X-Carve Technical and Maintenance

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X-Carve Technical and Maintenance

Hardware

Frame

- Shapoko 2 with X-Carve upgrade kit, 1000x1000mm frame.
- Guaranteed Usable area: 700x700x50mm (Slightly more with care)

Electronics

- Arduino Uno + Synthetos gShield (grblShield) V5b
- External Emergency stop(Kills power.) Plus Reset connected back to controller.
- Hard limit endstops(microswitches) on both ends of X and Y, plus top of Z
- Z Probe with 2.1mm Barrel plug connector.

Mechanical

- Nema 17 steppers. (Y and Z)
- * Smart Automation SM42HT47-1684B 1.8° 1.68A, (http://www.smartautomation.com.cn/ProductShow.asp?ArticleID=497)
- Nema 23 steppers (X)
- * SHINANO KENSHI NO. 03640 1.8° 2.0A (No datasheet)
- 6mm GT2 belts. **18** tooth drive wheels.
- ACME Thread Z drive.
- DeWalt D26204 Router.
- Collets for:
  - 1/8“ (Dremel/XCarve bits)
  - 1/4” (Standard Router Bits)
  - 6.0mm (Cheap Metric Tooling)

Hardware changes

- Springs to counteract router weight
- Spring loaded front guard

Software

Tested

Easel

- HTML5 Web based, XCarve default
- Good test, OK for home use, limited final use due to log in and web based.

Makercam + Universal G-Code Sender.

- (Flash+web based. http://www.makercam.com/)
- Limited in use due to no path/tool saving, reliance on internet, problems with flash.

Autodesk Inventor

- GCode exporting tool. Works well. Complicated and expensive.

Current

Vetric V-Carve Pro + Candle

- Easy to use, works very well, allows work off site. (Makerspace ID: 86B4F-F467A-280D9-9F4C6-9C56B-4C528-BEE6F)
- Candle(Previously grblController) is friendly and easy to use. Allows custom buttons.

Log of works

- Original kit dismantling.. (Prior to Holley's arival)
- First full build. (Started a few weeks into when Holly arrived)
- Original table. Early dust extraction.
- Final Vacuum cleaner based Cyclonic Dust extraction system.
- New custom built table
- New software(VCarve!)
- Z-Touch probe
- New computer, clean install, ready for Public. (Nearly done)
- Room sound proofing.

Things **TO DO**

- Room sound proofing. **(Critical)**
- Document running procedure. **(Critical)**
- Emergency stop needs to connect to an end stop to trigger Alarm.
- Wiring diagrams need to be drawn up.
- Dust mitigation. Guards for side wheels and edges. (Acrylic?)
- New dust shoe.
- Tooling lists need to be finished.
- New dust extractor barrel/top/baffle.
- XCarve Table lowered by 100mm
- Signage.

Upgrades

- TinyG v8 Controller. (Brought. Needs testing.)
- Nema 23 Steppers. (Obtained)
- 8mm GT2 belts.
- New dust shoe. (Needs finishing)
- SuperPID Speed controller for Spindle.

Config

Candle(grblController):

```
Z-Touch: G53G0Z-30 ;G21G91G38.2Z-50F50 ;G92Z15.61 ;G90G0Z40
Safe Home: G21G90; G53G0Z-3X-650Y-100

Motor timeout:
$1=255 for 'leave motors on'
$1=254  for 'switch off after 254mS'
```

grbl internal settings:

```
$$ < $0=10
$1=254
$2=0
$3=1
$4=0
$5=0
$6=0
$10=3
$11=0.020
$12=0.002
$13=0
$20=0
$21=1
$22=1
$23=3
$24=25.000
$25=3000.000
$26=250
$27=2.000
$30=1
$31=0
$32=0
$100=44.440
$101=44.440
$102=188.976
$110=8000.000
```

```
$111=8000.000
$112=500.000
$120=500.000
$121=500.000
$122=50.000
$130=720.000
$131=720.000
$132=100.000
```

Notes

```
Blah!
```