KEYBOARD DRIVEN ELECTRONIC NOTICE BOARD

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ABSTRACT

There are many places like college, share-market, railway stations, restaurant, hospital etc. which require the use of notice boards.

An Electronic Notice board will be useful in such places because: 1. Students gather at one notice board when results are announced, which creates chaos. Most of the times the relevant information is torn out and can't be read by the students. 2. Sometimes, the notices are missed by the students because of many reasons like lack of knowledge as to where the information is displayed.

This paper deals with the innovative manner of displaying the message to the people using keyboard driven electronic notice board. With this notice board, instantly received information can be displayed by entering the message through the keyboard. Also the time wasted in pasting paper notices will be saved. Various commands are used to display the required information on the notice board. The hardware board contains microcontroller AT8951 as its main component. The hardware also contains flash memory EEPROM 24c02. The EEPROM is used to store the messages which will be displayed on the notice board. The hardware also contains 5X7 LED dot matrix display attached to AT8951. The coding of microcontroller will be done using embedded C and Keil.

Key Words: EEPROM 24c02, Embedded C, Keil, 5X7 LED Dot Matrix Display, Microcontroller AT8951

I. INTRODUCTION

The use of embedded systems has given rise to many interesting applications which ensure a restful and secure human life. Now-a-days notice boards are widely used ranging from schools to large organizations to convey messages. A lot of paper is wasted by organizations for displaying the message. This leads to a lot of cutting of trees for paper extraction. Small steps are taken to improve the technology and reduce the use of paper. The main idea is to design a keyboard driven electronic notice board. The figure shows a block diagram of the system.

By using this project it is possible to display a message on a moving LED pattern. We use Keyboard as the main component and send the message to the particular Notice Board. Data from the keyboard is sent to the microcontroller via serial port. It gets into the microcontroller and is stored in the memory.

This project can be divided into two parts. One is the keyboard connectivity and second is the moving display board.
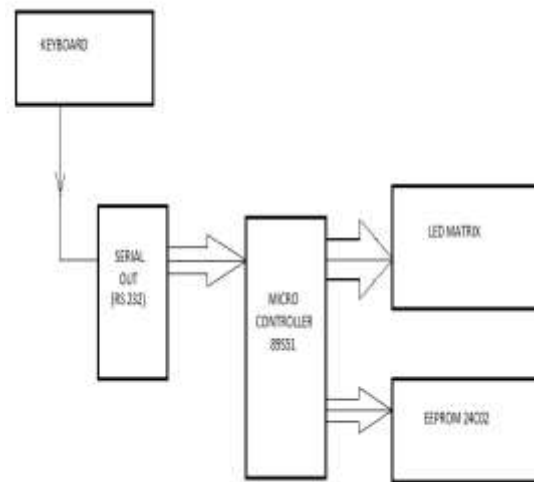
Fig. 1 Block Diagram

II. OPERATION

In this project we use 8951 as a main microcontroller and with the help of this microcontroller we move the data on led matrix. In addition with 8951 microcontroller we use IC 74154 (2) + 74138 + 24c02 memory + keyboard interface socket. Power supply is provided internally.
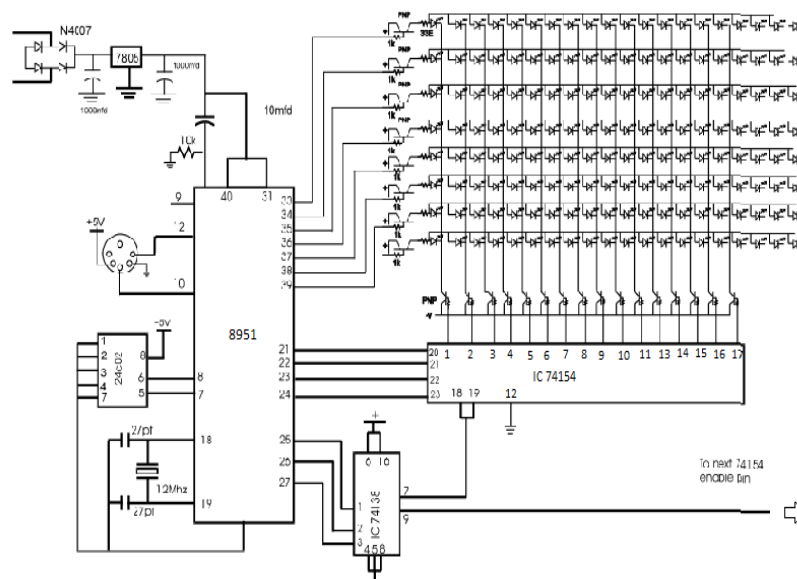

Fig. 2 Circuit Diagram

We provide 220V power supply and then we step down it to 12V by transformer and we use rectifier (IC N4C07).Then we use regulator (IC 7805) to convert 12V into 5V.and then power supply is given to the circuit through pin 31 and 40 of microcontroller. The microcontroller we use is 8951 i.e. the series of 8051. It has 8kb ROM, 256 byte RAM, 3 Timers and counter and 8bit processor. And then we interface memory (IC 24C02) with its pin 7 and pin 8. Memory is used to save data entered from keyboard. And when we will run the program, then whatever is saved in the memory is displayed according to the length and width given. Crystal oscillator is used to give clock pulse to machine cycle.

Data is to be continuous change in process and scanning is done by the IC74154. IC 74154 is 16 pin de multiplexer. Enable pin of the IC 74154 is control in the time of scanning. When one IC completes the 16 lines then second IC scan the L.E.D. To control the enable pin of IC 74154 we use IC 74138 (3 line to 8 line decoder). IC 74138 controls the switching of the IC 74154. We use IC 74138 because in future if we use more L.E.D. lines then we use more 74154 IC and with the help of 74138 we can control up-to 8 74154 ICs.

Here we use serial keyboard to enter the data from the keyboard to the micro controller. In the serial connector of the keyboard, there are total 5 pins. Out of these 5 pins, 2 pins are for positive and negative supply. Other 2 pins for serial data transfer.

III. RESULTS AND DISCUSSION

After the connection of the circuit and a thorough study of the individual components used in the system, the procedural usage of the commands required for displaying a message on the notice board has been recorded and will be shown in the form of flow charts.
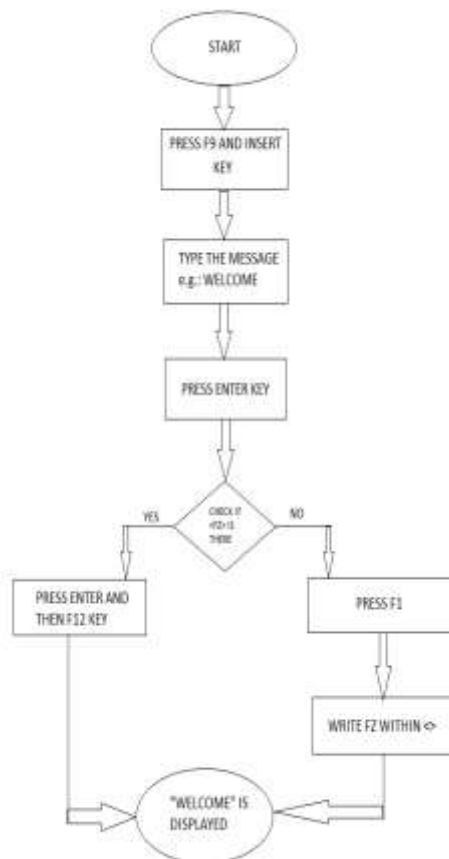
Fig. 2 Flow Chart 1
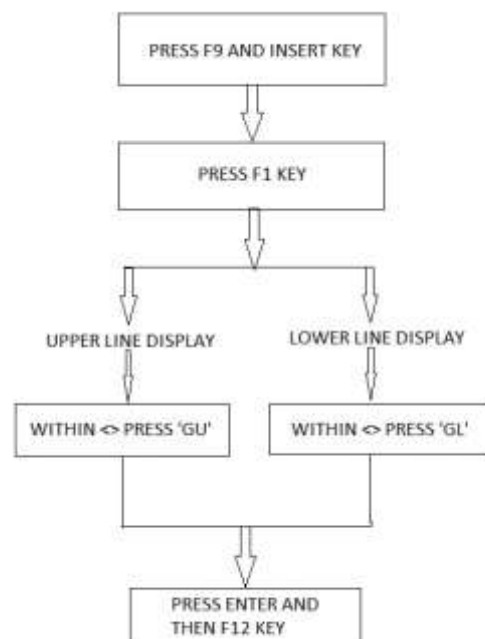
Fig. 3 Flow Chart 2

Each of the flow charts describes a sequence of steps required for performing different actions w.r.t. the display of the message on the notice board.

3.1 Initialization of the System and Message Display

Switch on the power supply and press the Start button. Wait for the default message to display. Press F9 and Insert key. Type the message to be displayed and press the Enter key. Check if <FZ> is displayed. If yes, press the Enter key and then F12 key. If no, press F1 and then write FZ within < >. The message will be displayed. (Fig. 2)

3.2 For Dual-Line Format When The Message Has Already Been Displayed

When the given message has been displayed, one might want a message to be displayed in the upper or lower line. In that case, press F9 and then the Insert key. Then press F1 key.

If a upper line display is desired, type 'GU' within < >. If a lower line display is desired, type 'GL' within < >. Then press Enter key followed by F12 key. (Fig. 3)

3.3 For Deleting The Message

When the message need to be deleted (generally in a case where the new message is to be displayed or a previously displayed message has errors), press F9 key followed by the Insert key. Move the cursor to the point where a deletion has to be made. Press the Backspace key. Press the Enter key followed by F12 key. (Fig. 4)
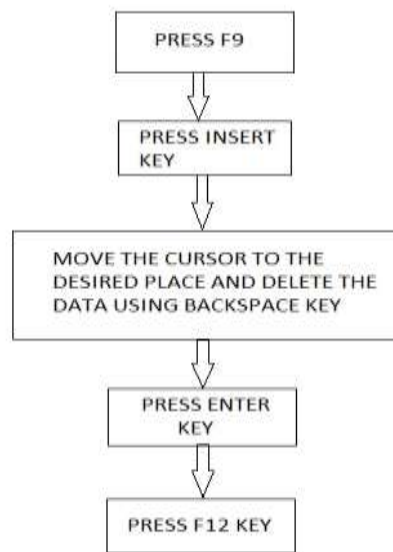
Fig. 4 Flow Chart 3

IV. FUTURE ASPECTS

4.1 Robots can be controlled in a similar fashion by sending the commands to the robots. These commands are read by using AT commands and appropriate action is taken. This can be used for spy robots at distant location, utilized by the military to monitor movement of the enemy troops.

4.2 Currently farmers have to manually put on or off pumps, drippers, etc. by using electric switches. Using the principle of AT commands we can put on or off these appliances remotely.

4.3 In our project we are sending message via keyboard and displaying on an LED. The same principle can be applied to control electrical appliances at a distant location using wireless communication.

4.4 Voice alarm circuit can be added to the system.

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