

# Design of Wireless Dot Matrix Printer

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**Abstract**— Major problem of Dot matrix Printer is its connection. Difficult to connect and disconnect again and again if different users are going to use different stations. This paper will solve the problem of connection by making it easy to connect wirelessly through ZigBee technology. ZigBee technology is advantageous in terms of range, coverage area, etc. It is very compact and easy to handle.

**Index Terms**—ZigBee, PIC(Peripheral Interface Controller), microcontroller

## I. INTRODUCTION

Now-a-days also dot matrix printers are used in many commercial and industrial applications; educational Institutes, government offices as well as medicals also use dot matrix printers. But one of the major problems in the use of the dot matrix printers is that it is non-portable i.e. it is very bulky and difficult to carry from one place to another. Also the connector pins are very delicate so it has to be handled with care. If any of the pin is broken or bended then it becomes very difficult to connect the connectors to the port. So in such cases the WIRELESS DOT MATRIX PRINTERS is very useful and print it without any wired connection between the two. The basic idea behind this project is to receive the data from the computer. Whenever a dot matrix printer is in use a major problem of connection arises. If the printer is connected to one computer then it cannot be connected to other computers at the same instant. So there was a need to solve this problem. In order to solve this problem if a single printer is connected to many computers it would become easy for a user to take the printouts. Also the bulky dot matrix printer would become portable and easy to use.

## II. BACKGROUND

The low cost allows the technology to be widely deployed in wireless control and monitoring applications, the low power-usage allows longer life with smaller batteries, and the mesh networking which promises high reliability and larger range. Today in market different types of printers are available. Such as thermal printers, laser printers, inkjet printer, dot matrix printers. The basic printer amongst them is the dot matrix printer. Dot matrix printers are used in banks, railway booking center, insurance companies etc. But all the dot matrix printers are wired one.



Fig.1. wireless thermal printer



Fig.2 Wireless Laser Printer

Above specified printers are available in market with Bluetooth technology as wireless option. But there is not a single system available with dot matrix printer. So this paper describes the solution for the same one. Let us review Dot matrix printer first. Printer diagram and connections are given below.

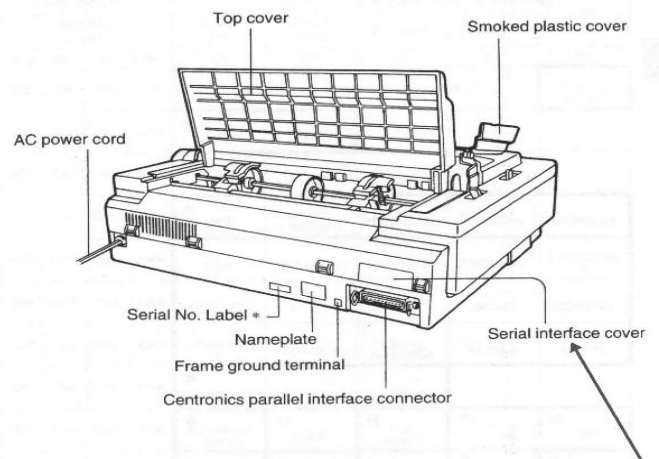


Fig.3 Dot Matrix Printer

## III. TECHNOLOGY COMPARISON

In market different technologies available are Bluetooth, Wi-Fi, ZigBee, etc. Bluetooth is one tough competitor to ZigBee. Comparison of which is given in following table. All technologies work in 2.4 GHz band. Some features differentiate ZigBee technology from others in terms of range, power consumption and much more. Comparison of various technologies available is briefed in following table.

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	ZigBee	802.11 (Wi-Fi)	Bluetooth
<b>Data Rate</b>	20, 40, and 250 Kbits/s	11 & 54 Mbits/sec	1 Mbits/s
<b>Range</b>	10-100 meters	50-100 meters	10 meters
<b>Complexity</b>	Low	High	High
<b>Power Consumption</b>	Very low	High	Medium

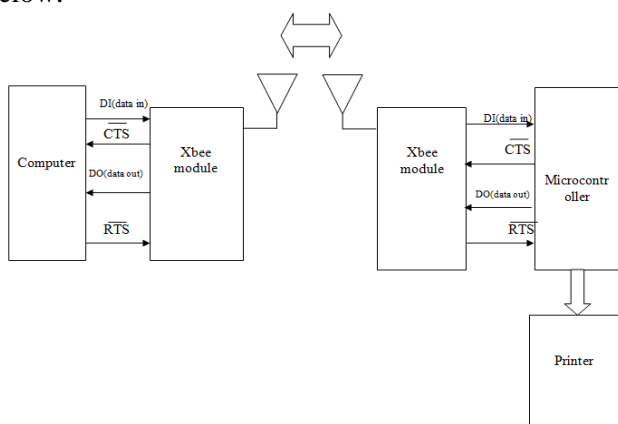
## IV. OVERVIEW

System overview diagram is shown below. Generalized connections of system are shown here. It will use ZigBee transmitters and receiver modules as well as computer and printer i.e. dot matrix one.

The basic idea of system is going to run is elaborated here. The data which is to be printed is transmitted using the zigbee modules. There is a serial interface between zigbee module and the computer. This data is then received by another zigbee module which is connected to the controller. The transmission and reception of the data is based on RS-232 standard. The controller stores the data in its serial buffer. This data is then given to the printer for printing. There is a parallel interfacing between the controller and the printer. The data is transmitted bit by bit. In this way the printing process would take place. Details of ZigBee modules:



The data which is to be printed then comes to the xbee modules. Zigbee series1 modules have been used. As mentioned earlier zigbee is a wireless control that simply works. The working of the zigbee modules can be explained with the help of the block diagram shown below.



### DI (Data in Buffer):

When the data enters the RF module through the DI pin (pin3), the data is stored in the DI buffer until it can be processed.

### RF TX Buffer:

The processed data is then given to the RF transmitter buffer. This buffer is use to store the data which is to be transmitted. This data is then given to the transmitter block. The transmitter block then transmits the data via antenna. Similar type of operation takes place in case of reception of the data. The data received is first stored in the receiver block.

### DO (Data Out) Buffer:

When RF data is received, the data enters the DO buffer and is sent out the serial port to a host device. Once the DO Buffer reaches capacity, any additional incoming RF data is lost. Zigbee modules as mentioned earlier are transceiver devices. Hence the data which is to be printed is transmitted by one zigbee module and is received by another zigbee module.

### Microcontroller:

After the zigbee modules the next block in this system is the microcontroller block. The controller is the brain of the system. The input to the controller comes from the zigbee modules. The controller then processes the data which is to be printed. The output of the controller is given to the printer. To serve the purpose different controllers such as PIC etc. can be used.

### Printer:

The printer used is the dot matrix printer.

## V. CONCLUSION

In this way an attempt has been made to solve the problem of dot matrix printers by making it portable and easy to use. The problem of connecting it again and again to the different computers has been reduced to great extent. Also the printer is made user friendly by employing such type of system. The printer can be now kept at one place and the prints can be given from different computers this reduces the damage cause to the printer as well as it reduces the human efforts.

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