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-LyraT
https://docs.espressif.com/projects/esp-adf/en/latest/design-guide/dev-boards/get-started-esp32-lyrat.html

https://docs.espressif.com/projects/esp-adf/en/latest/design-guide/dev-boards/board-esp32-lyrat-v4.3.html

https://dl.espressif.com/dl/schematics/ESP32-LYRAT_V4.3-20220119.pdf

ESP32-LyraT web-radio / mp3 player

Parts-list :

1 x ESP32-LyraT
https://www.tme.eu/be/nl/details/esp32-lyrat/ontwikkelkits-overige/espressif/
https://www.mouser.be/ProductDetail/Espressif-Systems/ESP32-LyraT?qs=MLItCLRbWsxPzPCja546ZA%3D%3D

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 webradio
1 x headphone / audio installation.

Put the dip-switches as shown on the picture.
Sorry picture not very clear.
2 ON 1,3,4,5,6,7,8 OFF

Download and install in the Arduino IDE :

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

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

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

download zipfile : SD card files.zip.
download program : ESP32_LyraT_webradio.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,

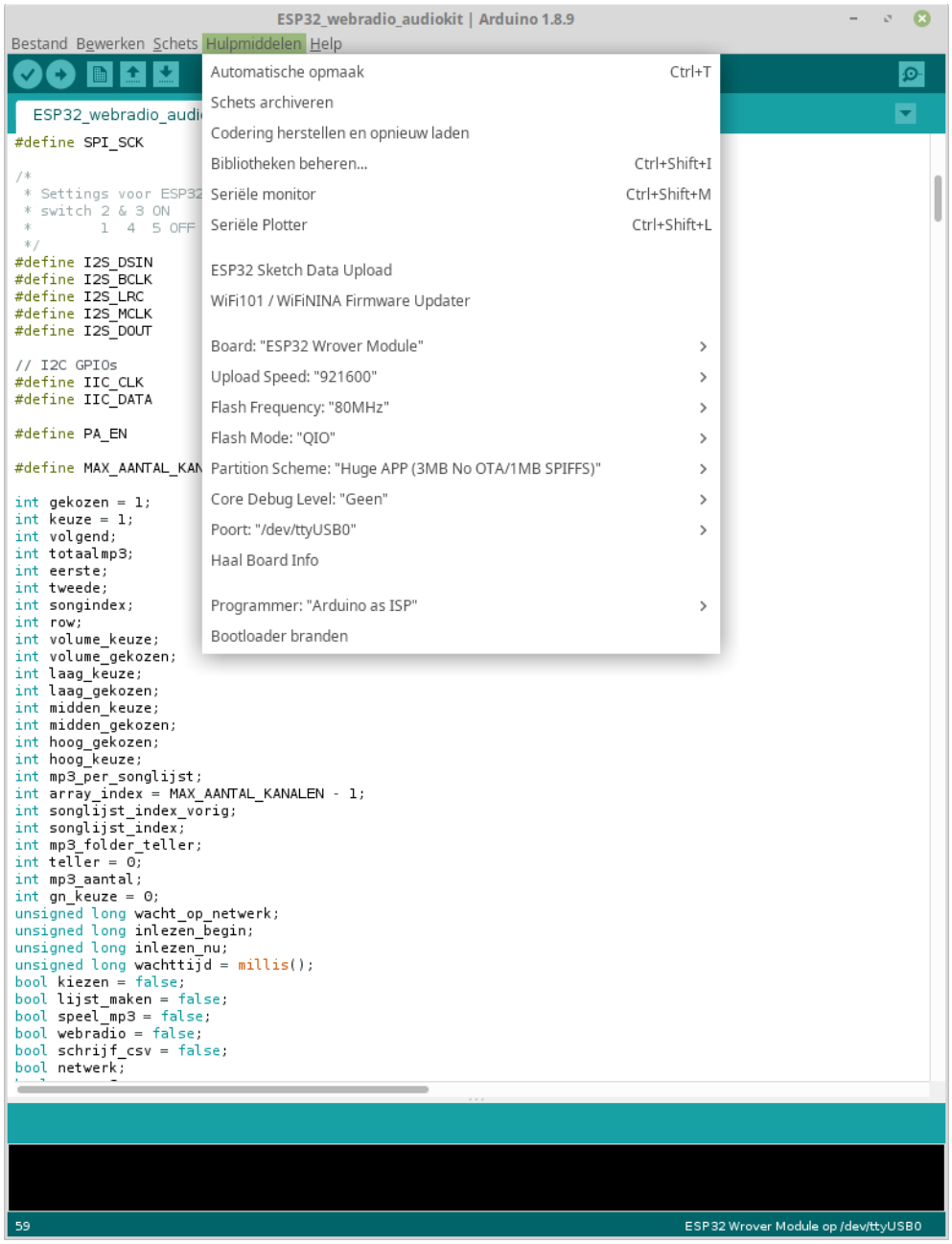
Change <gebruikersnaam> in your username.
In the ***/home/<gebruikersnaam>/arduino-1.8.6/hardware/expressif/esp32/libraries/SD/src/*** folder open the file SD.h and change the frequency as shown in the screen-print.
frequency=25000000

```
#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();
};
```

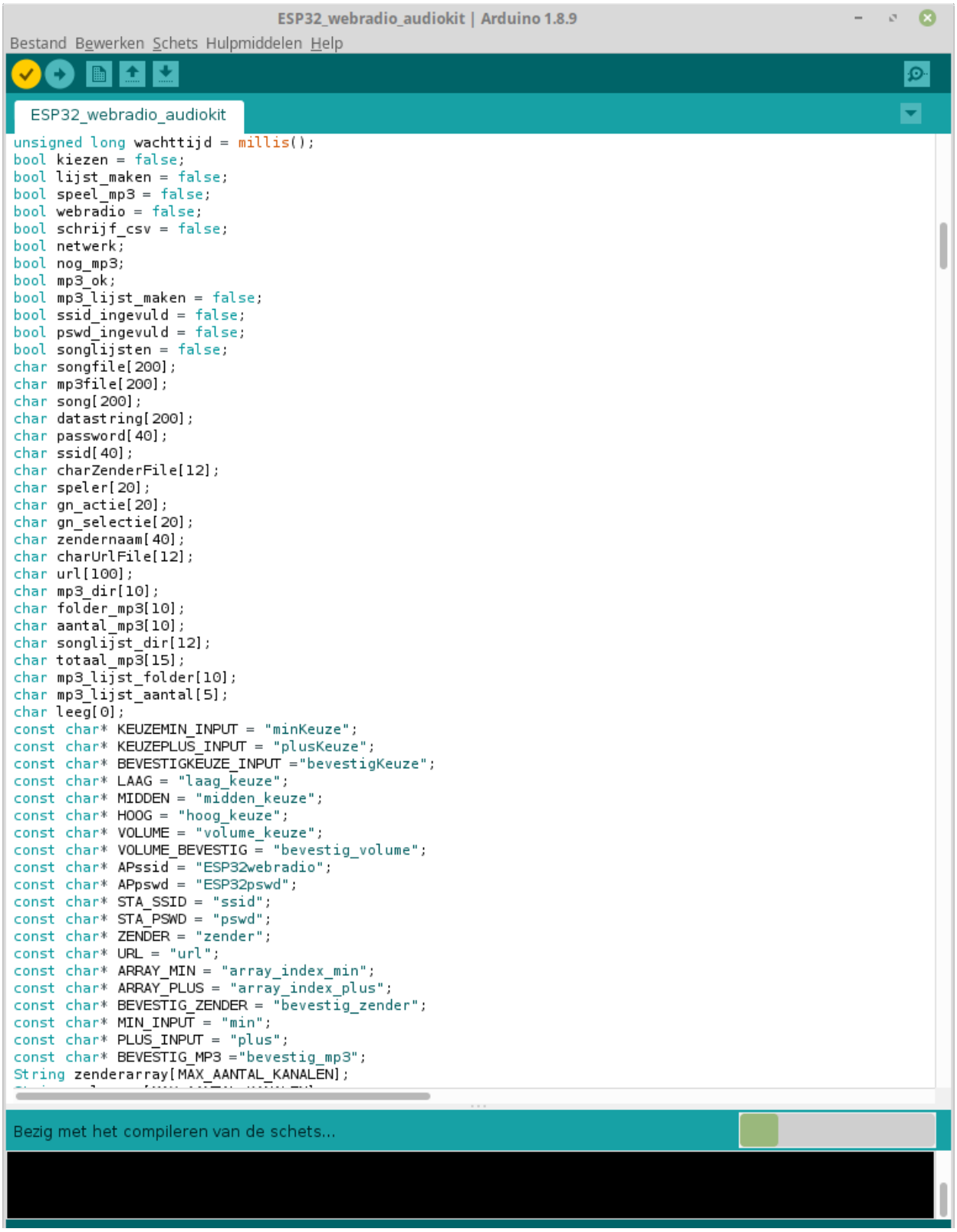
Maybe things are different in your Linux distribution or operating system but look for the SD folder in **../hardware/expressif/esp32/libraries/** another possibly installed SD libraries will not be used.

Open the program ESP32_LyraT_webradio.ino in the Arduino IDE.

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



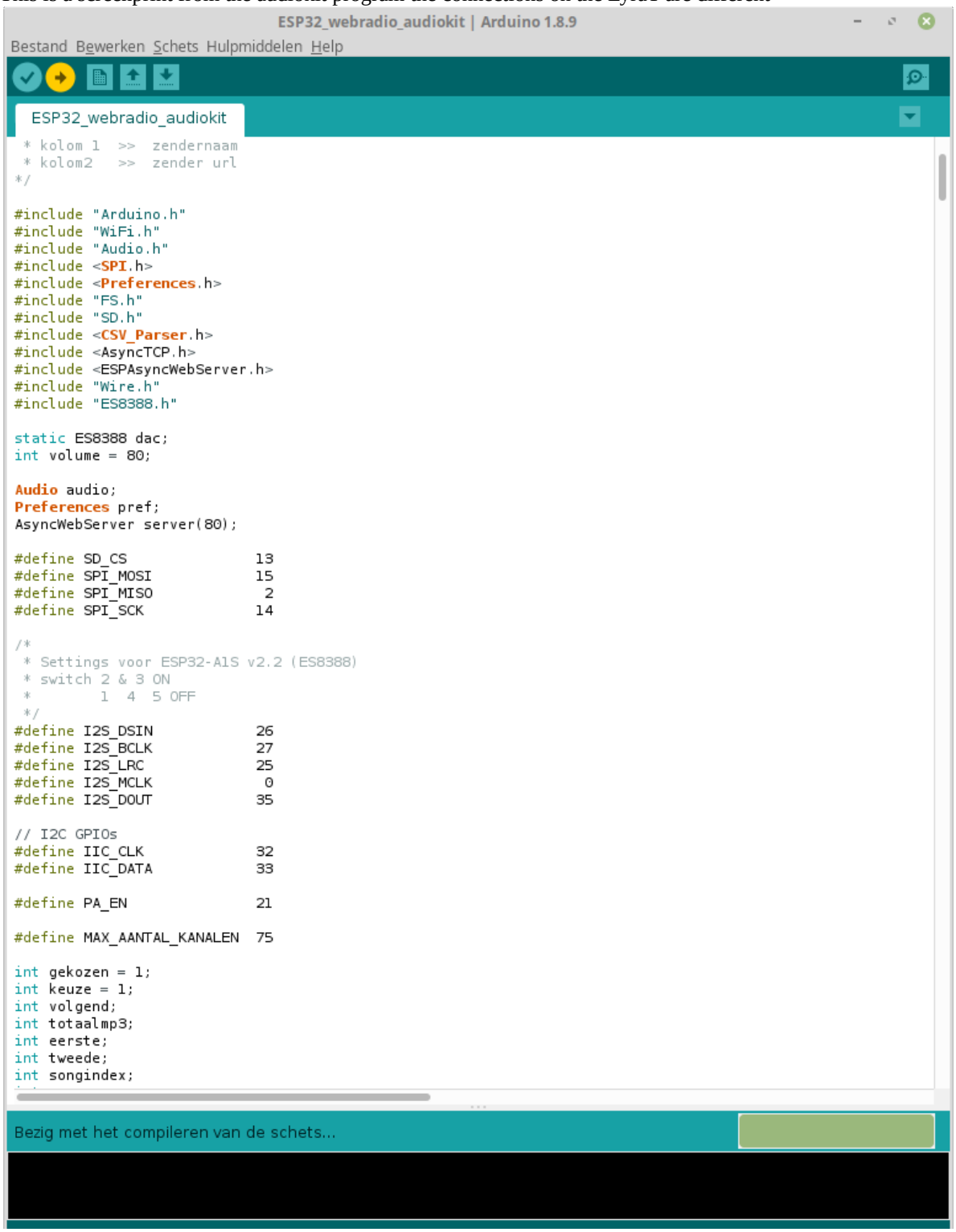
Verify program



Upload program (ESP32 in upload mode : push and hold RESET push and hold BOOT release RESET release BOOT)

Before uploading the program there is an ON-OFF switch in the middle left of the board don't forget to turn it ON

This is a screenprint from the audiokit program the connections on the LyraT are different

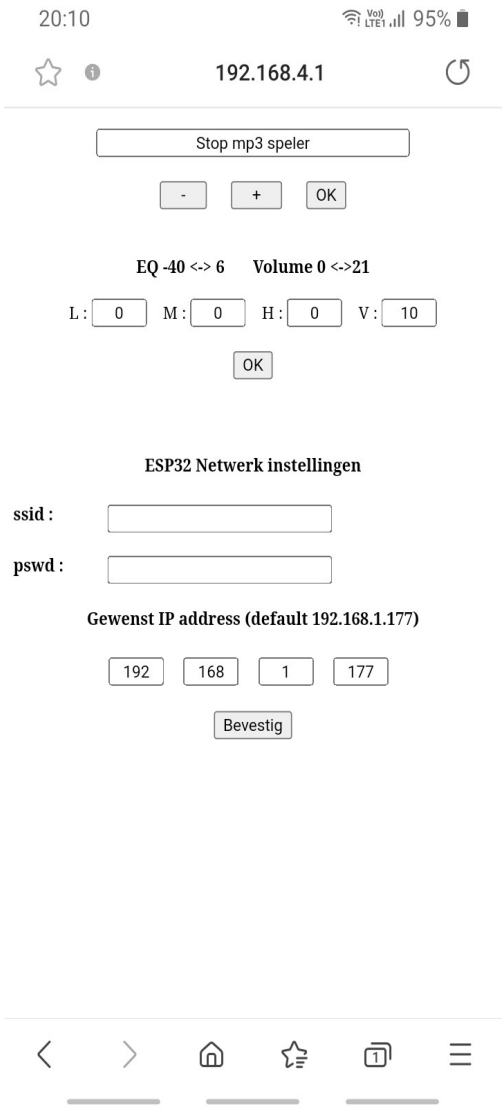


After upload RESET

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



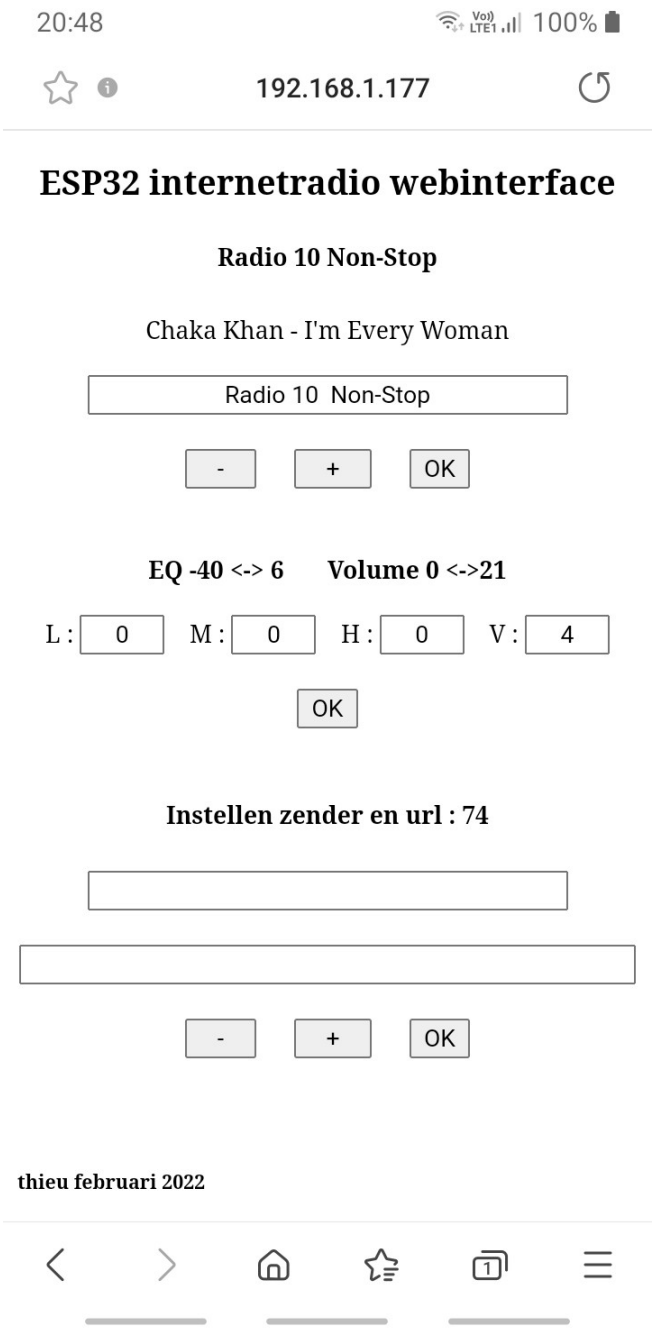
Below the titel **ESP Netwerk instellingen**

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.



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

How does it works :

Choose a station

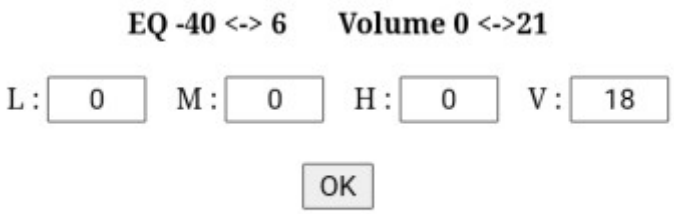
Below the text **ESP32 internetradio webinterface**

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

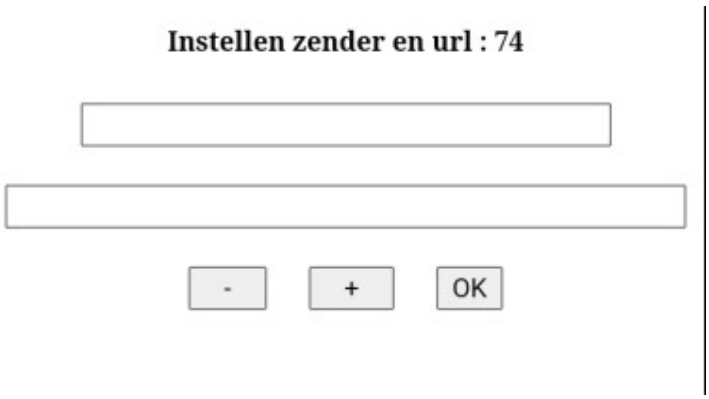


L : low
M: middle
H: high

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



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.

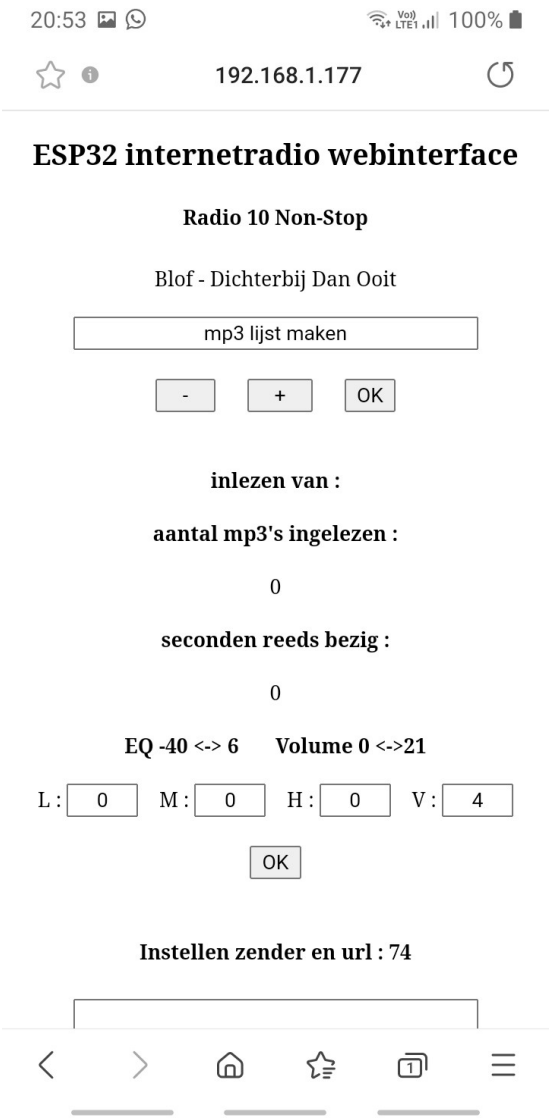
Important:
If this is not the first time you make a mp3 list you have to remove first all *sonlijstx* folders from the SD card.

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

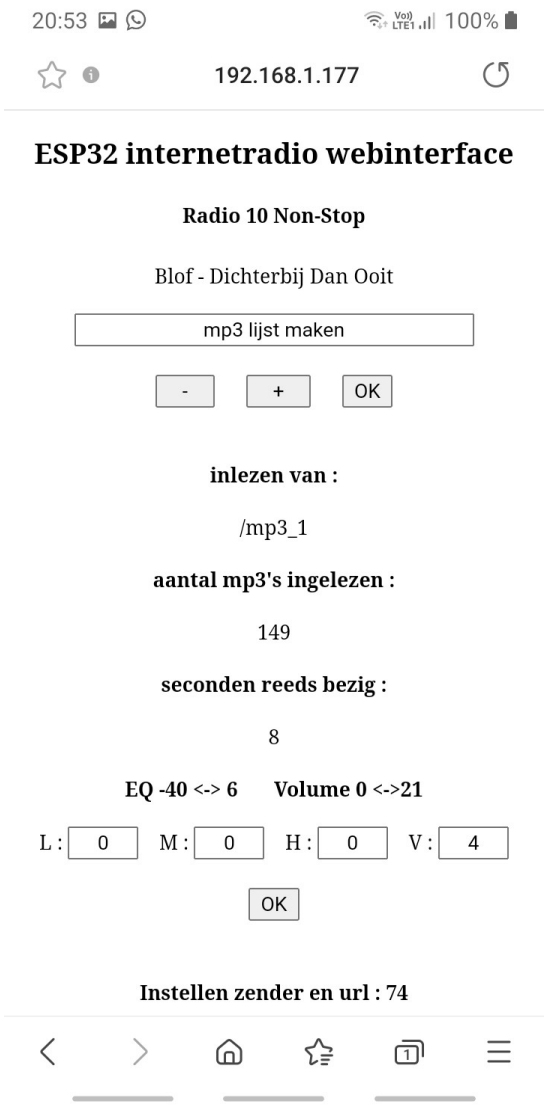
After copying all your mp3’s to the SD card and if necessary removing all songlistx folders, place the SD card in the holder.

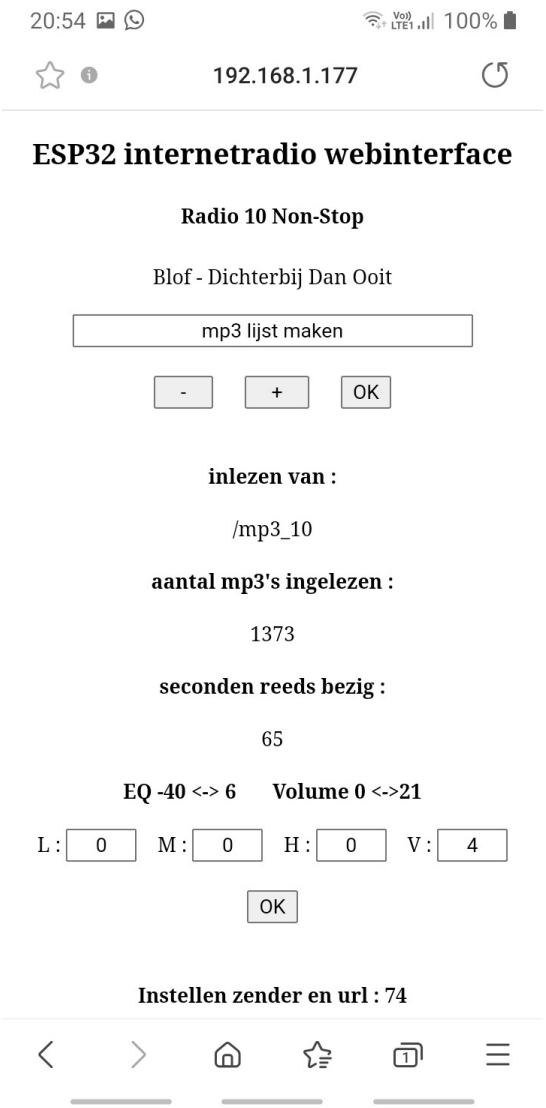
In the part for choosing a station choose <mp3 lijst maken> and press <OK>

Reading starts



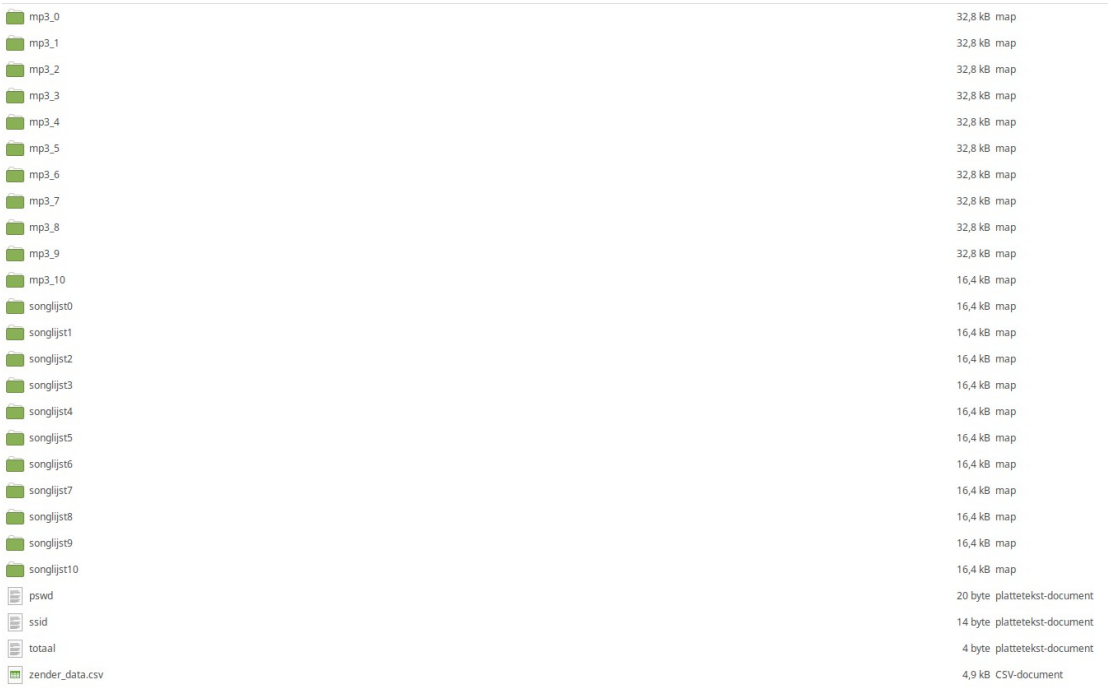
The progress of the reading can be followed by pressing the reload sign at the right upper corner.





After finishing reading the webradio starts with the mp3 player.

Screen-print from the SD card after reading the mp3_.. folders



Important:
For avoiding endless loops with corrupt mp3 files, at start-up the radio always starts as web-player. 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