ARDUINO¹ADAPTER V1B — UNO²R3 SHIELD HOST ON 5MOOTHIEBOARD V2 (PIVE GADGETEER SOCKETS, PER-PIN ROUTER)

Generated from v1B_model.py by make_schematic.py. Every pin has a stub wire and a net label or power symbol; same-name labels are connected.

01 / GADGETEER SOCKET GB (top view): pin 1 +3V3, pin 2 +5V_HOST, pin 10 GND



01 / GADGETEER SOCKET GC (top view): pin 1 +3V3, pin 2 +5V_HOST, pin 10 GND



01 / GADGETEER SOCKET GD (top view): pin 1 +3V3, pin 2 +5V_HOST, pin 10 GND



01 / GADGETEER SOCKET GE (top view): pin 1 +3V3, pin 2 +5V_HOST, pin 10 GND



01 / GADGETEER SOCKET GG (top view): pin 1 +3V3, pin 2 +5V_HOST, pin 10 GND



02 / UNO R3 HEADER J6 (official geometry)



02 / UNO R3 HEADER J7 (official geometry)



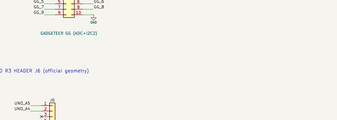
02 / UNO R3 HEADER J8 (official geometry)

02 / UNO R3 HEADER J9 (official geometry)

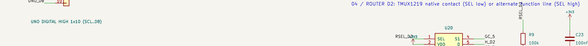
02 / UNO R3 HEADER J10 (official geometry)

03 / SN74LV595A 1: 4B-bit control chain (41 bits used)

03 / SN74LV595A 2: 4B-bit control chain (41 bits used)



PWR_FLAGs on nets driven only by passive pins (sockets, jumpers, resistors). +5V_LIM and +5V_SHD are driven by power_out pins of U TPS2553 / LM66100



PIN MAP (Arduino pin -> native host contact): D0 GB.5, D1 GB.6, D2 GC.5, D3 GC.6, D4 GE.5, D5 GD.7, D6 GD.8, D7 GB.7, D8 GG.8, D9 GD.9, D10 GC.8, D11 GE.7, D12 GE.8, D13 GE.9, A0 GG.3, A1 GG.4, A2 GG.7, A3 GG.5, A4 GB.8 (I2C3 SDA), A5 GB.9 (I2C3 SCL).

Control: GB.3 SER, GB.4 SRCLK, GC.3 RCLK, GE.4 /OE (10k pull-up) into six SN74LV595A (48 bits, 41 used: 18 DIRB, 12 RSEL, 6 BR, 4 PWM select/enable, 1 reset gate).

Per pin: host -> [TMUX1219 router on D2…D13] -> Hn -> SN74LV4T125 (VCC = VIO, /OE = DIRB) -> 33R -> Uno pad; Uno pad -> SN74LXC8T245 (A to B, 3V3) -> RX -> LED chain and TMUX1511 return switch (SEL = DIRB) -> Hn.

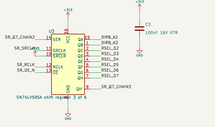
DIRB high = input mode (driver Hi-Z, return switch closed, default through 100k pull-ups); DIRB low = output mode (driver on, return open). One bit drives both, so driver and return can never conflict.

Analog: Uno A0…A5 -> 1k -> AD7138 AIN0…AIN5 (AVDD = +5V_A from +5V_HOST through 10R and 1uF, DVDD 3V3, I2C2 on GG.8/GG.9). The digital branch of A0…A3 and the shield I2C of A4/A5 sit behind TMUX1511 branch switches (default open).

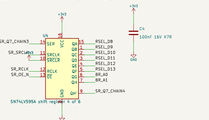
Power: +5V_HOST -> TPS2553 (4.9A ILIM, 520 mA typ) -> LM66100 ideal diode (backfeed block) -> +5V_SHD. VIO 5V default (SJ pads 1–2). IOREF = VIO, VIN open, RESET 10k to VIO with 2N7002 pull-down from a register bit. 3V3 pin through 100 mA PPTC.

CAD-verified design intent only; see version-notes.md for the fabrication status of this version. CERN-OHL-S-2.0 | KiCad only | black solder mask, white silkscreen.

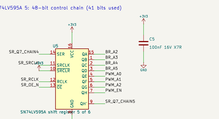
03 / SN74LV595A 3: 4B-bit control chain (41 bits used)



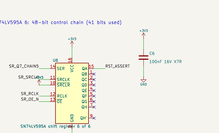
03 / SN74LV595A 4: 4B-bit control chain (41 bits used)



03 / SN74LV595A 5: 4B-bit control chain (41 bits used)



03 / SN74LV595A 6: 4B-bit control chain (41 bits used)



04 / ROUTER D2: TMUX1219 native contact (SEL low) or alternate function line (SEL high)

04 / ROUTER D3: TMUX1219 native contact (SEL low) or alternate function line (SEL high)



04 / ROUTER D4: TMUX1219 native contact (SEL low) or alternate function line (SEL high)

04 / ROUTER D5: TMUX1219 native contact (SEL low) or alternate function line (SEL high)

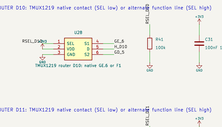
04 / ROUTER D6: TMUX1219 native contact (SEL low) or alternate function line (SEL high)

04 / ROUTER D7: TMUX1219 native contact (SEL low) or alternate function line (SEL high)

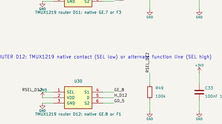
04 / ROUTER D8: TMUX1219 native contact (SEL low) or alternate function line (SEL high)

04 / ROUTER D9: TMUX1219 native contact (SEL low) or alternate function line (SEL high)

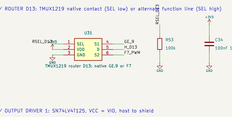
04 / ROUTER D10: TMUX1219 native contact (SEL low) or alternate function line (SEL high)



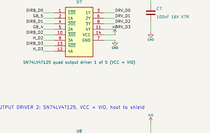
04 / ROUTER D11: TMUX1219 native contact (SEL low) or alternate function line (SEL high)



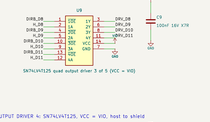
04 / ROUTER D12: TMUX1219 native contact (SEL low) or alternate function line (SEL high)



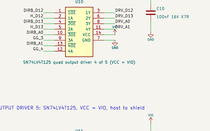
04 / ROUTER D13: TMUX1219 native contact (SEL low) or alternate function line (SEL high)



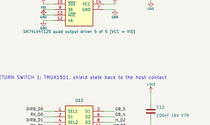
05 / OUTPUT DRIVER 1: SN74LV4T125, VCC = VIO, host to shield



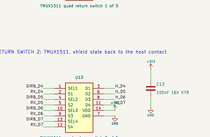
05 / OUTPUT DRIVER 2: SN74LV4T125, VCC = VIO, host to shield



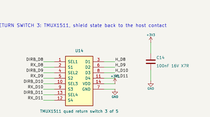
05 / OUTPUT DRIVER 3: SN74LV4T125, VCC = VIO, host to shield



05 / OUTPUT DRIVER 4: SN74LV4T125, VCC = VIO, host to shield



05 / OUTPUT DRIVER 5: SN74LV4T125, VCC = VIO, host to shield

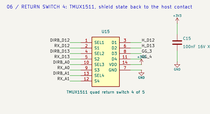


06 / RETURN SWITCH 1: TMUX1511, shield state back to the host contact

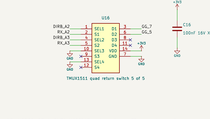
06 / RETURN SWITCH 2: TMUX1511, shield state back to the host contact

06 / RETURN SWITCH 3: TMUX1511, shield state back to the host contact

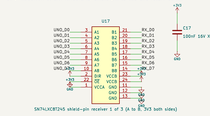
06 / RETURN SWITCH 4: TMUX1511, shield state back to the host contact



06 / RETURN SWITCH 5: TMUX1511, shield state back to the host contact



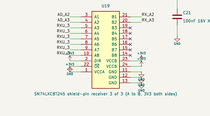
07 / RECEIVER 1: SN74LXC8T245, shield pin to LED and return switch



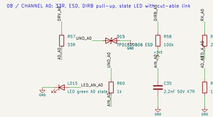
07 / RECEIVER 2: SN74LXC8T245, shield pin to LED and return switch



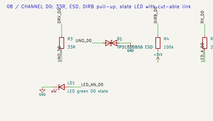
07 / RECEIVER 3: SN74LXC8T245, shield pin to LED and return switch



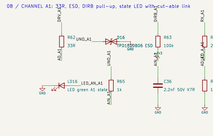
08 / CHANNEL A0: 33R, ESD, DIRB pull-up, state LED without-cut-able link



08 / CHANNEL D0: 33R, ESD, DIRB pull-up, state LED without-cut-able link



08 / CHANNEL A1: 33R, ESD, DIRB pull-up, state LED without-cut-able link



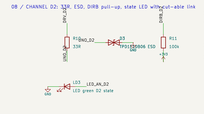
08 / CHANNEL D1: 33R, ESD, DIRB pull-up, state LED without-cut-able link



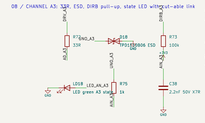
08 / CHANNEL A2: 33R, ESD, DIRB pull-up, state LED without-cut-able link



08 / CHANNEL D2: 33R, ESD, DIRB pull-up, state LED without-cut-able link



08 / CHANNEL A3: 33R, ESD, DIRB pull-up, state LED without-cut-able link



08 / CHANNEL D3: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D4: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D5: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D6: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D7: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D8: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D9: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D10: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D11: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D12: 33R, ESD, DIRB pull-up, state LED without-cut-able link

08 / CHANNEL D13: 33R, ESD, DIRB pull-up, state LED without-cut-able link

09 / BRANCH SWITCH 1: TMUX1511 isolates the digital branch from the Uno pad (default open = analog)

09 / BRANCH SWITCH 2: TMUX1511 isolates the digital branch from the Uno pad (default open = analog)

10 / SHIELD I2C TRANSLATOR (PCA9306) AND SHIELD PULL-UPS

10 / ANALOG INPUT PATH OF A5 (ESD, 1k, 2.2nF to the AD7138)

11 / QWIIC CONNECTOR GB (3V3 only, never 5V)

11 / QWIIC CONNECTOR GG (3V3 only, never 5V)

12 / AD7138 ON HOST I2C2 (GG.8/GG.9): A0…A5 on AIN0…AIN5, AVDD filtered 5V

13 / PWM SOURCE SELECTOR (TMUX1208) AND SHIELD RESET OUTPUT

15 / TEST POINTS (bottom side, observe only)

14 / SHIELD POWER, VIO SELECT, RESET, LEDS

+5V_HOST
+5V_SHD
+3V3
+3V3_SHD
VIO select 5V (default) / 3V3
+5V_SHD
SJ22
+5V_SHD
+5V_VIN
VIN <- 5V (open by default)
R90
10k
+5V_HOST
R91
2.2k
LED_PWR_AN
LED green