

JSM3040N/3060N Model

Laser Engraving Cutting Machine

User's Manual

JINAN ARTSIGN SCIENCE&TECHNOLOGY LTD.

Preface

Thanks for your purchase of Laser Engraving Machine, it covers some good features: easy operation, low requirements for user, high engraving precision, advanced performance and so on.

The manual is applied to JSM3040N/3060N.

Please read this manual firstly in order for correct operation.

1. About the manual

It helps you to be familiar with the operation of the machine, the usage of the relevant software, and some problems to be noticed.

Be sure to read the safety information and notices.

2. Safety Information

(1) Safety for Laser

It adopts closed-type design, laser and radiation are restricted in the shielding case and casing, so it brings no harm to the user in normal operation.

It uses CO2 laser tube, the laser shoot is invisible with strong heat, so the following should be noticed during operation:

- I Don't open the cover or take off any parts when the laser light is on or to be turned on.
- I When you need to open the top cover of the machine (transparent plastic and metal cover) for operation, be sure to wear the protective spectacles, and be care not to burn your hands.
- I If optics system needs to be adjusted, it needs professional worker to do.
- I Prohibit taking down laser tube, for there is no spare parts in it that needs user or technician to repair. Any improper operation will lead to leakage of laser and radiation, and brings harm to people.

(2) Safety for Electric

It uses single-phase 220V 50HZ alternating current, improper usage will bring hurt. Notice:

- I Make sure proper power supply used;
- I If the accessory pin is not accorded with your socket, please replace a safe one.
- I Make sure the gross current in one socket is no more than 15amp. ;
- I Check regularly whether the power line is broken, and be sure not to use the broken wire;
- I Not to use this machine around water or any liquid environment;
- I Not to disassemble any parts or open the cover of the machine when it is working or electrified;
- I Not to cut or connect the power supply when the gross power switch of the machine is on;
- I Prohibit disassembling laser tube, there maybe high-tension voltage around it;
- I Pull off the power pin before cleaning the machine;

(3) Safety for Fire Protection

Laser is a kind of light with high energy and concentration, in some cases as trouble of computer software and hardware, mechanic electron or characteristic of working material, it may lead to fire. Especially when it is cutting in low speed, please note:

- I Machinery operation must be done by professional worker, and the operator must have some knowledge of fire fighting;
- I When the material catches fire during work, cut the electricity immediately and put out fire. Don't electrify before the confirmation by the professional technician;
- I Let the flammable and explosive materials far away from the machine, alcohol, oil, thinner and so on;
- I When flammable materials are engraved, be sure to get familiar with the characteristic of it in advance;
- I Fire extinguisher is suggested to be equipped, but please use CO2 extinguisher to avoid much severer

damage.

(4) Safety for Cooling System

- I If fan doesn't work, please stop using the machine to avoid damage of tube and any other parts;
- I If cooling system has the following problem, please stop the work of the machine:
 - a. When the water pump starts, there is no water out within 3 minutes;
 - b. When the water pump is working, there is abnormal phenomenon as: noise, vibration, water descending and so on;
 - c. Water flows abnormally, too fast or too slow;
 - d. Use purified water for cooling, or it will damage the impeller of the pump and cause blockage of the pipe, this will affect the cooling effect;
 - e. Damage for water pipe.
- You should prevent frostbite of cooling water in winter. Remember to drainage it when machine doesn't work, avoiding the crack of laser tube.

3. Notes

- I Be sure to use this machine in good ventilation environment;
- I Many materials will release harmful gas in high temperature, especially for PVC and nylon, they will produce high corrosive and poisonous gas in high temperature, and this will bring hurt to people and the machine, so ventilation must be noticed;
- I Be sure to use the exhaust system during operation;
- I Suggest you use the professional purified equipment for the sake of your health;
- I The machine should be operated on a flat surface;
- I Not to try to disassemble, repair or alter any part of the machine in spite of with instruction of professional technician;
- I Not to use the machine with any electric appliance that may cause open circuit or short circuit in the same loop, suggest you equip UPS to avoid any troubles caused by the problem of power supply.
- I Suggest you equip the UPS, in case of trouble caused by power supply problem.

Chapter One Summarization

1. Introduction

JSM3060N is a high-tech product integrating laser technology and computer technology into a body. It can engrave such nonmetal materials as rubber, plastic, organic glass, oxhorn, wood, fabric, paper, leather, stone article and so on. With high-efficiency and high-precision controlling system under the work of computer, it has high efficient production, rapid processing speed, stable product performance, and can engrave both characters and figures with strong disposal function.

2. Component

It is composed with crust, stabilizer, graph plotter, optical system, up and down working table, electric controlling system, cooling system, exhausting system and so on.

3. Parameter

Name	JSM3040N	JSM3060N
Engraving Area	310X410mm	310X570mm
Engraving Speed	600mm/s	
Engraving Depth	5mm / 0.21in.(arylic)	
Cutting Depth	0-10mm / 0-0.39in. (arylic)	
Up and down work table	Electric Motor Honeycomb table Up and down 70mm adjustable	
Laser Power	40W/60W	
Focus method	Red dot positioner and 0 scale ruler included	
Driving Method	Step Motor	
Communication Terminal	USB2.0	
Resolution Ratio	0.0254mm/0.001in. (1000dpi)	
Power Supply	220V(or110V)+/-10% 50HZ	
Operating Temperature	0-45C	
Operating Humidity	35-70	
Operation System	Windows98/ME/2000/XP/VISTA	
Graphic Format Supported	PLT/DXF/BMP/AI (Direct output) JPG,GIF,PGN,TIF(Conversion output)	
Direct output Software	LASERCUT(Included), CorelDraw, AutoCAD	
Engraver For Curve Surfaces(Yes/No)	Yes, ≤1.5mm	
Water Cooling(Yes/No)	Yes	
Laser Tube(life hours)	1200-1500 Hours	
Certificate	CE and FDA	
Net weight	58KG	60KG
Gross weight	98KG(Wooden box)	100KG (Wooden box)
Equipment Dimensions	1100X700X330mm	1200x610x330mm
Shipping Dimensions	1270*880*580mm	1370*780*580mm

4. Application

Sign Making, Advertisement and decoration, Nameplates, Awards, Badges, Tags, Artworks making, Mould Making, Architectural Model, Fabric (Jeans.etc) Process, Leather Process, Notary Seals, Rubber Stamps, Souvenirs, etc.

5. Proper Material

Acrylic, Crystal, Bamboo, Cloth, Fabric, Denim, Fiberglass, Glass, Leather, Marble, Plastic, Paper, Rubber, Wood, MDF, Marble, Anodized Aluminium, Coated Metal, etc.

Chapter Two Installation

1. Package Backout

Take off the package like carton and foam, then remove any fixity and filler. Check whether there is anything left before connecting the power. Move the X axis(lateral axis) right and left slowly, and make sure there is no obstacle and feels smooth. Then move the dolly to-and-fro two times, and feel whether it is smooth. If there is any problem, please contact with the agent.

2. Bestow position for the machine

Put the machine around the computer for convenient usage. Leave enough room around the machine for easy operation, repair and ventilation. When the table works, the connected board will move up and down at the bottom of crust, so please install the stabilizer before adjusting the height of the worktable. And the machine should be emplaced on a suitable-height surface.

3. Assemblage for the power line

Make sure the power switch of the machine is off;

Connect the power line to the power interface of the machine, then the other side to the leadin socket.

Be attention that the crust of the machine should be grounding fixedly.

4. Connection of the machine to the computer

Connect USB interface of the machine and USB of the computer with USB cable we provide you along with the machine. Install the driver according to the computer clew. (After installation of the mainboard, connecting computer with USB cable; when you turn on the machine for the first time, the computer will examine USB interface automatically, and then indicate installation process, now you can insert the USB driver to CD-ROM, and operate following indication until finishing it; one computer only needs to be installed once, and later needn't to be installed any more.

After equipment installation and computer connection, turning on the machine, enter "control panel"- "system"- "hardware"- "device management"- "USB", if there is "PHILIPS LPC214X USB" showing under the "USB", then it indicates that the driver is finished installation, and now you can use it.)

Insert the softdog into the computer's USB, install the LASERCUT software.

5. Installation of the exhaust fan

Install the fan to the runner by the left side of the machine, connect the power of the fan, then

fix the exhaust pipe.

Attention: you should open the exhaust fan when engraving, for the smog caused by firing material is harmful for people's health, and clean the exhaust fan and the dust in the exhaust pipe regularly.

6. Installation of air pump(optional)

Connect the vent pipe into the enter gas mouth, and then fix the air pump.

Attention: there will be little oscillation when air pump works.

7. Installation of cooling system

Fix one silicone tube used for cooling water to the outlet of the water pump, then another to the water tank. Fill the cooling water, then connect the power.

Notes:

(1) Start up the circulating water cooling when the laser tube is working, the water must be purified water, there is no leakage in the water pipe, and make sure there is enough water, the water temperature must be no more than 30 centigrade after long time of working.

(2) Make sure there is no icing exists in the tube in winter with too low temperature.

8. Installation of software

Set the software in the computer, and about the detailed operation, please refer to the software manual.

Chapter Three Usage

1.Before electrification

Turn potentiometer for current regulation to the min. by anticlockwise.

2.Electrification for the machine

Turn on the power switch of the machine, the laser head should reposition. Water pump and exhaust fan should work normally. Make sure the cooling system works in normal condition before the next operation.

3.Test for laser

After normal work of cooling system, then the laser can be tested.

Press "laser switch", then press "laser test" without losing, the laser tube should shoot light, then you can adjust potentiometer for "current regulation" to make laser intensity meet your need. Note that the max current is no more than 18MA..

4.Adjustment for worktable

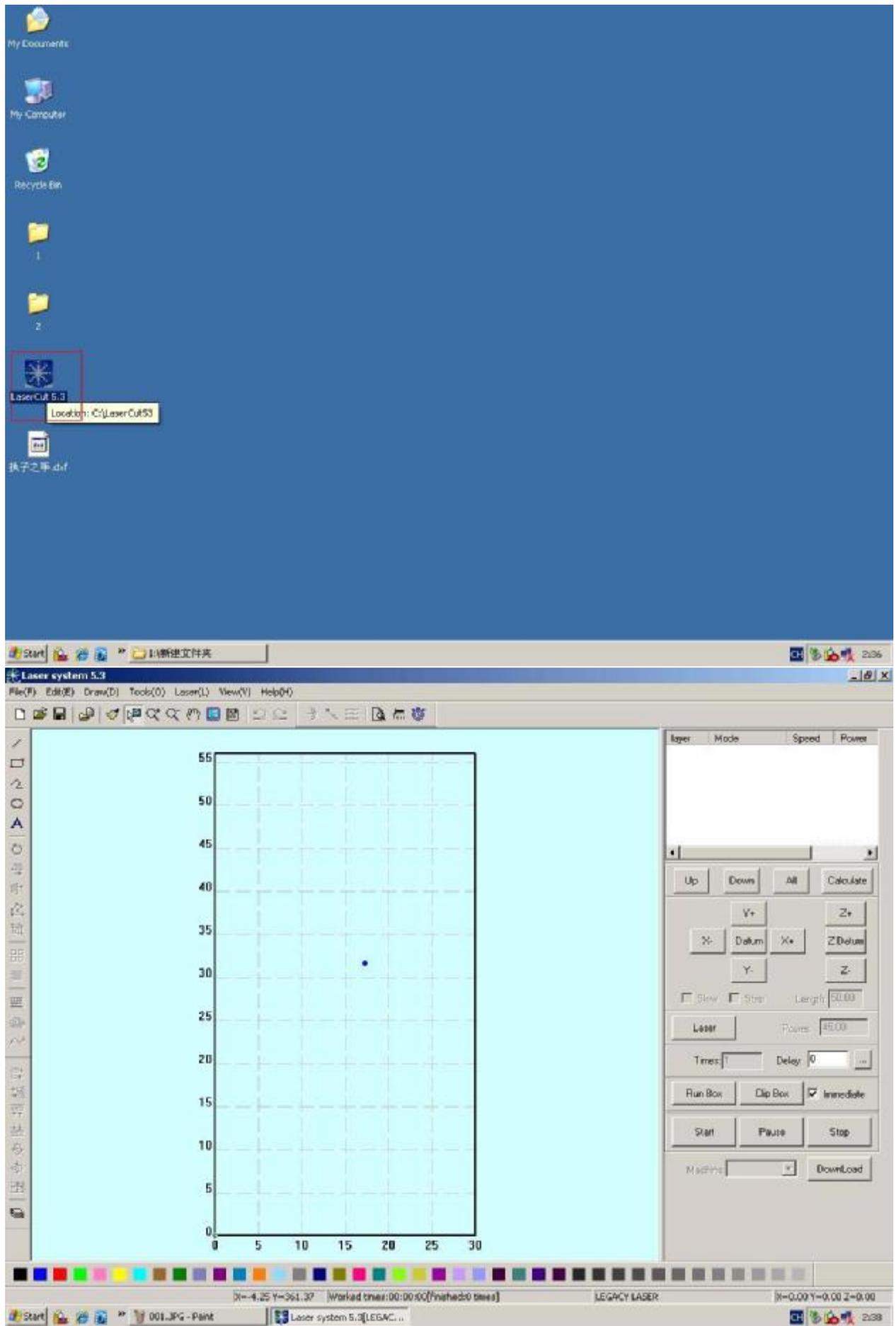
Adjust the height of table according to the thickness of the material, and can adjust the table high through the "UP/DOWN" button on the faceboard. Make sure the engraving object level is below the "0" of the worktable. (As picture)

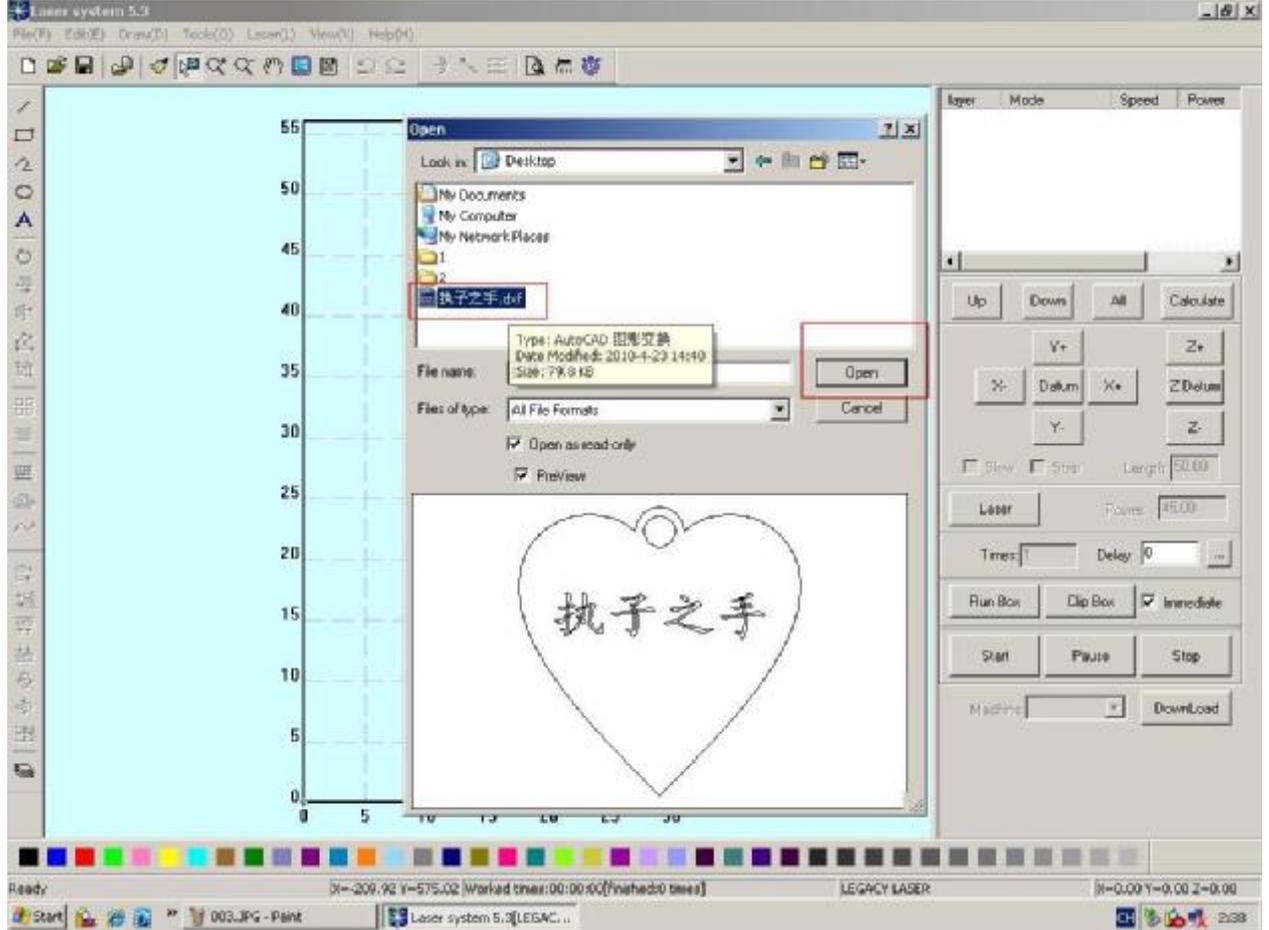
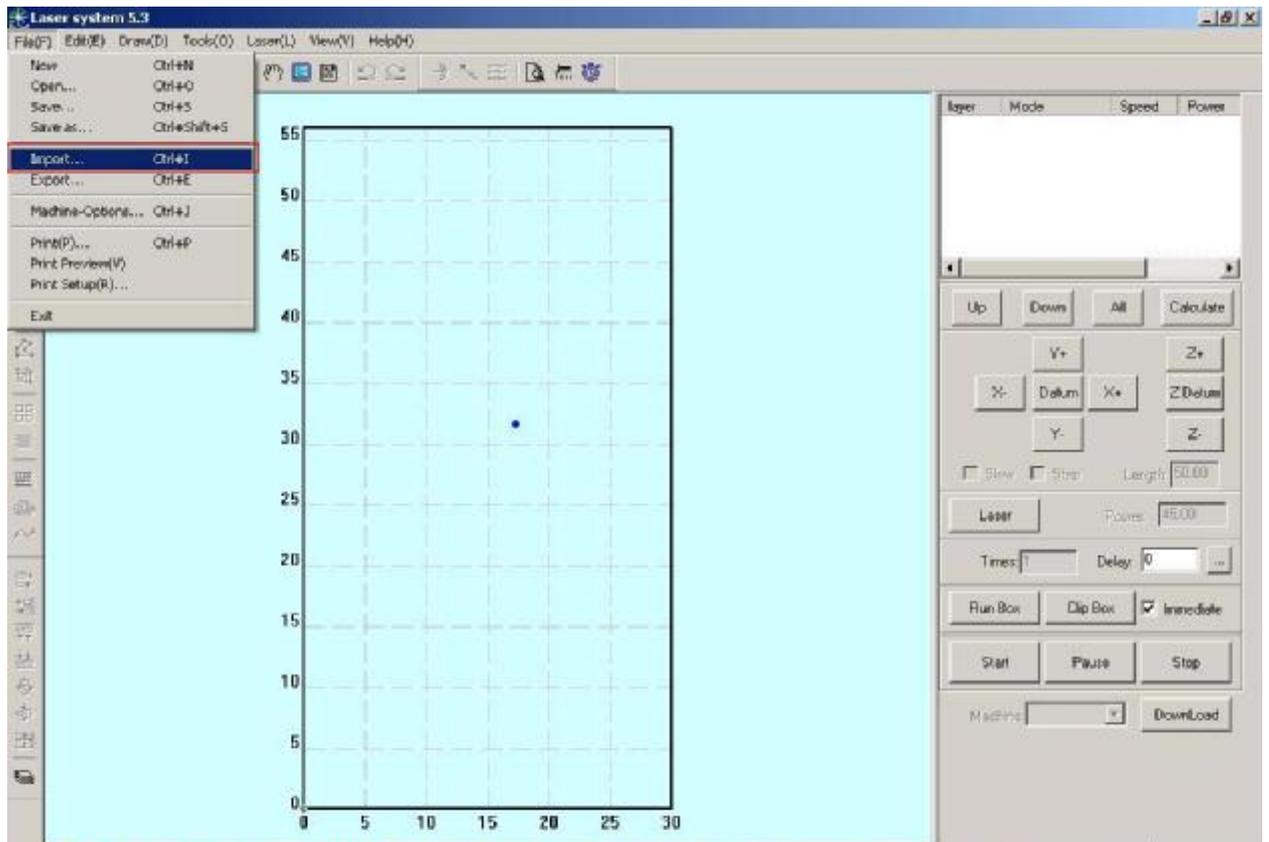
5.Usage for software

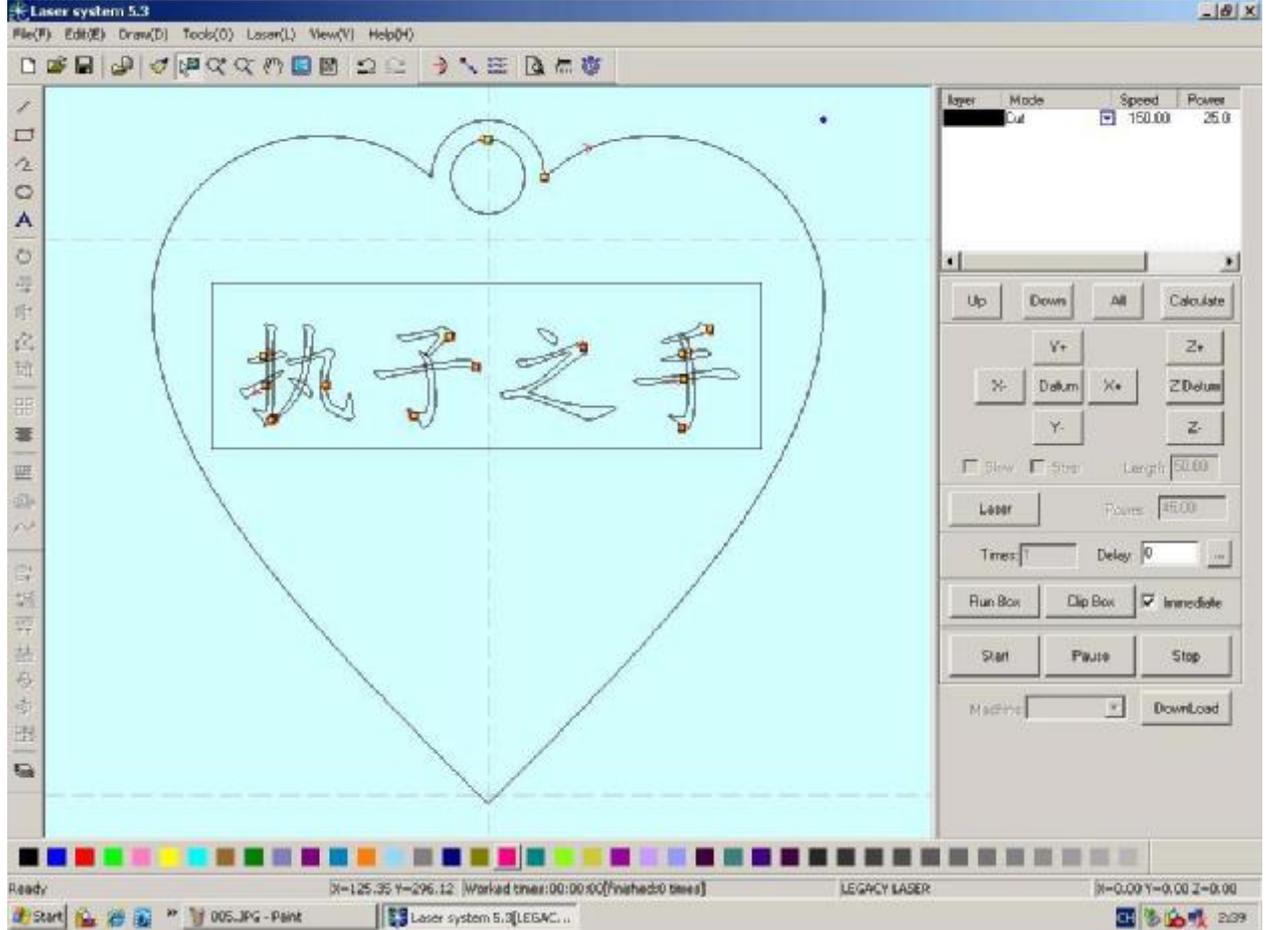
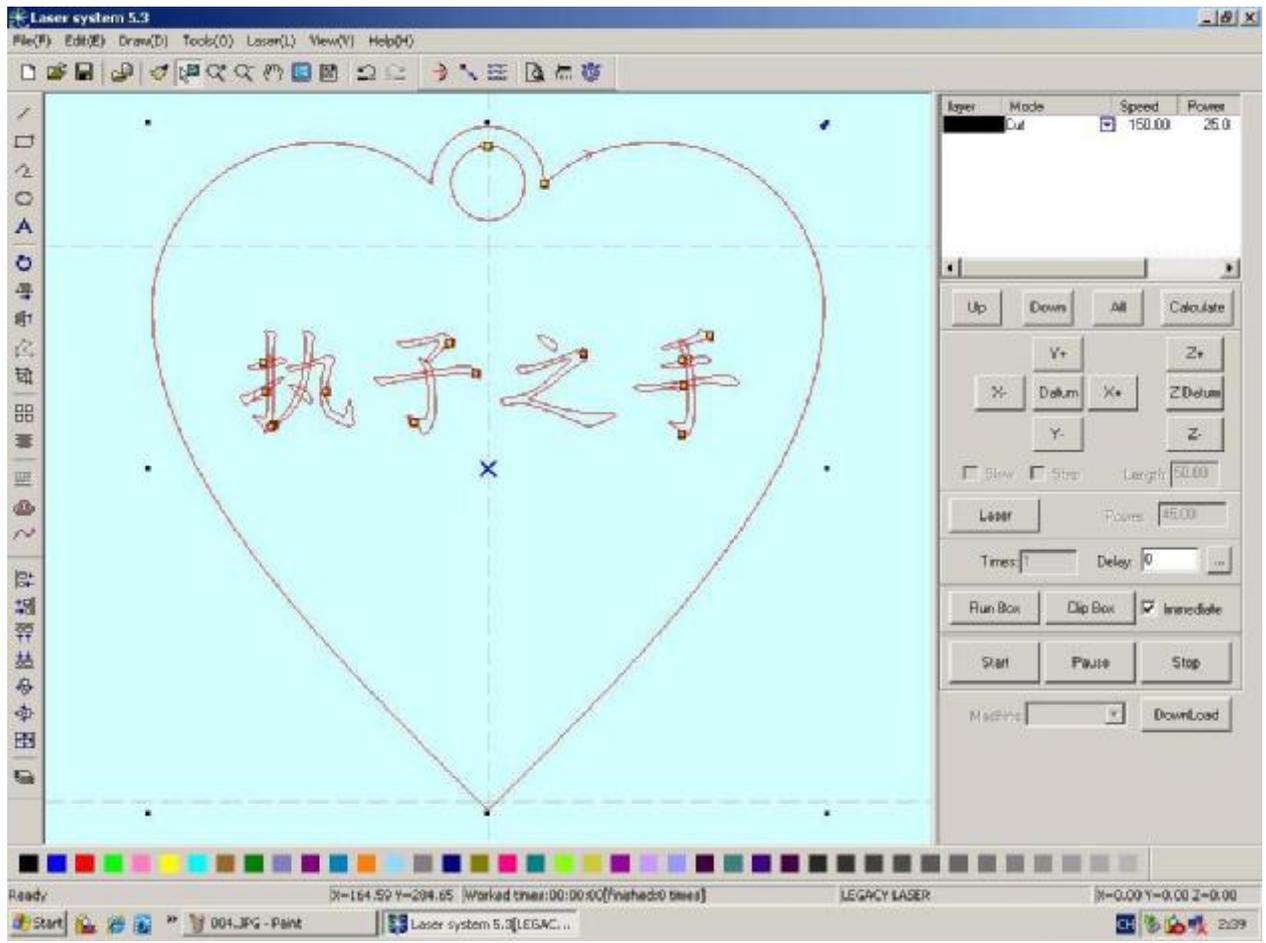
Please refer to software manual.

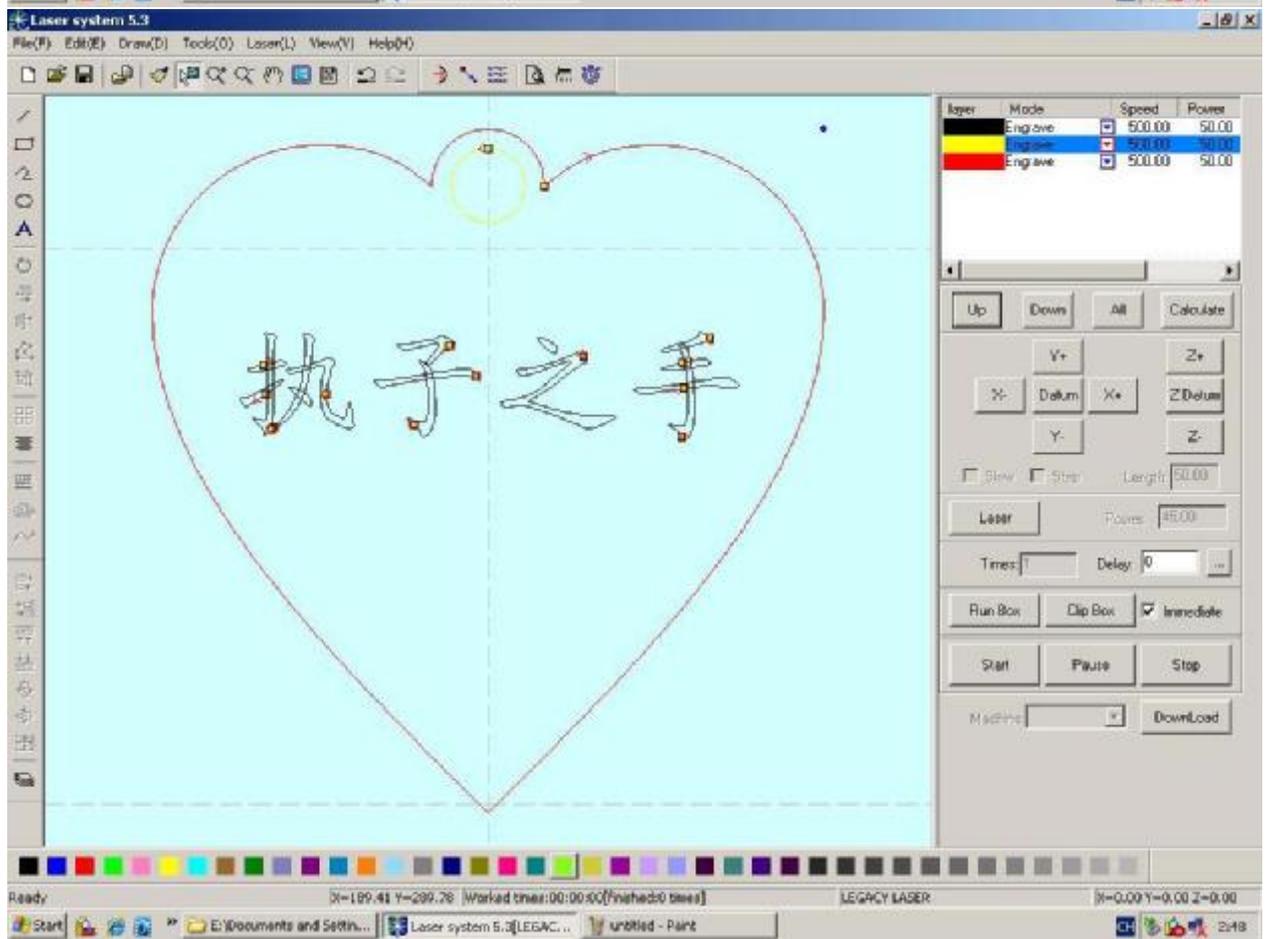
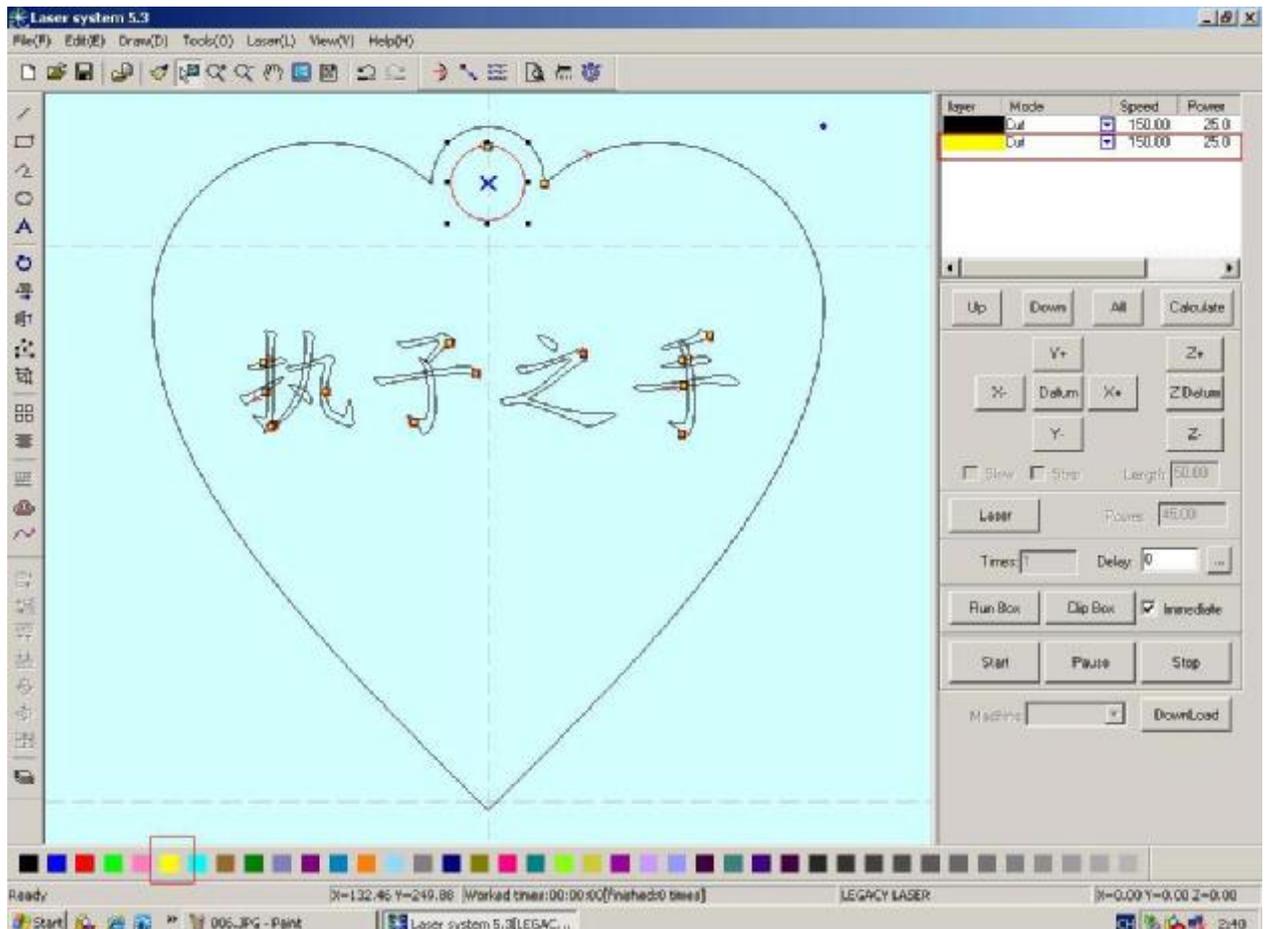
6.For engraving

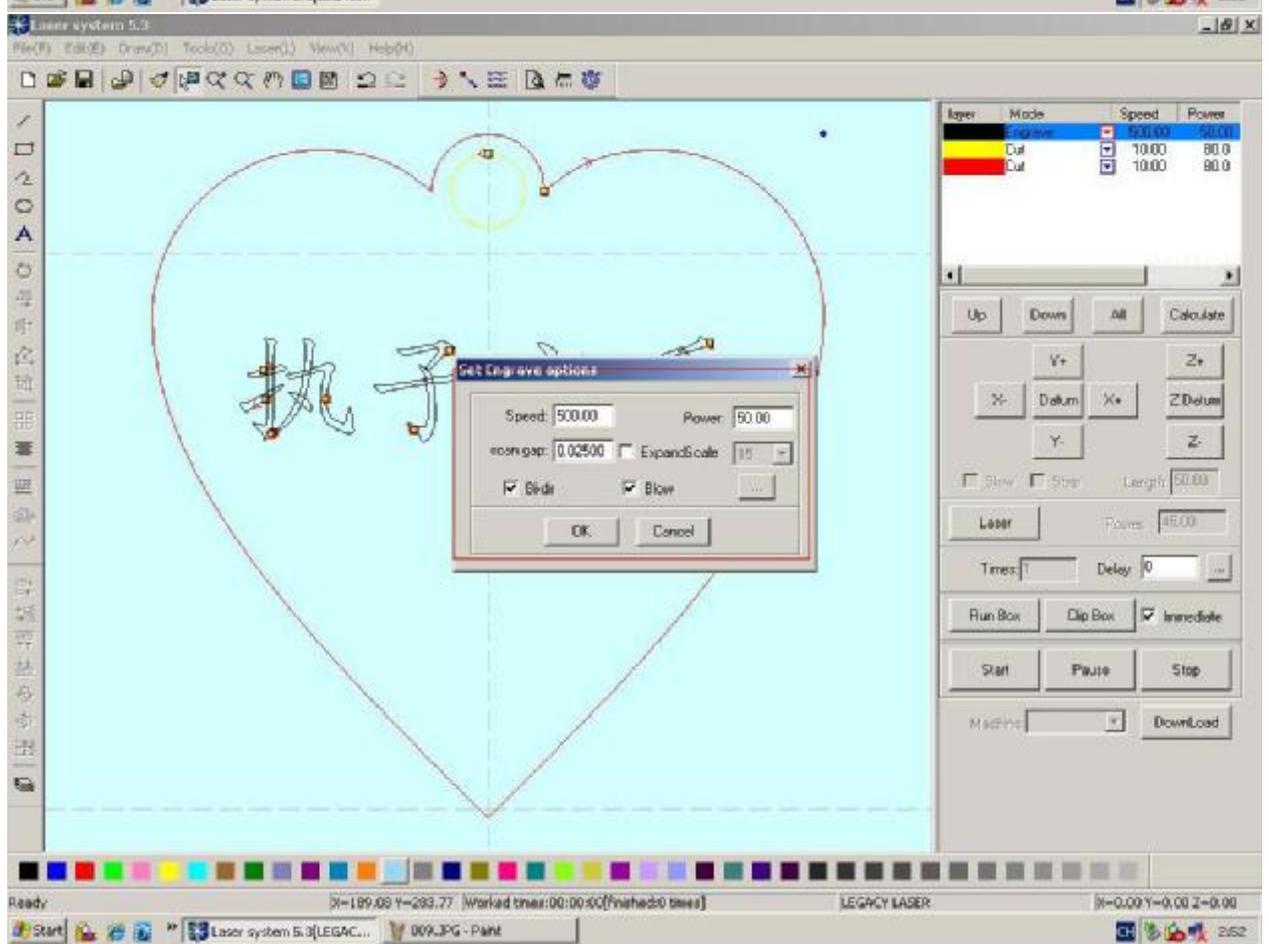
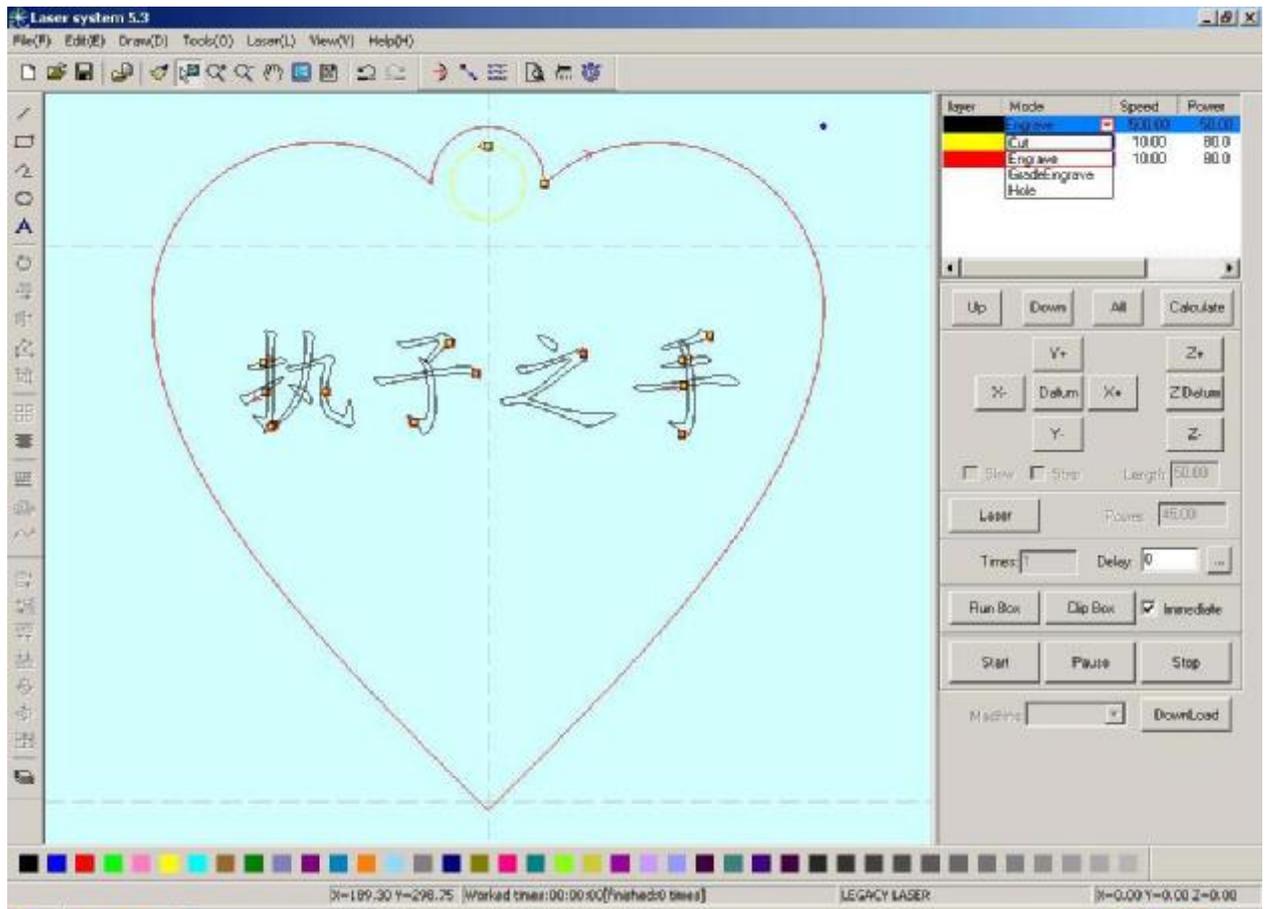
Set ready any needed designs with software in your computer, choose suitable parameters, then output to the machine, if machine works well, the material will be engraved with designs then.

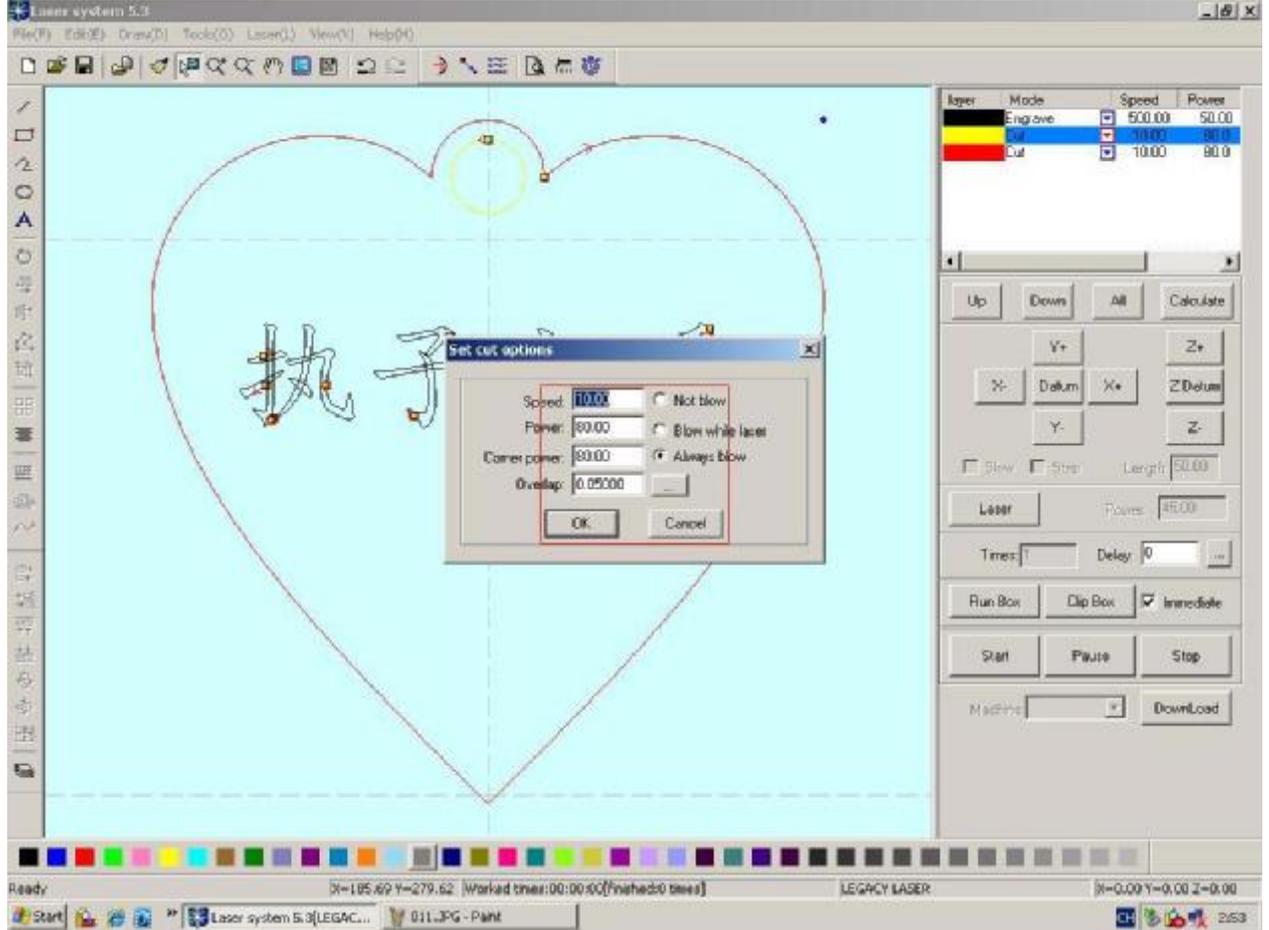
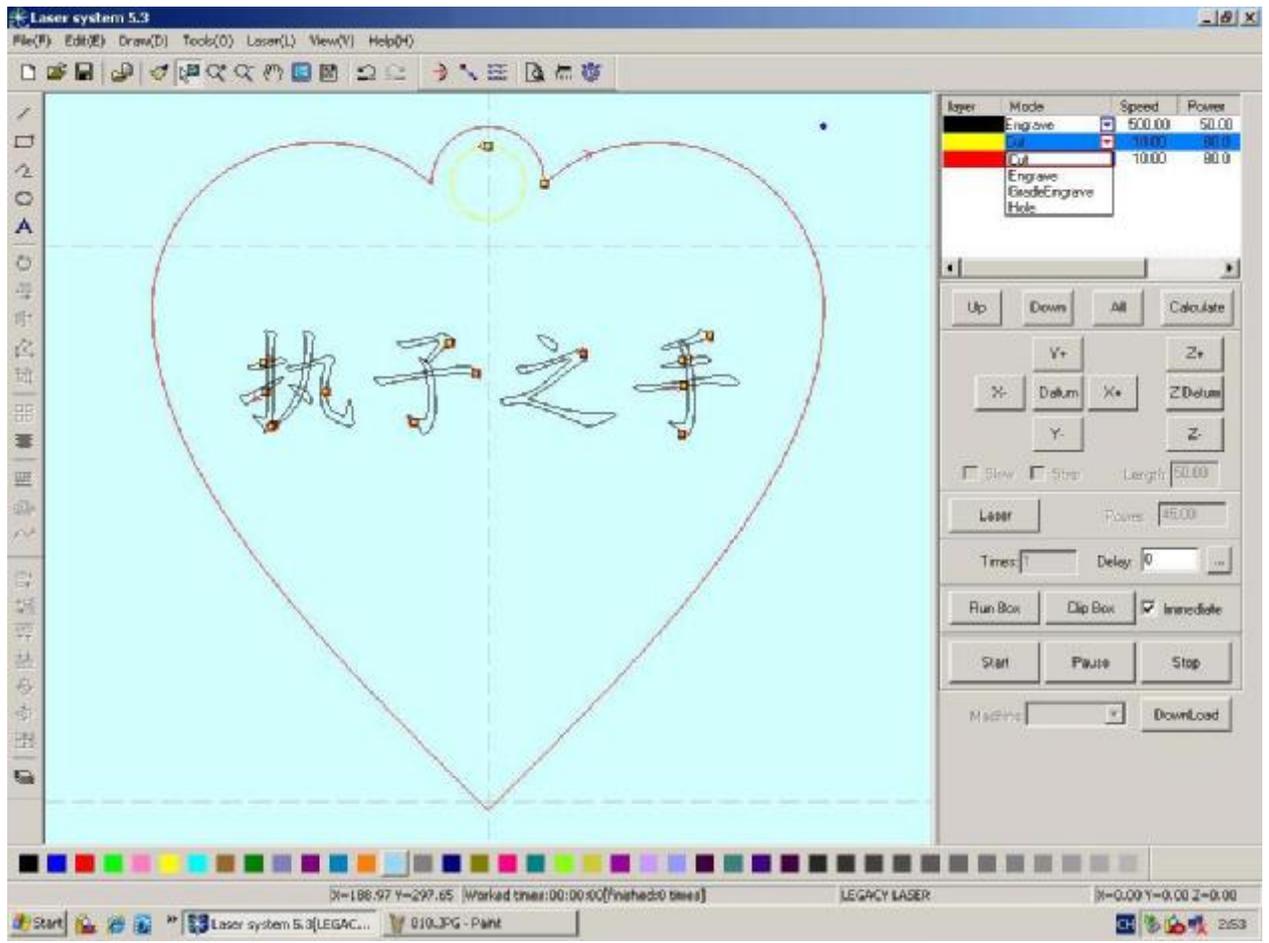


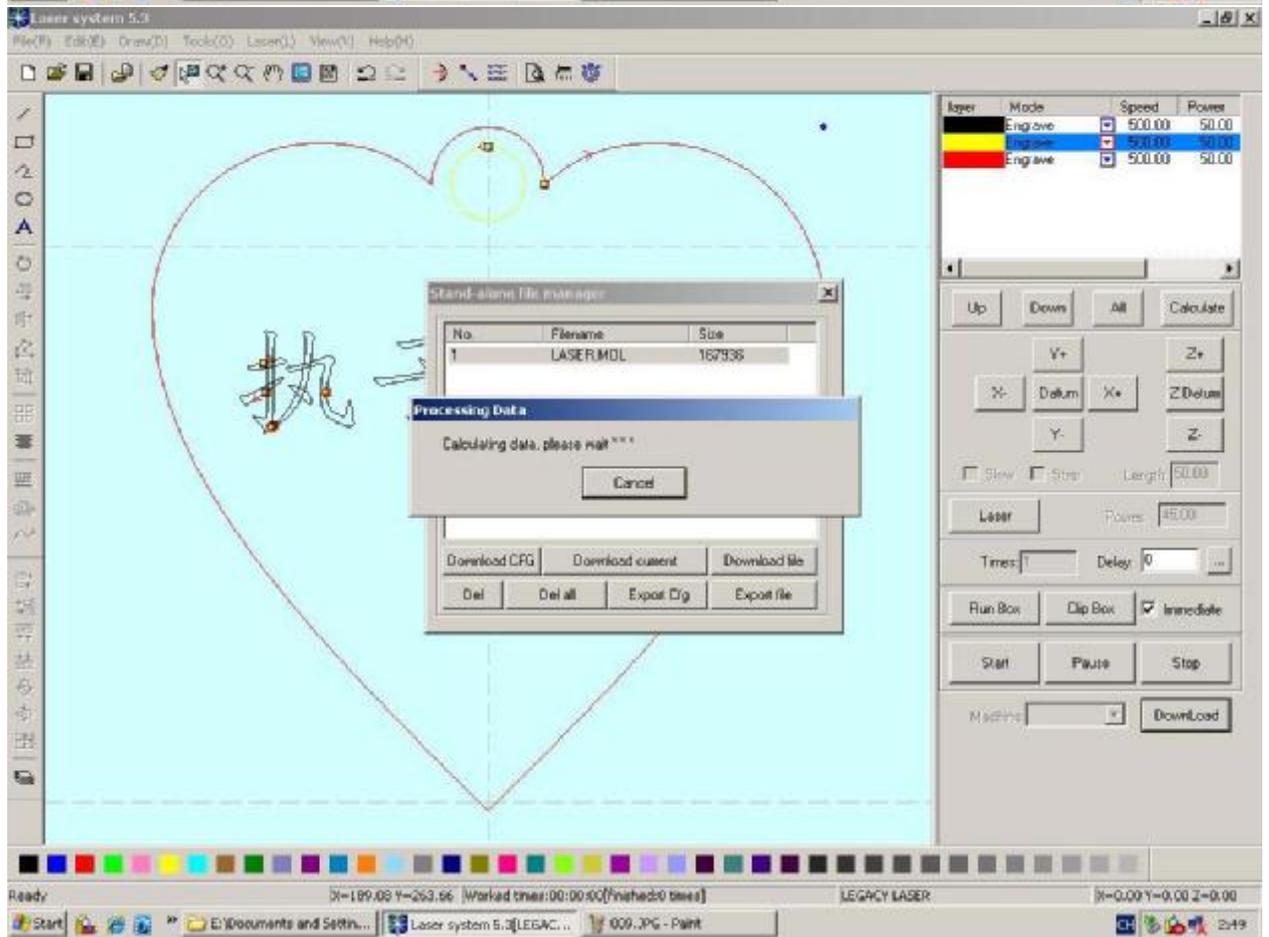
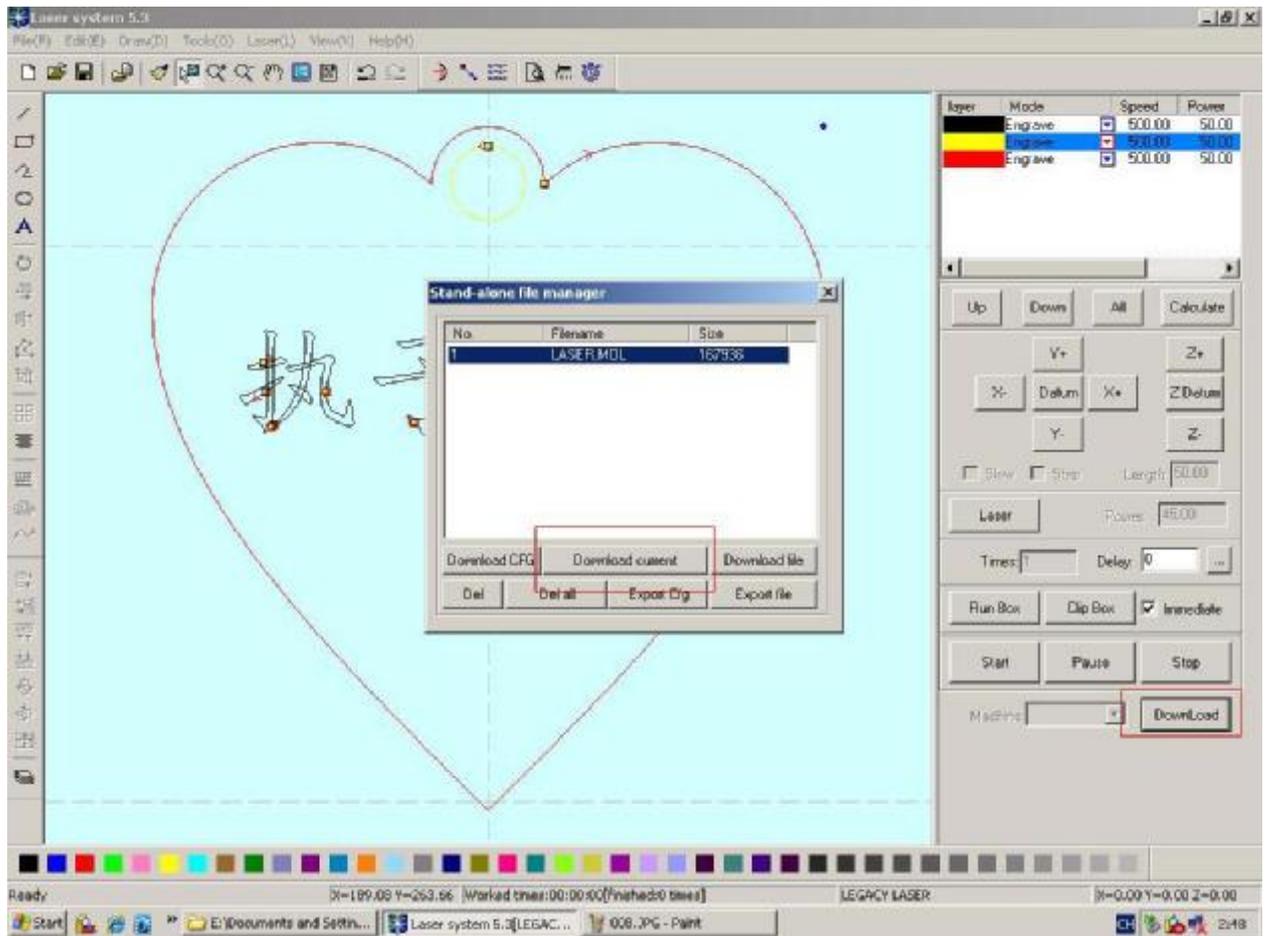


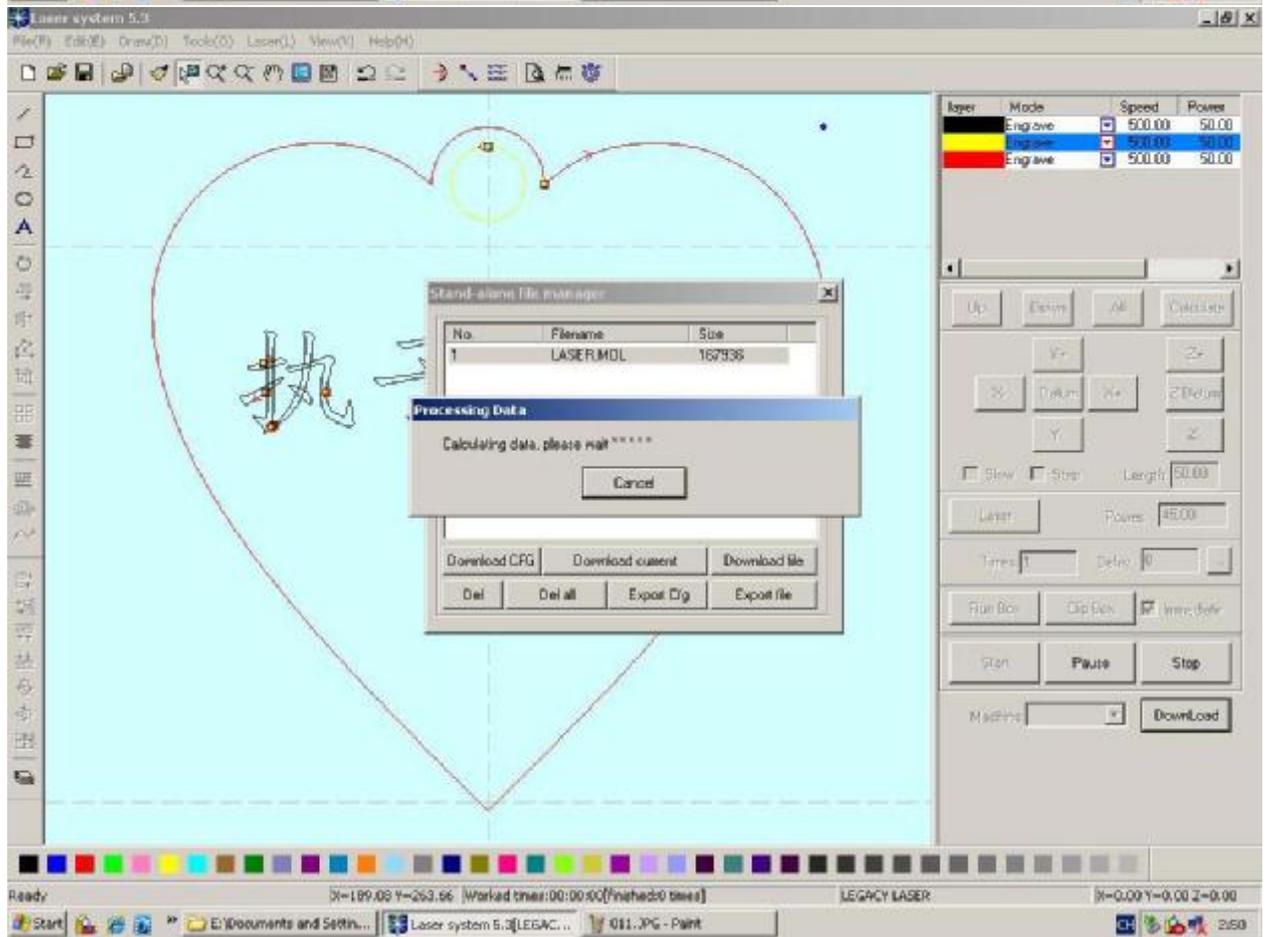
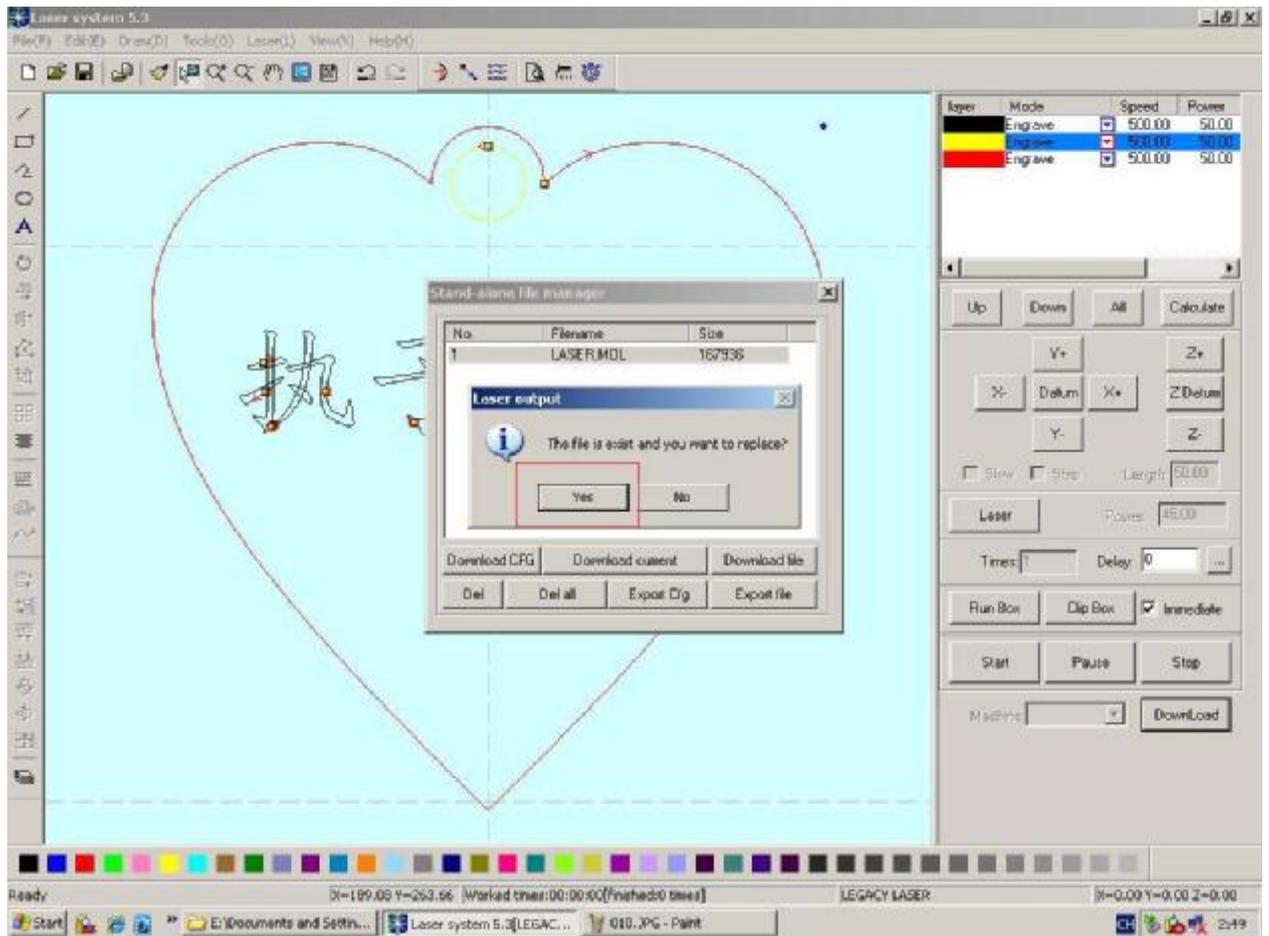


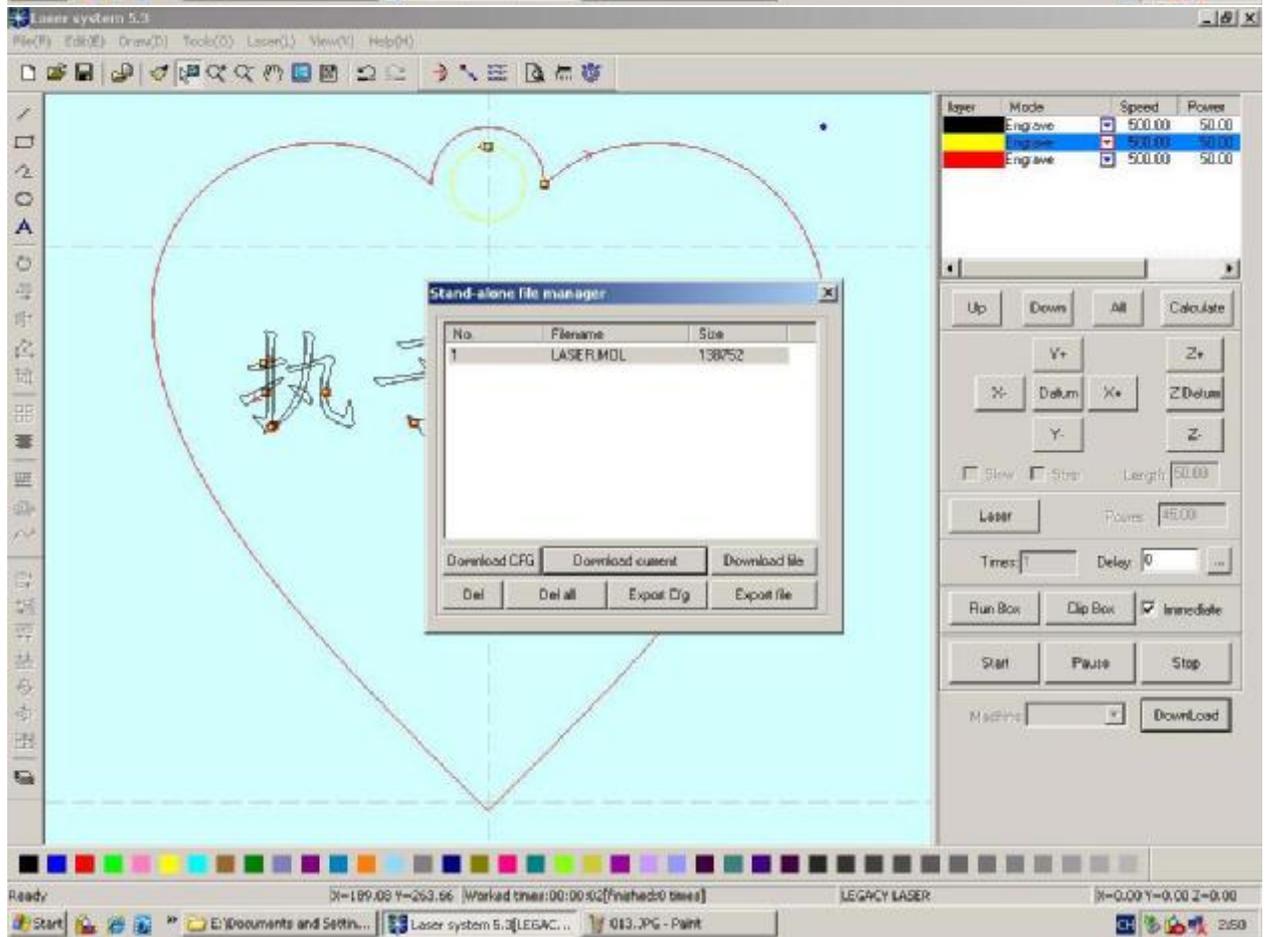
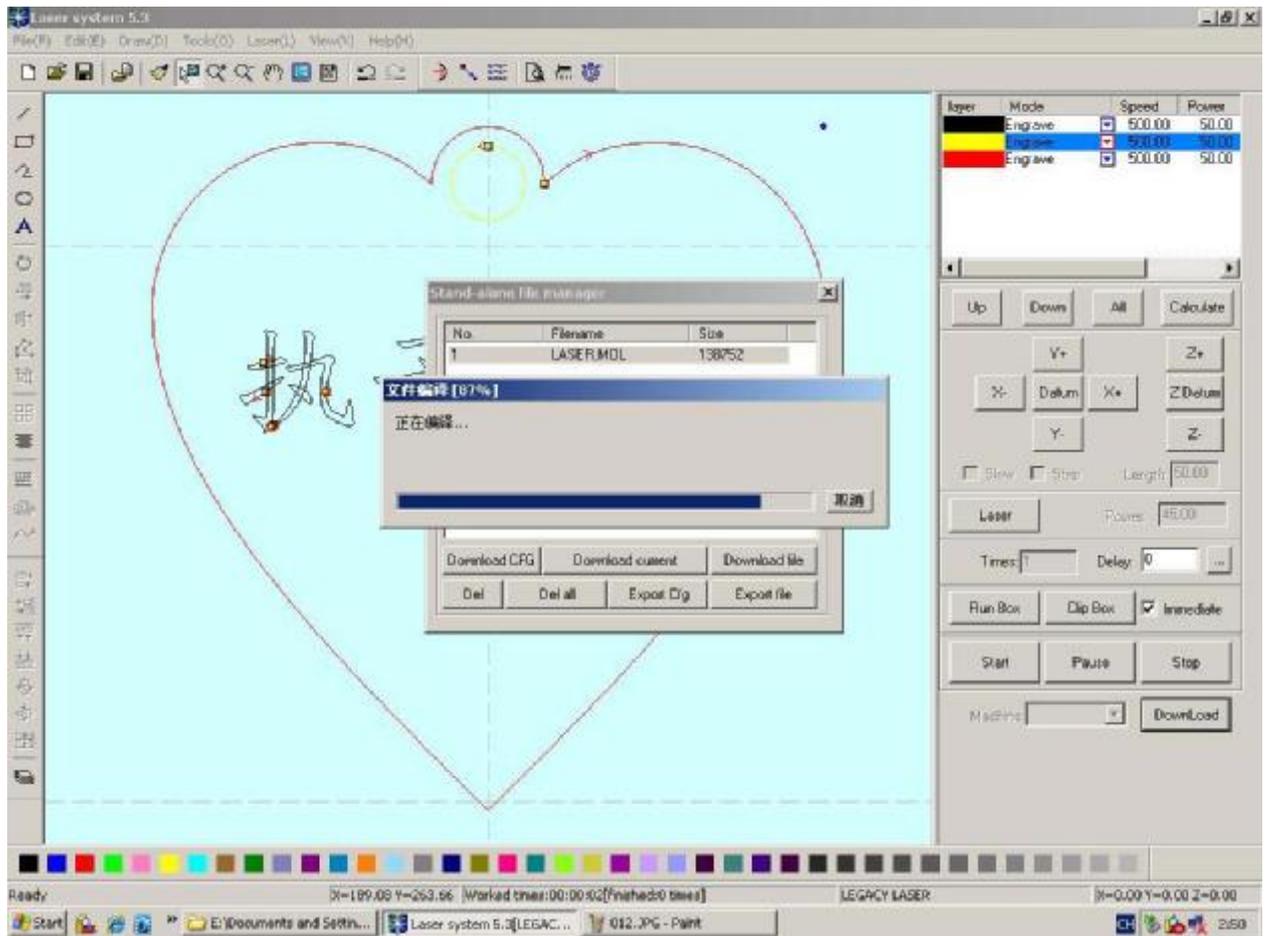












Notes:

(1) It will bring much hurt to people especially their eyes because of irradiation or reflection of laser, so it is prohibited to put any reflective materials on the table to avoid damage during operation.

(2) The laser power will produce much higher voltage during operation, so be far away from laser power and laser tube and not to touch them.

(3) The machine should be placed on a flat surface, and it is prohibited to move guide rail and dolly by force.

(4) The running part for guide rail and trolley should be kept clean.

(5) It will affect the laser output efficiency with dust in reflectors and condensing lens, so both should be kept clean.

Chapter Four Maintenance

1. Cleanness for the machine

In order to keep long and efficient work of the machine, regular cleanness is necessary. The cleanness cycle will depend on using frequency and workload.

2. Crust of the machine

Make sure the power switch of the machine is off and the leading power is cut before cleanness. When cleaning, neutral detergent is suggested, as some chemicals as alcohol or thinner will bring damage to crust, mechanical parts and electrical organ; Much wetter cloth is also prohibited as water also will bring damage to it; Don't touch the surface with nail or pungent materials, and soft fabric is better needed for surface wiping.

3. Graph plotter

It is precise parts, so special adjustment and cleanness is not needed. If necessary, use soft cotton stained with neutral detergent to clean runner in the guide rail.

Notes:

The adjustment of graph plotter should be done by professional technician, improper operation will affect the engraving precision seriously.

4. Worktable with up and down

The worktable is assembled by special tools, so don't tear it down.

Clean the honeycomb vacuum table above the worktable in time. Take out or set it softly to avoid damage and distortion.

5. Optical lens

It can be cleaned by special paper for lens with same way as camera lens cleanness. Notice that don't wipe the same place repeatedly or press lens forcefully to avoid scraping the lens. Lens paper can only be used once. After wiping, check whether there is any wastepaper left, if volatile detergent is used, you can only operate the machine after absolute volatilization.

Notes:

Some lens has special hard coat, so please contact with the agent in advance to make sure whether alcohol or any organic solvent can be used to clean lens.

6. Laser Tube

It need no special maintenance.

7. Exhausting system

Be sure to clean the exhausting fan and pipe regularly to wipe off any leftover. If there is any peculiar smell or any somke left in the machine, please check the connection of exhausting system and pipes immediatly.

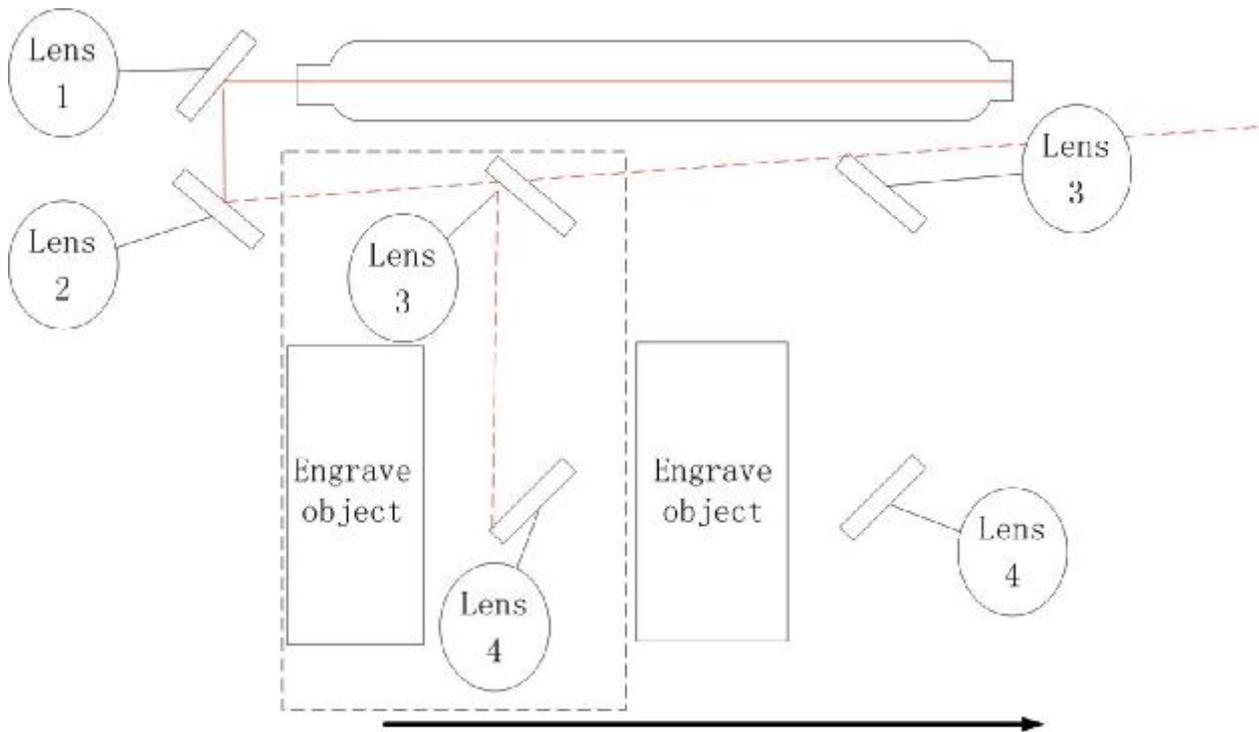
8. Cooling system

Before daily work, check whether the cooling system is normally running, if there is any break or shell of the pipe, and whether the circulating water is clean.

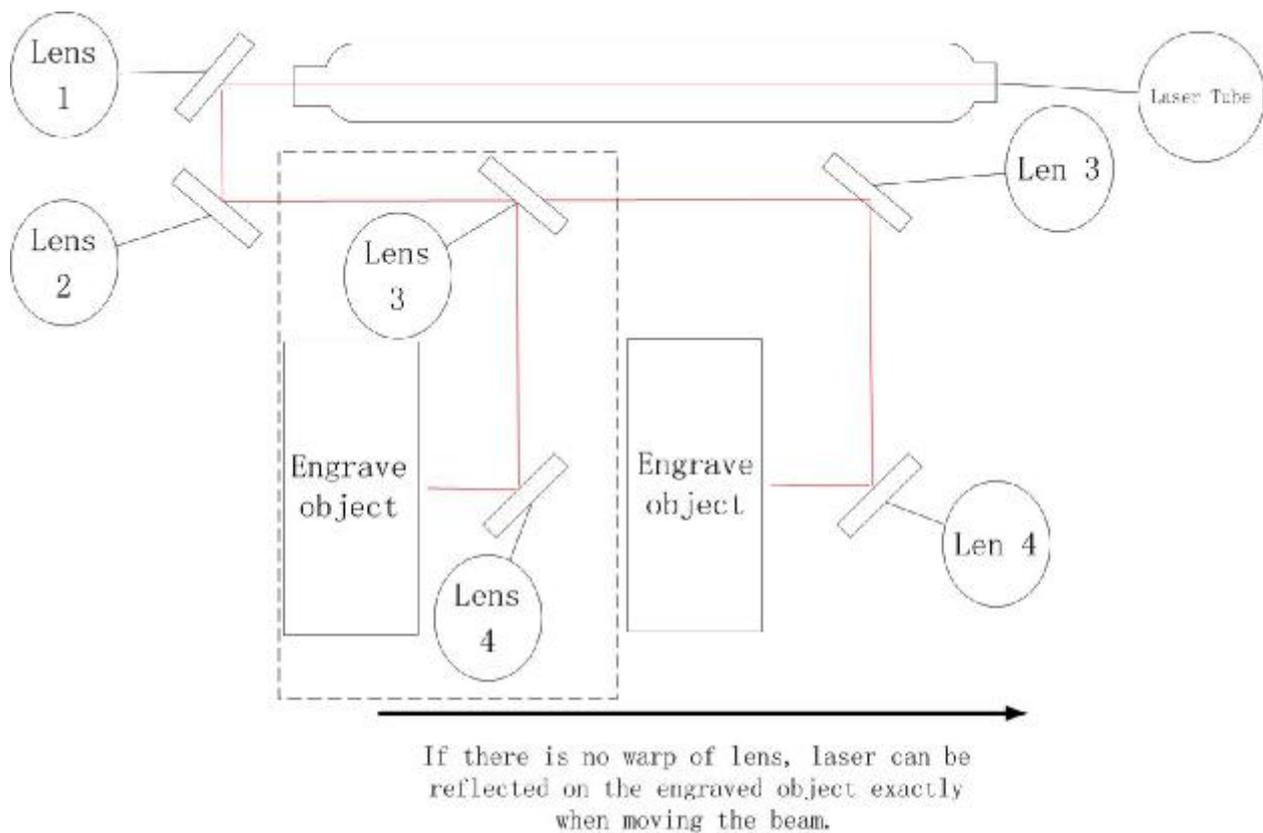
9. Electric controlling system

The maintenance of it should be done under professional technician.

10. Machine light line working theory picture



If there is no warp of lens, laser can be reflected on the engraved object exactly when moving the beam.



It needs adjust laser light in this condition, the step is as following:

Adjusting methods (be careful, it will be dangerous to operate this operation)

1. Shut off the power supply of laser engraving and cutting machine, and open the right control box, pull off the three cores cable line on the main board. Start the power supply after doing this, the beam and dolly will not move. You can manual move the beam and lens holder, preparing next laser adjustment.
2. Tear four pieces (each 15cm) adhesive tape which is provided with machine together. Stick four pieces adhesive tape into 4-6 layers, and then stick onto the lens 1 fram (try your best .not stick onto the lens, as picture 1). Manual test to light, laser will print one black point on the paper. Lighting time should not be too long, as long as the black point will appear is ok. The position of black point should be far from the middle of reflection lens(as picture 2).
3. Tear the adhesive tape from the lens, stick onto the reflection lens 2, and manual test to light, and then print one black point. The black point should in the middle of lens 2, if not, adjust the les 1's manual screw, until the black point is printed in the middle of lens 2.
4. Tear the adhesive tape from the lens, and stick onto the reflection 3. Push the dolly to the most left place, close lens 2 and lens 3, manual test to light and print one black point. Then move the dolly to the most right place, let lens 2 far from lens 3, manual test to light and print one black point. If these two black points is completely serried. If not, adjust manual screw of lens 2, and then test , until finally completely serried. You had better use forceps to adjust screw, tighten the screw.
5. After adjusting lens 1 and lens 2, stick the adhesive paper onto the dolly, and then move the dolly to the most top, close reelection lens 3 and reflection lens 4, manual test to light and print one black point. Then move the dolly to the most right place, let lens 3 far from lens 4, manual test to light and print one black point. If these two black points is completely serried. If not, adjust manual screw of lens 4, and then test , until finally

completely serried.

Chapter Five Troubles and Solutions

Laser engraving machine is a kind of precise equipment which has strict requirement for impersonal environment. Any improper operation or negligence will affect its normal running and cause great aftereffect.

If it occurs any troubles, deal with it as follows:

- I Consult this manual immediately to see whether there is any referring description.
- I Whether the usage environment suitable, e.g. whether the voltage, current, frequency are correct, whether the power supply is normal, whether the environment is too wet, etc.
- I Whether the hardware installation and usage have followed the rules and indications of the manual, e.g. whether the connecting wire is correct without any damage.
- I Whether the software has been set properly according to the description of software manual, whether each parameter is correct.

If problems still can't be solved following the above operation, or there appears fire, abnormal smell, please turn off the machine immediately, and ask professional technician to check.

Chapter SIX More Routine Knowledge

Safety Attention

- 1, Avoid starting the machine without connecting ground wire. The ground wire of laser power must be connected to ground, not to the door or window, pump and other establishments, and it must be connected to the outdoor ground.
- 2, Should check whether there is water coming from the water pump when starts the machine each time, strongly prohibit working without water.
- 3, The water case should be big enough to guarantee the circling water at about 20 KGs. The water temperature should be at about 25° C, you should change water if the temperature is higher than this degree. Pure water is better, and should guarantee the hand is clean enough, and change the circular water regularly (three days each time).
- 4, The reflection lens and focus lens should be cleaned by professional camera lens paper or hospital cotton stick with mixture of alcohol or aether. (the mixing proportion of alcohol and aether is 1:1) Usually they should be cleaned one week each time.
- 5, Should open the fan when working, avoid polluting the lens and focus lens.
- 6, Should let out the laser tube's water in Winter, avoiding crack of tube for cold weather.
- 7, Strongly prohibit putting dangerous things around machine for this type laser is invisible light, avoiding laser move which can cause fire.
- 8, Strongly prohibit operator leaving in the process of working, in order to avoid some unnecessary loss.
- 9, There is laser and high pressure part in the machine, so prohibit laypeople take apart machine.

- 10, Strongly prohibit putting any full-reflection or diffuse reflection in machine, avoiding laser reflecting on people or other dangerous objects.
- 11, Prohibit starting machine when the pressure is not steady, otherwise should use manostat.
- 12, Linear guiding should add lubricating oil each time a day.
- 13, Person without training can't use this machine.
- 14, Please press keys with average strength, prohibit pressing keys with too large strength to prevent damage to the keys.
- 15, If something abnormal fires happens, please cut off the power supply.
- 16, Do not start the machine when there is thunder and fulmination.

Maintenance

- 1, Prohibit using bad water for circulation. Bad water deeply affect the laser power and shorten the using life. The damage of laser tube due to the bad water is not under the warranty. We advise you use pure water. And must assure the water is not less than 30L, also should cover the water pump.
- 2, In the working process, worker must test the water temperature, once the water become warm, pls exchange water(The best way that doesn't affect working is spill out part of water and add cold water).
- 3, Special needs, when adjusting the lighting, pls don't make it exceed 20MA to prevent fast aging of laser tube.
- 4, Must clean the water case, water pump and rubber pipe every three days.
- 5, Must clean the lens before turning on the machine to start work. (Pls notice it is not when you are off duty)
- 6, The reflection lens should be cleaned carefully, otherwise you need to adjust light again.
- 7, When clean the third reflection len and focus len, you should unpick them firstly. After finish cleaning the lens, pls fix them firmly, but not too tight to make the lens broken.
- 8, Pls pay attention to the focus each time before starting to work, if the focus is not exact, it will badly affects the engraving effects.
- 9, Operator should simply clean the working table each time finish working, pls do not make the dust fly.
- 10, Operator should clean the machine when finish working. And it must be done when the power is off, you can push the rail and dolly slowly, prohibiting with too large force.
- 11, Every week, operator should clean the guide and add lubricant to the moving guide.
- 12, Every week, operator should clean the outside installation(fan, air pump and so on).