

Appendix C

User Manual

(Shall be added by Applicant)

User's Guide

for

LaserPro

L-12

L-25

L-50

FCC Compliance Statement:

This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Move the equipment away from the receiver
- Plug the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for additional suggestions

Only equipment certified to comply with Class B should be attached to this equipment, and must have shielded interface cables.

You are cautioned that any change or modifications to the equipment not expressly approved by the party responsible for compliance could void Your authority to operate such equipment.

This device complies with Part 15 of the FCC Rules. Operation is subjected to the following two conditions: 1) this device may not cause harmful interference and 2). this device must accept any interference received, including interference that may cause undesired operation.

Quick Menu

1. Connect the air exhaust system.
2. Setup computer and connect with engraving system properly.
3. Turn **ON** host computer system. Use Windows-based program, such as CorelDRAW, to operate with the engraver.
4. Install the GCC Driver. (for first time use only)
5. Turn **ON** engraver. The lens carriage should move to the home position (upper left corner) after system initialization.
6. **Focusing:** under **OFF-LINE** status, lower the table and put the workpiece on the table, move X-Axis. (Please refer to Fig. 2) and carriage by arrow keys to locate the lens carriage above the engraving material (holding carriage by hands for prompt moving is acceptable under off-line condition but not recommended). Attach the focus gauge then rotate Z-Axis moving knob (Please refer to Fig. 1) slowly to raise up the workpiece, as soon as it touch the bottom of the focus gauge, the laser beam is in focus. Remove the focus gauge.
7. Then follow the steps as using a printer. The following steps are an example by using CorelDRAW V.7.0.

a) Editing file:

Layout → Page Setup → Set from Printer, Landscape → OK

- Edit text

Edit text as desired → go to step b) Engraving

- Edit Image

Edit desired file (picture etc.) → Bitmap → Transfer to

Bitmap, 256 shades of gray → chose proper DPI →

OK

Bitmap → Convert to → Black and White, chose error diffusion → Ok

b) Engraving (Printout):

File → Print → Properties → Landscape, eliminate

Prompt for paper → Options, set up proper resolution, power and

speed → OK → setup objects for engraving and focusing,

“ON-LINE” the laser engraver → OK

CAUTION:

- The choices of DPI must be the same for both editing and printing out a file.
- Turn on the air exhausting system and press **ON/OFF LINE** to setup engraver in **ON-LINE** condition before engraving.

Content

Quick Menu

I.	INTRODUCTION	
	Front View -----	1
	Motion System -----	2
II.	UNPACKING -----	3
III.	RECOMMENDED CONFIGURATION	
	Computer -----	7
	Scanner -----	7
	Software -----	7
IV.	HARDWARE INSTALLATION	
	Cabling Connection -----	8
	Exhaust Vent -----	9
V.	SOFTWARE INSTALLATION -----	10
VI.	OPERATION	
	Environment -----	11
	Control Panel -----	11
	Operation Flow Chart -----	14
VII.	BASIC MAINTENANCE -----	15
VIII.	TROUBLE SHOOTING -----	18
	APPENDIX	
	A. Specification	
	B. Application Parameters	

I. INTRODUCTION

Fig. 1 Front View

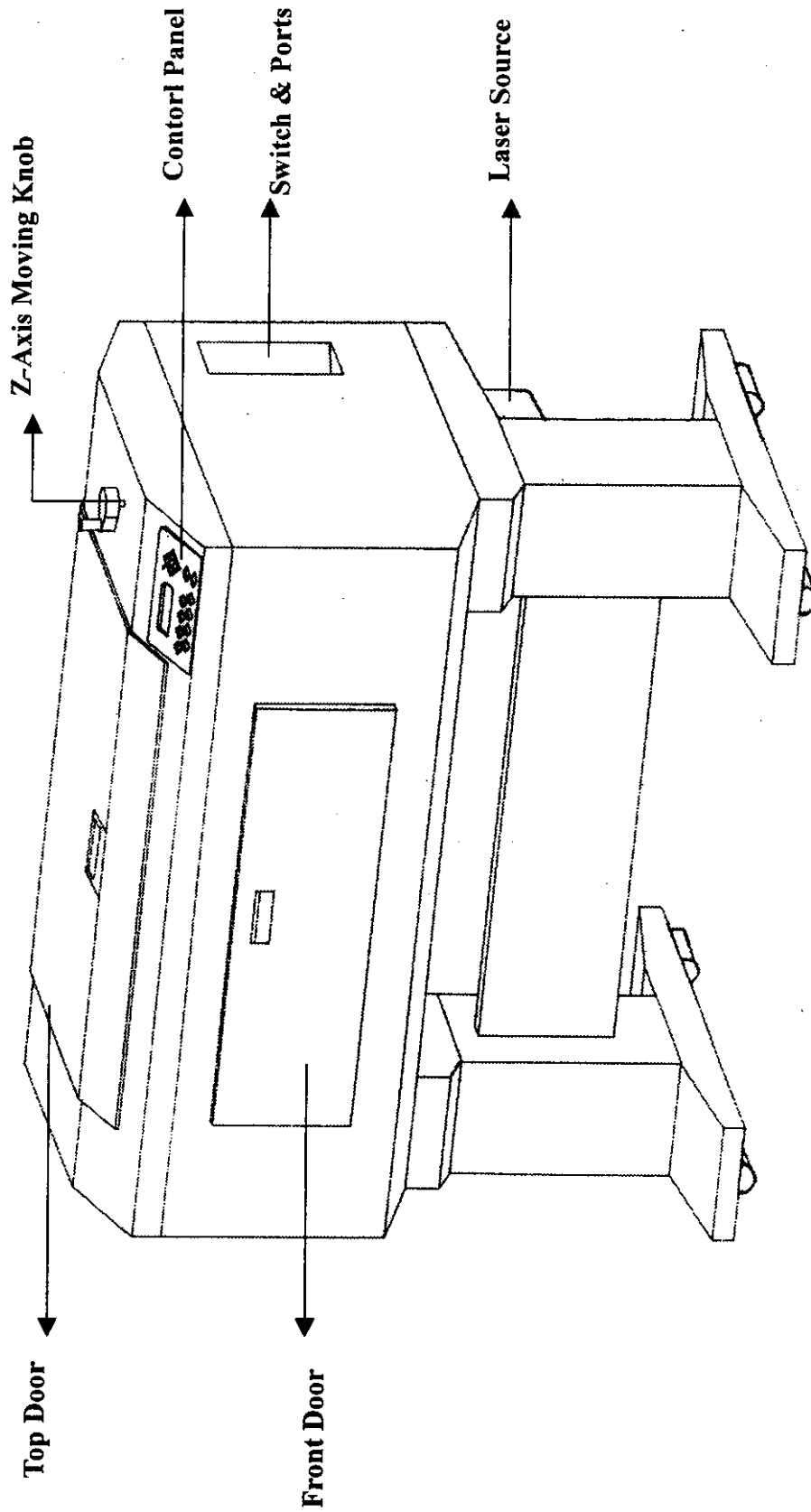
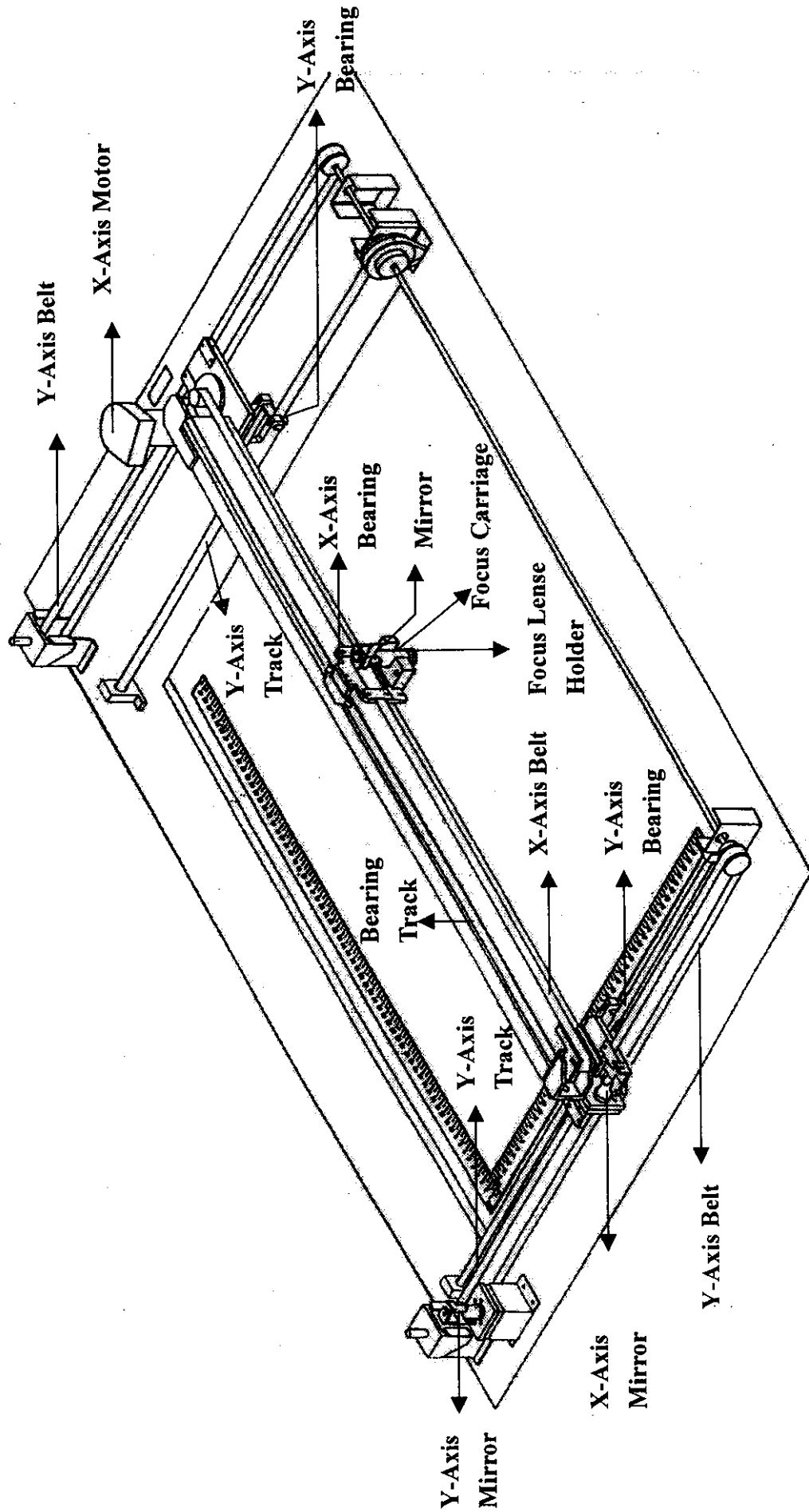


Fig. 2 Motion System



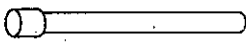
II. UNPACKING

Caution:

- The weight of LaserPro is about 330 pounds. To prevent damage to machinery or injury to workers, please get assistance. Do not lift the equipment alone.
- Please save the original shipping crate in case any returning service is needed.
- Please inspect what you have received from the shipped carton by comparing with the following listed items.

Unpacking inspection

Your package should contain the following items:

ITEM	QUANTITY
Cleaning Set	
cotton swab	1 pack
alcohol	1
lens tissue (lint free)	1
2" Focus Tool 	1
AC Power Cord	1
Print Port Cable	1
LaserPro Driver	1
Engraving Samples	1 pack

Step 1.

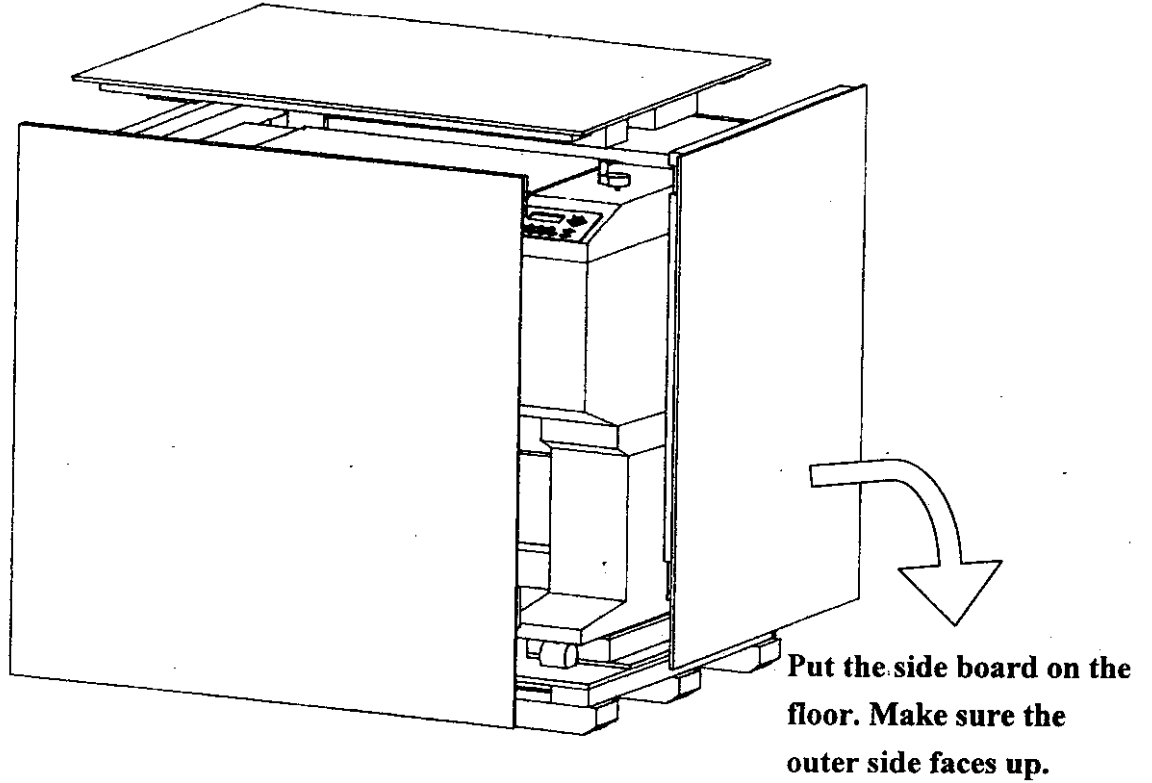


Fig. 3

Step 2.

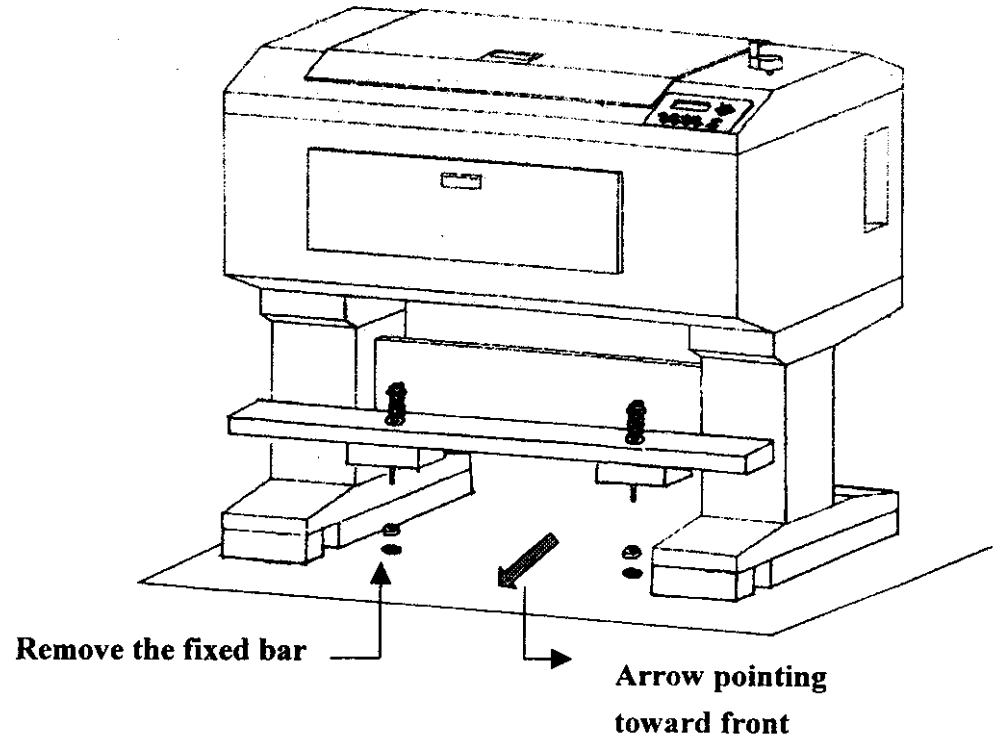


Fig. 4

Step 3.

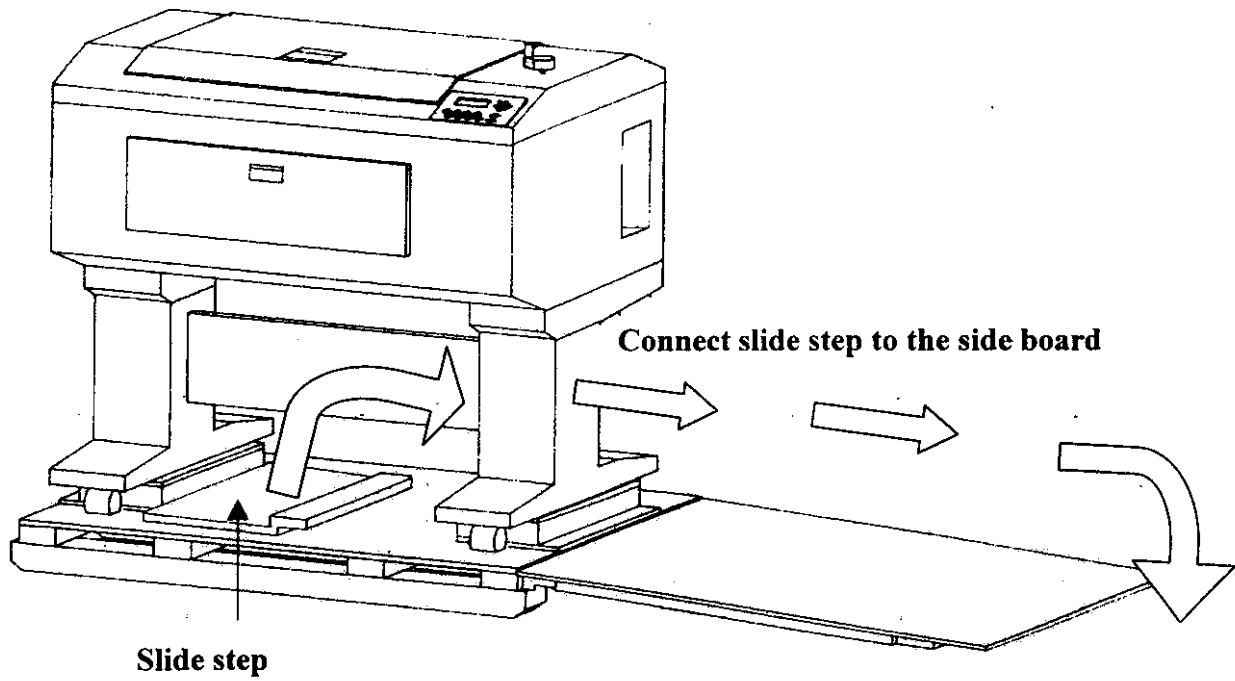


Fig. 5

Step 4.

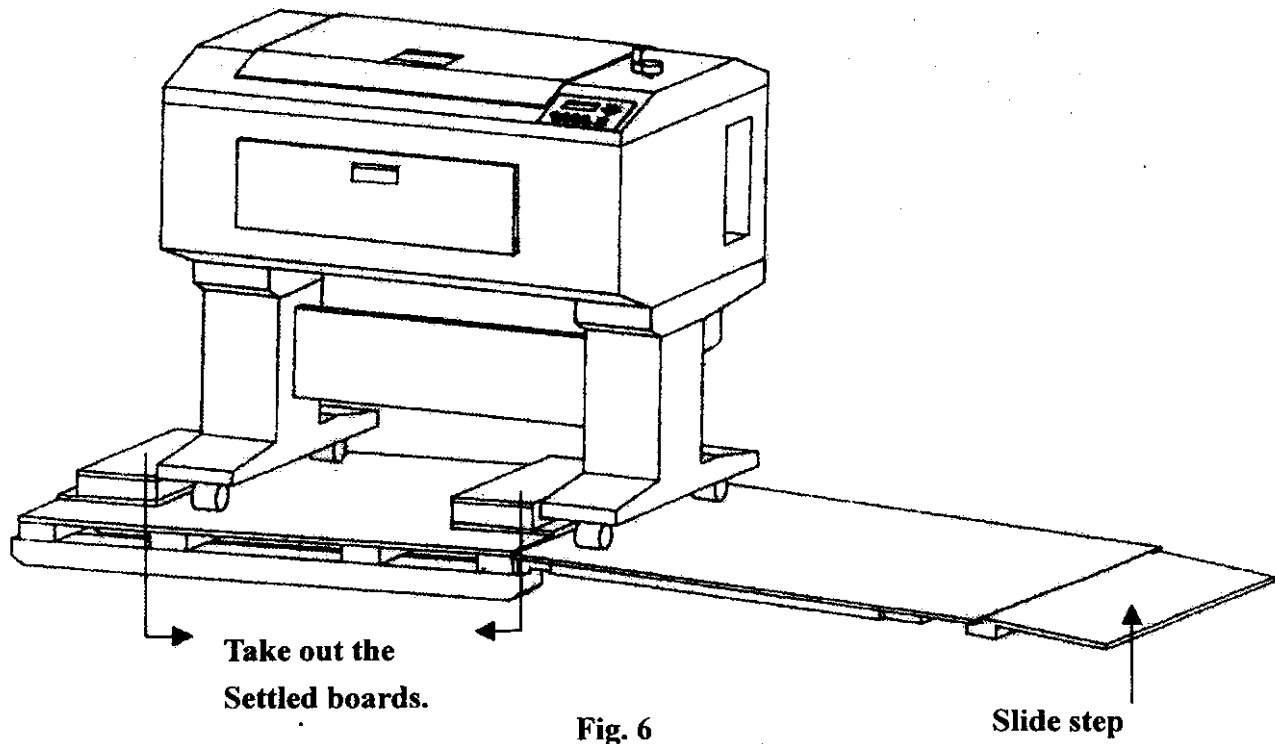


Fig. 6

Step 5.

**Unlock the wheels,
move engraver down
to the floor carefully.**

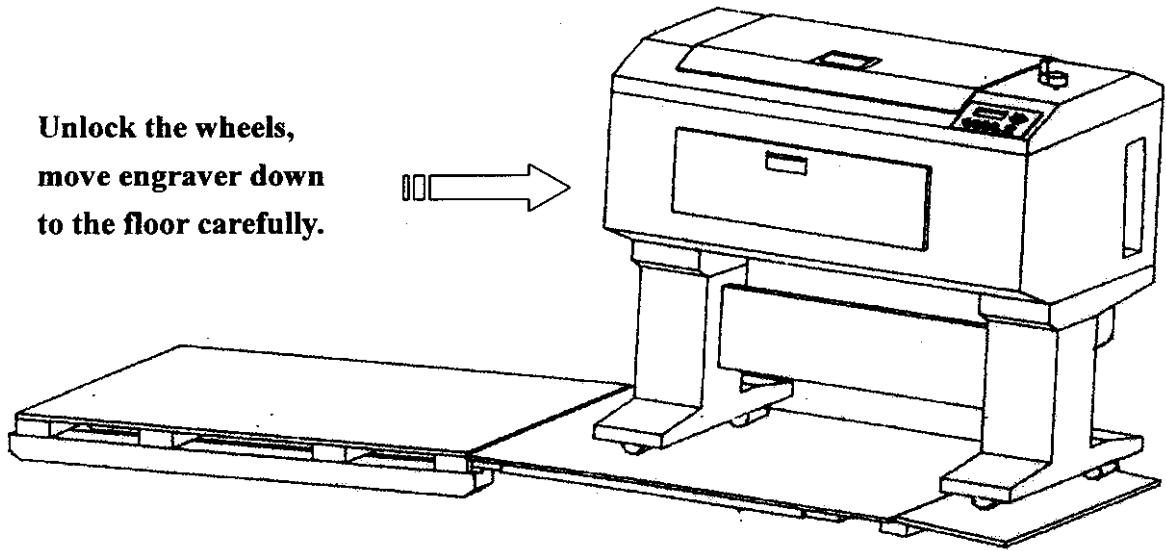


Fig. 7

III. RECOMMENDED CONFIGURATION

- **Computer:** Your PC must be sufficient to equip with Window 95 at least.

We recommend the specification of PC for better work as below:

CPU	Pentium at least
DRAM	32 MB RAM or up
FDD	One 3.5" 1.44 MB floppy
HDD	1.2 GB Hard Drive or up
SVGA	15" Super VGA Monitor

- **Scanner**

Flat Bed

Minimum resolution: 200 DPI

- **Software**

GCC driver (designed under Window 95 OR Windows 3.1)

Windows Window 95 or higher

CorelDRAW 7.0 Version or up

Any program that can output HPGL commands

IV. HARDWARE INSTALLATION

Caution:

- Turn all equipments off before making any connection.
- Check the plug of the power cord to see if it mates with the wall outlet. If not, please contact your dealer.

Cabling Connection:

1. Insert the power cord (male) into a grounded power outlet.
2. Plug the other end (female) into the engraver. The engraver has been design to switch from 100 - 240 VAC automatically.
3. The engraver can communicate with a computer through either a serial (RS-232C) or a parallel port (Centronics).

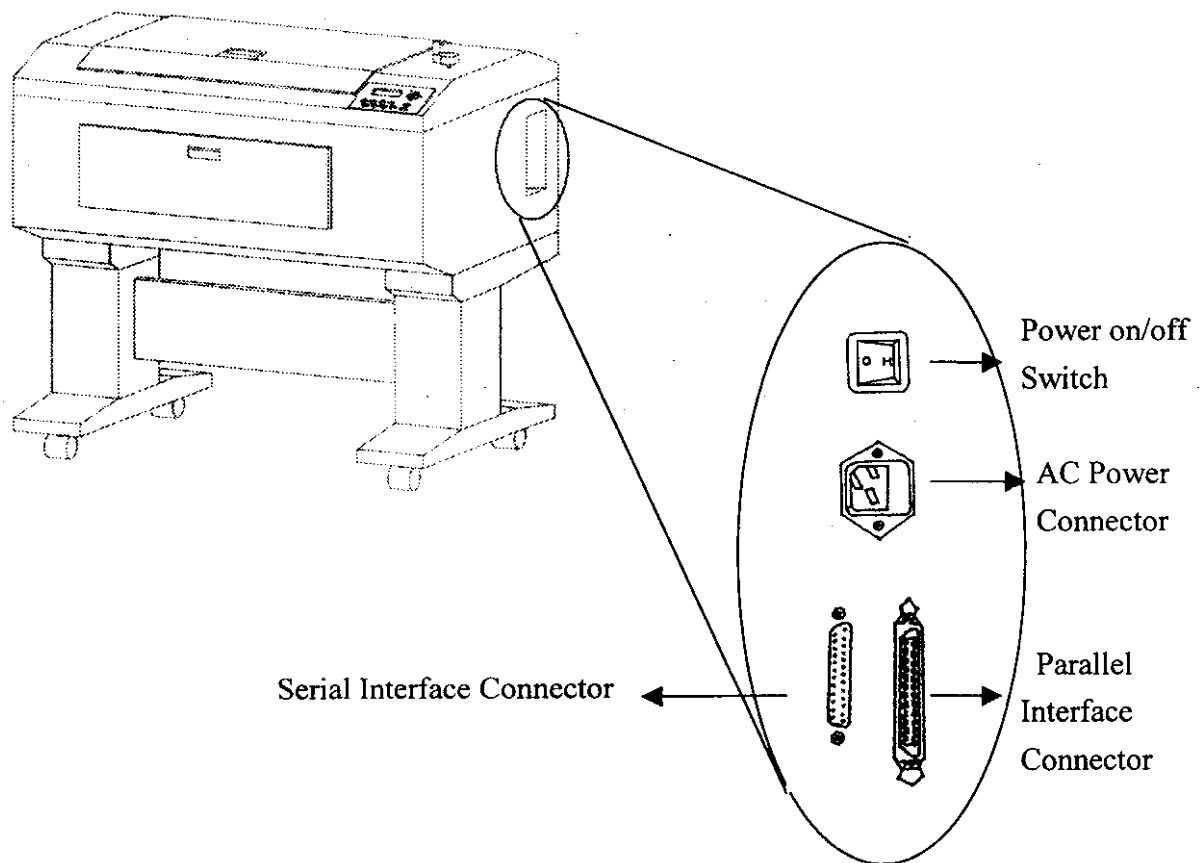


Fig. 8

- **Parallel Transmission**

Connect a parallel cable to the engraver (parallel port) then to the parallel port of the host computer.

Caution:

Never use a mechanical switch box when a second printer port is required. The electrical surges can cause damage to the computer and the engraver.

- **Serial Transmission**

If you are using IBM PC, PS/2 or their compatibles, connect the supplied RS-232C cable to the engraver (serial port) then to the serial port of the host computer.

- **Interface for Macintosh**

To operate the engraver with a Macintosh computer (e.g. Power Mac), you need a MAC modem cable (DB8 to DB25) as an adaptor to connect to the RS-232C cable.

Exhaust Vent

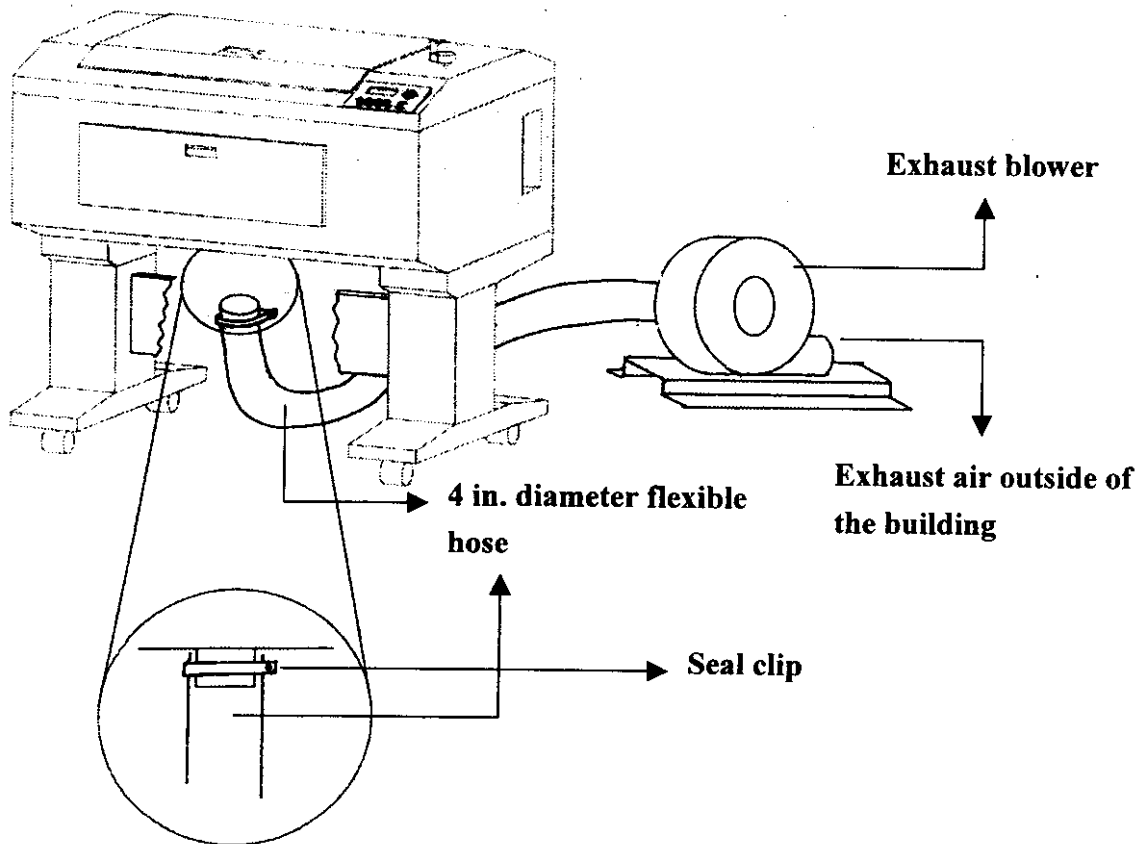


Fig. 9

V. SOFTWARE INSTALLATION

Install GCC printer driver for windows 95.

Power On, click **START**

→ choose **Settings** and click **Printers**

→ Double click **Add printer** and start **Add printer wizard**

→ **Next step**

→ Choose **Local** and click **Next step**

→ choose **Have disk** and click **Next step**

→ Insert the GCC Driver disk properly into the floppy drive then click **ok**

→ choose the port where your laser system is connected and click **Next step**

→ name your system or bypass

→ choose the driver to be default printer

→ **Next step**

→ select **No** when asked to print a test page and click **Finish**

Now the GCC print driver is installed completely. Don't forget to take the GCC driver disk from the floppy drive and store in a safe place.

VI. OPERATION

Environment

- A clean, well-ventilated room with a temperature of 10°C ~ 40°C (50°F ~ 104°F) and a relative humidity between 30% and 70%, as an office type environment.
- Stable floor isolated from vibration.
- Avoid from unstable voltage supply.
- Short path for an effective air exhaust.
- Have a fire extinguisher available at any time.

Control Panel

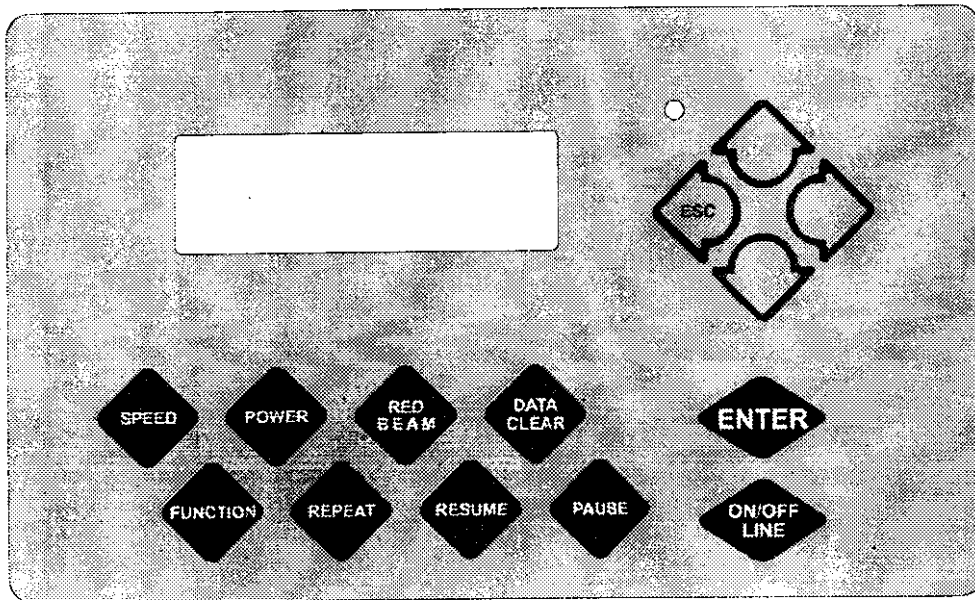


Fig. 10

ON/OFF LINE

ON-LINE: The laser engraving system is ready to receive data from the host computer and start engraving or cutting.

OFF-LINE: The laser engraving system is not communicating with the host computer.

You can setup or make changes for demanded function under OFF-LINE status. Press **ON/OFF LINE** during cutting or engraving will stop (abort) the current job. Repress the key will start the job again.

ENTER

Accept and store the selection for setting up.

Arrow Buttons

Move cursor on the display for selection.

ESC (Escape)

Exit and back to the main menu.

SPEED

Setup laser speed for desired effect.

NOTE : Working without using GCC's driver only.

Press **FUNCTION** key, select one of the sixteen steps then set up desired cutting speed.

POWER

Setup laser power for desired depth and effect. Other conditions are same as above stated in SPEED.

RED BEAM

On/off red beam

DATA CLEAR

Under OFF-LINE condition press this key will clear the data of the current file. After doing this no data can be repeated to engrave or cut.

PAUSE

Temporarily stop the job during cutting or engraving.

RESUME

Restart the job from the stop position of pausing.

REPEAT

Repeat the last job in the buffer under OFF-LINE status. (Engraver will not receive any new data at this moment.)

FUNCTION: Under OFF-LINE condition press this key, LCD will display as Follows:

1. Select Setup #1-16?

ENTER → Setup # 1-16 → press **ARROR KEY** to chose setup number → press **POWER / SPEED** then **ARROR KEY** for proper power / speed selection → **ENTER**, the chosen power and speed have been saved in the selected number.

">" → go to the next step "Select Baud Rate?"

2. Selectt Baud Rate?

Baud Rate is to determine the speed of data transmission to communicate with the host computer.

Setting Range: 9600, 19200

Defaults: 9600

">" → go to the next step "Set Data Bit/Parity?"

3. Set Data Bit/Parity?

Data Bits refers to the size of one block of data and **Parity** is used to check if data was revived correctly or not. The **Data/Parity** feature is to adjust the byte format and parity type in order to communicate with the host computer.

Setting Range: 7 Bits No Parity, 7 Bits Odd Parity, 7 Bits Even Parity, 8 Bits No Parity, 8 Bits Odd Parity, 8 Bits Even Parity.

Defaults: 8 Bits No Parity

">" → go to the next step "Select Language?"

4. Select Language?

ENTER → select desired language → **ENTER**

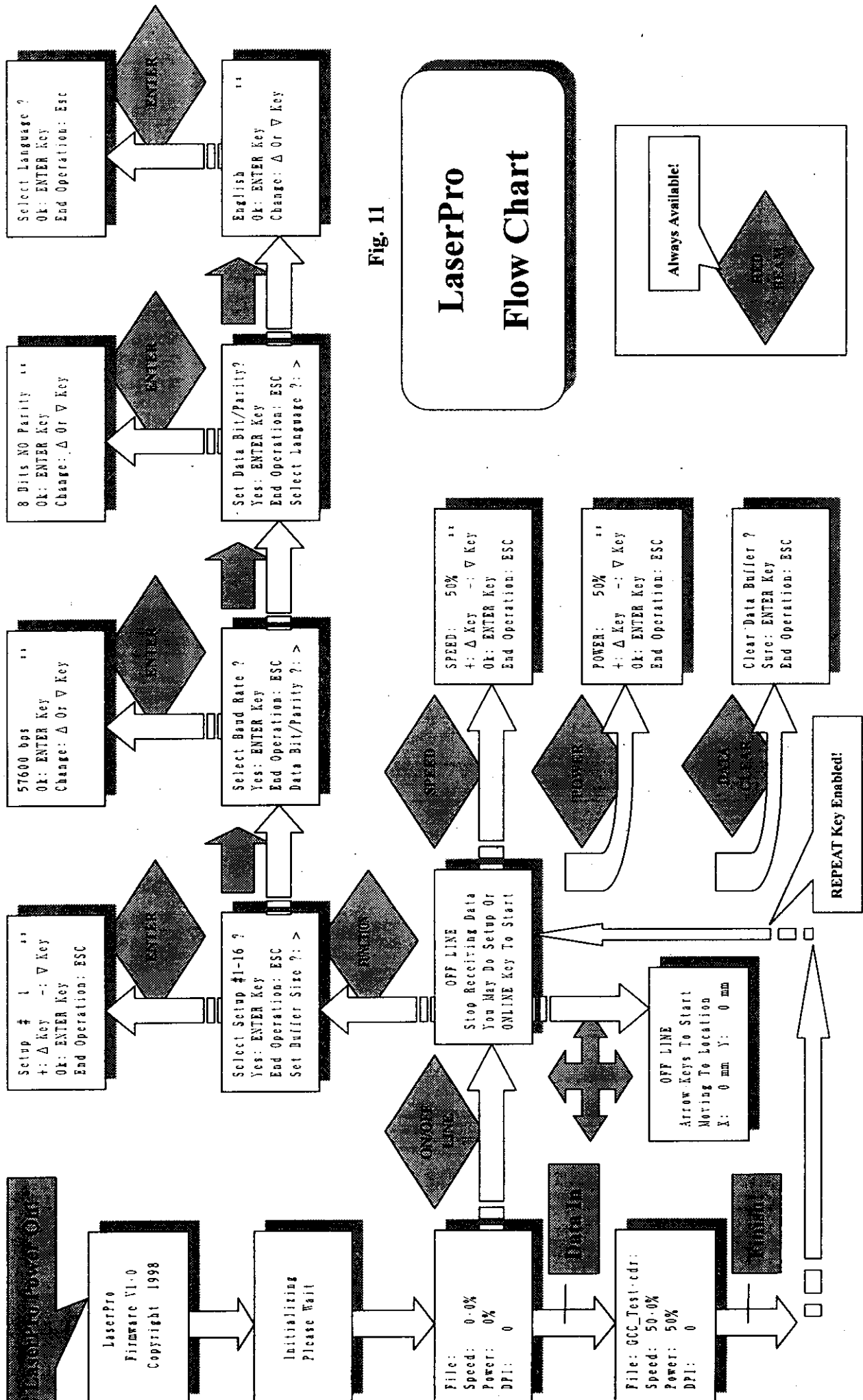


Fig. 11

LaserPro Flow Chart

Always Available!

VII. BASIC MAINTENANCE

Caution:

- Keeping the optics and motion system clean is essential to an excellent quality engraving and the reliability of your engraver.
 - Never pour or spray any solution directly onto the laser system.
 - Turn off the system and unplug the laser engraver before cleaning.
1. **Inside the System:** Open the top door, front door and the back door (if necessary). Vacuum clean inside the engraver and vent area thoroughly.
 2. **Engraving Table:** Dampen the paper towel or cloth with alcohol or soap solution to clean the Engraving Table.
 3. **Motion System:** Dampen the cotton swab to clean the rails of the Motion System. Get rid off any debris build up in the bearing tracks.
 4. **Bearings:** Hold a dampened cotton swab against the bearing and moving the motion system by hand to clean each bearing.
 5. **Mirrors and Lenses:** The focus lens and the mirror located on the carriage are the two components most likely to require cleaning about once a week.

Caution: Please wipe the mirror lightly and smoothly. Don't scratch out the soft coating of the mirror's surface. Excessive cleaning the mirrors and lenses may cause damage and reduce the life of the mirror.

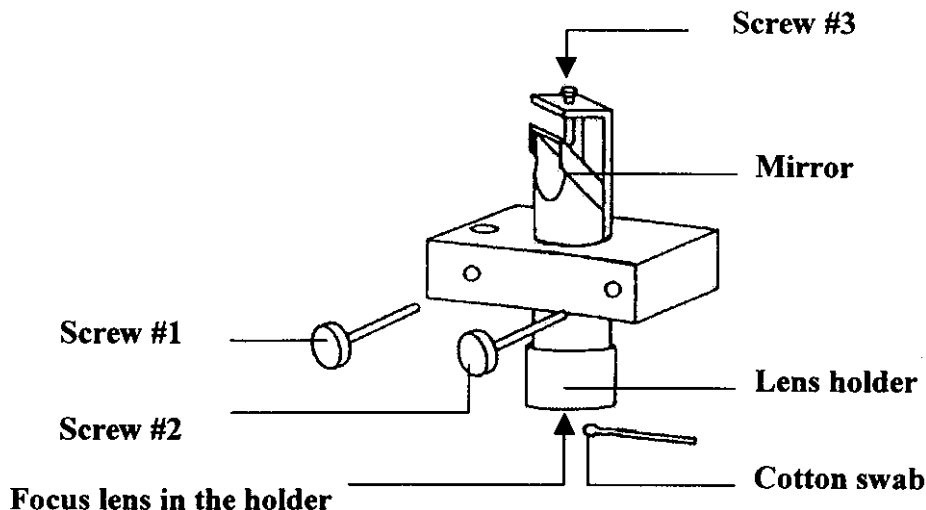


Fig. 12

- **Clean without disassembling the Carriage:**

1. Remove screws #1 and #2 (Please refer to Fig.12)
2. Take out the focus carriage, clean the lens and mirror by using a cotton swab and proper clean solution.

- **Clean the mirror and lens by removing them from Carriage:**

Clean the mirror -

1. Remove screw #3 and pull away the mirror carefully.
2. Drop a lens cleaner on the middle area of the mirror, gently pull the lens tissue across the mirror in **one direction** to absorb the fluid.
3. Let it air dry and reinstall it.
4. Clean the Upper Reflection Mirror and the X-Axis Mirror (Please refer to Fig. 2 and Fig. 13) same as the above process separately.

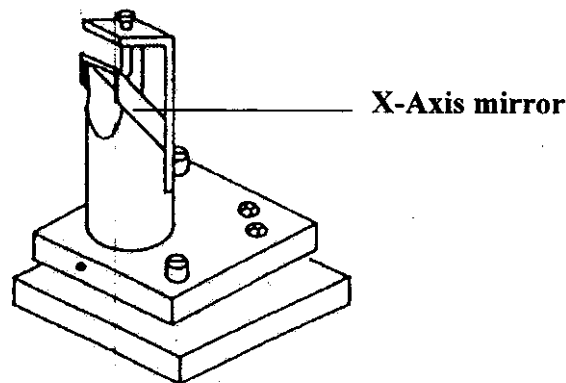


Fig. 13

Clean the focus lens -

1. Remove the Focus Holder.
2. Turn the focus lens holder upside down carefully and dump the lens gently onto a lens tissue placing on top of a soft cloth (Please refer to Figure 14).
3. Do not touch the lens surface with your bare hands or press down hard with any cleaning material.
4. Flood the focus lens with lens cleaner on both sides then using a cotton swab or lens tissue to dry off the remaining solution gently.
5. Reinstall with the round (convex) side of the focus lens facing up.

VIII. TROUBLE SHOOTING

Quality Problems

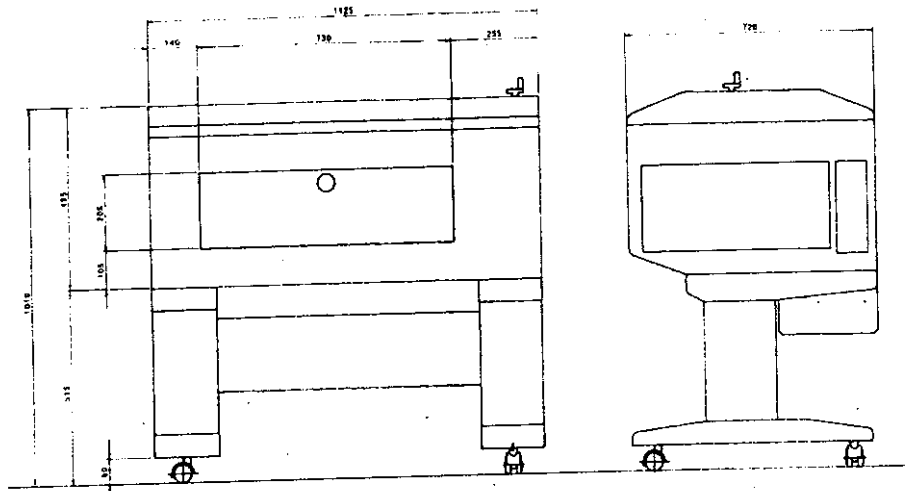
- Check focus length.
- Focus Lens and O-ring are not installed correctly. Focus Lens loose in the holder.
- Debris or dust builds up in the bearing tracks and X-Axis rails.
- The focus lens and the mirror in the carriage are damaged or need to be cleaned.

Non-operational Problems

- Laser beam is not generated.
If the red alignment beam is not revealed; the laser beam is misalignment. Adjust reflection mirrors for exact focus.
If the red alignment beam is revealed, the laser power may be too low to be detected.

APPENDIX

A. Specification



LaserPro	L-12	L-25	L-50
Laser Source	12W	25W	50W
	Sealed CO ₂ laser		
Work Area	24" × 18" (610mm × 457mm)		
Max. Working Piece (W×D×Thick) (back & front door closed)	33" × 22" × 7.5" (850mm × 570mm × 190mm)		
Max. Working Piece (W×D×Thick) (back & front door opened)	30" × ∞ × 7" 750mm × ∞ × 180mm		
Table Size	33" × 21" (840mm × 530mm)		
Overall Dimensions W×D×H	43" × 28" × 39" (1100mm × 720mm × 1000mm)		
Drive	DC servo control		
Speed Control	Adjustable from 0.1 to 42 inch/sec with up to 16 colors linked speed setting per job		
Power Control	Adjustable from 0~100% and 16 colors linked power setting per job		
Z Axis Moving	Manual (continuous levels)		
Resolution (DPI)	1000, 600, 500, 300, 250, 200		
Computer Interface	Print port and serial port for PC and Mac		
Memory Buffer	4MB standard upgradable to 64 MB with SIMM modules		
Display Panel	4-line LCD display showing current file name. Laser power, engraving speed, file loaded into memory buffer, setup and diagnostic menus.		
Power	100~240V, AC Auto Switch, 50~60Hz		
	3.5/7 Amp	4/8 Amp	5/10 Amp
Cooling	Air-cooled		Water-cooled

APPENDIX**B. Application Parameters****Engraving Parameter**

Material	LaserPro	POWER%	SPEED%
Acrylic	L-12	100	100
	L-25	50	100
	L-50	25	100
Laminated Acrylic	L-12	80	100
	L-25	40	100
	L-50	20	100
Immitation Leather	L-12	100	100
	L-25	50	100
	L-50	25	100
Leather	L-12	60	100
	L-25	30	100
	L-50	15	100
Mat Board	L-12	100	50
	L-25	100	100
	L-50	50	100
Padauk	L-12	100	30
	L-25	100	60
	L-50	85	100
Sign Vinyl	L-12	50	100
	L-25	25	100
	L-50	12	100
Rubber	L-12	100	8
	L-25	100	15
	L-50	100	30
Brass Coated	L-12	100	100
	L-25	50	100
	L-50	25	100
Glass	L-12	100	30
	L-25	100	60
	L-50	85	100
Crystal	L-12	100	30
	L-25	100	60
	L-50	85	100
Poly buttons	L-12	100	30
	L-25	100	60
	L-50	85	100
Marble	L-12	100	30
	L-25	100	60
	L-50	85	100
Ceramics	L-12	100	50
	L-25	100	100
	L-50	50	100

Cutting Parameters

Material		LaserPro	POWER%	SPEED%
Acrylic	1mm	L-12	100	1
		L-25	100	2
		L-50	100	4
	2mm	L-12	100	1
		L-25	100	2
		L-50	100	4
	3mm	L-12	100	0.4
		L-25	100	1
		L-50	100	2
	4mm	L-12	100	0.4
		L-25	100	0.8
		L-50	100	1
	5mm	L-12	100	0.2
		L-25	100	0.4
		L-50	100	1
8mm	L-25	100	0.2	
	L-50	100	0.4	
Rubber	2.5mm	L-12	100	0.4
		L-25	100	1
		L-50	100	2
Backlite	1mm	L-12	100	0.2
		L-25	100	0.4
		L-50	100	1
Plywood	3mm	L-12	100	1
		L-25	100	2
		L-50	100	4
	4mm	L-12	100	0.4
		L-25	100	0.8
		L-50	100	2
	5mm	L-12	100	0.2
		L-25	100	0.4
		L-50	100	0.8

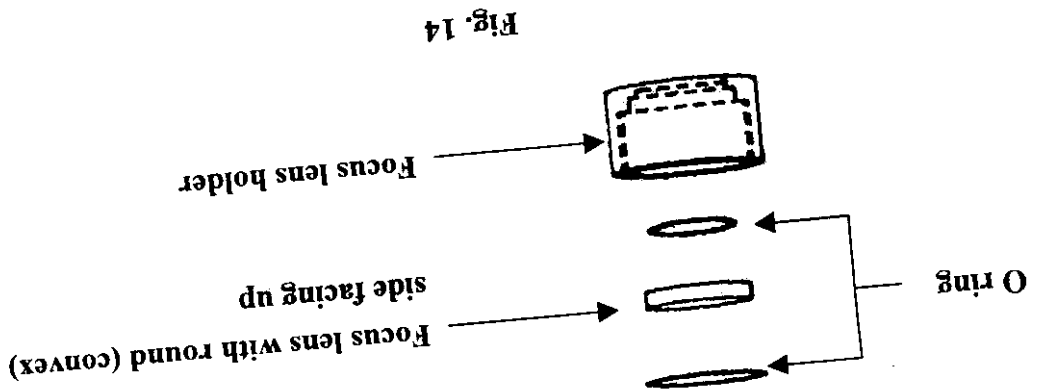


Fig. 14