertical cutting edge of a blade. Larger angles help the knife travel through thicker material that produce more friction between the blade and the medium. Bevels can be between 45 degrees for general vinyl, and 60 degrees for sandblast mask and reflective film.

O

Offset - The distance the tip of the blade trails behind the center of the blade.

Origin - Place marking the zero (0) coordinate on the X or Y axes. Used as a starting reference by plotters for knife paths.

Overcut - Distance the blade travels beyond the end of each cut vector.

Overlap - Amount of material cut in one panel (or tile) that duplicates what is done in the previous panel (or tile). The overlapped image allows for alignment when assembling and installing a large image.

P

Panel - Production area of a plotter. Plotters have a size limit along the Y axis (a few inches less than the width of the plotter) and the X axis. If a job exceeds the production area, different panels are set up by sign software, and can be produced by selecting individual panels. Also called tiling.

Pinch Wheel Roller - Wheeled roller, tensioned by springs, that clamps material between it and the grit shaft for transporting the material.

Pounce Pattern - A full sized pattern of any design to be painted. Once the pattern is created, the outline is perforated using the Pounce feature of the Super 88. The pattern is then held firmly against the substrate and perforations patted with powder, charcoal or colored chalk dust, leaving an outline of the design.

R

Resolution - Degree of accuracy that a plotter will place a knife head in relation to a theoretical, absolutely perfect location of a coordinate.

S

Serial communications - Method of sending information from a computer to a plotter by sending one signal at a time through a cable.

Service Loop - Slack material between the material roll and the plotter.

Stencil - A thin sheet of material into which a design is cut. When a stencil is placed on another substrate and paint or ink is applied, the image represented by the cut out portion of the stencil is printed on the substrate.

T

Throughput - Actual speed of a plotter in completing a job. Represents a plotter's ability to process information and then cut an image.

V

Vector - In computerized sign making, a line segment between two coordinates, on which a knife path can be created for plotting.

Vinyl - Polyvinyl chloride (PVC) film that, in sign making, is backed with an adhesive that will create a strong bond to a surface when pressure is applied.

W

Weeding - Process of peeling extraneous vinyl away for a plotter cut, leaving only the sections representing the final image. Pulling the extra vinyl away in quick strokes is known as rip weeding.

X

X-axis - Theoretical horizontal line providing a lengthwise reference point for plotters.

Y

Y-axis - Theoretical vertical line providing a longitudinal reference point for plotters.

GETTING HELP

In order to serve you better, before calling Ioline, please gather this information regarding your signcutter:

Name: _____

Company Name: _____

Phone Number: _____

Fax: _____

1) Model: _____

2) Serial Number: _____

3) Date of Purchase: _____

4) Dealer: _____

5) Specific type of material being used: _____

6) Type of Computer: _____

7) Type of design software: _____

8) Service History (if any); _____

GETTING HELP (continued)

Ioline is committed to providing the highest quality service and support to its customers. If you need assistance with an Ioline signcutter, a number of resources are available:

1. First, refer to other portions of this user's guide for specific answers to your questions.
2. For additional assistance, contact your local dealer or Ioline Customer Service Department at 425-398-8282, Monday-Friday, 7:00 am -5:00 pm Pacific Time.

Any warranty servicing of this product **not** specifically described in this manual must be authorized in writing by Ioline Customer Service. You may obtain service by:

Calling or faxing Ioline Customer Service. The technicians will help you determine the nature of the problem. If it is necessary for factory repair, you will receive a RMA (Return Material Authorization).

1. Carefully package the signcutter in its original container or equivalent. You may purchase shipping containers from Ioline by contacting Ioline Customer Service. **Ioline is not responsible for any damage due to inadequate or improper packaging.**
2. Carefully wrap and secure all items in the shipping container to prevent damage. Then, seal the container and note the RMA near the address block.
3. Ship the container using FED-EX or another approved carrier. **COD SHIPMENTS WILL NOT BE ACCEPTED.**

You will be contacted prior to the start of work with an estimate of repair cost. All repairs are warranted for 90 days.

THE FCC WANTS YOU TO KNOW...

This equipment generates and uses radio frequency energy and, if not installed and used properly (in strict accordance with the manufacturer's instructions), it may cause interference to radio and television reception. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. If this equipment does cause interference to radio or television reception - which can be determined by turning the equipment off and on - you are encouraged to try to correct the problem by one or more of the following measures:

- Use only shielded interface cables.
- Reorient the receiving antenna.
- Relocate the host computer with respect to the receiver.
- Move the host computer away from the receiver.
- Plug the host computer into a different outlet so that the host computer and receiver are on different branch circuits.

If necessary, consult your dealer or an experienced radio/television technician for additional suggestions. The following booklet, prepared by the Federal Communications Commission, is a helpful reference:

How To Identify and Resolve Radio-TV Interference Problems:

The stock number is: 004-000-00345-4

This booklet is available from:

U.S. Government Printing Office

Washington, D.C. 20402

YOUR COMMENTS ARE REQUESTED

Ioline Corporation is interested in your comments on our documentation. Please send your corrections or suggestions to:

Ioline Corporation

14140 NE 200th Street

Woodinville, WA 98072 USA

Email: info@ioline.com

This User's Guide is provided for informational purposes only. The contents are subject to change without notice, and Ioline Corporation assumes no responsibility for any errors that may be contained herein. No part of this User's Guide may be copied, disseminated, or distributed without the express written consent of Ioline Corporation.

CUSTOMER SERVICE

Ioline Corporation is committed to providing quality service and support to our customers. If you need assistance with an Ioline product, contact your local dealer or Ioline authorized service center. You may also contact the

Ioline Customer Service Department:

(Monday through Friday: 7:00 a.m. - 5:00 p.m. Pacific Time)

Voice: 1-425-398-8282

Fax: 1-425-398-8383

Email: techsupport@ioline.com WWW: www.ioline.com

Ioline has many years of experience working with signmakers. Feel free to contact us to share information.

LIMIT OF LIABILITY STATEMENT

It is the responsibility of the operator of the signcutter to monitor the performance of the signcutter and maintain it in proper working condition by following the instructions in this User's Guide. It is the responsibility of the operator of the signcutter to follow all safety precautions and warnings that are described in this User's Guide. Ioline is not responsible for injuries that may occur as a result of unsafe operating procedures. Ioline is not responsible for substandard operational performance as a result of failure to maintain the signcutter as described in this User's Guide.