Design & Development of RC Speed Boat

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Abstract: - *Rc boat are also easily affordable to the public. Although designing inherently self righting craft is challenging due to the difficulty of weight distribution's uncertainty during the design process. It also provides a deeper understanding and better conceptional information on the role of water dimension vessels. The main aim of this paper is to present the idea of self-righting of a RC speed boat with its basic construction & essential modification to avoid some issues related to RC speed boat. We can use RC speed boat for various activities such as for hobbies, fishing, measuring, distances in water transporting low weight and also to various regions and also to find the undiscovered areas where large water vessels cannot reach with safety features.*

Key Words: *Speed boat, Battery, Dc Motor, Ruddler, Propeller, Float Chamber, Self Rotating.*

1. INTRODUCTION

A radio controlled boat, in short, "RC" boat is the scaled-down version of an actual boat, that is equipped with radio control equipment. The size of a RC boat is relatively smaller in comparison to a normal boat as it is neither purposed to transport passenger nor cargo. A RC boat may be controlled via a radio receiver and transmitter, it can be controlled by a user by a radio at a defined range. This range often varies from a few meters to a few hundred meters. In RC speed boat various material is used to run the vehicle. So the idea is to use better power source and design a boat so as to increase overall performance.

The purpose of this review is to provide an effective overview on the research conducted into RC boats for the past 10 years and to address the basic component configuration of the RC boat. Following the review processes, basi setup and installation of the components will also be addressed appropriately and the writers' views on the potential application and future research into RC boats will also be discussed with the hope that it will assist in further research into RC boats and their composites.

Water vehicles shows better efficiency instead of air vehicle for developing countries in terms of economy and complexities. RC boats, after many years of innovation, have been modified to adapt to various applications. Boats have been a popular aspect of R/C modelling for many years and they take several forms: scale replicas, racing hydroplanes, deep vee, airboats, and sail boats. The most significant difference between boats and ships is the difference in size.

2. LITERATURE REVIEW

Studying through research papers from "An introduction to the shape & size of a ships full form and the principle of hydrostatics". We came to know these are several different types of speed boat. The hull of the obvious part of the boat. The hull makes a direct contact with the water & support. The must & fitting on speed boat so we came to idea of using a flood chamber to avoid the sinking of ship while also maintaining the balance of the boat while running on full throttle or full speed. This paper also made us realize about the wave resistance due to hull so we can modify the size & shape resistance. As per the several research paper the efficiency of the RC speed boat are less so overcome this we decided use Li-Po batteries which has better efficiency in also rechargeable compared to Ni-Cd & Ni-MH batteries. Thus increasing the run time using all these research paper and information on websites about the speed boat are came to a decision to start a research by combining the missing parts in all above papers.

RC boats may be classified into various types through the shape of their hull. Different types of boats have different specifications and applications. The three major types of boats are hydroplanes, monoplanes/mono hull or multi hulled. Where hydroplanes are classified in full body and outrigger hydroplanes. Monoplanes are classified in deep vees and shallow vees and multi-hulled are classified by catamarans and tunnel hulls.

Following is a table of some reviewed papers which we used for references, respective work done by them is specified there.

1: PAPERS REVIEWED FOR REFERNECES.

Sr. no.	Literature Survey	Date of Publication	Author Name	Study Topic
1	Hydrodynamics for Ocean Engineering Marine Propellers	2004	Techet AH	We concern about the Types of boats & their hull design
2	Characterization of Small DC Brushed and Brushless motors	2013	Harrington AM, Kroninger C.	Form this paper wegained information about Brushless electric technology.
3	Electronic Circuits: Handbook for Design and Application	2008	Ulrich Tietze, Christoph Schenk, Ch Schenk EG.	We got an idea About potential application of rc boat with its classification from this paper
4	Autonomous sailboats: An emerging technology for ocean sampling and surveillance	2008	Cruz NA, Alves JC.	Referring to this page it guided us about importance & significance of self righting methods.

3. PROBLEM DEFINITION

Today we are facing various major problems regarding to radio control speed boat, some of the problems are mentioned below.

1. Wave resistance:

Wave resistance occurs due to the generation of water waves or water spray. The waves create a drag force onto the vessel. In other words, more intense waves cause more resistance to the vessel. Leading to damage the boat.

2. Efficiency:

Speed boat consumes lot of power due to which it faces lots of problems which indirectly leads to lowering the efficiency of the internal product or speed boat.

3. Surveillance Issue:

There is no proper provision given for the surveillance, incase if the boat is lost.

4. Safety Issues:

Due to high tides & changes in climate the boat may sink also leading to damage of the internal parts.

5. Indications:

No special indications are given in order to run the boat at night time.

4. OBJECTIVES

The main purpose of this project is to improve and reduce problems of RC Speed boat.

1. In order to avoid wave resistance the boat hull is specially designed in Deep-V Shape, for having a proper stability & high speed which will help the speed boat to surpass any upcoming waves.

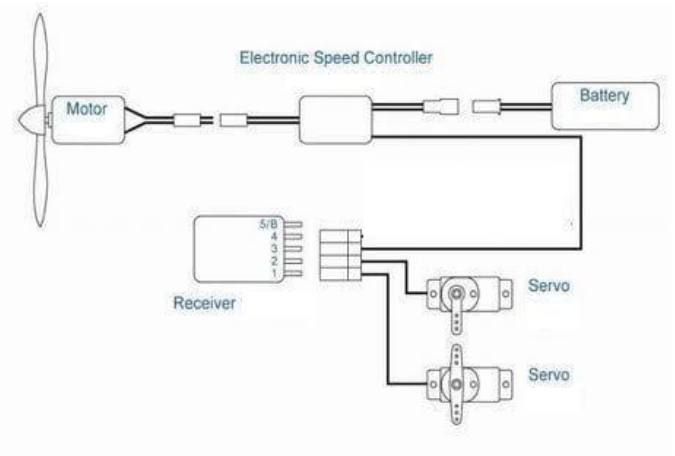
2. Efficiency can be increased by using a brushless dc motor which till now has proved to be more efficient & less battery consuming, hence increasing the lifespan of the boat.

3. The boat will not sink as it is made up of plywood & other wood material, this speed boat also comes with a special features which is called as 180 degree flip in case if the boat flipped or crashes due to high throttle or high tides it will retain its position.

4. In this speed boat the surveillance issue has been resolved, as the boat ishaving surveillance waterproof camera, which will provide a clear vision while running on water.

5. For night testing & running the boat have got LED light indications so it may be clearly visible at night time.

5. WORKING



A radio controlled boat is about controlled remotely with radio control equipment it had four main parts.

1. Transmitter- You hold the transmitter in your hands to control the boat. It sends radio waves to the receiver.

2. Receiver- An antenna and circuit be and inside the boat receives signals from the transmitter & activates motors inside the boat as commanded by the transmitter.

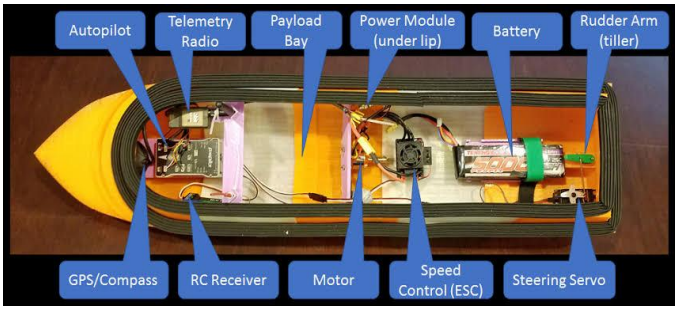
3. Motor- Motor can turn the shaft connected to the blade & thus manage to control the throttle.

4. Power source- The transmitter sends a control signal to the receives using radio wave which then drives a motor causing specification to occur the motor in boat cause the change in direction of servomotor thus charging the direction. The power so use is typically a rechargeable battery pack.

In many RC boats the radio control motor provides guidance. While another souce of power provides the locomotion.

The power source can be directly connected to [Esc] Electronic Speed Controller through The motor so as to control the speed & adjust the throttle of RC speed boat.

6. WORKING MODEL



7. RESULTS

- It will use WIFI direct camera to capture good quality image.
- It will use flood chamber to rotate/flip itself at 180 degree angle to avoid risk of sinking.
- It will use light indicators to be visible at night.
- Also the shape can be changed to increase the wave resistance by increasing the hull size of the boat and shape.

8. CONCLUSIONS

- Because of proper hull design the drag force on the body of boat can be reduced this giving it a proper wave resistance properly.
- Assembling of camera with various modes has improved the vision or viewing angle the vision of overall boat providing a proper view of the surrounding where the boat is moving which also have given an advantage to avoid misdirection in day & night situation.
- The efficiency of rc speed boat are low but by upgrading it to brushless motor & Li-Po battery the overall efficiency of the boat is increased.
- Due to flood chamber the safety of this boat can drastically processed because of which even after the boat tries to sink in water it tries to re itself by doing 180 degree flip with self righting method so as to regain its normal position. In avoiding any damage to parts or components inside the boat.
- At night or in darkest condition the boat is visible due to its led indications which provides the user or owner a proper viewing or sighting of the boat from long distance even after the signal is lost so to make it easy to find the boat in the dark.

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