Remotely Operated Vehicle

Name: Amirul Iman Bin Kamarudin
Matric: 1916367

FALCON ROV

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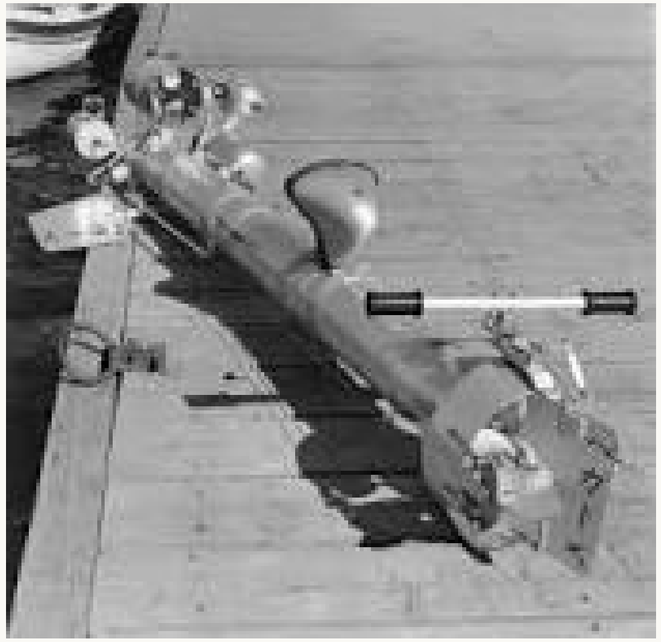
HISTORY



Several scientists started working on remote-controlled submersibles in the 1950s and 1960s. The first completely functional ROV, known as the POODLE, was developed by French engineer Dimitri Rebikoff in 1953. With Rebikoff's invention, data and control signals were sent between the surface and a tiny submersible vehicle through a tethered cable.

APPLICATIONS

Scientist

- ROVs have been utilised in marine archaeology for underwater exploration. Investigations in water depths that divers cannot reach are known as deep-water archaeology. The use of ROVs by scientists under these circumstances is common. 2 Marine archaeologists investigate and research submerged locations, such as shipwrecks. 3 An ROV For the Institute for Exploration, Hercules was created (IFE). It was created primarily to search for, examine, and salvage items from antiquated shipwrecks. The National Oceanic and Atmospheric Administration (NOAA) used Hercules in 2004 to map the Titanic wreck for 11 days and report on its condition. Also, it assisted a Mediterranean Sea archaeological find. It made it easier to find and examine the ruins of several ancient maritime cultures.

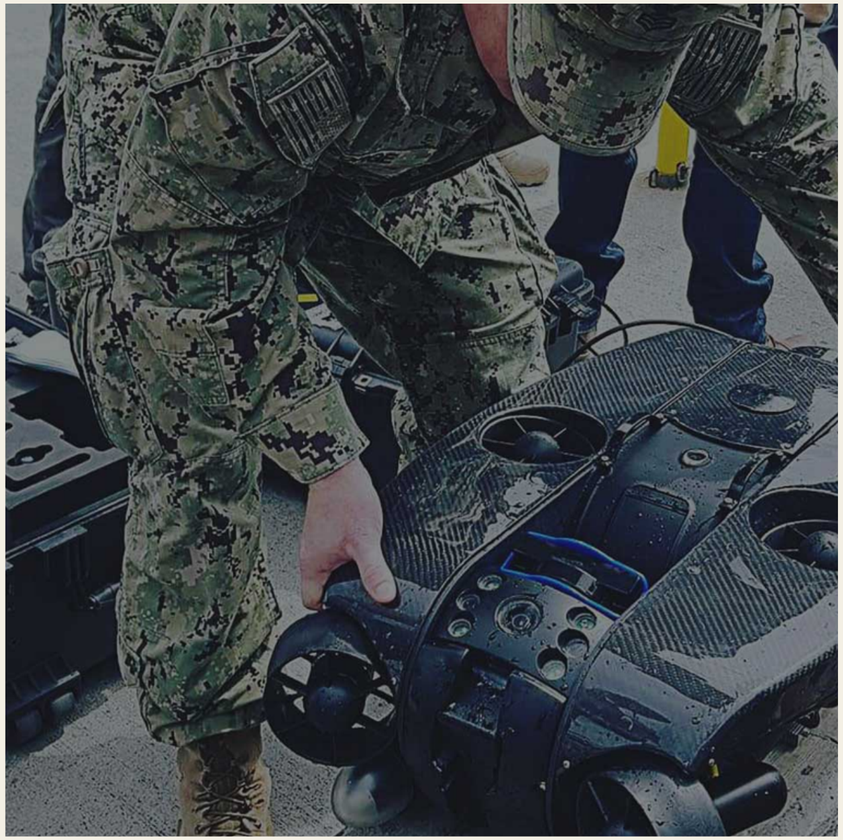
APPLICATIONS

Military

- The US Navy also had a vital influence in the development of ROV technology. The Navy created the Cable-Controlled Underwater Research Vehicle (CURV) in the early 1960s with the goal of finding and recovering lost torpedoes. The CURV, which could be controlled from a surface ship and could dive as deep as 20,000 feet, was effectively a tethered robot.

Civilians

- In the oil and gas sector, ROVs were employed for commercial purposes to examine and maintain offshore drilling platforms and pipelines. In the meantime, academic and scientific researchers used ROVs to investigate the geology, archaeology, and deep-sea ecosystems.



film-ocean
STAHM
OFFSHORE

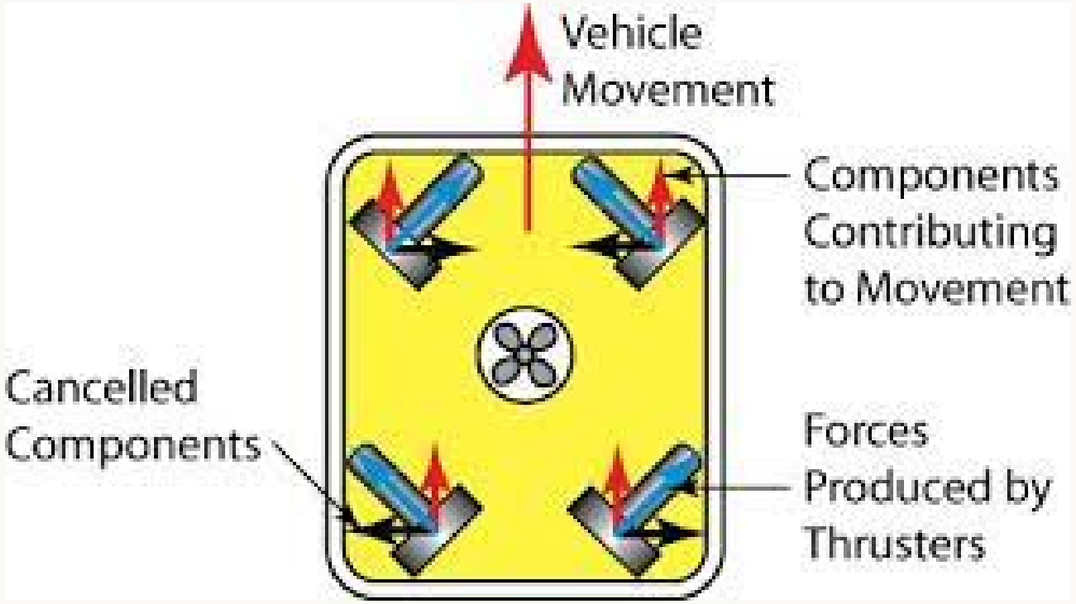
Main components of vehicles

1) Hull Design

	Open Frame Hull
Example	 The framework of the ROV's body is made up of metal bars or tubes that support its components and equipment.
Advantages	• The open frame design allows for greater manoeuvrability, as the ROV's thrusters and other equipment are more easily directed and positioned in different directions. • Stable 3 DOF translational motions based on large metacentric. • Withstanding high payload and being able to carry objects.
Disadvantages	These ROVs struggle with manoeuvres that require more than 3DOFs.

2) Propulsion system

- Falcon ROV's brushless DC thrusters have the highest power density and velocity feedback drive electronics for precise and fast thrust control.
- Falcon ROV's thrusters are connected to a quick PID control system and solid-state rate gyro for enhanced azimuth stability and overshoot prevention.
- Falcon ROV has superior control and responsiveness due to its advanced features and powerful thrusters, setting it apart from other ROVs in the market.
- Falcon ROV's breakthrough innovation is the Magnetically Coupled brushless DC Thruster unit (MCTI) that can handle larger torque loads than competing units.
- Falcon ROV is powered by five MCTI units, and each unit can produce 13 kgf thrust at 320W, with a combined bollard pull of 50 kgf.
- Falcon ROV's efficient design and 1:1 power to weight ratio make it an impressive choice for various underwater tasks.


Vehicle
Movement
Components
Contributing
to Movement
Cancelled
Components
Forces
Produced by
Thrusters

3) Navigation

- The navigation sensors and assistance on Falcon are housed in a single hardened aluminium pod. A compass and a solid state rate gyro are offered for automatic heading control. A depth sensor displays depth information in feet or metres on the video overlay and allows you to regulate auto depth.

Depth sensor

Gyro

Nav Specifications
Compass Accuracy ±1°
Depth Sensor Accuracy ±0.5% of FSD
Gyro 0.1 °/s
Surface Update Rate <100 ms

4) Data Collection

Falcon ROV video footage can be used for inspection, surveying, or documentation purposes.

Side-scan or multibeam sonar data can be utilised for mapping, search and rescue, or geophysical studies.

Falcon ROV's navigation data contains its position, heading, and depth as measured by sensors such as GPS, compass, gyro, and depth sensor.

5) Data Transmission

MK8 electric winch

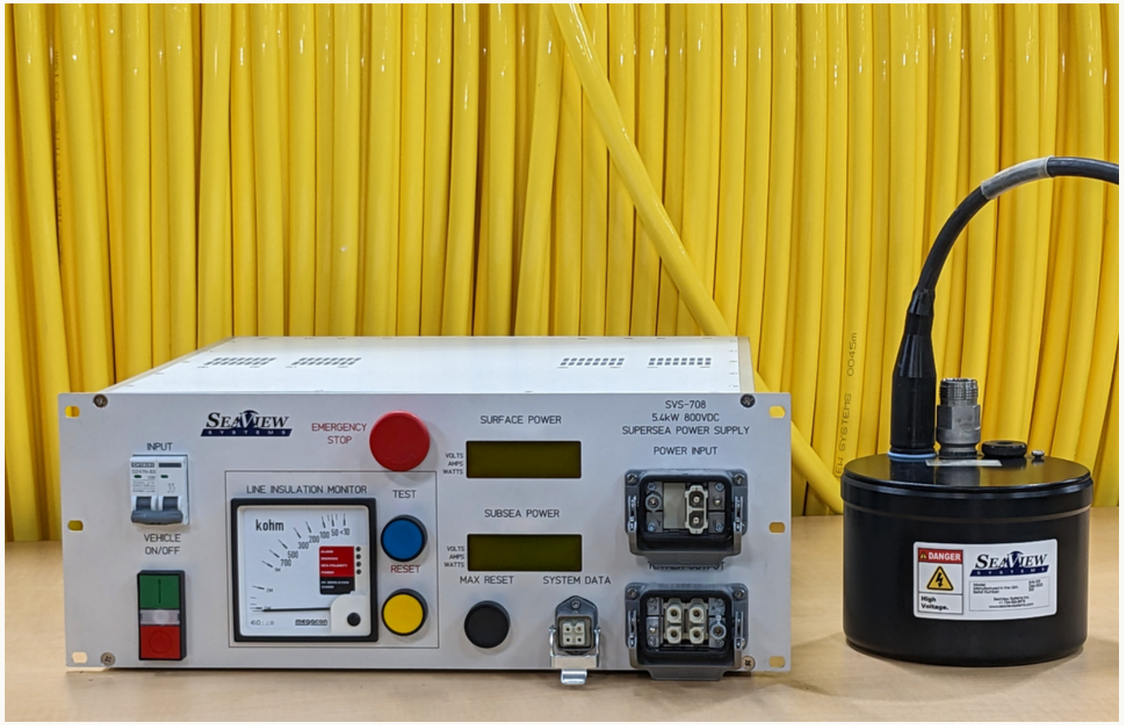
- It is propelled by electricity and has variable speed and direction control. Control is provided by a simple and secure handheld pendant. A engine and gearbox direct drive to the drum power the winch.

Saab Seaeye's iCON control system

- The Falcon surface unit features a 22" detachable daylight visible touchscreen, fully adjustable screen layouts and data displays, and storage for many layouts.

6) Power Management

SVS-708 SuperSea



- Smart power management is provided by the SVS-708 SuperSea Power Supply and the SVS-709 SubSea Vehicle Power Supply Unit (VPSU) to increase the umbilical power transmission capabilities of Inspection Class ROVs.

SVS-708 5.4kW 800VDC SuperSea Power Supply Features:

- Input voltage 180-260 VAC, 47-63 Hz
- 32 amps
- Output Voltage 800 VDC
- Output Power 5.4kW
- Display 1:
  - Output Voltage – Actual, Min, Max
  - Output Current – Actual, Min, Max
  - Output Power – Actual, Min, Max
- Display 2:
  - Input Voltage at VPSU – Actual, Min
  - Input Current at VPSU
  - VPSU Power – Actual, Max
  - Tether Losses- Watts, Voltage Drop
  - Temperature,
  - Leak Alarm
- Max Reset Button: Resets Min and Max readings and Leak Alarm