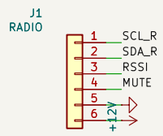
Bridge (control board) for the airband receiver

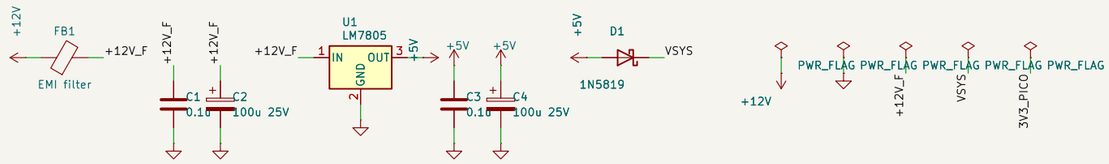
Pico 2 + orange 16x2 LCD + encoder + 3 buttons. Own LM7805 from the radio's switched +12 V. Rev B: LCD data direct from the Pico.

HARNESS FROM RADIO J3



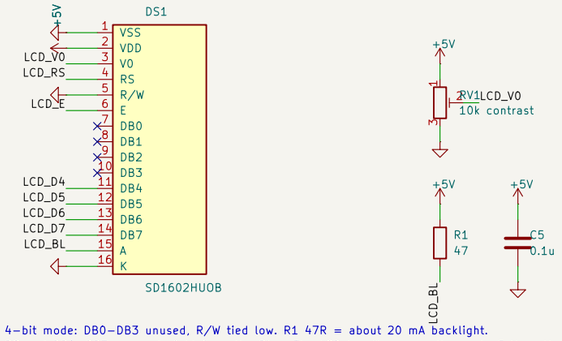
1 SCL, 2 SDA (radio pulls both up to 3.3 V)
3 RSSI (0.4 to 1.6 V), 4 MUTE (5 V = muted)
5 GND, 6 +12 V after the radio power switch
Plus 3 to 4 solder-wick ground straps across the hinge.

POWER



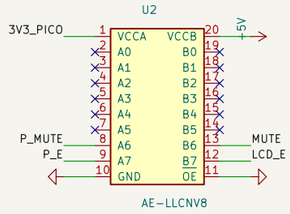
D1 lets USB and the 5 V rail both feed the Pico without fighting.
7805 load about 80 mA, about 0.5 W: no heatsink.

LCD SD1602HUOB (orange, 5 V)



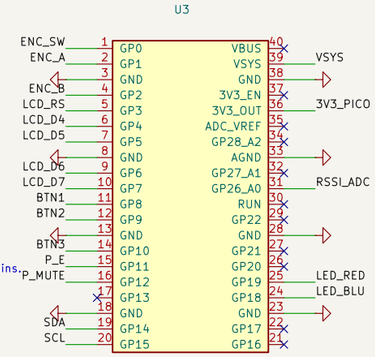
4-bit mode: DB0-DB3 unused, R/W tied low. R1 47R = about 20 mA backlight.
RS and DB4-DB7 come straight from the Pico. The LCD has its own pull-ups to 5 V on these pins, so the Pico must only pull them low or let go (never drive high), with its pad pulls turned off.
Physical pin order on the LCD edge (front view, left to right): 14 ... 1, 16, 15.
C5 sits right at the LCD pins.

LEVEL SHIFTER 3.3 V -> 5 V (AE-LLCNV8)



Only E and MUTE use the shifter: neither load has a pull-up. OE is active low: tied to GND.
FXMA108 rated load is 15 pF and at least 1 Mohm: no pull-ups, pull-downs or capacitors on its pins.
Unused pins are left open (the chip has bus-hold).

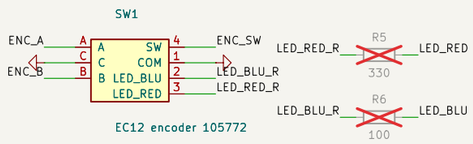
PICO 2 (wires soldered to the castellated pads)

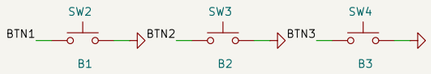


Pico 2

Spare: GP13, GP16/GP17 (debug serial), GP20-GP22, GP27, GP28. Pins picked to match the board layout.
In code: GP23 high (quieter onboard supply). I2C1 = GP14 SDA / GP15 SCL. Read GP26 as ADC only, and slowly (RSSI is a 55k source).

CONTROLS (to GND, Pico internal pull-ups)

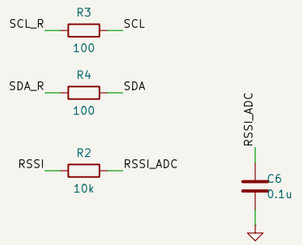




Tact switches 103647, 6 mm.

R5/R6 optional: light the knob (e.g. red = squelch open). Blue is dim at 3.3 V.

I2C AND RSSI



No pull-ups here: the radio already has 9.1k to 3.3 V on SCL/SDA.

Not built
Pico 2, SD1602HUOB LCD, AE-LLCNV8, EC12 encoder, 3 buttons, LM7805

Sheet: /
File: bridge.kicad_sch

Title: Airband receiver: bridge (control board)

Size: A3	Date: 2026-11-22	**Rev: B**
KiCad E.D.A. 10.0.5		Id: 1/1