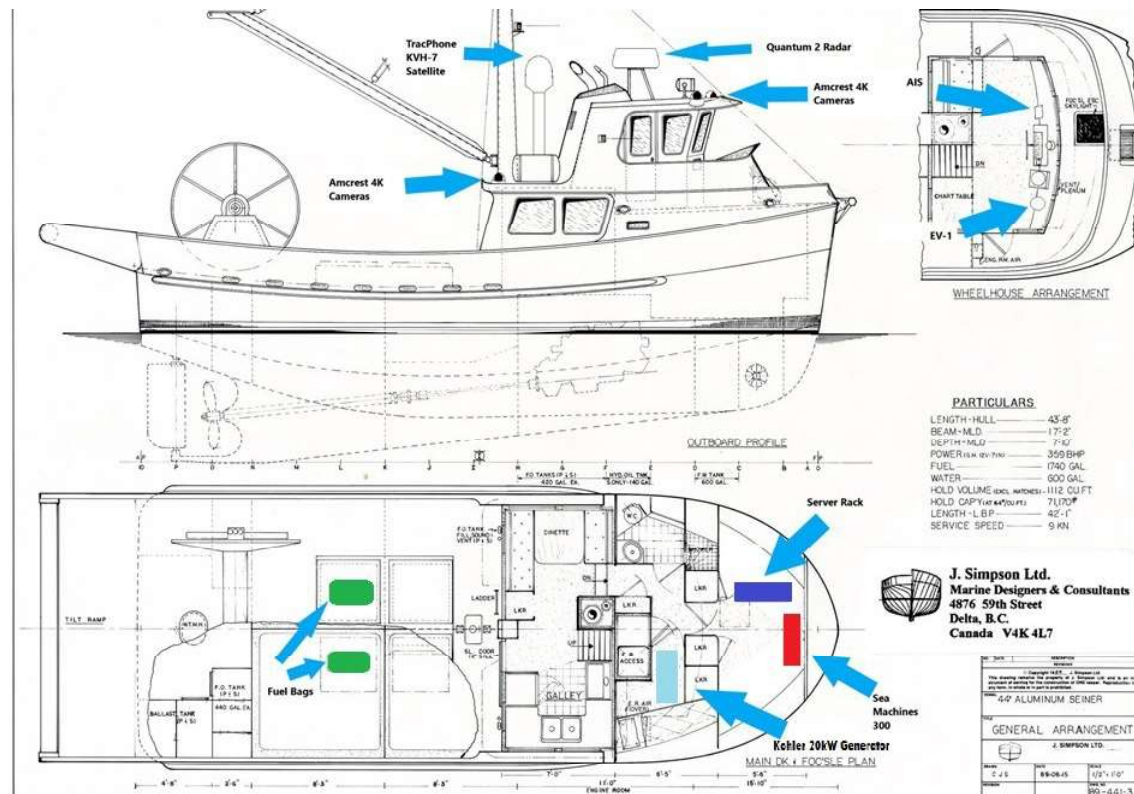


Autonomy of Opportunity (A/O) Kit for Conversion of a Fishing Vessel into a Low Cost Unmanned Platform

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Autonomous technology is now successfully implemented in the civilian maritime market. The purpose of this study was to understand the feasibility of obtaining fishing vessels from friendly fishing ports and deploying them to areas of interest for increased acoustic detection and tracking. The relatively low cost of the vessel makes potential loss of the vessel less significant from a strategic and financial sense and enables the Navy to potentially add lots of ISR vessels to the fleet in a short amount of time. The Navy’s increased interest in autonomy, the growing threat of area denial and acoustic monitoring by other countries, and an abundance of fishing vessels organically patrolling areas of interest motivate equipping a vessel of opportunity to perform autonomous acoustic search.

The outcome of this study converted a 44 ft Drum Seiner using current autonomous technology, such as the Sea Machines 300, into a low cost unmanned platform. We explored arrangements of the masts and antennas, topside deck, living quarters, and fishing cargo hold for conversion into our autonomous vessel. We designed additional fuel storage and transfer capabilities into the vessel to increase endurance range and addressed interfacing with existing systems. Summarized below are the arrangements of the modified vessel, estimated cost for autonomy, and the change in endurance range of the modified vessel at rated speed of 9.5 knots.



Item	Units	Unit Cost	Total Cost
Sensors & Comms			
Quantum 2 RADAR	1	\$1,899.99	\$1,899.99
AIS700	1	\$999.99	\$999.99
Amcrest UltraHD 4K Camera	5	\$129.98	\$649.90
KVH Tracphone V7-HTS Satellite	1	\$29,995.00	\$29,995.00
Sensors & Comms Total			\$33,544.88
Sea Machines and Steering			
SM300	1	\$98,500.00	\$98,500.00
EV-200	2	\$1,999.99	\$2,899.99
Sea Machines and Steering Total			\$101,399.99
Fuel Injection System			
Fuel Bags	2	\$3,065	\$6,130
Fuel Pipe	100 ft	\$0.81/ft	\$81.00
Fuel Pump	2	\$380.00	\$760
Fuel Injection System Total			\$6,971
Auxiliary System			
Bilge Pump	3	\$62.30	\$186.60
Auxiliary System Total			\$186.60
Electrical Generator			
Kohler 20EOZD-3 Generator	1	\$18,245.00	\$18,245.00
Electrical Generator Total			\$18,245.00
OVERALL			\$160,347.47