

Microcontroller and LCD Based Digital Bangla Clock cum Calander

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Abstract— In this paper, a microcontroller and lcd based digital Bangla clock has been constructed with ATmega8 and its software is written with Basic language. The designed clock is reliable, portable and fully functional and its Bangla digits are displayed accurately with a 16*2 lcd display. The clock is also functional in dual language mode both English and Bangla.

Keywords— Bangla, clock, Display, microcontroller, 16*2 lcd

I. INTRODUCTION

Now a day time and date is most important .clock is so important to provide time. Mechanical clock is available from the beginning. At present mechanical clock also converted into digital clock. But most of the digital clock represents time and date in English. According to mother tongue native language is important, easy to understand and favorite for all kind (literate and illiterate) of people in a country than English. In Bangladesh Bangla is our native language. There are many illiterate people than literate people. In this paper, a microcontroller based Digital Bangla Clock with calendar has been designed and constructed. Here, we used 16*2 LCD displays and an AVR microcontroller ATmega8 from ATMEL and other necessary elements as per our design requirement. This clock with calendar also operates in Bangla This calendar also shows the date, month and year in Bangla. Digital Bangla Clock with Calendar displayed all the character in Bangla language when it operate the bangle mode

II. GENERAL OVERVIEW OF THE SYSTEM

The bangla clock basically consists of four blocks as shown in figure (2). They are AVR microcontroller (ATmega8), key button, display unit, 5v power supply. A detail description of each block has given below.

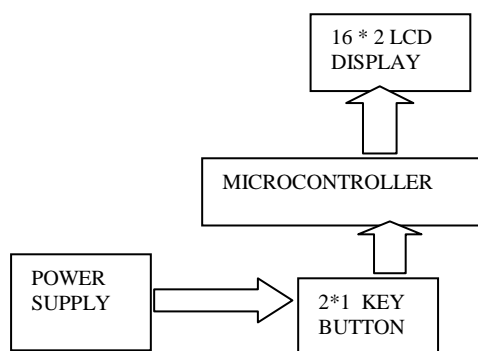


Fig.1 Block diagram of the proposed device.

English Digits	Bangla Digits
0	০
1	১
2	২
3	৩
4	৪
5	৫
6	৬
7	৭
8	৮
9	৯

Fig.2 Equivalent Bangla Digit

A. The ATmega8 Microcontroller

A microcontroller often serves as the “brain” of a mechatronic system. Like a mini, self-contained computer, it can be programmed to interact with both the hardware of the system and the user. Even the most basic microcontroller can perform simple math operations, control digital outputs, and monitor digital inputs. Most modern controllers have analog-to-digital converters, high-speed timers and counters; interrupt capabilities, outputs that can be pulse-width modulated, serial communication ports, etc. ATMEGA8 is one of the most popular microcontrollers used specially in automotive, industrial appliances and consumer applications. High-performance, Low-power Atmel AVR 8-bit Microcontroller. The low-power Atmel 8-bit AVR RISC-based microcontroller combines 8KB of programmable flash memory, 1KB of SRAM, 512K

EEPROM, and a 6 or 8 channel 10-bit A/D converter. The device supports throughput of 16 MIPS at 16 MHz and operates between 2.7-5.5 volts.

Some Key Parameters are given below

Parameter	Value
Flash (Kbytes)	8 Kbytes
Pin Count	32
Max. Operating Frequency	16 MHz
CPU	8-bit AVR
No of Touch Channels	12
Hardware QTouch Acquisition	No
Max I/O Pins	23
Ext Interrupts	2
USB Transceiver	0
Quadrature Decoder Channels	0

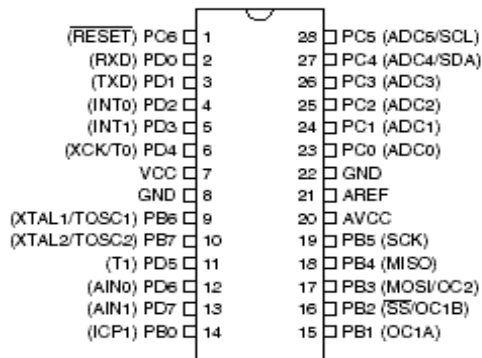


Fig 3. ATmega8 Pin-out Diagram

B. KEY BUTTON

We have only used six key buttons. The first three buttons represents second, minute and hour are connected to PA0-PA2 sequentially. The another three buttons represents day, month and year are connected to PA4-PA6 sequentially. To prevent the debouncing and to balance the current we have used resistors microcontroller pin to ground.

C. DISPLAY BUTTON

In our project we used 16*2 LCD (Liquid crystal display). We connect the data port of LCD (D4 - D7) to microcontroller PORTA (PD4 – PD7).The RS and E pin connected to the PORTA.2 and PORTA.3 accordingly .The RW and Vss pin of LCD connected to the ground. 5v power supply also connected to Vcc pin of LCD.

D. POWER SUPPLY

For both LCD and microcontroller requires 5v DC supply .The power supply unit is designed which consist 230 v transformer is used with output voltage of 9v. There also used four IN4007 diodes for making bridge rectifier. Bridge rectifier also used to convert AC to DC supply. There used capacitor (1000µF) to minimize the ripple voltage and smooth the DC voltage.

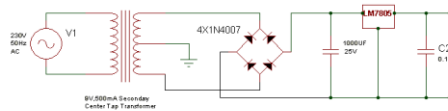


Fig. 4 Circuit diagram of 5V power supply

III. BANGLA FONT DESIGN

We can design BANGLA characters for LCD-text displays by using LCD Designer. The LCD-matrix has 7x5 points. The bottom row is reserved for the cursor but can be used. If a cell was selected it will be unselected. Clicking the Set All button will set all points. Clicking the Clear All button will clear all points. At finishing time we press the Ok button then a statement will be inserted in our active program-editor window at the current cursor position. The statement looks like this

‘Deflcdchar 7,31,17,17,31,1,1,1,32’

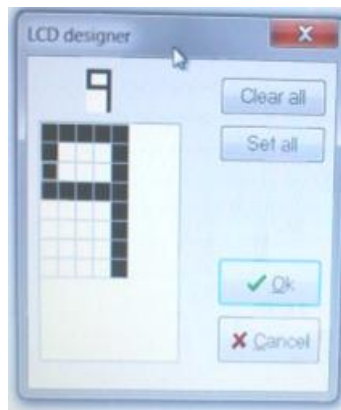


Fig. 5 Bangla font design for ‘7’

IV. METHODOLOGY

The TIME\$ variable is used in combination with the CONFIG CLOCK and CONFIG DATE directive. The CONFIG CLOCK statement will use the TIMER0 or TIMER2 in async mode to create a 1 second interrupt. In this interrupt routine the _Sec, _Min and _Hour variables are updated. By assigning TIME\$ and DATE\$ to a string variable these variables are assigned to the TIME\$ and DATE\$ variable respectively. The TIME\$ and DATE\$ variable assigned with a constant or other variable, the _sec, _hour, _min, _day, _month and _year variables will be changed to the new time. This is done for minimal code. In our programme first we make bangla font of each English digit. Then we call the bangla font according to time and date. We replace each english digit by equivalent bangla digit. To run this device we need software. It can be done by BASCOM compiler. we had to declare and initialize some variables (D, H, M, m, S and Y) to control this programme. Variable K is incremented by the pin is high. The 1st, 2nd, 3rd, 4th variables represents the variable H, M, S which represents hour, minute, second. the programme will check that S=60, if S=60 it increments the value of M and do S=0. The programme will check that M=60, if M=60 then it increments the value of H and do M=0. if H=12 then do H=0. The programme will display the bangla digit with respect to S, M, H. The 1st, 5th, 6th variables represents the variable D, m, Y which represents day, month, year. the programme will check that D>31, if D>31 it increments the value of m and do D=1. The programme will check that m>12, if m>12 then it increments the value of Y and do m=1. The programme will display the bangla digit with respect to D, m, Y.

V. ADVANTAGES OF OUR PROPOSED DEVICE

1. Easily affordable.
2. Easily portable.
3. It can be used by anyone.
4. Control process of this device is so easier

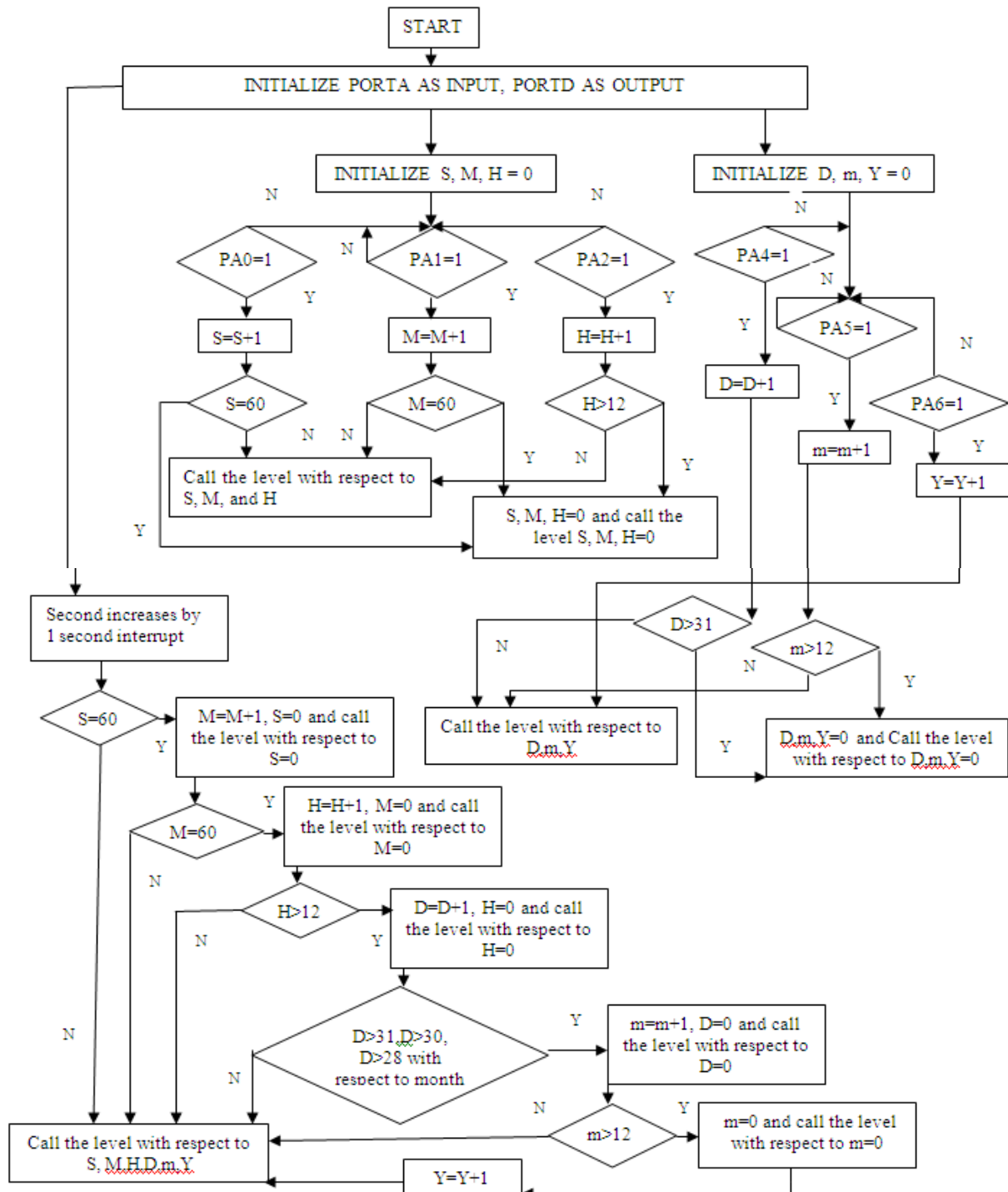


Fig.6 Flow chart for software

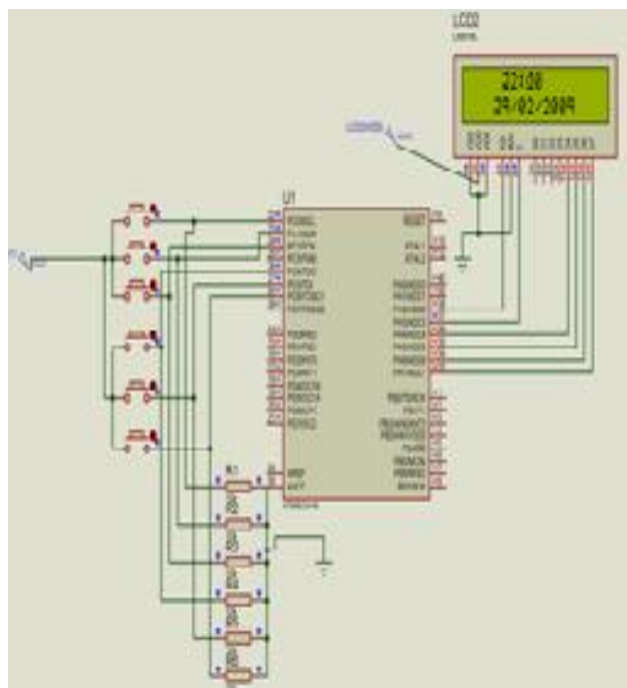


Fig.7 Proteus Simulation of proposed device

VI. CONCLUSION

We have designed a unique microcontroller and lcd based intelligent bangla clock cum calendar successfully. There are many illiterate people who are not familiar with English but with their native language. This proposed device is very helpful for them because it do his job with the native language Bangla .Its required power is very low. To make it user friendly we have kept different button for second, minute, hour, day, month and year to operate the device .Overall we are very hopeful about our proposed device.

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