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Anchor System-DC:

The Anchor system consists of the anchor, 200' of rope, 30' of chain and the 12v D/C windlass (Muir model HR 2500 Cheetah). An in line fuse is located behind the angled panel on the v-birth fwd. bulkhead. A 150amp breaker is located below the breaker panel. The windlass releases the anchor and chain by relaxing a manual clutch wheel on the unit. The anchor is dropped manually and the hoisting of the anchor is done via the windlass. A deck mounted foot switch is adjacent to the windlass. As anchor rode is brought on board it falls into a chain locker that drains into the thru-hull at the water line, starboard side of the bow. A chain brake/lock prevents release of the anchor while underway. An owners manual is in the black ring binder. The rope is marked in 50' and 100' increments.

50'=□ , 100'=□□ , 150'=□□□ , 200'=□□□□ etc.

Note: Common amount of scope when setting anchor is from 5:1 to 7:1. (i.e. 25' of water depth = 125' of rope or 5:1 scope.)

Automatic battery selector-DC:

Located on the aft eng. room bulkhead above holding tank. Underway this unit allows the main engine alts. to first charge their respective start battery and then to switch to charging the house banks automatically. When the battery charger is operating (shore/genset) the unit first charges the house bank and then charges the start banks. Owners man. In black ring binder.

Note: The automatic battery selector does not control charging of the generator start battery.

Batteries, House-DC:

The 12 volt house battery supply is made up of two pairs of 6 volt (Dyno L16, 350AH) deep cycle batteries in series parallel producing **12v** and **700 amp hours** of power. They are located under starboard/port master stateroom beds. Each engine initially charges its respective start battery (via 80amp alts.) while underway and then charges the house banks via the "automatic battery switch" on the aft eng. room bulkhead.

Battery usage for maximum battery life:

A 12v battery under **bulk Charge** should read **14.40 volts** on DC the multi-meter.

A 12v battery under **Float Charge** should read **13.20 volts** " " " "

A battery at **100%** capacity should read **12.66 volts**. (with no load) " " "

A battery at **50%** discharge should read **12.30 volts**. (with no load) " " "

Note: Do not deplete house batteries below 12.30 volts before recharging via shore/genset.

Batteries, Start-DC:

The 12-volt start supply (interstate group 27) is comprised of 3 batteries, one for each engine and the generator. These batteries are located under the bridge deck port side sofa. The start banks are used only for starting respective engines/genset. They are oriented so as to match the engines/genset layout.

Battery Charger-AC:

A 40 amp (Newmar) battery charger is located starboard forward engine room bulkhead. Charging is available with shore power or via generator. The on/off selection for the charger is the breaker on the AC panel labeled "charger/inverter. A remote battery charger controller("PT battery charger remote panel") is mounted below the breaker panel. This remote is not an on/off switch. It is used to monitor battery charging rates and to reinitiate a charging cycle. Refer to the owner's manual in the black ring binder.

Battery Charger Remote Panel-AC:

See battery charger section.

Battery Selector Switch-House-DC:

A selector switch is located on the lower left side of the circuit breaker panel. Selection is either on or off supplying power for the vessel's 12v equipment.

Note: Turning the selector switch to "off" while engines are running will not damage the alternators.

Battery Shut Off Switches-DC:

3 battery switches located on the engine room aft bulkhead above the holding tank. These will interrupt power to the respective engine/genset starters. These are normally left in the "on" position and are only used in abnormal situations or during maintenance.

Bilge Pumps-DC:

2 12-volt, 4000-gph pumps and a single 500gph bilge pump are located in the bilge under the v-birth dresser (move and lift carpet) and aft of the genset in engine room. Their operation is automatic and is controlled by "Water Witch" sensors that measure elevated water levels in the bilge. Additionally, manual "on" switch's are located port side of the helm(require battery selector in "on" position). The bilge pumps are the only electrical items on the boat which are supplied with battery power regardless of battery switch/breaker position. In the event of a pump running unattended due to a water leak, it will deplete the house banks only. These pumps have in-line circuit breakers as well as one located on the 12v circuit breaker panel. The circuit breaker only controls power to the manual switches on port side of helm. A third 12v 500-gph pump is located under the v-birth dresser. Operation is "manual only" and is used to remove small amounts of water left behind by the large pumps.

Cabin heaters-AC:

See: " Heaters, cabin" section.

Circuit Breakers 12 volt-DC:

A 12-volt breaker panel(Blue seas 360 model) is located in the starboard side locker on the bridge deck. The left portion of the panel controls the majority of electrical items on board. See the following section for those items not controlled by the DC panel breakers. The panel incorporates a DC Multi-meter. To monitor batteries use the buttons on the meter to select amps(load) or voltage.

Circuit Breakers 120/240volt-AC:

120/240-volt breaker panel(Blue Seas 360 model) is located in the starboard side bridge deck. The right panel side 120/240-volt breakers control the main AC shore power circuit, the 120-volt outlets, battery charger, the hot water heater and the galley range. The AC panel incorporates a multi-meter that will show Watts(load) consumption, Operating hertz, AC voltage and Amps(load).

Compass-DC:

The compass display is provided in the GPS/Radar display. The compass display will only be accurate when the vessel is moving. Owner's man. In black ring binder and under chart table.

Depth/Knot Meter-DC:

The helm mounted **GPS**/Radar supplies speed/depth info. It is powered by the red button on the unit face. The associated 12volt breaker is labeled "Radar". An owner's manual is located in the black ring binder and under the chart table.

Note: The fathometer read out on the GPS screen display's in "feet" the water depth below the lowest part of the boat. (Vessel draws 44"). A "keel offset" calibration compensates for the actual transducer location above the bottom of the keel.

Electrical Outlets-AC:

See "Electrical System, General 120 volts"..... 2 are located aft stateroom. 1 in the aft head, 2 in the galley,2 in the bridge deck area,1 on the v-birth forward most storage top and 1 in the fwd head.

Electrical System, General (12 volt/D/C):

The 12-volt 830amp hr battery system powers **everything** on board with the **exception** of the **outlets, battery charger, cabin heaters, water heater and range**. The system consists of a DC circuit breaker panel, battery selector switch, 4 6-volt batteries, a 12v starting battery for each engine/genset and two engine driven 80 amp alternators. To access battery power, rotate the battery switch to the 'on' position. The starting batteries are isolated from all items other than the engine starters. The single 12v genset start battery is charged by the **generator only**.

Note: To extend battery life it is important not to run battery banks below 50% capacity (below 12.30 volts).

The only 12-volt items which will operate with the battery switch "off" are the bilge pumps.

The battery selector switch does not need to be 'on' in order to energize the engine starting circuitry.

Turning the battery switch to "off" when the engines are running. Will not harm the engine Alternators.

Electrical System, General (50amp,120/240 volt A/C):

The **only items** on board **utilizing 120/240volt AC** shore/genset power are: **hot water heater, cabin outlets ,cabin heaters, battery charger** and the **range**.The 120/240-volt system consists of a 50 amp shore power cord, shore power receptacle, A 60hz,13KW genset and a 120/240 volt circuit breaker panel. To operate any household appliances; TVs, VCR's, etc.connect shore power/genset and plug in to any cabin outlet for power.

Note: There are several possible shore power cord configurations possible. Be sure to use the proper cords for the available dock amperage and pedestal outlets. (See "shore power cord" section for more information)

Engines, Cooling:

Cooling is fresh water via internal water and special "**Delo Long Life Coolant**"(**red color only**)utilizing an expansion tank with fill port on the top front of each engine. This internal water system is cooled by circulating raw water (water from outside the hull) around each engines self-contained cooling system. A raw water pump is mounted on the lower front side of each engine. The pump is engine driven and draws water through a valve, through-hull fitting and filter adjacent to each engine. The pumps utilize rubber impellers that will disintegrate if a loss of intake water occurs while engines are running. Loss of cooling water will result in a rapid engine overheat condition and the activation of the engine warning system light/buzzer located at the instrument panel. If this occurs, shut down affected engine immediately. You will first need to remove the water pump to access the impeller cover. Verify that through hull valves are open. **Each engine has 3 pencil zinc's** marked with stickers stating"zinc". These zinc's should be changed annually. Spare pump impellers are located in the Yanmar spare parts kit in the spares...

storage locker. The engine owner's manual are located in the black ring binder and in the chart table storage.

Note: "Delo extended life" coolant (red color) is used in the engines. Engines use only this red color coolant. Mixing of antifreeze types may require draining the system.

Engines, Exhaust:

The wet exhaust system utilizes 5" dia. Fiberglass tubing and hose sections. Two "vernalift" type mufflers are mounted in the aft cockpit. The mufflers are 6" dia. Units.

At start it is important to verify that cooling water is flowing from both transom exhausts.

Engines, General:

There are two engines of "Yanmar" make, 2008, turbo 6 cyl. Injected, 6LPA STP2's, 315 hp each, Diesel powered, fresh water-cooled.

Engine Hatch Lifts-DC:

2 electric engine hatch lifts open the respective hatches. Switches are located at bottom of the breaker panel. In the event the lifts fail to operate **an emergency pull cord is located under the v-birth stairs**. By pulling this wire you will release a safety pin at the base of the starboard side hatch lift piston. You will then be able to open the hatch by pulling up on the black web strap along the centerline of the two hatch openings.

Note: do not run both hatches in the "up" position simultaneously as the load will trip the DC breaker. Simultaneous lowering of the hatches is fine.

Engine warning buzzer's:

A warning buzzer for each engine is located on the each port and starboard side of helm pedestal. These will give audio (buzzer) alarms if oil pressure is low or water temp is high. Each buzzer/speaker has an inhibit switch above it. These switches are normally left in the "up" position. Positioning the switch to the down position will silence the buzzer.

Note: If buzzers sound while engines are running, shut off engines immediately and inspect.

Fire Extinguishers:

There are 5 portable CO2 extinguishers located throughout the interior. Look for the “fire extinguisher inside” stickers located next to each location. 1 in v-birth, 1 on bridge deck, 2 in galley/pantry and 1 in aft cabin. In addition a single fixed “Halon” type automatic extinguisher is located in the engine room above the genset. Owners man. In black ring binder.

Fluid Levels:

- **Engine Oil:**..... 11 qt. per engine.(Delo 400, 15/40 wt).
- **Engine Anti Freeze:**.....Fill to full line on expansion tank.
Use only “Delo Long Life coolant”(red color coolant)
- **Transmission Fluid:**..... Fill to top mark on dipstick while engine is shut down.
(Delo 400/30wt).
- **Generator anti freeze** Use only standard (green color) anti freeze.
- **Generator Oil** 4 qt. capacity. (Delo 400/30wt)
- **Battery Electrolyte:**..... Fill to top of the battery plates.

Fresh Water Tank:

The fresh water tank holds 150 gallons (apprx. 1200lbs) and is located under the v-birth bed. Tank level is checked via sight gauge on starboard side of tank. Located under the starboard side birth you will see a “vertical cut-out” in the wood side panel. Check the tank level through that cut out. The fill port is located at the fore deck next to the windlass. It is vented via a tube that overflows on the starboard fwd hull side. The supply out let is located under the step to the forward birth.

Fresh Water Pump-DC:

A 12-volt Headhunter XC pump powered by the house bank is located in the engine room below the hot water heater. This pump supplies water pressure to the faucets and water heater. Supply lines are made of polyethylene(PEX) tubing and are Red for hot supply and Blue for Cold. The associated breaker is located on the 12v D/C panel. There is no accumulator tank used with this system.

Note: The pump will run continuously if the water tank is run dry. If this happens, disable the pump via its breaker labeled “fresh water pump” and trip the 120/240v water heater breaker until the tank is refilled.

Fresh Water Refill:

The tank is replenished via a “fill port” located on the fore deck next to the windlass. The screw-down deck fill cover is only hand tightened with the tool located under the chart table.

Fuel Cross Feeding:

There is no cross feed function. Each engine draws fuel from its respective tank. The genset draws it’s fuel from the starboard fuel tank only.

Fuel Re-Fill:

Refuel using the deck fill ports located on each side of the midship deck at the bridge deck entry doors. Deck fill covers are only “Hand Tightened” with the tool located in the chart table. Fuel level “sight tubes” are located on each tank to view fuel levels. The tubes are marked in 50 and 100 gal increments. Do not fuel beyond a “full sight gauge” level to avoid fuel spillage. When fueling, first check tank levels then calculate gallons to be added so as to avoid overfilling. Fuel vents are located on midship hull sides.

Note: fuel tank capacity is 120 gal per tank (240 total). The top of the sight gauges is marked at 100 gal.....Do not fuel more than 10 gals beyond this point!

Fuel Filters:

Engine fuel/water separator filters are located forward on each fuel tank. The genset filter is located on the fwd. engine room bulkhead, starboard side. These filters are changed at each 100 hr oil change.

Fuel Pumps:

Fuel pumps are engine driven and mounted on each engine.

Fuel Tanks:

Two fuel tanks are located in the engine room port and starbd. Each tank holds 120 gallons with a total fuel capacity of 240 gallons. A sight glass is located on each tank to view fuel levels. No cross feed system is available between the two tanks. Each tank has its own supply and return fuel shut-off valve. Each tank supplies and returns fuel from its respective engine. The genset draws its fuel from the Starboard tank all fuel to) a single tank. Each tank has a hull mounted vent and deck mounted refill port located midships. Each tank also has a drain at the forward bottom end to remove contaminants.

Fuel Tank Vents:

See “Fuel Refill” and “Fuel Tanks” section.

Galley Blower-DC:

A high output blower is located in the stack above the galley. A switch located port side and forward of the range controls the fan. The fan will remove any cooking related odors, heat etc. Owners manual in black binder.

Galvanic Isolater-AC:

This unit located behind the breaker panel and prevents external stray AC current via shore power cable from deteriorating zinc anodes. Manual in black binder.

Generator-AC:

A Westerbeke mini-13, 60hz, diesel genset is located center aft in the eng. room. The genset is controlled by it's remote panel under the breaker panel. The unit has automatic “start” and “stop” buttons. Owners manual is in the black binder.

Generator, Cooling:

The generator is fresh water cooled. The cooling system is much the same as the engines(see “engine cooling section”). Unlike the engines anti freeze, the genset uses standard (Green) anti freeze which is cooled via raw water intake and sea strainer. A “gensep” exhaust unit is located on the port side of the generator. The exhaust unit separates the water and exhaust gasses and ports them separately below(cooling water) and above(gases) the water line.

GPS/Radar/Sounder-DC:

The GPS/Radar is 12v/ D/C powered and is of Garmin make. The antenna is located on the bridge cabin top port side forward and the radome is located in the stack. The circuit breaker is located in the galley labeled ‘navigation instruments’. The owner’s manuals are located in the black ring binder and in the chart table.

Heads-DC:

The heads are flushed via push buttons adjacent to each. They are “Jabsco” brand, 12v D/C powered, macerating units. The heads pressure pump into the 46-gallon holding tank located in the engine room. Care must be taken to avoid overfilling the holding tank. The heads draw raw water (from overboard) and a pressure pump located in the bilge adjacent to each head supplies water to flush the bowl. Circuit breakers are located on the DC breaker panel. Owners manual in the black binder.

Note: Coast Guard requires that the holding tank be installed and used with pump out being done dockside only. Use only holding tank approved toilet paper.

Heaters, Cabin(Pic A Watt/Red Dot)-AC:

The 5 stainless steel AC heater units(King make, pic-a-watt model) consist of an electric element and fan controlled by the unit mounted thermostat. Adjust thermostat for desired room temperature. There is 1 unit aft cabin,1 unit in galley,2 units on the bridge and 1 unit in the v-birth.The associated 120/240v breakers are labeled “heaters”. There is a “red Dot” heater under the helm sofa which utilizes engine coolant for heat while underway. A 2 speed push/pull fan switch is mounted on the sofa base port forward.

Holding Tank:

The 46 gallon holding tank is mounted between the two engines in the center bilge and can be emptied either via the deck pump-out fitting on the port side labeled “waste” or with the electric pump and through-hull valve located in the engine room. A vent hose on the tank exits through a fitting located on the port hull side aft. If the tank is overfilled it will overflow through this hull fitting (this is to be avoided).

(See “sanitation System” section)

Note: The electric waste pump is 12v D/C powered and is turned on and off via the circuit breaker labeled “holding tank pump”. This pump empties the contents of the holding tank overboard via a thru hull in the eng. Room port side. (There is a spare waste pump on board). This breaker is normally left in the ‘off’ position.

Note: Coast Guard requires that the through-hull valve be wired to the “closed” position at all times. If you are boarded and inspected a fine could result if the valve is not secured closed.

Holding Tank Pump:

See “Sanitation System” and “Holding Tank” sections.

Horns-Air:

The Buell air horns are supplied by a 5lb. 750psi CO2 bottle located in v-birth closet under the floor. Any fire ext. supply store can refill the bottle. The regulator has been calibrated for a 60psi supply to the horns. The AC outlet located adjacent was for an earlier electric system.

Lights, Anchoring-DC:

A 12-volt DC anchoring light is located atop the mast. The light is turned on via a switch labeled “anchor lt.” on the port side instrument panel pedestal. While anchoring at night this light should be left on. Spare bulbs are located in the spares locker.

Lights, Engine Room-DC:

12-volt fluorescent lights are mounted overhead forward and on each side of the engine room. Only the associated DC breaker labeled “engine room lights” controls these lights. Thus the circuit breaker serves as the on/off switch for those lights. Spare bulbs are in the spares locker

Note: Always turn off the breaker labeled “engine room lights” unless you need the lights on. Not turning off the breaker will lead to burned out bulbs.

Lights, Instrument panel-DC:

There are two switches located outboard of each engine tachometer that will illuminate the associated engines instruments..

Lights, Interior-DC:

All interior light fixtures are powered by 12-volt battery power. Bulbs used for the shaded fixtures are 12-volt/25-100 watt. Incandescent. 12v/15watt bulbs are for the dome lights. The over counter lights in the galley are LED's. The associated breakers are labeled “fwd cabin lights”, aft cabin lights etc. Spare bulbs are in the spares locker.

Lights, Running-DC:

The running light system for night operation consists of a white mast light, a red port side light, a green starboard light. All lights are 12 volt powered by the house bank. These lights must be on while operating at night. On/off switch is located on the port side of the instrument panel pedestal. The associated circuit breaker is labeled “nav. lights”. Spare bulbs are in the spares locker.

Mast, folding:

The mast has a mid point hinge system that allows it to be folded aft and rest on the top of the stack. There are spare latches and strap hinges in the spares locker.

Mufflers, Engine:

See “Engines, exhaust” section.

Mufflers,Genset:

See “Generator cooling” section.

Power Selector Switch-AC:

An AC power selector switch located on the breaker panel controls AC power supply to the boat. A choice of “off”, “shore 1(port side)”, “shore 2(stbd. side)” or “Generator” will route power from the respective AC source to supply the AC ½ of the panel. There are Three AC Multimeters on the Panel. The Middle meter displays 240v AC(genset/50amp shore pwr). The Left displays 12v DC(battery) power levels and the right side meter displays 120volt AC(30amp shore power).

Note: Individual AC Multimeters only illuminate when the correct power source is selected. They will remain blank even after i.e. (shore power is connected) until the correct shore 1,shore 2 or generator is selected.

Propellers, spares:

2 spare props are stored under the aft cockpit hatch.

Radar-DC:

See GPS/Radar section.

Refrigerator/Freezer-AC/DC: (Sea Freeze)

The refrigerator is powered by both 12 volt DC power(house bank) and by 120volt AC shore/genset power. The unit when turned on will automatically maintain the temperature range selected. **It is important not to turn off the main battery switch if you do not have shore/genset AC available and wish to maintain cold in the reefer.** The unit utilizes shore power/genset AC power when available and will automatically switch to 12v DC battery power when AC is unavailable. The associated breaker's (12 and 120 volt) are labeled "refrigerator". The compressor and control box are located behind the reefer and are accessed by pulling out the electric range. owner's manual is located in the black ring binder

To Operate Sea Freeze Unit:

1. Select "on" via control switch inside the fridge and under the freezer box.
 2. Select the cold range.(too cold a setting will turn the entire fridge into a freezer.
- As long as the battery switch is 'on', the refrigerator will run.
 - The unit will run if 12 volt DC power or shore/genset AC is available.
 - To turn the unit off, turn AC and DC circuit breakers to "off".

Note: The unit will remain coldest if prolonged openings are kept to a minimum.

Sanitation System-DC:

General: The system consists of two electric macerator type heads, a single 46 gallon holding tank, a port side midship deck fitting for pump out and an electric waste pump to empty the tank overboard via a thru hull ball valve.

Hold Tank Pump: A 12 volt/ D/C electric pump located on top of the holding tank is used to empty the holding tank when a dockside pump out station is not utilized. To turn the pump on/off , use the D/C circuit breaker labeled "Hold tank pump". **Note: Do not leave the waste pump circuit breaker on longer than needed. The pump is for short period use. The switch is normally left in the 'off' position.** A spare pump is located on board.

Search Light-DC:

The 12 v/D/C powered searchlight is located forward cabin top and is selected 'on or off' via a switch on the port side instrument panel. A circuit breaker is located on the breaker panel.

Shaft Bearings

There are two intermediate shaft bearings (one each prop shaft) that are located under the galley area floor. The **right bearing** is under the floor panel at the base of the galley stairs. The **left bearing** is reached by removing the “lazy Susan” from the port side cabinetry to reach its own floor panel. The bearings should be greased via individual zirc fittings annually. **Be sure to grease the 2 shaft logs at the same time (under galley floor).**

Shore Power Cord-AC:

The shore power cord is used to connect 50amp-120/240volt volt power when dockside. The cord is stowed under the helm sofa port side. Various adapter plugs are on board for docks with different amperage power supplies.....

If 50amp service is available you need only plug in the 50amp cord to the pedestal.

If 50 amp power is not available but you can access (2) 30amp plugs(separate legs), then you can use the “smart Y” adapter by plugging the “Y” into the 50amp shore cord and then using the two 30amp cords to connect to the shore pedestal. If you don't have 2 separate legs of 30 amp available then the “smart Y” won't complete the circuit.

If only 30amp power is available you can use the 30amp adapter. Plug the 30amp adapter into the 50amp shore cord and then into the shore pedestal. You will have only 30 amps of power available and so will have to reduce the number of items using AC power.

Shore Power Receptacle:

A receptacle for the 120/240-volt shore power plug is located on both starboard and port side forward midship under the teak step.. The receptacles utilizes a special 3-prong plug and only connects one way. Normal plug amperage is 50 amps. Additional plugs are located in the port helm sofa box for different amperage dock power supplies. The associated breaker is located in the AC breaker panel. A selector on the 120/240v panel allows a choice of which receptacle will supply shore power to the panel. Shore 1 is port and shore 2 is starboard.

Shower Sump Pumps-DC:

A sump and 12 volt pump for each shower drain is located in the bilge under the floor in the respective hallways. House bank will supply power to the pumps which are fully automatic. As water drains from the shower/sinks and fills the sump, it activates a small “bilge type” pump which pumps the water overboard portside for the aft head and Starboard side for the v-birth head. The associated breaker labeled “shower sump pump”

Spares Locker:

A spares locker is located in the.....

Stereo-DC:

The 12-volt house battery bank powered stereo is located in the v-birth closet. It consists of C.D. player, Amp, AM/FM and Satellite Radio receiver. The satellite antenna is located on the bridge cabin top stbd. side. The associated breaker is labeled "stereo". An owner's manual is located in the black ring binder

Stove:

The 4-burner AC electric stove/range utilizes no battery power. It can be run via shore or genset power. An owner's manual is in the black ring binder.

Swim Ladder:

A swim/boarding ladder mounts to the key holes on the teak pad, starboard aft deck at the cockpit. The ladder is stowed under the aft cockpit main hatch.

Throttles:

See Transmissions section.

Transmissions:

"Yanmar" make, 2.43 to 1 reduction, Dipstick is located on top of each unit. Check level of auto transmission fluid when the engine is shut down. Fluid is Delo 400/30wt. Shift pattern is forward, neutral and reverse. Shifting from neutral requires release of a "sleeve lock" on the throttle/shifter. In addition, a transmission disconnect button on the base of the shift lever can be depressed to allow full throttle movement without transmission engagement. Owners manual in black binder.

Voltage Regulator-DC:

individual three-stage voltage regulators control the output of the starboard and port engine alternators as they charge the **start and house banks respectively.** The units automatically control each alternator output.

Water Heater 120v A/C:

There is a 20-gallon stainless water heater (KUUMA) located starboard side forward in the engine room. The unit provides hot water via 120v A/C shore power or genset. The 120v circuit breaker is located on the breaker panel.

Windshield Wiper-DC:

Wiper is 12-volt battery powered. There is a switch labeled “wiper” located on the port side instrument panel. A breaker labeled “windshield wiper” is on the panel.