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# Line Detector for Council Maintenance

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***Abstract-*** *Now a day's house and industrial wiring is done using concealing method. All the wires are made to be drawn within the walls. After installation, after some years or during physical restructuring of wall these underplayed wires may get damaged and can cause electrical hazard. For eg. Hitting nails in wall without prior inspection of wall for electrical wires routes. Redevelopment during interior designing etc. in order to be able to locate the wires within the wall this line voltage detector proves useful device, since it beeps and provides the depth of wires laid within the walls. This device can be used in order to detect the Live wires from a distant without using Tester. Tester is very crude device and has chances for human getting shock. In tester a resistor of 1Mohm is employed in series with bulb. When human body presses the tester tip and live wire, a small amount of current flows through Line – the tester lid – resistor – bulb – human body- neutral. Due to ageing or due to poor quality of tester the internal resistance may lower and may cause fatal current to pass through human body leading to shock. Line detector device is a wireless non-contact type line tester which is safe to use and can indicate if line is present or not.*

***Keyword: Battery, Amplifier, Buzzer, Sensor, Microcontroller, LED.***

## I. INTRODUCTION

Electricity can cause serious injury or even death which is why safety must come first when working with electricity or electrical devices. In order to avoid injury, prior to starting work on an electrical box such as an AC mains switch-board or a power supply, for example, you must first verify there is no AC voltage. If you can't completely isolate your device from the supply wires, how can you be sure that there's no voltage remaining? Enter a non-contact AC voltage detector.

Presently testers are used to check presence of electricity. These testers have high value resistance In series with bulb in it and current passes through human body and bulb glows which signifies the presence of mains voltage. Due to ageing or poor quality this circuit may malfunction and may cause fatal shock to human using it.

Apart from this, during interior reconstruction of house the conceal wires goes hidden due to poor documentations. Hence there is need for the detection of this mains wires burrie inside walls before hitting nails or other tools within the walls.

In dark meter cabins it is impossible to use tester and check presence of mains.

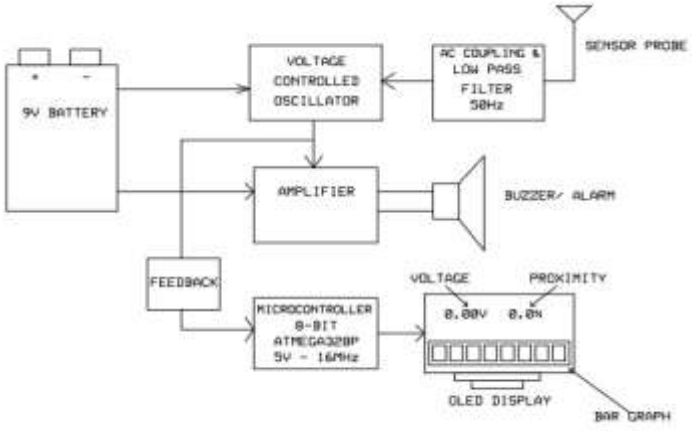


**Fig.1 Block Diagram**

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## II. EXPERIMENTAL DESIGN OF PROPOSED MODEL

In this prototype we have used a main condition monitoring sensor. It also consists of microcontroller (PIC18F452), LCD display and buzzer.

The above blocked diagram is designed to evaluate the hardware description.

## III. WORKING

A magnetic field is produced around a current carrying conductor and if current through the conductor is alternating current (AC), the magnetic field produced varies periodically. A non-contact AC voltage detector detects the changing magnetic field around AC energized objects.

A fault detection method with antennas has been developed in contrast to the conventional methods in this paper. An artificial fault using metal electrode system, and an artificial void as breakdown was applied to the communication wire. The results showed the precision of detecting distance of the order of meters.

## IV. CIRCUIT DIAGRAM

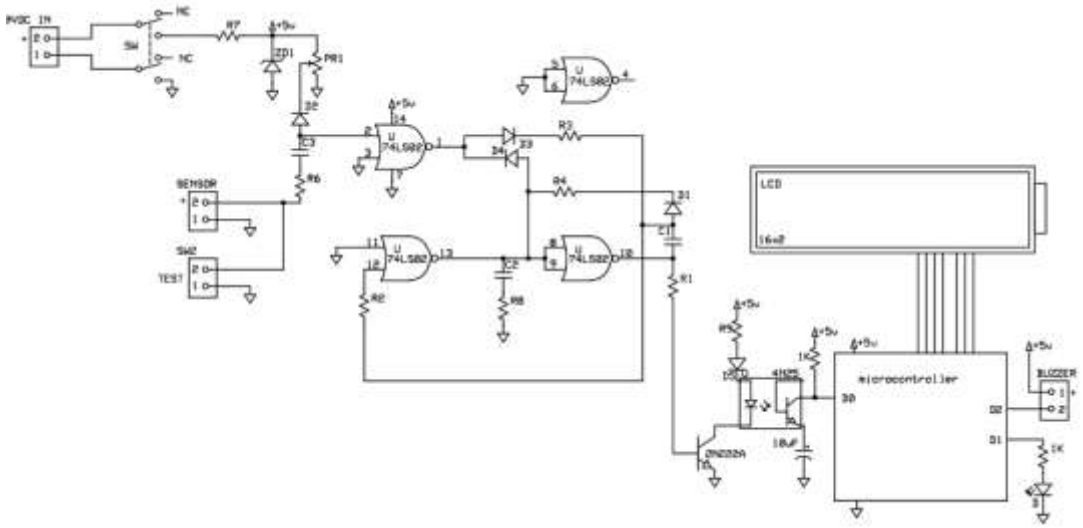


**Fig.2 Circuit Diagram**

The microcontroller is already programmed using C language and parameters are programmed in microcontroller. The sensor is already connected to the microcontroller. The DC voltage is stabilized using voltage regulator (7805) before is fed into microcontroller.

The buzzer is connected to the pin 28 of microcontroller. If any kind of fault is generated the microcontroller will send and alert. The filter is a combination of a high pass and a second order low pass filter forming a third order bandpass filter line is attached directly to one side of a large 30 pF parallel plate capacitor made out of metal and plexiglass. This capacitor not only filters out any low frequency noise but also permits the use of IOW power circuit components on the circuit side of the capacitor. filter out high frequency noise, the capacitor is connected to a second order low pass filter. only the 50Hz line frequency is passed through to the circuit, and that all other signals that might be on the line, such as communications or noise, will not affect the device's operation.

## V. COMPONENTS

- NAME : Arduino mini pro

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- MAXIMUM OUTPUT VOLTAGE : 5 V
- MAXIMUM OUTPUT CURRENT : 40 mA/pin
- COST : 350 Rs/-

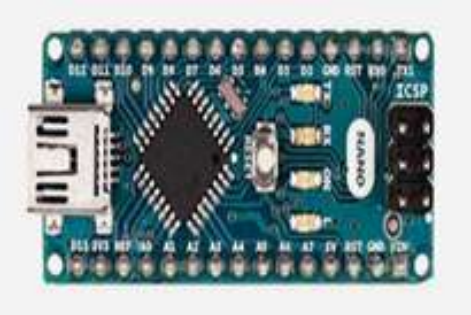


**Fig. 4 Arduino mini pro**

- NAME : lm7805
- MAXIMUM INPUT VOLTAGE : 15 V
- OUTPUT VOLTAGE : 5 V
- MAXIMUM CURRENT : 1.5 A
- COST : 30 Rs/-

**Fig. 5 lm7805**

- OSCILATOR: Voltage controlled oscillator
- MAXIMUM INPUT VOLTAGE : 15 V
- MAXIMUM OUTPUT CURRENT : 20mA
- COST : 65 Rs/-

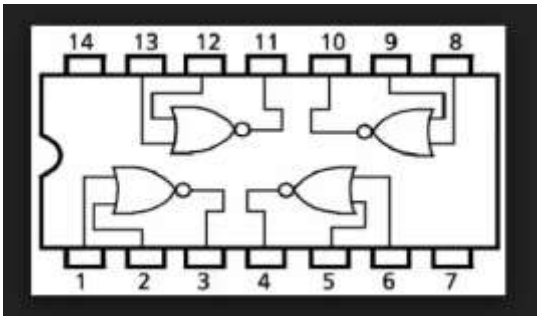


**Fig. 6 Voltage controlled oscillator**

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16*2 LCD Display: LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.


**Fig. 7 LCD Display**

- NAME : MCT2E
- TRIGGERING VOLTAGE : 5 V
- TRIGGERING CURRENT : 15 mA
- COST : 145 Rs


**Fig. 8MCT2E**

## VI. ADVANTAGES

1. Light Weight
2. Compact in size
3. It can be used in domestic as well as commercial purpose.
4. It can be used in dark meter cabins in order to check voltage.

## VII. CONCLUSION

This project provides for the detection of faults in the live wires and their protection in a purely wireless manner. This system checks the voltage fluctuations in the wire, indicates it on the receiver and auto cuts-off power in case of voltage fluctuations. Thus fault detection and protection of the circuit is achieved.

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