MAIN BUS BOARD · PARTS

Boat 1 · v10.5 · the main battery's bus, breakers and solar controllers · as it will be once the changes are done

A

plywood panel

The board, about 30 x 27 in
Plywood, upright on the hull beside the battery box
1 · built, mounted

B



Battery switch, Blue Sea 6006
The only switch for the mains. Off for haul-out work
1 · on the board

C



Shunts, FL-15, 75 mV
300 A battery, 100 A solar. Both on the + side, each with a cover
2 · on the board

D



400 A bars, Joinfworld
Four 3/8 in studs each: + studs A to D, – studs 1 to 4
2 · on the board

E



250 A MEGA fuse in holder
Motor branch, + stud C to the VESC A box
1 · on the board

F



100 A MEGA fuse in holder
+ stud B to the + branch bar, 6 AWG
1 · on the board

G



150 A branch bars, JUXILPP
8 small studs, a big stud each end. + and –
2 · on the board

H



Auto-reset stud breakers
5 A x5, 10 A x2, 15 A x2, 20 A x2, 30 A x2. Colors show the rating
13 · on the board

I



Argodiode 80-2SC, Victron
ARG080202000, 80 A, M6 studs, 4.7 x 2.4 in, 3 in tall. Out 2 empty
1 · ordered Nov 3

J



Backup-fed bar pair, 150 A
Red and black, covers. The second Oct 15 set
2 · have

K



Solar bars, 150 A, + and –
The five controllers and both bus surge modules land here
2 · on the board

L



Sealed inline fuse holders
Solar: 25 A x2 (100/20), 20 A x3 (75/15). Surge: 25 A x2
7 · on the board

M



SmartSolar MPPT 100/20
Two 100 W pairs each. LOAD left empty
2 · on the board

N



SmartSolar MPPT 75/15
No. 1: one 100 W pair (cold rule). No. 2, 3: one 200 W each
3 · on the board

O



PV surge modules, NanQue
250 V, one under each controller, ground screw to its own PV –
5 · on the board

P



Bus surge modules, Boartechs
48-70 V class. Ground jumpered to its own –
2 · on the board

Q



300 A Class T fuse
On the battery box's aft wall, not on this board. Lift one end to work
1 · have

R



Backup converter, Orion-Tr Smart 24/24-17
Beside the backup battery. Its 12/2 lands here
1 · ordered Nov 3

S

12 AWG cable

12 AWG red and black, from the 12/2 roll
The Argodiode wires and the backup-fed – link
1 · have

T



Ring lugs: 2 AWG, 6 AWG, 12-10
12-10 on 1/4 in holes at the Argodiode. Hole to fit each stud
1 · have

U

4-core cable

Sense cable, 4-core 20 AWG
Black, red, yellow, white. To the BMS box. No fuse
1 · as built

V

split loom

Split loom
On every jumper over 7 in
1 · have

W

duplex wire

Wire: 2 AWG, 12/2, 14/2, 16/2
Tinned marine. Sizes per line on page 4
1 · have

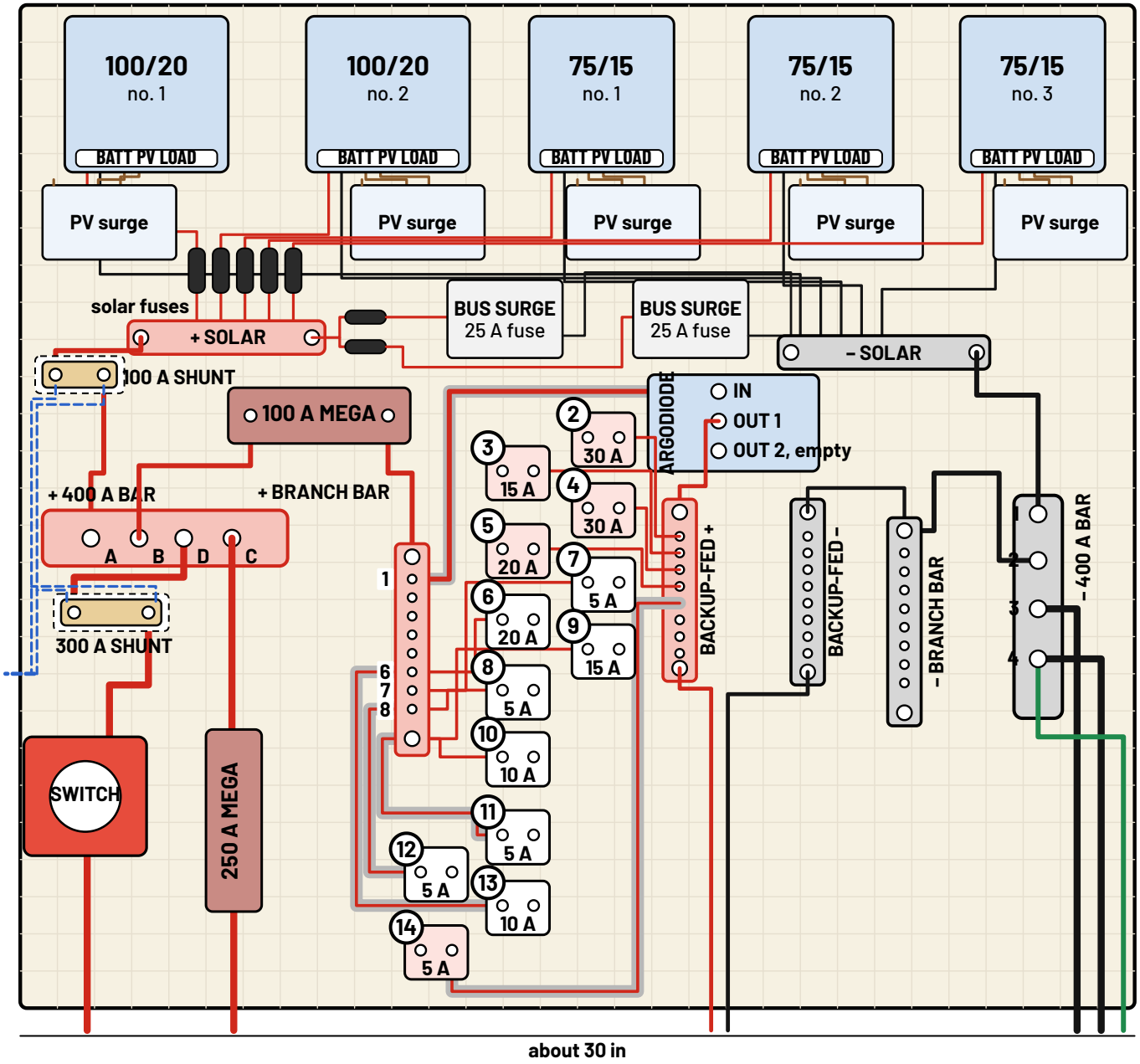
X

labels

Labels
SWITCH on the old Aft breaker; BACKUP-FED on the new + bar
1 · have

MAIN BUS BOARD · LAYOUT

face view, board standing on the hull · to scale, 1 grid square = 1 in · part spots from Mike's photo of Nov 10



BREAKERS (line no.)
2 Release Node B, 30 A
3 Central node, 15 A
4 Release bus A, 30 A
5 Steering, 20 A
6 Switch box (label: Switch), 20 A
7 Iridium A, 5 A
8 House CAN converter, 5 A
9 Wet lab, 15 A
10 Pi A box, 10 A
11 Bilge pump 1, 5 A
12 USB hub box, 5 A
13 Orion feed to backup board, 10 A
14 Wing box, 5 A

Pink breakers: fed from the backup-fed + bar (they stay where they sit; only the jumper moves).

Line 1: no breaker; its stud feeds the Argodiode.
Line 15 (bilge 2): on the backup battery board.

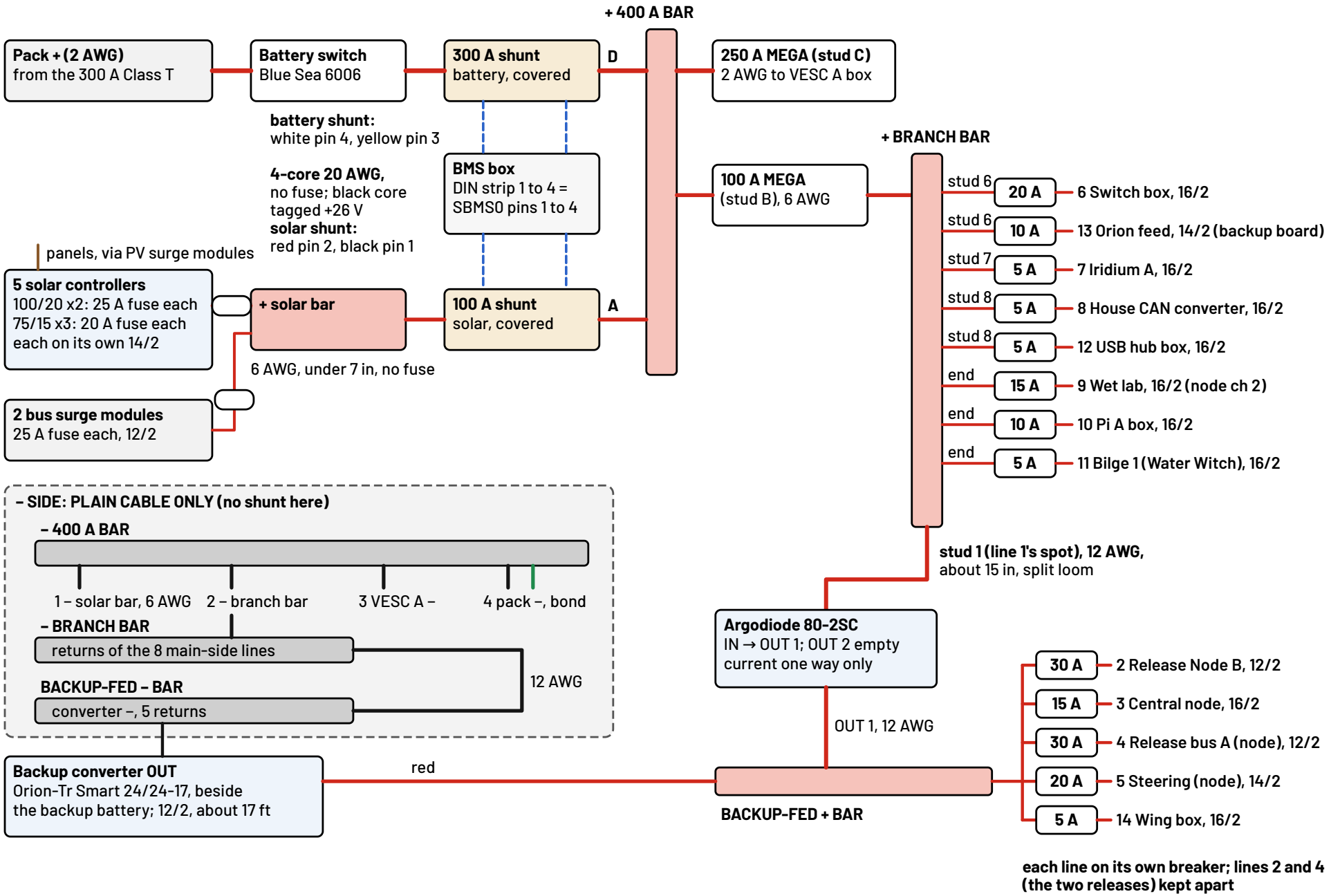
OFF THE BOTTOM EDGE
left to right:
Pack + 2 AWG (Class T)
VESC A + 2 AWG
Backup converter 12/2
VESC A – 2 AWG (stud 3)
Pack – 2 AWG (stud 4)
Bond 6 AWG green (stud 4)

Sense cable, left edge,
to the BMS box

+ (thickest 2 AWG, then 6 AWG, thin: jumpers and 14/2) – panel leads sense cable bond split loom dashed box = shunt cover

MAIN BUS BOARD · WIRING

how it connects · not to scale · the numbers by the breakers are line numbers



+ wire – wire sense cable panel leads bond

Line 13 never on the backup-fed bar. Line 15 (bilge 2) is on the backup battery board.

MAIN BUS BOARD · EVERY WIRE

stud letters and numbers as on page 2

THE MAINS

Run	From → to	Wire
Pack +	300 A Class T at the battery box → switch	2 AWG red, about 10 ft
Switch	→ 300 A shunt (switch side) → + 400 A stud D	2 AWG red, short links
Pack –	battery box → – 400 A stud 4, plain cable	2 AWG black, about 10 ft
Motor	+ stud C → 250 A MEGA → VESC A box +	2 AWG red, about 10 ft
Motor –	VESC A box minus → – 400 A stud 3	2 AWG black
Branch	+ stud B → 100 A MEGA → + branch bar feed stud	6 AWG red
Branch –	– branch bar → – 400 A stud 2	6 AWG black
Solar +	+ solar bar → 100 A shunt → + 400 A stud A	6 AWG red, all under 7 in, no fuse
Solar –	– solar bar → – 400 A stud 1, plain cable	6 AWG black
Bond	– 400 A stud 4 → lightning bond spur	6 AWG green

SHUNT SENSE CABLE

One 4-core 20 AWG to the BMS box's six-block strip (terminals 1 to 4 = SBMS0 pins 1 to 4), a ring under each small screw. **No fuse.** Tag the black +26 V. Keep it clear of the minus bars.

Shunt	Cores
Solar shunt	bus side black → strip 1 (PVn); solar-bar side red → strip 2 (PVp)
Battery shunt	bus side yellow → strip 3 (ADC1n); switch side white → strip 4 (ADC1p)

SOLAR

Controller	Panels	Fuse, wire
100/20 no. 1, 2	two 100 W pairs each	25 A fuse at + solar bar; 14/2
75/15 no. 1	one 100 W pair (cold rule)	20 A fuse; 14/2
75/15 no. 2, 3	one 200 W each, stern	20 A fuse; 14/2
Bus surge x2	on the DIN rail between the solar bars	25 A fuse each; 12/2; ground to its own –

Each controller has its own 14/2, + through its fuse within a few inches of the + solar bar, – to the – solar bar. PV leads (16/2 or bigger) through each one's PV surge module. Heat sink

EVERY LINE OFF THE BARS

Line	Stud	Breaker	Wire	To	Good to
1	stud 1	none	12 AWG, 15 in, loom	Argodiode IN	-
2	backup-fed	30 A	12/2	Release Node B (stern)	12 ft
3	backup-fed	15 A	16/2	Central node	18 ft
4	backup-fed	30 A	12/2	Release bus A, central node	9 ft
5	backup-fed	20 A	14/2	Steering, central node	10 ft
6	stud 6	20 A	16/2	Network switch box	16 ft
7	stud 7	5 A	16/2	Iridium A	any
8	stud 8	5 A	16/2	House CAN 24 to 12 V converter	90 ft
9	end	15 A	16/2	Wet lab converter (node ch 2)	22 ft
10	end	10 A	16/2	Pi A box	22 ft
11	end	5 A	16/2	Water Witch 1, pump 1	22 ft
12	stud 8	5 A	16/2	USB hub box	45 ft
13	stud 6	10 A	14/2	Orion-Tr, backup battery board	27 ft
14	backup-fed	5 A	16/2	Wing box (slip ring)	34 ft

The jumper from a stud to its breaker is the + only, the line's size. Over 7 in: split loom (USB, bilge 1, Orion, wing, the Argodiode feed). The duplex runs from the breaker to the load; its black comes back to the – branch bar, or for lines 2, 3, 4, 5 and 14 to the backup-fed – bar. Line 15 (bilge 2) is on the backup battery board.

THE BACKUP-FED BAR

From	To	Wire
Branch stud 1	Argodiode IN	12 AWG red, about 15 in, split loom, 1/4 in lug at the M6 stud
Argodiode OUT 1	backup-fed + bar, top big stud	12 AWG red, short. OUT 2 and the small tab empty
Backup-fed + bar	a small screw each: 2, 3, 4, 5, 14	the line's own size, + only; the two releases on different screws
Converter +	backup-fed + bar, bottom big stud	12/2 red, about 17 ft
Converter –	backup-fed – bar, bottom big stud	12/2 black
Backup-fed – bar	top big stud → – branch bar top stud	12 AWG black, short
Five returns	backup-fed – bar, small screws	the black of each line's duplex

TO WORK ON IT

Battery switch off. No PV connected (PV off at the controllers first). Lift one end of the 300 A Class T at the battery box: with only the switch off, the incoming 2 AWG and the switch's input stud stay live. The backup-fed bar is also live whenever Pi B has the backup converter on. New parts go on with screws no longer than the board is thick. Close the Class T last.

BEFORE THE FIRST POWER-UP

Both shunts on the + side, nothing but plain cable on the – side (Build Guide 11.1). Covers on both shunts and every bar. Read every breaker's rating.

OPEN

Board work left (Mike's photo, Nov 10; the Main Bus Board Changes plan): the CAN and bilge 2 breakers off the board, Aft relabelled Switch, the backup-fed – link, the converter's 12/2, split loom, covers. **Backup converter:** its cutoff and restart voltages.