

Identification of Flight Location Using Floatable Black Box on Water

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ABSTRACT

The main objective of this paper is for saving the human lives and improving the safety and reliability of Aircrafts. To locate an aircraft more easily in case of accident. The flight section has microcontroller, rechargeable battery, water sensor, LCD, and ejection mechanism. Whenever the flight falls into the sea, water sensor will start sensing and give command signal to microcontroller to eject the floatable object from flight with current GPS value of flight. The Black box ejects out into the water to collect the information about latitude and longitude of the position and all the data about the flight are sent to the Zigbee and through the serial transmission it is transmitted to the Ground Station. The proposed system will be overcoming the all disadvantages in Existing system, it includes mainly time delay in finding the black box, Spending cost for Sending the search teams. In this paper, It includes dividing the area into particular segments for continuous communication between airplane and the Rescue section, which means the earth station. The Results are implemented also with Simulation outputs.

Key Words: Flight Section, Floatable Object Section, Rescue Section, GPS, Zigbee, UART.

1. INTRODUCTION

Air transport provides the worldwide Transport facility. It is very essential for Global business and world tourism. It also plays a important role in improving the Economic growth, mainly in developing countries. A technology which has been came for more effective providing a new generation hypersonic vehicles[2]. Also the technology of Satellite based communication system has been emerged in the year 2013[4]. Adverse weather conditions such as snow, fog and also heavy rain may leads to cancelling of scheduled flights and deferment of air service. The main disadvantages of air transport compared to other mode of transport is more chances of accidents, flight crash and breakdowns. So, which as comparatively higher risk. Also very skilled and trained persons should be allowed for operating Air planes. Air transport leads to many accidents.

S. Anil, N. and Arundathi has proposed the paper Automatic Black System[1] for Automatic analysis has proposed a Automotive electronics which is playing a vital role in the industries of Automobile and also providing the splendid features including safety and security concerns. The main drawback of this paper is not integrating the GPS technology for intimating the accidents at any place.

Neena Susan Shaji has proposed the paper Black Box on earth[3] – Flight Data Recording at Ground Server Station has proposed a method for tracking the flight from this method the datas and informations regarding the flight can be transmitted to the earth station and information which is saved in the black box is Saved for finding the reason of flight crash. But in this paper there is no methods adopted for instantly finding the location of flight crash without time delay.

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2. PROPOSED METHODOLOGY

In existing system there is no GPS technology to find out the flight accident location. Black box also goes into the deep sea. Therefore very difficult to find out the accident location. In this Paper, using Ejection Methodology of black box with help of microcontroller to overcome the drawbacks in existing system.

2.1. Flight Section

The Figure 1 shows the Flight Block Section. Whenever the flight falls into the sea, water sensor will start sensing and give command signal to microcontroller to eject the floatable object from flight with current GPS value of flight. The AT89C2051 is used in this work which is used to store the information about the particular Flight details and to give instructions to eject the floatable object from flight with current GPS value of flight. The water level sensor connected to the microcontroller and it is made up of floating type of plastic, which floats in water to sense the level of water. When the water is full in the land the floating type sensor will float in water and reaches the top edge which used to indicate the water is full.

2.2. Floatable Object Section

The Figure 2 shows the Floatable Object Section. This object section has wireless device to transfer the GPS value to rescue section to take necessary actions. LCD is used to display the various statuses. A Solar Panel is attached with floatable object section to generate power to recharge the battery for continuous transmission of signal to base station or to rescue section. The microcontroller has the Stored datas of the Flight in which it is fixed. This GPS value is transmitted into the Rescue section or base station with the help of the wireless device Zigbee. The information about the Flight crash, Details of the Flight with flight number and Latitude, Longitude Position of the Flight crash all these datas are sent to the are station through the Serial Communication UART. Once the UART transmits the all the Datas to the Base station, then it will be displayed in the PC for further finding the exact location for Rescue operations. All these work will done at the Floatable object Section.

2.3. Rescue Section

Figure 3 shows the Rescue Section. In rescue section, Zigbee receives GPS value from floatable object section and it will be seen using PC.

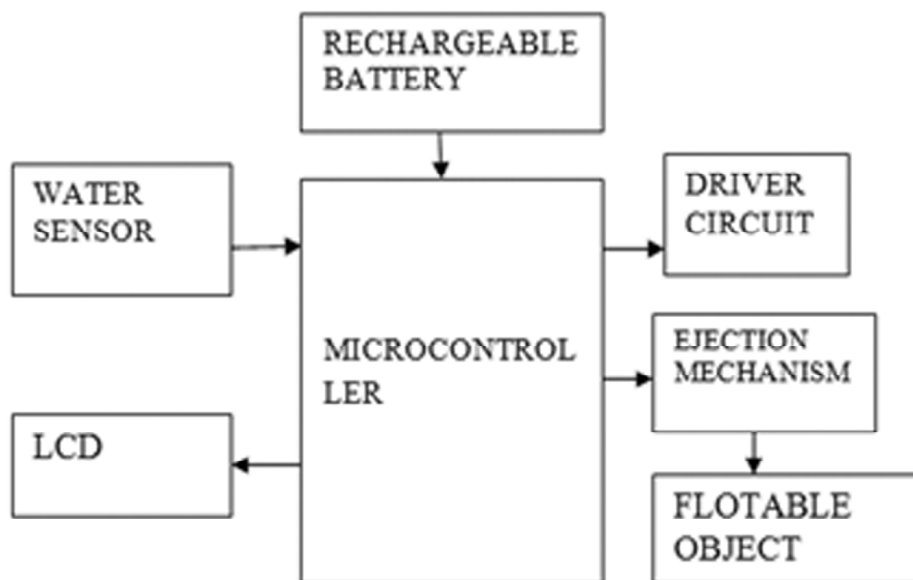


Figure 1: Flight Block Section

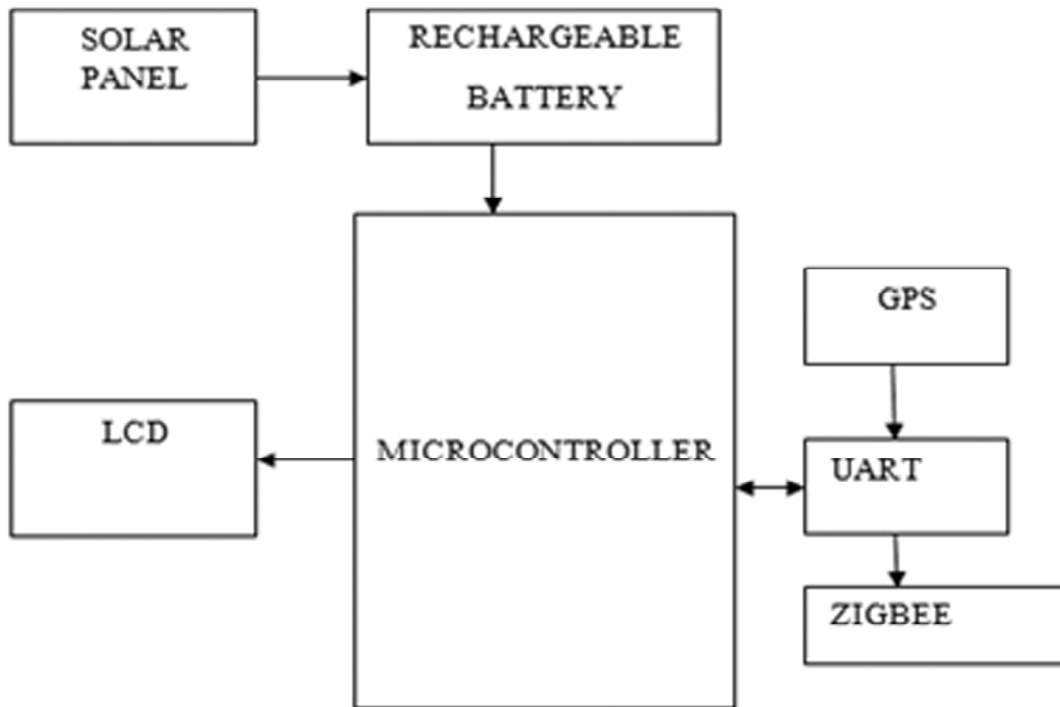


Figure 2: Floatable Object Block Section



Figure 3: Block Diagram Of Rescue Section

In this Section, The GPS value along with the Latitude and Longitude Values and Flight Datas are transmitted from the Floatable Section to the Rescue section. Here the Battery is provided for the Power supply for this Section. Zigbee is the Wireless device which is useful for transmitting the information for short range. While in the Real time, The GPS values can be transmitted via the Satellite Communication. The UART serial Transmission chip which is transmitting the Datas to the Ground station or the Rescue Section.

3. RESULTS AND DISCUSSIONS

The Results shown in the Figure 4 and 5 is that Flight Flying Safely before any Crash has occurred and After the Flight met an accident.

Suddenly the Black box ejects out into the water to collect the information about latitude and longitude of the position and all the datas about the flight are sent to the Zigbee and through the serial transmission it is transmitted to the Ground Station.

4. IMPLEMENTATION OF THE SIMULATION RESULTS

The above results shows that the Flight section which is transmitting the data to the Floatable Object Section showing in the LCD display that whether Flight met an accident or Flying safely. THE LANDING GEAR IS ON which shows that the pilot is Landing the Flight without any problems. LANDING GEAR IS OFF which shows that Flight is Flying and DETECTED shows that flight fall into the water and it is detected also Suddenly the accident location with Latitude and Longitude values are Transmitted to the Earth Station.

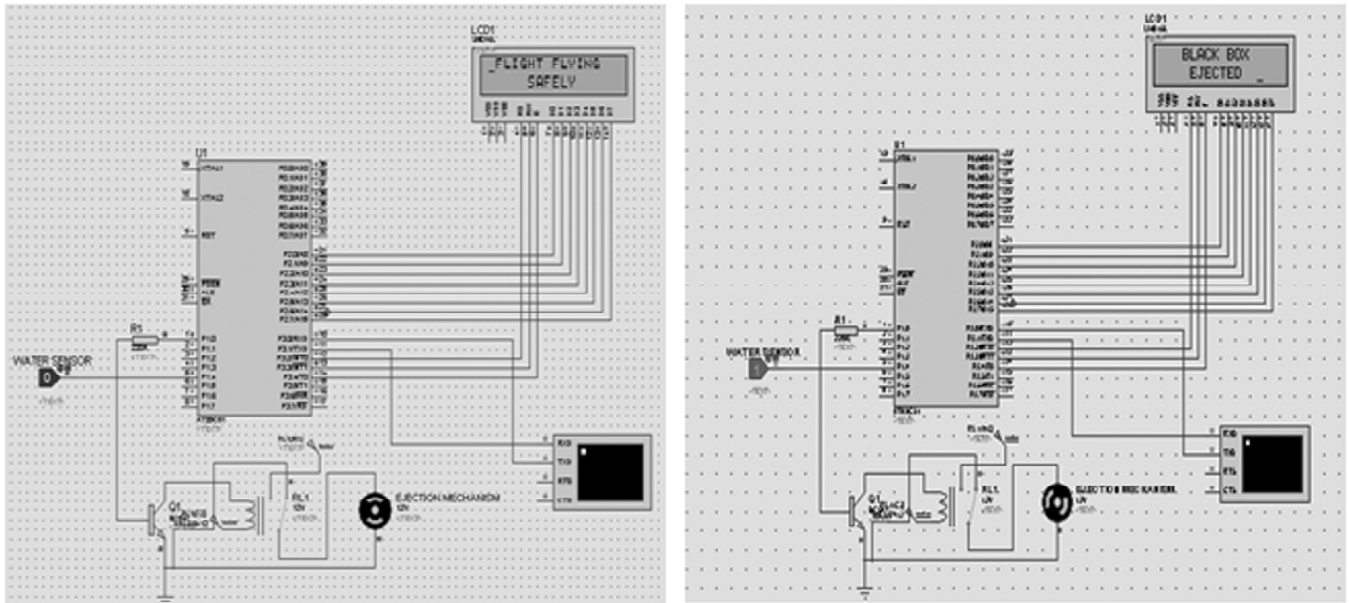


Figure 4: Simulation Result-1

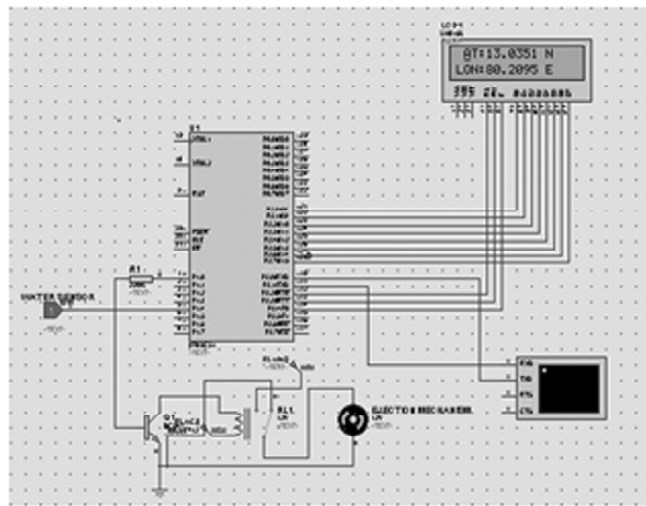


Figure 5: Simulation Result 2.

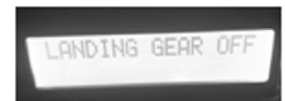


Figure 6: FLIGHT SECTION

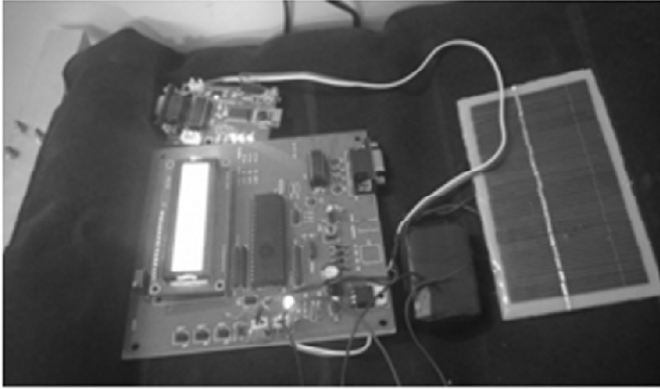


Figure 7: FLOATABLE OBJECT SECTION

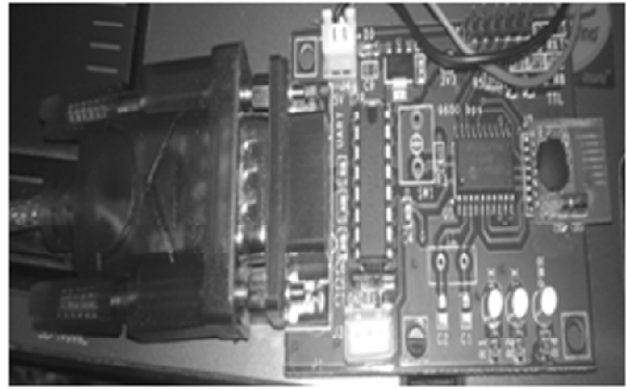


Figure 8: EARTH STATION



Figure 9: EARTH STATION PC

The Figure 7 shows the Floatable Object Section which sends the Latitude and Longitude values to the Earth station with the help of GPS receiver and transmits it through the Zigbee the wireless transmitter.

The figures 8 and 9 shows the Earth station which is receiving the Latitude and Longitude values where the Flight met an accident.

5. CONCLUSION

This paper deals with tracking the Flight location once the flight crashes. This system proposes a suitable solution for finding the location of the Airplane after the plane has met accident. sage of GPS Technology and wireless devices, the system works very fast and reliable transmission to the Ground station is possible. Apart from finding the flight location with the help of black box which is time consuming, Using this Floatable black box technology helps to rescue the accident soon and easiest method of tracking. Using of Wireless device which is for transmitting the information through the Serial Transmission is very fast and Efficient in today world. The hardware devices which is used to implement will not cost high and Efficiently give the better outputs. So this system is Affordable and With High Performance.

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