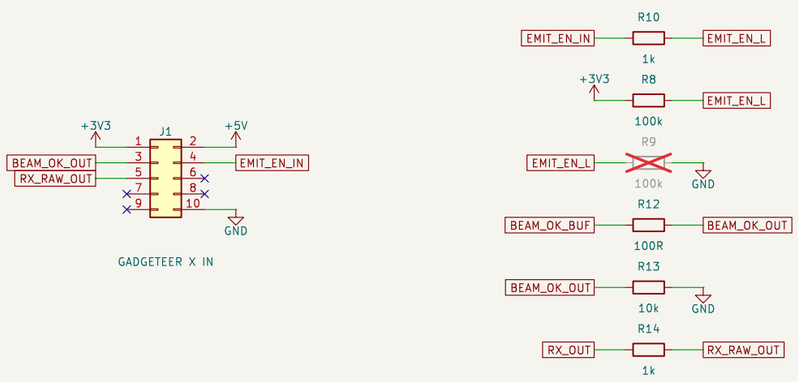
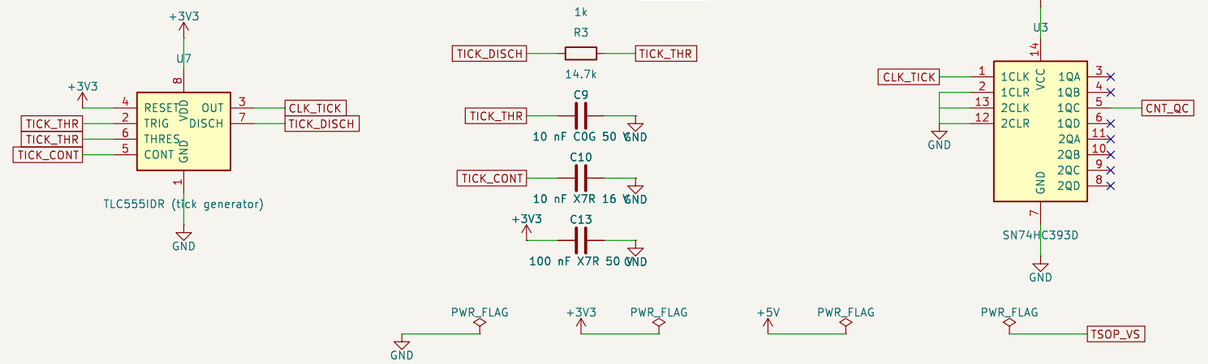
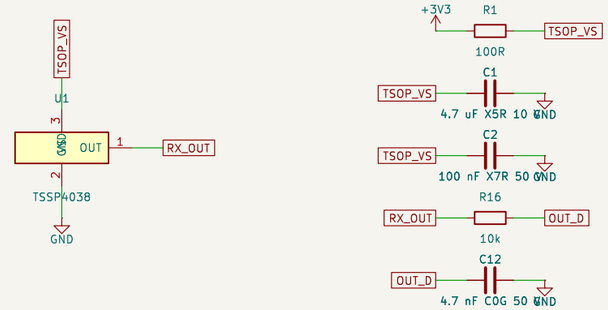
01 / HOST SOCKET J1 (GADGETEER X) AND HOST-FACING PARTS: EMIT_EN BIAS R8/R9/R10, BEAM_OK OUTPUT R12/R13, RAW OBSERVE R14



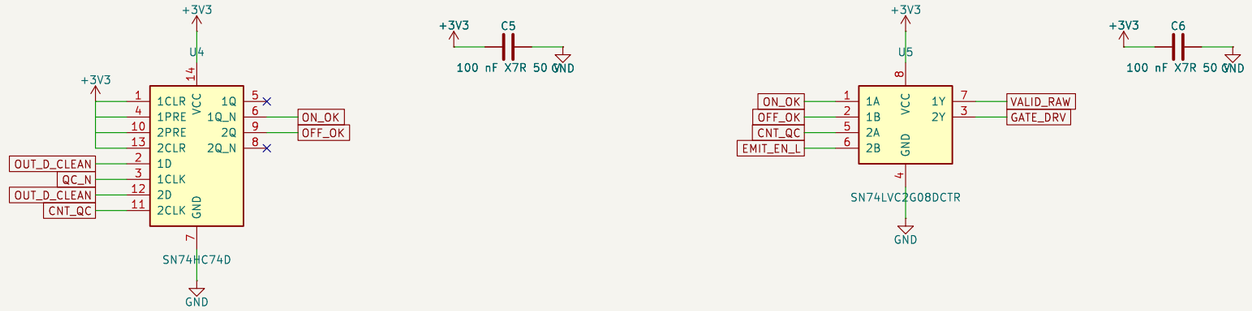
02 / TICK GENERATOR U7 (TLC555) AND GATE COUNTER U3 (HC393)



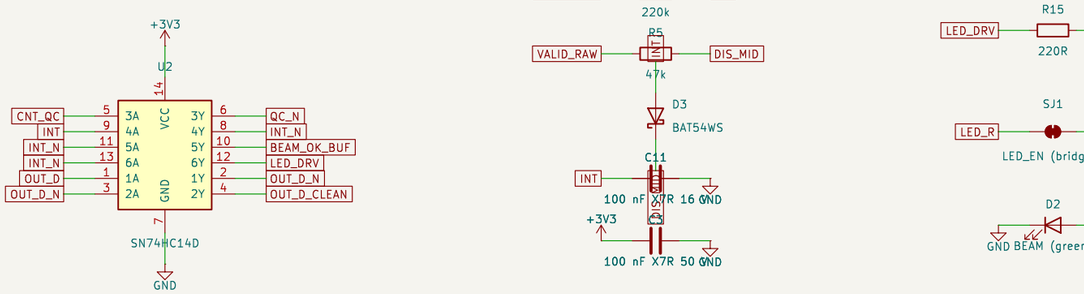
03 / TSSP4038 RECEIVER U1: SUPPLY FILTER R1/C1/C2, SAMPLING DELAY R16/C12



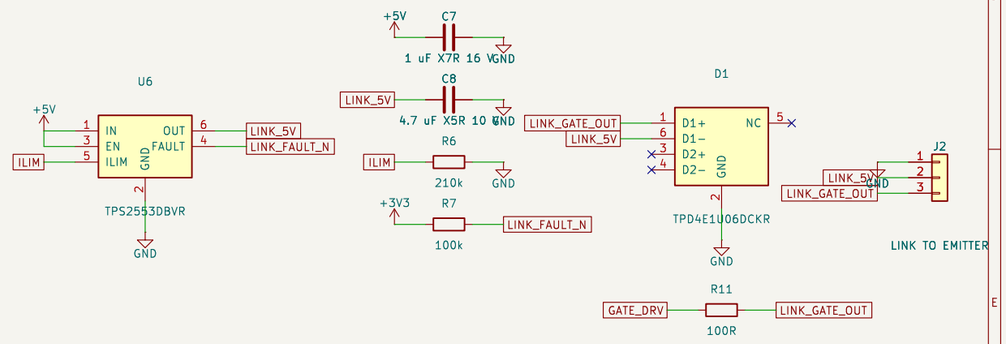
04 / SAMPLER U4 (HC74) AND AND-GATES U5 (LVC2G08)



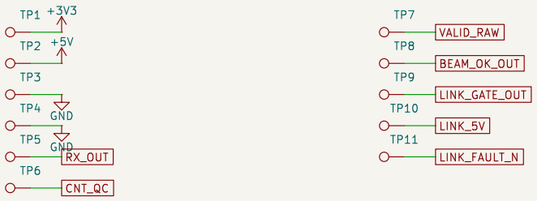
05 / INTEGRATOR R4/R5/D3/C11, SCHMITT U2 (HC14), BEAM LED CHAIN R15/SJ1/D2



06 / EMITTER LINK: U6 (TPS2553) FROM +5V, ESD CLAMP D1, GATE DRIVE R11, LINK HEADER J2



07 / BOTTOM-SIDE TEST POINTS TP1..TP11 (OBSERVE ONLY, NEVER INJECT)



NOT A SAFETY DEVICE. NOT FOR PERSONNEL PROTECTION. Invisible 940 nm IR link; IEC 62471 risk group not assessed. CAD STUDY: routing and physical qualification pending, not qualified, not for fabrication.
Gadgeteer X socket (3 GPIO): pin 1 +3V3, 2 +5V, 3 BEAM_OK_OUT (hi = beam valid, lo = fault), 4 EMIT_EN_IN (lo = emitter off), 5 RX_RAW_OUT (observation only), 6-9 unused, 10 GND.
Gate: U7 tick 4.75 kHz -> U3 QC = 593 Hz (0.84 ms burst window / 0.84 ms dark window). U4 samples the TSSP output at the END of each window; U5 ANDs ON_OK and OFF_OK; R4/R5/C11 integrate; U2 Schmitt buffers.
Variant A (population option): R8 fitted, R9 DNP (emitter ON when EMIT_EN floats). Variant B: R8 DNP, R9 fitted (emitter OFF until the host drives pin 4 high). SJ1 bridged = BEAM LED enabled.
No 38 kHz signal exists on this board. Link J2: pin 1 GND, pin 2 LINK_5V (U6, 110-150 mA limit), pin 3 LINK_GATE_OUT (593 Hz gate). Test points are observation only.
CERN-OHL-S-2.0 | KiCad only | black solder mask, white silkscreen

Not-certified study; not for fabrication
Group3 host-contract; version-local contract and symbol library
Smoothieware / CERN-OHL-S-2.0

Sheet: /
File: receiver.kicad_sch

Title: Laser barrier RECEIVER (Gadgeteer X, TSSP4038 + synchronous sample

Size: A3	Date: 2026-10-01	**Rev: v16**
KiCad E.D.A. 9.0.8		Id: 1/1