



KAILANI TELEMETRY BUOY

Subsea to Space Communications

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Subsea Controls Down Under

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AGENDA

RAPID ENVIRONMENTAL ASSESSMENT

KAILANI TELEMETRY BUOY

MORE INTERNET OF THINGS @SEA

CONCLUSION



Rapid Environmental Assessment

- Knowledge of the environment
- Crucial factor in the conduct of successful joint military operations
- Maritime REA is a key enabler for maritime task group operations in a littoral environment

RAPID ENVIRONMENTAL ASSESSMENT



THE FLIGHT DECK

202.3 m (L) x 32 m (W)
IT CAN LAUNCH A RANGE OF HELICOPTERS INCLUDING:



WELL DOCK & HEAVY VEHICLE DECK

110 VEHICLES
CAN BE STORED ACROSS THE TWO VEHICLE DECKS



WELL DOCK
1165 m²



CAN CATER FOR
FOUR LCMS
(LANDING CRAFT MEDIUM)

THE LIGHT VEHICLE DECK
1880 m²
FORWARD



LIGHT VEHICLE DECK

THE HANGAR
900 m² aft



8

THE HANGAR CAN ACCOMMODATE
MEDIUM-SIZED HELICOPTERS



THE MAIN ACCOMMODATION DECK

1400 PERSONNEL

400 CREW

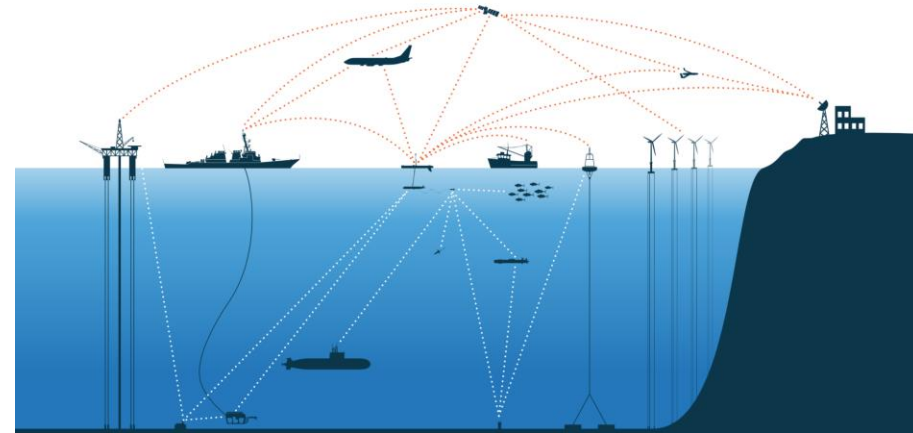
1000 EMBARKED FORCE PERSONNEL





Rapid Environmental Assessment

- Real time access to subsea instruments
- Reliable transmission of data
- Drive decision making in real time
- Reduction in “record only” deployments



Liquid Robotics "The Digital Ocean"



Rapid Environmental Assessment

- Deployable Geospatial Survey Teams
- Improve collection sensors
- Survey Craft
- Fly Away Survey Kit



RAPID
ENVIRONMENTAL
ASSESSMENT



SEA1770 Rapid Environmental Assessment

- Position: Wide area DGPS
- Wave: height, period, direction
- Current & Tide: direction, speed
- Water temperature
- Sound Velocity Profile
- Bottom sediment type
- 30 days endurance at 20 minute sample
- LOS & BLOS transmission





SEA1770 Rapid Environmental Assessment

- REMUS 100 Next Generation AUV
- Edgetech 4200 Side Scan Sonars
- Teledyne-Reson T20-P MBES
- Applanix WaveMaster II
- Teledyne-Odom EchoTrac CV100
- Valeport Sound Velocity Sensors
- RBR Tide Gauges
- Teledyne RDI Workhorse ADCP
- Kailani Telemetry Buoy System





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KAILANI TELEMETRY BUOY

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CONCLUSION



Kailani Telemetry Buoy

- Less than 600mm diameter
- Less than 40kg weight
- Onboard processing & forwarding of data
- LOS & BLOS communications
- Market survey found only larger and heavier products Off-the-Shelf



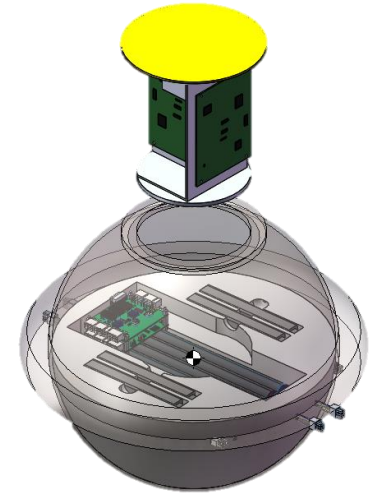
**KAILANI
TELEMETRY
BUOY**



Kailani Telemetry Buoy

Design Iteration 1

- Based on Datawell 400mm buoy
- Spherical form factors ensures a relatively large payload capacity
- Electronics mounted under lid
- Batteries in foam



KAILANI
TELEMETRY
BUOY



Kailani Telemetry Buoy

Design Iteration 2

- Solar panels added to improve endurance
- Manufacturing complexity reduced

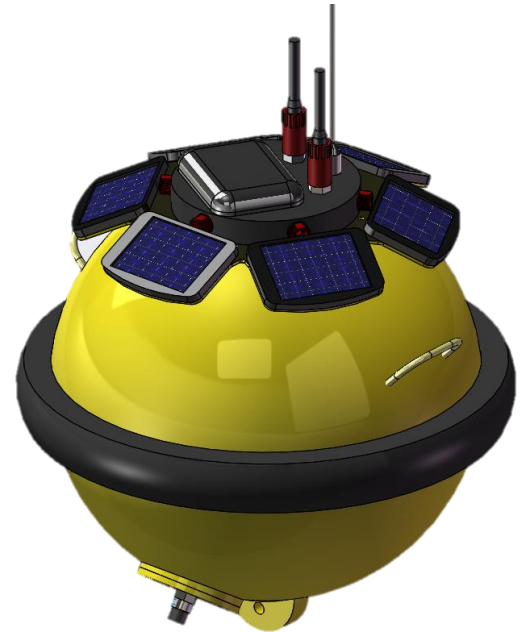




Kailani Telemetry Buoy

Design Iteration 3

- Manufacturing complexity reduced
- Flanges added to subsea modems



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TELEMETRY
BUOY



Kailani Telemetry Buoy



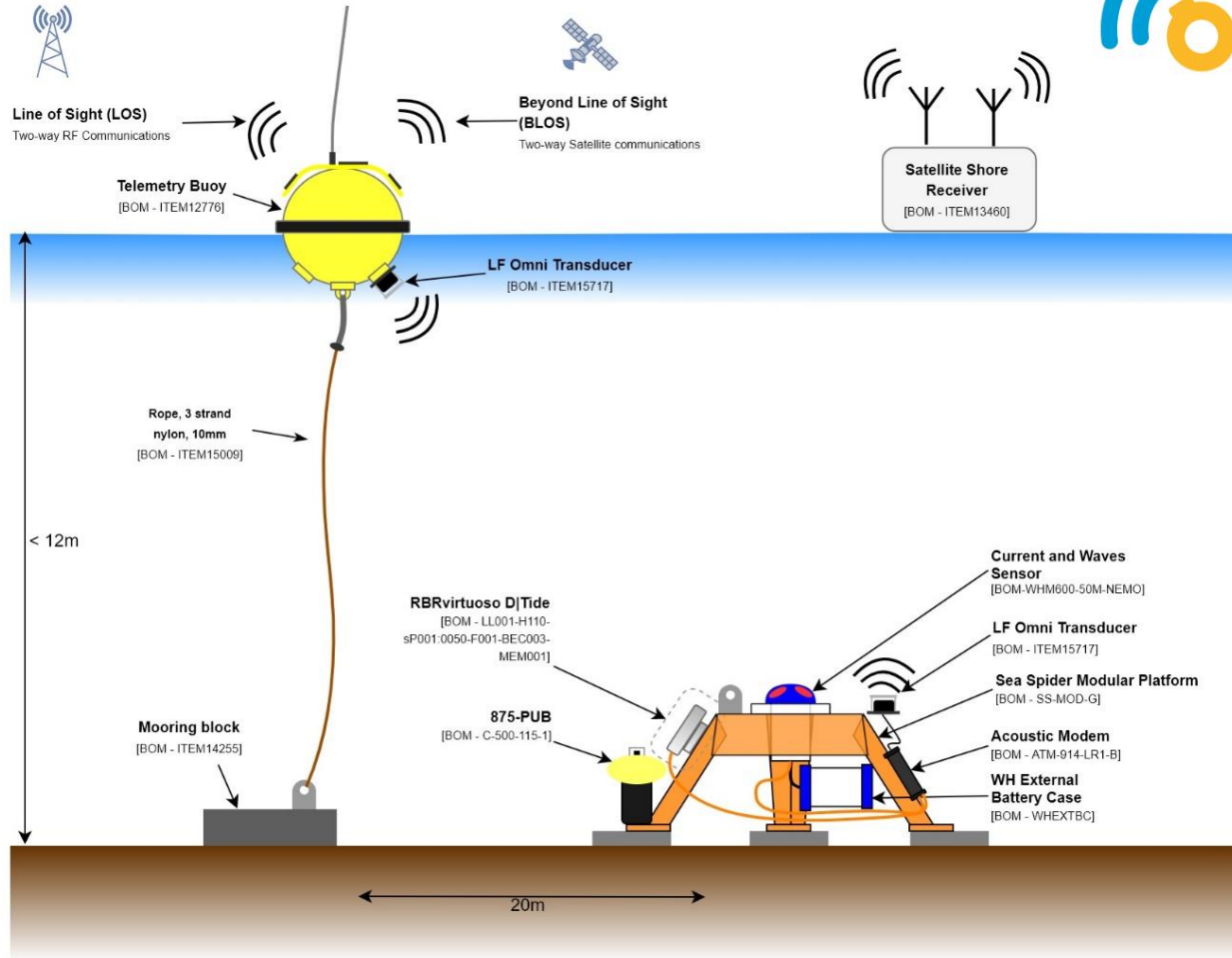
Design Iteration 4

- Acoustic modems used in place of magnetic inductive modems
- Shore Side Receiver finalised
- <25kg



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TELEMETRY
BUOY

TBS with WCSS and Tide Gauge Deployment



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CONCLUSION

Z-BOATS FOR ARMY



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- Proven & reliable
- Remote control or autonomous waypoint following
- Multiple payload options



SURVEY BOAT

Component	Product	Description
Platform	Teledyne OceanScience Z-Boat HS1800 RP	High Speed Ruggedised Platform
Primary Sensor	Teledyne Odom MB2 MBES	Multibeam echo sounder
Positioning and Motion Sensor	Applanix POS MV	Integrated into MB2 system
Camera	Axis P39 Series Network Camera	HD Forward looking camera, IP interface
LiDAR	Velodyne – VLP 16	Light Detection and Ranging sensor for topographic scanning
Software	Teledyne Odom - SUI	Sonar User Interface
	Hypack Max + Hysweep	Calibrating, collecting & processing multibeam, topographic laser backscatter and water column data

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HD Camera. IR
Camera on gyro
stabilised platform

LIDAR

Dual GPS



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Surveillance Boat at Pittwater

Zoom & HD Cameras

HD & IR Cameras





Z-BOAT
ARMY
INNOVATION

DL25 – EXTENDED MEMORY & CONTROL FOR ADCPS

Remote Area Data Assurance

- Long Term Data Logging
- Remote Control
- Access to logged files local & remote
- Remote access to parts of large files
- Monitoring health status of device



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DL25 – EXTENDED MEMORY & CONTROL FOR ADCPS

Section Download

- Download section of interest only



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DL25 – EXTENDED MEMORY & CONTROL FOR ADCPS

Real Time Data for Marine Dredging

- Monitoring dredging
- PD0 files buffered & pushed to server by 3G
- Complete PD0 data recorded
- 20 locations



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CONCLUSION



INTERNET OF THINGS @SEA

- Real time access to subsea instruments
- Drive decision making in real time
- Technology options from UAS (drones) market
- Smaller and more networked sensors

CONCLUSION



QUESTIONS?

Thank you