Boat Computer Wishlist

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https://bareboat-necessities.github.io

https://github.com/bareboat-necessities/my-bareboat

https://github.com/bareboat-necessities/my-bareboat/issues

https://bareboat-necessities.wixsite.com/my-bareboat

PDF version:

https://bareboat-necessities.github.io/my-bareboat/boat-computer-wishlist.pdf

Chapter 1. Wishlist for Raspberry Pi extension board for marine computer

The wishlist is inspired by MCS board (https://github.com/Thomas-GeDaD/openplotter-MCS/blob/master/QuickGuide_MCS.pdf), as well as CarPiHat, number of SupTronics boards, Moitessier Hat, PiJuice, SixFab, PICAN-M boards

1. RTC clock

2. UPS

3. Lithium Ion battery mounting place

4. Port for solar / wind power input

5. Charging from solar, overcharge protection. If solar is enough then work from solar and charge, if not then from lithium battery, if not enough from 12v house battery, if not enough then do a safe shutdown, but when solar comes back up (or house battery) start the pi automatically

6. 7-port USB hub (can be USB 2.0) self-powered, non back feeding

7. Audio in/out

8. SSD drive interface, place to mount SSD

9. Supplied with IP67 or better panel mounted interfaces (round holes) and cords to the board for USB, HDMI, Audio in/out, Ethernet, NMEA, power, momentary switch button, RF ports for antennas (GPS, AIS, SDR radio, etc)

10. External panel mounted SD card reader extension (IP68 or better) for easy software and charts swap

11. Panel mount status lights or (better) small (like m5stack) LCD display

12. Built-in on-board NMEA multiplexor functionality

13. Panel mount amp and volt meter

14. Buzzer for alarms

15. Panel mount USB charger port and cigarette 12v port (waterproof)

16. Conformant coating of the board

17. Two options to install the board

    ◦ mount inside a panel

    ◦ install in supplied protective case with wires routed via glands + waterproof case vent

18. Plus all existing MCS board functionality (optocoupled interfaces, self healing fuse, CAN bus, 5 NMEA 0183 interfaces, 1-wire, I2C ports, etc)

19. Ports for engine RPM, temperature, oil pressure, bilge pump monitoring, liquid levels inputs, navigation lights programmable controls, inputs for various gas alarm sensors, anchor windlass controls, bow thruster controls, a/c controls, fridge controls interface, water heater controls, air

blower controls, seacocks state inputs, heel/pitch/roll, IMU (heading), environment (air temp, pressure, water temp), rudder position, interfaces to electric winches, sail tension sensors ports, live well tank controls

20. Integration with on-board WiFi, LTE router via ethernet

21. Integration with SDR radio, SSB via audio in and USB (AIS, NavTex, Weather fax, Inmarsat Fleet)

22. Integration with Iridium satellite phone as a modem

23. Integration with radar

24. Integration with sonar, fishfinders

25. Integration with depth, speed, wind transducers, autopilot via NMEA

26. Integration with lidar or color night vision camera

27. Relays for programmatic nav/running/anchor lights on/off

Chapter 2. Wishlist for OpenWtr router extension board for marine LTE/WiFi router

1. 4-6 NMEA 1083 ports multiplexed via TCP/IP using Kplex running on OpenWrt

2. External panel mounted SIM card reader extension (IP67 or better) for easy swap

3. Supplied with IP67 or better panel mounted interfaces (round holes) and cords to the router for USB, Ethernet, NMEA, power, momentary switch button, RF ports for antennas (GPS, WiFi, etc)

Chapter 3. Wishlist for Power Board

This board would allow Pi to be up 24/7.

1. Port for solar / wind power input

2. Port for 12v house battery input

3. 12v output to power external monitor

4. Lithium Ion battery mounting place

5. Charging from solar, overcharge protection. If solar is enough then work from solar and charge, if not then from lithium battery, if not enough from 12v house battery, if not enough then do a safe shutdown, but when solar comes back up (or house battery) start the pi automatically

6. UPS via lithium battery

7. RTC clock

8. SSD drive interface, place to mount SSD

9. 7-port USB hub (can be USB 2.0) self-powered, non back feeding

10. Audio input (and better than default pi audio output)

11. Supplied with IP67 or better panel mounted interfaces (round holes) and cords to the board for USB, HDMI, Audio in/out, Ethernet, power, momentary switch button, RF ports for antennas (GPS, AIS, SDR radio, etc)

12. External panel mounted SD card reader extension (IP68 or better) for easy software and charts swap

13. 5v ports to power extension IO board and Pi

14. Safe shutdown button connector (with panel mountable momentary button)

15. Programmable buzzer

16. Connectors for front panel status lights

17. Connectors for front panel amp/volt meter indicator

18. Conformant coating of the board

And all sensors, NMEA, GPS/AIS, Radio, Bluetooth, relays done as a separate IO board.