

PRELIMINARY PHYSICAL PROTOTYPE DESIGN OF  
AUTONOMOUS SURFACE VEHICLE (ASV)

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**PRELIMINARY PHYSICAL PROTOTYPE DESIGN OF AUTONOMOUS  
SURFACE VEHICLE (ASV)**

**By**

**MOHD KHAIREE BIN IBRAHIM**

**A thesis submitted in partial fulfilment of  
the requirement for the award of the degree of  
Bachelor of Applied Science (Maritime Technology)**

**DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND SCIENCE MARINE  
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**DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND MARINE  
SCIENCE**

**DECLARATION AND VERIFICATION REPORT**

**FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled:  
**PRELIMINARY PHYSICAL PROTOTYPE DESIGN OF AUTONOMOUS  
SURFACE VEHICLE (ASV)** By **MOHD KHAIREE BIN IBRAHIM** Matric No.  
**UK 21242** have 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 **Bachelor Degree of Applied Science (Maritime  
Technology)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia  
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## DECLARATION

I hereby declare that this thesis entitled **PRELIMINARY PHYSICAL PROTOTYPE DESIGN OF AUTONOMOUS SURFACE VEHICLE (ASV)** is the result of my own research except as cited in the references.

Signature



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## **PRELIMINARY PHYSICAL PROTOTYPE DESIGN OF AUTONOMOUS SURFACE VEHICLE DATA COLLECTION CRAFT**

### **ABSTRACT**

An Autonomous Surface Vehicle (ASV) is a mobile robot designed for aquatic work environments that travel on the water surface and can function without cable or remote control. ASV nowadays is an automatic self-propelled which equipped with rechargeable battery and photovoltaic cell to provide long-lasting power to the system. With solar charge controller, the excess power was stored into the battery which is the system can get the continuously power from the battery. Used renewable energy allows ASV to stay on the surface for long-term by using solar power to recharge the battery. This research about the development of ASV that used double thrusters and wide water plane are used to build the prototype that can handle 6 character of sea. Besides that, the prototype supported by an Arduino UNO board and L298N motor shield to control the movement and power to the others component. Besides that, this ASV also equipped with ultrasonic sensor to avoid the object in fronts them. This prototype can be used in Malaysian Coastal only because due to hot weather and damp throughout the year which can provide sufficient solar ray to the prototype. By using renewable energy which is from solar, new source of *alternative power for marine research* was developed.

## **PROTOTAIP PERMULAAN REKABENTUK FIZIKAL KENDERAAN PERMUKAAN AIR BERAUTONOMI**

### **ABSTRAK**

Kenderaan Permukaan Air Berautonomi (ASV) adalah sebuah robot kenderaan mudah alih yang direka untuk melakukan kerja-kerja berkaitan akuatik yang beroperasi di atas permukaan air dan boleh berfungsi tanpa kabel atau alat kawalan jauh. ASV kini boleh bergerak sendiri dimana ia dilengkapi dengan sel fotovoltaiik untuk membekalkan kuasa yang berterusan kepada sistem dan bateri yang boleh dicas semula. Dengan menggunakan unit pengawal cas solar, kuasa yang dihasilkan daripada sel fotovoltaiik akan disimpan ke dalam bateri, dimana sistem akan mendapat bekalan kuasa yang berterusan dari bateri. Tenaga yang digunakan adalah tenaga yang boleh diperbaharui yang membolehkan ASV beroperasi untuk jangka masa yang lama di atas permukaan air dimana bateri dicas oleh kuasa solar. Penyelidikan ini mengenai perkembangan ASV yang menggunakan dua penjuah dan mempunyai satah air yang luas dimana ASV telah dibina untuk menangani 6 sifat semulajadi laut. Selain itu, ASV yang dibina disokong sepenuhnya oleh litar Arduino UNO untuk mengawal keseluruhan sistem dan disokong oleh litar pemacu motor L298N untuk mengawal arah dan kelajuan motor. Di samping itu, ASV ini juga dilengkapi dengan pengesan ultrasonik untuk mengukur jarak halangan di hadapan dan mengubah laluan dari melanggar halangan tersebut. ASV ini boleh digunakan sepanjang Pantai Malaysia kerana cuaca yang lembap dan terik sepanjang tahun memberikan sinar suria yang mencukupi untuk menjana kuasa kepada ASV.