

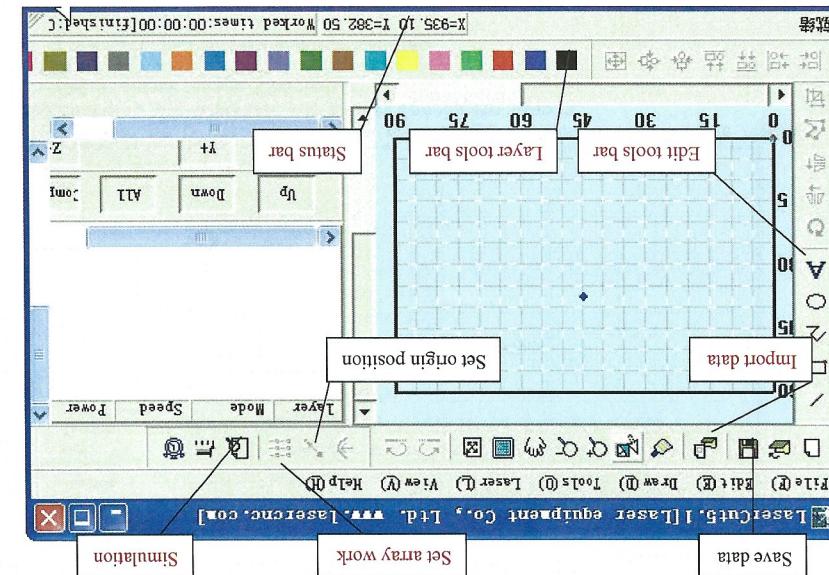


**PRO 2000 Series II**

**Computerised Laser Cutting, Engraving, Marking  
Machine**

**User's Manuals**

v 1.1



When run the software, the interface is as following. All system function can be found on tool bars.

#### Chapter 4 Explanation for Universal Edition

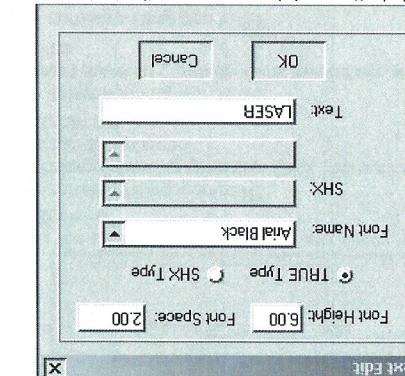
- 4.1.1 File
  - 4.1.1.1 New
  - 4.1.1.2 Open
  - 4.1.1.3 Save
  - 4.1.1.4 Save As ECP-EC Project File (\*.ecp)
  - 4.1.1.5 Import
  - 4.1.1.6 Export
  - 4.1.1.7 DXF file
- 4.1.2 Corresponding icon is
- 4.1.3 Corresponding icon is
- 4.1.4 Corresponding icon is
- 4.1.5 Corresponding icon is
- 4.1.6 Corresponding icon is
- 4.1.7 Corresponding icon is

Save the vector graphics data that is in current window as a standard PLT file (\*.plt) or DXF file.

Click this button, move mouse on the screen, and you can draw bezier of various sizes.

The corresponding icon is

Click this button, and drag mouse.

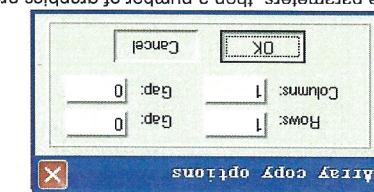


If you want to edit the text, please click this button and drag mouse on the text. Before you change the size of the text, the text should be changed to curve. The "To curve" button is located in "Tools -> Tools -> To curve". When the text changed to curve, the content of the text can't be changed.

The corresponding icon is

Click "select" button

, and choose the graphics you want to array copy. Then click this button.



Gap means the distance between two adjacent rows or columns. Input relative parameters, then a number of graphics are copied as "rows X columns".



Click "pick" button

button
Spacebar
key after you click

, and choose the graphics you want to rotate. Then click this button.

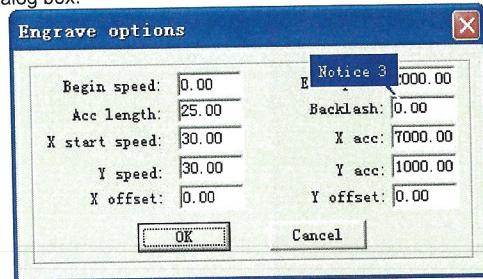
The corresponding icon is

Click "rotate" button

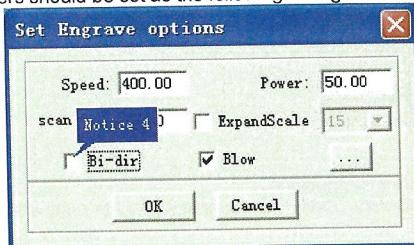
, you will see following dialog box.

## IMPORTANT SAFETY INFORMATION

Measure the gap between odd row and even row. And input the number in "Notice 3" of the following dialog box.



The best way is single direction engraving. But this will slow down the efficiency. Parameters should be set as the following dialog box.



1. The operator should read and understand the user's manual carefully before operating the machine.
2. During engraving/cutting process, ALWAYS keep any body parts away (stay away) from the laser beam path to avoid injuries.
3. ALWAYS ensure that clean and pure water circulates the laser tube before switching ON the machine, or the laser tube will break when the machine is ON. Cool tap water is acceptable.
4. NEVER operate your machine unattended. There is a significant risk of fire if the machine is set improperly, or if the machine should experience a mechanical or electrical failure while operating. The machine must be switched OFF when it is not in use.
5. NEVER vector cut any material while the machine is unattended. Because vector cutting moves relatively slow compared to raster engraving, a tremendous amount of heat is applied to the material being cut. This build up of heat can cause significant fire risk and the machine should always be monitored. Additionally, the air assist should always be turned ON especially when vector cutting to reduce the risk of fire.
6. ALWAYS use air assist, particularly when vector cutting.
7. NEVER attempt to engrave or cut mirror or any mirror-like reflective materials. If the laser beam strikes a reflective surface, it could be directed out of the cabinet. And this is very dangerous and may cause very serious injury/damage/fire hazards.
8. The operator must pay attention to the machine during operation. If something unusual happens, switch OFF the machine immediately.
9. ALWAYS keep a properly maintained and inspected fire extinguisher on hand.
10. DO NOT open any cover during operation.
11. NEVER operate with any of the covers or enclosures removed, and never modify the enclosure. The laser beam is invisible and hazardous!
12. DO NOT disassemble the machine or remove any of its protective covers while the unit is plugged in.
13. DO NOT open any of the machine's access panels while the unit is plugged in. Opening a panel may expose the operator to the unit's AC input power.
14. DO NOT make or break any electrical connections to the system while the unit is turned ON.
15. DO NOT view directly into the beam of the Red Dot Pointer. It is potentially hazardous if the red dot pointer beam is directed into the eye.
16. Keep the area around the machine clean and free of clutter, combustible materials, explosives, or volatile solvents such as acetone, alcohol, or gasoline.
17. NEVER operate the machine without a properly operating vent to the outside! Most material will only produce an irritating smoke when engraved. Some materials, including but not limited to paint, varnish, composition board and plastics, produce compounds that can be harmful if concentrated. A properly installed vent is the only way to ensure that such problems do not occur.
18. The cooling fans and vents should NEVER be covered or blocked in any way. Lasers that overheat will not operate properly and may begin to produce erratic laser output or possibly complete failure.
19. Ambient air temperature where the laser system is operating should not exceed 32 degrees Celsius (90 degrees Fahrenheit).
20. NEVER engrave or cut any material containing PVC or vinyl. When engraved, a corrosive agent is produced that will destroy your machine.
21. The temperature of water should be between 15 and 30 Celsius, to prevent the water from

2.1.5 Calculate. When the graph and processing parameters are changed, this button should be clicked to save the processing parameters in processing file.



2.2 Import DST file  
Click this button, you can import DST files.



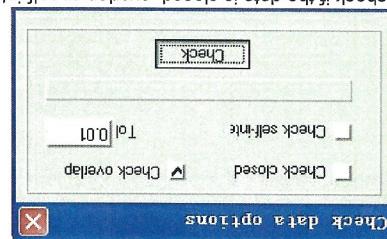
2.3 Output file  
Click this button; you can export the processing files.



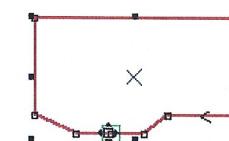
2.4 Options  
Please refer to "Chapter 6".



Move mouse to the node, and you can change the shape of the graph by dragging mouse. Move mouse to the graph, the mouse will change to a cross. Doubleclicking mouse will add a node. Move mouse to the node and click "Delete" key, the node will be deleted.



Tools  
4.4.1 Data check  
Click this button.

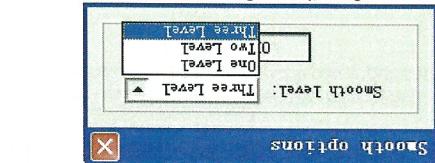


Move mouse to the node, and you can change the shape of the graph by dragging mouse.

2.1.5 Calculate. When the graph and processing parameters are changed, this button should be clicked to save the processing parameters in processing file.

When the data is input two times or more, it can't be processed properly. So if you find something is unusual such as you can't delete unwanted data. Before you click "Delete" key, you have to click "Delete" key and you can delete unwanted data. Then click "Check" and it will inform which part of the data is in trouble by red it. Overlapping is unusual such as you can't merge data, please use this tool to check overlapping other's. Click "Check" and it will inform which part of the data is in trouble by red it. Then click "Delete" key and you can delete unwanted data. Before you click "Delete" key, you have to click this button.

This tool can smooth curves. This can improve the cutting speed. Select the graphics you want, and click this button.



4.4.2 Smooth curve  
There are 3 options. Compared with "One Level" and "Two Level", "Three Level" is smoother. But the distortion is bigger than the others.

DXF files.  
4.4.3 Unite line  
This tool can unite several lines that are intersecting as one line. This is usually used for smoothening.

This corresponding icon is

This tool can expand or reduce the data. Select the data you need and click this button.

DXF files.  
4.4.4 Offset curve

## Chapter 10 Comments on tool programs

Tool programs are for checking if the control card is normal. It is helpful to find where the trouble is quickly.

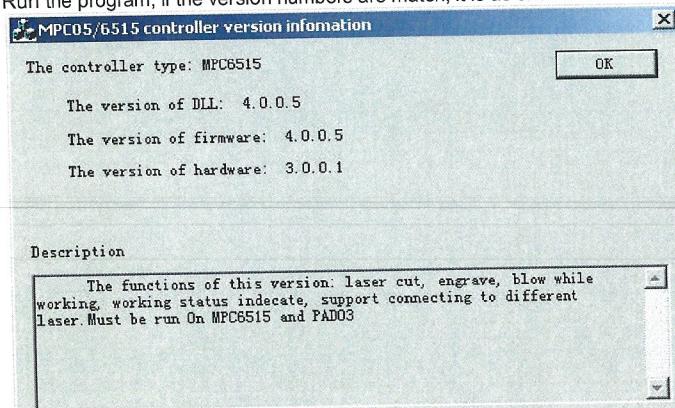
### 10.1 Version check program

If the version numbers of card and DLL don't match, the card won't work normally. Generally, the version numbers of card can't be changed (unless update the firmware). Proper DLL has to be found out to match the card. Version check program can indicate the version numbers of card and DLL.

DLL is laid in [Lasercut50], and the filename is MPC05ls.dll.

Version check program is laid in [Lasercut50], and the filename is Mpc05Ver+M05.exe.

Run the program, if the version numbers are match, it is shown below.



Note down the version numbers of card and DLL, and get the proper DLL from the supplier.

# 1. Introduction

## 1.1 Safety Information

The laser machine described here is a Class IV laser device and is dangerous. The laser will instantly ignite clothing, wood, paper, plastics, and many other common items. Care must be taken to avoid serious injury. Always operate this machine in an environment free of flammable materials and children. Failure to do so may result in a serious injury. This laser uses high voltage parts. Care must be taken when working with high voltage parts. Failure to do so may result in serious injury or death.

## 1.2 Preparation

Clean tap water is required for the water chiller.

A single stranded copper wire with 2mm diameter is required for grounding.

## 1.3 Technical Information

The laser machine makes use of high-energy laser beam to focus on the surface of material and cut/engrave/mark the material that you put on the work table.

The laser beam can cut the material to the designed shape.

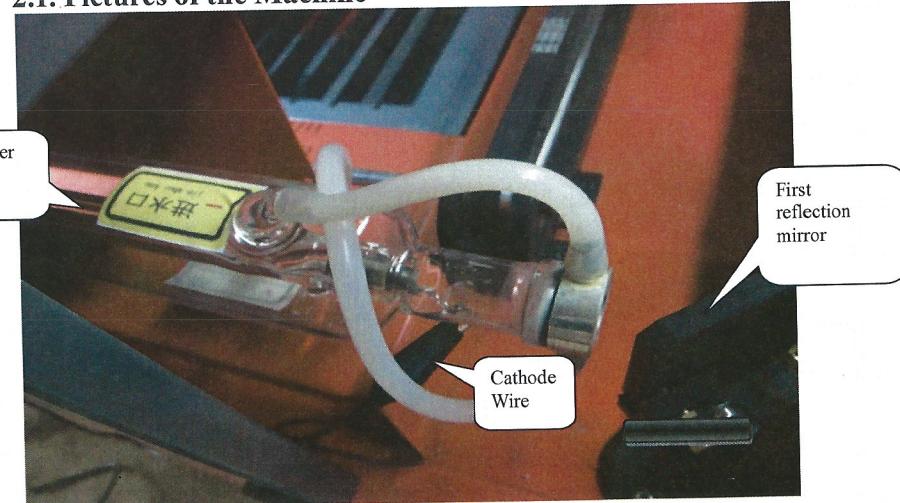
The machine uses a CO<sub>2</sub> glass laser tube, and uses high-pressure gas discharge.

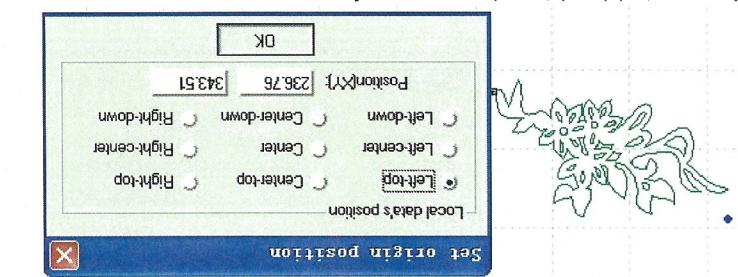
The output laser beam is reflected to the reflection mirrors, and then to the material.

Exhaust fans and air-exhaust pipes/hoses can remove the gas created during the cutting, engraving, or marking process.

# 2. Machine Structure

## 2.1. Pictures of the Machine

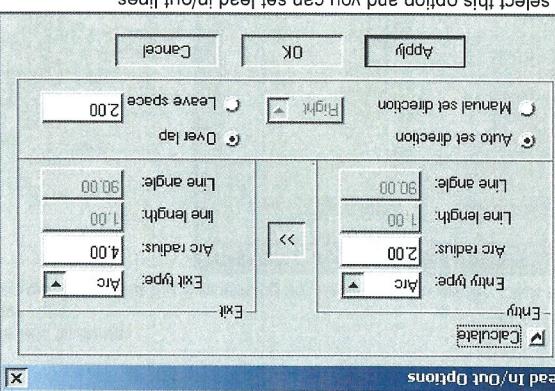




2.1.4.7. Array output options

You can set origin point anywhere as you prefer.

The corresponding icon is



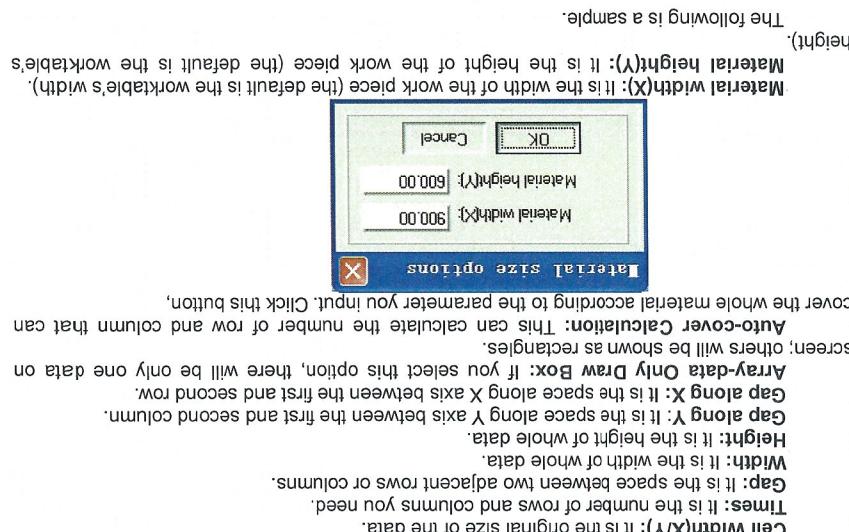
Click "Spacebar" and you can set lead in/out line.



4.5.1 Define cut route

The corresponding icon is

This software will define the starting point and direction automatically. Generally, the point is on the corner. When you need to change the starting point and direction, click this button, and then move mouse to the graphics, and this point will be the new starting point. You can change the direction by clicking "F" key. The following is a sample.



Material width(X): it is the width of the work piece (the default is the worktable's width).

Material height(Y): it is the height of the work piece (the default is the worktable's height).

Auto set direction: this software will set where the lead in/out lines are (in or out of the graphics outline) automatically.

Manual set direction: set where the lead in/out lines are.

Line angle: angle of lead in/out lines.

Line length: radius of lead in/out lines.

Arc radius: radius of lead in/out arcs.

Entry/Exit type: type of lead in/out lines. There are 2 types: arc and line.

Calculate: select this option and you can set lead in/out lines.

Width: it is the width of whole data.

Height: it is the height of whole data.

Gaps: it is the space between two adjacent rows or columns.

Gap along X: it is the space along X axis between the first and second row.

Gap along Y: it is the space along Y axis between the first and second column.

Auto-cover Calculation: This can calculate the number of row and column that can cover the whole material according to the parameter you input. Click this button.

Others will be shown as rectangles.

Auto set parameters as same as that of entry.

Length of over lap (or leave space) is set by the input number beside this option.

Over lap/leave space: this option determines whether the processing effect is closed. The length of over lap (or leave space) is set by the input number beside this option.

## Chapter 9 Download files

You can download update files, processing files and configuration files by USB disk conveniently.

### 9.1 Update MPC6515

9.1.1 Copy the latest firmware files (\*.FMW and \*.HDW) to the root directory of USB disk. The USB disk should be formatted to FAT. And it is suggested that other files should not be saved in this USB disk.

9.1.2 Power on MPC6515 controller and the indicator light (D3 on MPC6515/CPU) will flash 2 times.

9.1.3 After the indicator light (D3 on MPC6515/CPU) flashes 2 times, plug the USB disk in MPC6515 quickly (don't exceed 5 seconds).

9.1.4 The indicator light (D3 on MPC6515/CPU) will shine continuously 2-5 seconds. Now, MPC6515 is updating firmware.

9.1.5 If the updating procedure is finished, the indicator light (D3 on MPC6515/CPU) would flash frequently.

9.1.6 Pull out the USB disk, and MPC6515 will run new firmware program automatically.

9.1.7 After MPC6515 is updated, the CFG file should be downloaded again. Please refer to

"5.4 Download data" for detailed information.

If MPC6515 can't run normally, you may make a mistake when updating. You can repeat the above steps. If this doesn't work, please contact the equipment supplier.



You need update MPC6515 only when new version is issued.



Those USB disk with indicate light is suggested for it is convenient to check whether the download procedure is finished or not.

### 9.2 Download processing file (\*.mol)

There are 2 ways to download processing file to MPC6515 controller.

One is by USB data line. If the computer is close to the machine, this way is very conveniently. Please refer to "5.4 Download data" for detailed information.

The other is by USB disk. If you have two or more machines, this way is very conveniently. The following is the detailed steps.

9.2.1 Copy the processing file (\*.mol) to the root directory of USB disk. The USB disk should be formatted to FAT16. And it is suggested that other files should not be saved in this USB disk.

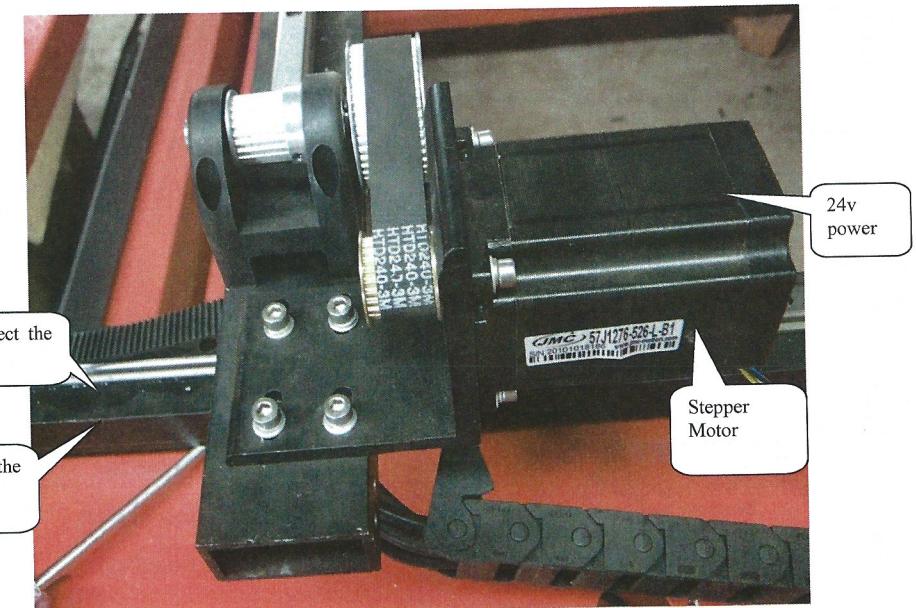
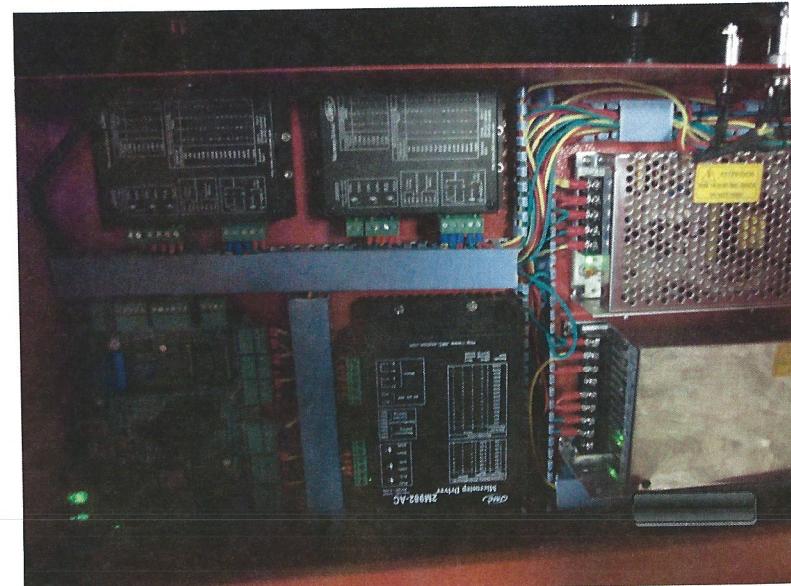
9.2.2 Power on MPC6515 controller.

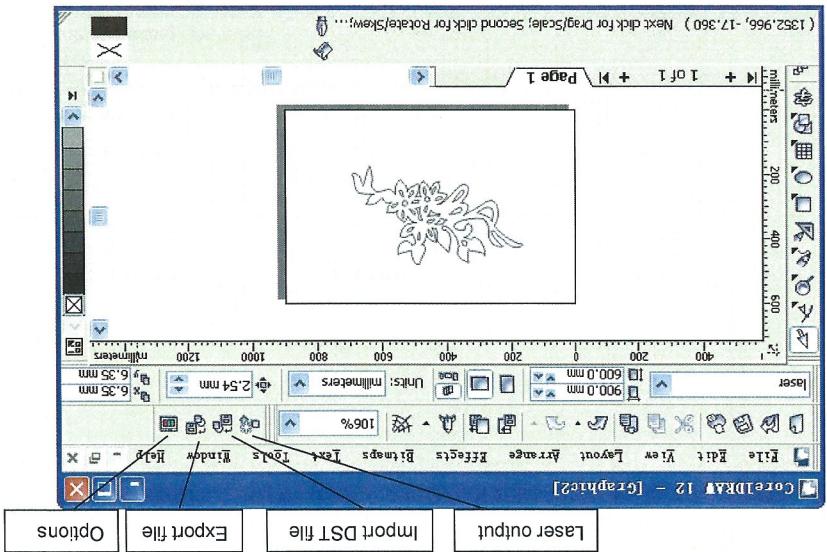
9.2.3 Plug USB disk in MPC6515 controller.

9.2.4 The indicator light (D3 on MPC6515/CPU) will shine continuously 2-10 seconds. If the file is too large, it will take several minutes. Now, MPC6515 is downloading file.

9.2.5 If the downloading procedure is finished, the indicator light (D3 on MPC6515/CPU) would flash frequently. And the PAD03 will give an alarm.

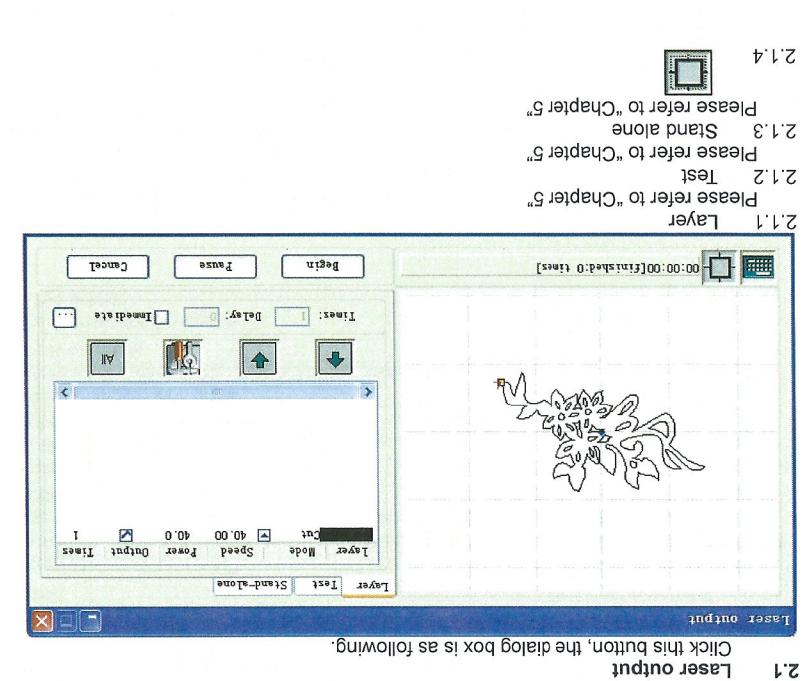
9.2.6 Pull out the USB disk, and you can run the files by PAD03.





Run CorelDraw and the interface is as follows.

## Chapter 2 Explanation for CorelDRAW Edition

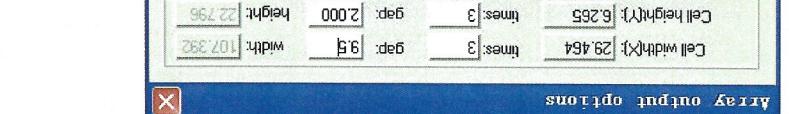


Click this button, the dialog box is as follows.

**Material width(x):** It is the width of the work piece (the default is the worktable's height).

The following is a sample.

**Material height(y):** It is the height of the work piece (the default is the worktable's height).



**4.5.4 Calculate**  
When the graph and processing parameters are changed, this button should be clicked to save the processing parameters in processing file.

**4.5.5 Clear log**  
Click this button, the system will clear the log.

**4.5.6 Simulate**  
Click this button, the system will clear the log.

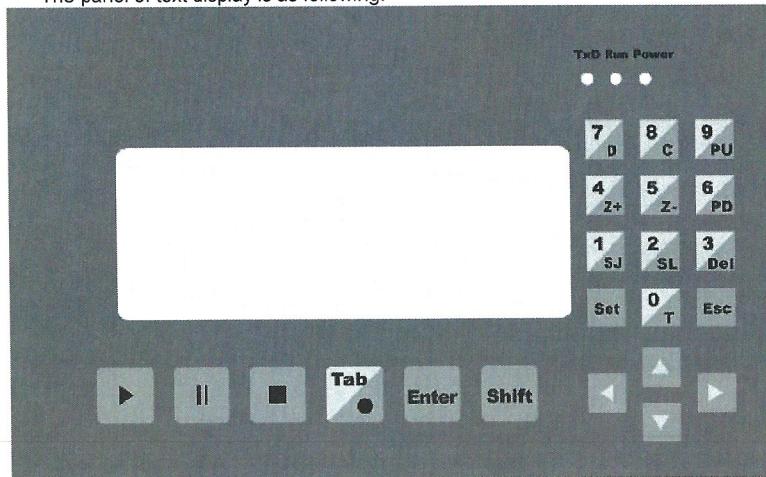
**4.6 View**  
When parameters set is finished, please click this button. It can simulate the procedure of output for checking the result of output. Click "Esc" on the keyboard and you can cancel the simulation process.

**4.6.1 Toolbar**  
File toolbar: Click this button, you can display or hide the following bar.  
Edit toolbar: Click this button, you can display or hide the following bar.  
Output toolbar: Click this button, you can display or hide the following bar.  
Layers toolbar: Click this button, you can display or hide the following bar.

**2.1.4**

## Chapter 8 Text display operation

The panel of text display is as following.



### 8.1 Main interface

#### 8.1.1 Introduction of displaying content

File: file name of the current file.

No.: serial number of the current file.

Sum: the number of files saved in the MPC6515 controller.

Power: the percentage of laser power. It can be adjusted from 0 to 100. The former is for corner power and the latter is for processing power.

Pcs: repeat times of the current file.

#### 8.1.2 Introduction of keys on the panel (cursor not be enabled)



: Press this key, and switch to work interface.



: Enable cursor.



: Move laser head.



: Switch to jog set interface.



: Switch to laser set interface.



: Delete the current file.



: Move Z axis. This function needs hardware support.



: Move Z axis. This function needs hardware support.



: Page up/Page down. Select file.



: Datum. Press this key, and the machine will run to the original switches.

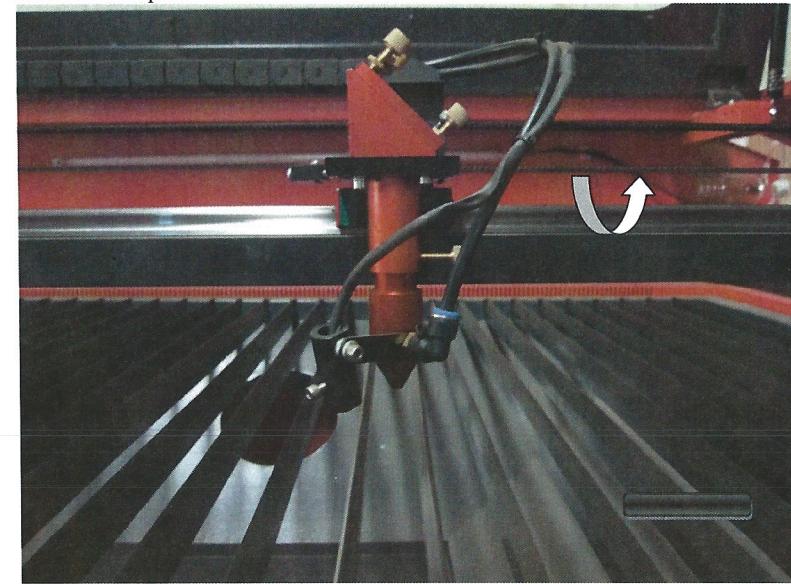


: Cut. Press this key, and the machine will cut down the work piece.

#### 8.1.3 Introduction of keys on the panel (cursor is enabled)

## 4.2. Disassembly of Machine

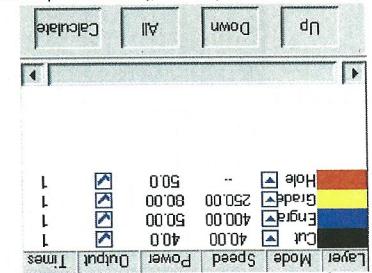
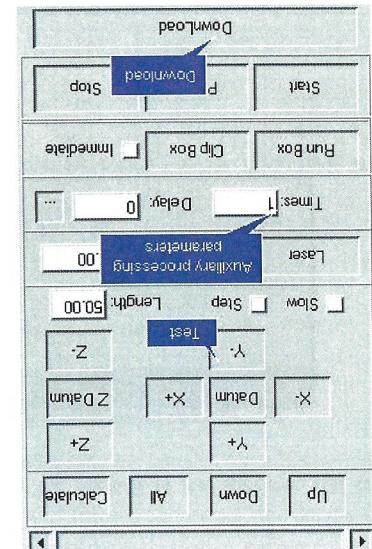
Open the wooden box and the machine's lid and front door to remove the accessories. Remove the straps.



Check for any damage from transportation. Inform us if there is any damage.

## Chapter 5 Laser output

There are 3 parts in this interface as following.



When there are many layers, select one row and click **All**, and all the processing parameters of the other layers can be set as the layer that has just been selected.  
When there are many layers, the processing sequence is from top down. Select one row and click **Up** or **Down**, and the sequence can be changed.

- 10.1 Version check program
- Chapter 10 Comments on tool programs
- 11.1 How to make AI (Adobe Illustrator) files
- 11.2 FAQ

Chapter 11 Addenda

## Chapter 11 Addenda

Pieces: Repeat times of a file.

Del: Delete the current file.

At first, file name is brightened (word is white and background is black).

Now,

Press and and you can select the option you want to modify.

Press and , and you can change the number in the selected option.

Press and all the number will be saved.

Press "Esc" and all the options will not be modified (none of the options is brightened).

Now, press and you can move the laser head.

Press again and you can modify the options (file name is brightened).

## 7.2 Processing interface of PAD03

Press "Start" and the interface will show as following.

FILE	AAA
SPEED	100%
POWER	100 /
100%	
TIME	0 : 0 : 15

File: File name which is being processed.

Speed: Percentage of speed.

Power: Percentage of power.

Time: Time for processing this file.

When processing,

Press and , and you can change the percentage of power (only for Power, not for Corner-Power).

Press and , and you can change the percentage of speed.

Press "Start/Pause" and you can control the processing procedure.

Press "Stop" and you can cancel the processing procedure. The interface shows "Stopped". Press "Esc" and you can see the main interface.

## 7.3 Accessory interface of PAD03

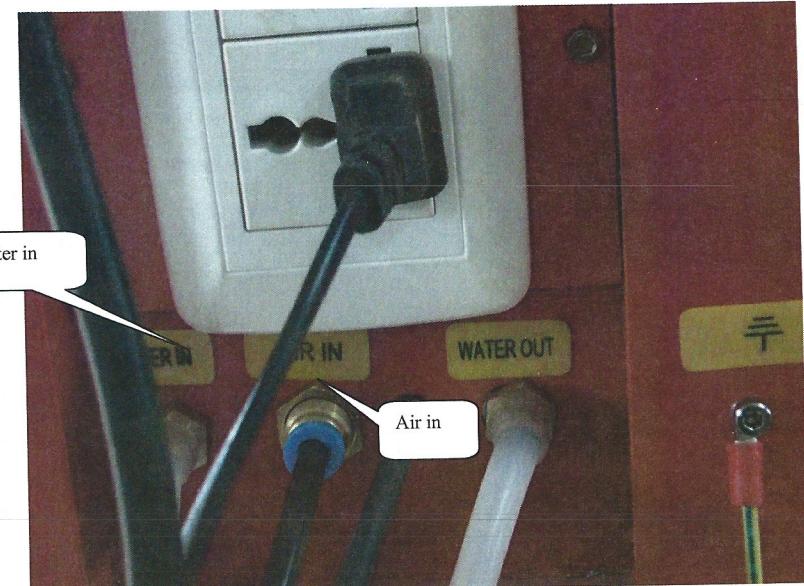
Press "Menu" and you can see the accessory interface.

CUT BDR	
LAS SET	
PMOV SET	
LANGUAGE	

CUT BDR: Laser head will move a rectangle with laser on according to the size of the graphics.

LAS SET: Select this option and press . The LAS SET interface is as following.

LASER TIME SET	
POW 000000	MS
% 000000	



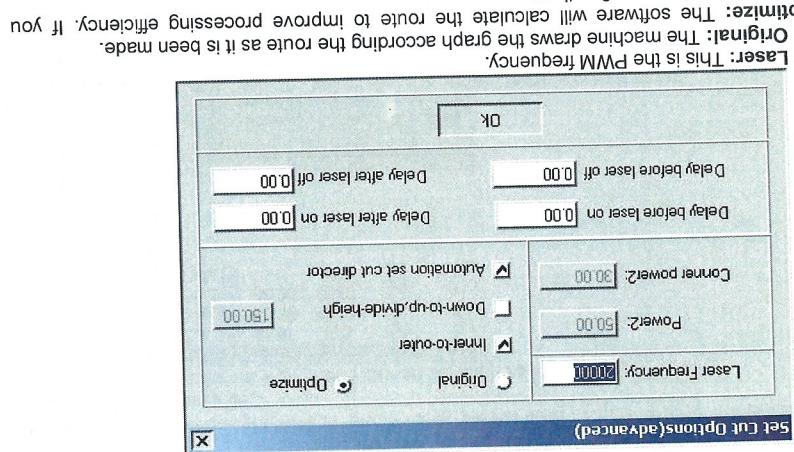
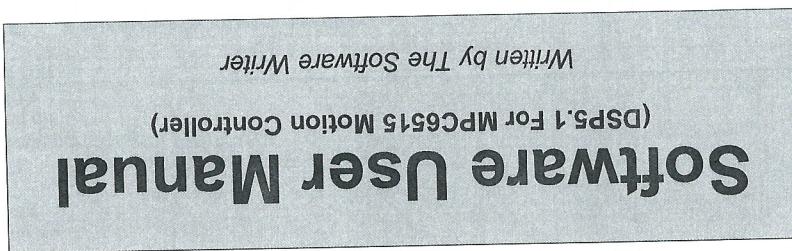
## 6. Installation of Accessories

### 6.1 Installation of Water Chiller

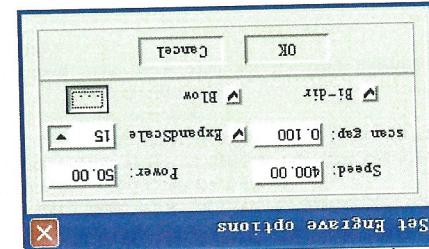
Ensure the water chiller is switched OFF, and add clean tap water into the water chiller until it is full. Connect the water outlet of the water chiller to the water inlet of the machine using the supplied water pipe, and connect the water inlet of the water chiller to the water outlet of the machine using the supplied water pipe.

Connect a power cable of the water chiller to the power board in the machine.

Ensure you check the water level every 3 days, and top it up when it is not full.



Laser: This is the PWM frequency.  
 Optimize: The software will calculate the route to improve processing efficiency. If you need to select this option, there are 2 options.  
 Automation set cut director: The software will confirm the direction automatically. If you need to set output order, "Ogima" should be selected.  
 Corner Power2: corner power of the second laser head. This needs hardware support.  
 Power2: laser power of the second laser head. This needs hardware support.  
 Power2: laser power of the second laser head. This needs hardware support.  
 Delay before laser on: delay before laser on.  
 Delay before laser off: delay before laser off.  
 Delay after laser on: delay after laser on.  
 Delay after laser off: delay after laser off.  
 5.1.3 Interface of "set engrave options":  
 Double click the color bar on the "Laser" column, and the dialog box as shown below.

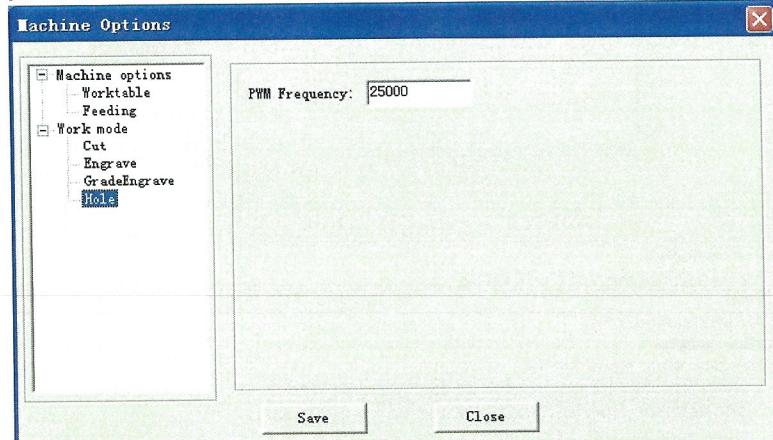


...: This is advanced layer options. Click this button.  
 Below: blow or not. This function needs hardware support.  
 Expand scale: When engraving this parameter can compensate it.  
 Smaller than the actual size. Adjusting this small letters, the width of transverse stroke may be smaller than the actual size.  
 Scan gap: movement distance on Y-axis and positive X-axis. When cancel this function, laser emit on only one direction.  
 Bi-dir: When engraving, laser emit on both negative X-axis and positive X-axis. When cancel this function, laser emit on only one direction.  
 Scan gap: movement distance on Y-axis when engrave a row on X-axis.  
 Power: the laser power when a layer is processed.  
 Speed: engraving speed on X-axis.

## 6.6 Grade Engrave

Please refer to 6.5

## 6.7 Hole



6.7.1 PWM Frequency  
It determines the frequency of PWM signal.

tube from the air pump to the air inlet of the machine.

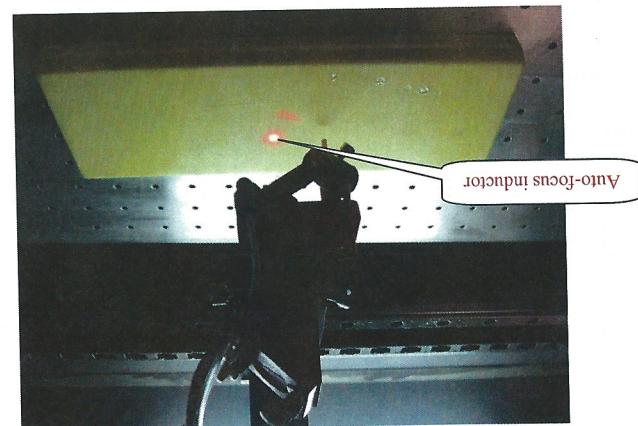
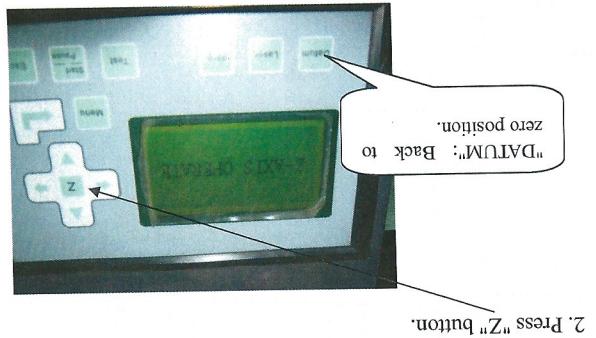


### 6.3. Installation of Smoke Exhaust Fan

Connect the fan to the exhaust port of the machine with an exhaust pipe, and connect a power cable of the fan to a power board in the machine.  
Due to the noise of the blower fan, it would be best to put the fan outside of premises.

## 7. Installation of Laser Tube

3. Put the an object under the laser head (see the first picture). Press "DATUM" button to start focusing. At this time, the work table will move up automatically, as far as touching the Auto-focus.



Auto-Focus Device

**Instructions:**

Speed: engraving speed on X-axis.  
Scan gap: movement distance on Y-axis when engrave a row on X-axis.  
Power: the laser power when a layer is processed. This parameter determines the depth of the slope.  
Min-Power: the lowest laser power when grade engraving.  
Grade-width: the width of grade.  
Bi-dir: when engraving, laser emit on both negative X-axis and positive X-axis. When cancel this function, laser emit on only one direction.  
Below: below or not. This function needs hardware support.  
Repair per: change the parameter will adjust the definition of the engraved letters.  
Repair: select this option and the engraved letters will be clearer.

Set Engrave options

Speed: 250.00	scan gap: 0.100	Min-Power: 0.00
grade-width: 0.80	Power: 80.00	Repair per: 20
Bi-dir	Repair	Below
OK Cancel		

5.5 Interface of setting hole options  
Double click the color bar on the "Layer" column, and the dialog box as shown below.

Power: the laser power when a layer is processed.  
Interval: the space between two adjacent holes.  
Hole on center: delay time for a hole. It determines the size of holes.  
Below or not: This function needs hardware support.  
Hole on center: hole on all the center of the close graphs.  
...: This is advanced layer options. Click this button.

Set hole options

Power: 80.00	Hole on center
Interval: 2.5000	Radius: 0.80
OK Cancel	

#### 6.4.4 Corner acc

It determines the processing precise when the processing route turns the corner.

When the machine can't draw lines smoothly, please input a smaller number in "Acceleration" and "Corner Acc".

#### 6.4.5 Gap on xy axis

Compensation gap when the motor changes direction. This parameter only works when cut with even speed.

#### 6.4.6 Original

The machine draws the graph according the route as it is been made.

#### 6.4.7 Optimize

The software will calculate the route to improve processing efficiency. If you select this option, there are 2 options.

**Inner-to-outer:** cut from inner to outer.

**Down-to-up:** cut from down to up according the number of "divide-height".

#### 6.4.8 Gap-Optimize

Select this option, when cut complex graphics, the software will generate cut route to compensate the mechanical gap. But this will greatly increase inefficient route.

#### 6.4.9 Automation set cut direction

The software will confirm the direction automatically. If you need to change the direction, please cancel this function. Compensation

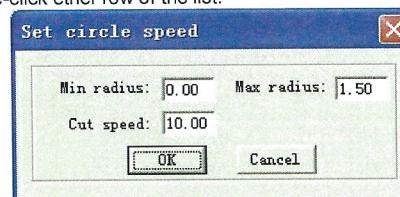
#### 6.4.10 Overlap length

Because of the mechanical gap, circle can't be cut round. Input a certain number in it, and you can get the circle more round. But this will increase the processing time.

#### 6.4.11 Circle speed

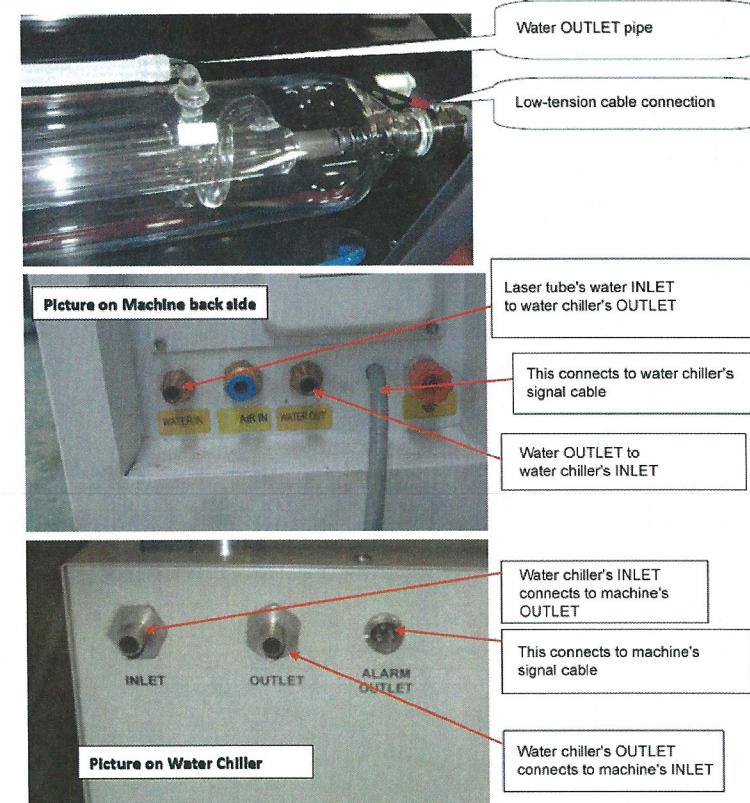
When cutting small circle (the diameter is especially between 1to 3) with high speed, it will be distorted. The parameters of "Set circle speed" are used to reduce distortion.

Double-click ether row of the list.



When the radius of circle is in the range between "Min radius" and "Max radius", the cut speed will automatically be changed to the number of "Cut speed".

### 6.5 Engrave



Power on the machine, and the water chiller will start to work.

The water from the water chiller should circulate in the laser tube now. The water tube should be fully filled with water in less than 20 seconds.

Water in the laser tube will cool down the laser tube during the laser operation. The laser tube will break without water circulating in the laser tube properly (*This is NOT covered by the warranty*).

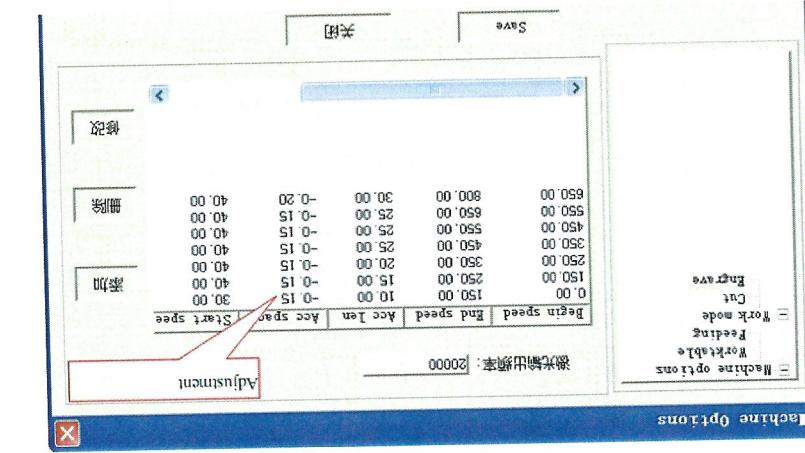
Find out if there is any bubble in the laser tube after one minute.

The water inlet of the laser tube should be located at the lower place, and the water outlet should be located at the higher place. This should avoid bubbles in the laser tube.

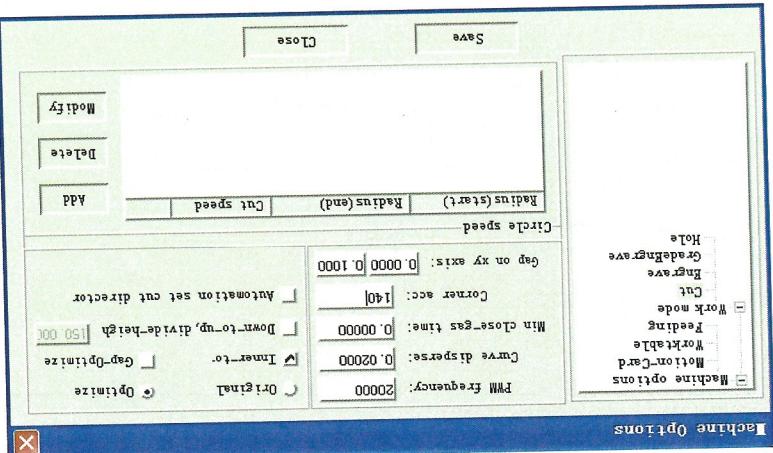
## 7. Installation of Software

### 7.1. Installation of Soft Dog

Insert the soft dog (USB key) into USB port of a computer (PC).



You can change the engraving accuracy by amending the value of Acc space, it is from -0.3 to 0.3. The parameter has been set up when the machine leaves factory, so it is recommended that the user does not amend it.



## 8. Setup of Software's Parameters

**Speed:** you can choose different speed according to different material. It's better to confirm proper speed through testing.  
**Power:** the laser power when cutting.  
**Blanks:** distance between processing graphics and the edge of cutting piece.  
**Save:** save the parameters for next data.

**Clip Box:** Click this button, laser head will move as a rectangle with laser on according to this size of the graphics. This function is also used for confirming the location of work piece.

**Run Box:** Click this button, and laser head will move as a rectangle without laser emitting according to the size of the graphics. This function is used for confirming the location of work piece.

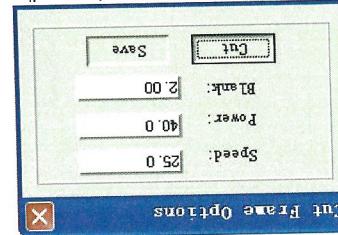
**Times and Delay:** if input 10 in "Times" and 20 in "Delay", then press "Run", you can get 10 seconds graphics. And it will stay for 20 seconds after every processing finished. The 20 seconds is same graphics. In the software will take the position that the laser head is original point: if this option is selected, the software will take the position you set.

**5.3 Auxiliary processing parameters**

In the following dialog box, some auxiliary processing parameters can be set.

**When run the software, it will be reset automatically (this function can be cancelled as you determine by "Quick Speed". Then the laser head will move to the origin point quickly (the speed is determined by "Quick Speed"). Then the laser head will move to the home point of the machine slowly (the speed is determined by "Datum Speed" that you can change in the "Option" dialog box). This can eliminate the cumulative error. Generally, the machine should be reset before processing.**

**Move the axes.**



**Speed:** this is advanced layer options. Click this button.

head will not change speed during processing.

#### 6.2.8 Quick Speed

This is the maximum speed of laser head moving without lasers emitting. When move the laser head up, down, left and right, this parameter will work. If the number is too high, machine will shake intensively.

#### 6.2.9 Acceleration

It is the acceleration from start speed to quick speed.

#### 6.2.10 Test Speed (fast)

This is the speed that you move the laser head when you select auto datum.

#### 6.2.11 Test Speed (slow)

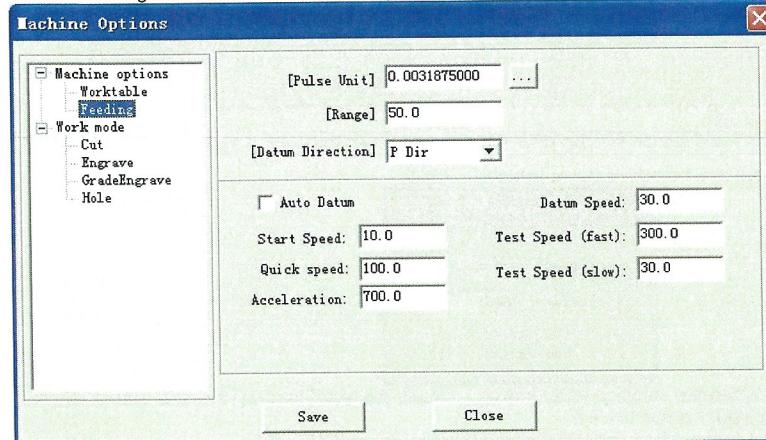
This is the speed that you move the laser head when you don't select auto datum.

#### 6.2.12 Laser space

If there are 2 laser heads, the space of the laser heads should be input.

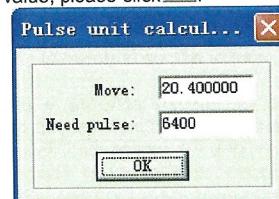
### 6.3 Feeding

The feeding axis can be used as feeding and lift working table.



#### 6.3.1 Pulse unit

It means the distance that the laser head moves when the control system output a pulse. If you don't know this numerical value, please click ...



**Move:** When the stepping motor moves a circuit, the laser head will move a relative length. You need to input the number in it.

**Need pulse:** The number is "driver's subdivision number" × 200.

#### 6.3.2 Range

It is the available processing area of the feeding axis. The moving range of the feeding axis will be restricted by this parameter.

#### 6.3.3 Datum Direction

It is determined by the position (up Or down) of original switch.

#### 6.3.4 Auto Datum

### Laser tube test:

1. Close the machine's cover/lid.
2. Open the laser tube's metal cover (part of machine's body).
3. Cover the front of the laser tube with a small piece of paper.
4. Close the laser tube's metal cover.
5. Press "Laser" button from the machines control panel to make a dot (burnt mark) on a piece of paper.
6. If there is a dot (burn mark) on the paper, the laser tube is working or properly installed. The burn mark should be around in the middle of the mirror. If it is not around the middle of the mirror, please slightly adjust the position of the laser tube.

The laser tube can adjust the location of the dot vertically.

### Test for the FIRST reflection mirror (No 2):

1. Cover the front of the mirror with a small piece of paper.
2. Close the machine's cover/lid.
3. Move the laser head to **upper left corner** of the machine. Use the machine's control panel to do it. Do not move it manually by hand.
4. Press "Laser" button from the machines control panel to make a dot (burnt mark) on a piece of paper.
5. Move the laser head to **lower left corner** of the machine to make another dot.
6. Use the adjustment screws (located at the back of the mirror) of the first reflection mirror to make these 2 dots overlap with each other.

### Test for the SECOND reflection mirror (No 3):

1. Cover the front of the mirror with a small piece of paper.
2. Close the machine's cover/lid.
3. You only need to test the X direction of the laser head for this test. Move the laser head to the **left** of the machine. Use the machine's control panel to do it. Do not move it manually by hand.
4. Press "Laser" button from the machines control panel to make a dot (burnt mark) on a piece of paper.
5. Move the laser head to the **right** of the machine to make another dot.
6. Use the adjustment screws (located at the back of the mirror) of the second reflection mirror to make these 2 dots overlap with each other.

### Test for the THIRD reflection mirror (No 4):

1. Cover the front of the mirror with a small piece of paper.
2. Close the machine's cover/lid.
3. Press "Laser" button from the machines control panel to make a dot (burnt mark) on a piece of paper.
4. Use the adjustment screws (located at the back of the mirror) of the third reflection mirror to make the dot appear.

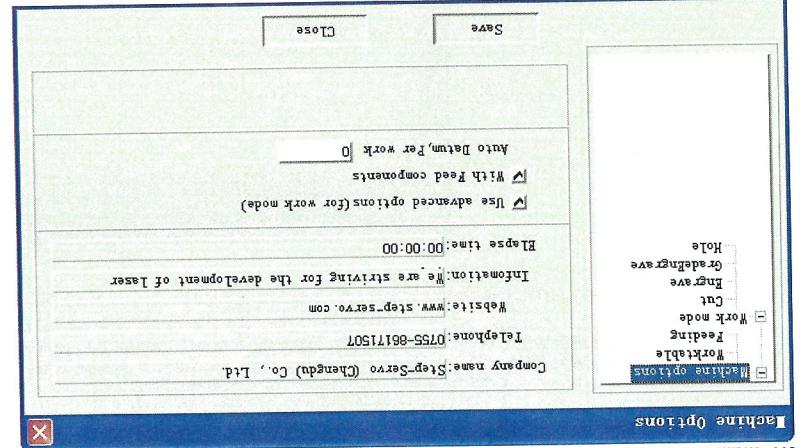
If the laser beam path is adjusted well, the beam of the laser head should be vertically reflected down to the material on the table.

If the burn mark on the material is not sharp or it is too wide, the focus is not right, please adjust the height of the work table.

## Chapter 6 Options

Any change of the parameters in "Options" will change the performance of the machine. Before changing the parameter, you should consult the supplier.

6.1 Main interface



Machine options

Work mode

Work name

Website

Information

Erase time

With Feed components

Auto Datum, Per work

Other options

Machine Options

6.1.1 Information about manufacturer

It shows the basic information about the manufacturer and can't be modified.

6.1.2 Elapse time

It shows the time that the machine has run. It can't be modified.

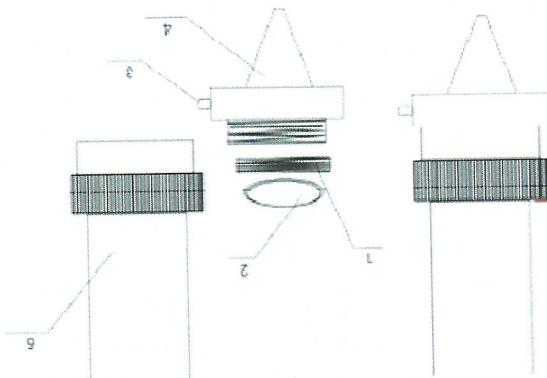
6.1.3 Other options

Some advanced options: There are advanced button as ... in "Laser output".

With Feed components: This is for feeding axis. If the machine has not feeding axis, this complex. Cancel this option, and you can't inter the interface of "advanced options".  
Accessorial parameters will help you get better effect. But it will make the software more complex. Cancel this option, and you can't inter the interface of "advanced options".

Auto Datum...: If you input a number in it, the machine will datum when the run time reaches the number. It can eliminate the cumulative error of the mechanism.

Option should be canceled.



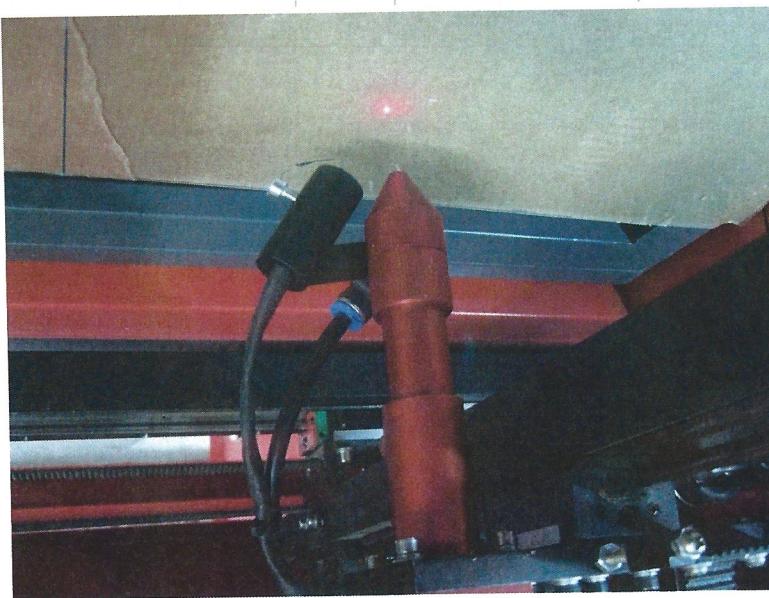
Focal length: (different machine have different focal length, you can use the random with the focal length of the block adjustable focal length)

5. Lens come  
4. Air-out nozzle  
3. Air-in nozzle  
2. Focus lens (convex side down)  
1. Focus lens cap

Put an acrylic piece on the work table, loosen the screw which is located on the left of the laser head from the control panel and observe the size of light. This is the right distance for good focusing.

Move the laser head to 55mm plus-minus 1mm. Close the machine's lid, and press the "Test" button from the control panel and observe the size of light. This is the right distance for good focusing.

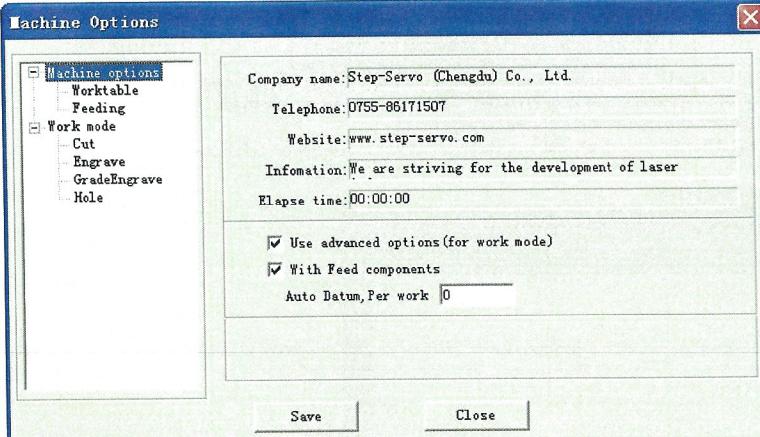
Put an acrylic piece on the work table, loosen the screw which is located on the left of the laser head from the control panel and observe the size of light. This is the right distance for good focusing.



## Chapter 6 Options

Any change of the parameters in "Options" will change the performance of the machine. Before changing the parameter, you should consult the supplier.

### 6.1 Main interface



#### 6.1.1 Information about manufacturer

It shows the basic information about the manufacturer and can't be modified.

#### 6.1.2 Elapse time

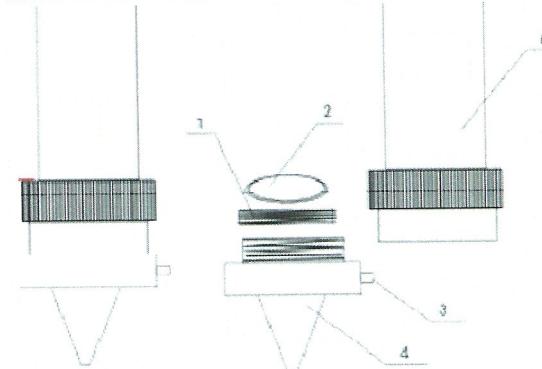
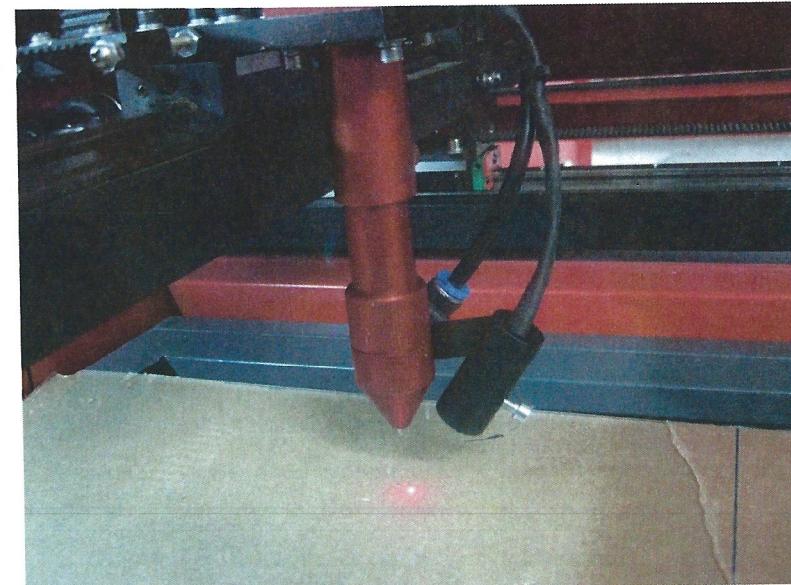
It shows the time that the machine has run. It can't be modified.

#### 6.1.3 Other options

Use advanced options: There are advanced button as in "Laser output". Some accessory parameters will help you get better effect. But it will make the software more complex. Cancel this option, and you can't enter the interface of "advanced options".

With Feed components: This is for feeding axis. If the machine has not feeding axis, this option should be canceled.

Auto Datum...: If you input a number in it, the machine will datum when the run time reaches the number. It can eliminate the cumulate error of the mechanism.



**Focal length:** (different machine have different focal length ,you can use the random with the focal length of the block adjustable focal length)

1. Focus lens cap
2. Focus lens (convex side down)
3. Air-in nozzle
4. Air-out nozzle
5. Lens cone

Put an acrylic pierce on the work table, loosen the screw which is located on the left of the laser head. Move the laser head to 55mm plus-minus 1mm. Close the machine's lid, and press the "Test" button from the control panel and observe the size of light. This is the right distance for good focusing.

**Laser tube test:**

1. Close the machine's cover/lid.
2. Open the laser tube's metal cover (part of machine's body).
3. Cover the front of the laser tube with a small piece of paper.
4. Close the laser tube's metal cover.
5. Press "Laser" button from the machine's control panel to make a dot (burnt mark) on a piece of paper.
6. If there is a dot (burn mark) on the paper, the laser tube is working or properly installed. The burn mark should be around in the middle of the mirror. If it is not around the middle of the mirror, please slightly adjust the position of the laser tube.
7. The laser tube can adjust the location of the dot vertically.

**Test for the FIRST reflection mirror (No 2):**

1. Cover the front of the mirror with a small piece of paper.
2. Close the machine's cover/lid.
3. Move the laser head to **upper left** corner of the machine. Use the machine's control panel to do it. Do not move it manually by hand.
4. Press "Laser" button from the machine's control panel to make a dot (burnt mark) on a piece of paper.
5. Use the adjustment screws (located at the back of the mirror) of the first reflection mirror to move the laser head to **lower left** corner of the machine to make another dot.
6. Use the adjustment screws (located at the back of the mirror) of the first reflection mirror to make these 2 dots overlap with each other.
3. You only need to test the X direction of the laser head for this test. Move the laser head to the left of the machine. Use the machine's control panel to do it. Do not move it manually by hand.

**Test for the SECOND reflection mirror (No 3):**

1. Cover the front of the mirror with a small piece of paper.
2. Close the machine's cover/lid.
3. You only need to test the Y direction of the laser head for this test. Move the laser head to the right of the machine. Use the machine's control panel to do it. Do not move it manually by hand.
4. Press "Laser" button from the machine's control panel to make a dot (burnt mark) on a piece of paper.
5. Move the laser head to **right** of the machine to make another dot.
6. Use the adjustment screws (located at the back of the mirror) of the second reflection mirror to make these 2 dots overlap with each other.

**Test for the THIRD reflection mirror (No 4):**

1. Cover the front of the mirror with a small piece of paper.
2. Close the machine's cover/lid.
3. Press "Laser" button from the machine's control panel to make a dot (burnt mark) on a piece of paper.
4. Use the adjustment screws (located at the back of the mirror) of the third reflection mirror to move the laser head to **left** of the machine to make another dot.
5. Move the laser head to **right** of the machine to make another dot.
6. Use the adjustment screws (located at the back of the mirror) of the second reflection mirror to make these 2 dots overlap with each other.
3. Press "Laser" button from the machine's control panel to make a dot (burnt mark) on a piece of paper.
4. Make the dot appear.
4. Use the adjustment screws (located at the back of the mirror) of the third reflection mirror to move the laser head on the table.
5. If the burn mark is not sharp or it is too wide, the focus is not right, please adjust the height of the work table.

**Move:** When the stepping motor moves a circuit, the laser head will move a relative length. It is the available processing area of the feeding axes. The moving range of the feeding axis will be restricted by this parameter.

**Need pulse:** The number is "driver's subdivision number" > 200. You need to input the number in it.

**Move:** When the stepping motor moves a circuit, the laser head will move a relative length. It is determined by the position (up or down) of original switch.

**Auto Datum:** If it is determined by the position (up or down) of original switch.

**Dataum Direction:** It is the available processing area of the feeding axes. The moving range of the feeding axis will be restricted by this parameter.

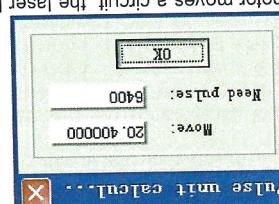
**6.3.2 Range:** It is the available processing area of the feeding axes. The moving range of the feeding axis will be restricted by this parameter.

**6.3.3 Datum Direction:** It is the available processing area of the feeding axes. The moving range of the feeding axis will be restricted by this parameter.

**6.3.4 Auto Datum:** It is the available processing area of the feeding axes. The moving range of the feeding axis will be restricted by this parameter.

**6.3.1 Pulse unit:** It means the distance that the laser head moves when the control system output a pulse. If you don't know this numerical value, please click ... .

**Pulse unit calculate ...**



**6.3 Feeding**

The feeding axes can be used as feeding and lift working table.

**6.3.10 Test Speed (fast):** This is the speed that you move the laser head when you don't select auto datum.

**6.3.11 Test Speed (slow):** This is the speed that you move the laser head when you select auto datum.

**6.3.12 Laser space:** This is the speed that you move the laser head when you don't select auto datum.

**6.2.9 Acceleration:** It is the acceleration from start speed to quick speed.

**6.2.10 Test Speed (fast):** It is the acceleration from start speed to quick speed.

**6.2.11 Test Speed (slow):** It is the speed that you move the laser head when you select auto datum.

**6.2.12 Laser space:** This is the speed that you move the laser head when you don't select auto datum.

**6.2.13 Quick Speed:** Head will shake intensively.

**6.2.8 Quick Speed:** Head will not change speed during processing.

**6.2.7 Acceleration:** This is the maximum speed of laser head moving without lasers emitting. When move the head will not change speed during processing.

**6.2.6 Range:** This is the maximum speed of laser head moving without lasers emitting. If the number is too high, machine will shake intensively.

**6.2.5 Acceleration:** Left and right, this parameter will work. When move the head will not change speed during processing.

**6.2.4 Quick Speed:** Head will not change speed during processing.

**6.2.3 Range:** Head will not change speed during processing.

**6.2.2 Acceleration:** Head will not change speed during processing.

**6.2.1 Range:** Head will not change speed during processing.

**6.2.0 Acceleration:** Head will not change speed during processing.

**X-**, **X+**, **Y+**, **Y-**, **Z+**, **Z-**: Move the axis.

**Datum**, **Z Datum**: Click this button and the laser head (or Z) will move to the home point of the machine slowly (the speed is determined by "Datum Speed" that you can change in the Option dialog box). Then the laser head will move to the origin point quickly (the speed is determined by "Quick Speed" that you can change in the "Option" dialog box). This can eliminate the cumulate error. Generally, the machine should be reset before processing. When run the software, it will be reset automatically (this function can be cancelled as you prefer).

**Slow**: No use.

**Step**: No use.

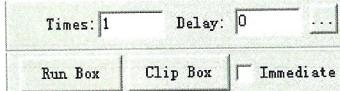
**Length**: No use.

**Power**: It determines the intensity of the laser power supply. The minimum value is 0 and the maximum value is 100.

**Laser**: Laser on/off.

### 5.3 Auxiliary processing parameters

In the following dialog box, some auxiliary processing parameters can be set.

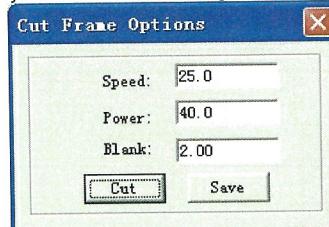


**Times and Delay**: If input 10 in "Times" and 20 in "Delay", then press "Run", you can get 10 same graphics. And it will stay for 20 seconds after every processing finished. The 20 seconds is for feeding and taking down material. Different time can be set as you need. This function can increase efficiency a lot.

**Immediate**: If this option is selected, the software will take the position that the laser head is as original point. If this option is not selected, the original point will be the position you set.

**Run Box**: Click this button, and laser head will move as a rectangle without laser emitting according to the size of the graphics. This function is used for confirming the location of work piece.

**Clip Box**: Click this button, laser head will move as a rectangle with laser on according to the size of the graphics. This function is also used for confirming the location of work piece, and you can see the following dialog box:



**Speed**: you can choose different speed according to different material. It's better to confirm proper speed through testing.

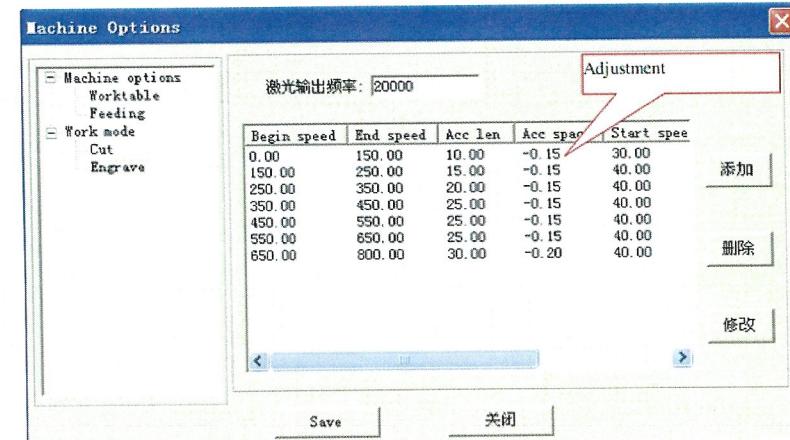
**Power**: the laser power when cutting.

**Blank**: distance between processing graphics and the edge of cutting piece.

**Save**: save the parameters for next data.

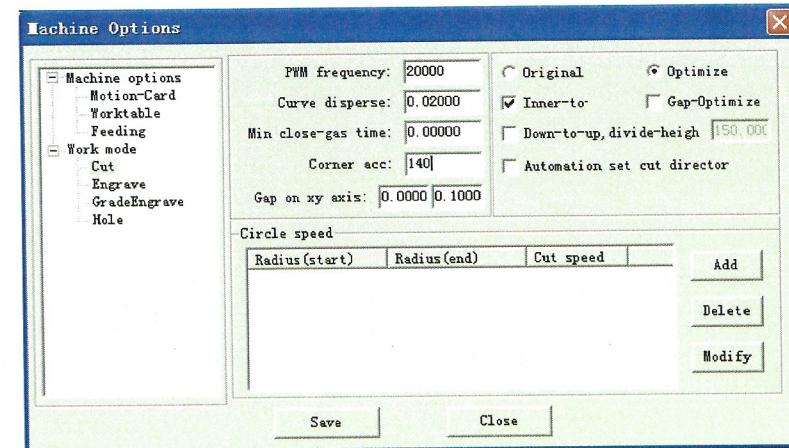
**...**: This is advanced layer options. Click this button.

You can change the engraving accuracy by amending the value of Acc space, it is from -0.3 to 0.3. The parameter has been set up when the machine leaves factory, so it is recommended that the user does not amend it.



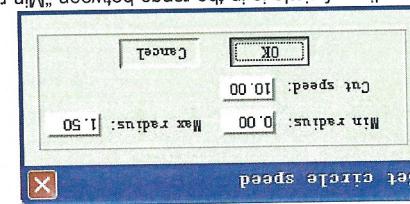
## 8. Setup of Software's Parameters

Any change of the parameters in "Options" will change the performance of the machine. It is very important that any user does NOT change any parameter before consulting Red Dot Machinery's technical people.



## 6.5 Engrave

When the radius of circle is in the range between "Min radius" and "Max radius", the cut speed will automatically be changed to the number of "Cut speed".



6.4.11 Circle speed  
When cutting small circle (the diameter is especially between 1 to 3) with high speed, it will be distorted. The parameters of "Set circle speed" are used to reduce distortion.

6.4.10 Overlap length  
Because of the mechanical gap, circle can't be cut round. Input a certain number in it, and you can get the circle more round. But this will increase the processing time.

6.4.9 Automation set cut direction  
The software will confirm the direction automatically. If you need to change the direction, please cancel this function.

6.4.8 Gap Optimize  
Select this option, when cut complex graphics, the software will generate cut route to compensate the mechanical gap. But this will greatly increase inefficient route.

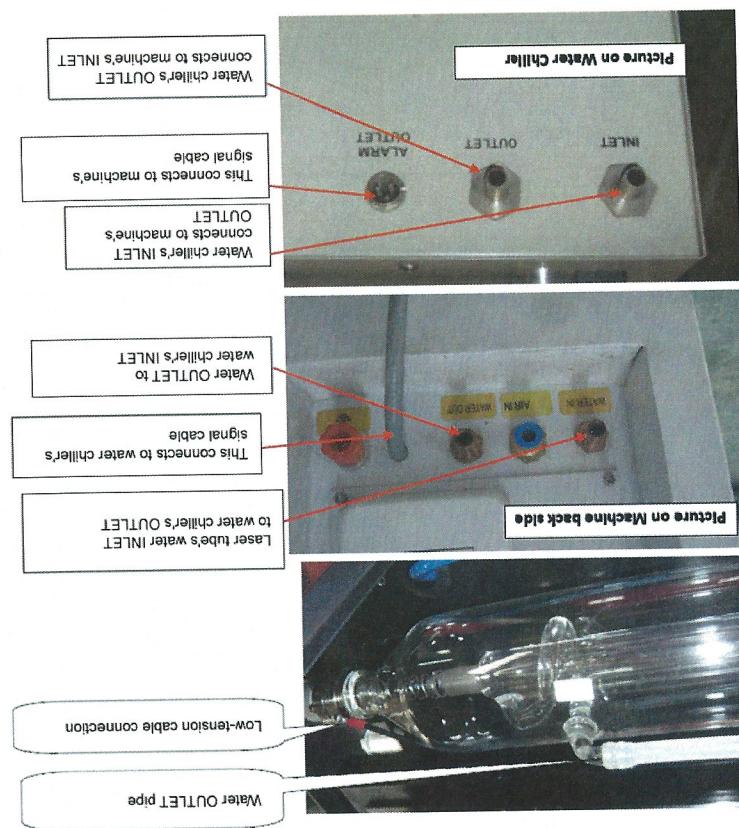
6.4.7 Optimize  
The software will calculate the route to improve processing efficiency. If you select this option, there are 2 options.

6.4.6 Optimal  
The machine draws the graph according the route as it is been made.

6.4.5 Gap on XY axis  
Compenesation gap when the motor changes direction. This parameter only works when cut with even speed.

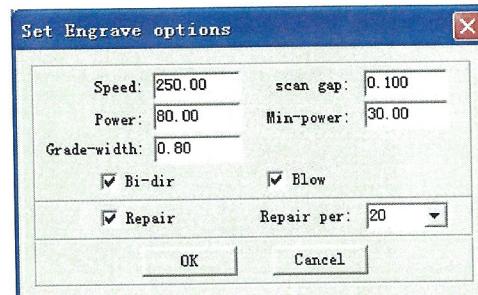
6.4.4 Corner acc  
If determines the processing precise when the processing route turns the corner.

When the machine can't draw lines smoothly, please input a smaller number in "Acceleration" and "Corner Acc".



7.1. Installation of Soft Doge  
Insert the soft doge (USB key) into USB port of a computer (PC).

## 7. Installation of Software



**Speed:** engraving speed on X-axis.

**Scan gap:** movement distance on Y-axis when engrave a row on X-axis.

**Power:** the laser power when a layer is processed. This parameter determines the depth of the slope.

**Min-Power:** the lowest laser power when grade engraving.

**Grade-width:** the width of grade.

**Bi-dir:** when engraving, laser emit on both negative X-axis and positive X-axis. When cancel this function, laser emit on only one direction.

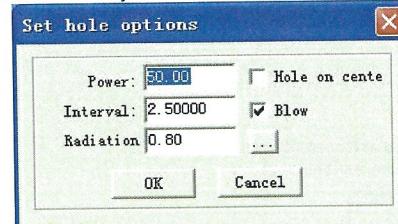
**Blow:** blow or not. This function needs hardware support.

**Repair:** select this option and the engraved letters will be clearer.

**Repair per:** change the parameter will adjust the definition of the engraved letters.

#### 5.1.5 Interface of setting hole options

Dblclick the color bar on the "Layer" column, and the dialog box as shown below.



**Power:** the laser power when a layer is processed.

**Interval:** the space between two adjacent holes.

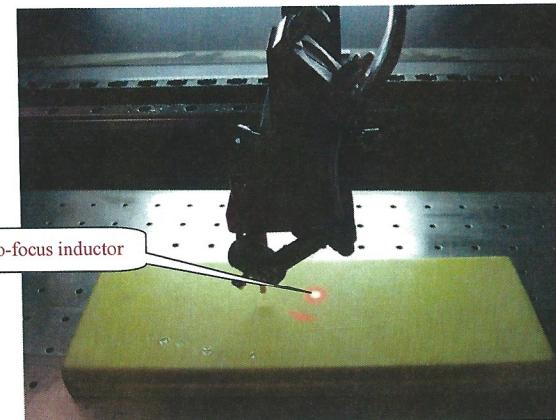
**Radiation time:** delay time for a hole. It determines the size of holes.

**Hole on center:** hole on all the center of the close graphs.

**Blow:** blow or not. This function needs hardware support.

**...:** This is advanced layer options. Click this button.

## Auto-Focus Device

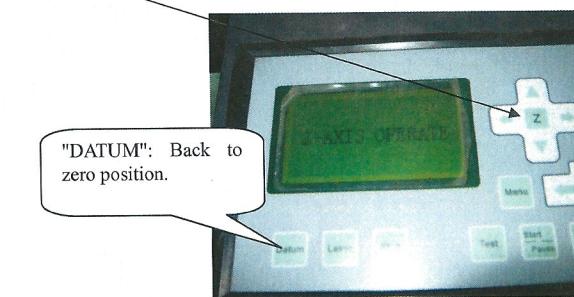


### Instructions:

1. Press "ESC" button.

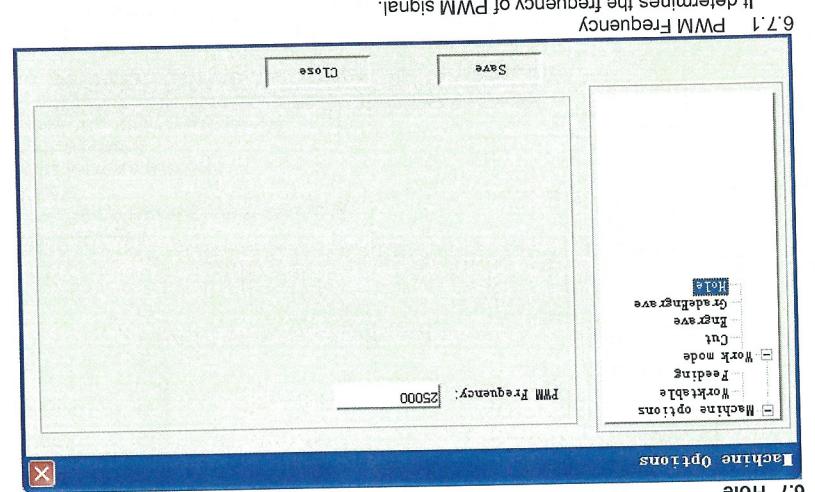


2. Press "Z" button.



3. Put the an object under the laser head (see the first picture). Press "DATUM" button to start focusing. At this time, the work table will move up automatically, as far as touching the Auto-

6.6 Grade Engrave  
Please refer to 6.5

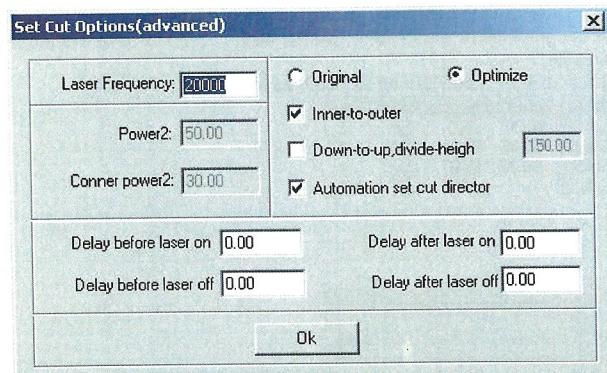


6.3 Installation of Smoke Exhaust Fan  
Connect the fan to the exhaust port of the machine with an exhaust pipe, and connect a power cable of the fan to a power board in the machine.

Due to the noise of the blower fan, it would be best to put the fan outside of premises.

## 7. Installation of Laser Tube

6.7.1 Pwm Frequency  
It determines the frequency of PWM signal.



**Laser:** This is the PWM frequency.

**Original:** The machine draws the graph according the route as it is been made.

**Optimize:** The software will calculate the route to improve processing efficiency. If you select this option, there are 2 options.

**Inner-to-outer:** cut from inner to outer.

**Down-up:** cut from down to up according the number of "divide-height".

**Automation set cut direction:** The software will confirm the direction automatically. If you need to change the direction, please cancel this function.

**Power2:** laser power of the second laser head. This needs hardware support.

**Corner power2:** corner power of the second laser head. This needs hardware support.

If you need to set output order, "Original" should be selected.

**Delay before laser on:** delay before laser on.

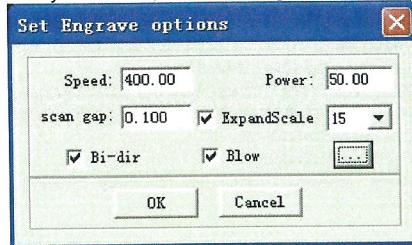
**Delay after laser on:** delay after laser on.

**Delay before laser off:** delay before laser off.

**Delay after laser off:** delay after laser off.

### 5.1.3 Interface of "set engrave options"

Dbclick the color bar on the "Layer" column, and the dialog box as shown below.



**Speed:** engraving speed on X-axis.

**Power:** the laser power when a layer is processed.

**Scan gap:** movement distance on Y-axis when engrave a row on X-axis.

**Bi-dir:** when engraving, laser emit on both negative X-axis and positive X-axis. When cancel this function, laser emit on only one direction.

**Blow:** blow or not. This function needs hardware support.

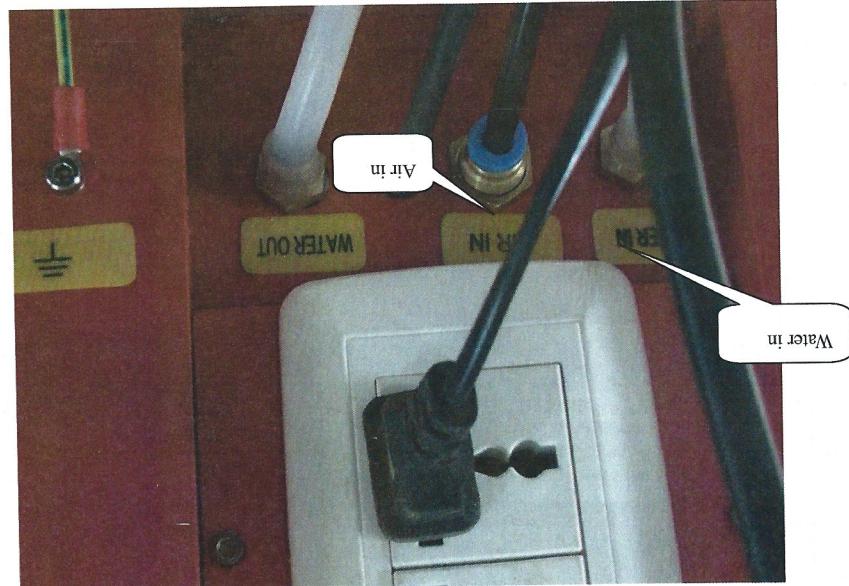
**Expand scale:** when engraving small letters, the width of transverse stroke may be smaller than the actual size. Adjusting this parameter can compensate it.

: This is advanced layer options. Click this button.

# Software User Manual

(DSP5.1 For MPC6515 Motion Controller)

Written by The Software Writer



## 6. Installation of Accessories

**6.1. Installation of Water Chiller**

Ensure the water chiller is switched OFF, and add clean tap water into the water chiller until it is full. Connect the water outlet of the water chiller to the water inlet of the machine using the supplied water pipe, and connect the water inlet of the water chiller to the water outlet of the water pipe, and connect the water outlet of the water chiller to the water inlet of the power board in the machine.

Ensure you check the water level every 3 days, and top it up when it is not full. Connect a power cable of the water chiller to the power board in the machine.

Press "Start" and the interface will show as following.

FILE	AAA	TIME	0 : 0 : 15
SPEED	100%	POWER	100%
FILE	AAA	TIME	0 : 0 : 15

Press again and you can modify the options (file name is brightened).

Now, press and all the number will be saved. Press "Esc", and all the options will be modified (none of the options is brightened).

Press and you can change the number in the selected option.

Now, file name is brightened (word is white and background is black).

At first, file name is brightened (word is white and background is black).

Del: Delete the current file.

Pieces: Repeat times of a file.

7.2 Processing interface of PADO3

File: File name which is being processed.

Speed: Percentage of speed.

Power: Percentage of Power.

Time: Time for processing this file.

When processing, Press and you can change the percentage of speed.

Corner-Power and you can control the processing procedure.

Press "Star/Pause" and you can cancel the processing procedure. The interface shows "Stopped". Press "Esc" and you can see the main interface.

7.3 Accessory interface of PADO3

CUT BDR

PMOV SET

LAS SET

LANGUAGE SET

Press "Menu" and you can see the accessory interface.

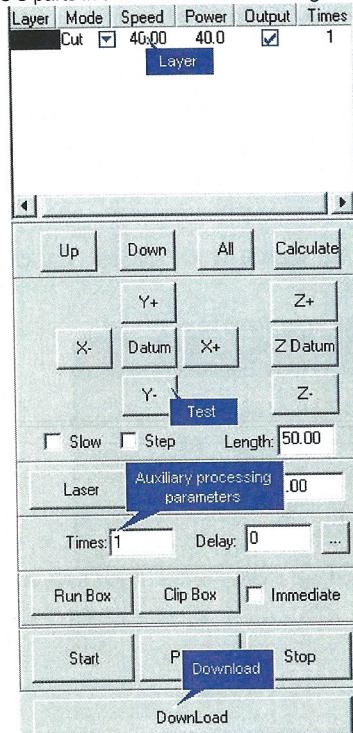
CUT BDR: Laser head will move a rectangle with laser on according to the size of the graphics.

LAS SET: Select this option and press . The LAS SET interface is as following.

000000	%
000000	POW MS

## Chapter 5      Laser output

There are 3 parts in this interface as following.



### 5.1 Layer

#### 5.1.1 Main interface of "Layer"

Layers management is shown as below:

Layer	Mode	Speed	Power	Output	Times
Cut	Cut	40.00	40.0	<input checked="" type="checkbox"/>	1
Engr	Engr	400.00	50.00	<input checked="" type="checkbox"/>	1
Grade	Grade	250.00	80.00	<input checked="" type="checkbox"/>	1
Hole	Hole	--	50.0	<input checked="" type="checkbox"/>	1

Up Down All Calculate

When there are many layers, the processing sequence is from the top down. Select one row and click Up or Down, and the sequence can be changed.

When there are many layers, select one row and click All, and all the processing parameters of the other layers can be set as the layer that has just been selected.

## Chapter 10    Comments on tool programs

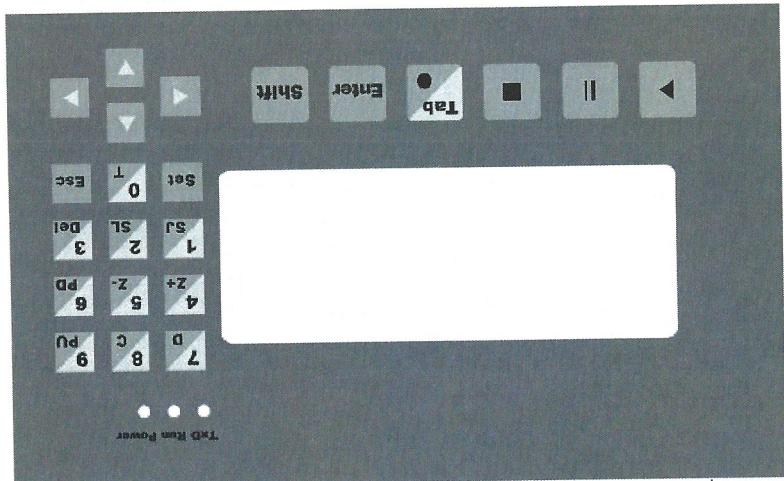
### 10.1 Version check program

## Chapter 11    Addenda

- 11.1 How to make AI (Adobe Illustrator) files
- 11.2 FAQ

## Chapter 8 Text display operation

The panel of text display is as following.



Remove the straps.

Open the wooden box and the machine's lid and front door to remove the accessories.

## 4.2. Disassembly of Machine



## 8.1 Main interface

8.1.1 Introduction of displaying content  
File: file name of the current file.  
No.: serial number of the current file.  
Sum: the number of files saved in the MPG6515 controller.  
Power: the percentage of laser power.  
corner power and the letter is for processing power.

PCs: repeat times of the current file.  
Power: the former is for sum of files saved in the MPG6515 controller.  
Move laser head.  
Switch to jog set interface.  
Delete current file.  
Move Z axis. This function needs hardware support.

## 8.1.2 Introduction of keys on the panel (cursor not be enabled)

: Press this key, and switch to work interface.  
Tab : Enable cursor.

: Move laser head.  
1 SL : Switch to jog set interface.  
2 SL : Switch to laser set interface.

3 Del : Delete the current file.

4 Z+ : Move Z axis. This function needs hardware support.

5 Z- : Datum. Press this key, and the machine will run to the original switches.

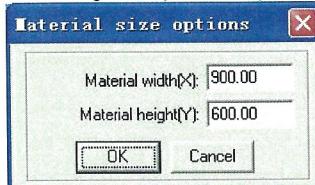
6 PU : Cut. Press this key, and the machine will cut down the work piece.

## 8.1.3 Introduction of keys on the panel (cursor is enabled)

**Gap along X:** It is the space along X axis between the first and second row.

**Array-data Only Draw Box:** If you select this option, there will be only one data on screen; others will be shown as rectangles.

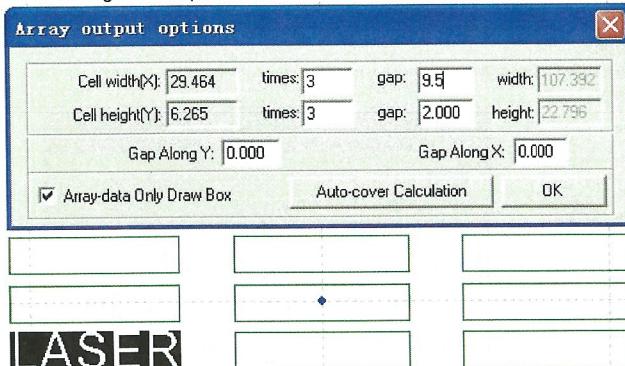
**Auto-cover Calculation:** This can calculate the number of row and column that can cover the whole material according to the parameter you input. Click this button,



**Material width(X):** It is the width of the work piece (the default is the worktable's width).

**Material height(Y):** It is the height of the work piece (the default is the worktable's height).

The following is a sample.



#### 4.5.4 Calculate

When the graph and processing parameters are changed, this button should be clicked to save the processing parameters in processing file.

#### 4.5.5 Clear log

Click this button; the system will clear the log.

#### 4.5.6 Simulate

The corresponding icon is

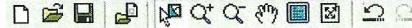
When parameters set is finished, please click this button. It can simulate the procedure of output for checking the result of output.

Click "Esc" on the keyboard and you can cancel the simulation process.

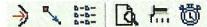
#### 4.6 View

##### 4.6.1 Toolbar

**File toolbar:** Click this button, you can display or hide the following bar.



**Output toolbar:** Click this button, you can display or hide the following bar.



**Edit toolbar:** Click this button, you can display or hide the following bar.

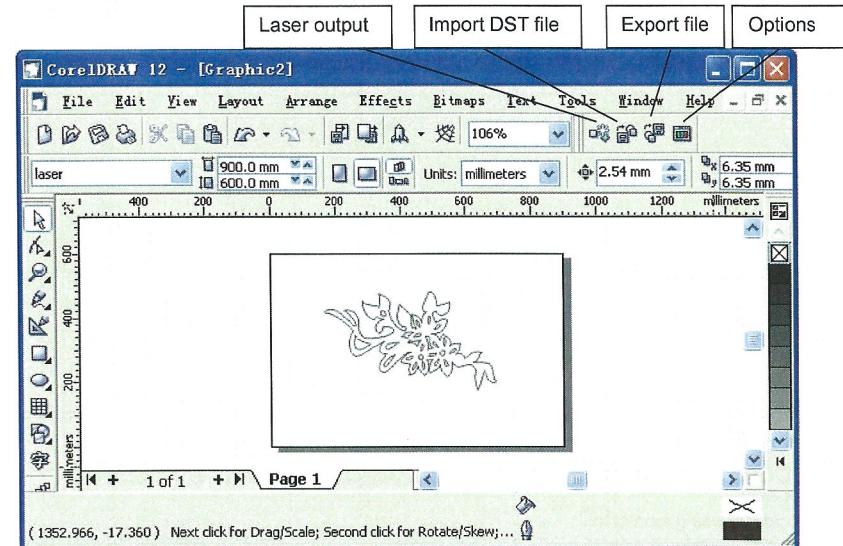


**Layers toolbar:** Click this button, you can display or hide the following bar.



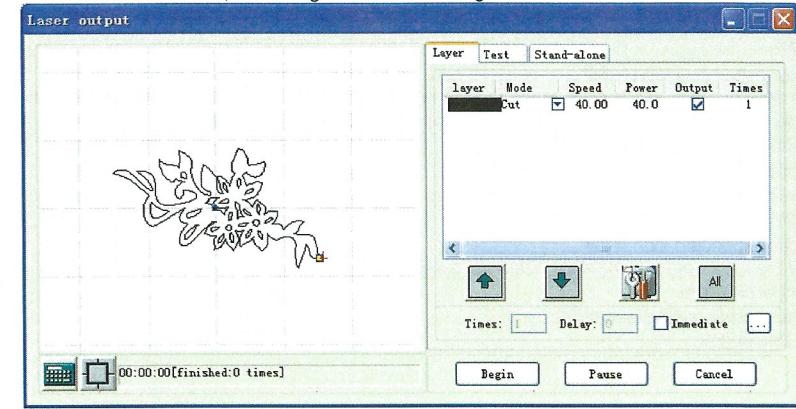
## Chapter 2 Explanation for CorelDraw Edition

Run CorelDraw and the interface as following.



#### 2.1 Laser output

Click this button, the dialog box is as following.



##### 2.1.1 Layer

Please refer to "Chapter 5"

##### 2.1.2 Test

Please refer to "Chapter 5"

##### 2.1.3 Stand alone

Please refer to "Chapter 5"

##### 2.1.4

## Chapter 9 Download files

You can download update files, processing files and configuration files by USB disk conveniently.

### 9.1 Update MPC6515

9.1.1 Copy the latest firmware files (\*.FMW and \*.HDW) to the root directory of USB disk. The USB disk should be formatted to FAT. And it is suggested that other files should not be saved in this USB disk.

9.1.2 Power on MPC6515 controller and the indicator light (D3 on MPC6515/CPU) will flash 2 times.

9.1.3 After the indicator light (D3 on MPC6515/CPU) flashes 2 times, plug the USB disk in MPC6515 quickly (don't exceed 5 seconds).

9.1.4 The indicator light (D3 on MPC6515/CPU) will shine continuously 2-5 seconds. Now, MPC6515 is updating firmware.

9.1.5 If the updating procedure is finished, the indicator light (D3 on MPC6515/CPU) would flash frequently.

9.1.6 Pull out the USB disk and MPC6515 will run new firmware program automatically.

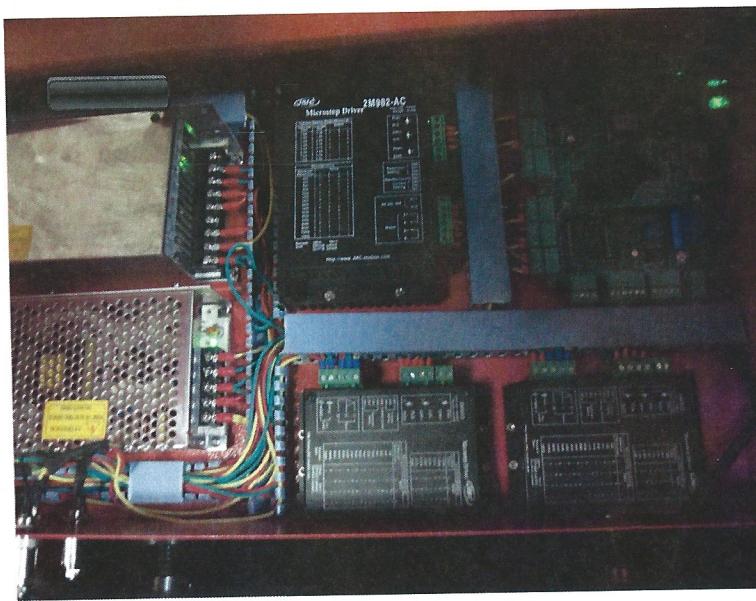
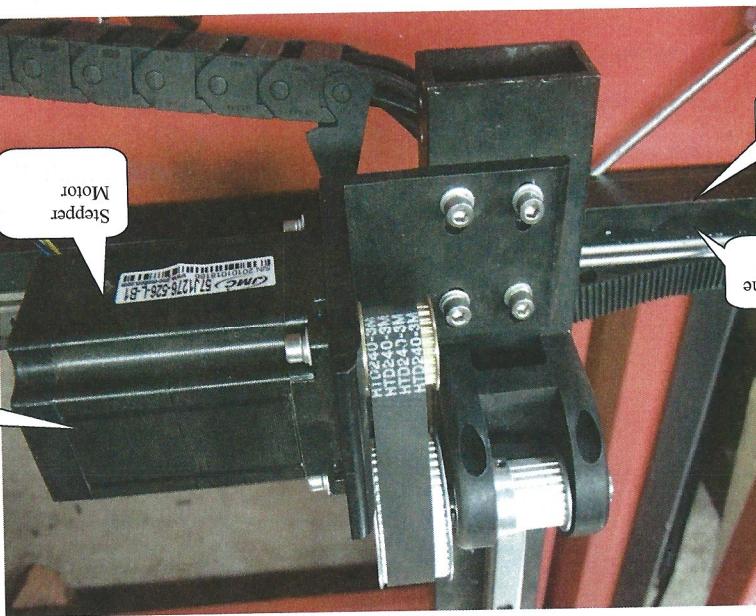
9.1.7 After MPC6515 is updated, the CFG file should be downloaded again. Please refer to "5.4 Download data" for detailed information.

If MPC6515 can't run normally, you may make a mistake when updating. You can repeat the above steps. If this doesn't work, please contact the equipment supplier.

Notice
version is issued. You need update MPC6515 only when new

Notice
Those USB disk with indicate light is suggested for it One is by USB data line. If the computer is close to the machine, this way is very convenient. Please refer to "5.4 Download data" for detailed information. The other is by USB line. If you have two or more machines, this way is very convenient. There are 2 ways to download processing file to MPC6515 controller. 9.2 Downloaded processing file (*.mol)

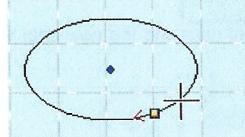
9.2.1 Copy the processing file (*.mol) to the root directory of USB disk. The USB disk should be formatted to FAT16. And it is suggested that other files should not be saved in this USB disk. The following is the detailed steps. The other is by USB disk. If you have two or more machines, this way is very convenient. One is by USB data line. If the computer is close to the machine, this way is very convenient. Please refer to "5.4 Download data" for detailed information. 9.2.2 Connect the computer to the MPC6515 controller. 9.2.3 Power on MPC6515 controller. 9.2.4 The indicator light (D3 on MPC6515/CPU) will shine continuously 2-10 seconds. If the file is too large, it will take several minutes. Now, MPC6515 is downloading file. 9.2.5 If the download procedure is finished, the indicator light (D3 on MPC6515/CPU) would flash frequently. And the PAD03 will give an alarm. 9.2.6 Pull out the USB disk, and you can run the files by PAD03.
--



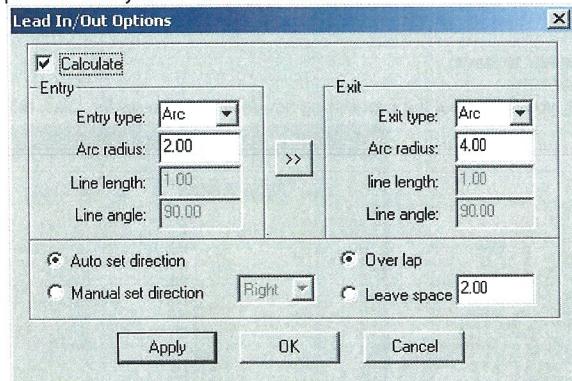
#### 4.5.1 Define cut route

The corresponding icon is .

This software will define the starting point and direction automatically. Generally, the point is on the corner. When you need to change the starting point and direction, you can click this button, and then move mouse to the graphics. The mouse will change to be a crisscross. Now click the left key of mouse on any point of the graphics, and this point will be the new starting point. You can change the direction by clicking "F" key. The following is a sample.



Click "Spacebar" and you can set lead in/out line.



Calculate: select this option and you can set lead in/out lines.

Entry/Exit type: type of lead in/out lines. There are 2 types: arc and line.

Arc radius: radius of lead in/out arc.

Line length: length of lead in/out lines.

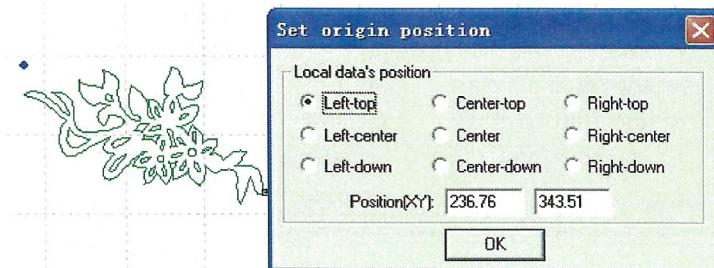
Line angle: angle of lead in/out lines.

: set the exit parameters as same as that of entry.

Auto set direction: this software will set where the lead in /out lines are (in or out of the graphics outline) automatically.

Manual set direction: set where the lead in /out lines are.

Over lap/leave space: this option determines whether the processing effect is closed. The length of over lap (or leave space) is set by the input number beside this option.

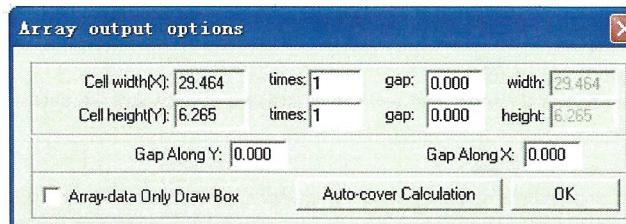


You can set origin point anywhere as you prefer.

#### 2.1.4.7 Array output options

The corresponding icon is .

Click this button.



LASER

Cell Width(X/Y): It is the original size of the data.

Times: It is the number of rows and columns you need.

Gap: It is the space between two adjacent rows or columns.

Width: It is the width of whole data.

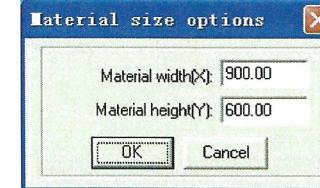
Height: It is the height of whole data.

Gap along Y: It is the space along Y axis between the first and second column.

Gap along X: It is the space along X axis between the first and second row.

Array-data Only Draw Box: If you select this option, there will be only one data on screen; others will be shown as rectangles.

Auto-cover Calculation: This can calculate the number of row and column that can cover the whole material according to the parameter you input. Click this button,



Material width(X): It is the width of the work piece (the default is the worktable's width).

Material height(Y): It is the height of the work piece (the default is the worktable's height).

The following is a sample.

## 1. Introduction

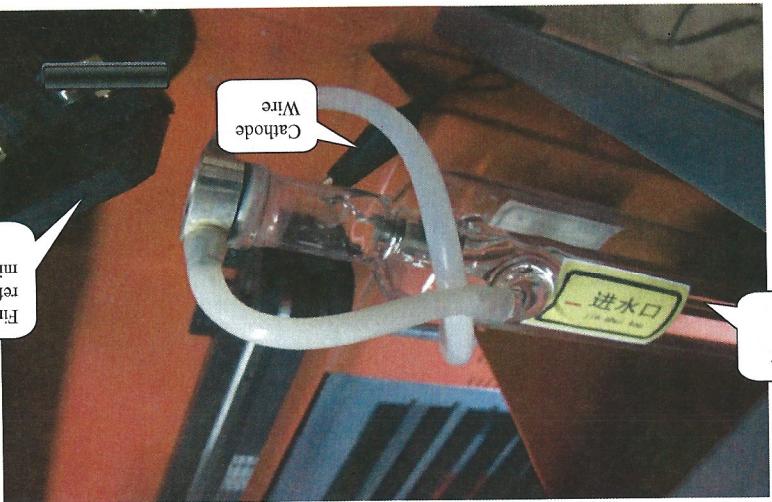
The laser machine described here is a Class IV laser device and is dangerous. The laser will instantly ignite clothing, wood, paper, plastics, and many other common items. Care must be taken to avoid serious injury.

Always operate this machine in an environment free of flammable materials and children. Failure to do so may result in a serious injury. This laser uses high voltage parts. Care must be taken when working with high voltage parts. Failure to do so may result in serious injury or death.

A single stranded copper wire with 2mm diameter is required for grounding. Clean tap water is required for the water chiller.

The laser machine makes use of high-energy laser beam to focus on the surface of material and cut/groove/mark the material that you put on the work table.

## 2. Machine Structure



2.1. Pictures of the Machine

1.3 Technical Information

The laser machine uses a high-energy laser beam to focus on the surface of material and mark/groove.

Exhaust fans and air-exhaust pipes/hoses can remove the gas created during the cutting, engraving, or marking process.

The output laser beam is reflected to the reflection mirrors, and then to the material. The machine uses a CO<sub>2</sub> glass laser tube, and uses high-pressure gas discharge.

The laser beam can cut the material to the designed shape.

Cutting/grooving/mark the material that you put on the work table.

The laser machine makes use of high-energy laser beam to focus on the surface of material and

mark/groove.

A single stranded copper wire with 2mm diameter is required for grounding.

Clean tap water is required for the water chiller.

1.2 Preparation

The laser machine described here is a Class IV laser device and is dangerous. The laser will

instantly ignite clothing, wood, paper, plastics, and many other common items. Care must be taken to avoid serious injury.

If the version numbers of card and DLL don't match, the card won't work normally. Generally, the version numbers of card can't be changed (unless update the firmware). Proper DLL has to be found out to match the card. Version check program can indicate the version numbers of card and DLL.

DLL is laid in [LaserCut50], and the filename is MPC05Ver+M05.dll.

Run the program if the version numbers are match, it is as shown below.

Version check program is laid in [LaserCut50], and the filename is MPC05Ver+M05.exe.

Run the program, if the version numbers are match, it is as shown below.

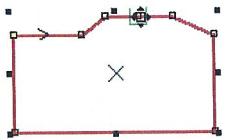
Version check program is laid in [LaserCut50], and the filename is MPC05Ver+M05.exe.

If the version numbers of card and DLL don't match, the card won't work normally. Generally, the version numbers of card can't be changed (unless update the firmware). Proper DLL has to be found out to match the card. Version check program can indicate the version numbers of card and DLL.

If the version numbers of card and DLL don't match, the card won't work normally. Generally, the version numbers of card can't be changed (unless update the firmware). Proper DLL has to be found out to match the card. Version check program can indicate the version numbers of card and DLL.

Tool programs are for checking if the control card is normal. It is helpful to find where the trouble is quickly.

Chapter 10 Comments on tool programs



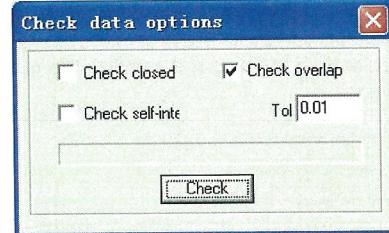
Move mouse to the node, and you can change the shape of the graph by dragging mouse.

Move mouse to the graphics, the mouse will change to a crisscross. Dblclicking mouse will add a node. Move mouse to the node and click "Delete" key, the node will be deleted.

#### 4.4 Tools

##### 4.4.1 Data check

Click this button.



This can check if the data is closed, overlap or self-intersect.

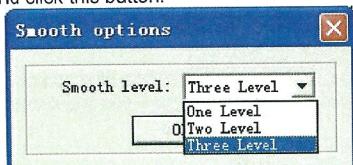
Tol: overlap error of dots.

When the data is input two times or more, it can't be processed properly. So if you find something is unusual such as you can't engrave a graphics data, please use this tool to check overlap or others. Click "Check" and it will inform which part of the data is in trouble by red it. Then click "Delete" key and you can delete unwanted data. Before you click "Delete" key, you have to click .

##### 4.4.2 Smooth curve

The corresponding icon is .

This tool can smooth curves. This can improve the cutting speed. Select the graphics you want, and click this button.



There are 3 options. Compared with "One Level" and "Two Level", "Three Level" is smoother. But the distortion is bigger than the others.

##### 4.4.3 Unite line

This tool can unite several lines that are intersecting as one line. This is usually used for DXF files.

##### 4.4.4 Offset curve

The corresponding icon is .

This tool can expand or reduce the data. Select the data you need and click this button.



2.1.5 Calculate. When the graph and processing parameters are changed, this button should be clicked to save the processing parameters in processing file.

#### 2.2 Import DST file

Click this button, you can import DST files.

#### 2.3 Output file

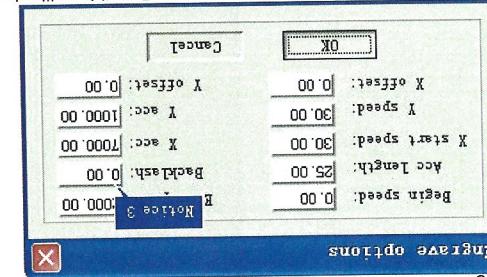
Click this button; you can export the processing files.

#### 2.4 Options

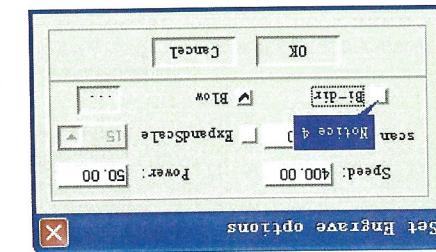
Please refer to "Chapter 6"

- The operator should read and understand the user's manual carefully before operating the machine.
- During engraving/cutting process, ALWAYS keep any body parts away (stay away) from the laser beam path to avoid injuries.
- ALWAYS ensure that clean and pure water circulates the laser tube before switching ON the machine, or the laser tube will break when the machine is ON. Cool tap water is acceptable.
- NEVER operate your machine unattended. There is a significant risk of fire if the machine is operating. The machine must be switched OFF when it is not in use.
- NEVER vector cut any material while the machine should experience a mechanical failure while set improper, or if the machine should experience a mechanical failure while moving. The machine must be switched OFF when it is not in use.
- ALWAYS use air assist, particularly when cutting especially when vector cutting.
- NEVER attempt to engrave or cut mirror or any mirror-like reflective materials. If the laser beam strikes a reflective surface, it could be directed out of the cabinet. And this is very dangerous and may cause very serious injury/damage/fire hazards.
- The operator must pay attention to the machine during operation. If something unusual happens, switch OFF the machine immediately.
- ALWAYS keep a property maintained and inspected fire extinguisher on hand.
- DO NOT open any cover during operation.
- NEVER operate with any of the covers or enclosures removed, and never modify the machine.
- DO NOT open any of the machine's access panels while the unit is plugged in. Opening a plugged in.
- DO NOT make or break any electrical connections to the system while the unit is turned on.
- DO NOT expose the operator to the unit's AC input power.
- DO NOT open any of the machine's access panels while the unit is plugged in. Opening a plugged in.
- Keep the area around the machine clean and free of clutter, combustible materials, explosives, or volatile solvents such as acetone, alcohol, or gasoline.
- NEVER operate the machine without smoke detector, alarm, or gasoline.
- Will only produce an infrared property operating unit to the outside! Most material limited to paint, varnish, composition board and plastics, produce compounds that can be harmful if concentrated. A property installed vent is the only way to ensure that such problems do not occur.
- The cooling fans and vents should NEVER be covered or blocked in any way. Lasers that operate will not operate properly and may begin to produce erratic laser output or possibly complete failure.
- Ambient air temperature where the laser system is operating should not exceed 32 degrees Celsius (90 degrees Fahrenheit).
- NEVER engrave or cut any material containing PVC or vinyl. When engraved, a corrosive agent is produced that will destroy your machine.
- The temperature of water should be between 15 and 30 Celsius, to prevent the water from overheating and vents should NEVER be covered or blocked in any way. Lasers that operate will not operate properly and may begin to produce erratic laser output or possibly complete failure.

Measure the gap between odd row and even row. And input the number in "Notice 3" of the following dialog box.



The best way is single direction engraving. But this will slow down the efficiency. Parameters should be set as the following dialog box.



#### 4.3.5 Bezier

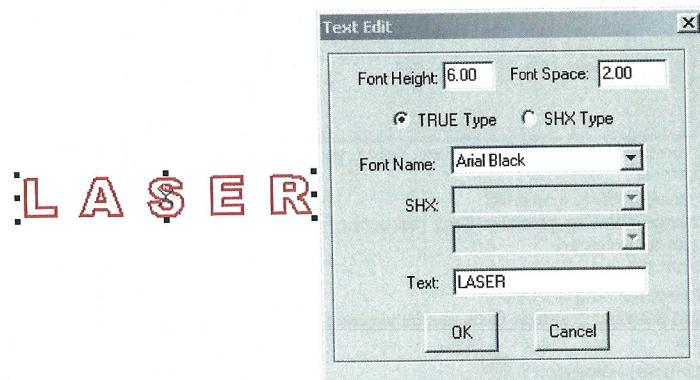
The corresponding icon is .

Click this button, move mouse on the screen, and you can draw bezier of various sizes.

#### 4.3.6 Text

The corresponding icon is .

Click this button, and drag mouse.



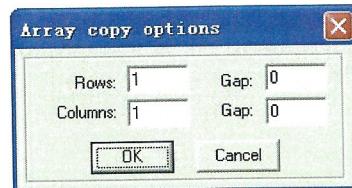
If you want to edit the text, please click this button and drag mouse on the text.

Before you change the size of the text, the text should be changed to curve. The "To the curve" button is located in "Tools-- To curve". When the text changed to curve, the content of the text can't be changed.

#### 4.3.7 Copies

The corresponding icon is .

Click "select" button , and choose the graphics you want to array copy. Then click this button.



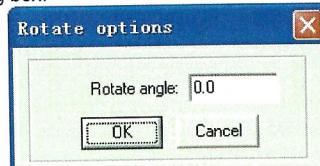
Input relative parameters, then a number of graphics are copied as "rows X columns".

Gap means the distance between two adjacent rows or columns.

#### 4.3.8 Rotate

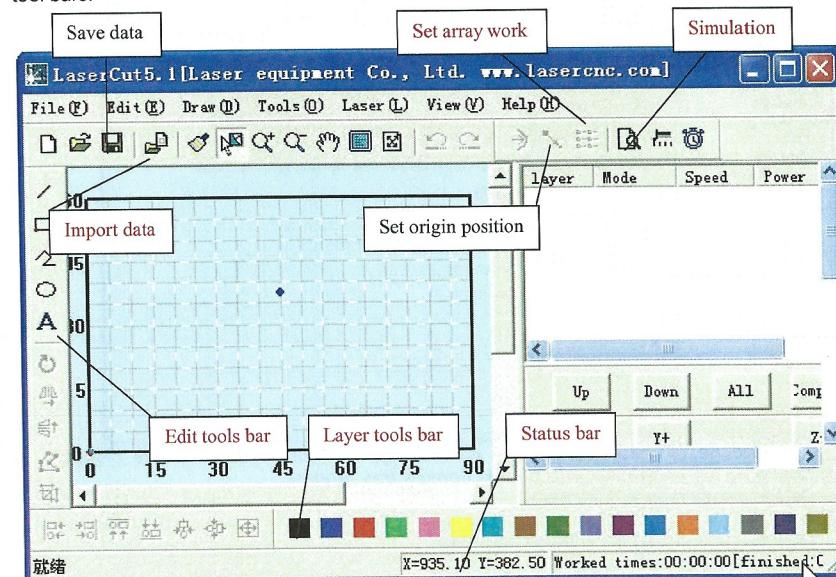
The corresponding icon is .

Click "pick" button , and choose the graphics you want to rotate. Then click this button, you can rotate the graphics. Click "Spacebar" key after you click , you will see following dialog box.



## Chapter 4 Explanation for Universal Edition

When run the software, the interface is as following. All system function can be found on tool bars.



Let mouse stay on an icon for a moment, and it will show the explanation of basic function of tools bar. The following is the explanation of all tool bars.

#### 4.1 File

##### 4.1.1 New

The corresponding icon is .

Create a new file.

##### 4.1.2 Open

The corresponding icon is .

Load process data made by the software. The file format is ECP-EC Project File (\*.ecp).

##### 4.1.3 Save

The corresponding icon is .

Save the graphics data that is defined processing parameters as ECP-EC Project File (\*.ecp).

##### 4.1.4 Save As

Save a ECP-EC Project File (\*.ecp) as another ECP-EC Project File (\*.ecp).

##### 4.1.5 Import

The corresponding icon is .

Load data that the software supports. The software can support \*.PLT, \*.AI, \*.DXF, \*.DST, \*.BMP etc files.

##### 4.1.6 Export

Save the vector graphics data that is in current window as a standard PLT file (\*.PLT) or DXF file.

##### 4.1.7 Relink machine

v1.1

User's Manuals

Machine

Computerised Laser Cutting, Engraving, Marking

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Dnisicn PluS

