XY Plotter V2.0 Software Manual

I. Preparation

a. An assembled XY Plotter V2.0

b. A Computer

c. Arduino IDE

d. XY Plotter V2.0 software package--GRemoteFull package (included control program, control software and G-code examples）

II. Download and Installation

a. Please download GRmoteFull from below website: http://learn.makeblock.cc/xy2/

b. According to the mainboard type of your XY Plotter V2.0, please download the corresponding PC control software. You can find the mainboard version on the back side of your mainboard (Orion or Base Board). File GCodeParser_Me Base Board（Old）.zip included the firmware and software for the oldest wiring way, which X-axis limit switch is connected to Port_8. Besides, there are 2 more files are for newer wiring method. Please download what you need.

|			
GCodeParser_Makeblock Orion.zip	2014/12/7 11:40	好压 ZIP 压缩文件	37,859 KB
GCodeParser_Me Base Board（Old）.zip	2014/12/7 11:40	好压 ZIP 压缩文件	37,870 KB
GCodeParser_Me Base Board.zip	2014/12/7 11:40	好压 ZIP 压缩文件	37,858 KB

c. Open firmware file "GCodeParser.ino" in GRemoteFull/GCodeParser by Auduino IDE, select the right version of your board (Orion -> UNOor Baseboard-> Leonardo) and the correct COM port, and then upload firmware in it. Another way to upload firmware is to install ArduinoTool.exe in your computer, and then choose the corresponding firmware.

For example, upload firmware for Orion mainboard.

1) Find ArduinoTool.exe, install and then open it.

Name	Date modified	Type	Size
ArduinoTool.exe	2014/9/1 9:38	Application	1,149 KB
GCodeParser.cpp（Orion）.hex	2014/12/5 11:39	HEX File	45 KB
GCodeParser.ino	2014/12/5 11:31	Arduino file	4 KB
process_string.ino	2014/5/10 19:13	Arduino file	13 KB
stepper_control.ino	2014/5/10 19:13	Arduino file	7 KB

2) .Select the corresponding COM port,

3) Choose version "Uno" for Orion mainboard.

4) Click "Open firmware" , choose "GCodeParser.cpp(Orion).hex"

5) Click "update firmware", finish.
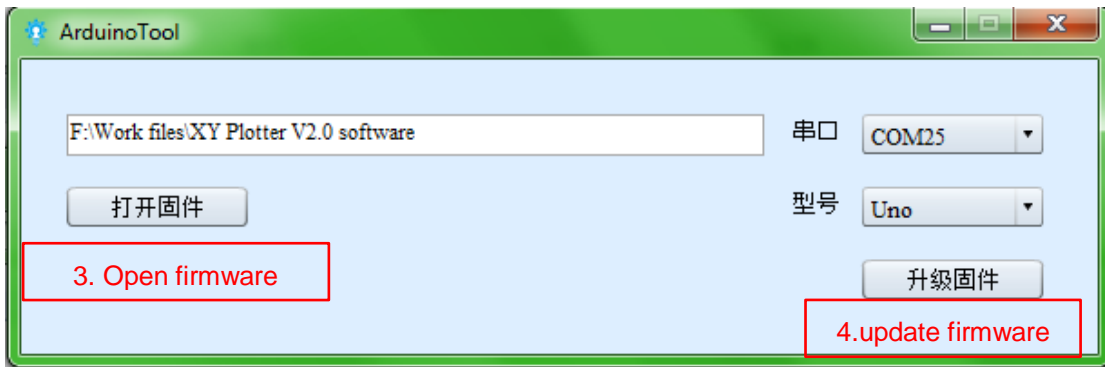
d. Close Arduino IDE or ArduinoTool.exe.

e. Find GRemote.bat batch file in folder GRemoteFull, and then open it.
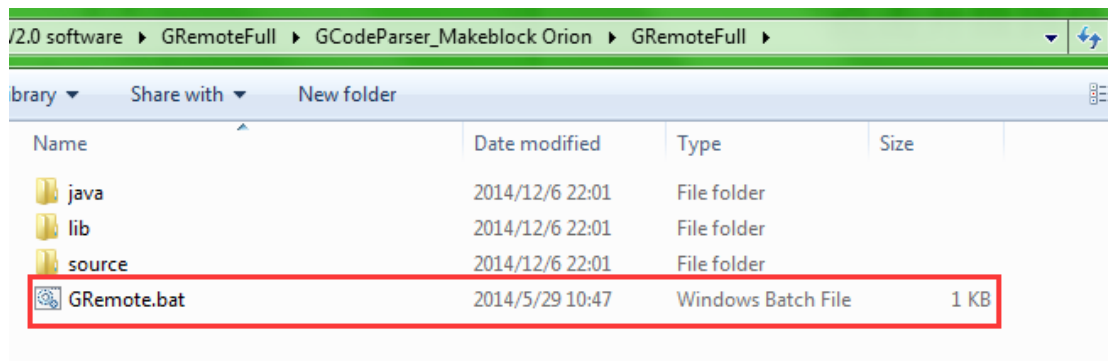
Below page will pop out.
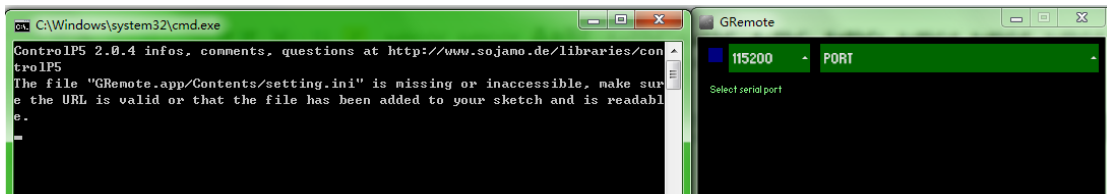
f. Select the corresponding serial port, and then GRemote will open the whole UI interface automatically. Now the application has been installed completely.

Fig. 1

III. Interface

a. Interface

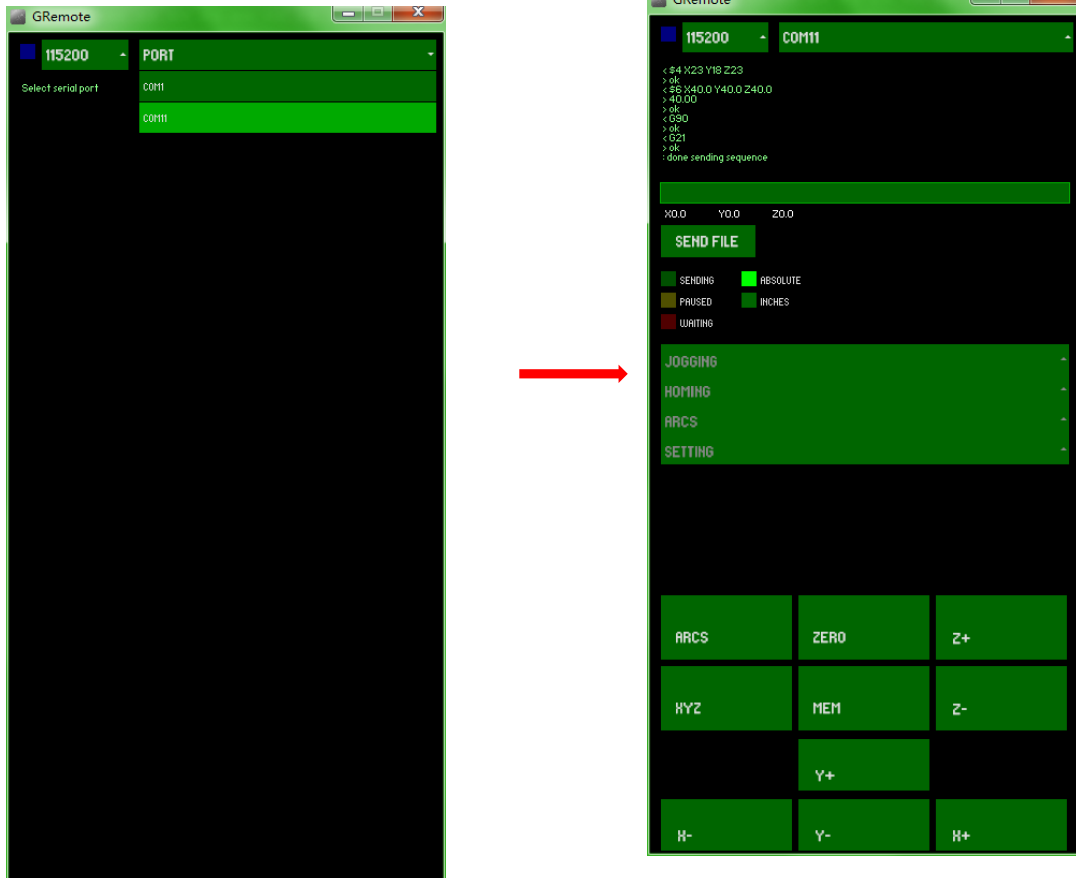Now you can control XY Plotter V2.0 with your mouse or keyboard. Direction keys can control movement in X&Y axis. Key > and < can control movement in Z axis(9g Micro Servo). There are many shortcut keys such as J/H/A/;/[/]/x/y/z/shift+x/shift+y/shift+zl, users can test their functions one by one. Generally you do not need to revise the default pin port setting(package has contained the screen shot of default pin port setting). However, if you did not wire your XY Plotter V2.0 in the exact way in our instruction, you would have to revise the corresponding pin port.

Fig. 2

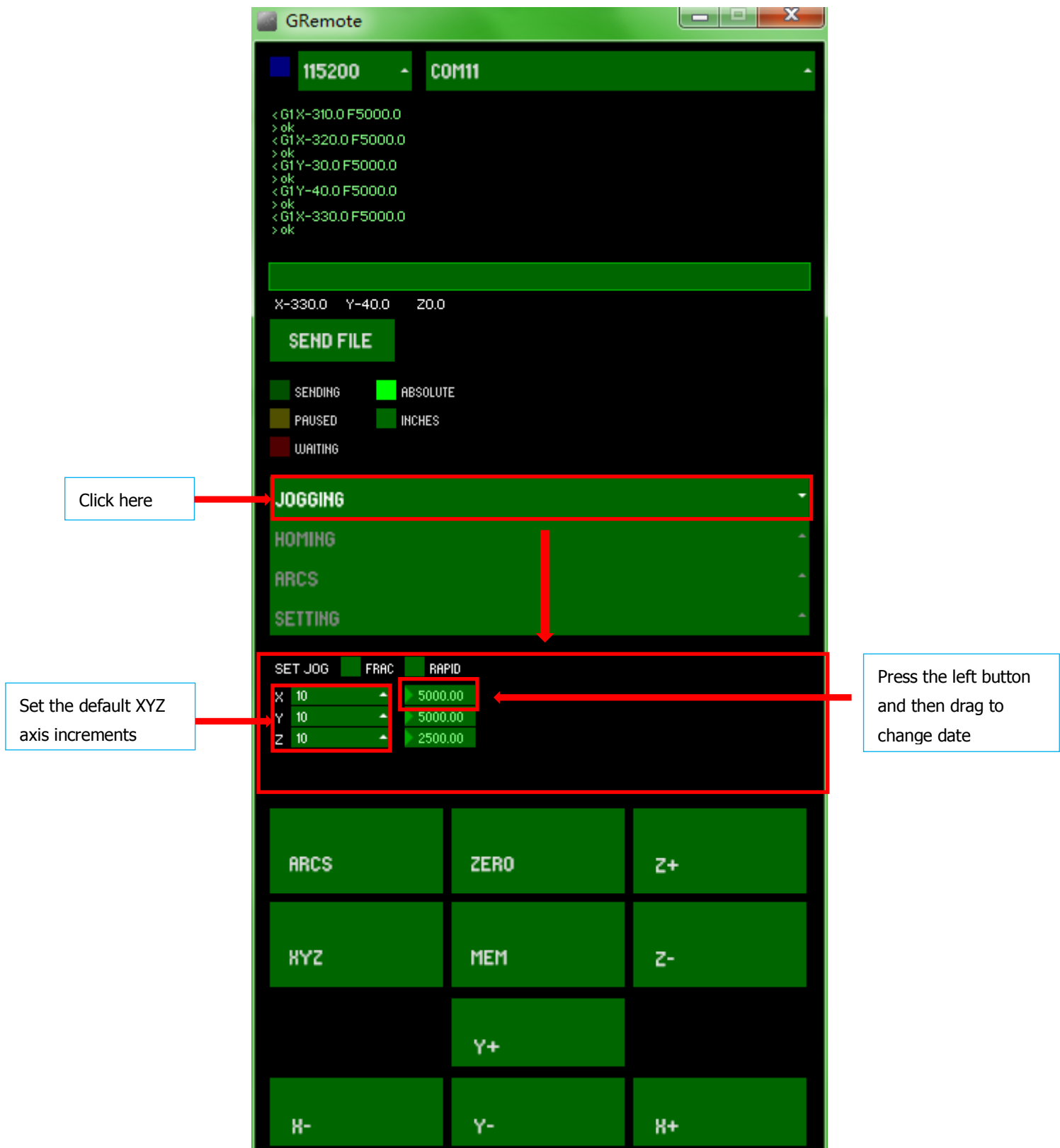1) Main interface of GRemote

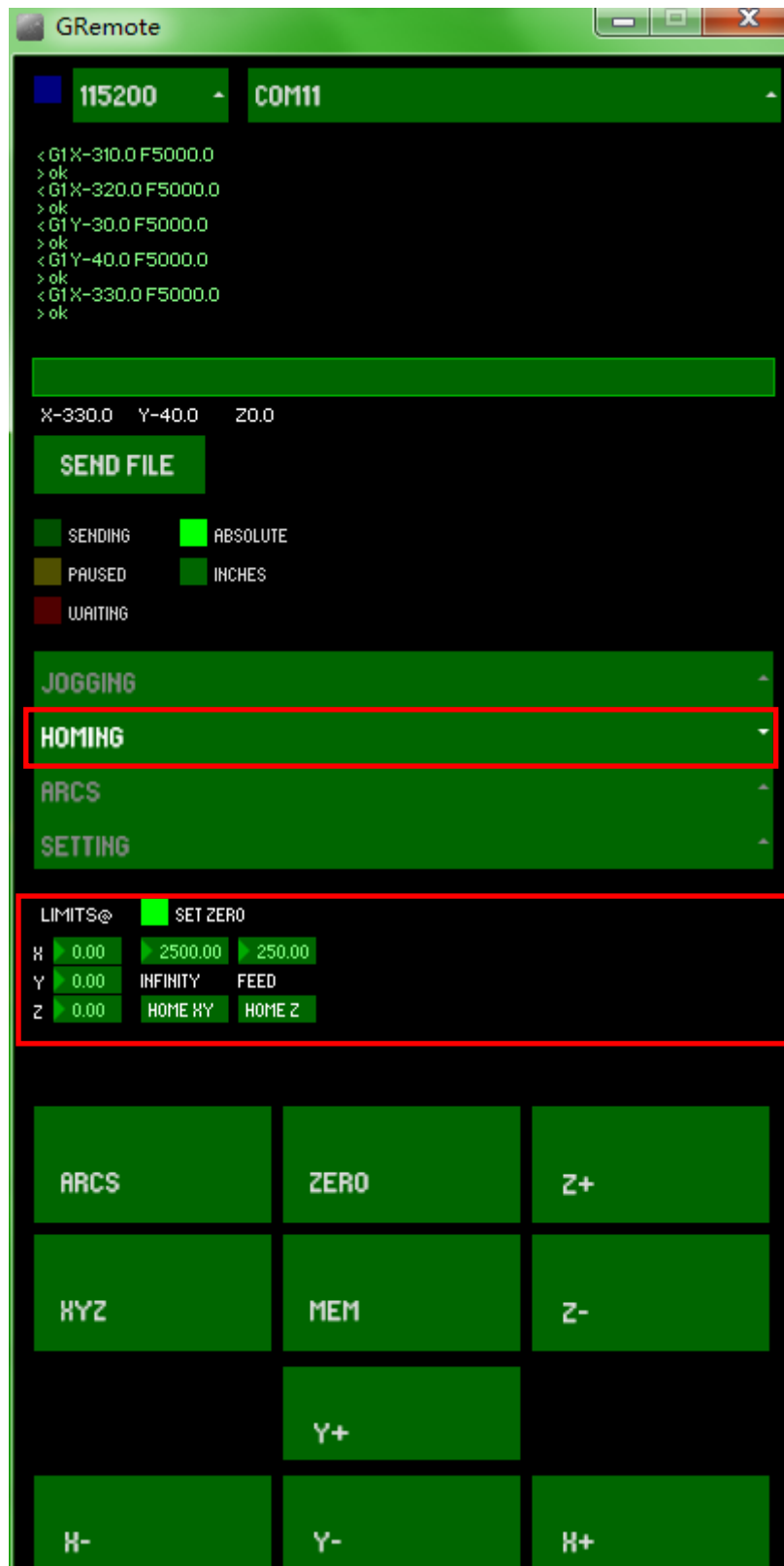Fig. 3

2) Function Zoon

1

Fig. 4

2.

Fig. 5

3.

ARCS settings

Radius Setting

Set the start/end
angle for circle

Fig. 6

4.
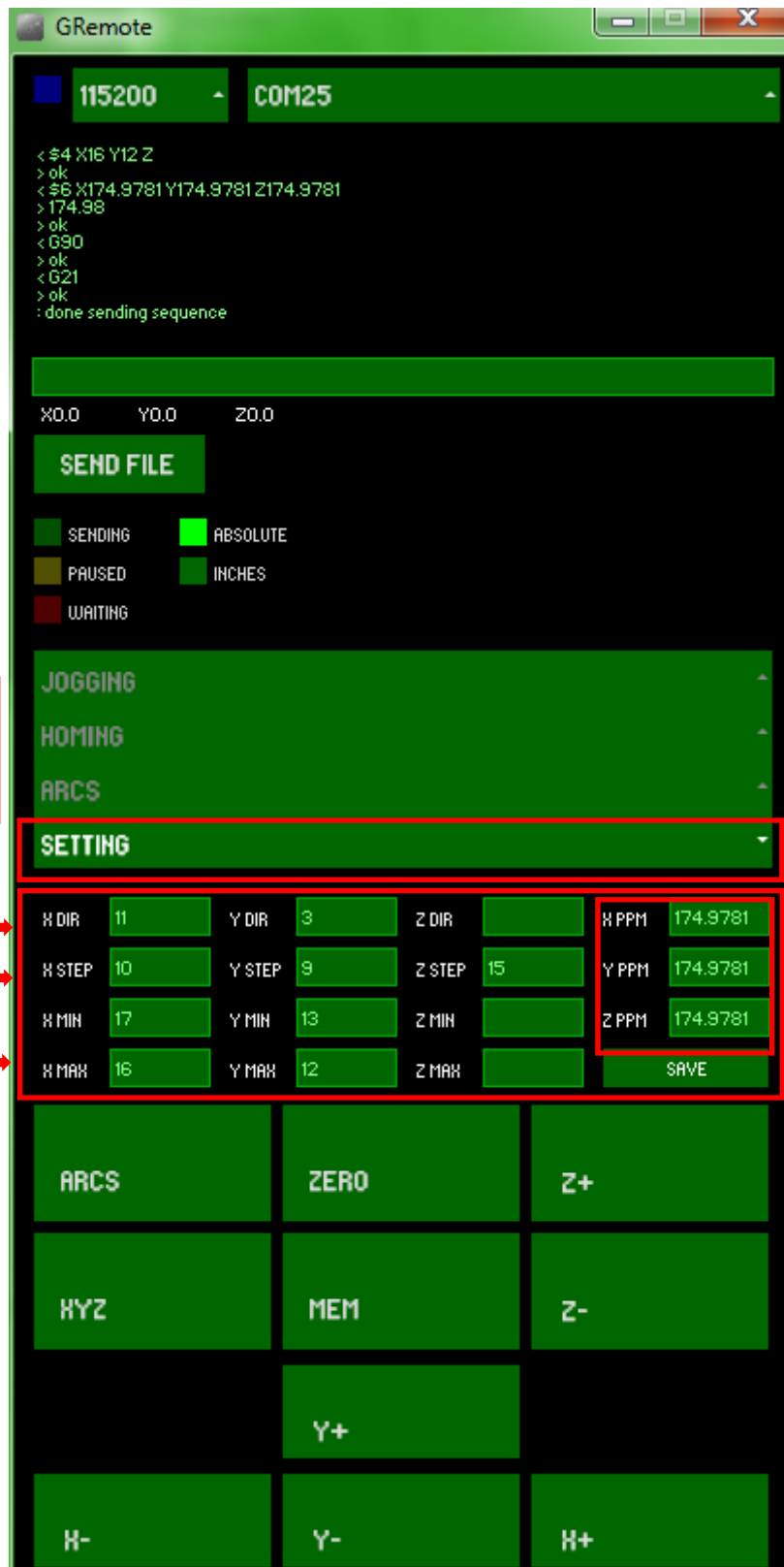
Fig. 7

5.
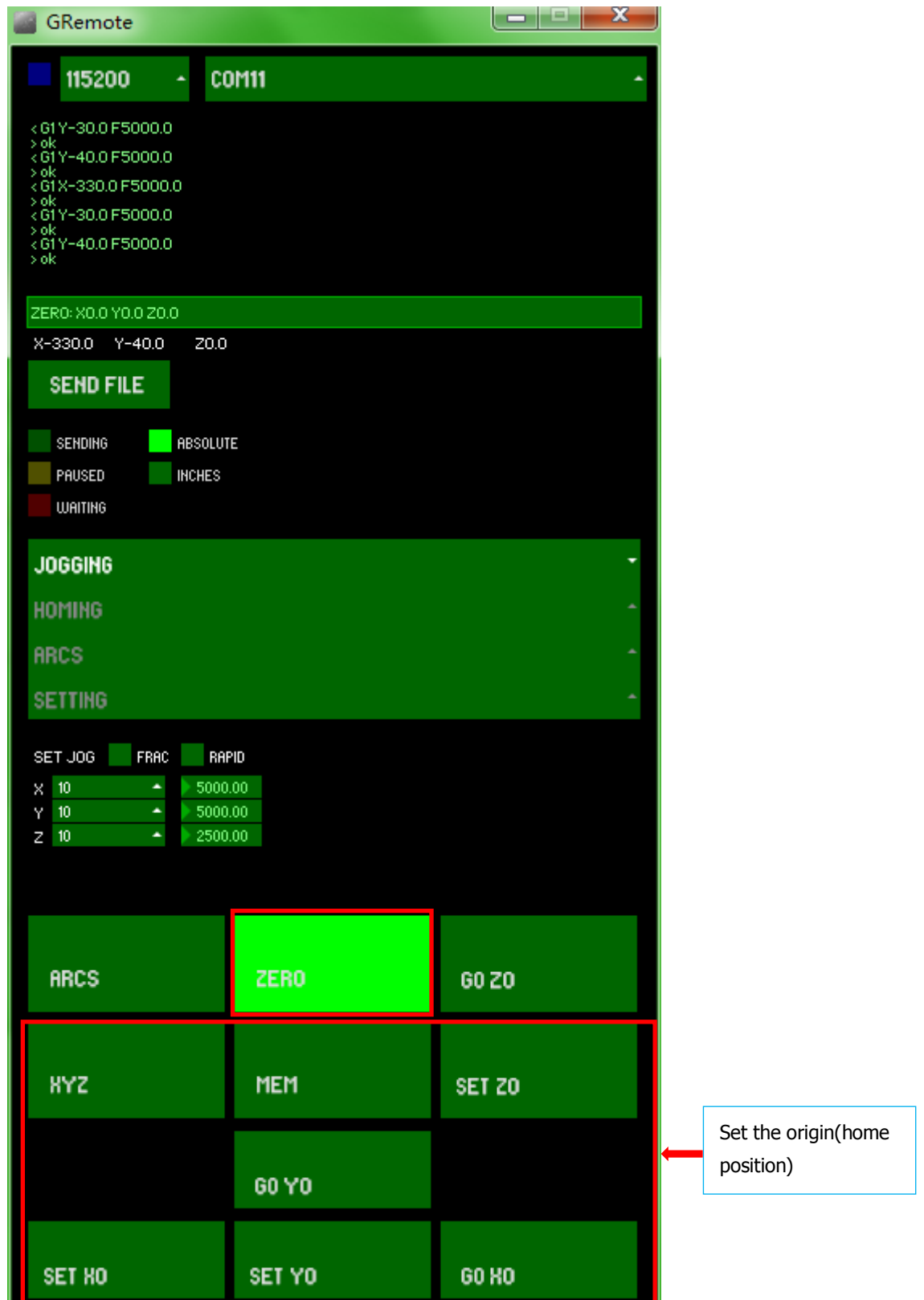
Fig. 8

IV．How to read G-code with control software?

After finished uploading firmware for Orion or Me_baseboard, please turn the power on and make X/Y/Z axis back to origin spot.

GRemote can recognize G-code file with suffix *.cnc. Below we provided 2 simple examples. (You can copy it in text and save as .cnc file, like name it as example1.cnc)

Click SEND FILE→····/example1.cnc→Open in control software, then XY Plotter V2.0 can start work.

a. Sample 1：

```
%
G21 (All units in mm)
G00 Z20.0
G00 X50.0 Y50.0 F3500.0
G01 Z33.0 F2500.0 (Penetrate)
G01 X100.0 Y50.0
G01 X100.0 Y100.0
G01 X50.0 Y100.0
G01 X50.0 Y50.0
G00 X75.0 Y75.0 Z20.0
G01 Z33.0
G02 X75.0 Y75.0 I25.0
G02 X75.0 Y75.0 I20.0
G02 X75.0 Y75.0 I15.0
G03 X75.0 Y75.0 I-25.0
G03 X75.0 Y75.0 I-20.0
G03 X75.0 Y75.0 I-15.0
G00 Z20.0
G00 X50.0 Y50.0 F3500.0
%
```

G-code in sample 1 stands for below graphic:
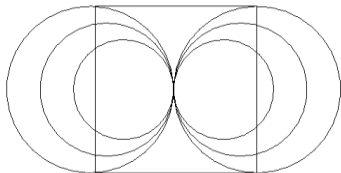
b. Sample 2：

```
G21
G90 Z1.000
G00 X0.000 Y0.000
G00 Z13.000
F2500
G00 X75.231 Y62.747 Z20.000
```

G01 X75.231 Y62.747 Z33.000 F2500

G01 X48.645 Y44.514 Z33.000 F2500

G01 X57.762 Y75.439 Z33.000

G01 X32.206 Y95.090 Z33.000

G01 X64.435 Y95.975 Z33.000

G01 X75.226 Y126.353 Z33.000

G01 X86.027 Y95.975 Z33.000

G01 X118.253 Y95.099 Z33.000

G01 X92.700 Y75.439 Z33.000

G01 X101.825 Y44.520 Z33.000

G01 X101.823 Y44.514 Z33.000
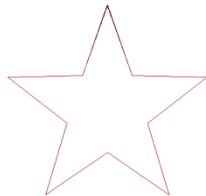
G01 X101.817 Y44.514 Z33.000

G01 X75.231 Y62.747 Z33.000

G00 X0.000 Y0.000 Z13.000

G00 Z13.000

G-code in sample 2 stands for below graphic:

Above are 2 samples of G-code. No matter what graphic it is, XY Plotter V2.0 can draw it if only you can generate an available G-code file.

V. Choose Software

You can use business software to generate G-code file, like MastCAM, Artcam; or you can use open source softwares as below.

1) InkScape+gcodetools.tar.gz   Open Source vector graphics creation software+gcodetools plug-in

2) dxf2gcode: useful for engravings

3) FreeCAD: 3D CAD design program; G-Code generation partly integrated (2011)

4) HeeksCNC: add-on for HeeksCAD; requires STEP files instead of STL; activity partly abandonedby its main author (2011)

5) cam-occ: based on solid models instead of trimeshs (no recent releases, but development seems to be active (2010))

6) monocam: no official releases, yet; no recent development activities (2010)

7) camvox: no official releases, yet; no recent development activities (2010)

8) gcnccam: uses DXF as input; quite active

9) CNC Code Generator: java-based, recently not very active (2010)

10) GCAM: DXF or GERBER input; sparse documentation

External software lists

1.EMC-Wiki: exhausting list of CAD/CAM/conversion software

2.xtronics wiki: broad overview of CAD/CAM software

3.Simple G-Code generators: a list of small scripts and simple interface for generating basic toolpaths for EMC2

You can also download the software you need in below website directly.

1.http://wiki.linuxcnc.org/cgi-bin/wiki.pl?Cam(Listof CAM references

2.http://cadcamcae.wikia.com

VI. Generate G-code with open source software InkScape+gcodetools

a. Instruction of Inkscape+ gcodetools

11) Download InkScape and gcodetools.tar.gz
12) Install Inkscape.
13) Install the plugin gcodetools.
14) Extract package gcodetools into D:\Program Files
15) (x86)\Inkscape\share\extensions. Run Inkscape, and then the plugin will appear in extensions.
16) Create a new file and a new layer.
17) Generate G-code file for a vector or a bitmap.
18) Vector graphic: Open a *.svg, *.dxf, or other vector graphic file with Inkscape, or create a new vector graphic in Inkscape.
19) Import a bitmap file into Inkscape, such as JPG/PNG/TIFF/PDF and so on. Select it, and select the Path > Trace Bitmap item. Set parameters for potrace, convert bitmap into vector graphic, and then delete the origin bitmap.
20) Select vector, click "Ungroup" in Object menu.
21) Click "Path->Stroke to Path". Click "Path->Object to Path".
22) Choose Extensions > Gcodetools, and then select Orientation points... > 3-points mode, click apply.
23) Choose Extensions > Gcodetools, and then select tool library… > Lathe cutter, click apply.
24) Choose Extensions > Gcodetools, and then select Path to gcode..., set tolerance/maximum depth/Z-axis parameters/file name and path of G-code file, click apply.
25) Rename the G-code file, change suffix from *.gcode to *.cnc， open the file with a text editor and check it. Set the starting position of Z-axis to Z15.0, working position to Z35.0, F code value to F100.0-F20000.0. After checking you can open the file with GRemote and start drawing.

(PS: for detailed tutorial please watch tutorial video)

https://www.youtube.com/watch?v=58UPnvPf9-0

https://www.youtube.com/watch?v=W0V-4O9x9Uk

https://www.youtube.com/watch?v=-yBMB5KtZj4

VII. For more FAQ, drawing samples and posts, please go

http://forum.makeblock.cc/