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AIR MOTION DETECTOR

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ABSTRACT

The objective of this project is to develop air motion detector working based on piezo element sensor. The project described here is the air motion detector can be warm against strong winds There are many popular electronic companies which are manufacturing these type of Piezo sensor element. piezo element sensor detect the air flow by using the piezoelectric effect. In our project the IC NE555 perform the important role after applying active pulse to it. The piezoelectric sensor convert the atmospheric pressure in the form of air into electrical voltage. these is the simple project useful for people who has no time to check weather outside.it alerts them and give information about weather. It is very important project when installing windmill at area where air is not detected. It is also used in ship for detecting the flow of air. When the air coming from any side the sensor sense the air and generate the active pulse and then speaker get on.

KEYWORDS: Timer IC NE55, Piezo element, speaker, amplifier, power supply.

INTRODUCTION

Air motion detector using a piezo element sensor circuit can be used for detecting the flow of air as well as direction of air. The piezo element sensor is detect the air around circuit.. By using the help of speaker. The project air motion detector specially design for the person which have no time , they are going for working and they are busy in there work ,they had not time for checking the weather outside . so they have not know the wind is present or not in nature so for those people for identifying the air is fast or slow as well as present or not in nature. The circuit uses like sensor element as piezo element and many element such as speaker. which is used as sensor element it sense the strong wind or weak wind in atmosphere.

MATERIALS AND METHODS

Functional Requirements are:

The 9v power supply is required for this project, the IC NE555 is drive at 9v power ,these power is given by using either transformer or power supply A buzzer which is used to produce sound No Software Requirements of the project.

CIRCUIT DIAGRAM

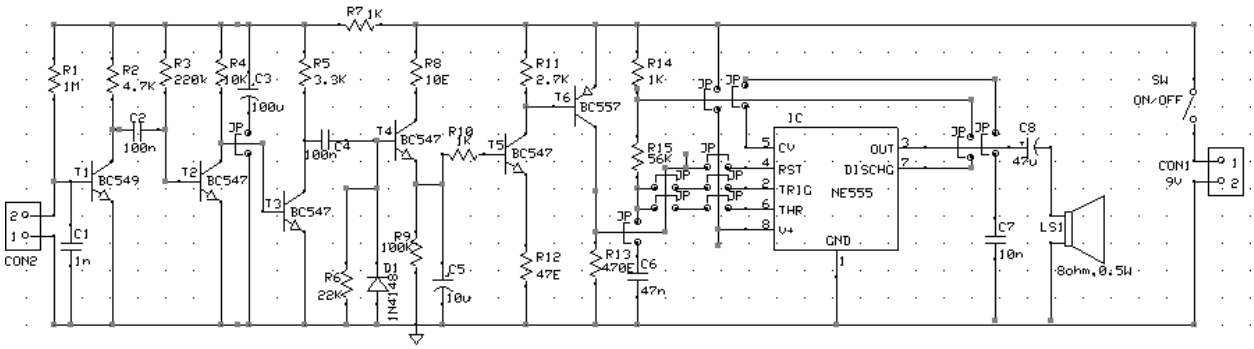

Fig1.circuit diagram of air motion detector

BLOCK DIAGRAM

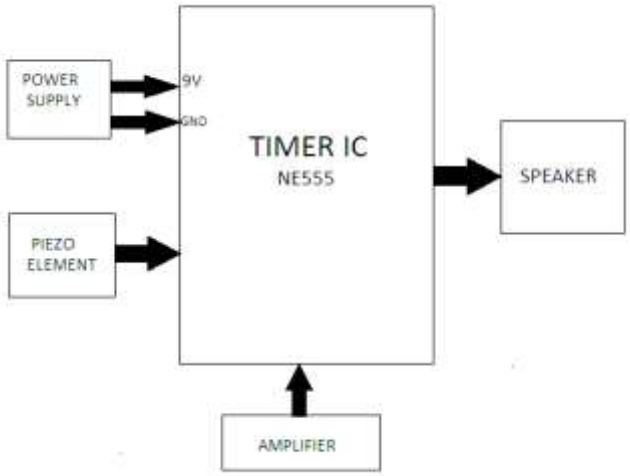

Fig2: Block Diagram of air motion detector

WORKING

Figure1 shows the actual circuit diagram of air motion detector alarm, the circuit is build around the piezo sensor element , this piezo element is connected across the connector 2.the transistor BC549(T1),BC 547(T2 Through T5) and BC557 (T6),timer NE55(IC) is in astable mode and other components.

The circuit uses piezo element used in buzzer as sensor, if it sense the strong winds it generate the electric pulses. The signal undergo the multistage amplification by using the transistors, the transistor T1, T2 and T3 are used to amplify the signal as well as they rectified the signal and filter. At the output dc pulse of this transistors T4 and T5 again process of amplification is done. The IC NE555 based on oscillator. The transistor T6 act as switch.

PIEZO ELEMENT SENSOR

Piezo element is device that used in this project for the purpose of converting the atmospheric pressure such as air into the electric charge, this is also called as transducer. This piezo element has very high dc output impedence, the generated dc voltage is directly proportional to applied input pressure. Mainly two groups of material are used in piezo electric sensor this two are ceramic and crystal material.

NE 555

We know the working of ic NE555 in this project the ic555 is in astable mode .this ic provide the time deley as an oscillator at the output of this ic is continuous rectangular pulses of specific frequency. Pin8 having given the 9v supply from transformer and pin1 is connected to ground. The speaker is connected at pin no3 of NE555.

These ic is operate at supply voltage 4.5 to 15v. supply current is 3 to 6 mA . normally reset pin4 is held at ground .

AMPLIFIER

Amplifier perform the main operation in this project, there are two type of transistors used in this project. Amplifier used in project for increasing the power signal generated from piezo element. All transistors in the project are used for amplification purpose , transistor T1,T2,T3 used to rectification and filtering the signal
And the signal is undergo the multistage amplifier. transistors are coupled to each other, the transistor T4 and T5 are again amplify the signal.

TABLE

Pin	Name	Purpose
1	GND	Ground reference voltage, low level (0 V)
2	TRIG	The OUT pin goes high and a timing interval starts when this input falls below 1/2 of CTRL voltage (which is typically 1/3 V_{CC}, CTRL being 2/3 V_{CC} by default if CTRL is left open).
3	OUT	This output is driven to approximately 1.7 V below $+V_{CC}$, or to GND.
4	$\overline{\text{RESET}}$	A timing interval may be reset by driving this input to GND, but the timing does not begin again until RESET rises above approximately 0.7 volts. Overrides TRIG which overrides THR.
5	CTRL	Provides "control" access to the internal voltage divider (by default, 2/3 V_{CC}).
6	THR	The timing (OUT high) interval ends when the voltage at THR ("threshold") is greater than that at CTRL (2/3 V_{CC} if CTRL is open).
7	DIS	Open collector output which may discharge a capacitor between intervals. In phase with output.
8	V_{CC}	Positive supply voltage, which is usually between 3 and 15 V depending on the variation.

Table1.pins configuration of NE555

CONCLUSION

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