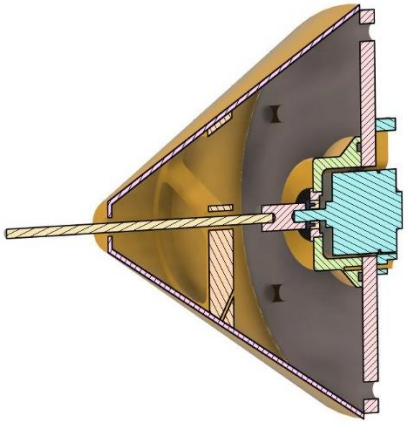
NEPTUNE REFURB LOG

Propulsion System:

I started out trying to install a brushless motor but stopped when I realized just how much work that would entail. Consequently, I confined the scope of the refurbishment to be as close to stock as was practical.

Brushless design:



The shaft housing had been modified by the previous owner and it appeared that packed grease was used for waterproofing. I wanted to use the original cup seal design so the shaft housing mod had to go.

I was also not satisfied with the stock configuration since the cup seal was used to take the shaft radial loads at the motor end. I managed to bore out the plastic and brass added to the housing and pressed in a 4 mm bushing. To add the cup seal an additional housing was fabricated to enclose the original housing.

Cup Seal Shroud:

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A ¾” polycarbonate tube was used to check for leaks. The cup seal was purchased online from OringsandMore. The 3D filament used was HATCHBOX PLA PRO. A closed cell neoprene gasket was made to seal the shroud to the shaft housing.

WTC:

The original bulkheads were cut-out to accommodate a larger lead acid battery. Two new bulkheads and a spliced section were made to accommodate the original battery.

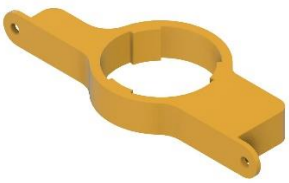
Ballast Pump Upgrade:

As a preventative measure, the original pump was replaced with a more robust one.

TOPINCN: 12V High Flow Peristaltic Liquid Pump Vacuum Pump Strong Suction Self Priming Peristaltic Pump.

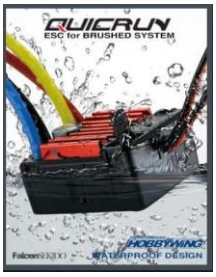
The tubing was replaced with: Pure Silicone Tubing, 4mm ID x 6mm OD.

3D mounting parts for pump:



The additional space required to mount the pump prevented the use of the original ESC so a smaller unit was incorporated.

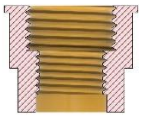
Hobbywing QuicRun 1060 Brushed:



Pump Inlet:

The original inlet was too restrictive. A threaded adapter was printed to accommodate a cable gland and 7/32” BRASS TUBE.

Inlet adapter:



Kort Nozzle:

Since the original three bladed propeller was used, a kort nozzle was designed and printed. This design slips inside the existing prop shroud and requires no modification to the Neptune.

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Battery Replacement:

Model Description: Eastar FM1222 Compatible Replacement Battery
Compatibility: FM1222 (12V 2.2Ah battery with F1 Terminals)
Condition: New, Fresh Stock
Includes: (1) battery, a compatible replacement for the Eastar FM1222
Warranty: 1 year full replacement warranty included, additional warranty is available
Life time expectancy: 3-5 years
Manufacturer: UPS Battery Center Ltd.

The Eastar FM1222 replacement battery is a high quality rechargeable sealed lead acid battery that is designed to provide excellent performance, durability and long life. This battery meets or exceeds original manufacturer specifications.

Our batteries are new and always fresh stock. The FM1222 replacement battery is covered by our industry leading 1 year replacement warranty. Extended warranty of up to 3 years is available for your convenience. Our warranty is inclusive of shipping costs and is hassle free, the only warranty of this kind in the marketplace.

Physical Dimensions:

Nominal Voltage: 12V
Nominal Capacity: 2.3Ah
Terminal Type: F1
Weight: 1.96 lbs
Length: 178 mm (7.01")
Width: 35 mm (1.38")
Height: 61 mm (2.40")

The Eastar FM1222 replacement battery consists of **(1) High Quality 12V 2.3Ah** battery.

Rx Pinout:

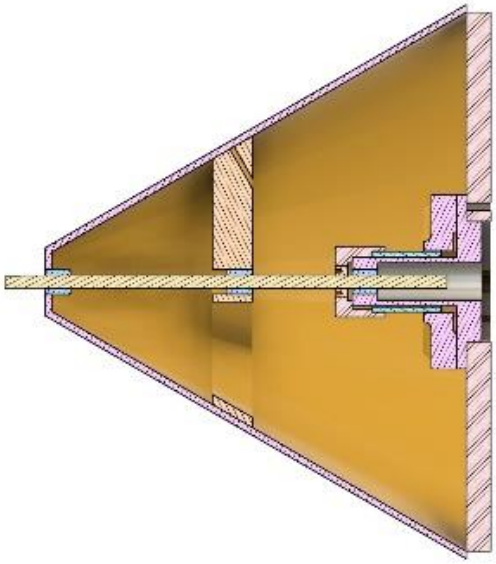
Channel	Signal	Plus	Minus
4	WHITE	RED	BLACK
3	ORANGE		
2	RED		
1	BLUE	GREEN	YELLOW

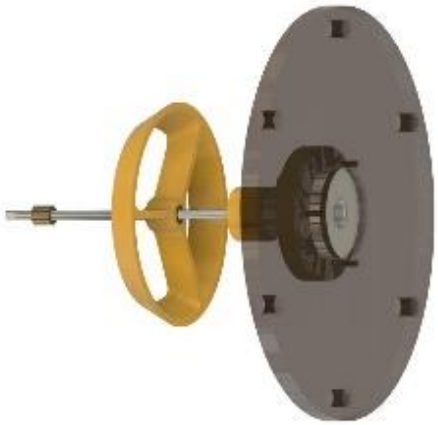
ESC & Motor:

ESC	Motor
BLUE	RED
YELLOW	BLACK

Testing Update:

Testing the drive motor resulted in shaft lockup after briefly running the motor. At first I thought it was nozzle – prop clearance but it turned out to be the outboard bushing. Apparently the original design tasked the cup seal to be a damper and support in addition to sealing. There seems to be too much bushing clearance (slop) and not enough bushing length at the prop end. As a result, I added a mid-span bushing support. I was tempted to add this from the start but technically, it's redundant. However, it solved the vibration and lockup issues. Case closed.





Thunder Tiger Seawolf style bow planes:

After reading other owner's experiences, it seems that the original dive planes are less than ideal. I chose to copy the manufacturer's bow planes used on the Neptune's successor.

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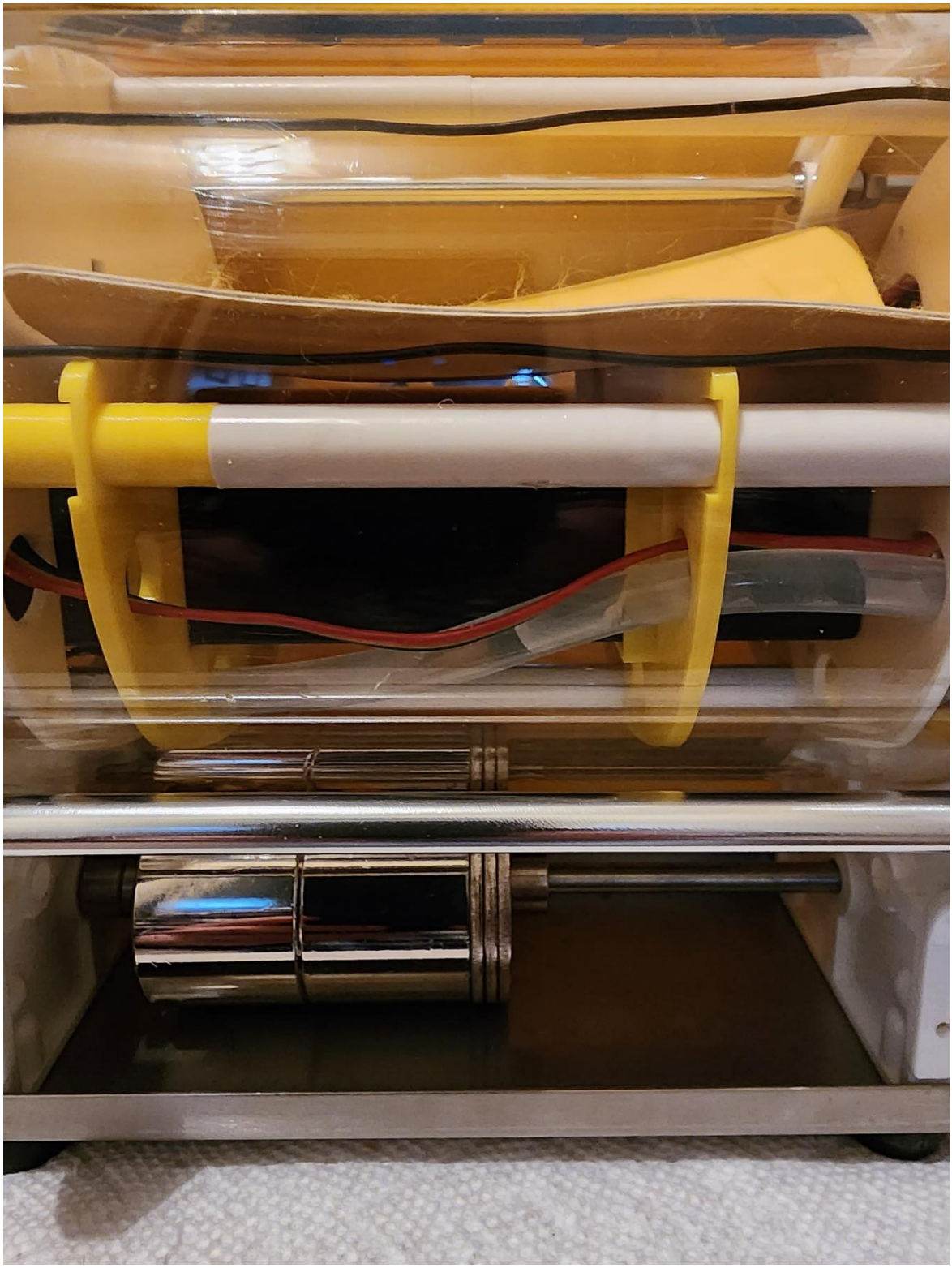
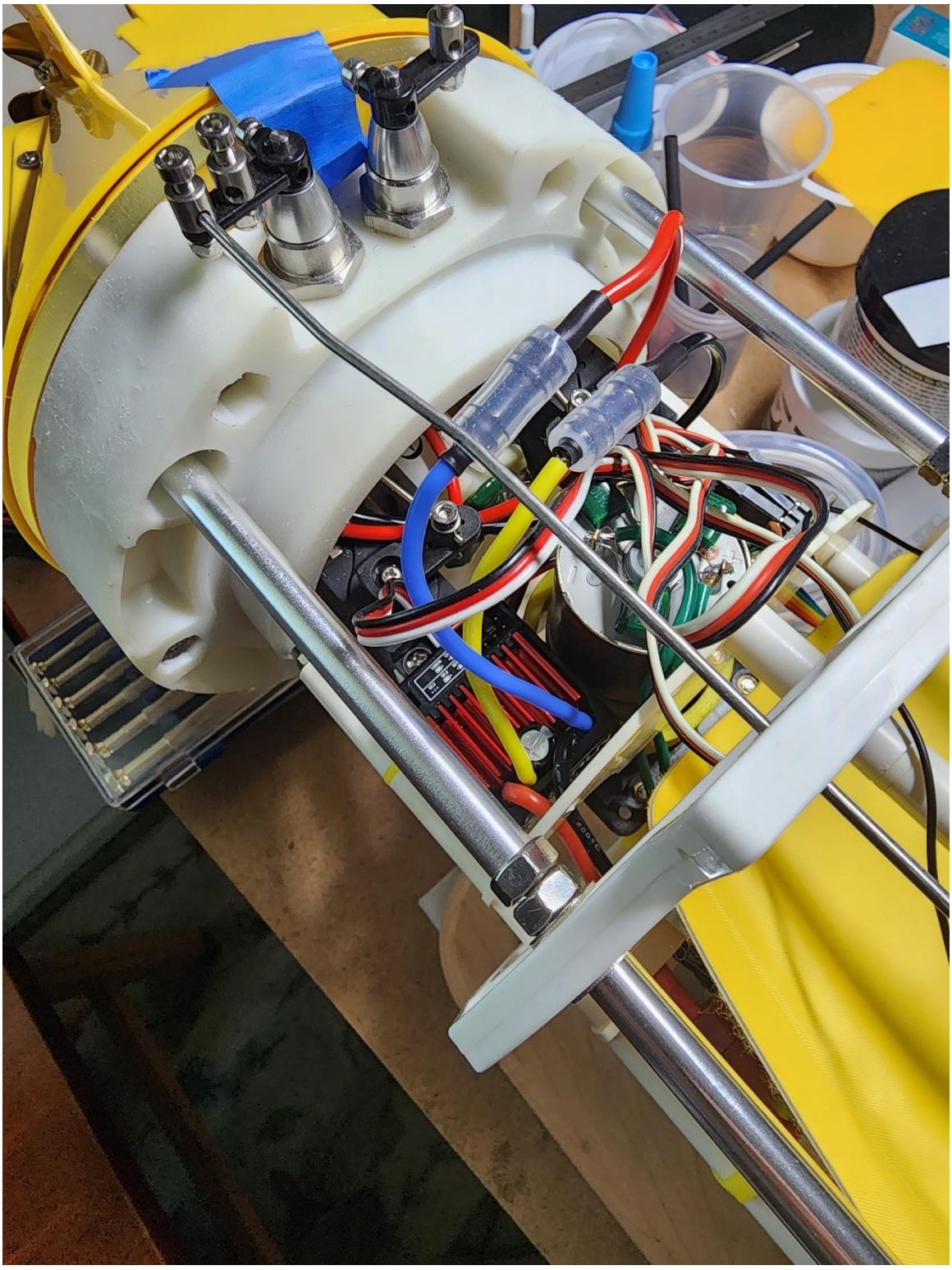
Gallery:

Kort Nozzle



Printed bulkheads

Printed adapter & cable Gland for pump inlet



High flow Pump & ESC mounting

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Build Timeline:

Date	Event
3-1-23	Ordered from Dry Docks
3-7-23	Shipment Received
4-1-23	Bathtub trim