

Icom IC-7300 S Meter, SWR & Power Meter

Using ESP32 with 2.8" TFT Display

Project to use an ESP32 and TFT Display with CI-V codes to provide an analog meter for IC-7300 Transceiver. Please note that portions of code and design here are not original – Much help has been found on the internet from others who have worked on similar projects.



Finished project using a HB6011 enclosure from Jaycar. Note that the switch has been wired as an ON/OFF which is not necessary but along with the display a touch screen allows for future addition of functions.

The ESP32 used was listed as an Expressif Wroom 32 Development Board – 36 GPIO Version (38 Pin) DOIT. The display used was a 2.8 inch SPI TFT Module touch screen 240x320. ILI9341 Driver.

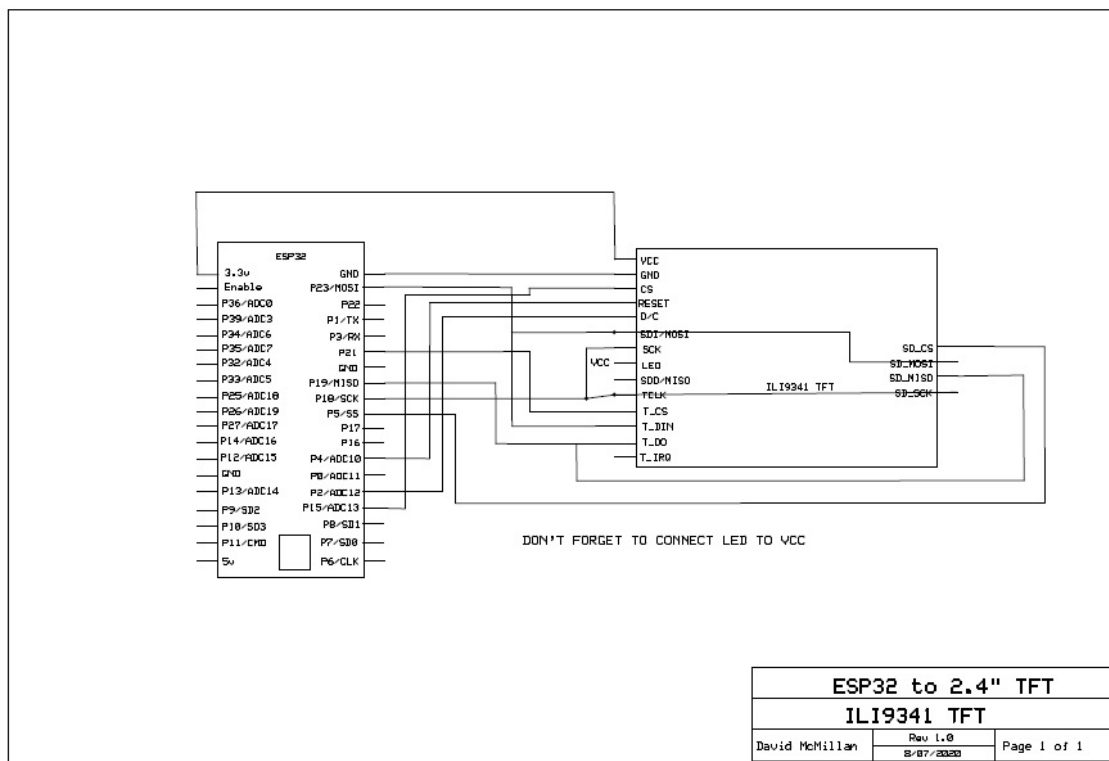
Getting the display to work

Using the Arduino programming platform there were some settings to be done to get the display showing with the wiring connections used. The connections I used are shown below and the setup files I used are included in the program files enclosed with this document.

TFT_eSPI is used so needs to be installed and can be downloaded from https://github.com/Bodmer/TFT_eSPI/ You need to locate the TFT_eSPI directory – in my case in the user Documents - Documents\Arduino\libraries\TFT_eSPI – and place your user customized setup files there. My files used are enclosed which may be used if you set up the display in the same way I have. Access to the Adafruit GFX Free Fonts is also defined in the User_Setup.h in this directory.

Caution: When updates to the Arduino programming platform are done your User_Setup.h and User_Setup_Select.h may get overwritten with the result that on uploading the software to the ESP32 the display ceases to function. I keep a copy of my setups separate to reinstate into the TFT_eSPI folder if this happens.

The display connections shown below include the SD card reader connections which I did not use in this project. Note also that the diagram is labelled for a 2.4" TFT which works fine but I used a 2.8" TFT in the final project.

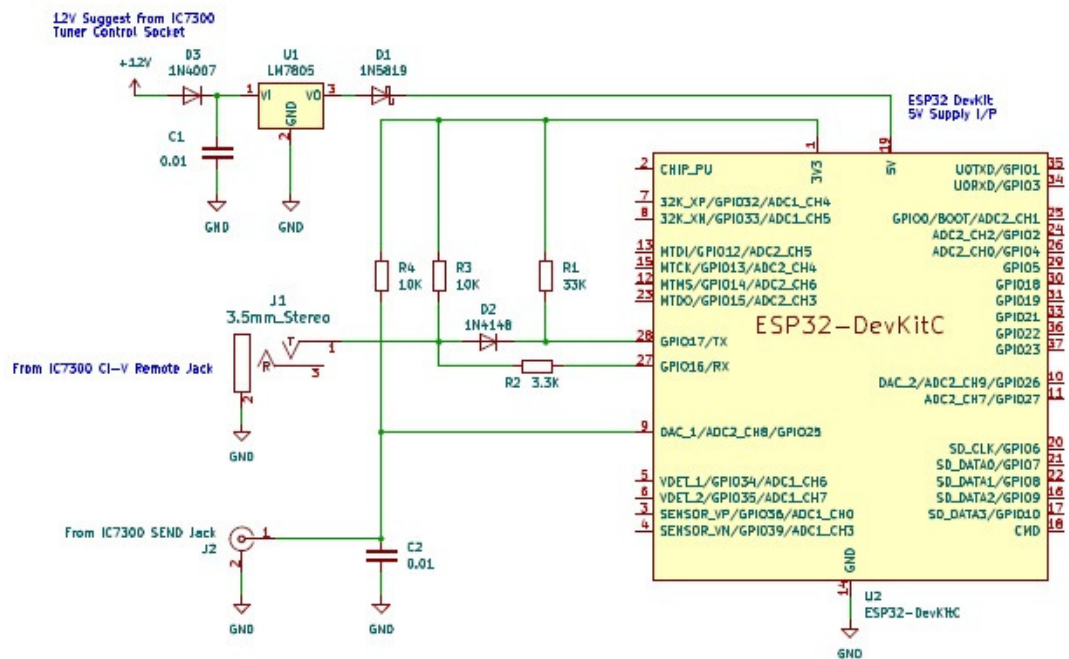


TFT	ESP32
VCC	VCC
GND	GND
CS	P15
RESET	P4
D/C	P2
SDI/MOSI	P23
SCK	P18
LED	VCC
SDO/MISO	NC
TCLK	P18
T_CS	P21
T_DIN	P23
T_DO	P19
T_IRQ	NC
SD_CS	P5
SD_MOSI	P23
SD_MISO	P19
SD_SCK	P18

Connections between the ESP32 and the Display. Don't bother with the SD connections.

Suggest you get the display working before going to the next stage of the project. There are some example programs in the Arduino IDE that may be used to check this.

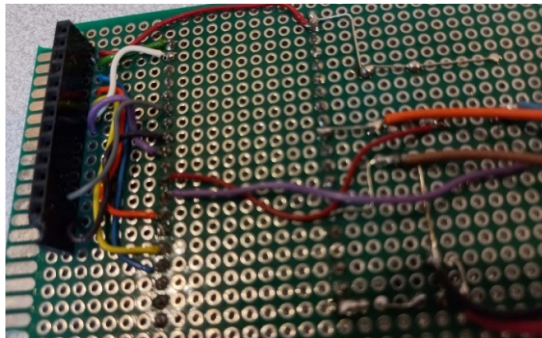
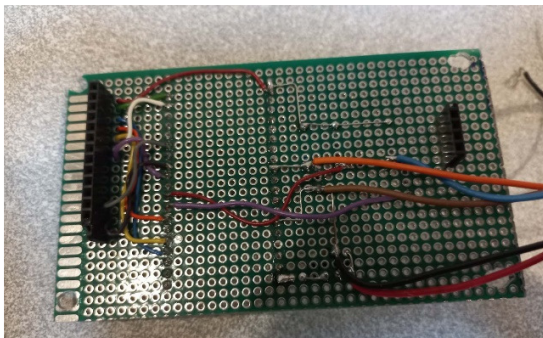
Connecting to the IC-7300

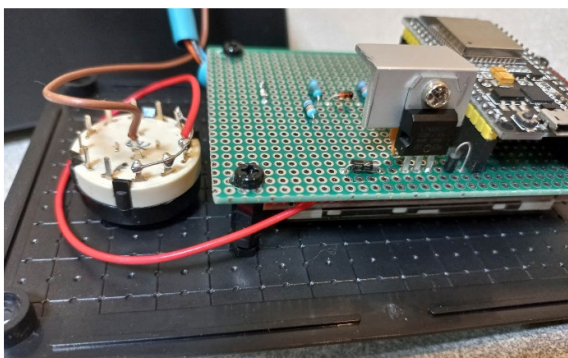
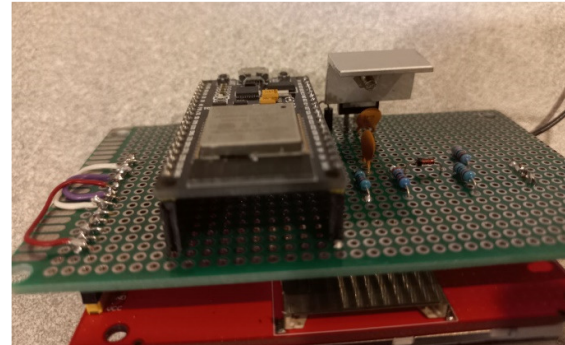
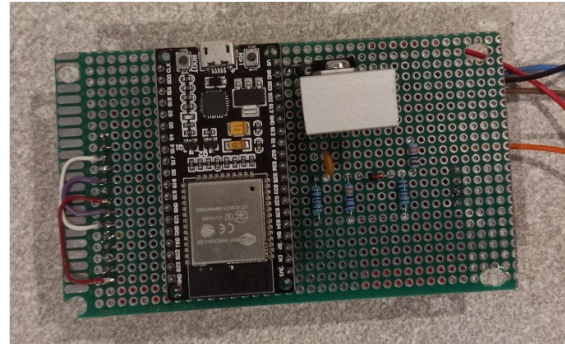
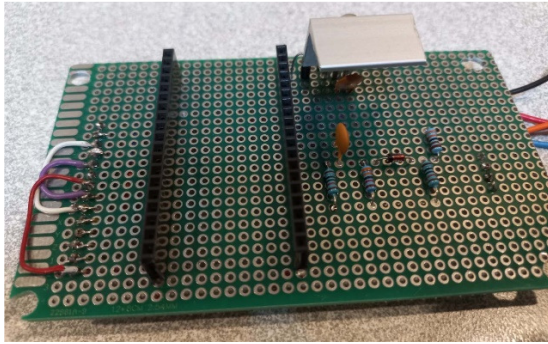


The circuit requires three external connections

1. 12v supply -ve GND and + to the 7805 Regulator – this example was connected to the 12v supply available from the **TUNER CONTROL SOCKET [TUNER]** on the rear of the IC-7300 – via a 1A fuse. This power is available when the transceiver is switched on and avoids the unit trying to communicate with the transceiver when it is switched off.
2. Well shielded audio connection between the **CI-V REMOTE CONTROL JACK [REMOTE]** on the rear of the IC-7300 and the 3.5 mm socket (J1) on the meter. Mono or stereo is okay.
3. A shielded audio lead from the RCA socket **SEND CONTROL JACK [SEND]** on the rear of the IC-7300 to the RCA socket (J2) on the meter.

Construction Stages







Finished project showing the S Meter on the left and on the right the SWR and Power Meter.

A small heat sink was added to the 7805 regulator. It is well within specs without a heat sink but I wasn't too happy with the temperature reached in operation and even this small heat sink made quite a difference. Added after some of the photos were taken was the diode in the 12v connection to the 7805 regulator – just to protect myself from connecting to the power source at the wrong polarity.

Transceiver settings

Select: Menu/SET/Connectors/CI-V

CI-V Board Rate	Auto
CI-V Address	94h
CI-V Transceive	OFF
CI-V USB-Remote Transceive Address	00h
CI-V Output (for ANT)	OFF
CI-V USB Port	Unlink from [REMOTE]
CI-V USB Baud Rate	Auto
CI-V USB Echo Back	OFF

With these settings showing both the meter and software controlling the transceiver through the USB port can work together. Software source using Delphi CI-V control through the USB port is also available on this web site.

Please Note

This project and the software may be freely used and given away but must not be sold for profit. As always you must use it at your own risk.