BlueJammer

- https://github.com/EmenstaNougat/ESP32-BlueJammer → solo binarios
- https://github.com/cifertech/RF-Clown → código
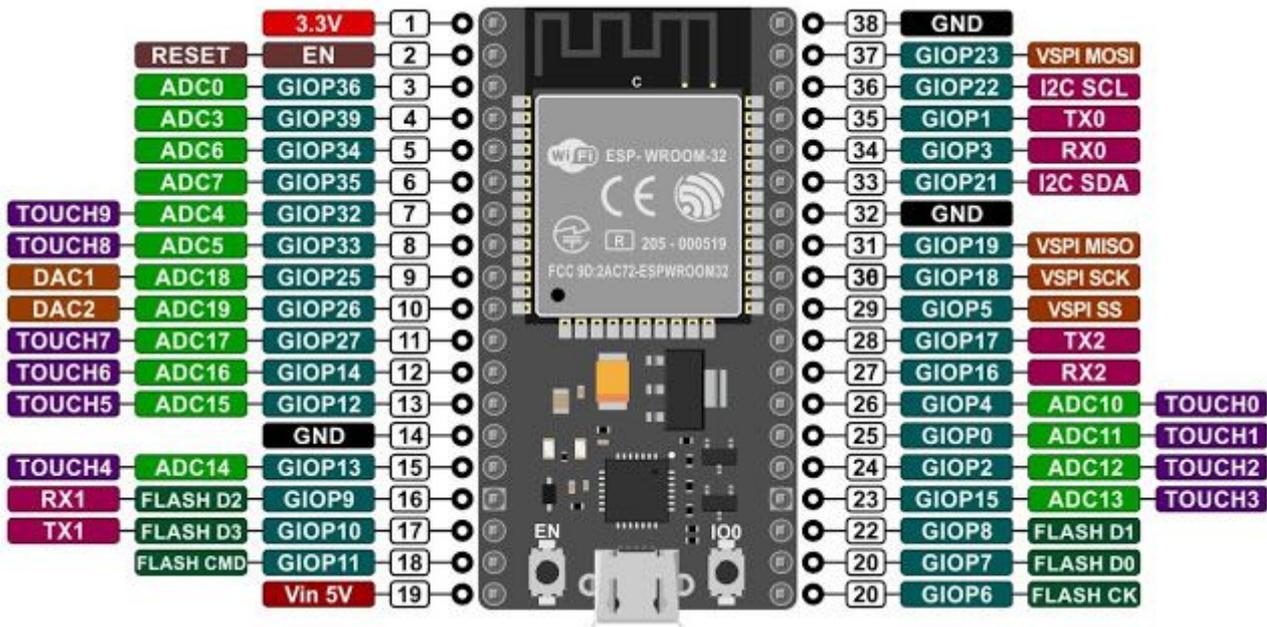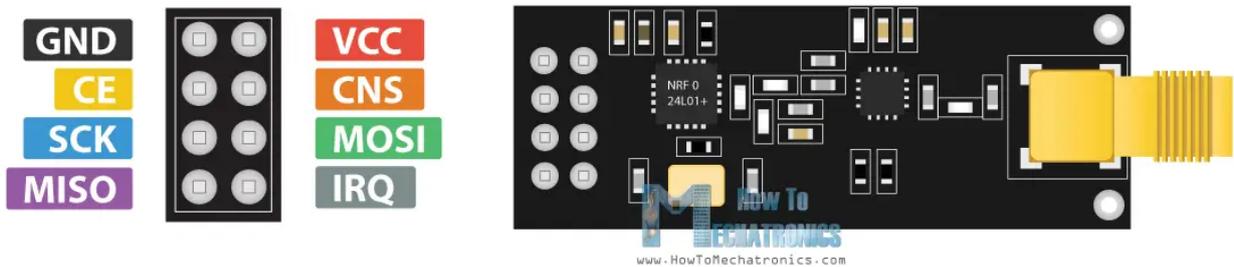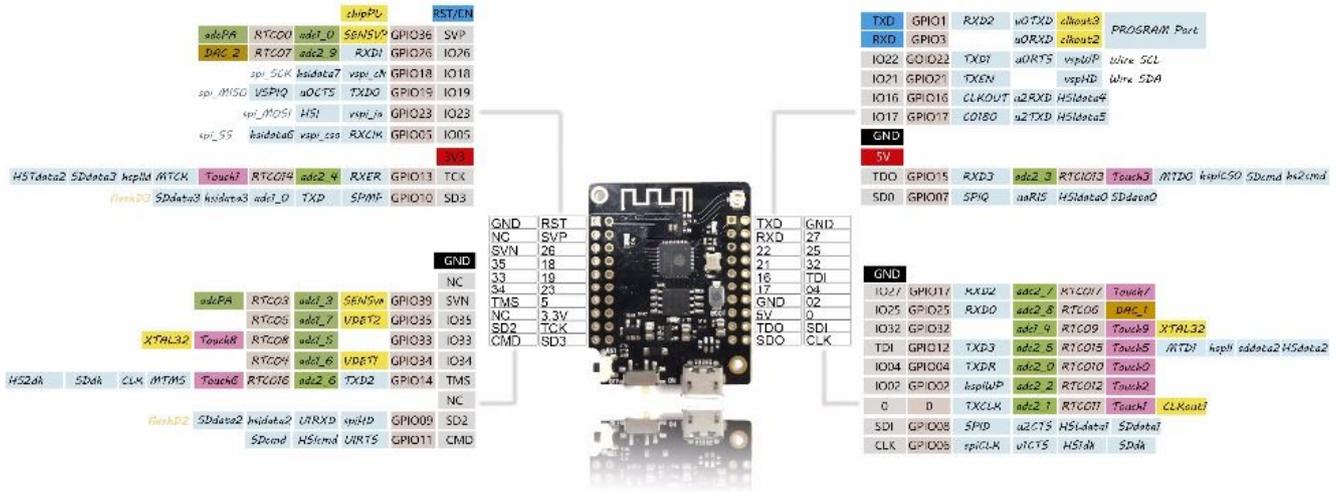
WiFi + Bluetooth Board
4MB Flash MINI 32 v2.0

Power
ESP32 VCC range: 2.2V-3.6V
VBAT: direct to battery (and charger)
VUSB: direct to USB (5V)
VCC: Output of regulator 3.3V/600mA
Up to 250mA during RF transmissions

Wireless
Wifi: 802.11 b/g/n/e/i
WPA/WPA2/WPA2-Enterprise/SPS
Bluetooth: Bluetooth 4.2/BLE

ESP32
Dual-core Xtensa 32-bit LX6
Up to 240MHz
520kB internal SRAM
4MB external flash

Multiplexed I/Os allow up to
18 ADC channels
3 SPI interfaces
3 UART interfaces
2 I2C interfaces
2 I2S interfaces
16 LED PWM outputs
2 DACs
10 Capacitive Touch Inputs

ADC Preamp
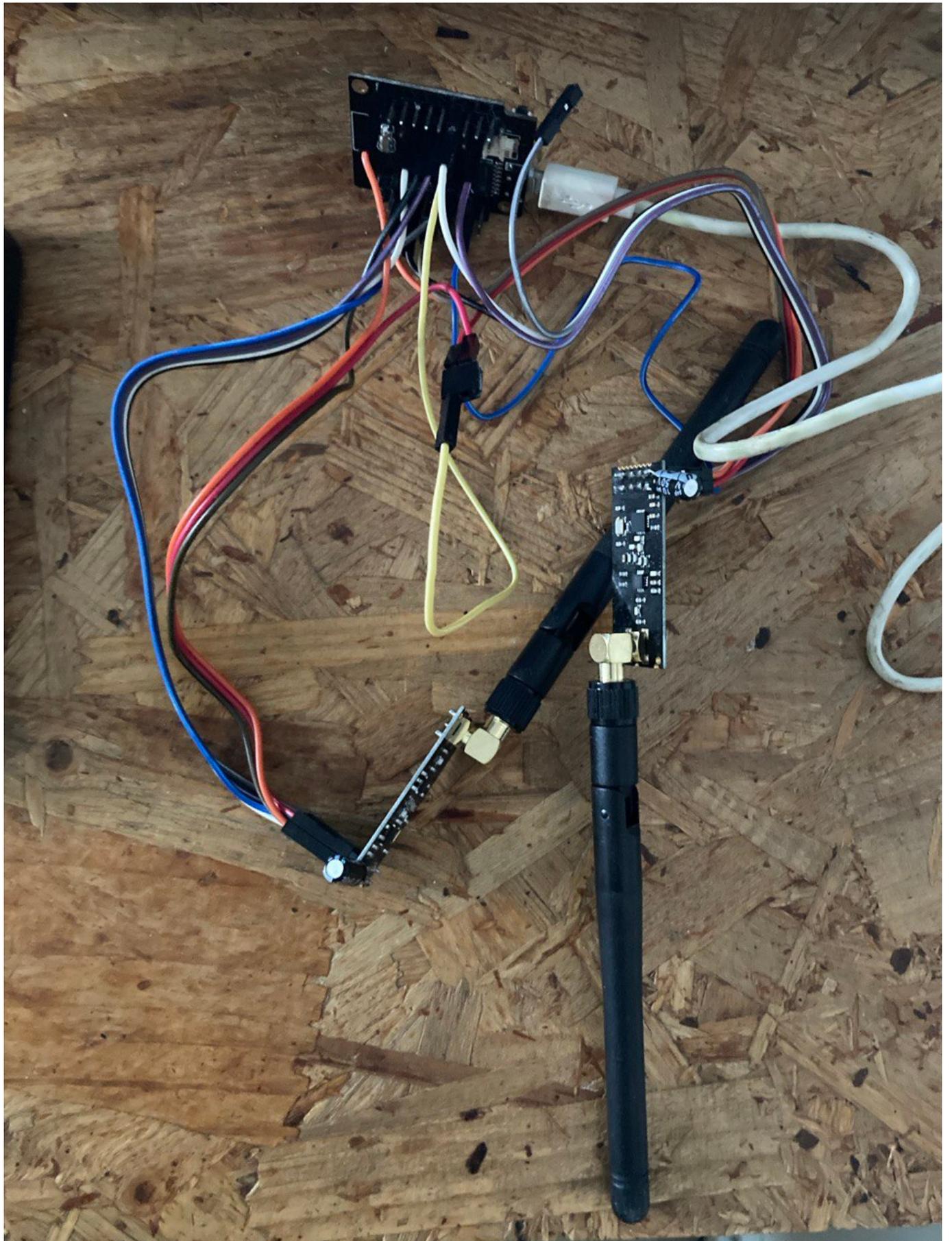GPIO pins 36,37,38, and 39 are able to be used as a low noise analog pre-amplifier

Other*
Hall Sensor
Temp sensor (-40C to 125C)
SD/SDIO/MMC Host Controller
CAN Bus

*On datasheet, but may not be supported yet

Name	ADC
Power	DAC
GND	SPI
Control	UART
Arduino	Touch
GPIO	Misc

*GPIO: Port Input Only
*ADC: Preamplifier ADC
GPIO 3.3V tolerant only

ESP32-nRF24L01+ pinout + battery mod

Here are both pinouts for HSPI and VSPI. You need both nRF24L01 modules connected in order to achieve full capability of the device.
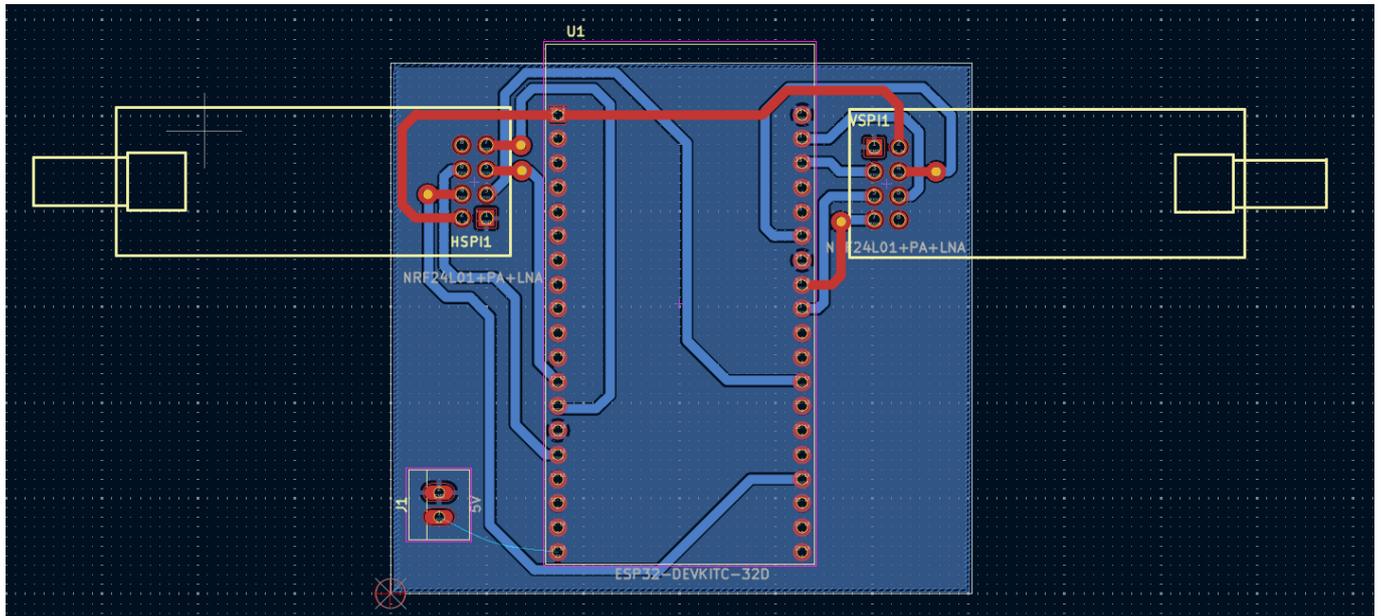[nRF24L01+ pinout](#)

HSPI

1st nRF24L01 module Pin	HSPI Pin (ESP32)	10uf capacitor
VCC	3.3V	(+) capacitor
GND	GND	(-) capacitor
CE	GPIO 16	
CSN	GPIO 15	
SCK	GPIO 14	
MOSI	GPIO 13	
MISO	GPIO 12	
IRQ		

VSPI

2nd nRF24L01 module Pin	VSPI Pin (ESP32)	10uf capacitor
VCC	3.3V	(+) capacitor
GND	GND	(-) capacitor
CE	GPIO 22	
CSN	GPIO 21	
SCK	GPIO 18	
MOSI	GPIO 23	
MISO	GPIO 19	
IRQ		

Diseño y fabricación PCB

Se realiza el diseño para un esp32 de 38 pines usando Kicad. Los archivos gerber obtenidos se procesan usango el comando pc2gcode con el siguiente archivo de proyecto millproject:

```
# pcb2gcode configuration generated from your command (all units in mm)

metric=1
metricoutput=1

# Inputs
back=/home/brolin/Documents/BlueJammer/UnBlueJammer/Gerbers/UnBlueJammer-B_Cu.gbr
outline=/home/brolin/Documents/BlueJammer/UnBlueJammer/Gerbers/UnBlueJammer-Edge_Cuts.gbr
drill=/home/brolin/Documents/BlueJammer/UnBlueJammer/Gerbers/UnBlueJammer-PTH.drl

# Outputs
output-dir=/home/brolin/Documents/BlueJammer/UnBlueJammer/Gerbers/out
basename=UnBlueJammer

# Autolevelling (Mach3)
software=mach3
al-back=0
al-x=100mm
al-y=80mm
al-probefeed=100mm/min

# Z heights and depths
zsafe=3mm
```

```
zchange=15mm
zwork=-0.10mm
zcut=-1.80mm
zdrill=-1.80mm

# Milling (isolation)
# For straight end mills (constant diameter):
#mill-diameters=0.2mm,0.4mm

# For angle tip mills (V-bits) - effective diameter at zwork=-0.10mm:
# Formula: diameter = 2 × depth × tan(angle/2)
mill-diameters=0.035mm   # 20° V-bit at -0.10mm depth
#mill-diameters=0.115mm  # 60° V-bit at -0.10mm depth
#mill-diameters=0.083mm  # 45° V-bit at -0.10mm depth
#mill-diameters=0.054mm  # 30° V-bit at -0.10mm depth
milling-overlap=50%
isolation-width=1mm
mill-feed=100mm/min
mill-vertfeed=50mm/min
mill-speed=10000

# Outline cutting
cutter-diameter=1.0mm
cut-feed=200mm/min
cut-vertfeed=80mm/min
cut-speed=10000
cut-infeed=0.5mm

# Drilling
drill-feed=300mm/min
drill-speed=10000
```

Firmware upload

- Descarga binarios para bootloader, particiones y firmware de https://github.com/EmenstaNougat/ESP32-BlueJammer/archive/refs/tags/ESP32-BlueJammer-v2.zip dentro de la carpeta Firmware_Files están los archivos
- El instalador web no funcionó (https://esp32-bluejammerflasher.pages.dev/)
- Se sube el firmware usando esptool

```
└λ # Upload with bootloader and partitions (if you have separate files)
    esptool --chip esp32 --port /dev/ttyUSB0 --baud 921600 \
        --before default_reset --after hard_reset \
        write_flash 0x1000 bootloader.bin \
        0x8000 partitions.bin \
        0x10000 firmware.bin
```

El firmware una vez cargado de manera exitosa arranca pero presenta errores al momento de leer los chips nRF24

Referentes

- https://lastminuteengineers.com/nrf24l01-arduino-wireless-communication/
- https://grabcad.com/library/nrf24l01-pa-lna-1
- https://github.com/Steffen-W/Import-LIB-KiCad-Plugin#use-of-the-application
- https://github.com/pcb2gcode/pcb2gcode

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