

A Project report on

Digital Clock with time and Alarm functions

Prepared By: Maulik Sanchela

Abstract

Digital clock is displays the time using RTC. This circuit is used many applications like cars, railway stations, houses, offices, etc. In order to provide accurate time and date, In this type of applications, normally we use RTC (Real Time Clock) ICs to displays the time data accurately. This Circuit displays the time on LCD. For this clock, we can set the time and alarm at any instant. Here the clock works in 24 hours mode and the RTC chip is configured by programming 8051 controller. Here 8051 controller continuously reads data from RTC and process it in correct order to display on time on LCD.

ACKNOWLEDGEMENT

We take this opportunity to humbly express our sincere thanks to all those concerned with our project titled “**DIGITAL CLOCK WITH TIME AND ALARM SET FUNCTIONS**”. We have taken efforts in this project. However there are many individuals and senior members who gave their essential guidance. We would like to extend our sincere thanks to all of them. We wish to express our warm gratefulness appreciation to all those who have contributed to this project, both directly and indirectly, without the co-operation of whom, it would not have been possible to complete this project. We are highly indebted to our colleagues for their immense support and Mr. A M Bhatt (HOD, Dept. of ECE) and our project guide **Ms. F. G. Patel** and **Mr. A. M. Bhatt** for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project. We would like to express our gratitude towards our parents & faculties of Electronics & Communication Dept. Of Government Polytechnic, Jamnagar for their kind co-operation and encouragement which help us in completion of this project.

With Regards,

Maulik M. Sanchela

Index:

Chapter	Name	Page No.
1	Introduction	7
2	System Block Diagram	8
3	Circuit Diagram	10
4	Hardware description	12
5	Software Logic Explanation	31
6	Bill of Material	42
7	Troubleshooting	43
8	How to run Project	44
9	Future Enhancement	45
10	Conclusion	46
11	Reference	47

Chapter – 1: Introduction

This Project is automatic electronics circuit, which consists several components, like buzzer, LCD, Microcontroller, 7805, switches, for set functions.

This all components are controlled by microcontroller which have been programmed before. The main controller unit of the system is rtc & controller, the programmed logic in microcontroller gives different works, output will displays from LCD & BUZZER which indicate alarm & time on display.

The circuit is shown in report which designed in PROTEOUS ckt designing software and programming codes are varied into Keil & after that it dumped in to microcontroller.

In controlling, in this several push buttons are uses for different works, They consist alarm set, time set, hour and minute set of time and alarm, reset button, and all have particular works for set.RTC varies the time continuous and delays.

Chapter -2: System Block Diagram

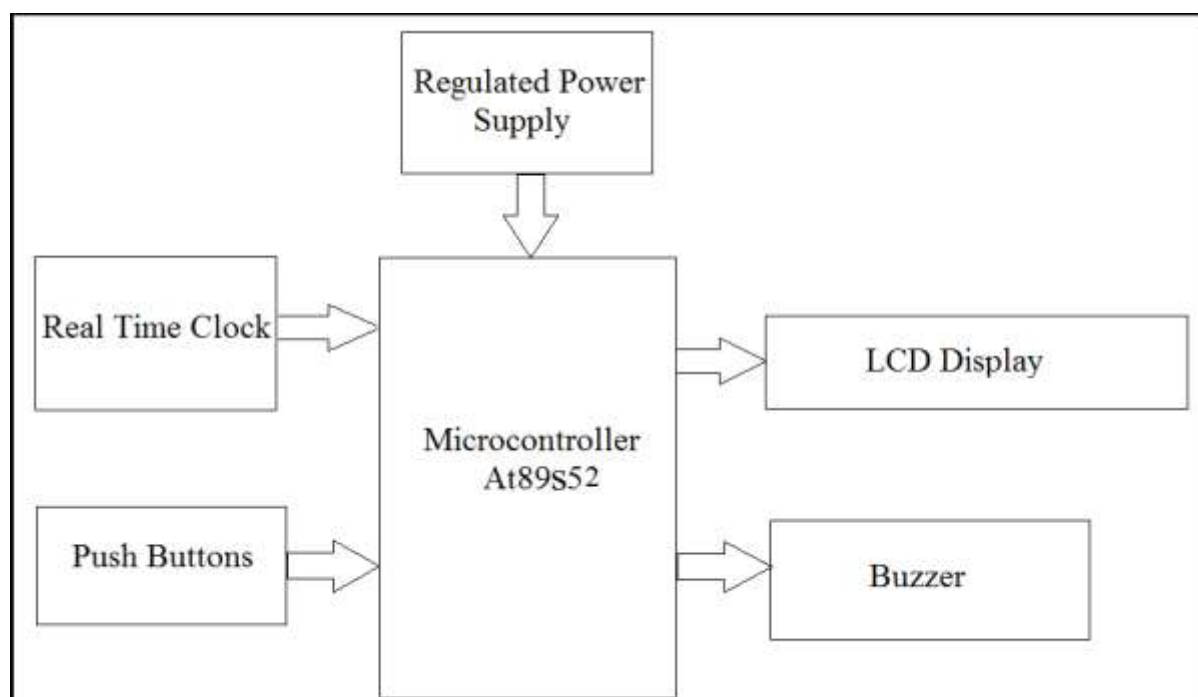


Figure 1

Block Description:

1. Power supply: Provides supply to controller.
2. LCD: LCD is the Output device. In LCD, we can get the output signal, and day, date, time, month, and year.
3. Buzzer: Generates loud and sound when we the alarm time is come.
4. Microcontroller: The microcontroller can be controller the full circuit and it can give the output to the LCD.
5. Real Time Clock: The RTC is Real Time Clock chip. It can be used for to take up Time, Calendar, and Day, Date, Month, Year, because of inbuilt Battery. RTC is main Block of our Project.
6. Push buttons: This are used to set time and alarm.

Chapter – 3: Circuit Diagram

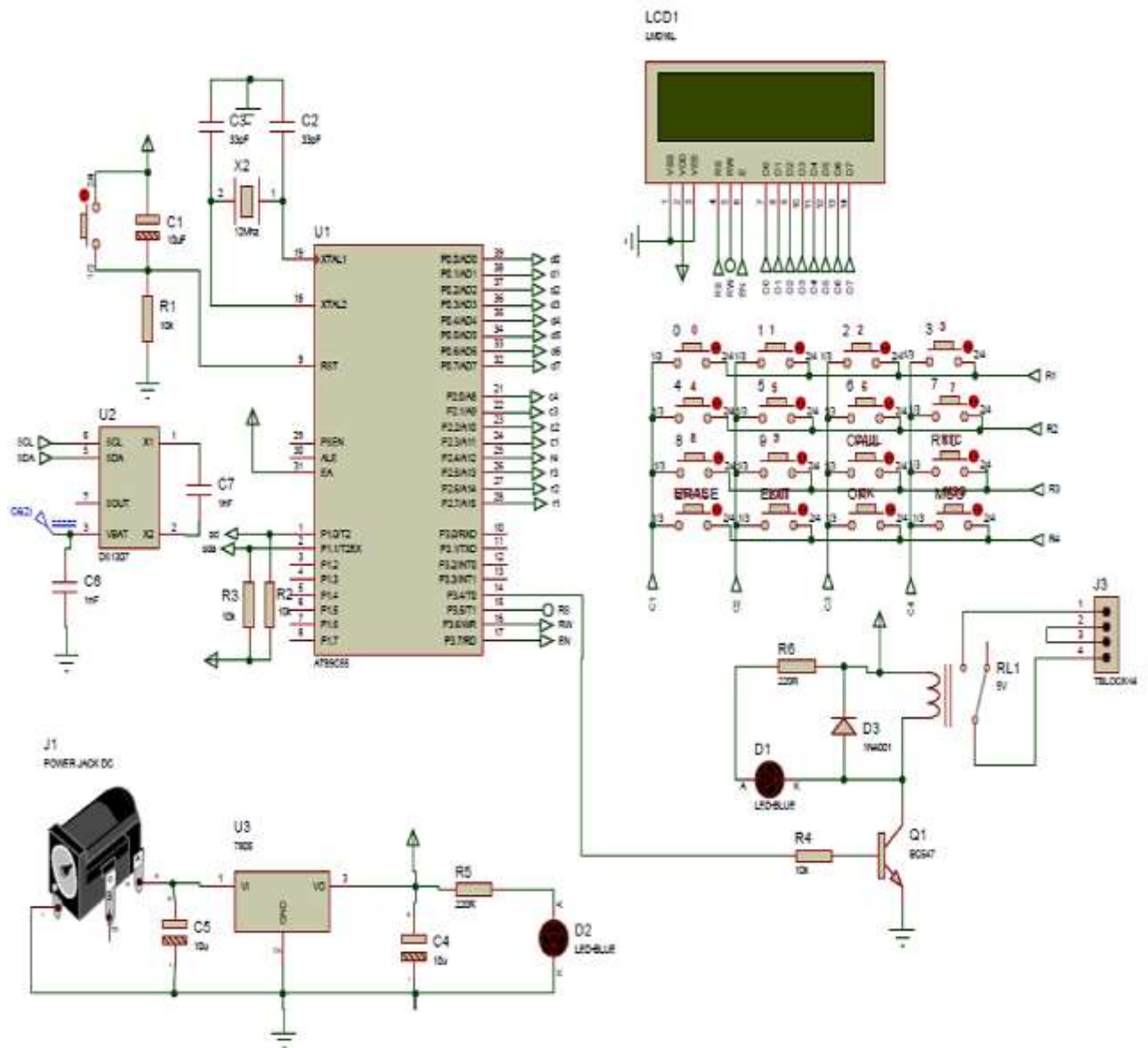
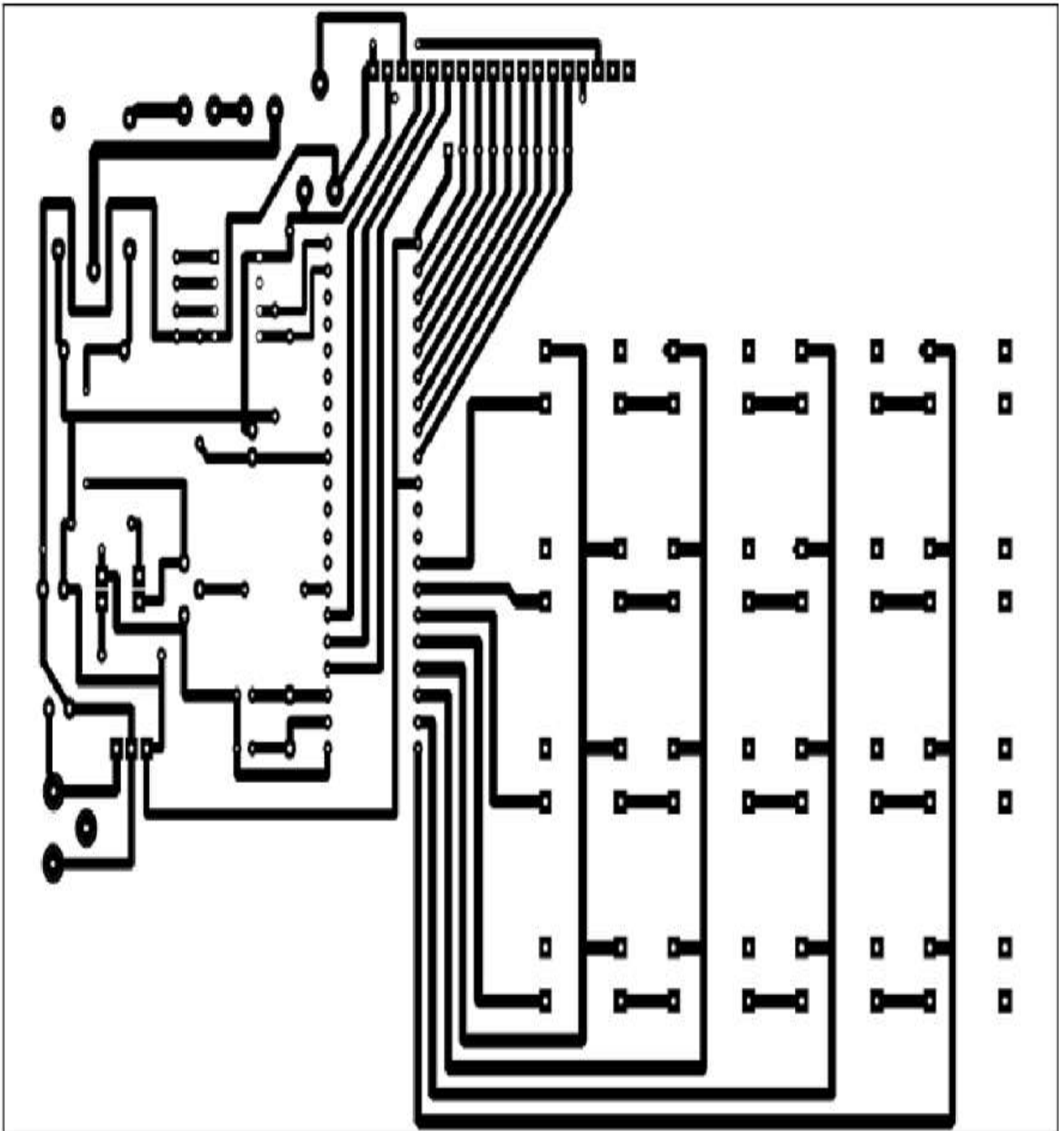


Figure 2

Description of Circuit Diagram:

- The circuit diagram shows the connection of [RTC](#) with the microcontroller. Port P0 is used as data port for LCD and P3.5, P3.6, P3.7; The PORT 2 is used for Push Buttons.
- RTC output signal connected to P1.0 and P1.1.
- Relay and alarm are connected to the Pin no. P3.4.
- In this clock the RTC is used in 24 hour mode which gives accurate time and can be displayed on [LCD](#) through microcontroller.
- Firstly oscillator is set, than RTC is set in 24 hour mode by setting 0X20 in register.
- The microcontroller continuously reads the data from the RTC. The algorithm processes the data and displays the data in correct order on the LCD screen. Interrupt 2 of the microcontroller is used to set time. Whenever Start pin is made low (0), interrupt2 comes and set time function is called for setting the time. After setting the time, start pin is made high and the clock starts with the time set by user.

PCB Design:



Chapter – 4: Hardware Description

No.	Component	Value
1	Resistor	10K ohm
2	Capacitor	33pf,10 uf
3	IC	7805
4	LED	-
5	Microcontroller	At89s52
6	Crystal	11.0592 MHz, 32.768KHz
7	Real Time Clock	Ds1307
8	LCD	16*2
9	Buzzer	-
10	Relay	Ras-0510
11	Push Button	-
12	Battery and Adapter socket	-

Resistor:



Figure 3

Performance Specification

- Temperature Coefficient : $\leq 10\Omega$: $\pm 350\text{PPM}/^\circ\text{C}$ 11Ω to $99\text{k}\Omega$: 0 to $-450\text{PPM}/^\circ\text{C}$ $100\text{k}\Omega$ to $1\text{M}\Omega$: 0 to $-700\text{PPM}/^\circ\text{C}$ $1.1\text{M}\Omega$ to $10\text{M}\Omega$: 0 to $-1500\text{PPM}/^\circ\text{C}$
- Short Time Overload : $\pm(1\% + 0.05\Omega)\text{Max.}$ with no evidence of mechanical damage
- Insulation Resistance : Min. $1,000\text{M}\Omega$
- Dielectric Withstanding Voltage : No evidence of flashover, mechanical damage, arcing or insulation breakdown.
- Terminal Strength : No evidence of mechanical damage.
- Resistance to Soldering Heat : $\pm(1\% + 0.05\Omega)\text{Max.}$ with no evidence of mechanical damage.
- Solderability : Min. 95% coverage
- Resistance to Solvent : No deterioration of protective coating and markings
- Temperature Cycling : $\pm(1\% + 0.05\Omega)$ Max. with no evidence of mechanical damage
- Load Life in Humidity : Normal Type : $<100\text{k}\Omega$: $\pm(3\% + 0.05\Omega)\text{Max.}$ $\geq 100\text{k}\Omega$: $\pm(5\% + 0.05\Omega)\text{Max.}$
- Non-Flame Type : $<100\text{k}\Omega$: $\pm(5\% + 0.05\Omega)\text{Max.}$ $\geq 100\text{k}\Omega$: $\pm(10\% + 0.05\Omega)\text{Max.}$
- Load Life : Normal Type : $<56\text{k}\Omega$: $\pm(2\% + 0.05\Omega)\text{Max.}$ $\geq 56\text{k}\Omega$: $\pm(3\% + 0.05\Omega)\text{Max.}$
- Non-Flame Type : $<100\text{k}\Omega$: $\pm(5\% + 0.05\Omega)\text{Max.}$ $\geq 100\text{k}\Omega$: $\pm(10\% + 0.05\Omega)\text{Max.}$

Features of Resistor:

- Automatically insert able
- High quality performance
- Non-Flame type available
- Cost effective and commonly used
- Too low or too high values can be supplied on case to case basis

Capacitor:

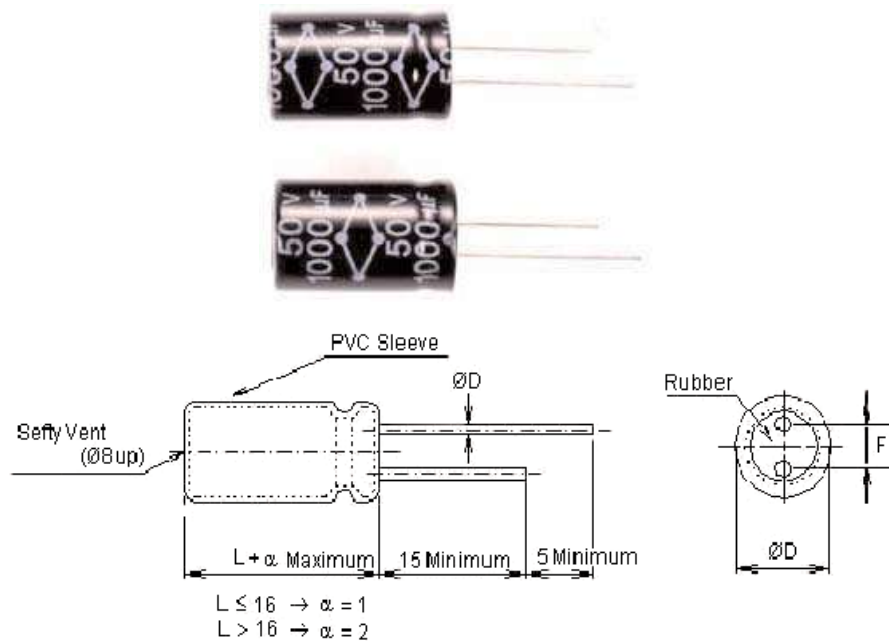


Figure 4

Features:

- For general purpose.
- Wide CV value range.
- Safety vent construction products, RH series are guaranteed 2,000 hours at 105°C.

General Description:

- Capacitor or electric condenser is a device for storing an electric charge.
- The simplest form of capacitor consists of two metal plates separated by a non touching layer called the dielectric.
- When one plate is charged with electricity from a direct current or electrostatic source, the other plate have induced in it a charge of the opposite sign; that is, positive if the original charge is negative and negative if the original charge is positive.
- The electrical size of the capacitor is its capacitance.
- Capacitors are limited in the amount of electric charge they can absorb; they can conduct direct current for only instances but function well as conductors in alternating current circuits.
- Fixed capacity and variable capacity capacitors are used in conjunction with coils as resonant circuits in radios and other electronic equipment. Capacitors are produced in a wide variety of forms. Air, Mica, Ceramics, Paper, Oil, and Vacuums are used as dielectrics depending on the purpose for which the device is intended.

General Description of Capacitor:

An electrolytic capacitor is a capacitor that uses an electrolyte (an ionic conducting liquid) as one of its plates to achieve a larger capacitance per unit volume than other types. The large capacitance of electrolytic capacitors makes them particularly suitable for passing or bypassing low-frequency signals and storing large amounts of energy. They are widely used in power supplies and for decoupling unwanted AC components from DC power connections.

A non-polarized capacitor is a type of capacitor that has no implicit polarity-it can be connected either way in a circuit. Ceramic capacitors are non-polarized.



FIG. UNPOLARISED / CERAMIC CAPACITORS

Figure 5

IC 7805:

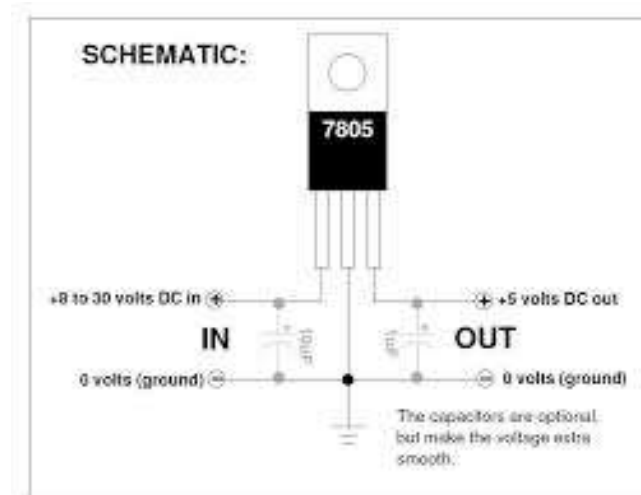


Figure 6

Features:

- Output Current up to 1A.
- Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24.
- Thermal Overload Protection.
- Short Circuit Protection.
- Output Transistor Safe Operating Area Protection.
- Output voltage tolerances of $\pm 2\%$ at $T_j = 25^\circ$.
- Line regulation of 0.01% of V_{OUT}/V of V_{IN} at 1A load.
- Load regulation of 0.3% of V_{OUT}/A .

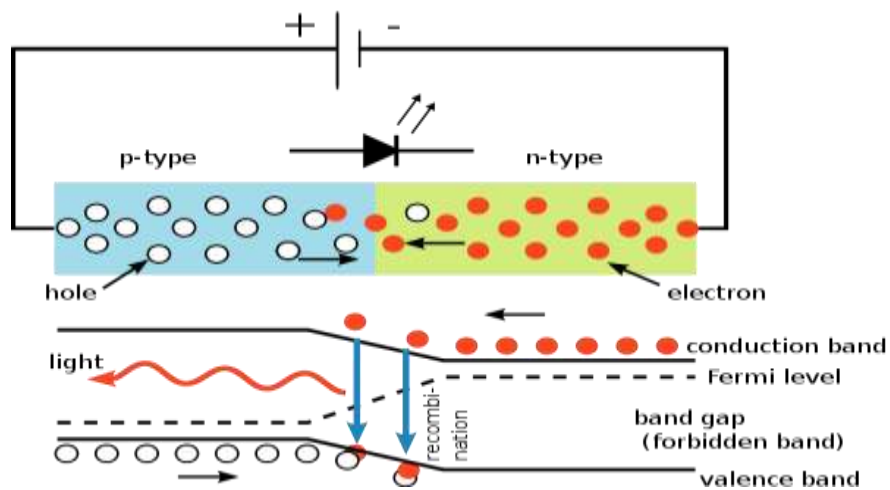
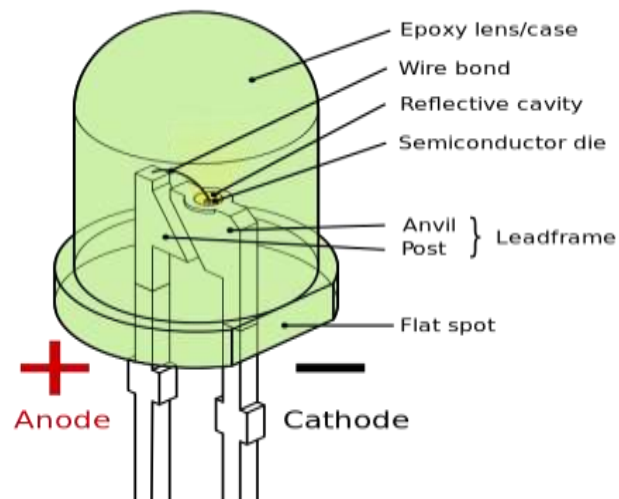
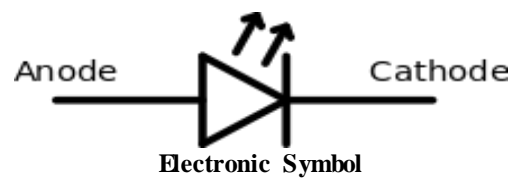
General Description of IC 7805:

The LM78XX series of three terminal positive regulators are available in the TO-220 package and with several fixed output voltages, making them useful in a wide range of applications. Each type employs internal current limiting, thermal shut down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

Regulator IC (LM 7805):

The LM7805 monolithic 3-terminal positive voltage regulators employ internal current-limiting, thermal shutdown and safe-area compensation, making them essentially indestructible. If adequate heat sinking is provided, they can deliver over 1.0A output current. They are intended as fixed voltage regulators in a wide range of applications including local (on-card) regulation for elimination of noise and distribution problems associated with single-point regulation. In addition to use as fixed voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents. Considerable effort was expended to make the entire series of regulators easy to use and minimize the number of external components. It is not necessary to bypass the output, although this does improve transient response. Input bypassing is needed only if the regulator is located far from the filter capacitor of the power supply.

LED:



The inner workings of an LED

Figure 7

General Description of LED:

- A **light-emitting diode (LED)** is a two-lead semiconductor light source.
- It is a PN-junction diode, which emits light when activated.
- When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons.
- This effect is called electroluminescence, and the color of the light is determined by the energy band gap of the semiconductor.
- LEDs convert electrical energy into light energy.

Characteristics of LED:

- Color
- White light
- Intensity
- Eye safety information
- Visibility
- Operating Life
- Voltage/Design Current

Specification:

Color	Wavelength range (nm)	Typical efficacy (<u>lm</u> / <u>W</u>)	Typical efficiency (W/W)
Red	$620 < \lambda < 645$	72	0.39
Red-orange	$610 < \lambda < 620$	98	0.29
Green	$520 < \lambda < 550$	93	0.15
Cyan	$490 < \lambda < 520$	75	0.26
Blue	$460 < \lambda < 490$	37	0.35

Microcontroller At89s52:

Pin Diagram of At89s52:

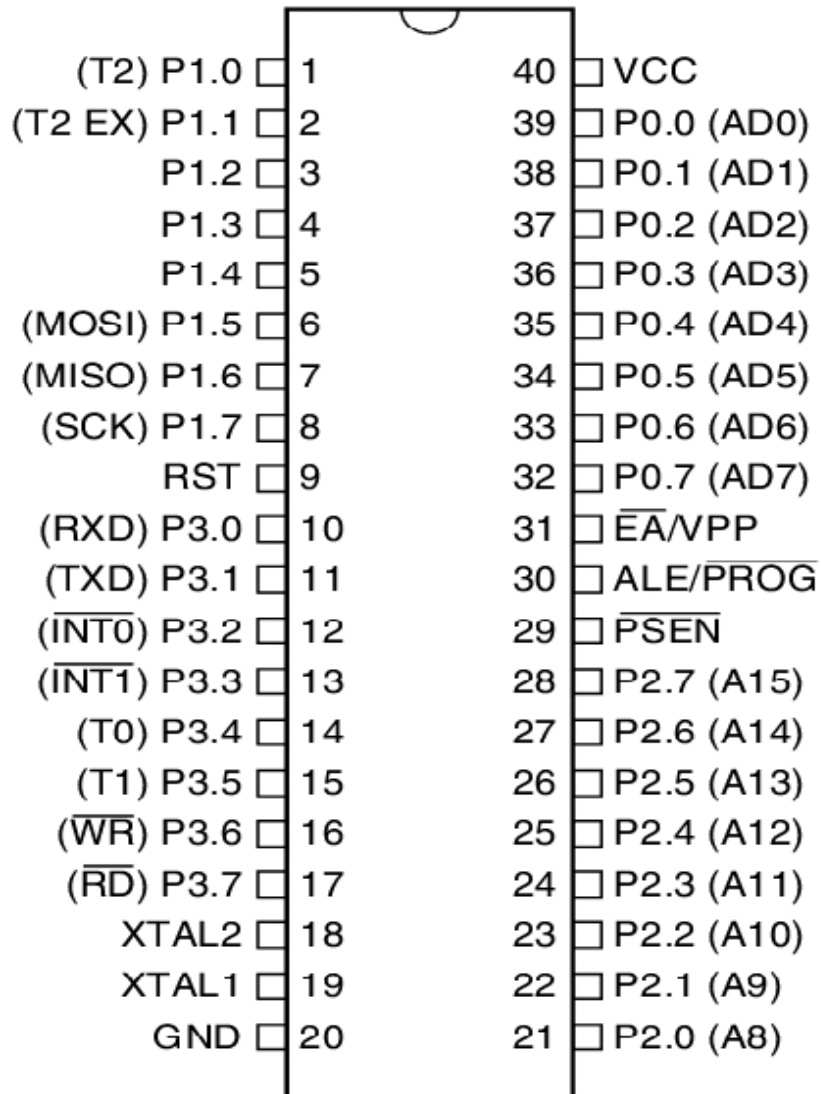


Figure 8

Features of Microcontroller:

- Compatible with MCS[®]-51Products\
- 8K Bytes of In-System Programmable (ISP) Flash Memory – Endurance: 10,000 Write/Erase Cycles
- 4.0V to 5.5V Operating Range
- Fully Static Operation: 0 Hz to 33 MHz
- Three-level Program Memory Lock
- 256 x 8-bit Internal RAM
- 32 Programmable I/O Lines
- Three 16-bit Timer/Counters
- Eight Interrupt Sources
- Full Duplex UART Serial Channel
- Low-power Idle and Power-down Modes
- Interrupt Recovery from Power-down Mode

Crystal Oscillator:



Crystal Oscillator 11.0592

Crystal Oscillator 32.768MHz

Figure 9

Feature of Crystal Oscillator 11.0592 MHz:

- The crystal oscillator circuit sustains oscillation by taking a voltage signal from the quartz resonator, amplifying it, and feeding it back to the resonator.
- It provides clock pulses of 11.0592 MHz frequency.
- The popularity of the crystals is due to low cost.

Features of Crystal Oscillator 32.768 MHz:

- Model :CXO\VCXO
- Frequency range:1.000125.000MHz
- Supply voltage:3.3V dc+5% / 5.0V dc+5%
- Dimensions: DIP-14/ DIP-8
- Ts :<10ms
- Operation temperature: -10+60/-20+70
- Storage temperature:-40+85
- Frequency stability:+25ppm/+50ppm/+100ppm
- Symmetry:40%60% 45%55%
- Output level: TTL/HCMOS
- Output load: 15pf 50pf
- Output 0 level:0.5V
- Output 1 level:>4.5V(5.0V)/>2.4V(3.3V)

RTC DS1307:

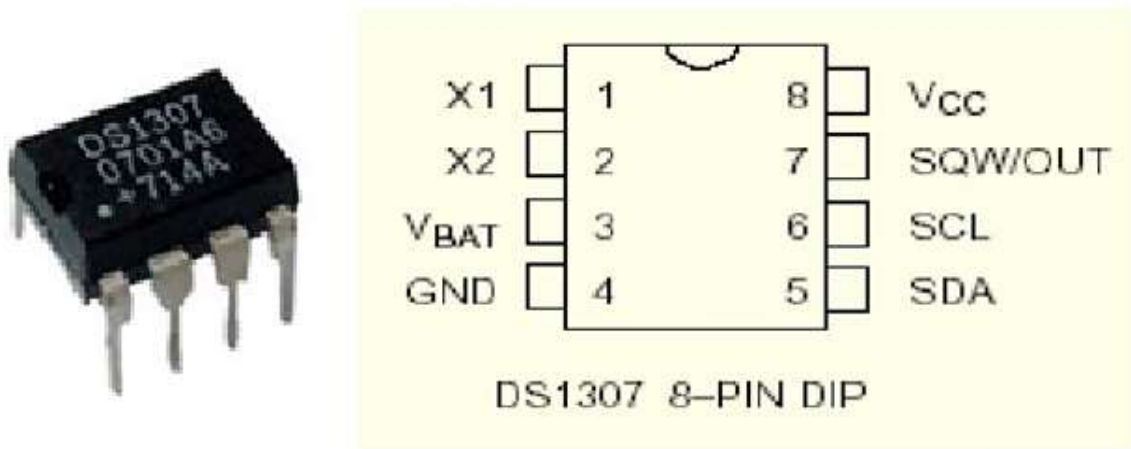


Figure 10

A **real-time clock (RTC)** is a computer clock (most often in the form of an integrated circuit) that keeps track of the current time. Although the term often refers to the devices in personal computers, servers and embedded systems, RTCs are present in almost any electronic device which needs to keep accurate time

Although keeping time can be done without an RTC, using one has benefits:

- Low power consumption (important when running from alternate power)
- Frees the main system for time-critical tasks
- Sometimes more accurate than other methods

Most RTCs use a crystal oscillator, but some use the power line frequency. In many cases the oscillator's frequency is 32.768 kHz. This is the same frequency used in quartz clocks and watches, and for the same reasons, namely that the frequency is exactly 2¹⁵ cycles per second, which is a convenient rate to use with simple binary counter circuits.

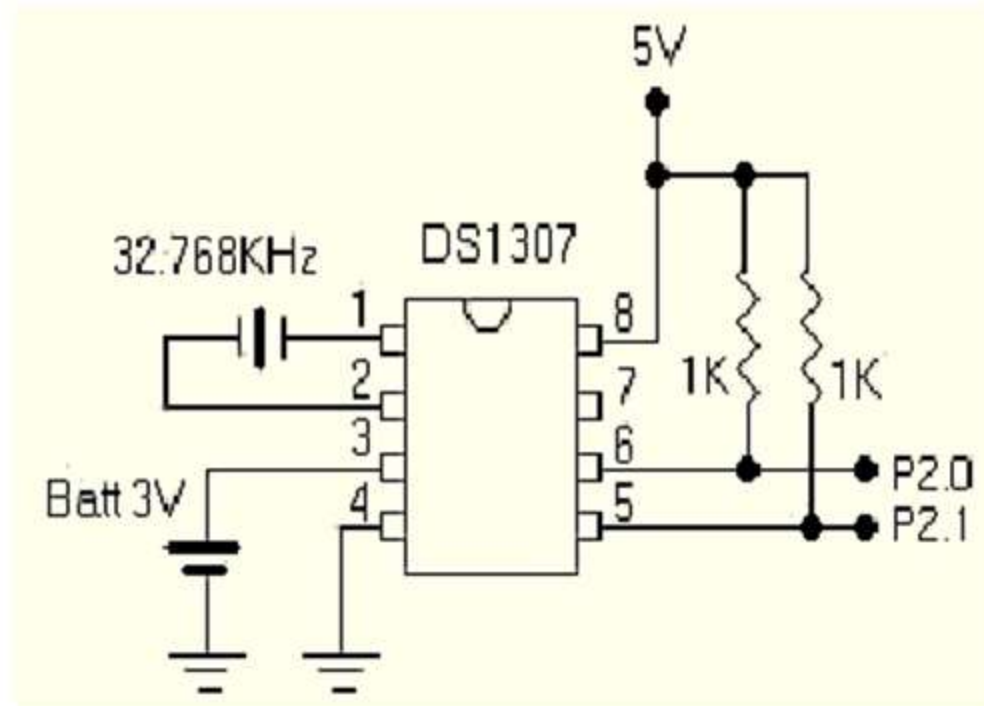


Figure 11

Features of RTC Ds1307:

- Real time clock counts seconds, minutes ,hours , date of month ,day of week and year with leap year compensation valid up to 2100.
- 56 byte nonvolatile RAM for general data storage
- 2-wire interface (I2C)
- Automatic power fail detect
- Consumes less than 500 nA for battery back-up

Liquid Crystal Display (LCD):



Figure 11

General Description of LCD:

- Alphanumeric displays are used in a wide range of applications, including palmtop computers, word processors, photocopiers, point of sale terminals, medical instruments, cellular phones, etc. The 16 x 2 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols. A full list of the characters and symbols is printed on pages 7/8 (note these symbols can vary between brand of LCD used). This booklet provides all the technical specifications for connecting the unit, which requires a single power supply (+5V).
- Available as an optional extra is the Serial LCD Firmware, which allows serial control of the display. This option provides much easier connection and use of the LCD module. The firmware enables microcontrollers (and microcontroller based systems such as the PICAXE) to visually output user instructions or readings onto an LCD module. All LCD commands are transmitted serially via a single microcontroller pin. The firmware can also be connected to the serial port of a computer.
- To display the notifications of dedicated charges and also to display the information. It contain certain characteristics like.
- 5 x 8 dots with cursor.
- + 5V power supply (Also available for + 3V).
- 1/16 duty cycle.

Buzzer:



Figure 12

- A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.

- **Uses:-**

1. Electronic metronomes.
2. Game show lock-out device.
3. Microwave ovens and other household appliances.
4. Sporting events such as basketball games.
5. Electrical alarms.

Relay Ras0510:

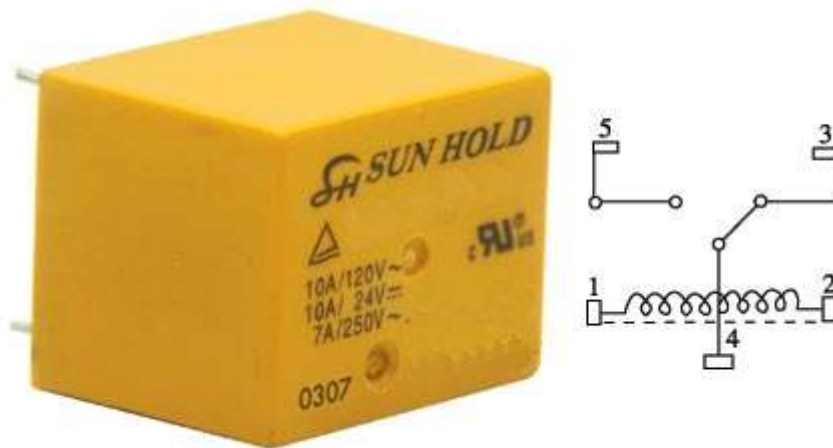


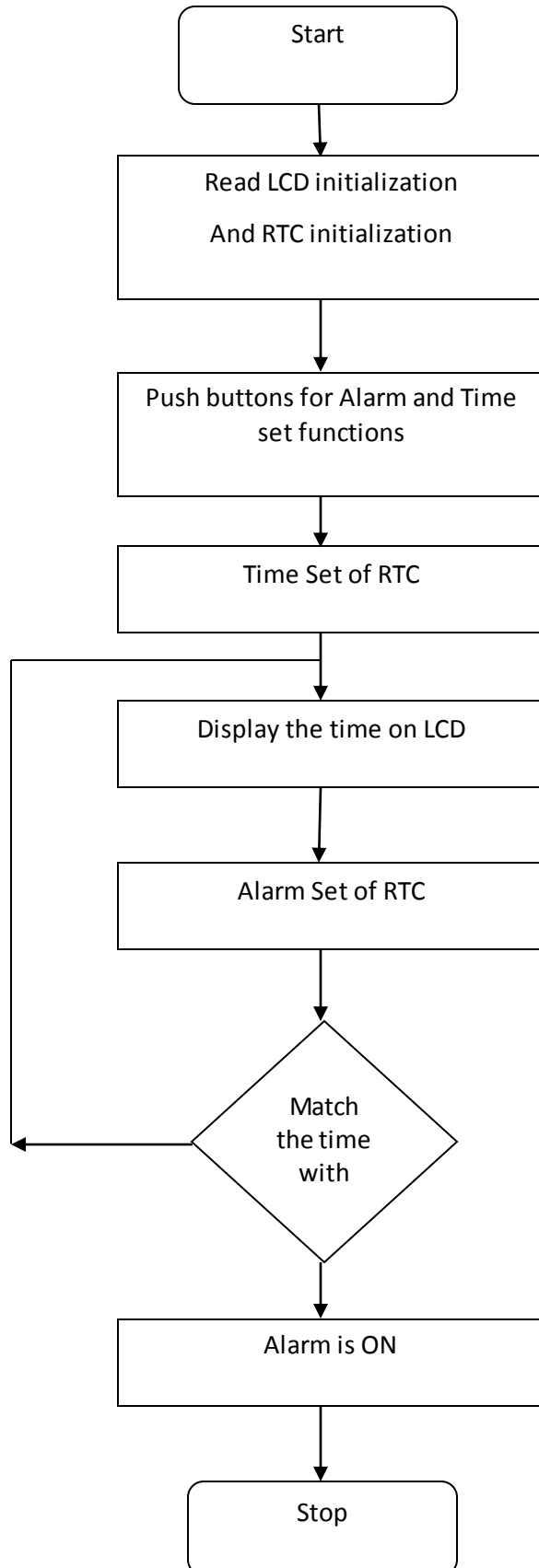
Figure 13

Feature:

- 5 VDC coil, 1 pole / 2 throw (SPDT), compact relay.
- Ideal relay for Electronics equipment.
- Silver alloys:
 - 24 VDC / 10A
 - 120 VAC / 10A
 - 250 VAC / 7A
- Pin Terminal.
- Sealed Plastic with epoxy resin.

Chapter – 5 Software Logic Explanations

Flowchart



ALGORITHM:

1. START
2. initialize LCD
3. clear LCD
4. print "Set Time" on LCD
5. set time with PUSH BUTTONS.
6. display time in LCD Display.
7. set alarm with push buttons.
8. if alarm is on, buzzer is on.
9. else display the time.
10. STOP

SOFTWARE DESCRIPTION

The software used by us in the project are:

1 - PROTEUS

2 – KEIL

1) PROTEUS is used for CIRCUIT DESIGNING.

2) KEIL is used for PROGRAMMING.

General Description:

- Proteus 7.0 is a Virtual System Modeling (VSM) that combines circuit simulation, animated components and microprocessor models to co-simulate the complete microcontroller based designs. This is the perfect tool for engineers to test their microcontroller designs before constructing a physical prototype in real time. This program allows users to interact with the design using on-screen indicators and/or LED and LCD displays and, if attached to the PC, switches and buttons.
 - One of the main components of Proteus 7.0 is the Circuit Simulation -- a product that uses a SPICE3f5 analogue simulator kernel combined with an event-driven digital simulator that allow users to utilize any SPICE model by any manufacturer.
 - Proteus VSM comes with extensive debugging features, including breakpoints, single stepping and variable display for a neat design prior to hardware prototyping.
 - In summary, Proteus 7.0 is the program to use when you want to simulate the interaction between software running on a microcontroller and any analog or digital electronic device connected to it.
-
- Keil Software to provide us with software development
 - Tools for the 8051 and 251 family of microprocessors.
 - With this tool, you can generate embedded applications for the multitude of 8051 and 251 derivatives.
 - 8051 and 251 development tools are listed below:
 - † C51/C251 Optimizing C Cross Compiler,
 - † A51/A251 Macro Assembler,
 - † 8051/251 Utilities (linker, object file converter, library manager),
 - † dScope for Windows™ Source-Level Debugger/Simulator,
 - † µVision for Windows™ Integrated Development Environment.

Codes of Project:

```
#include<reg51.h>
#include<string.h>
#include<rtc.h>

sbit led = P3^4;
sbit rw0 = P2^7;
sbit rw1 = P2^6;
sbit rw2 = P2^5;
sbit rw3 = P2^4;
sbit cl0 = P2^3;
sbit cl1 = P2^2;
sbit cl2 = P2^1;
sbit cl3 = P2^0;
sbit rel = P3^4;
sbit RS = P3^5;
sbit RW = P3^6;
sbit EN = P3^7;
sbit SDA = P1^1;
sbit SCL = P1^0;

bit new_sms = 0;
bit incoming_call_flag = 0;
unsigned char ms_count=0,reltime=0;

unsigned char time[7]={0x00,0x40,0x09,0x00,0x01,0x12,0x10},check[1];
unsigned char ALARM_time[7];
unsigned char keyboard()
{
    unsigned char key_number = 16;
    rw0 = 0;
```

```

rw1 = 1;
rw2 = 1;
rw3 = 1;

if(c10 == 0)
{
    key_number = 12;
    while(c10 == 0);//for key debounce it will wait here.
}
else if(c11 == 0)
{
    key_number = 13;
    while(c11 == 0);
}
else if(c12 == 0)
{
    key_number = 14;
    while(c12 == 0);
}
else if(c13 == 0)
{
    key_number = 15;
    while(c13 == 0);
}

rw0 = 1;
rw1 = 0;
rw2 = 1;
rw3 = 1;
if(c10 == 0)
{
    key_number = 0;

```

```

        while(c10 == 0);
    }
    else if(c11 == 0)
    {
        key_number = 1;
        while(c11 == 0);
    }
    else if(c12 == 0)
    {
        key_number = 2;
        while(c12 == 0);
    }
    else if(c13 == 0)
    {
        key_number = 3;
        while(c13 == 0);
    }
    rw0 = 1;
    rw1 = 1;
    rw2 = 0;
    rw3 = 1;

    if(c10 == 0)
    {
        key_number = 4;
        while(c10 == 0);
    }
    else if(c11 == 0)
    {
        key_number = 5;
        while(c11 == 0);
    }

```

```

else if(c12 == 0)
{
    key_number = 6;
    while(c12== 0);
}
else if(c13 == 0)
{
    key_number = 7;
    while(c13== 0);
}

rw0 = 1;
rw1 = 1;
rw2 = 1;
rw3 = 0;

if(c10 == 0)
{
    key_number = 8;
    while(c10 == 0);
}
else if(c11 == 0)
{
    key_number = 9;
    while(c11 == 0);
}
else if(c12 == 0)
{
    key_number = 10;
    while(c12 == 0);
}
else if(c13 == 0)

```

```

    {
        key_number = 11;
        while(c13 == 0);
    }
    return(key_number);
}

void mydelay(int time)
{
    int y,z;
    for(y=0;y<time;y++)
    {
        for(z=0;z<1275;z++);
    }
}

void delay()
{
    unsigned int j;
    for(j=0;j<300;j++);
}

void small_delay()                                //30ms if x'tal is 12mhz.
{
    unsigned int j;
    for(j=0;j<40000;j++);
}

void long_delay()                                //65ms if x'tal is 12mhz.
{
    unsigned int j;
    for(j=0;j<65000;j++);
}

```

```
void lcd_command(unsigned char lc)
```

```
{  
    P0 = lc;  
    RS = 0;  
    RW = 0;  
    EN = 1;  
    delay();  
    EN = 0;  
}
```

```
void lcd_data(unsigned char ld)
```

```
{  
    P0 = ld;  
    RS = 1;  
    RW = 0;  
    EN = 1;  
    delay();  
    EN = 0;  
}
```

```
void lcd_string(unsigned char row_add, char *str_base)
```

```
{  
    unsigned char i=0;  
    lcd_command(row_add);  
    while(*str_base != '\0')  
    {  
        lcd_data(*str_base);  
        str_base++;  
    }  
}
```

```

void lcd_init()
{
    lcd_command(0x38);
    lcd_command(0x0C);
    lcd_command(0x01);
}

void main()
{
    unsigned char temp;
    rel=0;
    lcd_init();
    lcd_command(0x01);
    lcd_command(0x0E);
    lcd_string(0x80,"REAL TIME CLOCK");
    lcd_string(0xC0,"TIME:");
    while(1)
    {
        RTC_Read();
        RTC_Display();
        buzzer();
        temp = keyboard();
//        lcd_command(0x80);
//        lcd_data(temp+0x30);
//        mydelay(100);
        if(temp!=16)
        {
            if(temp==15)
            {
                RTC_Edit();
            }
        }
    }
}

```

```
    }  
    if(temp==10)  
    {  
        ALARM_Edit();  
    }  
}  
}  
}
```


Chapter – 6: Bill of Material

No.	Name of Component	Nos.	Price
1.	LCD Display 16*2	1	180
2.	Microcontroller AT89S52 + Socket	1	70
3.	RTC Ds1307 + Socket	1	60
4.	General Purpose PCB	3	120
5.	IC7805	1	20
6.	Two Port Connector	2	30
7.	Capacitors-33pf & 10uf	3 & 1	15
8.	12v Battery + Cap	3	60
9.	Resistor and LED	6,2	15
10.	Variable Resistor	2	20
11.	Buzzer	1	40
12.	LCD Display Connectors(Male-Female)	1	25
13.	RTC DS1307	1	50
14.	Relay - Ras0510	1	50
15.	Crystal Oscillator- 11.0592 and 32.768MHz	2	40
16.	Push buttons	14	112
17.	3v cell	1	50
18.	Adapter Socket	1	20
		Total	977

Chapter – 7: Troubleshooting

- Vcc and Ground was shorted by the Push Buttons.
- Instead of Use of Push button, we used the SPDT relay Start and Stop the alarm.
- We tested output of LCD and RTC independently to check it's properly working.

Chapter – 8: How to run project

1. Initially burn the program to the 8051 microcontroller.
2. Now give the connections as per the circuit diagram.
3. Switch on the board supply.
4. Now you can observe the time on LCD, if you want to set the time make the start pin low and press the push button.
5. LCD show set time message, now use push button for setting time.
6. Now make start pin high to run the clock.
7. To set the alarm set the alarm with the push button and set hour and minute.
8. When the alarm time matched with Real Time, the alarm will ON and the Buzzer is on.

Chapter – 9: Future Enhancement

- In the future we will implement in our project that we use any sensor and displays its value in display and recorded in the PC.
- In our project we also implement GSM module for give the data to Mobile from the circuit.
- To reduce the circuit are in future we implement this on the advance controller.

Chapter – 10: Conclusion

- On working this project we conclude that to varied the time and functions to set the alarm on the Digital Clock, which sated particular time the buzzer will be ring up and indicate the time of alarm has been exceed at the sated time.

Chapter – 11: Reference

www.engineersgaurage.com

www.circuitstoday.com

www.8051projects.com

www.sunrom.com

www.mikroe.com

Photo of Our Project:

