

PART 3 POWER MANAGEMENT

INTRODUCTION

Just after buying MAVEA in November in Le Havre we made the delivery to St Brieux. Windy (20 to 25 knots, with rain (a deeply cold one)... I decided to plan the route and connected for the first time my rugged laptop on my new boat. SBLAMMMMMM.... Oops.... The first problem in this new boat was a blown fuse. Remy did not worry and told me "It is not a major problem". He pulled off a paper clip, which was being used to hold a wooded panel covering the electric circuit board, and started burrowing in a cascade of different coloured and sized wires all connected by rusted electrical board. During the 170 mile delivery we had to charge the 2 x 100 AMP batteries three times and had no music, no electronics and no fridge. We only had a laptop (part time) and a navigation light...

At St Brieux my decision was made, rip out all the electrics and start again!

1-3 WHAT ARE MY NEEDS?

- To not use engine during sailing (2 days of autonomy): MAEVA was, is and will be a sailing boat. Sometimes a fishing boat but NEVER a motor yacht.
- To be able to know all the time where I am and where I am going with the music playing
- To get dry & insulated from the cold and always to have a cold can of Coke

To measure these needs I created an Excel spreadsheet from which the size of the batteries and the diameter of the wire could be determined. I sail often singlehanded and weight is not really an enemy if it is well positioned. => Batteries can be heavy.

Below is the Excel spreadsheet from which the conclusion of my needs are:

Total Consumption per day	725 watt	60 AMP
Necessary power (+50%)		91 AMP
Batteries (25% of discharge max)		247,5 AMP
AUTONOMY (DAYS BETWEEN CHARGES)		2,7

↓
2 BATTERIES OF 165 AMP HOURS

I measured the size of the storage place for the batteries and found that the VICTRON 165 AMP would fit. The weight 48 kg per battery. This is why now I sail single handed with a sleeping crew. The position is always OK with my trim, strategy (Yes James some time I make strategy!!!) and this sleeping crew never gets tired or needs to drink or eat. Always happy. A very good fellow indeed.

I use a battery monitor to measure the performance. I use this to see the voltage and time to go. At 12.2 V I switch to the second battery. I set up an audible alarm to warn me when the battery is low or when it is high when charging (Very useful tools!).



[BMV-600Sseries](#)

The BMV-600S and BMV-602S are our newest high precision battery monitors.

The essential function of a battery monitor is to calculate ampere-hours consumed and the state of charge of a battery. Ampere-hours consumed are calculated by integrating the current flowing in or out of the battery.

Because I trust only checked & calibrated instruments I tested this battery monitor during a double handed Channel Race (pilot 10% of the time, music 100% and computer 100%). We used only one battery (not completely, it went down to 12.4v and we finished 3rd Overall before SOLAN of GOOSE (Peter had not received his incentive before this day!).

DETAIL OF MY NEEDS

Power Users	Power		Utilisation over 24hours	Consumption		%
	Watts	Ampères		Wh	Ah	
Interior Lighting	0			3	0,3	0,4%
Éclairage divers	3	0,25	0,5	1,5	0,13	0,2%
Lum carré évier	0	0,00	0,5	0	0,00	0,0%
Lum. table à carte	3	0,25	0,5	1,5	0,13	0,2%
Lumière cabine 1	0	0,00	0,5	0	0,00	0,0%
Lum. cabine 2	1,3	0,11	0	0	0,00	0,0%
Lum. salle de bain	1,3	0,11	0	0	0,00	0,0%
Lum. couloir penderie	1,3	0,11	0	0	0,00	0,0%
Lum. cabine avant	1,3	0,11	0	0	0,00	0,0%
Exterior Lighting				16	1,3	2,2%
Bow light	5	0,42	0	0	0,00	0,0%
Stern light	2,5	0,21	0	0	0,00	0,0%
Anchor light	2,5	0,21	0	0	0,00	0,0%
Compass (Tacktick)	2,5	0,21	0	0	0,00	0,0%
Mast light	2	0,17	8	16	1,33	2,2%
Comfort Equipment				276	23,0	38,1%
Fresh water pump	50	4,17	0	0	0,00	0,0%
Fridge USB	2	0,17	12	24	2,00	3,3%
HiFi Sony stereo 50 watt par 4 a 25%	50	4,17	5	250	20,83	34,5%
Cigarette lighter socket	1	0,08	2	2	0,17	0,3%
Électronique				430	35,8	59,3%
Radar detector	1	0,08	24	24	2,00	3,3%
PC Xplore 103 receive	2	0,17	18	36	3,00	5,0%
PC Xplore 103 Actif	11	0,92	4	44	3,67	6,1%
Seamate / Actisense	0,5	0,04	0	0	0,00	0,0%
Ultra Sonic	10	0,83	0	0	0,00	0,0%
Pilote XP5 (standby)	1	0,08	18	18	1,50	2,5%
Pilote XP5 (engaged)	30	2,50	6	180	15,00	24,8%
Pupitre XP5	0	0,00	24	0	0,00	0,0%
Pilote TP 32 (veille)	0	0,00	0	0	0,00	0,0%
Pilote TP 32	0	0,00	0	0	0,00	0,0%
GPS Garmin 32	0	0,00	24	0	0,00	0,0%
VHF RT650 (receive)	5	0,42	23,9	119,5	9,96	16,5%
VHF RT650 (transmit)	25	2,08	0,1	2,5	0,21	0,3%
Centrale Tacktic	0	0,00	24	0	0,00	0,0%
Battery charger	2	0,17	3	6	0,50	0,8%
Stand alone engine starter battery	360	30,00	0	0	0,00	0,0%
Total Consumption (per 24 Hours)				725	60	100,0%

I can give you this Excel Sheet or transfer it to you for the price of a beer!!

CONCLUSION CHAPTER 3

HOW TO PROVIDE POWER,

At Sea

One hour of engine is enough to charge from 12.4v to 14.3v both of 165 AMP batteries with the 430 AMP engine alternator! But I once did not charge the batteries in a race when I had only 10 litres of diesel (nice reminder during Channel Week!) Thanks to GEOFON for helping me with her spare 10 litres fuel tank!

Sometimes I use a solar panel which I can position on a halyard, or under the boom or on the lifelines). It is stored under the aft berth when not in use. When charging it can supply enough amps to keep the pilot and computer working.

In the Harbour

I use a DOLPHIN all in one 230v/40AH battery charger all the time because during night I use a 230v heater. I have been IRC measured with it as it is connected directly by a splice to the 230v circuit so as not be considered as mobile!

The All in One Marine Electrical Cabinet combines an AC distribution system with a 12V switch mode battery charger, all in the same compact box. AC circuit protection is via a 30 mA, 16 amp R.C.C.B. Unit. Several AC loads can be connected, each with its own 10 amp double pole circuit breaker. The charger converts the input line frequency from 50Hz to 150Hz, which reduces the size of the transformers and chokes used in conventional chargers.

All the charging systems (alternator, solar panel and 230V charger are connect to a load sharer (CRISTEC) able to service all 3 batteries (2 for service and one for engine).

I forgot to tell you:

All wires are at the right section with minimum length (which is why all antennas are inside at the chart table). They are all tinned and protected by one or two pieces of heat-shrunk sleeving... It took two weeks to do the total installation. But thee years later I still have my sleeping crew below the berth, in good shape and still giving 2,5 days of autonomy...

Only for fun below a photo taken at the chart table during a delivery to Cherbourg to do Cherbourg Solent (see the chapter on Strategy...). Fortunately for me there were not enough entries for the race to count in the Series as I only finished 6th out of 7. If this race had counted I would not have won the SORC annual Championship...Rules some time are good! To compensate for this race I had to make a 300 miles delivery for a 60 miles race.....Rules are good but sometimes tough to!

