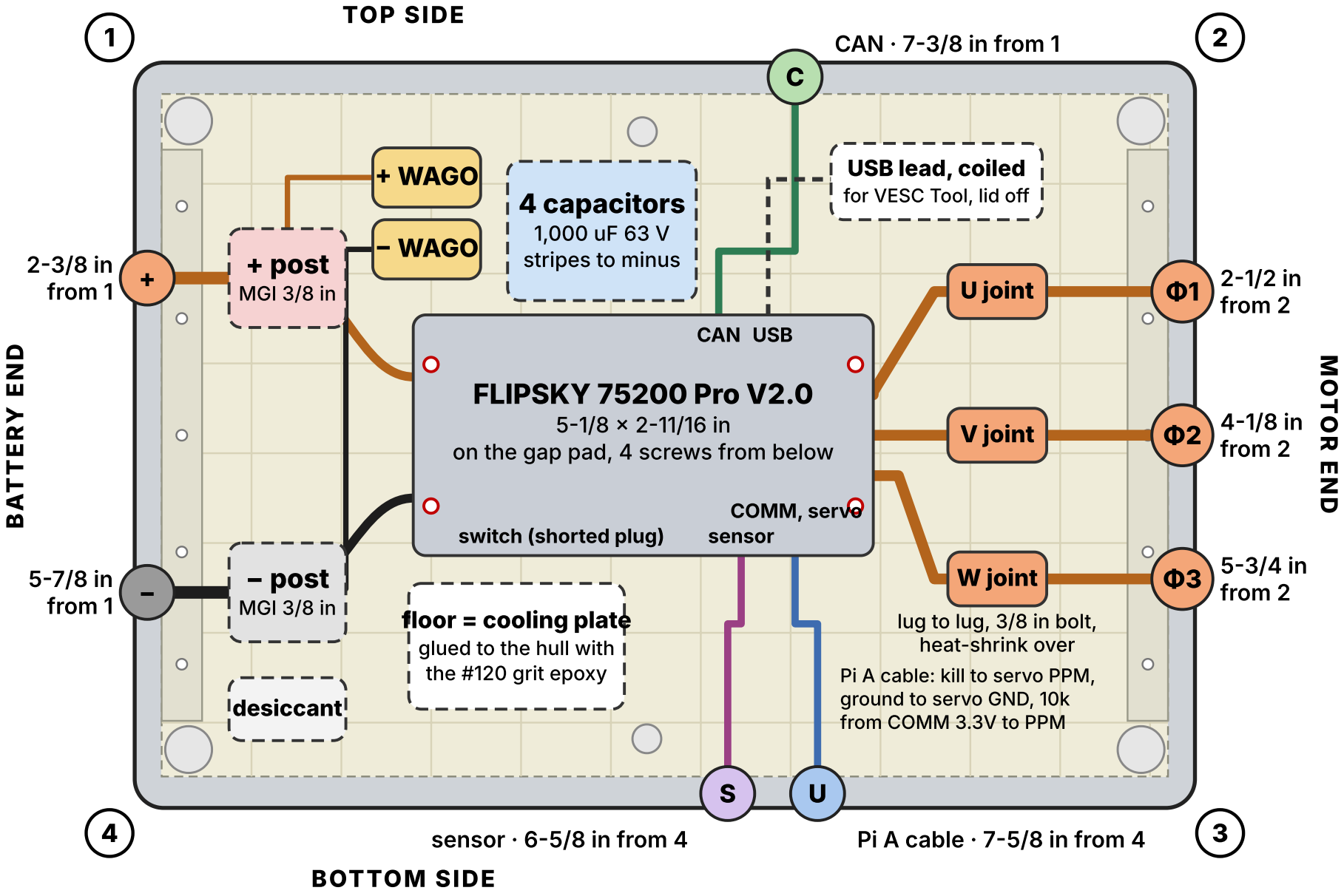


Holes, 8: + and − PG16 (7/8 in), Φ1 to Φ3 PG16 (7/8 in), S, U, C PG7 (1/2 in). Every center 1 in below the rim, measured from the numbered outside corner. Nothing through the lid, or the floor except the stud holes.

DECIDED

- The box floor is the cooling plate: glued straight to the hull in the heat-carrying epoxy. The Flipsky screws down from outside into its own 4 holes on a gap pad, before gluing; it stays in for good. No separate plate.
- Motor leads: cut the lugs off, feed in through the PG16s, new 3/8 in lugs inside, bolted lug to lug to the Flipsky lead of the same letter, heat-shrink over.
- Capacitors on two WAGO 221-415s. No copper strips, no solder.
- Pi A cable: kill to the servo plug's PPM, ground to the servo plug's GND, a 10k from COMM 3.3V to PPM.
- Epoxy grit: the #120 on hand.
- No surge diode, no ferrite, no vent. The box is wired to nothing.

RULES

- Main battery switch off and the 250 A MEGA out while handling power leads.
- Nothing bare but the post lugs. Crimps only, no solder.
- Each post, bottom up: 2 AWG, 8 AWG, 12 AWG, then the nut.
- Only red in the + WAGO, only black in the − WAGO. Stripes face minus.
- Motor leads bundled tight, nothing beside them.

STILL OPEN

- Read off the parts: servo, sensor and switch plug types; the motor lead size (on its jacket); the floor screw threads (the parts' holes).

BUILD ORDER

BEFORE THE BOX COMES

1. Flipsky bench check (Build Guide 11.1): pin 1 on COMM and CAN; sin and cos tops (over 3.2 V means the 10k and 18k divider); temperature sensor about 600 ohm at 77 F.
2. Read the parts above; order what is missing.

BOX PREP

3. Number the corners. Lay the parts out as on page 1; mark the screw spots.
4. Floor holes: Flipsky's 4 from the hole pattern sheet, drilled and countersunk outside (90 degrees if metric). Post studs: 316 flat-heads set in epoxy, heads flush.
5. Gland holes from page 1: 7/8 in x5, 1/2 in x3. Deburr.
6. Scrape the paint under the four lid screws. Glands in, domes loose.

INSIDE, AT THE BENCH

7. Capacitor tails: a butt splice and an 18 AWG tail, 3 to 4 in, on each leg. Red on plus, black on minus.
8. WAGOs: 4 red tails + red 12 AWG lead (port 1) in +; 4 black + black lead (port 5) in −. 3/8 in lugs on the leads.
9. Glue the cans and WAGOs down with the silicone, stripes one way, levers up.
10. Flipsky: shorted switch plug. Cut B+ and B− under 6 in, U, V, W to reach their joints. 8 AWG 3/8 in lugs. Label U, V, W.
11. Board down on the 0.04 in gap pad, punched at the holes. From outside, 4 flat-heads up into it, snugged evenly until the pad squeezes about a quarter.
12. Posts onto their studs. Post nuts off for now.
13. Plug leads: COMM (5V, GND, ADC1 sin, ADC2 cos, TX, RX, 3.3V to the 10k); CAN (CANH, CANL, GND); servo (PPM, GND); sensor (TEMP, GND).

AT THE BOAT

14. Glue the box to the hull, lid on: grind to dull glass, sand the floor bare, wet out, bed in the #120 grit epoxy, glass a tab, strap as backup.
15. Battery feed through + and −: lug, onto the posts first, then the 8 and 12 AWG lugs, then the nuts. Twist red and black outside.
16. Motor leads: lug off, in through Φ1 to Φ3, sleeve on, new lug, bolt to the same letter, shrink.
17. Signals. C: white CANH, blue CANL, black GND; red and drain taped. U: Pi TX to RX, Pi RX to TX, kill to PPM, ground to servo GND. S: to the COMM and sensor plug leads.
18. Tighten the glands; drip loop on every cable.
19. Desiccant in. Stripes face minus. Lid on.

LAST

20. MEGA in, battery switch on. VESC Tool settings (right). Kill switch on PPM, active low. Motor setup with the prop clear.

VESC TOOL SETTINGS

Battery max / min	28.0 V / 22.0 V
Battery current	about 85 A; cut-burst 180 A, 10 s
Motor current	about 180 A; cut-burst 300 A
Regen ends	27.8 V
Motor thermistor	KTY84/130 (never NTC or KTY83)
Motor temp start / end	212 F / 248 F; shore alert 194 F
MOSFET temp start / end	167 F / 194 F
Accel temp decrease	0 percent
Field weakening	Off
Position sensor	sin ADC1, cos ADC2; sensorless fallback
Kill switch	PPM, active low
CAN	control bus, 250 kbps

HOLES

+ −	battery end, 2-3/8 and 5-7/8 in from 1	PG16
Φ1 Φ2 Φ3	motor end, 2-1/2, 4-1/8, 5-3/4 in from 2	PG16
C	top side, 7-3/8 in from 1	PG7
S U	bottom side, 6-5/8 and 7-5/8 in from 4	PG7

PG16 = 7/8 in hole, seals 0.39 to 0.55 in cable. PG7 = 1/2 in hole, 1/8 to 1/4 in cable. All 1 in below the rim.

TO BUY

- The box (Mike, Oct 24).
- Two 12 AWG 3/8 in ring lugs: Amazon B073PGZC5V.
- Neutral-cure silicone: Permatex Ultra Black.
- Three 3/8-16 × 1 in 316 hex bolts.
- 316 flat-heads: 4 for the Flipsky (M3 or M4), 4 for the posts, with nylocs.
- Motor lead lugs, only if the leads are not 2 AWG.

Check the shelf: WAGOs, Metri-Pack pair, 18 and 12 AWG red and black, PG16 ×5, PG7 ×3, gap pad, desiccant, 1 in glue-lined heat-shrink.