

Preamble:

The following notes are not intended to teach you how to sail but will hopefully highlight the differences from our other yachts.

Reference Data

Lifejackets + Harnesses	7 People
Hull length	10.82 m / 35' 6"
Waterline length	9.22 m / 30' 3"
Beam	3.57 m / 11' 10"
Draft (Keel UP)	0.72m / 2' 4"
Draft (Keel Down)	2.18 m / 7' 2"
Safe Air Draft	16 m / 52'6"

Sails

Main	27.0 sq m / 290 sq ft
Reefing Single Line Reef 1 & 2 / 2 Lines – reef 3	
Genoa	28.03sq m / 301.6 sq ft
Jib	Not Purchased
Gennaker	52.00 sq m / 560 sq ft

Engine	Yanmar 3YM30
kW / HP	21.3 kW / 29HP
Maximum Rpm	3300
Maximum Cruising Rpm	2800
Prop Walk in Reverse	Mildly Port
Diesel Capacity	182 Lts / 40 imp Gallons
Consumption	3.5 Lts /Hr
Diesel Fill Point	Starboard Side Deck

Water Capacity	205 Lts / 45 Gallons
Water Fill Point	Port Side Deck
Holding Tank Capacity	78 Lts / 17 Imp. Gallons
Waste Pump-out Point	Starboard Side Deck

Bow Anchor 15 kg Bruce	30m Chain 30m warp
Marking	every 5 m
See Front of Logbook for more detail	
Kedge 16kg Vetus / Fortress	35m Warp

General:

Carina is a Category A sloop with a fully variable / retractable keel. Ours is the more powerful version with a "Tall Rig" that increases the sail area by 19%.

***Category A - Definition:** This craft is designed to operate in winds that may exceed wind force 8 (Beaufort scale) and in significant wave heights of 4m and above (see note below), and vessels largely self-sufficient. Abnormal conditions such as hurricanes are excluded. Such conditions may be encountered on extended voyages, for example across oceans, or inshore when unsheltered from the wind and waves for several hundred nautical miles.*

Note:

The significant wave height is the mean height of the highest one third of the waves, which approximately corresponds to the wave height estimated by an experienced observer. Some waves will be double this height.

The stability figures are excellent. There is very little difference between keel up & keel down. All the tanks are low set & the massive ballast /grounding plate / keel-raising structure is lowest of all, having been bolted from the outside of the hull. It will float in 1Metre with the keel up but needs 2.2m with keel down. Don't forget how much water is required, especially when crossing the Port Solent cill at LW springs.

The depth indicator reads from the Waterline. (Offset +0.3m)

When handing over the wheel, remind the new helmsman of the keel position!

Steering:

The steering is precise whether motoring or sailing.

- Wheel Steering
- Rod actuated from base of pedestal
- Auto helm, internally attached to the transom, connects to Starboard Rudder shaft. The normal inter connect then runs the Port Rudder from under the pedestal.
- Emergency steering can be connected to either rudder stock. Fit with the arm pointing up for better control.
- Emergency steering arm & cap release tool are in the Port aft Locker.

Anchor/ Windlass:

Connect the hand controller to the point on the Port bow, ensure the switch in the fore cabin is on (Down) & the engine running.

Ease the anchor forward over the bow roller until hanging vertically before deploying normally. This is to avoid damaging the bow.

Use the normal techniques to avoid over-stressing the motor.

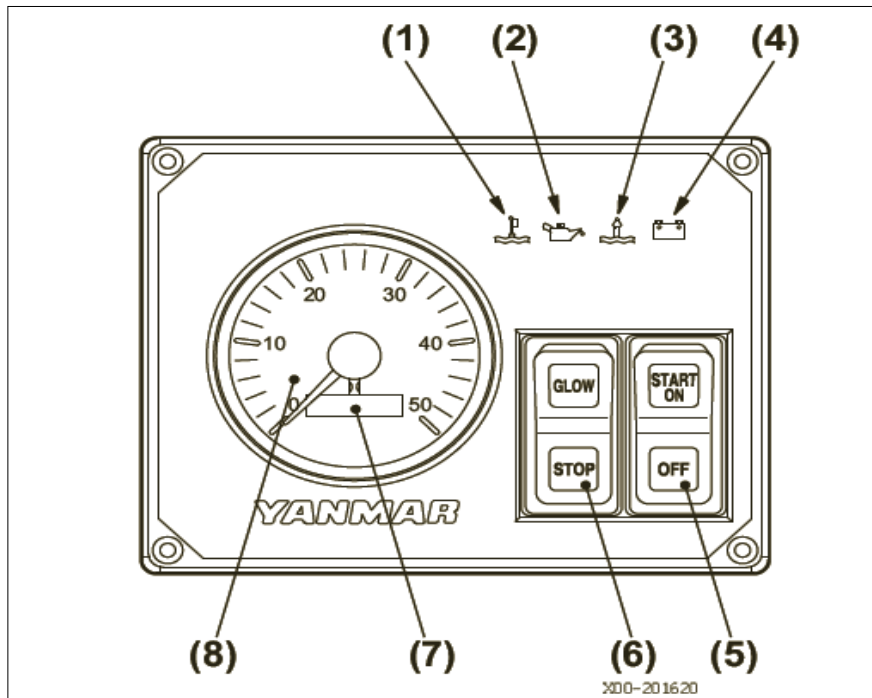
Adverc Battery Manager:

This device modifies the alternator output to optimise battery charging. Our other yachts have or have had one but this one has a GREEN light on the Engine panel by the last letter of the YANMAR logo. When the engine is running, the light should be out. If the light is flashing or on, it means a fault within this unit but should NOT affect normal battery charging. Just check the battery volts to confirm that charging is taking place. It should not affect your voyage. Note: A Fully charged 12 V battery will only produce 12.6V. If the alternator is charging it, you should see >14 Volts.

To Access the Adverc unit, remove the middle galley drawers. The multi plug can be disconnected if required. The Alternator reverts to its own internal regulation.

Engine Information: The Yanmar 3YM30 is a well proven & reliable unit. It very rarely requires the use of the glow setting except in sub-zero conditions.

Carina has a KEYLESS SYSTEM.



This is all controlled by 2 Multi function Switches.

Switch 1	Effect	Switch 2	Effect
GLOW	Operates Relay to send current to Glow plugs (VERY cold starts only)	ON	Selects Electrical power on. Alarms active Hour Meter Active Alternator fields Active
STOP	Cuts off Fuel Supply to Injector Pump to stop the engine. Only works with electrical power ON. Hold until the Engine Stops completely & the Rev Needle Drops to Zero	START	Engages starter motor when held against spring
		OFF	Electrical Deactivation

Do NOT Confuse the STOP function with the OFF Function as:

- 1) The Fuel Solenoid will not cut off & the engine will continue to run.**
- 2) Running the Engine without the electrical power on could damage the alternator!**

The “Alarms” information on the next page gives a fuller explanation and must be read in conjunction with the above

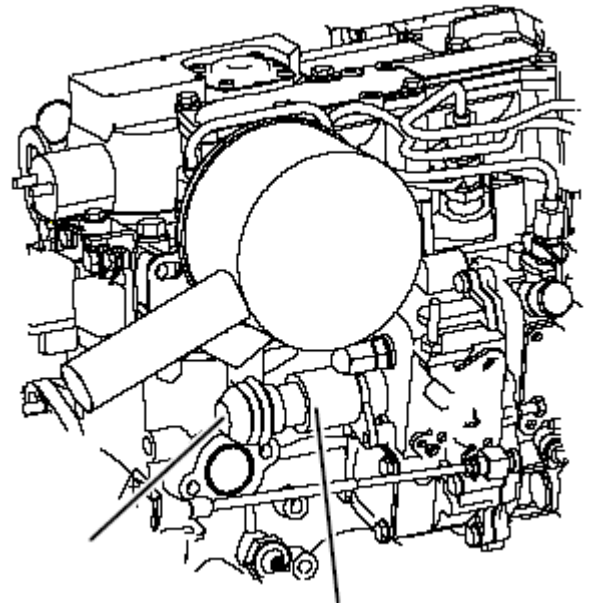
Alarms

Check that indicators and alarms are working normally when the key is turned to ON.

Key Switch		OFF ⇒ ON	START ⇒ ON
Engine		Before start	Running
Alarm		Sound	No sound
Indicators	Battery Low Charge Indicator	ON	OFF
	Coolant High Temperature Indicator	OFF	OFF
	Engine Oil Low Pressure Indicator	ON	OFF
	Water In Sail Drive Indicator	OFF	OFF

Manual STOP Button on Engine

If the engine does not STOP when the Stop button is pushed & held, firstly check that the key is ON then operate the manual alternative on the engine itself. This can be identified by the corrugated ORANGE rubber boot on the starboard rear side of the engine. Press & hold this in to stop the engine before resorting to other methods.



**Figure 12****Battery Low Charge Indicator (Figure 12)**

-When the alternator output is too low, the indicator will light. When charging begins, the indicator will turn off. No alarm will sound for low battery charge.

**Figure 15****Water in Sail Drive Indicator and Alarm (Figure 15) – Not applicable to Carina****Figure 13**

Coolant High Temperature Indicator and Alarm (Figure 13) – When the primary coolant temperature reaches the maximum allowable (95°C [203°F] or higher) or the exhaust gas temperature reaches the maximum recommended (40°C [104°F] or higher) the indicator will light and the alarm will sound. Continuing operation at temperatures exceeding these limits will result in damage and seizure. Check the load and troubleshoot the cooling and sea water heat exchanger systems.

**Figure 14**

Engine Oil Low Pressure Indicator and Alarm (Figure 14) – When the engine oil pressure falls below normal, the oil pressure sensor will send a signal to the indicator causing it to light and the alarm to sound. Stop operation immediately to avoid damage to the engine. Check the oil level and troubleshoot the lubrication system.

Manoeuvring under Power:

There is only wash from the yacht's movement over the twin rudders. These produce sufficient turning force from about 1.0 Kts. This can be augmented by the bow thruster. This will mean some different techniques for manoeuvring.

The gear / throttle lever Neutral is set at the 10 o'clock position i.e. AFT to reduce the chances of fouling the lever with mainsheet.

Coming alongside:

In conventional yachts, you tend to park the bow & the deal with the stern. Due to the twin rudders, you cannot push the stern in with a burst of power. SO, make sure you "park" the stern, secure it, then use the bow thruster if required to get the bow in. If the stern gets out, it's very difficult to recover the situation.

Tight Turns:

If a tight turn is required, get the yacht moving at about 2 Kts (you may have to "back-up" to give a run up) then reduce power (some power is required to counteract the drag from the rudders at large turning angles) & simultaneously apply full rudder. Keeping excess power on during the turn merely accelerates the yacht & INCREASES the turning circle.

Bow Thruster:

This is powered through the Windlass / Keel / Thruster battery isolator.

This is switched on/off from the pedestal. Just give it a "blip" before you actually need it to check it functions correctly. It is controlled by the small joystick. The bow thruster is very useful tool to assist manoeuvring the bow. Use all the normal techniques (tide / wind / spring off etc) then augment this with the bow thruster when required. It is possible to manoeuvre the yacht in quite tight spaces without recourse to the bow thruster. There are, however, some circumstances in which is essential, rather than a luxury.

Starting off with the premise that the bow thruster, is a "cure all" can lead to difficulties!

In crude terms, this is a car starter motor attached to a small propeller. Just think about how long you want to use a starter motor in a burst & apply the same logic to the bow thruster. Anticipation is required as the bow will keep moving after the thruster has stopped. Small corrective bursts are very effective. However, if you need it, use it to its potential. It has maximum limit of 3 minutes continuous use, after which it shuts down.

Sailing:

The main is fully battened & loose footed. The loose foot means there is more opportunity to create the correct depth of draught in the lower part of the sail for the wind angle / conditions. Attention to the use of the outhaul can bring large benefits in sailing performance; conversely, ignoring this aspect can have the opposite effect. Play the mainsheet & outhaul in a concerted manner.

If this is a sail control that you do not regularly adjust on the other yachts, it will bring benefits when you do.

Broadly, in light winds & off the wind there should be a deeper camber than close hauled in stronger winds.

The mainsheet is detachable from the traveller. This means it can be parked out of the cockpit when using the cockpit table. Please leave it attached until the yacht is secured as the boom end projects over the side deck & could get fouled when reversing.

Upwind sailing:

The optimum heel angle appears to be when the upwind rudder is generally skimming the water surface. If more heel is experienced, the advice is to reduce the headsail (moving the deck cars to keep the correct lead angle) to regain the optimum heel angle. Balance this with commensurate reductions in the Mainsail.

Offwind / Downwind:

Apart from the usual actions with sails / preventer, we have the option to use the furling Gennaker from the short bowsprit. A Gennaker may be thought of as a flatter cruising chute. It is capable of shy reaching but will not happily fly as far downwind as a cruiser chute. Using the Barber haulers it is possible to sail at 55° to the apparent wind. Without Barber hauling, it would be about 60°. If you have used the short bowsprit on Jocalia, you will have realised what an important contribution it makes to getting sail set ahead of the Jib / forestay. The only means of tightening the luff is to use the halyard. Ease the halyard as the yacht moves towards the limit of downwind to allow it to fly even more forward of the forestay & to increase the fullness of the sail.

When Deploying or Furling the Gennaker, the halyard must be TIGHT. This appears to be counter-intuitive but remember that the gennaker winds itself around its own stay, merely driven from the tack. In use, the halyard should be adjusted to suit the conditions.

The recommendation is that rolled gennaker should not be left rigged for periods when not in use in anything other than light winds as there is a possibility that it might develop a flap in the leech. The deck pads / halyards / sheets & other associated gear are very robust. Remove the Bowsprit before entering any congested area to prevent damage to either the fitting or to other yachts.

Hoist the rolled gennaker in the usual way then start the unfurling by freeing the continuous line, then pull out the sheet.

To furl, ensure the halyard is tight, de-power the sail completely then furl in. It may be necessary to blanket the gennaker with either the Genoa or Main to really de-power this sail. Release any tension in the sheets, hold the clew low during the process. This keeps the leech from billowing into a flap, thereby preventing the sail from candling on the next deployment. When fully rolled, the clew should be about head height above the deck & should look evenly rolled along the length of the luff.

If a flap develops, get the sail down immediately before it wraps itself up so tight, that it will not untangle.

You might notice the addition of 2 rings on the pulpit stanchion. These make it possible to prepare the pole & lock it securely forward, ready to be deployed. It needs to be extended by one click to reach from the mast to the pulpit locator. As Carina has a Baby Stay, the pole cannot be swung across the fore deck unless it is pretty vertical (i.e. almost stowed).

Finally, drop the rolled gennaker to the deck. I think it should be pretty obvious to decide whether this is something that needs doing immediately or can be delayed.

Whisker Pole:

As its name suggest, this is a light pole for holding out the Genoa ONLY. It is not strong enough for to use with a normal spinnaker. It is left slightly extended as this best fits our current Genoa set up. Triangulation lines are set up to rig the pole firmly. Please use a sacrificial sheet so that full control of the sail is always available.

Holding Tank Operation:

The Diverter valve is in the heads, easily accessible. It has 2 positions – out to sea or into the tank – both clearly labelled. There is a waste tank level indicator on the rear face of the toilet hand basin. The LED provides a convenient night light for the area. The holding tank can be pumped out manually with the dedicated Whale type bilge pump located on the front face of the Starboard Side of the Aft Berth. It doesn't take very long, even with the tank full. Just pump until it feels “dry”. The Diverter valve can be in either position. It uses the same toilet outlet seacock as direct operations. Therefore this cock must be open to pump out to sea. If closed, it will soon be apparent from the resistance felt through the pump. Keep paper out of the toilet system. See the advice notice on the shower seat lid.

It is good practice to flush the tank when at sea by filling it with clean seawater & then pumping it overboard each trip.

In Normal Circumstances, set the Tank selector to SEA & pump it dry before returning to the berth unless there is a need for it to be at tank. If this is the case, note its current position in the Logbook.

The holding tank may also be vacuumed out if you can find a sanitation station. Starboard Deck Fitting (same side as Diesel- all smelly stuff on the Starboard side!). The position of the sea cock is immaterial for this process.

The toilet / shower is generously sized. It makes a good storage area for foul weather gear

Keel Operations: [1 Red LED = Fully Down / 2 RED LEDs + 6 Green LEDs = Fully UP]
See front of Logbook for more details.

The keel is normally switch operated from the pedestal. A series of red & green LEDs indicate the approximate position. The indicating system has a separate switch that powers the LED indicators only. If night sailing, consider switching them off on the 12V electrics panel, left column next to bottom switch. The keel lift mechanism will function with or without the indicator lights. (Need to remember to turn back on during daylight!)

When the keel is fully down there will be 1 Red LED on to indicate the system is powered. When away from fully down another Red LED appears followed by an increasing number of green LEDs until all the LEDs are illuminated, indicating the keel is fully up. An electric switch runs a hydraulic pump that pumps the keel up, it descends by gravity. The hydraulic ram works on a "Spectra" rope that links to the keel. This allows the keel to move up, if necessary. The ram is angled beside the keel trunk port.

The hydraulic pump has a manual back up located under floor by the navigator table. There is a fuse in this compartment. If this blows, it is indicative of a serious problem. Resort to manual operation until the electrical issue is resolved.

To Raise Keel Manually: Open the access panel; by the electrics panel. Retrieve the long handle from under the navigator seat. Insert the handle into the pump arm and pump consistently backwards and forwards until fully raised. This will take about 110 pumps!

To Lower Keel Manually: Remove the wooden plate under the floorboard. This reveals the pump electric master switch, 7.5 amp fuse & hydraulic control valve (Fwd). Release the hydraulic valve by turning anti-clockwise and the keel will drop under its own weight, braked by a restrictor valve in the hydraulic system (this is pre-set & must not be adjusted). Close the valve by turning clockwise when the keel is down – this prepares it for being raised subsequently.

Keel Lock Pin:

The keel may be locked in the Up position by a substantial pin. This relieves pressure within the hydraulic system when the keel is needed to be held up for considerable time. Typically, if ashore or any time it is considered to be a useful strategy.

The pin is stowed in the Nav seat cupboard.

1. Remove the pin from its stowage.
2. Remove the cover cap on the keel mechanism trunking. (Windlass handle required).
3. Look through the opening to check the relative position of the keel locating hole.
4. Liaise with the helm to raise / lower the keel until the locating holes align.
5. Insert the pin & screw home.
6. Select Down on the keel control so the weight is taken on the pin.

To remove the pin, first select "up" briefly to take the weight off the pin.

Shallow water Operations:Sailing:

If sailing, rather than motoring, in shallow water is required, the recommendation is to raise the keel no more ½ way, giving a draft of about 4 ft. This configuration ensures that the keel should touch bottom before either of the rudders when heeled over. It also gives you the opportunity to “escape”!

Getting into shallow water can be great fun but needs careful planning. Really check that there are no obstructions. We noted that Portsmouth harbour reveals quite a few obstacles at low water. Also remember that areas outside the main channels are rarely surveyed. Treat the information with caution.

Motoring:

Having motored in shallow water (say <50% Max Draft), check the seawater strainer for silt / weed contamination at the first sensible opportunity. It is simple to look down through the clear top of the strainer. This should also be inspected following encounters with weed or at anytime blockage is suspected (engine note change etc.)

Drying Out Procedure:Planning:

Take every opportunity to gain information regarding the seabed, tidal effects etc. Although the yacht sits on its grounding plate, the presence of rocks could lead to a damaging & unstable situation.

Positioning:

In a beach situation, consider laying a kedge anchor. Basically you should try to ensure that the yacht does not swing around as it settles / lifts off.

Hull Issues:

1. Remove the Speed log & insert the plug to protect the speed impeller.
2. Close off the 3 Underwater Seacocks to prevent ingress of mud / weed or other foreign matter.
 - a) Engine Seawater Cock – trail the red streamer as a reminder.
 - b) Toilet Inlet Cock.
 - c) Toilet Outlet Cock
3. Select the Toilet Outlet to TANK.

Apply water into the bowl from the showerhead then pump out into the holding tank. If short of potable water, harvest a bucket of seawater when available??
4. Pin the Keel up?? If you are going to spend several days in a “Mud” berth, consider lowering the keel a little into clear water each high tide to prevent mud drying out in the gap between the keel & the centre box.
5. Lock the wheel to the binnacle using a harness tether as a very obvious reminder of this unusual yacht condition.

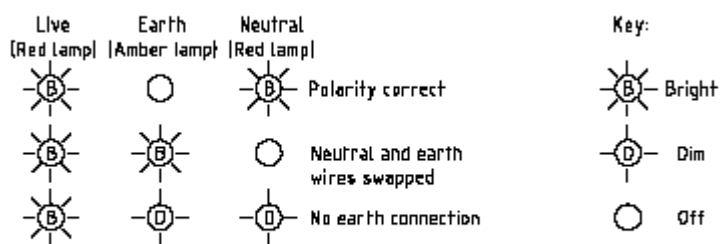
After Lift off ensure all is returned to “Normal” including a specific check on the engine seawater inlet strainer.

Keel Fully Down**Electrical Panel**

DC Systems

- The gauges need to be selected on
- Illumination of the switch lights is controlled by its own switch
- The keel position indicator has its own switch
- All functioning switches are labelled

AC Systems

Polarity check and fault indicating lights

Note: Other combinations are possible
All indicate fault conditions

- 240 Volt Circuit Breaker is in the Lazarette.

Battery Isolators:

These are located in bottom of the forward port wardrobe of the aft cabin.

There are 4 Isolators:

1. Services
2. Thrust / Keel / Windlass
3. Emergency link.
4. Engine.

Emergency Link:

As this implies, it is only to be used should the starter battery fail. Use the key from the Thrust/Keel/Windlass isolator. After successful engine start, this should be DISCONNECTED again. [This prevents problems associated with the starter battery from affecting the domestic bank, which powers the navigation, radios etc!]. Reconnect the Thrust / Keel / Windlass.

Forward of the isolators are 2 Circuit Breakers:

1. Bilge Pump
2. Maintained.

[The bilge pump & Eberspacher air heater are “hot wired” i.e. permanently connected to the services battery through these CBs.]

When leaving the yacht ensure that the Eberspacher is NOT in programme mode or it will run the heater even though the battery isolators are off, unless the Maintained CB is also pulled.

The checklist requires the Air Heater CB to be pulled when leaving the yacht at the end of a trip to prevent the heater from running. The upper CB (Bilge Pump) should be left in with Electric bilge pump set to Auto.

Sea cocks:

Only 3 sea cocks are below the waterline:

1. The engine inlet (Aft cabin port floor panel)
2. Toilet Inlet (Aft cabin port floor panel)
3. Toilet Outlet (Aft cabin Stbd floor panel)

The rest are all above the waterline & can remain open.

Summary:

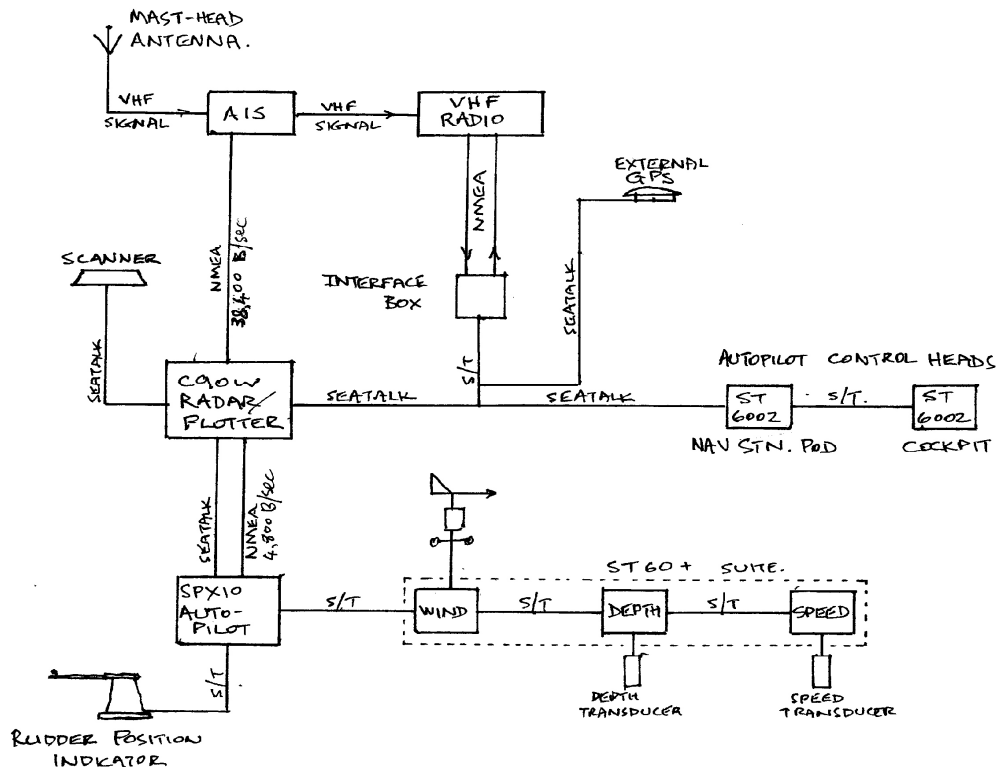
This is a very capable yacht. She has a fast, comfortable ride. The quality of the fittings & the finish are all very good. Every significant piece of equipment is clearly labelled.

We hope you enjoy sailing her.

Fair Winds,
Chris Williams 29/10/2017

Carina's Navigation Electronics – SeaTalk and NMEA Networking

The diagram below shows the SeaTalk (ST) and NMEA 0183 connections between Carina's electronic equipments.



Carina's SeaTalk and NMEA Connection Diagram

Carina's Raymarine and COMAR electronic equipments are connected using a combination of Raymarine's proprietary Seataalk protocol and NMEA 0183.

Auto-Pilot – Raymarine SPX10

This is a course computer with 2 control heads (at nav table and cockpit), and connections to the ST60+ instruments (wind, depth and speed), rudder indicator, external GPS, and C90W plotter. It has ST connections, and NMEA IN/OUT ports working at 3 speeds of 4,800 B/s, 9,600 B/s and 38,400 B/s. It can process NMEA sentences and ST data but cannot convert them in the way that the plotter and interface box can.

Radar/Plotter – Raymarine C90W

To conserve battery power, the power and data connections are arranged so that the A-P, GPS, VHF radio, and instruments can function independently of the plotter. The plotter's internal GPS is disabled to avoid interference with the preferred external GPS. For radar operation, and particularly MARPA, fast heading data (boat's own course, heading etc) is provided by the SPX10 course computer via its 4.800 B/s NMEA output.

External GPS – Raymarine RS125

The plotter includes a built-in RS125 GPS, but because of signal strength inconsistencies in the confines of the saloon, an external type mounted in the coach roof area has been installed on Carina. If the GPS Position is “lost” first check that no-one is sitting on the deck Aerial.

Interface Box – Raymarine E85001

This device is mounted inside the nav table instrument pod, and broadly speaking converts ST to NMEA 0183 and vice versa. It is powered via its connection to the ST network (ST is a 3 wire power and data system). The plotter can do these conversions but advantage cannot be taken of the facility because the plotter is likely to be switched OFF more than ON.

VHF Radio – IC M423

The VHF radio requires ‘real-time’ lat & long data to auto-transmit boat’s current position in the event of an MOB situation for instance, but the radio can only accept this data in NMEA 0183 format - normally provided by the plotter. However for reasons stated above, it has to be provided by the interface box. As well as receiving position data, the VHF radio also auto-sends lat and long to the plotter when the MOB button is pressed. If ON the plotter will note this position and display it on screen.

AIS – COMAR ‘multi’

The unit is mounted inside the nav table instrument pod.

It can be switched ON and OFF independently of the plotter at the 12v DB (at the ex GPS CB), but to display target position and information the plotter must be ‘AIS enabled’ by the user via the plotter MENU.

Required data connections are: NMEA 0183 (38,400 B/s) AIS to plotter, and NMEA 0183 (4,800 B/s) fast heading/GPS data to the plotter from the Auto-Pilot (SPX10) and external GPS (RS125). Very simply, the AIS unit converts target lat/long position, speed, course, etc received in short bursts of VHF signal data to NMEA sentences readable by the plotter and displayed in chart mode. This data is computed with fast heading/GPS data from the A-P to display positions of own ship and targets.

The VHF input is from the mast-top antenna with a straight-through connection to a socket connecting to the VHF radio. The AIS VHF signal is teed off this direct link and amplified to compensate for insertion loss. This arrangement ensures that even when the AIS is switched off, the VHF feed to the VHF radio is unaffected.

Navtex –Furuno NX300D

The Navtex is not shown in the diagram above because it has no connection to ST or NMEA. There is provision for NMEA GPS input but there seemed no real benefit in having an additional lat/long read-out.

The antenna is mounted on a stainless steel mast at the pushpit, and is different from other Navtex antennae in that it works on electro-magnetic principles (H type) as opposed to electrostatic (E type), and is much more effective in weak signal conditions.

Gas Alarm – Nerius Alarm mounted by the Nav Seat.