Underwater Robots

Proseminar

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University Hamburg

14. December 2009

Overview

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Introduction

- Why do we develope underwater robots?
- Reach dangerous spots in the sea
- Long term observations
- Automatic maintenance

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Basic Types of Underwater Robots

- ROV
  - Remotely Operated underwater Vehicle
- AUV
  - Autonomous Underwater Vehicle

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What is a ROV?

- remotely operated
- connected to support unit by:
  - wire
  - tether
- battery or surface supported
- mostly frame shaped
- more of a tool than of a robot

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- powered by capacitor, battery or fuel cell

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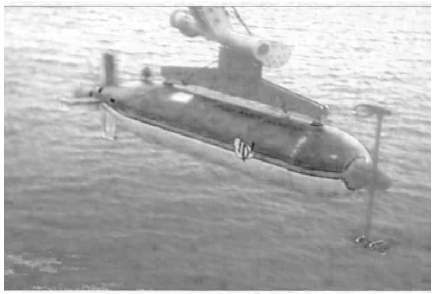
First AUV

- SPOV
- manufactured by University of Washington Applied Physics Laboratory
- torpedo shaped
- DOF: 1
- nominal speed: ca.2 m/s
- maximum depth: 3.600m



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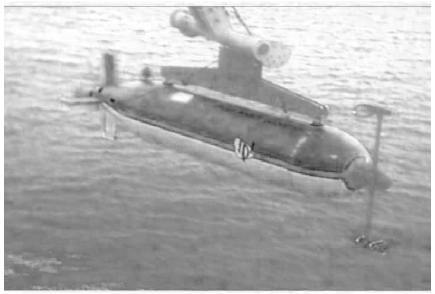

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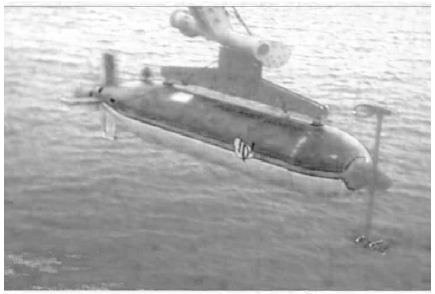

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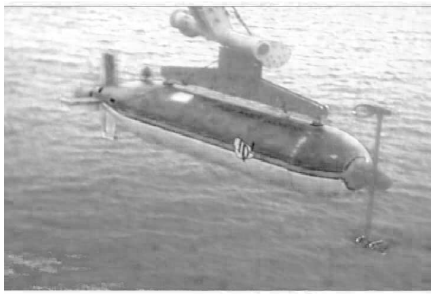

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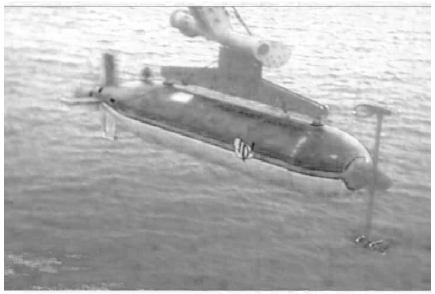

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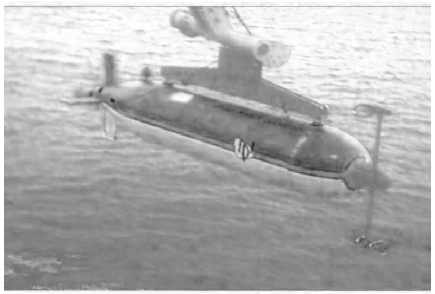


timeline

- 1957 SPOV
- 1973 SPOV II
- 1974 SKAT
- 1977 EAVE I
- 1978 SKAT-GEO
- 1980 L-2,Epaulard
- 1981 EAVE III
- 1983 ARCS
- 1987 EAVE IV, LSV-1
- 1988 Seasquirt, MT-88
- 1990 Tiphlonus
- 1992 ALBAC,Odyssey

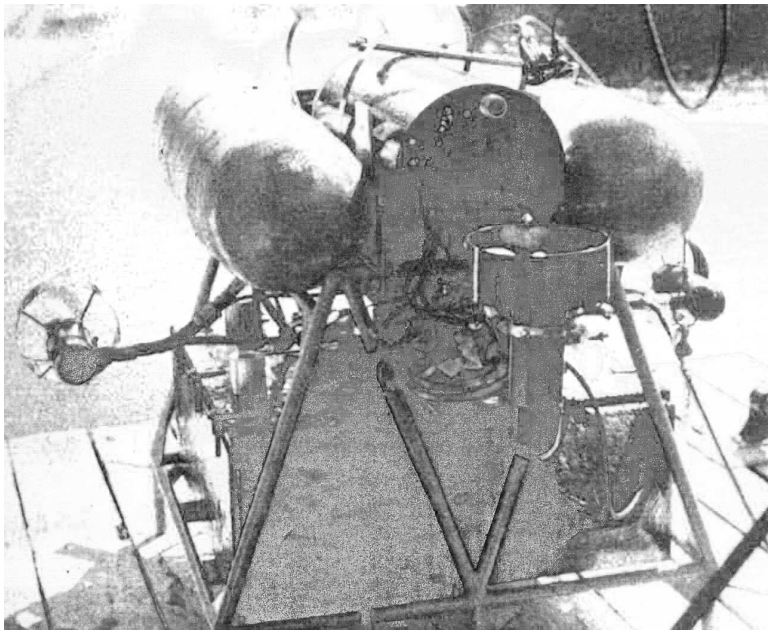
timeline-continued

- 1993 Odyssey II
- 1993 Twin Burger
- 1994 TSL
- 1995 CR01,ABE
- 1996 Autosub
- 1997 OKPO-6000
- 1998 SAUV,Rauver MkII, Taipan

Overview

Shapes

- Torpedo
- Rectangular
- Open-Space-Frame
- Biomimetic



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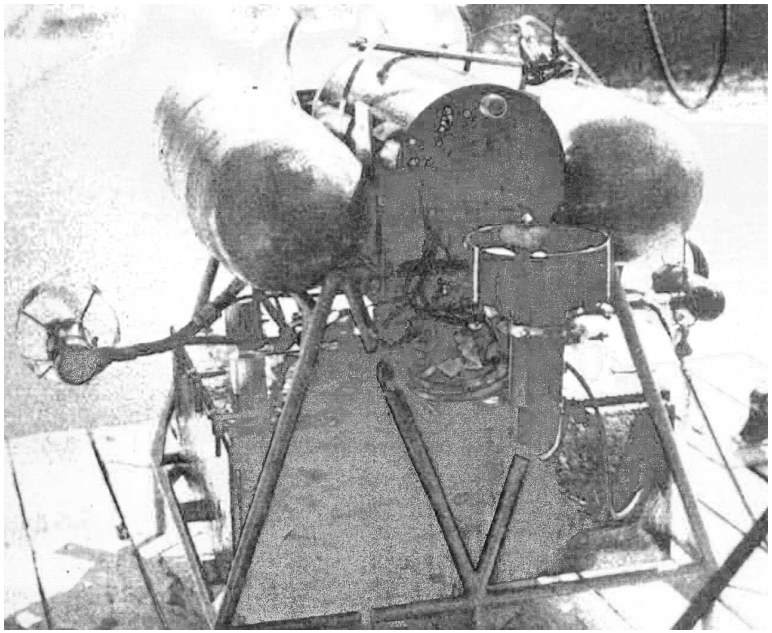

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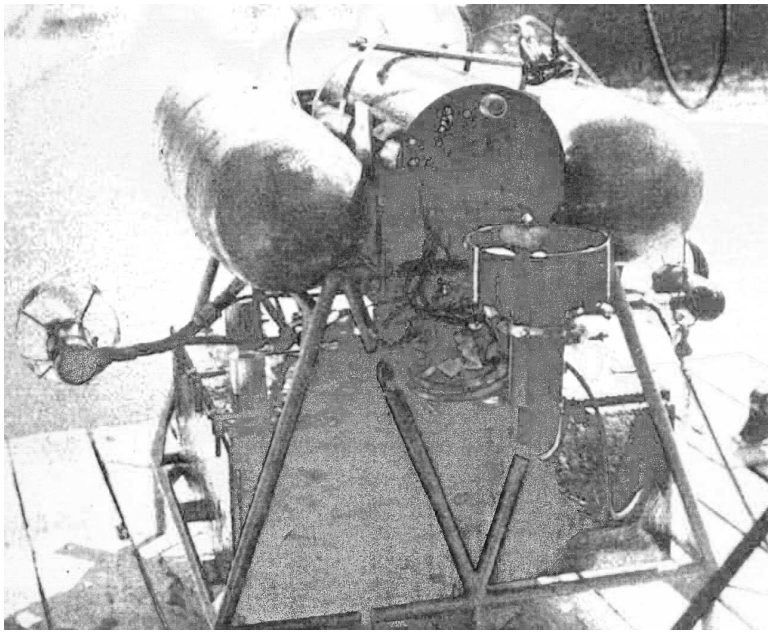

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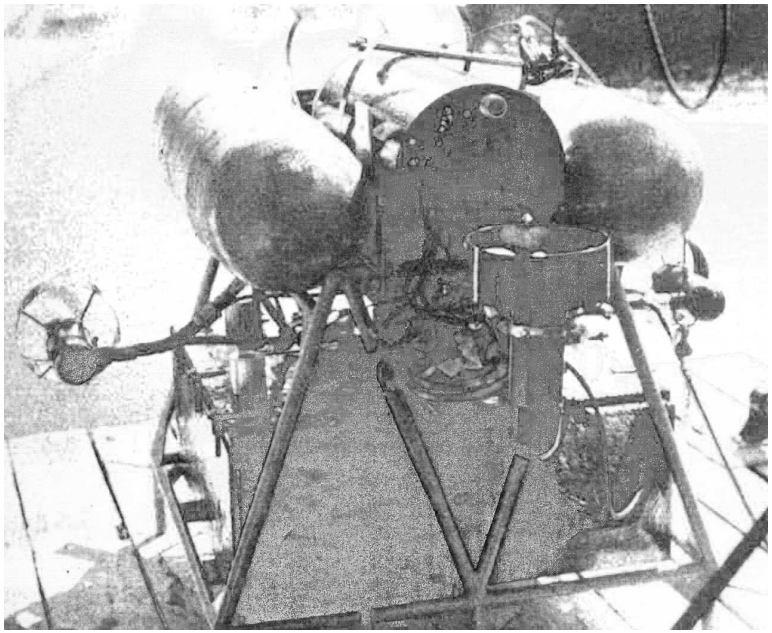

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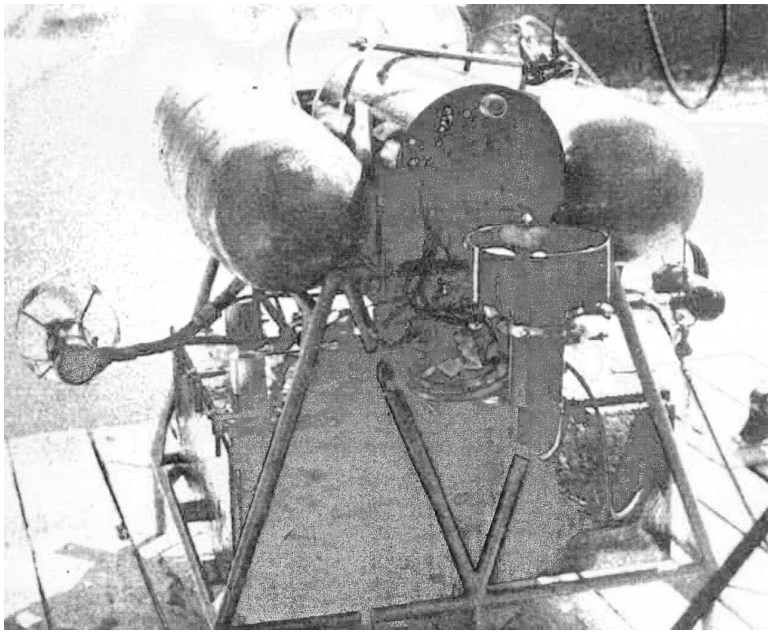
- 

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- solar energy
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- pressure
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- sonar and similar systems
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- first deployed in 2007
- deep diving vehicle
- hybrid ROV
- AUV for surveys
- ROV for direct multipurpose interaction

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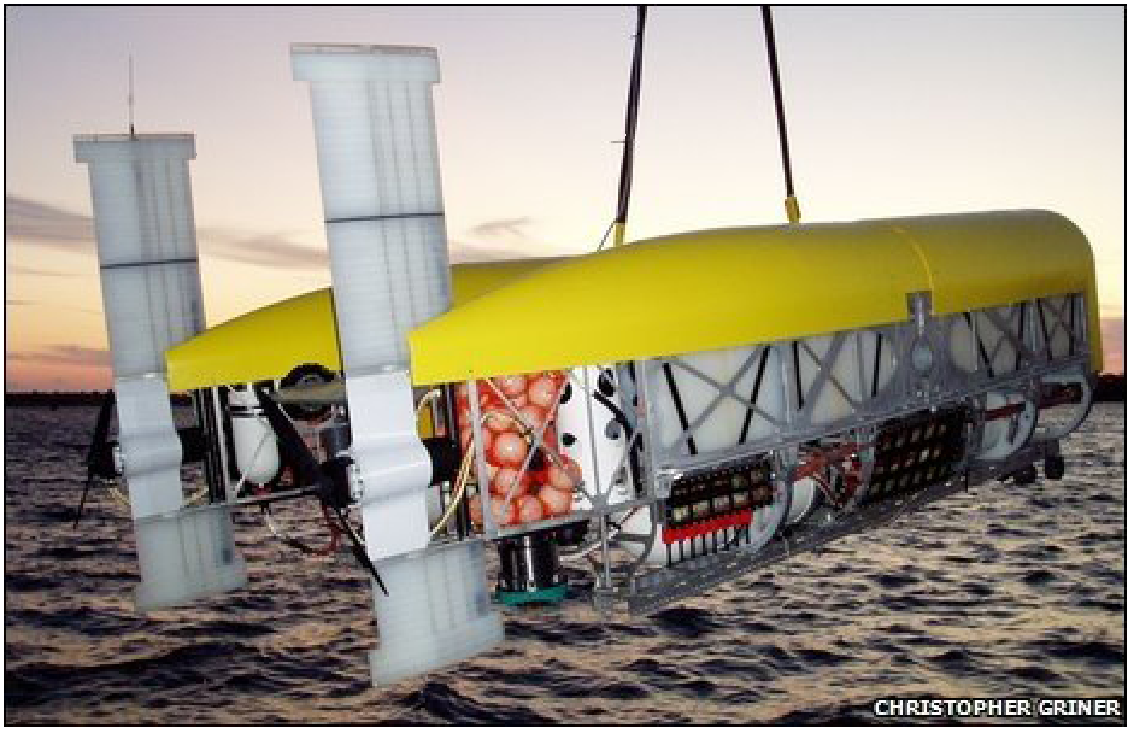

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- introduced and first deployed 1996
- first launched as demo vehicle in Loch Linnhe
- limited capabilities
- continously upgraded
- distributed control system

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