DTMF BASED BOAT CONTROL SYSTEM FOR OCEAN RESEARCH APPLICATIONS

Mrs. Sundara Jeyalakshmi V[1], Abdul Kadir A[2], Ajith Kumar V[3], Jaya Kumar S[4], Jaya Prakash A[5],

[1]Assistant Professor, Department of Electronics and Communication Engineering, Adhiyamaan College of Engineering, Hosur, Tamil Nadu, India
[2-5]U.G. Student, Department of Electronics and Communication Engineering, Adhiyamaan College of Engineering, Hosur, Tamil Nadu, India

Sundarajeyalakshmi.v@gmail.com[1], abdulkadir.mail001@gmail.com[2], ajithaj941@gmail.com[3], jayakumarace04@gmail.com[4], jayaprakashcgm@gmail.com[5]

ABSTRACT: The major principle of the project is to control movement of the boat by utilizing DTMF (Dual Tone Multiple Frequency) technology. In this project we use microcontroller, customized to control the information and yield modules interfaced to it with the assistance of portable keypad. Likewise, a cell phone which will work the boat bearings and speed dependent on the DTMF technology. DTMF relies on the keypad tones where each tone can produce certain recurrence relying upon that, the boat will work and it will move in particular directions or stop. The microcontroller interfaced with DTMF decoder is utilized to control the heading of the boat. The cell phone is used as a controller.

KEYWORDS: **DTMF, Motor Driver, Arduino**

I. INTRODUCTION

Traditionally, Wireless-controlled boats use RF circuits, which have the disadvantages of restricted working reach, restricted recurrence range and the restricted control. Utilization of a cell phone for automated control can defeat these impediments. It gives the benefit of strong control, working reach as extensive as the inclusion zone of the specialist co-op, no obstruction with different regulators and up to twelve regulators. Man has come long path regarding advancement throughout some undefined time frame we would utilize the RF modules for the reason remote after that we defeat with the methods of DTMF in remote framework. The DTMF innovation has conquered the issue of constraint which we can work just in restricted reach or restricted territory was in RF innovation by utilizing wireless (DTMF). Dual-tone multi-frequency signalling (DTMF) is a telecom flagging framework utilizing the voice-recurrence band over phone lines between phone hardware and different specialized gadgets and exchanging focuses.

II. RELATED WORKS

In 1898, Nikola Tesla collected the essential propeller driven radio-controlled boat, which can be seen as the main model of all high level uninhabited raised vehicles and precision guided weapons. Records express that it is the first among all remotely controlled vehicles in air, land or sea. It was constrained by lead-destructive batteries and an electric drive motor. The vessel was arranged with the goal that it might be moved nearby a target using headings got from a far-off regulator transmitter. Once in its position, a request would be sent off detonate a risky charge contained inside the boat's forward compartment. The weapon's heading system introduced a protected correspondence associate between the pilot's controller and the surface running torpedo with an ultimate objective to ensure that control could be kept up even inside seeing electronic counter measures.

Remote controlled automated vehicles which are utilized these days ordinarily use RF circuits for movement and control. Yet, RF circuits experience the ill effects of the burden of restricted working reach which brings about restricted control. As RF circuits' follows LOS (Line of sight) approach, it flops hopelessly in NLOS (Non-Line of Sight) conditions including impediments and boundaries. To beat these, one technique was proposed by Amrit Kumar Panigrah et al, (2017)

[1] which ordinarily utilizes the DTMF innovation alongside a microcontroller-based circuit for move and control of these automated mechanical vehicles. Likewise, Abidweli Abdillahi Soufi et al, (2016)

[2] additionally proposed the development of an automated vehicle which could be particularly utilized for ground battle utilizing a comparative innovation. As of late, Arunava Banerjee et al (2015) [3] examined in insight concerning how the strategy depicted in [1] could be actualized utilizing a microcontroller by giving the important circuit subtleties and the product code.

We executed the plan of an automated boat framework utilizing similar innovation as depicted in the papers referenced before, adjusted the current circuit and code portrayed in paper [3] and gave an intensive and definite examination of the plan worldview which is the most ideal clarification as far as anyone is concerned till date in [4].

III. EXISTING SYSTEM

RF based ROBOT is a machine that can be controlled with a regulator. In the current task, the robot is constrained by a radio recurrence (RF) that controls the robot. Throughout its computerization, if the robot ventures more the predefined distance it detaches and the client lets completely go over the robot. The robot has lesser use, since the significant disadvantage of the RF based robot being its lower signal transfer speed. The RF based robot sends contribution to parallel digit and this double number is ship off the microcontroller, the microcontroller is pre-customized to take choice for any give info and yield its choice to engine drivers to drive the engines for forward or in reverse movement or a turn.

IV. PROPOSED SYSTEM

In this project we utilize miniature regulator, which is customized to control the information and yield modules interfaced to it. The regulator makes use drivers; contingent on the signs the DC engines can be turned. With the assistance of versatile keypads tasks will be finished. Likewise, a cell phone which will work the boat bearings and speed dependent on the DTMF innovation. DTMF (Dual Tone Multiple Frequency) relies on the keypad tones though each tone can produce certain recurrence relying upon that, the boat will work.

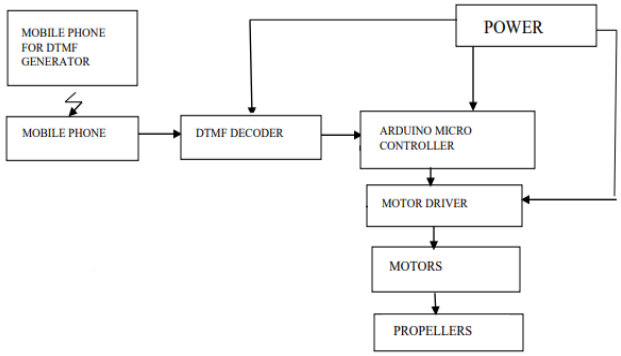

Fig. 4.1 Block diagram of the proposed system

This project uses two DC Motors separately. The DC engine produces force straightforwardly from DC power provided to the engine by utilizing inward recompense, fixed perpetual magnets, and pivoting electrical magnets. Preferences DC engine incorporate low beginning expense, high unwavering quality, and straightforward control of engine speed. The driver utilized for DC Motors is L298N. This microcontroller is equipped for speaking with information and yield modules. The miniature regulator interfaced with DTMF decoder is utilized to control the heading of the boat. The mobile phone acts as remote control.

In this undertaking the boat, is constrained by a cell phone that settles on decision to the cell phone appended to the boat. Over the span of the call, if any catch is squeezed, a tone relating to the catch squeezed is heard at the opposite finish of the call. This tone is called 'Double TONE MULTIPLE-FREQUENCY' (DTMF) tone. The boat gets this DTMF tone with the assistance of telephone stacked in the boat. The got tone is prepared by the atmega16 microcontroller with the assistance of DTMF decoder MT8870. The decoder deciphers the DTMF tone in to its comparable paired digit and this twofold number is ship off the microcontroller. The microcontroller is pre-customized to take a choice for any give info and yields its choice to engine drivers to drive the engines for forward or in reverse movement or a turn.

The versatile that settles on a decision to the cell phone stacked in the boat goes about as a far off. So this basic boat project doesn't need the development of beneficiary and transmitter units. DTMF flagging is utilized for phone motioning over the line in the voice recurrence band to the call exchanging focus. The form of DTMF utilized for phone

dialling is known as 'Contact – Tone'. DTMF appoints a particular recurrence (comprising of two separate tones) to each key s that it can without much of a stretch be distinguished by the electronic circuit. The sign created by the DTMF encoder is the direct mathematical accommodation, of the amplitudes of two sine rushes of various frequencies, i.e., squeezing '5' sends a tone made by adding 1336Hz and 770Hz the opposite finish of the portable.

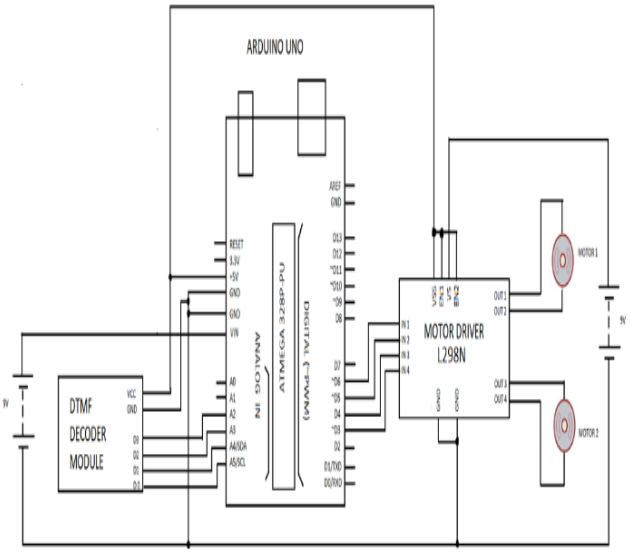

Fig. 4.2 Circuit diagram of the proposed system

V. EXPERIMENTAL RESULT

To control the boat, you need to settle on a decision to the cell connected to the boat (through earphone) from any telephone, which sends DTMF tunes on squeezing the numeric catches. The cell in the boat is kept in 'auto answer' mode. On the off chance that the versatile doesn't have the auto noting office, get the call by 'alright' key on the vehicle associated portable end at that point made it in without hands mode. So, after a ring, the wireless acknowledges the call.

Presently you may press any fasten on your versatile to perform activities as recorded beneath

- When you press 2 the boat will push ahead
- When you press 4 the robot will move left
- When you press 8 the boat will move in reverse
- When you press 6 the robot will move right
- When you press 5 the robot will stop.

The DTMF tones consequently delivered are gotten by the mobile phone in the robot. These tones are taken care of to the circuit by the headset of the wireless. The MT8870 disentangles the got tone and sends the gear paired number to the microcontroller, the robot begins moving.

At the point when you press key '2' on your cell phone, the microcontroller yields '10001001' parallel same. Port pins PD0, PD3 and Pd7 are high. The high yield at PD7 of the microcontroller drivers the engine driver (L293D). Port pins PD0 and PD3 drive engines M1 and M2 forward way. Additionally, engines M1 and M2 move for left turn, right turn, in reverse movement and stop condition.

Fig. 5 Circuit Model

VI. APPLICATION

Remote control vehicles have various scientific uses including hazardous environments, working in the deep-ocean, and space exploration. The majority of the probes to the other planets in our solar system have been remote control vehicles, although some of the more recent ones were partially autonomous. Military usage of remotely controlled military vehicles dates back to the first half of 20th century. Soviet Red Army used remotely controlled Tele tanks during 1930s in the Winter War and early stage of World War II. UAVs will likely play an increased role in search and rescue in the United States. This was demonstrated by the successful use of UAVs during the 2008 hurricanes that struck Louisiana and Texas. Radio-controlled model, small-scale remote-control vehicles have long been popular among hobbyists. These remote-controlled vehicles span a wide range in terms of price and sophistication. There are many types of radio-controlled vehicles. These include on-road cars, off-road trucks, boats, airplanes, and even helicopters.

VII. FUTURE ENHANCEMENT

IR sensors can be utilized to naturally recognize and keep away from snags if the boat goes past view. This evades harm to the vehicle in the event that we are moving it from an inaccessible spot. Undertaking can be changed to secret word ensure the robot with the goal that it very well may be worked just if right secret phrase is entered. Either PDA ought to be secret word ensured or essential adjustment ought to be made in the low-level computing construct code. This presents adapted admittance and builds security generally. By replacing DTMF Decoder IC CM8870 by a 'DTMF Transceiver IC' CM8880, DTMF tones can be created from the boat. In this way, an undertaking called 'Alert Phone Dialer can be assembled which will produce vital cautions for something that is wanted to be checked (ordinarily by setting off a hand-off). For instance, a high-water caution, low temperature alert, opening of back window, carport entryway, and so on.

When the system is activated it will call a number of programmed numbers to let the user know the alarm has been activated. This would be great to get alerts of alarm conditions from home when user is at work.

VIII. CONCLUSIONS

By building up this boat control framework, we have defeated the disadvantages of RF correspondence which have a restricted reach though this boat control framework can be controlled from anyplace utilizing this DTMF innovation. In these tasks with the utilization of a cell phone for boat control to defeat the RF based circuit constraints. It gives the upsides of hearty control, working reach as extensive as the inclusion zone of the specialist co-op, no obstruction with different regulators and up to twelve controls. Albeit the appearance and abilities of boat control framework differ tremendously, all robots share the highlights of a mechanical, mobile design under some type of control.

REFERENCES

[1] Amrit Kumar Panigrah, Reshav Ranjan, Subhasish Bhoi, Neha kumara, “DTMF based Home Automation System” International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, ISSN: 2278-8875, Vol-6, 2017.

[2] Abdiweli Abdillahi Soufi, Abdirasoul Jabar Alzubaidi, “Remote control system through mobile and DTMF”, IJCER (international journal of computational engineering research), Vol-3, Issue-8, 2016.

[3] Arunava Banerjee, Deep Mukherjee, Joy Chowdhury, Abhirup Mukherjee, “Design of an Advanced Cell phone Operated Wheel Chair using DTMF”, Advanced Research in Electrical and Electronic Engineering, ISSN:2349-5819, Vol-2, 2015.

[4] Basavanna, Ashwini, Divyashree, Pooja Bhat, Sanjana S Prabhu, “GSM based Wireless Robot vehicle with POF features using DTMF”, International Refereed Journal of Engineering and Science (IRJES), ISSN:2319 1821, Vol-4, Issue-5, 2015.

[5] Rajesh kumar, Manpreet Singh, Raman, Ashish Riyal, “ROBAASTRA the self destructive Robot Control using DTMF”, International Journal of Engineering and Innovative Technology (IJEIT), Vol -1, Issue-6, 2012.

[6] Sourangsu Banerji, “Design and Implementation of an Unmanned Vehicle Using A GSM Network without Microcontrollers”, Journal of Electrical Engineering, Vol. 14, Issue. 1, 2014.

[7] Dr.T.Pearson, S.Pranitha, K.Sheshank, M.Srujan Goud, L.ManiNithin, “Design and Implementation of Smart Boat Technique”, International Journal of Scientific and Research Publications, Vol- 9, Issue 4, April 2019.

[8] Chitralekha Jena, Krishna Kumar Mishra, Srikanta Mohapatra, Babita Panda Arjyadhara Pradhan, “Dual Toned Multi-Frequency Controlled Robotic Vehicle without Micro-Controller”, International Journal of Innovative Technology and Exploring Engineering (IJITEE), Vol-9 Issue-2, December 2019.