

*By Bread Boards & Bill*

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# Project # 1 Scanning Radio

## AKA Ghost Box

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February 20 2022 Part 3

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# Ghost Box Part 3

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Bill Chappell presents this Project, build at your own risk. The author is not responsible for errors or omissions in this document.

This Project uses open-source software "[arduino.org](https://www.arduino.org)"

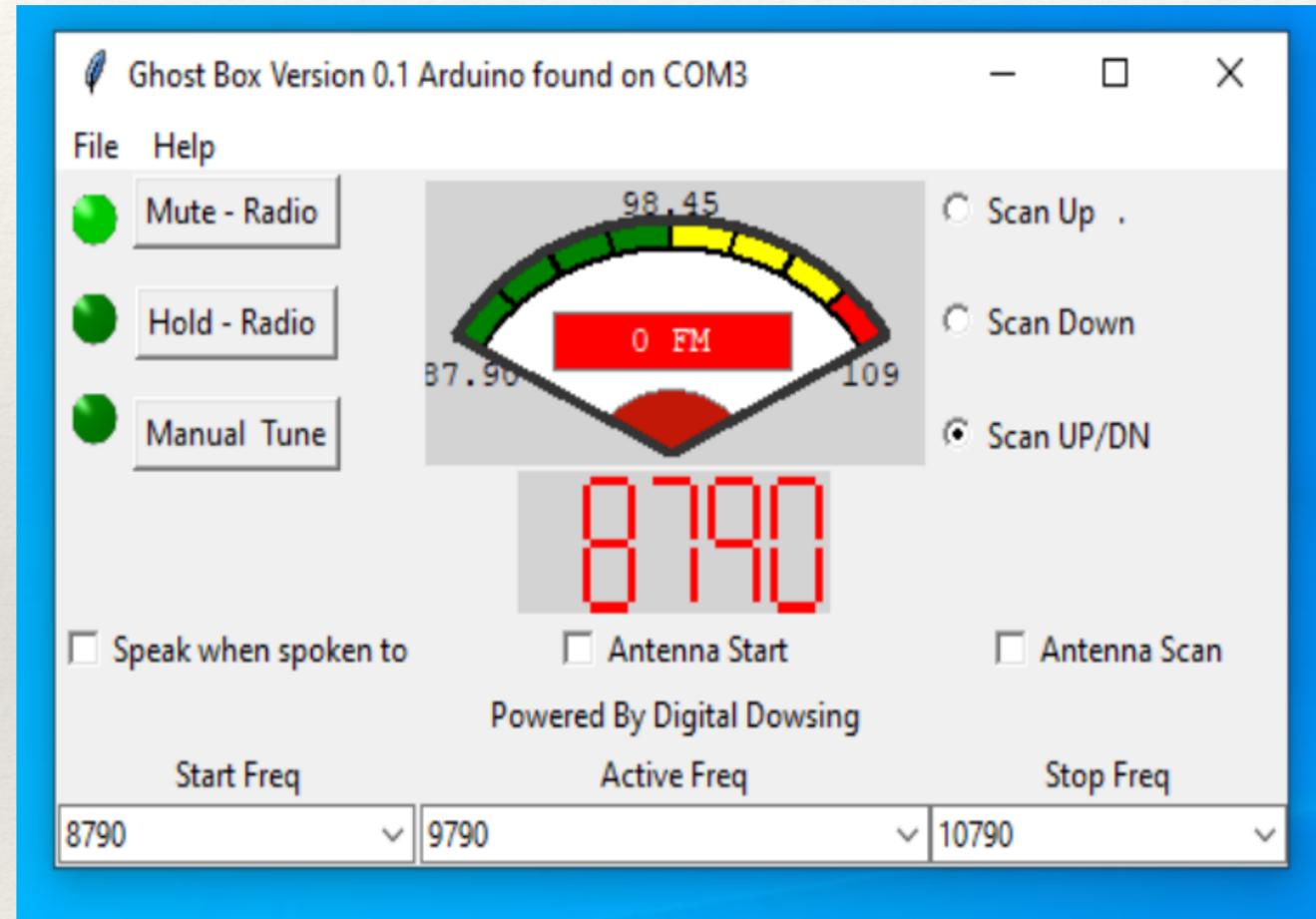
Find links at [www.digitaldowsing.com/diy/](http://www.digitaldowsing.com/diy/)

The Sketch for Part 2 can be downloaded at:

[Part 3 Arduino code](#)

# Ghost Box Part 3

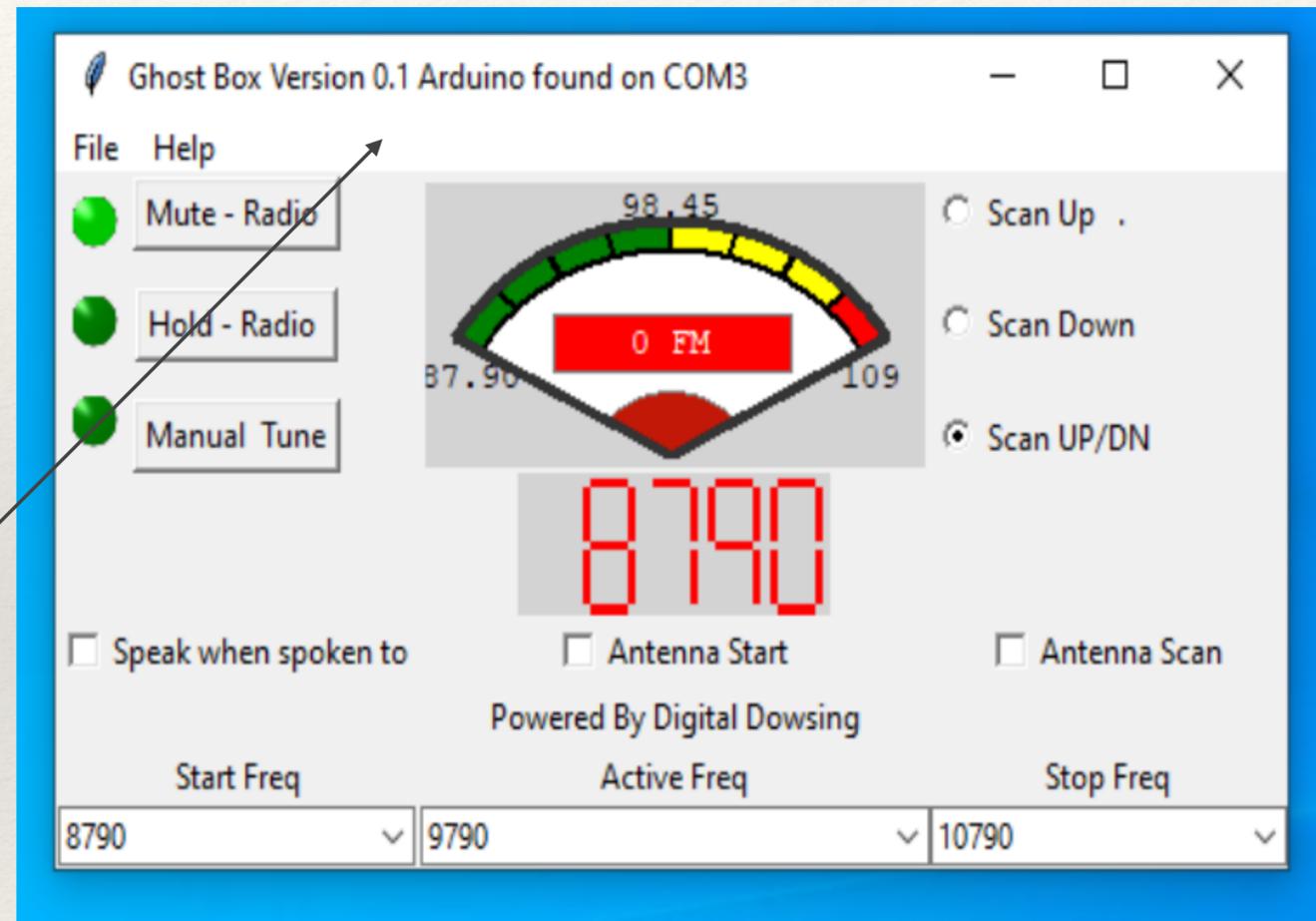
Software for the simple Ghost Box part 3. In this section I introduce more functions to the basic Arduino sketch. Along with a sample program written in python.



# Ghost Box Part 3

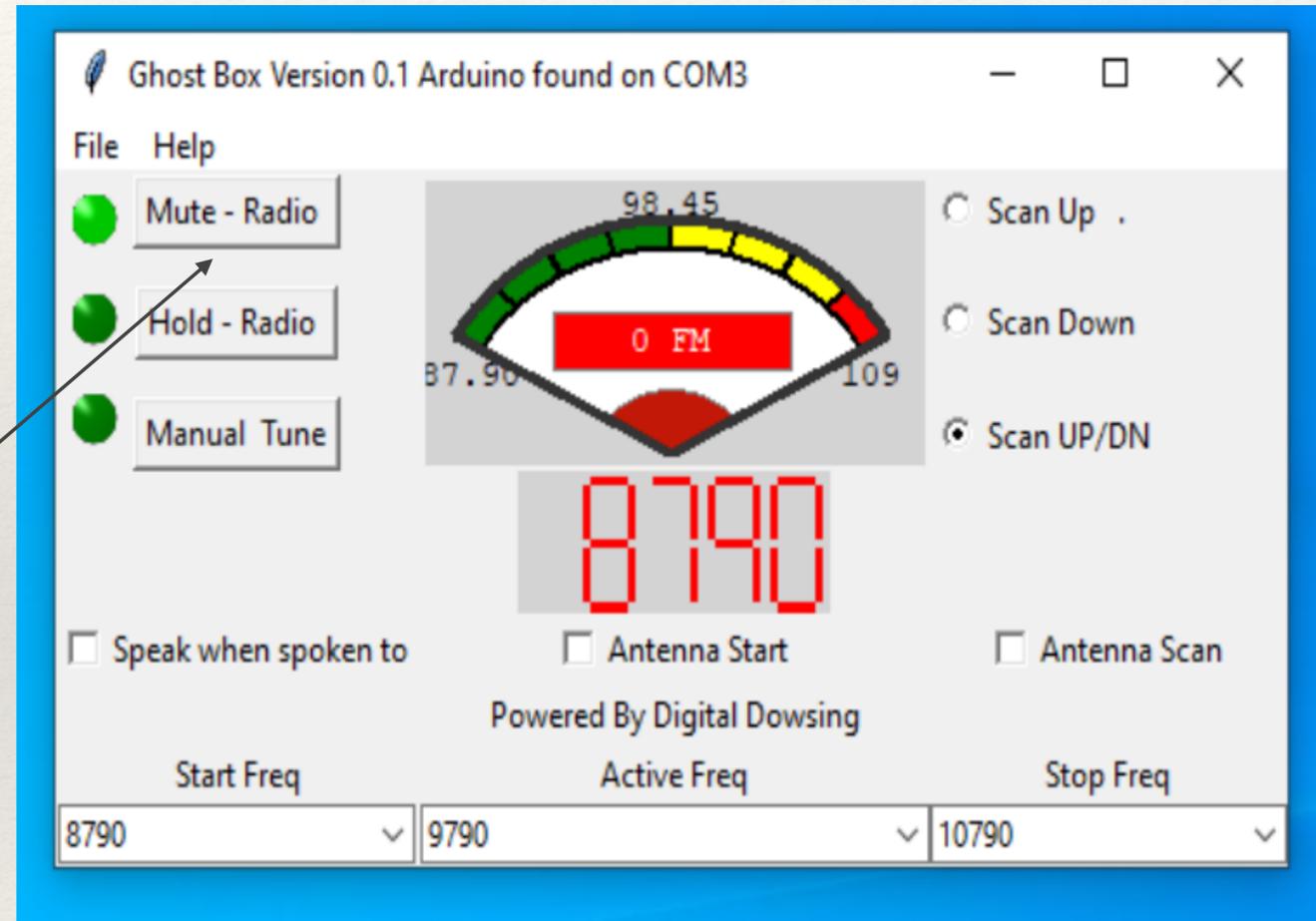
The software shown here is for Windows. When loaded, the software searches for a connected Arduino Uno. You must have your Arduino connected before loading the software.

The Title bar will show where the Arduino is connected.



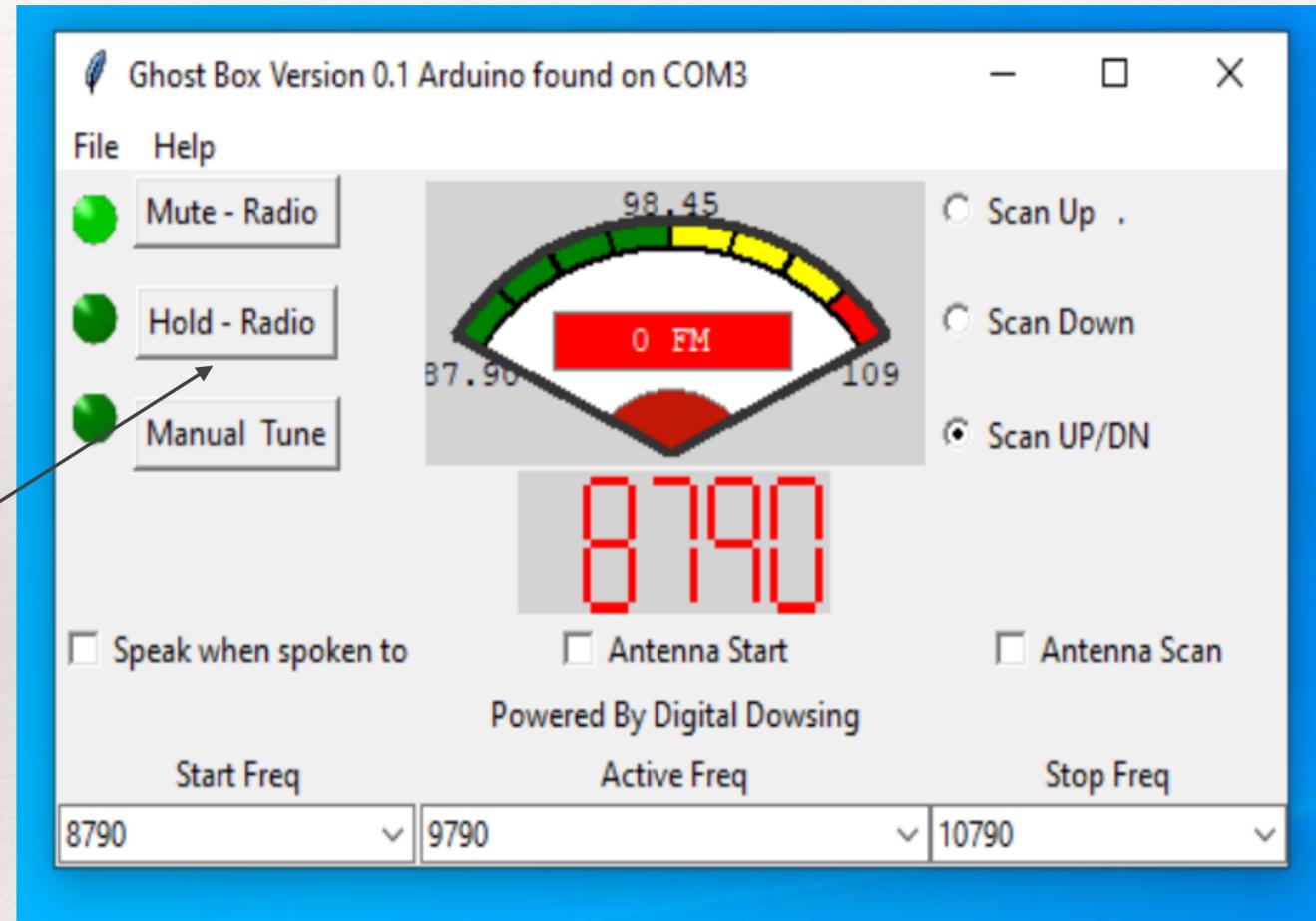
# Ghost Box Part 3

Mute on is the default for this software. The radio will not produce sound when Mute is on.



# Ghost Box Part 3

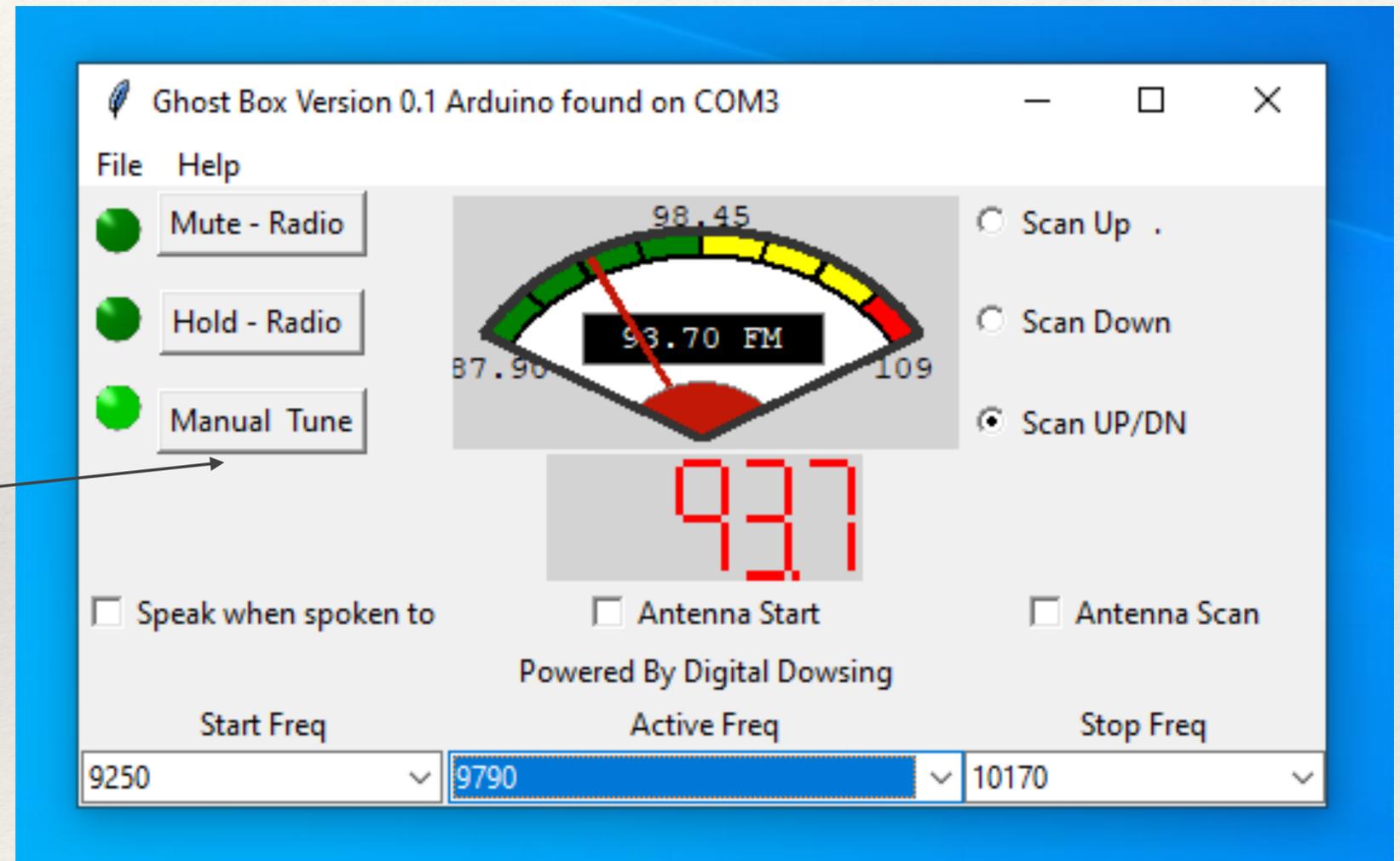
Hold stops the radio function. Functions resume when Hold is released.



# Ghost Box Part 3

Manual Tune is used when checking local stations using the Manual Tuning dropdown. Mute should not be on when using this feature.

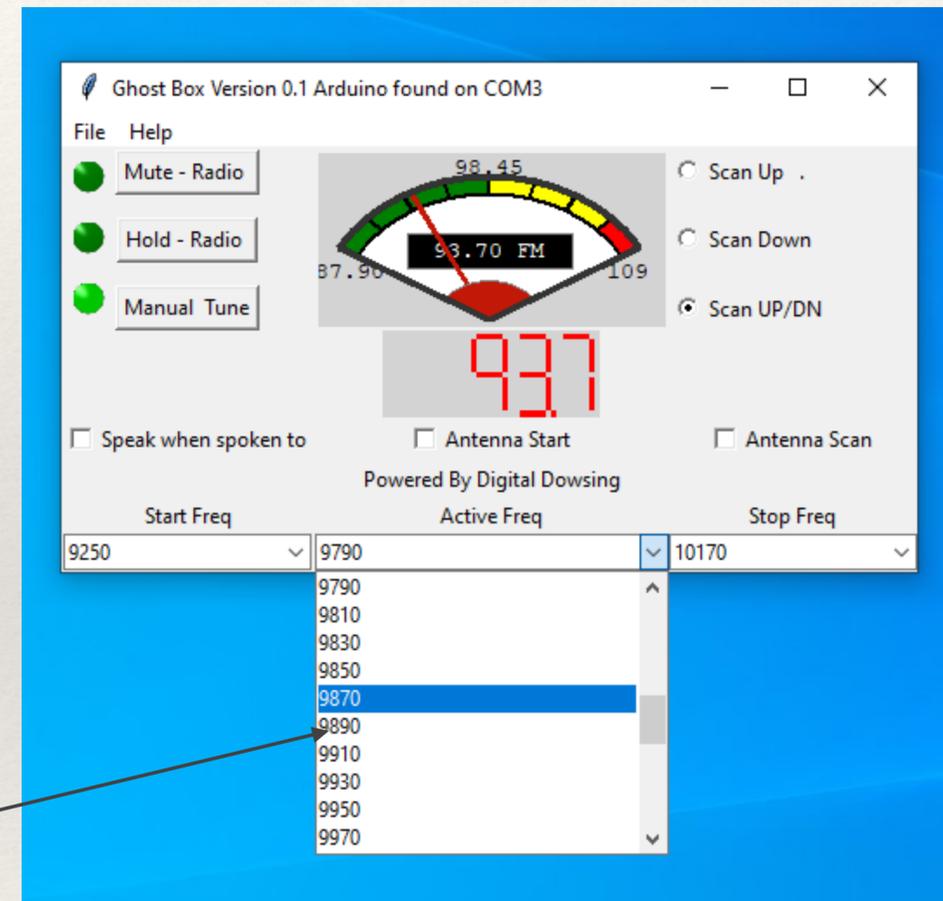
Press Manual Tune, then select the desired station from the dropdown box.



# Ghost Box Part 3

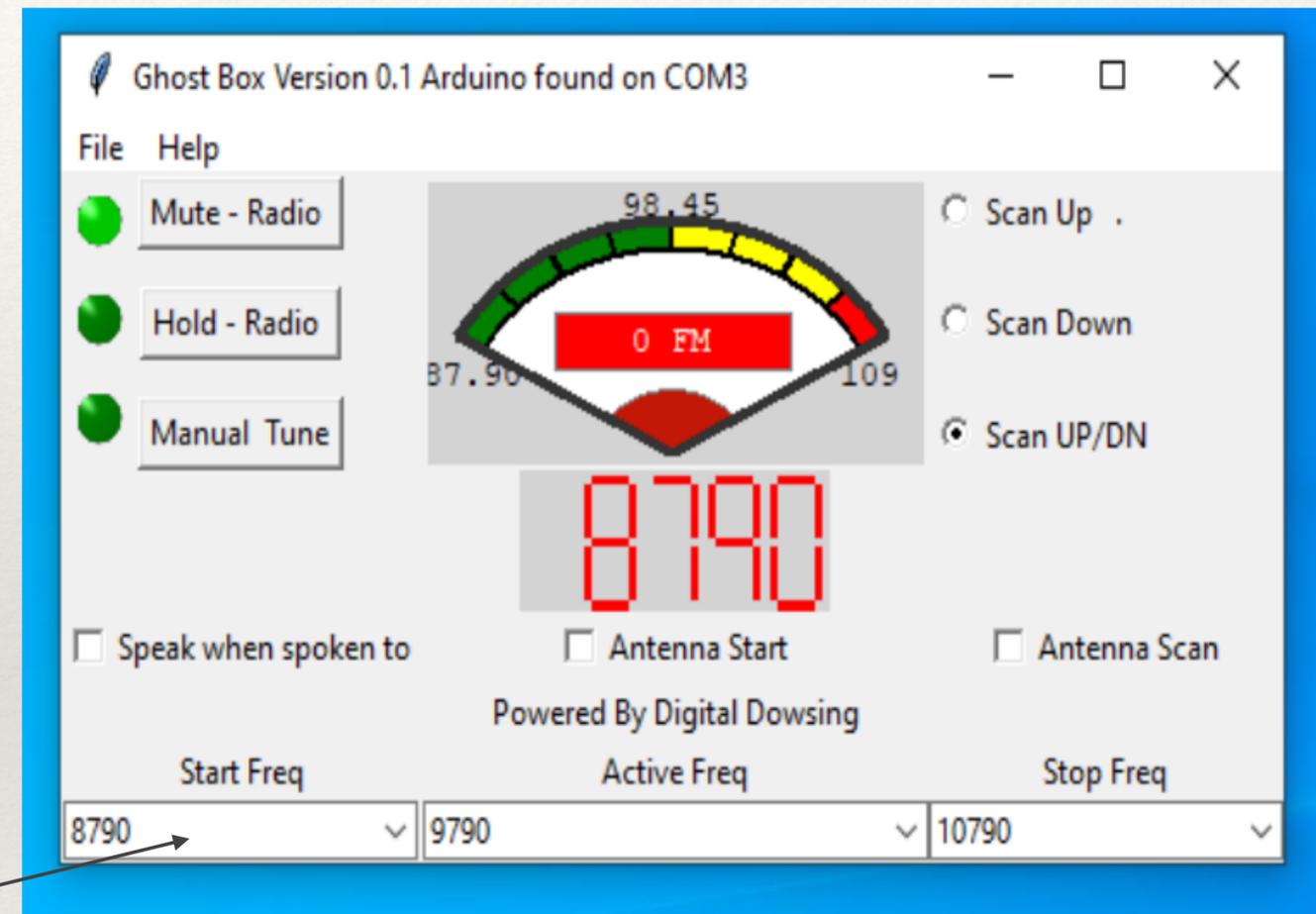
Manual Tune is used when checking local stations using the Manual Tuning dropdown. Mute should not be on when using this feature.

Press Manual Tune, then select the desired station from the dropdown box.



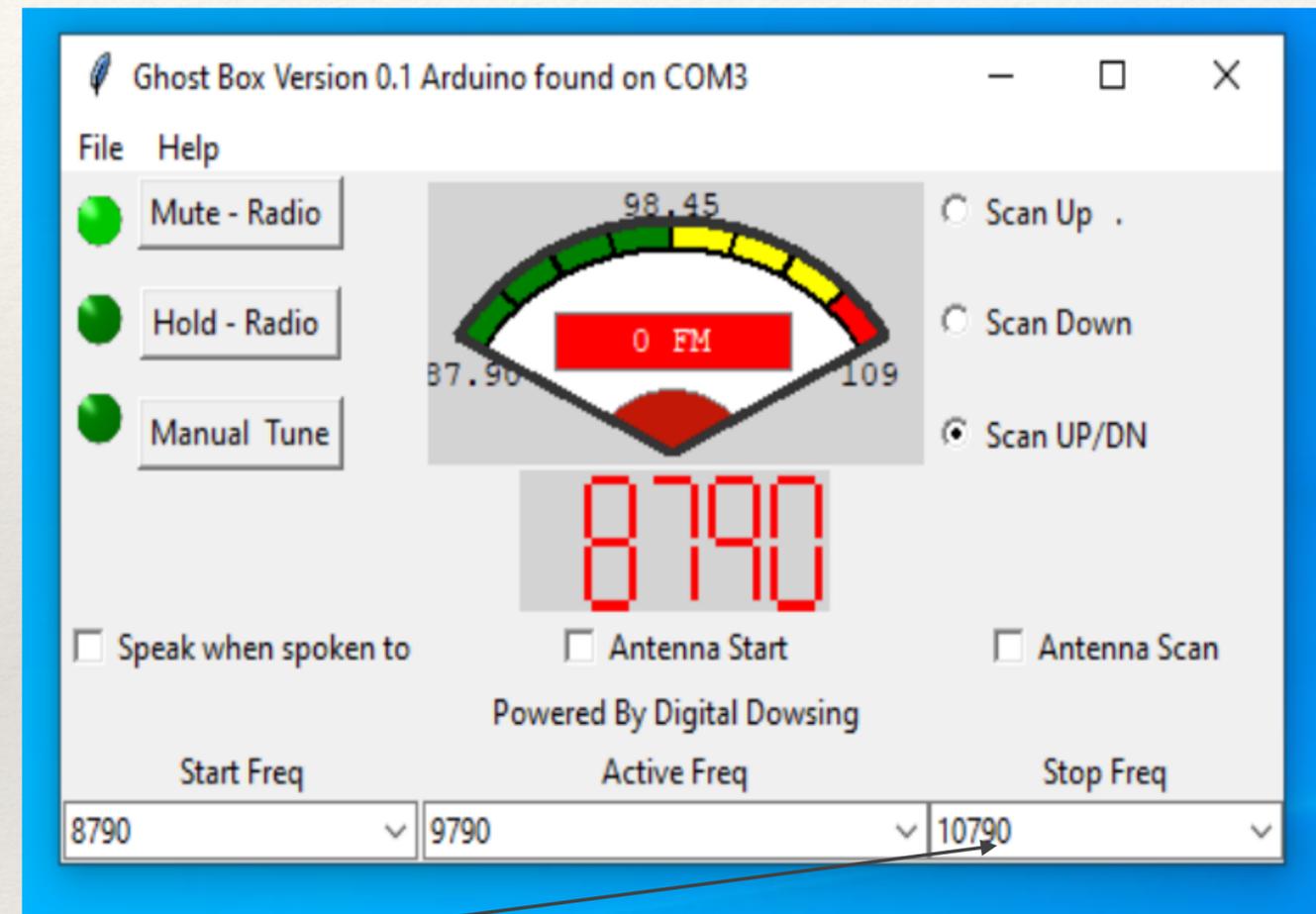
# Ghost Box Part 3

Start frequency can be set for the scan from the drop boxes. Select the desired frequency and click on it. Make sure the frequency display changes to show your selection.



# Ghost Box Part 3

Stop frequency can be set for the scan from the drop boxes. Select the desired frequency and click on it. Make sure the frequency display changes to show your selection.

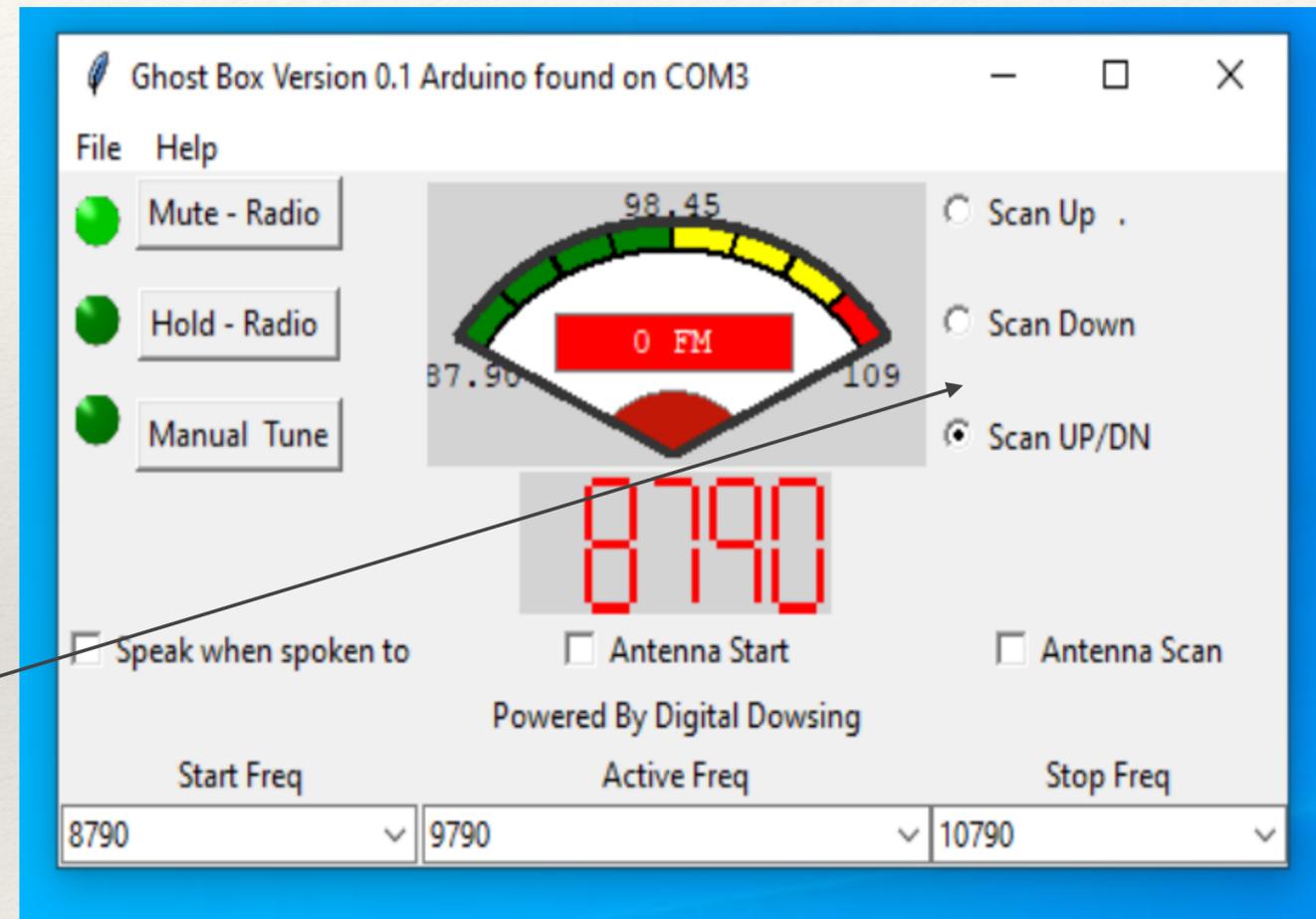


# Ghost Box Part 3

Set Scan Control selecting one of the three scan buttons on the right-hand side.

The Software can scan from start to stop frequencies Scan Up  
Scan Down From Stop to Start  
Scan Down.

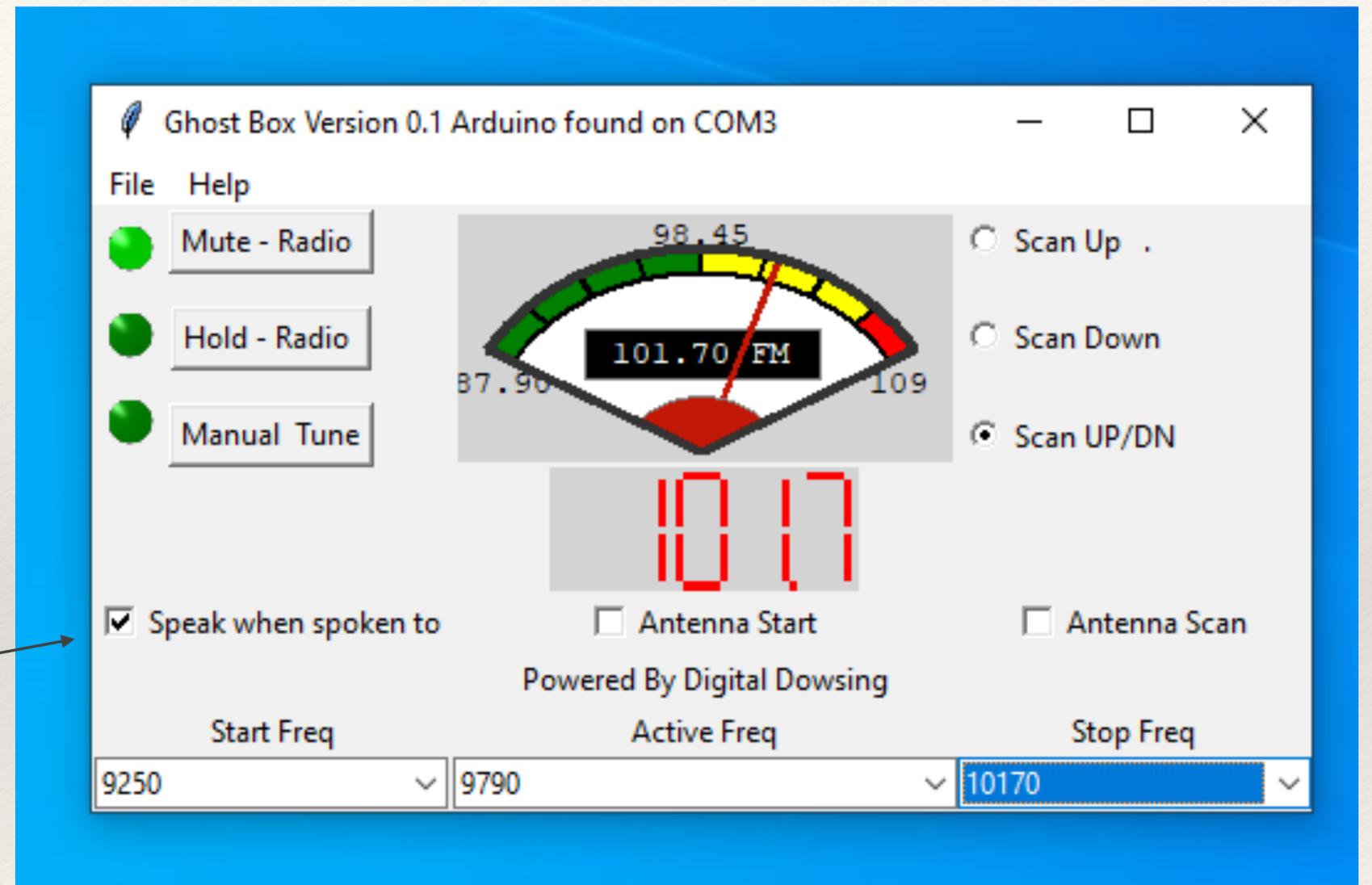
Scan Control can also scan from start to stop and back down to start.



# Ghost Box Part 3

Speak when spoken to function holds the radio from scanning till it gets a signal from the microphone. When a signal from the microphone is received, the radio will scan once.

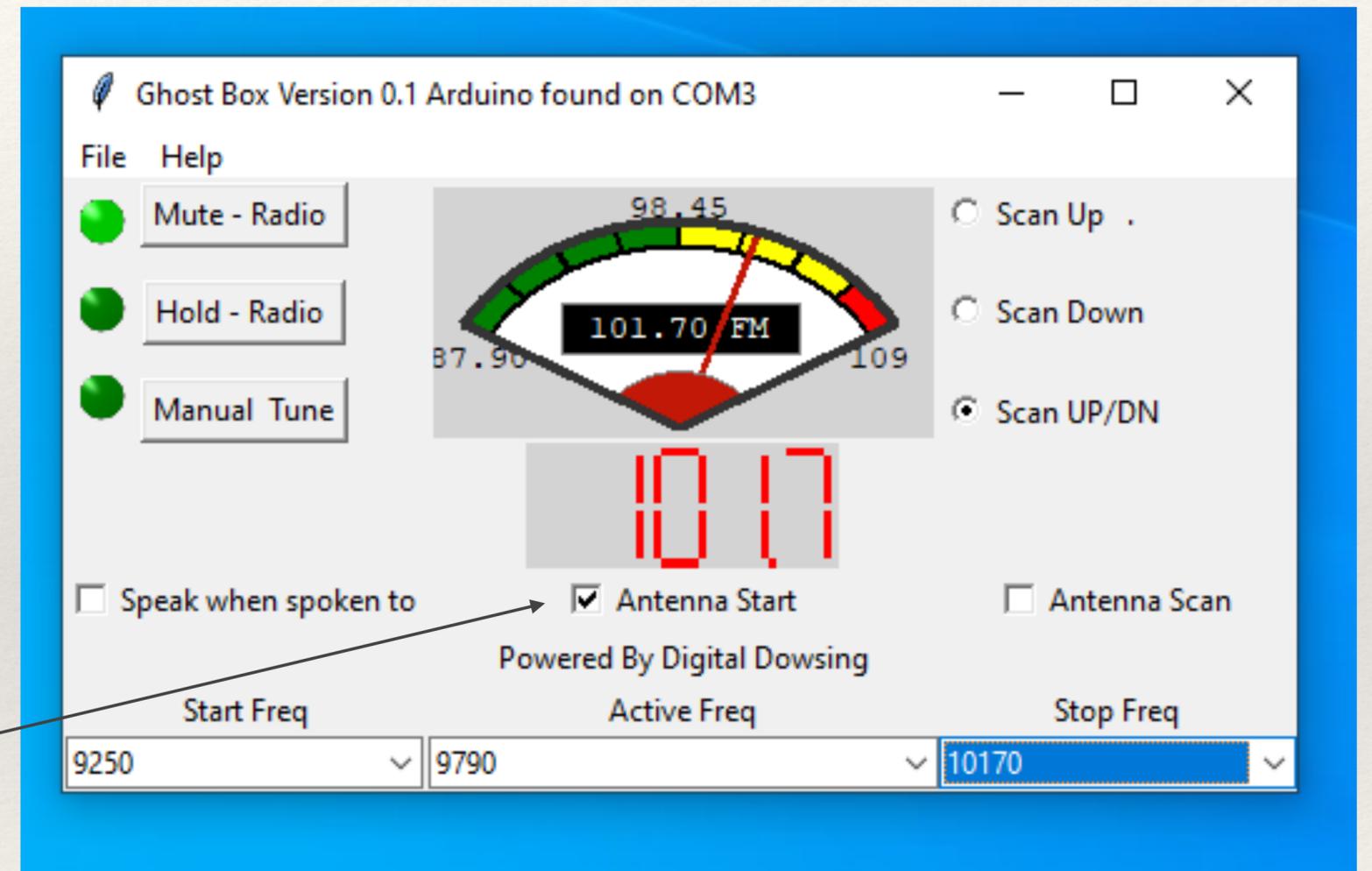
Scan controls and Start and stop frequency will control the scan performed. Once the scan is complete, the radio will again go silent waiting for the next microphone signal.



# Ghost Box Part 3

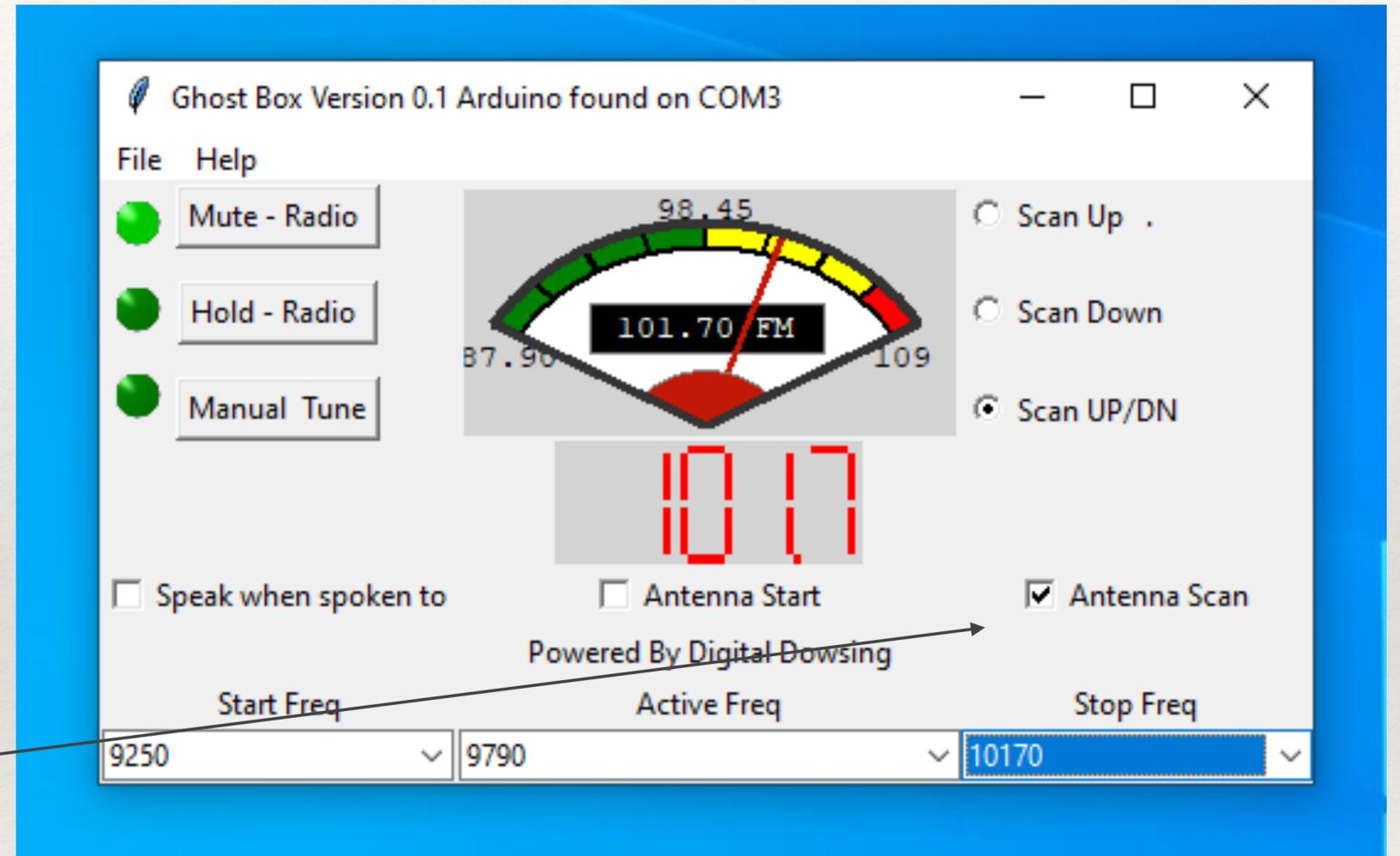
Antenna Start holds the radio from scanning till it gets a signal from the Antenna. When there is a signal from the Antenna, the radio will scan once.

Scan controls and Start and stop frequency will control the scan performed. Once the scan is complete, the radio will again go silent waiting for the next Antenna signal.



# Ghost Box Part 3

Antenna Scan uses the energy level on the antenna to tune the radio. In this mode, the radio can tune by any increment and any direction.



# Ghost Box Part 3

Beta Software is not complete and has some bugs.

There are missing functions and missing menu items.

I'll come back to this software later in the year as we progress on additional features.

In the file you download is the .py python code used to create this software.

```
import tkinter
from tkinter import ttk
import warnings
import serial
import serial.tools.list_ports
import time
from tkinter.messagebox import showinfo

arduino_ports = [
    p.device
    for p in serial.tools.list_ports.comports()
    if 'Arduino' or 'CH340' in p.description # may need tweaking to match new a
]
if not arduino_ports:
    raise IOError("No Arduino found")
if len(arduino_ports) > 1:
    warnings.warn('Multiple Arduinos found - using the first')

arduino = serial.Serial(arduino_ports[0],baudrate=115200, timeout=.1)

root = tk.Tk()
root.title("Ghost Box Version 0.1 Arduino found on "+str(arduino_ports[0]))
g = 0
h1 = 0
x = 1
ra = 0
n = 16

def ts(v):
    root.title(str(v))

def tc():
    root.title(txt.get())
```

# Ghost Box Part 3

You will need to upload the new Arduino sketch to your Arduino Uno. This file is called `ghostbox_ver301.ino`. Also, in the zip file you downloaded from the site.

I'll not be going through the Arduino code at this time. Later in the year, I'll add a hardware panel to control the Arduino without software. I'll go line by line then.

```
ghostbox_ver301
//*****
// Ghost Box program scans up then down flashes led on UNO indicate
// Microphone add and new library Mutes while not scanning
//*****
/// \file TestTEA5767.ino
/// \brief An Arduino sketch to operate a TEA5767 chip based radio
///
/// \author Matthias Hertel, http://www.mathertel.de
/// \copyright Copyright (c) 2014 by Matthias Hertel.\n
/// This work is licensed under a BSD style license.\n
//
// Sketch modified for the Simple ghost box project 1/20/2022
// added functions for serial interface software "BETA"
//
//*****
// Includes
//*****
#include <radio.h> // Library
#include <Wire.h> // SLC SDA
#include <TEA5767.h> // Tells Ra
TEA5767 radio ; // Define ra
//*****
// Global Variables
//*****
int LED1 = 13; // create a r
int hold = 50; // hold is th
int inc = 20; // How far to
int start_FM = 8790; //8790 // US FM Banc
int stop_FM = 10790; //10790 // US FM band
```