



Mini, Helix, & EXT International Service Training Manual

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Section 1: Specifications

Epilog 36EXT Specifications

Maximum Engraving Area	36" x 24" (914 x 609 mm)
Maximum Material Thickness	12" (304 mm) – 14" (355 mm) with Task Plate and Vector Grid removed
Laser Control Display Panel	Displays stored file names, speed, power, runtime and more.
Intelligent Memory Buffer	Store unlimited files up to 64 MB. Rolling buffer allows files of any size (64 MB and larger) to be engraved.
Permanent Memory Buffer	Permanently store individual files up to 2 MB in size...
Operating Modes	Optimized raster engraving, vector cutting, or combined raster/vector mode.
Motion Control	High speed, continuous loop, brushless DC servomotors using linear and rotary encoding technology for precise positioning.
Laser Source	State-of-the-art, digitally controlled, air-cooled CO2 laser tubes are fully modular, permanently aligned, and field replaceable/upgradeable.
Optics	Radiance™ High Energy Optics
Bearings	Ground and polished stainless steel NeverWear™ bearing system.
Belts	Advanced B-style Kevlar precision drive belts.
Resolution	User controlled choice of 75, 150, 200, 300, 400, 600, or 1200 dpi.
Speed/Power Control	Computer or machine controlled Speed and Power in 1% to 100% increments. Vector color mapping links Speed and Power setting to any RGB color.
Print Interface	10 Base T Ethernet or USB connections. Compatible with Windows XP/2000.
Standard Features	Red Dot Pointer, Air Assist (pump optional), Auto Focus, 2" focus lens, relocatable home, flash upgrade electronics.
Size/Weight	50.5" wide x 33.5" deep x 43.25" high (1282 x 1098 x 851mm) 440 lbs (200 kg)
Electrical Requirements	Auto-switching power supply accommodates 100 to 240 VAC, 50 or 60 Hz, single phase, 15 amps AC. The 120-watt system requires 208/240 VAC.
Ventilation	External exhaust to the outside required. There are two output ports, each 4" (100 mm) in diameter at machine.
Safety	IEC Class 3R
Max Ambient Room Air	90 degrees F (32 C) Max Temperature

Section 1: Specifications

Epilog Mini 18 x 12 Specifications

Maximum Engraving Area	18" x 12" (457 x 305 mm)
Maximum Material Thickness	4" (101.5 mm) - 6" (152 mm) with Task Plate and Vector Grid removed
Laser Control Display Panel	Displays stored file names, speed, power, runtime and more.
Intelligent Memory Buffer	Store unlimited files up to 64 MB. Rolling buffer allows files of any size (64 MB and larger) to be engraved.
Operating Modes	Optimized raster engraving, vector cutting, or combined raster/vector mode.
Motion Control	High speed, continuous loop, DC servomotors using linear encoding technology for precise positioning.
Laser Source	State-of-the-art, digitally controlled, air-cooled CO2 laser tubes are fully modular, permanently aligned, and field replaceable/upgradeable.
Bearings	Ground and polished stainless steel NeverWear™ bearing system.
Belts	Advanced B-style Kevlar precision drive belts.
Resolution	User controlled choice of 75, 150, 200, 300, 400, 600, or 1200 dpi.
Speed/Power Control	Computer or machine controlled Speed and Power in 1% increments to 100%. Vector color mapping links Speed and Power setting to any RGB color.
Print Interface	10 Base T Ethernet or USB 1.0 connections. Compatible with Windows XP/2000.
Standard Features	Red Dot Pointer, Air Assist (pump optional), Auto Focus, 2" focus lens, relocatable home, flash upgrade electronics.
Size/Weight	27.5" wide x 23" deep x 12.5" high (699 x 584 x 318 mm) 70 lbs (32 kg)
Electrical Requirements	Auto-switching power supply accommodates 100 to 240 VAC, 50 or 60 Hz, single phase, 15 amps AC.
Ventilation	External exhaust to the outside required. Output diameter at machine is 4" (100 mm).
Safety	CDRH Class IIIR
Max Ambient Room Air	90 degrees F (32 C) Max Temperature

Section 1: Specifications

Epilog Mini 24 x 12 Specifications

Maximum Engraving Area	24" x 12" (610 x 305 mm)
Maximum Material Thickness	6" (152 mm) - 8" (203 mm) with Task Plate and Vector Grid removed
Laser Control Display Panel	Displays stored file names, speed, power, runtime and more.
Intelligent Memory Buffer	Store unlimited files up to 64 MB. Rolling buffer allows files of any size (64 MB and larger) to be engraved.
Operating Modes	Optimized raster engraving, vector cutting, or combined raster/vector mode.
Motion Control	High speed, continuous loop, DC servomotors using linear encoding technology for precise positioning.
Laser Source	State-of-the-art, digitally controlled, air-cooled CO2 laser tubes are fully modular, permanently aligned, and field replaceable/upgradeable.
Bearings	Ground and polished stainless steel NeverWear™ bearing system.
Belts	Advanced B-style Kevlar precision drive belts.
Resolution	User controlled choice of 75, 150, 200, 300, 400, 600, or 1200 dpi.
Speed/Power Control	Computer or machine controlled Speed and Power in 1% increments to 100%. Vector color mapping links Speed and Power setting to any RGB color.
Print Interface	10 Base T Ethernet or USB 1.0 connections. Compatible with Windows XP/2000.
Standard Features	Red Dot Pointer, Air Assist (pump optional), Auto Focus, 2" focus lens, relocatable home, flash upgrade electronics.
Size/Weight	34.5" wide x 22.5" deep x 16" high (876 x 572 x 406 mm) 90 lbs (40 kg)
Electrical Requirements	Auto-switching power supply accommodates 100 to 240 VAC, 50 or 60 Hz, single phase, 15 amps AC.
Ventilation	External exhaust to the outside required. Output diameter at machine is 4".
Safety	CDRH Class IIIR
Max Ambient Room Air	90 degrees F (32 C) Max Temperature

Section 1: Specifications

Epilog Helix Specifications

Maximum Engraving Area	24" x 18" (610 x 457 mm) – 23.5"x 17" with Task Plate and Vector Grid removed
Maximum Material Thickness	9" (229 mm) - 11" (279 mm) with Task Plate and Vector Grid removed
Laser Control Display Panel	Displays stored file names, speed, power, runtime and more.
Intelligent Memory Buffer	Store unlimited files up to 64 MB. Rolling buffer allows files of any size (64 MB and larger) to be engraved.
Operating Modes	Optimized raster engraving, vector cutting, or combined raster/vector mode.
Motion Control	High speed, continuous loop, DC servomotors using linear encoding technology for precise positioning.
Laser Source	State-of-the-art, digitally controlled, air-cooled CO2 laser tubes are fully modular, permanently aligned, and field replaceable/upgradeable.
Bearings	Ground and polished stainless steel NeverWear™ bearing system.
Belts	Advanced B-style Kevlar precision drive belts.
Resolution	User controlled choice of 75, 150, 200, 300, 400, 600, or 1200 dpi.
Speed/Power Control	Computer or machine controlled Speed and Power in 1% increments to 100%. Vector color mapping links Speed and Power setting to any RGB color.
Print Interface	10 Base T Ethernet or USB 1.0 connections. Compatible with Windows XP/2000.
Standard Features	Red Dot Pointer, Air Assist (pump optional), Auto Focus, 2" focus lens, relocatable home, flash upgrade electronics.
Size/Weight	36.5" wide x 29" deep x 39" high (927 x 737 x 991 mm) 180 lbs (80 kg)
Electrical Requirements	Auto-switching power supply accommodates 100 to 240 VAC, 50 or 60 Hz, single phase, 15 amps AC.
Ventilation	External exhaust to the outside required. Output diameter at machine is 4".
Safety	CDRH Class IIIR
Max Ambient Room Air	90 degrees F (32 C) Max Temperature

Section 1: Specifications

Processor Specifications

- Intel processor 400 MHz
- 64 Meg of on board memory, U44 and U45
- If the data exceeds 64 Mb, the buffer will “Roll”. Rolling is the process of releasing old data to make room for new data. Think of this as a large funnel. As fluid escapes out the bottom of the funnel there is room at the top for more fluid.
- Flash Memory: Takes the place of EPROMS of the past. U46 and U47 are the flash memory chips.
- File Size:
 - Saved file size is not an indication of print job size.
 - To determine the print job size
 - Prepare a job to be sent to the engraver.
 - Open the print queue
 - Send the print job to the engraver
 - Watch the data transfer in the print queue. It will show the progress of the data transfer the number on the right is the total job size.

Section 1: Specifications

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Section 2: Set Up

In This Section

- Leveling (EXT only)
 - Alignment EXT Engraver
 - Alignment Mini Engraver
 - Printing
-

Leveling (EXT only):

Machine Type

Legend 36EXT

Tools Needed:

10 mm open end wrench (this wrench is included in the accessories kit that came with your EXT)



2 ft Level



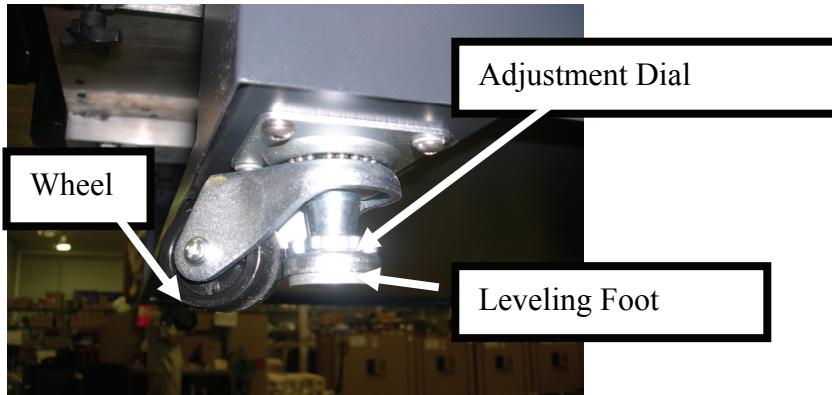
Intro

This procedure will direct you through leveling the 36EXT. The 36EXT is a large and heavy machine and leveling insures its stability as well as optimal beam alignment. Once it is level it will no longer be able to move freely on its wheels so you will want to be sure the electrical, computer and exhaust connections are all installed and working properly before you level the EXT.

Section 2: Set Up

Procedure

1. Roll the machine into position where it will be stationed.



2. Begin by lowering all four leveling feet, rotating the silver adjustment dial in a counter clockwise direction. Initially, it is easiest to rotate the adjustment wheel by hand until you start to feel resistance. Once you feel resistance you will need to use the wrench. Raise each wheel so that it no longer touches the floor and can be rotated freely by hand ($1/16''$ to $1/8''$ (1.5 to 3 mm). However, clearance is adequate.
3. Obtain a 2ft level.
4. Open the main door of the machine.
5. Position the level in the center of the front ledge.



Section 2: Set Up

6. Locate the level's center indicator.



7. The center indicator bubble shows the level of the machine. If the bubble is right of center — such as shown here — use the following directions. If the bubble is left of center please see step 8:



- a) Locate the front right castor.

Section 2: Set Up

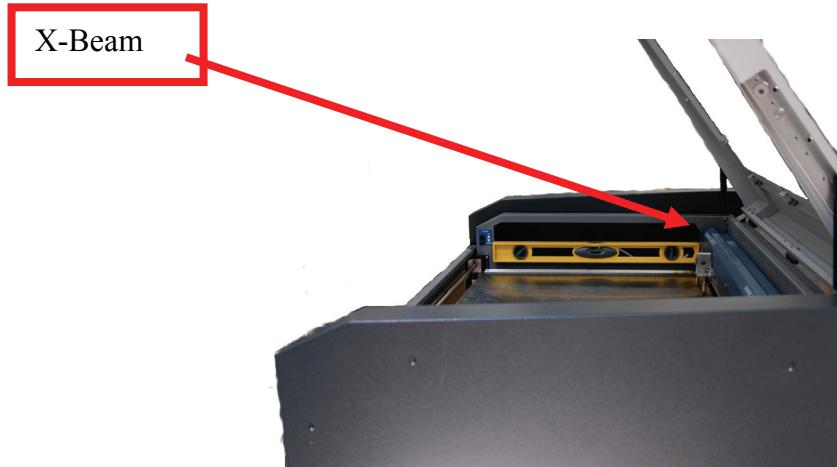
- b) With the 10mm open wrench, rotate the orange dial adjustment counter clockwise. This adjustment will raise the front-right side of the machine.
 - c) After one rotation, check the position of the bubble. If the bubble is still right of center continue to rotate the right-front caster adjustment dial counter clockwise until the bubble lies in the center of the level.
8. If the bubble is left of center — such as shown here —follow these directions:



- a) Locate the front-left castor.
- b) With the 10mm open wrench, rotate the orange dial adjustment counter clockwise. This adjustment will raise the front-left side of the machine.

Section 2: Set Up

- c) After one rotation, check the position of the bubble. If the bubble is still left of center continue to rotate the left-front caster adjustment dial counter clockwise. Stop rotating the adjustment dial when the bubble lies in the center of the level.
9. Once the machine is level from left to right, the next step is to level it from front to back on both sides of the machine.
 - a) Make sure the X-beam of the laser is pushed to the farthest back position.
10. Move the level to the left side of the machine. The best place to put the level is inside the machine, resting on the laser carriage runner.



11. Check the position of the center dial bubble in the level. Adjust the front or back castors as you would the left or right front castors—explained in steps 7 & 8.
12. When the left side of the machine is level, move the level over to the right edge and make sure the right side is level.

Section 2: Set Up



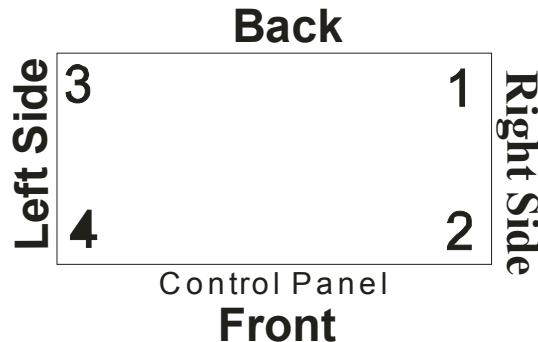
13. Check the front of the machine again with the level. If the front of the machine is level, you do not need to do any further adjustments. However, the front of the machine may need adjustment after you adjust the left and right sides. Check the wheel to make sure they still roll. Repeat steps 7 through 12 until each side of the machine is level. You do not need to measure the balance of the back of the machine.

Section 2: Set Up

Aligning the EXT

Intro:

This procedure details steps to aligning the laser in the 36 EXT. For this procedure the engraving table will have the following orientation:



WARNING: This procedure requires that the laser be operated with the machines door safety interlocks defeated and with protective covers removed. While the laser power levels reduced from those of normal operation, they are sufficient to inflict eye injury or burns.

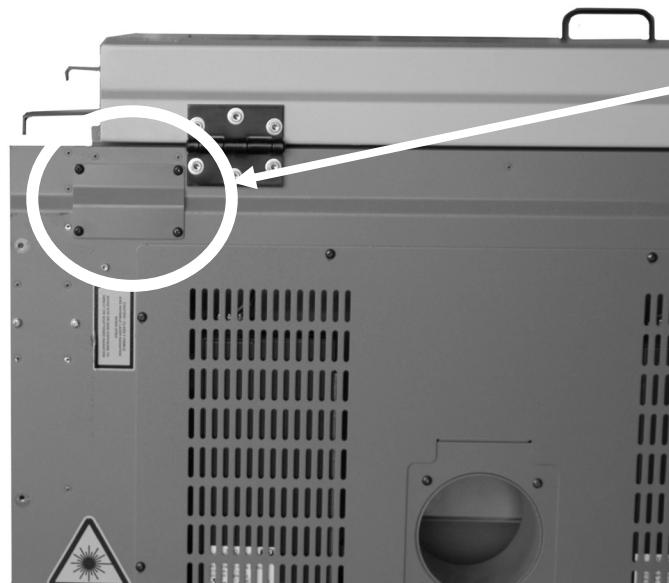
The operator **MUST ENSURE** that all persons present during the performance of this procedure are equipped with adequate eye protection (eyeglasses or goggles), and that no one looks or places any part of his or her body into the path of the laser beam.

Section 2: Set Up

1. Remove right side panel. This panel should already be off if you followed Procedure 2 under G.



2. Remove the small back plate in the upper left corner of the laser.

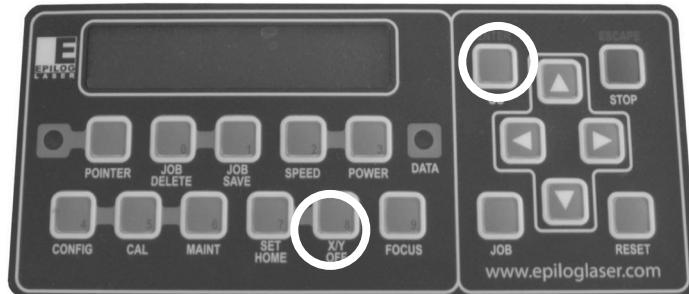


Remove this plate

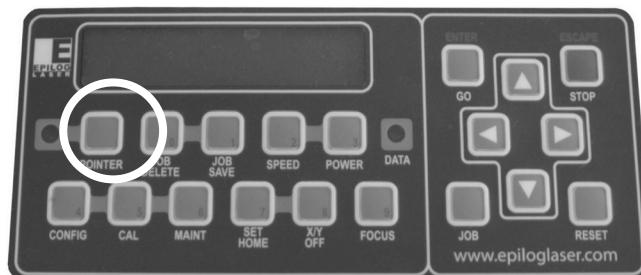
3. Turn the machine on. Wait for the machine to start up.

Section 2: Set Up

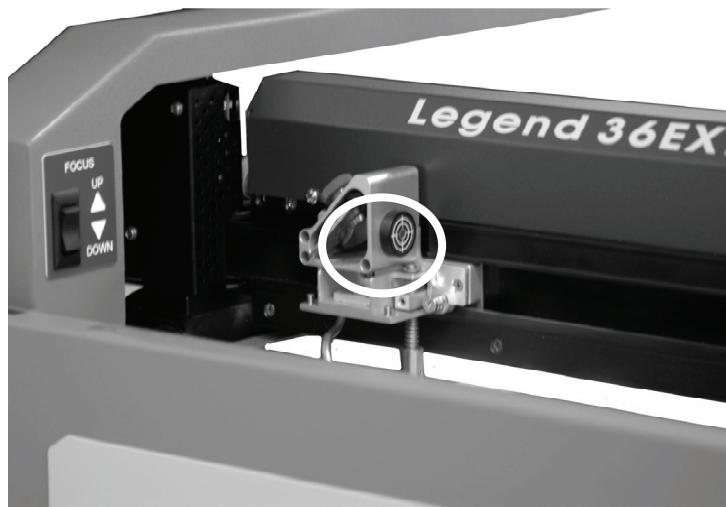
4. Press x/y off button, then when prompted, press go.



5. Press POINTER to turn on the red diode pointer.

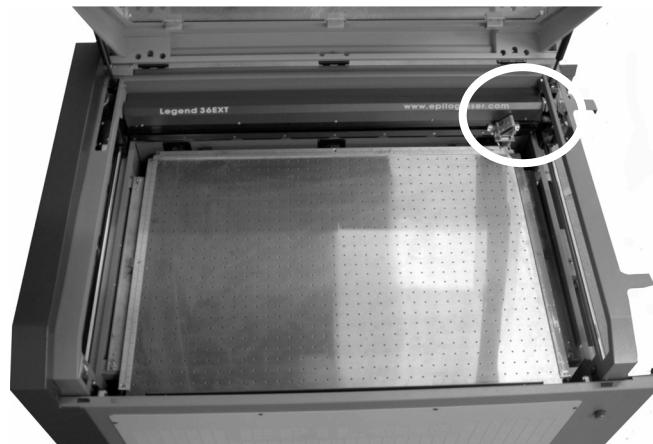


6. Insert a target stop on the right side of the lens assembly.

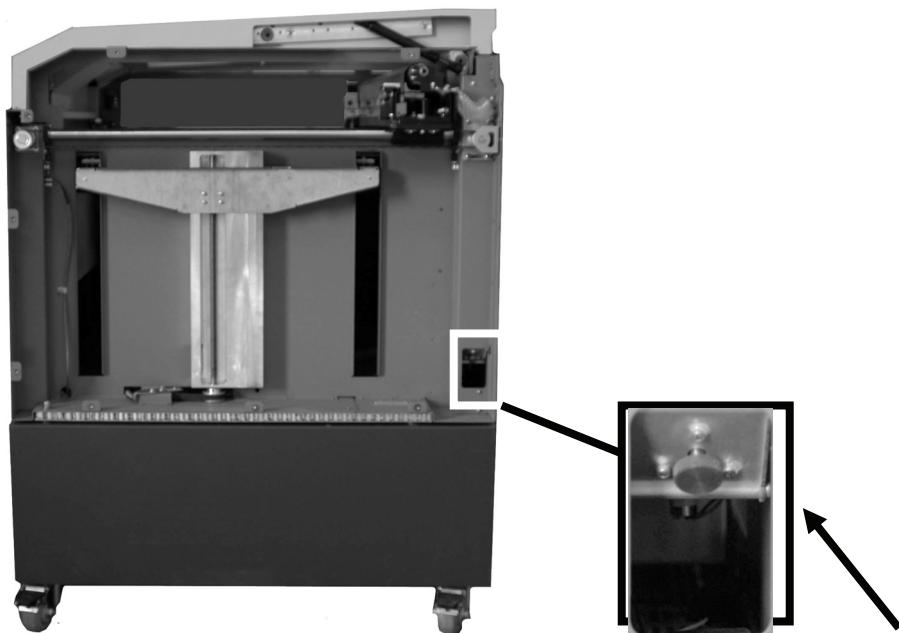


Section 2: Set Up

7. Move the X-beam to the back of the machine and the lens assembly to position 1.



8. The red dot should be in the center of the target. If the red dot is off center, use a 3/32 hex tool to adjust the mirror found at the lower right corner of the machine.

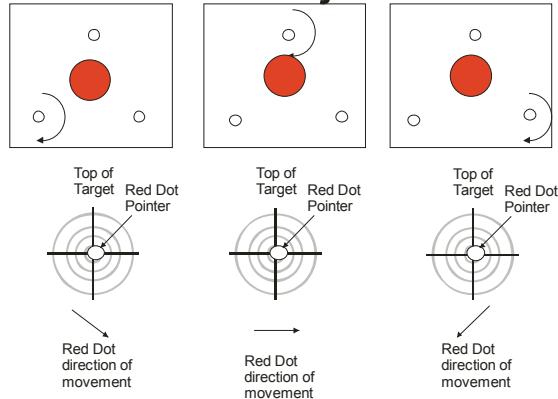


Section 2: Set Up

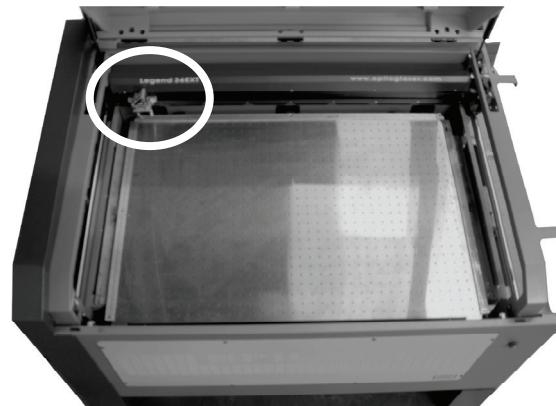
Note: Gently tighten the red mirror holding screw to ensure the mirror does not slip

- Follow the diagram to adjust the mirror:

Position 1 Adjustments

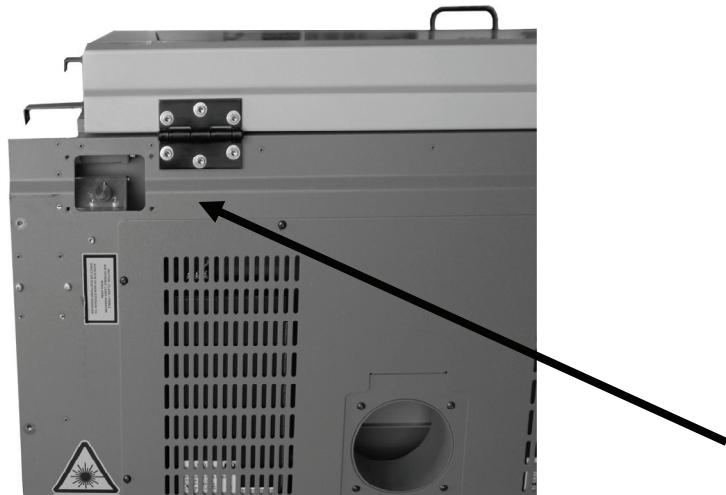


- Move the lens assembly to position 2.



Section 2: Set Up

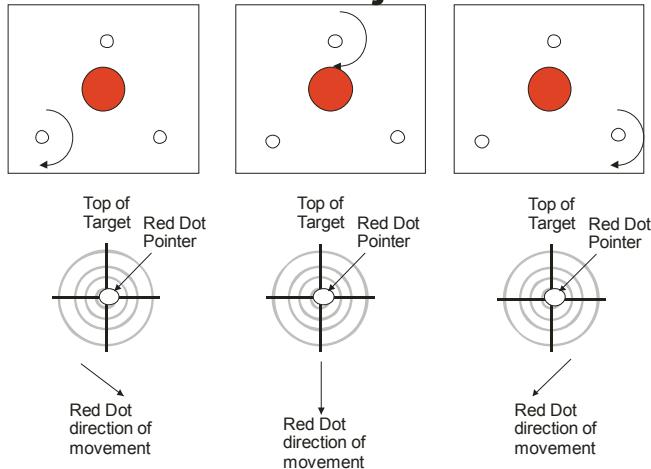
11. If the red dot is off center, use a 3/32 hex tool to adjust the mirror found on the back of the machine, in the upper left corner.



Note: Gently tighten the red mirror holding screw to ensure the mirror does not slip.

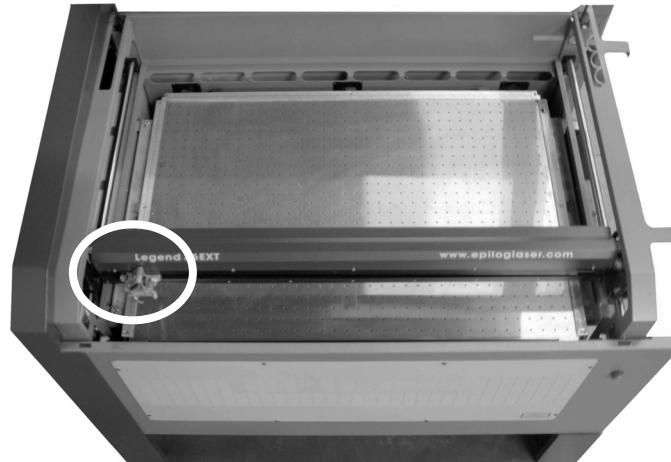
12. Follow this diagram to adjust the mirror.

Position 2 Adjustments

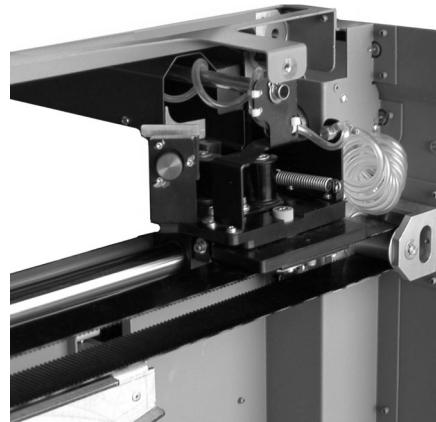


Section 2: Set Up

13. Move the I-beam to the front of the machine and the lens assembly to position 4.



14. If the red dot is off center, use a 3/32 hex tool to adjust the mirror found on the right side of the I-beam.

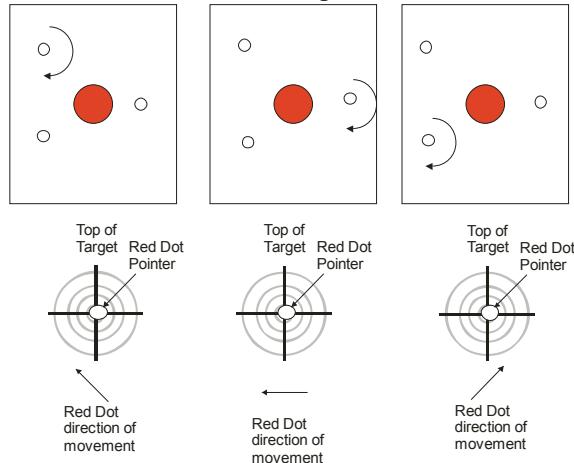


Note: Gently tighten the red mirror holding screw to ensure the mirror does not slip

Section 2: Set Up

15. Follow the diagram below to adjust the mirror.

Position 4 Adjustments



Note: If the machine is aligned in position 4 it should also be aligned in position 3. Repeat steps 7 through 12 until the machine is completely aligned.

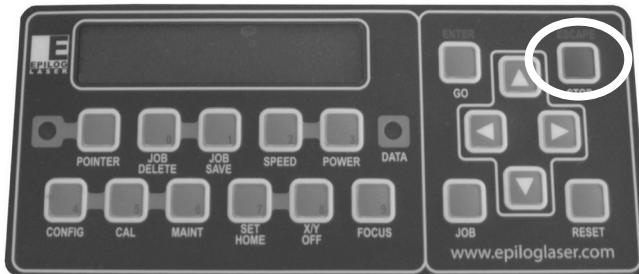
16. Test the laser to ensure alignment.

- Press MAINT then, using the arrow keys, scroll down until prompted for aligning the laser, press GO to accept.



- Place a piece of tape over the target.
- Move the lens assembly to position one.
- Press the up arrow a couple of times. This will make the laser fire.

Section 2: Set Up

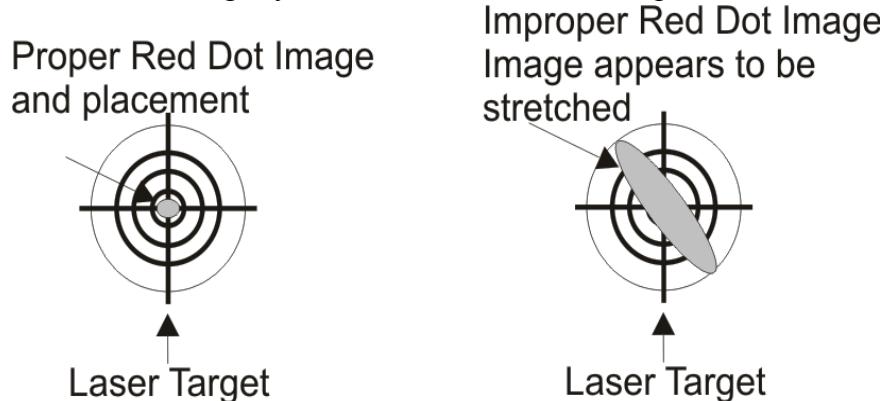


- e) Check to make sure the red dot and the laser fire in the same place. If the laser and red dot do not line up, adjust the mirror at position 1, detailed in steps 7 and 8.
 - f) Replace the tape and move the laser head to position 2. Fire the laser a couple of times to make a mark, checking the position of the laser and the red dot. If the laser and the red dot do not line up, adjust the mirror at position 2, detailed in steps 9 and 10.
 - g) Move the laser head to position 1 and check the location of the laser and red dot. If the laser and red dot are off center, go through steps 13d to 13f.
 - h) Once the laser is aligned in positions 1 and 2, move the laser to position 3. Test the position of the laser and the red dot. If any adjustments are made, repeat step 13 until the machine is aligned.
17. Replace the right side panel.
 18. Remove target stop on the laser head.
 19. Replace the small plate on the back of the machine.

Section 2: Set Up

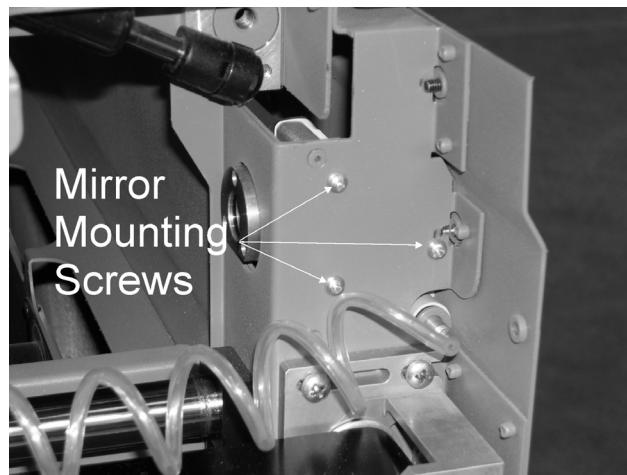
II Procedure: Ensuring correct shape of Red Dot Image

1. Move lens carriage to position 4 of the engraving table (the farthest position from the laser). See diagram at the beginning of this note.
2. Install the laser target that was provided with your engraver, or place a piece of tape over the opening in the lens carriage.
3. Invoke the Red Dot pointer
4. If pointer shape is ANYTHING OTHER THAN CIRCULAR, machine is in need of additional alignment. See diagram below to assist you in determining if your red dot is the correct shape

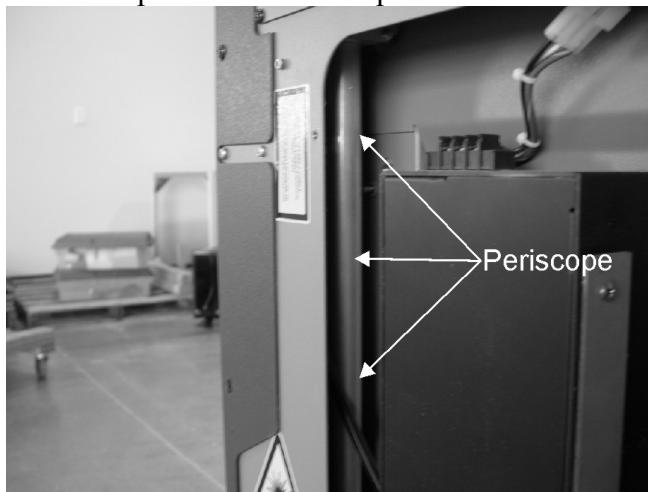


5. If the Red Dot Pointer appears to be circular and is NOT stretched in one direction then please continue with the next procedure: Aligning the EXT.
6. If the Red Dot pointer image appears to be stretched please proceed with next step.
7. Facing the front of the engraver from the front, remove the right hand side panel from the engraver.
8. Remove the Chassis rear panel from the engraver.
9. Locate the upper mirror assembly. The upper mirror assembly is located in the upper right hand corner of the engraver when facing the machine from the front.
10. Loosen all three (3) and then remove two (2) of the mounting screws which secure the mirror assembly to the engravers chassis. Carefully remove the remaining screw, when the last screw is removed the mirror mount will be free of the chassis. Carefully remove the mirror mount from the engraver and place to one side.

Section 2: Set Up

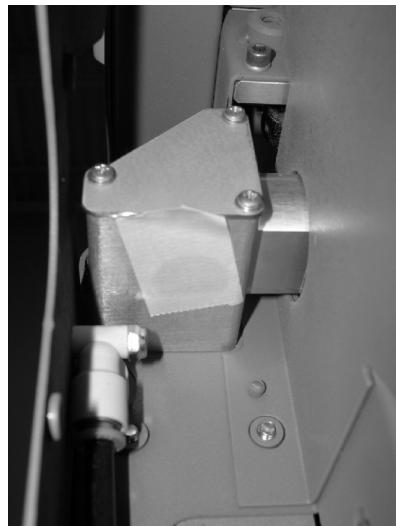


11. Remove the ‘Periscope’ that was directly below the mirror mounted to the chassis. The Periscope is shown in the picture below



12. On the bottom or underside of the Mirror mount there is a small opening. Place a piece of tape over this opening. In this picture the Mirror mount is shown in place. It is easier to place the tape over the opening prior to replacing the mirror mount.

Section 2: Set Up



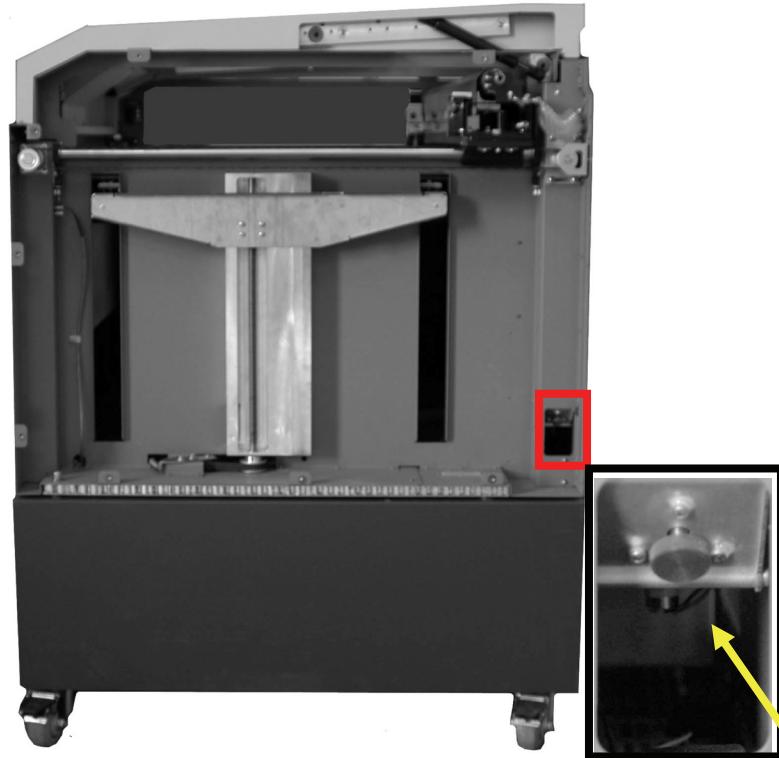
13. Re-install the upper Mirror assembly.
14. Invoke the Red Dot pointer.
15. Face the rear of the engraver and locate the mirror that is just to the right of the laser assembly.

Note: Gently tighten the red mirror holding screw to ensure the mirror does not slip

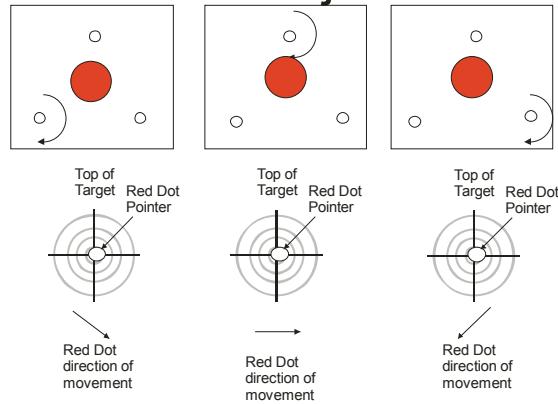
Follow the diagram to adjust the mirror:

16. On the back of the mirror are three (3) Allen screws. These are used to adjust the laser alignment. Turning each of the screws cause a change on the location of the laser beam. See the diagram below for an explanation explaining the movement of the beam based upon which screw is turned.

Section 2: Set Up



Position 1 Adjustments



17. Use these adjustment screws to move the Red Dot pointer image to the center of the opening in the bottom of the mirror housing.
18. Once the Red Dot image is in the center of the mirror mount, shut the engraver off and remove the mirror mount. By removing the upper mirror and mount at this time you may alter the alignment slightly, but not enough to keep you from completing the Alignment procedure. The mounting

Section 2: Set Up

screws have very little “through” room so the mirror mount will go back in very close to the original location.

19. Install the “Periscope” and then the upper mirror mount, use only one mounting screw to secure the mirror mount at this time.
20. Reconfirm that the “Periscope” is in the proper position and install the remaining mirror mounting screws. Once all of the screws are in place, press down on the mirror mount and tighten the mounting screws.

It is very important to reinstall the “Periscope”. Failure to install the “Periscope” reclassifies your engraving system from Class 1 to Class 4. This means that the laser no longer has proper containment around the beam and it is possible for an operator to get in to the beam path.

21. Reboot the engraver and invoke the Red Dot pointer.
22. Is the Red Dot Pointer now circular? If not, this procedure will need to be started again from the beginning of the procedure: Ensuring correct shape of Red Dot Image

Section 2: Set Up

Adjusting laser alignment for perpendicular cuts (EXT ONLY)

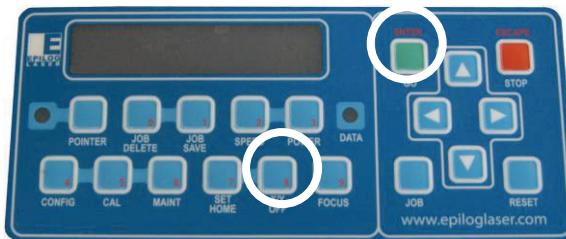
Tools needed:

7/64 Allen wrench (Hex Key)

Alignment target supplied with your engraver

Get Notes of Caution from earlier tech notes.

1. Perform EXT leveling operation prior to starting this procedure.
2. Perform the EXT alignment procedure prior to beginning this procedure.
3. Turn the machine on. Wait for the machine to start up.
4. Press x/y off button then when prompted, press go.

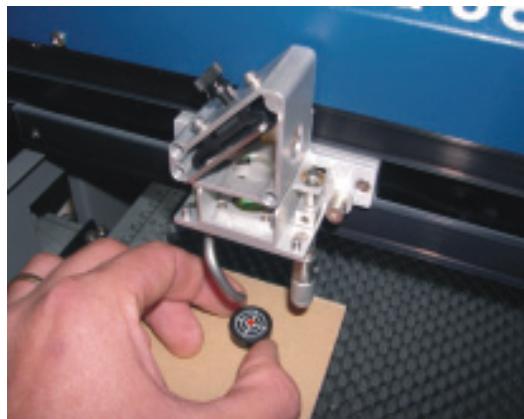


5. Press POINTER to turn on the red diode pointer.



Section 2: Set Up

6. Move the lens carriage out of the home position and position the alignment target, that was supplied with your engraver, on the task plate so that the image projected by the Red Dot pointer is centered on the alignment target. This is shown in the pictures below.



NOTE: It is difficult to see in this picture if printed in black and white, and the Red Dot image was placed in location in Corel since the digital camera would not pick up the Red Dot image. The spot created by the Red Dot pointer is in the center of the alignment target.

7. Using the focus control located inside the engraving cabinet, lower the table. If the Mirror over the lens carriage is properly aligned, the Red Dot pointer will not change locations. If the Red Dot Pointer does change location please continue with this procedure.
8. Using the Three (3) adjustment Allen (Hex) screws on the rear of the lens carriage, make the necessary adjustments to the position of the Red Dot pointer.

Section 2: Set Up



Adjust the Red Dot pointer so that the Red Dot is in the middle of the laser alignment target.

Using the Focus controls located inside the engraving cabinet, raise the table assembly. Verify that the location of the Red Dot Pointer does not change position on the Red Dot. If the Red Dot changes position, please repeat this procedure from the beginning.

Section 2: Set Up

Alignment Mini Engraver

Machine Type: Mini 1812, Mini 2412 and Helix Engraver

Procedure Title: Laser Alignment

Tools Required:
1 Phillips Screw Driver
3/32 Hex (Allen) wrench
Target, was supplied with engraver
Target holder, was supplied with engraver
1 roll of Masking tape

NOTE: DO Not Operate the laser with the side panels off. This alignment procedure is written so the alignment will be performed with out risk of exposure to the laser beam.

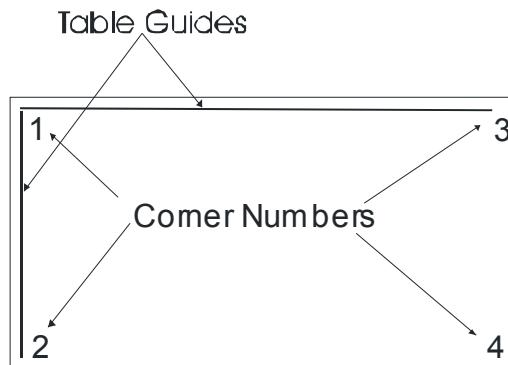


Section 2: Set Up

Some Conventions:

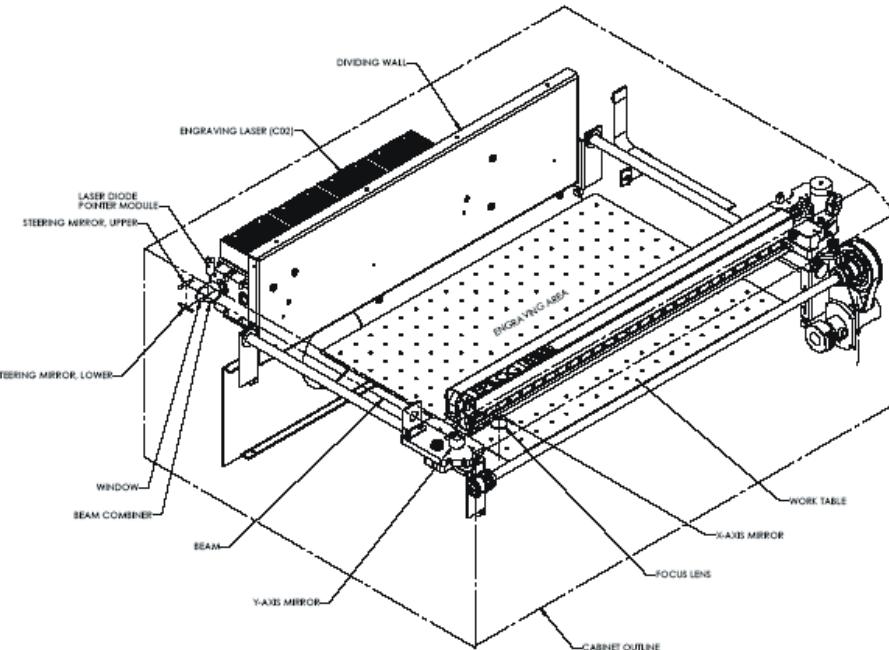
1. The front of the machine is where the control panel is located. When facing the front of the machine, left is your left, and right is your right (toward the control panel).
2. To make the process easier to understand the corners of the engraving area will be labeled as follows:

<u>CORNER</u>	<u>POSITION</u>
Left REAR	1
Left FRONT	2
Right REAR	3
Right FRONT	4



3. The table positions above are listed based on their distance from the laser tube.
4. The laser beam diverges, or spreads out as it travels the distance from the laser tube to the focal lens. Thus the burn marks on the tape WILL get larger the farther the lens is from the laser tube.
5. The Upper Steering mirror adjusts laser positions #1 and #2 primarily. Similarly, the Y-Axis steering mirror adjusts laser positions #3 and #4.

Section 2: Set Up

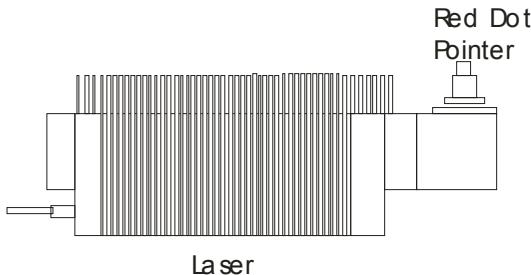


Procedure

1. Set up your Corel page so it is equal to the size of your table.
2. Create a small box $\frac{1}{4}$ inch by $\frac{1}{4}$ inch in the lower right hand corner of Corel page
3. Send this job to the engraver with very low speed and very low power. Because each laser is different, you will need to experiment with power settings needed to mark the tape. Once the job is started be prepared to open the access window to disable the laser beam once the tape starts to discolor. This will limit the amount of burning on the tape and make this process a little easier.
4. Once the tape has discolored, depress the stop button to stop the carriage and then the reset button to move the carriage back to the home position.
5. Depress the X/Y off button and then the Go button to disable the axis. You can now move the X/Y carriage around the 4 corners of the table.
6. Depress the "Pointer" button to invoke the red dot pointer.
7. Move the lens carriage to the lower right hand side of the engraver and inspect the position of the red dot compared to the position of the mark that the laser beam left on the tape. If the laser and the red dot are coaxial or aligned, the red dot will be over the mark left by the laser.
8. If the red dot pointer is over the mark left by the laser, proceed to step 14.
9. If the red dot is not over the mark left by the laser, proceed to the next step.

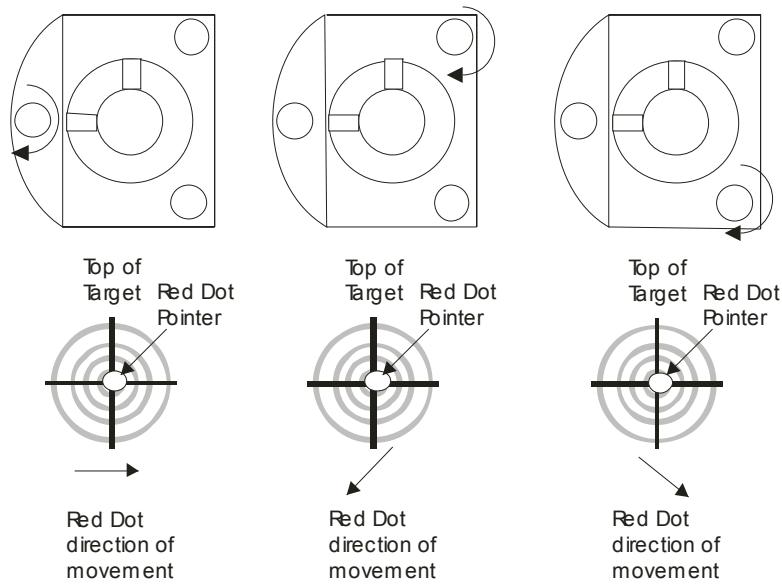
Section 2: Set Up

10. Remove the back panel from the engraver, by removing the 8 #1 Phillips screws which secure the panel in place.
11. Behind this panel you will find the laser tube. On the far right hand side of the laser tube, as you face the engraver from the rear, there is a small gold colored block. There are 2 wires coming out of the top of this block, this is the red dot pointer.



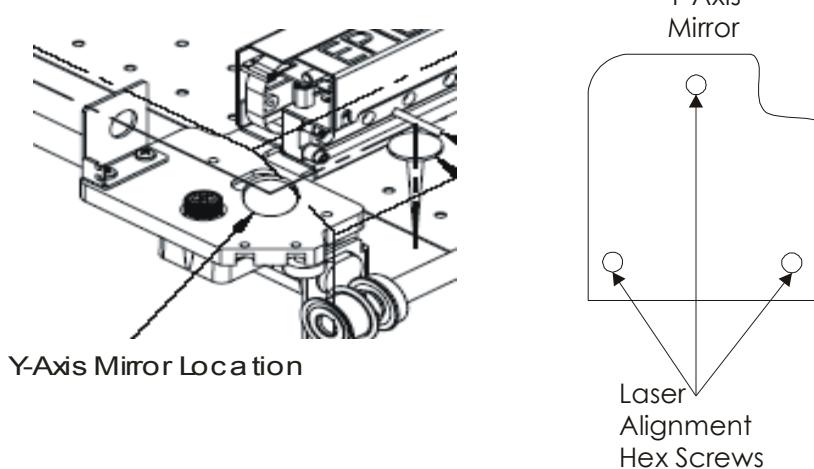
12. The red dot pointer is mounted in an adjustable ring. Around the outside of this ring are three adjustment screws. See below for a diagram of Red Dot pointer adjustments.

Red Dot Adjustment diagram



Section 2: Set Up

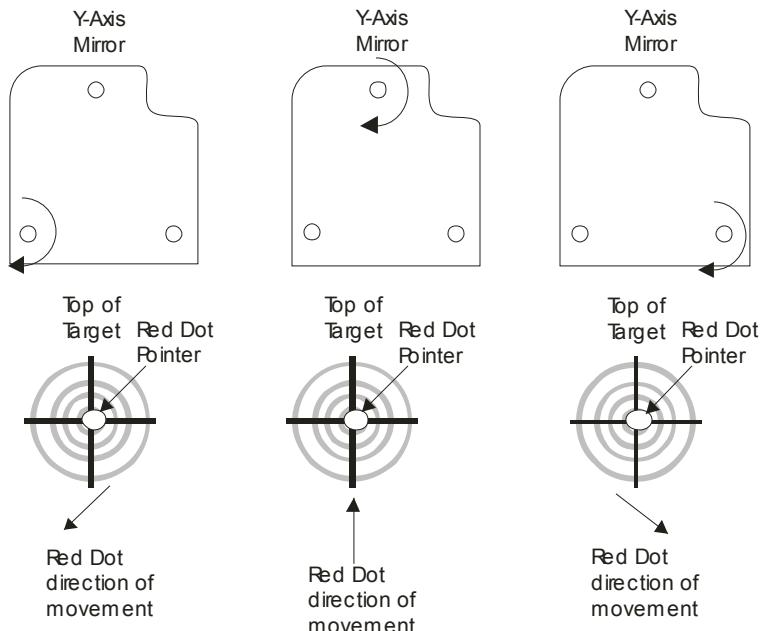
13. Use the adjustment screws located on top of the Red Dot mount to change the position of the Red Dot on the target. Make the necessary adjustments to move the Red Dot pointer over the top of the mark left by the laser. The laser and the Red Dot pointer are now coaxial, or aligned to each other.
14. Remove the left side panel, as you face the engraver from the front, by removing the 6 #1 Phillips screws which secure it in place.
15. Once you have the side panel removed, locate the Y-Axis steering mirror mounted on the left side of the X-carriage.



16. On the back of the mirror mount are three 3/32 Allen (Hex) screws. These screws are used to adjust the engravers alignment. Below is a diagram that explains the direction that the beam will move based upon the direction that the screws are turned.

Section 2: Set Up

Y-Axis Mirror Adjustment diagram



17. Invoke the Red Dot pointer by depressing the “Pointer” button on the engravers display panel.
18. Disable the X/Y axis by pressing “X/Y OFF” and then the “GO” Button. This will allow you to move the lens carriage around the engravers table by hand.
19. Move the lens carriage to table position Number 4. Using the Y-Axis Mirror and the diagram above, move the “Red Dot” to the center of the alignment target. The red dot needs only to be in the inner ring of the target, like what is shown in the diagram above.
20. The next step is to verify the alignment in all 4 corners of the table. Slowly move the lens carriage from corner 3 to corner 4, observing the location of the red dot pointer on the target. The red dot pointer should move very little. On the range of 1/8th of an inch.
21. Next move the lens carriage from corner 1 to corner 3. Again observing the position of the red dot. The red dot should move very little, again on the range of 1/8 of an inch. For most applications this is all that is required.

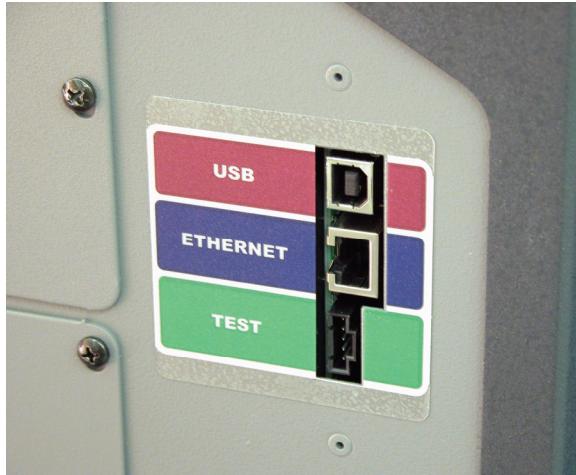
Section 2: Set Up

Connecting the Laser to your Computer



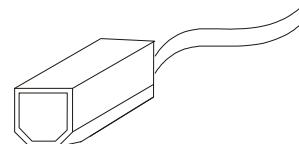
All Epilog systems are designed to be used with Microsoft Windows XP or 2000 operating systems. There are two different methods of connecting the laser to your computer. You can connect to your computer with either an Ethernet cable or a USB cable. **Choose either the USB or Ethernet cable – but do not plug both cables into the laser at the same time!** Many users, especially those that do not have a lot of experience installing printers or other devices to their computers, find the USB cable is the easier method of connection. If your laser is going to be a long distance from your computer, you will be better off using the Ethernet cable. If you are using the USB port, make sure the laser system is turned off before connecting the USB cable from your computer (it doesn't matter if the computer is on or off). For your convenience, Epilog includes both an Ethernet crossover cable and a USB cable in the Accessories kit.

The data port connections are on the back of the machine, towards the bottom right. The drawing below shows the location of the data ports on the laser system.



USB Port

Connect to laser



A USB cable is also included in the accessory kit. The USB port is located on the right side of the machine, near the rear. USB cables have different connectors on each end. Turn the laser *Off*, then connect this end to the laser and connect the other end into any available USB port at the back of your computer. After connecting the USB cable, turn the laser back on.

Section 2: Set Up

Ethernet Port

The Ethernet Port is a standard 10BaseT connection. A crossover cable (included in the accessories kit) plugs into the Ethernet port. The Ethernet port is located on the right side of the machine, near the rear. Your Epilog laser has all of the versatility of a Network capable peripheral. As such, there are many different ways that the laser can be connected to a computer or a network. A direct connection using a crossover cable is the only method that will be described. The crossover cable is identical at both ends. Plug the cable into the Ethernet port on the laser and then plug the other end into the Ethernet port on the back of your computer.

Note: When you turn the laser back on after connecting the USB cable, you should see a little window show up on the lower right of your computer monitor stating that it has “**Found New Hardware**”. Depending on the age of your computer, there is a possibility that you will see a second window with a warning “**!Found New Hardware: A problem occurred during new hardware installation. Your new hardware may not work properly.**” If this second message appears, you must turn off the laser (but not your computer) then turn it back on again. Simply turning the laser off and back on again will now allow your computer to talk to your laser.

Section 2: Set Up

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Section 3: Keyboard Functionality

In This Section

- Software Version
 - Configuration
 - Calibration
 - Maintenance Menu
 - Printing
-

Software Version

Prior to performing any maintenance or repair on an engraver, verify that the engraver is running the latest version of the operating code. The latest version of the operating code and the print drivers can be found on the Epilog website under the Technical Support heading.

When the engraver is first started up, the version of the operating code will be displayed on the LCD panel.

Configuration

S/N of machine

The serial number that is printed on the data plate of the engraver is made up of a number of components. Take the serial number 9 120 -05 0015 3624 as an example:

Section 3: Keyboard Functionality

9 indicates the model series of the engraver. In this case an EXT. If this was an 8 that would indicate that this was a mini series machine.

120 indicates the wattage of the laser installed

05 indicates the year of manufacture

0015 indicates the number of the engraver, the 15 unit built.

3624 indicates the table size of the engraver.

IP Address

This is IP Address of the engraver. This will be different than the IP Address of the PC used to print to the engraver.

Subnet Mask

A subnet (short for "subnetwork") is an identifiably separate part of an organization's network.

Gateway

The Gateway is for use with LAN or small network. If the cross over cable is used to make the connection, the Gateway does not need to be set.

Load Flash Jobs:

The Load Flash Jobs default is No.

If default is set to “No” then when the engraver is booted up, the flash jobs will not load.

If the default is changed to Yes, then the flash job will load at boot up.

Auto Focus

The Auto Focus default is “Yes”.

With this heading set to “No” the Auto Focus will not operate.

Section 3: Keyboard Functionality

Air Assist

The Air Assist can be set to four (4) different operating conditions:

Both: When this heading is set to “BOTH” the air assist will operate during both the Raster and the Vector portions of the print job.

Vector: When this heading is set to “Vector” the air assist will only operate during the Vector portions of the job. Most common selection

Raster: When this heading is set to “Raster” the air assist will only operate during the raster portions of the job.

Off: Turns the Air assist off entirely. Air Assist will not operate with either the Vector or the Raster portion of the job.

Save Changes:

To Save Changes: If you want to save any of the changes you have made, depress the “GO” button.

To disregard any changes that may have been made, depress the stop button. This will close the menu without saving the changes.

Calibration

Table Size

Sets the table size on the control board to the same size as the engraver.

X-Home

Sets the X-Axis home position of the engraver.

These values are set at the factory and should not need adjustment at the time of set up.

Section 3: Keyboard Functionality

Home must be checked if any of the following maintenance or repair steps are taken:

- X-Axis home switch is replaced
- X-Axis rail is removed
- Table Assembly is removed
- Table guides are removed

The numbers expressed in this menu represent 0.001 inches or 0.025mm

Y-Home

Sets the Y-axis home position of the engraver.

This value is also set at the factory, and should not need adjustment at the time of set up.

Home must be checked if any of the following maintenance or repair steps are taken

- Y-Axis home switch is replaced
- X-Axis rail is removed
- Table Assembly is removed
- Table Guides are removed

Home must also be checked if the table, or the table guides have been removed for any reason

The numbers expressed in this menu represent 0.001 inches or 0.025mm

X R Home

Sets the X-Axis home position for the rotary device.

This value is set at the factory and should not need adjustment at the time of set up.

Home must be checked if any of the following maintenance or repair steps are taken.

- X-Axis Home switch is replaced
- X-Axis is removed

Section 3: Keyboard Functionality

- Table Assembly is removed

Y R Home

Sets the Y-axis home position for the rotary device

This value is set at the factory and should not need adjustment at the time of set up.

Home must be checked if any of the following maintenance or repair steps are taken

- Y-Axis home switch is replaced
- X-Axis is removed
- Table assembly is removed

Laser Match

Typical setting is -1 or -2

Set at the factory and should never need adjustment.

Encoder Match

This setting is used to match or align the encoder signals coming from the linear encoder and the rotary encoders

X-Encoder Match: up and down arrows on the display to make changes to the settings. Depress the “Go” button to save any changes you have made.

Y-Encoder Match: This setting is used to set the scale of the Y-axis. Can be used to increase or decrease the image size in the Y-axis.

Encoder Match: is used to achieve high level of accuracy in the Y-axis.

Focus Adj

This is used to adjust the distance between the lens and the work piece.

The numbers in this menu equal 0.001 inches or 0.025 mm.

Section 3: Keyboard Functionality

Maintenance Menu

Depress the Maintenance key to invoke the Maintenance menu.

Laser Alignment (EXT only)

This heading is used to invoke the Alignment mode of your EXT laser engraver.

- Depress the go key to initiate the alignment mode
- Press the up key to fire the laser.
- Access window must be closed to fire the laser. This is done for safety purposes.
- Over head door must also be closed to fire the laser. This is done for safety purposes.
- To perform alignment procedure, please see the instructions above or that are included in the Reference materials provided.

Job Save feature

This can be used to permanently store job data in the engraver.

- To save a job in memory, have the job displayed on the LCD display and depress “Job Save” on the keyboard.
- To load a saved job, change the default from “No” to “Yes” and reboot the engraver. This is the only way to load saved jobs.
- Saved job size is limited to 2meg per job and 10 jobs total.
- The last job saved will be the first to be displayed.

Job Delete feature

This can be used to delete jobs from permanent storage

Bring the job you want to delete in to the LCD display and depress “Job Delete” on the Keyboard. The next time you boot up the engraver, the job that was deleted will not be displayed.

Section 4: Troubleshooting/ Repair

In This Section

- Engraver Boot Sequence
 - Power Supplies
 - X-Axis
 - Y-Axis
 - Laser
 - Table
 - Controller Assembly
 - Troubleshooting Aids
 - Reference Material Printer
 - Parts Usage Guides
-

Engraver Boot Sequence

It is very important to understand the starting sequence of the engraver.

The following steps take place when the engraver is first powered up.

- The 48VDC power supply provides power to the controller assembly
- The controller board then steps the 48 VDC down to 5VDC.
- The 5VDC is then stepped even further, providing the rest of the voltage ranges required to operate the engraver, 3.3VDC, 2.5VDC and 1.3VDC
 - **48VDC provides power to the following components:**
 - Laser tube
 - Control board regulators
 - Fan assemblies
 - Air Assist Solenoid

Section 4: Troubleshooting/Repair

- **5 VDC provides power to the following components:**
 - Motors; X, Y and Z
 - Control board processor
 - LCD Panel
 - Red Dot Pointer
 - Encoder Readers
- **3.3VDC, 2.5 VDC and 1.3VDC** are used by components on the control board.
- **Voltage Regulator:** If there is a failure in the voltage regulator the engraver will not boot and the table will rise until the engraver is powered down or the table reaches the upper limit.

The CPU will turn on in a couple of seconds, and the engraver will “BEEP” and the initialization will begin

- Y-Axis travels to the rear of the engraver
 - If you hear the “BEEP” but the Y-Axis does not start to move to the rear check the following:
 - Y-Motor
 - Y-motor amplifier
 - Controller Board
- Y-Axis finds its home position
 - If the Y-axis moves to the rear and the lens carriage does not start to move immediately, the y-axis has not found its home position.
 - If the Y-axis has moved to the rear, but the X-axis does not start to move immediately check the following items:
 - Y-Axis home switch: this can be tested by placing a magnet under the switch while the Y-axis is moving to the rear of the engraver. If the switch is working, the Y-Axis will stop moving and the X-axis will start to move to the left.
 - Y-Axis flex cable: Not likely to fail, but part of the circuitry for the Y-Axis home switch.
 - The problem may be in the X-Axis. Check the following components:
 - X-Motor: Check X-Motor windings with Ohm meter. If “Open” then the motor needs to be replaced.
 - X-Axis Amplifier: EXT Only.
 - For Mini machines replace the controller board Controller board
- X-Axis starts to move to the left to locate it home position:

Section 4: Troubleshooting/Repair

- If the X-axis moves to the left, but does not stop until it reaches the limit of its travel, check the following component:
 - X-Axis home switch:
 - This can be tested by placing a magnet under the switch, after the Y-axis has found home, but before the X-axis moves all the way to the left.
 - If the switch is working, the lens will stop immediately and the rail will move forward to the home position. Understand that this is not the correct home position.
 - All you have done is confirm the operation of the X-Axis home switch.
 - Reboot the engraver to establish the “true” home position.
 - Once the X-axis has found its home position, the sequence will start again from the “Find Y-Axis home”. This is done for consistency in the home position.
 - If either Axis “slams” during the boot sequence, it indicates a problem in the encoder of the axis that slammed.

Power Supplies

- 48V, 600 Watt Power Supply used in 35, 40 and 45 watt machines.
- 48V, 600 Watt x2 Power Supplies used in 60 and 75 watt machines.
- 48V, 600 Watt x4 for 120 watt machines (EXT Only)
- 48VDC provides power to the following components:
 - Laser tube
 - Control board regulators
 - Fan assemblies
 - Air Assist Solenoid
- 5 VDC provides power to the following components:
 - Motors; X, Y and Z
 - Control board processor
 - LCD Panel
 - Red Dot Pointer
 - Encoder Readers

Section 4: Troubleshooting/Repair

- 3.3VDC, 2.5 VDC and 1.3VDC are used by components on the control board.
 - If there is a failure in the Voltage Regulator:
 - The engraver will not complete the boot sequence.
 - The table will rise until it reaches its upper limit or rail assembly.

Y-Axis

EXT Home Switch

- Located on the LF012 Board located near the X-Motor
- Troubleshooting:
 - Typical Failure mode, Y-axis does not stop moving when switch passes by the magnet
 - Very low failure rate
 - Switch can be tested by placing a magnet over the switch during the boot sequence.
 - If the rail stops moving to the rear and the Lens carriage starts to move to the left, the switch is working.
 - If the rail DOES NOT stop moving when the magnet is placed next to the switch, the needs to be replaced.

Mini Y-Axis Home Switch

- Encoder reader and Encoder Strip:
 - Used for all engraving applications
 - Troubleshooting:
 - Not a common failure
- Failure mode is usually indicated by erratic operation in the Y-Axis.
 - Can appear as a jump forward in the image or gaps in the engraving from top to bottom.
 - Only way to test is to replace the encoder reader.

Section 4: Troubleshooting/Repair

- The Encoder strip does not fail, it is a passive device. It can be damaged though by cleaning with aggressive solvents or using an abrasive cleaner on the strip.

Flex Cable

- Used for all Y-Axis movements
- Troubleshooting:
 - Because of the minimal movement of the Y-Axis the Y-Axis flex cable is not an item that fails often.
 - Like the X-Axis flex cable, the Y-Axis can be turned around.
 - The flex cable is the same on both ends. This allows us to switch the direction that the cable runs. Many times this is the easiest way to test the functionality of the flex cable.
 - The flex cable can be tested electrically.
 - Test for continuity while moving flex cable around.
 - It is important to move the cable around while testing. If there is a break in the conductor, testing the flex cable in a static manner may result in an inaccurate continuity test.

X-Axis

Home Switch

- Used only when engraver is first started up to establish the engravers X-Axis home position.
- The switch can be tested by placing a magnet under the switch during the boot sequence.
- If magnet is working, lens will stop moving to the left, the rail will move forward and the lens will move to the right.

Bearing

- **Bearing failures typical failure mode:**
 - Edges of letters are not sharp

Section 4: Troubleshooting/Repair

- There is some variation in the engraving when the head switches direction.

➤ **To Test the IKO bearing:**

- Move the art work to the right hand side of the machine away from the areas of high use.
- Run a print job using Time New Roman, or a similar font with Serifs.
- If the appearance of the print job improves then the rail needs to be replaced.
- If there is no improvement in the image, the problem is not bearing related.

Flex Cable

- **The flex cable is the same on both ends.** This allows us to switch the direction that the cable runs. Many times this is the easiest way to test the functionality of the flex cable.
- **The flex cable can be tested electrically.**
- Test for continuity while moving flex cable around.
 - It is important to move the cable around while testing. If there is a break in the conductor, testing the flex cable in a static manner may result in an inaccurate continuity test.

X-Motor

- **Helix, Mini 1812 and Mini 2412:**
- Encoder is no longer included on the motor
- **Helix, Mini 1812 and Mini 2412 Failure mode:**
- Motor shaft will not turn; seized bearing; replace motor
 - Motor shaft turns but motor will not power up. Winding has failed.
 - Can be tested via continuity; open shows failed motor.
 - If the motor shows that it has continuity then it is assumed that the motor is good.

Section 4: Troubleshooting/Repair

➤ **EXT Only:**

- Rotary Encoder is integrated on Motor
 - Used for:
 - Boot up
 - All X-axis move commands
- Linear encoder:
 - Used for:
 - Pulsing of the laser.

➤ **EXT Only Failure Mode:**

- The motor shaft will not turn (motor must be removed from machine or X-Axis belt is disconnected) Bearing Failure; replace motor.
- Motor shaft turns but motor will not power up. Winding has failed.
- Can be tested via continuity; open shows failed motor.
- If the motor shows that it has continuity then it is assumed that the motor is good.

Encoder Reader assembly

- Performs 3 distinct functions for engraver
- Encoder Reader:
 - Reads the marks on the encoder strip for proper pulse timing of the laser tube.
- X-Axis Home switch:
 - Located on this board, see above for explanation of X-Axis home switch
- Auto Focus Sensor: The Auto focus sensor is located on this board.
 - Failure modes are:
 - Table comes up and does not stop Auto focus sensor has failed
 - Table comes up, reverses direction, but does not stop on the way down. Motor encoder has failed, replace motor.

Section 4: Troubleshooting/Repair

- Table comes up. Reverse direction, and stops but does not stop in the correct location. Auto Focus settings need to be adjusted. See tech note for adjusting auto focus

Encoder Strip

- Used for pulsing of the laser.
- Troubleshooting:
 - Visually inspect the encoder strip for scratches
 - Visually inspect the encoder strip for missing, or damaged, printed areas
 - Visually inspect the encoder strip for kinks or rub marks where the encoder reader has been rubbing against it. This will remove the encoder marks from the strip.

X-Axis Amplifier

- Does not fail often
- Only way to test is to exchange amplifiers
- Y-Axis amplifier can be swapped to X-Axis for testing purposes.

Laser

Power testing when laser is installed in machine

See Tech note in reference materials.

No Output

- Invoke Red dot pointer to ensure optical path is not obstructed.
 - If the red dot pointer appears at the work piece the optical path is not obstructed.
 - If the red dot pointer does not appear on the work surface, ensure that the red dot pointer is operational.

Section 4: Troubleshooting/Repair

- If the red dot is operational, but still does not appear at the work surface, the optical path is blocked, or a mirror has degraded to the point that it can not reflect the beam.
- Inspect each of the Mirrors in the optical path.
 - The mirrors should have a uniform amber color across the entire surface.
 - Flaking along the edge of the mirror is a normal part of the aging process and will not affect mirror performance until the damage reaches where the laser strikes the mirror.
 - There is a coating that is applied to the mirrors. This does come off over time. When the coating comes off the mirrors, they need to be replaced.
- Inspect the lens.
 - Make sure that the lens is clean and free of large scratches.
 - The lens also has a coating applied, when this coating starts to come off, it is time to replace the mirror.
- Remove the side cover and expose the controller board. On the controller board are two (2) indicator LED's; D8 and D9.
 - These will light up when the door interlocks are closed.
 - If these indicator LEDS are not on the laser will not fire even in alignment mode.
 - If the LEDs are not on check the following:
 1. Door magnets. These do sometimes come out.
 2. Door interlock switches.
 3. Controller board
- On the controller board is a Lase indicator LED (D10). This LED will flash when the laser is to fire. If this LED is not flashing when the laser is to fire, there is no signal coming form the controller board telling the laser to fire or the LED has failed. This does occur periodically.
 - If the lase indicator LED will not come on, run something like a black filled box. This is a very simple job and will eliminate art work as a source of the problem.
 - If the Lase indicator LED will still not come on, replace the controller board.
 - Check the laser harness. Disconnect and then reconnect the signal harness (the one that looks like a phone connection) to the laser tube.

Section 4: Troubleshooting/Repair

- If the laser will still not fire at this point, the laser tube must be replaced.\

EXT ONLY LASER NO OUTPUT NOTES:

Invoke alignment mode and manually fire the laser.

- Laser fires in alignment mode:
 - If the laser will fire in Vector mode, but not Raster mode, trouble shoot X-Axis.
 - If the linear encoder and the rotary encoder on the motor do not match, the laser will not fire.
 - If the laser will not fire in Vector mode, continue with troubleshooting process.
- No output
 - 35 to 75 watt lasers. No output replace the entire laser assembly
 - 120 watt lasers.
 - No output typically is RF related.
 - No laser output in alignment mode is most often RF related.
 - Low Output in typically laser tube related.

Low Output

- Inspect each of the mirrors in the optical path. The mirrors will have a uniform amber color across the entire surface. It is acceptable to have small black spots on the mirror this is a normal part of the aging process.
- Inspect the lens to ensure that it is clean and free of spots
- Check the quality of the focus. Raise and lower the table slightly, see if the intensity of the laser on the work surface improves.
- Check the alignment of the engraver. For the maximum amount of power to be delivered to the work piece the laser must be well aligned.

Section 4: Troubleshooting/Repair

Table

Lowering the table

In the event of a catastrophic failure (table runs in to Auto Focus Plunger/X-axis rail)

Table rocks front to back

- If by pressing slightly on the task plate or vector grid the Table Lifting guides need to be tightened.
- This may appear very similar to an alignment issue, because the image will fade as the engraver comes out of focus.
- Auto Focus may need to be reset once the table assembly is tightened.

Table will not Auto Focus on thin material

- The table is out of adjustment
- In each of the four corners of the table, there are two screws. One is to secure the table. The other is to raise the table mechanism.
- Loosen the fixing screw, and tighten the lifting screw to raise the table and loosen the lifting screw to lower the table.
- Tighten the fixing screws
- Place the manual focus gauge on the lens carriage.
- With the Focus Gauge in place, move the lens carriage around the four corners of the table, ensuring that the Focus Gauge stays in contact with the table at all times.
- If the Focus gauge does not stay in contact, raise or lower the table as necessary.
- Readjust the Auto Focus for best focus.

Section 4: Troubleshooting/Repair

Table is not level side to side:

- Place the Manual Focus Gauge on the lens carriage and raise the table until the focus gauge touches the table surface.
- Shut the engraver down.
- Remove the side panels from the engraver.
- Loosen the Z-Axis drive belt.
- Determine which side needs to be adjusted.
- With the belt loose, raise or lower the table so that each side is at the same height.
- Use the Manual Focus Gauge as your reference
- Once the table is at the correct height retighten the Z-Motor drive belt.
- Be sure that when the tension is applied to the belt that the table height does not change.

Controller Assembly

DO NOT ATTEMPT TO MAKE REPAIRS TO CONTROLLER BOARDS.

UNAUTHORIZED REPAIRS MADE TO CONTROLLER BOARDS WILL RENDER YOUR WARRANTY NULL AND VOID.

EXT Code VS Helix/Mini code

The XS002 control board can be used in either the EXT or the Mini/Helix product line. The difference is the code that is used to operate the engraver.

- A control board with EXT code can not be used in a Mini/Helix machine.

Section 4: Troubleshooting/Repair

- A control board with Mini/Helix code can not be used in an EXT machine.
- In the event that you install an EXT control board in to a Mini machine the following statement will be displayed on the LCD: “SYSTEM ERROR”. Install a control board that has the EXT code already loaded, or reprogram the control board with the proper operating code.

Testing Ethernet connection:

- Open the DOS prompt
- Enter the command: ping + (IP Address of the engraver)
- If request times out, you do not have a connection
- If you have a connection you will receive 4 replies stating the number of packets sent and the number of packets received.

Section 4: Troubleshooting/Repair

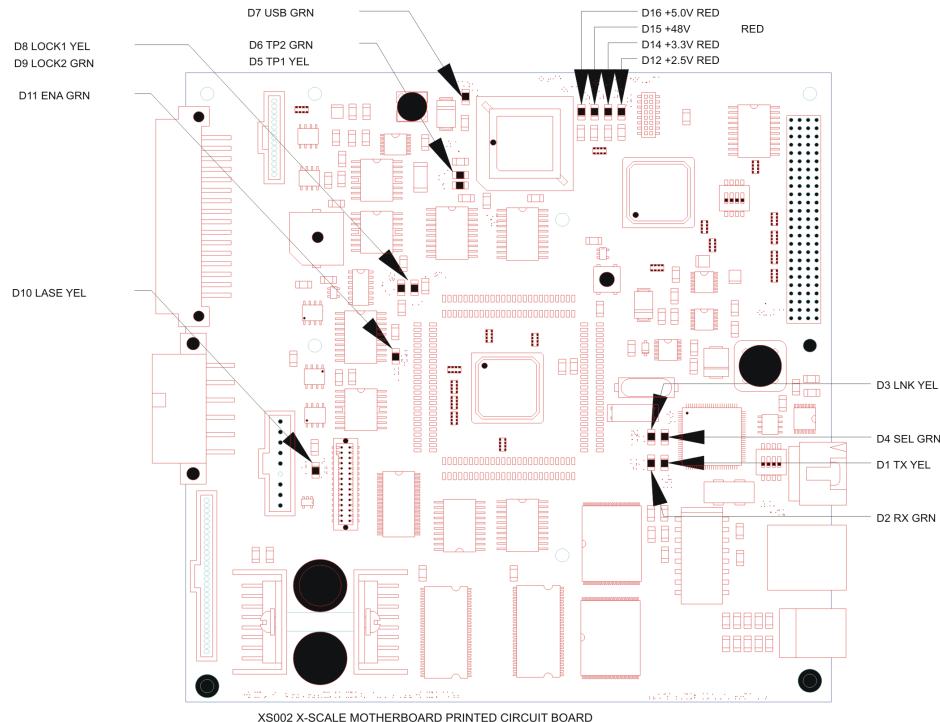
Controller Board Built in Diagnostics and Test Switch Functions

Mini 18, Mini 24 and HELIX (XS002) STATUS LED (STATUS LIGHT) AND TEST POINT LOCATIONS

BOARD DESIGNATOR	LED COLOR	DESCRIPTION OF LED STATUS OR FUNCTION
D1	YELLOW	LED ON WHEN ETHERNET PORT CONTROLLER IS TRANSMITTING DATA
D2	GREEN	LED ON WHEN ETHERNET PORT CONTROLLER IS RECEIVING DATA
D3	YELLOW	LED ON WHEN ETHERNET PORT CONTROLLER LINK INTEGRITY IS ESTABLISHED
D4	GREEN	LED ON WHEN ETHERNET PORT CONTROLLER BOARD SELECT IS ACCESSED
D5	YELLOW	LED STATUS OF TEST SWITCH FUNCTION <small>(SEE TEST SWITCH AND STATUS LEDS DOCUMENT)</small>
D6	GREEN	LED STATUS OF TEST SWITCH FUNCTION <small>(SEE TEST SWITCH AND STATUS LEDS DOCUMENT)</small>
D7	GREEN	LED ON WHEN USB PORT CONTROLLER IS ACTIVATED
D8	YELLOW	LED ON WHEN INTERLOCK SWITCH (LOCK1) IS CLOSED (WINDOW CLOSED)
D9	GREEN	LED ON WHEN INTERLOCK SWITCH (LOCK2) IS CLOSED (WINDOW CLOSED)
D10	YELLOW	LED ON WHEN LASER TUBE CONTROL SIGNAL IS ACTIVE (TUBE FIRING)
D11	GREEN	LED ON WHEN CIRCUIT BOARD ENABLE CIRCUIT IS ENABLED AFTER BOOTUP
D12	RED	LED ON WHEN +2.5 VOLTS DC IS PRODUCED BY ON BOARD REGULATOR
D14	RED	LED ON WHEN +3.3 VOLTS DC IS PRODUCED BY ON BOARD REGULATOR
D15	RED	LED ON WHEN +4.8 VOLTS DC IS PRESENT FROM OFF BOARD POWER SUPPLY
D16	RED	LED ON WHEN +5.0 VOLTS DC IS PRODUCED BY ON BOARD REGULATOR

NOTES:

D12, D14, D15 AND D16 VOLTAGE STATUS LEDS ONLY INDICATE THAT VOLTAGES ARE PRESENT ON THE POWER BUS. THEY DON'T INDICATE THAT THE VOLTAGES ARE AT THE CORRECT LEVELS.
MEASUREMENT OF THESE VOLTAGES USING A VOLTAGE METER IS REQUIRED TO VERIFY CORRECT LEVELS.



Section 4: Troubleshooting/Repair

Mini 18, Mini 24 and HELIX CONTROLLER BOARD (XS002) TEST SWITCH AND TEST STATUS LEDS (LIGHTS)

SW2 LEVERS				LED D5 ON YELLOW	LED D6 ON GREEN
1	2	3	4		
OFF	OFF	OFF	OFF	FUNCTION DISABLED	FUNCTION DISABLED
ON	OFF	OFF	OFF	X AXIS ENCODER CHA	X AXIS ENCODER CHB
OFF	ON	OFF	OFF	Y AXIS ENCODER CHA	Y AXIS ENCODER CHB
ON	ON	OFF	OFF	TABLE ENCODER CHA	TABLE ENCODER CHB
OFF	OFF	ON	OFF	X AXIS AT HOME	Y AXIS AT HOME
ON	OFF	ON	OFF	FOCUS PLUNGER UP	TABLE DOWN SWITCH
OFF	ON	ON	OFF	UNDEFINED-NOT USED	25 WATT JUMPER IN
ON	ON	ON	OFF	UNDEFINED-NOT USED	UNDEFINED-NOT USED

DETAIL DRAWING A
NOT TO SCALE

SW2
SWITCH

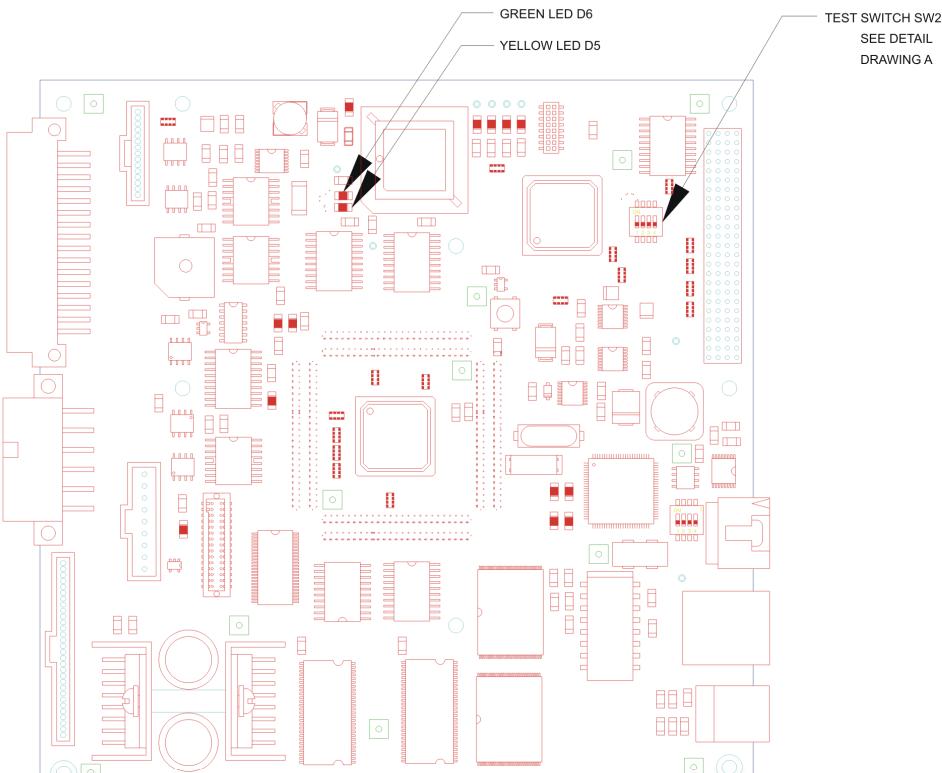


LEVER 1 SHOWN IN
THE "ON" POSITION.
LEVERS 2,3,4 SHOWN
IN THE "OFF" POSITION.

NOTES:

SET THE FOUR LEVER POSITIONS LISTED IN THE ABOVE TABLE TO
DISPLAY THE STATUS OF THE SIGNALS ON LED LIGHTS D5 AND D6.

SET ALL FOUR LEVER POSITIONS TO THE "OFF" POSITION TO DISABLE
THIS TEST FUNCTION AND USE THE ENGRAVER FOR NORMAL ENGRAVING.



XS002 X-SCALE MOTHERBOARD PRINTED CIRCUIT BOARD
FLASH FIRMWARE REVISION: 1.0.0.2

FILENAME: XS002SW1.DWG M. WEIR 040804

Section 4: Troubleshooting/Repair

**EXT ONLY CONTROLLER BOARD
(XS002) TEST SWITCH AND TEST STATUS LEDS (LIGHTS)**

SW2 LEVERS				LED D5 ON YELLOW	LED D6 ON GREEN
1	2	3	4		
OFF	OFF	OFF	OFF	FUNCTION DISABLED	FUNCTION DISABLED
ON	OFF	OFF	OFF	X AXIS LINEAR ENCODER CHA	X AXIS LINEAR ENCODER CHB
OFF	ON	OFF	OFF	Y AXIS ENCODER CHA	Y AXIS ENCODER CHB
ON	ON	OFF	OFF	X-MOTOR ROTARY ENCODER	X-MOTOR ROTARY ENCODER
OFF	OFF	ON	OFF	X AXIS AT HOME	Y AXIS AT HOME
ON	OFF	ON	OFF	FOCUS PLUNGER UP	TABLE DOWN SWITCH
OFF	ON	ON	OFF	UNDEFINED-NOT USED	25 WATT JUMPER IN
ON	ON	ON	OFF	UNDEFINED-NOT USED	UNDEFINED-NOT USED

DETAIL DRAWING A
NOT TO SCALE

SW2
SWITCH

LEVER 1 SHOWN IN
THE "ON" POSITION.
LEVERS 2,3,4 SHOWN
IN THE "OFF" POSITION.

NOTES:

SET THE FOUR LEVER POSITIONS LISTED IN THE ABOVE TABLE TO DISPLAY THE STATUS OF THE SIGNALS ON LED LIGHTS D5 AND D6.

SET ALL FOUR LEVER POSITIONS TO THE "OFF" POSITION TO DISABLE THIS TEST FUNCTION AND USE THE ENGRAVER FOR NORMAL ENGRAVING.

XS002 X-SCALE MOTHERBOARD PRINTED CIRCUIT BOARD
FLASH FIRMWARE REVISION: 1.0.0.2

FILENAME: XS002SW1.DWG M. WEIR 04/08/04

Section 4: Troubleshooting/Repair

Reference Material

Core Charges

EXT Core Charges

EXT Core Charge Sheet

Part Number	Part Description	Core Charge	Model
AS0804524-11-M-01TS	MINI 24, 45 WATT LASER BRACKET - TS	\$500.00	36EXT
AS0900A36-08A-M-01TS	36EXT X-Axis Beam Assy	\$800.00	36EXT
AS0900A36-08-M-01TS	36EXT X-Axis Motor Assy	\$100.00	36EXT
AS0900A36-09-M-01TS	36EXT Y Motor Assy	\$200.00	36EXT
AS0900H36-11-M-01TS	EXT Power Supply for 60-75 Watts	\$400.00	36EXT
AS0900L36-11-M-01TS	EXT Power Supply for 30-45 Watts	\$250.00	36EXT
AS090HL36-15-M-01TS	EXT Laser Bracket for 40-45 & 75 Watts	\$500.00	36EXT
AS090HL36-15-M-02TS	EXT Laser Bracket for 30-35 & 60 Watts	\$300.00	36EXT
AS0912036-11-M-01TS	EXT Power Supply for 120 Watts	\$1,550.00	36EXT
AS0912036-13-M-01TS	EXT Fan Assembly for 120 Watt RF Unit	\$200.00	36EXT
AS0912036-15-M-04TS	New - EXT Laser Bracket for 120W	\$1,000.00	36EXT
DOA-P172-AA	Compressor	\$200.00	36EXT
LF010	L36EX CARRIAGE HEAD PCB	\$50.00	36EXT
LF275	C55 LASER	\$5,500.00	36EXT
LF278	L36EX ISOLATOR BLOCK	\$300.00	36EXT
LF280	C70 LASER	\$6,500.00	36EXT
LF295	MEANWELL PSP 600 P/S	\$200.00	36EXT
PH265M-33	Motor, Stepping, VL586	\$100.00	36EXT
ROTARY	Rotary Glass Attachment	\$500.00	36EXT
RT541	Deos 100 Watt Air Cooled Laser	\$4,900.00	36EXT
RT542	Deos Air Cooled Power Supply	\$4,900.00	36EXT
RT581	30 WATT DEOS LASER	\$2,750.00	36EXT
RT582	45 Watt Deos Laser	\$3,550.00	36EXT
XS002	Mini MB REV: 4	\$400.00	36EXT

Section 4: Troubleshooting/Repair

Helix Core Charges

Helix Core Charge Sheet

Part Number	Part Description	Core Charge	Model
AS0800A24-05-M-01TS	MINI 24 - 600W POWER SUPPLY	\$250.00	Helix
AS0800A24-08-M-01TS	MINI 24/Helix X-AXIS RAIL	\$600.00	Helix
AS0800HHE-05-M-01TS	Dual Meanwell P/S for Helix 60/75 Watts	\$400.00	Helix
AS0800LHE-05-M-01TS	Meanwell P/S for mini24 & Helix 30-45	\$200.00	Helix
AS0803524-11-M-01TS	MINI 24, 35W Laser Brckt	\$250.00	Helix
AS0804524-11-M-01TS	MINI 24, 45 WATT LASER BRACKET - TS	\$500.00	Helix
DOA-P172-AA	Compressor	\$200.00	Helix
LF275	C55 LASER	\$5,500.00	Helix
LF280	C70 LASER	\$6,500.00	Helix
LF295	MEANWELL PSP 600 P/S	\$200.00	Helix
LX006	LINEAR HEAD PCB ASSY	\$50.00	Helix
MT468	600 Watt, 48V C.S P/S	\$400.00	Helix
PH265M-33	Motor, Stepping, VL586	\$100.00	Helix
ROTARY	Rotary Glass Attachment	\$500.00	Helix
RT581	30 WATT DEOS LASER	\$2,750.00	Helix
RT582	45 Watt Deos Laser	\$3,550.00	Helix
XS002	Mini MB REV: 4	\$400.00	Helix

Section 4: Troubleshooting/Repair

Mini 1812 and 2412 Core Charges:

Mini 18 and 24 core Charge Sheet

Part Number	Part Description	Core Charge	Model
DOA-P172-AA	Compressor	\$200.00	Mini
PH265M-33	Motor, Stepping, VL586	\$100.00	Mini
ROTARY	Rotary Glass Attachment	\$500.00	Mini
LX006	LINEAR HEAD PCB ASSY	\$50.00	Mini
RT582	45 Watt Deos Laser	\$3,550.00	Mini
RT581	30 WATT DEOS LASER	\$2,750.00	Mini
XS002	Mini MB REV: 4	\$400.00	Mini
AS0800A18-11-M-01TS	MINI 18 LASER COMPONENTS	\$150.00	Mini
MT161	POWER SUPPLY, 300 WATT	\$100.00	Mini
MT468	600 Watt, 48V C.S P/S	\$400.00	Mini
AS0803518-05-M-01TS	MINI 18 - 600W Power Supply	\$250.00	Mini
AS0803524-11-M-01TS	MINI 24, 35W Laser Brckt	\$250.00	Mini
AS0804524-11-M-01TS	MINI 24, 45 WATT LASER BRACKET - TS	\$500.00	Mini
AS0800A24-08-M-01TS	MINI 24/Helix X-AXIS RAIL	\$600.00	Mini
AS0800A18-05-M-01TS	MINI 18 - 500W POWER SUPPLY	\$200.00	Mini
AS0800A24-05-M-01TS	MINI 24 - 600W POWER SUPPLY	\$250.00	Mini
AS0802518-05-M-01TS	MINI 18 - 300W POWER SUPPLY - 25W ONLY	\$150.00	Mini
LF295	MEANWELL PSP 600 P/S	\$200.00	Mini
AS0800LHE-05-M-01TS	Meanwell P/S for mini24 & Helix 30-45	\$200.00	Mini
AS0800A18-06-M-01TS	Mini 18 600W Power Supply	\$200.00	Mini

Section 4: Troubleshooting/Repair

Parts Usage Guides

EXT Parts Usage Guide (4/26/06)

LASER:

35 W:	AS090HL36-15-M-02TS RT581 (LASER)
45 W:	AS090HL36-15-M-01TS RT582 (LASER)
60 W:	AS090HL36-15-M-02TS LF275 (LASER)
75 W:	AS090HL36-15-M-01TS LF280 LASER)
120 W	RF Unit AS0912036-13-M-01TS RT542
	Laser AS0912036-15-M-04TS RT541

POWER SUPPLY:

35 - 45 W	AS0900L36-11-M-01TS
60/75 W	AS0900H36-11-M-01TS
120 W	AS0912036-11-M-01TS

X-AXIS:

Rail Assembly	AS0900A36-08A-M-01TS
X Motor	AS0900A36-08-M-01TS
X belt	LF228
2" Lens	260558
Mirror	AS0900A36-08B-M-01TS
Plunger	AS0900A36-11-M-01TS
Focus Gauge	LF265
	LF266
Flex Cable	LF016
Encoder Reader	LF010
Encoder strip	LF003

Y-AXIS:

Y Motor	AS0900A36-09-M-01TS
Y belt	LF229
Flex Cable	LF004

Section 4: Troubleshooting/Repair

Z-AXIS:

Z Motor	LX016
Vector Grid	LF312

CONTROLLER:

Main board	XS002
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Section 4: Troubleshooting/Repair

Helix Parts Usage Guide (4/26/06)

LASER:

35 W:	AS0803524-11-M-01TS RT581 (LASER)
45 W:	AS0804524-11-M-01TS RT582 (LASER)
60 W:	AS0803524-11-M-01TS LF275 (LASER)
75 W:	AS0804524-11-M-01TS LF280 LASER)

POWER SUPPLY:

35 - 45 W	AS0800LHE-05-M-01TS
60/75 W	AS0800HHE-05-M-01TS
Dual power supply	

X-AXIS:

Rail Assembly	AS0800A24-08-M-01TS
X Motor	AS07000ATT-03-M-01
X belt	RT197-F
2" Lens	260558
Mirror	TT009
Plunger	AS07000ATT-10-M-01
Focus Gauge	LX116 LX117
Flex Cable	MT471
Encoder Reader	LX006
Encoder strip	TT116

Y-AXIS:

Y Motor	AS07000ATT-02-M-01
Y belt	RT197-D
Flex Cable	MT751

Z-AXIS:

Z Motor	LX016
Vector Grid	MT767

CONTROLLER:

Main board	XS002
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Section 4: Troubleshooting/Repair

Mini 24 Parts Usage Guide (4/26/06)

LASER:

35 W:	AS0803524-11-M-01TS RT581 (LASER)
45 W:	AS0804524-11-M-01TS RT582 (LASER)

POWER SUPPLY:

35 - 45 W (Old)	AS0800A24-05-M-01TS
35-45 W (Current)	AS0800LHE-05-M-01TS

X-AXIS:

Rail Assembly	AS0800A24-08-M-01TS
X Motor	AS07000ATT-03-M-01
X belt	RT197-F
2" Lens	260558
Mirror	TT009
Plunger	AS07000ATT-10-M-01
Focus Gauge	LX116
	LX117
Flex Cable	MT471
Encoder Reader	LX006
Encoder strip	TT116

Y-AXIS:

Y Motor	AS07000ATT-02-M-01
Y belt	RT197-D
Flex Cable	MT106

Z-AXIS:

Z Motor	ASSEMBLY # is pending
	MT130 (Motor)
Vector Grid	MT010 (Harness)
	MT439

CONTROLLER:

Main board	XS002
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Section 4: Troubleshooting/Repair

Mini 1812 Parts Usage Guide (4/28/2006)

LASER:

25 W – 35 W:	AS0800A18-11-M-01TS RT581 (LASER)
40 W – 45 W:	AS0800A18-11-M-01TS RT582 (LASER)

POWER SUPPLY:

25 W ONLY: (300 watts P.S.)	AS0802518-05-M-01TS
30 W – 45 W (2004 built) (500 watts P.S.)	AS0800A18-05-M-01TS
30 W – 45 W (Current) (600 watts P.S.)	AS0803518-05-M-01TS

X-AXIS:

Rail Assembly	AS0800A18-08-M-01TS
X Motor	AS07000ATT-03-M-01
X belt	RT197-D
2" Lens	260558
Mirror	TT009
Plunger	AS07000ATT-10-M-01
Focus Gauge	LX116 LX117
Flex Cable	MT108
Encoder Reader	LX006
Encoder strip	MT056

Y-AXIS:

Y Motor	AS07000ATT-02-M-01
Y belt	RT197-D
Flex Cable	MT106

Z-AXIS:

Z Motor	ASSEMBLY # is pending MT130 (Motor) MT010 (Harness)
Vector Grid	MT116

CONTROLLER:

Main board	XS002
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Section 4: Troubleshooting/Repair

International Warranty Statement

Epilog Corporation warrants to the original purchaser of Epilog Model 8000 or Epilog Model 9000 that these products will be free from defects in material or workmanship when purchased, and under proper, normal use within one (1) year from the original date of purchase. This warranty applies only to Epilog Model 8000 and Epilog Model 9000 systems that are originally purchased for shipment outside of the United States of America.

Epilog will replace or, at its option, repair the defective part(s). Normally, Epilog will supply a replacement part for the customer to replace. Once the replacement has been performed, the replaced part must be returned to Epilog. In the case where repair is required, Epilog requires that the defective part, or machine, be returned to the Epilog factory or other Epilog designated facility. Epilog will be responsible solely for the cost of repairs, including parts and labor, which are made at an authorized Epilog facility. All other costs for replacement or repair, including, but not limited to, packaging and shipping both to and from Epilog, shall be paid by the owner. A "Core" charge may be required by Epilog to insure the return of replacement and repair parts. This warranty excludes any damage from abuse (including, without limitation, incorrect voltages, power surges, fires, improper or insufficient ventilation, "acts of God", or other situations out of the control of Epilog), failure to operate in accordance with instructions provided in the Owner's Manuals for the Epilog models 8000 and 9000, including specific safety and operational warnings contained therein, cosmetic damage sustained in use, and damage caused by unauthorized modifications of any equipment. All warranties to original purchasers are non-transferable. The registered owner must initiate warranty claims within the warranty period.

THE ABOVE AND FOREGOING IS THE ONLY WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED; INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, THAT ARE MADE BY EPILOG ON MODEL 8000 or 9000. ANY WARRANTIES IMPLIED BY LAW ARE HEREBY EXPRESSLY DISCLAIMED. No oral or written information or advice given by Epilog, its dealers, its distributors, agents, officers, or employees shall create a warranty or in any way increase the scope of this warranty. Neither Epilog nor anyone else who has been involved in the creation, production, or delivery of the Epilog Model 8000 and Model 9000 shall be liable for any direct, indirect, consequential, or incidental damages, including but not limited to damages for loss of business profits, business interruption, loss of business information, adverse health impacts, fire, and the like, arising out of the use or inability to use these products.

Epilog Corporation provides no warranties whatsoever on any software used in connection with Epilog Model 8000 or Epilog Model 9000.

Section 4: Troubleshooting/Repair

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Section 5: Administrative

In This Section

- Administrative Policies
-

Parts Ordering, International; Not a consignment part

- If part or component is NOT part of your consignment inventory a parts order must be placed.
- If you know which component or part that you require, complete the “International Parts order form”
- The following information must be on EVERY International Parts order form.
 - Machine Serial number
 - P.O. Number (if applicable)
 - Ship to Address
 - Payment information
 - Net 20
 - Credit card information
 - Prepayment information
 - Part number
 - Quantity

Please send the completed form to Epilog by one of the methods below.

- Email: tech@epiloglaser.com
- Fax: 303-277-9669

Section 5: Administrative

If you are unsure of the part that you need, please contact Epilog's technical support for further troubleshooting assistance or part identification assistance.

Once the order is received, the order will be processed.

An RMA number will be associated to this part if this part has a core charge, or is a part that Epilog would like returned.

At this point the process changes slightly based on the warranty status of the engraver and your credit terms with Epilog.

Net 20 Terms with Epilog

In Warranty:

- The core charge for the part will be applied to your Net 20 account with Epilog.
- If the part is returned in the specified time frame, the RMA is closed and the part is entered into the repair cycle.
- If the part is not returned in the specified time AND you have not contacted Technical Support for an RMA extension, you will be invoiced for the full replacement value of the part.
- If the invoice remains unpaid for a period of 45 days, you may be ineligible for service until such time as the part is returned or the invoice is paid.

Out of Warranty:

- An invoice is created for the cost of the part or if RMA'd item, repair value.
- The invoice is mailed or emailed
- If the part is returned in the specified time frame, the RMA is closed.
- If the part is not retuned in the specified time frame, you will be invoiced for the remaining replacement value of the part.
- If the invoice remains unpaid for a period of 45 days, you may be ineligible for service until such time as the part is returned or the invoice is paid.

Section 5: Administrative

No Terms with Epilog

In Warranty:

- If a core charge applies, you will be asked to provide a credit card and the following information.
 - Name on the credit card
 - Billing address of the credit card
 - The Expiration Date of the card
 - The CCV number from the back of the card.
 - Each of these items is needed to process any credit card.
- A hold will be placed on the funds used to secure the part. No money is transferred from the card, but you will be unable to use the amount secured for the core.
- Failure to provide all requested information may result in a delay in the shipment of your parts.
- If the part is returned in the specified time frame, the RMA is closed and the part is entered into the repair cycle.
- If the part is not returned in the specified time AND you have not contacted Technical Support for an RMA extension, the credit card provided will be authorized as a sale and an invoice issued for this amount.
- You will be mailed notice of this charge with an extended warranty date to return the RMA part. If not returned in the specified time frame, you will be invoiced for the remaining replacement value of the item and will no longer be eligible for a refund of the core charge.
- If the additional invoice remains unpaid for a period of 45 days, you may be ineligible for service until such time as the part is returned or the invoice is paid.

Out of Warranty:

- **Credit card number:** You will be asked to provide a credit card number to secure both the core charge and to pay the invoice for the repair parts.
- If a credit card is used, you will be asked to provide the following information:

Section 5: Administrative

- Name on the credit card
 - Billing address of the credit card
 - The Expiration Date of the card
 - The CCV number from the back of the card.
 - Each of these items is needed to process any credit card.
- **Credit Memo for the Purchase:** A credit memo is sent as a receipt. The method of payment will be noted on the Credit Memo.
- In the event of a core charge: A hold will be placed on the funds used to secure the part. No money is transferred from the card, but you will be unable to use the amount secured for the core.
- If the part is not returned in the specified time AND you have not contacted Technical Support for an RMA extension, the credit card provided will be authorized as a sale and an invoice issued for this amount.
- You will be mailed notice of this charge with an extended warranty date to return the RMA part. If not returned in the specified time frame, you will be invoiced for the remaining replacement value of the item and will no longer be eligible for a refund of the core charge.
- If the additional invoice remains unpaid for a period of 45 days, you may be ineligible for service until such time as the part is returned or the invoice is paid.

RMA's

- RMA Process Outline:
- Work order is created
 - RMA Number is associated to parts to be returned
 - Date is logged
 - Serial Number of engraver is logged
 - The reason that the part is needed is logged. (I need this information to be able to help you. I can use this information in the event that there have been multiple failures to better direct you to a long term solution to the problem.)
 - Part is shipped
 - The part is installed in the field
 - Part is returned to Epilog

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- Received into repair system
- RMA is closed
- Core is refunded or a credit memo is issued
- The part is repaired
- The parts is tested
- The part is placed back into inventory and is readied for the next time that it is needed.

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RMA Web Page

The RMA Web Page will be a web location where you may check on the status of any of your RMA items.

ApplyCoreTo:	RMA Totals						
(Distributor Name)	\$ <u>1,000.00</u>						
	-						
	-						
<u>CompanyName</u>	<u>RMANumber</u>	<u>Invoice Number</u>	<u>DueDate</u>	<u>Days Open</u>	<u>RMATotal</u>	<u>Days Past Due</u>	
(Distributor Name or Customer Name)	04100618	N/A	11-May-06	14	\$ 100.00	N/A	
<u>Part Number</u>	<u>Part Description</u>	<u>Otv Returning</u>					
UGFMED-C9SB40E	Y-Axis Motor	1					
(Distributor Name or Customer Name)	04170612	N/A	18-May-06	7	\$ 900.00	N/A	
<u>Part Number</u>	<u>Part Description</u>	<u>Otv Returning</u>					
AS06000A32-09-M-01	L24 & 32 Controller Board Trivit	1					
AS06000A32-11-M-01	RT 431, Legend board w/RT403	1					

Core Charges

- When a core charge is collected the following steps take place:
 - The credit card information is collected including the following:
 - Name on the credit card
 - Billing address of the credit card
 - The Expiration Date of the card
 - The CCV number from the back of the card.
- Each of these items is needed to process any credit card.
- A “hold” is then placed on the funds securing them until the part is returned.
- If the part is not returned you will receive 3 invoices, each 15 days apart, stating that there is a past due RMA associated to your engraver and that it must be returned or you risk loosing your core charge.
- If after the end of the 45 day period, the part is still not returned:

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➤ **Net 20 Terms:**

- Your account will be considered past due and you will be ineligible for additional parts shipment until your account is current.

➤ **Credit Card:**

- In the time period between the end of the RMA and the final notice stating that the RMA part had not been returned, you will be placed on the NO Service list and will be ineligible for service assistance or parts.
- Your credit card will be charged for the core charge.

Stated Value of Parts:

- US customs law requires that we place on the commercial invoice, at the very minimum, the cost that Epilog paid to have the part produced.
- Epilog will not place a value on the part lower than what is required by law.
- If the part has been purchased, the purchase cost will be stated on the commercial invoice.

Returning parts for Credit

- Please contact technical support to obtain a credit authorization for the returns. Inform the technician of the items to be returned for the credit and you will be provided with an RMA number which will ensure credit upon receipt.
- Failure to contact a service technician will delay your refund.

Consignment Inventory

Parts ordering; International Consignment Parts Orders:

- If the parts used were part of your consignment inventory, please take the following steps:
 - Log the following information:
 - Machine Serial number
 - Part number

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- Date Used
- Forward this information to Inventory@epiloglaser.com
- We use this to monitor your inventory levels. If you are low on a particular component we have the opportunity to send prior to a replenishing shipment. This information can also be used to determine where increases in inventory need to take place.
- Once your email has been received, Epilog will respond stating that we have received this information.
- Information that is required when ordering parts
 - Serial Number
 - Reason for replacement
 - Date of replacement

Consignment inventory reports

- Consignment usage reports must be filed with Epilog each month.
- This is done to assist you in the management of our inventory

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Consignment inventory web page

Epilog is in the process of upgrading our IT infrastructure to support posting of secure documents on the Internet. This will allow you access to the Consignment Inventory Web Page:

Consignment ID:

Dist. ID:

Company Name: (Distributor Consignment Holder)

Phone

Address:

Fax

DistributorEmail:

Contact:

Part Name	Part Description	Model	Quantity	Replacement Cost	Subtotal
260558.	Lens 2 Focal Length"	TT	1	\$83.20	\$83.20
AS06000A32-10-M-01	L24 & 32 Keyboard Assy.	TT	1	\$469.58	\$469.58
TT053	PCB Assy,TTX-Y 24TT	TT	1	\$30.16	\$30.16
TT009	Mirror .75 X .120	TT	2	\$24.96	\$49.92
AS07000ATT-02-M-01	TT Y Axis Motor Assy.	TT	2	\$170.06	\$340.11
AS07000ATT-06-M-01	TT Controller Board Assembly	TT	2	\$796.00	\$1,592.00
AS07000ATT-03-M-01	TT X Axis Motor Assy.	TT	2	\$94.58	\$189.16
TT005	TT Linear Guide	TT	1	\$256.28	\$256.28
AS07000ATT-04-M-01	TT Gear Spur - TT137, TT099	TT	2	\$20.00	\$40.00
RT197-A	L24 X-AXIS DRIVE BELT 5FT	TT	4	\$8.00	\$32.00
RT197-E	TT X/Y-AXIS BELT 4 FT	TT	4	\$8.00	\$32.00
AS06000A32-09-M-01	L24 & 32 Controller Board Trivit	EX	1	\$791.48	\$791.48
AS06000A32-10-M-01	L24 & 32 Keyboard Assy.	EX	1	\$469.58	\$469.58

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Invoicing Report

Invoicing Web Page: Epilog has upgraded our IT infrastructure to support posting of secure documents on the Internet. This allows you access to the Invoicing Web Page. You may access this information at any time:

(Distributor Name) Weekly Account Statement

Invoice Description	Invoice #	Invoice Date	Due Date	Days Past Due	Invoice Amount
Credit Memo	26494	5/23/2006	(\$158.03)		
Parts Purchase	26556	4/13/2006	5/3/2006	22	\$45.62
Parts Purchase	26605	4/17/2006	5/7/2006	18	\$1,694.56
Credit Memo	26605	5/23/2006	(\$1,639.52)		
Parts Purchase	26768	4/25/2006	5/15/2006	10	\$487.64
Total Past Due		\$430.27			

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Policy Letters

Check Acceptance

- Epilog does not accept personal checks as payment for parts or services.

COD's

- At a customers request, Epilog will ship parts COD.
- UPS charges a \$10.00 premium for COD shipments.
- Epilog does not take personal checks for payment on COD shipments and UPS does not accept cash as payment.
- Money orders are the only accepted form of payment.

Collimator Upgrades

- Epilog is proud to announce that Collimator upgrades are now available for installation into L24 and L24EX engravers.
- The cost of the collimator upgrade for the L24 or the L24EX is \$700.00
- To have an L24 or L24EX laser upgraded with a collimator, the laser must be returned to Epilog for installation.
- The customer will be responsible for shipping costs both directions.
- In the event that a laser is returned for repair/replacement the customer will NOT be responsible for the shipping charges, but will be responsible for the installation/upgrade costs.

Core Charges

In the past many of the parts that were sent out for the repair of engravers were never returned. Since these items have residual value to Epilog, and they must be replaced, this drives up costs for everyone. In an effort to reduce the costs to our customers Epilog has begun requiring a “Core” charge, or deposit, on these parts to ensure that they are returned in a timely manner. To have parts, other than laser tubes; for laser tubes please see the Laser Exchange Policy, shipped the customer or distributor may do one of the following.

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- Provide a credit card number, the expiration date, the name on the card and the billing address or where the bill for the credit card is sent. A “Core” charge will be authorized against the card and an RMA number will be generated. If the defective part(s) are not received within 7 days your RMA will be considered past due. Your credit card will be charged in the amount of the authorization AND you will be invoiced for the balance of the replacement cost.
- Customers can return the non-functional parts to Epilog for evaluation and repair. Parts returned to Epilog for repair and evaluation will be given priority in the repair process. Epilog will, at its discretion repair or replace the non-functional item. Please contact your Technical Support Representative for an RMA number,
- Core charges can be wired to Epilog in the form of a money transfer. Once the items are returned to Epilog the “core charge” will be wired back to the customers account or a check will be sent.
- Distributors may submit tracking numbers for shipments in exchange for a “core charge.” This will be accepted on the condition that Epilog can track the parts via the tracking number. This means that Epilog must be able to verify that the shipment has actually been sent. If the package cannot be tracked at the time of shipment no parts will be sent.
- Recently we have had a number of components returned to Epilog that were not complete. Please be aware if you do not return the complete assembly then you will be billed for the missing components. This is especially important with items like RF’s for laser tubes and the memory module on control boards.

Direct Calls for Support

- Periodically, Technical Support receives phone calls, emails and faxes directly from International customers.
- When these types of calls come in service will collect the following information:
 - Company name
 - Contact Name
 - Serial Number
 - A short description of the problem
- This information will then be forwarded to the distributor in the area, via e-mail.

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End Cap Upgrades

- All motor and end cap upgrades will be provided to the customer at no cost.
- At the discretion of the service technician, the customer may be offered the following options for the upgrade.
- Epilog will send out all of the necessary parts to perform a field upgrade of the end cap and motor
- The customer may return the rail to Epilog for installation of the end cap and motor
- All parts removed/exchanged during the upgrade must be returned to Epilog using the provided preprinted return air bill.
- Available upgrades are listed below:

L32EX/L24EX:

There are two upgrades available for the L24EX and the L32EX.

- **End cap upgrade:**
 - This upgrade reroutes the direction of travel on the X-Axis belt, and is intended to halt the fraying or breakdown of the X-Axis belts.
- **X-Motor Upgrade (Addition of out board bearing):**
 - This upgrade adds an outboard bearing to the end of the X-motor shaft. This upgrade is intended to extend the life of the X-motors by removing the load on the X-motor rear bearing.

TT:

- **X-Motor and support bracket Upgrades:**
 - This upgrade is very similar to the L32/L24EX motor upgrade. It is intended to extend the life of the X-motor by removing the load from the rear motor bearing.

Mini 1812

- **End cap upgrades:**

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- The first 51 Mini engravers manufactured did not have the socket to accept the out board bearing. These engravers must have the end cap replaced prior to the upgraded motor being installed.

➤ **X-Motor Upgrades:**

- This upgrade is intended to extend the X-motor life of the Mini engraver by removing the load from the rear motor bearing.

Mini 2412

➤ **X-Motor Upgrade:**

- This motor upgrade is intended to extend the life of the X-Motor by removing the load from the rear bearing.

Engraver Evaluation Fee

- An evaluation fee of \$300.00 will be charged for engravers returned to Epilog to be evaluated for repair.
- Epilog will waive the evaluation fee if the engraver is repaired, in house, by Epilog technicians.
- Customers will be responsible for the cost of the return shipping regardless if repairs are performed on the engraver.

Field Upgrade

- Epilog's Technical Support reserves the right to offer field upgrades to customers who are experiencing service related problems. We will notify distribution of the upgrade but no commission will be paid on said upgrade.

International Shipping

Requirements

- The following items are required for EVERY international parts shipment.
- Requests for parts shipments that do not contain this information may be refused.

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- Serial number
- Short description of problem
- Core charge, if applicable
- Shipping address, if not the distributor location.

Shipping Costs

➤ In Warranty

- Epilog will pay the shipping costs in both directions for “In Warranty” engravers only.
- Epilog WILL NOT pay any duties or taxes associated with “In Warranty” shipments.
- When returning IN WARRANTY parts please use the following UPS Account number:
- E4F174 UPS
- Do Not Use the DHL account number, this number will be deactivated in the near future.

➤ Out of Warranty:

- OUT of WARRANTY Shipments, Epilog will pay the out bound shipping only.
- Epilog will not pay duties or taxes associated with any “Out of Warranty” shipment
- Customers are responsible for the charges incurred for the return shipment to Epilog.
- Do not ship out of warranty parts “Bill Recipient”, you will be billed for the shipping charges and any storage fees associated with the shipment.

➤ Duties and Taxes:

- Epilog will place a value on parts shipped to International locations.
- The prices shown on the customs paperwork will be the lowest value allowable by US law.
- Epilog will NOT pay Duties or Taxes for ANY shipment, inbound or outbound, warranty or non warranty.

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International Warranty Returns

Pre-Pay

➤ In-Warranty Returns / Replacements

- Distributor must contact their assigned Epilog Technical Rep for trouble-shooting. If there is a part that needs to be replaced the tech rep will provide a **RMA** number. The distributor will then ship back the part, with the RMA number referenced, and provide a **tracking number** to Epilog for tracking.
- In the case of a laser tube, the distributor will need to provide a **credit card** for charges. The card will be charged for the full repair amount of the laser tube. After the laser tube has been received and evaluated, a refund (if any) will be credited to the distributor for the difference between the maximum repair charge and the actual charge.
- If the above conditions are met, a replacement part will be sent out to the distributor when at the time their returned part has **cleared customs in the US**.
- **Shipping charges for receiving the part and sending out the replacement part will be covered by Epilog.** (The cost for these shipments will be charged to the marketing group.)

➤ Out-of-Warranty Returns / Replacements

- Distributor must contact their assigned Epilog Technical Rep for trouble-shooting. If there is a part that needs to be replaced the tech rep will provide a **RMA** number. The distributor will then ship back the part, with the RMA number referenced, and provide a **tracking number** to Epilog for tracking.
 - In the case of a laser tube, the distributor will need to provide a **credit card** for charges. The card will be charged for the full repair amount of the laser tube. After the laser tube has been received and evaluated, a refund (if any) will be credited to the distributor for the difference between the maximum repair charge and the actual charge.
- If the above conditions are met, a replacement part will be sent out to the distributor when at the time their returned part has **cleared customs in the US**.
- **Shipping charges are the responsibility of the distributor/customer.**

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Net-20 days Credit Terms

➤ In-Warranty Returns / Replacements

- Distributor must contact their assigned Epilog Technical Rep for trouble-shooting. If there is a part that needs to be replaced the tech rep will provide a **RMA** number. The distributor will then ship back the part, with the RMA number referenced, and provide a **tracking number** to Epilog for tracking.
- If the above conditions are met, a replacement part will be sent out **at the time and RMA has been issued**.
- **Shipping charges for receiving the part and sending out the replacement part will be covered by Epilog.** (The cost for these shipments will be charged to the marketing group.)
- If the distributor does not have the failed part to be sent back, then an invoice for the core charge on the failed part along with an invoice for the new part will be sent in the shipment of the new part. The invoice for the new part and the invoice for the failed part will be dated with the date the new part was shipped to the distributor.
- When the failed part is received back to Epilog a credit note will be applied to the invoice for the core charge on that invoice.
- If the failed part is not sent back and the distributor has not paid the core charge invoice within 20 days of the shipment date of the new part, then the distributor will risk being placed on the “no support” list until either the invoice for the core charge has been paid or the failed part has been returned.

➤ Out-of-Warranty Returns / Replacements

- Distributor must contact their assigned Epilog Technical Rep for trouble-shooting. If there is a part that needs to be replaced the tech rep will provide a **RMA** number. The distributor will then ship back the part, with the RMA number referenced, and provide a **tracking number** to Epilog for tracking.
- If the above conditions are met, a replacement part will be sent out **at the time and RMA has been issued**.
- **Shipping charges are the responsibility of the distributor/customer.**

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Applying for Net 20 Terms

- Distributors are welcome to, and encouraged to, apply for credit terms with Epilog. In order to be eligible for credit terms, the distributor will need to provide the following information:
 - The legal company information: legal name, address, etc., any tax identification numbers
 - Credit references from three companies you currently do business with. Just the names and contact information for these companies
 - A US\$150 processing fee.
- It will take approximately two weeks to process this information including running a credit report on our side, but once the distributor has been approved, they will be given net 20 terms and an initial credit limit of US\$50,000.
- There will be a .0065% credit insurance charge applied to invoices under these terms, but this will be well worth the added convenience for purchasing machines and spare parts.

Laser Evaluation Fee

- A \$200.00 evaluation fee will be charged to evaluate lasers that are returned to Epilog to be repaired.
- Epilog will waive the evaluation fee if the Laser is repaired, in house, by Epilog technicians.
- Customers will be responsible for the cost of the return shipping in the event that the laser is not repaired.

Laser Exchange Policy; IN WARRANTY

The following policy applies to all laser manufacturers and wattages.

- **Within the first 30 days of ownership:** The defective laser will be replaced with a “new” laser. Within the first 30 days of ownership no Core charge will be collected. The defective laser MUST be returned to Epilog in accordance with Epilog’s RMA and Core policy. If the laser is not returned the customer will be placed on the “No Service” list.
- **After 30 days of ownership:**
 - For immediate replacement, Epilog requires either a credit card receipt for the Core charge or a return Tracking Number from the

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customer before a replacement will be shipped. For credit card receipts, the customers account will be credited as soon as Epilog receives the defective tube.

- If the customer does not wish to supply a credit card or a Tracking number, they can ship the defective laser to Epilog. Upon receipt, Epilog will ship a replacement laser. If the laser is returned prior to a replacement being shipped, a core charge will not be collected.

- **Please Note:** If you are going to submit a tracking number, this tracking number must be verifiable. This means that Technical Support must be able to get on the Internet and verify the shipment with the shipping company.

Laser Exchange Policy; OUT OF WARRANTY

The following policy applies to all laser manufacturers and wattages.

- The customer has two choices when it is determined that an out of warranty laser needs to be replaced.
 - For immediate replacement Epilog requires either a credit card receipt for the Core charge or a Tracking number for the returning laser, **plus**, a deposit for the maximum repair amount possible before a replacement laser will be shipped. The customer's credit card will be credited for the Core charge as soon as Epilog receives the defective tube that is being returned. Epilog will retain the deposit for the repair until the repair cost has been determined. Epilog will then refund the difference (if any) between the repair deposit and the actual repair cost.
 - If the customer does not wish to supply a credit card or a Tracking number for the Core charge, they can ship the defective laser, **plus**, a deposit for the maximum repair amount possible. Once the repair is made, Epilog will return the repaired laser along with any difference (if any) between the repair deposit and the actual repair cost. Epilog will inform the customer of the repair charges before the repairs are made.
- **Please Note:** If you are going to submit a tracking number, this tracking number must be verifiable. This means that Technical Support must be able to get on the Internet and verify the shipment with the shipping company.

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No RMA Charges

- Due to the high number of parts shipped.
- Epilog reserves the right to add a 5% surcharge to any item returned to Epilog without an RMA number.
- RMA numbers are required for internal tracking of parts.

No-Service List

- When a part(s) are shipped to a customer an RMA number is generated. If the part(s) are not returned within the specified time frame the customer will be placed on the “No Service” list until such time that the part(s) is returned, or the part is paid in full.
- Once placed on the “No Service” list a customer will be ineligible for Technical Support of any kind, this includes the answering of questions and or the shipment of further parts. For complete details of the RMA process please see the “RMA Procedure”.
- The “No Service” policy also applies to outstanding invoices. If an Invoice goes beyond the Net 20 terms provided by the accounting department you will be put on the “No Service” list. THIS INCLUDES DISTRIBUTORS.
- Once a customer goes beyond 45 days late, either with an invoice or an RMA part, the following actions will take place.
 - The customer will be moved to a “Prepay Only” status.
 - Customers on “Prepay” status must pay via Credit card for all parts prior to parts being shipped.
 - Any part(s) that are sent; will be sent as “Purchased”. In the case of a customer on Prepay status, cards will be charged as though the parts were purchased.
 - Any credit due will be refunded once the defective parts are returned to Epilog.

Options Policy

- Options for current models of machinery can be purchased through the Sales department
- Options for “older” machinery can be purchased from the Technical Support; provided parts are available.

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Parts Discounting Policy

- Epilog's Technical support will provide a discount of 20% off the list price of parts sold to International distributors.

Remanufactured Parts Statement

- Epilog retains the right to use remanufactured parts for warranty replacement items.
- Machines LESS than 30 days old will receive NEW replacement parts.
- After 30 days of service, the parts that are shipped; remanufactured or new, will be at Epilog's discretion.

Return and Exchange Policy

- AN RMA NUMBER and COMPLETED EPILOG PARTS RETURN FORM MUST ACCOMPANY ALL RETURNS or EXCHANGES: An RMA number either provided in your shipment or assigned by your Technical Support Representative must be placed on the outside of your returned product package.
- A completed Epilog Parts Return Form must be placed inside the returned package for accurate identification.
- The parts must be returned within 7 days of your invoice date to avoid additional charges.
- IT IS THE CUSTOMERS RESPONSIBILITY TO PLACE THE RMA LABEL ON THE OUTSIDE OF THE PACKAGE AND THE PARTS RETURN FORM INSIDE THE PACKAGE BEFORE RETURNING THE PACKAGE TO EPILOG.
- An approved Return Merchandise Authorization Number and completed Parts Return form must accompany returns. This number and form are required to insure prompt and accurate service. Packages returned without an appropriate RMA number will be refused and returned to you. Please include as much information about the problem that you are experiencing as possible, this will reduce the evaluation time drastically. All return parts will be tested. Parts that test good will not be replaced and you will be responsible for the return shipping costs.
- Items shipped to Epilog's Technical Support COD or FREIGHT COLLECT may be refused and returned to you freight collect.

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- Or Epilog may accept the shipment and bill the cost of the freight back to you.
- Failure to pay freight bill risks your company being placed on the “No Service” list and would make you ineligible for service

RMA Policy

- Since many of the parts that Technical Support sends for the repair of laser engravers have residual value to Epilog, Epilog has had to implement an RMA/Core policy for parts. RMA numbers are used to track parts and their return.
 - When a part that has residual value to Epilog is shipped, an RMA number, and return air bill will be generated and a “core” charge will be collected.
 - For questions about the “Core” charges please see the “Core” charge policy.
 - The RMA number, in sticker form, and a UPS Ground Return air bill will be shipped to the customer along with the replacement part(s).
 - The Damaged part(s) must be returned to Epilog within 7 days of the receipt of the part or additional charges may apply.
 - It is the responsibility of the customer to place the enclosed labels on the outside of the package.

Administrative

Attached CD

1. Reference Material provided on CD
2. Manuals: Legacy and current Machine Manuals
3. Lasers & RF's: Pictures of laser assemblies with proper part numbers (All Products)
4. Power Supplies: Pictures of Power Supplies and proper part numbers (All Products)
5. Pricing Reports: All Machines
6. Technical Notes
 - a) Corel Notes
 - b) EXT Technical Notes
 - c) General Technical Notes
 - d) Legacy Engravers Technical Notes
 - i) Eclipse
 - ii) Express
 - iii) Radius
 - iv) Summit
 - e) Legend EX 24&32
 - f) Mini (1812, 2412, Helix)
 - g) TT