ESP32 webradio – mp3 player with webinterface

First some useful url's.

How to program a ESP32 with the Arduino IDE
https://randomnerdtutorials.com/installing-the-esp32-board-in-arduino-ide-windows-instructions/

More info ESP32
https://randomnerdtutorials.com/projects-esp32/

Internet streaming addresses:
https://www.hendrikjansen.nl/henk/streaming.html#cz

Audio library
https://github.com/schreibfaul1/ESP32-audioI2S

es8388 library
https://github.com/maditnerd/es8388

ESP32 webradio mp3 player with ESP32 audiokit

Partslist :

1 x ESP32 audiokit
https://nl.aliexpress.com/item/32957553086.html?spm=a2g0o.productlist.0.0.389a3d4cBeg5oA&algo_pvid=266b27ae-6d55-46bf-9bf6-94fba3f40677&algo_exp_id=266b27ae-6d55-46bf-9bf6-94fba3f40677-4&pdp_ext_f=%7B%22sku_id%22%3A%2266450553790%22%7D&pdp_npi=2%40dis%21EUR%2119.07%2114.27%21%21%21%21%21%40210318cf16534227642522102ee092%2166450553790%21sea
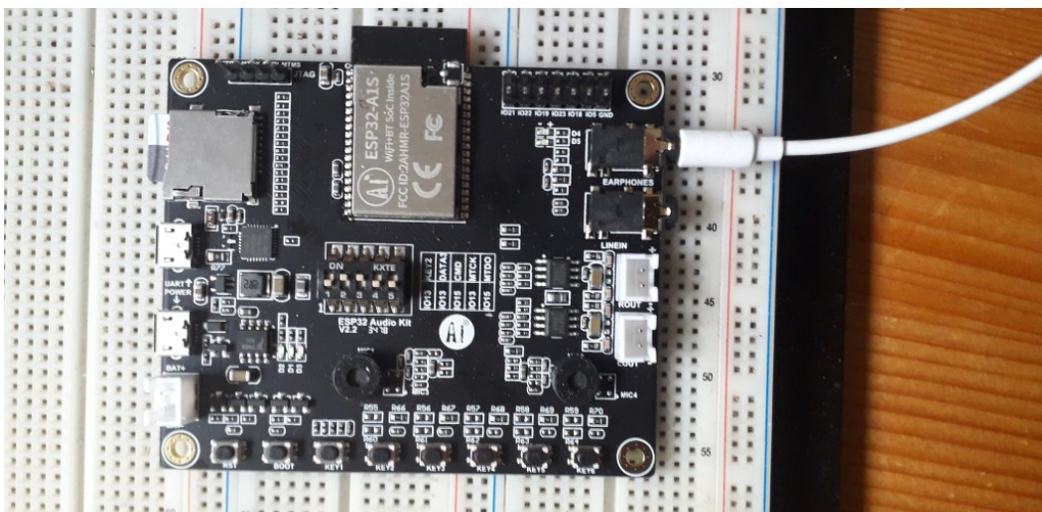
1 x SD card FAT32 formatted.
    When use as mp3 player High Speed SD card.
1 x 5V 2A power supply (smartphone charger is OK)
1 x smartphone for servicing the web-radio
1 x headphone / audio installation.

Zet de dipswitchen op het bord zoals afgebeeld op de foto.

Download and install in the Arduino IDE :

Audio library
https://github.com/schreibfaul1/ESP32-audioI2S

es8388 library
https://github.com/maditnerd/es8388

Go to https://github.com/thieu-b55/ESP32-audiokit-webradio-webinterface

download zipfile   :   SD card files.zip.
download program   :   ESP32_webradio_audiokit.ino

Unzip the zipfile and copy the 4 files (totaal, pswd, ssid en zender_data.csv) to the SD card and put card in the SD card holder.

The following is only necessary is you want to use the mp3 player.

These are the settings for my Linux Mint operating system,

Change <gebruikersnaam> in your username.
In the ***/home/<gebruikersnaam>/arduino-1.8.6/hardware/expressif/esp32/libraries/SD/src/***
folder open the file SD.h and change the frequency as shown in the screenprint.
frequency=25000000

```
#ifndef _SD_H_
#define _SD_H_

#include "FS.h"
#include "SPI.h"
#include "sd_defines.h"

namespace fs
{

class SDFS : public FS
{
protected:
    uint8_t _pdrv;

public:
    SDFS(FSImplPtr impl);
    bool begin(uint8_t ssPin=SS, SPIClass &spi=SPI, uint32_t frequency=25000000, const char * mountpoint="/sd");
    void end();
    sdcard_type_t cardType();
    uint64_t cardSize();
};
```
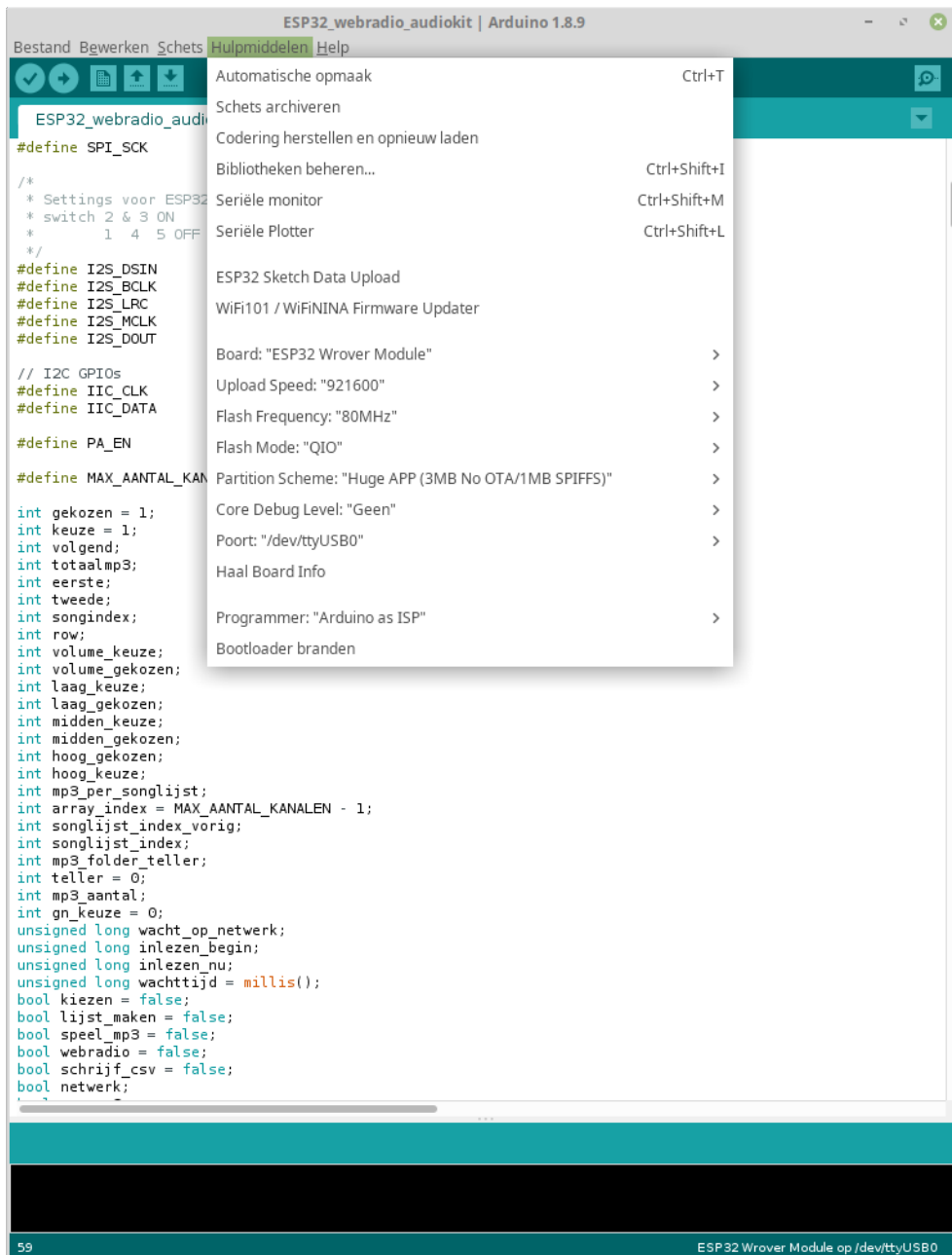
Maybe things are different in your Linux distribution or operating system but look for the SD folder in **../hardware/expressif/esp32/libraries/** another possibly installed SD librarie will not be used.

Open the program ESP32_webradio_audiokit.ino in the Arduino IDE.

Settings see screen-print. Port setting depends on your configuration.

Verify program


```
unsigned long wachttijd = millis();
bool kiezen = false;
bool lijst_maken = false;
bool speel_mp3 = false;
bool webradio = false;
bool schrijf_csv = false;
bool netwerk;
bool nog_mp3;
bool mp3_ok;
bool mp3_lijst_maken = false;
bool ssid_ingevuld = false;
bool pswd_ingevuld = false;
bool songlijsten = false;
char songfile[200];
char mp3file[200];
char song[200];
char datastring[200];
char password[40];
char ssid[40];
char charZenderFile[12];
char speler[20];
char gn_actie[20];
char gn_selectie[20];
char zendernaam[40];
char charUrlFile[12];
char url[100];
char mp3_dir[10];
char folder_mp3[10];
char aantal_mp3[10];
char songlijst_dir[12];
char totaal_mp3[15];
char mp3_lijst_folder[10];
char mp3_lijst_aantal[5];
char leeg[0];
const char* KEUZEMIN_INPUT = "minKeuze";
const char* KEUZEPLUS_INPUT = "plusKeuze";
const char* BEVESTIGKEUZE_INPUT ="bevestigKeuze";
const char* LAAG = "laag_keuze";
const char* MIDDEN = "midden_keuze";
const char* HOOG = "hoog_keuze";
const char* VOLUME = "volume_keuze";
const char* VOLUME_BEVESTIG = "bevestig_volume";
const char* APssid = "ESP32webradio";
const char* APpswd = "ESP32pswd";
const char* STA_SSID = "ssid";
const char* STA_PSWD = "pswd";
const char* ZENDER = "zender";
const char* URL = "url";
const char* ARRAY_MIN = "array_index_min";
const char* ARRAY_PLUS = "array_index_plus";
const char* BEVESTIG_ZENDER = "bevestig_zender";
const char* MIN_INPUT = "min";
const char* PLUS_INPUT = "plus";
const char* BEVESTIG_MP3 ="bevestig_mp3";
String zenderarray[MAX_AANTAL_KANALEN];
```

Upload program

Bestand Bewerken Schets Hulpmiddelen Help

ESP32_webradio_audiokit

```
 * kolom 1  >>  zendernaam
 * kolom2   >>  zender url
*/

#include "Arduino.h"
#include "WiFi.h"
#include "Audio.h"
#include <SPI.h>
#include <Preferences.h>
#include "FS.h"
#include "SD.h"
#include <CSV_Parser.h>
#include <AsyncTCP.h>
#include <ESPAsyncWebServer.h>
#include "Wire.h"
#include "ES8388.h"

static ES8388 dac;
int volume = 80;

Audio audio;
Preferences pref;
AsyncWebServer server(80);

#define SD_CS              13
#define SPI_MOSI           15
#define SPI_MISO            2
#define SPI_SCK            14


/*
 * Settings voor ESP32-A1S v2.2 (ES8388)
 * switch 2 & 3 ON
 *       1  4  5 OFF
 */
#define I2S_DSIN           26
#define I2S_BCLK           27
#define I2S_LRC            25
#define I2S_MCLK            0
#define I2S_DOUT           35

// I2C GPIOs
#define IIC_CLK            32
#define IIC_DATA           33

#define PA_EN              21

#define MAX_AANTAL_KANALEN  75

int gekozen = 1;
int keuze = 1;
int volgend;
int totaalmp3;
int eerste;
int tweede;
int songindex;
```

Bezig met het compileren van de schets...

First you have to fill in your WiFi credentials

Connect your smartphone to
network : **ESP32webradio**
password : **ESP32pswd**

Open the webpage at address 192.168.4.1

Below the titel **ESP Netwerk instellingen**

in the field **ssid** fill in the name for your WiFi network
in the field **pswd** fill in the password for this network
default IP address is 192.168.1.177 .

Below **Gewenst IP address …**
you can change the IP address make sure to stay in the range possible with your WiFi router.
Software does not check the values.

Push <**Bevestig**> and the ESP32 restarts automatically

If everything is OK, the network **ESP32webradio** is no longer available. Connect your smartphone with your WiFi network and open the webpage at 192.168.1.177 or at the chosen IP address.

☆ ⓘ   192.168.1.177   ↺

ESP32 internetradio webinterface

Radio 10 Non-Stop

Chaka Khan - I'm Every Woman

Radio 10 Non-Stop

-	+	OK

EQ -40 <-> 6   Volume 0 <->21

L : [0]   M : [0]   H : [0]   V : [4]

[OK]

Instellen zender en url : 74

[   ]

[   ]

-	+	OK

thieu februari 2022

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A internet-radio should be available at the audio output.

How does it works :

Choose a station
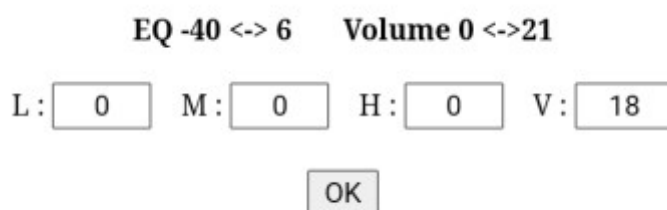
Below the text **ESP32 internetradio webinterface**

Here : Veronica Rock Radio is the station chosen at this moment.
If song data is available it will be shown below the station.

With the <-> <+> en <OK> buttons you can choose another station.

In the list there is also the choice **mp3 lijst maken** en **mp3 speler** more about this at the end of the
manual.

Volume and EQ

L : low
M: middle
H: high

V: volume

L M H   between -40 en 6
V   between 0 en 21
confirm with <OK>
more info about volume and more
https://github.com/schreibfaul1/ESP32-audioI2S/wiki

Setup Stations

Instellen zender en url : 3

Radio 2 Limburg

http://icecast.vrtcdn.be/ra2lim-high.mp3

| - | + | OK |

Instellen zender en url : 74

| - | + | OK |

Already filled in stations or empty positions can be changed at your own choice. Maximum is 75.
In the field below <Instellen zender en url : ..> you can fill in the name of the station.
In the field below this you have to fill in the url of this station.
Confirm with <OK>.

mp3 player

This option can be used when you have connection with your WiFi network or with the ESP32webradio network page 192.168.4.1 when you don't have connection with a WiFi network.

To avoid unwanted silence between two mp3 files it is important to use a fast SD card and change the SPI speed to 25Mhz. **see page 3 of this manual**

The mp3 files are played at random, to make this possible we have to do some things first.
When you have more than 100 mp3 files it is a good idea to divide these files in more folders.
Starting at mp3_0, mp3_1, mp3_2 and so on. How many of these folders you have is not important but they must be in sequence. First mp3_0 then mp3_1 … the program stops searching when there is no next following mp3_. folder.
When you have 1000 mp3 files you can divide these in 10 folders, from mp3_0 to mp3_9.
It is not necessary to have exact the same number of files in a folder but the more equal the better.
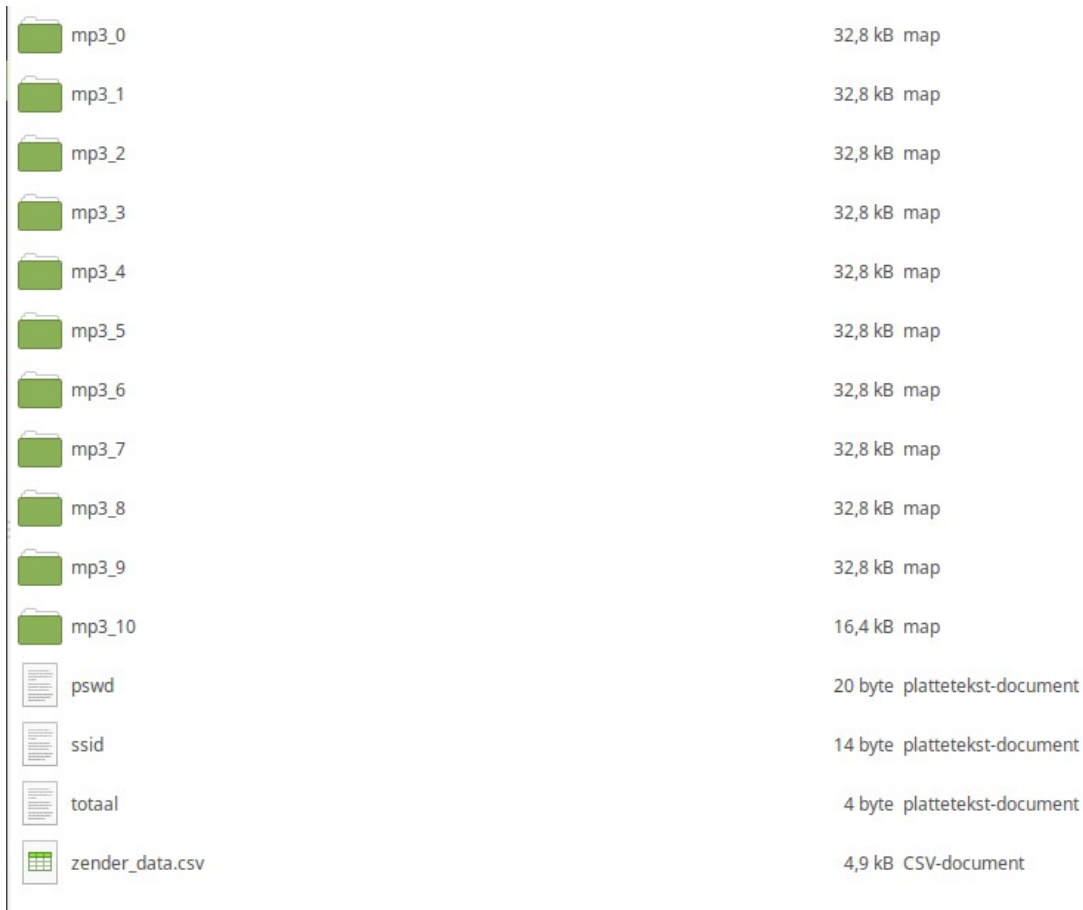
Important:
If this is not the first time you make a mp3 list you have to remove first all *sonlijstx* folders from the SD card.

Screenprint from a SD card with mp3_. folders not read by the program.

📁 mp3_0	32,8 kB	map
📁 mp3_1	32,8 kB	map
📁 mp3_2	32,8 kB	map
📁 mp3_3	32,8 kB	map
📁 mp3_4	32,8 kB	map
📁 mp3_5	32,8 kB	map
📁 mp3_6	32,8 kB	map
📁 mp3_7	32,8 kB	map
📁 mp3_8	32,8 kB	map
📁 mp3_9	32,8 kB	map
📁 mp3_10	16,4 kB	map
📄 pswd	20 byte	plattetekst-document
📄 ssid	14 byte	plattetekst-document
📄 totaal	4 byte	plattetekst-document
📊 zender_data.csv	4,9 kB	CSV-document

After copying all your mp3's to the SD card and if necessary removing all songlistx folders, place the SD card in the holder.

In the part for choosing a station choose <mp3 lijst maken> and press <OK>

ESP32 internetradio webinterface

Radio 10 Non-Stop

Blof - Dichterbij Dan Ooit

| mp3 lijst maken |

[-] [+] [OK]

Reading starts

20:53 🖼 ⓦ   📶 ᴸᵀᴱ¹ 100% 🔋

☆ ⓘ   192.168.1.177   ↻

ESP32 internetradio webinterface

Radio 10 Non-Stop

Blof - Dichterbij Dan Ooit

| mp3 lijst maken |

[-] [+] [OK]

inlezen van :

aantal mp3's ingelezen :

0

seconden reeds bezig :

0

EQ -40 <-> 6   Volume 0 <->21

L : [0]   M : [0]   H : [0]   V : [4]

[OK]

Instellen zender en url : 74

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The progress of the reading can be followed by pressing the reload sign at the right upper corner.

☆ ⓘ   **192.168.1.177**   ↻

ESP32 internetradio webinterface

Radio 10 Non-Stop

Blof - Dichterbij Dan Ooit

mp3 lijst maken

-	+	OK

inlezen van :

/mp3_1

aantal mp3's ingelezen :

149

seconden reeds bezig :

8

EQ -40 <-> 6   Volume 0 <->21

L : [0]   M : [0]   H : [0]   V : [4]

[OK]

Instellen zender en url : 74

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☆ ⓘ   **192.168.1.177**   ↻

ESP32 internetradio webinterface

Radio 10 Non-Stop

Blof - Dichterbij Dan Ooit

mp3 lijst maken

-	+	OK

inlezen van :

/mp3_10

aantal mp3's ingelezen :

1373

seconden reeds bezig :

65

EQ -40 <-> 6   Volume 0 <->21

L : [0]   M : [0]   H : [0]   V : [4]

[OK]

Instellen zender en url : 74

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After finishing reading the webradio starts with the mp3 player.

ESP32 internetradio webinterface

mp3 speler

Bryan Adams - 18 Til I Die

mp3 speler

-	+	OK

Screenprint from the SD card after reading the mp3_.. folders

🟩 mp3_0	32,8 kB	map
🟩 mp3_1	32,8 kB	map
🟩 mp3_2	32,8 kB	map
🟩 mp3_3	32,8 kB	map
🟩 mp3_4	32,8 kB	map
🟩 mp3_5	32,8 kB	map
🟩 mp3_6	32,8 kB	map
🟩 mp3_7	32,8 kB	map
🟩 mp3_8	32,8 kB	map
🟩 mp3_9	32,8 kB	map
🟩 mp3_10	16,4 kB	map
🟩 songlijst0	16,4 kB	map
🟩 songlijst1	16,4 kB	map
🟩 songlijst2	16,4 kB	map
🟩 songlijst3	16,4 kB	map
🟩 songlijst4	16,4 kB	map
🟩 songlijst5	16,4 kB	map
🟩 songlijst6	16,4 kB	map
🟩 songlijst7	16,4 kB	map
🟩 songlijst8	16,4 kB	map
🟩 songlijst9	16,4 kB	map
🟩 songlijst10	16,4 kB	map
📄 pswd	20 byte	plattetekst-document
📄 ssid	14 byte	plattetekst-document
📄 totaal	4 byte	plattetekst-document
📄 zender_data.csv	4,9 kB	CSV-document

Important:
For avoiding endless loops with corrupt mp3 files, at startup the radio allways starts as webplayer. To start mp3 playing you have to choose <mp3 speler> just like you choose another station.

That's all, enjoy the music
greetings,
thieu-b55