**KENDALI KEMUDI KAPAL AUTO PILOT**

**MENGGUNAKAN MIKROKONTROLLER**

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**ABSTRAK**

Sistemkendaliotomatissaatinibanyakdigunakanolehbeberapaalattransportasi di Indonesia, sepertipadakendalikemudikapal.Dimanasudahmenggunakansistemkendali radar yang bisamemantaukondisisekitarkapal, dariarahkapalbergerakbahkanbenda yang terdapatdisekitarkapalsepertikapallain, benda, pulau, karangdllbisadiidentifikasimelalui radar kapal.

Padatugasakhirinitelahdirancangalatsimulasikendalikemudikapallaut auto pilot yang berbasis mikrokontroller. Sistemalatterdiridarisensor kompasdanrangkaianelektronikmikrokontroller atmega32. Denganmengunakan motor servo sebagaialatkemudidan LCD untukmenampilkan data hasildarisimulasitersebut.

Sensor kompasadalahpengaturarahtujuandanditampilkanberdasarkan data sheet motor servo yang menjadikendalikemudikapaltersebut, sehinggasimulasitersebutmenampilkancaramengetahuikesalahanarah yang dialamiolehkemudikapal.

*Kata Kunci :Kompas, Mikrokontroller,KendaliKapal, Motor Servo.*

**SHIP STEERING CONTROL AUTO PILOT**

**USING MICROCONTROLLER**

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**ABSTRACT**

Automatic control systems currently used by several means of transportation in Indonesia, such as the control of steering the boat. Where already use radar control system that can monitor the conditions around the ship, from the direction of the ship even objects that are moving around the boat like other ships, objects, islands, coral etc. Can be identified through the ship's radar.

In this final project has been designed simulation tool control auto pilot steering a ship-based mikrokontroller. Tool system consists of sensors compasand electronic circuits atmega32 microcontroller. By using a servo motor as a steering wheel and an LCD to display data from the simulation results.

Compas sensor is regulating direction and displayed based on the data sheet the servo motor control of the steering of the ship, so that the simulation to show how to determine fault direction experienced by steering the boat.

*Keywords: Compas ,Microcontroller , ship control , Servo Motor.*

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**DAFTAR PUSTAKA**

Aziz Zainuddin,Akhmad Hendriawan, Hary Oktavianto, 2013, Kompas Digital Penunjuk Arah Kiblat dengan Output Visual, [www.pens.ac.id](http://www.pens.ac.id), dikases tanggal 1 Juni 2015, jam 11.30.

Bustanul Arifin, 2007, Aplikasi Mikkrokontroller AT89S52 untuk Kompas Digital, download.portalgaruda.org, diakses tanggal 2 Juni 2015, jam 12.15

|  |
| --- |
| Daryanto,200, *Pengetahuan Teknik Elektronika*, Jakarta: BumiAksara |

Kai Q, David den Haring, Li Cao, *Embedded Sofware Development with C*, Springer, New York, 2009.

Kartini Kartono, 2007. Perkembangan Psikologi Anak. Jakarta: Erlangga.

*Liquid Crystal Display Module M1632.*User Manual,Seiko Instrument Inc. Japan, 1987

O. Shoewu, Segun O. Olatinwo,*Design and Implementation of a Mikrokontroler Based Automatic Gate*, African Journal of Computing & ICT, Vol 6. No. 1, March 2013.

Romy B. Widodo, *Embedded System Menggunakan Mikrokontroler dan Pemrograman C*, Penerbit Andi, Yogyakarta, 2009.

William C. Dunn, *Introduction to Instrumentation, Sensors, and Process, Control*, Artech House, Canton Street Norwood, London, 2006.

Wahyudin, D, 2006, Belajar Mudah Mikrokontroler AT89S52 dengan Bahasa Menggunakan BASCOM-8051, ANDI . Yogyakarta

[(http://elektronika-dasar.web.id/teori-elektronika/motor-servo/](file:///E:\NAROTAMA\Skripsi%20Moh%20Ibnoe%20Hajar%202015\(http:\elektronika-dasar.web.id\teori-elektronika\motor-servo\)), dikases tanggal 4 Juli 2015, jam 14.30.

[Asharudin Achzab](http://blog.buaya-instrument.com/author/aviezab/), 2013, http://blog.buaya-instrument.com/mengakses-modul-cmps10/ diakses tgl 9 Juli 2015 jam 18.25