

Notes on programming with the Arduino IDE

In Preferences:

Additional Boards Manager URLs: https://dl.espressif.com/dl/package_esp32_dev_index.json

Preferences ×

Settings **Network**

Sketchbook location:
D:\Documents\Arduino Browse

Editor language: English (United Kingdom) (English (United Kingdom)) ⌵ (requires restart of Arduino)

Editor font size: 12

Interface scale: ☒ Automatic 100 ⬆ ⬇ ⬆ % (requires restart of Arduino)

Show verbose output during: ☒ compilation ☒ upload

Compiler warnings: All ⌵

☒ Display line numbers

☐ Enable Code Folding

☒ Verify code after upload


☐ Use external editor

☒ Aggressively cache compiled core

☒ Check for updates on startup

☒ Update sketch files to new extension on save (.pde -> .ino)

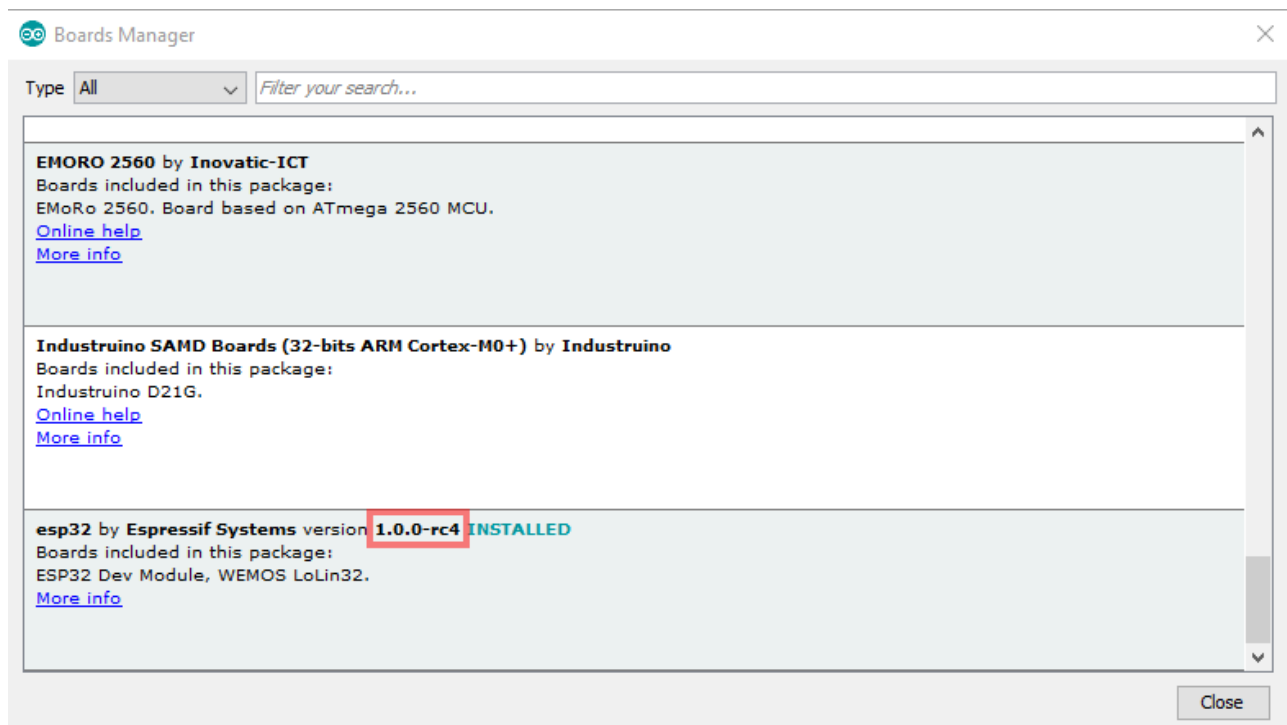
☒ Save when verifying or uploading

Additional Boards Manager URLs: https://dl.espressif.com/dl/package_esp32_dev_index.json 








More preferences can be edited directly in the file
C:\Users\Wolle\AppData\Local\Arduino15\preferences.txt
(edit only when Arduino is not running)

OK Cancel

Install V1.0.0-rc4, not V1.0.1.... (WiFi is not reliable)



In (user) AppData\Local\Arduino15\packages\esp32\hardware\esp32\1.0.0-rc4\tools\partitions
copy the partition table miniwebradio.csv

	boot_app0.bin	26.07.2018 20:32	BIN-Datei	8 KB
	default.bin	26.07.2018 20:32	BIN-Datei	3 KB
	default.csv	26.07.2018 20:32	Microsoft Excel-C...	1 KB
	min_spiffs.csv	26.07.2018 20:32	Microsoft Excel-C...	1 KB
	minimal.csv	26.07.2018 20:32	Microsoft Excel-C...	1 KB
	miniwebradio.csv	23.07.2018 12:50	Microsoft Excel-C...	1 KB
	no_ota.csv	26.07.2018 20:32	Microsoft Excel-C...	1 KB

Then add in boards.txt (section ESP32 Dev Module):

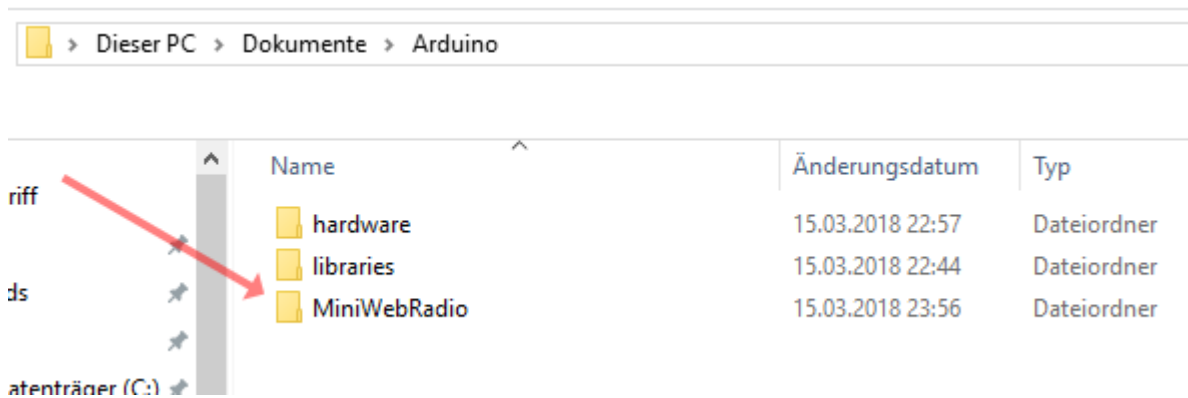
```
esp32.menu.PartitionScheme.miniwebradio=MiniWebRadio (3MB No OTA)
esp32.menu.PartitionScheme.miniwebradio.build.partitions=miniwebradio
esp32.menu.PartitionScheme.miniwebradio.upload.maximum_size=3145728
```

```
esp32.menu.PartitionScheme.default=Default
esp32.menu.PartitionScheme.default.build.partitions=default
esp32.menu.PartitionScheme.minimal=Minimal (2MB FLASH)
esp32.menu.PartitionScheme.minimal.build.partitions=minimal
esp32.menu.PartitionScheme.no_ota=No OTA (Large APP)
esp32.menu.PartitionScheme.no_ota.build.partitions=no_ota
esp32.menu.PartitionScheme.no_ota.upload.maximum_size=2097152
esp32.menu.PartitionScheme.min_spiffs=Minimal SPIFFS (Large APPS with OTA)
esp32.menu.PartitionScheme.min_spiffs.build.partitions=min_spiffs
esp32.menu.PartitionScheme.min_spiffs.upload.maximum_size=1966080
esp32.menu.PartitionScheme.miniwebradio=MiniWebRadio (3MB No OTA)
esp32.menu.PartitionScheme.miniwebradio.build.partitions=miniwebradio
esp32.menu.PartitionScheme.miniwebradio.upload.maximum_size=3145728
```

Select Board and Partition Scheme

Auto Format	Ctrl+T
Archive Sketch	
Fix Encoding & Reload	
Serial Monitor	Ctrl+Shift+M
Serial Plotter	Ctrl+Shift+L
ESP32 Sketch Data Upload	
ESP8266 Sketch Data Upload	
WiFi101 Firmware Updater	
Board: "ESP32 Dev Module"	>
Flash Mode: "QIO"	>
Flash Frequency: "80MHz"	>
Flash Size: "4MB (32Mb)"	>
PSRAM: "Disabled"	>
Partition Scheme: "MiniWebRadio (3MB No OTA)"	>
Upload Speed: "921600"	>
Core Debug Level: "Info"	>
Port: "COM3"	>
Get Board Info	
Programmer: "USBtinyISP"	>
Burn Bootloader	

Create a new sketch and save it as MiniWebRadio. The IDE creates a new folder named MiniWebRadio.



The easiest way to do this is to add all the libraries you need in this folder. The required files can be found in my repositories.

https://github.com/schreibfaul1/ESP32-vs1053_ext














<https://github.com/schreibfaul1/ESP32-IR-Remote-Control> Optional, for a IR Remote Control)

In addition, the driver for an SPI display with Touchpad is required. For the Waveshare 2.8 inch display, the:

<https://github.com/schreibfaul1/ESP32-TFT-Library-ILI9431-HX8347D>

For other displays an adjustment is necessary. The TFT libraries from Adafruit are well suited.

If everything is included, the contents of the folder will look like this:

Name	Änderungsdatum	Typ	Größe
 IR.cpp	31.10.2017 07:39	CPP-Datei	6 KB
 IR.h	31.10.2017 07:39	H-Datei	1 KB
 fonts.h	14.03.2018 09:30	H-Datei	1.424 KB
 tft.cpp	14.03.2018 09:30	CPP-Datei	38 KB
 tft.h	14.03.2018 09:30	H-Datei	10 KB
 vs1053_ext.cpp	15.03.2018 10:50	CPP-Datei	44 KB
 vs1053_ext.h	15.03.2018 10:50	H-Datei	9 KB
 html.cpp	15.03.2018 13:11	CPP-Datei	10 KB
 html.h	15.03.2018 13:11	H-Datei	2 KB
 rtime.cpp	15.03.2018 13:11	CPP-Datei	3 KB
 rtime.h	15.03.2018 13:11	H-Datei	1 KB
 web.h	15.03.2018 13:11	H-Datei	25 KB
 MiniWebRadio.ino	15.03.2018 23:17	INO-Datei	46 KB

The contents of the archive „Content_on_SD_Card. zip " https://github.com/schreibfaul1/ESP32-MiniWebRadio/blob/master/Content_on_SD_Card.zip will be unzipped to the SD card.

Name	Size
..	
voice_time	
ring	
png	
mp3files	
logo	
digits	
day	
btn	
unknown.jpg	3.187
stations.txt	1.635
Night_Gown.bmp	43.062
networks.txt	1.135
MiniWebRadio_gr.jpg	33.793
MiniWebRadio.jpg	22.706
favicon.ico	1.536
Brightness.bmp	112.374

voice_time	Language files for the time (can be played at any hour)
ring	MP3 file for the alarm tone
pictures	Bitmaps to test the display (not strictly required)
mp3files	Music files etc. for the MP3 player
logo	Sender logos as bitmap (96x96 pixels in size)
digits	Alarm clock and time bitmaps
day	Bitmaps for the day (alarm on/off)

btn	Bitmaps for the buttons
stations.txt	The channel list
networks.txt	If more than one WiFi network exists, the access data can be entered here
favicon.ico	is displayed by the browser on the Web portal. The default URL is: http://miniwebradio/index.html
miniwebradio.jpg	The Home screen
Brightness.bmp	Display Brightness menu graphic

Choose the tft controller

```
//objects
TFT tft(1); // parameter: (0)ILI9341, (1)HX8347D
VS1053 mp3(VS1053_CS, VS1053_DCS, VS1053_DREQ);
hw_timer_t* timer=NULL; // instance of the timer
```

And the timezone

```
// Timezone
#define TZName "CET-1CEST,M3.5.0,M10.5.0/3"
```

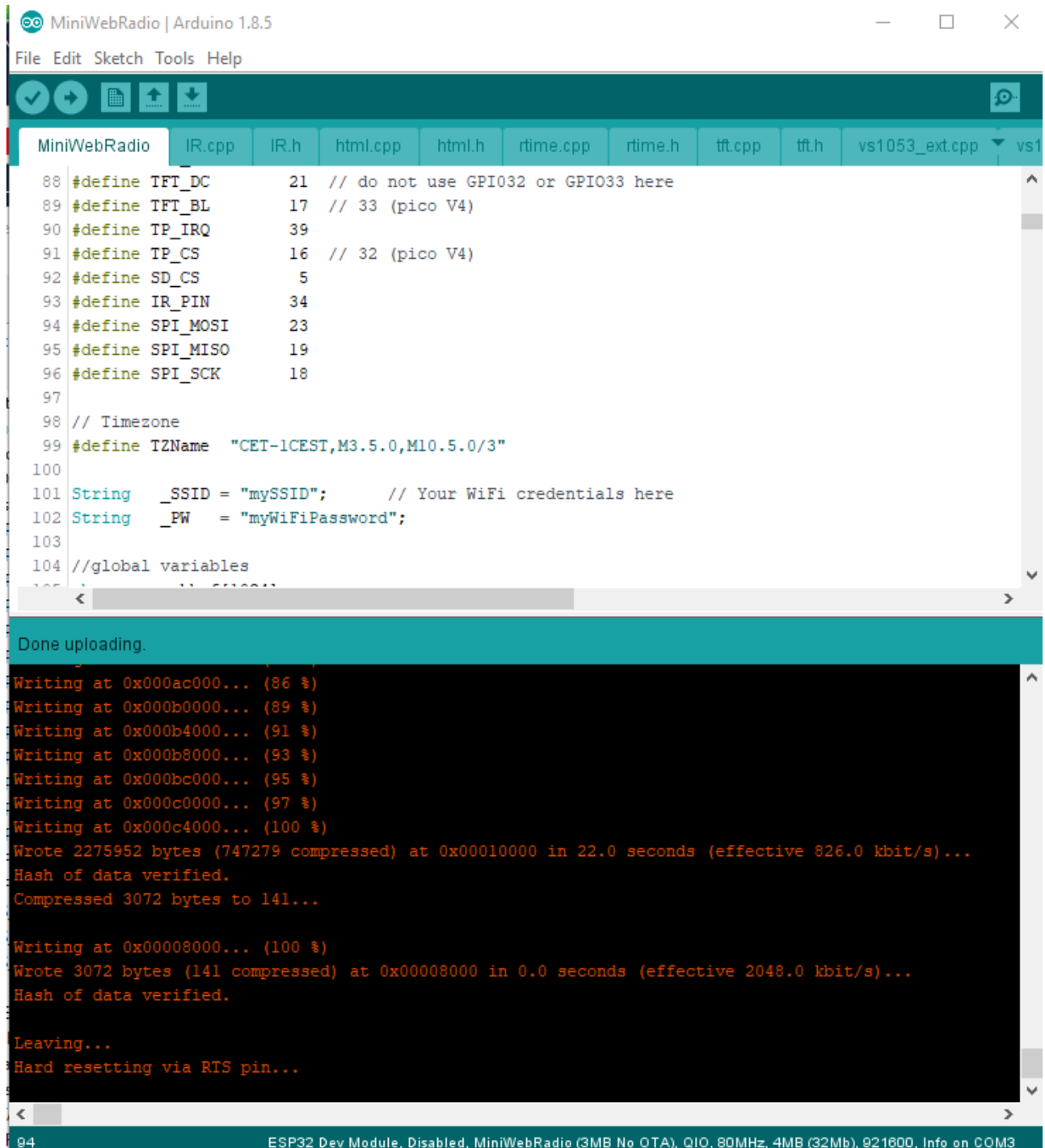
Goto tft.h and include (uncomment) the font Times_New_Roman

```
// this font needs a bigger partition change from "default" to "NO OTA (large app)"
#include "fonts/Times_New_Roman.h" // latin, greek, cyrillic with all extensions
```

Set Your credentials in the code or in networks.txt

```
String _SSID = "mySSID"; // Your WiFi credentials here
String _PW = "myWiFiPassword";
```

After that, the sketch can be compiled and uploaded.



The screenshot shows the Arduino IDE interface with the 'MiniWebRadio' sketch open. The sketch is a C++ program for an ESP32 Dev Module, featuring various hardware definitions and WiFi credentials. The upload progress window is visible at the bottom, showing the successful upload of the sketch to the device.

```
MiniWebRadio | Arduino 1.8.5
File Edit Sketch Tools Help

MiniWebRadio IR.cpp IR.h html.cpp html.h rtime.cpp rtime.h tft.cpp tft.h vs1053_ext.cpp vs1
88 #define TFT_DC      21 // do not use GPIO32 or GPIO33 here
89 #define TFT_BL      17 // 33 (pico V4)
90 #define TP_IRQ      39
91 #define TP_CS       16 // 32 (pico V4)
92 #define SD_CS        5
93 #define IR_PIN      34
94 #define SPI_MOSI     23
95 #define SPI_MISO     19
96 #define SPI_SCK      18
97
98 // Timezone
99 #define TZName "CET-1CEST,M3.5.0,M10.5.0/3"
100
101 String _SSID = "mySSID"; // Your WiFi credentials here
102 String _PW  = "myWiFiPassword";
103
104 //global variables
105
Done uploading.

Writing at 0x000ac000... (86 %)
Writing at 0x000b0000... (89 %)
Writing at 0x000b4000... (91 %)
Writing at 0x000b8000... (93 %)
Writing at 0x000bc000... (95 %)
Writing at 0x000c0000... (97 %)
Writing at 0x000c4000... (100 %)
Wrote 2275952 bytes (747279 compressed) at 0x00010000 in 22.0 seconds (effective 826.0 kbit/s)...
Hash of data verified.
Compressed 3072 bytes to 141...

Writing at 0x00008000... (100 %)
Wrote 3072 bytes (141 compressed) at 0x00008000 in 0.0 seconds (effective 2048.0 kbit/s)...
Hash of data verified.

Leaving...
Hard resetting via RTS pin...

94 ESP32 Dev Module, Disabled, MiniWebRadio (3MB No OTA), QIO, 80MHz, 4MB (32Mb), 921600, Info on COM3
```

Sincerely,

Wolle