

DEVELOPMENT OF WIRELESS BOAT FOR RESCUE OPERATION USING DTMF

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Abstract- In this project the aim is to design such a system which can be implemented into a boat and can be control

Using mobile phone. These system will help to drive the boat in the required direction. One camera is being also placed which can be rotated clockwise and anticlockwise with the help of motor .These camera will help to capture the surrounding images and these images can be seen in the control room. There is a water level sensor placed in the boat to sense the water level. with the help of these **system** there is a possibility to rescue the affected people at the time of flood. (2)

Keywords: DTMF decoder ,L293D Motor driver, water level sensors, dc motor.

I. INTRODUCTION

Flood as a natural calamity can cause several destruction to human being ,nearby surrounding etc. At the time of flood there are some major task which are allocated to rescue boats which are

- Life saving.
- Movement of evacuation of person from flood threatened areas.
- Rescue and recovery livestock.
- Body recovery.

Now a days, the flood rescue boat are operated by the crew members of the boat. The crew members are prior to the knowledge of safety rules of boating, knowledge of motor & boat, basic navigational skills, basic first aid skills etc.(2)

With the above also good deal of common sense is necessary.

The crew members of the boat will undertake the task only if the

instruction is given by the authority under whose control they are

operating. Also the crew must have the details of the flood affected areas. They are also supposed to have familiar with the circumstances. crew members of the boat must carry maps, navigation to know the exact location where he is.

With the help of the system design in the project the control of the flood rescue boat is being done by mobile phone with the help of pressing the keys. The boat is moved forward, backward, left ,right on the required direction. There is no requirement of crew members on the boat in these system as it is controlled from the control room. The live images of the flood infected areas is given with the help of cameras to the control room.(4)

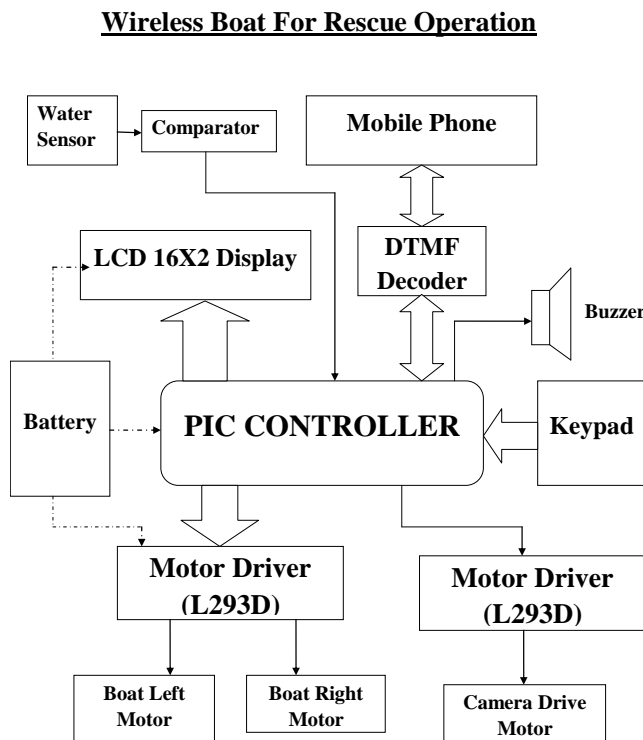
II. Comparison of PIC microcontroller with the other microcontroller:

PIC	AVR	8051	ARM
Harvard architecture	Harvard architecture	Harvard architecture	Von-neuman architecture
8 bit	8 bit	8 bit	16 and 32 bit architecture
Directly address only	Directly addresss all	Directly addresss all	Directly addresss all

256 bytes	available RAM.	available RAM.	available RAM.
Multiple clock cycle instruction	Single clock	Multiple clock	Single clock
Low power consumption	High	Average	Low power consumption

So PIC Microcontroller is being used in this system as it has a flash memory for program storage and newer models allow the pic to reprogram itself and many more.

III. PROPOSED BLOCK DIAGRAM



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1. Water Sensor: It is used to sense the level of water whether it is going to high or not. Whenever there is a rise in the level of water in the boat it alerts about it by sending the signal or by making the buzzer ON.

2. Mobile Phone: Mobile phone is used to control the direction of boat and to move in the required direction i.e. forward, backward, right or left as required by the situation. The keys which are assigned for this operation are '2', '8', '4', & '6'. Instead of mobile phone we can also use keyboard.
3. DTMF decoder: DTMF decoder is being placed in the system to convert the signals coming from the mobile phones into binary forms. The DTMF decoder which is being used is MT8870. These binary signals are sent to PIC microcontroller from where the entire operation takes place.
4. Buzzer: the piezoelectric buzzer is being used in the system to alert in case of emergency. Piezoelectric buzzer gives a very pleasant sound.

5. LCD 16*2 DISPLAY:

LCD display is being used in these system to display any message regarding the rise of water level. lcd display is being placed in the system.

6. MOTOR DRIVER L293D:

There are two motor driver used in these system. One motor driver can drive two motor simultaneously clockwise and anticlockwise. And another motor to drive the camera in clockwise and anticlockwise direction. The command coming from the PIC microcontroller goes to the motor driver from where actual operation takes place of motor that whether it should be in on or off condition. similarly for camera it is moved in anticlock wise and clockwise direction.

7. PIC MICROCONTROLLER:

The main part of the system is PIC microcontroller. all coding is being done in PIC instruction. PIC microcontroller is the heart of the system.(6)

8. Battery:

Power supply is being provided to each required device.

9. LED:

An LED is being placed in the system to give an alert message in case of any emergency.

10. keypad:

In case of any problem with the mobile devices the controlling of boat is being done by keypad also.

11. dc motor: there are 3 DC motor used in these system. 2 motors to rotate the boat and one to rotate the boat in clockwise and anticlockwise direction.

IV. HARDWARE MODULE SPECIFICATION

The hardware required for this system is being mentioned below:

A simply small boat is being used for demonstration which is made up of wood, light weight, large size, flat surface from bottom, easy to place the system in it & operate it. In front of the boat there is a camera placed which is rotated using dc motor. Two motors are placed in the bottom side of boat to drive the boat in any required direction. Rest of the system is being placed in the boat from where the entire operation takes place.

The specification of hardware are as follows:

1) PIC microcontroller:

It is a 40 pin IC. The controller which is being used is pic 16f877. It is a high performance RISC cpu. It has 35 single instruction to learn. all single instruction cycle except for program, branches which are two cycle. Operating speed dc 20mhz.(6)

2) DTMF decoder:

The DTMF decoder which is being used is MT8870. It is 18 pin IC. Complete DTMF receiver. Low power specification. Power down mode. Application of DTMF decoder is paging, remote controlling etc.

3) MOTOR DRIVER L293D:

It is 16 pin IC. Wide supply voltage range: 4.5 to 36v. Separate input logic supply. Thermal shutdown. The L293D is quadruple high current H-driver. The L293D is designed to provide bidirectional drive current upto 1A. The L293D motor is used to drive the DC motor. One IC of L293D is able to drive two motors simultaneously.

4) LCD display 16*2

Display: 16 character * 2 lines
Backlight: yellow. Operating temperature: 0 to 50 degree Celsius. Operating voltage: 4.5v to 5.5v
Backlight voltage: 5v

5) Buzzer:

Buzzer is used to meet loud sound volume at the time of emergency. Easy generation of sound by constable multivibrator circuit. Clear pleasant electronic tone.

6) Water non corrosive sensor:

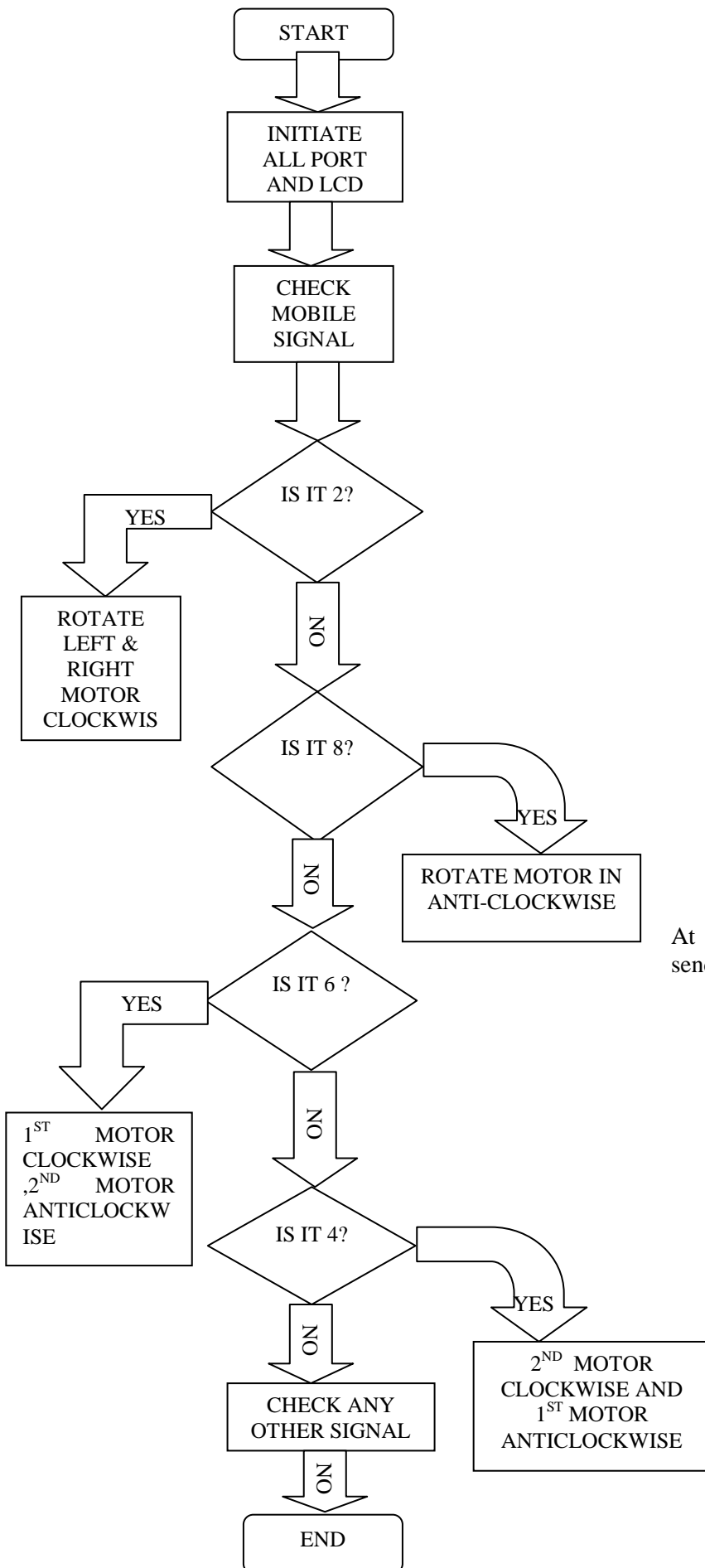
Water non corrosive sensor It is used to sense that the water level is high or not.

7) Battery : Power supply is given to the system.

8) Camera: Camera is being used in these system to capture the live images at the flood and send it to the control room.

Range of camera is depend on the type of camera used.

V. SOFTWARE SPECIFICATION MODULE



Software description description:

At first the call is established as soon as the call is established. Mobile signal is checked

1.if the key pressed is 2 rotate left & right motor in clockwise direction.

2.if the key pressed is 8 rotate the motors in clockwise & anticlockwise direction.

3.if the key pressed is 6 rotate 1st motor in clockwise direction & 2nd motor in anticlockwise direction.

4.if the key pressed is 8 rotate 1st motor in anticlockwise & 2nd motor in clockwise direction.

VI. WORKING

At the time of flood , the flood rescue boat is being send into the flood affected area.

1. With the help of the camera placed in the boat .the live images of the flood affected areas is being captured & send it to the control room.
2. With the help of the images ,the controlling of boat is being done.
3. The boat is being move forward ,backward, left ,right with the help of mobile phone keys '2', '8', '4', '6'.
4. The camera is being also rotated clockwise and anticlockwise with the help of mobile keys '1' & '3'.

5. Water non corrosive sensors are also being used to sense the water level whether it is going high or not.
6. The buzzer will alert an signal as soon as the water level goes high.
7. There is an LED placed in the system it will blink in case of emergency.
8. As soon as the key is pressed the signal is converted into binary form using DTMF decoder MT8870.
9. These DTMF decoder then sends the binary data to the PIC microcontroller.
10. The code is already being build in the PIC microcontroller.
11. With the help of the code the motor driver works .and it operates the DC motor.
12. In case if the mobile device is not working the system is controlled by keypad.

VII. ADVANTAGES

- Easy user interface
- More accuracy
- Less installation cost
- Very less maintainence is required
- Large network area

VIII. RESULT & CONCLUSION

FOR MOTOR ROTATION

DIRECTION	MOTOR ON/OFF
FORWARD	M1 ON M2 ON
BACKWARD	ROTATE BY SIDE
LEFT	M1 OFF M2 ON
RIGHT	M1 ON M2 OFF

FOR CAMERA ROTATION

CLOCKWISE	ON IF '1' IS PRESSED OTHERWISE OFF
ANTI CLOCKWISE	ON IF '3' IS PRESSED OTHERWISE OFF

CONCLUSION

- With the help of these system it is able drive the motor with the help of mobile device.
- There is no requirement of crew members in the boat as it is operated by using DTMF Technology.

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- 2) Australian search and Rescue (Aus SAR)-‘National search and Rescue Manual’
- 3) Queens land state Emergency Service-‘Flood Boat Operating Manual’
- 4) Victoria State Emergency Service-‘Flood Rescue Boat manual’
- 5) Marine GPS Search and rescue system By Worcester polytechnic institute.
- 6)PIC MICROCONTROLLER BY PROF. AJAY DESHMUKH.