

PHYSICAL PROTOTYPE DESIGN AND TESTING OF REMOTELY  
OPERATIONAL UNDERWATER VEHICLE (ROV)

MOHD AKMAL BIN MD NAWAWI

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PHYSICAL PROTOTYPE DESIGN AND TESTING OF REMOTELY  
OPERATIONAL UNDERWATER VEHICLE (ROV)

By

MOHD AKMAL BIN MD NAWAWI

Thesis submitted in fulfillment of the requirements for the degree of bachelor of  
Bachelor of Applied Science (Maritime Technology)

Department of Maritime Technology

FACULTY OF MARITIME STUDIES AND MARINE SCIENCE

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**DECLARATION AND VERIFICATION REPORT  
FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled: **PHYSICAL PROTOTYPE DESIGN AND TESTING OF REMOTELY OPERATIONAL UNDERWATER VEHICLE (ROV)** by **MOHD AKMAL BIN MD NAWAWI**, Matric No. **UK 20932** has been examined and all errors identified have been corrected. This report is submitted to the Department of Maritime Technology as partial fulfillment towards obtaining the Degree **APPLIED SCIENCE (MARITIME TECHNOLOGY)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

Verified by:

Principal Supervisor

Name: **DR. AHMAD FAISAL BIN MOHAMAD AYOB**

Official stamp:

**DR. AHMAD FAISAL MOHAMAD AYOB**  
LECTURER  
DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE  
UNIVERSITI MALAYSIA TERENGGANU (UMT)  
21030 KUALA TERENGGANU


Date: **13/1/2013**

Second Supervisor (where applicable)

Name:

Official stamp:

Date:


  
.....  
Head of Department of Maritime Technology  
Name: **DR. MOHAMAD FADHLI BIN AHMAD**  
Official stamp:

Date: 13-1-13.

.....  
**ASSOC. PROF. DR. MOHAMMAD FADHLI AHMAD**  
HEAD  
DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE  
UNIVERSITI MALAYSIA TERENGGANU (UMT)  
21030 KUALA TERENGGANU

## DECLARATION

I hereby declare that this thesis entitled **PHYSICAL PROTOTYPE DESIGN AND TESTING OF REMOTELY OPERATIONAL UNDERWATER VEHICLE (ROV)** is the result of my own research except as cited in the references.

Signature :   
Name : MOHD AKMAL BIN MD NAWAWI  
Matric No. : UK 20932  
Date : 13/01/2013

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## **ABSTRACT**

Remotely operated vehicles (ROVs) controls by human commands for underwater research have been under study and development over the past few years mainly for academic purpose. Due to the risks to human life that underwater operations possess, they have been gradually replaced divers and manned submersibles. In addition to safety, ROVs offered a more effective and low-cost method for underwater research or sea exploitation, and this is the primary reason for the rapid development of numerous vehicles over the past few years. The aim of this project ROV is to design, create, build and implement an underwater vehicle that will be able to do simple task and also dive deeper to the seabed to obtain objects. For that purposes, a small ROV which is light and easy to carry is considered and developed. This will operate using 12 volts, able to operate at a depth of 3 meters, and fit within an 18 centimeter by 18 centimeter by 22 centimeter area. It will have a camera to allow for hull inspection or underwater viewing, such as a coral reef. The vehicle gets its maneuverability from 3 mounted electrical thrusters (left, right and middle). It will have a control box with a screen for viewing of the camera's video and the control box will be attached to the ROV by a tether. Its maximum use depth will be 3m. Eventually, this project is shall contribute in promoting exploration interest among scientific society in UMT and to become a prototype platform for advanced ROV development.



## ABSTRAK

Sejak beberapa tahun kebelakangan ini, kajian telah dilakukan dalam membangunkan Kenderaan Operasi Berkawalan Jauh (ROV) yang dikendalikan oleh operator ROV bagi tujuan penyelidikan dalam air dan akademik. Disebabkan risiko terhadap nyawa manusia semasa melakukan operasi dalam air, penyelam telah digantikan dengan ROV. Di samping itu untuk keselamatan, ROV menawarkan kaedah yang lebih berkesan dan kos rendah untuk penyelidikan air atau meneroka laut, dan ini adalah sebab utama semakin banyak pembangunan dilaksanakan dalam membangunkan kenderaan ROV sejak beberapa tahun kebelakangan ini. Tujuan projek ROV ini adalah untuk merekabentuk, membuat, membina dan melaksanakan kenderaan air yang akan dapat melakukan tugas yang mudah dan juga menyelam lebih mendalam kepada dasar laut untuk mendapatkan objek. Bagi tujuan itu, pembangunan ROV kecil yang ringan dan mudah diperlukan. Kenderaan ROV ini akan beroperasi menggunakan 12 volt, dapat beroperasi pada kedalaman 3 meter, dan saiznya ialah 18 sentimeter bagi tinggi dan lebar dan sebanyak 20 sentimeter panjang ROV itu. Ia akan mempunyai kamera bagi pemeriksaan hull atau keadaan semasa dalam air, seperti terumbu karang. Kenderaan ROV dapat digerakkan dengan pemasangan 3 motor tujahan elektrik pada bahagian kiri, kanan dan tengah. Ia akan mempunyai kotak kawalan yang disambungkan menggunakan wayar untuk melihat keadaan semasa didalam air menggunakan video kamera. Kedalaman maksimum yang akan diuji ialah 3m. Akhir, projek ini adalah bertujuan menyumbang dalam mempromosikan kepentingan penerokaan di kalangan masyarakat saintifik di UMT dan menjadi pentas atau sempadan baru dalam pembinaan prototaip untuk pembangunan ROV pada masa akan datang.