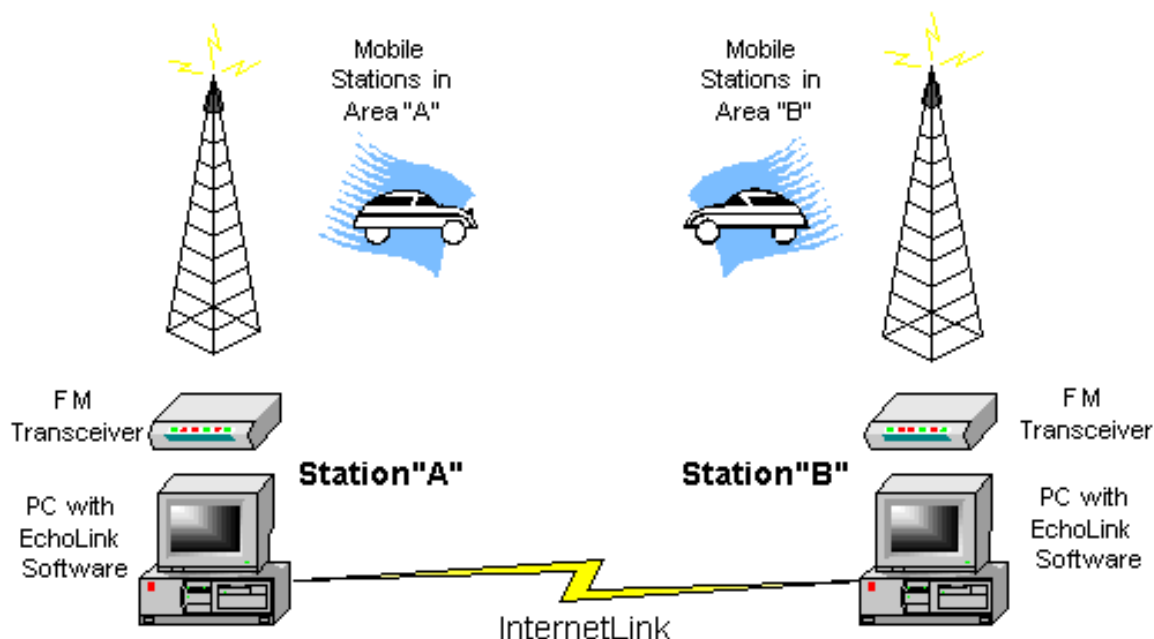


Réalisation d'un relais SVXLINK composé d'un RASPERRY 2B et d'un portable KENWOOD TH-205

SVXLINK conçu par SM0SVX (Echolink est l'équivalent en Windows conçu par K1RFD) est un logiciel qui permet aux radioamateurs de communiquer entre eux via Internet en utilisant la technologie VoIP (voix au-dessus du Protocole Internet).

Linking Example

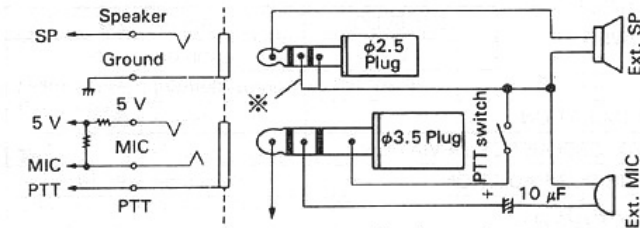


Dans cet article, nous utilisons un RASPERRY 2B avec un dongle WiFi et un TH-205 comme récepteur/émetteur FM portable.



4 Using Other Microphone

If not using the SMC-33, we recommend using an electret type microphone. The input impedance is 2k ohms and the DC voltage on the microphone terminal is approximately 4 volts (Max. 3.5 mA). Do not use a dynamic microphone.



※ Always ensure that this connection is made.

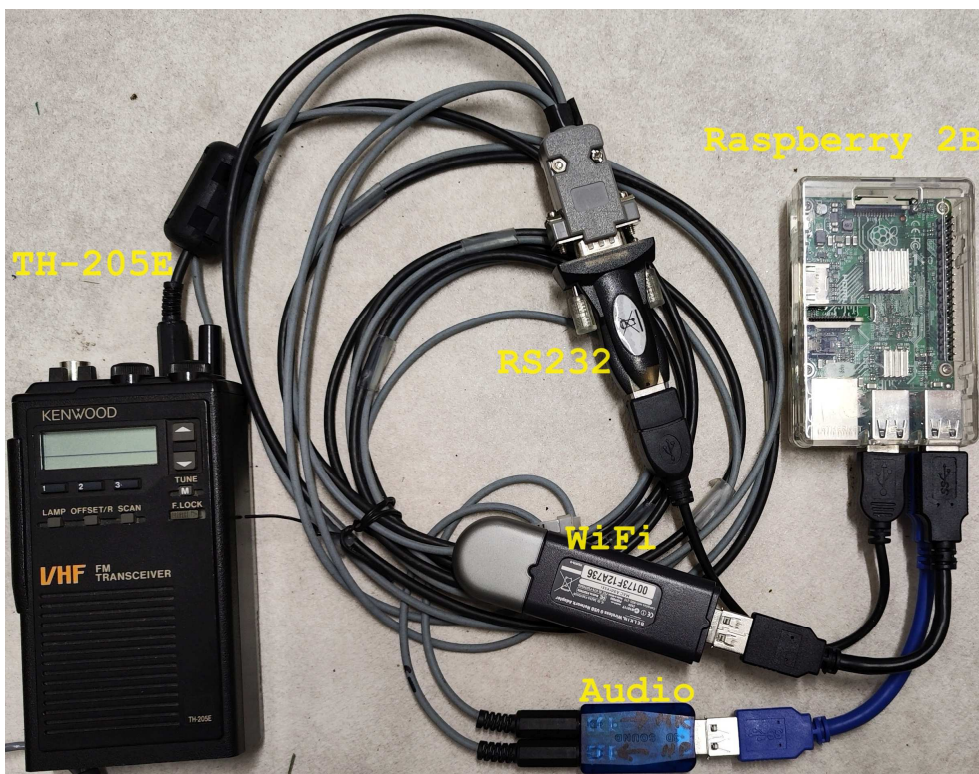
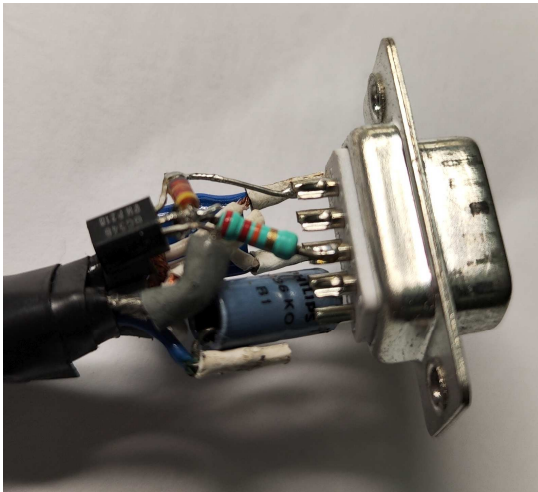
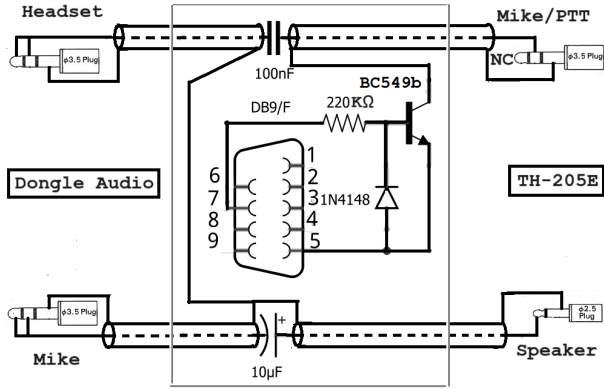
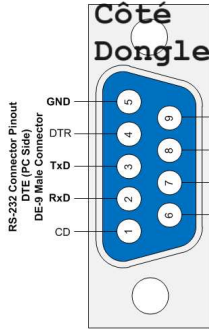
Première réalisation sans modification du Rx/Tx

Les liaisons entre le Raspberry et le TH-205 sont:

- un dongle audio pour micro et casque connectés via deux jacks stéréo 3.5



- un dongle RS232 pour le PTT via la masse jack stéréo 3.5

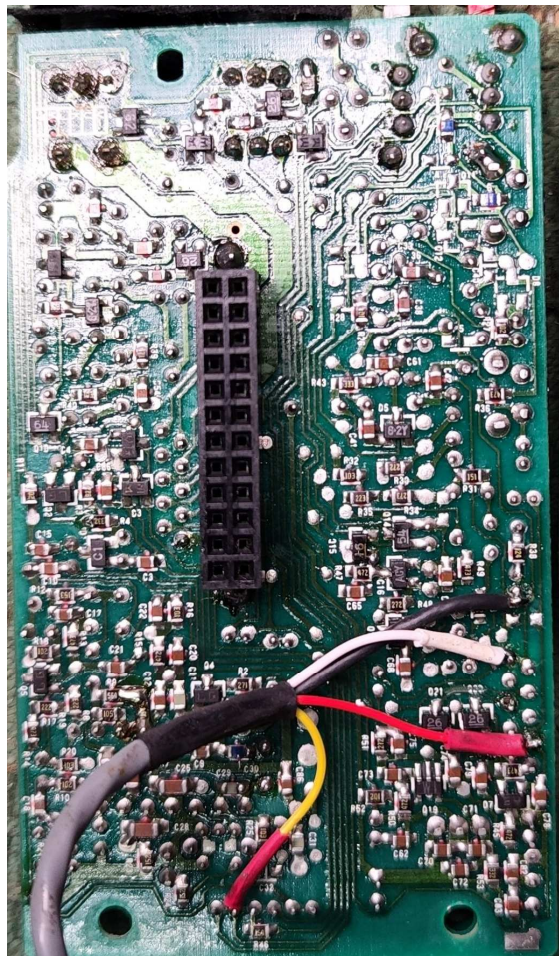


Il faut ajuster quelques paramètres dans le fichier svxlink.conf

```
#####  
# Configuration file for the SvxBLink server #  
#####  
[Rx1]  
...  
AUDIO_DEV=alsa:plughw:1 (dongle Audio)  
AUDIO_CHANNEL=0  
SQL_DET=VOX (Voice Operated switch ou Voice-Operated eXchange)  
...  
[Tx1]  
...  
AUDIO_DEV=alsa:plughw:1 (dongle Audio)  
AUDIO_CHANNEL=0  
PTT_TYPE=SerialPin  
PTT_PORT=/dev/ttyUSB0 (dongle RS232)  
PTT_PIN=DTRRTS
```

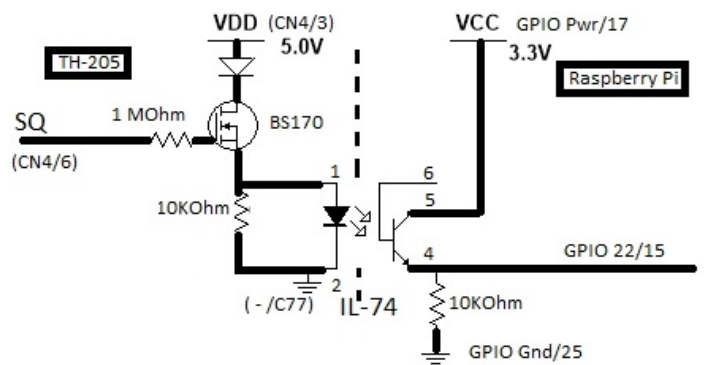
En configuration VOX l'audio n'est pas toujours bien détectée et si un silence se présente SVXLINK bascule en pause d'où l'idée de récupérer un signal porteuse HF (Squelch) du Rx/Tx et de l'injecter dans le Raspberry avec le montage suivant:

Seconde réalisation avec modification du Rx/Tx (Squelch avec GPIO)



CN3 5/ ST

- CN4
- Masse
- 10/ AFC
- 6/ SQ
- 3/ VDD 5v



Regardons le descriptif du circuit squelch :

TH-205A/AT/E

CIRCUIT DESCRIPTION

Microprocessor and its peripheral circuits

This unit is controlled by 4-bit 1-chip microprocessor μ PD7502G incorporating an LCD driver. The display uses LCD for saving power consumption.

• Backup circuit

When voltage CB drops to near 4V, the collector of Q2 : 2SC2412K on the panel ass'y goes high (HI), pin 55 of the microprocessor also goes high (HI), and the microprocessor enters the backup mode.

When voltage CB returns to the normal condition, pin 55 also returns to low (LO). As pin 56 returns low (LO) with a certain delay after pin 55 has returned low (LO), there is a period in which pin 55 is low (LO) while pin 56 is high (HI), and the microprocessor is reset in this period.

When the microprocessor is reset, the content of its RAM (stored frequencies, etc.) is backed up by the lithium battery and is not cleared by resetting.

• Squelch circuit

The received signal, detected by IC1 : TA7761P of IF unit, is noise-amplified by the active filter using the amp inside the IC and by Q4 : 2SC2712(GR), then rectified and smoothed.

The voltage adjusted with SQ-VOL. is used to turn Q2 ON/OFF in order to supply the above output to the microprocessor's SQ port (pin 61).

When the unit is busy, SQ port goes high (HI) and "BUSY" is displayed on the LCD display. At the same time, the microprocessor's AFC port (pin 4) goes low (LO) and the power supply to IC2 is turned ON by Q8 : 2SA1241(Y), Q9 : 2SC2712(GR) and Q10 : DTC114TK in the IF unit to open the Squelch circuit. When the MONITOR switch is pressed, the SQ line goes high (HI) and AFC line goes low (LO) to open the squelch circuit forcibly.

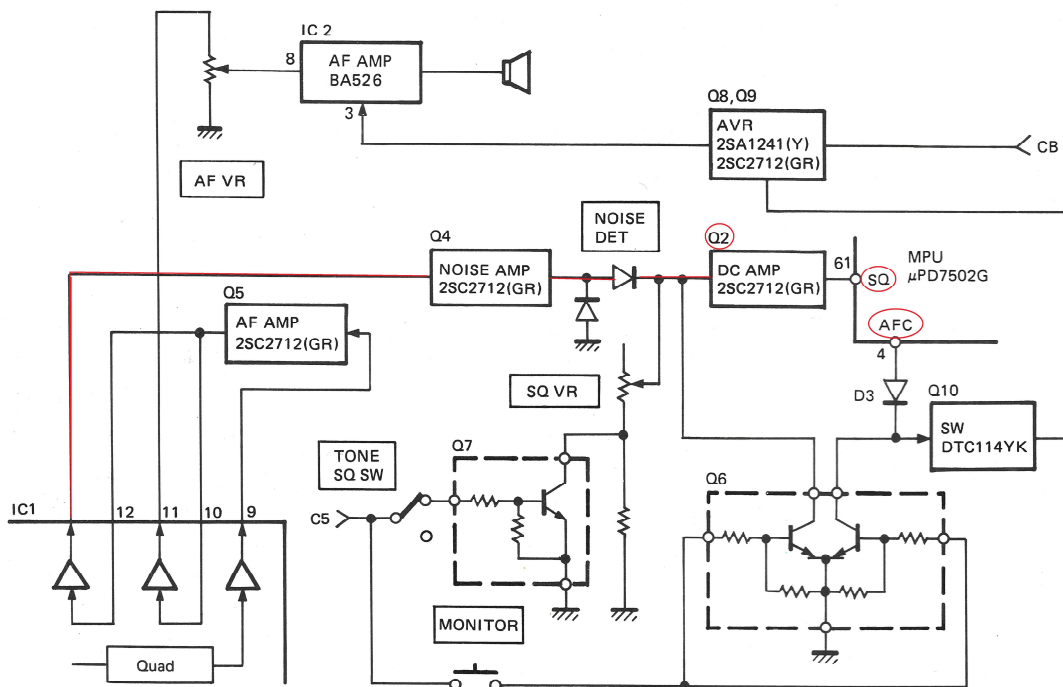
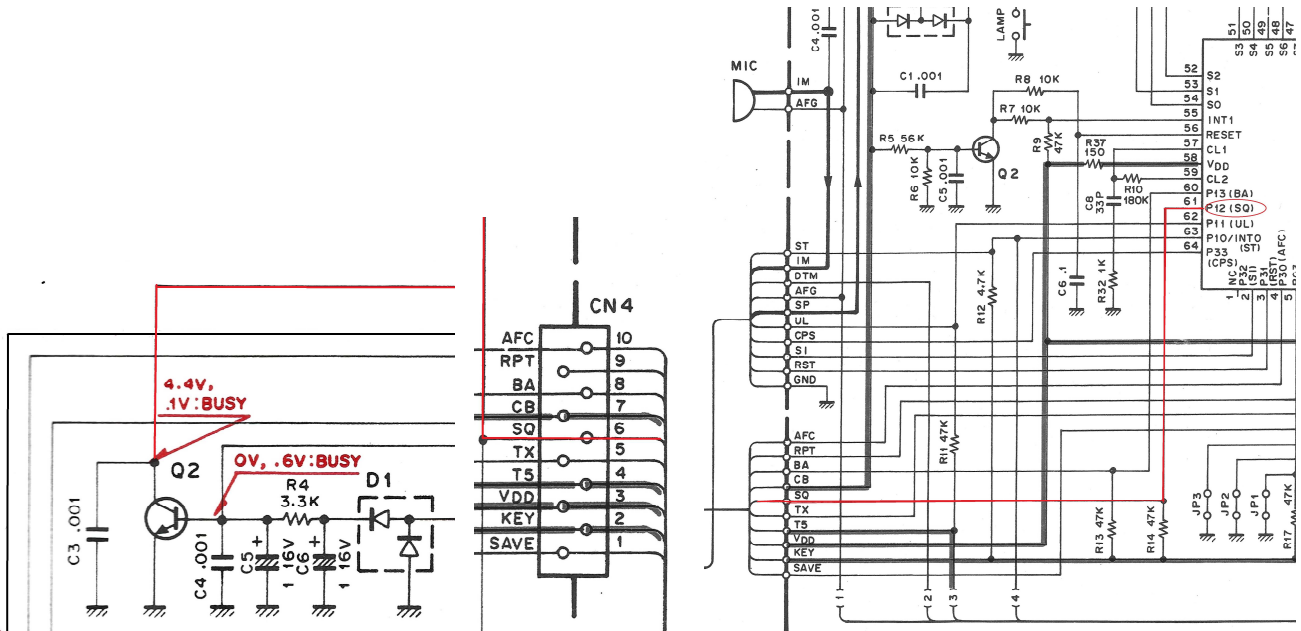


Fig. 4 Squelch circuit



Il faut modifier quelques paramètres dans le fichier svxlink.conf.

```
#####
# Configuration file for the SvxLink server #
#####
[Rx1]
...
AUDIO_DEV=alsa:plughw:1 (dongle Audio)
AUDIO_CHANNEL=0
#SQL_DET=VOX (Voice Operated switch ou Voice-Operated eXchange)
SQL_DET=GPIO
...
GPIO_PATH=/sys/class/gpio
GPIO_SQL_PIN=gpio22
...
[Tx1]
...
AUDIO_DEV=alsa:plughw:1 (dongle Audio)
AUDIO_CHANNEL=0
PTT_TYPE=SerialPin
PTT_PORT=/dev/ttyUSB0 (dongle RS232)
PTT_PIN=DTRRTS
```

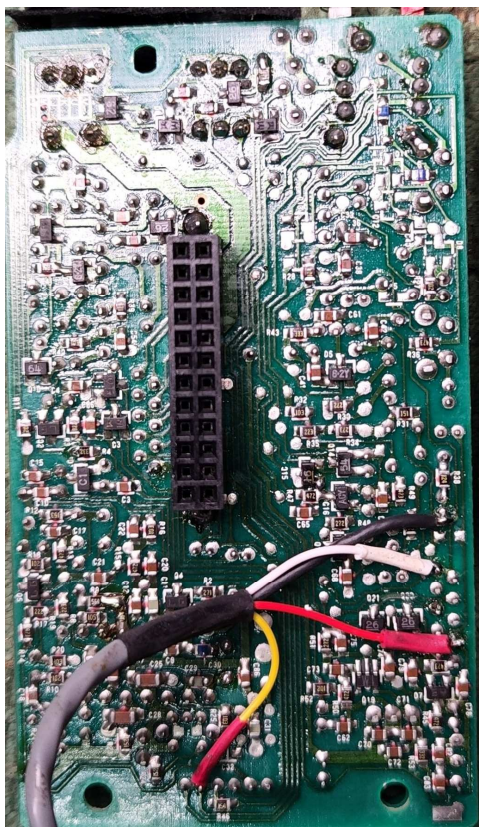
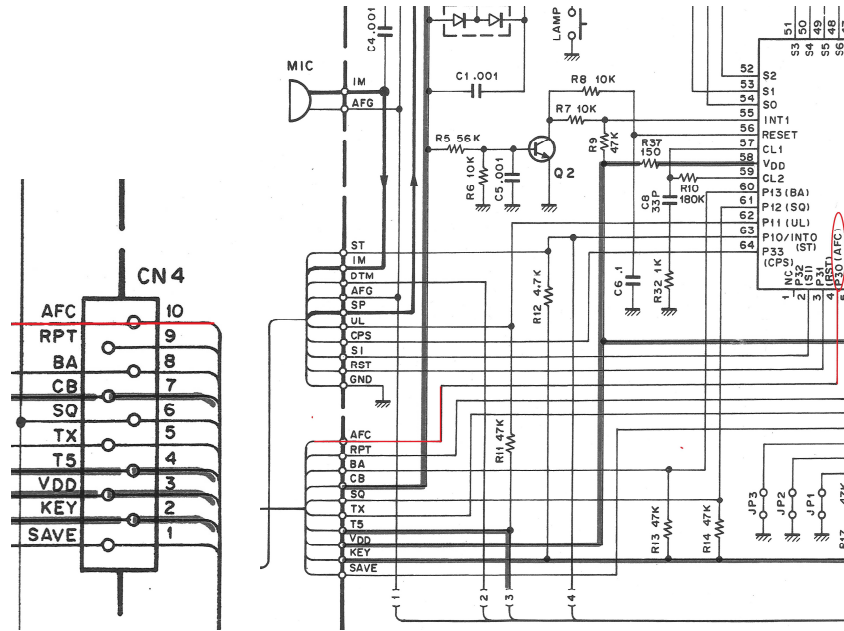
Remarque: il faut paramétrer le GPIO dans le fichier rc.local pour l'activer.

```
#GPIO SCRIPT TO BE INSERTED ON START-UP #
# GPIO 22 as Squelch to RX1
echo 22 > /sys/class/gpio/export
echo in > /sys/class/gpio/gpio22/direction
# echo 1 > /sys/class/gpio/gpio22/active_low
sudo chmod 777 /sys/class/gpio/gpio22/value
sleep 30
#end of GPIO
```

La première idée était de récupérer le signal SQ mais cela n'a pas fonctionné car la tension sur le collecteur de Q2 chutait et le BUSY de l'afficheur LCD restait allumé ce qui bloquait l'émission.

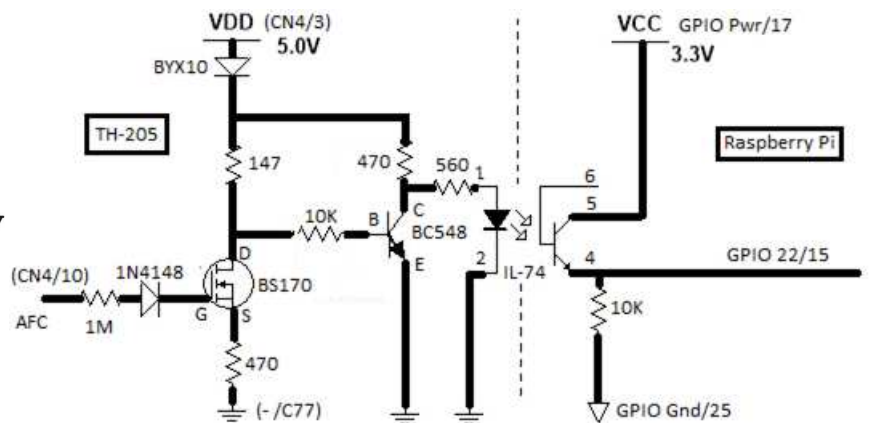
Troisième réalisation avec modification du Rx/Tx (Squelch + PTT avec GPIO)

Regardons sur le schéma du Rx/Tx d'où nous pourrions récupérer le signal AFC (voir description).

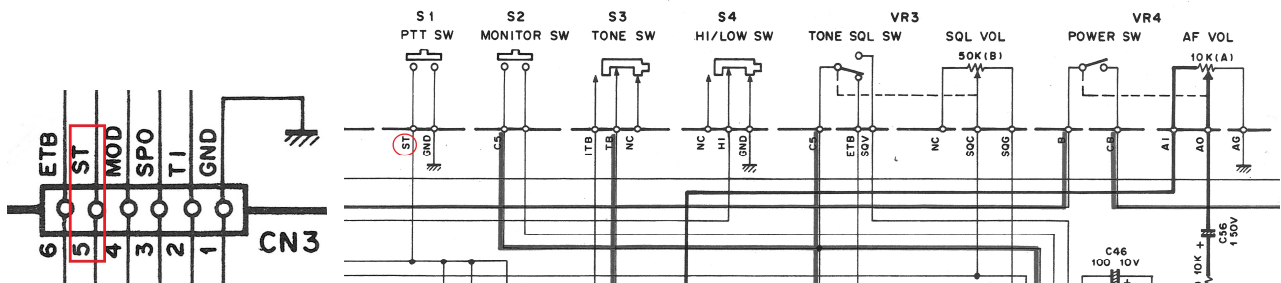


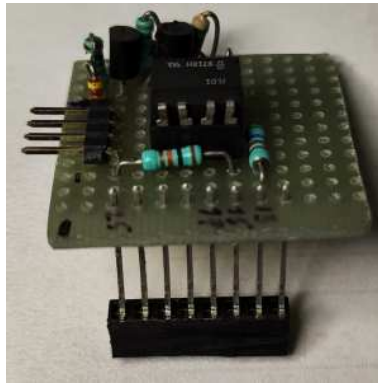
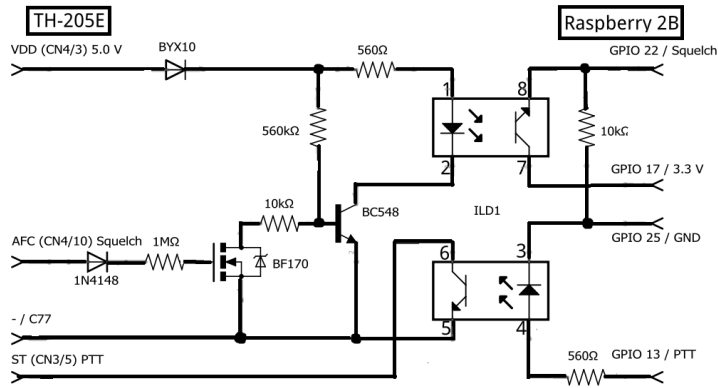
CN3 5/ ST

CN4
Masse
10/ AFC
6/ SQ
3/ VDD 5v

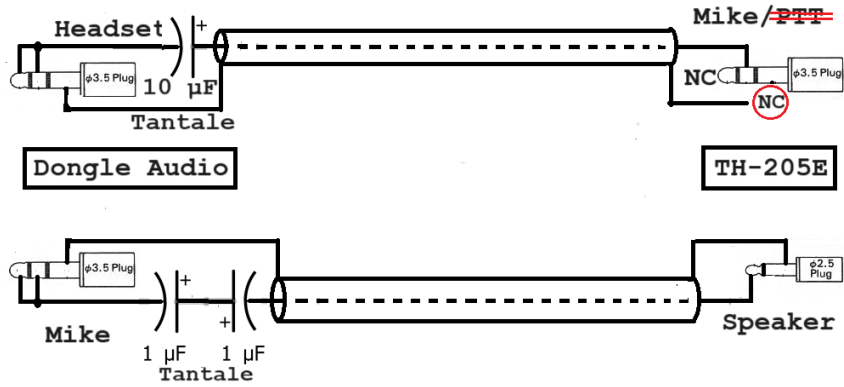


Prochaine étape, relier le signal ST (PTT) au Raspberry avec un double opto-coupleur et un schéma revisité.

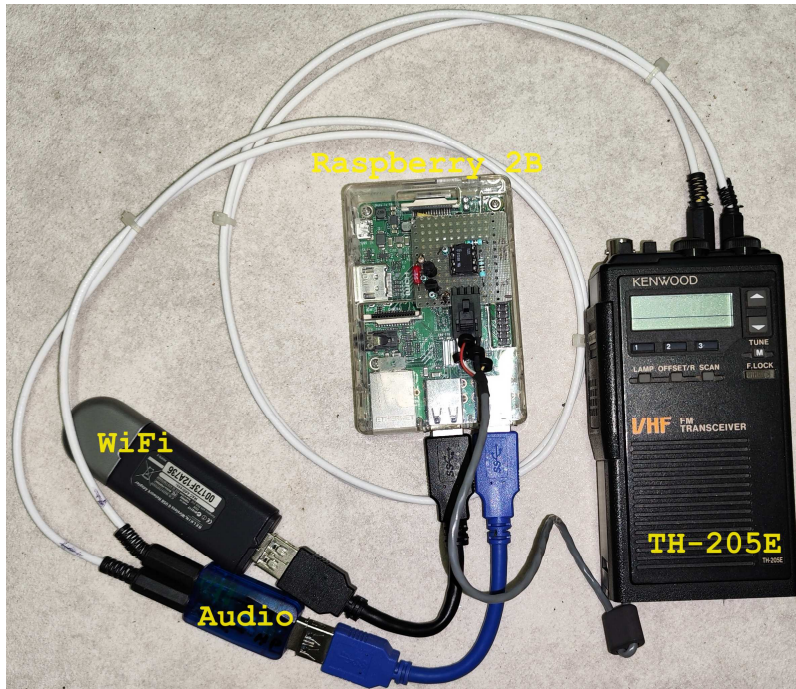




Câbles audio simplifiés



Montage final



Il faut modifier quelques paramètres dans le fichier svxlink.conf.

```
#####  
# Configuration file for the SvxLink server #  
#####  
[Tx1]  
AUDIO_DEV=alsa:plughw:1 (dongle Audio)  
AUDIO_CHANNEL=0  
# config PTT gpio 27 pin 13  
PTT_PORT=GPIO  
PTT_TYPE=GPIO  
PTT_PIN=gpio27  
#  
# config dongle RS232  
##PTT_TYPE=SerialPin  
##PTT_PORT=/dev/ttyUSB0  
##PTT_PIN=DTRRTS  
#
```

Remarque: il faut paramétrer le GPIO dans le fichier rc.local pour l'activer.

```
#GPIO SCRIPT TO BE INSERTED ON START-UP #  
# GPIO 22 as Squelch to RX1  
echo 22 > /sys/class/gpio/export  
echo in > /sys/class/gpio/gpio22/direction  
# echo 1 > /sys/class/gpio/gpio22/active_low  
sudo chmod 777 /sys/class/gpio/gpio22/value  
#GPIO 27 as PTT to TX1  
echo 27 > /sys/class/gpio/export  
echo out > /sys/class/gpio/gpio27/direction  
sudo chmod 777 /sys/class/gpio/gpio27/value  
sleep 30  
#end of GPIO
```

FIN