Sequential Timer Control System to Facilitate the Vipassana Meditation

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Abstract

The main purpose of this research work is to construct the "Sequential Timer Control System to Facilitate the Vipassana Meuitation". Buddhists contemplate Vipassana, insight meditation to liberate from Sansara, life cycle of life and death. The Buddha said the state attained after such liberation is called Nirvana and those who wish to achieve Nirvana must practice Vipassana meditation. In practicing Vipassana meditation, there are four favorable positions, walking, standing, sitting and laying; and these four positions should be in balance to get in harmony with health and succeed the goal that we want. The timer will be of great help in the process of maintaining the balance between the four posiyions as it can be set to alart the user at 15 minutes, 30 minutes, 45 minutes and 60 minutes to change the meditation position. As it is an evolutionary system, it is a system that allows the time and timer to work in sequence. The system is constructed by using one PIC 16F887 microcontroller, a 32.78kHz crystal oscillator, LEDs and other electronic components. The 5V and 12V regulated power supply is used for power. The output will be seen by red, green, yellow, and blue LEDs with Piezo sounders. The control program is written in Assembly Programing Language. Since this system uses a microcontroller, it can be done precisely. Just by modifying the program a little, you can set the desired time for the interaction. The constructed system can be used wide range of area.

Keywords: Vipassana Dhamma, Nirvana, meditation, Assembly Language, microcontroller

INTRODUCTION

Buddhism is one of the world's largest religions and originated 2,500 years ago in India. The goal of Buddhism is to become enlightened and reach Narvana.The Buddha firmly preached that Nirvana is a place where there is no birth and death, where suffering ends and there is only enternal tranquility. The Buddha was a person who practiced himself and attained Nirvana. Therefore, the Buddha is the only one who can accurately guide the way to Nirvana. This way to Narvana is through Vipassana practice. There are four positions in Vipassana meditation. This system is made with the aim of balancing the four positions.

Meditation is a practice in which an individual uses a technique such as mindfulness, or focusing the mind on a particular object, thought, or activity, to train attention and awareness, and achieve a mentally clear and emotionally clam and stable state. Meditation is practiced in numerous traditions. Meditation can give you a sense of cleam, peace and balance that can benefit both your emotional well-being and your overall health. You can also use it to relax and cope with stress by refocusing your attention on something calming. Meditation can help you learn to stay centered and keep inner peace.

The "Sequential Timer Control System to Facilitate the Vipassana Meuitation" is designed and constructed by using PIC 16F887 microcontroller, crystal oscillator, light emitting diodes, a piezo sounder, a voltage regulator circuit and other electronic components. The megahertz (MHz) range oscillators can cause the rapidly change in timing so the kilo hertz

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(kHz) range crystal oscillator is suitable for sequential timer circuit. In this research work, 32.78 kHz

crystal oscillator is used to produce the required timing. Besides, the controlled program is required to run the sequential timer circuit and it is written in Assembly Programming Language. In this program, delay routines comprise as timer durations. The timing sequences are four steps as 15 min, 30 min, 45 min, 60 min. But, for demonstration simplicity only 5sec, 10sec, 15sec and 20sec timing sequence is used. The first step is counted from 0sec to 5sec and the output will be red light with one beep sound. The second step is counted from 5sec to 10sec and the output will be green light with two beeps sound. The third step is counted from 10sec to 15sec and the output will be yellow light with three beeps sound. The fourth step is connected from 15sec to 20sec and the output will be blue light with four beeps. The hardware of the sequence-controlled timer is designed on the proteus 8.1 software until getting the optimum condition. Then, the written program hex code is downloaded into the PIC and simulated the sequence-controlled timer circuit. After finishing the simulation successfully, the system is designed by PCB Designer software. This design is copied on the printed circuit board and then applying pressure and heat, the printed track line is deposited on the copper side of the printed circuit board. After etching, mounting component and testing procedure are carried on, the sequential control timer system is successfully constructed. By the aid of PIC kit 3 programmer, the hex code is downloading to the memory of the microcontroller again. Then the "Sequential Timer Control System to Facilitate the Vipassana Meuitation" is ready to use. Figure 1 shows the block diagram of this system.
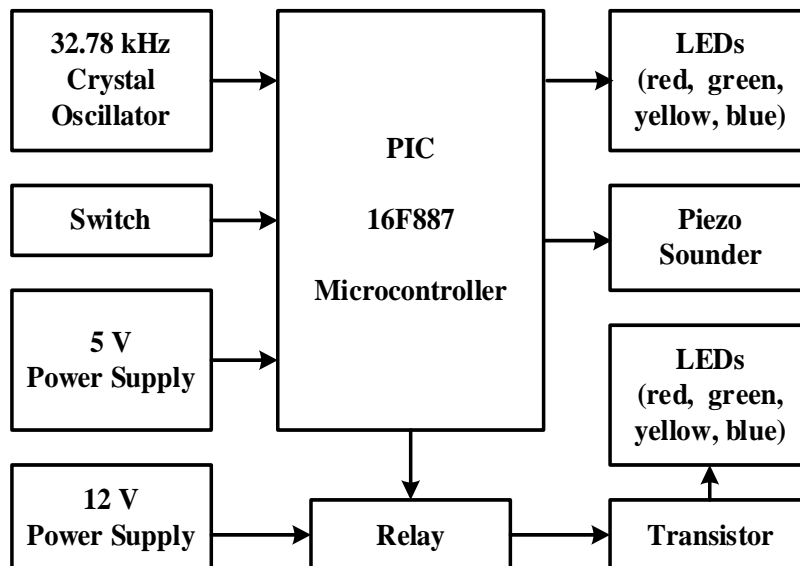

Figure1. Block Diagram of this System

Theoretical Background

A PIC microcontroller and some electronic devices are used in carrying out this work. This section describes the devices used in this work.

PIC 16F887 Microcontroller

The PIC16F887 is a well-known by product by Microchip. It features all the components in which microcontrollers normally have. For its low price, wide range of application, high quality and easy availability, it is an ideal solution in applications such as control of different processes in industry, machine control devices, measurement of different

values etc. The PIC16F887 is a high-performance reduced set computer CPU. It is necessary to learn 35 single word instruction to use the device. The PIC16F887 comes in 40 pin duals in line packages IC. There are five I/O ports. It had precision internal oscillator, software selectable frequency ranges of 31 kHz to 8 MHz.

Design and Construction of the Whole System

The work of "Sequential Timer Control System to Facilitate the Vipassana Meuitation" is composed of **three** factors: input voltage unit, microcontroller processing unit, and control timer unit.

Input Voltage Unit

The PIC 16F887 microcontroller functions properly at DC +5V. The electromagnetic relay needs to work DC +12V.

Microcontroller Processing Unit

The control program is written in Assembly Programming Language. Then the assembly codes were converted to hexadecimal code file. This program is embedded into the PIC. The "Sequential Timer Control System to Facilitate the Vipassana Meuitation" is designed on the proteus 8.1 and simulated this circuit. After finishing this work, the circuit is constructed by project board design. The constructed system control timer and displays it on the LEDs. A piezo sounder is used for sound section. The circuit uses the relay and transistor as a switch. Figure 1 shows the flowchart of the operation. The complete circuits diagram of "Sequential Timer Control System to Facilitate the Vipassana Meuitation" is shown in Figure 2.
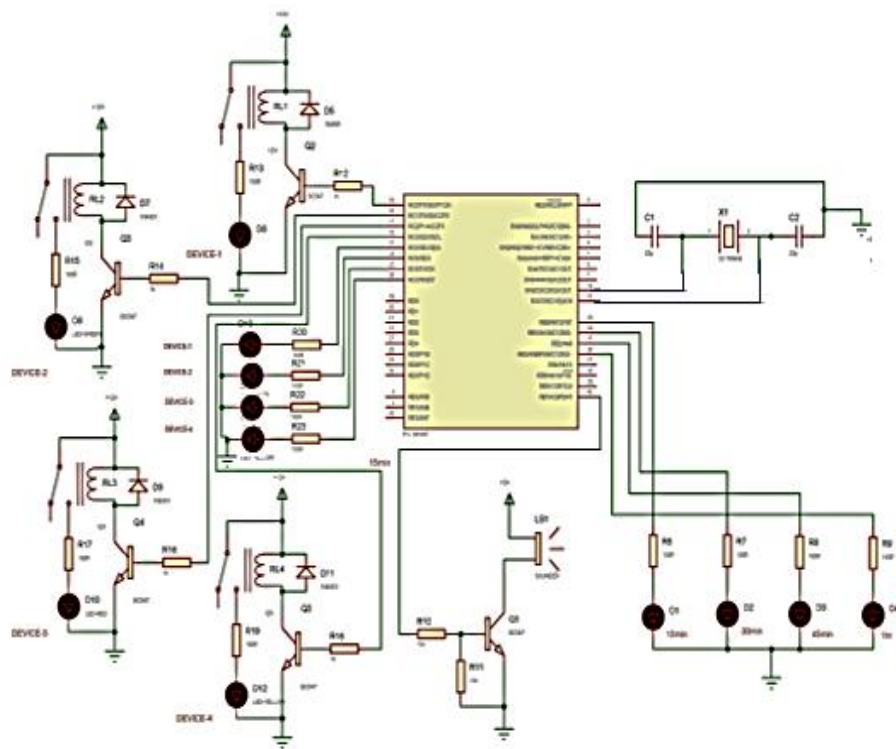

Figure 2. Complete Circuits Diagram of Sequential Timer Control System

Control Timer Unit

The "Sequential Timer Control System to Facilitate the Vipassana Meuitation" consists of LEDs and sounder. We switch on the SW_1 button; three red LEDs will light. After 15min, three red LEDs are off the light with one beep sound from the sounder, three yellow LEDs are light. After 30min, three yellow LEDs are off the light with two beeps sound from the sounder, three green LEDs are light. After 45min, three green LEDs are off the light with three beeps sound from the sounder, three blue LEDs are light. After 60min, three blue LEDs are off the light with four beeps sound from the sounder.

Circuit Operation

The work of "Sequential Timer Control System to Facilitate the Vipassana Meuitation" is designed and implemented. The program for sequence control timer is written, compiled and installed in the PIC 16F887 microcontroller. The PORTA is defined as input pin. The PORTC and PORTB are defined as output pins. A RESET switch is fixed at pin 1(**MCLR**). For experimental work, four type of control timer are made. If the SW_1 button is switch on, transistor 1, relay 1 operate and three red LEDs are light.

First timer, when the time reaches 15min, transistor 1, relay 1 and three red LEDs are off. An alarm is sound (1 beep) from the piezo sounder. The transistor 2 and relay 2 operate, three green LEDs are light.

Second timer, when the time reaches 30min, transistor 2, relay 2 and three green LEDs are off. An alarm is sound (2 beeps) from the piezo sounder. The transistor 3 and relay 3 operate, three yellow LEDs are light.

Third timer, when the time reaches 45min, transistor 3, relay 3 and three yellow LEDs are off. An alarm is sound (3 beeps) from the piezo sounder. The transistor 4 and relay 4 operate and three blue LEDs are light.

Fourth timer, when the time reaches 60min, transistor 4, relay 4 and three blue LEDs are off. An alarm is sound (4 beeps) from the piezo sounder. Figure 3 shows operation flow chart of this system.
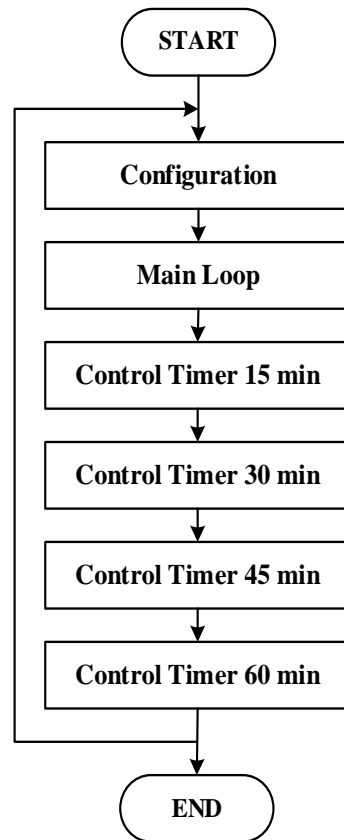
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                          ┌──────────┐
                          │  START   │
                          └────┬─────┘
           ┌───────────────────┤
           │       ┌────────────────────────┐
           │       │      Configuration      │
           │       └───────────┬────────────┘
           │       ┌────────────────────────┐
           │       │        Main Loop        │
           │       └───────────┬────────────┘
           │       ┌────────────────────────┐
           │       │   Control Timer 15 min   │
           │       └───────────┬────────────┘
           │       ┌────────────────────────┐
           │       │   Control Timer 30 min   │
           │       └───────────┬────────────┘
           │       ┌────────────────────────┐
           │       │   Control Timer 45 min   │
           │       └───────────┬────────────┘
           │       ┌────────────────────────┐
           │       │   Control Timer 60 min   │
           │       └───────────┬────────────┘
           └───────────────────┤
                          ┌──────────┐
                          │   END    │
                          └──────────┘
```

Figure 3. Operation Flowchart of the System

RESULTS AND DISCUSSION

This system is not the same clock timer. This system divides one hour into four parts and will continuously alarm according to the schedule, so it is not the same as setting an alarm on telephones for hours. As it is an evolutionary system, it is a system that allows the time and timer to work in sequence. The timer value can be changed by changing the program. Most Vipassana meditation practitioners are in their fifties, so they may have poor eyesight and hearing. This system includes two types of sound and light alerts, so it can be used not only by visually impaired but also the hearing impaired. The photograph of "Sequential Timer Control System to Facilitate the Vipassana Meuitation" is shown in Figure 4, Figure 5, Figure 6 and Figure 7.

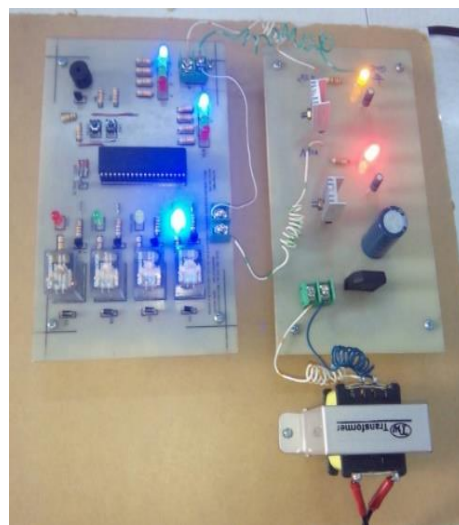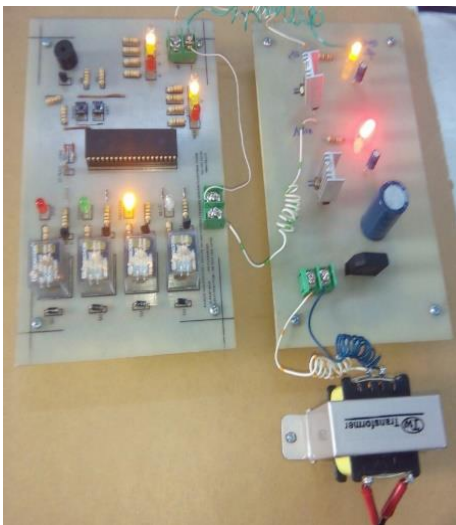Figure 4. Photograph of First Timer   Figure 5. Photograph of Second Timer

Figure 6. Photograph of Third Timer Figure 7. Photograph of Fourth Timer

CONCLUSION

Buddhists believe that the human life is one of suffering and that meditation, spiritual, and physical labor, and good behavior are the ways to achieve enlightenment, or Nirvana. Nirvana signifies the end of the cycle of death and rebirth. In order to reach Nirvana, Vipassana must be exerted. The "Sequential Timer Control System to Facilitate the Vipassana Meuitation" will be helpful in practicing Vipassana. Furthermore, this system is a common electronic device and it works precisely as it uses a microcontroller. Just by making a few changes to the program, we can change the timing of the interaction. The constructed system can be used many places such as meditation, physical jerks, school ball, gymnasium and gymnastics (gym), fitness centre, in timely activities and so on.

Acknowledgements

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