

DETECTION OF AN INTRUDER AND PREDICTION OF STATE OF MOTION BY USING SEISMIC SENSOR

Submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering Degree in Electronics and Communication Engineering

by

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SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with Grade "A" by NAAC

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **PEDAPATNAPU NAVEEN (37130304)** and **P.BHANU PRAKASH REDDY (37130305)** who carried out the project entitled “**DETECTION OF AN INTRUDER AND PREDICTION OF STATE OF MOTION BY USING SEISMIC SENSOR**” under our supervision from December 2020 to April 2021.

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DECLARATION

We, **PEDAPATNAPU NAVEEN (37130304)** and **P.BHANU PRAKASH REDDY (37130305)** hereby declare that the Project Report entitled **DETECTION OF AN INTRUDER AND PREDICTION OF STATE OF MOTION BY USING SEISMIC SENSOR**“ done by me under the guidance of **VINOTHKUMAR.C**, at Sathyabama Institute of Science and Technology is submitted in partial fulfillment of the requirements of the award of Bachelor of Engineering degree Electronics and Communication Engineering.

DATE:

PLACE:

1.

2.

SIGNATURE OF THE CANDIDATES

ACKNOWLEDGEMENT

We are pleased to acknowledge our sincere thanks to Board of management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. We are grateful to them.

We convey my thanks to **Dr. N.M. NANDHITHA, M.E., Ph.D.**, Prof. & Dean, School of Electrical and Electronics Engineering and **Dr. T. RAVI, M.E., Ph.D.**, Head of the Department, Dept. of Electronics and Communication Engineering for providing me necessary support and details at the right time during the progressive reviews.

We would like to express my sincere and deep sense of gratitude to my Project Guide **VINOTHKUMAR.C, M.TECH.**, for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

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ABSTRACT

The human-elephant struggle is one among the premier extreme normal issues in south India. We have farmlands close to the elephant natural surroundings where these elephants attack these ranches looking for food. Regular conflicts between wild elephants and townspeople have brought about serious harm to property, additionally as loss of lives for the two people and elephants which has been the most prior reason for almost 70 human passings and more than 200 elephant passings which are captured yearly inside the new past. Rivalry for space is that the essential justification struggle among people and elephants. Also elephants which escape from the untamed life public parks into towns making annihilation afterward. To forestall such incidents, a right situation is needed to contain and screen elephants in public stops. Here we depict various ways to deal with distinguish elephants and potential methods of checking the public untamed life parks. To deal with the matter, the public authority has started projects that safe the public untamed life parks with electrical wall. Nonetheless, keeping up the electrical fence is a test, due to its huge edge and the absence of accessible labor. A specific concern is that of finding flaws in electrical wall since these ordinarily several hundred miles. Right now, park officers are needed to walk to find the flaws, which could require days to wrap up.

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CHAPTER-1

INTRODUCTION

1.1 INTRODUCTION:

Elephas Maximus which is the magnificent Asian elephant is the biggest earthbound vertebrate in the world. This species is known as imperiled species. In Sri Lanka elephants are always been the wellspring of numerous struggles among people and untamed life. The quantity of frequencies of alleged elephant-human clashes, has consistently expanded throughout the long term. The primary justification of such struggles has been the opposition over restricted space. Logging that leads to the deforestation of backwoods, moving development and single culture tree ranches has made all elephants adventure into the settlements of human looking for daily needs like water and food. The increasing populace development and the getting free from woods for financial advancement will offer furthermore to the expanded number of HEC. In process to look over the elephant and human conflict, the public authority has started a few orders to maintain the groups of elephants in regions secured by the natural life office ensured zones, away from people a bio Palmyra trees fence has been proposed to forestall elephants going into human territories. In general, elephants will be kept away from Palmyra trees in light of their prickly recoils. A few associations that includes the Department of Wildlife Conservation of Sri Lanka has dispatched a task to plant Palmyra trees fence as a technique for keeping elephants under control. Nonetheless, Palmyra trees set aside a long effort to develop to a level that they can be successful obstructions against elephants and likewise such estates may effectively affect the backwoods' environment. Lord Et have proposed a fence of bee colonies as an obstruction against elephants. Colonies of bees are raised in a fence-like arrangement and are interconnected with wires. An encroaching elephant might disrupt the wires, subsequently delivering the honey bees who go about as an obstacle. In any case, development of huge honey bee swarms raises essential construction of an electrified barrier pragmatic contemplations on support, notwithstanding the common danger of

the environment unevenness. The utilization of electric wall has demonstrated to be definitely more successful than the aforementioned options in containing elephant crowds represents the essential construction of an electrified barrier. This specific electrified barrier framework highlights live twin wires and a ground wire that runs among them. All the wires are upheld on wooden posts raised around the untamed life safe-haven. A run of the mill fence would traverse a few hundred kilometers. The wires utilized are normally check 8 (3.264 mm). A non-deadly electric stun is directed to a meddling elephant right after it comes for contact with a ground wire and a live wire. Specifically, the live wires direct high voltage levels. They are associated with the posts utilizing separators to keep away from power spillage through the shafts. The voltage levels are itself non-deadly, yet adequate to deflect elephants from getting over the fence. Ground wire is utilized to work with a more successful live–wire to earth stun the elephants environments in Sri Lankan soil which dry and sandy makes it troublesome convey a decent earth return fence framework. Normal electrified barrier arrangements change on the quantity of ground wires and live wires, contingent upon the voltage of necessary measure is to be produced.

CHAPTER 2

LITERATURE SURVEY

Paper 1: Target detection and classification using seismic and pir sensors

Author : X. Jin, S.Sarkar, A.Ray, S.Gupta, T.Damarla

Abstract:

Unattended ground sensors are generally used to screen human exercises, like walker movement and discovery of interlopers in a protected district. Viability of UGS frameworks is regularly restricted by high bogus caution rates, conceivably because of deficiencies of the basic calculations and impediments of locally available calculation. In such manner, the paper1 presents a wavelet-based strategy for target discovery and order. The strategy that has been proposed is approved on informational collections of seismic and detached infrared sensors for target discovery and grouping, just as for payload and development type recognizable proof of the objectives. The proposed technique has the benefits of low memory and quick execution time prerequisites and is conceivably appropriate for ongoing execution with installed UGS frameworks.

Paper 2: Inside person identification through footstep induced structural vibration

Author : S.Pan, N.Wang, Y.Qian, I.Velibeyoglu, H.Y.Noh

Abstract:

Individual recognizable proof is vital in different shrewd structure applications, including client conduct investigation, patient observing, and so on Earlier works on individual recognizable proof mostly centered around access control related applications. They accomplish ID by detecting certain biometrics with explicit

sensors. Notwithstanding, these strategies and contraptions can be nosy and not versatile on account of instrumentation and detecting limits.

We present our indoor individual ID framework that uses stride incited underlying vibration. Since primary vibration can be estimated without intruding on human exercises, our framework is appropriate for some omnipresent detecting applications. Our framework detects floor vibration and identifies the sign instigated by strides. At that point the framework removes highlights from the signs that address qualities of every individual's walk design. With the removed highlights, the framework conducts progressive order at an individual advance level and afterward at a follow. Our framework accomplishes more than 83% recognizable proof exactness by and large. Besides, when the application requires various degrees of precision, our framework can change certainty level edge to dispose of questionable follows. For instance, at an edge that permits just most certain half follows for arrangement, the ID precision increments to 96.5%.

Paper 3: A novel application of a micro accelerometer for intruder classification

Author : J.Lan, T.Lan, S.Nahavandi

Abstract:

An epic technique for target order through a miniature accelerometer. Its standard is that the seismic signs from moving vehicle targets are distinguished by a miniature accelerometer, and targets are consequently perceived by the high level sign preparing strategy. The recognition framework dependent on the miniature accelerometer is little in size, light in weight, has low force utilization and ease, and can work under extreme conditions for a wide range of uses, like war zone reconnaissance, traffic checking, and so on To remove highlights of seismic signs invigorated by various vehicle targets and to perceive targets, seismic properties of normal vehicle targets are investigated in this paper. A method of counterfeit neural

organizations (ANNs) is applied to the acknowledgment of seismic signs for vehicle targets. An improved back spread (BP) calculation and ANN design have been introduced to improve learning speed and keep away from neighborhood least focuses in mistake bend. The improved BP calculation has been utilized for characterization and acknowledgment of seismic signs of vehicle focuses in the outside climate. Through tests, it tends to be demonstrated that target seismic properties obtained are right, ANN is viable to tackle the issue of characterization and acknowledgment of moving vehicle targets, and the miniature accelerometer can be utilized in vehicle target acknowledgment.

Paper 4: Discrimination of bipeds and quadrupeds using seismic footstep signatures

Author : A.Mehmood, V.M.Patel, T.Damarla

Abstract:

Seismic sensor is broadly used to distinguish moving focuses in the ground sensor organization, that can be handily utilized to separate human and quadruped dependent on their stride marks. Due to the complex ecological conditions and the mobility nature of the seismic signs, stride location and arrangement is an extremely difficult issue. The answer for this issue has different applications, for example, observation, line security, interloper discovery and edge insurance. Past works in the area of seismic discovery of human versus quadruped have depended on the rhythm recurrence based models. Nonetheless, rhythm based discovery alone outcomes in high bogus cautions. In this paper, we portray a seismic stride information base and present grouping results dependent on help vector machine (SVM). We exhibit that as well as applying a decent characterization calculation, discovering hearty highlights are vital for seismic separation.

CHAPTER 3

SYSTEM ANALYSIS AND MODULES

3.1 SYSTEM ANALYSIS

The advancement of electronic detecting gadgets for the outwardly weakened requires information on the necessities and capacities of this class of individuals. In this task we present a harsh examination that can be utilized to appropriately characterize the measures to be embraced for the plan of such gadgets. Specifically, consideration will be centered around make way markers, featuring their part in direction and versatility assignments. Another gadget having a place with this class is introduced. The indicator depends on a multi-sensor technique and embraces keen sign preparing to furnish the client with appropriate data about the situation of items preventing their way. Test preliminaries exhibit the effectiveness of the gadget created

3.1.1 Existing System:

Since antiquated occasions, townspeople have figured out how to shield their yields from wild elephants through methods for conventional strategies. By building stations along the border of the town, the residents stand gatekeeper to secure their harvests. Cautioning yells are made when an elephant is located and the entire town participates in pursuing back the elephants. When they smell the presence of elephants, canines are developed to bark which gives a significant benefit over distance because of the sharp feeling of scent of the canines. The electrical fence that goes around the untamed life asylums gives a helpful way to information correspondence. As a result of constantly electric barrier little birds and creatures cause dead because of significant degree of voltage past their resistive force. Individuals likewise delve a pit in underground wherever for to shield from elephants. Now and again saltines additionally used to flee from neighborhoods. Also nowadays crackers are being used to make elephants run away from residential areas.

Warning shouts are being made to warn the elephants from entering into the residential areas.

Disadvantage Of Existing System:

1. Baby elephants dies and also other wild animals will die due to digging a pit.
2. Due to crackers bursting other birds and animals get afraid.
3. 24hours of electrified fence will lead to humans, birds and other wild animals to get hurt.

3.1.2 Proposed System:

Elephants are seen to have a unique ability to convey mating calls by using seismic waves as the medium. These seismic waves are generated in the form of vibrations by the male elephant by hitting the ground . Since the elephants feet are furnished with exceptionally delicate vibration sensors, it gives them one of a kind correspondence capacity. Research shows that the ground vibrations that are brought about by every creature type take an interesting structure. By placing seismic waves, the alert is sent to the authority person about presence of elephants and other animals via GSM and the buzzer is turned on to panic the animals not to cross the fence. Here we include buzzer to make noise so that the elephants will not cross the border. At the same time GSM is brought into action by sending an appropriate message to the respective field incharge.

In this project, we propose a setup which detects the intrusion of elephants in human habitat region. Here, we use seismic sensor to detect the vibrations from elephant foot. Then a buzzer will be raised to panic the elephants. Simultaneously a message will be sent to the incharge.

Advantages Of Proposed System:

1. Prior information about the elephants entering the residential are passed through GSM to forest officers.
2. Many loss of wild animals is prevented.
3. We can also avoid this elephant and human conflict without loss of any life.

3.1.3 Applications:

1. To save wild animals and human beings.
2. Used in Smart cities.
3. Used in wildlife and heritage centres.

3.1.4 System Requirements:

Hardware Requirements:

1. MICROCONTROLLER PIC16F877A
2. BUZZER
3. VIBRATION SENSOR
4. SEISMIC SENSOR
5. GSM
6. UART

Software Requirements:

1. Embedded c
2. Keil compiler

3.2 BLOCK DIAGRAM OF INTRUDER DETECTION SETUP:

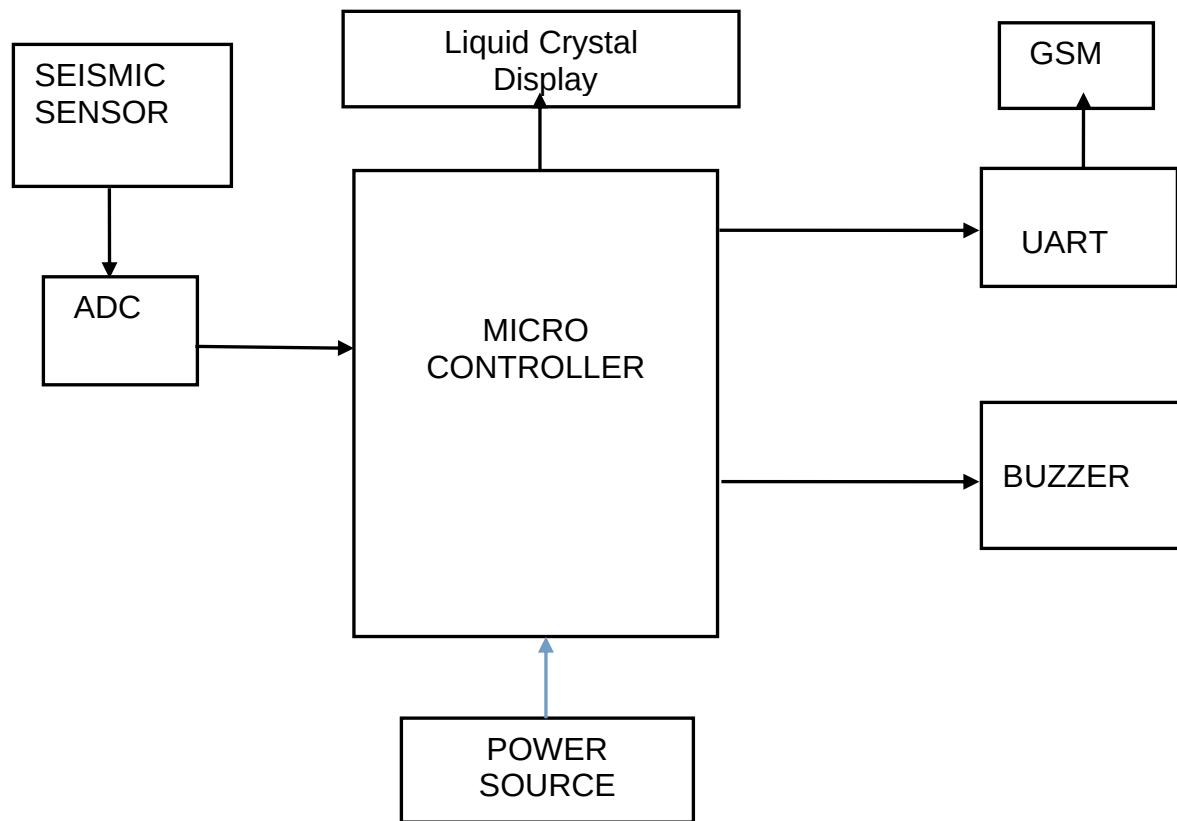


Fig.3.1 : Block Diagram Of Intruder Detection setup

The framework has two primary undertakings: the initial is to perceive if the fence has been broken or not and the final is to recognize the area of the damage. For the primary errand, the fence regulator associates the beat generator to the two fence wires. The other is the ground line. At regular intervals (time period is picked to save control yet can be moved by need), the fence regulator confines wire 3 from the beat generator and rather interfaces its ground terminal to wire 3. Locator 2 in the End Node recognizes this which at that point turns on a transfer which short circuits wires 1 and 3. This finishes the circuit which makes a return current heartbeat on wire 3. The regulator indicator at that point recognizes this return current heartbeat and conveys a message to the framework primary demonstrating that the fence has no issues. We have tried the discovery of a straightforward heartbeat utilizing an ATMEL ATMEGA32 microcontroller as the hub micro controller unit. delineates the fundamental plan. The beat finders use BC547 semiconductors as speakers. The high voltage in the wire instigates a voltage on the copper strip at that point causes a current stream in the base of the semiconductor. The subsequent current moving through the producer is sent through another intensifier to get a good voltage distinction that can be distinguished by the miniature regulator. A solitary rail comparator has been used before the MCU to give a paired contribution to the microcontroller. The received hub will be shown on to a LCD screen.

3.3 CIRCUIT DIAGRAM OF INTRUDER DETECTION SETUP:

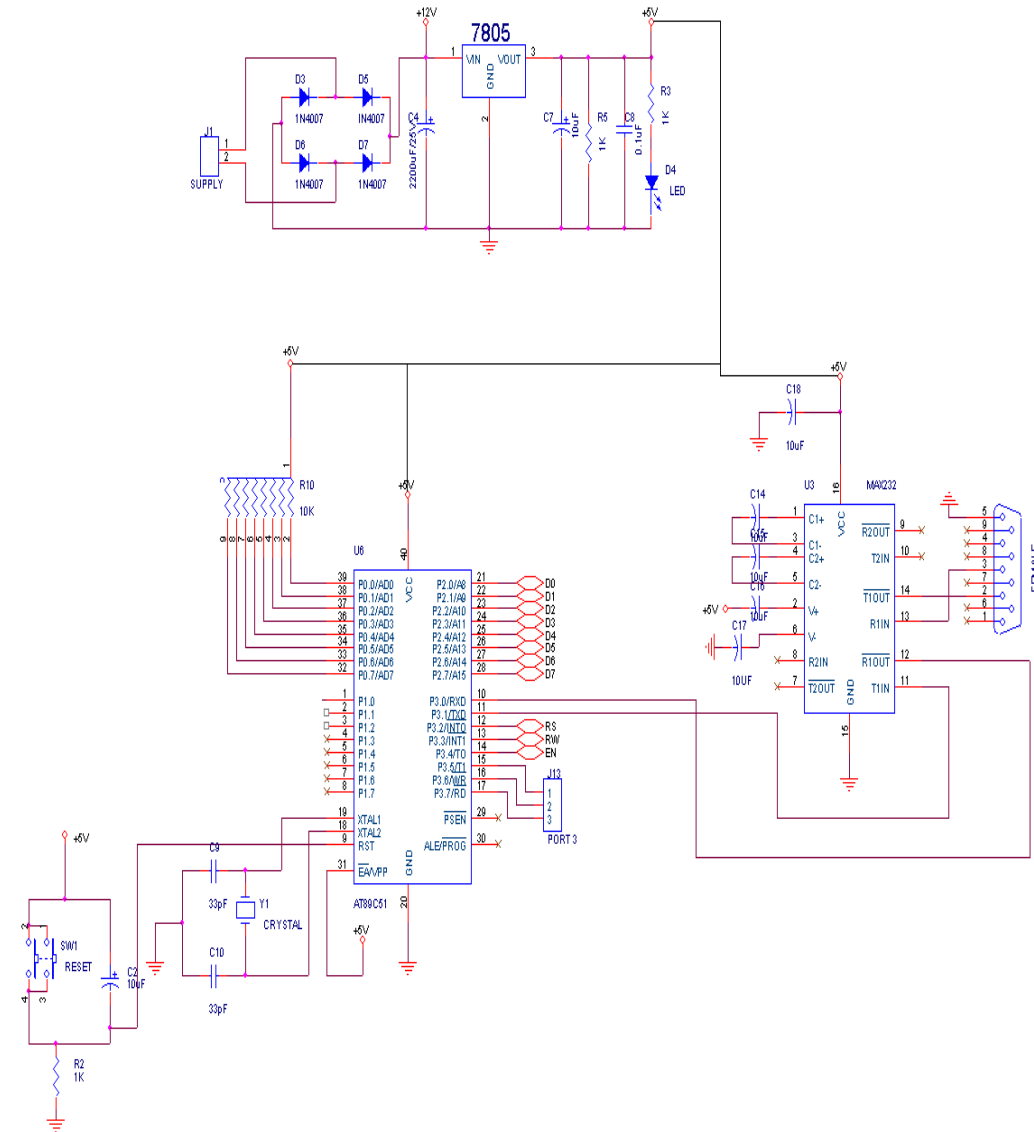


Fig.3.2 : Intruder Detection Setup Circuit Diagram

In the above circuit diagram, we can see that the setup consists of 12v AC transformer, AT89S51 micro controller, voltage regulator, UART, LCD display, GSM. The 12v AC step down transformer is being used to reduce the 230v AC power to 12v AC.

ADC unit is used to convert the physical values from our sensors into digital values. It has 8 channels so that, we can connect 8 sensors at the time. But in PIC controller we have inbuilt ADC. The output will be shown on the 16X2 LCD display. GSM is nothing but a wireless modem that works on the base of wireless network. It requires a SIM card to send the appropriate messages. We also have bridge rectifiers to convert the AC voltage to DC.

3.4 PCB LAYOUT:

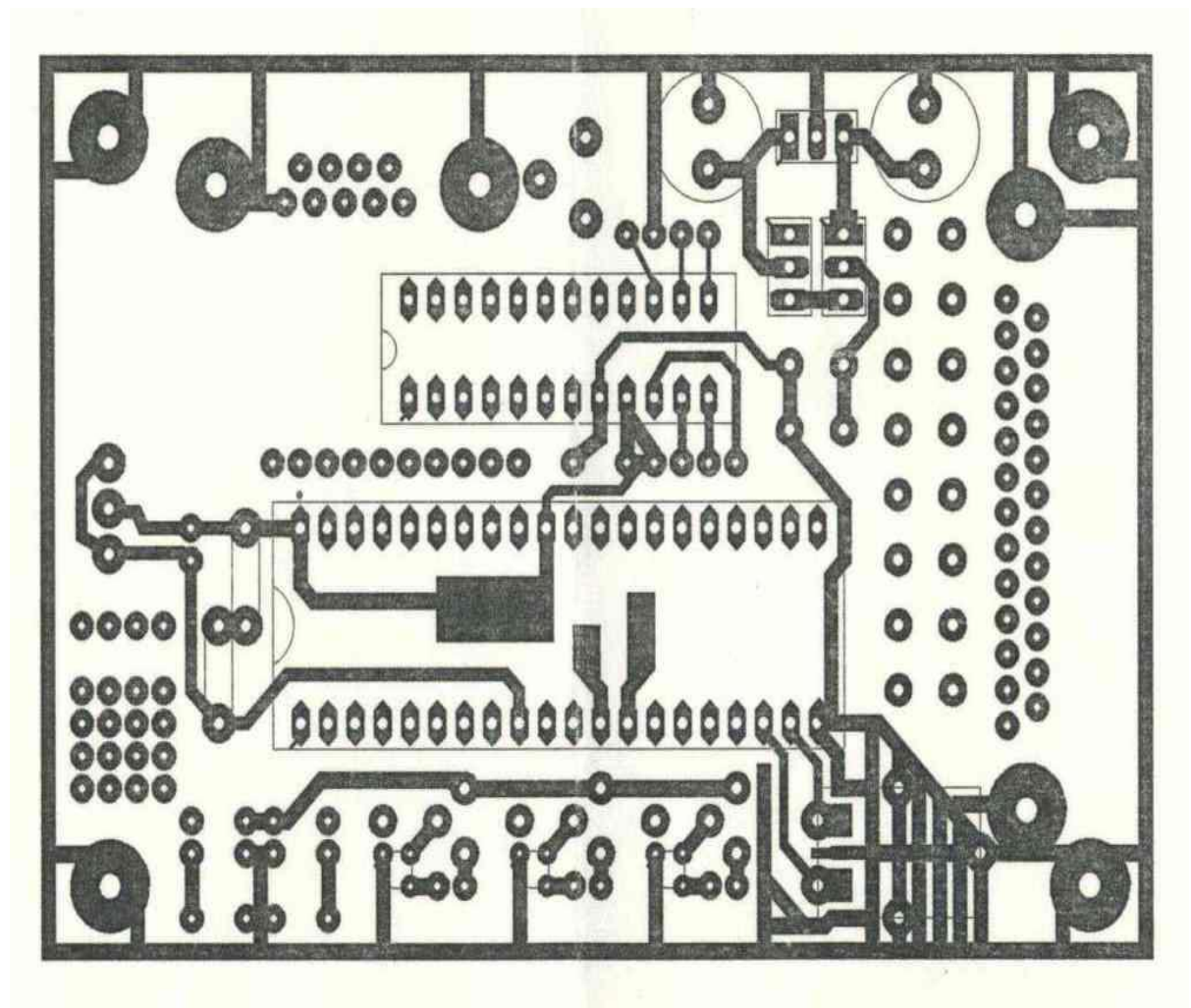


Fig.3.3 : PCB Layout

PCB is termed as Printed Circuit Board. It electrically connects all the components required for this project using conductive tracks and pads.

3.5 POWER SUPPLY:

Power supply means nothing but power source in the form of electric power. The system or device which supplies electrical or mechanical energy or energy in any form to a load output is called the power supply or power source. The term is most customarily applied to electrical energy supply, less frequently to other ones, and rarely to different ones.

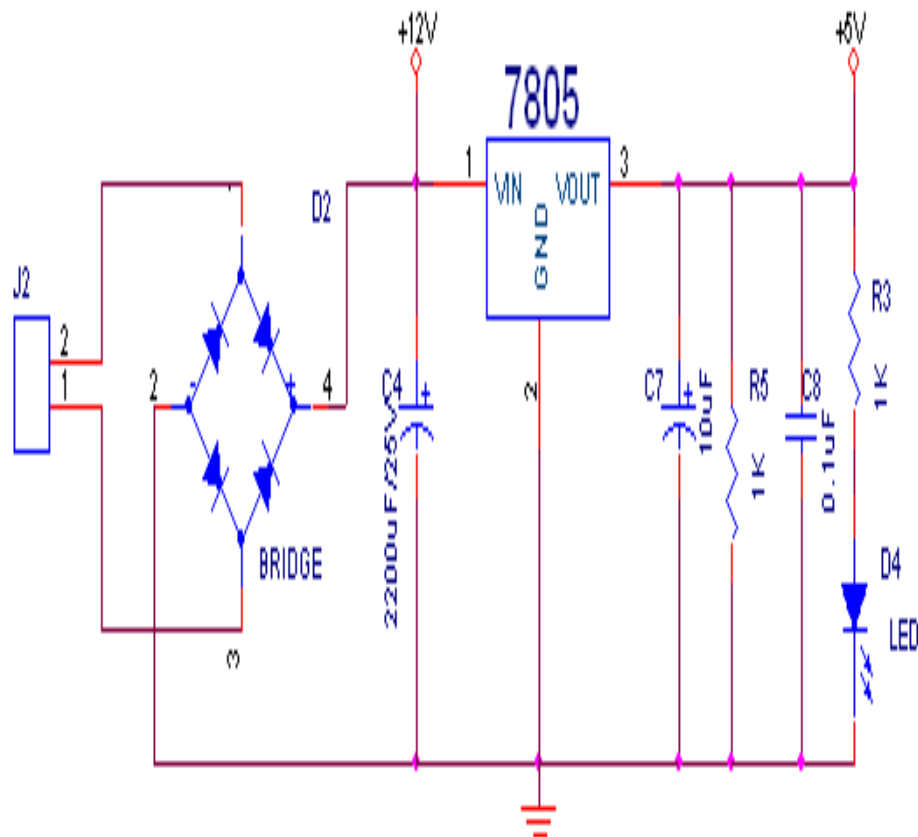


Fig.3.4 : Power Supply Circuit Diagram

Here, a 230v AC power supply is given to the 12v AC step down transformer to convert this 230v AC to 12v AC. Then by using bridge rectifier this 12v AC power supply is converted into 5v DC source. This converted 5v DC supply is given to the all the components that are present in the printed circuit board.

3.6 VOLTAGE REGULATOR:

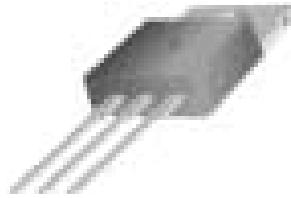


Fig.3.5 : Voltage Regulator

Features Of Voltage Regulator:

- Up to 1A of current is yielded
- 5, 6, 8, 9, 10, 12, 15, 18, 24V are the output voltages
- Protection over short circuit and thermal Overload

3.6.1 Internal Block Diagram Of Voltage Regulator:

The voltage regulator is used to maintain the unique voltage across the entire system.

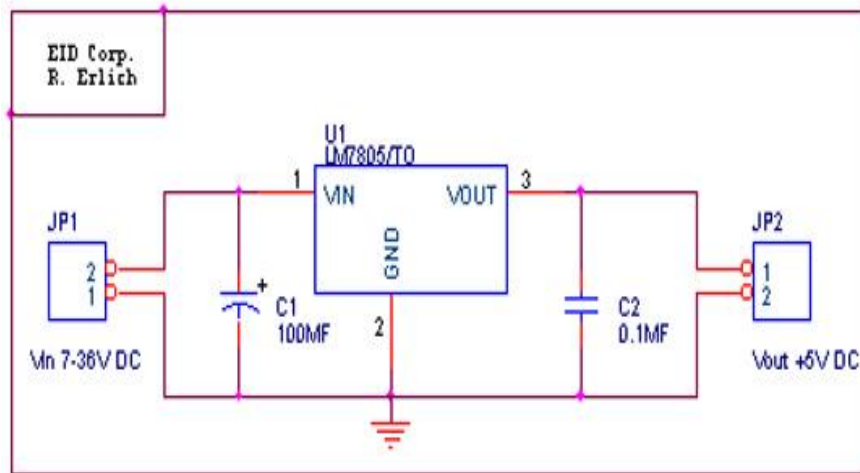


Fig.3.6 : Internal Block Diagram Of Voltage Regulator

CHAPTER 4

COMPONENTS AND ALGORITHMS USED

4.1 MICROCONTROLLER AT89S51:

A microcontroller (additionally microcontroller unit, MCU or μC) is a small PC on a single integrated circuit which is developed using crystal oscillators, capacitors, sequential as well as analog I/O and clocks etc.. likewise regularly remembered for chip, just as a commonly modest quantity of RAM. Microcontrollers are intended for little or applications that are dedicated.

4.1.1 Pin Diagram Of Microcontroller:

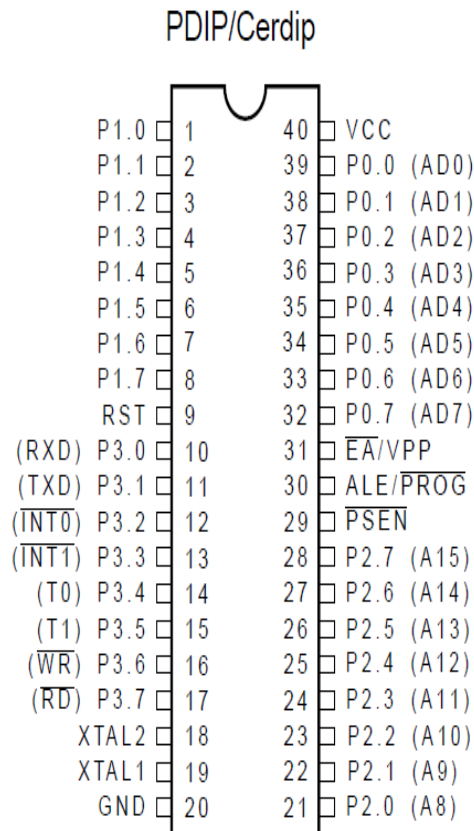


Fig.4.1 : Pin Diagram of AT89S51

4.1.2 Block diagram of Microcontroller:

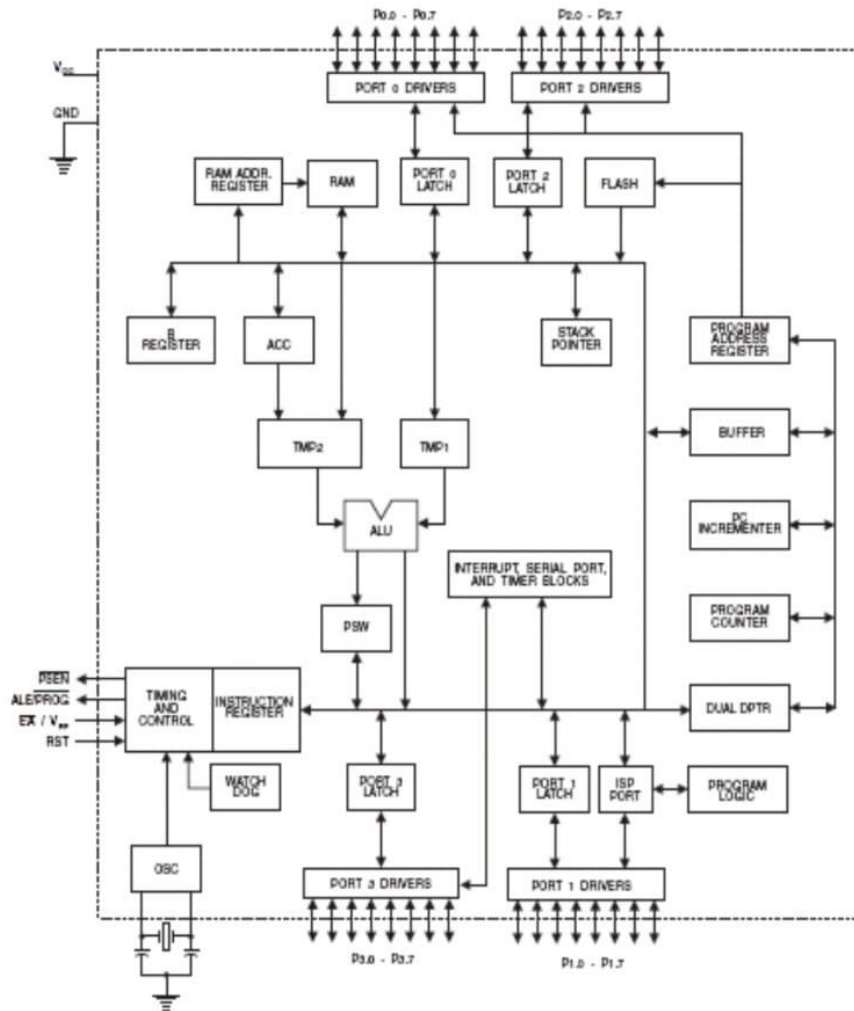


Fig.4.2 : Block Diagram Of AT89C51 Microcontroller

Memory Organization:

MCS-51 contraptions have AN alternate space house for Program and knowledge Memory. Up to 64K bytes all of outdoor Program and knowledge Memory is attended.

Program Memory:

In case the Semitic deity pin is expounded with GND, all program gets area unit composed to outside memory. On the AT89C51, if Semitic deity is expounded with VCC, program brings to addresses 0000H through 1FFFH area unit composed to internal memory and gets to addresses 2000H through FFFFH area unit to external memory.

Data Memory:

The AT89C51 executes 256 bytes of on-chip RAM. The higher 128 bytes burn-through constant space house to the Special operate Registers. This infers that the higher 128 bytes have comparative area unitas because the SFR house however are really secluded from SFR house. precisely once a direction gets to an enclosed region higher than address 7FH, the realm mode employed in the direction shows whether or not the processor gets to the higher 128 bytes of RAM or the SFR house. Rules that use direct having an inclination to induce to the SFR house. as an example, the going with direct keeping an eye fixed on direction gets to the SFR at region 0A0H (which is P2). MOV 0A0H, #data directions that use indirect having an inclination to induce to the higher 128 bytes of RAM.

For example, the going with winding look out for direction, wherever R0 contains 0A0H, gets to the information computer memory unit at address 0A0H, rather than P2 activities area unit instances of aberrant tending to, therefore the higher 128 bytes of knowledge RAM area unit accessible as stack house.

4.1.3 Oscillator Characteristics :

XTAL1 and XTAL2 are unit the knowledge and yield, singly, of associate displeasing attention which might be designed to be used as associate on-chip generator. Either quartz jewel or pink-slipped resonator could be utilized. To drive the widget from an out of doors clock supply, XTAL2 have to be compelled to be left detached whereas XTAL1 is driven. There are not any conditions on the duty pattern of the surface clock signal, since the contribution to the inward temporal arrangement hardware is thru a spot by-two flip-flop, nonetheless least and greatest voltage, high and low time determinations ought to be detected.

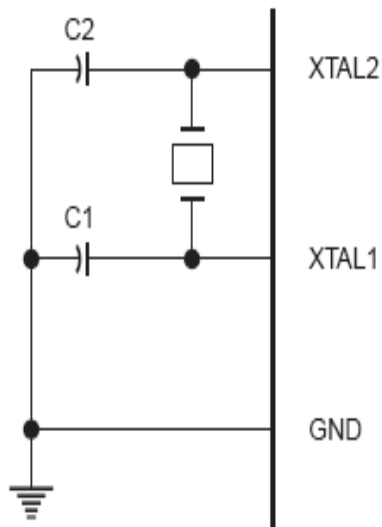


FIG:4.3 : OSCILLATOR CONNECTIONS

Inactive Mode :

Out of substances mode, the processor takes care of itself whereas all the on chip peripherals keep dynamic. The thing of the on-chip RAM and also the whole exceptional capacities registers keep unreduced throughout this mode. The inactive mode is all over by associate hinder or by an instrumentality reset. It need to be detected that once inactive is all over by a tough product reset, the gismo frequently continues program execution, from the most recent relevant purpose of interest, up to 2 machine cycles before the inward reset calculation takes management. On-chip instrumentality represses admittance to inward RAM during this occasion, but admittance to the port pins is not restrained. To lose the possibility of a stunning detain bit with a port pin once Idle is all over by reset, the steering following the one that conjures Idle ought not be one that keeps up-to-date with a port pin or to outside memory.

Outer Clock Drive Configuration:

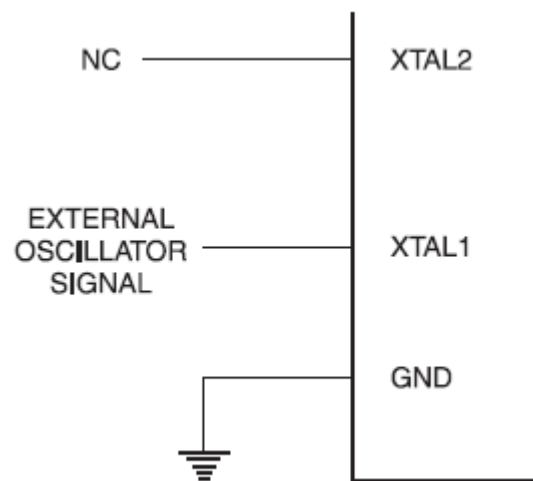


Fig 4.4 External Clock Drive Configuration

Program Lock Bits :

On the chip square measure 3 lock bits which might be left unprogrammed (U) or are often changed (P) to urge the additional highlights recorded within the table to a lower place. At the purpose once lock cycle one is tailor-made, the explanation level at the Ea pin is inspected and hooked throughout reset. On the off probability that the appliance is burning up while not a reset, the hook introduces to Associate in Nursing discretionary price, and holds that esteem till reset is initiated. it's necessary that the hooked estimation of Ea be in concurrence with this explanation level at that pin all at once for the appliance to figure suitably.

Power Down Mode:

In the pack up mode, the generator is halted, and also the steerage that conjures pack up is that the last steerage dead. The on-chip RAM and Special perform registers hold their qualities till the pack up mode is concluded. The lone exit from pack up is Associate in Nursing instrumentality reset. Reset reclassifies the SFRs but does not modification the on-chip RAM. The reset ought not be motivated before VCC is reestablished to its typical operating level and may be control dynamic to allow the generator to restart and settle.

Table 4.1 : Program Lock Bits

Program Lock Bits				Protection Type
	LB1	LB2	LB3	
1	U	U	U	No program lock features.
2	P	U	U	MOVC instructions executed from external program memory are disabled from fetching code bytes from internal memory, $\overline{EA}$ is sampled and latched on reset, and further programming of the Flash is disabled.
3	P	P	U	Same as mode 2, also verify is disabled.
4	P	P	P	Same as mode 3, also external execution is disabled.

Programming The Flash :

The AT89S51 microcontroller is typically dispatched with the on-chip Flash a low-tension (VCC) program empower signal. The low voltage programming mode offers associate advantageous methodology to program the AT89C51 within the client's framework, whereas the high-voltage programming mode is viable with ancient outsider Flash or fixed storage computer code engineers. The individual top-side stamping and gismo signature codes ar recorded within the concomitant table.

Table 4.2 : Flash Memory Table

	V_{PP} = 12V	V_{PP} = 5V
Top-Side Mark	AT89C51 xxxx yyww	AT89C51 xxxx-5 yyww
Signature	(030H)=1EH (031H)=51H (032H)=FFH	(030H)=1EH (031H)=51H (032H)=05H

The AT89C51 code memory cluster is customized byte by byte in either programming mode. To program any nonblank byte in the on-chip Flash Memory, the whole memory should be stopped utilizing the Chip Erase Mode.

3.2 PROGRAMMING ALGORITHM:

Prior to programming the AT89S51, the location, information and control signals ought to be set up as per the Flash programming mode table. To program the AT89S51, make the accompanying strides.

1. Input the proper memory area on true lines.
2. Input the fitting information memory board unit on the information lines.
3. Activate the right mixture of management signals.
4. Raise EA/VPP to 12V for the high-voltage programming mode.
5. Pulse ALE/PROG once to program a memory board unit among the Flash exhibit or the lock bits.

The byte-compose cycle is self-coordinated and ordinarily takes close to 1.5ms. Rehash stages 1 through 5, changing the location and information for the whole cluster or until the finish of the item record is reached.

4.2.1 Data Polling:

The AT89C51 highlights knowledge Polling to demonstrate the end of a compose cycle. throughout a compose cycle, associate degree endeavored scan of the last computer memory unit composed can achieve the supplement of the composed data point on PO.7. once the compose cycle has been finished, real data square measure legitimate on all yields, and therefore the following cycle could begin. data Polling could begin any time when a compose cycle has been started.

4.2.2 Ready/Busy:

The advancement of computer memory unit programming will likewise be ascertained by the RDY/BSY yield signal. P3.4 is force low once beer goes high throughout programming to point out BUSY. P3.4 is force high once more once writing laptop programs is rarely very prepared.

4.2.3 Program Verifies:

On the off probability that lock bits LB1 and LB2 haven't been bespoke, the changed code data will be perused back by suggests that of the situation and knowledge lines for confirmation. The lock bits cannot be checked foursquare. Confirmation of the lock items is accomplished by noticing . 4.2.4

Chip Erase:

The whole Flash exhibit is eradicated electrically by utilizing the acceptable mix of management signals and by holding ALE/PROG low for 10ms. The code cluster consists with all "1"s. The chip delete activity ought to be dead before the code memory will be re-modified.

The mark bytes area unit perused by similar methodology as a standard check of areas 030H, 031H, and 032H, then again, truly P3.6 and P3.7 ought to be force to a explanation low. The qualities came area unit as per the subsequent.

(030H) = 1EH shows made by Atmel

(031H) = 51H shows 89C51

(032H) = FFH shows 12V programming

(032H) = 05H shows 5V programming

Programming Interface:

Each computer memory unit within the Flash exhibit will be composed and therefore the whole cluster will be deleted by utilizing the right mixture of management signals. The compose activity cycle is self coordinated and once started, can consequently time itself to end result. All important programming merchants supply overall facilitate for the Atmel microcontroller arrangement. If it is not an excessive amount of hassle, contact your close programming merchandiser for the acceptable

programming change.

Unique perform Registers:

A guide of the on-chip memory region referred to as the Special perform

Register (SFR). Note that not the whole lot of the locations area unit concerned, and abandoned locations might not be dead on the chip. examine gets to those tends to can overall come back irregular data, and compose gets to can have a imprecise impact. client programming mustn't kind 1s to those unlisted regions, since they'll be utilized in future things to decision new options. Around there, the reset or torpid assessments of the new items can dependably be zero.

Clock two Registers:

Control and standing items area unit contained in registers T2CON and T2MOD for Timer two. The register try (RCAP2H, RCAP2L) is that the Capture/Reload registers for Timer two of every 16-cycle get mode or 16-digit auto-reload mode.

Interrupt Registers:

The individual thwart interact items area unit within the id est register. 2 wants will be set for all of the six interpose sources within the informatics register.

Data Memory:

The AT89C51 executes 256 bytes of on-chip RAM. The higher 128 bytes devour a similar space area to the Special perform Registers. that means the higher 128bytes have comparable area unitas because the SFR area however are extremely disengaged from SFR area. specifically once a direction gets to an interior region on top of address 7FH, the realm mode utilized in the direction decides if the processor gets to the higher 128 bytes of RAM or the SFR area. Rules that usage direct having a bent to induce to SFR area.

as an example, the concomitant direct tending to steerage gets to the SFR at

Guidelines that usage circuitous tending to induce to the higher 128 bytes of RAM. as an example, the concomitant backhanded tending to steerage, wherever R0 contains 0A0H, gets to the knowledge computer memory unit at address 0A0H, as opposition P2 (whose address is 0A0H).

Time in capture mode:

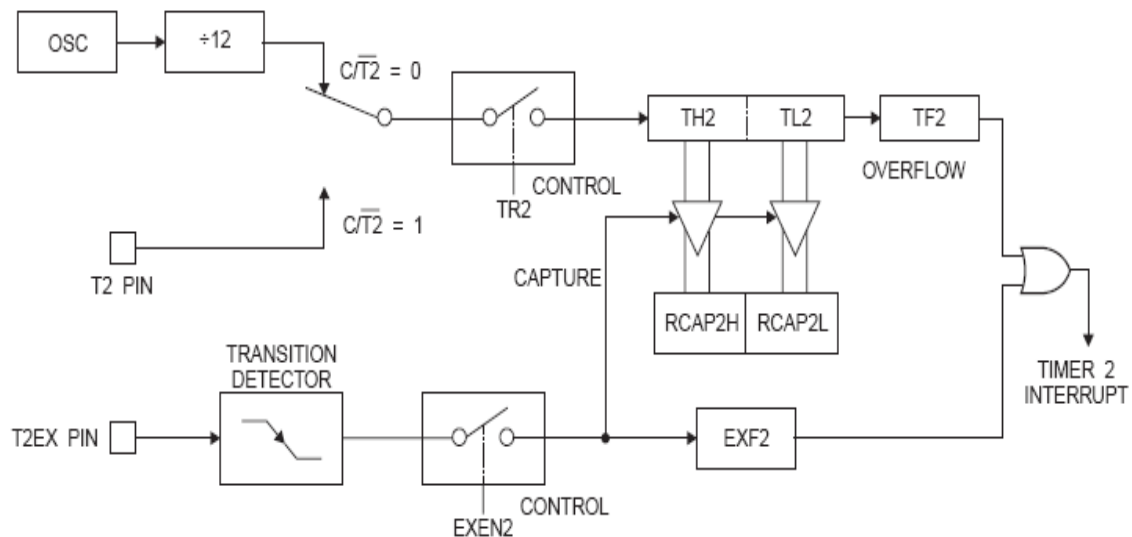


Fig.4.5 : Time In Capture Mode

4.3 ADC:

ADC unit is used to convert the physical values from our sensors into digital values. It has 8 channels so that, we can connect 8 sensors at the time. But in PIC controller we have inbuilt ADC .If we are using AT8051 controller we have to interface it externally.

4.3.1 General Description of ADC:

1. Easy interface to all microprocessors
2. Operates ratio metrically or with 5 VDC or analog span
3. Adjusted voltage reference
4. No zero or full-scale adjust required
5. 8-channel multiplexer with address logic
6. 0V to 5V input range with single 5V power supply
7. Outputs meet TTL voltage level specifications
8. Standard hermetic or molded 28-pin DIP package
9. ADC0808 equivalent to MM74C949

Key Specifications of ADC:

1. Resolution 8 Bits
2. Total Unadjusted Error $\pm 1/2$ LSB and ± 1 LSB
3. Single Supply 5 VDC
4. Low Power 15 mW
5. Conversion Time 100 μ s

4.3.2 Block Diagram of ADC:

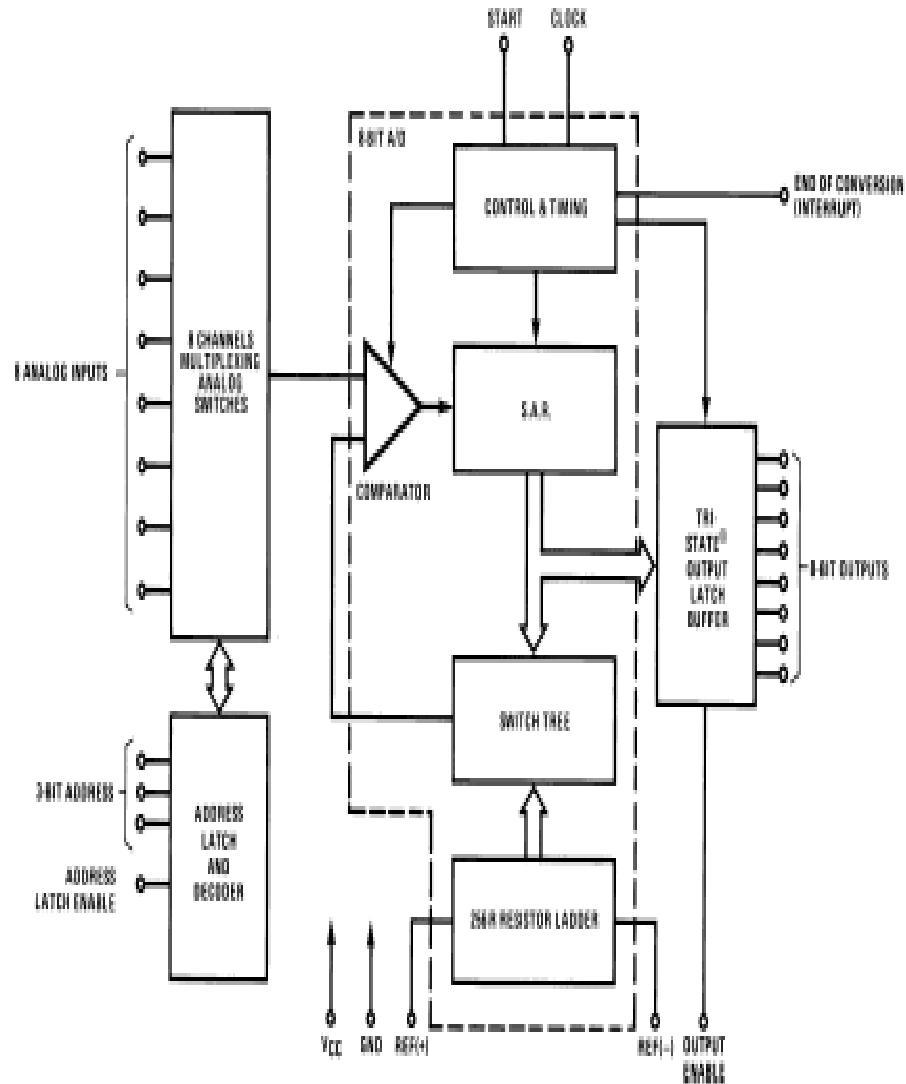


Fig.4.6 : ADC Block Diagram

In the above block diagram we can see that ADC is a combination of SAR, multiplexing switches, switch tree, address latch and decoder and control and timing.

The 8 channel multiplexer is used to accept the input signals in the form analog and allows only one after the other for conversion. Then SAR will make 8 number of

iterations to find the digital code for the analog input given. ADC can also be used in continuous conversion mode.

4.3.2 ADC PIN DIAGRAM:

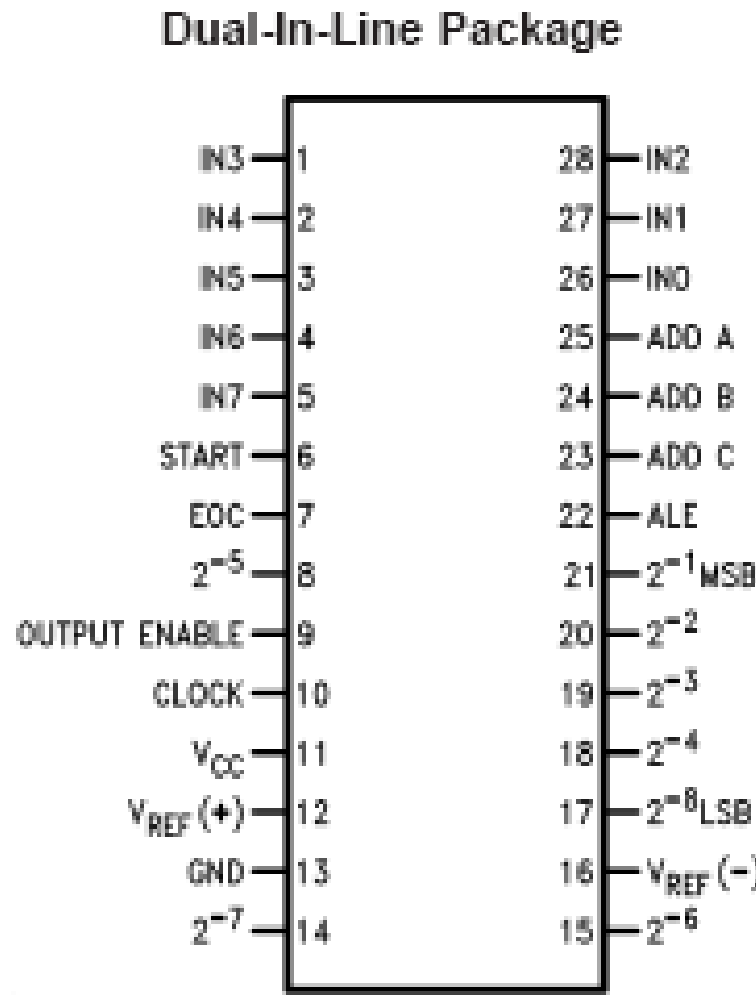


Fig.4.7 : Pin Diagram Of ADC

ADC 0808 has 8 input channels. The desired channel address is sent to the multiplexer inputs through port pins. The microprocessor can read the converted

digital signal through data bus by enabling the output enable signal after EOC is activated.

4.3.3 Functional Description of ADC:

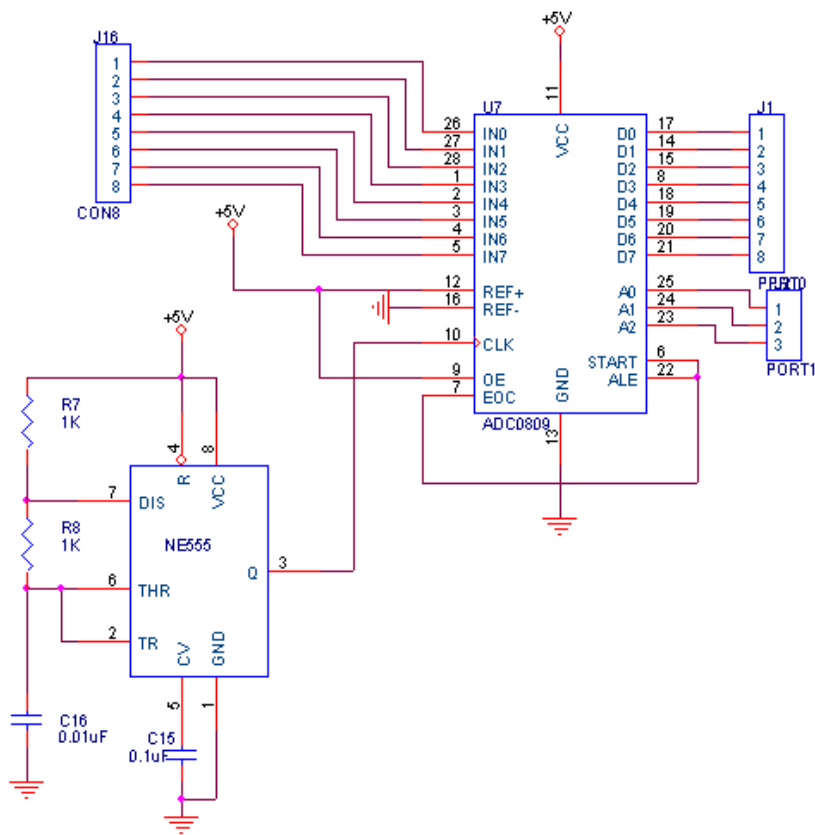


Fig.4.8 : Functional Description Of ADC

An ADC converts the analog signal which is in the form of continuous or infinitely variable to the digital signal in the form of discrete-time or discrete-amplitude. **4.4**

4.4 MULTIPLEXER:

A multiplexer is that which has multiple inputs and one output. 8X1 multiplexer, 4X1 multiplexer are the examples. A particular information channel is been used to send the signal. Table 4.3 shows the info states to chose the appropriate location channels.

Table 4.3 : Address Decoder Table

SELECTED ANALOG CHANNEL	ADDRESS LINE		
	C	B	A
IN0	L	L	L
IN1	L	L	H
IN2	L	H	L
IN3	L	H	H
IN4	H	L	L
IN5	H	L	H
IN6	H	H	L
IN7	H	H	H

4.5 ULTRASONIC SENSOR:

Item running is fundamental in numerous kinds of frameworks. Perhaps the most well known going procedures is ultrasonic going. Ultrasonic going is utilized in a wide assortment of uses including:

- Autofocus cameras
- Motion recognition
- Robotics direction
- Proximity detecting

- Object going

This application note portrays a strategy for interfacing PIC16CXXX microcontrollers to the Polaroid 6500 Ranging Module. This execution utilizes at least microcontroller assets, a CCP module and two I/O pins. The two significant segments of the framework are:

- Microcontroller
- Polaroid 6500 Ranging Module

The microcontroller plays out the insight and number-crunching capacities for ultrasonic running, while the Polaroid 6500 Ranging Module plays out the ultrasonic sign transmissions and reverberation recognition.

4.6 OBSTACLE SENSOR:

Advanced yield on recognizing obstruction in restricted view point.

- 3 pin connectors of simple interface
- Used in LED
- Modulated IR transmitter
- Up to 12 inch range for white article
- Bus controlled module
- Can separate among light and dim tones

Application:

- Used as proximity sensor
- Used as obstacle detector sensor
- Used as line follower sensor

- Used as wall follower sensor.

4.7 VOICE BOARD:

4.7.1 Digital Voice Recording Using 2-Bit and 4-Bit ADPCM:

A 8 or 16 second advanced voice recorder was executed which used the ADPCM calculation for lossy discourse pressure. We put away our discourse tests on a 32 KB SRAM. The Atmel Mega32 microcontroller was utilized to run the ADPCM calculation, to interface with the SRAM, to yield sound to the B/W TV, and to test the yield from a receiver circuit.

Undeniable Level Design:

We thought the DTFM discourse sounded alright, and thought there may be a superior method to do (lossy) discourse pressure. The discourse union page showed that ADPCM would be a decent calculation to improve discourse quality. The page additionally demonstrated that it would be a smart thought to carry out for a last undertaking, so we thought we give that a shot. To make things really fascinating, we chose to incorporate the calculation into a basic computerized voice recorder Overall, the framework worked. We had the option to talk into the mouthpiece and the framework duplicated the discourse clearly. The voice nature of 2-cycle ADPCM isn't generally excellent by any means, yet in a compelled memory climate, it isn't that awful of a decision. The voice nature of 4-digit ADPCM is far better than its 2-bit cousin. The lone "issue" is that we could in any case hear that irritating sharp, PWM screech, anyway faint it could be.

Highlights Of Voice Board:

- Single-chip, incredible voice recording and arrangement of playback
- Minimum outer segments
- Flash memory innovation stability
- Battery less reinforcement required
- Customer-Selectable informing choices

4.8 ZIGBEE:.

4.8.1 Features of ZigBee MRF24J40MA:

1. IEEE Std. 802.15.4™ Compliant RF Transceiver
2. Supports ZigBee®, MiWi™, MiWi™ P2P and
3. Proprietary Wireless Networking Protocols
4. Small Size: 0.7" x 1.1" (17.8 mm x 27.9 mm),
5. Surface Mountable
6. Integrated Crystal, Internal Voltage Regulator,
7. Matching Circuitry and PCB Antenna
8. Easy Integration into Final Product – Minimize
9. Product Development, Quicker Time to Market
10. Radio Regulation Certification for United States
11. (FCC), Canada (IC) and Europe (ETSI)
12. Compatible with Microchip Microcontroller
13. Families (PIC16F, PIC18F, PIC24F/H, dsPIC33
14. and PIC32)
15. Up to 400 ft. Range

4.8.2 Pin Diagram Of ZigBee:

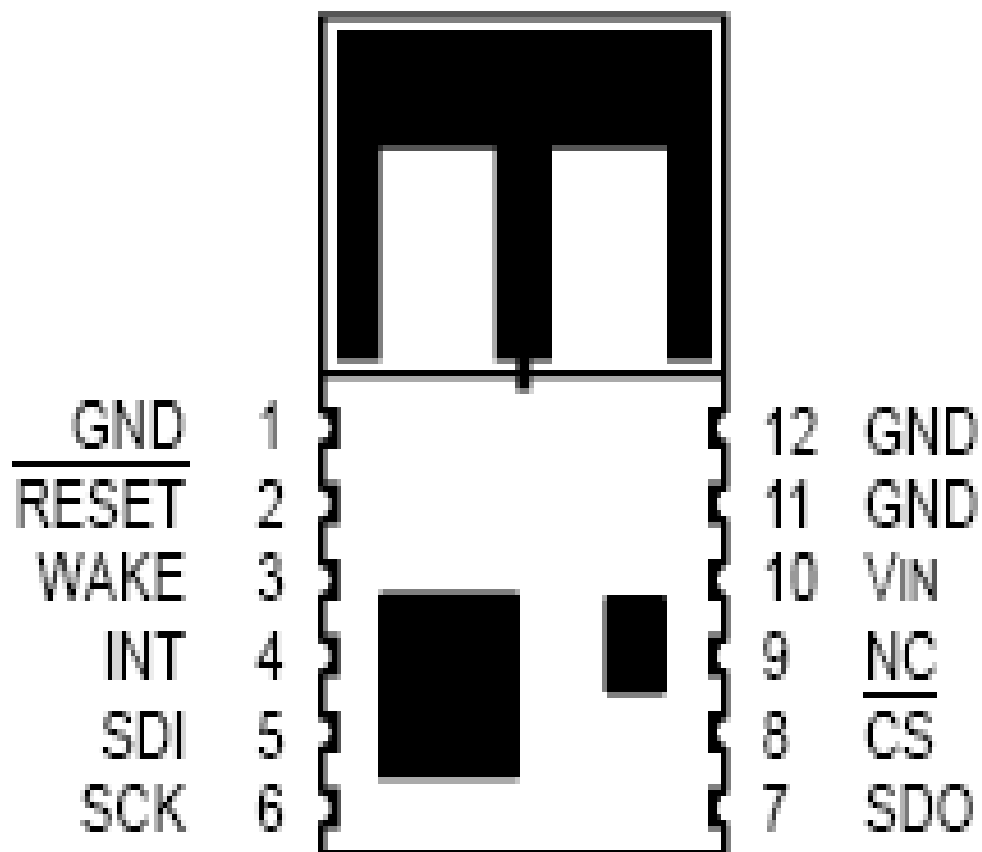


Fig.4.9 : Pin Diagram Of ZigBee

Table 4.4 : Pin Description table of ZigBee

Pin	Symbol	Type	Description
1	GND	Power	Ground
2	$\overline{\text{RESET}}$	DI	Global hardware Reset pin
3	WAKE	DI	External wake-up trigger
4	INT	DO	Interrupt pin to microcontroller
5	SDI	DI	Serial interface data input
6	SCK	DI	Serial interface clock
7	SDO	DO	Serial interface data output from MRF24J40
8	$\overline{\text{CS}}$	DI	Serial interface enable
9	NC	—	No connection (allow pin to float; do not connect signal)
10	VIN	Power	Power supply
11	GND	Ground	Ground
12	GND	Ground	Ground

Overview Of The ZigBee:

The ZigBee is a 2.4 GHz coordinated precious stone, inner voltage controller, coordinating with hardware and PCB receiving wire. This module works in the non-authorized 2.5 GHz recurrence band and is IC, FCC and ETSI consistent. This coordinated module configuration liberates the integrator from broad RF and radio wire plan, and administrative consistence testing, permitting faster an ideal opportunity to showcase. This module is viable with Microchip's programming stacks. Every product stack is open source as a free download with source code, from the Microchip. This module has gotten administrative endorsements for particular gadgets in the US (FCC), Europe (ETSI) and Canada (IC). Secluded endorsement eliminates the requirement for costly RF and radio wire plan and permits the end client to put the module inside a completed item and not need administrative testing.

4.9 UART:

UART is abbreviated as Universal Asynchronous Receiver or Transmitter. In this type of communication, both UART will communicate directly with each other. UART sends asynchronous signals that means there is no clock signal to output that has to be synchronized.

4.10 MAX232:

MAX232 is a co-ordinated circuit which converts information from a port of RS-232 sequential to signals reasonable for use in TTL variable advanced rationale circuits. The MAX232 is a couple beneficiary/driver and casually varies over the CTS, RX, TX and RTS signals.

The drivers will give RS-232 voltage level which yields around ± 7.5 V from a solitary + 5 V. So it will make valuable for executing RS-232 in devices that in any case don't have to bother with any voltages in the range of 0 V - + 5 V reach, as force supply configuration could not be made more convoluted only for making the RS-232 for this situation.

4.10.1 Pin Diagram Of MAX232:

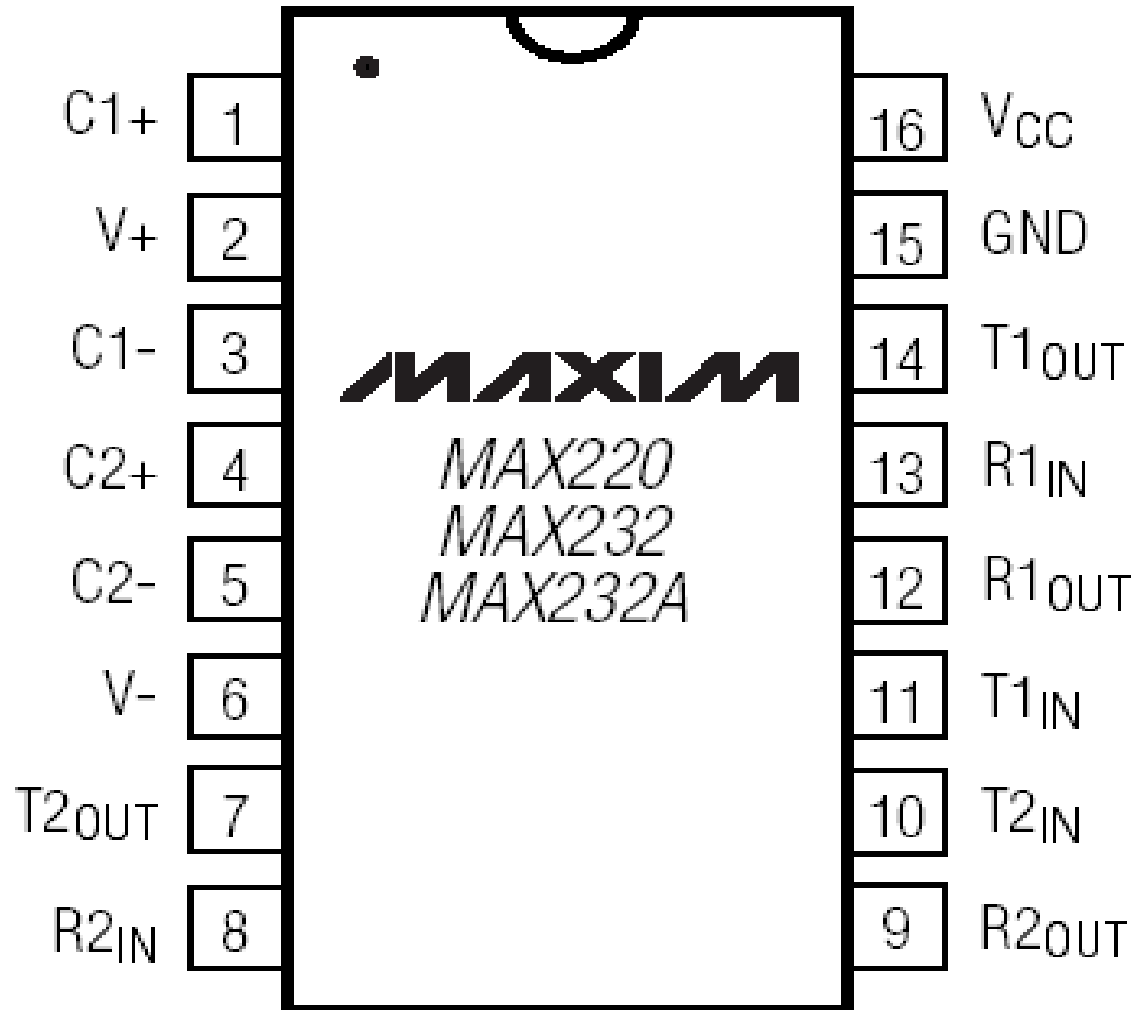


Fig.4.10 : MAX232 Pin Diagram

4.11 SYSTEM SOFTWARE :

4.11.1 Embedded C :

1. Embedded C is shorter and easier to write as it is high level language. It is independent of the Processor. Embedded C has been used regularly than assembly language.
2. C language has two prolific advantages, because of which it is much easier for developer to develop quality programs which are easier to read, revise, and dump to a different system. It has built in structure.

4.11.2 KEIL Cross Software:

- TEXT EDITOR
 - Used for typing the embedded c programs.
- Simulator
 - Used for debugging.
- Compiler
 - Used for converting high-level language into machine level language (hex code)
- ANSI C Compiler
- Generates fast compact code for the 8051 and it's derivatives

Advantages of C compiler against Assembler:

1. Microcontroller instruction set is not necessary to know.
2. The compiler handles register allocation and all the addressing modes.
3. Reduced programming time.
4. Code can be inserted easily to all microcontrollers

CHAPTER 5

RESULT ANALYSIS

5.1 RESULT:

The system to monitor intruder detection using seismic sensor is proposed. With the use of seismic sensor the elephant foot steps are detected by monitoring the vibrations caused by the elephant. Fig.5.1 shows the entire setup of intruder detection using seismic sensor.

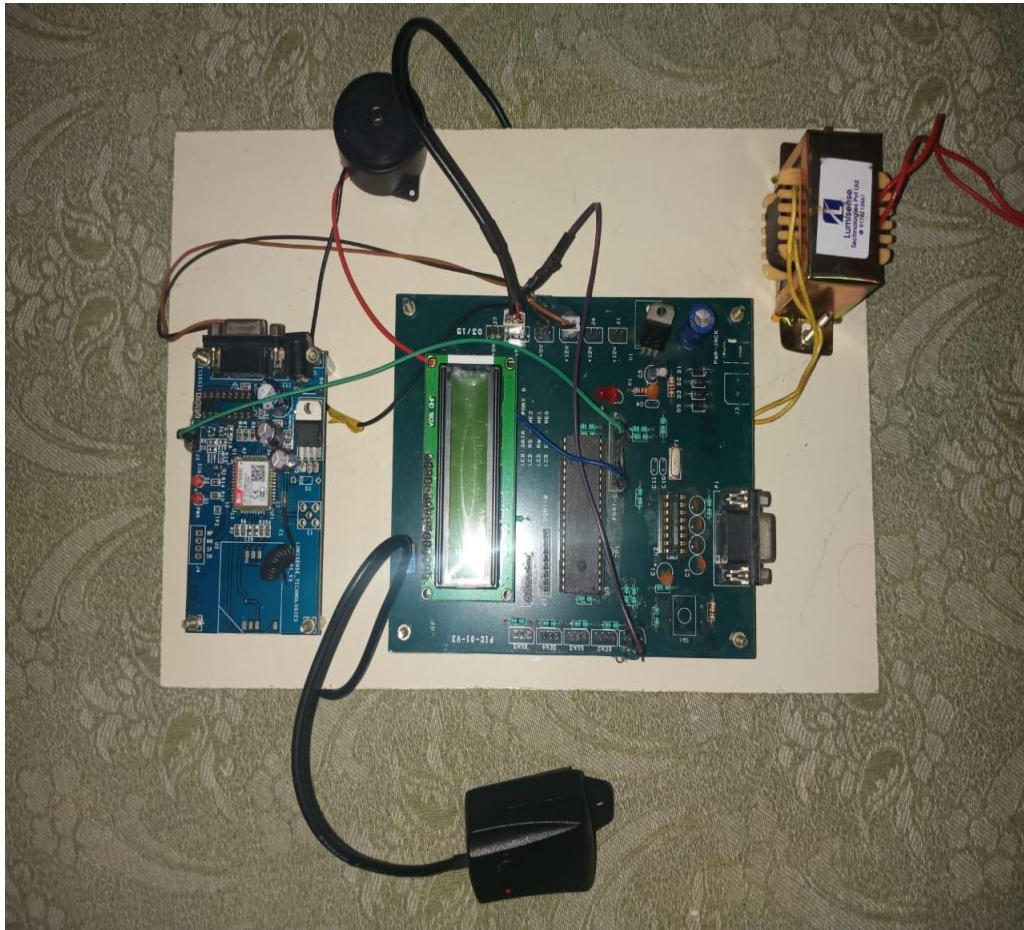


Fig.5.1 : Intruder Detection Setup Image 1

In Fig.5.2 we can see that the device is turned on. Whenever there is a vibration, the seismic sensor detects it and the buzzer is raised. Through GSM modem the appropriate message will be sent to the field incharge.

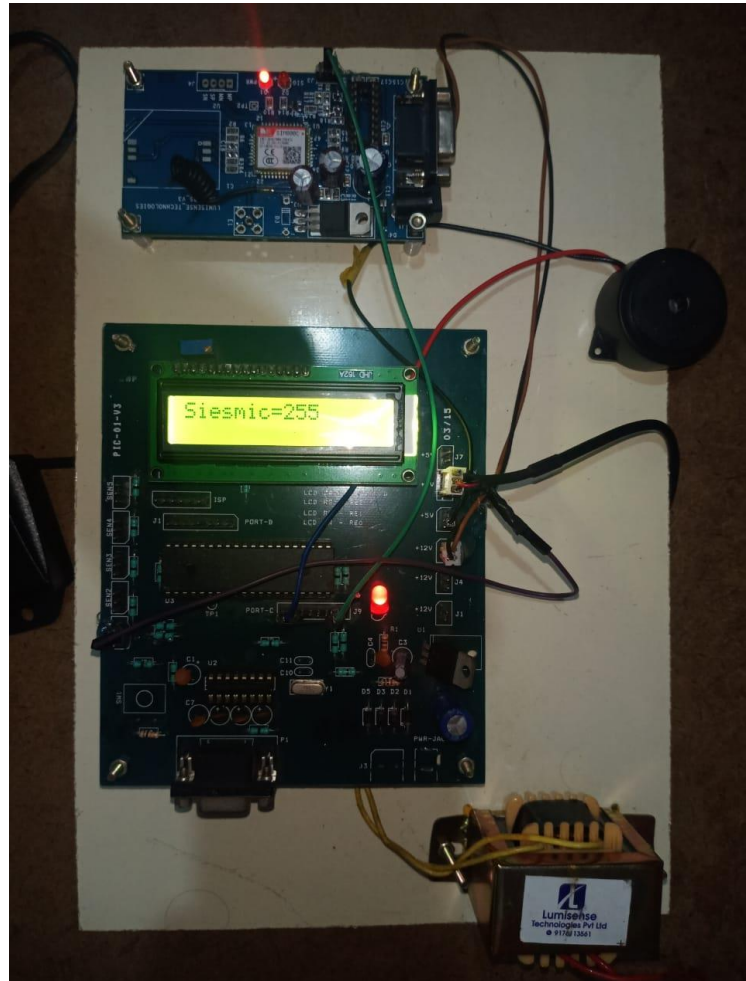


Fig.5.2 : Intruder Detection Setup Image 2

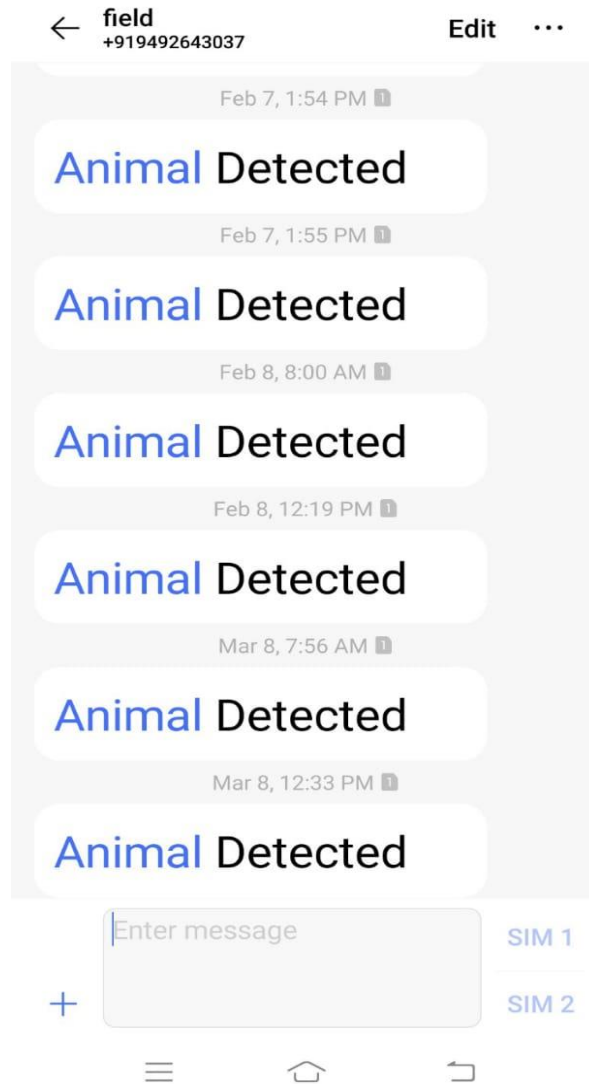


Fig.5.3 : Message Alert Screenshot

In Fig.5.3, it is observed that the message 'Animal Detected' is sent to inform the field incharge about presence of an intruder and to make appropriate decision.

CHAPTER 6

CONCLUSION AND SUMMARY

The condition of movement of a gatecrasher by utilizing a geophone. We have proposed another calculation utilizing STA/LTA which recognizes and extricates parts of the sign that address an occasion. The proposed occasion extraction method expands classifiers exactness and F1 Score by 11% and saves 22% of highlight extraction time when executed on a sign of 10 sec. We have done a relative report of the classifiers to analyze their presentation boundaries with the variety of sign length. It has been seen that signs of length (2-4) sec are adequate to identify the presence/nonappearance of an interloper. We have denoted that the presentation boundary of the classifiers debases radically if the span of the sign is under 6 sec. Thus, to foresee the condition of movement of a gatecrasher with a precision of 76%, we need a sign in any event of 6 sec length.

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5
**DETECTION OF AN INTRUDER AND PREDICTION OF STATE OF
MOTION BY USING SEISMIC SENSOR**

PEDAPATNAPU NAVEEN (37130304)

PEDDABALIREDDYGARI BHANU PRAKASH REDDY (37130305)

ABSTRACT

The human-elephant struggle is one among the premier extreme normal issues in south India. We have farmlands close to the elephant natural surroundings where these elephants attack these ranches looking for food. Regular conflicts between wild elephants and townspeople have brought about serious harm to property, additionally as loss of lives for the two people and elephants which has been the most prior reason for almost 70 human passings and more than 200 elephant passings which are captured yearly inside the new past. Rivalry for space is that the essential justification struggle among people and elephants. Also elephants which escape from the untamed life public parks into towns making annihilation afterward. To forestall such incidents, a right situation is needed to contain and screen elephants in public stops. Here we depict various ways to deal with distinguish elephants and potential methods of checking the public untamed life parks. To deal with the matter, the public authority has started projects that safe the public untamed life parks with electrical wall. Nonetheless, keeping up the electrical fence is a test, due to its huge edge and the absence of accessible labor. A specific concern is that of finding flaws in electrical wall since these ordinarily several hundred miles. Right now, park officers are needed to walk to find the flaws, which could require days to wrap up.

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CHAPTER-1

INTRODUCTION

1.1 INTRODUCTION:

Elephas Maximus which is the magnificent Asian elephant is the biggest earthbound vertebrate in the world. This species is known as imperiled species. In Sri Lanka elephants are always been the wellspring of numerous struggles among people and untamed life. The quantity of frequencies of alleged elephant-human clashes, has consistently expanded throughout the long term. The primary justification of such struggles has been the opposition over restricted space. Logging that leads to the deforestation of backwoods, moving development and single culture tree ranches has made all elephants adventure into the settlements of human looking for daily needs like water and food. The increasing populace development and the getting free from woods for financial advancement will offer furthermore to the expanded number of HEC. In process to look over the elephant and human conflict, the public authority has started a few orders to maintain the groups of elephants in regions secured by the natural life office ensured zones, away from people a bio Palmyra trees fence has been proposed to forestall elephants going into human territories. In general, elephants will be kept away from Palmyra trees in light of their prickly recoils. A few associations that includes the Department of Wildlife Conservation of Sri Lanka has dispatched a task to plant Palmyra trees fence as a technique for keeping elephants under control. Nonetheless, Palmyra trees set aside a long effort to develop to a level that they can be successful obstructions against elephants and likewise such estates may effectively affect the backwoods' environment. Lord Et have proposed a fence of bee colonies as an obstruction against elephants. Colonies of bees are raised in a fence-like arrangement and are interconnected with wires. An encroaching elephant might disrupt the wires, subsequently delivering the honey bees who go about as an obstacle. In any case, development of huge honey bee swarms raises essential construction of an electrified barrier pragmatic contemplations on support, notwithstanding the common danger of

the environment unevenness. The utilization of electric wall has demonstrated to be definitely more successful than the aforementioned options in containing elephant crowds represents the essential construction of an electrified barrier. This specific electrified barrier framework highlights live twin wires and a ground wire that runs among them. All the wires are upheld on wooden posts raised around the untamed life safe-haven. A run of the mill fence would traverse a few hundred kilometers. The wires utilized are normally check 8 (3.264 mm). A non-deadly electric stun is directed to a meddling elephant right after it comes for contact with a ground wire and a live wire. Specifically, the live wires direct high voltage levels. They are associated with the posts utilizing separators to keep away from power spillage through the shafts. The voltage levels are itself non-deadly, yet adequate to deflect elephants from getting over the fence. Ground wire is utilized to work with a more successful live-wire to earth stun the elephants environments in Sri Lankan soil which dry and sandy makes it troublesome convey a decent earth return fence framework. Normal electrified barrier arrangements change on the quantity of ground wires and live wires, contingent upon the voltage of necessary measure is to be produced.

CHAPTER 2

LITERATURE SURVEY

Paper 1: Target detection and classification using seismic and pir sensors

Author : X. Jin, S.Sarkar, A.Ray, S.Gupta, T.Damarla

Abstract:

Unattended ground sensors are generally used to screen human exercises, like walker movement and discovery of interlopers in a protected district. Viability of UGS frameworks is regularly restricted by high bogus caution rates, conceivably because of deficiencies of the basic calculations and impediments of locally available calculation. In such manner, the paper1 presents a wavelet-based strategy for target discovery and order. The strategy that has been proposed is approved on informational collections of seismic and detached infrared sensors for target discovery and grouping, just as for payload and development type recognizable proof of the objectives. The proposed technique has the benefits of low memory and quick execution time prerequisites and is conceivably appropriate for ongoing execution with installed UGS frameworks.

Paper 2: Inside person identification through footstep induced structural vibration

Author : S.Pan, N.Wang, Y.Qian, I.Velibeyoglu, H.Y.Noh

Abstract:

Individual recognizable proof is vital in different shrewd structure applications, including client conduct investigation, patient observing, and so on Earlier works on individual recognizable proof mostly centered around access control related applications. They accomplish ID by detecting certain biometrics with explicit

sensors. Notwithstanding, these strategies and contraptions can be nosy and not versatile on account of instrumentation and detecting limits.

We present our indoor individual ID framework that uses stride incited underlying vibration. Since primary vibration can be estimated without intruding on human exercises, our framework is appropriate for some omnipresent detecting applications. Our framework detects floor vibration and identifies the sign instigated by strides. At that point the framework removes highlights from the signs that address qualities of every individual's walk design. With the removed highlights, the framework conducts progressive order at an individual advance level and afterward at a follow. Our framework accomplishes more than 83% recognizable proof exactness by and large. Besides, when the application requires various degrees of precision, our framework can change certainty level edge to dispose of questionable follows. For instance, at an edge that permits just most certain half follows for arrangement, the ID precision increments to 96.5%.

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Paper 3: A novel application of a micro accelerometer for intruder classification

Author : J.Lan, T.Lan, S.Nahavandi

Abstract:

An epic technique for target order through a miniature accelerometer. Its standard is that the seismic signs from moving vehicle targets are distinguished by a miniature accelerometer, and targets are consequently perceived by the high level sign preparing strategy. The recognition framework dependent on the miniature accelerometer is little in size, light in weight, has low force utilization and ease, and can work under extreme conditions for a wide range of uses, like war zone reconnaissance, traffic checking, and so on To remove highlights of seismic signs invigorated by various vehicle targets and to perceive targets, seismic properties of normal vehicle targets are investigated in this paper. A method of counterfeit neural

organizations (ANNs) is applied to the acknowledgment of seismic signs for vehicle targets. An improved back spread (BP) calculation and ANN design have been introduced to improve learning speed and keep away from neighborhood least focuses in mistake bend. The improved BP calculation has been utilized for characterization and acknowledgment of seismic signs of vehicle focuses in the outside climate. Through tests, it tends to be demonstrated that target seismic properties obtained are right, ANN is viable to tackle the issue of characterization and acknowledgment of moving vehicle targets, and the miniature accelerometer can be utilized in vehicle target acknowledgment.

²²
Paper 4: Discrimination of bipeds and quadrupeds using seismic footprint signatures

Author : A.Mehmood, V.M.Patel, T.Damarla

Abstract:

⁷
Seismic sensor is broadly used to distinguish moving focuses in the ground sensor organization, that can be handily utilized to separate human and quadruped dependent on their stride marks. Due to the complex ecological conditions and the mobility nature of the seismic signs, stride location and arrangement is an extremely difficult issue. The answer for this issue has different applications, for example, observation, line security, interloper discovery and edge insurance. Past works in the area of seismic discovery of human versus quadruped have depended on the rhythm recurrence based models. Nonetheless, rhythm based discovery alone outcomes in high bogus cautions. In this paper, we portray a seismic stride information base and present grouping results dependent on help vector machine (SVM). We exhibit that as well as applying a decent characterization calculation, discovering hearty highlights are vital for seismic separation.

CHAPTER 3

SYSTEM ANALYSIS AND MODULES

3.1 SYSTEM ANALYSIS

The advancement of electronic detecting gadgets for the outwardly weakened requires information on the necessities and capacities of this class of individuals. In this task we present a harsh examination that can be utilized to appropriately characterize the measures to be embraced for the plan of such gadgets. Specifically, consideration will be centered around make way markers, featuring their part in direction and versatility assignments. Another gadget having a place with this class is introduced. The indicator depends on a multi-sensor technique and embraces keen sign preparing to furnish the client with appropriate data about the situation of items preventing their way. Test preliminaries exhibit the effectiveness of the gadget created

3.1.1 Existing System:

Since antiquated occasions, townspeople have figured out how to shield their yields from wild elephants through methods for conventional strategies. By building stations along the border of the town, the residents stand gatekeeper to secure their harvests. Cautioning yells are made when an elephant is located and the entire town participates in pursuing back the elephants. When they smell the presence of elephants, canines are developed to bark which gives a significant benefit over distance because of the sharp feeling of scent of the canines. The electrical fence that goes around the untamed life asylums gives a helpful way to information correspondence. As a result of constantly electric barrier little birds and creatures cause dead because of significant degree of voltage past their resistive force. Individuals likewise delve a pit in underground wherever for to shield from elephants. Now and again saltines additionally used to flee from neighborhoods. Also nowadays crackers are being used to make elephants run away from residential areas.

Warning shouts are being made to warn the elephants from entering into the residential areas.

Disadvantage Of Existing System:

1. Baby elephants die and also other wild animals will die due to digging a pit.
2. Due to crackers bursting other birds and animals get afraid.
3. 24 hours of electrified fence will lead to humans, birds and other wild animals to get hurt.

3.1.2 Proposed System:

Elephants are seen to have a unique ability to convey mating calls by using seismic waves as the medium. These seismic waves are generated in the form of vibrations by the male elephant by hitting the ground. Since the elephants' feet are furnished with exceptionally delicate vibration sensors, it gives them one of a kind correspondence capacity. Research shows that the ground vibrations that are brought about by every creature type take an interesting structure. By placing seismic waves, the alert is sent to the authority person about the presence of elephants and other animals via GSM and the buzzer is turned on to panic the animals not to cross the fence. Here we include a buzzer to make noise so that the elephants will not cross the border. At the same time GSM is brought into action by sending an appropriate message to the respective field incharge.

In this project, we propose a setup which detects the intrusion of elephants in human habitat region. Here, we use a seismic sensor to detect the vibrations from elephant foot. Then a buzzer will be raised to panic the elephants. Simultaneously a message will be sent to the incharge.

Advantages Of Proposed System:

1. Prior information about the elephants entering the residential are passed through GSM to forest officers.
2. Many loss of wild animals is prevented.
3. We can also avoid this elephant and human conflict without loss of any life.

3.1.3 Applications:

1. To save wild animals and human beings.
2. Used in Smart cities.
3. Used in wildlife and heritage centres.

3.1.4 System Requirements:

Hardware Requirements:

1. MICROCONTROLLER PIC16F877A
2. BUZZER
3. VIBRATION SENSOR
4. SEISMIC SENSOR
5. GSM
6. UART

Software Requirements:

1. Embedded c
2. Keil compiler

3.2 BLOCK DIAGRAM OF INTRUDER DETECTION SETUP:

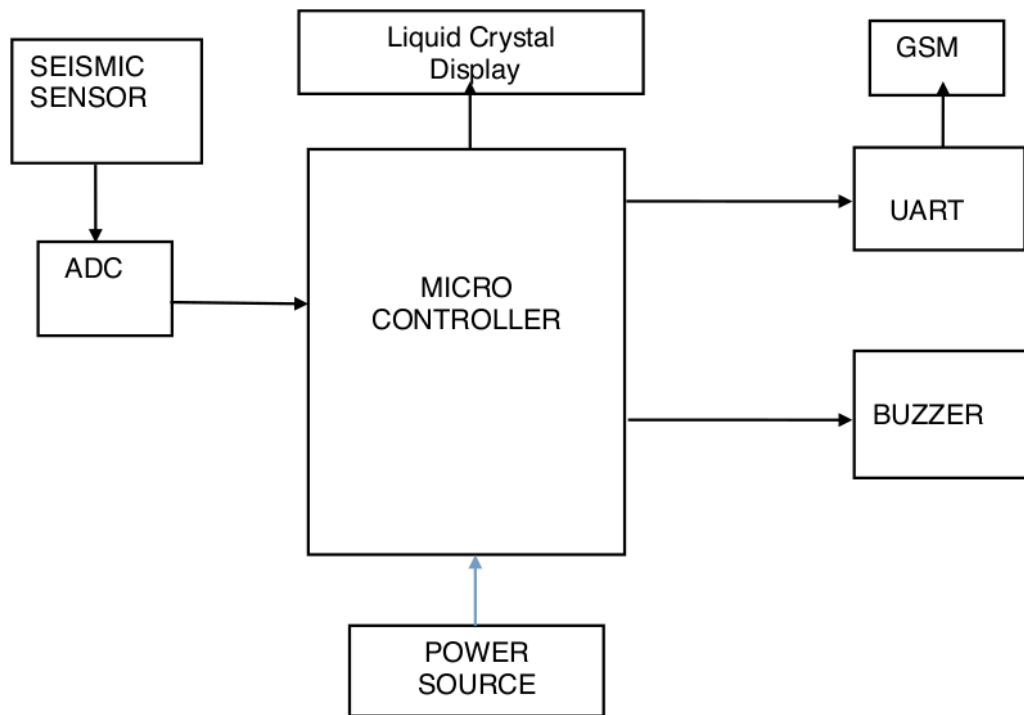


Fig.3.1 : Block Diagram Of Intruder Detection setup

The framework has two primary undertakings: the initial is to perceive if the fence has been broken or not and the final is to recognize the area of the damage. For the primary errand, the fence regulator associates the beat generator to the two fence wires. The other is the ground line. At regular intervals (time period is picked to save control yet can be moved by need), the fence regulator confines wire 3 from the beat generator and rather interfaces its ground terminal to wire 3. Locator 2 in the End Node recognizes this which at that point turns on a transfer which short circuits wires 1 and 3. This finishes the circuit which makes a return current heartbeat on wire 3. The regulator indicator at that point recognizes this return current heartbeat and conveys a message to the framework primary demonstrating that the fence has no issues. We have tried the discovery of a straightforward heartbeat utilizing an ATMEGA32 microcontroller as the hub micro controller unit. delineates the fundamental plan. The beat finders use BC547 semiconductors as speakers. The high voltage in the wire instigates a voltage on the copper strip at that point causes a current stream in the base of the semiconductor. The subsequent current moving through the producer is sent through another intensifier to get a good voltage distinction that can be distinguished by the miniature regulator. A solitary rail comparator has been used before the MCU to give a paired contribution to the microcontroller. The received hub will be shown on to a LCD screen.

3.3 CIRCUIT DIAGRAM OF INTRUDER DETECTION SETUP:

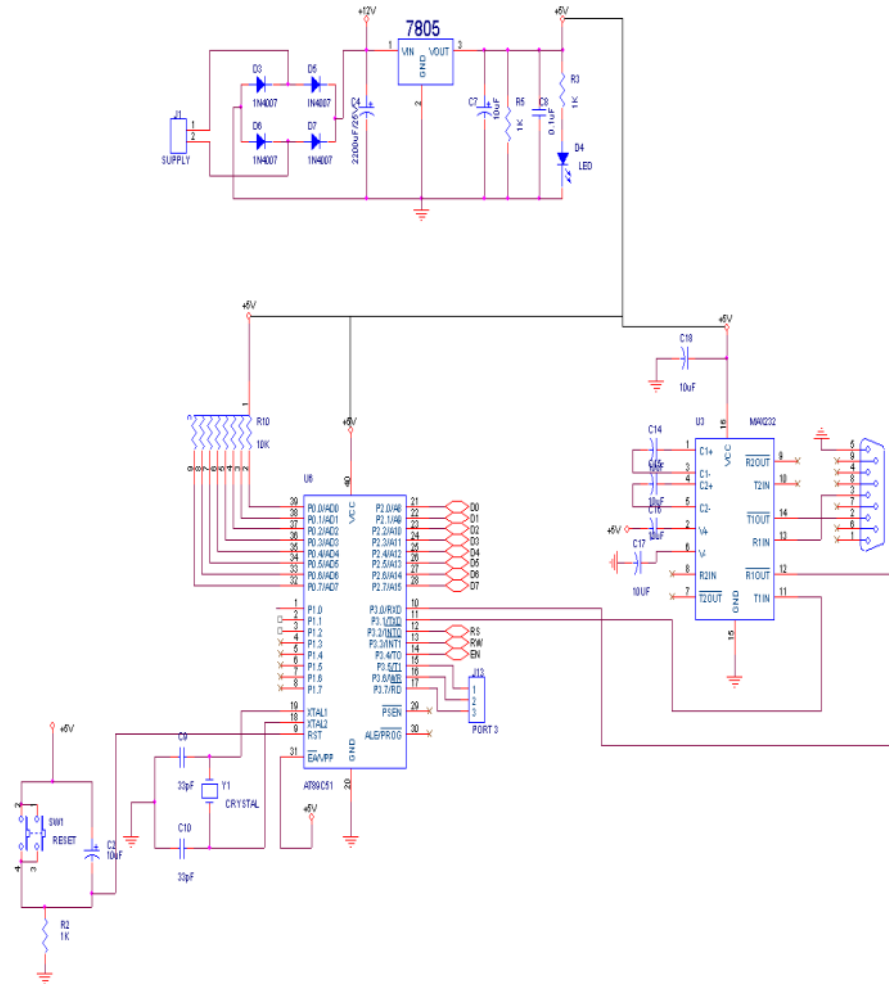


Fig.3.2 : Intruder Detection Setup Circuit Diagram

In the above circuit diagram, we can see that the setup consists of 12v AC transformer, AT89S51 micro controller, voltage regulator, UART, LCD display, GSM. The 12v AC step down transformer is being used to reduce the 230v AC power to 12v AC.

ADC unit is used to convert the physical values from our sensors into digital values. It has 8 channels so that, we can connect 8 sensors at the time. But in PIC controller we have inbuilt ADC. The output will be shown on the 16X2 LCD display. GSM is nothing but a wireless modem that works on the base of wireless network. It requires a SIM card to send the appropriate messages. We also have bridge rectifiers to convert the AC voltage to DC.

3.4 PCB LAYOUT:

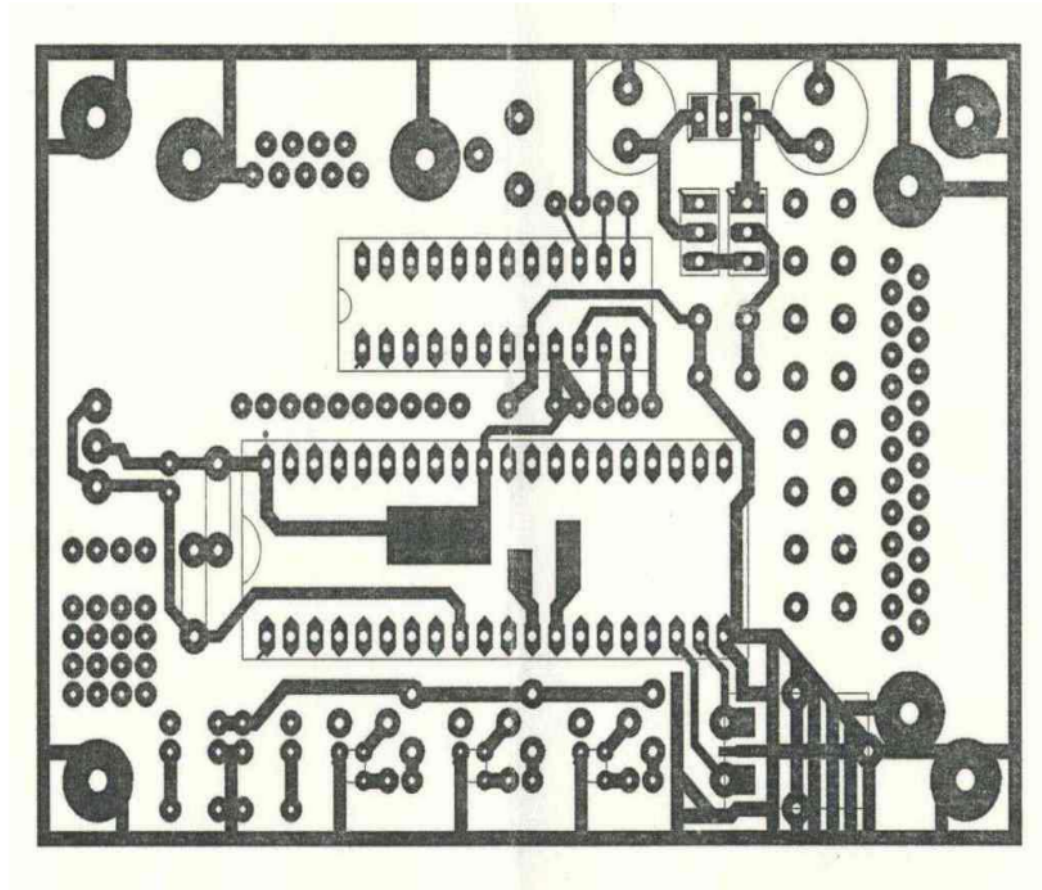


Fig.3.3 : PCB Layout

PCB is termed as Printed Circuit Board. It electrically connects all the components required for this project using conductive tracks and pads.

3.5 POWER SUPPLY:

Power supply means nothing but power source in the form of electric power. The system or device which supplies electrical or mechanical energy or energy in any form to a load output is called the power supply or power source. The term is most customarily applied to electrical energy supply, less frequently to other ones, and rarely to different ones.

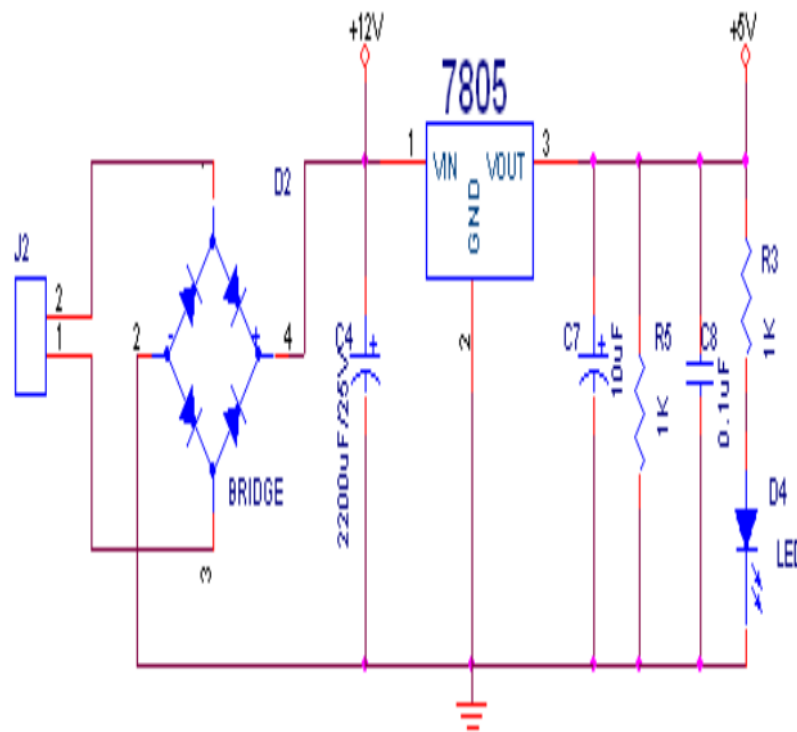


Fig.3.4 : Power Supply Circuit Diagram

Here, a 230v AC power supply is given to the 12v AC step down transformer to convert this 230v AC to 12v AC. Then by using bridge rectifier this 12v AC power supply is converted into 5v DC source. This converted 5v DC supply is given to the all the components that are present in the printed circuit board.

3.6 VOLTAGE REGULATOR:



Fig.3.5 : Voltage Regulator

Features Of Voltage Regulator:

- Up to 1A of current is yielded
- 5, 6, 8, 9, 10, 12, 15, 18, 24V are the output voltages
- Protection over short circuit and thermal Overload

3.6.1 Internal Block Diagram Of Voltage Regulator:

15 The voltage regulator is used to maintain the unique voltage across the entire system.

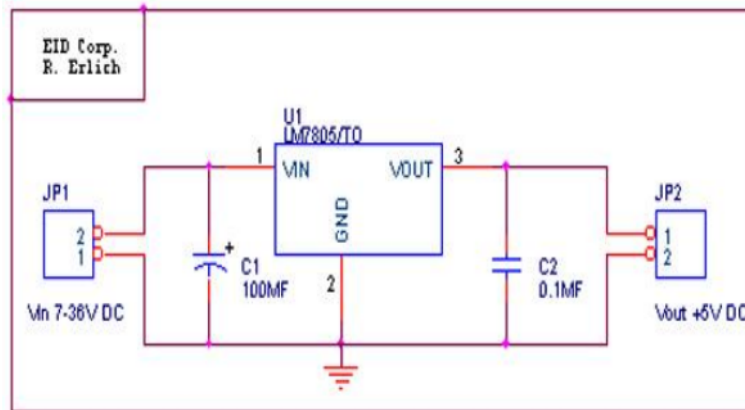


Fig.3.6 : Internal Block Diagram Of Voltage Regulator

CHAPTER 4

COMPONENTS AND ALGORITHMS USED

4.1 MICROCONTROLLER AT89S51:

A microcontroller (additionally microcontroller unit, MCU or μC) is a small PC on a single integrated circuit which is developed using crystal oscillators, capacitors, sequential as well as analog I/O and clocks etc.. likewise regularly remembered for chip, just as a commonly modest quantity of RAM. Microcontrollers are intended for little or applications that are dedicated.

4.1.1 Pin Diagram Of Microcontroller:

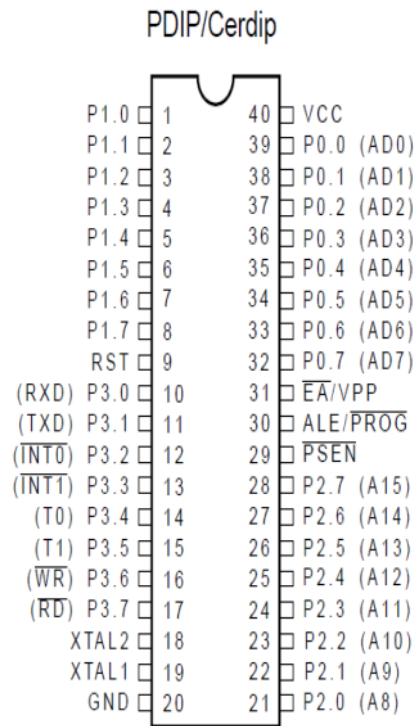


Fig.4.1 : Pin Diagram of AT89S51

Memory Organization:

MCS-51 contraptions have AN alternate space house for Program and knowledge Memory. Up to 64K bytes all of outdoor Program and knowledge Memory is attended.

Program Memory:

In case the Semitic deity pin is expounded with GND, all program gets area unit composed to outside memory. On the AT89C51, if Semitic deity is expounded with VCC, program brings to addresses 0000H through 1FFFFH area unit composed to internal memory and gets to addresses 2000H through FFFFFH area unit to external memory.

Data Memory:

The AT89C51 executes 256 bytes of on-chip RAM. The higher 128 bytes burn-through constant space house to the Special operate Registers. This infers that the higher 128 bytes have comparative area unitas because the SFR house however are really secluded from SFR house. precisely once a direction gets to an enclosed region higher than address 7FH, the realm mode employed in the direction shows whether or not the processor gets to the higher 128 bytes of RAM or the SFR house. Rules that use direct having an inclination to induce to the SFR house. as an example, the going with direct keeping an eye fixed on direction gets to the SFR at region 0A0H (which is P2). MOV 0A0H, #data directions that use indirect having an inclination to induce to the higher 128 bytes of RAM.

For example, the going with winding look out for direction, wherever R0 contains 0A0H, gets to the information computer memory unit at address 0A0H, rather than P2 activities area unit instances of aberrant tending to, therefore the higher 128 bytes of knowledge RAM area unit accessible as stack house.

4.1.3 Oscillator Characteristics :

XTAL1 and XTAL2 are unit knowledge and yield, singly, of associate displeasing attention which might be designed to be used as associate on-chip generator. Either quartz jewel or pink-slipped resonator could be utilized. To drive the widget from an out of doors clock supply, XTAL2 have to be compelled to be left detached whereas XTAL1 is driven. There are not any conditions on the duty pattern of the surface clock signal, since the contribution to the inward temporal arrangement hardware is thru a spot by-two flip-flop, nonetheless least and greatest voltage, high and low time determinations ought to be detected.

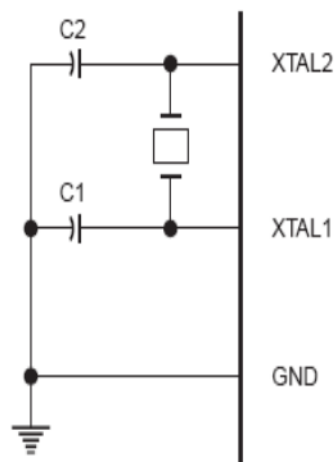


FIG:4.3 : OSCILLATOR CONNECTIONS

Inactive Mode :

Out of substances mode, the processor takes care of itself whereas all the on chip peripherals keep dynamic. The thing of the on-chip RAM and also the whole exceptional capacities registers keep unreduced throughout this mode. The inactive mode is all over by associate hinder or by an instrumentality reset. It need to be detected that once inactive is all over by a tough product reset, the gismo frequently continues program execution, from the most recent relevant purpose of interest, up to 2 machine cycles before the inward reset calculation takes management. On-chip instrumentality represses admittance to inward RAM during this occasion, but admittance to the port pins is not restrained. To lose the possibility of a stunning detain bit with a port pin once Idle is all over by reset, the steering following the one that conjures Idle ought not be one that keeps up-to-date with a port pin or to outside memory.

Outer Clock Drive Configuration:

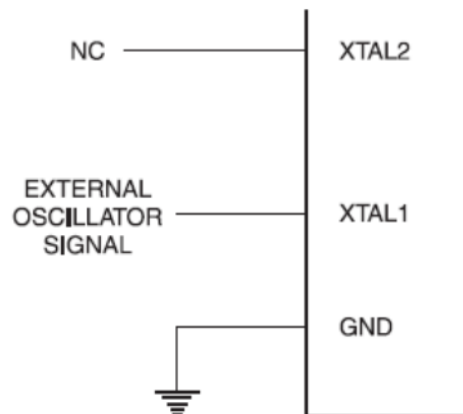


Fig 4.4 External Clock Drive Configuration

Program Lock Bits :

On the chip square measure 3 lock bits which might be left unprogrammed (U) or are often changed (P) to urge the additional highlights recorded within the table to a lower place. At the purpose once lock cycle one is tailor-made, the explanation level at the Ea pin is inspected and hooked throughout reset. On the off probability that the appliance is burning up while not a reset, the hook introduces to Associate in Nursing discretionary price, and holds that esteem till reset is initiated. it's necessary that the hooked estimation of Ea be in concurrence with this explanation level at that pin all at once for the appliance to figure suitably.

Power Down Mode:

In the pack up mode, the generator is halted, and also the steerage that conjures pack up is that the last steerage dead. The on-chip RAM and Special perform registers hold their qualities till the pack up mode is concluded. The lone exit from pack up is Associate in Nursing instrumentality reset. Reset reclassifies the SFRs but does not modification the on-chip RAM. The reset ought not be motivated before VCC is reestablished to its typical operating level and may be control dynamic to allow the generator to restart and settle.

Table 4.1 : Program Lock Bits

Program Lock Bits				Protection Type
	LB1	LB2	LB3	
1	U	U	U	No program lock features.
2	P	U	U	MOVC instructions executed from external program memory are disabled from fetching code bytes from internal memory, $\overline{EA}$ is sampled and latched on reset, and further programming of the Flash is disabled.
3	P	P	U	Same as mode 2, also verify is disabled.
4	P	P	P	Same as mode 3, also external execution is disabled.

Programming The Flash :

The AT89S51 microcontroller is typically dispatched with the on-chip Flash a low-tension (VCC) program empower signal. The low voltage programming mode offers associate advantageous methodology to program the AT89C51 within the client's framework, whereas the high-voltage programming mode is viable with ancient outsider Flash or fixed storage computer code engineers. The individual top-side stamping and gismo signature codes ar recorded within the concomitant table.

Table 4.2 : Flash Memory Table

	V _{PP} = 12V	V _{PP} = 5V
Top-Side Mark	AT89C51 xxxx yyww	AT89C51 xxxx-5 yyww
Signature	(030H)=1EH (031H)=51H (032H)=FFH	(030H)=1EH (031H)=51H (032H)=05H

The AT89C51 code memory cluster is customized byte by byte in either programming mode. To program any nonblank byte in the on-chip Flash Memory, the whole memory should be stopped utilizing the Chip Erase Mode.

3.2 PROGRAMMING ALGORITHM:

Prior to programming the AT89S51, the location, information and control signs ought to be set up as per the Flash programming mode table. To program the AT89S51, make the accompanying strides.

1. Input the proper memory area on true lines.
2. Input the fitting information memory board unit on the information lines.
3. Activate the right mixture of management signals.
4. Raise EA/VPP to 12V for the high-voltage programming mode.
5. Pulse ALE/PROG once to program a memory board unit among the Flash exhibit or the lock bits.

The byte-compose cycle is self-coordinated and ordinarily takes close to 1.5ms. Rehash stages 1 through 5, changing the location and information for the whole cluster or until the finish of the item record is reached.

4.2.1 Data Polling:

The AT89C51 highlights knowledge Polling to demonstrate the end of a compose cycle. throughout a compose cycle, associate degree endeavored scan of the last computer memory unit composed can achieve the supplement of the composed data point on PO.7. once the compose cycle has been finished, real data square measure legitimate on all yields, and therefore the following cycle could begin. data Polling could begin any time when a compose cycle has been started.

4.2.2 Ready/Busy:

The advancement of computer memory unit programming will likewise be ascertained by the RDY/BSY yield signal. P3.4 is force low once beer goes high throughout programming to point out BUSY. P3.4 is force high once more once writing laptop programs is rarely very prepared.

4.2.3 Program Verifies:

On the off probability that lock bits LB1 and LB2 haven't been bespoke, the changed code data will be perused back by suggests that of the situation and knowledge lines for confirmation. The lock bits cannot be checked foursquare. Confirmation of the lock items is accomplished by noticing . 4.2.4

Chip Erase:

The whole Flash exhibit is eradicated electrically by utilizing the acceptable mix of management signals and by holding ALE/PROG low for 10ms. The code cluster consists with all "1"s. The chip delete activity ought to be dead before the code memory will be re-modified.

The mark bytes area unit perused by similar methodology as a standard check of areas 030H, 031H, and 032H, then again, truly P3.6 and P3.7 ought to be force to a explanation low. The qualities came area unit as per the subsequent.

(030H) = 1EH shows made by Atmel

(031H) = 51H shows 89C51

(032H) = FFH shows 12V programming

(032H) = 05H shows 5V programming

Programming Interface:

Each computer memory unit within the Flash exhibit will be composed and therefore the whole cluster will be deleted by utilizing the right mixture of management signals. The compose activity cycle is self coordinated and once started, can consequently time itself to end result. All important programming merchants supply overall facilitate for the Atmel microcontroller arrangement. If it is not an excessive amount of hassle, contact your close programming merchandiser for the acceptable

programming change.

Unique perform Registers:

A guide of the on-chip memory region referred to as the Special perform

Register (SFR). Note that not the whole lot of the locations area unit concerned, and abandoned locations might not be dead on the chip. examine gets to those tends to can overall come back irregular data, and compose gets to can have a imprecise impact. client programming mustn't kind 1s to those unlisted regions, since they'll be utilized in future things to decision new options. Around there, the reset or torpid assessments of the new items can dependably be zero.

Clock two Registers:

Control and standing items area unit contained in registers T2CON and T2MOD for Timer two. The register try (RCAP2H, RCAP2L) is that the Capture/Reload registers for Timer two of every 16-cycle get mode or 16-digit auto-reload mode.

Interrupt Registers:

The individual thwart interact items area unit within the id est register. 2 wants will be set for all of the six interpose sources within the informatics register.

Data Memory:

The AT89C51 executes 256 bytes of on-chip RAM. The higher 128 bytes devour a similar space area to the Special perform Registers. that means the higher 128bytes have comparable area units because the SFR area however are extremely disengaged from SFR area. specifically once a direction gets to an interior region on top of address 7FH, the realm mode utilized in the direction decides if the processor gets to the higher 128 bytes of RAM or the SFR area. Rules that usage direct having a bent to induce to SFR area.

as an example, the concomitant direct tending to steerage gets to the SFR at

Guidelines that usage circuitous tending to induce to the higher 128 bytes of RAM. as an example, the concomitant backhanded tending to steerage, wherever R0 contains 0A0H, gets to the knowledge computer memory unit at address 0A0H, as opposition P2 (whose address is 0A0H).

Time in capture mode:

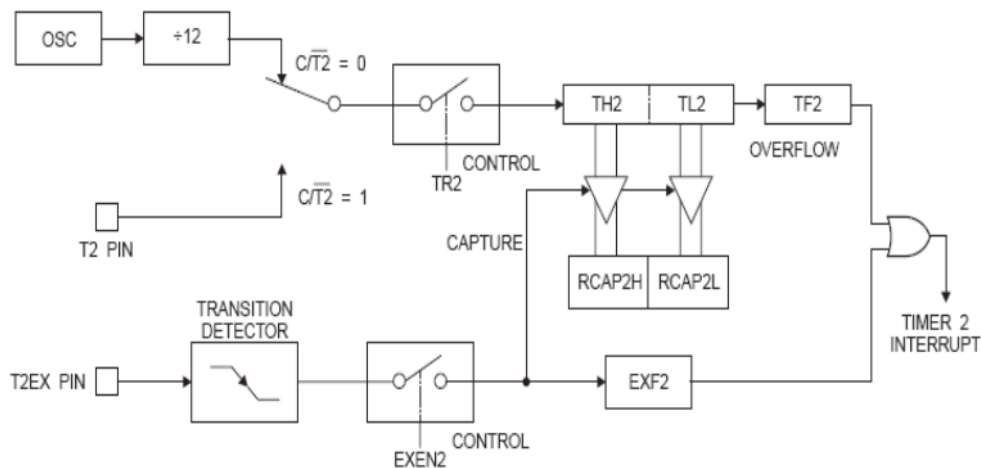


Fig.4.5 : Time In Capture Mode

4.3 ADC:

ADC unit is used to convert the physical values from our sensors into digital values. It has 8 channels so that, we can connect 8 sensors at the time. But in PIC controller we have inbuilt ADC .If we are using AT8051 controller we have to interface it externally.

4.3.1 General Description of ADC:

1. Easy interface to all microprocessors
2. Operates ratio metrically or with 5 VDC or analog span
3. Adjusted voltage reference
4. No zero or full-scale adjust required
5. 8-channel multiplexer with address logic
6. 0V to 5V input range with single 5V power supply
7. Outputs meet TTL voltage level specifications
8. Standard hermetic or molded 28-pin DIP package
9. ADC0808 equivalent to MM74C949

Key Specifications of ADC:

1. Resolution 8 Bits
2. Total Unadjusted Error $\pm 1/2$ LSB and ± 1 LSB
3. Single Supply 5 VDC
4. Low Power 15 mW
5. Conversion Time 100 μ s

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4.3.2 Block Diagram of ADC:

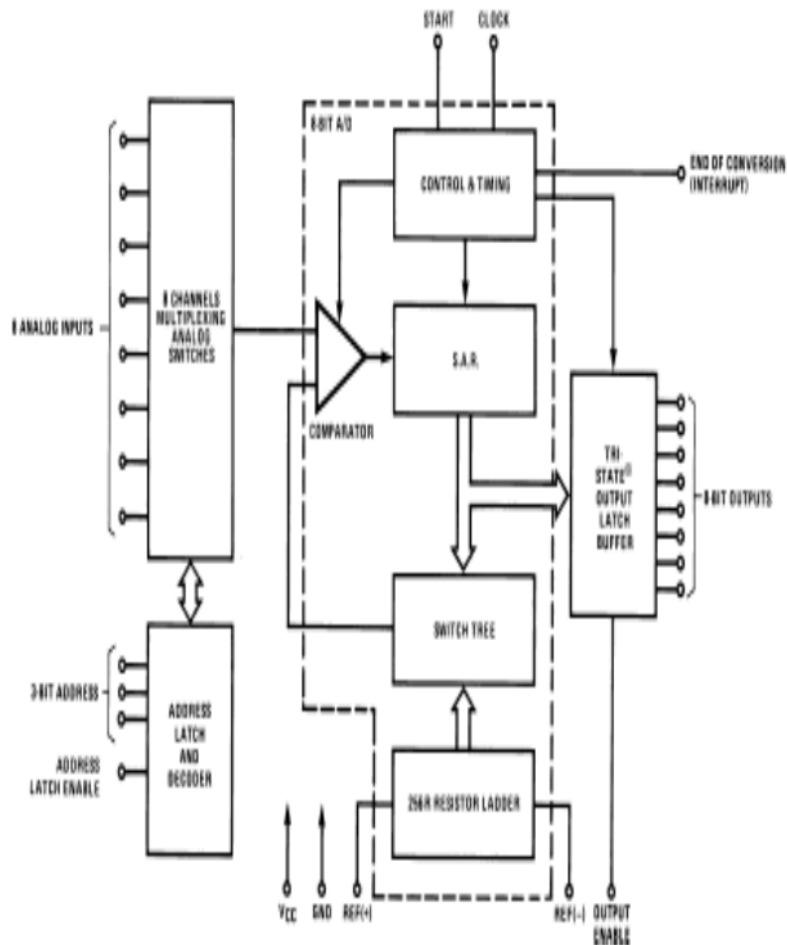


Fig.4.6 : ADC Block Diagram

In the above block diagram we can see that ADC is a combination of SAR, multiplexing switches, switch tree, address latch and decoder and control and timing.

The 8 channel multiplexer is used to accept the input signals in the form analog and allows only one after the other for conversion. Then SAR will make 8 number of

iterations to find the digital code for the analog input given. ADC can also be used in continuous conversion mode.

4.3.2 ADC PIN DIAGRAM:

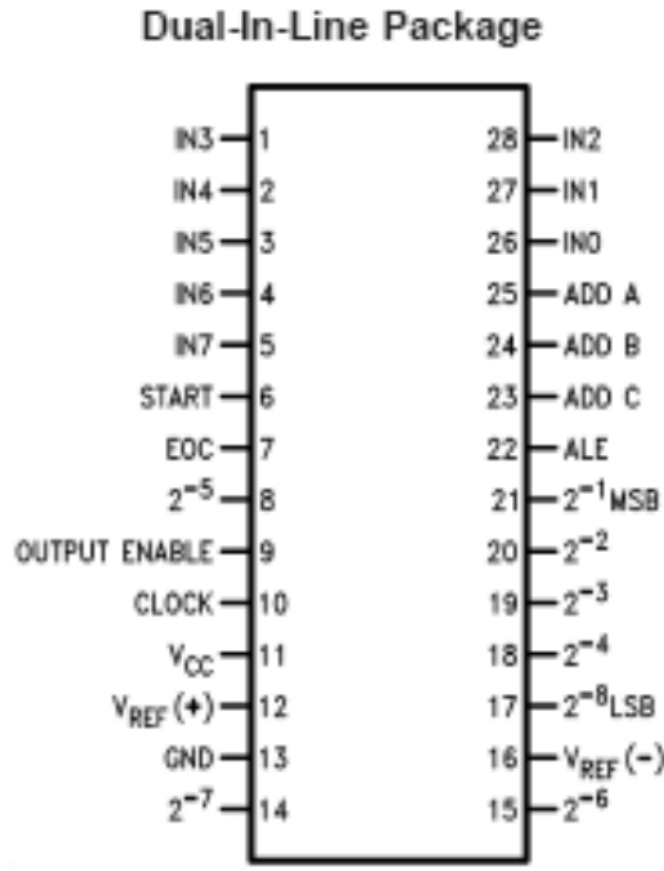


Fig.4.7 : Pin Diagram Of ADC

ADC 0808 has 8 input channels. The desired channel address is sent to the multiplexer inputs through port pins. The microprocessor can read the converted

4.3.3 Functional Description of ADC:



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4.4 MULTIPLEXER:

A multiplexer is that which has multiple inputs and one output. 8X1 multiplexer, 4X1 multiplexer are the examples. A particular information channel is been used to send the signal. Table 4.3 shows the info states to chose the appropriate location channels.

Table 4.3 : Address Decoder Table

SELECTED ANALOG CHANNEL	ADDRESS LINE		
	C	B	A
IN0	L	L	L
IN1	L	L	H
IN2	L	H	L
IN3	L	H	H
IN4	H	L	L
IN5	H	L	H
IN6	H	H	L
IN7	H	H	H

4.5 ULTRASONIC SENSOR:

Item running is fundamental in numerous kinds of frameworks. Perhaps the most well known going procedures is ultrasonic going. Ultrasonic going is utilized in a wide assortment of uses including:

- Autofocus cameras
- Motion recognition
- Robotics direction
- Proximity detecting

- Object going

This application note portrays a strategy for interfacing PIC16CXXX microcontrollers to the Polaroid 6500 Ranging Module. This execution utilizes at least microcontroller assets, a CCP module and two I/O pins. The two significant segments of the framework are:

- Microcontroller
- Polaroid 6500 Ranging Module

The microcontroller plays out the insight and number-crunching capacities for ultrasonic running, while the Polaroid 6500 Ranging Module plays out the ultrasonic sign transmissions and reverberation recognition.

4.6 OBSTACLE SENSOR:

Advanced yield on recognizing obstruction in restricted view point.

- 3 pin connectors of simple interface
- Used in LED
- Modulated IR transmitter
- Up to 12 inch range for white article
- Bus controlled module
- Can separate among light and dim tones

Application:

- Used as proximity sensor
- Used as ³⁰obstacle detector sensor
- Used as line follower sensor

- Used as wall follower sensor.

4.7 VOICE BOARD:

4.7.1 Digital Voice Recording Using 2-Bit and 4-Bit ADPCM:

A 8 or 16 second advanced voice recorder was executed which used the ADPCM calculation for lossy discourse pressure. We put away our discourse tests on a 32 KB SRAM. The Atmel Mega32 microcontroller was utilized to run the ADPCM calculation, to interface with the SRAM, to yield sound to the B/W TV, and to test the yield from a receiver circuit.

Undeniable Level Design:

We thought the DTFM discourse sounded alright, and thought there may be a superior method to do (lossy) discourse pressure. The discourse union page showed that ADPCM would be a decent calculation to improve discourse quality. The page additionally demonstrated that it would be a smart thought to carry out for a last undertaking, so we thought we give that a shot. To make things really fascinating, we chose to incorporate the calculation into a basic computerized voice recorder Overall, the framework worked. We had the option to talk into the mouthpiece and the framework duplicated the discourse clearly. The voice nature of 2-cycle ADPCM isn't generally excellent by any means, yet in a compelled memory climate, it isn't that awful of a decision. The voice nature of 4-digit ADPCM is far better than its 2-bit cousin. The lone "issue" is that we could in any case hear that irritating sharp, PWM screech, anyway faint it could be.

Highlights Of Voice Board:

- Single-chip, incredible voice recording and arrangement of playback
- Minimum outer segments
- Flash memory innovation stability
- Battery less reinforcement required
- Customer-Selectable informing choices

4.8 ZIGBEE:.

4.8.1 Features of ZigBee MRF24J40MA:

1. IEEE Std. 802.15.4™ Compliant RF Transceiver
2. Supports ZigBee®, MiWi™, MiWi™ P2P and
3. Proprietary Wireless Networking Protocols
4. Small Size: 0.7" x 1.1" (17.8 mm x 27.9 mm),
5. Surface Mountable
6. Integrated Crystal, Internal Voltage Regulator,
7. Matching Circuitry and PCB Antenna
8. Easy Integration into Final Product – Minimize
9. Product Development, Quicker Time to Market
10. Radio Regulation Certification for United States
11. (FCC), Canada (IC) and Europe (ETSI)
12. Compatible with Microchip Microcontroller
13. Families (PIC16F, PIC18F, PIC24F/H, dsPIC33
14. and PIC32)
15. Up to 400 ft. Range

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4.8.2 Pin Diagram Of ZigBee:

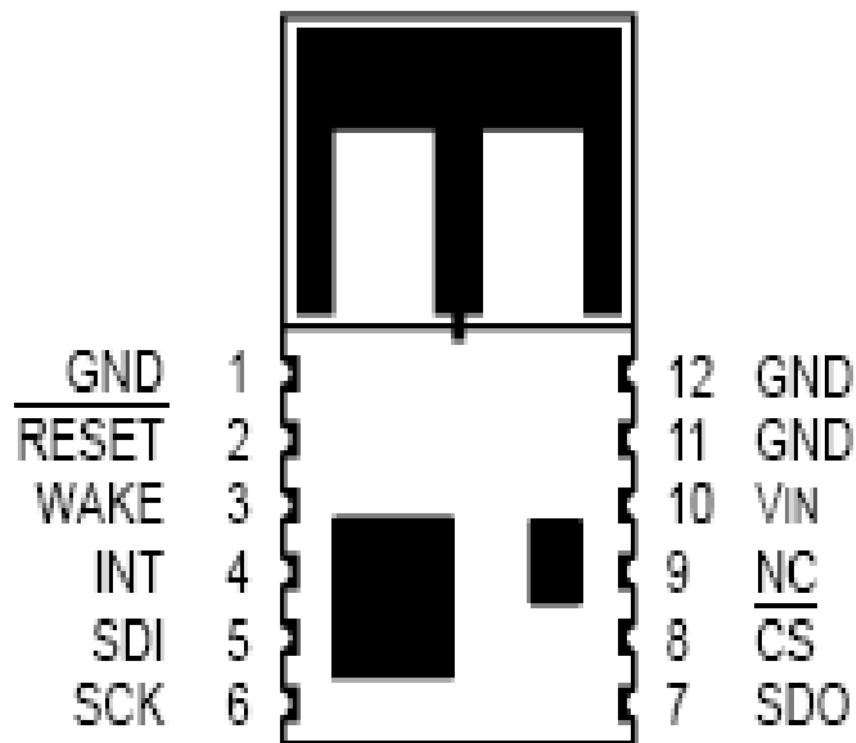


Fig.4.9 : Pin Diagram Of ZigBee

Table 4.4 : Pin Description table of ZigBee

Pin	Symbol	Type	Description
1	GND	Power	Ground
2	RESET	DI	Global hardware Reset pin
3	WAKE	DI	External wake-up trigger
4	INT	DO	Interrupt pin to microcontroller
5	SDI	DI	Serial interface data input
6	SCK	DI	Serial interface clock
7	SDO	DO	Serial interface data output from MRF24J40
8	CS	DI	Serial interface enable
9	NC	—	No connection (allow pin to float; do not connect signal)
10	VIN	Power	Power supply
11	GND	Ground	Ground
12	GND	Ground	Ground

Overview Of The ZigBee:

The ZigBee is a 2.4 GHz coordinated precious stone, inner voltage controller, coordinating with hardware and PCB receiving wire. This module works in the non-authorized 2.5 GHz recurrence band and is IC, FCC and ETSI consistent. This coordinated module configuration liberates the integrator from broad RF and radio wire plan, and administrative consistence testing, permitting faster an ideal opportunity to showcase. This module is viable with Microchip's programming stacks. Every product stack is open source as a free download with source code, from the Microchip. This module has gotten administrative endorsements for particular gadgets in the US (FCC), Europe (ETSI) and Canada (IC). Secluded endorsement eliminates the requirement for costly RF and radio wire plan and permits the end client to put the module inside a completed item and not need administrative testing.

4.9 UART:

UART is abbreviated as Universal Asynchronous Receiver or Transmitter. In this type of communication, both UART will communicate directly with each other. UART sends asynchronous signals that means there is no clock signal to output that has to be synchronized.

4.10 MAX232:

MAX232 is a co-ordinated circuit which converts information from a port of RS-232 sequential to signals reasonable for use in TTL variable advanced rationale circuits. The MAX232 is a couple beneficiary/driver and casually varies over the CTS, RX, TX and RTS signals.

The drivers will give RS-232 voltage level which yields around ± 7.5 V from a solitary + 5 V. So it will make valuable for executing RS-232 in devices that in any case don't have to bother with any voltages in the range of 0 V - + 5 V reach, as force supply configuration could not be made more convoluted only for making the RS-232 for this situation.

4.10.1 Pin Diagram Of MAX232:

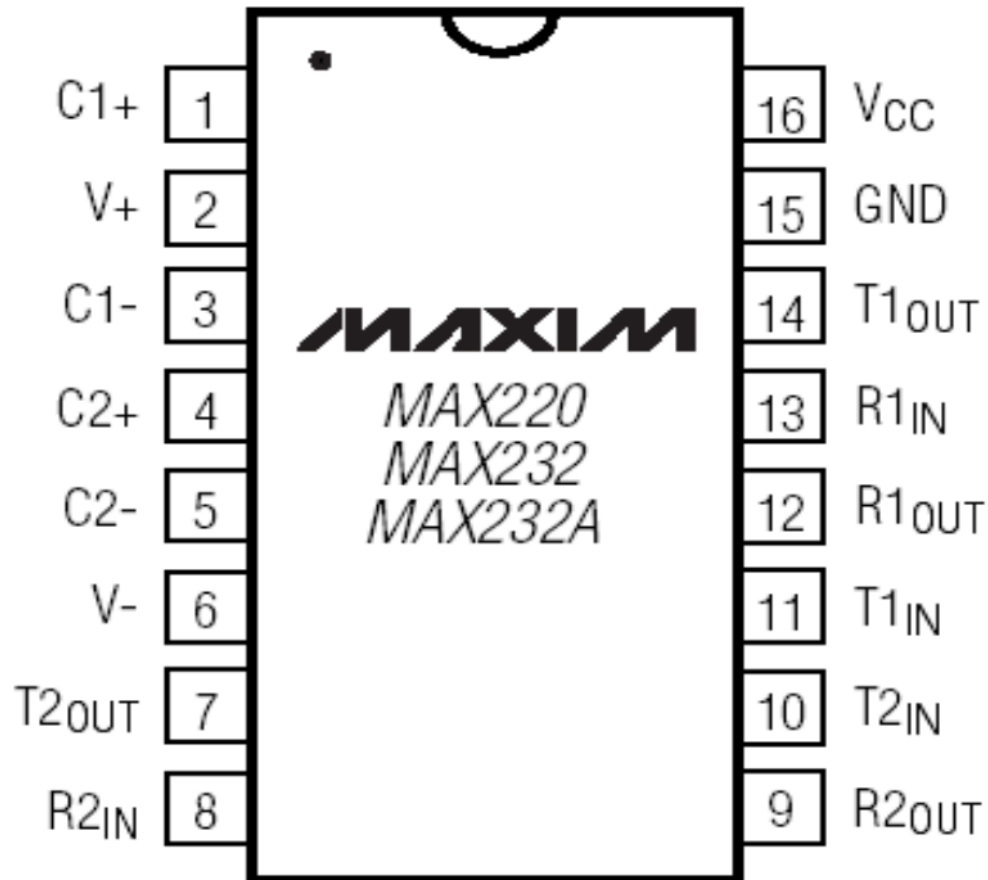


Fig.4.10 : MAX232 Pin Diagram

4.11 SYSTEM SOFTWARE :

4.11.1 *Embedded C* :

1. Embedded C is shorter and easier to write as it is high level language. It is independent of the Processor. Embedded C has been used regularly than assembly language.
2. C language has two prolific advantages, because of which it is much easier for developer to develop quality programs which are easier to read, revise, and dump to a different system. It has built in structure.

4.11.2 *KEIL Cross Software*:

- ¹⁶ TEXT EDITOR
 - Used for typing the embedded c programs.
- Simulator
 - Used for debugging.
- Compiler
 - Used for converting high-level language into machine level language (hex code)
- ¹⁵ ANSI C Compiler
 - Generates fast compact code for the 8051 and it's derivatives

Advantages of C compiler against Assembler:

1. Microcontroller instruction set is not necessary to know.
2. The compiler handles register allocation and all the addressing modes.
3. Reduced programming time.
4. Code can be inserted easily to all microcontrollers

CHAPTER 5

RESULT ANALYSIS

5.1 RESULT:

The system to monitor intruder detection using seismic sensor is proposed. With the use of seismic sensor the elephant foot steps are detected by monitoring the vibrations caused by the elephant. Fig.5.1 shows the entire setup of intruder detection using seismic sensor.

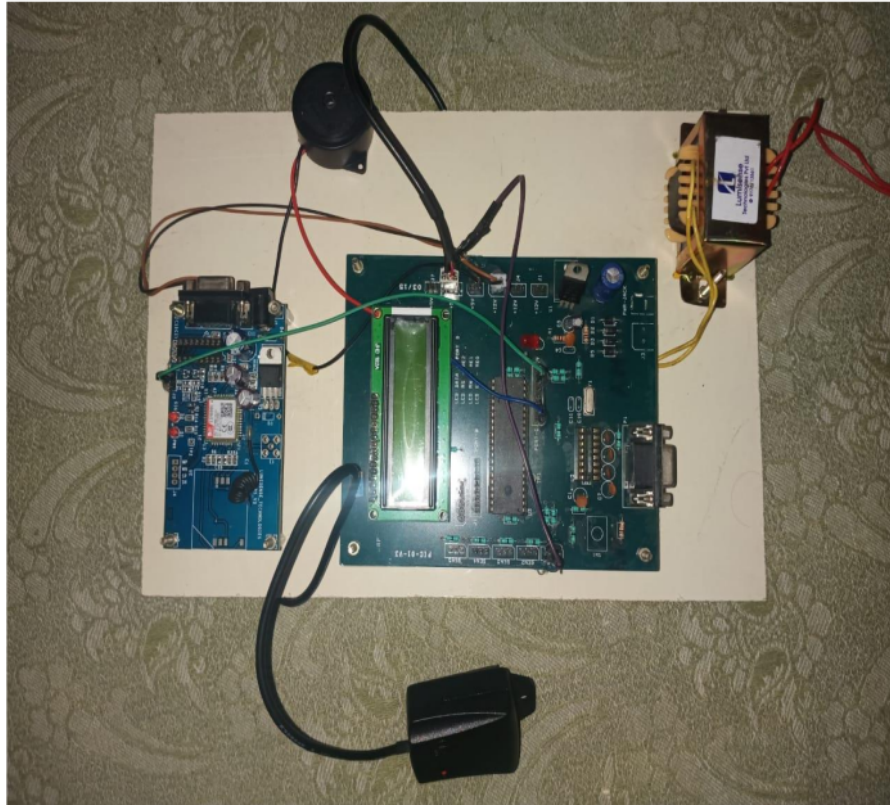


Fig.5.1 : Intruder Detection Setup Image 1

In Fig.5.2 we can see that the device is turned on. Whenever there is a vibration, the seismic sensor detects it and the buzzer is raised. Through GSM modem the appropriate message will be sent to the field incharge.

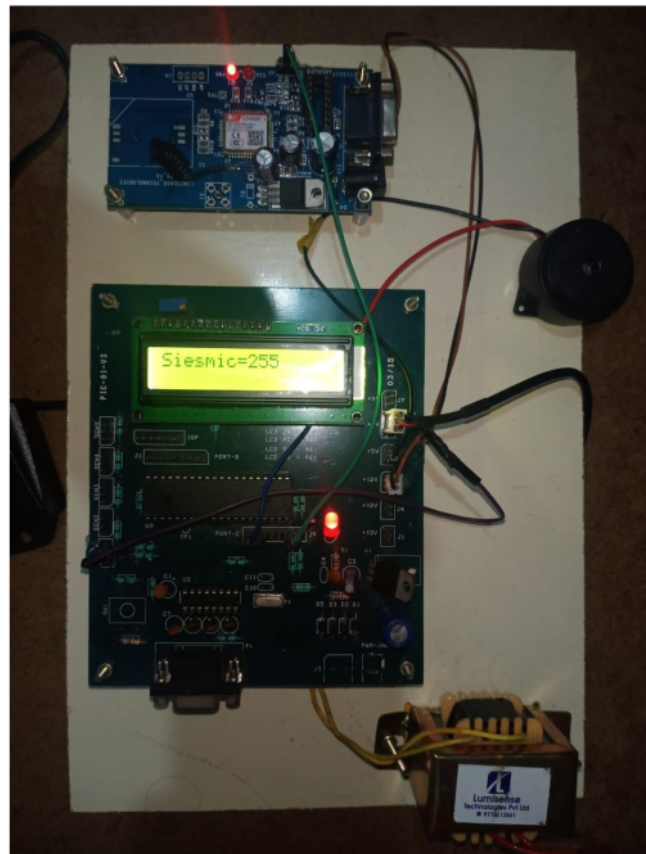


Fig.5.2 : Intruder Detection Setup Image 2

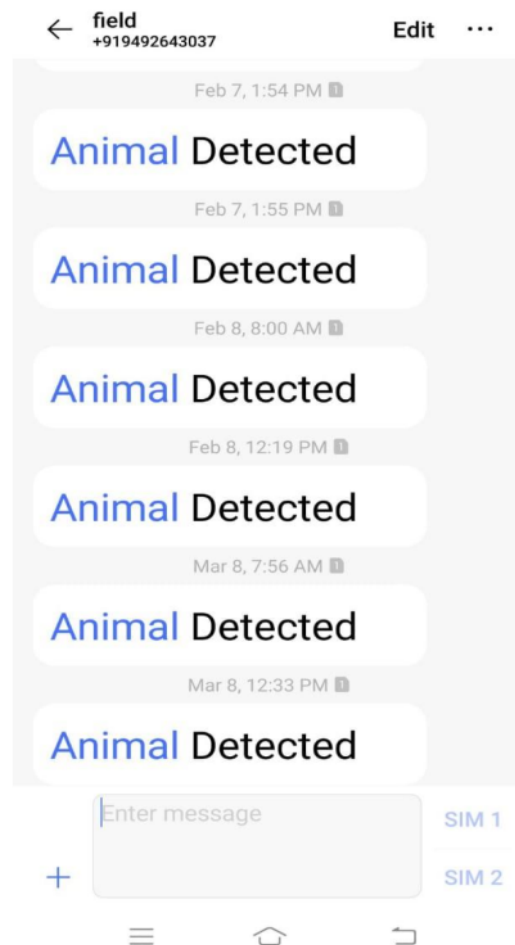


Fig.5.3 : Message Alert Screenshot

In Fig.5.3, it is observed that the message 'Animal Detected' is sent to inform the field incharge about presence of an intruder and to make appropriate decision.

CHAPTER 6

CONCLUSION AND SUMMARY

The condition of movement of a gatecrasher by utilizing a geophone. We have proposed another calculation utilizing STA/LTA which recognizes and extricates parts of the sign that address an occasion. The proposed occasion extraction method expands classifiers exactness and F1 Score by 11% and saves 22% of highlight extraction time when executed on a sign of 10 sec. We have done a relative report of the classifiers to analyze their presentation boundaries with the variety of sign length. It has been seen that signs of length (2-4) sec are adequate to identify the presence/nonappearance of an interloper. We have denoted that the presentation boundary of the classifiers debases radically if the span of the sign is under 6 sec. Thus, to foresee the condition of movement of a gatecrasher with a precision of 76%, we need a sign in any event of 6 sec length.

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DETECTION OF AN INTRUDER AND PREDICTION OF STATE OF MOTION USING SEISMIC SENSOR

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P.Bhanu prakash reddy-37130305

Department of ECE

Supervisor

Mr.Vinothkumar.C,M.Tech.,

Department of EIE,,

Sathyabama Institute of Science and Technology.

INTRODUCTION

- The human-elephant conflict is one of the most severe natural problems in south India.
- There are rich farmlands near the elephant habitats and elephants raid these farms in search of food.
- Frequent clashes between wild elephants and villagers have resulted in severe damage to property, as well as loss of lives for both humans and elephants.
- Our work deals with Elephant intrusion detection in the forest border areas, which is a common problem in this division.
- To repel the elephant, electric fencing is being used but the major disadvantage of electric fencing is it causes accidents to humans and power consumption.
- To avoid this we design a system based on seismic sensor to identify the intrusion and repel the elephant from the field.

EXISTING WORK

- Since ancient times, villagers have learned to protect their crops from wild elephants through means of traditional methods.
- By constructing outposts along the perimeter of the village, the villagers stand guard to protect their crops.
- Warning shouts are made when an elephant is sighted and the whole village takes part in chasing away the elephants.
- Dogs trained to bark when they smell the presence of elephants gives a considerable advantage over distance due to the keen sense of smell of the dogs.
- The electric fence that runs around the wildlife sanctuaries provides a convenient means for data communication.
- Because of all the time electrified fence small birds and animals cause dead due to high level of voltage beyond their resistive power.
- People also dig a pit in underground everywhere for to safeguard from elephants.
- Sometimes crackers also used to run away from residential areas

OBJECTIVES

- The object of the study is to design a system to spot an elephant intrusion in the human habitat region.
- To detect it's presence using seismic waves.
- To send an alert to the authority person about presence of elephants and other animals via GSM
- To turn on the buzzer to panic the animals not to cross the fence.
- Thereby creating a secured environment to both animals and humans

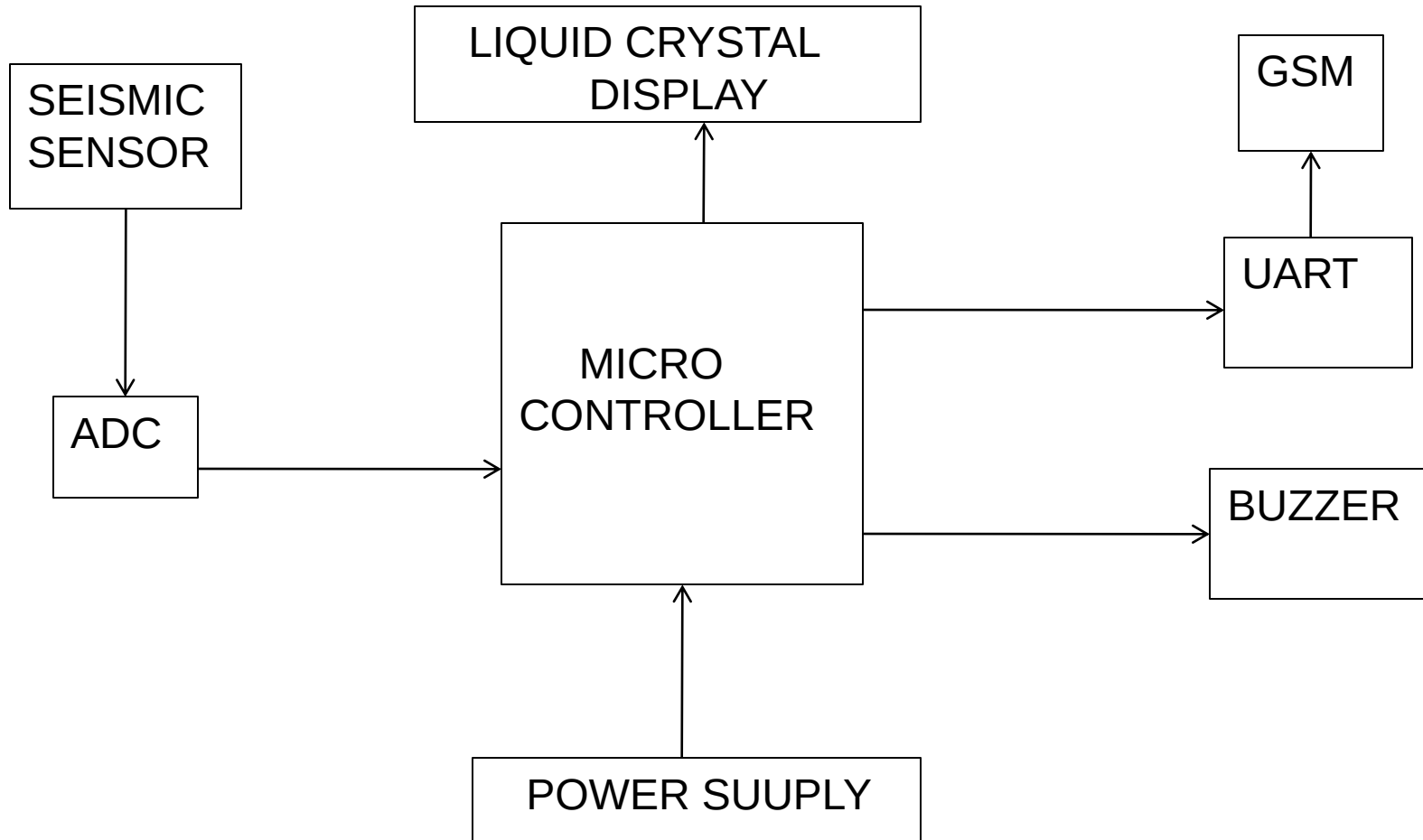
Literature survey:

S NO.	TITLE	AUTOR	CONTENT
1	Target detection and classification using seismic and pir sensors	X. Jin, S. Sarkar, A. Ray, S. Gupta, and T. Damarla	Unattended ground sensors (UGS) are widely used to monitor human activities, such as pedestrian motion and detection of intruders in a secure region. Efficacy of UGS systems is often limited by high false alarm rates, possibly due to inadequacies of the underlying algorithms and limitations of onboard computation
2	Indoor person identification through footstep induced structural vibration	S. Pan, N. Wang, Y. Qian, I. Velibeyoglu , H. Y. Noh	We introduce our indoor person identification system that utilizes footstep induced structural vibration. Because structural vibration can be measured without interrupting human activities, our system is suitable for many ubiquitous sensing applications. Our system senses floor vibration and detects the signal induced by footsteps.

Literature survey:

S NO.	TITLE	AUTOR	CONTENT
3	A novel application of a micro accelerometer for target classification	J. Lan, T. Lan, and S. Nahavandi	A novel method of target classification by means of a micro accelerometer. Its principle is that the seismic signals from moving vehicle targets are detected by a micro accelerometer, and targets are automatically recognized by the advanced signal processing method. The detection system based on the micro accelerometer is small in size, light in weight, has low power consumption and low cost.
4	Discrimination of bipeds from quadrupeds using seismic footstep signatures	A. Mehmood, V. M. Patel, and T. Damarla,	Seismic sensors are widely used to detect moving targets in the ground sensor network, and can be easily employed to discriminate human and quadruped based on their footstep signatures.

BLOCK DIAGRAM OF THE PROPOSED WORK



REQUIREMENTS

- **HARDWARE:**

1. MICROCONTROLLER AT89C51
2. BUZZER
3. PCB
4. SEISMIC SENSOR
5. GSM
6. UART

- **SOFTWARE:**

1. EMBEDDED C
2. KEIL COMPILER

HARDWARE SECTION

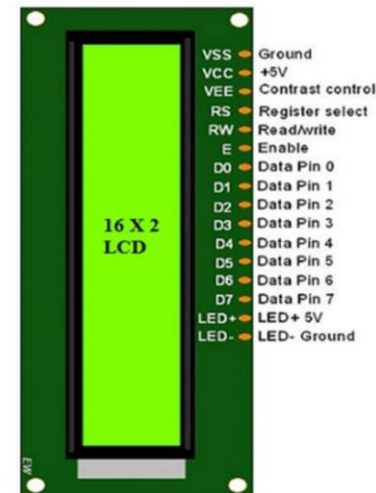
COMPONENTS

- **ADC:**

- ADC unit is used to convert the physical values from our sensors into digital values. It has 8 channels so that, we can connect 8 sensors at the time.
- But in PIC controller we have inbuilt ADC .

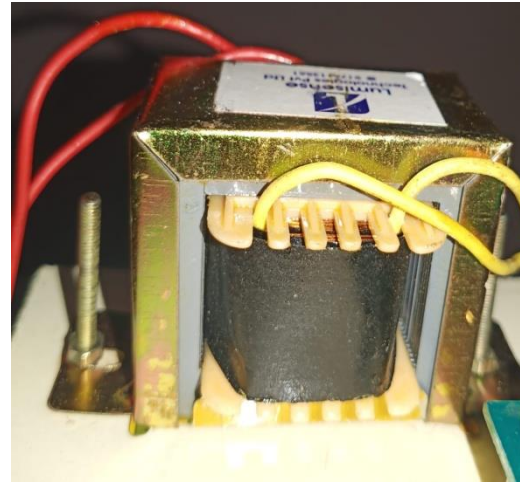
- **16×2 LCD:**

- It is a 16 character, 2-line alphanumeric LCD display connected to a single 9-way D-type connector.
- Input voltage 5V.
- E blocks compatible .



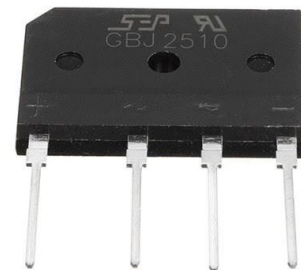
- **TRANSFORMER:**

- We use step down transformer to reduce the power supply from 230 volt AC to 12 volt AC.



- **RECTIFIERS:**

- Bridge rectifiers are used to convert the AC voltage to DC.



- **SEISMIC SENSOR:**

- Seismic sensor detects the seismic waves and sends the signal to LCD display.
- Frequency range is 0-255hz
- Human footsteps frequency is 1-4hz
- Elephant footsteps frequency is in range of 20 hz.



- **BUZZER:**

- If the sensor detects any intruder, then automatically the buzzer will raise an alarm.



- **VOLTAGE REGULATOR:**

- Voltage regulator is used to maintain a constant voltage across the system.
- Output Current up to 1A
- Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24V
- Thermal Overload Protection
- Short Circuit Protection
- Output Transistor Safe Operating Area Protection



SOFTWARE

EMBEDDED C

- As it is the high level language it is shorter and easier to write. It is independent of the Processor. It is used more frequently than assembly language.
- **KEIL CROSS SOFTWARE:**
 - TEXT EDITOR
 - Used for typing the embedded c programs.
 - SIMULATOR.
 - Used for debugging.
- **COMPILER**
 - used for converting high-level language into machine level language(hex code)
- **ANSI C COMPILER**
 - Generates fast compact code for the 8051 and it's derivatives.

RESULT

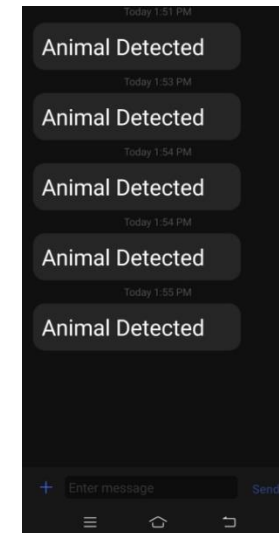
- A seismic sensor which detects vibrations of particular range is placed in the field.
- Whenever there is a vibration of range of below 255hz a buzzer will be raised automatically.

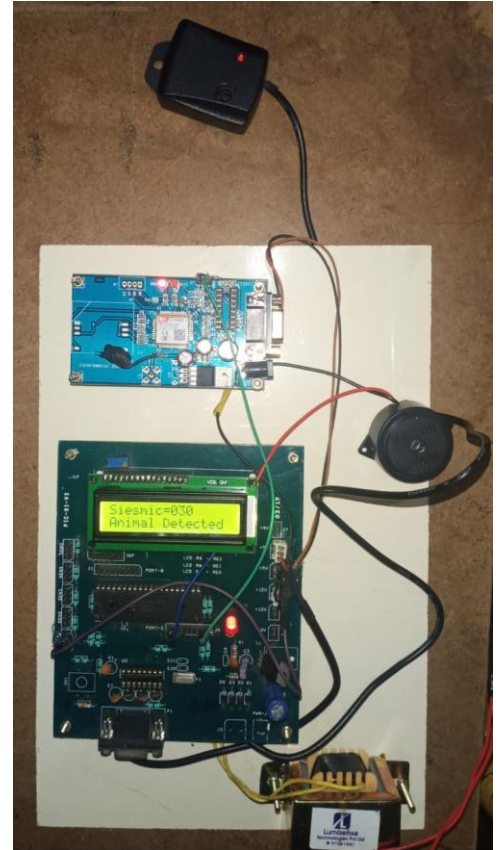
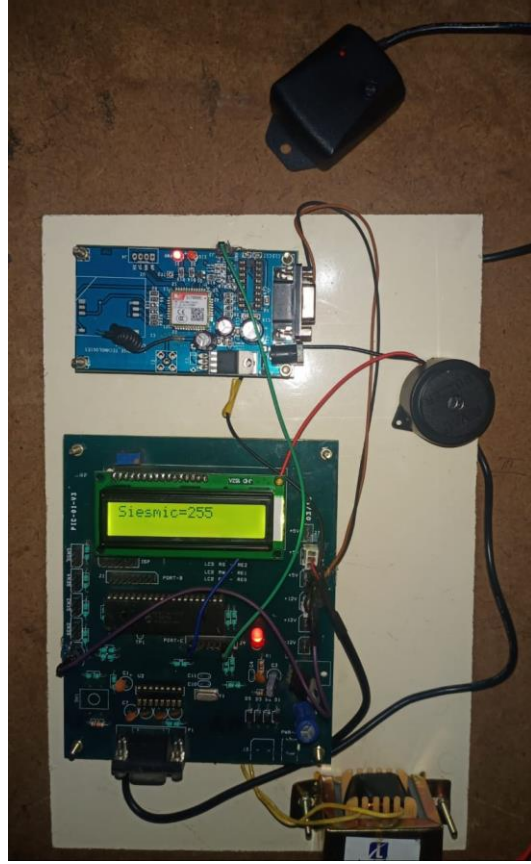
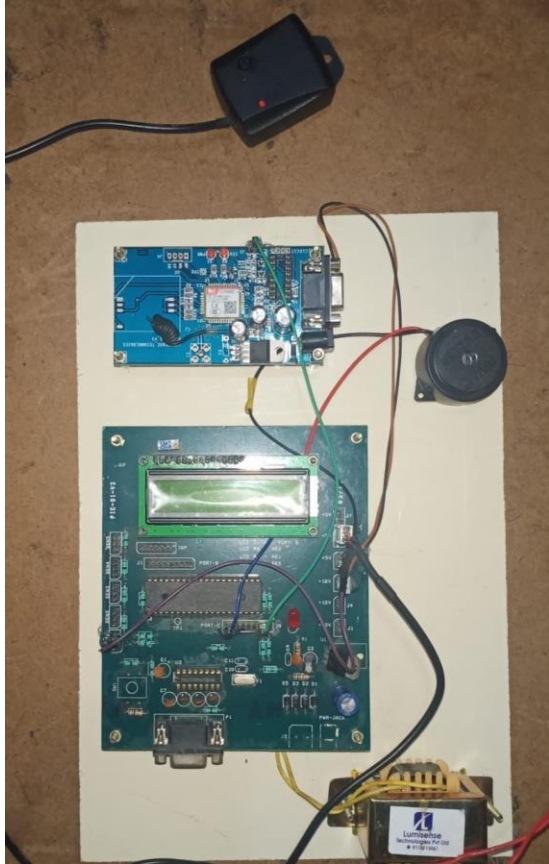


- On the LCD display, 'Animal detected' message is displayed.



- Signal will be transfered to GSM module and it will send the same message ('Animal detected') to the field incharge.





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