2.4GHz Wireless Transmitter/Receiver for Audio System

By Clint Thompson, ECE 491 Senior Design Project II, May 5, 2017
Faculty Advisors: Hadi Alasti, and Paul I-Hai Lin,
http://www.etcs.ipfw.edu/~lin

Department of Computer, Electrical and Information Technology
College of Engineering, Technology and Computer Science

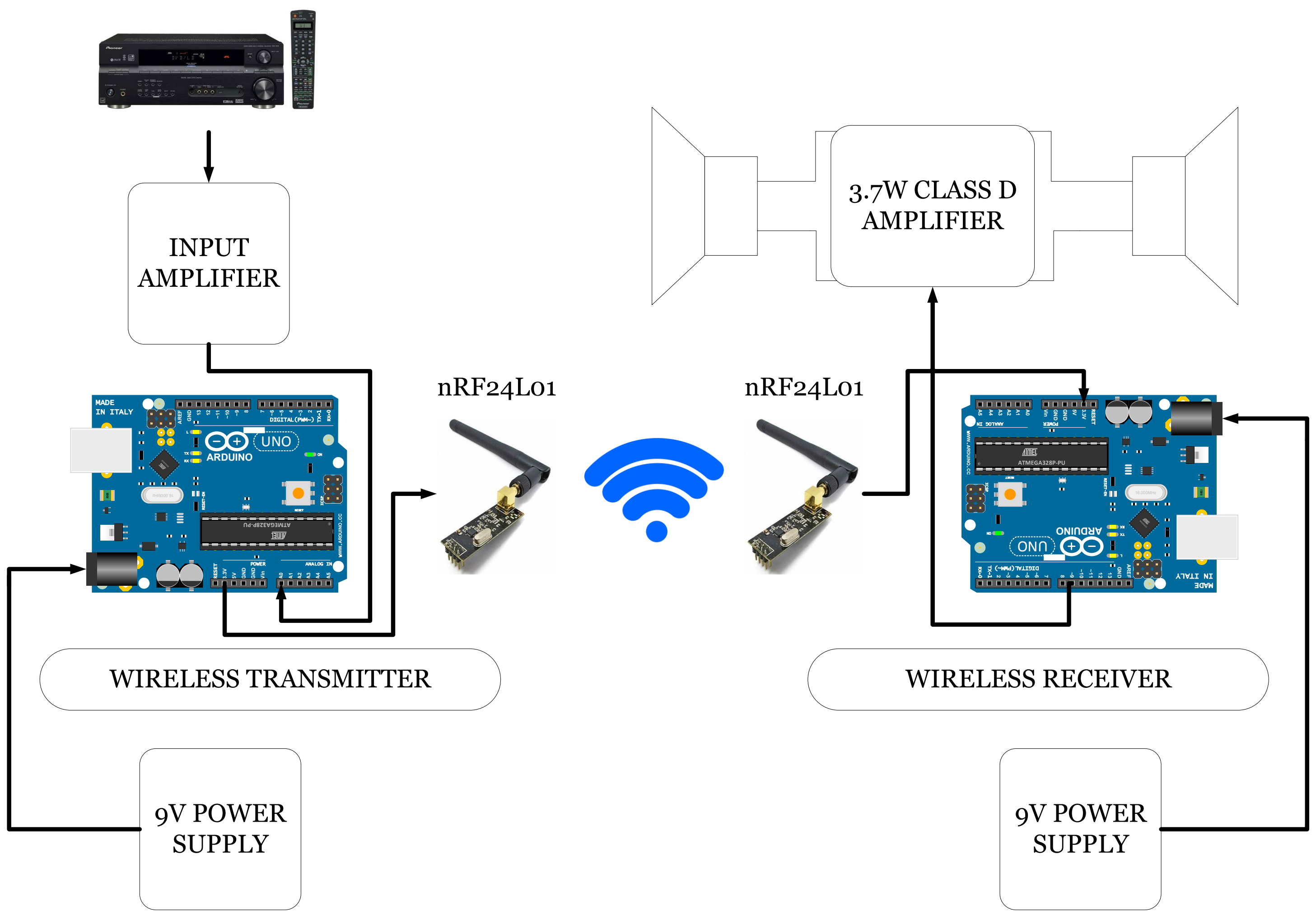
Abstract

A 2.4 GHz Wireless Transmitter/Receiver for audio system application includes Arduino microcontrollers, wireless transceivers, low-pass filter, class D audio amplifier, and a speaker (less than 3 watts).

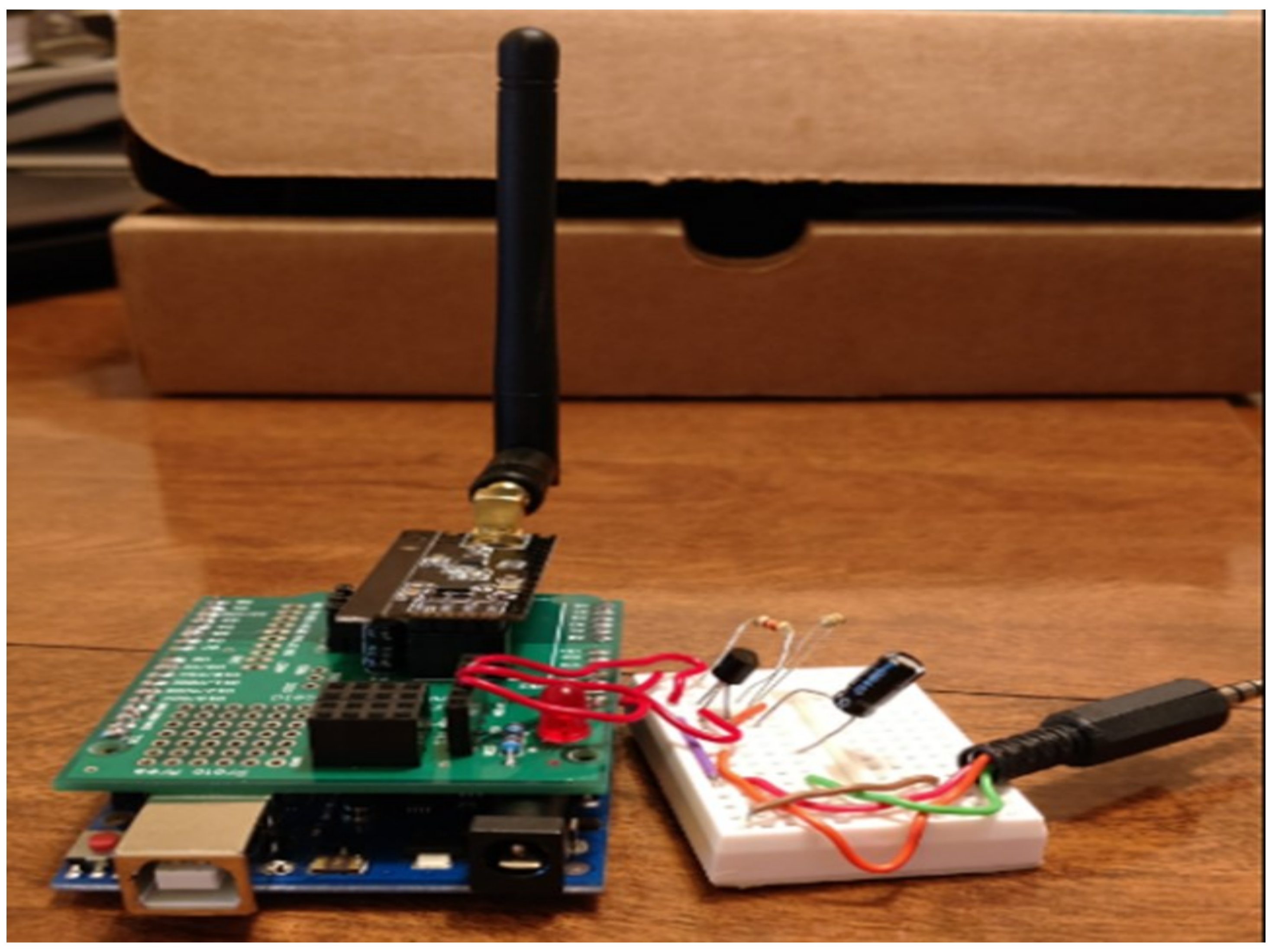
PURPOSE

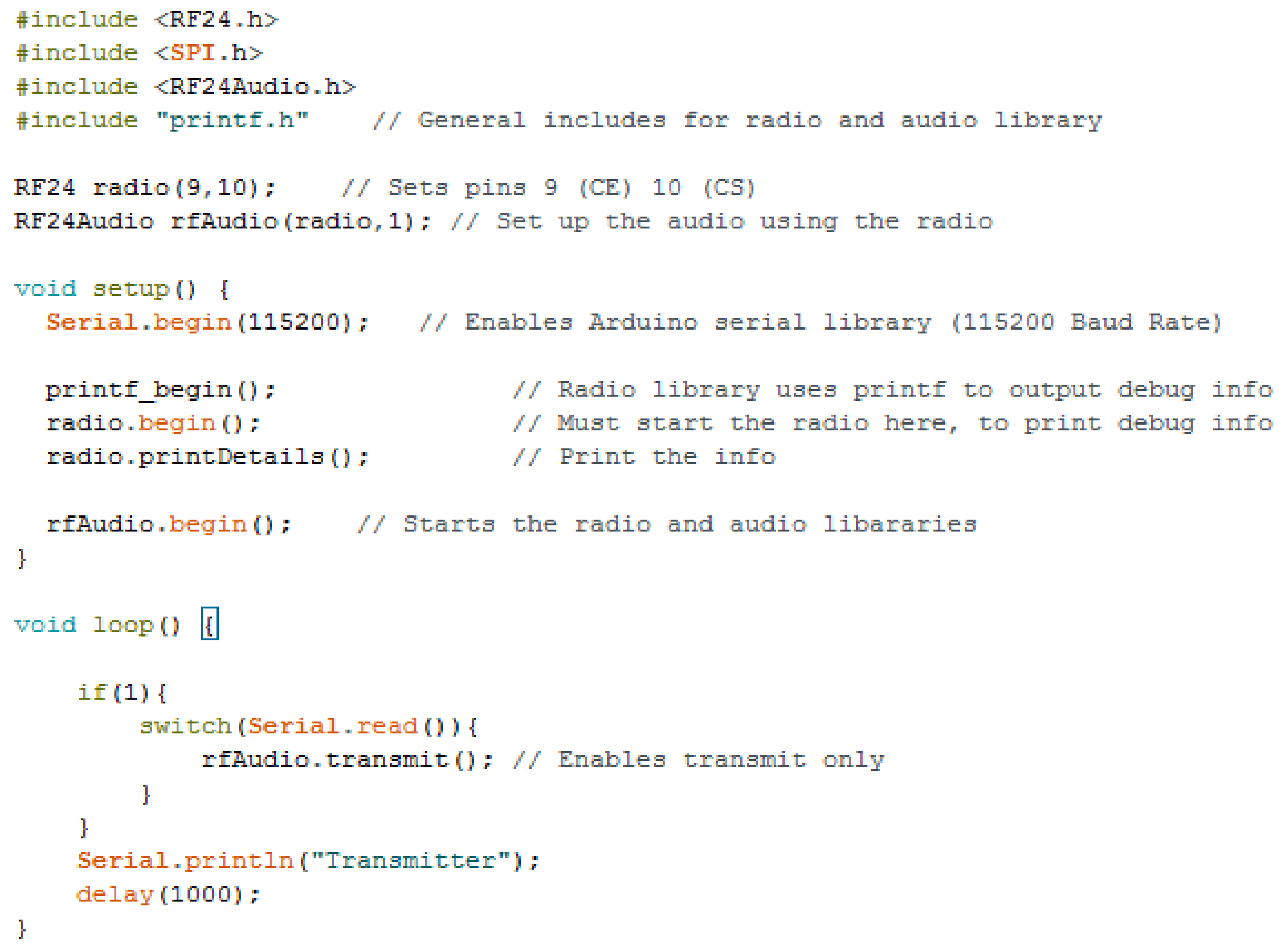
To develop a new wireless system for audio application and gain knowledge on such subsystems as Wi-Fi 2.4 GHz wireless technology, transceiver modules, microcontroller, hardware interface, and software code.

System Block Diagram



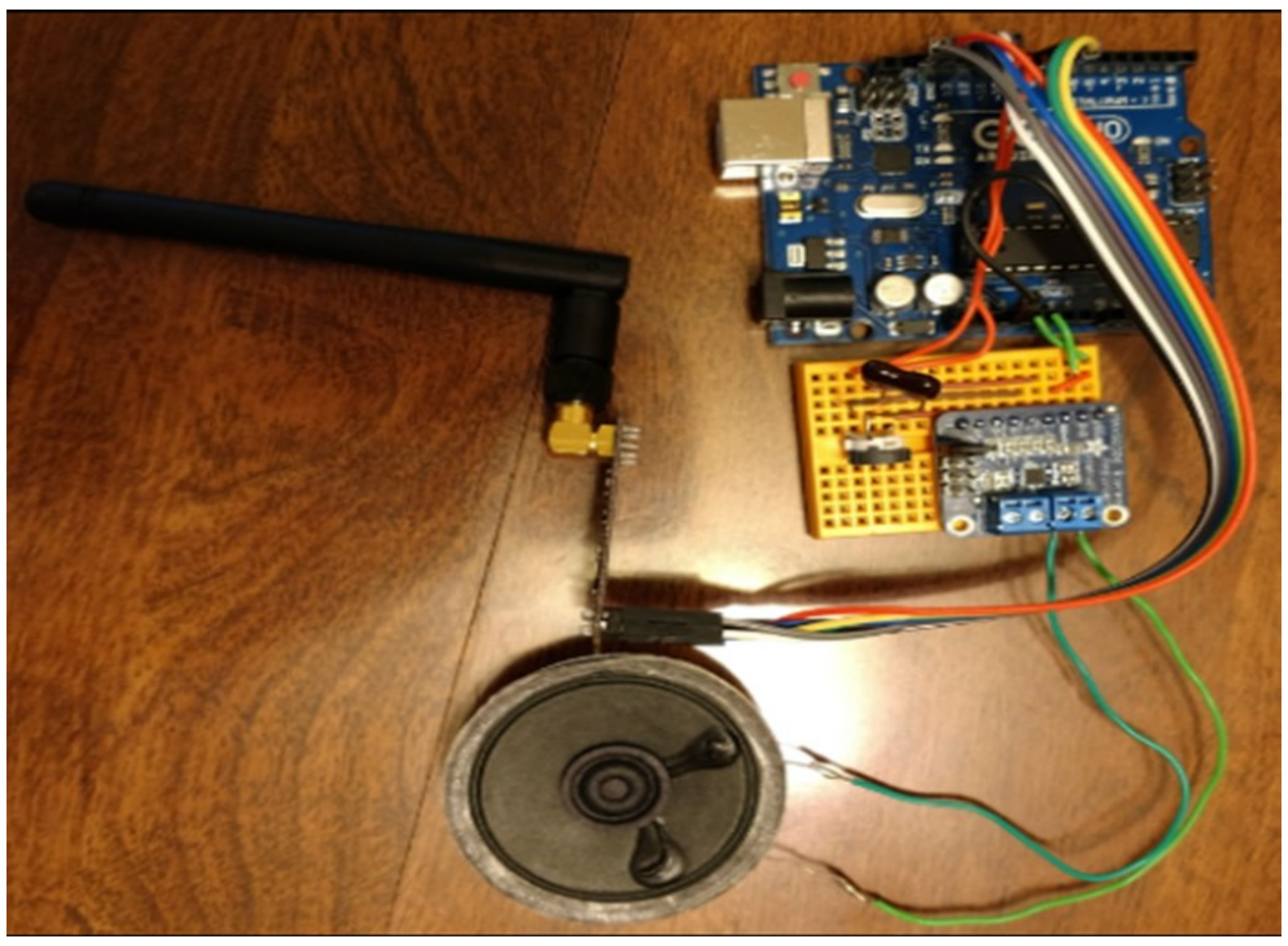
Transmitter Module

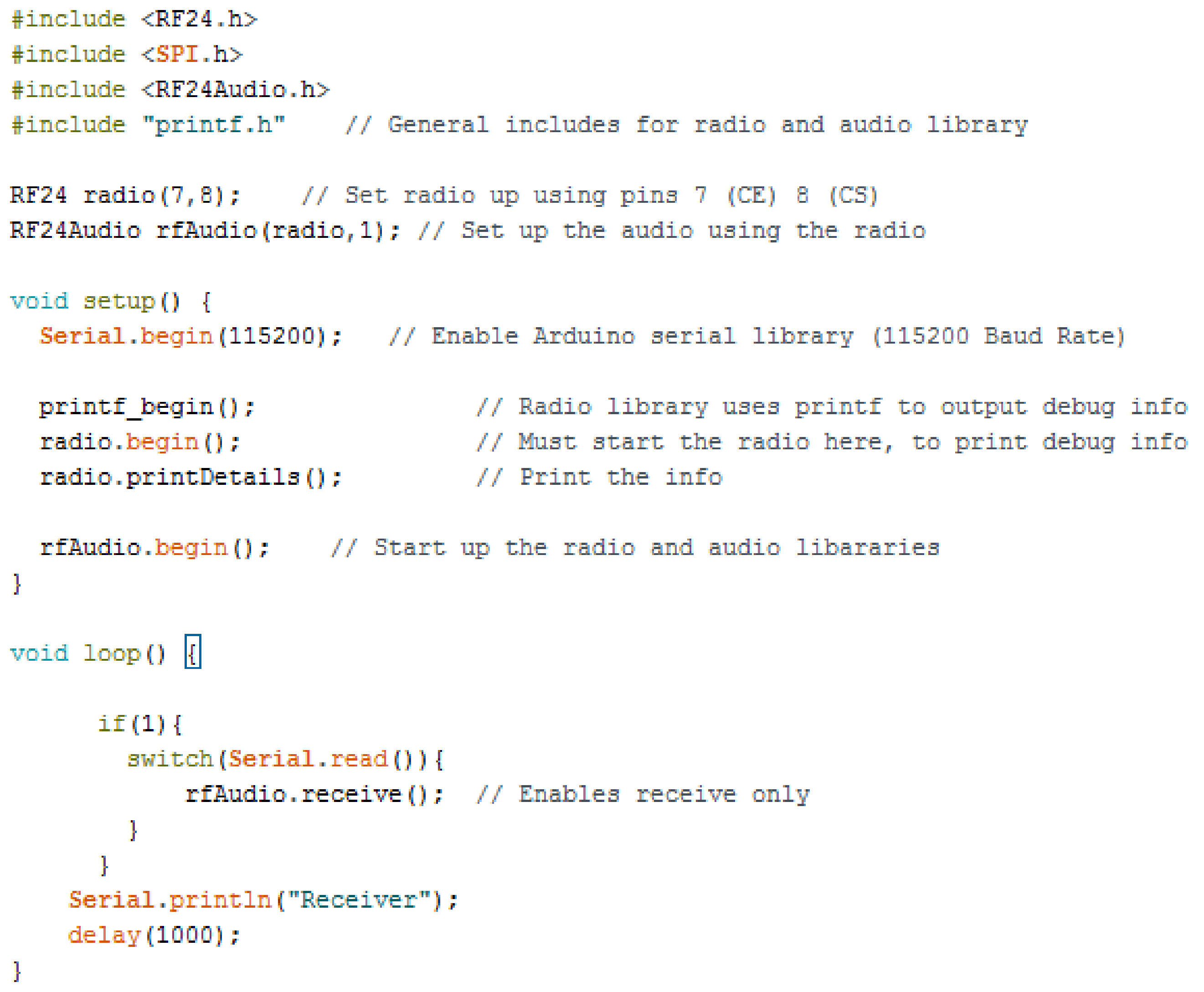




```
#include <RF24.h>
#include <SPI.h>
#include <RF24Audio.h>
#include "printf.h"    // General includes for radio and audio library

RF24 radio(9,10);    // Sets pins 9 (CE) 10 (CS)
RF24Audio rfAudio(radio,1); // Set up the audio using the radio

void setup() {
  Serial.begin(115200);   // Enables Arduino serial library (115200 Baud Rate)

  printf_begin();                // Radio library uses printf to output debug info
  radio.begin();                 // Must start the radio here, to print debug info
  radio.printDetails();          // Print the info

  rfAudio.begin();    // Starts the radio and audio libararies
}

void loop() {

    if(1){
        switch(Serial.read()){
            rfAudio.transmit(); // Enables transmit only
        }
    }
    Serial.println("Transmitter");
    delay(1000);
}
```

Receiver Module





```
#include <RF24.h>
#include <SPI.h>
#include <RF24Audio.h>
#include "printf.h"    // General includes for radio and audio library

RF24 radio(7,8);    // Set radio up using pins 7 (CE) 8 (CS)
RF24Audio rfAudio(radio,1); // Set up the audio using the radio

void setup() {
  Serial.begin(115200);   // Enable Arduino serial library (115200 Baud Rate)

  printf_begin();                // Radio library uses printf to output debug info
  radio.begin();                 // Must start the radio here, to print debug info
  radio.printDetails();          // Print the info

  rfAudio.begin();    // Start up the radio and audio libararies
}

void loop() {

      if(1){
        switch(Serial.read()){
            rfAudio.receive();  // Enables receive only
        }
      }
    Serial.println("Receiver");
    delay(1000);
}
```

CONCLUSION

Project requirements were met and deliverables completed. More research and further testing are expected.