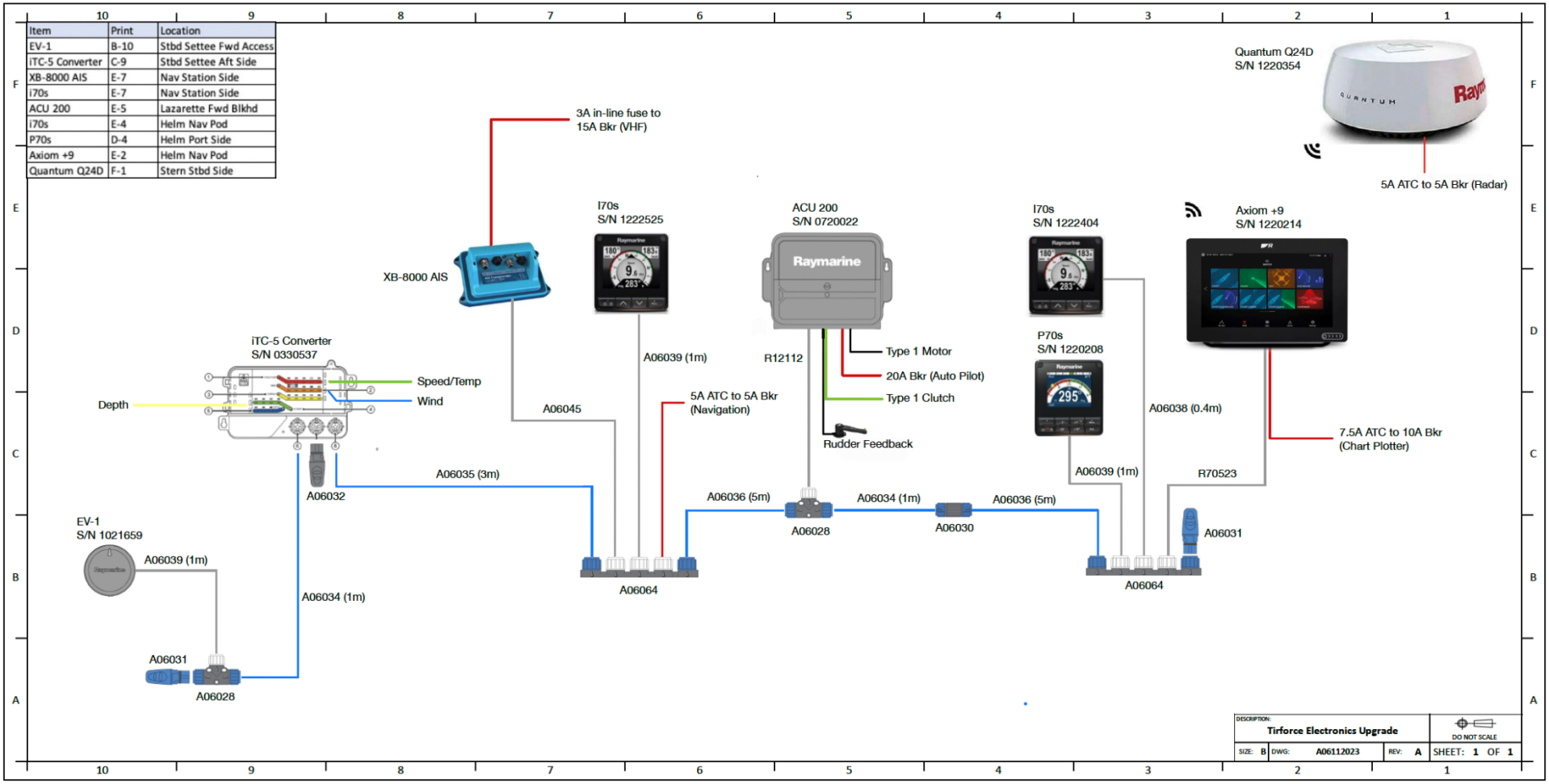
Tartan 4100 (#6) Triforce

Item	Print	Location
EV-1	B-10	Stbd Settee Fwd Access
iTC-5 Converter	C-9	Stbd Settee Aft Side
XB-8000 AIS	E-7	Nav Station Side
i70s	E-7	Nav Station Side
ACU 200	E-5	Lazarette Fwd Blkhd
i70s	E-4	Helm Nav Pod
P70s	D-4	Helm Port Side
Axiom +9	E-2	Helm Nav Pod
Quantum Q24D	F-1	Stern Stbd Side



DESCRIPTION: Tirforce Electronics Upgrade

DO NOT SCALE

SIZE: B | DWG: A06112023 | REV: A | SHEET: 1 OF 1

Raymarine Electronics' Upgrade (June 2023)

EV-1 (S/N 1021659)

The EV-1 was installed on the aft partition of the forward access in the starboard settee berth. Installed a 1 m spur cable (A06039) from the attitude sensor aft into the aft access of the starboard settee berth into a SeaTalkNG tee connector (A06028). The tee connector is mounted on the outboard vertical side of the access. A 120 ohm resistor (blue terminal connector A06031) was installed on one side of the tee. On the other side, a 1 m back bone cable (A06034) was installed and led aft up into the vertical access (just below the TV/Radio compartment and terminates in the iTC-5 Converter.

iTC-5 Converter (S/N 0330537)

The existing wind anemometer, speed/temperature transducer, and depth transducer cables were routed underneath the mast step and fed thru the white conduit on the starboard side of the forward section of the keel stub. The conduit leads aft and to starboard up through the aft end of the aft access to the starboard settee berth. The three transducer wires are then led into the iTC-5 converter.

In terms of wiring into the converter, the process was similar for each cable. For ease of description, only the installation of the speed/temp cable is described.

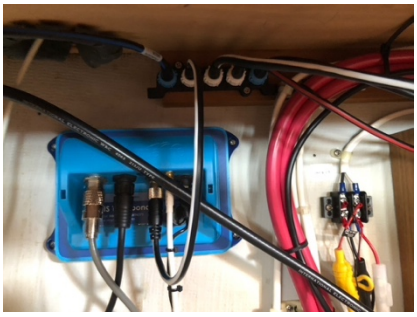
Carefully strip back 3.5 inches of insulation and remove the foil shielding. Carefully separate the wires (red, screen, green, white and brown). Install shrink tubing for the main cable (green in this case). Dry fit the cable into the converter such that the cable insulation terminates in the middle of the two cable routing supports for that particular cable. Red wire – strip back 0.5 in (22 AWG), twist and bend back so that you have 0.25 in inserted into the female spade connector and crimp. Next, route the screen wire and install shrink wrap back to the insulation. Measure 1.25 inches beyond the screen male connector in the iTC-5 unit and cut wire. Strip back 0.5 in, twist and bend back for 0.25 in that is inserted into the next female spade connector and crimp. Green wire – route the wire and measure 1.25 in beyond the green male connector and cut wire. Strip back 0.5 in, twist and bend back for 0.25 in that is inserted in the next female spade connector and crimp. Continue the process with the white wire and then the brown wire. Position shrink wrap and heat. Perform the exact same process for wind (I used blue shrink wrap). For depth, because there are only 3 wires instead of five, I initially

stripped back 3.25 in rather than the 3.5 in for wind and speed. The rest of the process was the same.

Note: Eleven 1/8 in female spade connectors (RAY Q085) and one blanking plug (A06032) came with the iTC-5, even though they are not listed in the iTC-5 installation documentation from Raymarine. Additional connectors can be purchased thru Fisheries Supply Company.

The iTC-5 converter was installed in the access below the TV/Radio on the aft partition, just below the converter box for the TV streaming device. The 1 m back bone cable from the EV-1 was installed in one of the back bone connectors and a 3 m back bone cable (A06035) was installed in the other back bone connector on the iTC-5. A blanking plug (A06032) was installed in the center spur connection on the iTC-5. The 3 m back bone cable was led up behind the TV and into the nav station side access and follows the VHF antenna cable into a 5 way back bone connector (A06064).

Navigation Station Side Access Panel



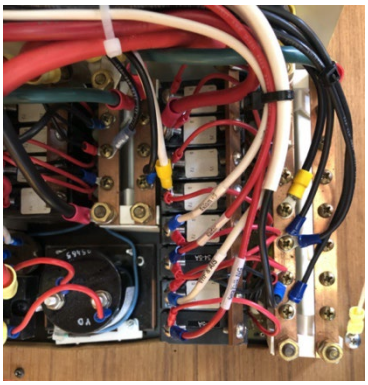
Due to the size of the spur cable (A06045) leading from the Vesper Marine XB-8000 AIS device to the 5-way back bone connector, I had to relocate the AIS device. I took the opportunity to install a 3A in-line fuse to the AIS splitter and do some cable management for the power going into and out of a 2-way junction block so that all three fuses were in the same location. The in-line fuses from left to right are: 3A – AIS splitter; 3A – AIS power and 10A – VHF power.

An I70s (S/N 1222525) multi-instrument display was installed above the Victron Energy Battery Monitor. The cable ferrite was installed 3.5 in from the device (maximum is 3.94 in) on a 1 m spur cable (A06039) and then connected into the 5-way back bone connector (A06064).

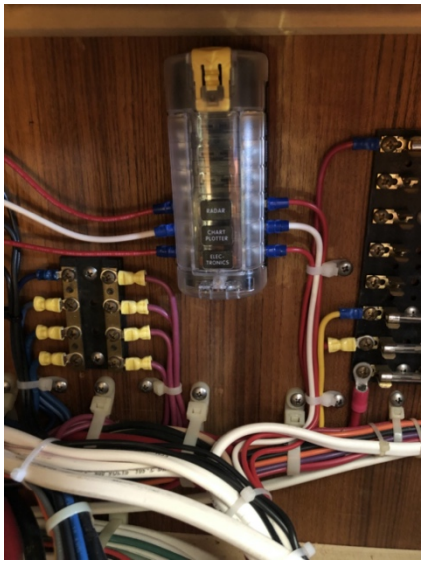
The SeaTalkNG power cable was led aft into a 6-way junction block. 16 AWG black wire (DC -) was led to the negative bus on the distribution panel and 16 AWG red wire (DC +) was led to a Blue Sea Systems ATC fuse box (5A ATC fuse) and then to the Navigation 5A thermal breaker on the distribution panel. The RF ground was connected to DC- at the junction block.

Note: In order to do this installation, some thermal breaker management needed to be done on the distribution panel.

- The DC Outlet wiring was moved from the SSB breaker to the DC Outlet breaker (not sure why it was installed this way) but now it is correct.
- A 20A breaker from the Blower breaker was relocated to the Auto Pilot breaker for use with the ACU 200. The Blower breaker is now a 30A breaker and is not used.
- Two 5A breakers were purchased and installed for the Navigation breaker and the Radar breaker.
- A 10A breaker was relocated for the Axiom +9.
- A 15A breaker was relocated for the VHF breaker (10A for the VHF and 3A for the AIS).



A 14 AWG 2-wire safety marine cable was installed for the Axiom +9. The cable terminates in the 6-way junction block above the SeaTalkNG power cable. 14 AWG black wire (DC -) was led to the negative bus on the distribution panel and 14 AWG white wire (DC +) was led to a 7.5A ATC fuse and then to a 10A thermal breaker on the distribution panel.



A 16 AWG red wire (DC +) was run from the Radar breaker on the distribution panel to a 5A ATC fuse and then to the 6-way junction block above the Axiom +9 cable. A 16 AWG black wire (DC -) was run from the negative bus on the distribution panel to the 6-way junction block. The radar is pre-wired. The radar has not been installed yet due to the Scanstrut LMP-1 being on back order.

The pictures show the 6-way junction block and the ATC fuse panel.

At this point, with the EV-1, iTC-5 converter with depth, speed and wind installed, the 5-way back bone connector, and I70s installed; a systems check was warranted to test the installation for errors. Before plugging in the power cable to the backbone, another 120 ohm blue terminal blank was installed into the 5-way connector and then the resistance was tested between Can A and Can B on the spur connector leading to the I70s. The reading was 59.9 ohms. Before installing the power connector into the 5-way backbone connector, DC voltage was tested between DC+ and DC- and DC+ and RF-. The readings were 13.45 volts (on shore power). I then turned on

the breaker for Navigation on the distribution panel and powered up the i70s MID. The main goal here was to ensure the installation was done properly up to this point before proceeding aft with the remainder of the installation and to check the iTC-5 converter and EV-1 installation. All had green solid indicator lights.

I removed the blue terminator plug and unplugged the power from the backbone in order to continue with the installation.

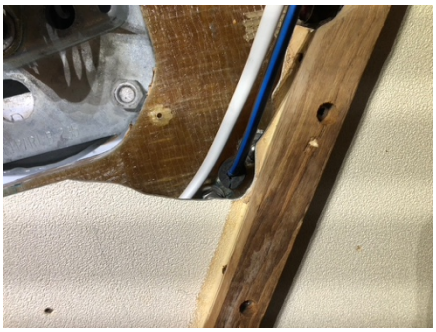
ACU 200 (S/N 0720022)

The ACU 200 was mounted vertically on the forward bulkhead of the starboard lazarette, just outside of one of the two installed galvanic isolators. This was the location of the original ACU 100. On the ACU 200, connections were made for SeaTalkNG (SeaTalk set to Power Off), rudder feedback, Type 1 linear drive clutch (switch set to 12 V), Type-1 linear drive motor power, and ACU 200 power. All cabling existed except for the SeaTalkNG spur cable.

A 5 m back bone cable (A06036) was led aft from the 5-way connector (A06064) at the navigation station through the upper conduit along the gunnel on the starboard side. The spur cable (R12112) from the ACU 200 was led into a backbone tee connector (A06028) on the end of the 5 m back bone cable. A 1 m back bone cable (A06034) was run from the tee connector to an extender (A06030) and then a 5 m back bone cable (A06036) was led aft to the helm through the black conduit that leads from the aft part of the lazarette to the centerline just aft of the fuel tank. The back bone cable followed the same path as the Axiom +9 power cable.

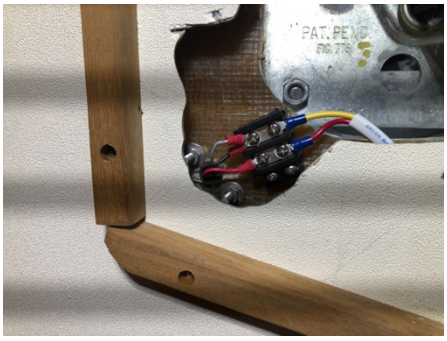
Nav Pod (GP1040-16)

Before installing the nav pod, the 5 m back bone cable (A06036) coming from the tee connector at the ACU 200 was led to the helm through the starboard pedestal guard into the final 5-way back bone connector (A06064) located in the nav pod. A 0.5 in hole was drilled on the starboard side to access the starboard pedestal guard. Previously only one SeaTalk 1 wire ran through the starboard pedestal guard.



The nav pod was being installed in the same location as the previous instrument pod for the old ST50 instruments. However, I had to grind out and make the holes bigger in the pedestal guard to accommodate the SeaTalkNG connectors.

For the nav pod installation, four #7 holes were drilled and then a ¼-20 tap was used for the mounting screws. The nav pod was installed as per the manufacturers instructions.



The 14 AWG 2-wire safety marine cable was run aft from the 6-way junction block aft through the same conduit as the back bone cable for the network. Once in the lazarette, it was led aft through the same black conduit running aft of the lazarette to the centerline and then up and into a 2-way junction block at the bottom of the helm pedestal. The wiring (R70523) from the Axiom +9 was run down through the port pedestal guard into the 2-way junction block to make the connection.

A 0.25 inch hole was drilled in two 9/16 in rubber stoppers and then a slit was made along the length in order to fit the back bone cable and the power cable to the Axiom +9. The rubber stoppers were inserted into the holes at the bottom of the pedestal guard. In addition, 5/8 inch with ¼ hole rubber grommets were installed in the nav pod where the back bone cable, Axiom power cable, and P70s spur cable exited the pedestal guard to prevent chaffing. An additional rubber grommet was installed in the pedestal guard where the P70s spur cable entered the pedestal guard on the port side.

Axiom +9 (S/N 1220214) and I70s (S/N 1222404)

The Axiom +9 and second I70s were installed in the Nav Pod which had been pre-cut for both instruments. Only the mounting screw holes for the I70s had to be drilled. Pilot holes were drilled prior to drilling the correct size holes and all holes were drilled using the slowest speed possible. A Dremel tool (slowest speed setting) was used to initially mark the location of the holes for the I70s. A cable ferrite was installed 3.5 in (max is 3.94 in) from the I70s on a 0.4 m spur cable (A06038) that connected the I70s to the 5-way back bone connector. The Axiom +9 was connected to the back bone using the provided SeaTalkNG to DeviceNet adaptor cable.

P70s (S/N 1220208)

The P70s was installed in the same location as the old ST6000+ auto pilot controller. The old plastic mounting surfaces were cracked and beyond repair. Two 5.5 in square x ¼ in white King Starboard plastic sheets were pre-cut and shipped from Boat Outfitters. Once received, the 4

mounting screws for the back surface and the four mounting screws, center hole and P70s mounting screws all had to be drilled and cut. A Dremel tool using the hole cutting device was used to cut the mounting hole for the P70s. Gaskets were made using left over gasket material from the Axiom +9 installation and the P70s was mounted on the Edson mounting bracket. A cable ferrite was installed 3.5 in (max is 3.94 in) from the P70s on the 1 m spur cable that was already led up to the nav pod into the 5-way back bone connector. The last connection was a 120 ohm blue terminal connector (A06031) in the 5-way connector to properly terminate the backbone installation.

Prior to installing the I70s in the nav pod, resistance checks were done on the back bone cable to ensure there was 60 ohms. The resistance check between Can A and Can B on the I70s spur cable read 59.9 ohms.