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Optical Fibre Voice Retrieval

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ABSTRACT

*:***In this article, the optical fiber link is used to send pre-recorded voice from one end to another end. One can record his voice message from one end defined as slave unit. On the other end, one can listen to the pre-recorded voice by the help of specified code (digital code lock) at master unit. This communication is completed with the help of optical fiber link that is used. The voice recording and playback IC (APR 9301) is playing a vital role in this model. This IC is capable to record and play the voice upto few seconds.**

***Keywords:*Microcontroller (AT89C2051), Voice Recording IC (APR 9301), LCD, MIC, Optical Fibre Link Network (OFLN), Speaker, IR Transmitter, IR Receiver.**

I. INTRODUCTION

Before fibre optics came along, the primary means of real-time, reliable data communication was electrical in nature. It was accomplished using copper wire or by transmitting electromagnetic (radio) waves through free space. Fibre optics changed that by providing an alternate means of sending information over significant distances — using light energy. Although initially a controversial technology, fibre optics has today been shown to be very reliable and cost-effective. The fibre optic cable has lower energy loss and wider bandwidth capabilities than copper wire. Fibre optic communication is a quite simple technology, and utilizing electronic technology to a large extent. In fact, it was researched in electronics that established the groundwork for fibre optics to develop into the communications giant that it is today. Fibre optics became reality when several technologies came together at once. It was not an immediate process, nor was it easy, but it was most impressive when it occurred.
Optical fibre link is very secure medium for voice and data transfer, so we use this advantage in this model.

II. OBJECTIVES

The main objectives of this model are:

- Greater information transfer capability.
- Transmission over long distance.
- Reduces the chance of loss of information.
- Secure way of transmission of information due to code lock system.

III. BLOCK DIAGRAM

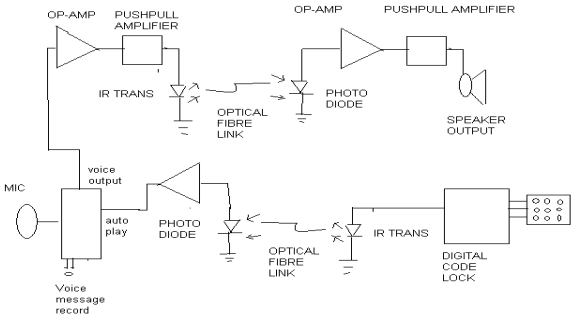

Fig.1 Block Diagram of OFVR

IV. PROPOSED WORK:

The proposed work implies that what type of challenges we have to face during the implementation of this modeland what should be done to achieve our goal.

- To transmit the information in secure way.
- Information can be easily transferred from one end to another end.
- Greater information can be transmitted over long distance.
- LCD screen is used to display the password.

- Code lock system enables the further transmission of information.

V. COMPONENT DESCRIPTION:

The key components for the project are:

- Microcontroller AT89C2051
- Code Lock
- LCD
- IR Transmitter& Receiver

- *AT89C2051:* The AT89C2051 is a low-voltage, high-performance CMOS 8-bit microcomputer with 2K bytes of Flash programmable and erasable read only memory (PEROM). The device is manufactured using Atmel's high-density non-volatile memory technology and is compatible with the industry-standard MCS-51 instruction set. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C2051 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications.

- *Code Lock:* This simple code lock project is based on a 20-pin ATMEL microcontroller AT89C2051. It employs a 4-digit sequential code with time-out security feature.

In addition to microcontroller, the circuit uses a single additional IC (CD4050) and a transistor to drive a relay. Although the project uses a liquid-crystal display (LCD), it is useful for design and developmental purpose only and is not really an essential part of the circuit. The same can be removed from the circuit without any change in the software.

- *LCD*: LCD's typically have 14 data pins and 2 for the LED backlight. Character LCDs use a standard 14-pin interface and those with backlights have 16 pins. There may also be a single backlight pin, with the other connection via Ground or VCC pin. The two backlight pins may precede the pin 1.The nominal backlight voltage is around 4.2V at 25˚C using a VDD 5V capable model. Character LCDs can operate in 4-bit or 8-bit mode. In 4 bit mode, pins 7 through 10 are unused and the entire byte is sent to the screen using pins 11 through 14 by sending 4-bits at a time.

- *IR Transmitter:*The simplest fibre optic transmitters are typically composed of a buffer, driver, and optical source. Often, optical connectors are also integrated into the final package. The buffer electronics provide both an electrical connection and "isolation" between the driver electronics and the electrical system supplying the data. The driver electronics provide electrical power to the optical source in a fashion that duplicates the pattern of data being fed to the transmitter. Finally, the optical source (LED in this model) converts the electrical power to light energy with the same pattern. The following discussion assumes the reader has a basic knowledge of analog circuit functions (e.g., amplifiers, AC-coupling, DC bias) and vocabulary.

- *IR Receiver:*Once light energy from the fibre optic transmitter reaches the destination it must be converted back to a form of electrical energy with the same information pattern that was fed to the transmitter by the person sending the message.

Analog fibre optic receivers typically perform these functions using three elements: a photo detector, an amplifier and sometimes a buffer. As with fibre optic transmitters, the optical connector is often integrated into the receiver package. The photo detector converts light energy (optical power) to an electrical current. Any pattern or modulation imparted in the optical power (from, for instance, a fibre optic transmitter) will be reproduced as an electric current with the same pattern. Long lengths of fibres and other distribution losses can reduce the optical power, resulting in a comparatively weak electrical signal from the photo detector. To compensate for this decline in signal strength, the amplifier increases the amplitude of the electrical signal. Finally, buffer electronics isolate the photo detector and amplifier from any load the receiver is required to drive.

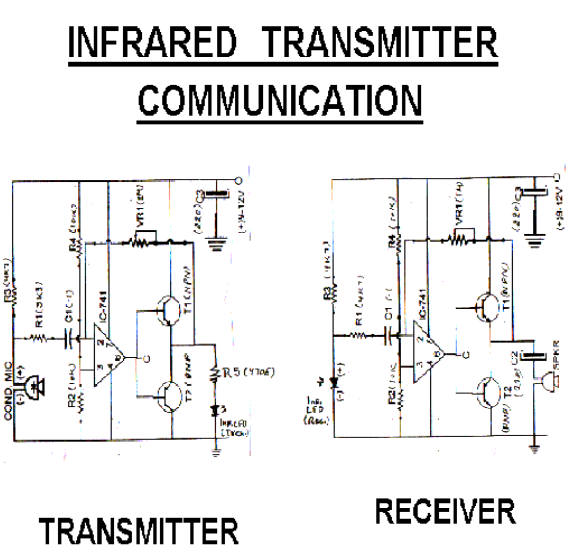

Figure.2 Circuit Diagram of IR Transmitter & IR Receiver

VI. RESULTS:

The output of this project is obtained in the form of sound signal at the receiver end. This model can be used at any border area for secure message retrieval, where Radio Communication is restricted or banned. This model retrieves voice over a long distance. This model is secure due to digital code lock system and optical fiber link.

VII. CONCLUSION

Through this model the optical fiber link is used to send pre-recorded voice from one end to another end, one can record his voice message from one end, on the other end the master unit can listen the pre-recorded voice by using specified code (digital code lock).

VIII. REFERENCES:

[1] http://www.academia.edu/7781527/COMMUNICATION_LINK_DESIGN_USING_OPTICAL_FIBER
[2] https://technet.microsoft.com/en-us/library/bb962026.aspx
[3] https://www.utdallas.edu/~torlak/courses/ee4367/lectures/FIBEROPTICS.pdf
[4] http://www.ece.umd.edu/~davis/optfib.html
[5] http://cableconnexionsllc.com/voice-datafiber-optic-termination-installation/
[6] http://www.arcelect.com/fibercable.htm
[7] http://www.britannica.com/EBchecked/topic/430391/optical-fibre