By Bread Boards & Bill

Project # 1 Scanning Radio AKA Ghost Box

January 16 2022

About this Project

- This Project is presented by Bill Chappell Build at your own risk
- Author is not responsible for errors or omissions in this document.
- This project uses open source software “arduino.org"
- An Arduino UNO cost $9-14
- Radio Module cost $4-5
- Hook up wire cost $3-5
- The total cost to get this project running should be @20.00
- Purchase links can be found at www.digitaldowsing.com/diy/

About this Project

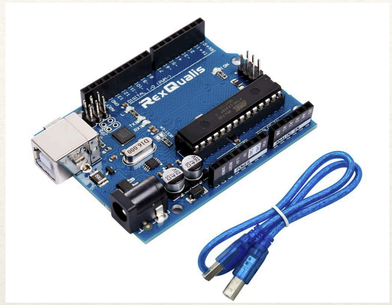
- The project will start with a simple build not even a bread board
- Over several weeks many features will be added
- Software will be kept very simple to allow everyone to understand it
- Several posts will be about the program, the software and how to use it
- example and complete code will be available at
- www.digitaldowsing.com/diy

About this Project

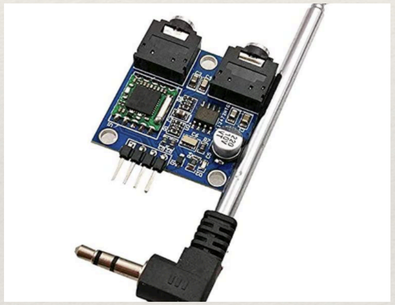
- Features to be included in this project
- Full scanning control, up / down , energy driven scan. Scan Increments
- Speak when spoken to feature “radio responds after you ask something”
- Serial display as well as a full display
- When complete the “radio” can run without a computer or additional device

Materials Needed for this Project

Arduino Uno [Arduino Uno]



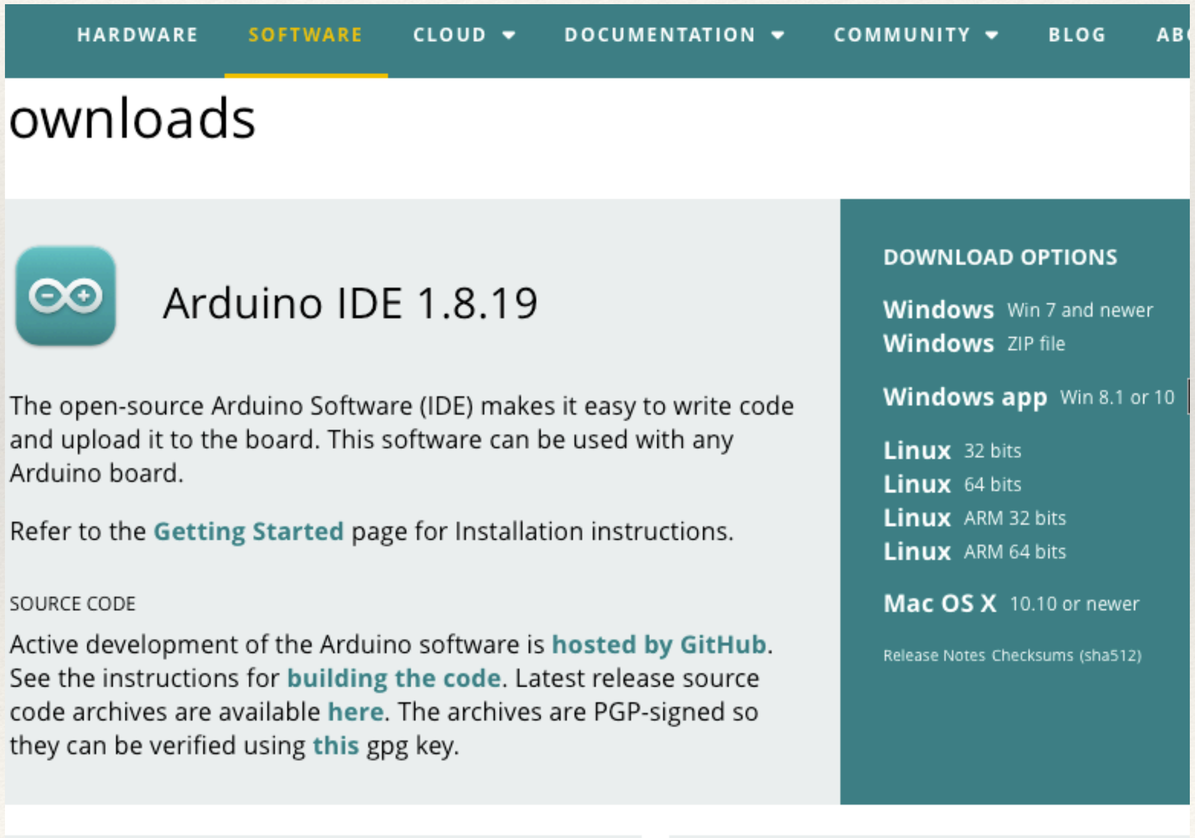
Arduino Radio Module [Radio Module]



Hook Up Wire [Hook Up Wire]

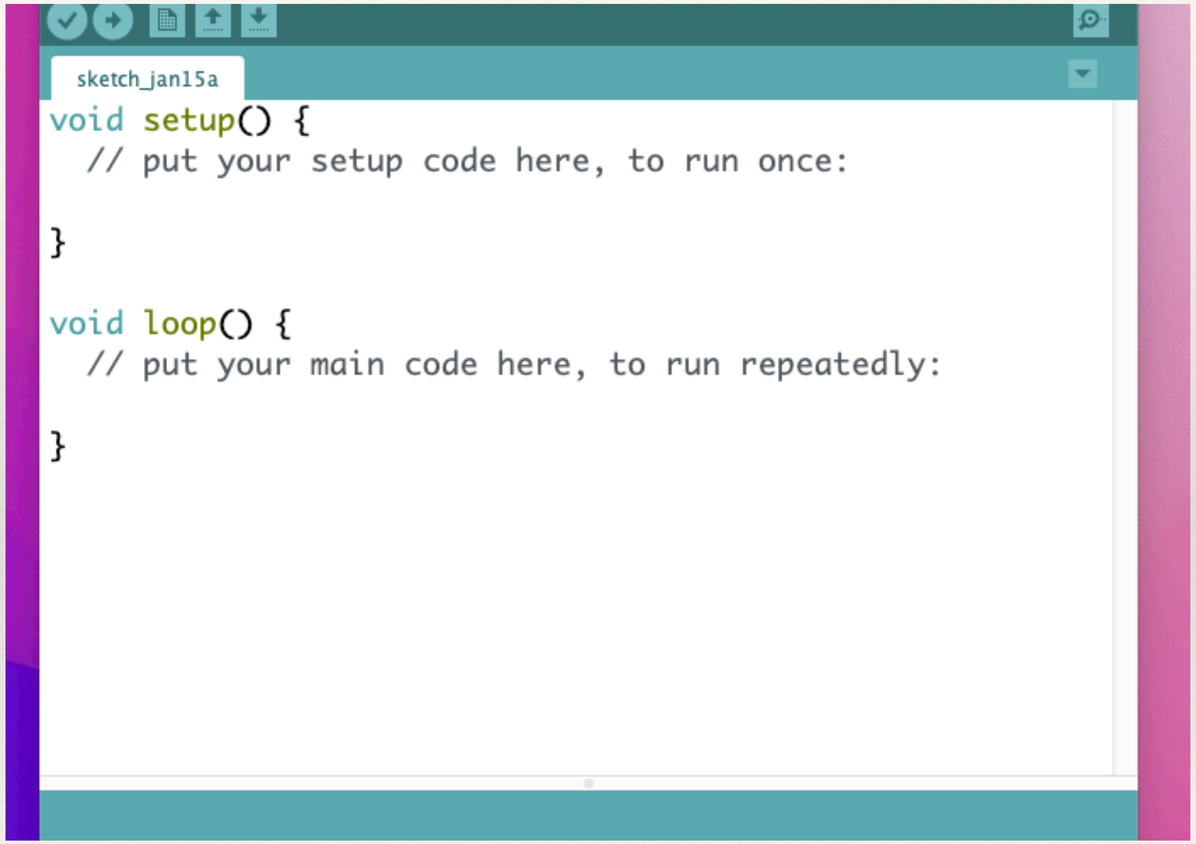
Software

Download Arduino Software , from www.Arduino.org
Choose the IDE based on the type of computer it will run on
Download and start Arduino IDE



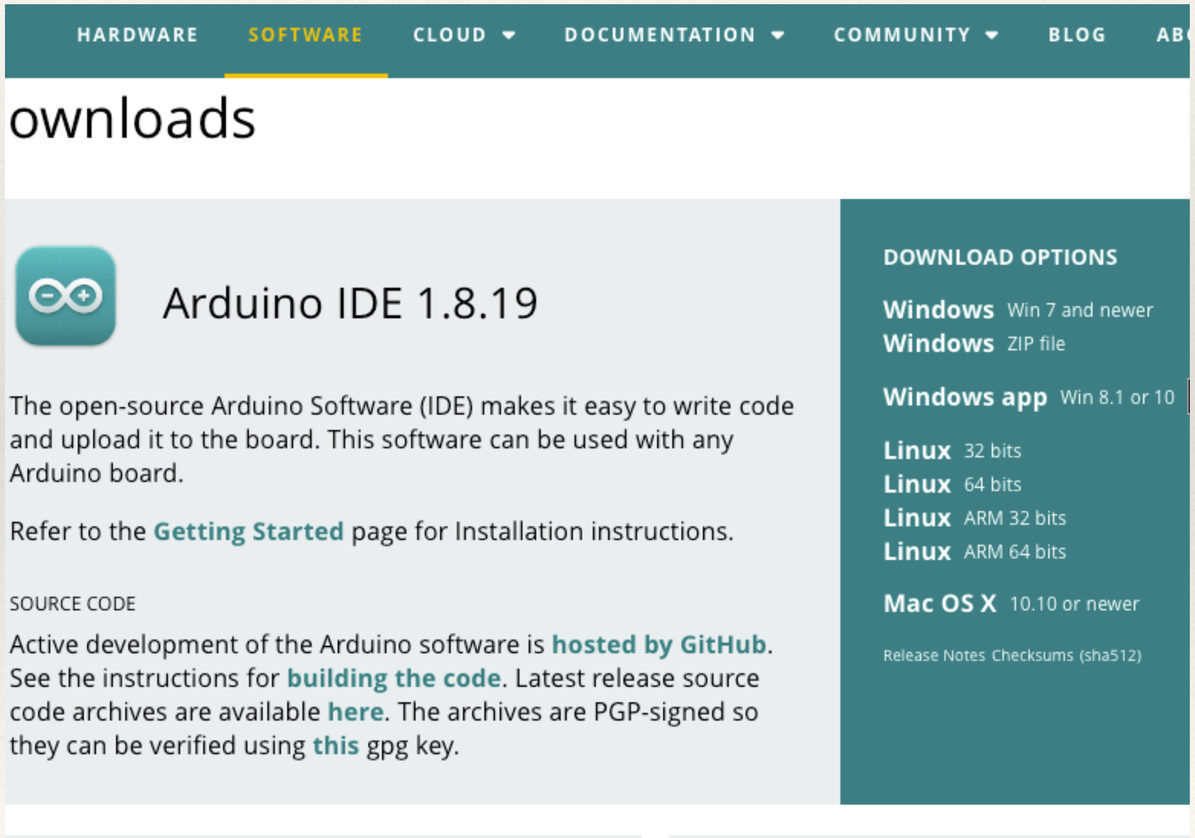
Software

Run the Arduino Software.
Your Screen should look something like this.



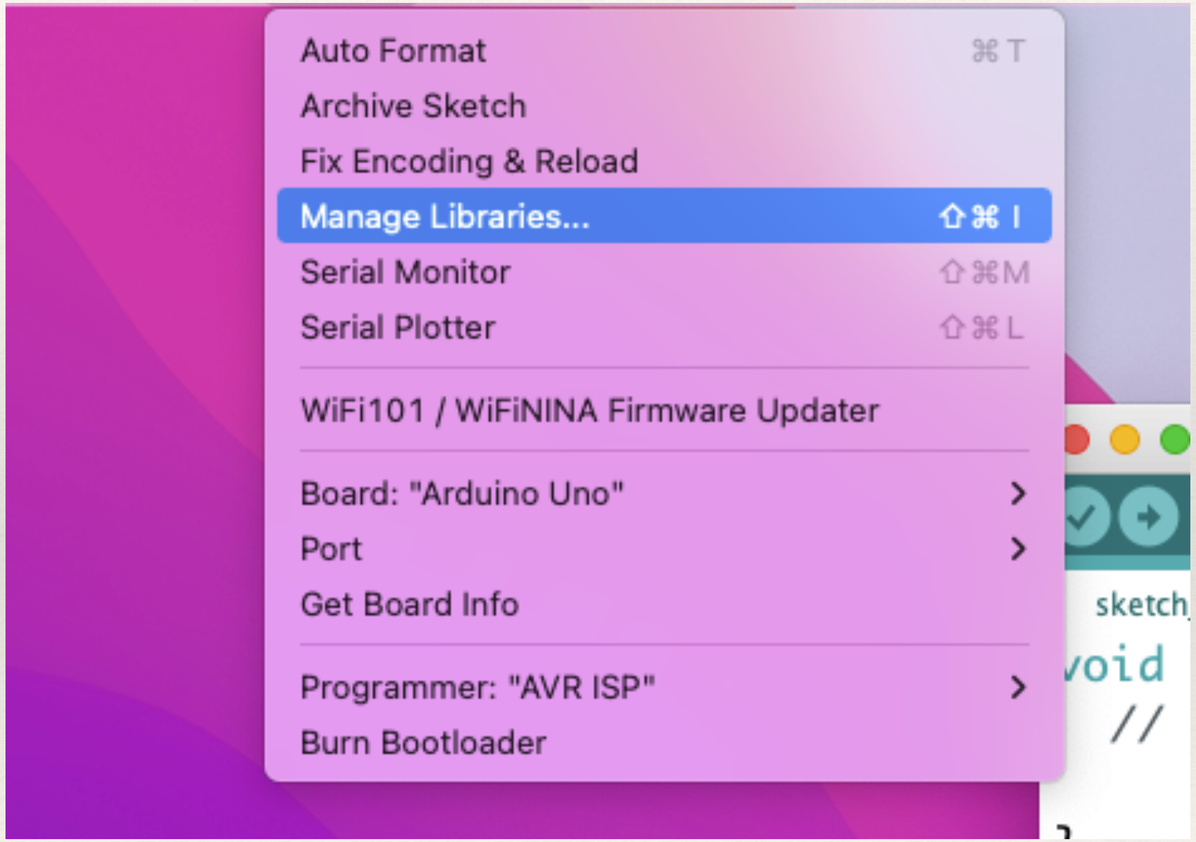
Software

If you're having trouble, Try searching on Installing Arduino Software.
There are 1000's of online resources to help.



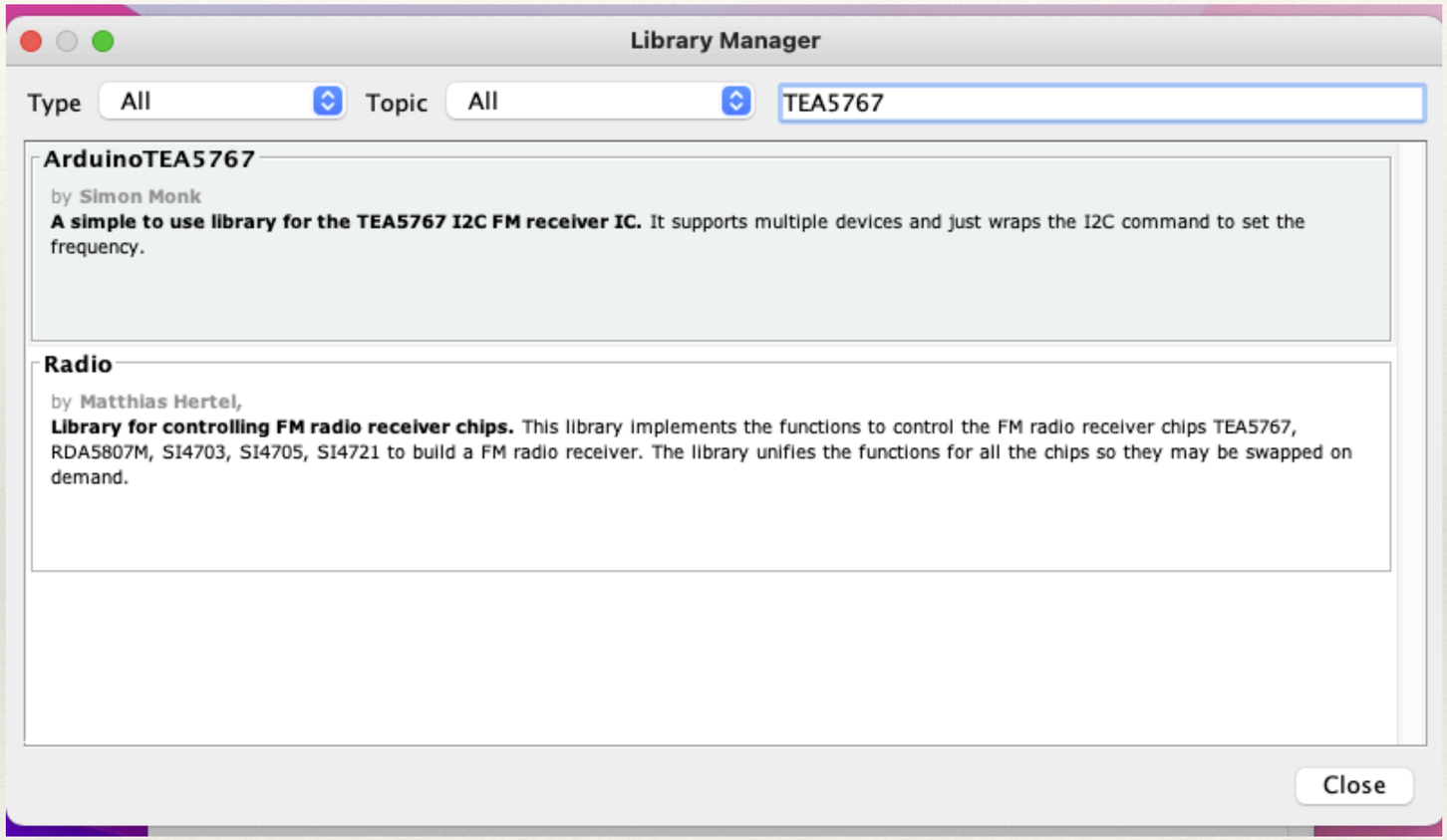
Software

Before we can Write code for the project
A couple libraries need to be installed .
From the Tools Menu Select Manage Libraries

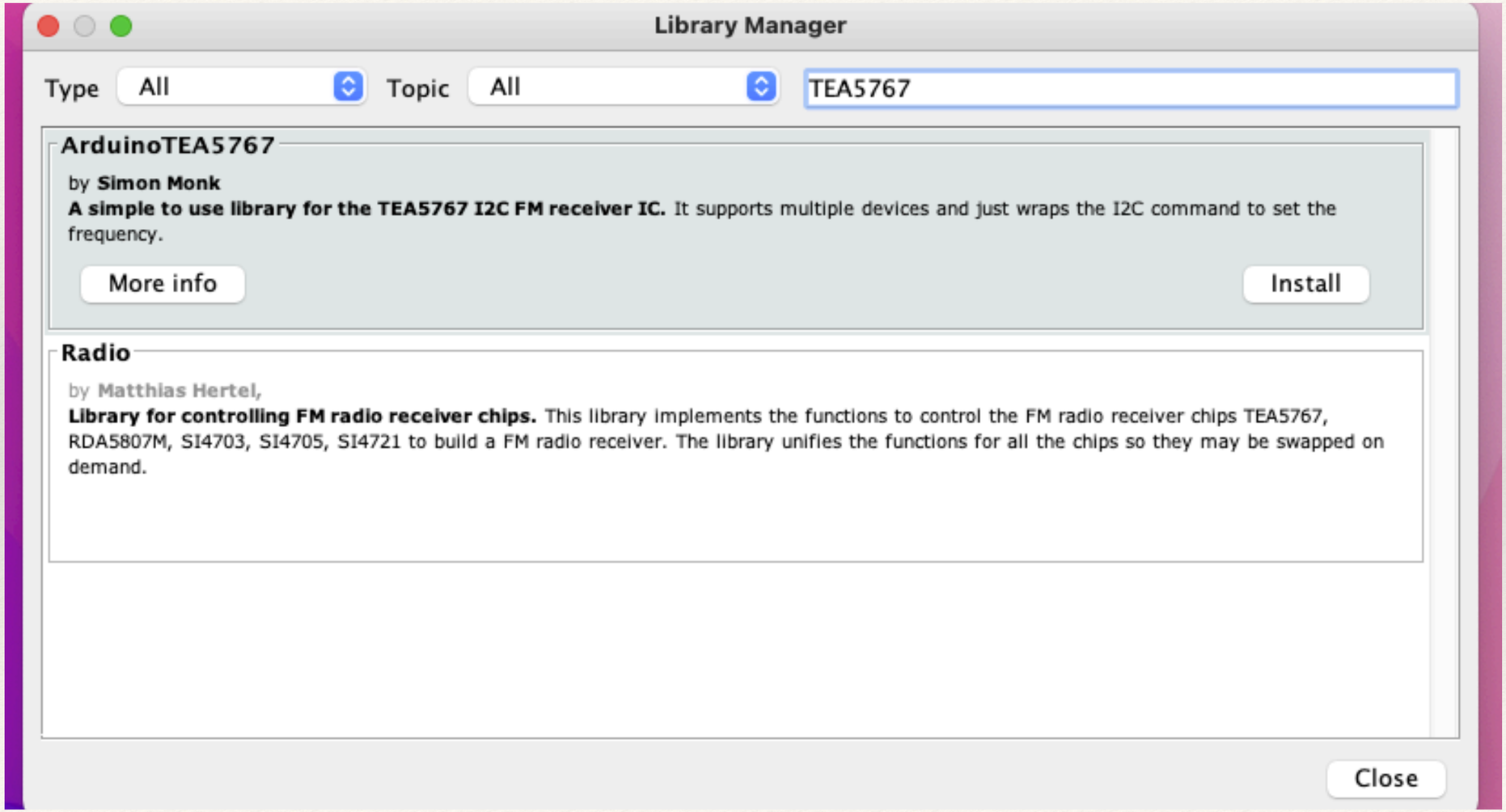


Software

When the Library Manger window appears type TEA5767 in the search bar. The Window will show a couple libraries Click on ArduinoTEA5767



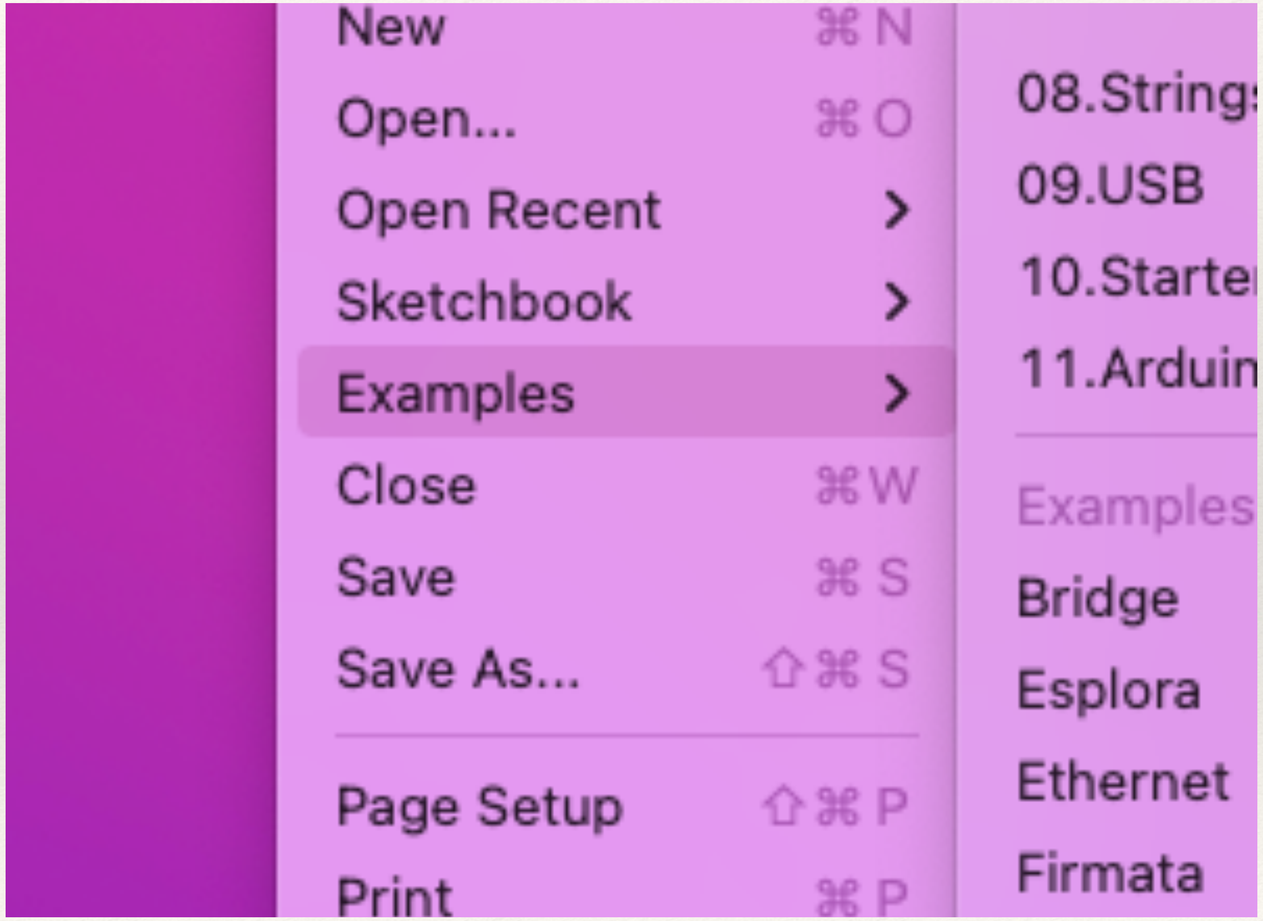
Software



Click on ArduinoTEA5767 then Click on Install when done Click close.

Software

From the File Menu Click on Examples

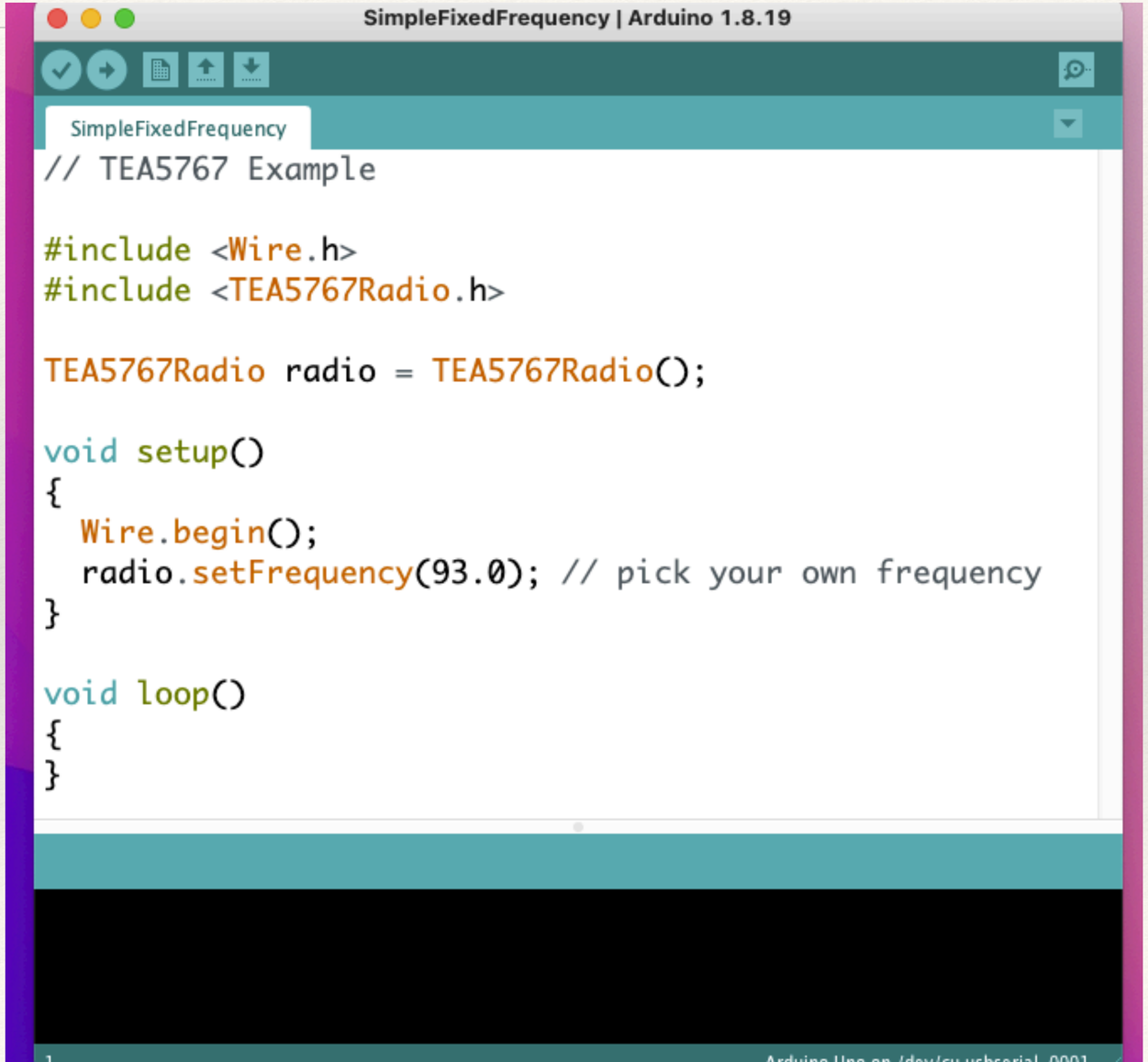


Software

Scroll down to ArduinoTea5767 ,Select SimpleFixedFrequency

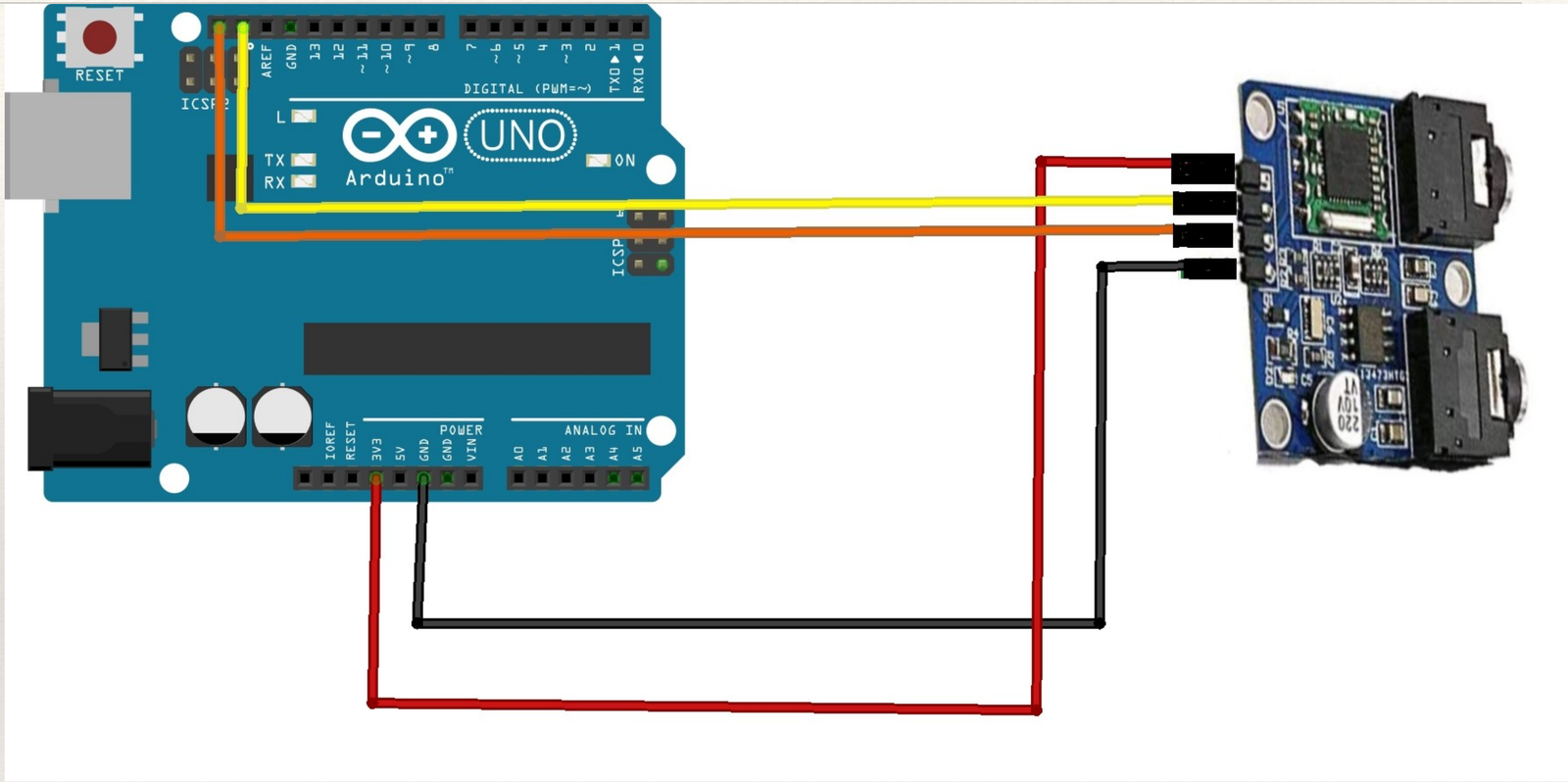
Software

The Arduino IDE Editor should open this file.
You have the basic software installed.
We will return to this after the build



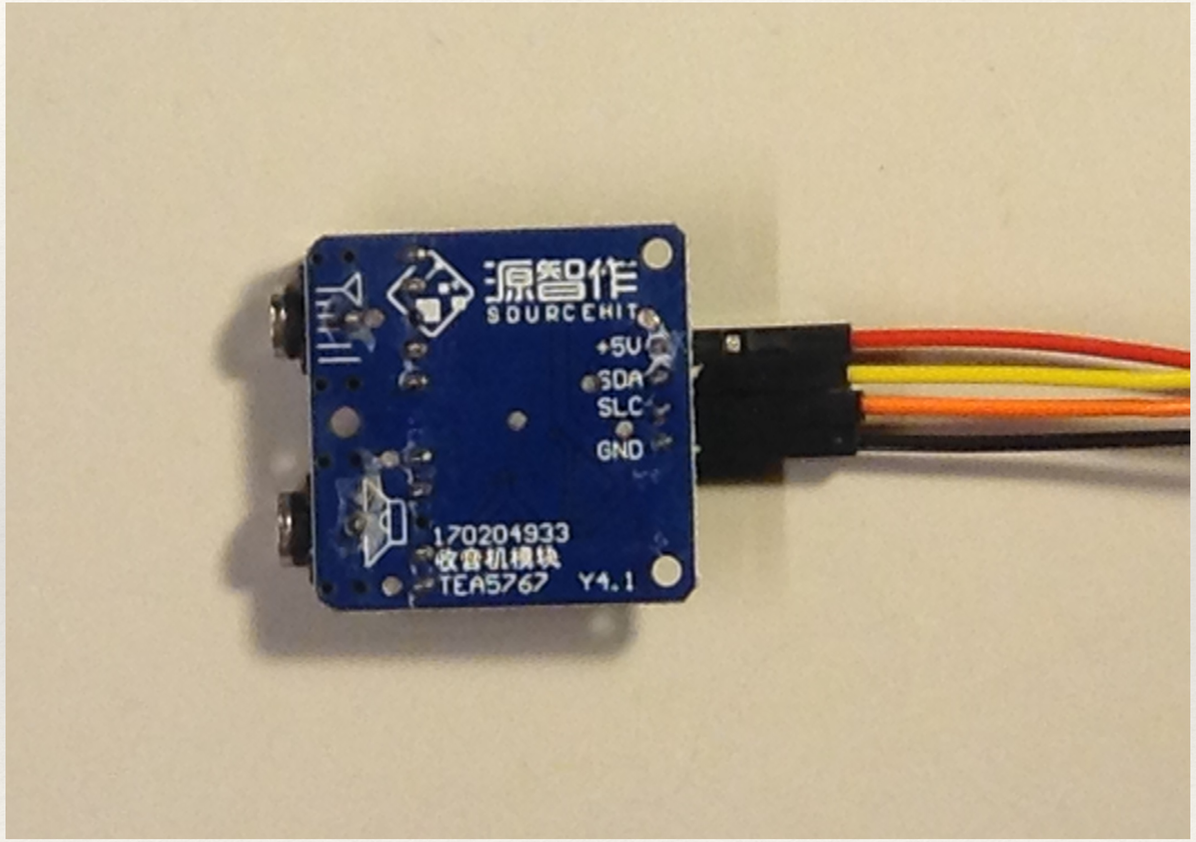
Hardware

- This Build is very easy!
- Using the Plug & Socket hook up wires
- Arduino GND to Radio GND Black Wire
- Arduino 3.3v to Radio +5v Red Wire
- Arduino SLC to Radio SLC Orange Wire
- Arduino SDA to Radio SDA Yellow Wire



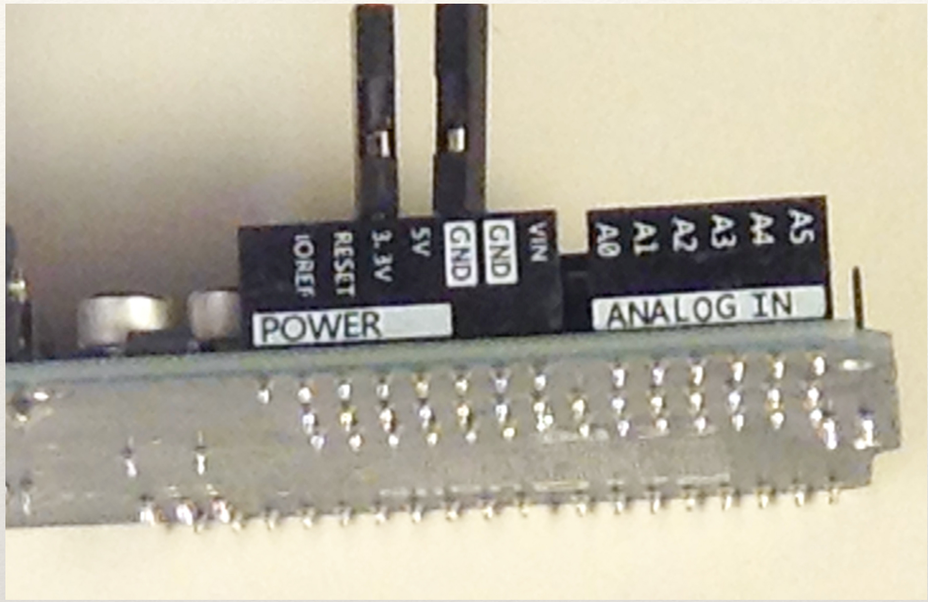
Hardware

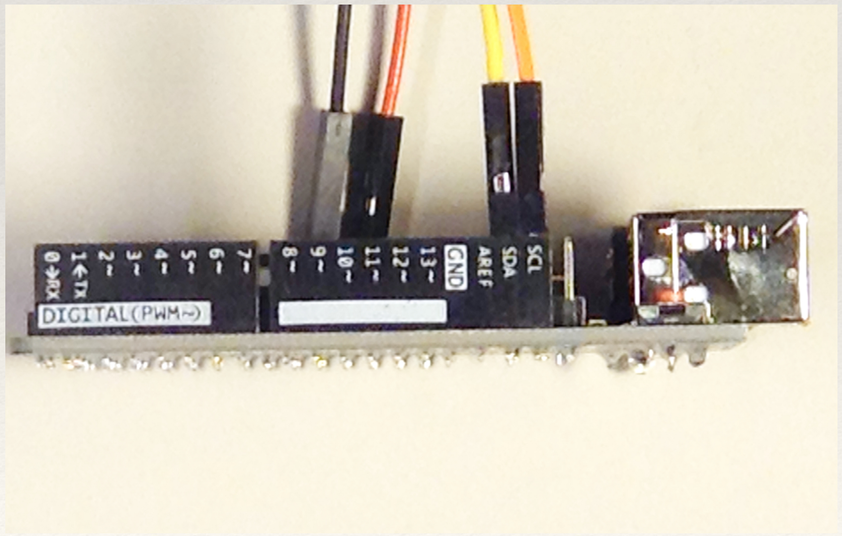
- Your radio should look like this



Hardware

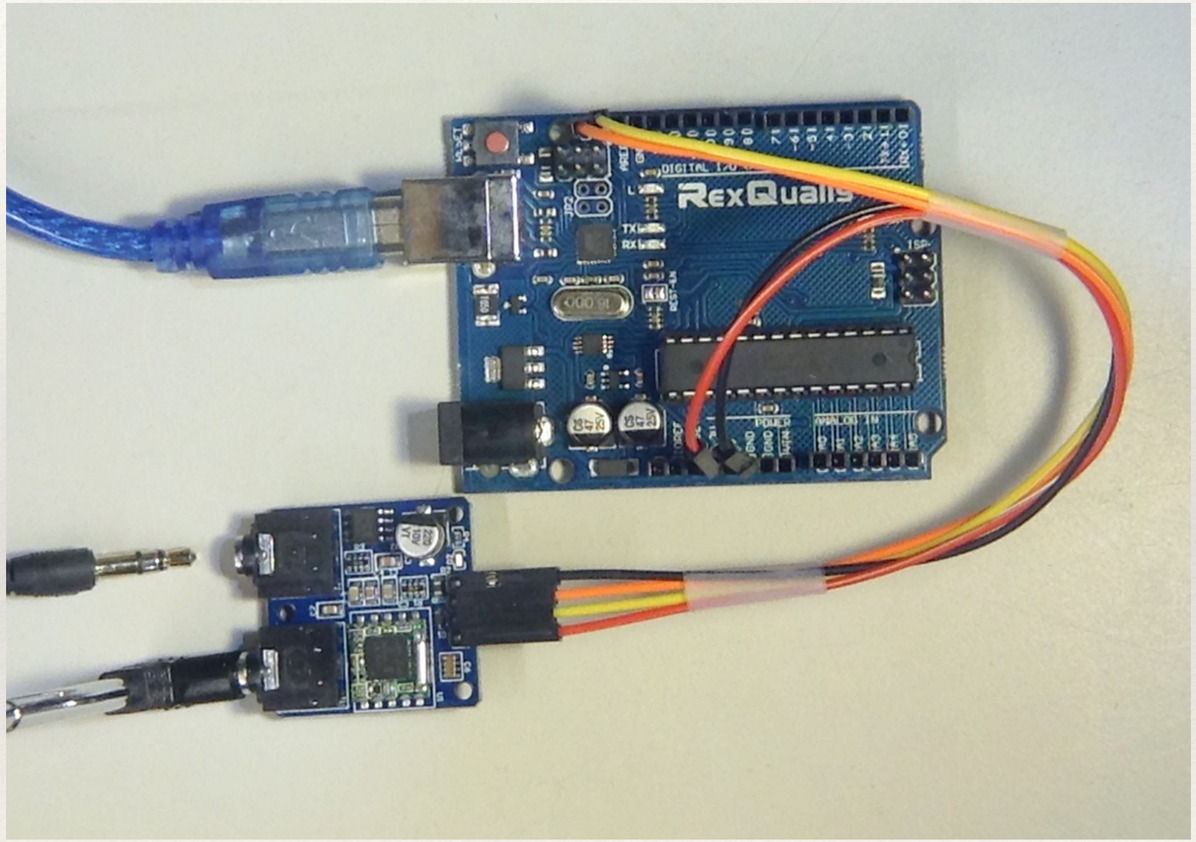
- Your Arduino Uno should look like this





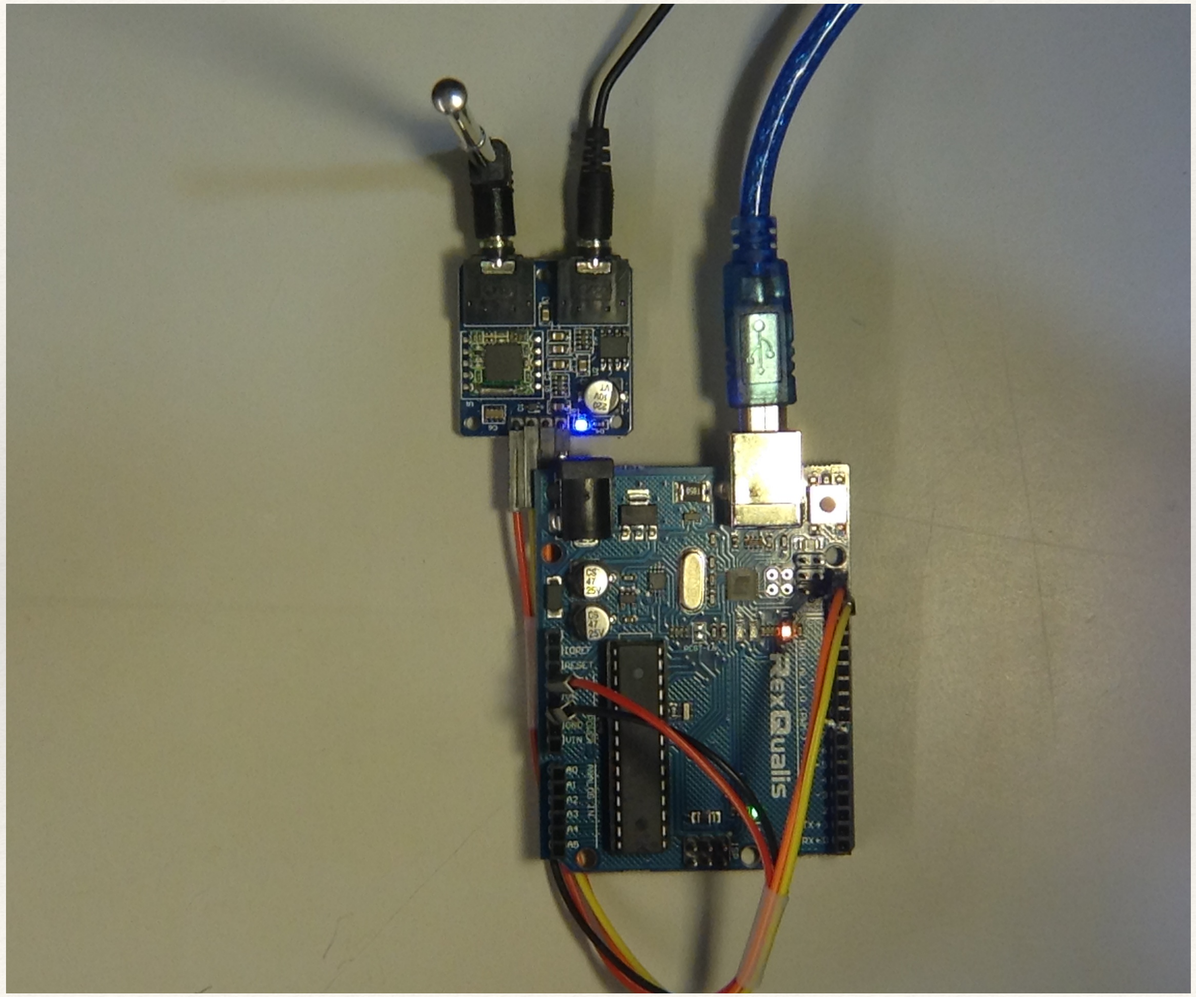
Hardware

- Next plug in the Antenna to the Radio
- Plug in Speakers or Head Phones to the Radio
- Plug in the USB to the Arduino UNO



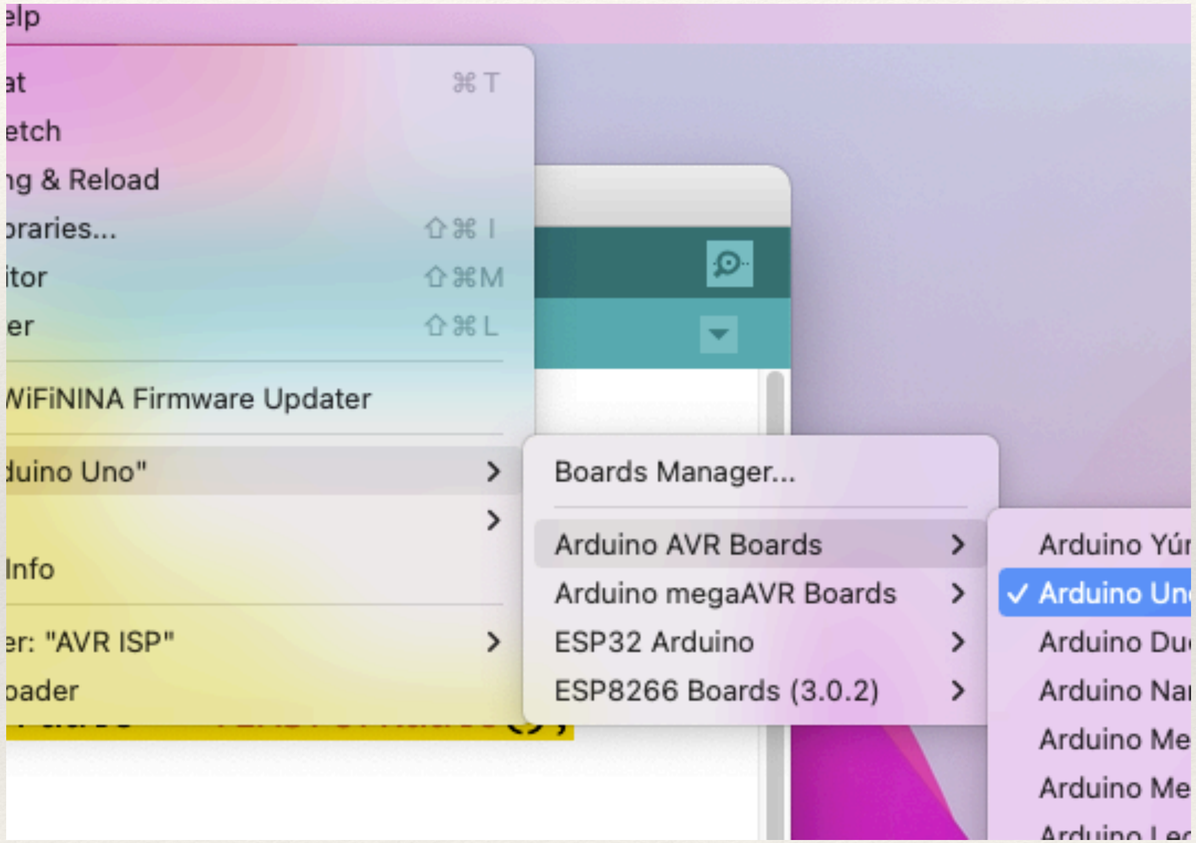
Hardware

- Double Check the wires
- Plug in the other end of the USB cable to
- your computer
- The Arduino Uno and Radio should have lights on



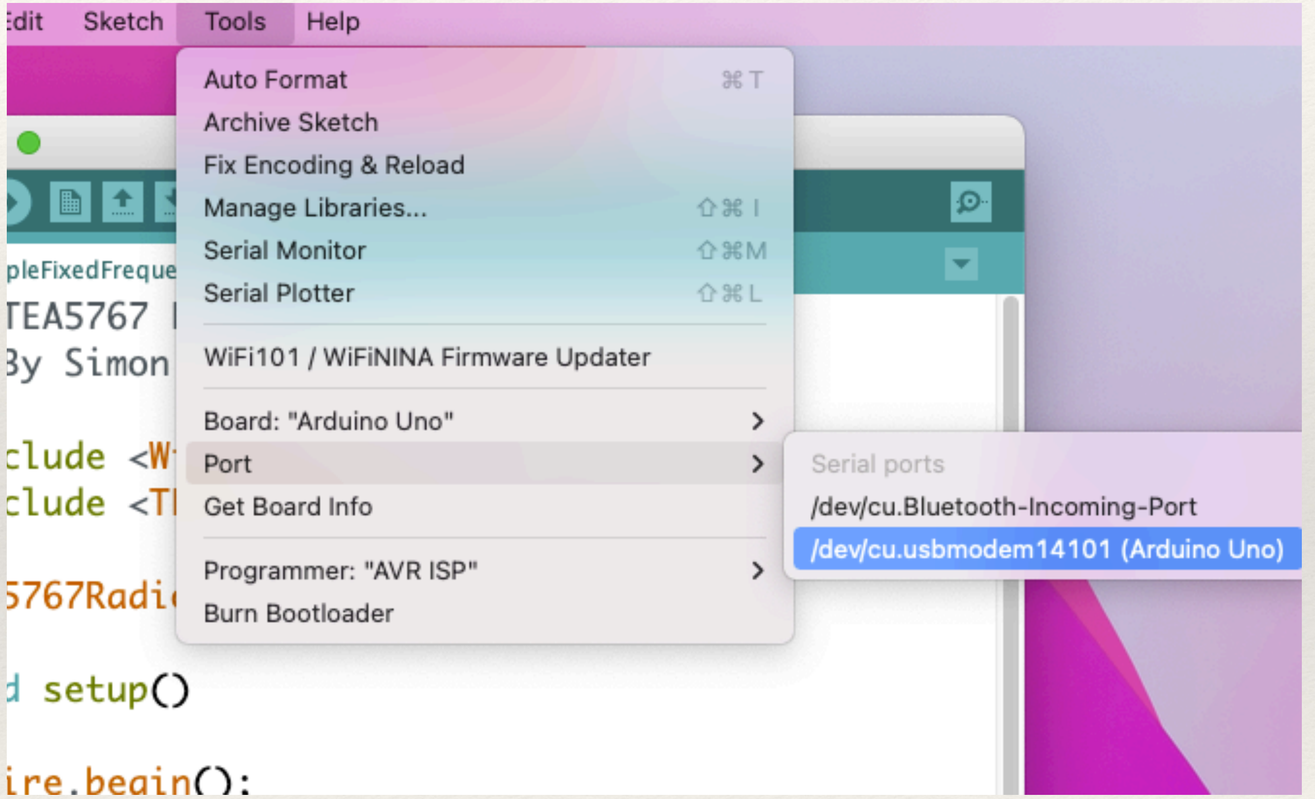
Programming the Arduino Uno

- We need to tell the Arduino IDE what we are programming
- From the Tools Menu Select Boards:Arduino AVR:Arduino UNO
-



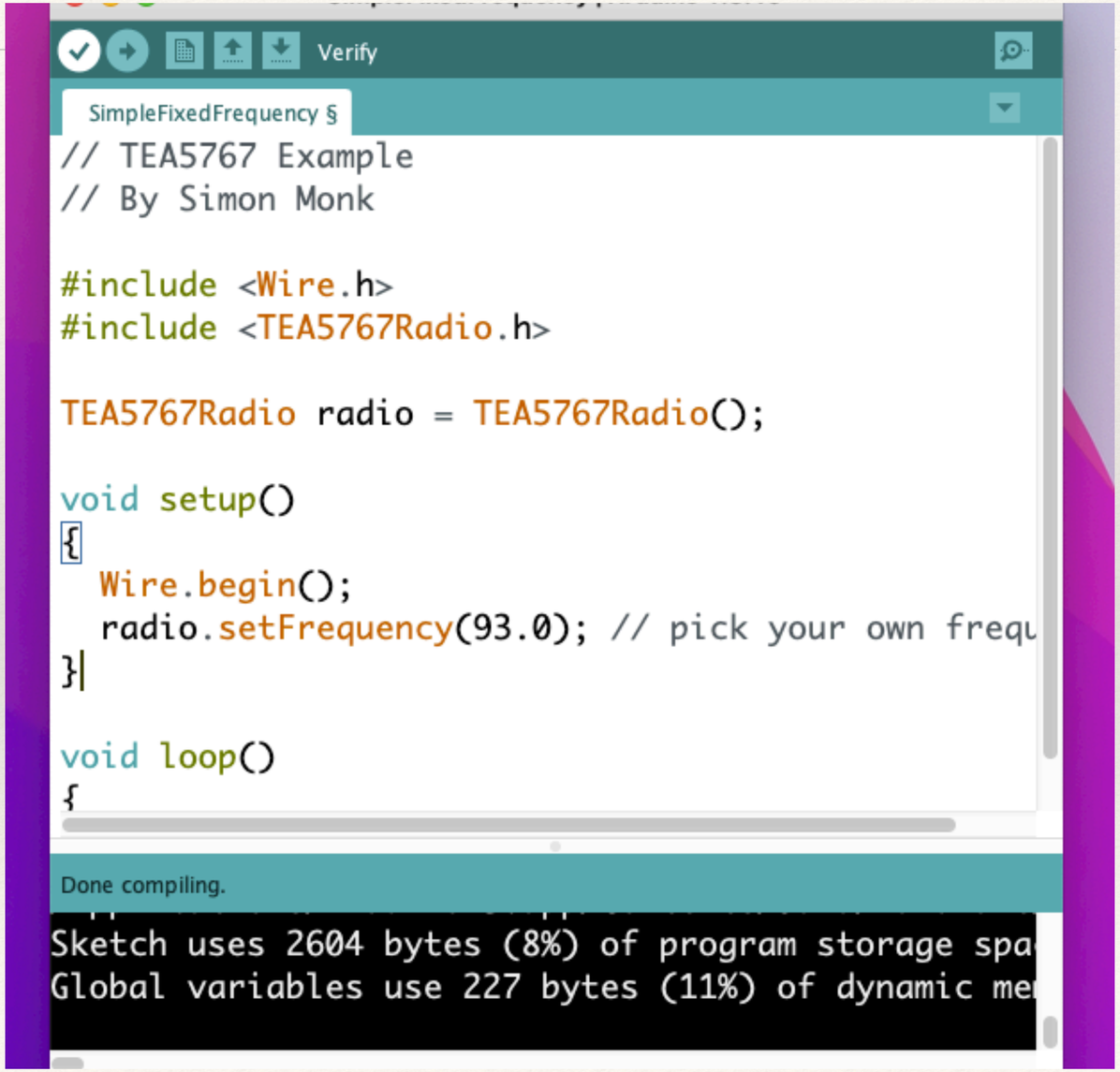
Programming the Arduino Uno

- Last step before we program , Tell the Arduino IDE
- Where the UNO is .. From Tools Select Port
- The Select the Port the Arduino Uno is on.
- This will look different on a PC it will say COMX (Arduino Uno)
- We are ready to load a program !



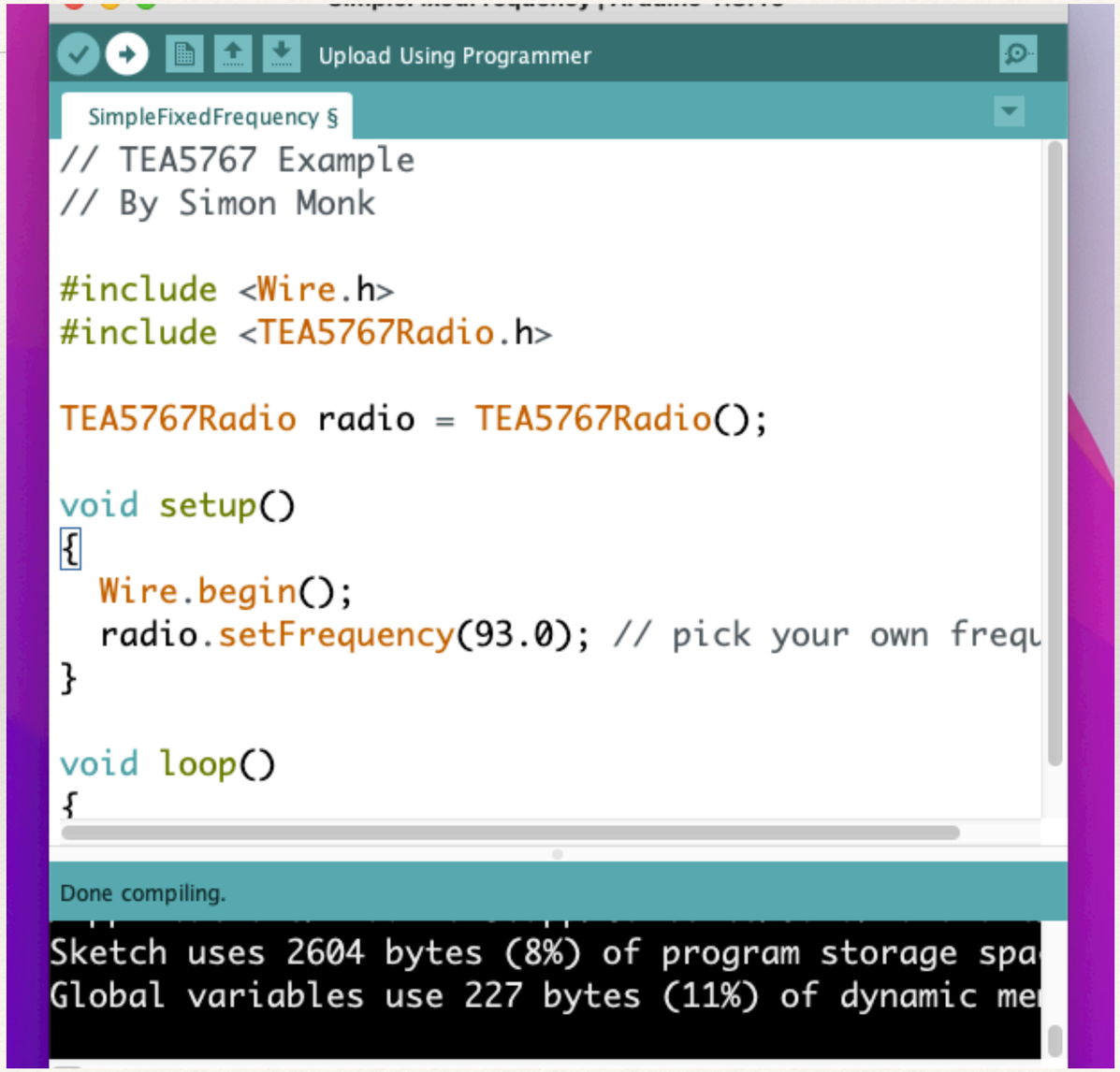
Programming the Arduino Uno

- From the Arduino IDE Screen Press the Check Mark
- This will compile the code for the Arduino
- If successful your screen will look like this.
-



Programming the Arduino Uno

- From the Arduino IDE Screen Press the Right Arrow
- This will send the Program to the Arduino
- When done Your Screen should look like this.
-



Programming the Arduino Uno

- From the Arduino IDE Screen Press the Right Arrow
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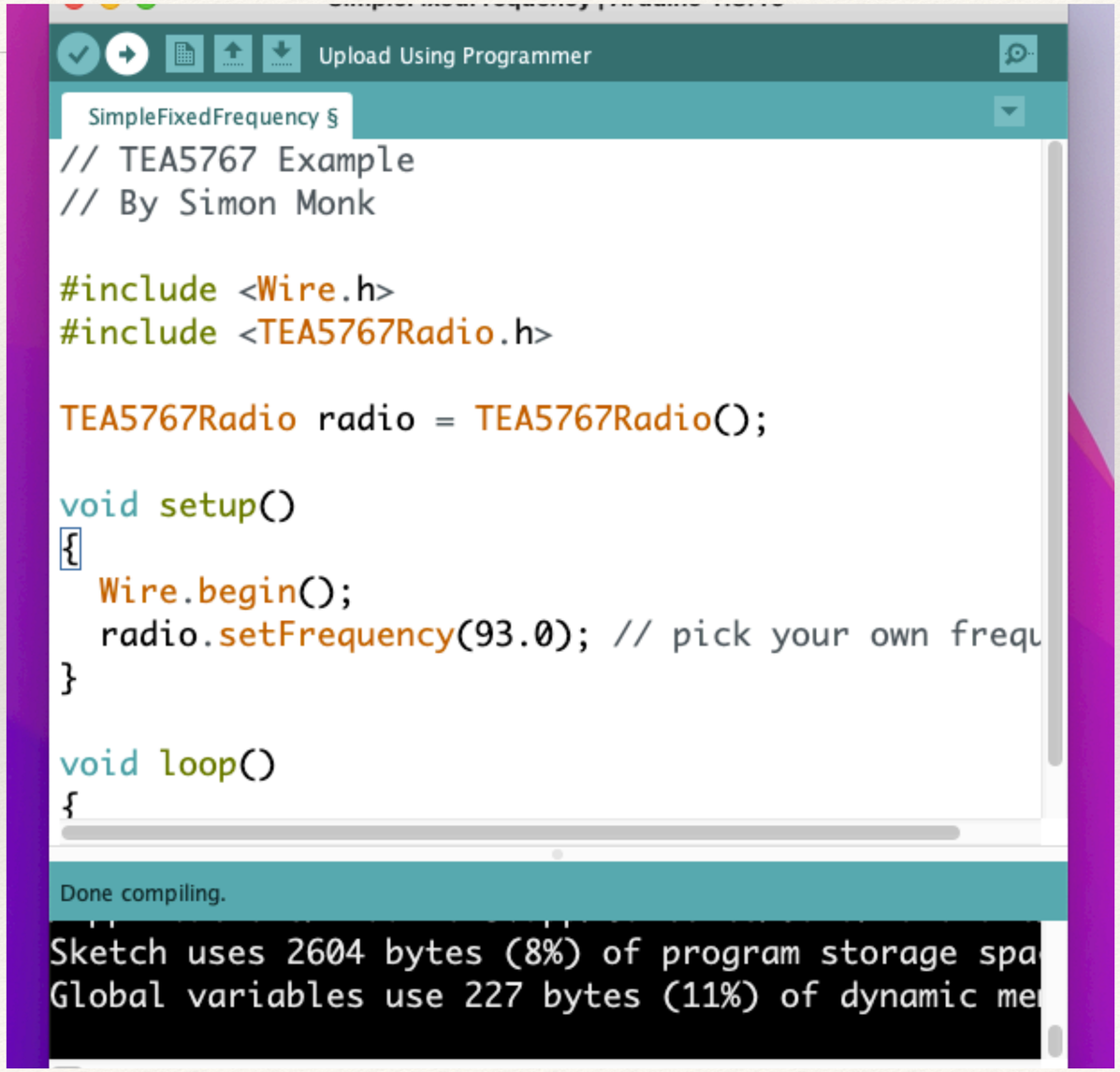
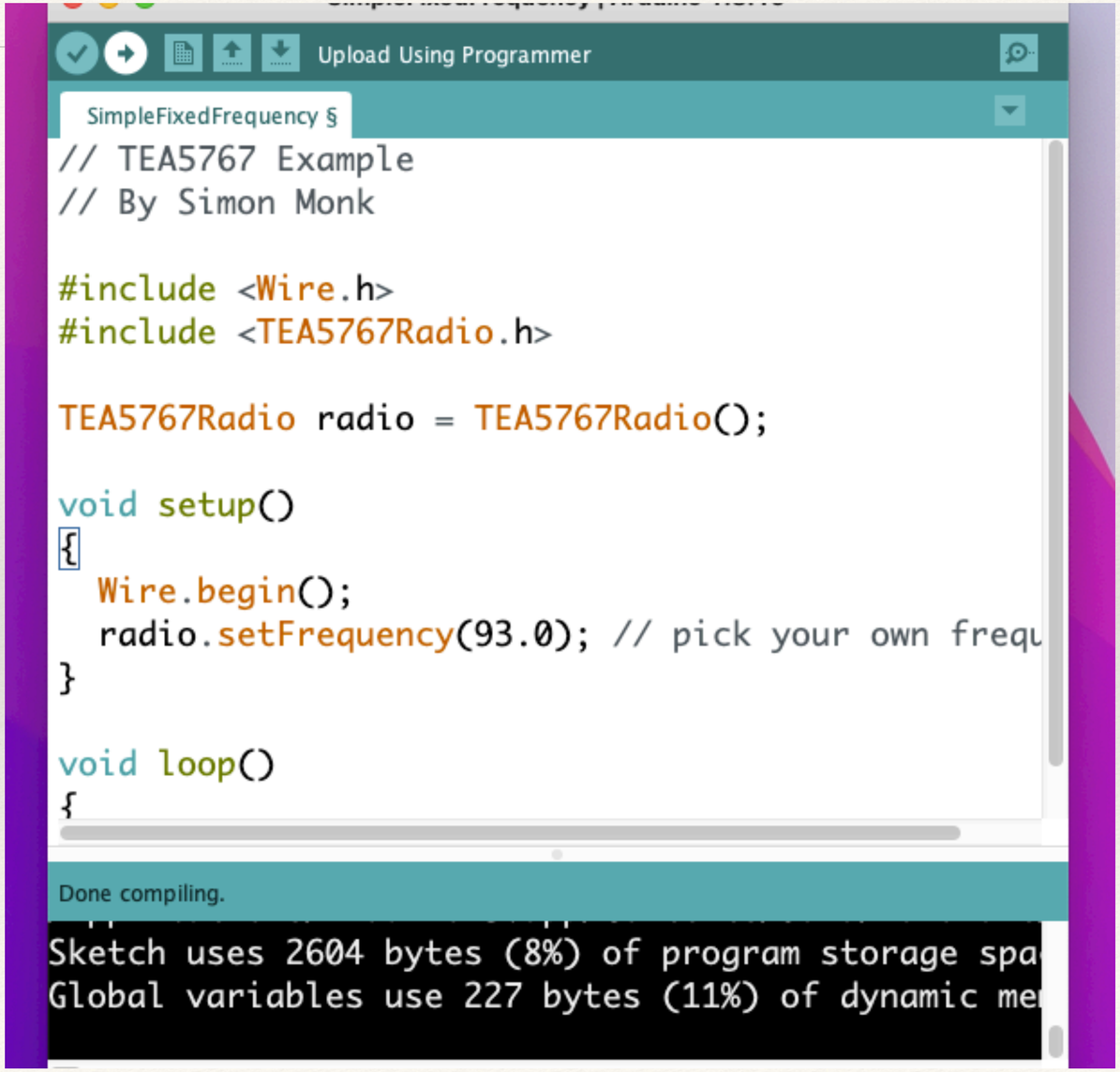
- When done Your Screen should look like this.
-



Programming the Arduino Uno

- This is the end of Part 1 installment 1
- Later in the week I'll post code to make the radio scan
- It will be a simple copy and paste
- To tune your radio in this example
- change this line radio.setFrequency(93.0); / /
- For Example to tune to 103.5 FM you make the change to
- radio.setFrequency(103.5); / /
- See you in a couple days !!!!



Programming the Arduino Uno

```
// TEA5767 Example
// By Simon Monk
// Scanning for open Ghost Box

#include <Wire.h>                          // SLC SDA communications for radio module
#include <TEA5767Radio.h>                  // Radio library tells the Arduino how to interface the radio module
TEA5767Radio radio = TEA5767Radio();       // Define radio model

void setup()                               // setup files
{
  Wire.begin();                            // start IC2 communications
}

void loop()
{

  for ( float r = 88.00; r <= 108.00;r = r+.1)     // loop and scan from 88 to 108 stepping .1 MHz
  {
    radio.setFrequency(r);                  // Set radio to new frequency
    delay(200);                             // wait here for .2 seconds
  }
}
```

Copy and paste the above text into your Arduino IDE editor this will allow the GhostBox to scan from 88.00 to 108.00 FM. The R+.1 sets the scan distance .1 = .1 MHz. The time between scans is is controlled by the delay (200); IE: delay 200 mills second or .2 seconds