M/V Gizmo core 12v elec energy components				**-- Note separate house & starter systems with crossover switching, each with alternators**	
version: 7/3/2024					
House bank and charging sources		Install		Notes	
Batteries	*4x Victron LiFePO4 Battery 12.8V/100Ah Smart	4/2022			
" management	*Victron Lynx 500A BMS with 2x Lynx Distributors	4/2022		Victron's top-of-the-line BMS, also manages solar and shorepower charging	
Main eng alternator	Leece-Neville 8LHA207OVB 130a	1/2000		Leece-Neville likely original equipment, but rebuilt 5/2011	
" regulator	Balmar MC-618H regulator	4/2022		Includes SG200 & app for regulator monitoring/configuration. Helm gauge also displays house bank current (and inaccurate state of charge). Located under top galley step.	
	Victron SolidSwitch 104	4/2022		Protects main alternator if Lynx needs to shut down house bank. Also under top step.	
	*VictronOrion-Tr Smart 30A DC-DC charger	4/2022		Uses excess starter bank alternator to further charge house bank	
Solar Panels	2x Kyocera KD140SX-UPU	8/2012		280W total with custom tilting rack (that also works with mast crutch for storage / low bridges).	
" regulator	Victron SmartSolar MPPT 100/30	3/2019			
Shorepower	*Victron Multiplus Inverter/Charger	4/2022		Rated 120A charging, 3000W inversion	
	*Victron SmartShunt 500A/50mV	4/2022		Measures current output of the maine alternator & DC-DC charger, also starter bank voltage	
	**Victron Cerbo GX & GX Touch 50 screen	4/2022		Monitors electric power system & more, including off boat data collection & display. Located behind panel above main breaker panels.	
	* = these components can be configured and monitored with Victron Connect Bluetooth app				
	** = Cerbo monitoring & more accessable via boat WiFi, and if online at Victron Remote Monitoring				
	Gizmo VRM guest view:			https://vrm.victronenergy.com/installation/105905/share/ea38a0bd	
Starter Bank	2x Odyssey ODX-AGM31, CA 1379 cca 1150	4/2022		More cranking amps than previous batteries, bought at Autozone w 4 yr warranty	
eng alternator	stock Volvo Penta 450hp VP TAMD74C	1/2000		Max amperage unknown, but likely about 60	
shorepower	trickle charge from Multi 12/2000/80				
Notes on power usage					
Currently the boat rarely gets shore power, and according to my VRM stats it consumes about 115ah/day at her mooring, with refrigeration running and solar covering about 100 of those on average.					
Consumption is higher when cruising but so, usually, is engine alternator time. The new dual alternator house bank charging can produce about 125A, even at low RPMs and high states of charge.					
The inverter isn't currently used much -- as only the microwave, the Visio display, and various device chargers need it -- but it can fully power the microwave oven directly from the new lithium house bank.					
The biggest DC load is a Lewmar 185TT 4kw bow thruster, which has never shut down due to battery overload, and works fine with the lithium bank, even without the engine on.					
In fact, I think that the major DC cabling is oversize at mostly 4/0 gauge.					

	NMEA 2000 networks	location	function	note
	Network 1 (Nav)			**Main nav, autopilot**
1	LTU GPS/Heading	Antenna Mast	**GPS/Heading**	
2	B&GTriton T41	Fly Bridge	AP display	also rudder angle & more
3	B&G Triton Pilot Keypad	Fly Bridge	AP control	
4	Furuno TZT2 12" MFD	Fly Bridge	Chart, Radar, FishF	DRS4D-NXT radar & 520-PLD 600W ducer
5	Furuno FI70 instrument	Fly Bridge	Instrument	display Nav, engine, depth, etc
6	Furuno FI70 instrument	Fly Bridge	Instrument	display Nav, engine, depth, etc
7	Vesper Cortex	Fly Bridge cabinet starboard	AIS, GPS, WiFi	Handset = alternate instrument display
8	Airmar DST850	Forward Cabin (under floor)	Depth, Speed, Temp	Calibrates by CAST app
8	Simrad OP12 keypad	Lower Helm	AP control	
9	Simrad GO5 XSE	Lower Helm	AP, chart, more	includes StructureScan transducer
10	Furuno FI70 instrument	Lower Helm	Instrument	mainly substitute for old Ritchie compass
11	Actisense USB xxxx	Lower Helm (behind)	Gateway	to TZ PC Nav & Actisense apps
12	Actisense EMU	Lower Helm (below)	Engine monitor	Converts VP analog to N2K
13	Simrad AC12 ap controller	Lower Helm (cabinet behind)	AP	runs hydraulic solinoid
14	FFM 100	Engine Room port fwd	Fuel flow	**currently not working**
15				
	Network backbone is mostly thick gray Mini cable, with terminators at mast base and engine room forward port overhead			
	Network 2 (Maretron) -- all devices Maretron unless noted			**Monitoring, switching, backup nav**
1	LJ Capteurs	Antenna Mast	Wind, baro	
2	GPS 200	Fly Bridge (starboard rail)	GPS	
3	Yacht Device humidity	Fly Bridge (mast base)	Humidity	used by DSMs to calculate Dew Point
4	DSM 250	Fly Bridge	Instrument	
5	ALM 100	Fly Bridge	loud audio alarm	controlled by Maretron DSM's
6	M12 Switch panel	Fly Bridge	light switching	**not yet installed but switching on DSM**
7	Standard Horizon GX2400	Fly Bridge attaches	VHF/AIS	
8	LTU GPS/Heading	Fly Bridge seat way fwd		
9	USB100	Lower Helm (behind)	Gateway	Maretron N2KAnalyzer on PC
10	YD voyage recorder	Lower Helm (behind)	Analysis	

	NMEA 2000 networks	location	function	note
11	Actisense WK1	Lower Helm (behind)	WiFi data	**not installed**
12	Victron Venus	Lower Helm (behind)	Elec monitor/control	
13	Victron Cerbo (via Venus)	Breaker Panel	Elec display	Also displays tank levels and more temps
14	DSM xxx	Lower Helm	Instrument	
15	M12 Switch Panel	Lower Helm	light switching	**not configed but switching on DSM**
16	DSM 410	Breaker Panel	Instrument	
17	SIM 100	Breaker Panel	high bilge, smoke, etc	**not yet installed**
18	ALM 100	Breaker Panel	loud audio alarm	
19	M12 Switching module	Breaker Panel	Switching	Lights: eng room, nav, mast floods
20	TEMP 100 #1	Engine Room fwd port	Eng block, boiler, hot water, frig	
21	TEMP 100 #2	Engine Room aft star	tranny, dripless, water pump, Victron bat	
22	DST100	Engine Room	Depth, Speed, Temp	
23	YDES-04	Engine Room	Eng & Fuel flow	Uses engine diagnostics port
24	Offshore	Engine Room	Racor fuel pressure	
	Network backbone is blue Mid cable, with terminators at mast base and engine room aft starboard overhead			

Lnyx multiconnector				
Pin	**Name**	**Type**	**Function**	
1	AUX voltage output +	System voltage positive	1a fuse red to Cerbo	Cable flat white 18awg to Cerbo
2	AUX voltage output -	System voltage negative	blk to Cerbo	" " ditto
3	Allow to charge		1a from AUX	Wire: red wire fused loop
4	Allow to charge		Red to Alarm relay #8	Wire: red **unfused** loop
5	Allow to discharge		1a from AUX	not installed
6	Allow to discharge		to SBP High	not installed
7	Alarm relay NC			n/a
8	Alarm relay COM		Red to ATC #4	Wire: red unfused loop
9	Alarm relay NO		to Solid Switch High	Thin bulk cable, blue wire
10	Remote on/off H	pull-up resistor	to circuit panel switch	Cable: round black 22awg to breaker panel lower right
11	Remote on/off L	Pull-down resistor	to circuit panel	" " ditto
Distributor #1 -- battery bank				
	Batteries 1, 2, 3, 4		Pos	100 amp fuse each
	Batteries 1, 2, 3, 4		Neg	
Distributor #2 -- major loads and charge sources, plus				
	Solid Switch		2a fuse on POS	Cable: flat white 16 awg (old SmartGuage)
			Neg	
	Balmar regulator		2a fuse on POS	Bulk round glass fuse, not used
			Neg	
	Main house feed from 400a fuse		Pos	
	Neg feed from bus bars		Neg	
	Solar		Pos	
			Neg	
	DC-DC		Pos	
			Neg	
	*needs specifics on terminals and fuse sizes but they are visible			

Lewmar windlass	Purple = power, Brown = UP, White = DOWN						
Weema tank channels	#1 white starboard fuel 125 gallon or 140?						
Now to Cerbo tank iputs	#2 white port fuel						
in same 1-4 order	#3 black fresh water 100?						
	#4 color _____ black water 50 gallon						
Carling MPower 12		M12 channel	old DCM#	fuse	**old Maretron DCR for reference**		
	Nav Lights	1	2	5	Input what fuse fuse wiring		
	Flood lights (fix fwd?)	2	6	10	12 forward bilge power 3a b/b		
	Bow Power	3	4	5	10 eng rm bid LED 3a o/b		
	Foward Engine Room Lights	4	8	5	08 old eng rm fixtures 3a r/b		
	Aft Starboard Engine Room Light	5	10	8	06 deck (masthead) lts 4a b/b		
	Bow Light (fix)	6	12	5	04 bow light 3a r/r		
					02 nav lights 5a b/b		
Mystery wires?	gray signal -- bilge activation?						
behind circuit panel	high water -- SIM? or Maretron?						
Surecall Boiler system							
Main Switch	Red to thermastat, red to Surecall controller, upper tab for neg 12v to light toggle tip						
Thermostat	Red - right post, Black second post	No ground found. Red to main switch. Blk to Surecall controller/					
2 speed fan switches	fused wire to center tab, fan wire to lower tab	Note different switch models for different fans (.7 for bigger galley unit)					