HPC LASER LTD

LS3060 MANUAL

HPC LASER LTD – NEVER LEAVE YOUR MACHINE UNATTENDED WHEN WORKING

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LASER ENGRAVER SAFETY

NEVER over ride any of the safety switches on the engraver or leave the engraver unattended while it is in operation.

NEVER operate the engraver with the lid up or any of the doors open. These should be locked at all times.

KEYS: - The laser engraver has locks with keys provided with the machine.
All doors with locks must be locked and keys removed.
Only one key should be kept with the Operator at any time.
Please put all other keys away safely.

NEVER look directly into the laser beam.

RECOMMENDED:

It is recommended that the user wears eye protection, especially when aligning the beam. HPC laser can supply suitable glasses. Alternatively 10.6 micron protective eye wear can be purchased elsewhere. This protection will not impair viewing and can easily be combined with safety glasses.

ELECTRICAL SAFETY

DO NOT open the centre and lower right panels of the machine when switched on as there is mains voltage present.

DO NOT make or break electrical connections to the engraving system when the unit is turned on.

FIRE SAFETY

Laser engravers represent a potential fire risk.

Most engraving materials are inherently combustible, and while the objective of most engraving and cutting operations is to vaporize material without burning, it is astonishingly easy to ignite a flame. Usually this is a simple “flare” of burning gases, issuing from the focused spot on the engraver, which follows the moving spot and which extinguishes itself as soon as the laser beam is modulated off. Should the engraver actually be set on fire, the fire must be extinguished by the operator at once after using the emergency stop button, or the engraver will be seriously damaged or destroyed!

DO NOT operate the engraver in the presence of unnecessary combustible materials. Remove the debris from under the work table regularly.

NEVER operate the machine without a fume filter system or 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 problems do not occur.

NEVER engrave or cut any material containing PVC or vinyl. When engraved, a corrosive agent is produced that will destroy your machine.

Any non recommended materials being used on the unit should be assessed for potential dangers:- e.g Health & Fire Risks.

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.

NEVER operate with any of the covers or enclosures removed, and never modify the enclosure. The laser is invisible!

Section 1: Unpacking your engraver

Unpack the machine from the wooden crate using 14mm and 17mm spanner.

Wear protective gloves to avoid splinters.

Environmentally dispose of packaging safety.

Unload the machine and place on a level floor.

Remove DVD / software CD from the accessory pack and watch installation DVD fully.

Remove transit cable ties to all parts, including laser head, keys, and laser bed.

Unlock side doors using keys provided to allow laser tube removal.

Put keys into the on / off key switch.

Undo rear flap of engraver using keys, use "stay" to hold flap in upright position.

Open the left hand lower cabinet door, and remove the accessories.

Take the foam laser tube mounts and allen keys from the accessory pack, and use allen key to unscrew the clamps which hold the laser tube.

Unpack laser tube from brown cardboard box, visually check tube for damage.

Check for damage prior to fitting.

Insert laser tube into holders with the metal end of the laser tube nearest to the mirror (to the right of the machine).

Clamp in place (loosely) this allows the tube to be rotated to allow air bubble removal later if required.

Connect rubber water pipe to each end of laser tube, insert laser tube with the metal end approx 50mm from the mirror.

Tighten the tube clamps using allen key.

Push on the power connectors to the laser tube, black at the mirror end, red at the control panel end, secure these in place with a blob of silicone (dow corning 732 multipurpose sealant).

Section 2: Laser tube / pump

Unpack the water pump (if not using chiller) immerse in contained (min 35l of deionised water), connect outlet from pump to water inlet pipe.

The return pipe goes back into the tank.

Remove air compressor from the box, connect the pipe which leads to the air inlet on the rear of the engraver.

Connect all power leads into on 4-way extension.

Section 3: Fan Unit

Unpack the off centre fan unit, connect the horizontal inlet to the rear of the machine, and vertical outlet to your exhaust. Plug in to extension lead.

Section 4: Installation of Software

Connect the USB lead to the computer, plug in the software dongle (looks like a small usb stick) into the USB port, switch on the computer.

Insert software CD from the accessory pack.

Open CD drive on computer, click on English.
Double click on install
Double click on set-up
(welcome to use)
Click Set-up
(proceeding date)
Succeed in install)
Click "OK"
Close Box

The software will install on the desk top, with an icon stating "laser cut".

Double click on this to open the software.

Section 5: Initial set up of engraver

Power on the extension lead, check the fan and air pump are working, check the water flow through the laser tube, visually inspect to make sure there are no air bubbles, (if these do not disappear release the clamps and rotate the tube gently to be in a position where these are no longer visible) –re-tighten clamps on completion double check the engraver is level.

Close the rear flap over the laser tube, lock and remove keys (put away for safe keeping).

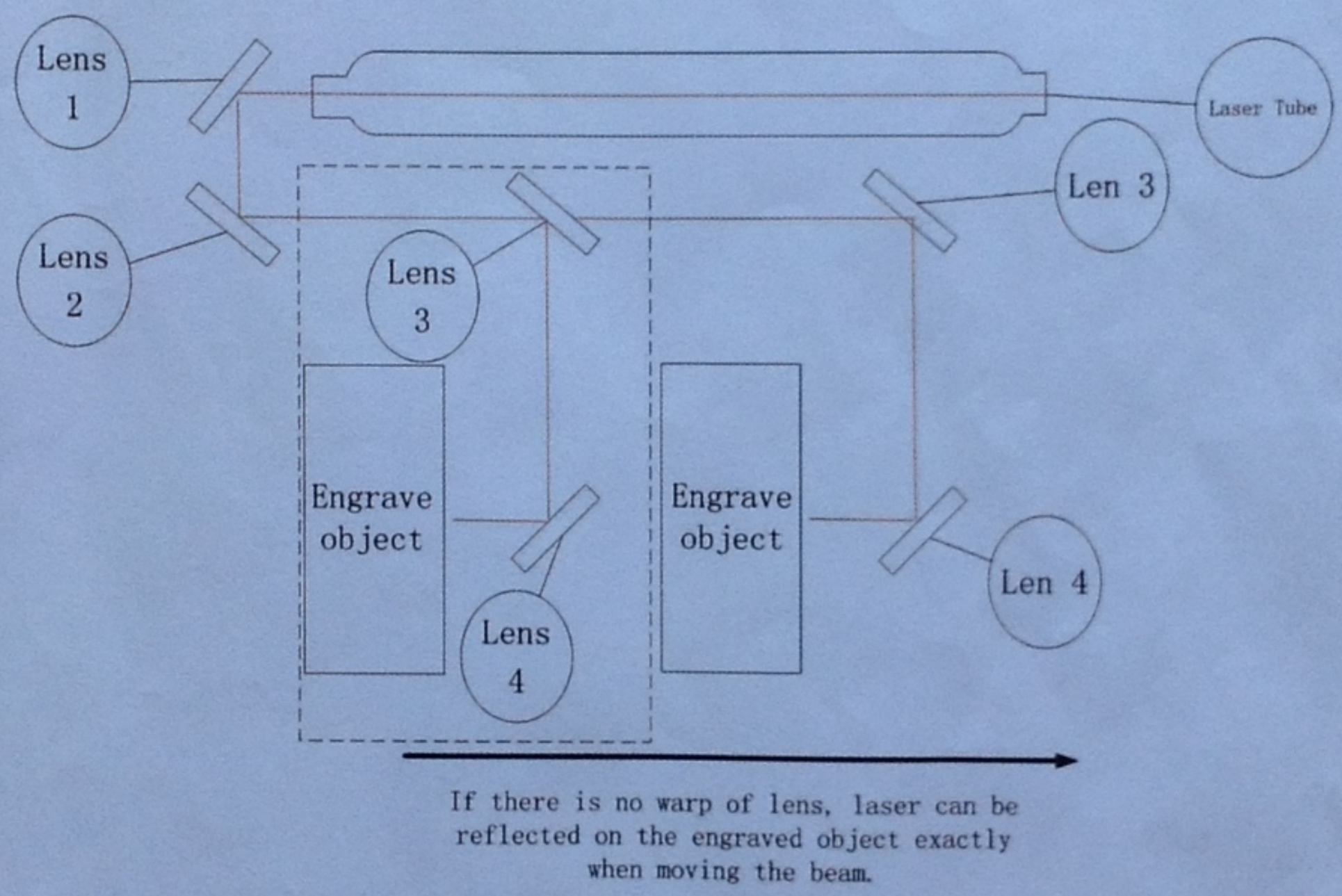
On the rear of the machine, switch the on / off switch to "on".

If the red emergency button on the top of the machine is "depressed" turn clockwise to release this.

(The machine MUST run for a minimum of 5 minutes to ensure the tube is at a constant temperature – before each use).

Now turn the key switch to the "on" position, check the alignment (as per DVD) ensure the Lid is down, and all side doors are closed and locked before firing the laser.

To check alignment:-



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

- Tear four pieces (each 15cm) Cardboard and stick onto each lens (try your best to not stick onto the lens, as picture 1). Manual test "laser", laser will print one black point on the paper. Do not hold the "laser" switch down, just enough to make a black point appear. The position of black point should be in the middle of reflection lens (as picture 2).

Follow the above instructions for lens 1 and 2

“Quick Guide”

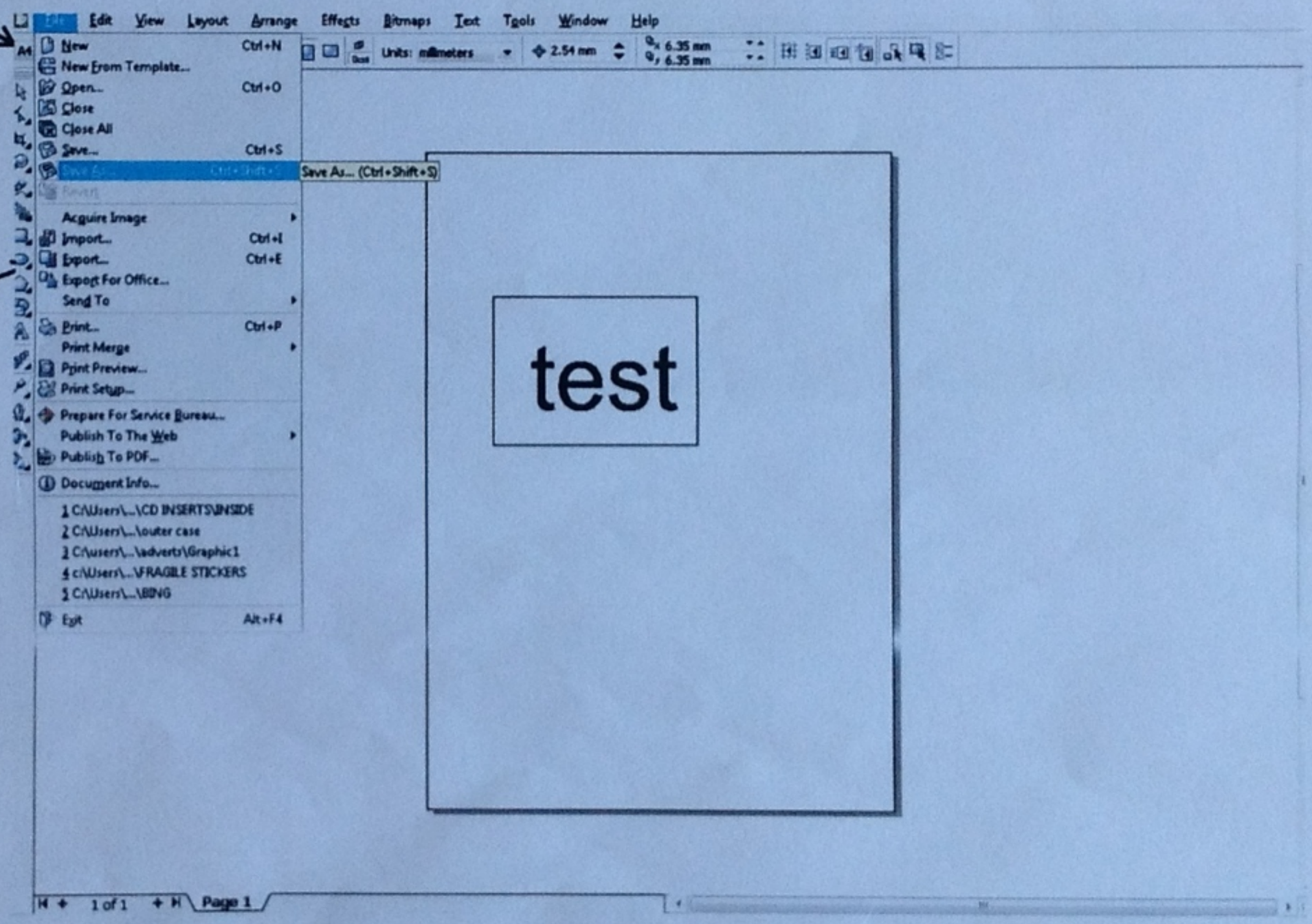
Operation of **HPC LASER** *engraver and associated software*

When your 2D Design project is completed, export this file as a .dxf file

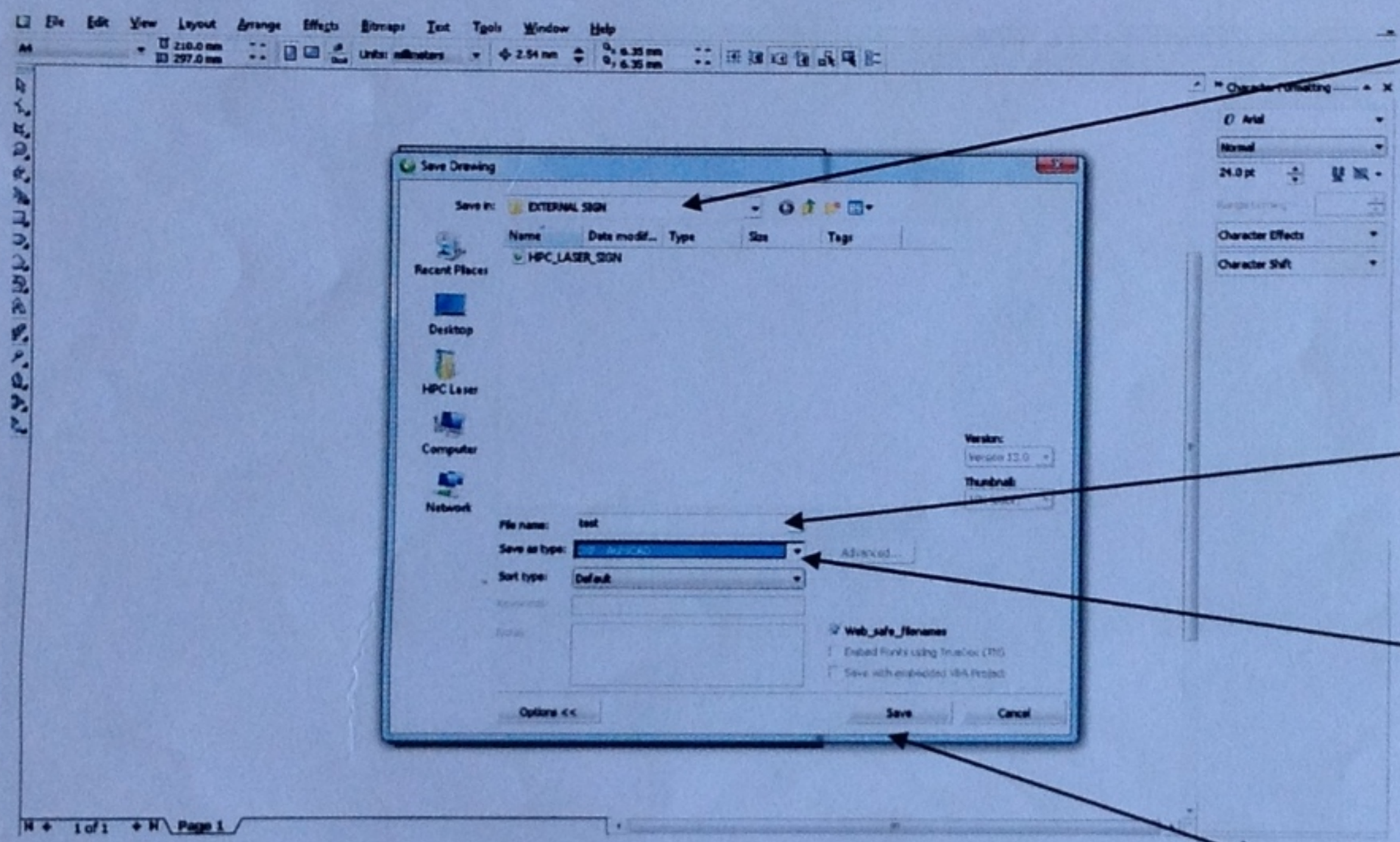
<u>Preparation</u> The LASER engraver & software work with DXF files.
Ensure that you have exported your work as a .dxf file.
Instructions follow for coreldraw …

Click on ‘File’

Click on ‘Export File’



How to Export 2D Design file as a .dxf file:



Select file destination

Type file name

Select DXF file

Click save

Importing a .dxf file into LaserCut

Double click on 'LaserCut ' 

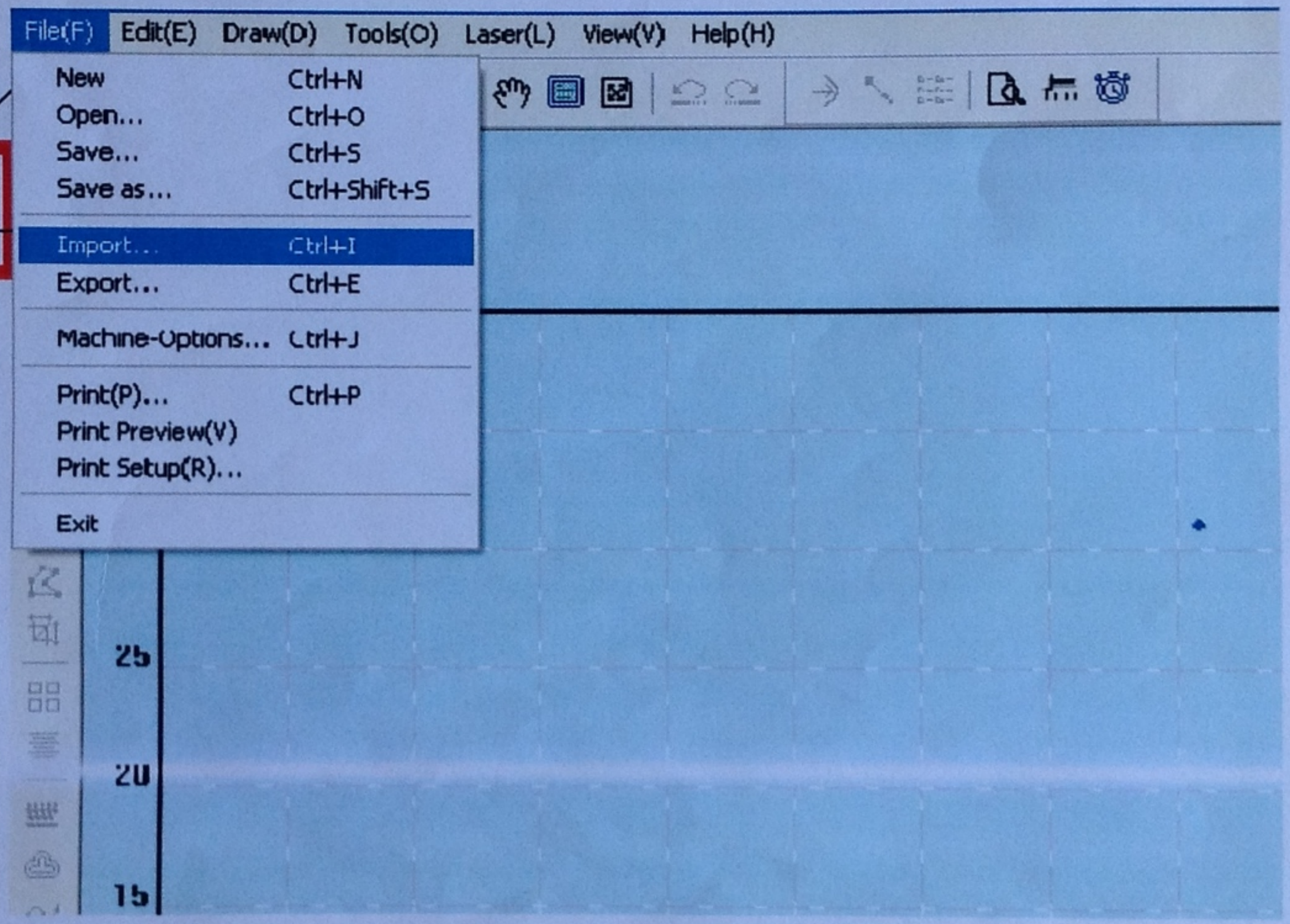
icon. on the PC connected to the LASER machine.

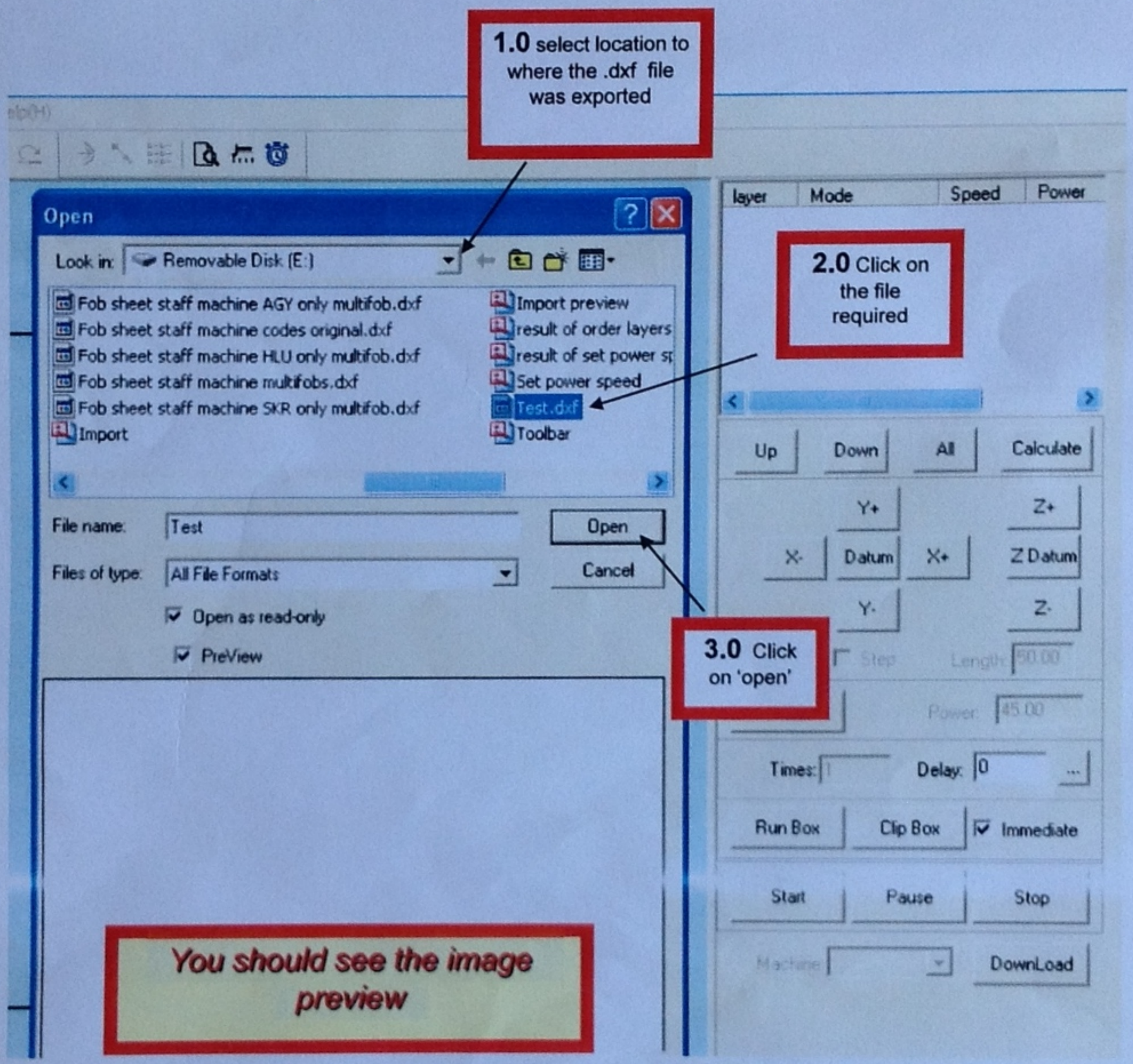
The program should open with a blank workspace.

(The LASER machine is switched on at a later stage)

Importing your .dxf file

1.0 Click on File > Import




1.0 select location to where the .dxf file was exported
Open
Look in: Removable Disk (E:)
Fob sheet staff machine AGY only multifob.dxf
Fob sheet staff machine codes original.dxf
Fob sheet staff machine HLU only multifob.dxf
Fob sheet staff machine multifobs.dxf
Fob sheet staff machine SKR only multifob.dxf
Import
Import preview
result of order layers
result of set power sp
Set power speed
Test.dxf
Toolbar
File name: Test
Open
Files of type: All File Formats
Cancel
Open as read-only
PreView
2.0 Click on the file required
3.0 Click on 'open'
You should see the image preview
layer
Mode
Speed
Power
Up
Down
All
Calculate
Y+
Z+
X-
Datum
X+
Z Datum
Y-
Z-
Step
Length
50.00
Power:
45.00
Times:
1
Delay:
0
Run Box
Clip Box
Immediate
Start
Pause
Stop
Machine:
DownLoad

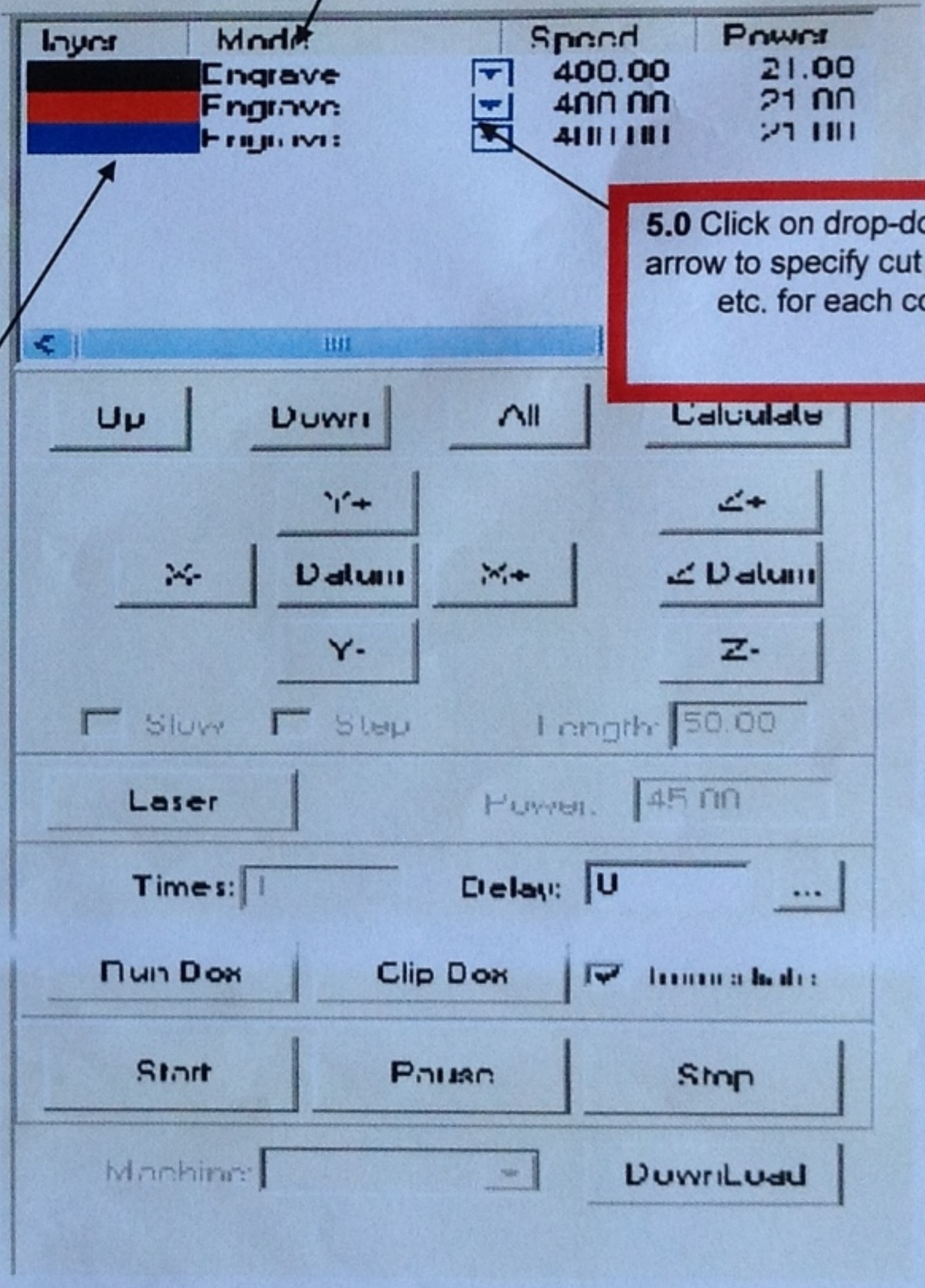
File is imported and is displayed in the work area

4.0 Set the type of LASER operation – each layer operation should be set to match the colours on the image imported as the DXF file

Click anywhere outside of the object to de-select it

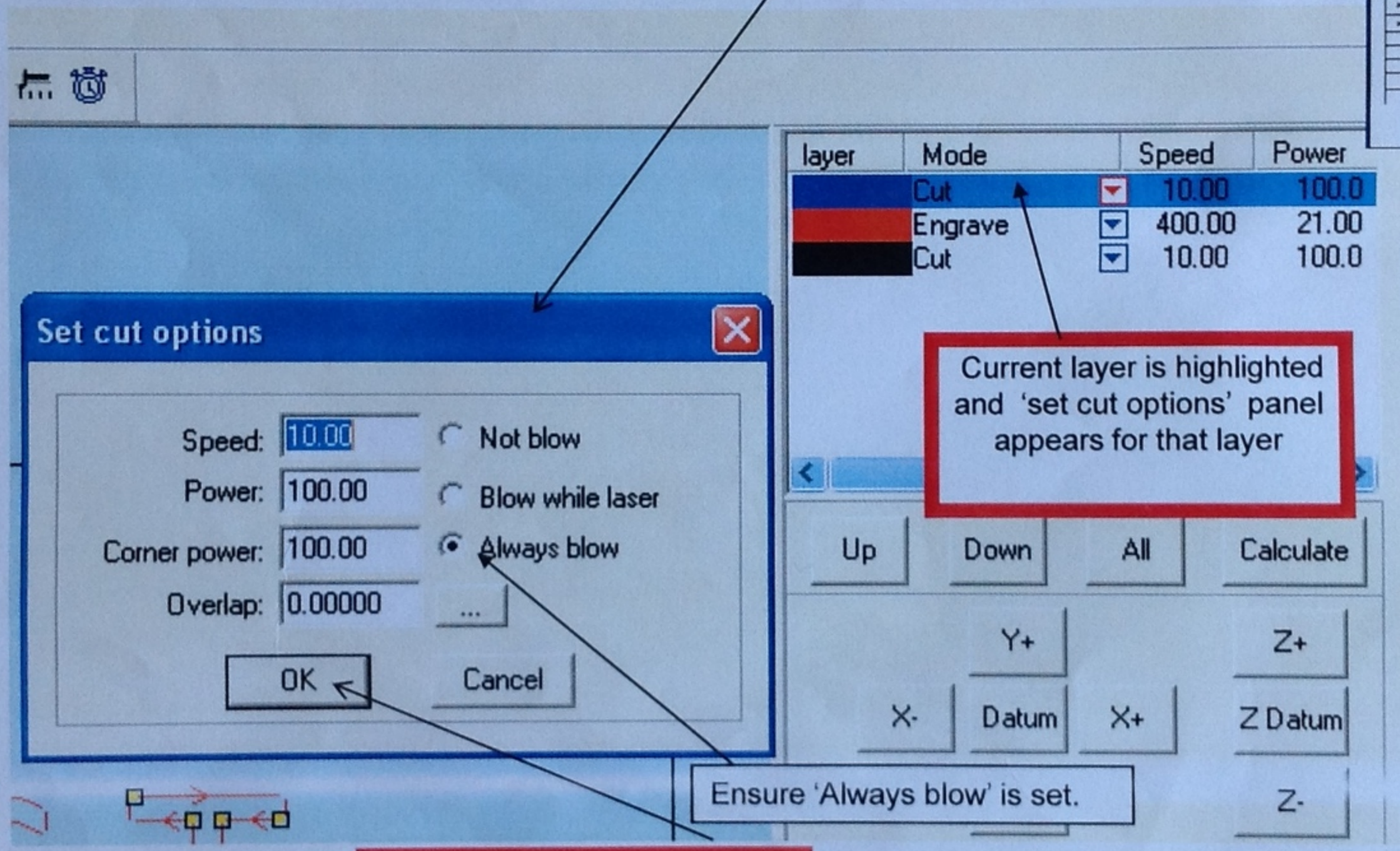
5.0 Click on drop-down menu arrow to specify cut / engrave etc. for each colour

6.0 Double click on each layer colour to set power / speed to suit material and type of operation, as per the chart fixed to the machine



new layer by pick a new color

Refer to the chart for power / speed settings for material & thickness



Current layer is highlighted and 'set cut options' panel appears for that layer

Ensure 'Always blow' is set.

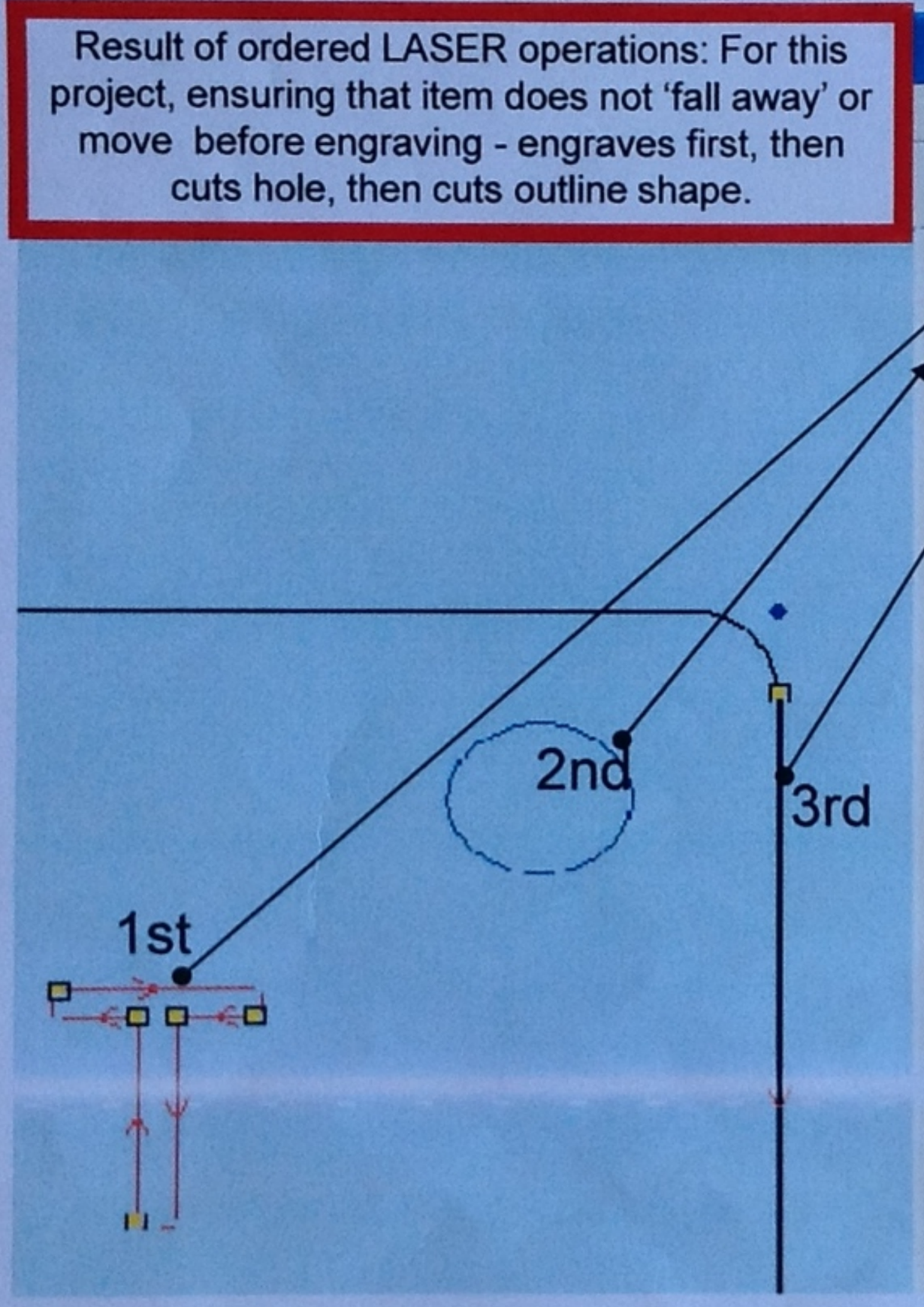
Click OK....repeat process for each layer / colour

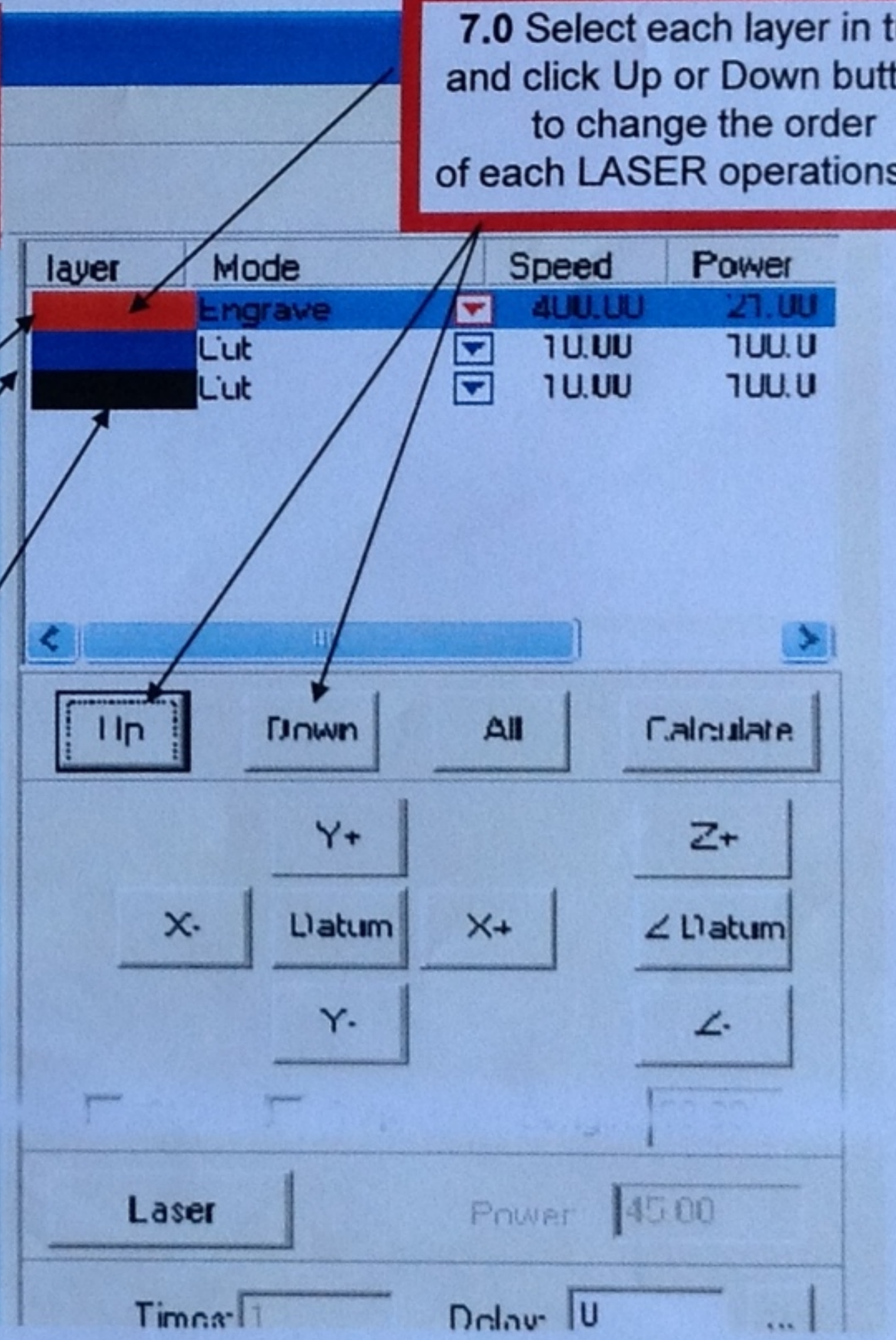
first engrave then cut

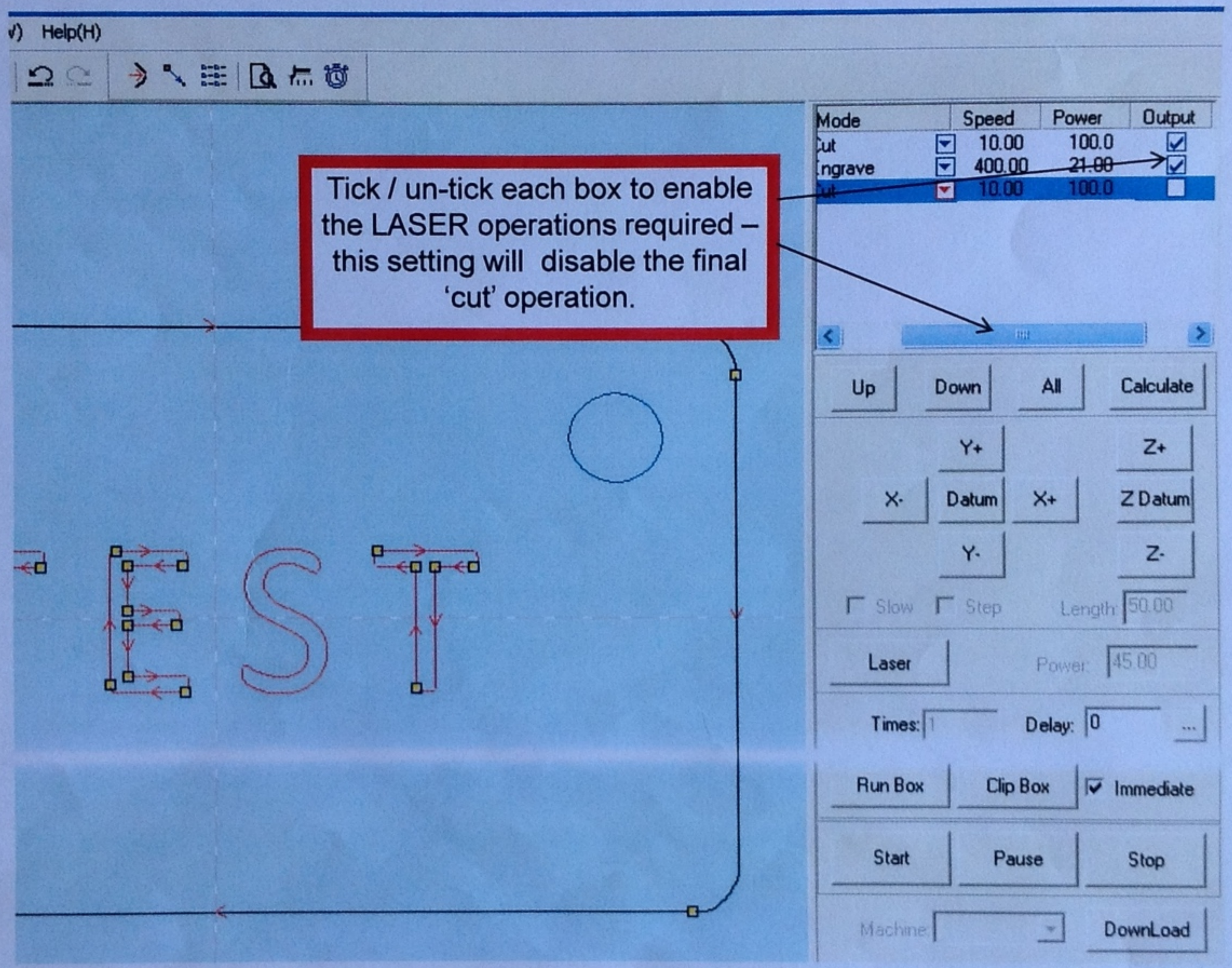
Result of ordered LASER operations: For this project, ensuring that item does not 'fall away' or move before engraving - engraves first, then cuts hole, then cuts outline shape.

7.0 Select each layer in turn and click Up or Down buttons to change the order of each LASER operations.

why does drag & drop not work







Next slide – downloading file to LASER machine

Downloading a file to the LASER machine

Insert key and turn clockwise

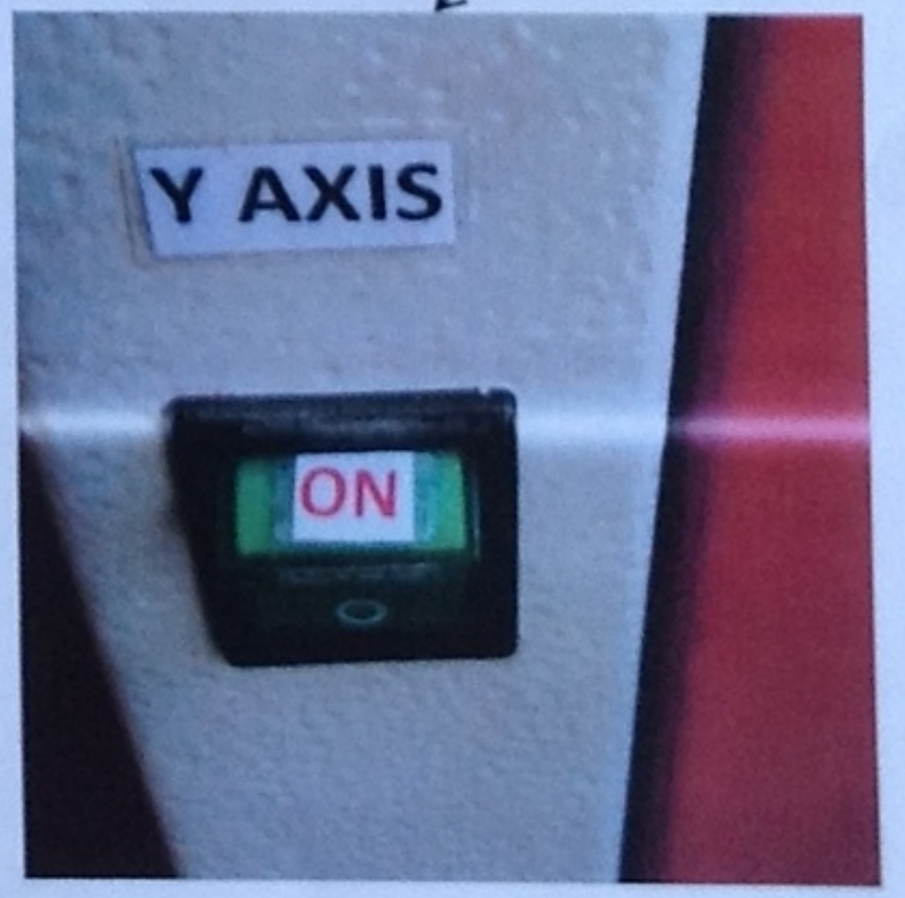
ENSURE that PC and LASER are connected via the USB lead

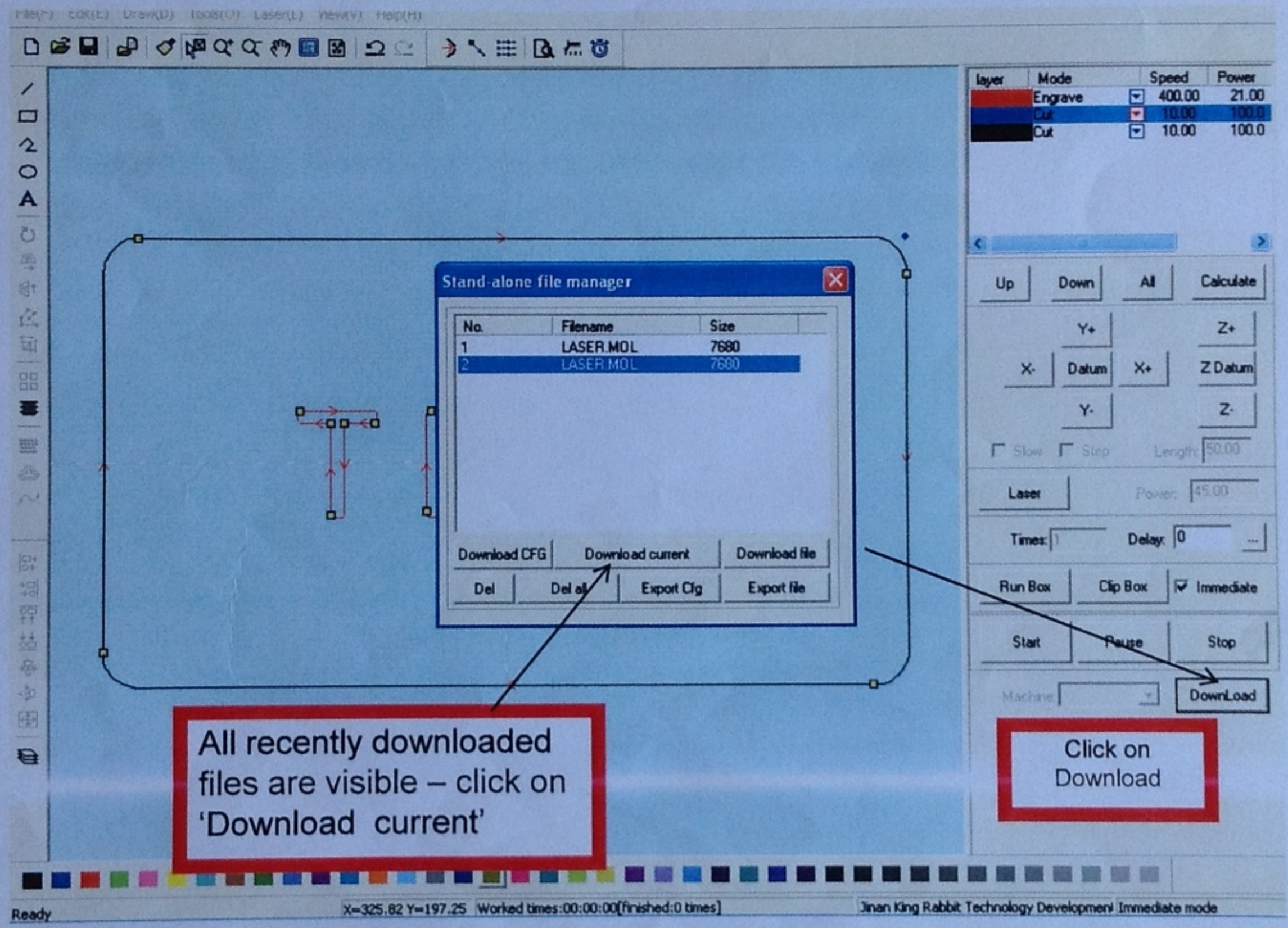
Downloading a file to the LASER machine - initialising the machine

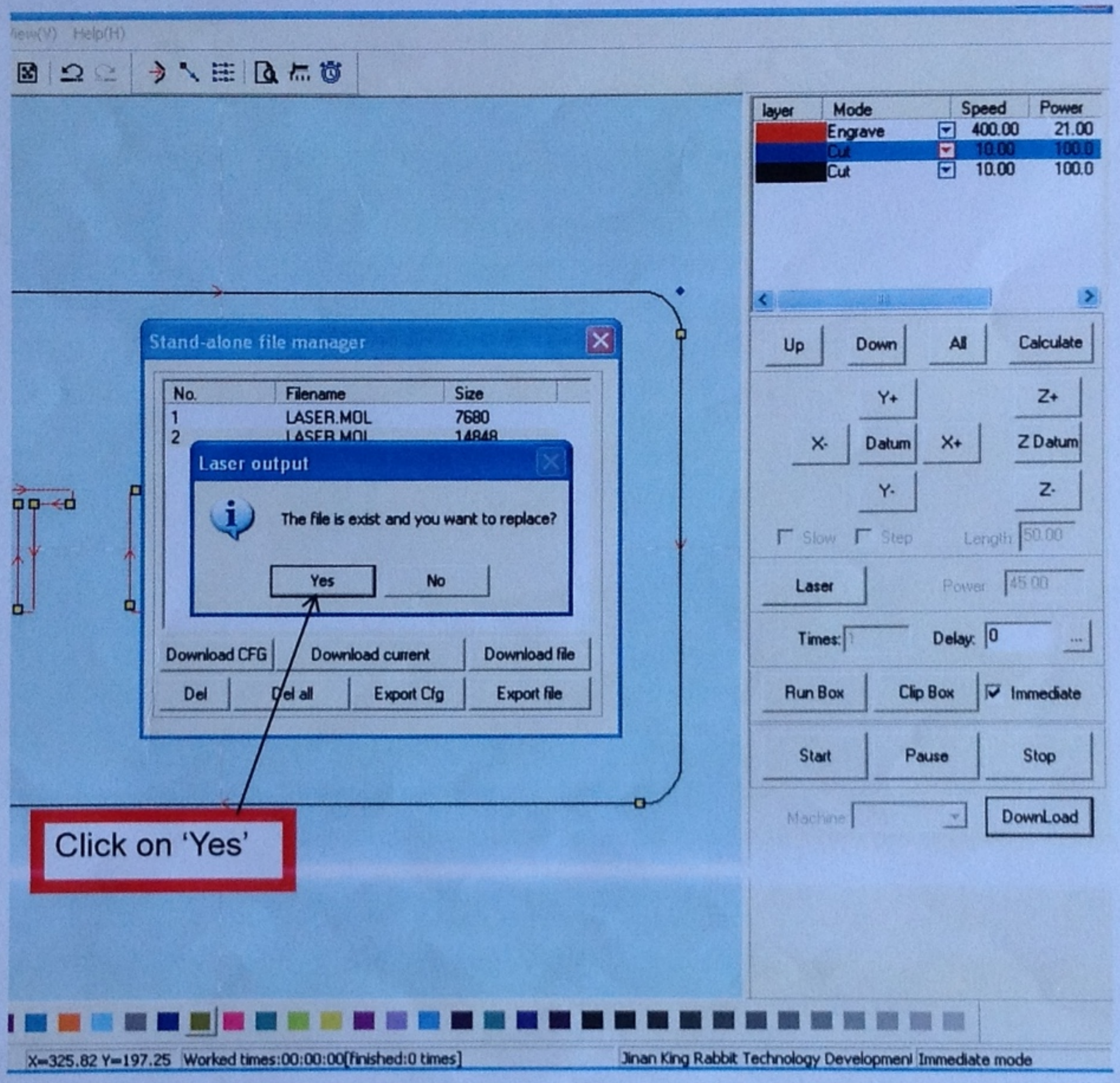
Insert ‘RONIS’ key and turn clockwise

You may hear confirmation ‘bleeps’ as the LASER communicates with the PC

Ensure LIGHTS, LASER and Y AXIS switches are ‘ON’



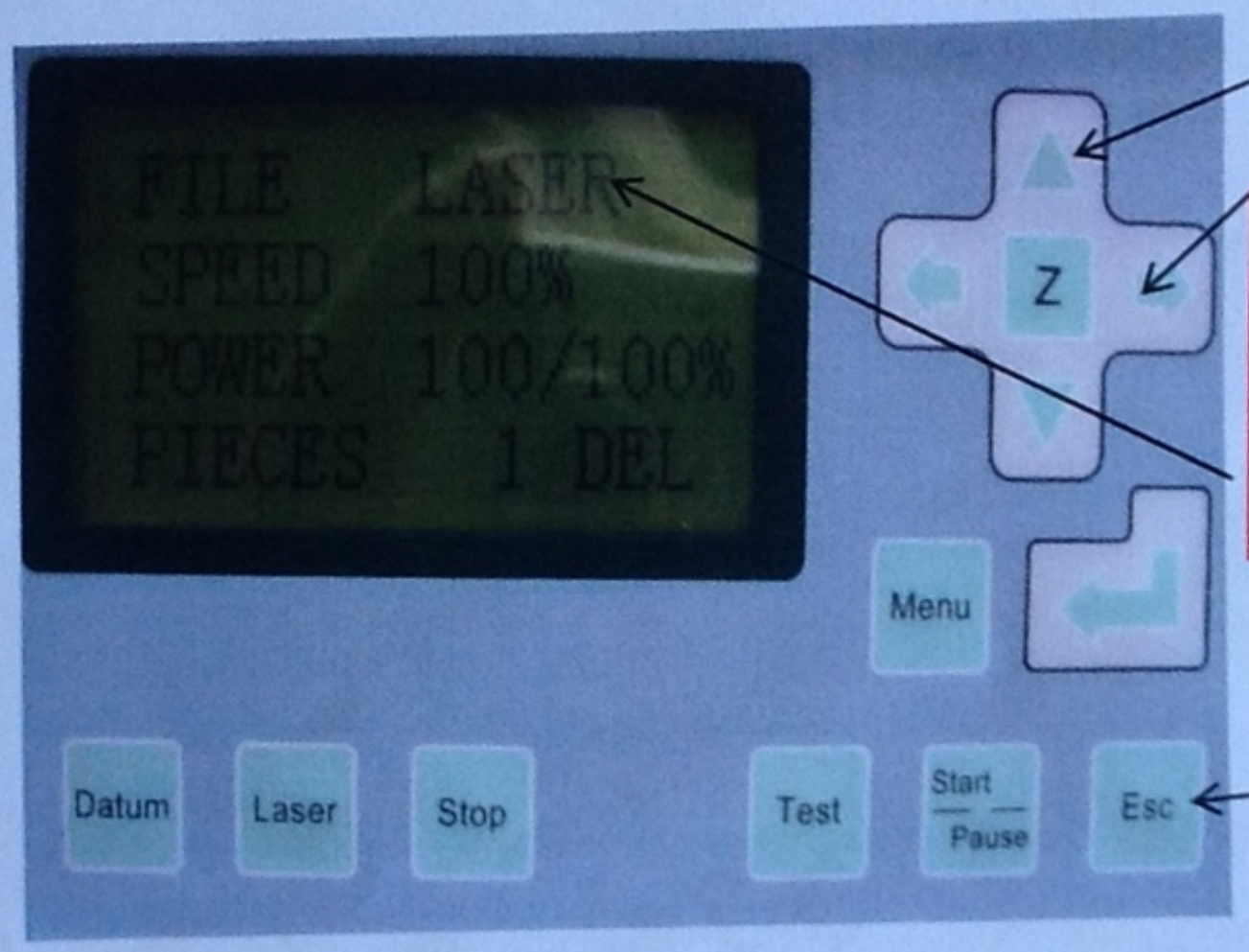

Stand-alone file manager
No.
Filename
Size
1
LASER.MOL
7680
2
LASER.MOL
7680
Download CFG
Download current
Download file
Del
Del all
Export Cfg
Export file
layer
Mode
Speed
Power
Engrave
400.00
21.00
Cut
10.00
100.0
Cut
10.00
100.0
Up
Down
All
Calculate
Y+
Z+
X-
Datum
X+
Z Datum
Y-
Z-
Slow
Step
Length:
50.00
Laser
Power:
45.00
Times:
Delay:
0
Run Box
Clip Box
Immediate
Start
Pause
Stop
Machine:
DownLoad
All recently downloaded files are visible – click on 'Download current'
Click on Download
Ready
X=325.82 Y=197.25
Worked times:00:00:00[finished:0 times]
Jinan King Rabbit Technology Development
Immediate mode


Stand-alone file manager
No.
Filename
Size
1
LASER.MOL
7680
2
Laser output
The file is exist and you want to replace?
Yes
No
Download CFG
Download current
Download file
Del
Del all
Export Cfg
Export file
Click on 'Yes'
layer
Mode
Speed
Power
Engrave
400.00
21.00
Cut
10.00
100.0
Cut
10.00
100.0
Up
Down
All
Calculate
Y+
Z+
X-
Datum
X+
Z Datum
Y-
Z-
Slow
Step
Length
50.00
Laser
Power
45.00
Times:
Delay:
0
Run Box
Clip Box
Immediate
Start
Pause
Stop
Machine
DownLoad
X=325.82 Y=197.25
Worked times:00:00:00[finished:0 times]
Jinan King Rabbit Technology Development
Immediate mode

Preparing the LASER machine and work

Lift the lid and place the material to be worked on onto the bed of the machine – it doesn't necessarily matter where, as the 'datum reference point ' (the start point) set on your 2D Design file can be changed on this machine to utilise any size of material or any available area of partly used material.

Changing the ‘datum’ (start) point



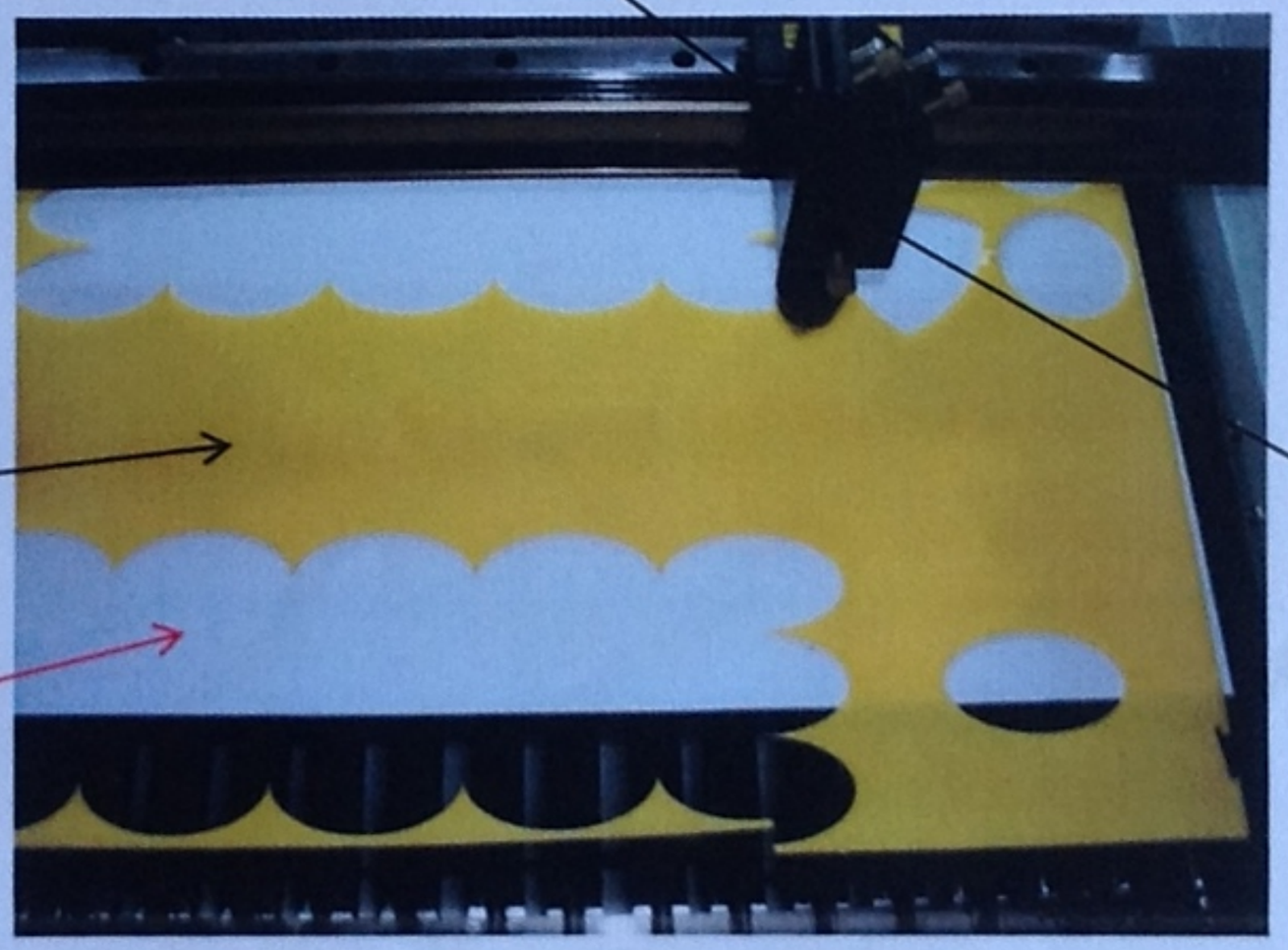
Use the four arrow keys to move the LASER head to the new start point

Holding down a button for longer than 3 seconds will move the LASER head quickly

Press the ‘escape’ key so that ‘LASER’ in the display is deselected (black >> clear)

Changing the ‘datum’ (start) point

LASER cutting head needs to be focused……



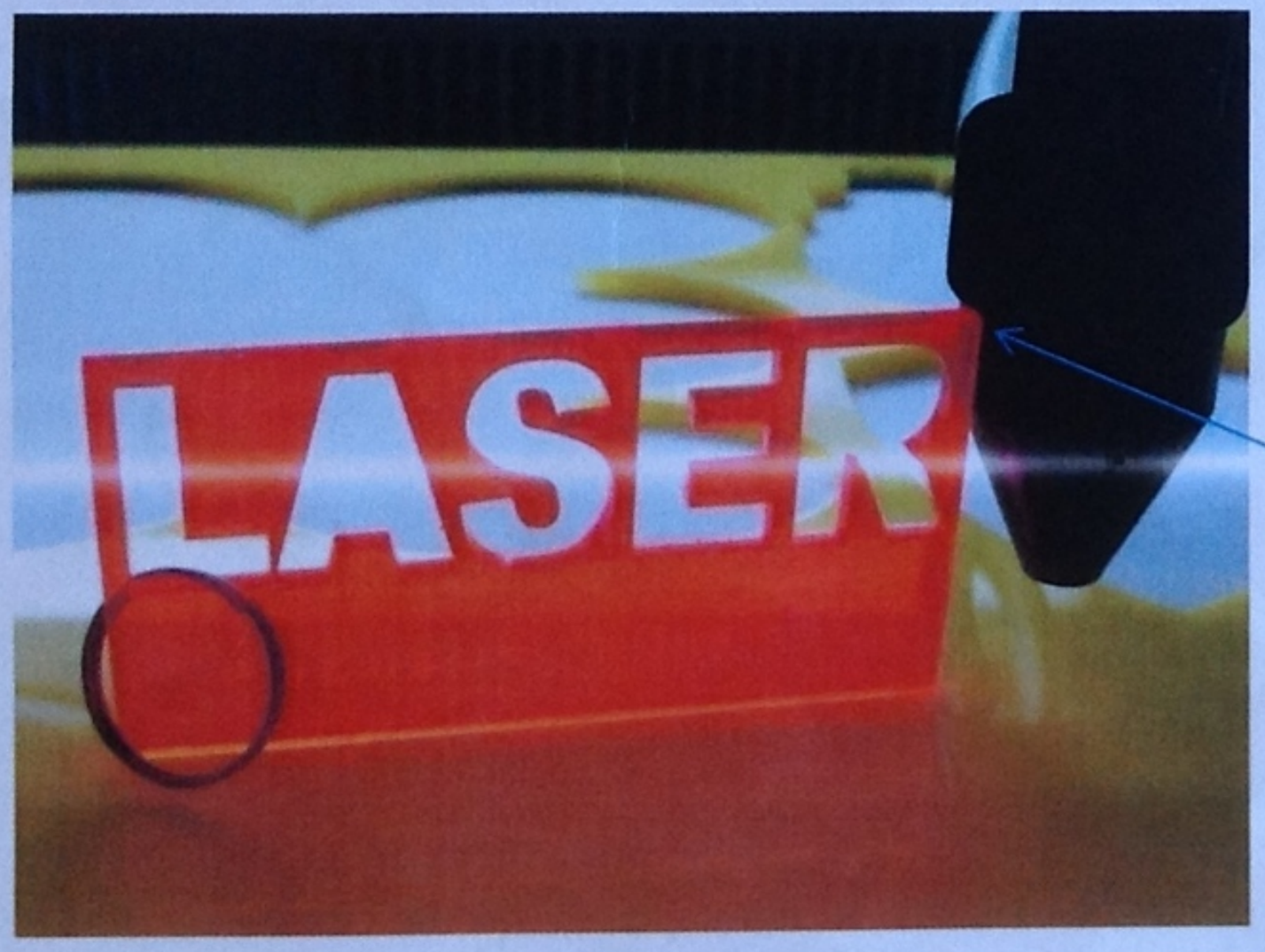
New ‘datum’ (start) point

White card has been places under the work so that cut items do not fall through the support grids

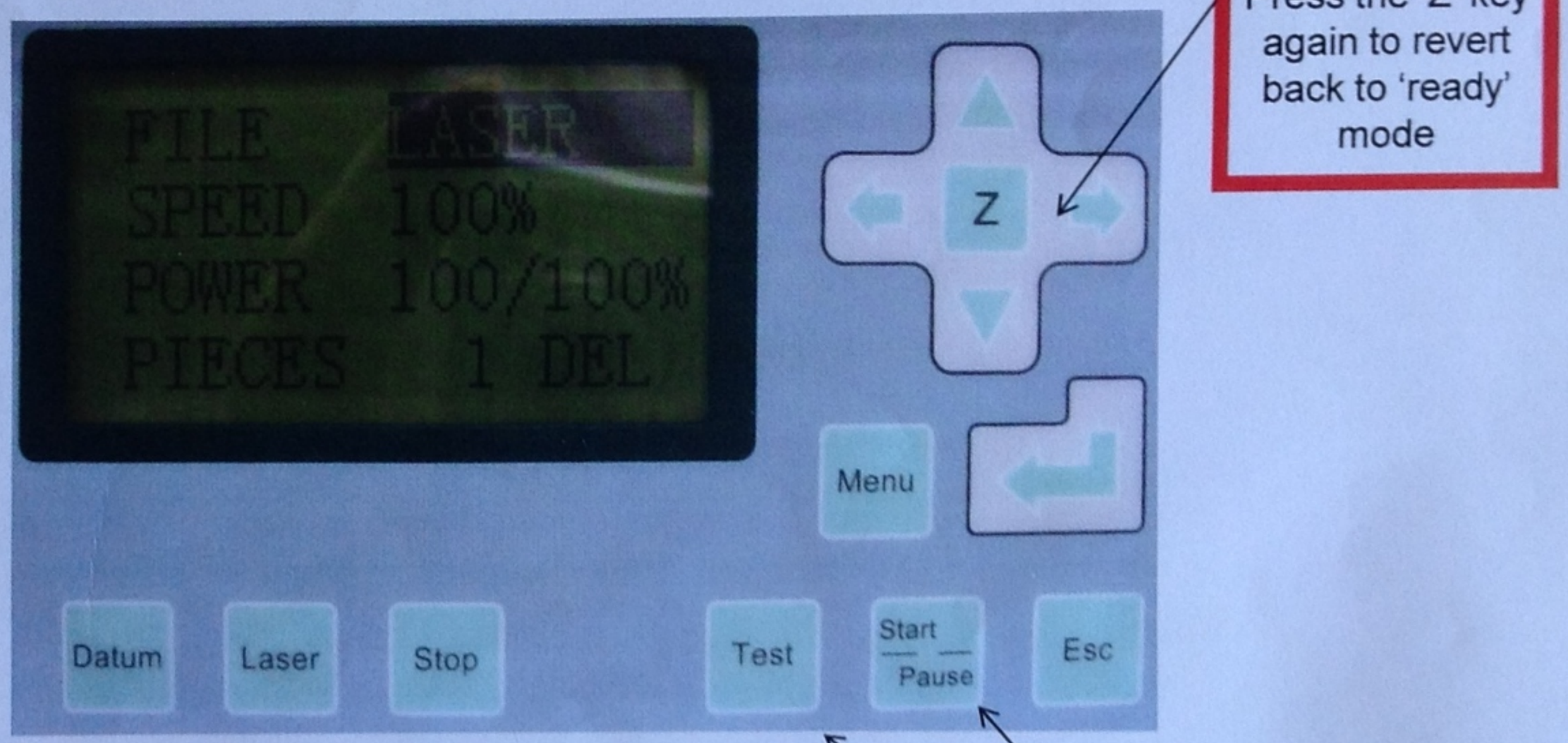
Focusing the LASER head

Press the 'Z' key

The LASER machine remembers this setting.
This focus adjustment will have to be repeated if thinner or thicker material was subsequently used.



The focus template tool should sit snugly under the shoulder of the knurled nut. Use the two up / down arrow keys to lift / lower the workpiece platform to achieve this



Press the 'Z' key again to revert back to 'ready' mode

Don't leave the machine unattended while operating

Should the axis motion system fail or stick, constantly focused LASER energy on one spot could cause a fire.

CLOSE THE LID

Press Start / Pause key to start the LASER operations

After adjusting lens 1 and lens 2, stick the adhesive paper onto the dolly, and then move the dolly to the top of the bed, close reflection lens 3 and reflection lens 4, manual test the laser and print one black point. Then move the dolly to the most right hand side, manual test the laser and print one black point. The black dot needs to be central in the cardboard, if not, adjust manual screw of lens 4, and then test, until finally completely central.

YOUR MACHINE IS NOW READY TO USE

Note: if machine is re-sited, the above procedure needs to be repeated

If your machine was installed by an HPC LASER ENGINEER please refer from this section:-

3060 (tube)		ENGRAVE		CUT	
		Speed	Power	Speed	Power
3MM	PERSPEX	200	21	8	98
5MM	PERSPEX	200	21	3.5	98
10MM	PERSPEX	200	21	1	98
1½	BIRCH PLY	200	17	10	98
3MM	BIRCH PLY	200	17	7	98
5MM	BIRCH PLY	200	17	7	98
6MM	PLY	200	17	1.5	98
3MM	MDF	200	25	5	98
4MM	MDF	200	25	4	98
6MM	MDF	200	25		
3MM	CORRUGATED CARDBOARD	200	20	12	98
3MM	HARDBOARD			3	98
	PAPER	200	15	20	20
	CARD	200	20	25	40
	MOUNT BOARD	200	20	12	98
	ENGRAVING LAMINATE	200	21	15	80
	FUNKY FOAM	not suitable		25	25

TIPS

To get a better result from engraving:-

a slow the speed down

b untick the bi-directional box

c (reduce any lines) by reducing scan gap

TROUBLESHOOTING

- Make sure focus is set properly
- Make sure the power and speed settings are appropriate
- Please refer to setting sheet provided with your machine

ENGRAVING MAINTENANCE:

The single most important thing that you can do to keep your engraver working as if it were new is to keep it clean! Five minutes once a day will keep the residue and debris from building up and causing problems. There is virtually no maintenance required for your engraver if you KEEP IT CLEAN!

EXHAUST:

Make sure the exhaust blower you are using receives proper maintenance. Periodically clean the exhaust blower and duct system to remove built-up debris. If you detect odour while engraving, or if the smoke in the cabinet is visible in the area of the lens carriage, inspect the exhaust system. Check for loose or broken pipe/hose connections, or obstructions.

BEARINGS:

The bearing system on the engraver is designed to be maintenance free, with the exception of periodic cleaning, please oil.

CLEANING:

Periodically (once a week), the machine will benefit from a light cleaning. Use a soft cloth and some hardware store alcohol. Open the large door and wipe down the bearing surfaces first, while the cloth is still clean. These are shown with arrows in the photo. Please clean these components thoroughly, along their entire length.

OPTICS:

About once a week, you will need to clean the optics (mirrors and lenses) of your engraver. If smoke, resin, or other contaminants are allowed to accumulate too heavily, they will reduce the available laser power and may even cause damage.

To clean the optics use a high-quality cotton bud moistened with isopropanal alcohol.

Wet the cotton bud thoroughly with the solvent, and then blot it against a paper towel or piece of cotton so that it is no longer soaking-wet. Then daub the optic gently, rotating the cotton bud after each daub to expose clean cotton to the surface, until the optic is free of visible contamination.

At that point, prepare a fresh cotton bud and clean the surface with a gentle zigzag motion across it. Avoid any hard "scrubbing" of the surface, especially while there are visible particles on it, and try not to use repetitive circular motions. When you are done, be careful to remove any cotton threads that may have snagged on the mountings, and allow the optics to dry before you operate your engraver.

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MAINTENANCE SCHEDULE

WEEKLY (40 hours approx)

Clean Lens with Acetone / Alcohol

Oil Runners with light oil

Clean Laser Bed

Check water level

Visually check mirrors (clean if required)

Remove Debris from machine base

MONTHLY

Check water for contamination (change if required)

Oil Rise and Fall of laser bed

Clean Impeller on fan unit (not if a Fume Filter is fitted)

Clean Mirrors if required

ANNUALLY

Call HPC LASER LTD for annual service
01422 310800