



 **DYSSEY'S**

RV DORADO DISCOVERY **AN INTEGRATED MINERAL EXPLORATION CAPABILITY**

Deep-Ocean Exploration Equipment on *Dorado Discovery*

• Navigation and Positioning Technology

- Applanix POS/MV Inertial Motion Reference Unit
- Hemisphere DGPS
- Veripos DGPS Worldwide Precise Point Positioning System
- Winfrog Navigation Software
- Fledermaus 3D for Visualization
- Sonardyne RangerPro Wideband USBL
- Integrated USBL Thru-Hull Deployable Pole Mount
- MK-3 Precision Echo Sounder

• Ship Mounted Multibeam

- SeaBat 7150-F 12/24 KHz Deep Water Multibeam Sonar
- Dual Reson SVP 70 Sound Velocity Probe
- Valeport Sound Velocity Probe
- Reson PDS 2000 Acquisition Software
- Lockheed Martin Expendable Sound Velocity Probe System

• TowYo Technology

- Dynacon Traction Winch with 10km 0.68 Inch Fiber Optic Cable
- Seabird SBE 11Plus, SBE 32C Carousel, SBE 9Plus CTD
- Custom TowYo Tow Body
- Orion 3Star pH Meter
- Seapoint Turbidity Sensor
- Mini-ORP Sensor
- Benthos PSA 916 Altimeter
- NOAA MAPR Systems

• Side-Scan/Magnetometer Technology

- EdgeTech Dual Frequency 75/400KHz Chirp Side-scan Sonar (Fiber) with Deep Tow Body and Valeport CTD
- Geometrics G882 Cesium Magnetometer
- Dynacon Traction Winch with 10km 0.68 Inch Fiber Optic Cable

• ZEUS ROV Technology for Inspection and Archaeological Recovering

- ZEUS II, 400hp SMD ROV System
- Dual Schilling Conan Manipulators
- Simrad MS1000 Scanning Sonar
- Geocoded video and Electronic Stills Photography
- Reson 400KHz 7125 Multibeam Sonar
- ROV Winch with 2.3km 1.658 Inch Cable (Fiber)
- CDL MiniPOS3 INS (ROV) with integrated RDI Doppler Speed Log
- Digiquartz Precision Depth
- Autotrack System
- Hydraulically Operated Collection Drawer

• Coring Capabilities

- Rossfelder 6m Vibracore
- Ocean Instruments MC-400 Multi Corer
- Piston 3m Corer
- Gravity 3m Corer
- Box Corer
- One Cubic Meter Clamshell Grab

• One-Pass Sea Floor Drill Rig

- 6 Meter Bore Hole
- 1000 ft/lbs Torque
- 3000 Meter Depth
- Diamond Core Drilling
- Deep Vibracoring
- Reverse Circulation Sample Drilling
- Dedicated Motion Compensated
- Launch and Recovery System

• Critical Support Equipment

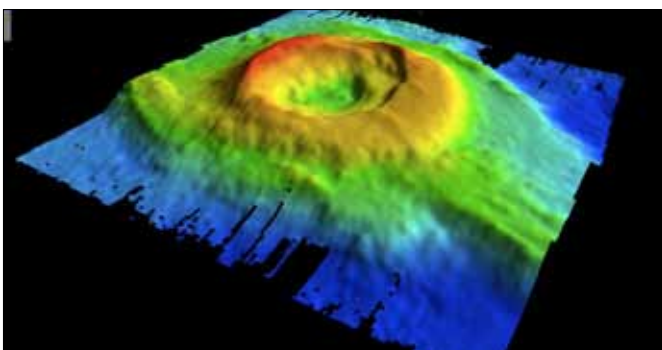
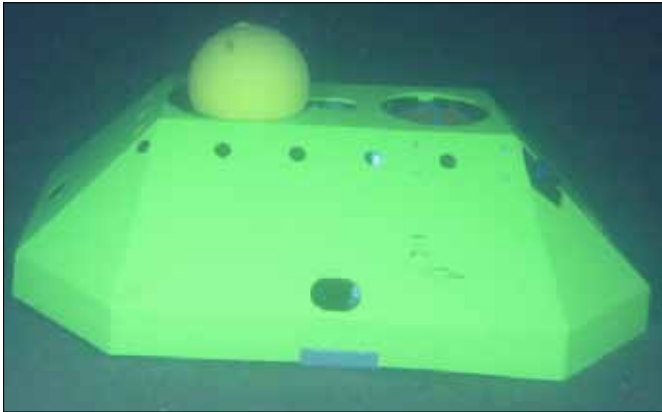
- ClearCom Wired and Wireless Communications throughout Ship
- Full Charting Capabilities, Plotters and Printers
- Multiple Networked Processing Workstations with ArcGIS, 20/20 and ISIS Sonar Processing Software and Visualization Packages and full Databasing Capabilities
- Everetz GPS-Based Time Standard Synching all Systems
- Large Screen Programmable Displays in both Online and Offline Spaces
- Large Capacity UPS and Frequency/Voltage Control throughout Online and Offline Spaces

• Fully Integrated Environmental Suite

- MOCNESS (Multiple Opening/Closing Net and Environmental Sensing System) with 9 Codends
- Multicorer
- Trawl Resistant Bottom Deployable Acoustic Doppler Current Profiler
- Biological Collection and Preservation Lab



Deep-Ocean Exploration Equipment on *Dorado Discovery*



RV *Dorado Discovery* Ship Specifications



Principal Features	
Official Number	916647
Port of Registry	Leith, UK
Class Number	952C44
Call Sign	2DJU3
Gross Tonnage	5099.00
Net Tonnage	1529.00
IMO Number	8715156
Type	DP Research
Built	Gdansk - 1997
Length Overall	100m
Breadth	18.00m
Depth	7m
Fuel Survey	7.0 tons/day
Fuel Use Port	1.5 tons/day
Fuel Use Cruise	10.0 tons/day
Navigation Equipment	
Radio	Full GMDSS
Radar	21X7 ARPA (X band) 28X7 ARPA/AIS (X band + S band)
Communication	Inmarsat F 77 Networked VSAT
Gyro	Anschutz ST022
Autopilot	Robertson AP9 MII
Echosounder	Atlas Elektronik 481 Digigraph
GPS	2 x Furuno 150 2 x Simrad MX 150
Plotter	1 per radar unit
Weather Fax	Furuno 208
AIS	JRC (JHS-180 AIS)

Machinery	
Main Engines	1 MAN B&W 8L35 MC Cegielski
Horse Power	3680 Kw
Auxiliary Power	6 x Sulzer 677 Kw 1 x Shaft 1500 Kw
Bow Thruster	1 Zamek 250 Kw
Azimuth Bow Thruster	1 Brnnvoll A/S 800 Kw
Stern Thruster	1 Brunvoll A/S 700 Kw
Propeller	1 CPP + 1 Nozzle
Rudder	1 Flap
DP System	Emri JS/DP
Fuel Capacity	MGO 768m ³
FW Capacity	220m ³ + 8m ³ /Day
Accommodations	
Cabins	42 Single + 6 Double
Messroom	Steward served
TV Lounge	2
Climate Control	Full A/C and Heating
Safety Equipment	Full SOLAS for 54



Lifting Gear	
Stbd Fwd Crane SWL	2,500 kg
Port Fwd Crane SWL	3,200 kg
Stbd Aft Crane SWL	3,000kg
Port Aft Crane SWL	4,000 kg
ROV Knuckle Crane	10,000 kg
Stern A Frame Central Lifting Point Static SWL	35 tons
Stern A Frame Central Lifting Point Dynamic	35 tons
Stern A Frame Port Lifting Point	15 tons
Stern A Frame stbd Lifting Point	15 tons
Helideck	Requires Cert
MOB Boat	6 Person

Features	
Survey, Exploration, Archaeological, Technical and Scientific Labs	
Large Refrigerated/Freezer Sample and core Storage	
Dedicated Geological Sample Laboratory	
Water Chemistry Lab	
Electrical, Mechanical, Welding and Fabrication Shops	
High Speed Internet Access	
Multimedia Equipped Conference/ Briefing Room	
Recreational Lounges and Gym	
Seafloor Drill	
Motion Compensated Launch & Recovery System	



Deep-Water Robotic Coring and Sampling Drill

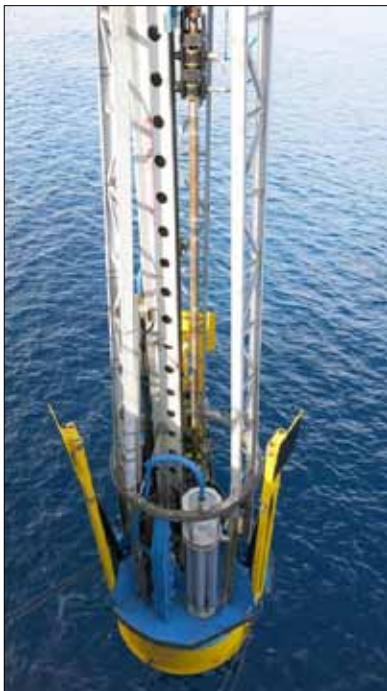
Odyssey Marine Exploration has installed a Deep Water Robotic Drill Rig (DWRD) on the RV *Dorado Discovery* in order to enhance its capability to conduct integrated seabed mineral exploration.

The DWRD was designed and built by St. Vincent Bay Exploration, Inc., (SVBE) of Huntington Beach, CA, to be rapidly deployed to conduct remote coring and reverse-circulation drilling to sample a single 6 meter borehole. The DWRD offers the choice of diamond coring, vibro-coring, or reverse circulation sampling, depending on bottom type and project objectives.

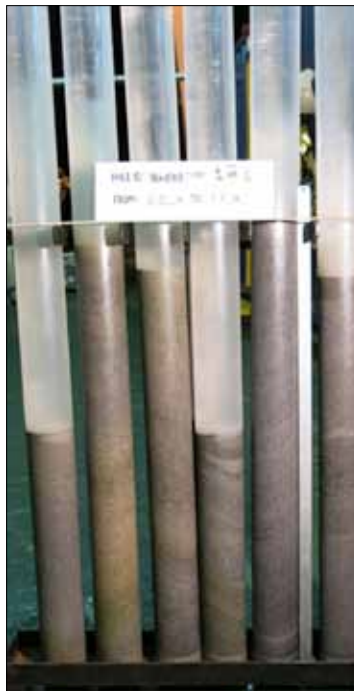
The rig can work on the seabed at a depth of 3000 meters of water and is controlled remotely from the surface. A single umbilical cable deploys the system and provides electrical power for the onboard electrical and hydraulic systems; and fiber optics for video and control data for remote operation. DWRD utilizes proven T.E.I. Rockdrill components, and is controlled with state-of-the-art Schilling ROV telemetry.

Utilizing a unique self-leveling base enables DWRD to land and stabilize on up to 20 degree slopes quickly and easily.

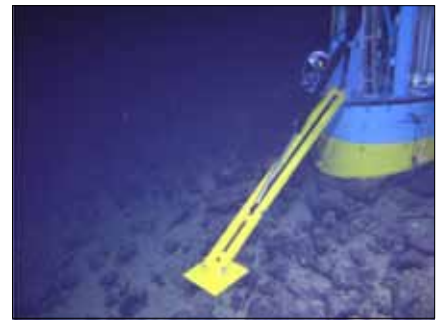
An all-electric McCartney active heave-compensated winch provides for rapid transit through the water column at speeds up to 110m/minute, and damping of relative motion when landing on the seabed in seas up to 3m.



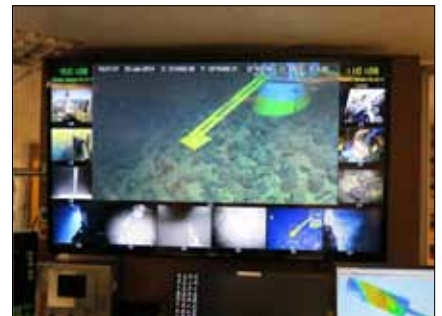
Drill with articulating legs



Reverse Circulation Samples



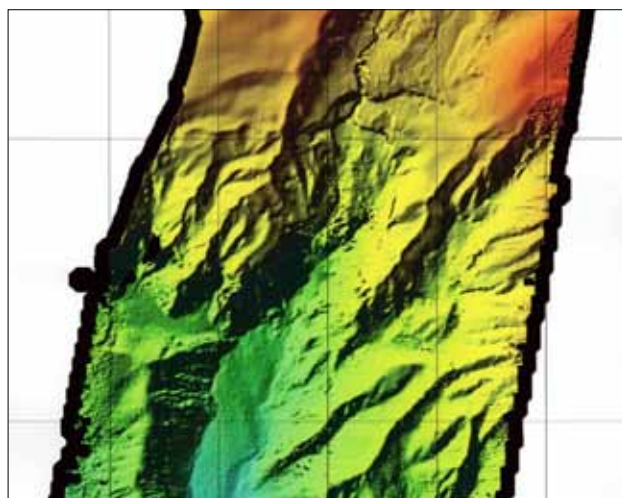
Robotic Drill on Seabed with Self-leveling Base



Robotic Drill Telemetry and Control

SeaBat 7150 Technical Specifications	
Operating Depth	3000 msw (9850 fsw)
Dimensions	Diameter: 2.5m Footprint with legs extended: 4.1m
Total Height	9m (additional 0.5m with mud skirt)
Mast Height	7.7m
Drilling	6m stroke RDS250 rotary drill with dual motor and 1000ft/ lbs torque and 600 RPM
Recovery Force	8000 lbs retract
Electrical	The electrical system utilizes a standard work-class ROV architecture, components and controls supplied by Schilling Robotics
Lift Point	Custom A-frame and motion compensated umbilical winch

Deep-Water Multibeam Echosounder: SeaBat 7150-F 12/24KHz



The **SeaBat 7150-F** is a dual frequency deep-water multibeam sonar system, operating at 12KHz and 24KHz that measures relative water depths over a wide swath perpendicular to the vessel's track.

SeaBat 7150 Technical Specifications	
Sonar Operating Frequency	12KHz / 24KHz
Transmit and Receive Beam <i>(Nominal and dependent on environmental conditions)</i>	2.0° x 2.0° / 1.0° x 1.0°
Number of Receive Beams	Up to 880 beams (configuration dependent)
Coverage Sector	150°
Depth	3500m at 24KHz; 6000m at 12KHz
Ping Rate	Range Dependent. 15 Hz maximum
Pulse length	0.5 to 20 ms
Power Requirements	110/220V AC 50/60Hz 500 W (Processor)

- Bathymetry, side-scan & snippets
- Roll stabilization
- Pitch stabilization
- 256 Equi-angle focused beams
- 880 beam equi-distant footprint selection
- Autopilot
- Beam data recording & playback on local hard drive
- Hardware sync pulse out
- External trigger IN
- 1PPS pulse handling and time stamping
- BITE

6000m *CLIO* ROV – Optional



<i>CLIO</i> Technical Specifications	
Depth	Operating depth 6000m, Parascientific Digiquartz 6000m depth Sensor
Power	All electric with hydraulic power pack for manipulators
Manipulators	Two Hydrolek 5 function hydrolic manipulators
Payload	Payload 75Kg, > 200Kg using recovery basket underneath vehicle
Image Capture	Supports HD video and electronic stills camera with LED lighting
Versatility	Available electrical and telemetry for supporting additional sensors and equipment

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