BATTERY BOX · PARTS

Boat 1 · A9 · v10.5 · main bank, 32 cells as 8 groups of 4 · built, glued in, cells in (order tracker)

A



EVE MB31 cells, 314 Ah
8 groups of 4. 2.8 x 6.8 x 8.1 in, M6 studs
32 aboard · in the box

B

flat two-hole copper bars

Cell busbars, HWYEE
Two-hole, 2.83 in (72 mm) apart. Count: open
20-pack · check (no delivery mail)

C



Copper braid link, M6 holes
Stack to stack, forward end. Sleeve it if bare
1 · have

D



M6 cone washers, flange nuts
One each per stud. Blue Loctite 242, 37 in-lb
64 + 64 · check

E



Pack squeeze: G10 plates, rods
3/8 in end plates, three 3/8-16 rods, Bellevilles
1 · in the box

F



Main fuse: 300 A Class T
Block and cover. Outside the aft wall, + side
1 · have

G



Glands: PG16 x2, PG13.5, PG9 x2
Holes 1, 2, 3, 3a, 3b. One cable each
5 · count the shelf

H

thin mica sheets

Mica heat barrier sheets
Between cells. 5/64 in, or 1/16 in if tight
32 · check (not on the tracker)

I



Mains: 2 AWG tinned, red, black
About 10 ft each. Ring lugs, NO-OX-ID on each face
1 · have (68 ft roll)

J



Tap rings for the M6 studs
1/4 in hole. For 22 AWG and 18 AWG
18 · to pick (not named)

K



30 AWG copper wire
A fuse link right at each ring. Not the nichrome
18 links · buy

L



Balancer cable, 18 AWG 10-core
ENERJOUR, 0.39 in across. White core spare
1 · have

M



SBMS0 cable, 22 AWG 12-core
Shielded, 0.24 in. Drain cut, taped here
1 · have

N



XT1 thermistor, DROK 10K 3950
On a cell face. Reads about 4 F low near freezing
1 · have

O

3-core cable

Probe trunk: Mike's 20 AWG 3-core
Red power, black ground, third data
1 · have (not on the tracker)

P



DS18B20 pack probes
Each named by its serial number. 3 ft leads
6 · have

Q



Red butt splices, glue-lined sleeves
22 to 16 AWG. 3 per probe, 1 sleeve each
18 + 6 · have (kit)

R

PVC stub and duckbill

Relief stub: PVC and duckbill
1-1/2 in Sch 40, duckbill 385310076, lips out
1 · have

S

nylon cable clamps

Nylon clamps, short screws, loom
Screws 1/2 in or less, dipped in epoxy
1 · check

T



NO-OX-ID, grease, Loctite 242
Paste on metal, grease on rubber; never swapped
1 · have

U

brass inserts, gasket

Lid: inserts, gasket, battens
24 E-Z Lok 1/4-20 inserts, sponge gasket
1 · have

V



Breather screw, M12 (Gore type)
1/2 in hole, high on the aft wall
1 · fitted (Oct 19)

W

small adapter board

DS18B20 adapter, spare Nano Every
Reads each probe's serial number at setup
1 · have

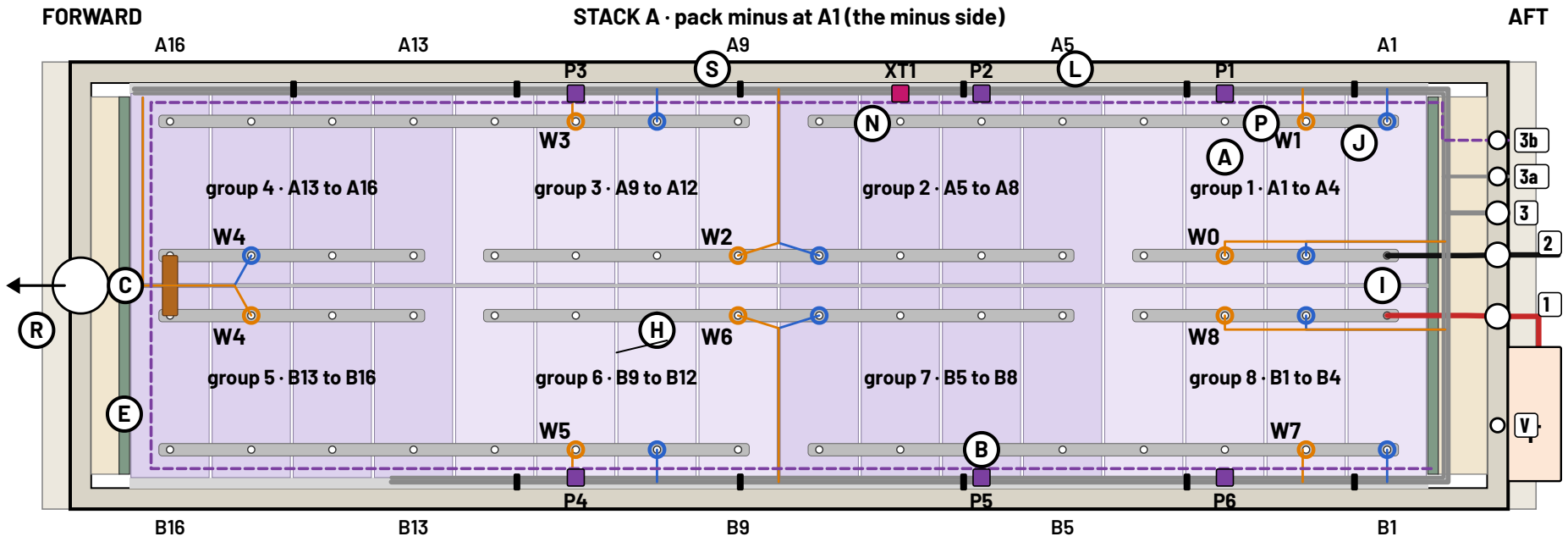
X

label tape

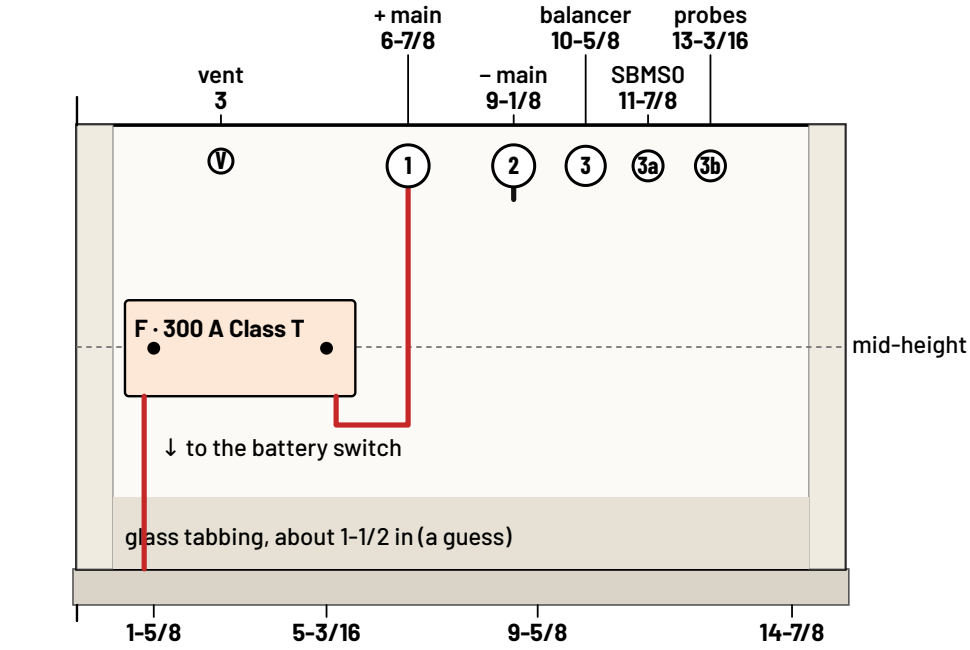
Wire flags, thermal tape
Label all 18 taps at both ends. Tape: backup only
1 · check

BATTERY BOX · LAYOUT

the pack from above, to scale (forward at left, as the Oct 3 tap drawing) · letters = page 1



AFT WALL FROM OUTSIDE (from aft, looking forward) · + side at left · inches from its left (+) edge



KEY

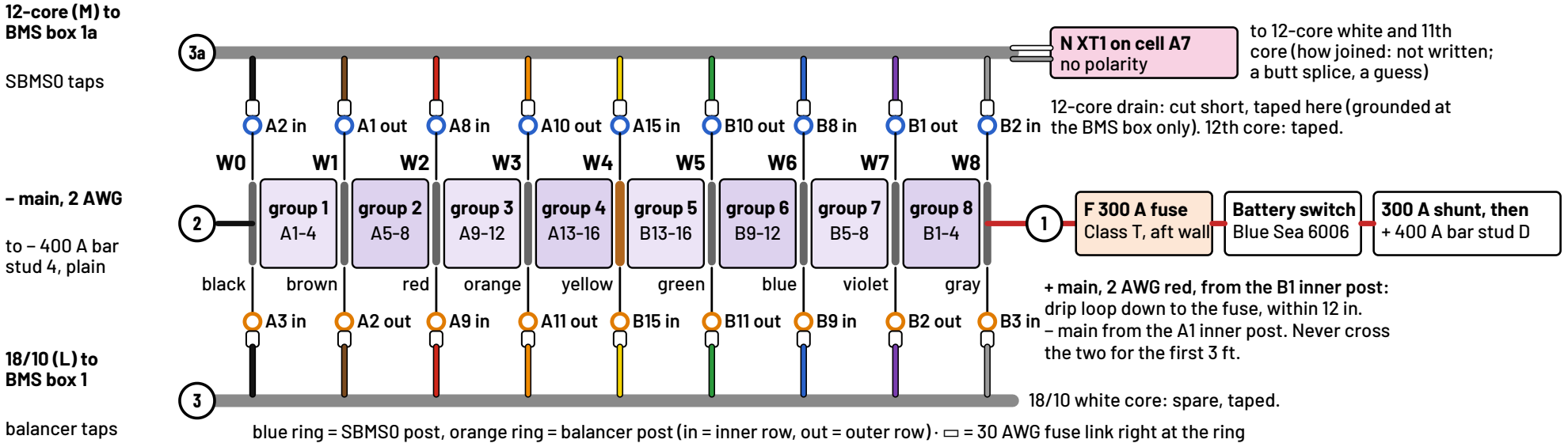
- + main, 2 AWG red (I)
- – main, 2 AWG black (I)
- tap cables (L, M), clamped along both long walls (S)
- probe trunk (O); P1 to P6 the probes (P), on cell faces
- tap ring (J): blue SBMS0 (22 AWG), orange balancer (18 AWG)
- busbar (B): every post on one bar is one joint, W0 to W8
- braid link (C), the one stack-to-stack joint
- XT1 thermistor (N) on a cell face

Each of the 18 rings: its own 30 AWG fuse link (K) right at the ring.
One ring per stud. Probe and XT1 cells: Claude's pick (the guide: two middle groups and one end group per stack, held on a cell face).
Heights from the top of the floor: glands 8-3/8 in, vent 8-1/2, fuse bolts 4-5/8. Keep every hole clear of the lid inserts.
F: the fuse block's bolts, only if they go through the wall, in sealant.
R, forward wall: centered, 7-5/8 in up, 2 in hole saw, aimed up and forward.
Cells counted from the aft end. Inner row = posts along the center gap; outer row = posts along the long wall.

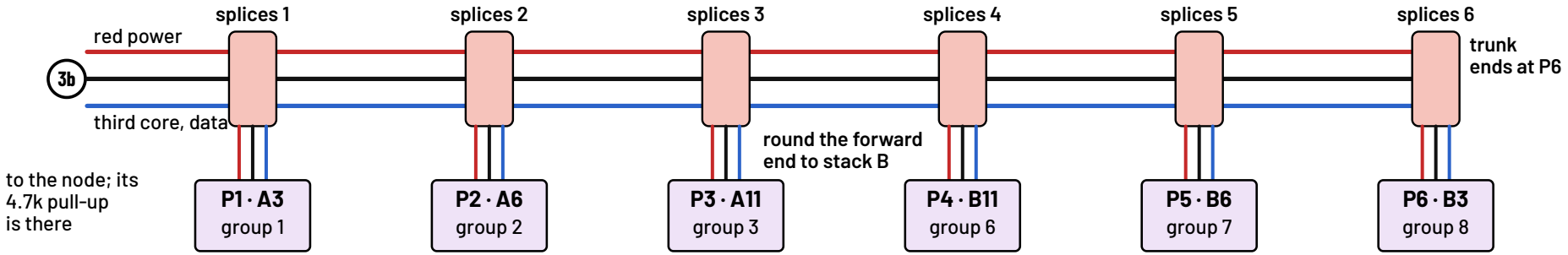
BATTERY BOX · WIRING

how it connects · numbers in circles = holes · not to scale

THE PACK, THE 18 TAPS AND THE MAINS · each joint has two rings on two different posts, each on its own 30 AWG fuse link



PROBE TRUNK: A DAISY CHAIN OUT BY HOLE 3b, STRAIGHT TO CENTRAL NODE ENTRY 21 (never through the BMS box)



At each probe the trunk's three wires are cut; each joins in one red butt splice (Q): the incoming trunk wire in one end, the outgoing trunk wire plus the probe's own wire, folded double, in the other. Stagger the three about 1 in; a glue-lined sleeve over the joint. At P6 the trunk wire goes in one end, the probe's wire in the other. Probe leads 3 ft, left full length, coiled and tied; their colors go by the seller's listing. Each probe held against its cell face (under the side padding or in an epoxied saddle); thermal tape is the backup, never the mount.

+ main · – main · tap cores in their own colors · probe data · groups in chain order: up stack A, across the braid, back down stack B

BATTERY BOX · EVERY WIRE

joints, rings, splices and holes as on pages 2 and 3

THE 18 TAPS, JOINT BY JOINT

Same colors in both cables. Each wire: a 30 AWG fuse link right at its ring, a small S-bend of slack, a flag at both ends.

Joint	Color	SBMS0 ring (12-core, 3a)	Balancer ring (18/10, 3)
W0 pack –	black	A2 inner	A3 inner
W1	brown	A1 outer	A2 outer
W2	red	A8 inner	A9 inner
W3	orange	A10 outer	A11 outer
W4	yellow	A15 inner	B15 inner
W5	green	B10 outer	B11 outer
W6	blue	B8 inner	B9 inner
W7	violet	B1 outer	B2 outer
W8 pack +	gray	B2 inner	B3 inner

Not landed here: the 12-core drain, cut short and taped (grounded at the BMS box only); its 12th core and the 18/10's white core, taped. **XT1** on cell A7: one lead to the 12-core white, the other to its 11th core (how joined: not written; a butt splice, a guess). The far ends: A4 plan.

EACH RING ON ITS STUD

Bottom to top: busbar, the tap ring, the cone washer hollow side down, the flange nut with blue Loctite 242 on the top threads, 37 in-lb once. NO-OX-ID on every contact face. Witness stripe once all rings are on. One ring per stud; never join an SBMS0 tap to a balancer tap.

ROUTES

Jackets on to just inside the glands, then one branch per long wall in split loom, nylon clamps on short screws (1/2 in or less, dipped in epoxy) 18 in apart at most. Never tied to the cells; nothing over a busbar, stud top or cell vent. W2 and W6 cross the outer row in the gap between cells 8 and 9 (a 3/8 in notch in that lid batten); W4 goes round the forward end; the center batten stops short at both ends for W0, W4 and W8.

NOT IN THIS BOX

Nothing that thinks: no heaters, thermostats, thermal fuses, gas or high-water sensors; no WAGOs or solder on the probe joints; no hole in the lid. Lid: gasket greased, screws snug with blue Loctite, witness stripes; re-snug after a week.

THE CHAIN: BUSBARS AND THE BRAID

Joint	Joins	Busbars along the row
W0	group 1 – (pack –); – main on A1 inner	A inner, A1 to A4
W1	group 1 + to group 2 –	A outer, A1 to A8
W2	group 2 + to group 3 –	A inner, A5 to A12
W3	group 3 + to group 4 –	A outer, A9 to A16
W4	group 4 + to group 5 –	A inner A13 to A16, **braid A16 to B16**, B inner B13 to B16
W5	group 5 + to group 6 –	B outer, B9 to B16
W6	group 6 + to group 7 –	B inner, B5 to B12
W7	group 7 + to group 8 –	B outer, B1 to B8
W8	group 8 + (pack +); + main on B1 inner	B inner, B1 to B4

THE MAINS

Wire	Route	Cable
+ main	B1 inner post, over the aft plate, out hole 1, down its drip loop to the 300 A fuse's in stud (within 12 in)	2 AWG red, tinned, ring lugs; 0.15 in slack at the post
fused +	Fuse out stud to the battery switch (Blue Sea 6006), then the 300 A shunt, then the + 400 A bar stud D	2 AWG red, sleeved
– main	A1 inner post, over the aft plate, out hole 2, to the – 400 A bar stud 4. No shunt on the minus side	2 AWG black, plain; chafe sleeve, clamped

Battery switch off before anyone touches the mains. Clamp both a few inches from the fuse block. Stud nuts torqued, witness stripes.

BEFORE WIRING

Towel over every busbar not being worked on, taped tools, rings off. Build the BMS box end first, both its boards unplugged (A4 plan). XT1 calibrated in stirred ice water first: write down the SBMS0's reading (parameter 29) and the unplugged reading. Read each probe's serial number with the adapter board and spare Nano Every; tag each lead and write it against its cell on the Settings Sheet sec 9 and the node lid.

BEFORE PLUGGING IN

Meter both tap sets before either board is plugged in: each neighbor pair about 3.3 V, W0 to W8 about 26 V (A4 plan).

PROBE TRUNK, HOLE 3B: SPLICE SETS

Red to power, black to ground, the third core to data, in every set. Probe leads go into each set's outgoing end.

Set	Probe · cell	Trunk in	Trunk out
1	P1 · A3	from hole 3b	on to set 2
2	P2 · A6	from set 1	on to set 3
3	P3 · A11	from set 2	on to set 4, round the forward end
4	P4 · B11	from set 3	on to set 5
5	P5 · B6	from set 4	on to set 6
6	P6 · B3	from set 5	none: the trunk ends here

HOLES

Hole	Fitting	What passes
1	PG16, 7/8 in	+ main
2	PG16, 7/8 in	– main
3	PG13.5, 13/16 in	18/10 to BMS box hole 1
3a	PG9, 5/8 in	12-core to BMS box hole 1a
3b	PG9, 5/8 in	probe trunk to central node entry 21
V	M12 breather, 1/2 in	air; fitted Oct 19
F	bolts, per part	300 A fuse; each bolt bedded in sealant
R	2 in hole saw, forward wall	relief stub, glassed through

Aft wall unless marked. A drip loop outside each cable; grease on each insert. Grease on rubber and plugs only, NO-OX-ID on metal only.

OPEN

Room on the aft wall for the fuse block and its cable bend: not measured. **The BMS box**: on a long side wall as built; side and height not logged. **Probe and XT1 cells**: Claude's pick drawn. **30 AWG copper**: to buy. **Busbar count**: one 20-pack ordered; tying every joint takes about 54 two-hole links (Claude's count) unless the cells came with bars. **Middle padding strip**: measure before cutting. **The breather**: the tracker keeps one M12 vent yet says this one is fitted. **Nothing cuts the bank off** on the cell-temperature trip.