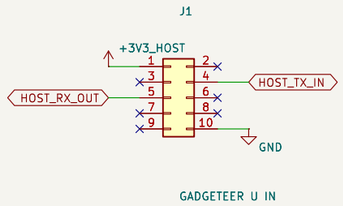
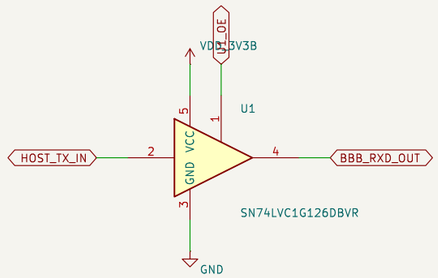
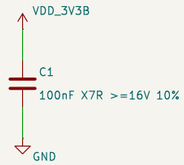
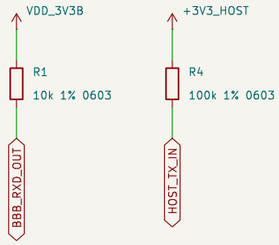
01 / GADGETEER U SOCKET J1 (HOST SIDE, 1:1 RIBBON)



02 / U1: HOST TX -> BBB UART4 RX BUFFER, VCC = VDD_3V3B, OE = U1_OE

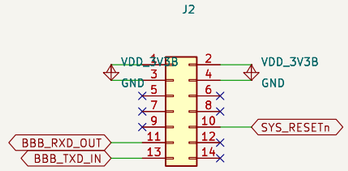




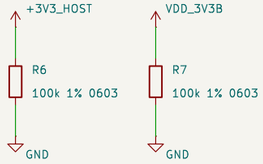


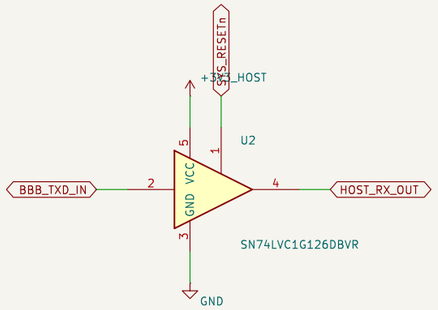
03 / U2: BBB UART4 TX -> HOST RX BUFFER, VCC = +3V3_HOST, OE = SYS_RESETn

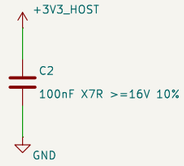
05 / BBB P9 PLUG J2 (pin n = P9.n, body on the BOTTOM face)

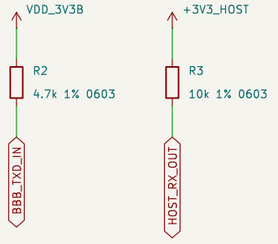


06 / RAIL-ABSENT PULL-DOWNS R6 (+3V3_HOST) AND R7 (VDD_3V3B)



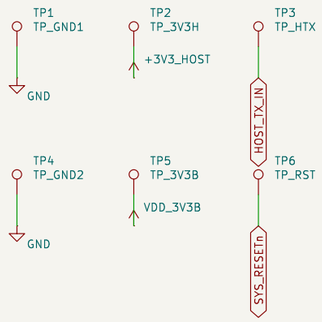


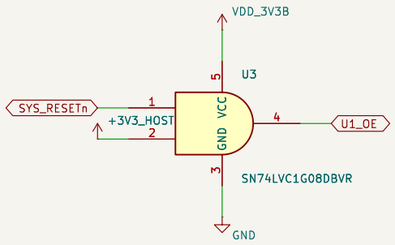


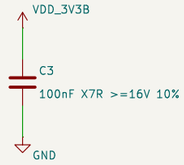


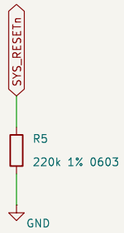
04 / U3: OE = SYS_RESETn AND HOST-ALIVE (+3V3_HOST), VCC = VDD_3V3B

07 / TEST PADS (OBSERVE ONLY, NEVER INJECT)











PWR_FLAG: the rails enter through connector pins (passive); the flag marks them as driven for ERC.

ADAPTER TRANSFERS NO POWER. J1.2 (+5V) and J2.5-J2.9, J2.12, J2.14 are unconnected: power the BeagleBone from its own jack or USB.

Direction (adapter viewpoint): J1.4 = HOST_TX_IN -> U1 -> J2.11 BBB_RXD_OUT (P9.11 UART4_RXD); J2.13 BBB_TXD_IN (P9.13 UART4_TXD) -> U2 -> J1.5 HOST_RX_OUT.

U1 VCC = VDD_3V3B (BBB), U2 VCC = +3V3_HOST (host): the two 3.3 V domains never connect; only high-impedance inputs and Ioff-protected buffer outputs cross.

Power-order truth table (E = buffer enabled, Z = Hi-Z):

A host off, BBB off: U1 Z, U2 Z. B host on, BBB off: U1 Z (VCC=0), U2 Z (OE low). C host off, BBB on, reset low: U1 Z, U2 Z.

D host off, BBB running: U1 Z (U3.B low), U2 Z (VCC=0). E both on, reset low: U1 Z, U2 Z. F both on, SYS_RESETn high: U1 E, U2 E.

R6/R7 (100 k to GND) make an unplugged peer read as an unpowered one. Pull-ups return to the SOURCE-side rail of their line (R1, R2: VDD_3V3B; R3, R4: +3V3_HOST).

SYS_RESETn is only read (U2.OE, U3.A, R5, TP6, J2.10); this board never drives it. R5 220 k + BBB R14 10 k leave it at about 3.16 V when released.

Gadgeteer U socket (Version 16): 1 +3V3, 2 +5V (NC), 3 GPIO! (NC), 4 TX, 5 RX, 6 GPIO (NC), 7-9 UN, 10 GND. Pin 4 is the HOST transmit (Prime2590 J35/J33).

No hot-plug. Plug J2 into P9 pins 1-14 only, Ethernet end west, pin 1 outer row. 3V3 TTL only. CERN-OHL-S-2.0 | KiCad only | v02 first-cut study, CAD only, not fabrication-ready.

v02 first-cut study, not fabrication-ready
Gadgeteer U <-> BBB P9 UART4, signal only
Smoothieware / CERN-OHL-S-2.0

Sheet: /
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Title: Smoothie BeagleBone UART adapter

Size: A3	Date: 2026-10-01	**Rev: v02**
KiCad E.D.A. 9.0.8		Id: 1/1