Microcontroller-based scrolling display

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Abstract

In this paper we have focussed on emerging a scrolling LED display by using the simplified Printed Circuit Board (PCB). In this paper we have explained designing of the circuit and assembly of the electronic components. A scrolling display has many applications in various field which includes presenting attractive advertisements and messages to broad audiences. This sort of display is an early stage of growth in the process of modern displays like LCDs, LEDs, OLEDs, etc. The basic principle used for scrolling display is based microcontroller process, we have also designed the code for the same. The initial stage of our work is to study the working of displays which is widely known and quite popular at the application point of view. Persistence of vision for the any work is essential for the fabrication and execution of the project. Time required for execution of operation is in the range of microseconds, which is bit impossible for mankind. Therefore, with the help of micro controlling and coding approach, we are looking Forword. Therefore, here engineering aspects of electronics as well as computer come into picture which plays vital role in our project. With the help of microcontrollers, ICs, transistors, we were able to do project effectively.

Keywords: *PCB, Microcontroller, Scrolling display.*

Introduction:

In computer displays, scrolling or sliding text, images, or video across a monitor vertically or horizontally. When we are talking about scrolling display, basically it is not associated with change the layout of the text or pictures but it is associated with movement of the user's view across what is apparently visible. In an ordinary display of television or computer or mobile, there are numerous special effects are used for scrolling phenomenon [1] while leaving the background remains in a stationary position. Scrolling may take place completely without user intervention or interactive device, it can be triggered by a touchscreen or a keypress and continue without further intervention until a further user action, or be entirely controlled by input devices.

 Scrolling may take place in discrete increments. such a scrolling models are very useful in chain hotels and restaurants where they can show special offers and special menus for particular day. In colleges, they can display special events and news for students [2]. Frame rate is the speed at which an entire image is redisplayed. It is related to scrolling in that changes to text and image position can only happen as often as the image can be redisplayed.

Problem Defination:

When we are associated with the events which includes large crowds, sometime, it is essential to convey the message altogether. Such messages could be short or long. In the case of short messages, it is easy to fulfil the requirement as it can be done on a small display. But it is not possible to do so with the long ones with the loss of a chuck of data. The entire message can also be displayed but then it would require the development of a large display which would require an enormous amount of space and money. Moreover, as these messages are not constant and may be required to be changed regularly, having a single display may cause problems, especially considering that most of the consumers of these products are small shop owners who cannot afford to spend large amounts from their budget on marketing alone. A scrolling display aims to solve this issue. Being concise in size and using cheap electronic components it is a very economical solution to the problem. What it

does is takes a text message and keeps it rolling continuously over the screen repeatedly. Therefore, a message with any length can be displayed on this small screen.

Advantages of this module:

- Completely Indigenized Indian Design
- Highly Modular construction of flexible Size.
- Multiple Inputs via specialized Software.
- Customized as per the Applications.
- Impact Resistant.
- Weatherproof.
- Portable & Highly Modular.
- High Viewing Angle.
- Monochrome Graphics.
- Low Maintenance Cost.
- Long Durability & High Quality

System Design

The following components were used in the development of the display:

1. General Purpose PCB

2. 7x5 Dot Matrix Display (Common Anode)

3. IC: CD74HC595 (8-Bit Shift Register)

4. Microcontroller: N79E352R

5. n-p-n Transistors

The following engineering processes were involved:

1. Soldering

2. Cutting

3. Trimming

4. Stipping

5. Programming

Circuit Diagram
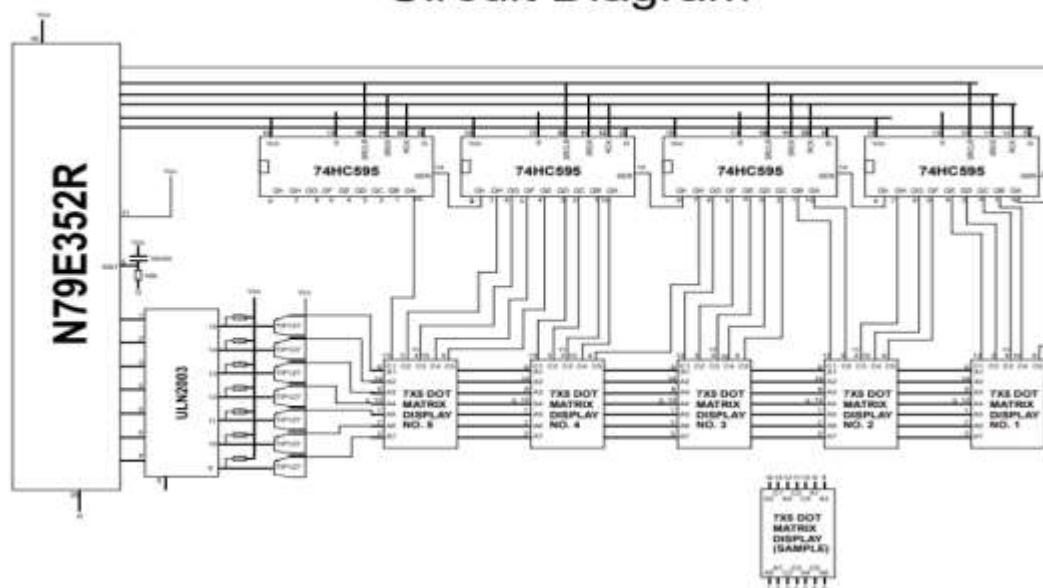
This prototype facilitates to be integration with a computer and further displays a message. Only one SMS can be displayed at a time. These limitations can be removed using higher-end microcontrollers and extended RAM. The prototype can be implemented using commercial display boards [3]. In this case, it can solve the problem of instant information transfer. With advancements in technology, these displays can be further developed. And they already have been like in the case of mobile phone screens and other screens like Television and Laptops. Such display can now be

controlled with the touch of fingers and the lag is so low that it is not even noticed. Newer displays can even physically be folded hence increasing the mobility of mobile devices even more.

Conclusion:

The prototype of a LED scrolling display was successfully designed. It accepts the message/information, stores it, validates it and then displays it in the LED display. The message is deleted from the EEPROM each time it is read, thus making room for the next message. In future, holographic displays can be developed or even displays that are so thin that they are not even noticeable to the human eye.

References:

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