Automatic National Anthem Player System

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A B S T R A C T

In an era where technology seamlessly integrates with everyday life, innovations continue to reshape our world. Whether it's at a public gathering, a school assembly, or a sporting events, all the events start with National Anthem. National Anthem hold a special place in the hearts of citizens around the world. They are a powerful symbol of identity, unity, and patriotism, often played during significant events, ceremonies, and gathering. To guarantees a flawless rendition of the national anthem every time. However, ensuring the flawless rendition of the national anthem every time. However, ensuring the flawless performance of a national anthem can be challenging in diverse settings, where human factors such as timing and precision may vary. This is where the Automatic National Anthem Player steps in, revolutionizing the way we pay tribute to our nations. The Automatic National Anthem Player with Microcontroller guarantees a flawless rendition of national anthem every time by removing the risk of human error or forgetfulness; it underscores the important of honoring our heritage and fostering a sense of unity among citizens. This innovative device harnesses the capabilities of microcontroller, a compact yet powerful electronic component, to automate the playing of nation's anthem with unparallel precision.

Keywords: RTC- Real Time Clock, CMOS- Complementary Metal Oxide Semiconductors, USB- Universal Serial Bus

1. INTRODUCTION

The primary objective of this project is to design and implement a system that autonomously plays the national anthem of a given country on predetermined occasions. The incorporation of a microcontroller facilities precise timing, seamless execution, and the ability to customize the anthem playback to suit different events and environments. In this project, we designed an Arduino-based-Time-Clock with the capability to play the national anthem. A Real-Time Clock(RTC) is a battery powered clock that continues to measure time even when there is no external power or when the microcontroller is reprogrammed using Arduino. An RTC displayed the clock and calendar with all timekeeping functions. The battery, connected to the RTC, is separate and not related or connected to the main power supply. When power is restored, The RTC displayed the real-time irrespective of the duration for which the power is off. Such Real time clock are commonly found in computers and are often referred to as just CMOS(Complementary Metal Oxide Semiconductors). The DS1307 is the frequently used Real Time Clock (RTC) IC for clock and calendar functions. The clock function provide seconds, minutes, and hours, while the calendar function provides day, date, month, and year values. The clock can operate in either a 12-hour format with AM/PM indicators or a 24-hour format. A 3V backup battery supply in case of power failure. A32.768KHZ crystal is connected to the oscillator terminal of DS1307 for 1Hz oscillations. Arduino retrieves data and displays it on an LCD screen. By using Arduino programming the national anthem can be played using a USB player for a particular time slot, and after that, it can be turned off using a MOSFET/relay or a transistor.

2. Methodology

1. All figures should be numbered with Arabic numerals (1,2,3,….). Every figure should have a caption. All photographs, schemas, graphs and diagrams are Gather Components: Collects the necessary components including an Arduino boards(eg, Arduino Uno), a realy module, a speaker or buzzer, power source(battery or adapter), wires, and possibly Pandrive for recorded audio.

2. Setup Arduino: Install the Arduino IDE on your computer. Connect the Arduino Board to your computer via USB. Write a basic Arduino sketch to control the relay module and trigger audio playback.

3. Relay connection: Connect the relay module to Arduino according to its specifications. Typically, you'll connect the control pins of the relay to digital pins on the Arduino. The relay will switch the power supply to the speaker or buzzer.

4. Code Implementation: Write the Arduino code to control the relay module and trigger audio playback.

3. Block Diagram
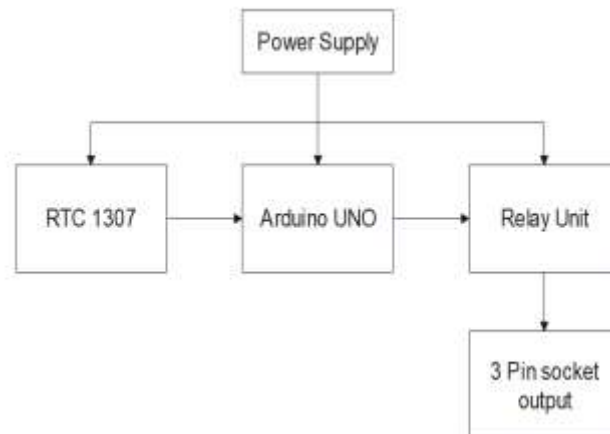
1.   **Microcontroller Arduino UNO :**

This microcontroller serves as the brains of the system, orchestrating the entire operation. It interfaces with the RTC module, reads the current time, and controls the external media player through a relay.

2.   **Real-Time Clock DS1307:**

The DS1307 is a serial RTC that provides accurate timekeeping information, including seconds, minutes and hours, day, date, month, and year. It operates with a low power consumption, making it suitable for applications where maintaining accurate time is crucial.

3.   **Relay Unit:**

A relay is used to control the power supply to the external media player. The microcontroller activates the relay at specific times, enabling the media player to play the national anthem.

4.   **Backup Power Supply**:

A 3.3-volt lithium battery serves as a backup power supply for the RTC module. This ensures that even in the event of a mains power failure, the system can maintain accurate timekeeping.

5. Hardware Implementation
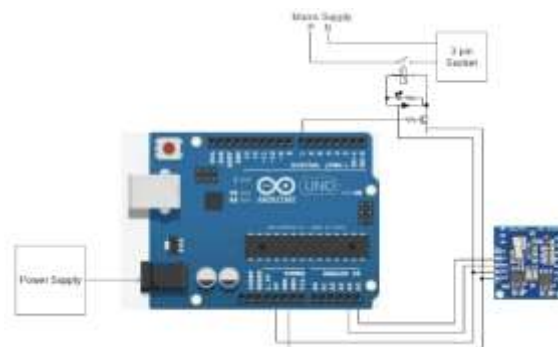
1.   The 230V AC input is given to the step-down transformer, which steps down the input to 12V AC. The output is then passed to the rectifier circuit to obtain a DC supply of 12V.

2.   A capacitor is used as a filter to remove ripples to remove ripples and provide pure DC supply for the Arduino, relay, and amplifier circuit. The 12V DC is indicated using a red LED.

3.   The remaining circuit such as the USB player, RTC, and LCD requires 5v DC. To achieve this, the positive regulator IC 7805 is used to covert 12V to 5V .

4.   RTC provides real time data which is displayed on the LCD screen. Switches are used to set the time, date, month, and year in case the RTC malfunction.

6. Software Implementation

- Connect the relay module to the Arduino.

- Connect the speaker or buzzer to relay

- Upload Arduino code.

- Store the national anthem audio

- Trigger the Arduino to play the anthem

7. Security Aspects

It is potential to prevent tampering or unauthorized interruption during public events or ceremonies. By centralizing control through the Arduino system, it becomes easier to monitor and manage access, reducing the risk of interference or sabotage. Implementing authentication mechanisms can ensure that only authorized person can activate or control the anthem player enhancing overall security and reliability.

8. Conclusion

The project successfully demonstrates the use of Arduino and relays to automate the playing of national anthem, showcasing the integration of hardware and software. This innovation offers potential applications in events, ceremonies, institutes, educational society and public space, enhancing convenience and efficiency. In conclusion, this innovative device plays a crucial role in fostering patriotism, unity, and pride, while also embracing technological innovation and progress.

9. Future Scope

- Smart Features: Integration with AI algorithm for predictive scheduling and adaptive playback based on audience size or demographics.

- Enhanced Control: Development of smartphone apps or web interface for remote management and customization of anthem playback.

- Sustainability: Implementation of energy efficient components and renewable power sources to minimize environmental impact.

- Customization: Offering options to customize the playback of the national anthem to suit different preference and requirements, such as adjusting volume level, timing and accompanying visuals.

- Data Analytics: Integration with data analytics platforms to gather insights on anthem usage, audience engagement, and event effectiveness.

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