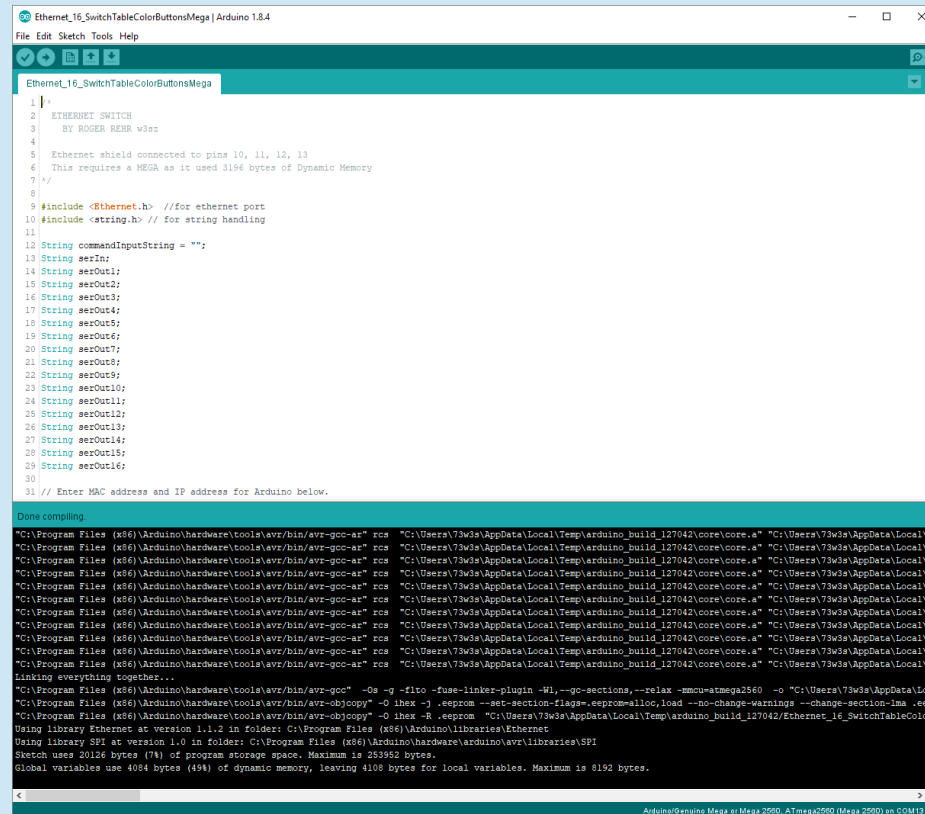


Getting Started With Arduino



```
Ethernet_16_SwitchTableColorButtonsMega | Arduino 1.8.4
File Edit Sketch Tools Help

Ethernet_16_SwitchTableColorButtonsMega
1 |>
2 ETHERNET SWITCH
3 BY ROGER REHR w3sr
4
5 Ethernet shield connected to pins 10, 11, 12, 13
6 This requires a MEGA as it used 3196 bytes of Dynamic Memory
7 /
8
9 #include <Ethernet.h> //for ethernet port
10 #include <string.h> // for string handling
11
12 String commandInputString = "";
13 String serIn;
14 String serOut1;
15 String serOut2;
16 String serOut3;
17 String serOut4;
18 String serOut5;
19 String serOut6;
20 String serOut7;
21 String serOut8;
22 String serOut9;
23 String serOut10;
24 String serOut11;
25 String serOut12;
26 String serOut13;
27 String serOut14;
28 String serOut15;
29 String serOut16;
30
31 // Enter MAC address and IP address for Arduino below.

Done compiling
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a" "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a" "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a" "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a" "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a" "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a" "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a" "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a" "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a" "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\core\core.a"
Linking everything together...
"C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc" -Os -g -flto -fuse-linker-plugin -H -lc -c-sections -relax -mmcallmmcall560 -o "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\arduino_16_SwitchTableColorButtonsMega.ino.elf" "C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-objcopy" -O ihex -e .eeprom --set-section-flags=.eeprom=alloc,load --no-change-warnings --change-section-lma .eeprom --save-sections "C:\Users\73w3sr\AppData\Local\Temp\arduino_build_127042\Ethernet_16_SwitchTableColorButtonsMega.ino.elf"
Using library Ethernet at version 1.1.2 in folder: C:\Program Files (x86)\Arduino\libraries\Ethernet
Using library SPI at version 1.0 in folder: C:\Program Files (x86)\Arduino\hardware\arduino\avr\libraries\SPI
Sketch uses 20126 bytes (74) of program storage space. Maximum is 253952 bytes.
Global variables use 4084 bytes (49%) of dynamic memory, leaving 4106 bytes for local variables. Maximum is 8192 bytes.

Arduino/Genuino Mega or Mega 2560, ATmega2560 (Mega 2560) on COM13
```

https://www.arduino.cc/en/Main/Software

ARDUINO

HOME BUY SOFTWARE PRODUCTS EDUCATION RESOURCES COMMUNITY HELP

SOFTWARE ENGLISH


ARDUINO WEB EDITOR

Start coding online with the Arduino Web Editor, save your sketches in the cloud, and always have the most up-to-date version of the IDE, including all the contributed libraries and support for new Arduino boards.

GETTING STARTED

CODE ONLINE

Download the Arduino IDE



ARDUINO 1.8.5
The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software.
This software can be used with any Arduino board. Refer to the [Getting Started](#) page for installation instructions.

Windows Installer, for Windows XP and up
Windows ZIP file for non admin install

Windows app Requires Win 8.1 or 10
[Get](#)

Mac OS X 10.7 Lion or newer

Linux 32 bits
Linux 64 bits
Linux ARM

[Release Notes](#)
[Source Code](#)
[Checksums \(sha512\)](#)

HOURLY BUILDS

LAST UPDATE
3 January 2018 9:34:46 GMT

Download a **preview of the incoming release** with the most updated features and bugfixes.

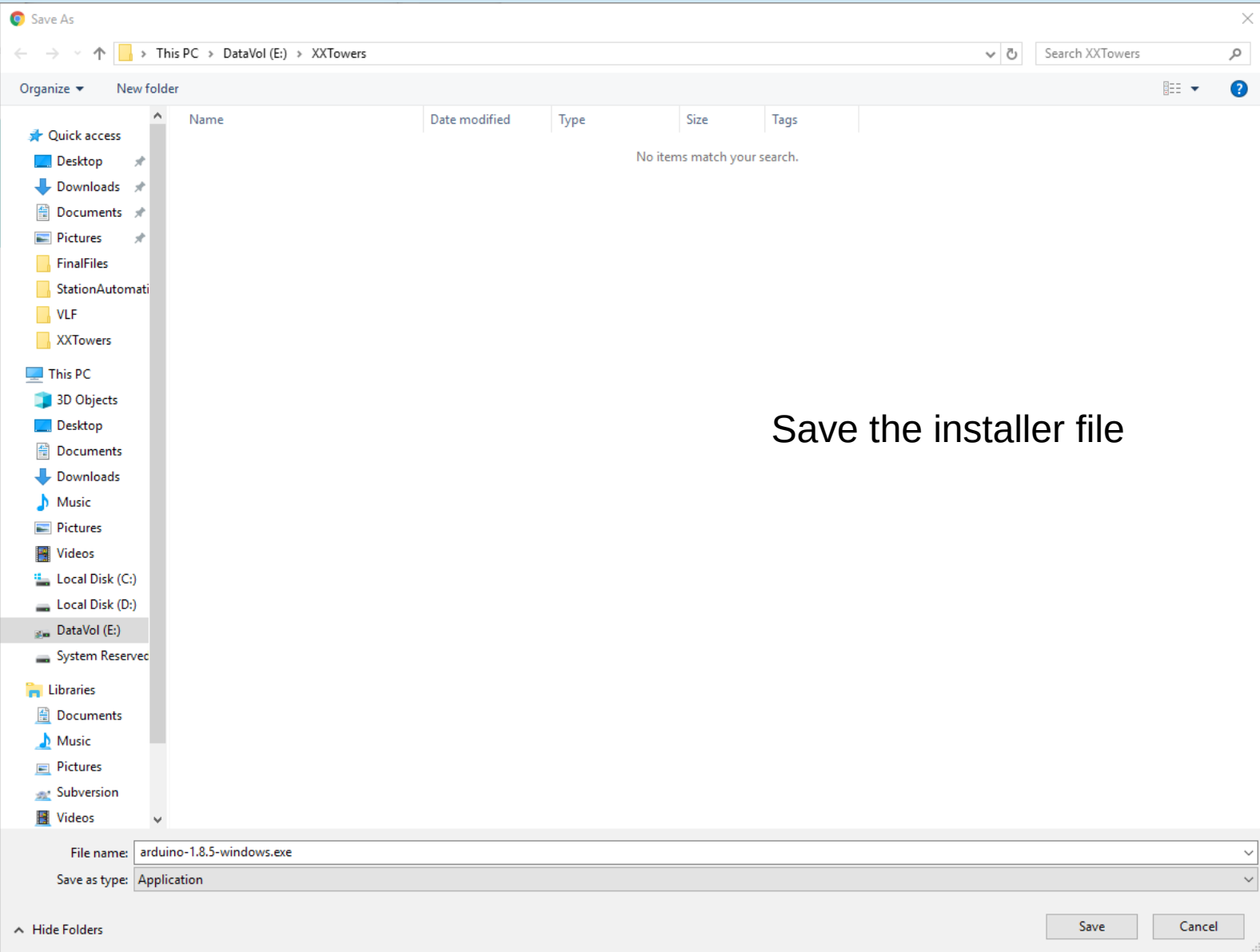
Windows
Mac OS X (Mac OS X Lion or later)
Linux 32 bit, Linux 64 bit, Linux ARM

BETA BUILDS

BETA

Download the **Beta Version** of the Arduino IDE with experimental features. This version should NOT be used in production.

Windows
Mac OS X (Mac OS X Mountain Lion or later)
Linux 32 bit, Linux 64 bit, Linux ARM



Downloads

File Home Share View

Clipboard: Pin to Quick access, Copy, Paste, Copy path, Paste shortcut

Organize: Move to, Copy to, Delete, Rename

New: New folder, Easy access

Open: Properties, Open, History

Select: Select all, Select none, Invert selection

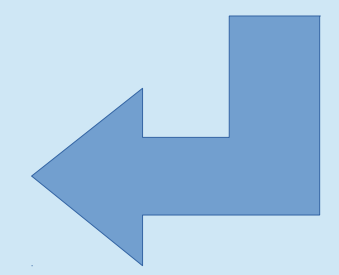
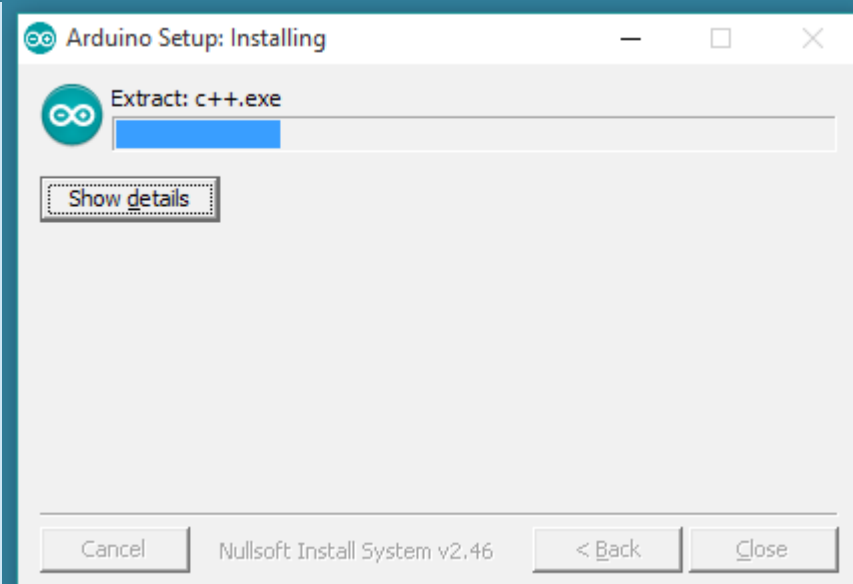
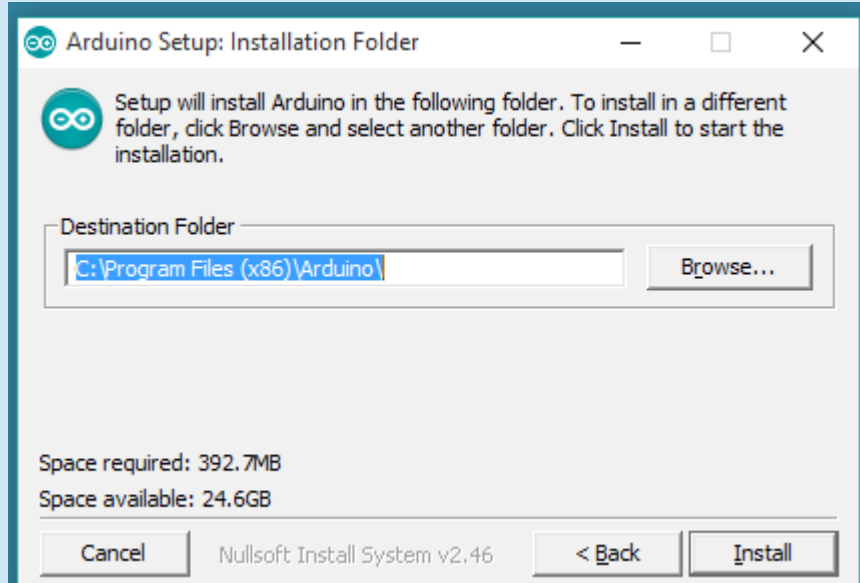
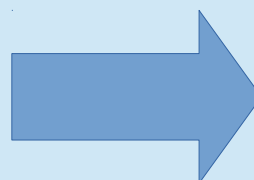
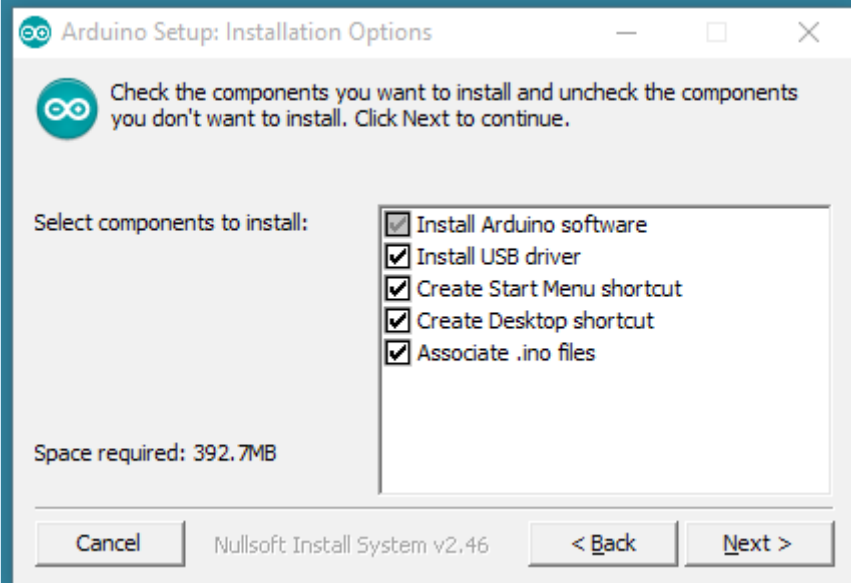
This PC > Downloads

Search Downloads

Name	Date modified	Type	Size
arduino-1.8.5-windows.exe	3/25/2018 2:58 PM	Application	92,554
MamasPizzaSatelliteView.PNG	3/24/2018 12:05 PM	PNG File	2,320
BerkshireMall2.PNG	3/21/2018 5:40 PM	PNG File	1,179
BerkshireMall3.PNG	3/21/2018 5:40 PM	PNG File	3,334
BerkshireMall1.PNG	3/21/2018 5:21 PM	PNG File	1,073
desktop.ini	3/17/2018 12:44 AM	INI File	1
mdbplus.ini	3/15/2018 3:09 AM	INI File	1
MDBPlus.exe	3/14/2018 11:20 PM	Application	4,705
Thumbs.db	5/19/2017 10:49 AM	DB File	21
ReadingEagleGuardiansStory	3/11/2018 11:18 AM	File folder	
MathWorks	2/24/2018 2:35 PM	File folder	
Zplots	2/24/2018 1:19 AM	File folder	
yaru64.v.1.63.win	2/6/2018 11:46 PM	File folder	
livecq	2/4/2018 10:22 AM	File folder	
Checkdotnet	2/4/2018 10:21 AM	File folder	
updates	1/19/2018 8:04 AM	File folder	
rmweb	1/18/2018 5:23 AM	File folder	
VBCABLE_Driver_Pack43	1/16/2018 12:00 PM	File folder	
VBANReceptor_v1003	1/13/2018 4:16 PM	File folder	
vac450full	1/2/2018 2:33 PM	File folder	
OmniRig_Demo64	12/23/2017 5:14 AM	File folder	
OmniRig_Demo	12/23/2017 5:12 AM	File folder	
ADIFMasterSetup	12/21/2017 6:51 AM	File folder	

94 items

Run the Installer File





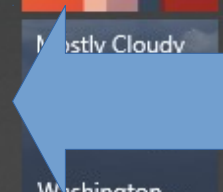
- Adobe Acrobat XI Pro
- Adobe FormsCentral
- Advanced IP Scanner v2
- AircraftScatterSharp
- Alarms & Clock
New
- Amazon
- Amazon Music
- Apple Software Update
- Arduino
- Arduino Create Agent
- Argo
- ARRL Software
- Audacity
- Autodesk SketchBook
New
- B
- Bash on Ubuntu on Windows
- Di+Di...

Life at a glance

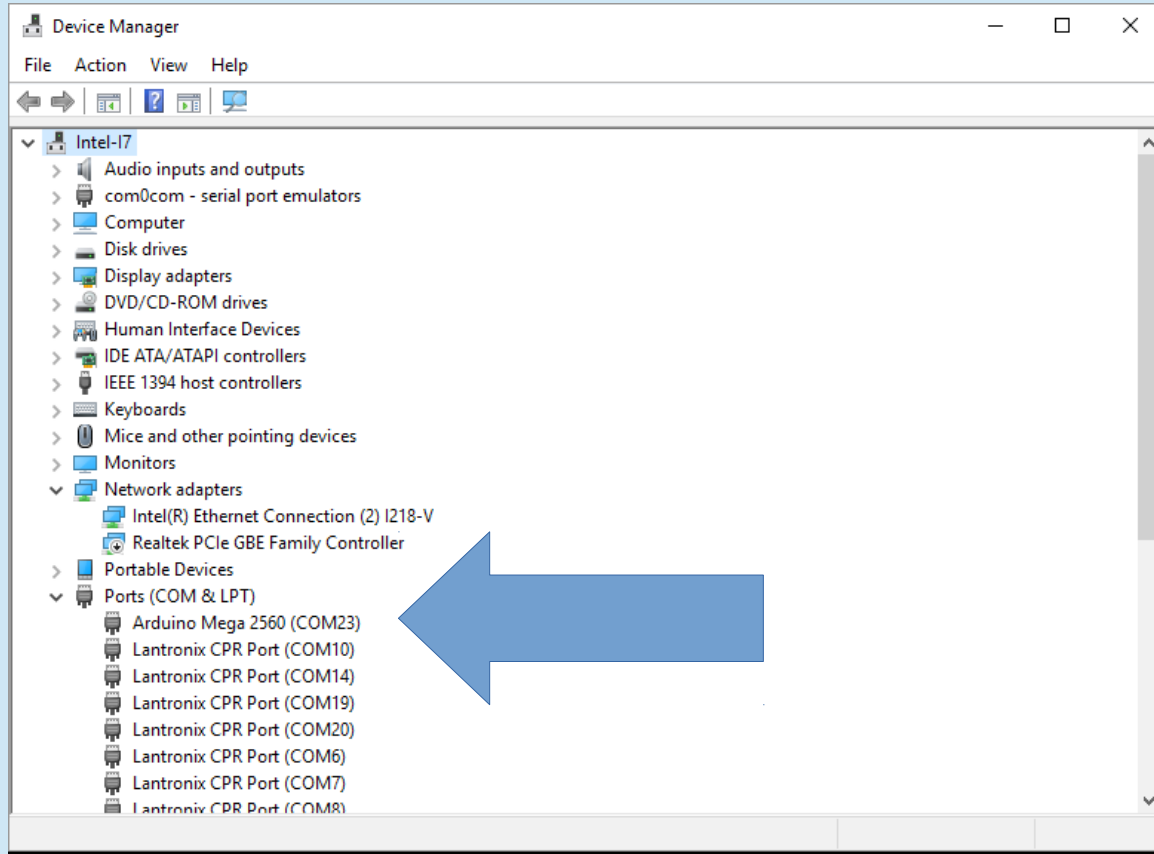
Calendar	Mail
Autodesk Ske...	Setup
Washington,...	Command Prompt
MoonSked	LibreOffice Writer
Microsoft Store	Audio Repeater (KS)
	XAMPP Control Panel

Play and explore

Crimson Editor SVN286M	WinMerge	grepWin
WS_FTP95	CheckIP	Snipping Tool
Control Panel	VAC Control panel	Mozilla Firefox
WordPad	GIMP 2	TightVNC Viewer
Utilities and IDEs		

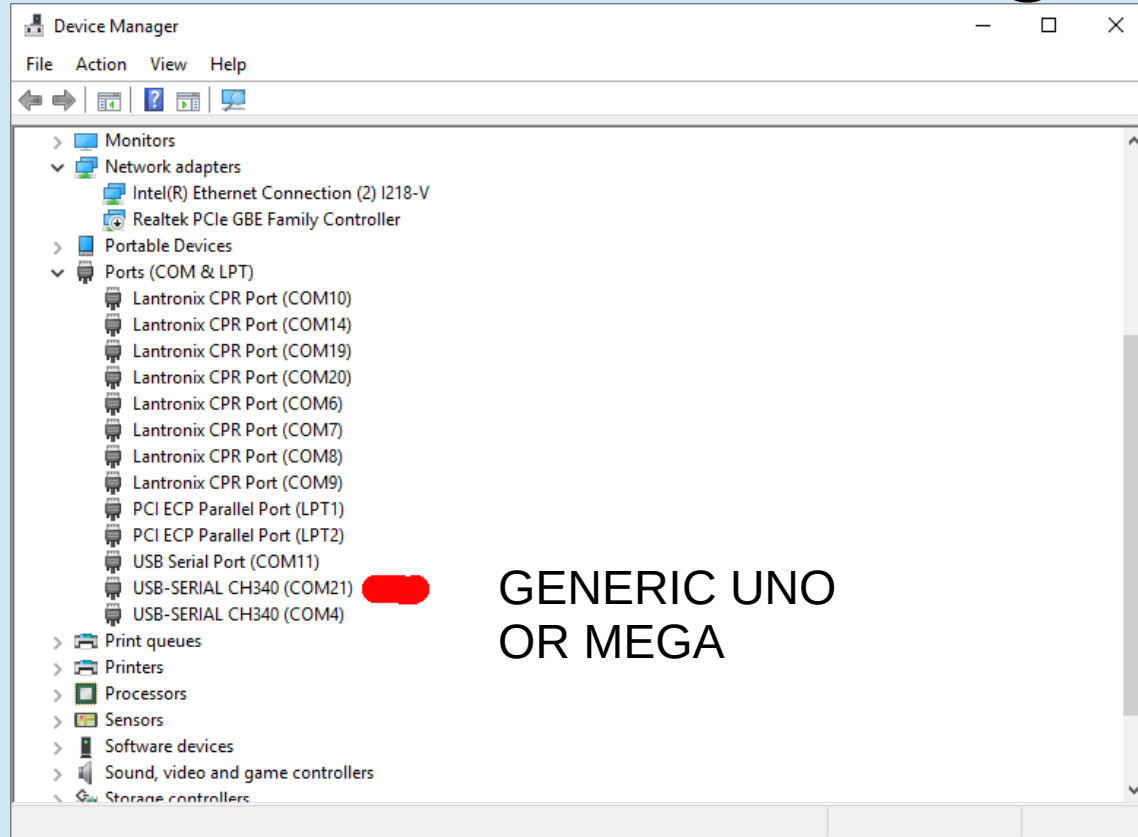


Plug your Arduino into a USB port and check if the driver is installed



Some devices (e.g. UNO) aren't named in Device Manager

Need to plug and unplug device to determine COM port assignment



Arduino

Getting Ready

- Download the IDE and Install it. That should also install the driver. **If it doesn't, download and install drivers from** http://www.wch.cn/download/CH341SER_EXE.html

CH341SER.EXE

资料名称: CH341SER.EXE
资料类型: 驱动&工具
资料大小: 237KB
资料版本: 3.4
更新时间: 2016-09-28

软件简介: CH340/CH341的USB转串口WINDOWS驱动程序的安装包, 支持32/64位 Windows 10/8.1/8/7/VISTA/XP, SERVER 2016/2012/2008/2003, 2000/ME/98, 通过微软数字签名认证, 支持USB转3.5线和9针串口等, 用于随产品发行到最终用户。
适用范围: CH340G, CH340C, CH340B, CH340E, CH340T, CH340R, CH341A, CH341T, CH341H

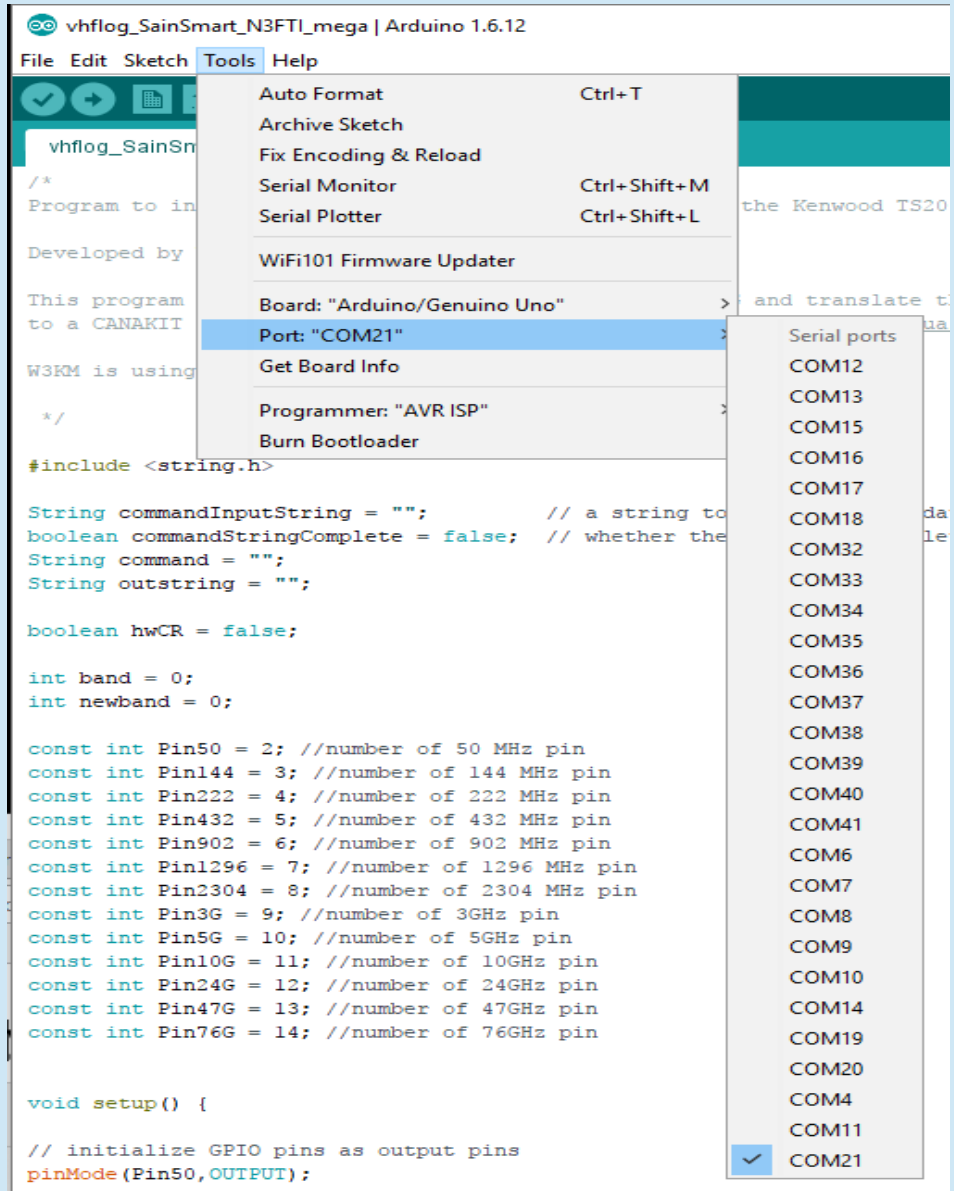
DOWNLOAD ↓

相关资料:

- [CH341SER.ZIP](#) CH341的USB转串口WINDOWS驱动程序和DLL动态库, 内含非标...
- [CH341SER_LINUX.ZIP](#) CH340/CH341的USB转串口LINUX驱动程序, 支持32/64...
- [CH341SER_MAC.ZIP](#) CH340/CH341的USB转串口MAC OS驱动程序的安装包, 支持...
- [CH340DS1.PDF](#) CH340技术手册, USB总线转接芯片, 用于USB转串口, 打印口, Ir...
- [CH341DS1.PDF](#) CH341技术手册, USB总线转接芯片, 接口丰富, 平台驱动齐全, 用于U...
- [CH341SER_ANDROID.ZIP](#) CH340/CH341的USB转串口安卓免驱应用库, 用于Android...

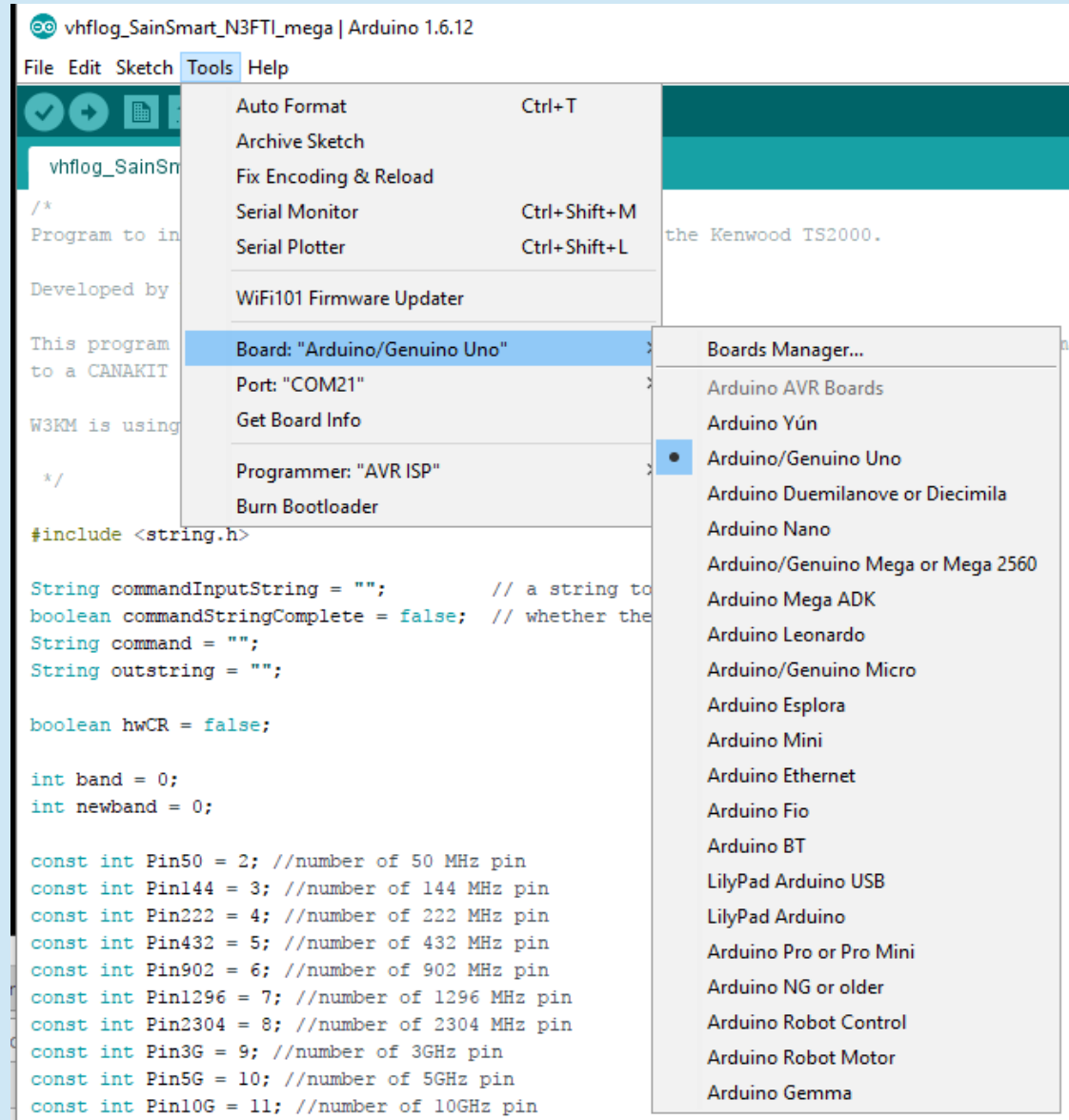
Arduino Getting Ready

- Start the IDE
- Select COM port



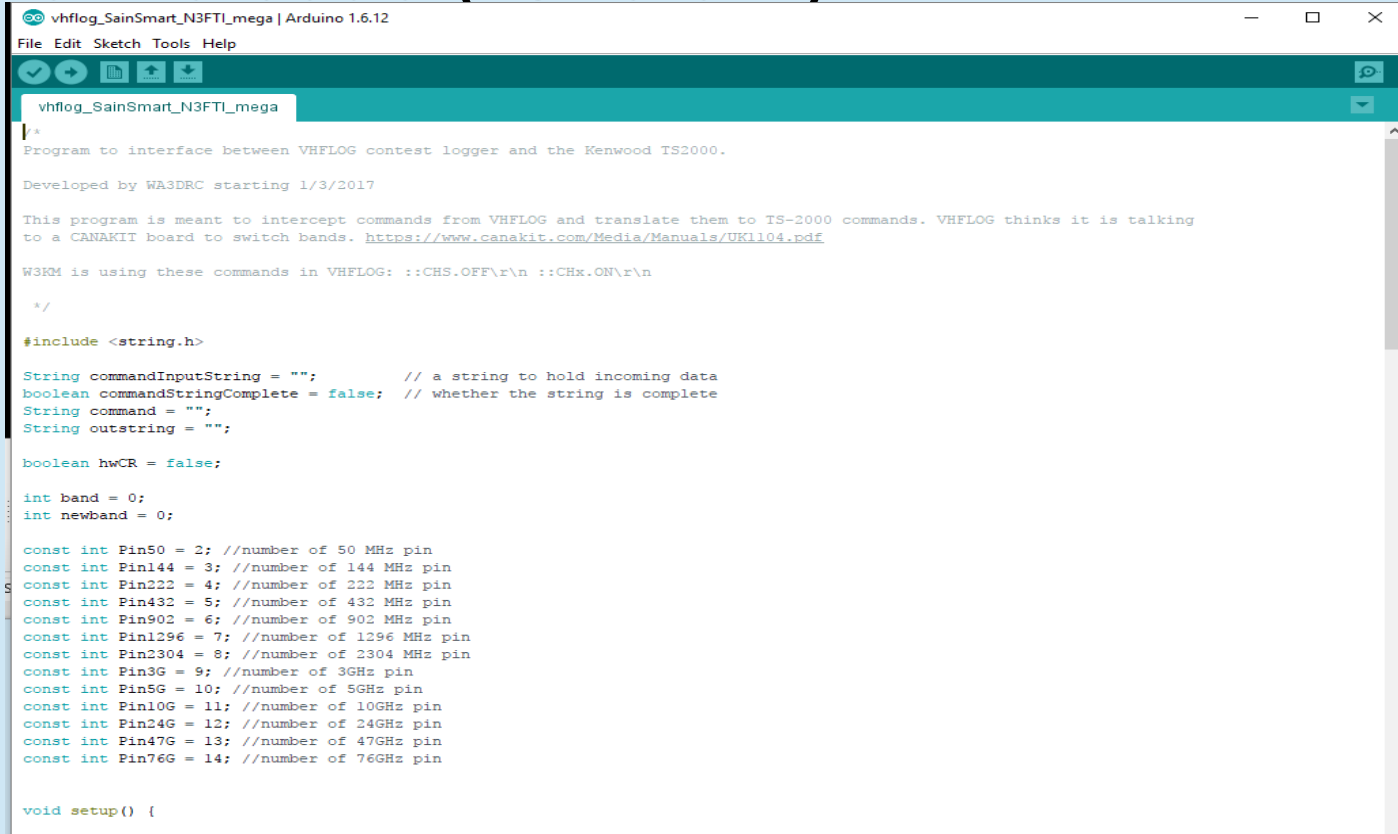
Arduino Getting Ready

- Start the IDE
- Select COM port
- Select Arduino Type



Arduino Getting Ready

- Write the code (“Sketch”)

A screenshot of the Arduino IDE interface. The window title is 'vhflog_SainSmart_N3FTI_mega | Arduino 1.6.12'. The menu bar includes 'File', 'Edit', 'Sketch', 'Tools', and 'Help'. Below the menu bar is a toolbar with icons for opening, saving, and running. The main text area contains the following code:

```
vhflog_SainSmart_N3FTI_mega
/*
Program to interface between VHFLOG contest logger and the Kenwood TS2000.

Developed by WA3DRC starting 1/3/2017

This program is meant to intercept commands from VHFLOG and translate them to TS-2000 commands. VHFLOG thinks it is talking
to a CANAKIT board to switch bands. https://www.canakit.com/Media/Manuals/UK1104.pdf

W3KM is using these commands in VHFLOG: ::CHS.OFF\r\n ::CHx.ON\r\n

*/

#include <string.h>

String commandInputString = ""; // a string to hold incoming data
boolean commandStringComplete = false; // whether the string is complete
String command = "";
String outstring = "";

boolean hwCR = false;

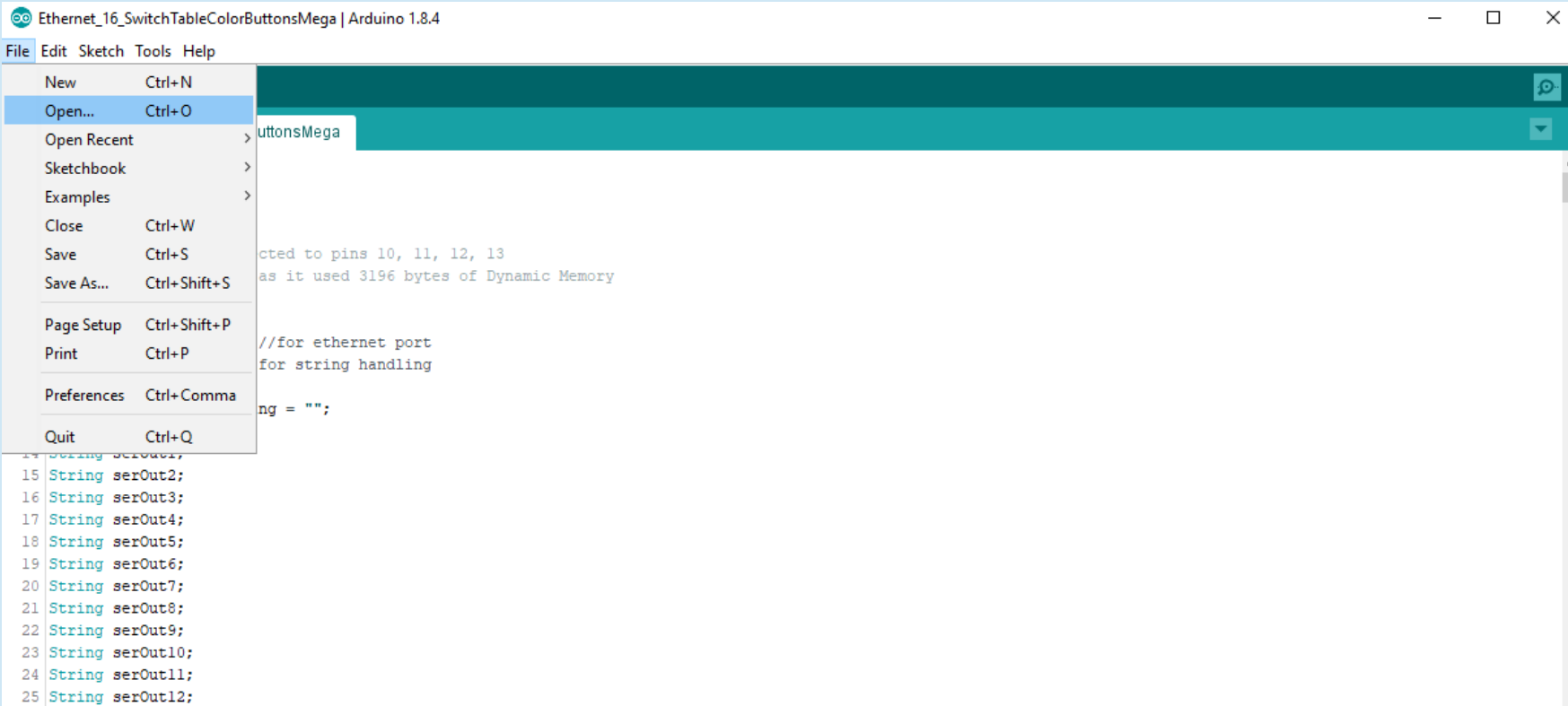
int band = 0;
int newband = 0;

const int Pin50 = 2; //number of 50 MHz pin
const int Pin144 = 3; //number of 144 MHz pin
const int Pin222 = 4; //number of 222 MHz pin
const int Pin432 = 5; //number of 432 MHz pin
const int Pin902 = 6; //number of 902 MHz pin
const int Pin1296 = 7; //number of 1296 MHz pin
const int Pin2304 = 8; //number of 2304 MHz pin
const int Pin3G = 9; //number of 3GHz pin
const int Pin5G = 10; //number of 5GHz pin
const int Pin10G = 11; //number of 10GHz pin
const int Pin24G = 12; //number of 24GHz pin
const int Pin47G = 13; //number of 47GHz pin
const int Pin76G = 14; //number of 76GHz pin

void setup() {
```

Arduino

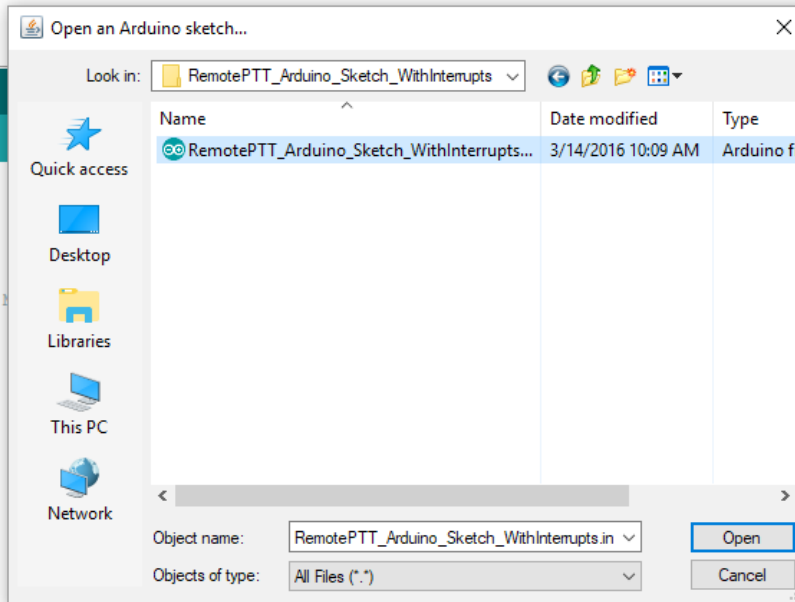
- Or, open a pre-existing sketch (.ino file)





Ethernet_16_SwitchTableColorButtonsMega

```
1 /*
2  ETHERNET SWITCH
3  BY ROGER REHR w3sz
4
5  Ethernet shield connected to pins 10, 11, 12, 13
6  This requires a MEGA as it used 3196 bytes of Dynamic M
7  */
8
9  #include <Ethernet.h> //for ethernet port
10 #include <string.h> // for string handling
11
12 String commandInputString = "";
13 String serIn;
14 String serOut1;
15 String serOut2;
16 String serOut3;
17 String serOut4;
18 String serOut5;
19 String serOut6;
20 String serOut7;
21 String serOut8;
22 String serOut9;
23 String serOut10;
24 String serOut11;
```





RemotePTT_Arduino_Sketch_WithInterrupts

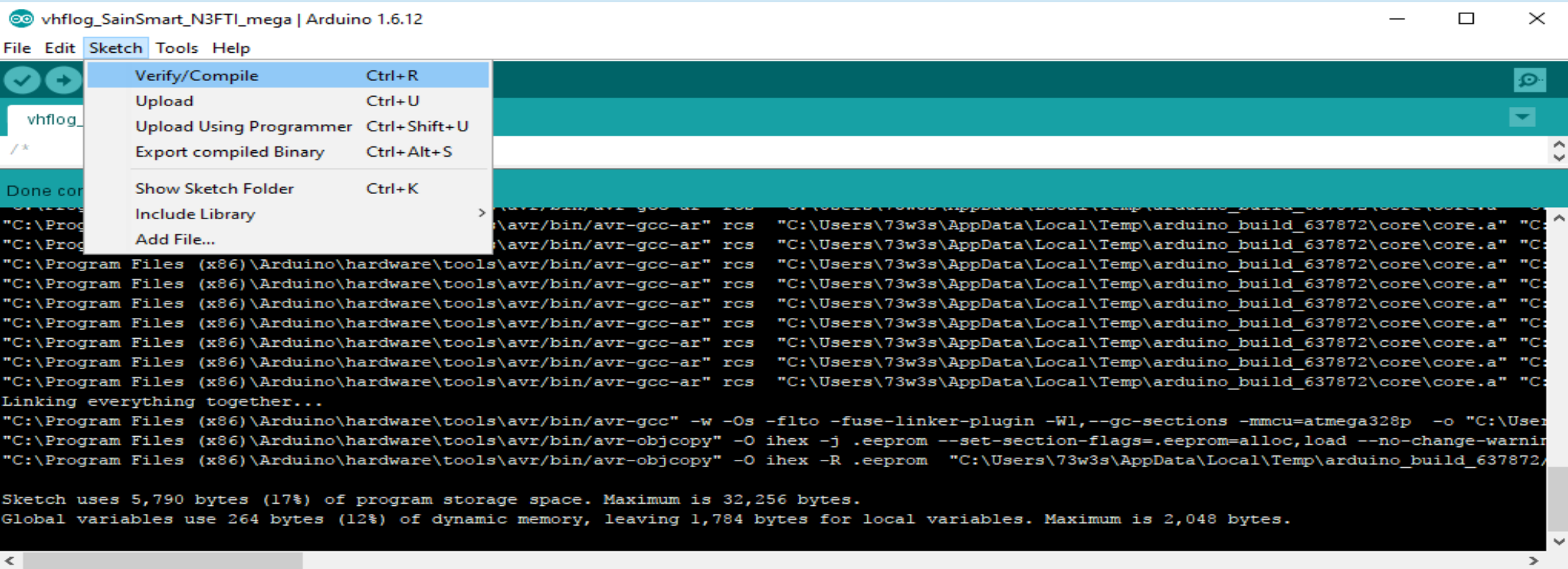
```
1  | //by W3SZ
2  | //used in conjunction with C# program RemotePTT
3  | //to control up to 6 remote switches
4  | //Copyright Roger Rehr 2016
5  |
6  | #include <SPI.h>
7  | #include <Ethernet.h>
8  | #include <EthernetUdp.h>
9  |
10 | String command = "";
11 | //Output Pin Assignments
12 | int ptt = 3;
13 | int cmd1 = 4;
14 | int cmd2 = 5;
15 | int cmd3 = 6;
16 | int cmd4 = 7;
17 | int cmd5 = 8;
18 |
19 | volatile int pttstate = LOW;
20 | volatile int cmd1state = LOW;
21 | volatile int cmd2state = LOW;
22 | volatile int cmd3state = LOW;
23 | volatile int cmd4state = LOW;
24 | volatile int cmd5state = LOW;
25 |
26 | int packetSize = 0;
27 |
28 | byte mac[] = {0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED };
29 | IPAddress ip(192, 168, 10, 177);
30 | IPAddress remoteIP(192,168,10,244);
31 |
```

Once the code
is ready to go...

Arduino

Getting Ready

- Verify and Compile the code

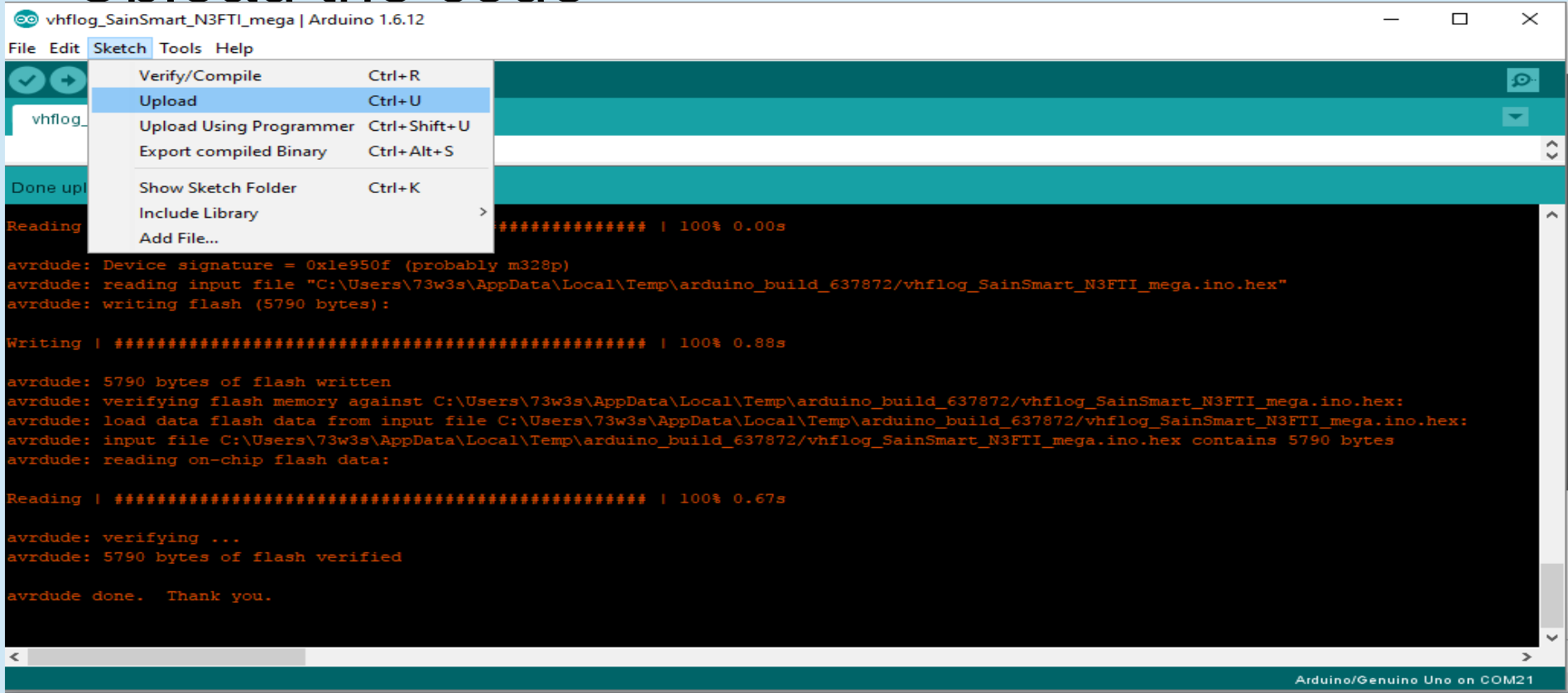


The screenshot shows the Arduino IDE interface with the 'Verify/Compile' menu option highlighted. The menu is open, showing options like 'Verify/Compile', 'Upload', 'Upload Using Programmer', 'Export compiled Binary', 'Show Sketch Folder', 'Include Library', and 'Add File...'. The background shows the IDE's workspace and the serial monitor output.

```
vhflog_SainSmart_N3FTI_mega | Arduino 1.6.12
File Edit Sketch Tools Help
Verify/Compile Ctrl+R
Upload Ctrl+U
Upload Using Programmer Ctrl+Shift+U
Export compiled Binary Ctrl+Alt+S
Show Sketch Folder Ctrl+K
Include Library
Add File...
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a" "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a" "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a" "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a" "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a" "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a" "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a"
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-gcc-ar" rcs "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a" "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\core\core.a"
Linking everything together...
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-gcc" -w -Os -flto -fuse-linker-plugin -Wl,--gc-sections -mmcu=atmega328p -o "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\arduino_build_637872\firmware.elf"
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-objcopy" -O ihex -j .eeprom --set-section-flags=.eeprom=alloc,load --no-change-warnings -o "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\firmware.hex" "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\firmware.elf"
"C:\Program Files (x86)\Arduino\hardware\ttools\avr\bin\avr-objcopy" -O ihex -R .eeprom "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\firmware.hex" "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\firmware.hex"
Sketch uses 5,790 bytes (17%) of program storage space. Maximum is 32,256 bytes.
Global variables use 264 bytes (12%) of dynamic memory, leaving 1,784 bytes for local variables. Maximum is 2,048 bytes.
```


Arduino Getting Ready

- Upload the code



```
vhflog_SainSmart_N3FTI_mega | Arduino 1.6.12
File Edit Sketch Tools Help
Sketch
vhflog_
Done upl
Reading | ##### | 100% 0.00s
avrdude: Device signature = 0x1e950f (probably m328p)
avrdude: reading input file "C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\vhflog_SainSmart_N3FTI_mega.ino.hex"
avrdude: writing flash (5790 bytes):

Writing | ##### | 100% 0.88s
avrdude: 5790 bytes of flash written
avrdude: verifying flash memory against C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\vhflog_SainSmart_N3FTI_mega.ino.hex:
avrdude: load data flash data from input file C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\vhflog_SainSmart_N3FTI_mega.ino.hex:
avrdude: input file C:\Users\73w3s\AppData\Local\Temp\arduino_build_637872\vhflog_SainSmart_N3FTI_mega.ino.hex contains 5790 bytes
avrdude: reading on-chip flash data:

Reading | ##### | 100% 0.67s
avrdude: verifying ...
avrdude: 5790 bytes of flash verified

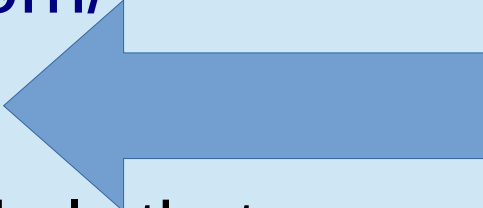
avrdude done. Thank you.

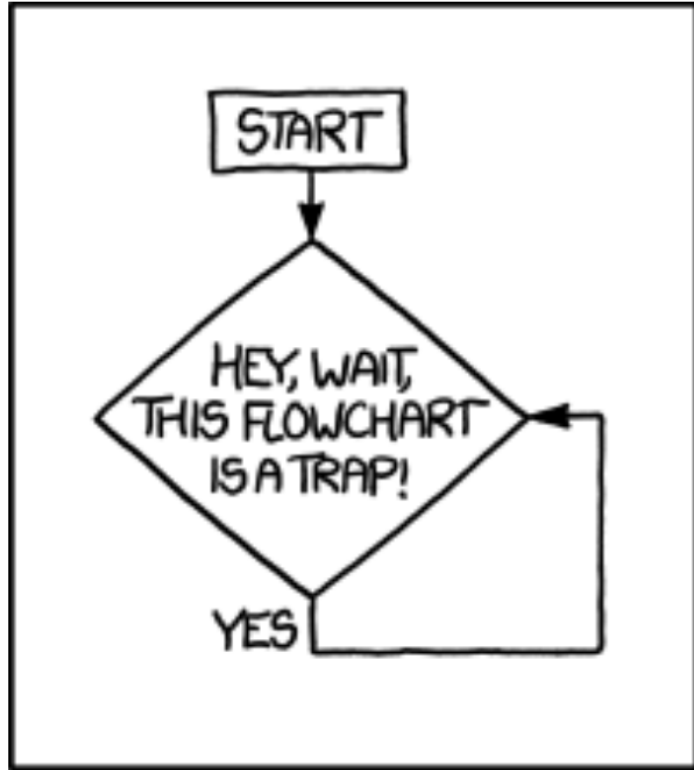
Arduino/Genuino Uno on COM21
```

Where to Look for Help

- There is an excellent Arduino tutorial here:
 - <https://www.tutorialspoint.com/arduino/index.htm>
- There is an active **forum** at:
 - <https://forum.arduino.cc/>
- The **Arduino Playground** has many open-source **sketches** (programs) that you can copy, modify, use:
 - <https://playground.arduino.cc/>

Where to Look for Help

- There is an **Arduino StackExchange!**
 - <https://arduino.stackexchange.com/>
- **Google is your (BEST) Friend!!** 
 - No matter what you want to do, it is likely that someone else has done something like it. So don't reinvent the wheel! Start with their code and modify it as necessary.



The way out is to use the marker you have to add a box that says 'get a marker' to the line between you and 'start', then add a 'no' line from the trap box to 'end'.