DrawingTests

September 2, 2017

1 Drawing Tests

1.1 Object

- Play around with drawing things.

2 Code:

```
In [18]: import GCode
         import GRBL
         import numpy as np
         from utils import picture
         cnc = GRBL.GRBL(port="/dev/cnc_3018")

         print("Laser Mode: {}".format(cnc.laser_mode))

         from enum import IntEnum
         class Tool(IntEnum):
             SPINDLE = 0
             LASER = 1

         from enum import IntEnum
         class LaserPower(IntEnum):
             CONSTANT = 0
             DYNAMIC = 1

         LaserPower.CONSTANT

         def init(power = LaserPower(0), feed = 200, laser = 1):
             program = GCode.GCode()
             program.G20() # Metric Units
             program.G91() # Absolute positioning.
             program.G1(F=feed) #
             if power==LaserPower.CONSTANT:
                 program.M3(S=laser) # Laser settings
             else:
```

```
            program.M4(S=laser) # Laser settings
        return program

    def end():
        program = GCode.GCode()
        program.M5() # Laser settings.
        return program

    def square(size=0.25):
        program = GCode.GCode()
        program.G1(X=size)
        program.G1(Y=-size)
        program.G1(X=-size)
        program.G1(Y=size)
        return program
```

```
Laser Mode: 1.0
```

2.1 Test Setup

Power Supply: - CicuitSpecialists CSI3010SW @ 12V - PostIt Note Grid notes. .25" grid. Position the paper & other things.

```
In [44]: def laser_on(pwm):
             if int(pwm) != np.uint8(pwm):
                 raise(Exception("UINT8! {}".format(pwm)))
             # Set minimal power setting to focus and position laser
             cnc.cmd("M3 S{:03d}".format(np.uint8(pwm)))
             cnc.cmd("G1 F10") # Laser On

         def laser_off():
             cnc.cmd("M5") # Laser off
```

```
In [51]: cnc.cmd("$X")
```

```
Out[51]: ['ok', 'ok']
```

```
In [52]: laser_on(1) # Position the axis by hand
```

```
In [53]: laser_off()
```

```
In [54]: tests_x = 10
         tests_y = 7
```

```
In [55]: cnc.run(init(laser=0.1)+square(0.25))
```

```
Out[55]: 0.8327279090881348
```

```
In [56]: def jogx(x=10):
             program = GCode.GCode()
             program.G0(X=x)
             cnc.run(program)
         def jogy(y=10):
             program = GCode.GCode()
             program.G0(Y=y)
             cnc.run(program)
         def jogz(z=10):
             program = GCode.GCode()
             program.G0(Z=z)
             cnc.run(program)

In [ ]: square_size = 0.25
```

3 Test Setup

```
In [57]: cnc.cmd("$G")

Out[57]: ['ok', '[GC:G1 G54 G17 G20 G91 G94 M3 M9 T0 F5080 S0]', 'ok']

In [58]: cnc.cmd("$#")

Out[58]: ['ok',
          '[G54:0.000,0.000,0.000]',
          '[G55:0.000,0.000,0.000]',
          '[G56:0.000,0.000,0.000]',
          '[G57:0.000,0.000,0.000]',
          '[G58:0.000,0.000,0.000]',
          '[G59:0.000,0.000,0.000]',
          '[G28:0.000,0.000,0.000]',
          '[G30:0.000,0.000,0.000]',
          '[G92:0.000,0.000,0.000]',
          '[TLO:0.000]',
          '[PRB:0.000,0.000,0.000:0]',
          'ok']

In [59]: cnc.cmd("$$")

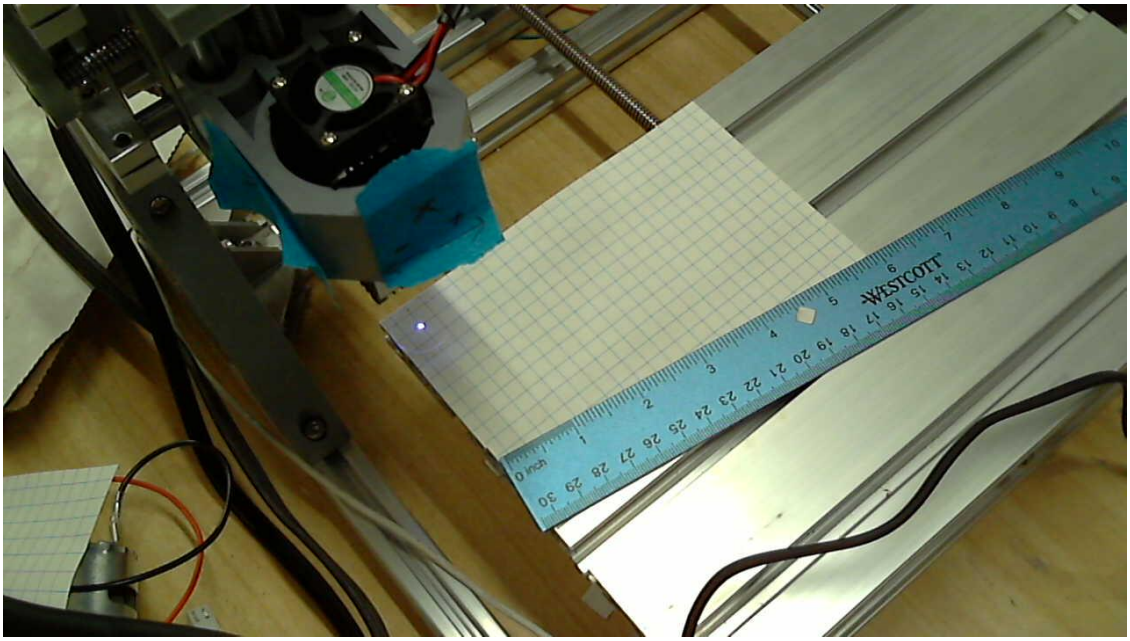
Out[59]: ['ok',
          '$0=10',
          '$1=25',
          '$2=0',
          '$3=5',
          '$4=0',
          '$5=0',
          '$6=0',
          '$10=3',
```

```
            '$11=0.010',
            '$12=0.002',
            '$13=0',
            '$20=0',
            '$21=1',
            '$22=0',
            '$23=0',
            '$24=25.000',
            '$25=500.000',
            '$26=250',
            '$27=1.000',
            '$30=1000',
            '$31=0',
            '$32=1',
            '$100=800.000',
            '$101=800.000',
            '$102=800.000',
            '$110=800.000',
            '$111=800.000',
            '$112=500.000',
            '$120=10.000',
            '$121=10.000',
            '$122=10.000',
            '$130=200.000',
            '$131=200.000',
            '$132=200.000',
            'ok']

In [60]: cnc.cmd("$I")

Out[60]: ['ok', '[VER:1.1f.20170801:]', '[OPT:V,15,128]', 'ok']

In [61]: picture()
```




```
In [63]: square_size = 0.25

In [64]: for feed in np.linspace(50, 1, tests_y):
             for pwm in np.linspace(0, 100, tests_x):
                 i = init(laser=np.uint8(pwm), feed=np.round(feed))
                 s = square(square_size)
                 cnc.run(i+s)
                 jogx(square_size*2)
             jogx(-1*2*tests_x*square_size)
             jogy(-square_size*2)
```

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In [65]: cnc.cmd("!")
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Out[65]: ['ok', 'ok']
```

```
In [66]: cnc.reset()
```