

Robots for the RAN

An Innovation Journey

Forum for
Operational
Oceanography
25 – 27 July 2017

Darren Burrowes
Chief Technology Officer



About BlueZone
Group

Our Innovation
Journey

Current Projects
& Lessons
Learned

Other Activities

Agenda



SAAB

ATSA Defence Services

- Australian Industry Capability
- Service
- Support/Engineering
- Defence/Maritime
- Minewarfare/ASW



About BlueZone Group



UVS Pty Ltd

- Product sales
- Service
- Application engineering



About BlueZone Group



Business Capability

- Newcastle, Melbourne, Perth
- Diverse Markets
 - Defence
 - Offshore Oil & Gas
 - Oceanographic/Hydrographic
 - Water Resources
 - Water Infrastructure
 - ROVs & Robotic Vehicles



Our Workspace

- 71% of the surface of the globe is water
- 80% life on earth is under the ocean surface
- 30% of world oil from offshore fields
- Largest active carbon sink on Earth
- *Underwater technology creates the tools to manage and utilise ocean resources*

Country	Land Area	Sea Claims	Total Area
Australia	7,700,000	28,500,000	36,200,000

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Our Innovation
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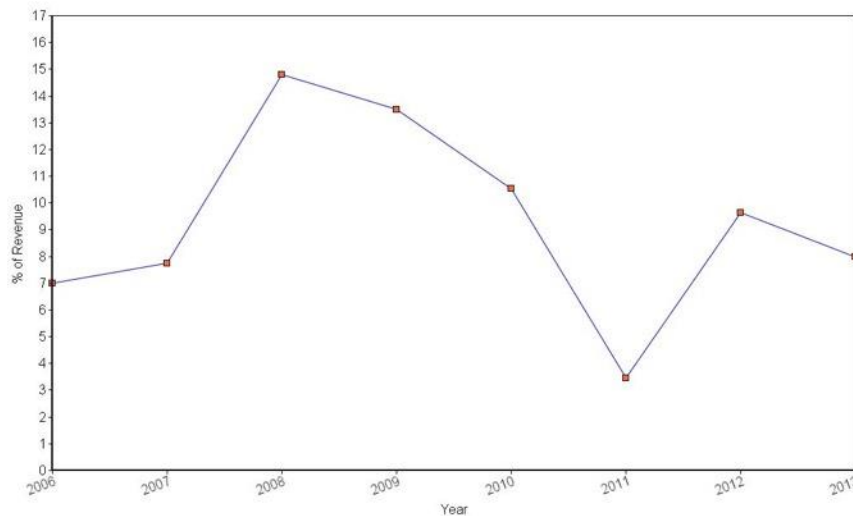
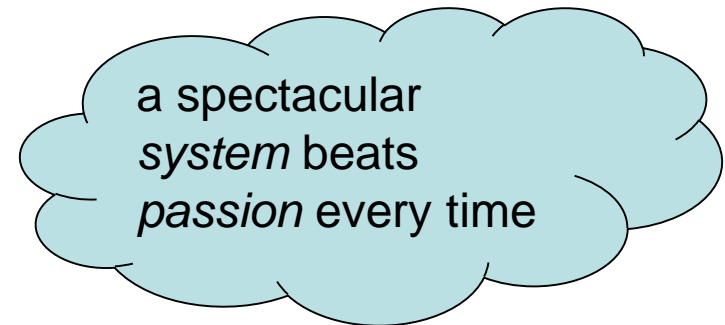
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Innovation as a Process

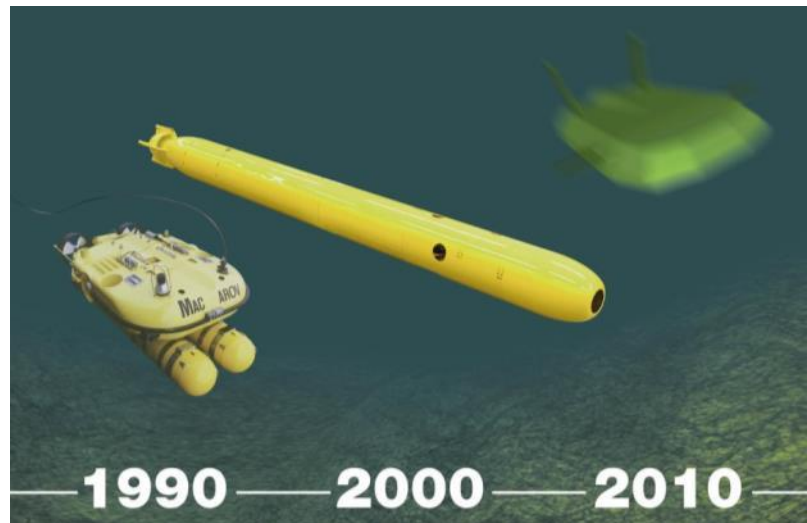
- R&D investment > 9%
- Engineering for execution
- Risk tolerance





ATSA Saab Journey

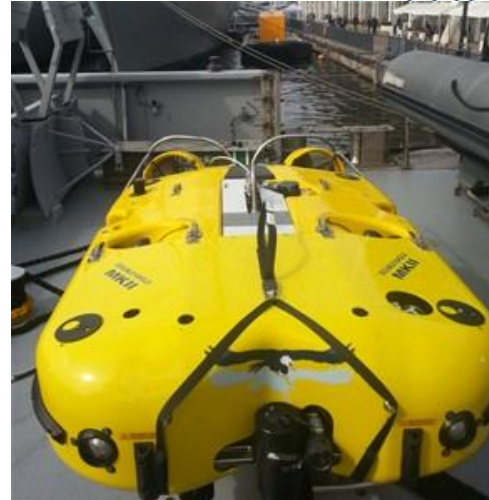
- Process Innovation
- Service
- Training
- Engineering new components



Apple acquires Beats for \$3.2 billion, confirms Dr. Dre

By Sebastian Anthony on May 9, 2014 at 11:35 am

75 Comments



Tether Connection Mk II



Tether Connection Mk III

Component Development

Supplier



Customer



Manufacturer

- Saw the market
- Took the risk
- Created the value





Portable Control Box

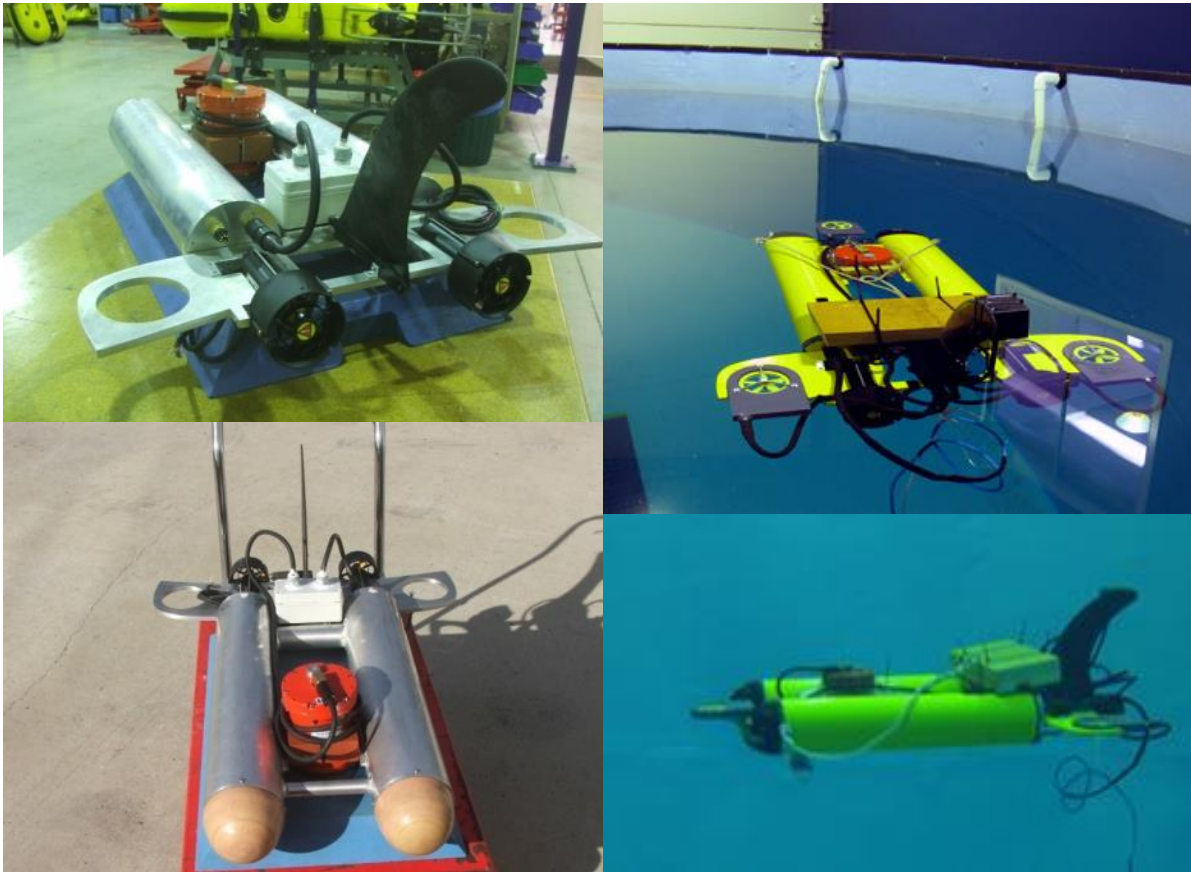
- Smaller & lighter
- Custom software
- Reverse engineering



Project: SeaVision

“Mod 0” Vehicle Construction

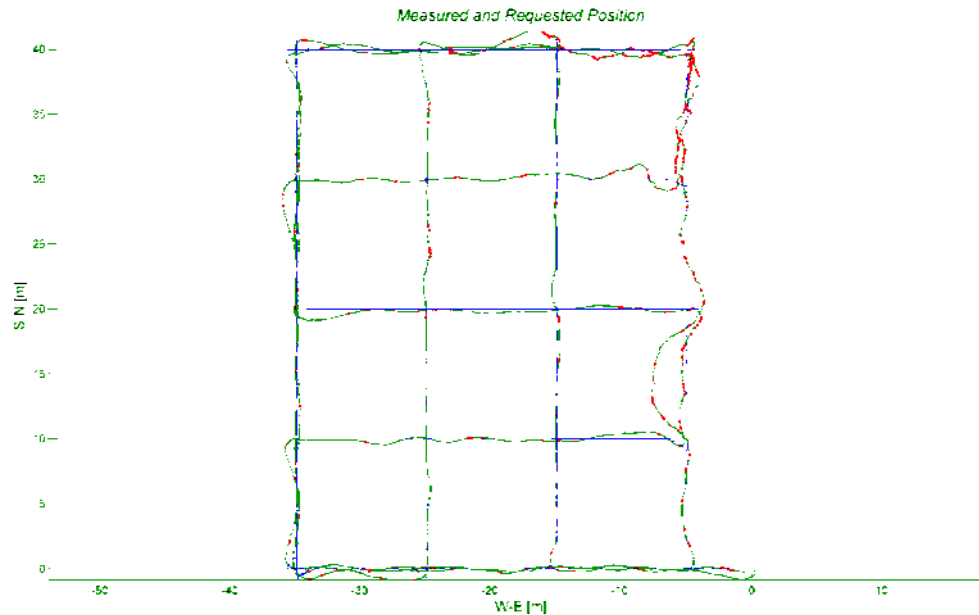
Product Development



500m mission &
return to 25m
from start



Successful Trials Results





Submarine Camera Surveillance

- 2 Projects
- Design, manufacture & commissioning
- Low-light UW cameras
- On-board monitoring & control



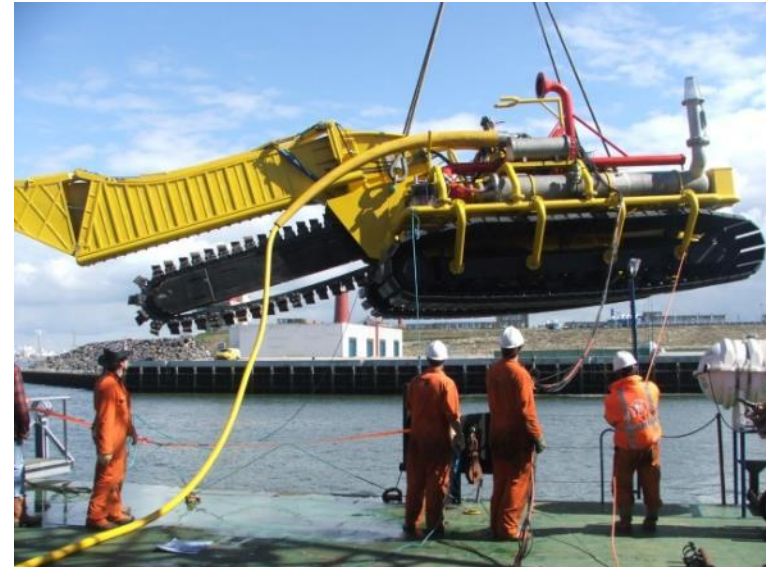
Drivers of innovation



One never replaces the other they just add a new focus

Subsea Trenchers

- Trencher design in Australia
- Q7 Windfarm, The Netherlands
- St Petersburg Harbour, Russia





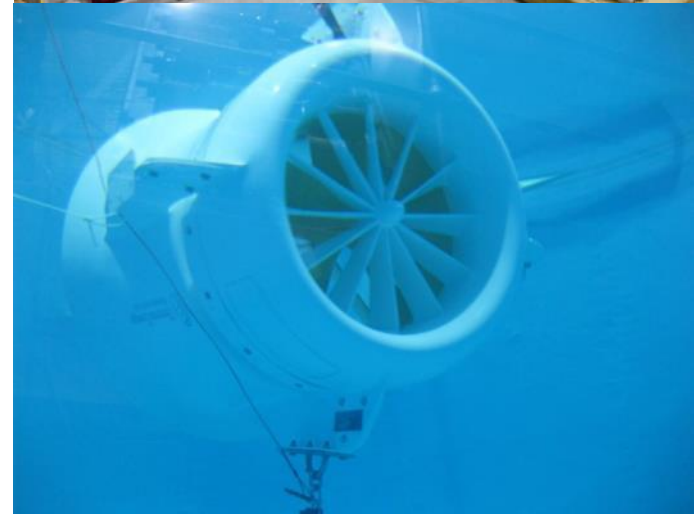
Elemental Energy
TECHNOLOGIES LTD



Sea Urchin

Renewable Energy

- Engineering development
- Project Management
- Test & Trials



Collaboration



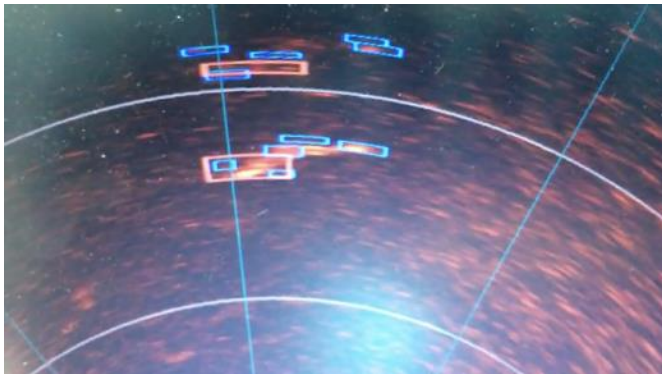
AUSTRALIAN ENGINEERING
EXCELLENCE AWARDS 2012

WINNER



Clever Buoy

- World's first
- Detection of sharks at beaches
- Prototype development in twelve weeks





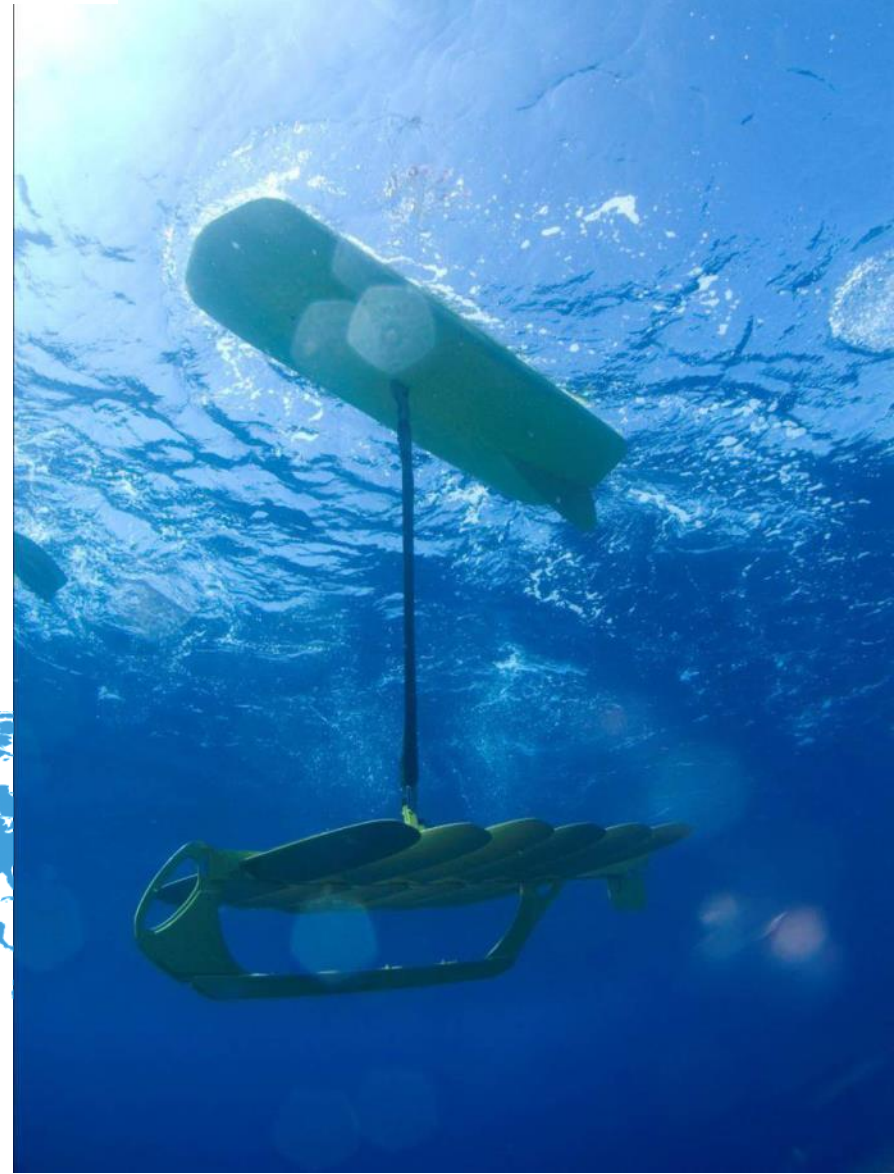
LIQUID ROBOTICS
instrument the ocean



Wave Glider

- Wave powered
- Autonomous
- Innovate ubiquitous ocean sensing

Collaboration





Wave Glider Products



WG01 Wave Glider
Recovery Device

[MORE INFO](#)



WG02 Wave Glider
Transport Case

[MORE INFO](#)



WG03 Wave Glider
Purge Kit

[MORE INFO](#)

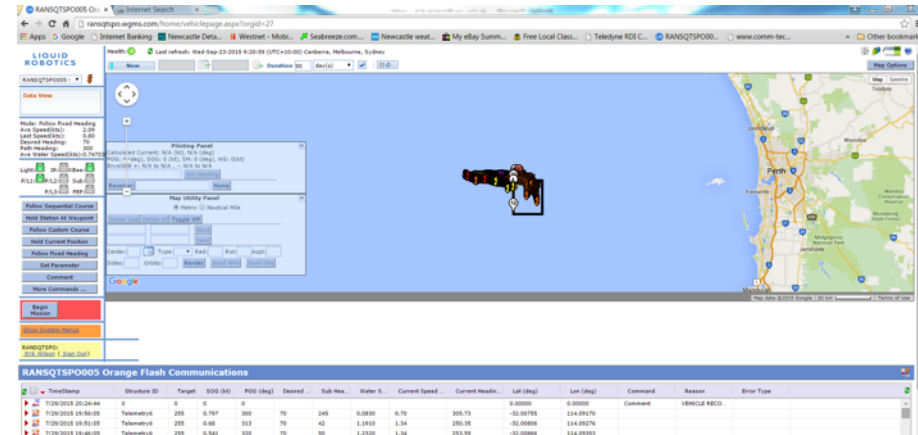


WG04 Rapid Access
Drybox

[MORE INFO](#)



UVS



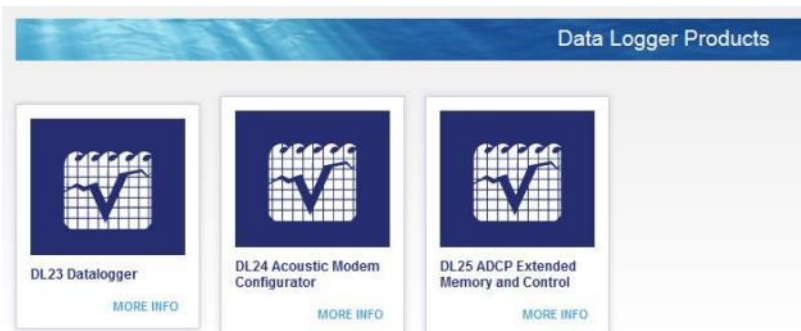


TELEDYNE
RD INSTRUMENTS
Everywhere you look™



Authorised Service Centre

- Acoustic Doppler Current Profiler (ADCP)
- One technology, many applications
- First Service Centre outside of Teledyne

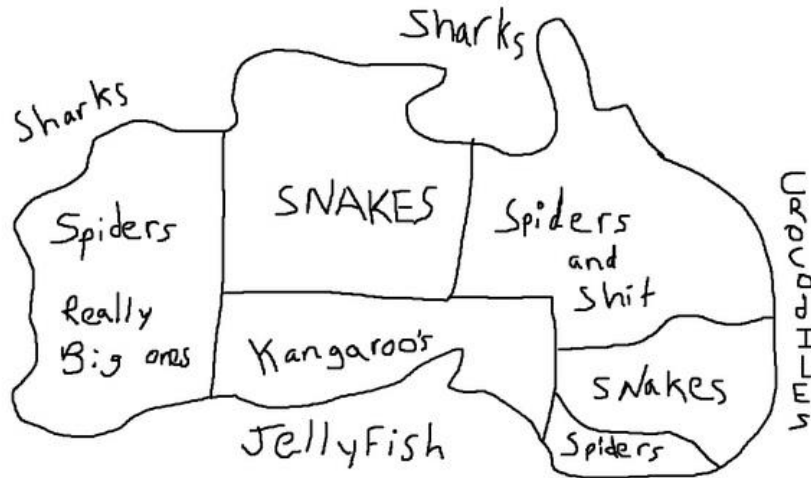




DL25 ADCP Data Logger



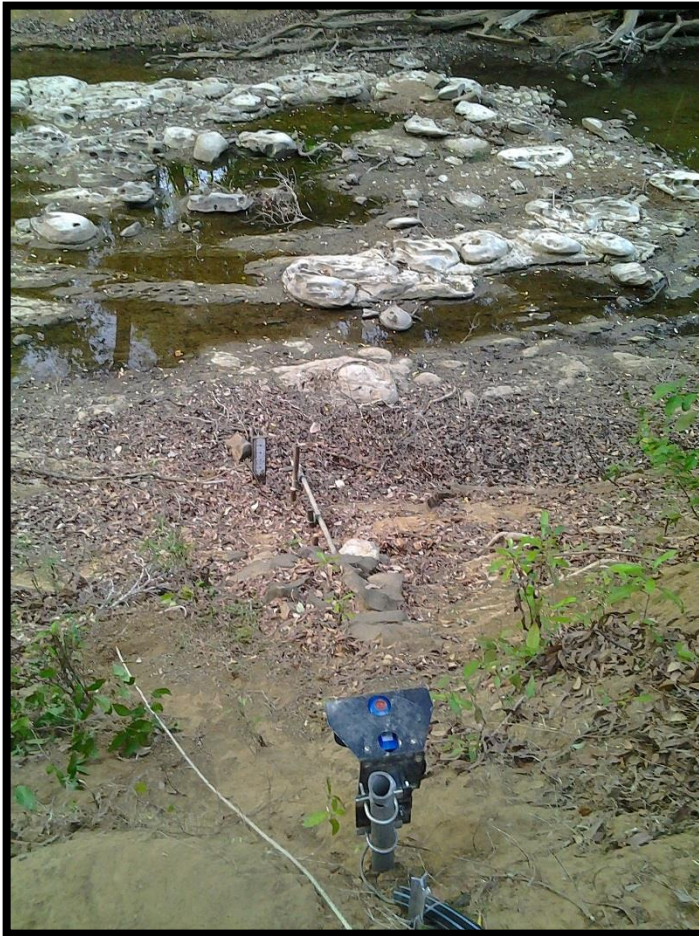
Remote Area Rivers



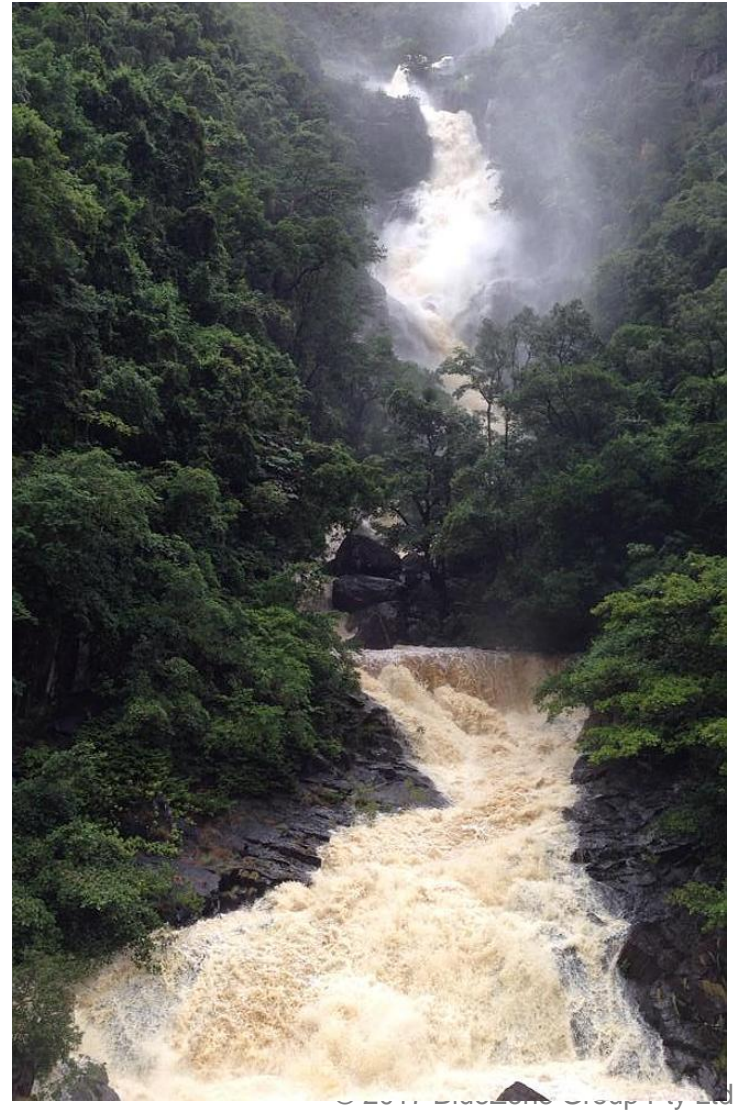
Motivation

Remote Area Rivers

Motivation



Remote Area Rivers

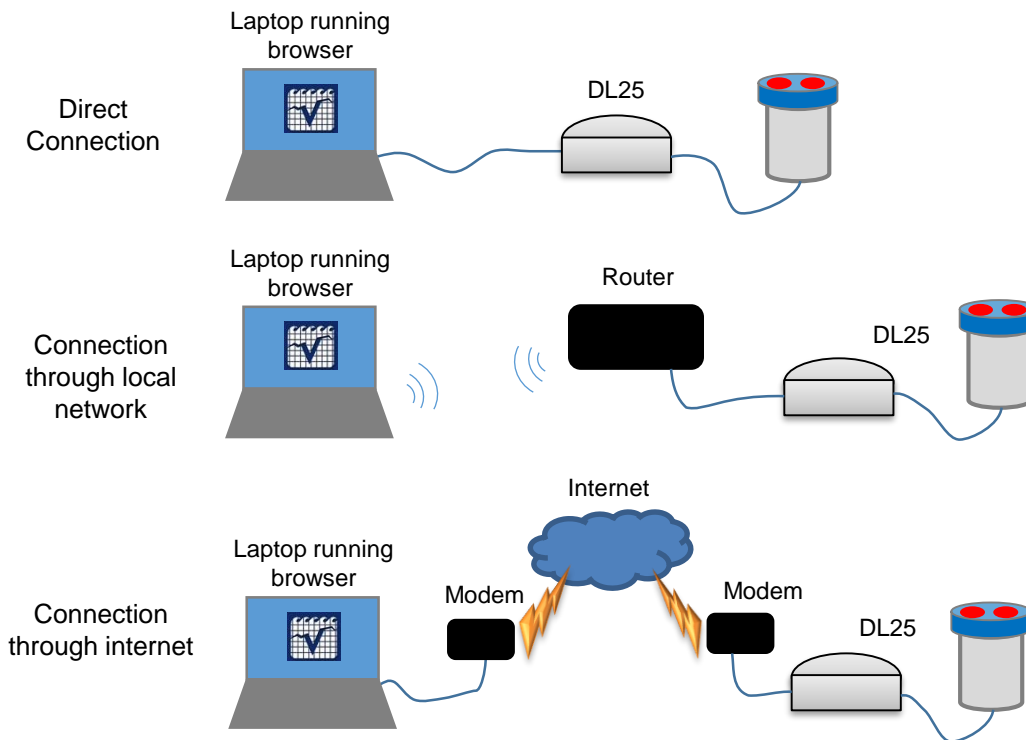


DL25 Features

- Data logger - 32GB
- Onboard processing
- Remote download of files
- Remote configuring
- Receive status updates via email, Twitter
- Push ADCP data to FTP server
- Use OEM software to control ADCP
 - or acoustic modem



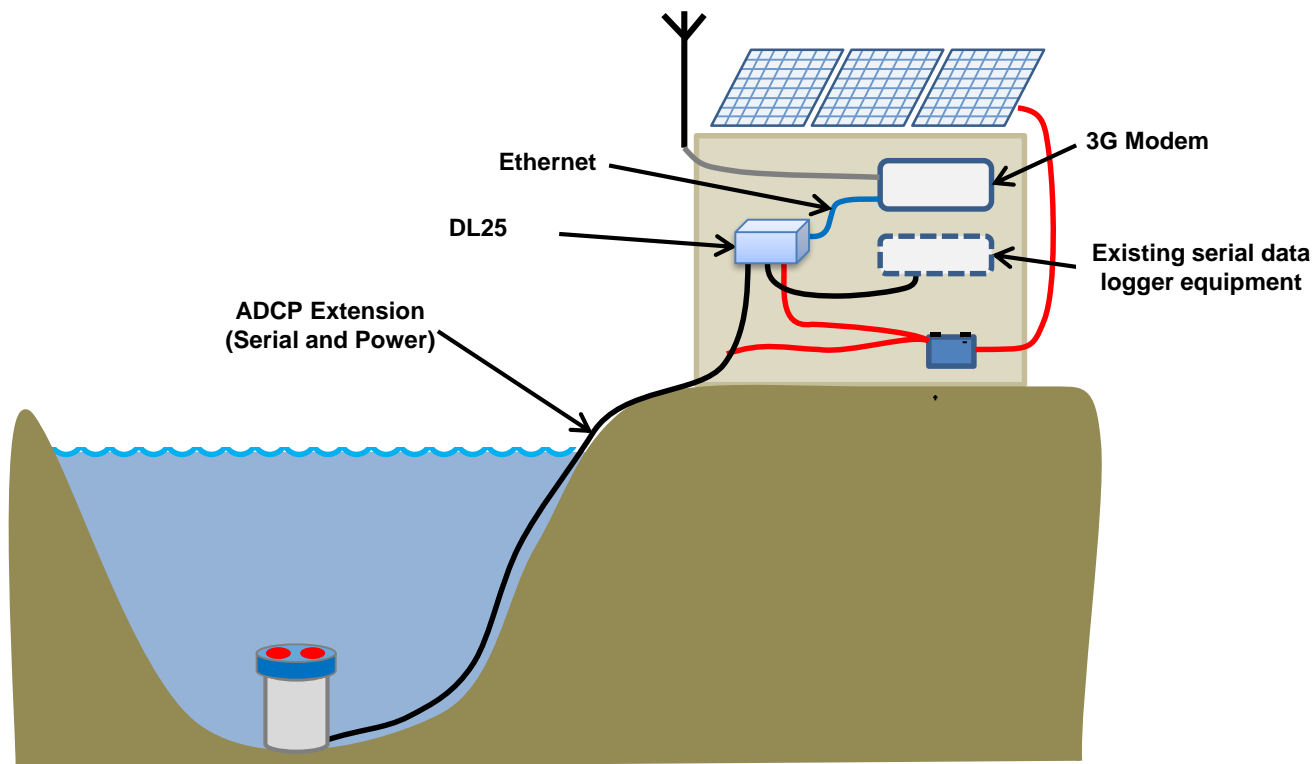
Configurations



*ADCP
Access
Anywhere!*

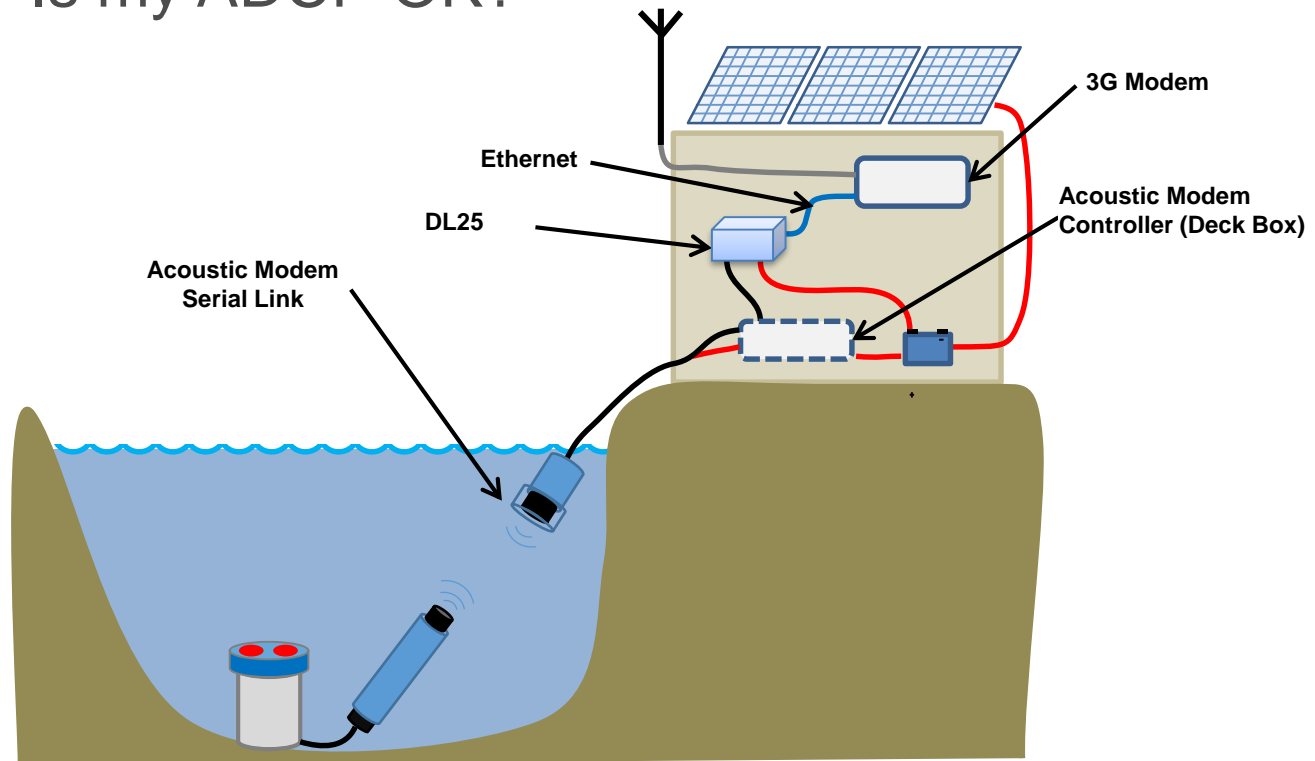
Remote Access

- Provide remote access
- Existing logger



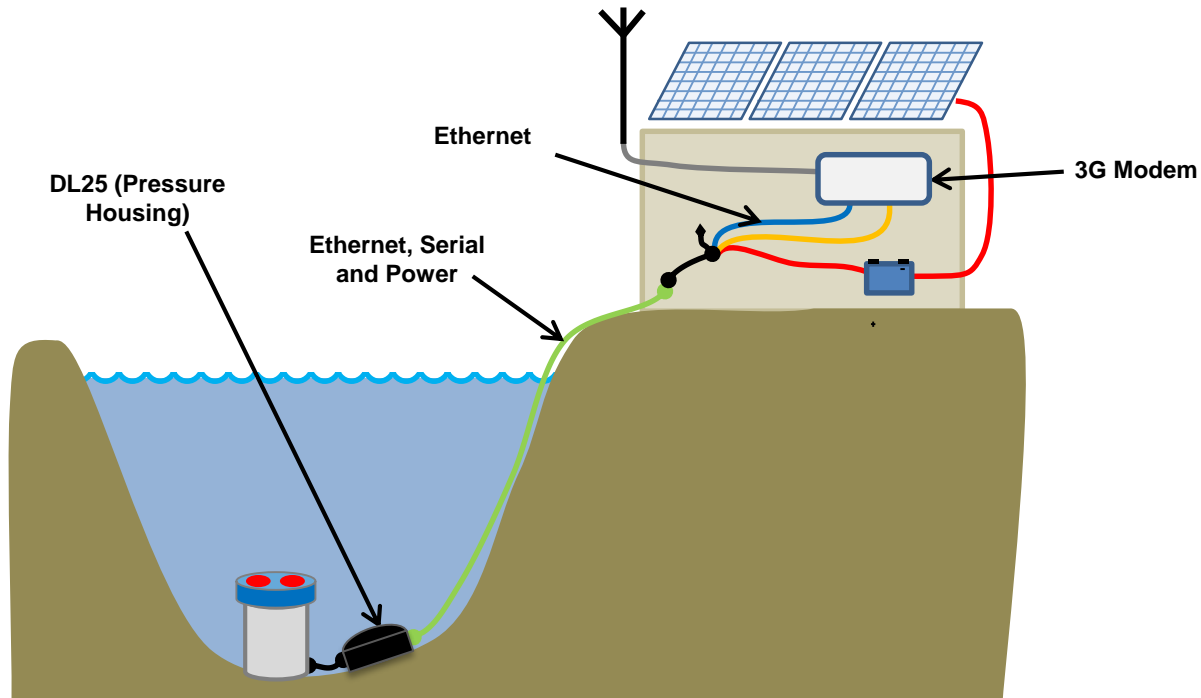
Remote Access

- Acoustic Modem
- Marine Measurements
- Is my ADCP OK?



Typical scenarios

Ethernet Cable



Specifications

- Depth: max 300m
- Ethernet cable: max 80m
- Storage: 32GB
- Input voltage: max 48V

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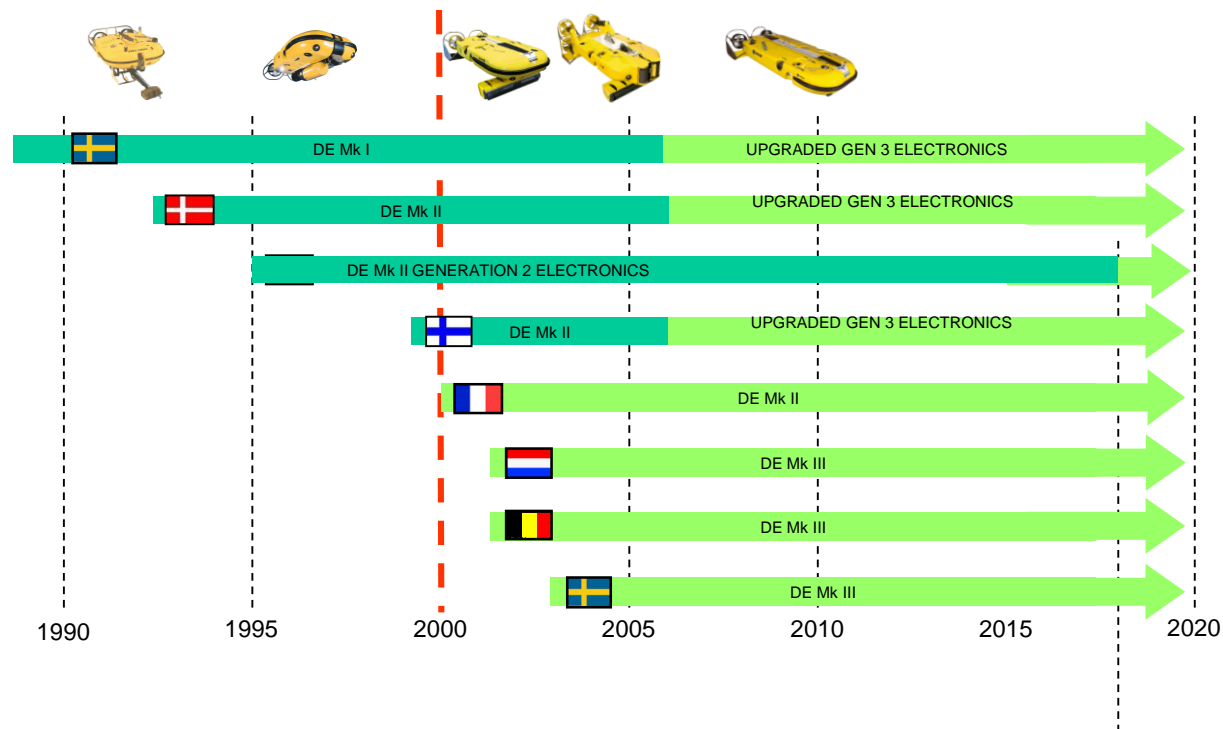
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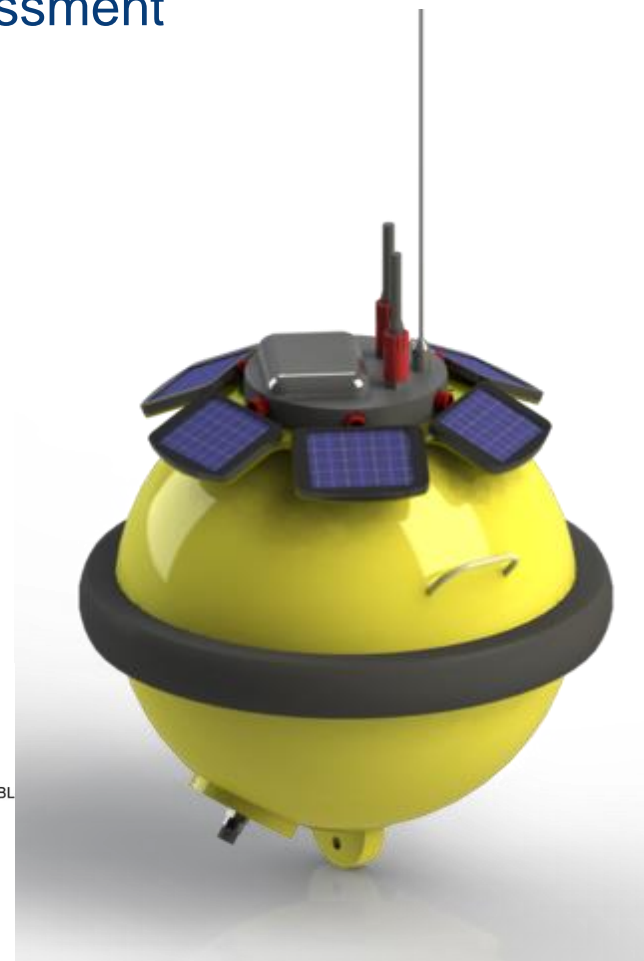
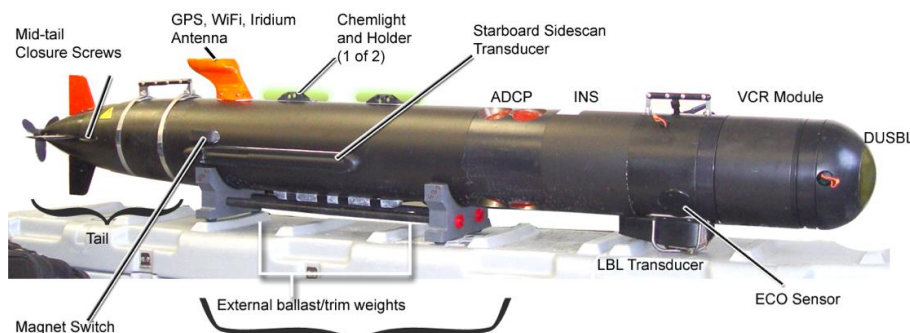
Upgrade Path for SEA1179 – Minehunter Coastal Ship Life Extension



Double Eagle

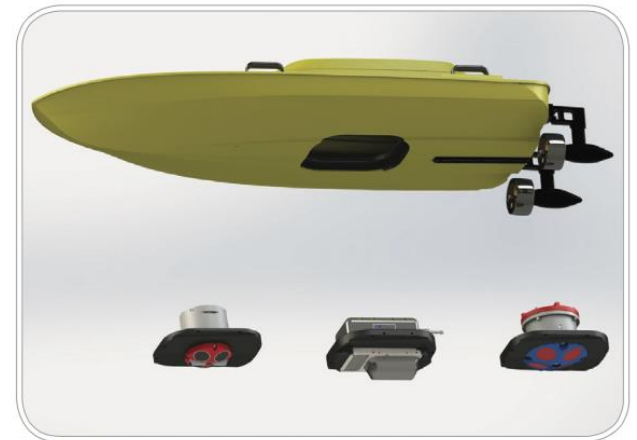
SEA 1770 – Rapid Environmental Assessment

- Deployable Geospatial Survey Teams (DGST)
- Environmental & survey sensors
- Communications and data transmission systems



SEA2400 - Hydrographic Data Collection Capability

- Z-Boat with MB2 Multibeam Echosounder
- High-resolution shallow-water hydrographic surveying
- Data processing is available in real time through Caris® Onboard
- Fully autonomous waypoint navigation
- Army Innovation Day Sep16
- 3 boats to be supplied to Army



SEA2400 - Hydrographic Data Collection Capability

- Wave Glider with MBES
- Data processing is available in real time through Caris® Onboard

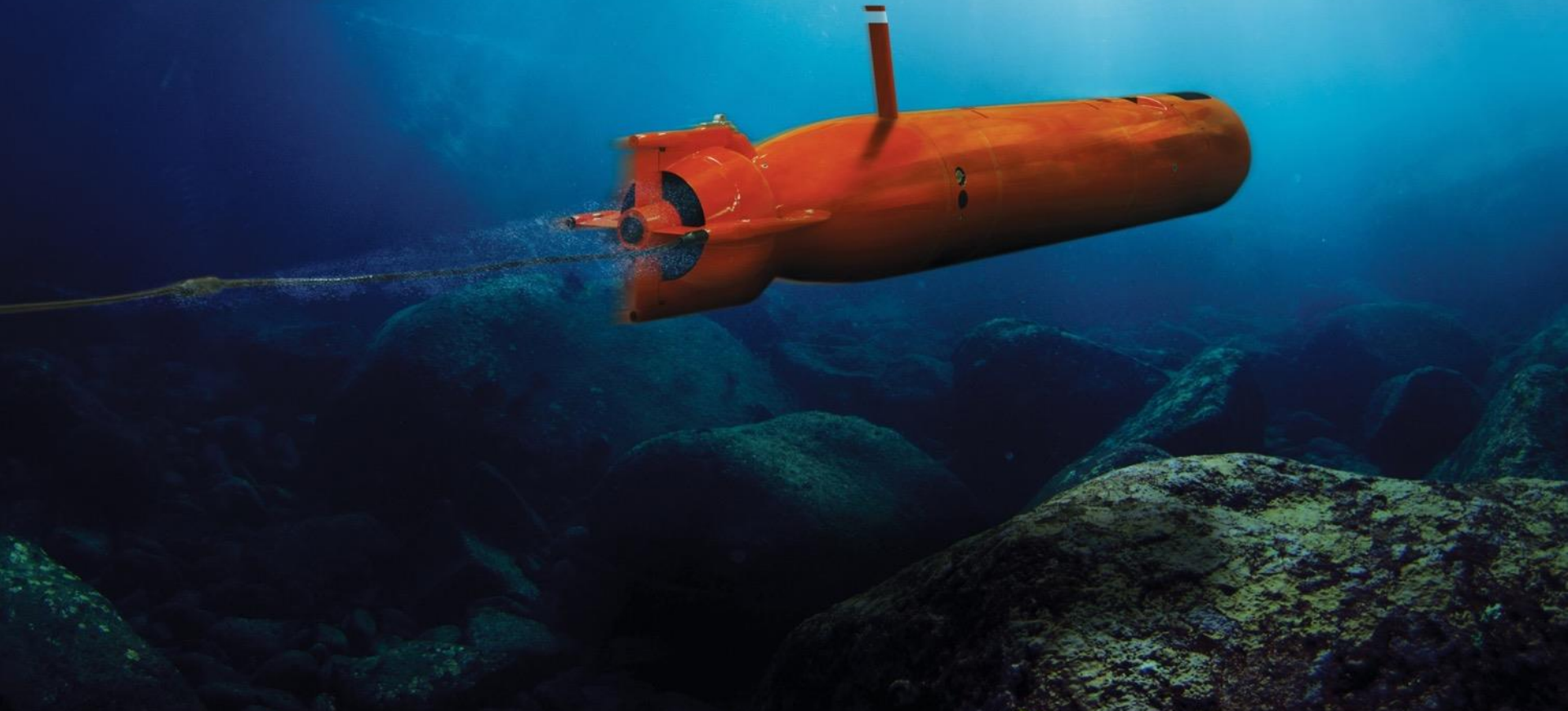




SAAB



AUV62 Autonomous Target



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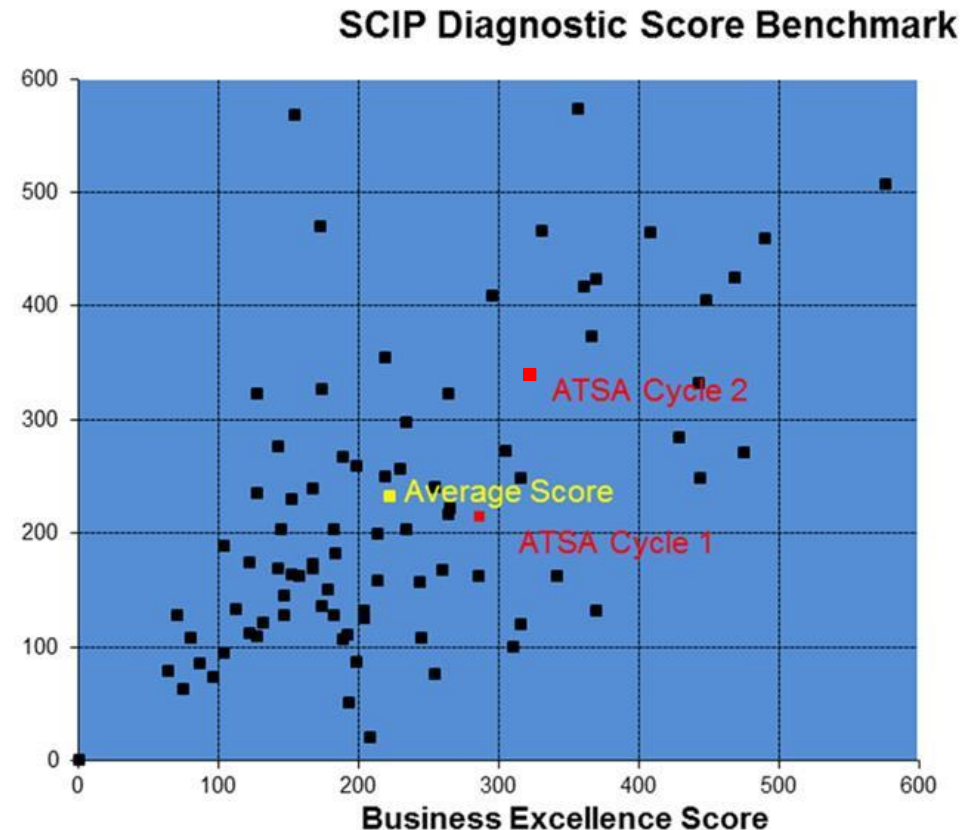
Quality
Endorsed
Company

Other Activities

Continuous Improvement

- ISO 9001 certified
- Project Managed Organisation
- Supplier Continuous Improvement Program
- LEAN principles
- Government assistance

Manufacturing Excellence Score



Skills Development

- Work experience students
- Engineering interns
- HunterNet Group Training for apprentices



Capital Angels



Angel Investment

WetPC



- 5-button Chordic Graphical User Interface (CGUI)
- Operated using one-hand

Startups

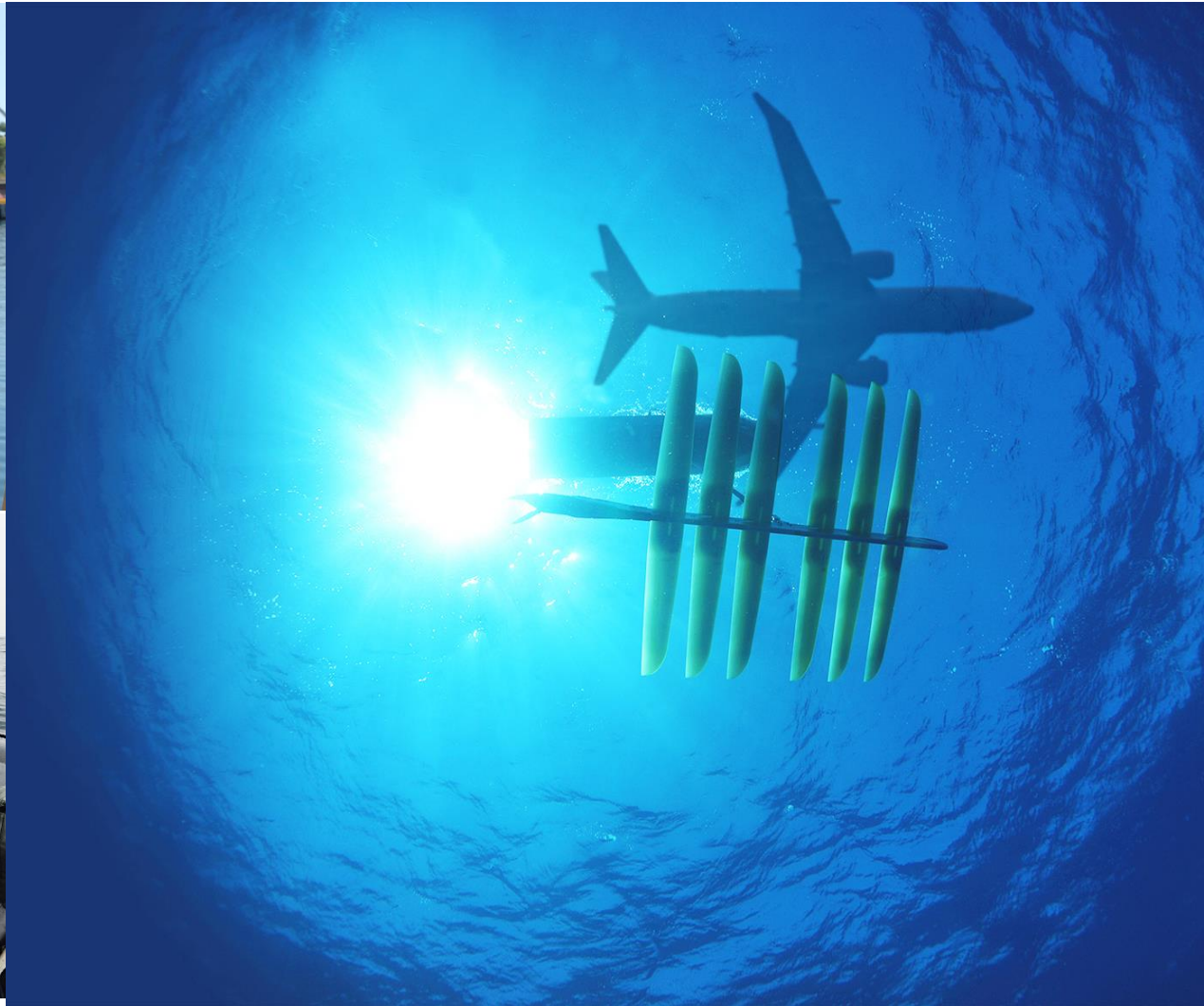
3D Printing

- Carbon fibre
- Fibreglass
- Kevlar®
- Nylon
- Higher strength-to-weight ratio than 6061-T6 Aluminium



Robotics for the RAN ADF

“if you change your tools you change your world”





Innovation Track Record

- Niche manufacturing
- Global engagement
- Robotics engineering & support



Conclusion

Passive Monitoring without Detection



50m range

Thank you