



SAAB Seaeye Cougar-XT

Technical Specifications



ABOUT THE SEA EYE COUGAR XT

The Seaeye Cougar-XT is a development of the successful Seaeye Cougar range; proven worldwide in demanding applications and recognized for its capability to operate effectively as a compact work ROV.

The Cougar-XT comes with a considerable improvement in performance. Developments in drive and power technology has seen vehicle thrust increased by over 50% in all directions - creating a vehicle with the highest thrust to weight ratio in its class.

Vehicle power in the XT has been doubled by increasing the supplied voltage from the standard 250 Volts DC to 500 Volts. Apart from improving the vehicles handling this enables a Seaeye Cougar-XT to accommodate a wider range of heavier duty tooling for work tasks. These include drill support, salvage and IRM to depths of 2,000 meters (6,661 feet).

Tackling an expanding range of applications is made easier with Seaeye Cougar ROVs because task-specific tooling skids can easily be bolted on, and changed as needed. The Seaeye Cougar-XT leads a new generation of compact, highly flexible and extremely powerful electric ROVs that offer users the ability to undertake a wider range of demanding tasks at lower operating costs.

THE VEHICLE

Chassis

The extremely rugged polypropylene chassis with a stainless steel lift frame, is totally maintenance free, non corroding and self-supporting in seawater. The design allows for additional equipment to be directly bolted to the chassis for ready customization. Seaeye was the first company to introduce polypropylene for the construction of ROV frames.

Buoyancy

The syntactic foam buoyancy block is split into two sections for easier handling and access to vehicle components. Apertures are provided for sonar, Xenon strobe and tracking transponders.

Equipment Interfaces

Global provides a range of standard interfaces / tooling:

- Two five-function manipulator & cutter interfaces
- CP interface (proximity or contact)
- Obstacle avoidance, profiling, side scan sonar – MS 1000
- Capable of supporting bathymetric system
- Fixed focus, zoom and stills cameras
- 3-phase tooling supply, 3,000 psi hydraulic
- Auxiliary connections providing telemetry and DC power for other accessories

Specifications

Depth Rating	2000 msw / 6,561 feet
Length	1506 mm / 59 inches
Height	745 mm / 29 inches
Width	1000 mm / 39 inches
Launch Weight	344 kg / 758 pounds
Forward Speed	> 3.2 knots
Thrust Fwd	170 kgf / 374 pounds force
Thrust Lateral	120 kgf / 264 pounds force
Thrust Vertical	110 kgf / 242 pounds force
Payload	80 kg / 176 pounds

Propulsion

The Cougar-XT features brushless DC thrusters which, apart from having the greatest power density, have integrated drive electronics with velocity feedback for precise and rapid thrust control. These thrusters are interfaced to a fast PID control system and a solid-state rate gyro for enhanced azimuth stability.

These essential building blocks enable superior control and response from the powerful thrusters.

Four vectored horizontal and two vertical SM7 500 Volt brushless DC thrusters provide full three-dimensional control of a Cougar-XT.

Compass & Rate Gyro

A flux-gate compass and a solid-state rate sensor give the Cougar-XT superior azimuth stability in forward flight and in auto heading.

Depth Sensor

The system uses an electronic depth sensor accurate to $\pm 0.1\%$ FSD accuracy.

Specifications

Accuracy	+/- 1°
Resolution	0.351°
Update rate	98 mS



Automatic Pilot

The compass, rate gyro, altimeter and depth sensors provide an automatic pilot for depth, heading and automatic altitude operation.

Video System

Equipped with a high resolution / low light black and white camera and a color zoom (18:1) camera and four high efficiency, high power LED lamp units the standard configuration transmits multiplexed video over two multimode fibers in the umbilical/tether. This provides up to four simultaneous video channels which are networked to two DVD recorders or USB drive.



Pan & Tilt Unit

The 90 degree camera pan & tilt platform is equipped with two cameras and one LED lamp. A proportional tilt feedback potentiometer provides an accurate pan & tilt angles which are displayed on the video overlay. The mechanical and electrical components used to operate the platform are housed in a robust unit designed for the harsh subsea environment. This improved Pan & Tilt Unit (PT35NM) is oil filled and manufactured from anodized aluminum.

Pan and tilt positional information is displayed graphically on the video overlay.

ROV TOOLING & QUICK-CHANGE TOOL SKID

Manipulator Skid

The Cougar-XT includes a detachable dual five-function manipulator tool skid. These manipulators have an integral 12 mm rope cutter. Alternatively, a combination of five-function manipulator, three-function grabber, or a 14 inch disc cutter is available.

Five-Function Manipulator

- Lift capacity at full reach – 85 pounds
- Jaw open / close 0 – 6 inches
- Rotate torque – 26.5 foot pounds

Heavy Duty Grabber

- Jaw open – close - 0 – 12.5 inches

Disc Cutter

- Disc size – 14inch
- Diameter of cut – 4.25 inches



Five-function manipulator and three-function grabber skid

SURFACE CONTROL AND POWER SUPPLY

Global's custom-fabricated surface control van:

- 20 foot ISO container frame

Surface Control Van provides:

- AC and DC supply switching control
- DC current and voltage indication
- Control of video and video overlay
- A keypad for system configuration
- Plugs and sockets for system connections and interfaces for ancillary equipment
- ROV control system (remote from the Hand Control Unit)
- Output to Telemetry monitor unit for RS232

Control data is transmitted between the surface Central Processor Unit (CPU), PCB and subsea CPU PCB via dedicated twisted-pair cables from the ROV using a half duplex RS485 communication link.



Monitors

The Control Van is equipped with two 15" color video monitors that are multi-standard, dual-input.

Specifications

Height	265 mm
Width	484 mm
Depth	500 mm
Weight	20 kg



Video Overlay

The monitors display the video information from the cameras and video overlay data as follows:

- Heading data (in degrees)
- Analogue Compass Rose
- Depth in meters (or feet)
- Pan & Tilt position
- Date and time
- Free text from keyboard
- TMS Bail Count (TMS cable counter when used with TMS)
- CP probe readings (if fitted)
- Vehicle Turns Counter

Telemetry Monitor Unit

This interface unit with its associated software allows ROV data, such as heading and depth, to be displayed on a PC and/or exported to a survey computer. In addition to exporting data, it can be used for fault diagnostics.

Keyboard

A rack mounted keyboard for entering data and free text onto the video overlay.

Hand Control Unit

The Hand Control Unit (HCU) provides the interface between the operator and vehicle using a series of switches and controls. Working on a 5 meter 'flying' lead, the HCU controls the following:



- Vehicle movement, direction and speed
- Pan control for P&T Unit
- Lighting
- Safety thruster enable switch
- Auto depth and heading
- Additional camera selection
- Propulsion system offsets and power settings

COUGAR-XT DEPLOYMENT

Global's Seaeye Cougar-XT can be operated in either free swimming with up to 450 meters (1,476 feet) of soft umbilical or for greater protection of the vehicle as it passes through the splash zone and for faster travel to and from the working depth, it is deployable via a garage Tether Management System (TMS).

A skid mounted 'A' frame, hydraulic power unit (HPU) and winch with 1600 meters (5,250 feet) of steel wire armored lift umbilical comprise the Launch and Recovery System (LARS) used for this vehicle.

TYPE 3A TMS

This garage-style TMS uses a bale arm arrangement to spool 150 meters (495 feet) of tether on and off a fixed drum without the complexity of incorporating a slip ring which is remotely controlled by the ROV pilot.



LARS in stowed position with TMS and Cougar ROV ready for transport

The floor of the TMS can be adjusted to accept the additional height of a Cougar when fitted with the tool skid.

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HIGHLIGHTED PROJECTS



S.S. Montebello ROV Assessment

Global was contracted by the United States Coast Guard to determine if the original cargo, 3.2 million gallons of oil, remained aboard the sunken ship S/S Montebello, which sits 900 feet below the ocean surface approximately 6.5 miles off the coast of Cambria, CA. Global's Cougar-XT ROV was used as the platform to support the inspection, both visual and sonar, thickness gauging, backscatter tooling operations, physical sampling of the tank contents, and sediment sampling from the general area. Global teamed with T & T Bisso to provide engineering support and 3D modeling of the vessel. Additionally, Tracerco was subcontracted to utilize their neutron backscatter tool, a non-invasive sensing device, to determine the presence of oil and oil/water interface.



J-Tube Pull In

In preparation of a new pipeline being installed onto an oil platform in the Long Beach, CA area, we were contracted to replace the existing 1" pull wire with a new 1 1/4" pull wire. Our Saab Seaeye Cougar-XT ROV with Launch and Recovery System (LARS) was mobilized aboard the DP Ocean Pioneer. All ROV operations were carried out from the DP Ocean Pioneer while in DP mode (live boating). Crews working on the platform mounted winches and rig-in pulleys to assist with the removal of the old wire and installation of the new one. As part of this operation, a pipe pig was sent down the existing J-tube to ensure that it was clear of growth and properly prepared to receive the new pipeline.



Bridge Retrofit & East Half Replacement Span

Global provided ROV and dive services to assist with the installation of new anchor cables that secured new section of the Hood Canal Bridge to newly installed anchors.

We were contracted to route the 3-inch galvanized steel anchor wires through the new concrete anchor blocks that support the new east half of the bridge. The anchors are located in 60 to 380 feet of water. The new anchor wire was ran through the anchor and connected to the bridge where it was tensioned. Each leg of the two wires that attach to the anchor block has a tensile strength of over 1 million pounds. The anchors themselves weigh over 2 million pounds each. The project required the placement and connection of 20 anchors to secure the bridge in place.

On the deeper anchors, the Cougar-XT ROV was used. This vehicle, equipped with two five-function manipulators, was able to make the required connections, monitor the wire operation, and had enough power to stay on station during the heavy currents.



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