JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

A Project Report on

"SPEED BREAKER EARLY WARNING SYSTEM"

Submitted to
Jawaharlal Nehru Technological University Kakinada

in partial fulfillment for the award if the degree of

BACHELOR OF TECHNOLOGY

in

ELECTRONICS AND COMMUNICATION ENGINEERING

Submitted by

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Kanchikacherla - 521180, Krishna Dist, A.P, India.

A.Y : 2017-18

NBA-Accredited B.Tech (CSE|ECE|EEE|ME)
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CERTIFICATE

This is to certify that the project entitled "**SPEED BREAKER EARLY WARNING SYSTEM''** is a bonafide work carried out by **N. DILEEP KUMAR (14H71A0410), B.PUSHPALATHA (14H71A0434), P. JAYA CHANDRAN (14H71A0416), SK .AYESH TALATH (14H71A0406)** in partial fulfillment for the award of degree of Bachelor of Technology in **Electronics and Communication Engineering** of **Jawaharlal Nehru Technological University Kakinada** during the year 2017-2018.

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Examiner 2

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We would like to extend our warm appreciation to all my friends and also parents to their valuable contributions and help for the completion of Project.

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DECLERATION

We **N.DILEEP KUMAR (14H71A0410), B.PUSHPALATHA (14H71A0434), P.JAYA CHANDRAN (14H71A0416), SK.AYESHA TALATH (14H71A0406)** of the project **"SPEED BREAKER EARLY WARNING SYSTEM''** hereby declare that the matter embodied in this project for the A.Y 2017-18 is the genuine work done by us and not been submitted either to this university or to any other university /institute for the fulfillment of the requirement of any course.

Regards

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LIST OF ACRONYMS

GSM : GLOBAL SYSTEM FOR MOBILE COMMUNICATION

RMS : ROOT MEAN SQUARE

RMQ : ROOT MEAN QUAD

VN : VIBRATION NUMBER

SDCS : SPEED DETECTION CAMERA SYSTEM

ADAS : ADVANCED DRIVER ASSISTANCE SYSTEMS

ABSTRACT

Speed– breakers are inconspicuous in low visibility conditions, like at night, or when there is fog, rain or snow. This problem is particularly acute in developing countries where speed breakers don't always accompany warning signs. So, In this project an early warning system that uses a BUZZER, LCD, and SMS based on application to alert the driver in advance when the vehicle is approaching a speed – breaker. When the speed doesn't control by the driver then accident will occur, thus for the driver safety we can use GSM to alter the police, hospital and family members. Now-a-day the major problem is drunken driver cases due this gas sensor are used to avoid the accidents when it is sense the vehicle will stop its functioning.

In this project RF Transmitter modules are placed at the speed breakers. RF receivers are used in the vehicles to detect the speed breakers. The RF receiver will detect the RF Transmitter module at about the 100m distance from the speed breaker and alert the driver in the form of audible beeps or tunes. If any accident occurs, then the integrated GSM module sends an alert message to the people of our choice and a alcohol sensor detects the alcohol present in the rider's breath and accordingly controls the ignition of the vehicle.

CHAPTER 1
INTRODUCTION

In the today's era, especially in the young generation, the craze to ride vehicles (like Bikes, cars) is rapidly increasing. The middle class families prefer to buy two – wheeler over four wheeler because of their low price. As the number of two wheeler on the road is increasing, road mishaps are also increasing day by day. In the event of an accident, lack of timely medical attention to the injured person may lead to death. Thus, there is evidence to support the claim that speed –breaker can cause accident and injury. When vehicle approaches a speed -breaker than some threshold velocity, the risk of accident or injury in substantial. Speed– breakers are inconspicuous in low visibility conditions, like at night, or when there is fog, rain or snow. This problem is particularly acute in developing countries where speed breakers don't always accompany warning signs. We propose an early warning system that uses a BUZZER, LCD, and SMS based on application to alert the driver in advance when the vehicle is approaching a speed – breaker. When the speed doesn't control by the driver then accident will occur, thus for the driver safety we can use GSM to alter the police, hospital and family members. Now-a-day the major problem is drunken driver cases due this we use gas sensor to avoid the accidents when it is sense the vehicle will stop its functioning, though this we can avoid the accidents.

1.1 MOTIVATION

The road accident is one of the major problems all over the world problem all over the world. The recent report says that the annual average road accident is estimated to be about 7, 00,000 of which 10 percentage occur in India which has overtaken China. The annual statistics revealed by the World Health Organization (WHO) in its Global status report on road safety says that around 80,000 people are killed on Indian road due to rash driving, drunken driving and less usage of helmets. Also, most of the countries are forcing the motor rider to wear the helmet and not to use the vehicles when the person is in drunken condition. To overcome problems, a system called **"speed breaker early warning and accident detection system"**. Theft and drive protection by using Buzzer, LCD, and SMS are introduced.

1.2OBJECTIVES

- To design a vehicle which will detect the speed breaker and large obstacles and control its speed according to avoid damages.
- Speed control of vehicles at speed breakers, school zones, hospitals, turnings etc.
- To avoid the accident of vehicles at speed limit zones.
- To help the passengers to cross the road safely without facing any danger from high speed vehicles.
- This project can be used to avoid the rash driving of the drivers.
- Security in travel in primary concern for everyone.
- SMS can be received from the spot.
- Accident spot can be detected.
- This is extended with alcoholic detection also.
- If the person took alcohol who is driving then vehicle will be stopped immediately by giving buzzer sound.

1.3 DEFINITION OF SPEED BREAKER

A speed breaker is a hump surface across the roadway having a rounded shape with width greater than the wheel base of most of the vehicles using the road. When there is decrease variation in sensory stimuli and at location where speed controls are desired, a speed breaker acts as a strong stimulus to arouse reaction in the brain. Since the driver reaction times are faster in response to audible and tactile stimuli than to visual stimuli, a driver subconsciously reduce the speed. An ideally design hump should satisfy the following requirements:

- There should be neither damage to vehicle nor excessive discomfort to the drivers and passengers when passing at the preferred crossing speed.
- The speed breaker should not give rise to excessive noise or cause harmful vibration to the adjoining buildings or affect the other residents of the area.
- Above the design speed, a driver should suffer increasing level of discomfort depending on the extent through which design is exceeded.

Speed breakers can be justified primarily under the following 3 circumstances

- T- intersection on minor roads characterized by relatively low traffic volumes on the minor road but very high average operating speed and poor slight distances. Such location have a high record of fatal accidents and as such a speed breaker on the minor roads is recommended.
- Intersections of minor roads with major roads, and mid – block sections in urban areas where it is desirable to bring down the speeds; and
- Selected Local Street in residential areas, school, college or university, campuses, hospitals, etc. also in areas where traffic in observed is observed to travel faster than the regulated or safe speed in the area.

1.4 Design of speed breakers

- Speed breakers are formed basically by providing a rounded hump of 3.7 metre width and 0.10 metre height for the preferred advisory crossing speed of 25km\h for general traffic.
- Trucks and buses having larger wheel based may feel greater inconvenience on passage at such humps.
- To facilities appreciable and comfortable passage for longer and heavier vehicles may be modified with 1.5 metre long ramps at each edge.
- This design will also enable larger vehicles to pass the hump at about 25km\h.
- In certain location speed breakers may have to be repeated over a section to keep speeds low throughout.
- More humps may be constructed at regular intervals depending on desired speed and acceleration deceleration characteristics of vehicles.
- The distance between one hump to another can vary from 100 to 120 metre centre to centre.

1.5 Specification for speed breaker

- Speed breaker are laid by first marking the location of hump of the hump on the pavement and marking in dents in this area proper bonding
- Surface is then cleared of all dust and loose particles and a tack coat applied, forms of requisite heights, shape and width are then placed, and hot premixed bituminous materials is poured to the required depth and shaped.

- Arrangement for proper draining of the speed breakers must be made to prevent formation of ponds and puddles
- The premixed material should be well compacted before opening to traffic,allowance material having fine aggregate or by scrapping, as necessary.

CHAPTER 2

LITERATURE SURVEY

2.1 A STUDY ON SPEED BREAKERS

The roads are designed for a certain design speed to meet the mobility requirement. However, at some of the locations control of speed may become necessary. For that purpose, traffic calming measures have been used. This paper describes the various traffic calming measures used to reduce accidents/crashes or reduce the severity of accidents. Speed breakers are one of the widely used traffic calming measures such as speed bump, speed hump and speed table. Various types of speed breakers should be discussed along with problems associated with them and suitable remedial measures are also suggested in this study.

2.1.1 INTRODUCTION

The roads of different categories are designed for certain design speeds, which the vehicles are required to maintain proper functioning of the roadway system. To ensure that the required speeds are maintained, it is practice to provide certain control measures. These measures can ensure improved traffic movement with better safety and convenience.

Traffic scenario has changed drastically over the past decade. An increase in the number of vehicles has led to increase in the number of the accidents. Scenario of traffic safety is worsening day by day in our country which requires proper attention. Accident data reveals that more than 1.5 lakh people die in road accidents every year which is significantly high as compared to other developed countries.

Analysis of various accidents shows that the main causes of accident are inappropriate speed, lack of road safety awareness, driving under the influence of alcohol and narcotics and violation of traffic rules. To reduce the frequency as well as the severity of accidents various traffic calming measures are used. The most commonly used traffic calming measures are:-

- Police Enforcement
- Visual Stimuli (Traffic signs and signals)

Tactile Stimuli (Audible and Vibratory attention seeking devices) there can be various definition of traffic calming measures but the main aim of a traffic calming measure is to reduce the speed and provide a safe environment for non-motorized and motorized traffic. It may be defined as follows:-

"Traffic calming is a set of engineering measures to reduce speeds and volumes of motor vehicles in local area and thereby increasing road safety."

The traffic signs and other visual traffic control devices especially the speed control signs are generally found to be less effective when used alone. However their performance can be significantly improved when used in combination with physical traffic calming measures like speed breakers.

In the present world people spend a great amount of time travelling from one place to another for various purposes. This requires the traffic calming measures like speed breakers to be designed keeping in view these two factors i.e. comfort and delay. This paper focuses on the problems associated with the speed breakers, suitable measures and measurement of discomfort.

As per the road accident report, 2014 in India a total of 4726 lives were lost due to crashes at speed breakers on National Highways. More life would have been lost on State Highways and on other roads due to speed breakers. So, this is a point of concern to study and need to review the traffic calming measures selection

2.1.2ANALYSIS OF TRAFFIC CALMING MEASURES

The study is essentially about the effects of speed breakers on traffic performance. There are various effects of speed breakers such as a considerable delay, damage to the vehicles and significant discomfort to vehicle occupants and more fuel consumption due to acceleration and deceleration. Hence, there is a strong need of comprehensive study to analyse the effects of speed breakers.

Recently study conducted at accident spot at Mani agar area of Ahmedabad city, where an accident occurred due to speed hump. A one person fell off from scooter and died. After analysis of that hump it was found that the hump was not as per the standards laid down by IRC. Analysis of various humps across city reveals that a few of the humps provided as traffic calming measures are of improper dimensions and not as per the

standards laid down by IRC. This requires serious attention as this ignorance in provision of speed breakers can result in fatal accidents.

Further the analysis shows requirement of a proper planning in locating the speed breakers. For example certain BRTS stations are provided with speed tables near the approaches of the BRTS stations which results in unnecessary delays and discomfort to the passengers. Not only this, it also found that it increases operating and maintenance cost of BRTS too.

2.1.3 PLACEMENT OF SPEED BREAKER

- The pattern of placement of speed beakers depends upon the location and the type of treatment used. Some of the suggested locations have already been indicated in Clause 2. At 'T' intersections, speed breakers should be installed on minor roads; or perpendicular arms about 10 meters away from the inner edges of major roads.
- Proper sign boards and markings are required to be provided at such locations, on sharp curves, available sight distances guide the placement and number of speed breakers, for other situations, the Engineer-in–Charge should use his ingenuity and judgment.
- In order to check the tendencies of drivers to avoid speed breakers and using shoulders, it is recommended that the speed breakers should be extended through the entire width of shoulder supported on a proper base. For undivided carriageways, speed breakers should invariably be extended over the entire carriageway width including shoulders.
- On bridges, speed breakers should not be provided. However, where frequent accidents have been reported or the bridges are on curves or they are narrow; either approach must have two speed breakers each.

2.2 BASICS TYPES OF SPEED BREAKERS

Out of the various traffic calming measures speed breakers are one of the most widely used devices and they are found to be very effective. In India, based on locality, place and other factors, speed breakers are provided on the roads as per IRC: 99- 1988.

A speed breaker is a hump surface across the roadway having a rounded shape with width greater than the wheel base of most of the vehicles using road. The various types of speed breakers are:-

2.2.1 Speed Bump

Speed bumps are the devices that use the vertical deflection on the road to slow down the moving traffic. They are suitable to reduce speeds of the vehicles to around 40 Kmph for roads and/or 8 to 16 mph for car parking. They are generally 1 to 3 feet long and 7 to 15 cm high. The speed bump reduces speed considerably, avoids accidents and reduces severity of crash. However the provision of bumps may cause significant discomfort to drivers as well as passengers, increased damage to the vehicle, increases response time of emergency services, it requires additional road markings and traffic signs and it causes increase in traffic noise and pollution.

Fig 2.2.1: SPEED BUMP

2.2.2 Speed Hump

The speed humps are rounded raised areas placed across the roads. They are generally 10 to 14 feet in length in the direction of travel and is 7 to 10 cm high, thus making them different from the speed bumps. The profile of a speed hump can be circular, parabolic or sinusoidal. They are tapered as they reach the kerb on each end to allow proper drainage.

Speed humps are suitable where low speeds are desired. The speed humps are inexpensive and relatively easy for bicycles to cross if designed properly.

Speed humps cause a rough ride for drivers as well as passengers and can cause severe pain for people with certain skeletal disabilities. They force large vehicles, such as

emergency vehicles and those with rigid suspensions, to travel at slower speeds, they may increase noise and air pollution and have questionable aesthetics.

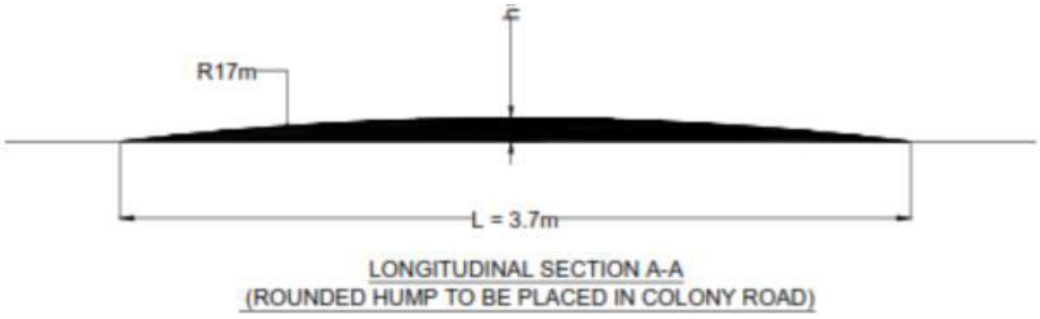


Fig. 2(a) Speed hump

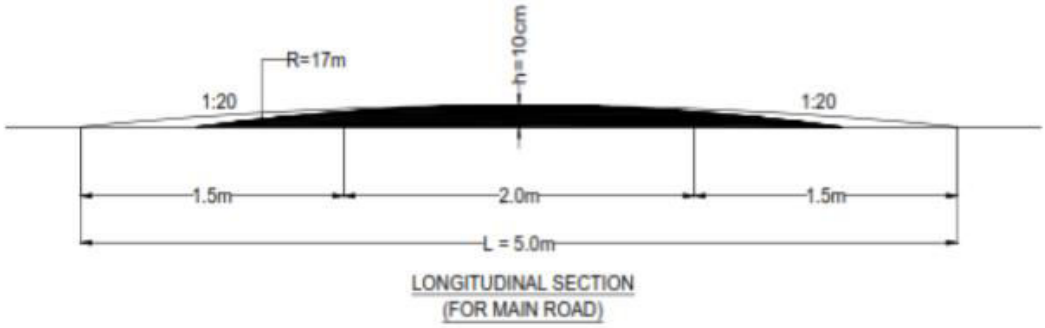


Fig. 2(b) Speed hump

FIG2.2.2: SPEED HUMP

2.2.3 Speed table

Speed tables are flat-topped speed humps and are long enough for the entire wheelbase of a passenger car to rest on the flat section. Their long flat fields give speed tables higher design speeds than Speed Humps. They are 22-24 feet long and 7-10 cm high and are good for locations where low speeds are desired with smooth ride for larger vehicles. If pedestrian markings are used over the flat section it is referred as raised crosswalk. They can be expensive and may increase noise and air pollution. The shown speed table.

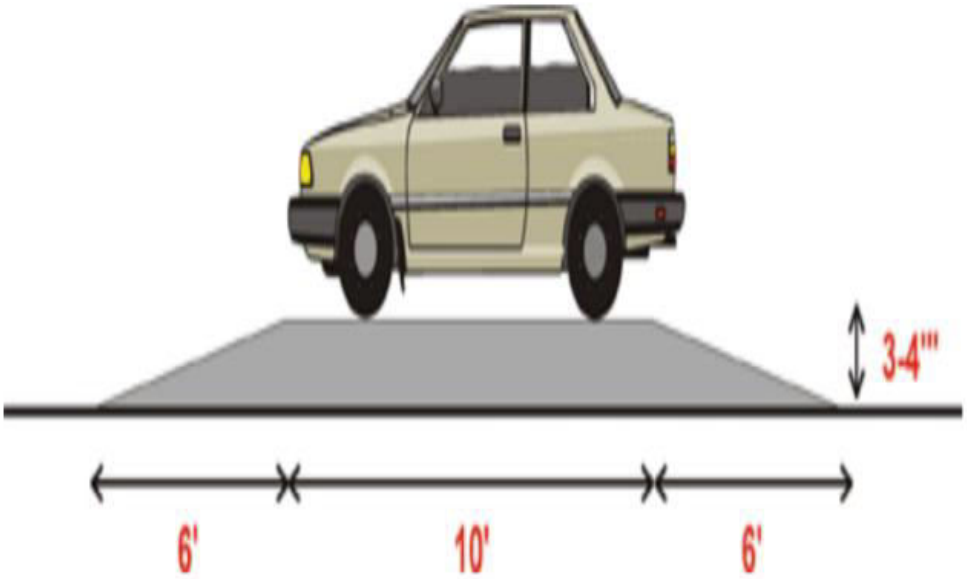


FIG2.2.3: SPEED TABLES

2.24 Speed Cushion

Speed cushions are a type of speed hump designed to avoid the negative impacts that vertical deflections have on emergency vehicle response times. Speed cushions are made up of several small speed humps installed across the width of the road with spaces between them as show. They force normal cars to slow down as they ride with one or both wheels over the humps. Meanwhile, they allow fire engines and other large vehicles with wider axles to straddle the cushions without slowing down. Thus it results in movement of emergency vehicles as well as heavy vehicles with no discomfort to vehicle occupants and no delays.

FIG2.2.4: SPEED CUSHION

2.3THE LAW ON SPEED BREAKERS

Did you know that there were laws governing speed breakers? Very few government officers and even motorists are aware of these laws and design specification. The article attempts to explain the law on speed breakers in India.

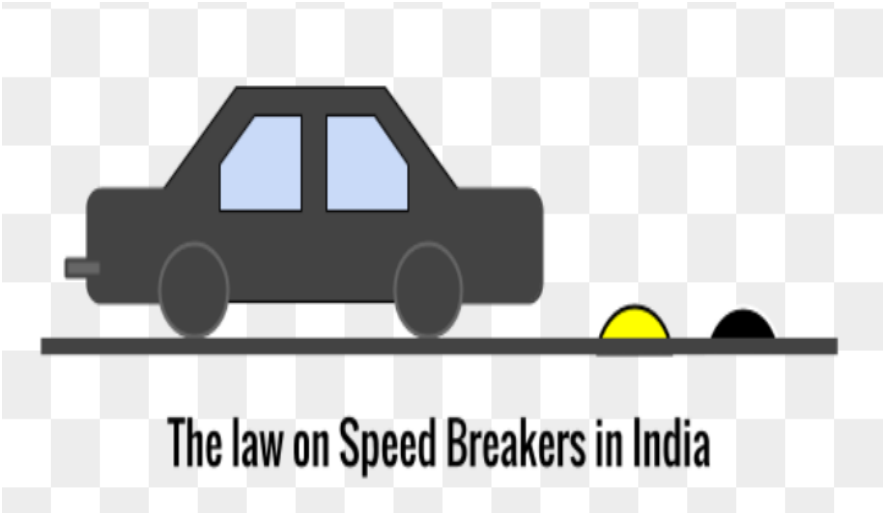


Fig2.3.1: LAW OF SPEED BREAKERS

Speed Breakers are traffic management device which use vertical deflection to slow down vehicles passing over them. Speed bumps speed Ramps, Speed cushions or speed tables. Speed Breaker are used to slow down traffic near school, the road more easily or senior citizens can cross at ease. They are also placed near toll booths and entry points of bridges or narrow roads, to ensure that motorists reduce their speed.

While speed Breakers can help in slowing down traffic and reducing high speed crashes, and unplanned or illegal speed breaker can be as much dangerous than the high speed crashes it is trying to prevent .It is very common across India to see speed breaker being laid willy-nilly.

There are various judgements by various courts, directing the government to formulate rules and policies for setup of speed Breakers.

2.3.1 LAWS WHICH REFER TO SPEED BREAKERS

- Home Department's resolution no TFC-1092-991-V dated 23rd march 1992.
- Seed breakers must be used only in urban areas for minor roads and residential areas.

- Speed breakers are not recommended on high speed roads or highways outside urban limits.
- As per the Indian road congress, guidelines, dated 12 June 1987, speed breakers must place on minor roads only.

2.3.2 What type of marking and painting need to be done on speed breakers?

- Drivers should be warned to the presence of speed breakers by posting suitable advance warning signs.
- The warning sign, should be of the design 'HUMP OR ROUGH ROAD' detailed in IRC:67-1977'code of practice for Road sign' the sign should have a definition plate with the words 'speed breaker' inscribed there on should located 40m in advance of the first speed breaker.
- Speed breaker should be painted with alternate black and white bands to give additional visibility, it is desirable that the marking are in luminous paint/luminous stip.

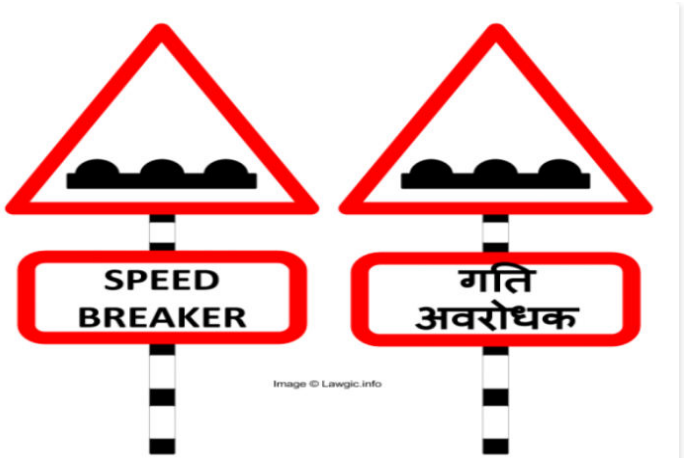


Fig2.3.2: Marking of sign board

2.4Speed Humps vs. Speed Bumps

2.4.1 Speed Humps

- Is a gradual raised area in the pavement surface extending across the entire travel width?
- Typically, 3½ inches in height with a travel length of 22 feet

- Have evolved from extensive research & testing
- Create a gentle vehicle rocking motion which results in most vehicles slowing to 15 - 20 mph at each hump and 25 to 30 mph between properly spaced humps in a system
- They are painted to identify a vertical change in the road
- Need to be properly designed, marked and signed according to the standards in the MUTCD)
- Effective at controlling speeds without creating accidents or imposing unreasonable or unacceptable safety risks
- Either permanent bituminous ones or portable rubber ones can be installed--- there are pros and cons to each type
- Can be utilized as a raised crosswalk as well
- Pilot project successfully complete on Lex woods Drive

Fig2.4.1: SPEED HUMPS MARKING

Speed Bumps

- Are abrupt raised areas in the pavement surface?
- Effective at controlling speeds on low volume private driveways and parking lots
- Typically, 3 to 6 inches in height with a travel length of 6 in. to 3 ft.
- Cause significant driver discomfort at typical residential speeds\
- Cause vehicles to slow to 5 mph or less at the bump
- Considered an increased liability risk on public roads
- Truck, emergency response, cargo and bus passengers more likely to be affected

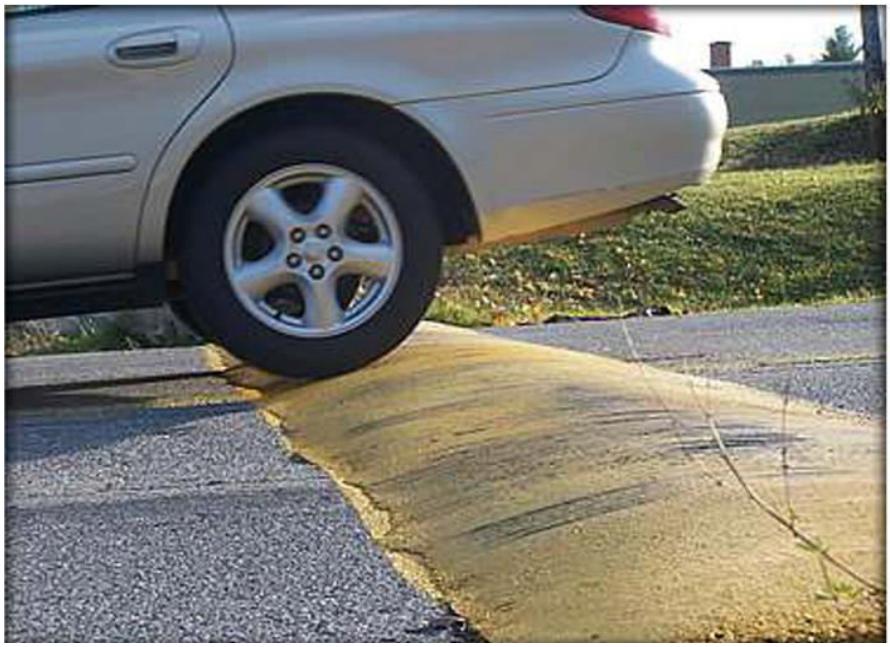


FIG2.4.2: SPEED BUMPS MARKING

2.5.1 PROS

- Diverts traffic to other streets, which is positive if the traffic is diverted from a local to a collector arterial street.
- Speed and volume changes tend to remain over time.
- Residents usually report that they are effective and generally support them.
- Emergency vehicles usually have no problem with them.
- Have advantage of being largely self-enforcing and of creating a visual impression, real or imagined, that a street is not intended for speeding or “through” traffic.
- Potential to reduce accident rates. Fewer citizen complaints.
- Increased safety. Potential noise reduction due to reduced volumes.
- Less public controversy than other concepts.
- Another tool or option in the traffic calming toolbox.

2.5.2 CONS

- Humps are a gentle design and thus cannot reduce speeds as much as some residents want.
- May divert traffic to other local streets thus moving the problem.

- Large trucks, buses and emergency vehicles must pass over the humps at a low speed or risk possible loss of control.
- Humps require signing and striping; some residents object to these signs and markings as unattractive.
- Noise levels increase at the hump due to deceleration/acceleration and the noise of a vehicle going over the humps.
- Initial construction and continuing maintenance costs.
- Gutter running (swerving off road into gutter or sidewalk to avoid hump with some tires.)
- More potential for neighbourhood conflicts since there may not be 100 percent support for the speed hump installation.
- Potential vehicle damage if traversed at high speeds. Longer emergency vehicle response times possible

CHAPTER 3

PROBLEMS ASSOCIATED WITH SPEED BREAKERS

As discussed above in the introduction the main causes of road accidents include inappropriate speed, absence of safe crossing facilities and violation of traffic rules. Speed breakers are one of the most suitable measures for reducing road accidents and increasing safety of road users. The effectiveness of speed breakers can be determined by nature of the problem, local community involvement and the disadvantages which must be keep in mind:

- Speed breakers are very effective in reducing the speed of vehicles but people may not accept it readily and can cause a public outcry if public is not consulted in prior.
- They are uncomfortable and painful to people who suffering from medical conditions such as back problems.
- Road users, especially, the two wheelers try to avoid speed breakers to remove all possible discomfort caused by speed breakers.
- Speed humps are a major problem for an emergency vehicle such as ambulances and fire engines. It is found that in USA about 85 people die due to delay of emergency vehicles because of speed breakers.
- Different vehicles respond differently with heavy vehicles like buses, trucks and other public transport vehicles are prone to discomfort unless humps are traversed at very low speeds.
- Vehicles may get damaged frequently even at normal speed levels. This problem is more severe with older, heavier vehicles and the vehicles with low ground clearance.
- Speed breakers cause atmospheric pollution from the acceleration and deceleration of traffic at speed breakers. Use of speed cushions encourages the use of larger vehicles which are more polluting.
- Speed breakers create additional traffic noise. Heavy vehicles generate substantially more noise than before, not only this a heavy vehicle traversing a hump generates a considerable amount of vibration to the adjoining properties.

- It is observed that the road surface near the humps shows development of potholes and signs of subsidence which requires a greater road maintenance cost.
- Practically provision of speed breakers is not a complete solution to improve road safety or to reduce the accidents. This is because in many of the cases it is found that accidents are caused due to careless driving of the car driver or of other factors that are not solved by the speed breakers.

3.1 Remedial Measures:

A few remedial measures for associated with speed breakers are given below:

- Speed breakers should be constructed conforming to the standard laid down by IRC-99:1988.
- It should be provided with proper road marking and proper signage and signage should be properly located and maintained.
- The speed breakers that have properly designed profile cause a reduction in the discomfort. This encourages the road users to reduce their speed at approaches of speed breakers.
- Use of speed cushions should be encouraged. This because it is observed that the vehicles involved in crashes due to over speeding are generally four wheelers having axle width which less than spacing between the cushions. This force the four wheelers to slow down while allow emergency and heavy vehicles to straddle speed breakers without any discomfort.
- At signalized intersections, we have observed that speed breakers are provided at many locations. As such intersections signals are being properly followed and also they are manned intersections to enforce the traffic regulation. Thus, these speed breakers are found to be causing unnecessary acceleration and deceleration delays such practices should be discouraged

3.2 Measurement of Discomfort

Few measuring and evaluating methods have been developed to study the comfort in vehicles. The number of factors affecting the comfort of vehicle occupants is temperature, air quality, noise, light and vibration. In the authors also focus the study of

vibration while crossing the bump and tried to identify the severity of bump by making various study. A body is considered in vibration when it oscillates relative to a reference position. When studying the effect of vibration in human body, it should be taken into account that it is constituted of different parts with different behaviours when excited by oscillatory movement. Konawa and Suzuki developed a portable ride comfort meter in 1986 giving an index called Vibration Number (VN) as an objective measure of comfort of passengers. To develop this apparatus, a subjective evaluation test of whole body vibration was carried out using a dual-axis vibration table. The index scale has range between 0 (no vibration) to 100 (maximum vibration). The VN was obtained through multiple regression analysis performed with data from subjective evaluations. [8] Ford Motor Company developed a vibration simulator in that the road profiles were reproduced in laboratory. In the vibrator simulator, a set of computer-controlled actuators creates vibrations in the seat as well as in all parts of the car and VN was measured.

In another study, a Society of Automotive Engineers pad was developed to measure the vertical and horizontal acceleration on speed breakers. It is a semi rigid circular pad consisting of an accelerometer that placed between seat and individual. It is of 200 mm diameter plastic pad. The accelerometer was calibrated for the acceleration readings. The peak, root-mean-square (RMS) and root-mean-quad (RMQ) horizontal and vertical accelerations were determined for the test. RMS values are used to relate the vibration and discomfort. An analytical approach was used to establish the criteria of discomfort for speed breakers. From the study, it is concluded that speed breakers are effective means of controlling speed as well as reducing frequency and severity of accidents. However, they also means of accidents at some locations where no standards are followed and placed at random locations. Speed tables are provided in public transit routes such as in BRTS lanes near the stations where speed of transit vehicles already to be low. It increases operating cost as well as causes significant discomfort to passengers. It is also suggested the effect of the comfort also to be measured after implementation. In India, there will be a strong need for a proper study before and after implementation of speed breakers to check their effectiveness.

CHAPTER 4
INTIMATION METHOD

4.1 SIGN BOARDS

Speed bumps are the common name for a family of traffic claiming devices that use vertical deflection to slow motor-vehicle traffic in order to improve safety conditions. Variations include the **speed hump**, **speed cushion**, and **speed table**.Sign boards are used with particular colors to represent the speed breakers ahead. But this method is not useful in low visibility conditions and smog areas.

Fig4.1: sign board

The use of vertical deflection devices is widespread around the world, and they are most commonly found to enforce a low speed limit, under 40 km/h (25 mph) or lower. Although speed bumps are effective in keeping vehicle speeds down, their use is sometimes controversial—as they can increase traffic noise, may damage vehicles if traversed at too great a speed, and slow emergency vehicles. Poorly-designed speed bumps that stand too tall or with too-sharp an angle (often found in private car park can be disruptive for drivers, and may be difficult to navigate for vehicles with low ground clearance, even at very low speeds. Many sports cars have this problem with such speed bumps. Speed bumps can also pose serious hazards to motorcyclists and bicyclists if they are not clearly visible, though in some cases a small cut across the bump allows those vehicles to traverse without impediment. Speed bumps cost $50–200 and may need replacement over time due to wear.

FIG 4. 1. 2: DIFFERENT TYPE SIGN BOARDS

4.2 SPEED BREAKER DETECTION BY USING RASPBERRY PI PROCESSOR

4.2.1 INTRODUCTION

Obstacle Detection System (ODS) employs fixed transmitters on the dividers and speed breakers that continuously give out signals indicating its presence. The vehicle fitted with a receiver will identify these signals and decode the image of the obstacle. The corresponding voice alert is given to the driver. Typically, these systems recognize speed breakers and dividers their primary function is to inform the driver of the upcoming dividers that are interpreted and displayed on a panel fitted on the vehicle dashboard. This project runs on Raspberry Pi platform. Signals through RF can travel through larger distances making it suitable for long range applications. RF signals can travel even when there is an obstruction between transmitter & receiver. Next, RF transmission is more strong and reliable. RF communication uses a specific frequency several carrier frequencies are commonly used in commercially-available RF modules, including those in the industrial, scientific and medical (ISM) radio bands such as 433.92 MHz, 315 MHz, 868 MHz, 915 MHz, and 2400 MHz These frequencies are used because of national and international regulations governing the use of radio for communication. The first generation Raspberry Pi chip operated at 700 MHz by default and did not become hot enough to need a heat sink or special cooling, unless the chip was overclocked. The

second generation runs on 900 MHz by default, and also does not become hot enough to need a heat sink or special cooling, again overclocking may heat up the SOC more than usual.

Nowadays every news media communication is filled with horrible reports on road accidents. Looking closely at the reasons behind, invisible dividers and the steep build of speed breakers have always posed a major problem to the commuters on road. For the drivers travelling in the night time, their journey always has a high risk factor when the dividers and pedestrian crossings are not visible even with highlighters or road signs with glow-in-the-dark sheets. When all these alerts fail miserably to alert the drivers, there is a strong need to device a better method and a more efficient one. The project at hand aims at giving a constant as well as an accurate positional presence of the road barriers with the help of a radio frequency identity transmitter embedded to the chosen barrier to be detected. This will keep sending out signals at equal intervals of time for a pre-determined circumference of distance. The vehicle passing this stretch of road will be fixed with a radio frequency identity receiver. This will detect these signals from the barrier and map the exact location. After this is done, an audio alert is given on the monitor with speaker module on the dashboard of the car, lorry/front hood of the bike. This alert will tell what kind of barrier is present and at what distance is it located. Thus the driver will be attentive and navigate with intelligence.

A method for detecting vehicle braking and road bumps was proposed in; they used machine learning techniques to detect road anomalies and braking events from accelerometer and magnetometer data. The method will not always work because magnetometer is not present in all phones, is susceptible to magnetic interference and increases battery consumption. In addition, the performance of this algorithm was not evaluated for various different types of speed-breakers, vehicles and drivers. A method for detecting speed bumps and braking events wasalsoproposed in. Thiswork did not differentiate between potholes and speed-breakers, and labelled them both as speed bumps. Just like requires magnetometer for reorientation, requires GPS for reorientation, increasing overall complexity and battery consumption. Recently, mobile phone crowd-sourcing based pothole detectionhasalsogainedsignificant attention. In this work, the mobile phone had to be placed a certain way on the dashboard to avoid reorientation

complexity. Authors of attempted to solve the pothole detection problem without taking into account accelerometer reorientation. In another work, authors of proposed a fixed threshold based pothole detection algorithm that may not work with different types of phones or cars because of the difference in overall sensitivity to variations along vehicle's z-axis.

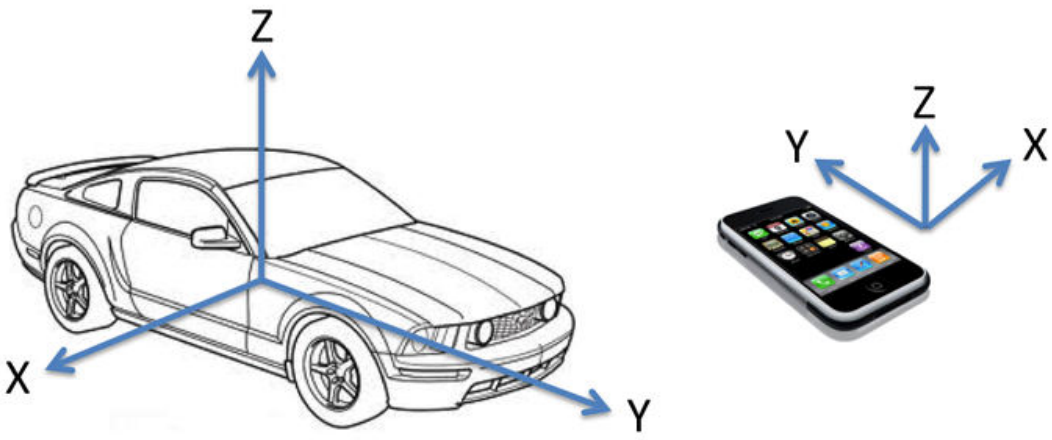


Figure 4.2.1: The three axes of a car and a smartphone. The Z-axis of the phone does not always align with the z-axis of the car, e.g., when the phone is in the driver's pant pocket.

4.2.2Detection Methodology:

If the sampling rate is fixed at R samples/sec, the SWAS application collects a total of 3×RT samples in a fixed time duration of T seconds (1×RT samples from each of the 3 axes). Then, given a set of 3×RT samples, the application must decide whether or not there was a speed-breaker when these samples were collected. The value of T was fixed to 2 seconds based on the observation that it usually takes less than 2 seconds to cross a speed-breaker Smartphone's axes don't always align with the car's axes (see Figure 1) because passengers can place their smartphone in any location, e.g., pant pocket, purse, car seat, dashboard, etc. Since road anomalies like potholes and speed-breakers primarily manifest along the z-axis of the vehicle, previous works attempted to

reorient the phone's axes with that of the car using some other sensors [4, 16]. We have adopted a slightly different approach in this work, wherein, only the amplitude of the acceleration vector is sufficient to detect speed breakers. Since the amplitude comprises of forces experienced along all three axes, it already has a component of forces experienced along the vehicle's z-axis. Hence, it should be possible to detect speed-breakers from time series of amplitude data. As a first step, the 3×RT accelerometer readings are converted to the corresponding tof RT amplitude samples. If xi, yi and zi are the values of the X, Y and Z axis accelerometer readings, then the amplitude is simply ai =qx2 i +y2 i +z2 i. 3.1 Feature Vector Given a set of RT amplitude samples, the following features are used to detect speed-breakers. The vehicle crosses a speed-breaker. As a result the standard deviation of amplitude samples collected in a T second window is expected to be higher than usual during a speed-breaker (see Figures 2 and 3).

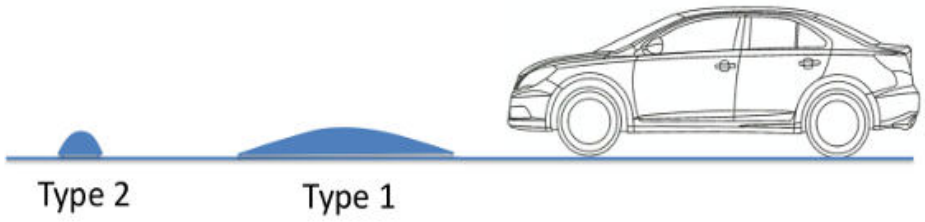


Figure4.2.2: Two different types of speed-breakers common in any areas

Series of accelerometer data from a particular drive, we first extracted sample windows where the person conducting the measurements had visually observedand marked a speed-breaker. Feature vectors obtained from these windows formed the set labelled "speed-breaker". The set labelled "not a speed-breaker" was obtained by selecting windows of samples where the person collecting the measurements did not observe any speedbreakers. The two labelled data sets were of the same size to avoid bias in classification.

We wrote an Android application for recording accelerometer data along with user input. At least two phones were used in every drive, one for collecting accelerometer

data (measurer), and the other for record. User input (marker). The measurer was placed in different locations during the different drives, e.g., pant pocket, dashboard, near the gearbox, near the rear car speakers, etc. Whenever we observed that the vehicle was passing over a speed-breaker, we pressed a button on the marker to record the ground truth. The two phones were time synchronized so that the ground truth markings in the marker could be correlated with the accelerometer readings in the measurer. The marker had two buttons for recording user input, namely, "Type 1 Speed-Breaker" and "Type 2 Speed-Breaker". Depicts two types of speed-breakers that are common in New Delhi. Type 1 speed-breakers usually have a travel length of 3 to 6 feet and are 5 to 10 inches high, whereas Type 2 speed-breakers are 3 to 6 inches high with a length of 1 ft. to 2 ft. The evaluation data was collected in New Delhi, National Capital Region (NCR) and the total data set distance was 677.9 Km. Three measurers and one marker were used for some of the drives resulting in data set distance that was three times the actual travelled distance. The three data sets are still unique and interesting because measurers were of different make and were placed in different locations inside the vehicle. We used several different vehicles for the data collection, 219.5 Km in auto rickshaws (or three wheeler or tut-tut), 40.15 Km in cycle rickshaws (or bike taxi), 290.5 Km in cars, 53.6 Km in motorcycles and 74.1 Km in Bus.

4.3 POWER GENERATION DUE TO SPEED BREAKERS

Energy is the primary need for survival of all organisms in the universe. Everything what happens in the surrounding is the expression of flow of energy in one of the forms. But in this fast moving world, population is increasing day by day and the conventional energy sources are lessening. The extensive usage of energy has resulted in an energy crisis over the few years. Therefore to overcome this problem we need to implement the techniques of optimal utilization of conventional sources for conservation of energy. My paper includes how to utilize the energy which is wasted when the vehicles passes over a speed breaker. Lots of energy is generated when vehicle passes over it. We can tap the energy generated and produce power by using the speed breaker as power generating unit. The kinetic energy of the moving vehicles can be converted into mechanical energy of the shaft through rack and pinion mechanism. Then, this mechanical energy will be converted to electrical energy using generator which will be

saved with the use of a battery. The energy we save during the day light can be used in the night time for lighting street lights. Therefore, by using this arrangement we can save lot of energy which can be used for the fulfilment of future demands.

4.3.1 INTRODUCTION

Increasing demand of energy adds to the need of identifying non-conventional resources of energy. In my paper, I will discuss about power generation from speed breaker and the possible mechanism required for it. This project explains the mechanism of electricity generation from speed breakers. The vehicle load acted upon the speed breaker system is transmitted to rack and pinion arrangements. Then, reciprocating motion of the speed-breaker is converted into rotary motion using the rack and pinion arrangement where the axis of the pinion is coupled with the sprocket arrangement. The sprocket arrangement is made of two sprockets. One of the sprockets is larger in dimension than the other sprocket. Both the sprockets are connected with chain which transmits the power from the larger sprocket to the smaller sprocket. As the power is transmitted from the larger sprocket to the smaller sprocket, the speed that is available at the larger sprocket is relatively multiplied at the rotation of the smaller sprocket. The axis of the smaller sprocket is coupled to a gear arrangement. Here we have two gears with different dimensions. The gear wheel with the larger diameter is coupled to the axis of the smaller sprocket. Hence, the speed that has been increased at the smaller sprocket wheel is passed on to this gear wheel of larger diameter. The smaller gear is coupled to the larger gear. Therefore, as the larger gear rotates it increases the speed of the smaller gear which is following the larger gear and multiplies the speed to more intensity. Though the speed due to the rotary motion achieved at the larger sprocket wheel is less, as the power is transmitted to gears, the final speed achieved is high. This speed is sufficient to rotate the rotor of a generator and is fed into the rotor of a generator. The rotor which rotates within a static magnetic stator cuts the magnetic flux surrounding it, thus producing the electric motive force (EMF). This generated EMF is then sent to an inverter, where the generated emfis regulated. This regulated EMF is now sent to the storage battery where it is stored during the day time and can be used in night time for providing power to street lights.

4.3.2 DETECTION METHODOLOGY

The energy crisis is a bottleneck in the supply of energy resources to an economy. The studies to sort out the energy crisis led to the idea of generating power using speed breaker. First to make use were South African people; their electrical crisis has made them to implement this method to light up small villages of the highway. The idea of basic physics to convert the kinetic energy into electrical energy that goes waste when the vehicle runs over the speed-breaker was used. Since then a lot has been done in this field. The idea caught our working team and we have decided to develop such a project that will produce more power and store it for use at night time as it proves to be a boon to the economy of the country.

BLOCK DIAGRAM

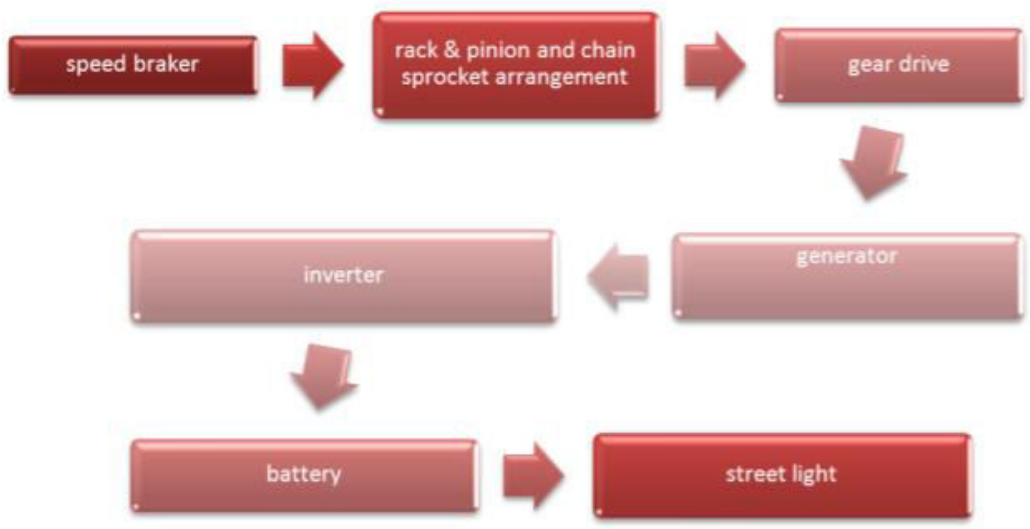


FIG 4.3.1 : BLOCK DIAGRAM

Rack and Pinion Gears

The rack and pinion used to convert between rotary and translator motion. The rack is the flat toothed part, while the pinion is the gear. Rack and pinion can convert rotary to linear of from linear to rotary motion.

Ball Bearings

A roller-element bearing is a bearing which carries a load by placing round elements between the two pieces. The relative motion of the pieces causes the round elements to roll (tumble) with little sliding. They reduce the friction and transmit the motion effectively.

Spur Gear

It is a positive power transmission device with definite velocity ratio. It is preferred for adjusting some linear misalignment. It should have high wear and tear, shock-absorbing capacity.

Flywheel

The primary function of flywheel is to act as an energy accumulator. It reduces the fluctuations in speed. It absorbs the energy when demand is less and releases the same when it is required.

Shaft

It is a rotating element, which is used to transmit power from one place to another place. It supports the rotating elements like gears and flywheels. It must have high torsional rigidity and lateral rigidity.

Generator

It is a device, which converts mechanical energy into electrical energy. The generator uses rotating coils of wire and magnetic fields to convert mechanical rotation into a pulsing direct electric current through "Faraday‟ s law of electromagnetic induction".

CONSTRUCTIONAL DETAILS

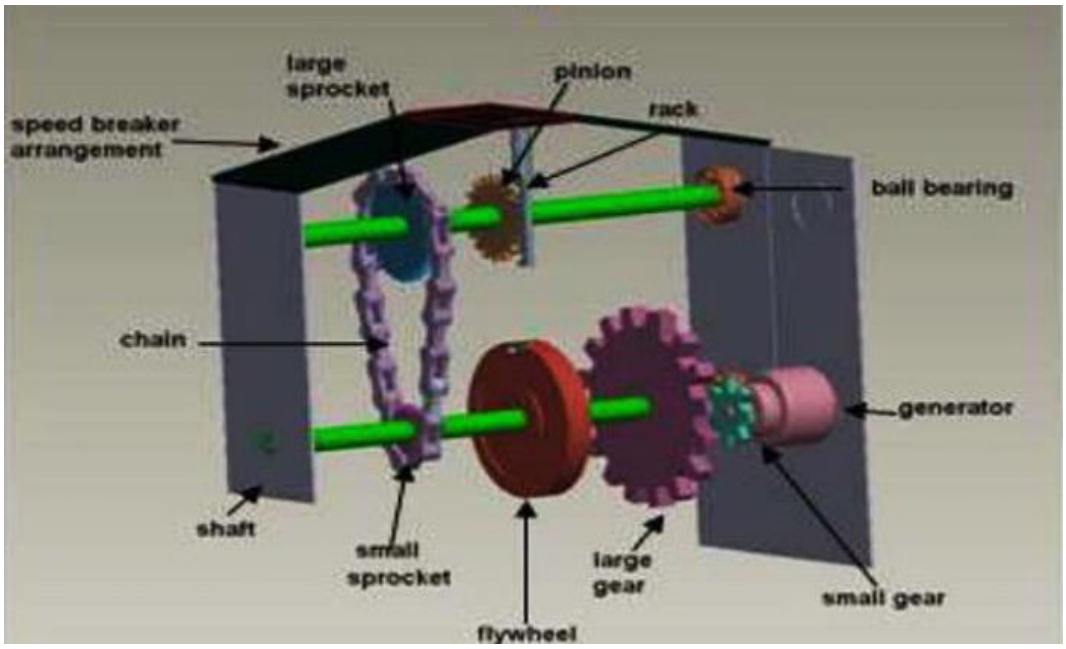


FIG 4.3.2: CONSTRUCTION DETAILS

4.3.3 POWER CALCULATIONS

Let us consider, the mass of any vehicle travelling over the speed breaker= 300Kg

Height of speed brake = 15 cm

Work done = weight of the body x distance travelled by the vehicle Here,

Weight of the Body = 300 Kg x 9.81 = 2943

N Distance travelled by the body = Height of the speed breaker = 15cm

Power = Work done/Second = (2943 x 0.15)/60 = 7.3575 Watts

Output Power developed for 1 vehicle passing over the speed Breaker arrangement for one minute = 7.3575 watts Power developed for 60 minutes (1 hr) = 441.45 watts

Power developed for 24 hours = 10.5948 Kw

This power generated by vehicles is more than sufficient to run four street lights in the night time.

4.3.4 ADVANTAGES:

- Power generation with low cost and using non-conventional energy sources which will help us to conserve the conventional energy sources to meet the future demand.
- By using this method, electricity will be generated throughout the year without depending on other factors.
- Easy for maintenance and no fuel transportation problem.
- Pollution free power generation.
- Less floor area required and no obstruction to traffic.
- No need of manpower during power generation.

"Electricity plays a very important role in our life". Due to population explosion, the current power generation has become insufficient to fulfil our requirements. In this project we discover technology to generate electricity from speed breakers in which the system used is reliable and this technique will help conserve our natural resources. In coming days, this will prove a great boon to the world, since it will save a lot of electricity of power plants that gets wasted in illuminating the street lights. As the conventional sources are depleting very fast, it's high time to think of alternative resources. We got to save the power gained from the conventional sources for efficient use. So this idea not only provides alternative but also adds to the economy of the country.

4.4 SPEEDDETECTION CAMERA SYSTEM USING IMAGE PROCESSING TECHNIQUES ON VIDEO STREAMS

4.4.1INTRODUCTION

This paper, presents a new Speed Detection Camera System (SDCS) that is applicable as a radar alternative. SDCS uses several image processing techniques on video stream in online -captured from single camera- or offline mode, which makes SDCS capable of calculating the speed of moving objects avoiding the traditional radars' problems. SDCS offers an en-expensive alternative to traditional radars with the same

accuracy or even better. SDCS processes can be divided into four successive phases; first phase is Objects detection phase. Which uses a hybrid algorithm based on combining an adaptive background subtraction technique with a three-frame differencing algorithm which ratifies the major drawback of using only adaptive background subtraction? The second phase is Objects tracking, which consists of three successive operations, object segmentation, Object labelling, and Object canter extraction. Objects tracking operation takes into consideration the different possible scenarios of the moving object like; Simple tracking, object has left the scene, object has entered the scene, object cross by another object, and object leaves and another one enters the scene. Third phase is speed calculation phase, which is calculated from the number of frames consumed by the object to pass-by the scene. The final phase is Capturing Object's Picture phase, which captures the image of objects that violate the speed limits. SDCS is implemented and tested in many experiments; it proved to have achieved a satisfactory performance.

4.4.2 SYSTEM DESIGN, RESEARCH AND IMPLEMENTATION

This section briefly discusses SDCS novel theory, system detailed design and project implementation. SDCS can be divided into four successive phases; these are

- Objects detection
- Objects tracking
- Speed calculation
- Capturing Object's Picture Detection of moving objects in video streams is known to be a significant, and difficult, research problem.

Aside from the intrinsic usefulness of being able to segment video streams into moving and background components, detecting moving blobs provides a focus of attention for recognition, classification, and activity analysis, making these later processes more efficient since only “moving” pixels need be considered. On the other hand, inaccurate foreground object segmentation due to shadows, reflectance and occlusions makes tracking a difficult research problem. Since the output of object detection phase is considerably reliable and it handles sudden illumination changes and shadows. Therefore the foreground image is ready for segmentation, labelling and tracking. Also, the objects’ speeds can be calculated by detecting the first frame which

the object has entered the scene at (Fr0) and keeping track of the object till it leaves the scene at frame (Frn). This is while neglecting the other unimportant objects such as people crossing the road. While the background model eventually adapts to these "holes", they generate false alarms for a short period of time. Frame differencing is not subject to this phenomenon; however, it is generally not an effective method for extracting the entire shape of a moving object.

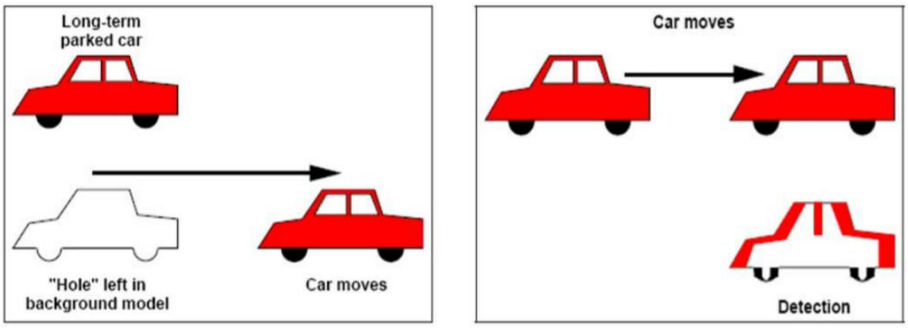


Fig 4.4.2: Background subtraction leaves holes when stationary object moves&Frame differencing doesn't detect entire object.

To overcome these problems, we preferred to use the combination of the two methods. Object detection process, contains three different successive steps, these are Constructing the motion matrix the main idea of this section is to construct a matrix corresponds to the current frame. This is being processed to decide what pixels are in motion and what are stationary. The moving pixels will have high probability to represent a foreground pixel while stationary pixels will have high probability to represent a background pixel. A three-frame differencing operation is performed to determine regions of legitimate motion as shown at figure 2 (we call that part "constructing the motion matrix"). It is followed by adaptive background subtraction to extract the entire moving region. Consider a video stream from a stationary (or stabilized) camera. Let In(x,y) represent the intensity value at pixel position (x,y), at time t=n. The three-frame differencing rule suggests that a pixel is legitimately moving if its intensity has changed significantly between both the current image (In) and the last frame (In-1), and the current image (In) and the next-to-last frame (In-2).

Fig 4.4.3: Masked subtraction sample, a: sample scene with moving object, b: foreground image constructed by masked subtraction, c: foreground image constructed using two frames differencing, d: final foreground image after combining both images

Most of the foreground detection algorithms are susceptible to both shadows and sudden illumination changes which cause inaccurate foreground object segmentation. Since later processing steps like object classification and tracking depend on the correctness of object segmentation, it is very important to cope with shadow and sudden illumination changes in smart surveillance systems. After examining the properties of shadow one concludes that:

1. Shadow regions are darker.

2. Shadow regions represent the same background surface under a reduced illumination, and share similar textures to the background.

There two approaches for shadow detection and removal, (1) using edge detection, (2) compare the intensities of pixel in(x, y) Bn(x, y). The drawback of the first approach simply is complexity, it is a time consuming approach but give an accurate results and can be used to differentiate between self-shadow and cast shadow, but since our application main approach is speed while keeping quality in mind, we decided to use the second approach. Simply we need a robust and adaptive method to detect whether the current pixel in(x, y) is a foreground or shadow. After try and test we have concluded that: If $0.23 < In(x, y)/Bn(x, y) < 0.95$ then the pixel is shadow Otherwise the pixel is a foreground. The strength of this method is that: it is simple and adaptive to a wide range of shadows. We keep the thresholds at those two ranges. This is in order not to mess-detect a shadow point as if it is a foreground one. Although this can affect the object at some special cases, like the dawn period, it still does not mess-classify shadow. It will

just detect a smaller part of the object but with no shadow at all. As a result we have constructed a foreground image without any shadow. It is adaptive to sudden illumination changes (since we use adaptive background). Besides that, we are using a dynamic threshold which will adapt to the lighting conditions.

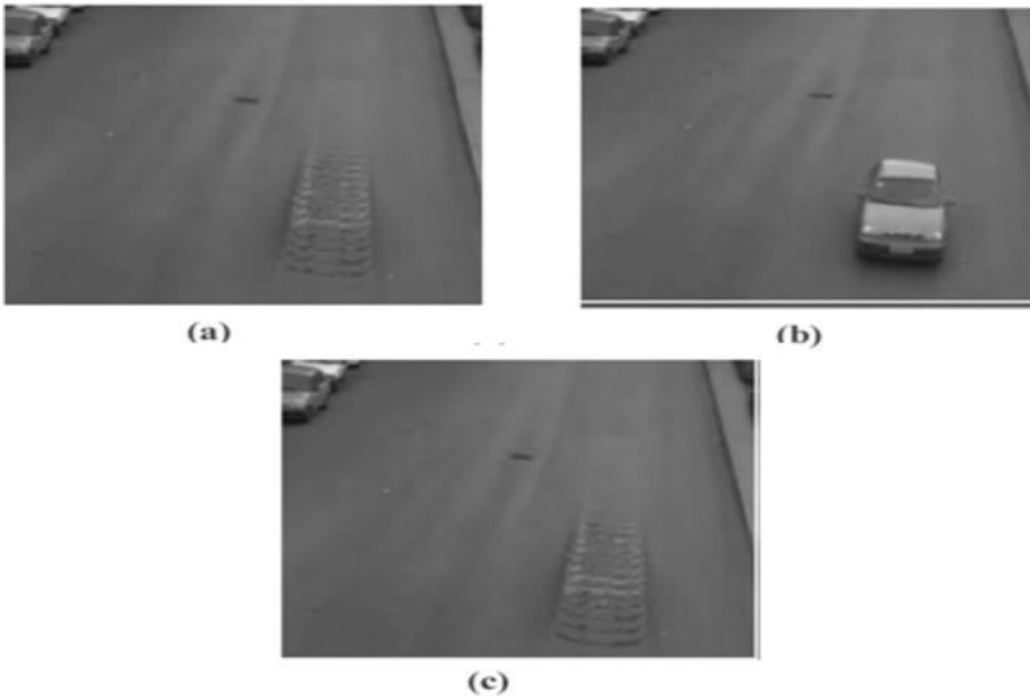


Fig 4.4.4: new background generation, a: initial background, b: current frame, b: new generated background. C: Objects tracking detected objects frame by frame in video are a significant and difficult task.

It is a crucial part of smart surveillance systems since without object tracking, the system could not extract cohesive temporal information about objects and higher level behaviour analysis steps would not be possible. On the other hand, inaccurate foreground object segmentation due to shadows, reflectance and occlusions makes tracking a difficult research problem. Object tracking driven using three successive phases;

- Object segmentation
- Object labelling
- Object centre extraction

Object segmentation Object segmentation is based mainly upon the connectivity of the objects. In other words, in order to segment a foreground image into a group of

objects we must assure that every object is being connected as one part. Otherwise, segmentation will not act in an appropriate way; this will result in excess objects count since the single object is being treated as many several objects. Since the objects are not connected, we need to detect the area which surrounds the objects.

CHAPTER 5

PROPOSED METHOD

5.1 INTRODUCTION:

To control the speed of motor vehicles on busy and accident prone areas a device is mandatory to avoid vehicle accidents due to over speed. Commonly road humps are laid at service road junctions. Speed breakers are used in locations where very low speeds are desired and reasonable, typically placed on residential areas and roads. When a vehicle is approaches a speed breaker at a speed greater than some threshold velocity, the risk of accident or injury is substantial. Speed Breakers are inconspicuous in low visibility conditions, like at night, or when there is a fog, rain. Depending on the speed of the vehicle and the distance to the speed breakers on road to any vehicle, the device indicates the driver about the speed breaker through RF module feedback .The feedback to the driver will generally indicate the presence of the speed breakers.

The RF modules are used as transmitters which are placed on road .RF module are used for the vehicles to detect the breakers. The RF modules are used as receiver modules, which are placed in the vehicles to detect the breakers. The RF receiver will detect the speed breaker. Then the RF receiver will give the information to the driver in the form of audible beeps or tunes and light blinking. Generally the frequency of the beep indicates distances from an obstructer with the beep becoming the faster , the closer the vehicle moves towards speed - breaker without controlling the space of driving speed ,so then driver can control the speed of the vehicle.

BLOCK DIAGRAM

Transmitter module (placed at Speed Breaker)

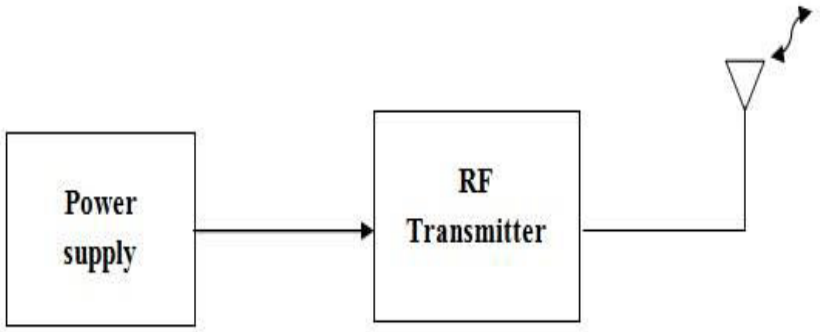


FIG 5.1: TRANSMITTER

5.2 DESCRIPTION

Conventional Display board's method is to be replaced by proposed method, in which RF TX module is placed at speed breaker and RF Rx module is placed in vehicles. Alert will be given to the driver after RF detection using indicators like buzzers and LCD. And also in this method we are using alcohol sensor to control the ignition of vehicles and message alert in case driver taken alcohol, any accident occurs.

- Speed breakers are used in locations where low speeds are desired.
- When a vehicle approaches a speed breaker at a speed greater than some threshold velocity, the risk of accident or injury is substantial.
- Speed breakers are inconspicuous in low visibility conditions like at night or where there is fog, rain.
- Depending on the speed of the vehicle and the distance to speed breaker, an indication should be made to the driver about the speed breaker.
- If any case accident occurred message sent through the GSM modem.
- Driver taken alcohol message sent through the GSM modem and ignition of vehicle is off.

In this project RF Transmitter modules are placed at the speed breakers. RF receivers are used in the vehicles to detect the speed breakers. The RF receiver will detect the RF Transmitter module at about the 100m distance from the speed breaker and alert the

driver in the form of audible beeps or tunes. If any accident occurs, then the integrated GSM module sends an alert message to the people of our choice and an alcohol sensor detects the alcohol present in the rider's breath and accordingly controls the ignition of the vehicle.

RECIEVER AT VEHICLE

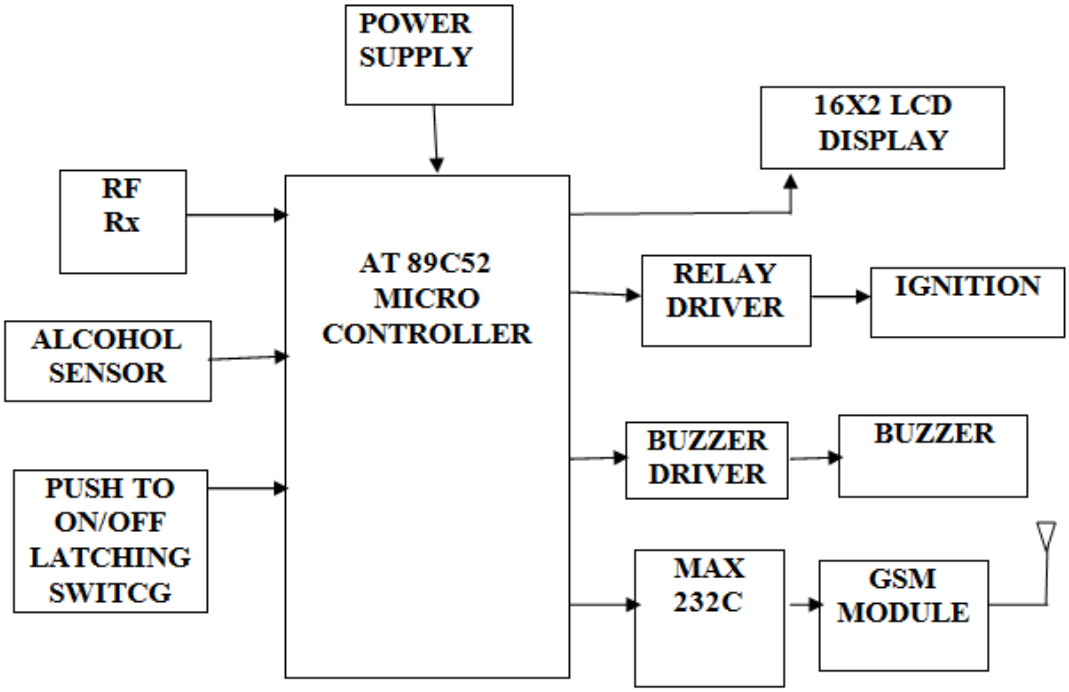


FIG 5.2.1: BLOCK DIAGRAM OF RECEIVER

5.3 DESIGN OF RF BASED SPEED BREAKER

Nowadays people are driving very fast; accidents are occurring frequently, we lost our valuable life by making small mistake while driving (school zone, hills area, and highways). So in order to avoid such kind of accidents and to alert the drivers and to control their vehicle speed in such kind of places the highway department have placed the signboards. But sometimes it may to possible to view that kind of signboards and there is a chance for accident. So to intimate the driver about the zones and the speed limit automatically, is done by means of using RF technology. The main objective is to design a Smart Display controller meant for vehicle's speed control and monitors the zones, which can run on an embedded system. Smart Display & Control (SDC) can be custom

designed to fit into a vehicle's dashboard, and displays information on the vehicle. The project is composed of two separate units: zone status transmitter unit and receiver (speed display and control) unit. Once the information is received from the zones, the vehicle's embedded unit automatically alerts the driver, to reduce the speed according to the zone, it waits for few seconds, and otherwise vehicle's SDC unit automatically reduces the speed.

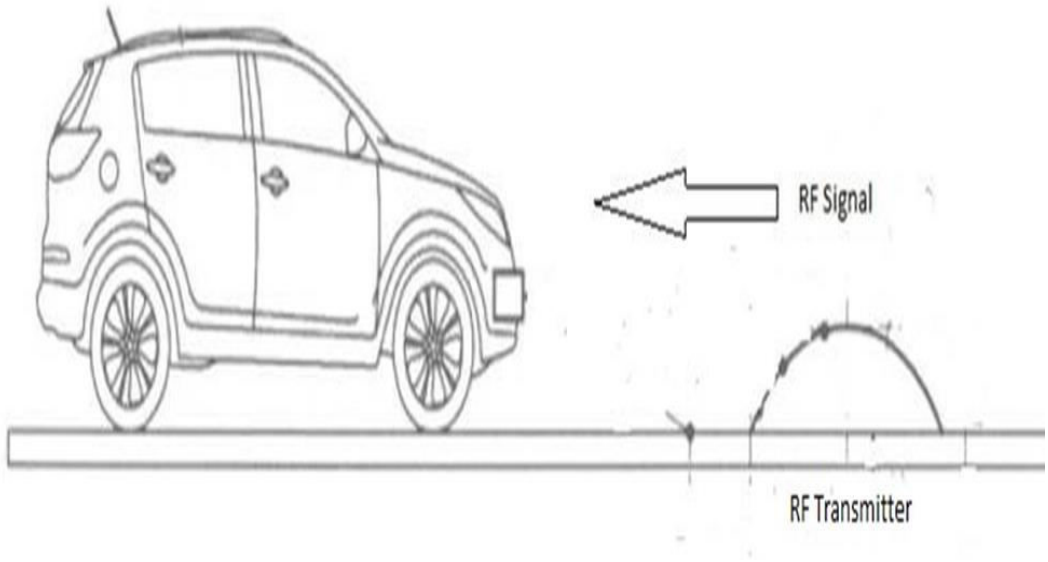


FIG 5.3.1: RECEIVING SIGNAL FROM TRANSMITTER

Road facilities are a major concern in the developed world. Recent studies show that one third of the number of fatal or serious accidents are associated with excessive or inappropriate speed, as well as changes in the roadway (like the presence of road-work or unexpected obstacles). Reduction of the number of accidents and mitigation of their consequences are a big concern for traffic authorities, the automotive industry and transport research groups. One important line of action consists in the use of advanced driver assistance systems (ADAS), which are acoustic, hectic or visual signals produced by the vehicle itself to communicate to the driver the possibility of a collision. These systems are somewhat available in commercial vehicles today, and future trends indicate that higher safety will be achieved by automatic driving controls and a growing number of sensors both on the road infrastructure and the vehicle itself. A prime example of driver assistance systems is cruise control (CC), which has the capability of maintaining a constant user present speed and its evolution, the adaptive cruise control (ACC), which

adds to CC the capability of keeping a safe distance from the preceding vehicle .A drawback of these systems is that they are not independently capable of distinguishing between straight and curved parts of the road, where the speed has to be lowered to avoid accidents. However, curve Warning systems (CWS) have been recently developed that use a combination of global positioning systems (GPS) and digital maps obtained from a Geographical Information System (GIS), to assess threat levels for a driver approaching a curve to quickly, Likewise, intelligent speed assistance (ISA) systems warn the driver When the vehicle's velocity is inappropriate, using GPS in combination with a digital road map containing information about the speed limits However useful, these systems are inoperative in case of unexpected road circumstances (like roadwork, road diversions, accidents, etc.), which would need the use of dynamically generated digital maps. The key idea offered by this paper is to use Radio Frequency Identification (RFID) technology to tag the warning signals placed in the dangerous portions of the road. While artificial vision-based recognition of traffic signals might fail if visibility is poor (insufficient light, difficult weather conditions or blocking of the line of sight by preceding vehicles), RF signals might still be transmitted reliably. IN the last years, RFID technology has been gradually incorporated to commercial transportation systems.

The aim of the research is to build a sensor system for infrastructure to vehicle (l2V) communt10n,which can transmit the information provided by active signals placed on the road to adapt the vehicle's speed and prevent collisions. By active signals we mean ordinary traffic signals that incorporate long-range active RFID tags with information stored into them. This information is collected in real time by RFID sensors placed on board of the vehicle (an electric Citroën Berlin go), which we have modified to automatically change its speed to adapt to the circumstances of the road. In particular, we have implemented a fuzzy logic control algorithm acting on the longitudinal speed of the vehicle, with actuators which control the vehicle's throttle and brake to reach and maintain a given target speed.

5.4 PROPOSED METHODOLOGY AND DISCUSSION

This system is not only efficient but also worthy to be implemented. Accident detection and messaging system can be fitted in vehicle (Ambulance & Police) and they are informed about any such untoward incident at the go. Accident detection and

messaging system is execution simple as the system makes use of GSM & GPS technologies. GPS is used for taking the coordinate of the site of the accident while GSM is used for sending the message to phone. To make this process all the control is made using Arduino whereas LCD is used to display the accident.

The system detects accident from vehicle and send message through GSM module. The message is received by another GSM module. Google Map Module It displays google map show u exact location of accident and it details. It gets detail SMS from accident location. Hence there is small variation in the coordinates, initial value of latitude and longitude are same but fractional value changes with small difference.The proposed system is developed to provide the information about the accident occur and the location of the accident. It helps to easily provide the assistant and help to the victim of the accident. This system uses GPS module to locate the vehicle. GSM is used to provide the information of accident. The results of the proposed systems are satisfactory.Further this system can be implemented by using sound sensor, in order to make it more accurate and efficient to detect an accident. This is extended with alcoholic detection also. If the person took alcohol that is driving then the vehicle will be stopped immediately by giving alarm. This can also be developed by interconnecting camera to the controller module that takes the photograph of the accident spot makes tracking easier.

The system incorporates 89S52 microcontroller, Alcohol sensor, vibration sensor, Global Positioning System (GPS), Global System for Communication (GSM). The vibration sensor works on the piezoelectric property of the crystals and produces an electric signal as it senses vibrations of the unit and gives the signal as input to the microcontroller. The controller analyses the signal with its output given to relays. A relay is an electrically operated switch. It is used where electrical isolation is to be provided between controlled and controlling system. In running condition the 1st relay is in normally closed state and is connected to the car's engine. It ensures that the vehicle runs under the normal working condition. As soon as an accident is detected, that is if the sensor signal values deviate from the specific limits then microcontroller gives an active high signal. The relay's connection gets opened and the engine will stop working, thus stopping the car. Another relay is connected to the air-bag. And it is in normally open state. The air compressor is activated and airbag blows as soon as the controller signal

goes high.at every instant the current location of the vehicle is sent by the GPS's receiver to microcontroller. GSM sends a message to previously coded numbers. GSM is connected to microcontroller with the accident location details. MAX232 IC converts signals from anRS-232 serial port to signals suitable for use in TTL compatible digital logic circuits.it synchronizes baud rates of microcontroller and GSM modem.

The purpose of this work is to find the vehicle accident location by means of sending a message using a system which is placed inside the vehicle system. Author has used assembly programming for better accuracy along with GPS and GSM. In this project, whenever a vehicle meets with an accident immediately vibration sensor will detect the signal and send it to the microcontroller. Microcontroller sends the alert message through the GSM to an authorized mobile no. An alternate condition can be allowed by pressing a switch, in order to interrupt the flow of sending the message in case of no casualty. The system ensured increased safety and credibility. It used C8051F120 microcontroller and a vibration sensor. The vehicle owner gets the message regarding the vehicle location at specific intervals through GSM. Have presented Automatic Vehicle Accident Detection and Messaging System Using GSM.In this paper an accelerometer can be used in a car alarm application so that dangerous driving can be detected. This paper is useful in detecting the accident precisely by means of both vibration sensor and Micro electro Mechanical system (MEMS) or accelerometer. In this project GPS is used for tracking the position of the vehicle, GSM, controller is used for saving the mobile number in the EEPROM and sending the message to it when an accident has occurred.

In emphasised on a system that is cost effective and also inculcates the modern internet facility for networking purposes. Linux operating system has been used along with General Packet Radio Service(GPRS).Advancements include more exact identification of the vehicle location at all times, data transfer facilitation, and freedom from software monitoring.

The system detects the vehicle accident with the help of vibration sensor or MEMS sensor. GSM module captured the location of vehicle accident and a message is transmitted with the help of GSM modem. This contains the co-ordinates values .One more facility is also provided which can be very handy during the critical times. If a

person requires help due to other reasons like having symptoms of heart attack.in such a situation all he has to do is to press a single switch provided in the system. By pressing this switch a message is transmitted by the GSM module to the help centre which contains the location of car provided by GSM with the information of the user.

- This paper gives a design which has many benefits like low cost, portability, small size. This system uses the microcontroller in conjunction with vibration and alcohol sensor, GPS and GSM. Interfacing which reduces the alarm time to a large level and give the location of accident accurately.
- It can also overcome the issue of lack of automated system for the detection of the site of accident. As a result, the time for detecting the site is reduced and the person can be treated as soon as possible which will save many lives. As per the above survey, the scope of the work can be listed as follows:
- A wireless webcam can be added in this for capturing the images which will help in providing driver
- This can also be bettered by locking all the brakes automatically in case of accident. Mostly in accidents, it becomes serious as the drivers lose control and fail to stop the vehicle.
- In such cases, the vibration sensor will be triggered because of the vibrations received and also processed by the processor. The processor has to be linked to the devices which can lock the brakes which triggered. With this improvement, we can stop the vehicle and can weaken the impact of the accident.
- This system can also be utilized in fleet management, food services, traffic violation cases, rental vehicle services etc.

5.5 AUTOMATIC SPEED CONTROL OF VEHICLE IN RESTRICTED AREAS USING RF AND GSM

5.5.1 INTRODUCTION

This project has an aim to control the speed of any vehicles automatically in cities and also in restricted areas such schools, parks, hospitals and in speed limited areas etc. Nowadays in a fast moving world all the peoples are not have self-control. Such peoples are driving vehicles in a high speed. So the police are not able to monitor all those things. This paper provides a way for how to control the speed without harming others. Driver

does not control anything during such places; controls are taken automatically by 0the use of electronic system. In this project we using RF for indicating the speed limit areas it is placed front and back of the restricted zones. RF receiver is placed inside the vehicle. Speed is acquired by the help of speedometer in the vehicle. The controller compares the speed. If it exceeds the limited speed the controller alerts the driver and controls taken automatically. If they do not respond that message information along with the vehicle number is transmitted to the nearest police station by the use of GSM and penalty amount is collected in the nearest toll gate.

At present accidents are mostly occurs due to rash driving and over speed in road. People do not bother about human lives. The accidents rates are increasing year to year by more vehicles on to ground. The government has taken to many steps to prevent this kind of Things but it not enough. Most of the manufactures has developed a laser based control system but its cost is too high. But it is again a difficulty when human crosses the road it cannot detect properly so we tried to develop a system to control these things in a simple manner. At first we have an idea to use laser diodes but it was costly so we go for IR module again there is a draw back in using this it works under line of sight so finally decided to use RF.

RF transmitter is in the road zone areas and receiver is placed in the vehicle. Then it transfers the information to the controller. The current speed will be monitored by the separate module or by the use of ultrasonic sensor that also sends information to controller. The controller compares both speed and the driver does not decreases the speed the control transfers automatically but the driver again operate it manually and exceeds the limited speed means the information transferred to the nearest police station. The information contains the current speed and registration number of the vehicle. The controller transmits the information with the help of GSM module. Then the penalty amount is paid by the owner.

5.5.2 RF MODULE

RF transmitter and receiver needs power source or battery power for operating and it can be useable for a long period over more than decades. It has an inbuilt short range antenna or we can use handheld antenna. The antenna type used in the RF module has a scanning antenna. The scanning antenna just release the signal and it is in short

range. Whenever an RF receiver come across the transmitter devices the information transmitted by the transmitter is passed to the receiver module placed in the vehicle will get the signal.

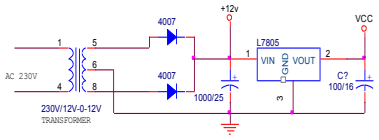
5.5.3 WORKING

When the vehicle enters in the normal area it speed does not decrease and it goes normally no action is performed .when the vehicle enters into the restricted areas that means it enters into the speed limiting .whenever it enters the transmitter module just send an information that contains how much speed a vehicle can go inside the speed limited region .Then the signal or information is received by the receiver and the signal acquired from the speed meter is also given to the controller. The signal is basically analogy in nature that will be converted into digital so only the micro controller able to process the signal.

The signal from the transmitter and the speed meter is compared by the controller.in this there are two case: first, the current speed is less than the transmitted speed the vehicle goes normally no action is required .Second, the information from the speed meter is greater than the transmitted speed by the transmitter module the controller waits for few second whether the driver reduce the speed to the below value if the driver does not reduce the speed means it automatically takes the control and reduce the speed according to it.at the same time that information is transmitted to the nearest police station. The information contains the vehicle number and the time .The time denotes that at which time the vehicle cross that area .then the fine or penalty amount is collected by the nearest tollgate or the check post. After that at the end of the speed limit area there is an another transmitter that contains a stop information means the control releases by the controller.

From the block diagram we found the vehicle when it will steal. And stop the ingestion to control the position of the vehicle. The GSM modem is used to send and receives the SMS data to the micro controller to the mobile and vice-versa. The GSM interface is used to interface the micro controller to the GSM modem. This interface is required due to the micro controller will not understand the GSM data. So convert the GSM based SMS data into required data conversion for the micro controller. If the vehicle will stole. Then we found the information from the micro controller kit installed

on the vehicle. The sending of the vehicle information by the micro controller when the original key will not be found. Then the message receiver will send the off notation to vehicle kit. Then the micro controller will understand the received data and turn off the ignition switch to protect the vehicle from the thief. The block is providing the clock signal to operate the micro controller. It gives the clock signal to the internal oscillator circuit. The reset is used to protect the internal program when in the conditions of the present of the power spikes. Display is used to display the alphanumeric data which is corresponding to the output of the micro controller. Power supply is used to convert the line ac signal into the required dc level. This is must be used in the dc required stages.



POWER SUPPLY

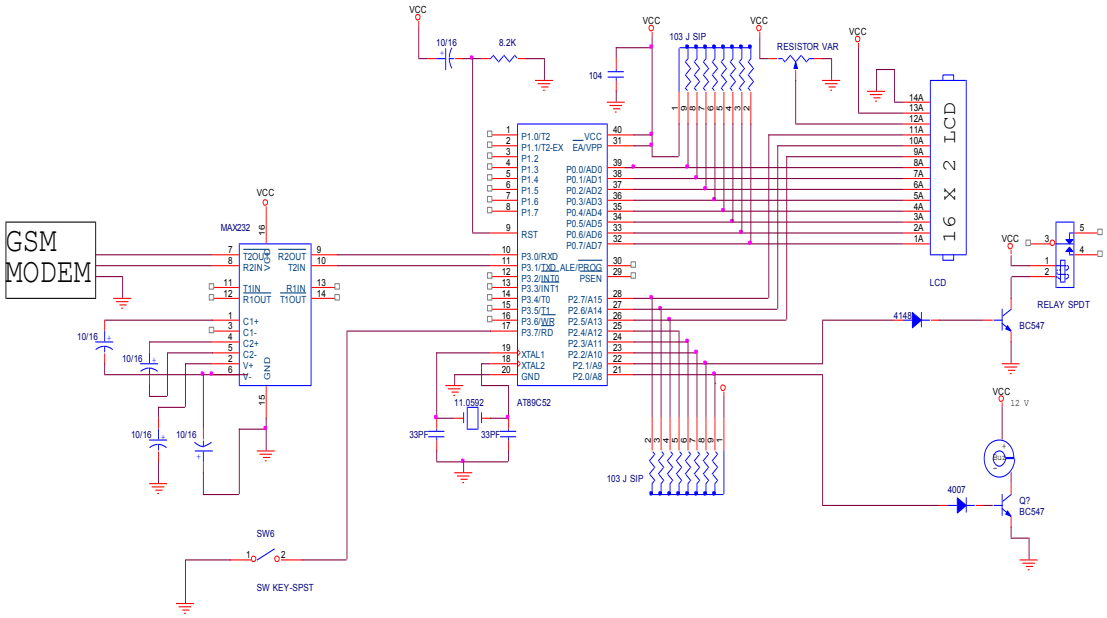


FIG 5.5.3.1: INTERFACING OF MICROCONTROLLER

From the circuit 5v dc and 12 v dc is required to drive the all the components. The mains give the 230v ac so first we step down the 230v ac in to 12v ac by using step down transformer. Then the output is given to the full wave rectifier as given in the circuit diagram. The rectifier is eliminating the negative peek voltage of the input voltage the output of the rectifier is the pulsating dc as shown in the block diagram of the rectifier. The error pulses are eliminating by using capacitor filter. Then the output at the parallel of the capacitor is the 12v dc. But the Micro Controller is work on 5v dc so convert the 12v dc in the 5v dc by using regulator (7805) the output of the regulator is constant irrespective of the input voltage.

The Micro Controller requires the pre-set logic circuit for protection of the internal program and internal clock when in the power failure. A sudden change in the power may cause data error. These types of the errors will corrupt the internal program. The reset logic circuit contains one capacitor and a resistor. This arrangement is shown in the Micro Controller circuit.

XTAL1 and XTAL2 are the input and output, respectively. An inverting amplifier which is configured an on-chip oscillator, as shown in Figure 1. Either a quartz crystal or ceramic resonator may be used. To drive the device from an external clock source, XTAL2 should be left unconnected while XTAL1 is driven. There are no requirements on the duty cycle of the external clock signal.

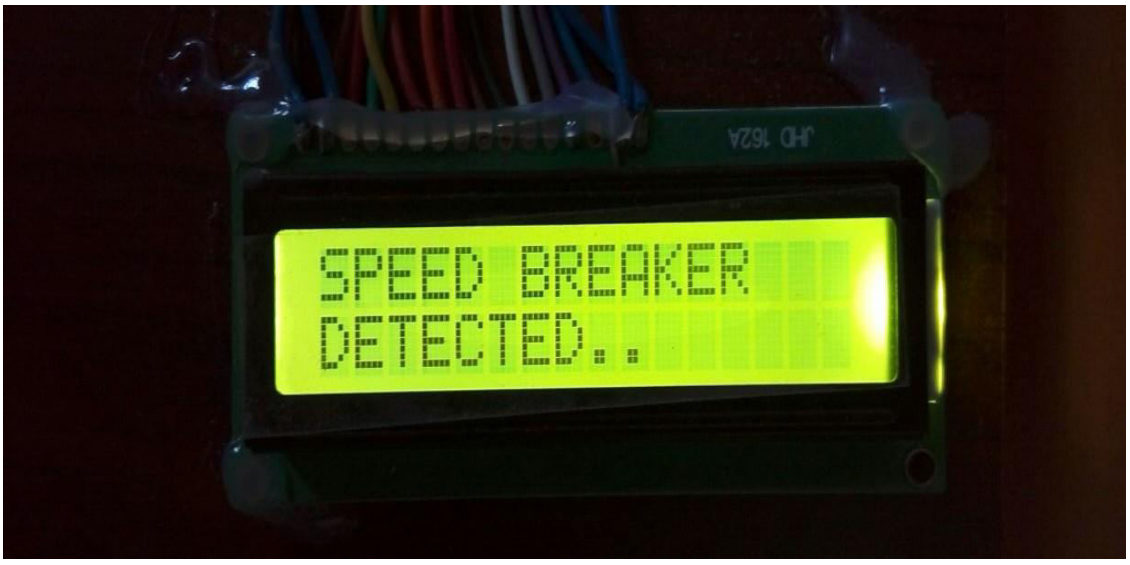


FIG 5.5.3.1 : INDICATION OF SPEED BREAKER

The display will be the construction of 2 rows and 16 columns of matrix pixels. This display was also having the two types of data input modes one is parallel data input and another one is series input data type. In the first type the data will give in the form of parallel from the micro controller it need not to require the parallel to series conversion but in the series input mode the Micro Controller can require the parallel to the series converter to convert the parallel data to the corresponding serial data. This display requires the 5 volts power supply for back light. The driver circuit generally made by using one transistor for one relay. The driver circuit is mainly operated by the Micro Controller. The Micro controller changes the stateof the output pin from the low to high that of from O level to the 1 level. By using this sequence to control the base of the transistor.The transistor will act as an ON/OFF switch corresponding to the input of the base. If the base current of the transistor will high the transistor is under ON condition else it is in OFF state. These conditions will be used to control the

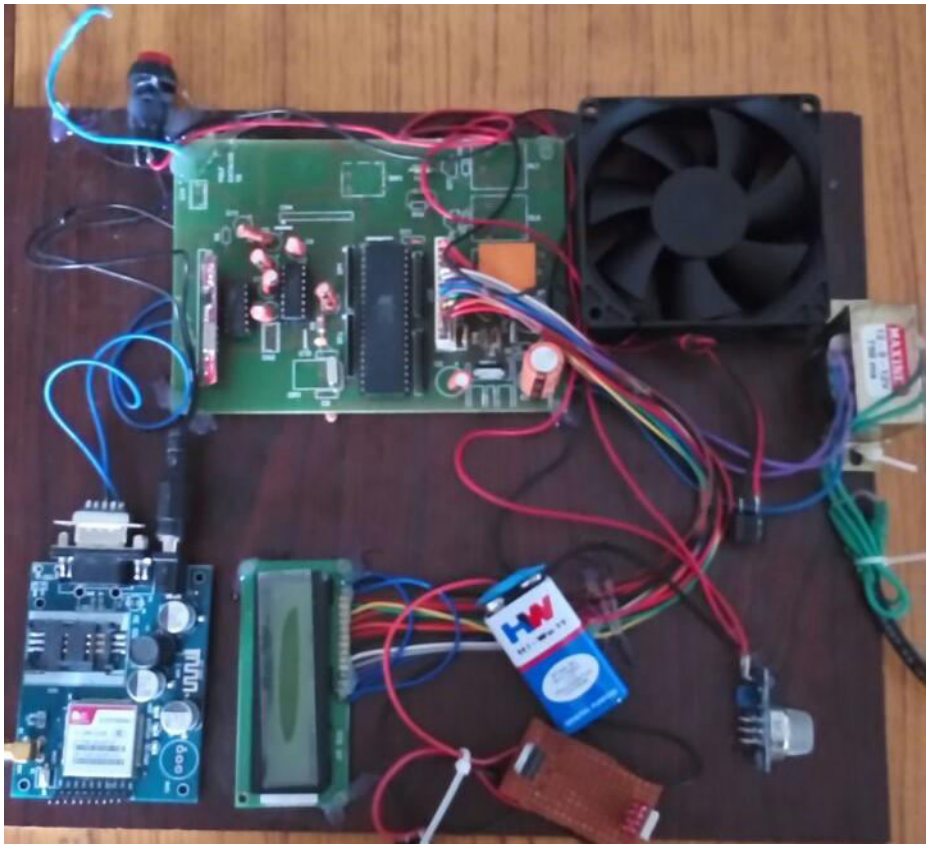


FIG 5.5.3.2: OVERVIEW OF THE PROJECT

The GSM modem is connected to the MAX 232 synchronous IC. This MAX 232 IC will set the baud rate to the micro controller. The GSM modem will used to send and

receives the SMS from the mobile. The micro controller will take the input data from the MAX 232 IC and compare with micro controller internal program and sent the off condition to the micro controller kit of the vehicle when the correct key will not paste. The micro controller can sent the data through the GSM modem if the correct key will not paste. Then the user receives the data from the kit via GSM network. The kit will turn off the ignition key relay until the user sent the on condition to the micro controller kit present on the vehicle. The micro controller internal operation will display in the display in the alphanumeric form for understand by the user. And the buzzer is used to blow when wrong key is present.

5.5.4 SHORT MESSAGES SERVICE (SMS):

The GSM network system, it was quickly adopted on the other generation voice system like cdmaOne, ident, and PDC. SMS uses option fields in setup and control messages used for traditional voice calls. This means that a user can send and receive SMS message and receive a SMS message while talking on the phone, but the messages must be short. In GSM, SMS is limited to 256bytes.

FIG 5.5.4: SENDING SMS

SMS is a store and forward messaging service. The messages goes first from the sender to a holding location, the short message service center (SMSC), to await delivery. For example, if the recipient has their phone powered-off or is out of range, the message is held until it can be successfully transmitted. The service was originally conceived as a means for user profiles. However, the service was quickly transformed into a two-way messaging service that could replace alphanumeric pagers. In addition, some applications, such as stock-quotes and reminder services, used SMS as a framework for the delivering of application content. There are two types of SMS, mobile original short

messages (MO-SM),and mobile terminated short messages(MT-SM) originate from a Short Messaging Entity (SME).A SME could be an e-mail gateway, a web application on the operators IP network to the short message service. The SMC and the short message service gateway (SMSC) are usually integrated into the same platform. The SMSC is responsible for storing and forwarding the received SMS message to their recipients. Because SMSs are addressed via the subscriber phone number, the delivery of messages works in the same way as the routing voice call works. The SMS Gateway MSC queries the Home Location Register after destination mobile to find the Mobile Switching Center (MSC), which is turn, finds the current location of the subscriber. If the subscriber is reachable, the SMSC passes the message to the SMS gateway MSC to be transported to the MSC servicing the subscriber.

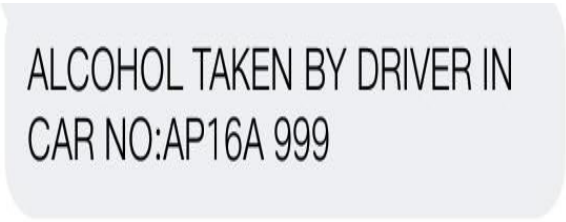


FIG 5.5.5: DETECTION OF ALOCOHOL

The MSC alerts the mobile in a similar way as signaling a telephone call. Similar to telephone operations, the mobile may have to authenticate itself to the MSC. After the message is delivered to the mobile, a confirmation is sent back to the SMSC indicating the delivery. This capability to push messages to a client is a very important feature. This feature is available to most IP applications because it involves finding the client, storing the message until the client is reachable, and passing the signal to the client when a message has arrived.

FIG 5.5.6: DETECTION OF ACCIDENT

CHAPTER 6

COMPONENTS DESCRIPTION

6.1 MICROCONTROLLER 89C52

6.1.1 FEATURES

- Compatible with MCS-51 Products.
- 8K Bytes of In-System Reprogrammable Flash Memory.
- Endurance: 1,000 Write/Erase Cycles.
- Fully Static Operation: 0 Hz to 24 MHz
- Three-level Program Memory Lock.
- 256 x 8-Bit Internal RAM.
- 32 Programmable I/O Lines.
- Three 16-bit Timer/Counters.
- Eight Interrupt Sources.
- Programmable Serial Channel.
- Low Power Idle and Power Down Modes

6.2. PIN DIAGRAM AND ITS DESCRIPTION

The microcontroller generic part number actually includes a whole family of microcontrollers that have numbers ranging from 8031to 8751 and are available in N-Channel Metal Oxide Silicon (NMOS) and Complementary Metal Oxide Silicon (CMOS) construction in a variety of package types.

With 4Kbytes of Flash Programmable and Erasable Read Only Memory (PEROM). The device is manufactured using Atmel's high density non -volatile memory technology and is compatible with the industry standard MCS-51 instruction set and pinout. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional non -volatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C52 is a powerful microcomputer which provides a highly flexible and cost effective solution to many embedded control applications.

PIN DIAGRAM

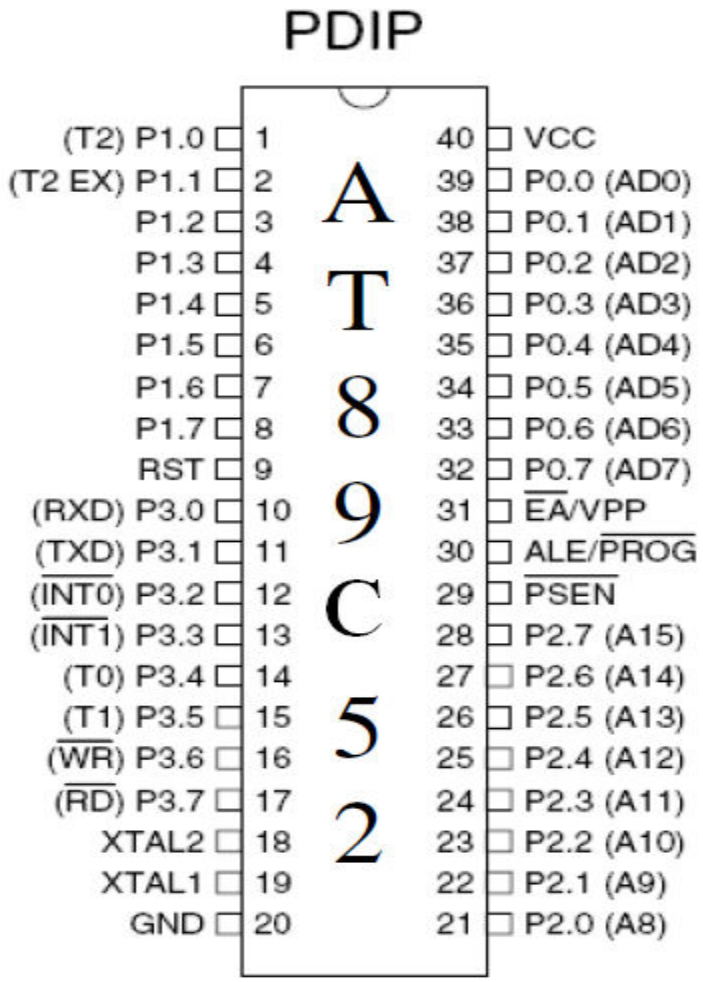


Fig6.2: Pin Diagram

The AT89C52 provides the following standard features: 4 Kbytes of Flash, 256 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, five vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator and clock circuitry. In addition, the AT89C52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port and interrupt system to continue functioning. The Power down Mode saves the RAM contents but freezes the oscillator disabling all other chip functions until the next hardware reset.

6.3ARCHITECTURE OF 89C52

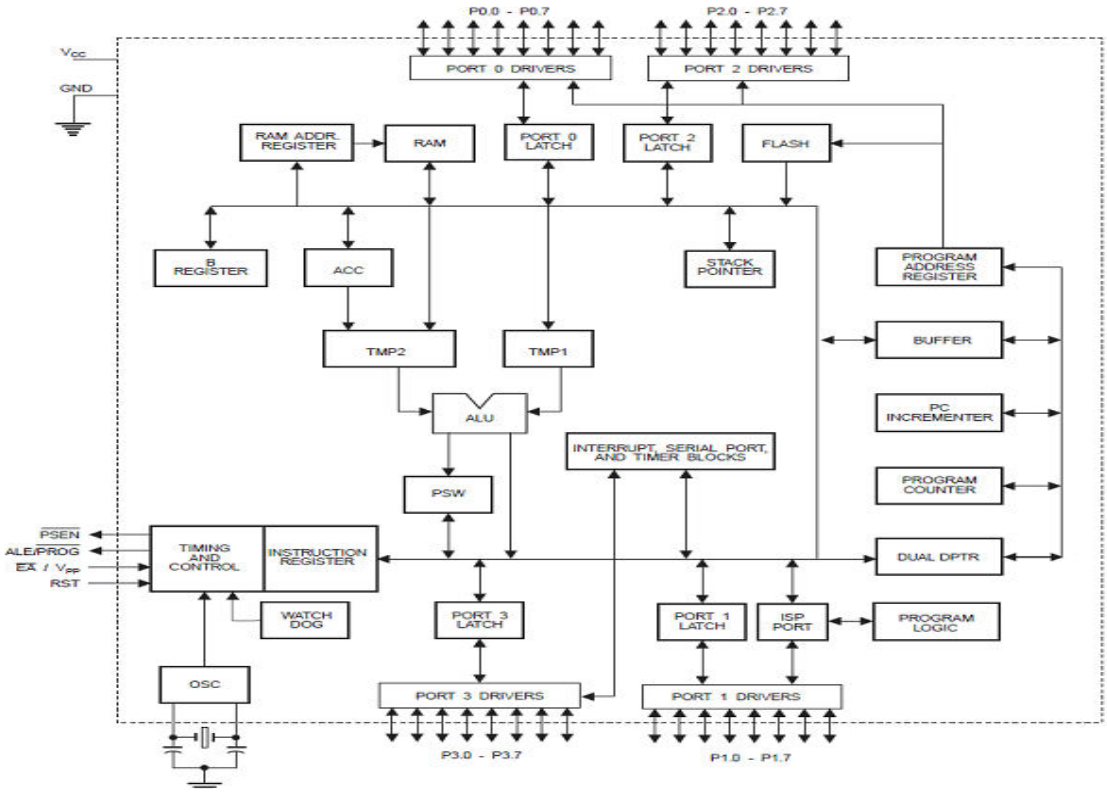


Fig 6.3:Architecture of 89C52

6.3.1 PORTS

Port 0:

Port 0 is an 8-bit open drain bidirectional I/O port. As an output port each pin can sink eight TTL inputs. When 1s are written to port 0 pins, the pins can be used as high-impedance inputs. Port 0 may also be configured to be the multiplexed low order address/data bus during accesses to external program and data memory. In this mode P0 has internal pull-ups. Port 0 also receives the code bytes during Flash programming, and outputs the code bytes during program verification. External pull-ups are required during program verification

Port 1:

Port 1 is an 8-bit bi-directional I/O port with internal pull-ups. The Port 1 output buffers can sink/source four TTL inputs. When 1s are written to Port 1 pins they are

pulled high by the internal pull-ups and can be used as inputs. As inputs, Port 1 pins that are externally being pulled low will source current (IIL) because of the internal pull-ups. Port 1 also receives the low-order address bytes during Flash programming and program verification.

Alternate functions of port 1

TABLE 6.2.1: ALTERNATE FUNCTIONS OF PORT 1

Port Pin	Alternate Functions
P1.0	T2 (external count input to Timer/Counter 2), clock-out
P1.1	T2EX (Timer/Counter 2 capture/reload trigger and direction control)
P1.5	MOSI (used for In-System Programming)
P1.6	MISO (used for In-System Programming)
P1.7	SCK (used for In-System Programming)

Port 2:

Port 2 is an 8-bit bidirectional I/O port with internal pullups. The Port 2 output buffers can sink/source four TTL inputs. When 1s are written to Port 2 pins they are pulled high by the internal pull-ups and can be used as inputs. As inputs, Port 2 pins that are externally being pulled low will source current (IIL) because of the internal pullups.Port 2 emits the high-order address byte during fetches from external program memory and during accesses to external data memory that use 16-bit addresses (MOVX A, @DPTR). In this application it uses strong internal pull-ups when emitting 1s. During accesses to external data memory that uses 8-bit addresses (MOVX A, @RI), Port 2 emits the contents of the P2 Special Function Register. Port 2 also receives the high-order address bits and some control signals during Flash programming and verification.

Port 3:

Port 3 is an 8-bit bidirectional I/O port with internal pullups. The Port 3 output buffers cansink/source four TTL inputs. When 1s are written to Port 3 pins they are pulled high by the internal pullupsand can be used as inputs. As inputs, Port 3 pins that are externally being pulled low will source current(IIL) because of the pullups. Port 3 also serves the functions of various special features of the AT89C52 aslisted below:

Alternate functions of port 3

TABLE 6.3: ALTENATE FUNCTION OF PORT 3

Port Pin	Alternate Functions
P3.0	RXD (serial input port)
P3.1	TXD (serial output port)
P3.2	$\overline{INT0}$ (external interrupt 0)
P3.3	$\overline{INT1}$ (external interrupt 1)
P3.4	T0 (timer 0 external input)
P3.5	T1 (timer 1 external input)
P3.6	$\overline{WR}$ (external data memory write strobe)
P3.7	$\overline{RD}$ (external data memory read strobe)

6.3.2RST:

RST means RESET; 89C52 uses an active high reset pin. It must go high for two machine cycles. The simple RC circuit used here will supply voltage (Vcc) to reset pin until capacitance begins to charge. At a threshold of about 2.5V, reset input reaches a low level and system begin to run.

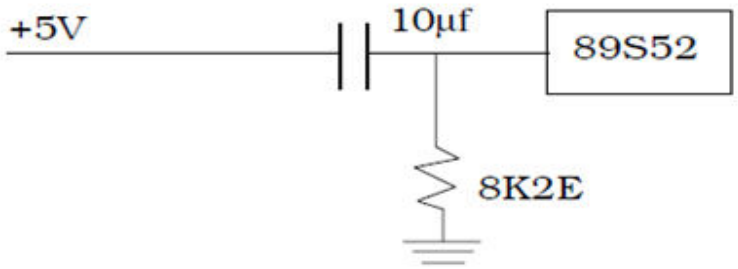


Fig6.3.1 : Reset Connection

ALE/PROG

Address Latch Enable output pulse for latching the low byte of the address during accesses to external memory. This pin is also the program pulse input (PROG) during Flash programming. In normal operation ALE is emitted at a constant rate of 1/6 the oscillator frequency, and may be used for external timing or clocking purposes. Note, however, that one ALE pulse is skipped during each access to external Data Memory. If desired, ALE operation can be disabled by setting bit 0 of SFR location 8EH. With the bit

set, ALE is active only during a MOVX or MOVC instruction. Otherwise, the pin is weakly pulled high. Setting the ALE-disable bit has no effect if the microcontroller is in external execution mode.

PSEN:

Program Store Enable is the read strobe to external program memory. When the AT89C52 is executing code from external program memory, PSEN is activated twice each machine cycle, except that two PSEN activations are skipped during each access to external data memory.

EA/VPP:

External Access Enable. EA must be strapped to GND in order to enable the device to fetch code from external program memory locations starting at OOOOH up to FFFFH. Note, however, that if lock bit 1 is programmed, EA will be internally latched on reset. EA should be strapped to Vcc for internal program executions. This pin also receives the 12-volt programming enable voltage (Vpp) during Flash programming, for parts that require 12-volt Vpp.

XTAL1: Input to the inverting oscillator amplifier and input to the internal clock operating circuit

XTAL2: Output from the inverting oscillator amplifier.

T2: External count input to Timer/Counter 2, Clock out.

T2EX: Counter 2 capture/reload trigger & direction control.

6.3.3 THE ON-CHIP OSCILLATORS

Pins XTAL1 and XTAL2 are provided for connecting a resonant network to form an oscillator. The crystal frequency is basic internal clock frequency. The maximum and minimum frequencies are specified from 1to 24MHZ. Program instructions may require one, two or four machine cycles to be executed depending on type of instructions. To calculate the time any particular instructions will take to be executed, the number of cycles ‘C’,

T = C*12d / Crystal frequency

Here, we chose frequency as 11.0592MHZ. This is because,

Baud= 2*clock frequency/ (32d. 12d [256d-TH1]).The oscillator is chosen to help generate both standard and nonstandard baud rates. If standard baud rates are desired, an 11.0592MHZ crystal should be selected. From our desired standard rate, TH1 can be calculated. The internally implemented value of capacitance is 33 pf.

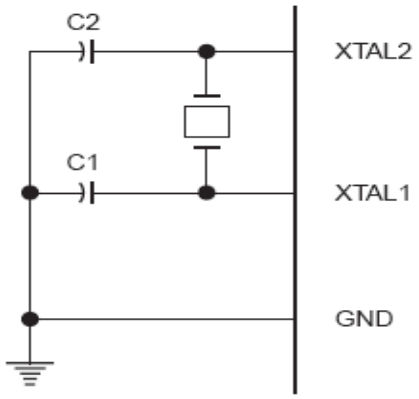


Fig6.3.3:On-Chip Oscillators

6.4 PROGRAM MEMORY LOCK BITS:

On the chip there are three lock bits which can be left programmed (U) or can be programmed (P) to obtain the additional features .When lock bit 1 is programmed, the logic level at the EA pin is sampled and latched during reset. If the device is powered up without a reset, the latch initializes to a random value, and holds that value until reset is activated. It is necessary that the latched value of EA be in agreement with the current logic level at that pin in order for the device to function properly.

6.4.1 PROGRAM COUNTER AND DATA POINTER:

The 89C52 contains two 16-bit registers: the program counters (PC) and the data pointer (DPTR), Each is used to hold the address of a byte in memory. The PC is the only register that does not have an internal address. The DPTR is under the control of program instructions and can be specified by its 16-bit name, DPTR, or by each individual byte name, DPH and DPL. DPTR does not have a single internal address; DPH and DPL are each assigned an address.

6.5 A & B REGISTERS:

The 89C52 contains 34 general-purpose, working, registers. Two of these, registers A and B, hold results of many instructions, particularly math and logical operations, of the 89C52 CPU. The other 32 are arranged as part of internal RAM in four banks, B0-B3, of eight registers. The A register is also used for all data transfers between the 89C52 and any external memory. The B register is used for with the A register for multiplication and division operations.

6.5.1 FLAGS AND THE PROGRAM STATUS WORD (PSW):

Flags may be conveniently addressed, they are grouped inside the program status word (PSW) and the power control (PCON) registers.

The 89C52 has four math flags that respond automatically to the outcomes of math operations and three general-purpose user flags that can be set to 1 or cleared to 0 by the programmer as desired. The math flags include Carry (C), Auxiliary Carry (AC), Overflow (OV), and Parity (P). User flags are named F0, GF0 and GF1; they are general-purpose flags that may be used by the programmer to record some event in the program.

6.6 MEMORY ORGANISATION

6.6.1 INTERNAL MEMORY*:*

The 89C52 has internal RAM and ROM memory for the functions. Additional memory can be added externally using suitable circuits. This has a Hardware architecture, which uses the same address, in different memories, for code and data.

6.6.2 INTERNAL RAM:

The 256-byte internal RAM. The upper 128 bytes occupy a parallel address space to the Special Function Registers. Instructions that use indirect addressing access the upper 128 bytes of RAM. Stack operations are examples of indirect addressing.

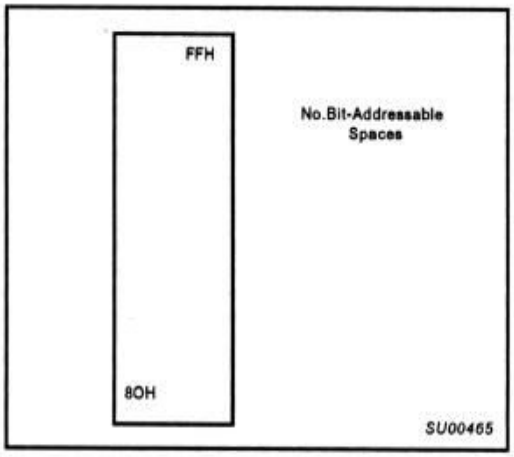
Internal Data Memory addresses are always one byte wide, which implies an address space of only 256 bytes. However, the addressing modes for internal RAM can in fact accommodate 384 bytes, using a simple trick. Direct addresses higher than 7FH access one memory space, and indirect addresses higher than 7FH access a different memory

space. Thus Figure shows the Upper 128 and SFR space occupying the same block of addresses, 80H through FFH, although they are physically separate entities.

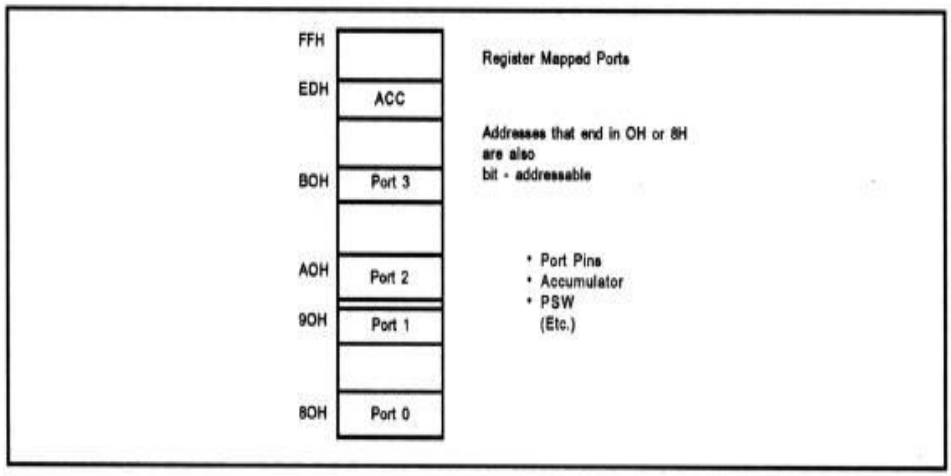
The Lower 128 bytes of RAM are present in all 89C52 devices as mapped in Figure. The lowest 32 bytes are grouped into 4 banks of 8 registers. Program instructions call out these registers as R0 through R7.

Two bits in the Program Status Word (PSW) select which register bank is in use. This allows more efficient use of code space, since register instructions are shorter than instructions that use direct addressing. The next 16 bytes above the register banks form a block of bit addressable memory space. The 89C52 instruction set includes a wide selection of single-bit instructions, and the 128 bits in this area can be directly addressed by these instructions. The bit addresses in this area are 00H through 7FH. All of the bytes in the Lower 128 can be accessed by either direct or indirect addressing.

The Upper 128 can only be accessed by indirect addressing. SFRs include the Port latches, timers, peripheral controls, etc. These registers can only be accessed by direct addressing. Sixteen addresses in SFR space are both byte- and bit-addressable. The bit-addressable SFRs are those whose address ends in OH or 80H.



Upper 128 Bytes of Internal RAM



SFR Space

The Stack and Stack Pointer*:*

The stack refers to an area of internal RAM that is used in conjunction with certain opcodes to store and retrieve data quickly. The 8-bit stack pointer register is used by the 89C52 to hold an internal RAM address that is called the top of the stack. The address held in the SP register is the location in internal RAM where the last byte of data was stored by a stack operation. As data is retrieved from the stack, the byte is read from the stack, then the SP decrements to point to the next available byte of stored data.

6.7 SPECIAL FUNCTION REGISTERS

The 89C52 operations that do not use the internal 128-byte RAM addresses from 00h to 7Fh are done by a group of specific internal registers, each called a Special Function register, which may be addressed much like internal RAM, using addresses from 80h to FFh. PC is not part of the SFR and has no internal RAM address

T2CON Address = 0C8H Reset Value = 0000 0000B

Bit Addressable

Bit	TF2	EXF2	RCLK	TCLK	EXEN2	TR2	C/$\overline{T2}$	CP/$\overline{RL2}$
	7	6	5	4	3	2	1	0

T2MOD Address = 0C9H Reset Value = XXXX XX00B

Not Bit Addressable

	-	-	-	-	-	-	T2OE	DCEN
Bit	7	6	5	4	3	2	1	0

Name	Function
A	Accumulator
B	Arithmetic
DPH	Addressing external memory
DPL	Addressing external memory
IE	Interrupt enable control
IP	Interrupt priority
P0	Input/Output port latch
P1	Input/Output port latch
P2	Input/Output port latch
P3	Input/Output port latch
PCON	Power control
PSW	Program status word
SCON	Serial port control
SBUF	Serial port data buffer
SP	Stack pointer
TMOD	Timer/counter mode control
TCON	Timer/counter control
TL0	Timer 0 low byte
TH0	Timer 0 high byte
TL1	Timer 1 low byte
TH1	Timer 1 high byte

TABLE 6.7.1: SPECIAL PURPOSE REGISTER

6.8 RELAY OR ELECTRO-MECHANICAL SWITCH

It is a mechanical switch which is operated electrically to turn ON or OFF current in an electrical switch. Some of the advantages by using relays are

The relay requires a small power for its operation. This permits to control a large power in the load by a small power to the relay circuit. Thus a relay acts as a power amplifier i.e. it combines control with power amplification.

The switch in the relay coil carries a small current as compared to the load current. This permits the use of a smaller switch in the relay coil circuit.

The operator can turn ON or OFF power to a load even from a distance. This is a very important advantage when high voltages are to be handled.

There is no danger sparking as the turning ON or OFF is carried by the relay coil switch which carries a small current. But the speed operation is very small.

6.9MAX 232C:

The MAX232 device is a dual driver/receiver that includes a capacitive voltage generator to supply EIA-232 voltage levels from a single 5-V supply. Each receiver converts EIA-232 inputs to 5-V TTL/CMOS levels. These receivers have a typical threshold of 1.3 V and a typical hysteresis of 0.5 V, and can accept ±30-V inputs. Each driver converts TTL/CMOS input levels into EIA-232 levels The MAX232 is characterized for operation from 0°C to 70°C.

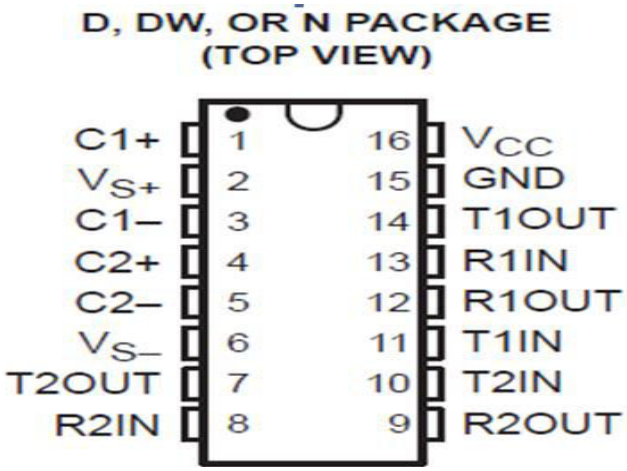


FIG 6.8: PIN DIAGRAM

6.10 RELAYS:

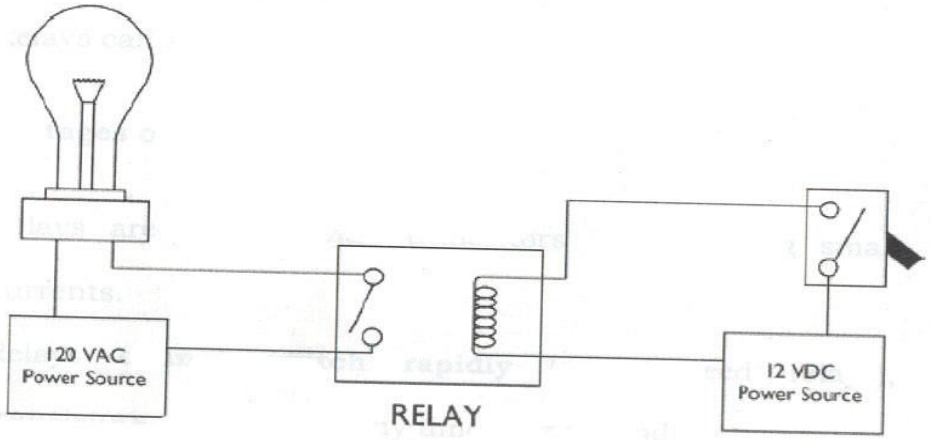
6.10.1 What is a relay?

A relay is usually an electromechanical device that is actuated by an electrical current. The current flowing in one circuit causes the opening or closing of another circuit. Relays are like remote control switches and are used in many applications because of their relative simplicity, long life, and proven high reliability. Relays are used in a wide variety of applications throughout industry, such as in telephone exchanges, digital computers and automation systems. Highly sophisticated relays are utilized to protect electric power systems against trouble and power blackouts as well as to regulate and control the generation and distribution of power. In the home, relays are used in refrigerators, washing machines and dishwashers, and heating and air-conditioning controls.

6.10.2 How do relay works?

All relays contain a sensing unit, the electric coil, which is powered by AC or DC current. When the applied current or voltage exceeds a threshold value, the coil activates the armature, which operates either to close the open contacts or to open the closed magnetic force that actuates the switch mechanism. The magnetic force is, in effects, relaying the action from one circuit to another. The first circuit is called the control circuit; the second is called the load circuit.

There are three basic functions of a relay: On/Off Control Limit Control and Logic



Operation.

On/OffControl: Example: Air Conditioning control, used to limit and control a "high power" load, such as a compressor

Limit Control Example: Motor Speed Control, used to disconnect a motor if it runs slower or faster than the desired speed

Logic Operation: Example: Test Equipment, used to connect the instrument to a number of testing points on the device under test

6.10.3 Advantages of relays:

- ❖ Relays can switch **AC and DC,** transistors can only switch DC.
- ❖ Relays can switch **high voltages,** transistors cannot.
- ❖ Relays are a better choice for switching **large currents** (> 5A).
- ❖ Relays can switch **many contacts** at once.

Disadvantages of relays

- Relays are **bulkier** than transistors for switching small currents.
- Relays **cannot switch rapidly** (except reed relays), transistors can switch many times per second.
- Relays **use more power** due to the current flowing through their coil.
- Relays **require more current than many chips can provide,** so a low power transistor.

6.11 LIQUID CRYSTAL DISPLAY:

In 1968, RCA Laboratories developed the first liquid crystal display (LCD). Since then, LCD's have been implemented on almost all types of digital devices, from watches to computer to projection TVs .LCD's operate as a light "valve", blocking light or allowing it to pass through. An image in an LCD is formed by applying an electric field to alter the chemical properties of each LCC (Liquid Crystal Cell) in the display in order to change a pixel's light absorption properties. These LCC's modify the image produced by the backlight into the screen output requested by the controller. Through the end output may be in color, the LCC's are monochrome, and the color is added later through a filtering process. Modern laptop computer displays can produce 65,536 simultaneous colors at resolution of 800 X 600.

To understand the operation of an LCD, it is easiest to trace the path of a light ray from the backlight to the user. The light source is usually located directly behind the LCD, and can use either LED or conventional fluorescent technology. From this source, the light ray will pass through a light polarizer to uniformly polarize the light so it can be acted upon by the liquid crystal (LC) matrix. The light beam will then pass through the LC matrix, which will determine whether this pixel should be "on" or "off". If the pixel is "on", the liquid crystal cell is electrically activated, and the molecules in the liquid will align in a single direction. This will allow the light to pass through unchanged. If the pixel is "off", the electric field is removed from the liquid, and the molecules with in scatter. This dramatically reduces the light that will pass through the display at that pixel.

In a color display, after the light passes through the liquid crystal matrix, it passes through a color filter (usually glass). This filter blocks all wavelengths of light except

those within the range of that pixel. In a typical RGB display, the color filter is integrated into the upper glass colored microscopically to render each individual pixel red,green or blue. The areas in between the colored pixel filter areas are printed black to increase contrast. After a beam of light passes through the color filter, it passes through yet another polarizer to sharpen the image and eliminate glare. The image is then available for viewing.

In an AMLCD, each LCC is stimulated individually by a dedicated transistor or diode. The two existing AMLCD technologies are Thin Film Transistor (TFT) and metal-insulator-metal (MIM). In an MIM display, dedicated diodes are fabricated at each pixel. MIM displays, currently being manufactured by Toshiba and Seiko-Epson, are not advantageous that TFT displays.

6.11.1 INTERFACING LCD TO THE MICROCONTROLLER:

This is the first interfacing example for the parallel port. We will star with something simple. This example does not use the Bi-directional feature found on newer ports, thus it should work with most, if not all Parallel Ports. It however does not show the use of the status port as an input. So what are we interfacing? A 16 Character X 2 Line LCD Module to the Parallel Port. These LCD Modules are very common these days, and are quite simple to work with, as all the logic required running them is on board.

Features:

- Interface with either 4-bit or 8-bit microprocessor.
- Display data RAM
- Character generator ROM
- Character generator RAM
- 8 different users programmed 5 7 dot-matrix patterns.
- Display data RAM and character generator RAM may be
- Accessed by the microprocessor.
- Numerous instructions
- Clear Display, Cursor Home, Display ON/OFF, Cursor
- ON/OFF, Blink Character, Cursor Shift, Display Shift.
- Built-in reset circuit is triggered at power ON.

FIG 6.11.1: A general purpose alphanumeric LCD, with two lines of 16 characters.

Pin diagram

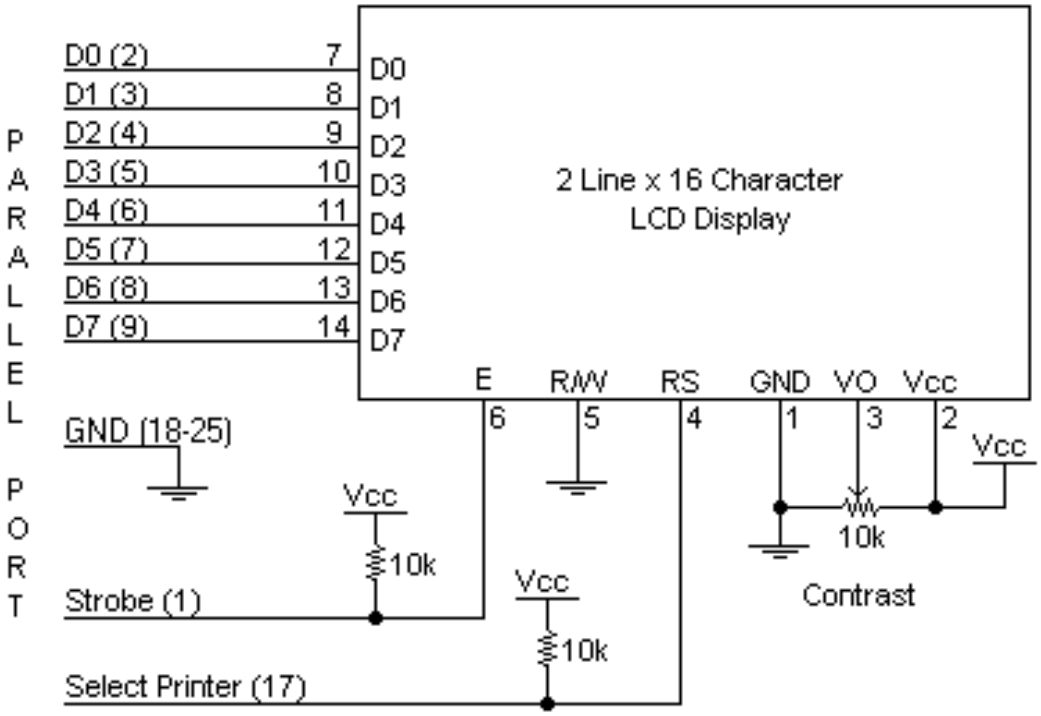


FIG 6.11.2 :PIN DIAGRAM

TABLE 6.11.2: PIN DEFINITION

PIN	SYMBOL	FUNCTION
1	Vss	Power Supply(GND)
2	Vdd	Power Supply(+5V)
3	Vo	Contrast Adjust
4	RS	Instruction/Data Register Select
5	R/W	Data Bus Line
6	E	Enable Signal
7-14	DB0-DB7	Data Bus Line
15	A	Power Supply for LED B/L(+)
16	K	Power Supply for LED B/L(-)

In the above table VCC and VSS are supply pins and VEE (Pin no.3) is used for controlling LCD contrast. Pin No.4 is Rs pin for selecting the register, there are two very important registers are there inside the LCD. The RS pin is used for their selection as follows. If RS=0, the instruction command code register is selected, allowing the user to send data to be displayed on the LCD. R/W is a read or writes Pin, which allows the user to write information to the LCD or read information from it. R/W=1 when reading R/W=0 when writing. The LCD to latch information presented to its data pins uses the enable (E) pin. The 8-bit data pins, D0-D7, are used to send information to the LCD or read the contents of the LCD's internal registers. To display letters and numbers, we must send ASCII codes for the letters A-Z, and number 0 -9 to these pins while making RS=1.

6.11.2ABSOLUTE MAXIMUM RATINGS

ELECTRICAL ABSOLUTE MAXIMUM RATINGS

TABLE 6.11.3:ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	CONDITION	MIN	MAX	UNIT
Supply Voltage (Logic)	Vdd – Vss	-	0	7.0	V
Supply Voltage (LCD Drive)	Vdd – V0	-	0	13.0	V
Input Voltage	Vi	-	-0.3	Vdd +0.3	V

Quality control:

Some LCD panels have defective transistors, causing permanently lit or unlit pixels which are commonly referred to as stuck pixels or dead pixels respectively. Unlike integrated circuits (ICs), LCD panels with a few defective pixels are usually still usable. It is also economically prohibitive to discard a panel with just a few defective pixels because LCD panels are much larger than ICs.

6.11.3 COLOR DISPLAYS:

In color LCDs each individual pixel is divided into three cells, or subpixels, which are colored red, green, and blue, respectively, by additional filters (pigment filters, dye filters and metal oxide filters). Each subpixel can be controlled independently to yield thousands or millions of possible colors for each pixel. CRT monitors employ a similar 'subpixel' structures *via* phosphors, although the analog electron beam employed in CRTs do not hit exact 'subpixels'.

Color components may be arrayed in various pixel geometries, depending on the monitor's usage. If software knows which type of geometry is being used in a given LCD, this can be used to increase the apparent resolution of the monitor through sub pixel rendering. This technique is especially useful for text anti-aliasing. To reduce smudging in a moving picture when pixels do not respond quickly enough to color changes, so-called pixel overdrive may be used.

6.12 POWER SUPPLY:

6.12.1 DESCRIPTION:

The Power Supply is a Primary requirement for the project work. The required DC power supply for the base unit as well as for the recharging unit is derived from the mains line. For this purpose centre tapped secondary of 12V-012V transformer is used. From this transformer we getting 5V power supply. In this +5V output is a regulated output and it is designed using 7805 positive voltage regulator. This is a 3 Pin voltage regulator, can deliver current up to 800 milliamps.

Rectification is a process of rendering an alternating current or voltage into a unidirectional one. The component used for rectification is called 'Rectifier'. A rectifier permits current to flow only during positive half cycles of the applied AC voltage. Thus, pulsating DC is obtained to obtain smooth DC power additional filter circuitsrequired.

BLOCK DIAGRAM:

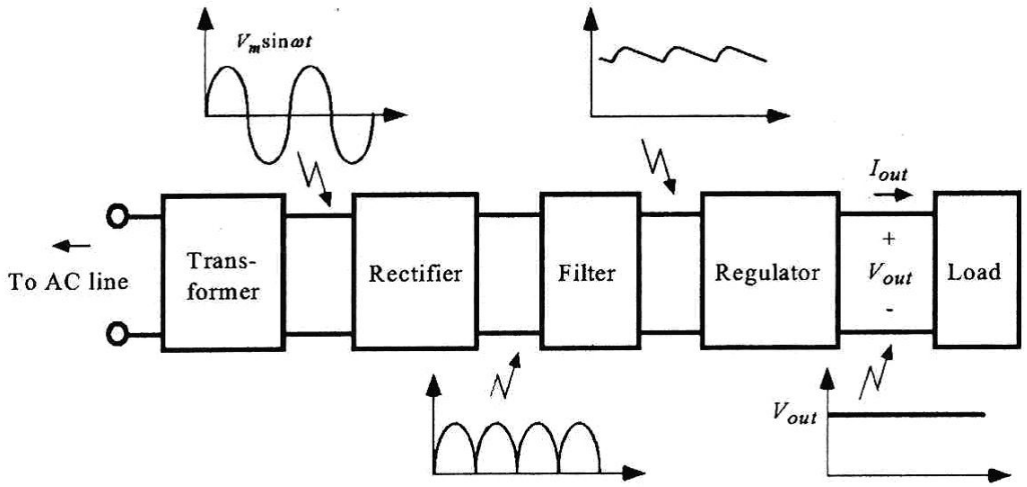


FIG 6.12.1: BLOCK DIAGRAM

CIRCUIT DIAGRAM:

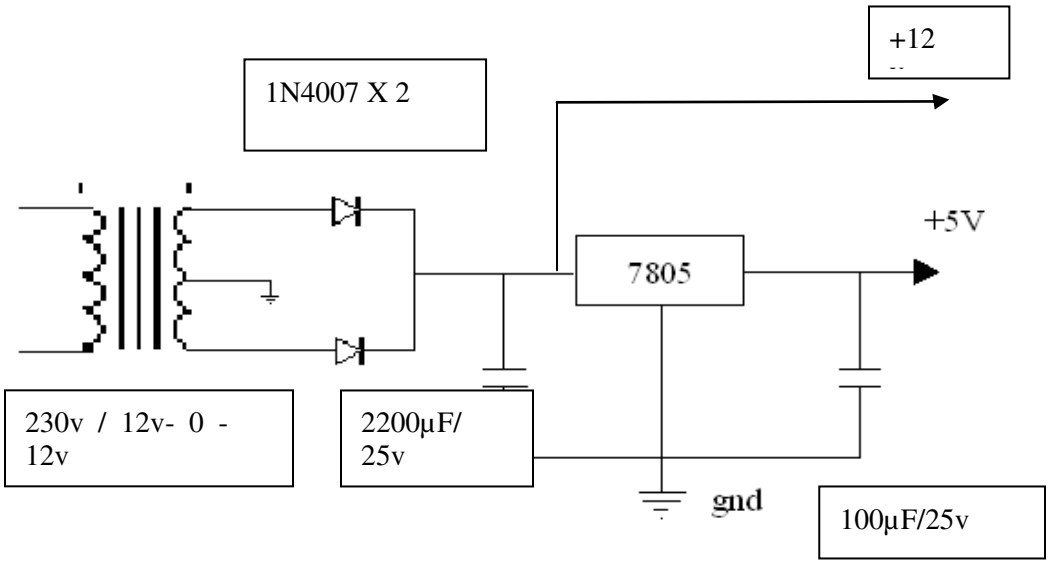


FIG 6.13: 230V AC – 12v DC

A diode can be used as rectifier. There are various types of diodes. However, semiconductor diodes are very popularly used as rectifiers. A semiconductor diode is a solid-state device consisting of two elements is being an electron emitter or cathode, the other an electron collector or anode. Since electrons in a semiconductor diode can flow in one direction only-form emitter to collector-the diode provides the unilateral conduction necessary for rectification.

The rectified Output is filtered for smoothening the DC, for this purpose capacitor is used in the filter circuit. The filter capacitors are usually connected in parallel with the rectifier output and the load. The AC can pass through a capacitor but DC cannot, the ripples are thus limited and the output becomes smoothed. When the voltage across the capacitor plates tends to rise, it stores up energy back into voltage and current. Thus, the fluctuation in the output voltage is reduced considerable.

6.13 VOLTAGE REGULATOR:

6.13.1 LM 78XX SERIES VOLTAGE REGULATOR

The LM 78XXX series of the three terminal regulations is available with several fixed output voltages making them useful in a wide range of applications. One of these is local on card regulation. The voltages available allow these regulators to be used in logic

systems, instrumentation and other solid state electronic equipment. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents. The LM78XX series is available in aluminium to 3 packages which will allow over 1.5A load current if adequate heat sinking is provided. Current limiting is included to limit the peak output current to a safe value. The LM 78XX is available in the metal 3 leads to 5 and the plastic to 92. For this type, with adequate heat sinking. The regulator can deliver 100mA output current.

The advantage of this type of regulator is, it is easy to use and minimize the number of external components.

The following are the features voltage regulators:

a) Output current in excess of 1.5A for 78 and 78L series

b) Internal thermal overload protection

c) No external components required

d) Output transistor sage area protection

e) Internal short circuit current limit.

f) Available in aluminium 3 package.

6.13.2 POSITIVE VOLTAGE REGULATOR

The positive voltage regulator has different features like

- Output current up to 1.5A
- No external components
- Internal thermal overload protection
- High power dissipation capability
- Internal short-circuit current limiting
- Output transistor safe area compensation
- Direct replacements for Fairchild microA7800 series

Nominal Output Voltage	Regulator
5V	uA7805C
6V	uA7806C
8V	uA7808C
8.5V	uA7885C
10V	uA7810C
12V	uA7812C
15V	uA7815C
18V	uA7818C
24V	uA7824C

FIG 6.13.1: DIFFERENT TYPES OF OPERATING VOLTAGES REGULATORS

6.14 ALOCOHOL SENSOR

PROBLEM: Accidents due to the alcohol taken by the driver of any vehicle (Drunk& Drive)

Existing solution: It is a complete manual solution by police checking with breath analysers

Proposed solution

An automotive anti-drunk driving system with real-time monitoring is introduced. The system guarantees the uniqueness of the driver by combining the function of alcohol detection and identification system, putting forward the design of combination of the alcohol main detection and the processing auxiliary surveillance. It can eradicate the fraudulent conduct that drunk driving.. It solved the problem accidents due to drunk & drive .the developed automatic vehicle that starts only when there is no alcohol taken by the driver. The vehicle automatically stops if the alcohol level is more than permissible level and subsequently raises alarm. The project is designed with microcontroller, alcohol

sensors, relays, power supply etc. The program written in the microcontroller for the above task.Incase of extension we may alert the respective owner of the vehicle and police authorities by sending SMS along with vehicle ID through GSM network.

FIG 6.14: MQ -135

ALCOHOL SENSOR (MQ-135):

A gas sensor MQ135 is used to detect the alcohol content in the breath of the rider. The ignition of the vehicle is controlled by the microcontroller, which acts according to the output of gas sensor.

SPECIFICTIONS:

- Operating voltage:5v DC
- Type:Analog&Digital
- Sensitivity to ammonia,sulphide and Benzene steam
- Detecting Range:100-1000ppm

6.15 RF MODULE

RF transmitter and receiver needs power source or battery power for operating and it can be useable for a long period over more than decades. It has an inbuilt short range antenna or we can use handheld antenna. The antenna type used in the RF module has a scanning antenna. The scanning antenna just release the signal and it is in short

range. Whenever an RF receiver come across the transmitter devices the information transmitted by the transmitter is passed to the receiver module placed in the vehicle will get the signal.

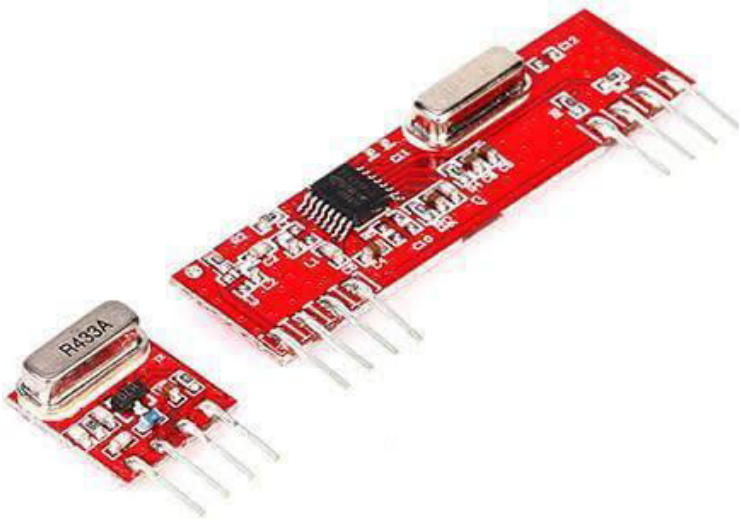


FIG 6.15: RF MODULE WITH TRANSMITTER AND RECEIVER

A. Transmitter Modules

An RF transmitter module is a small assembly it can able to transmit the radio waves. This is working along with microcontroller. This is used to give data to module which can be transmitted. Transmitter power output can be decreased by the physical environmental changes such as harmonics, noise and so other parameters.so we can take a necessary steps to overcome this to make transmitter to increase or maintain the quality.

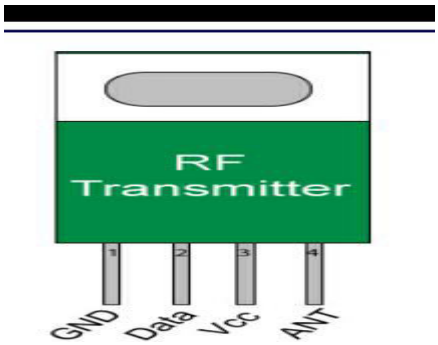


FIG 6.17: PIN DIAGRAM OF RF TRANSMITTER

RF TRANSMITTER 433MHZ ASK FEATURES:

- Frequency range: 433.92MHZ.
- Supply voltage: 3-12v.
- Circuit shape: saw
- Temperature range:-40degree C-80 degree C

B. Receiver Modules

An RF Receiver module receives the modulated RF signal, and demodulates it. There are two types of RF receiver modules: super heterodyne receivers and super-regenerative receivers. Super-regenerative modules are usually low cost and low power designs using a series of amplifiers to extract modulated data from a carrier wave. Super-regenerative modules are generally imprecise as their frequency of operation varies considerably with temperature and power supply voltage. Super heterodyne receivers have a performance advantage over super-regenerative they offer increased accuracy and stability over a large voltage and temperature range. This stability comes from a fixed crystal design which in turn leads to a comparatively more expensive product.

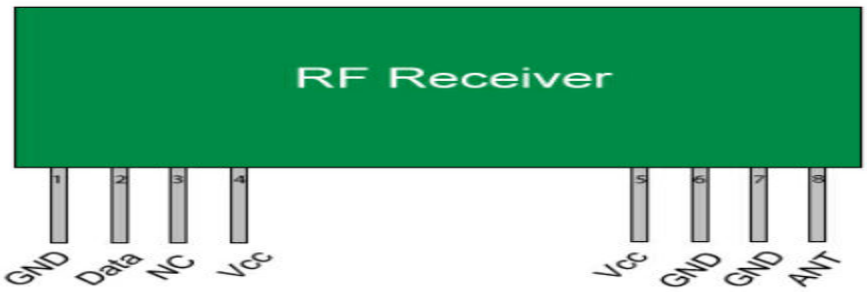


FIG 6.18: PIN DIAGRAM OF RF RECEIVER

RF RECEIVER 433MHZ ASK (PLL) FEATURES:

- Receiver Frequency :433.92MHZ
- Typical sensitivity:105dbm
- Supply current :2.5mA
- IF frequency 500KHZ
- Low power consumption

- Operating voltage:5volts

6.16 GSM ARCHITECTURE:

GSM has the following parts:

- Mobile station (MS)
- Base station sub-system (BSS)
- Network and switching subsystem (NSS), and
- Operation sub-system (OSS)

6.16.1 DESCRIPTION OF ARCHITECTURE:

The MS may be a stand-alone piece of equipment for the certain service or support the connection of External terminals, such as the interface for personal computer or fax. The MS includes mobile equipment (ME) and a subscriber identity module (SIM). I do not need to be personally assigned to one subscriber. The SIM is a subscriber module which stores all the subscriber-related information. The ME is not associated with a called number-it is linked to the SIM. In this case, any ME case be used by a subscriber when the SIM is inserted in the ME.

The BSS connects to the MS through a radio interface and also connects to the NSS. The BSS consists of a base transceiver station (BTS) located at the antenna site and a base station controller (BSC) that may control several BTS. The BTS consists of radio transmission and reception equipment similar to the ME in an MS. A transcoder/rate adaption unit (TRAU) carries out encoding and speech decoding and rate adaption for transmitting data. As a subpart of the BTS, the TRAU may be sited away from the BTS, usually at the MSC. In this case, the low transmission rate of speech code channels allows more compressed transmission between the BTS and TRAU, which is sited at the MSC.

GSM uses the open system interconnection (OSI). There are three common interfaces based on OSI: a common radio interface, called *air interface,* between the MS and BTS, an interface A between the MSC and BSC, and an A-bits interface between the BTS and BSC. With these common interfaces, the system operator can purchase the product of manufacturing company A to interface with the product of

manufacturing company B. the difference between interface and protocol is that an interface represents the point of the content between two adjacent entities and a protocol provides information flows through the interface. For example, the GSM radio interface is the Trans point for the information flow pertaining to several protocols.

GSM MODEM

The GSM modem used here is Wavecom Module. The AT commands based messages exchanged between an application and the wavecom products in order to manage GSM related eventservices.

Fig 6.16: GSM MODULE

6.17 BUZZER:

A buzzer or beeper is a signalling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows. It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound. Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong (which makes the ringing noise). Often these units were anchored to a wall or ceiling and used the ceiling or wall as a sounding board. Another implementation with some AC-connected devices was to implement a circuit to make the AC current into a noise loud enough to drive a loudspeaker and hook this circuit up to a cheap 8-ohm speaker. Now-a-days, it is more popular to use a ceramic-based piezo-electric sounder

like a Son alert which makes a high-pitched tone. Usually these were hooked up to driver" circuits which varied the pitch of the sound or pulsed the sound on and off.

Fig 6.20: BUZZER

Buzzer Driver:

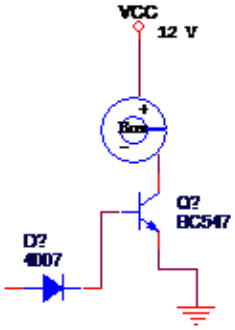


FIG 6.21: BUZZER DRIVER

The circuit is designed to control the buzzer. The buzzer ON and OFF is controlled by the pair of switching transistors (BC 547). The buzzer is connected in the Q2 transistor collector terminal. When high pulse signal is given to base of the Q1 transistors, the transistor is conducting and close the collector and emitter terminal so zero signals is given to base of the Q2 transistor. Hence Q2 transistor and buzzer is turned OFF state. When low pulse is given to base of transistor Q1, the transistor is turned OFF. Now 12V is given to base of Q2 transistor so the transistor is conducting and buzzer is energized and produces the sound.

6.17.1SPECIFICATOINS:

- Operates With Single 5V Power Supply
- Two Drivers and Two Receivers
- ±30V Input Levels
- Low Supply Current . . . 8 mA Typica

BUZZER (5v):

Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong (which makes the ringing noise).

Usually these were hooked up to driver" circuits which varied the pitch of the sound or pulsed the sound on and off.

6.18 PUSH TO ON/OFF LATCHING SWITCH

It works when mechanical force applied. it converts mechanical energy to electrical energy and it goes to micro controller .In case any accident occursthis switch is pushed and with the help of microcontroller, GSM module indicateaccident occurred.

FIG 6.18: PUSH TO ON\OFF LATCHING SWITCH

6.18.1SPECIFICATIONS:

- Operating voltage:5v DC or 230vAC
- Frequency: 50-60hz
- Insulated resistance:0 ohms
- continual working:10000times

6.19 REGULATOR (LM7805):

A variable regulated power supply, also called a variable bench power supply, is one where you can continuously adjust the output voltage to your requirements. Varying the output of the power supply is the recommended way to test a project after having double checked parts placement against circuit drawings and the parts placement guide.

This type of regulation is ideal for having a simple variable bench power supply. Actually this is quite important because one of the first projects a hobbyist should undertake is the construction of a variable regulated power supply. While a dedicated supply is quite handy e.g. 5V or 12V, it's much handier to have a variable supply on hand, especially for testing. Most digital logic circuits and processors need a 5 volt power supply. To use these parts we need to build a regulated 5 volt source. Usually you start with an unregulated power supply ranging from 9 volts to 24 volts DC (A 12 volt power supply is included with the Beginner Kit and the Microcontroller Beginner Kit.). To make a 5 volt power supply, we use a LM7805 voltage regulator IC (Integrated Circuit). The IC is shown below.

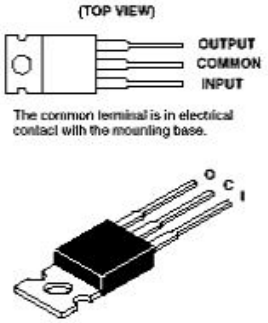


FIG 6.19.1: PIN DIAGRAM OF LM7805

The LM7805 is simple to use. You simply connect the positive lead of your unregulated DC power supply (anything from 9VDC to 24VDC) to the Input pin, connect the negative lead to the Common pin and then when you turn on the power, you get a 5 volt supply from the Output pin.

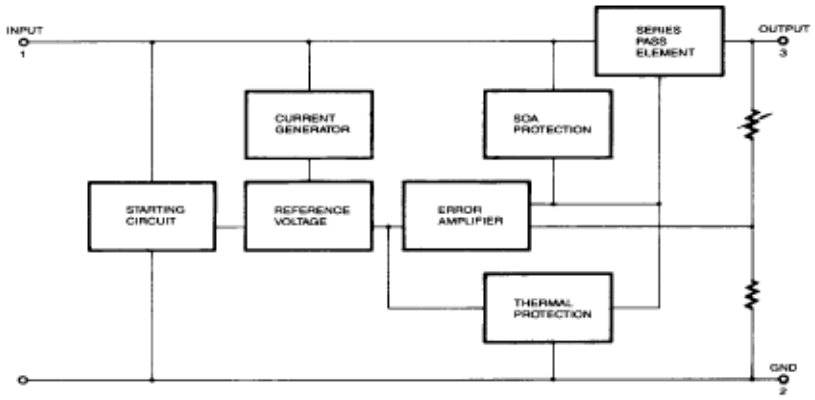


FIG 6.19.2: CIRCUIT DRIVER

Driver Circuit:

The driver circuit generally made by using one transistor and one relay. The driver circuit arrangement will show in the below figure.

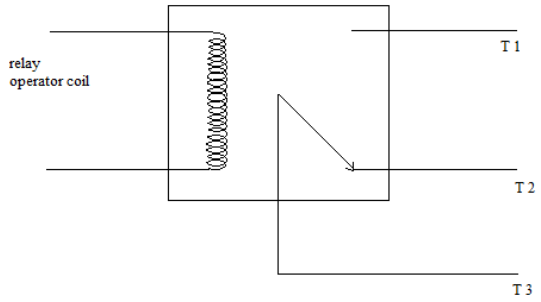


FIG 6.19.2: DRIVER CIRCUIT

Internal connection of relay

The driver circuit was mainly operated by the Micro Controller. The Micro Controller was change the state of the output pin from the low to high meance that of from O level to the 1 level. By using this sequence to control the base of the transistor. The transistor will act as a ON/OFF switch corresponding to the input of the base. If the base of the transistor wills high the transistor will act as an ON switch otherwise it will act as OFF switch. This conditions will be use to control the relay as shown in the below figure.

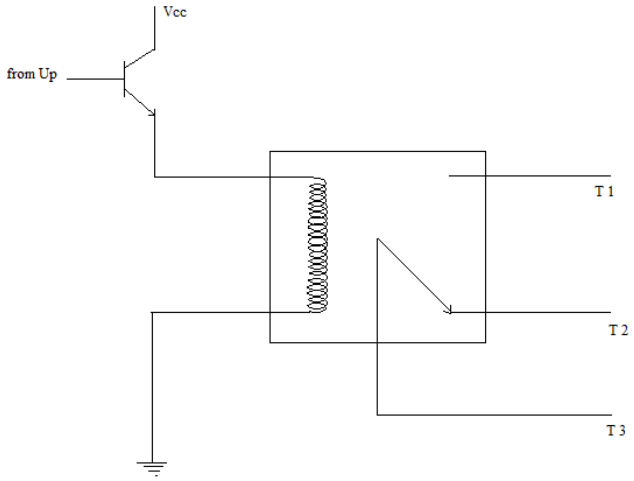


FIG 6.26: INTERNAL CONNECTION

CHAPTER 7

ADVANTAGES AND APPLICATIONS

7.1 ADVANTAGES

1. The risk of accident or injury is reduced by using this system.
2. It is helpful even in low visibility conditions and smog areas also.
3. It is helpful for Drivers new to the road.
4. Commercially Implementable system.
5. Accidents can be detected and taken care off.
6. Accidents can be prevented by detecting alcohol content in driver's breath.
7. The vehicle which has undergone to an accident can be identified by without and delay.
8. The immediate medication will be provided to the accident victims in the remote areas.
9. Mobile numbers can be changed at any time.
10. Numerous of road accidents can be prohibited.
11. Financially feasible
12. Damage for the vehicles can be reduced by using speed breakers.
13. Alcohol detection system in vehicles provides an automatic safety system for vehicles.
14. To prevent accidents due to drunk and driving.
15. Easy and efficient to test the alcohol content in the body
16. Quick and accurate results.
17. Helpful for police and provides an automatic safety system for vehicles.

7.2 APPLICATIONS

1. It is used in Automobile Vehicles to avoid accidents.
2. Usage of sign boards can be replaced with this system.
3. It is very helpful to police stations and hospitals, family members know about driver safety in case accident occur.
4. Alcohol detector can be used in the various vehicles for detecting whether the driver has consumed.

CHAPTER 8

CONCLUSION & FUTURE SCOPE

CONCLUSION

This work proposed an early warning system that can alert the driver in advance when the vehicle is approaching a speed breaker and restricted areas like school zones, turnings, hospitals etc.; it was also shown that detection in LCD display. We have provided a very effective solution to develop an intelligent system of vehicles for alcohol detection, when sensor is fine sensitivity range around the limited range then vehicle will stop its functioning. This system will improve the safety pf human being.

This project presents vehicles accident detection and alert system with SMS to the user defined mobile numbers. When accident is done will get SMS to family members, nearby police station, and hospital. Our many project is mainly based to save the human life.

FUTURE SCOPE

Impact sensor can be used for detecting the damage caused to a vehicle during an accident. GSM can be sent the message to the family members, police station, and hospitalsin the case accident. The speed breaker early warning system makes it possible to adjust the time of speed on the road .we use innovative idea in front of every school zones, turnings, hospitals etc.

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ANNEXURE -A

SOFTWARE TOOLS

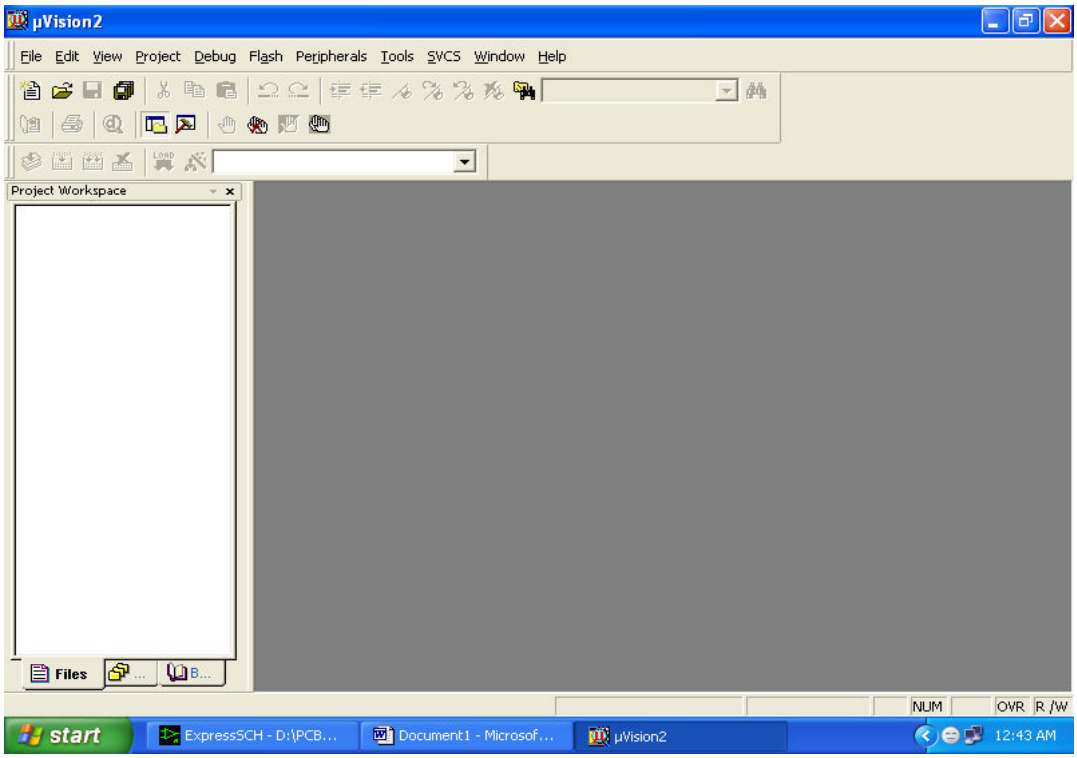
Keil µVision4

KEIL implemented the first C compiler designed from the ground up specifically for 8051 microcontroller. Keil provides broad range of development tools like ANSI C Compiler, macro assembler, debuggers and simulators, linkers, IDE library managers, real time operating system & evaluation boards for 8051 & ARM families. It is used to write programs for an application. The programs can be written in embedded C or in assembly language.

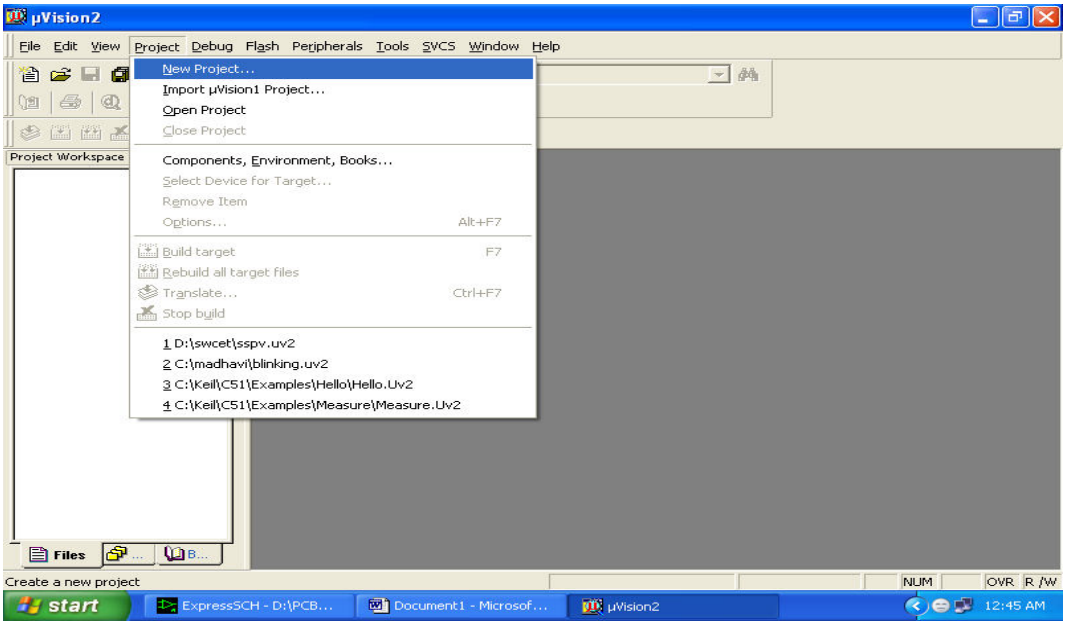
Keil compiler is software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keli compiler also supports C language code.

Working with KEIL:

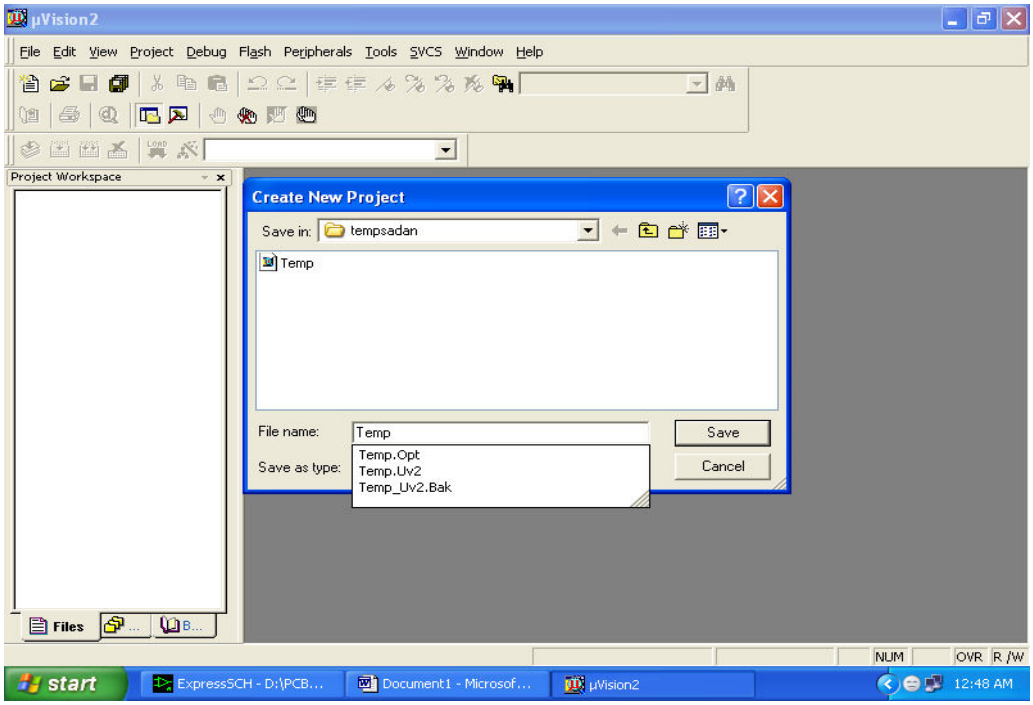
1.Initial window of Keil µ Vision.



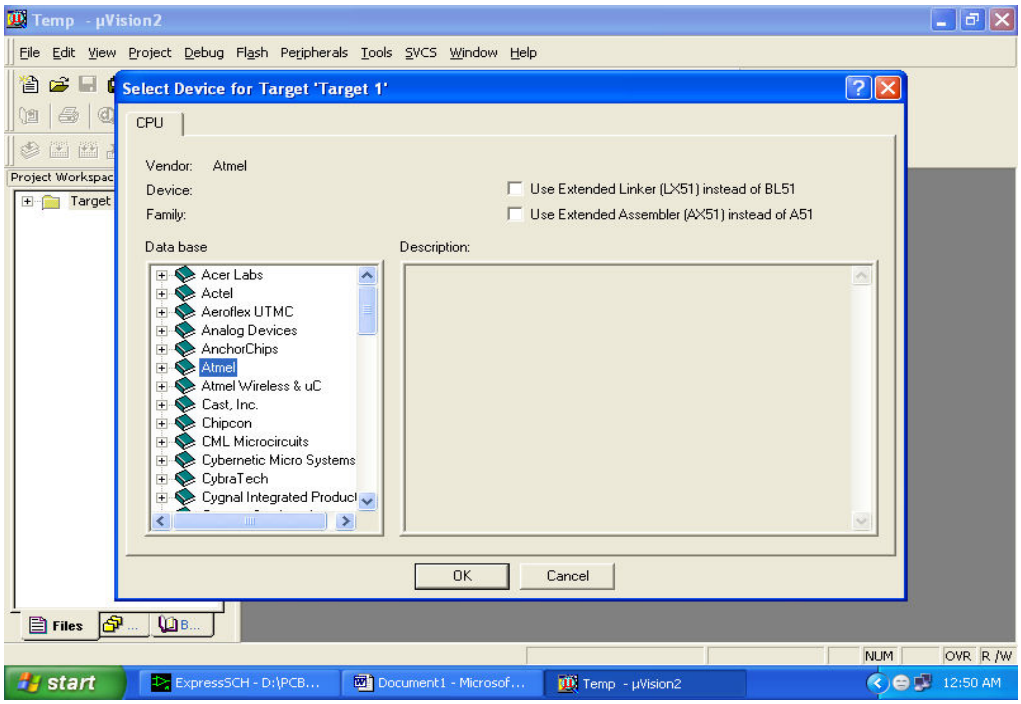
2. Creation of a New Project.



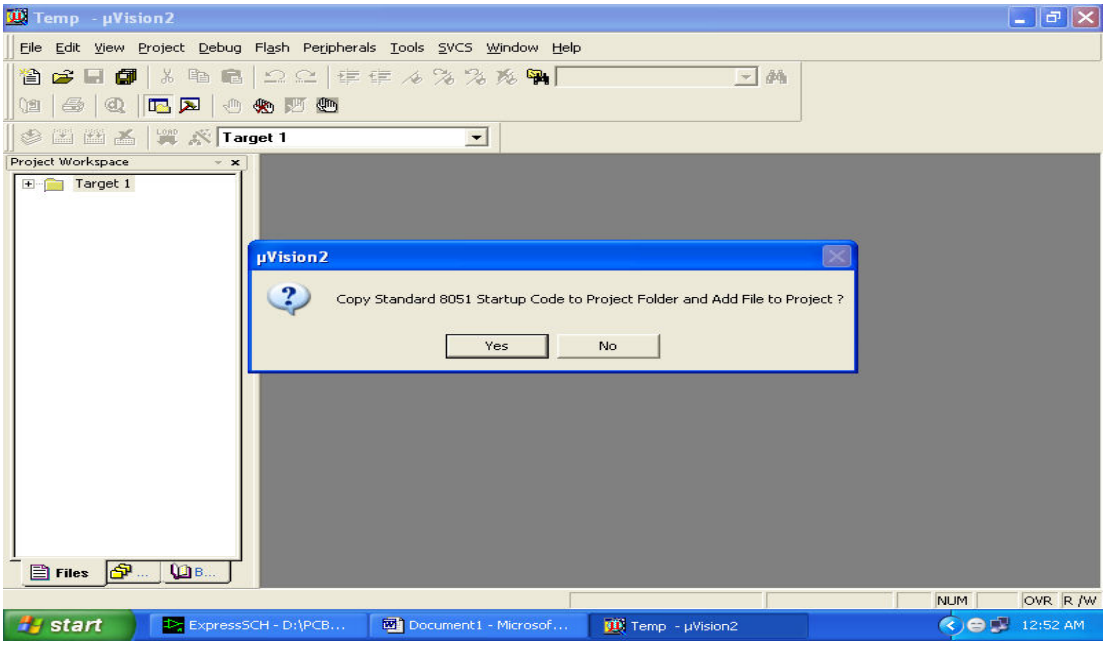
3. Saving a project.



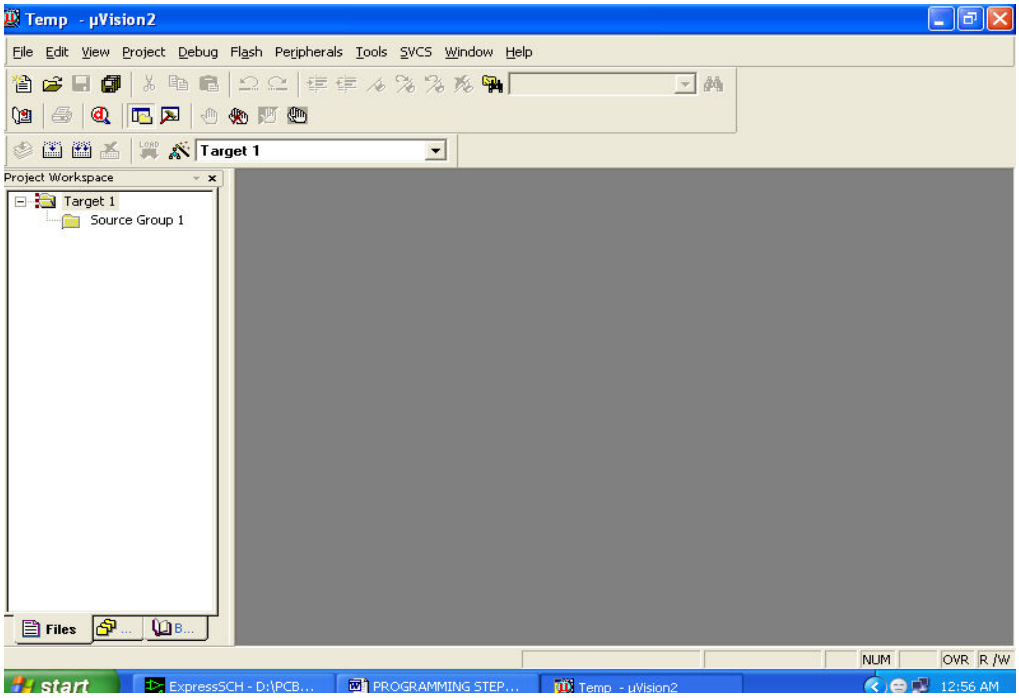
4. Selection of components for the project.



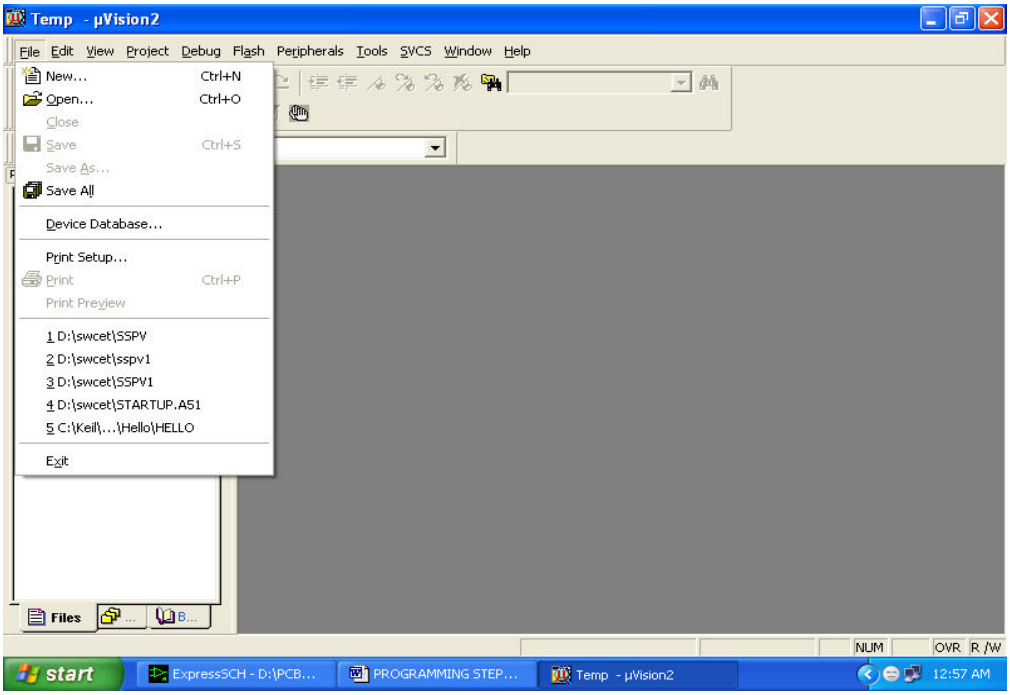
5.Adding files to the project



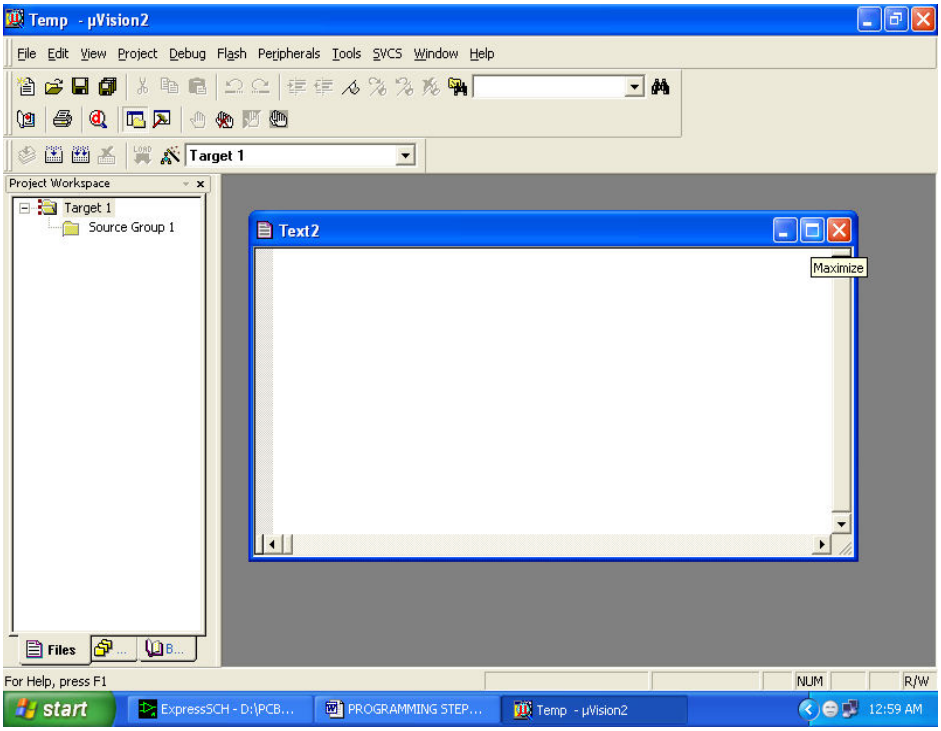
6.Project files are ready for the usage.



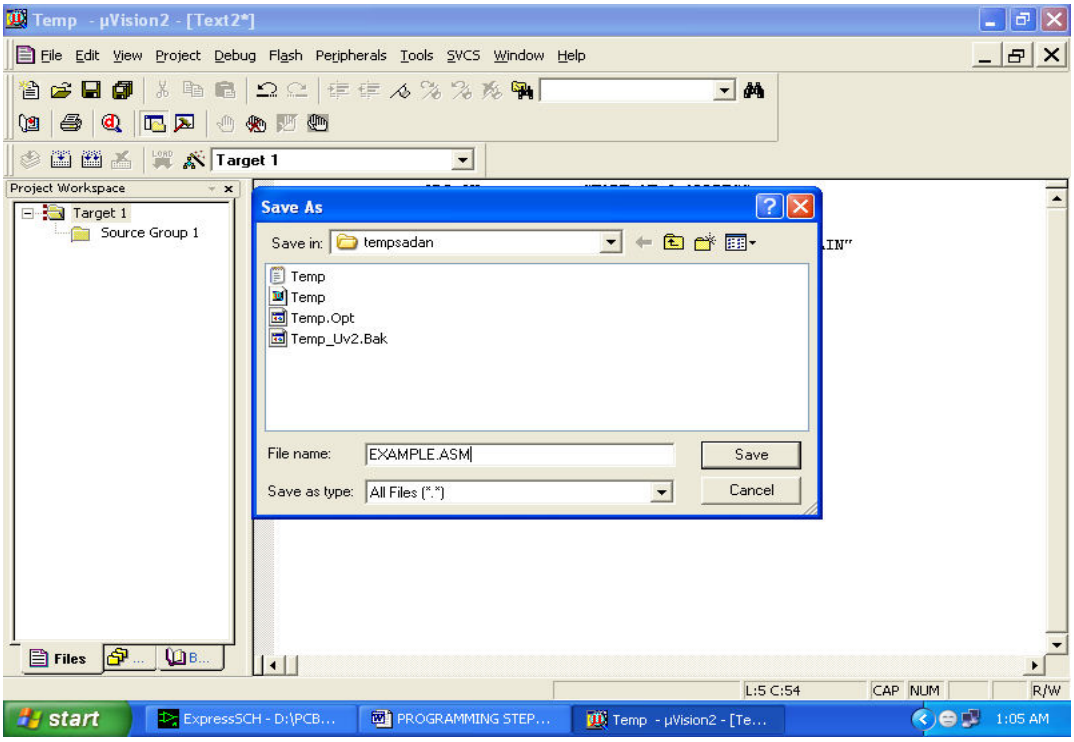
7. Selecting a new file.



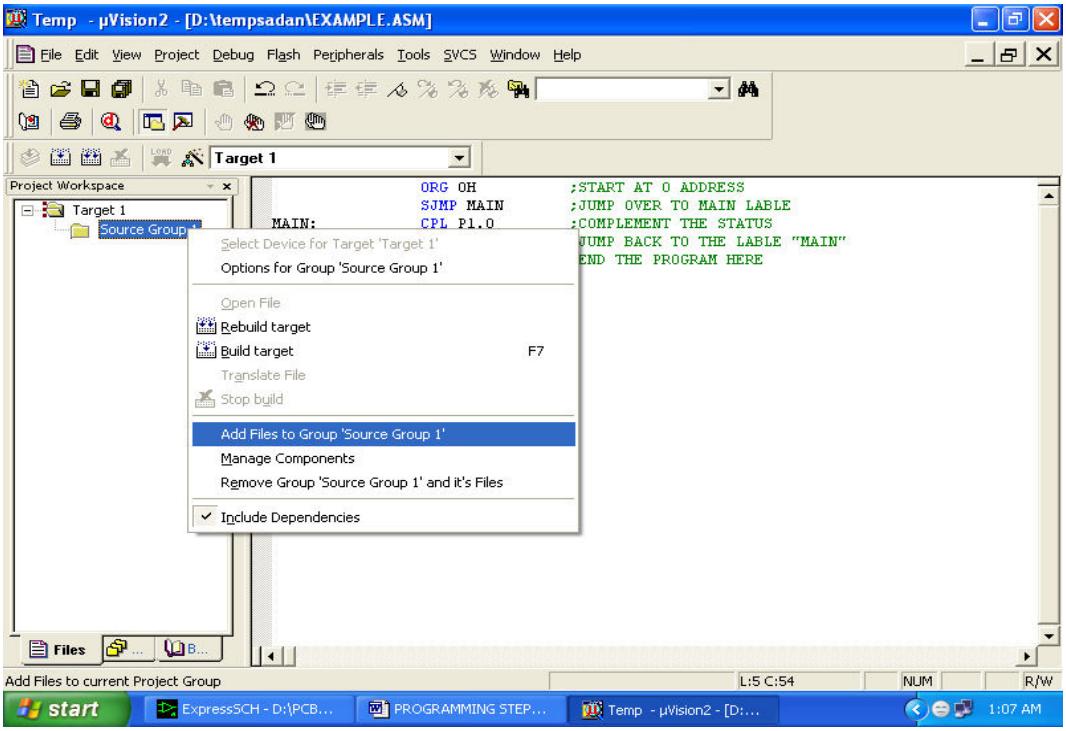
8. The blank sheet to start programming.



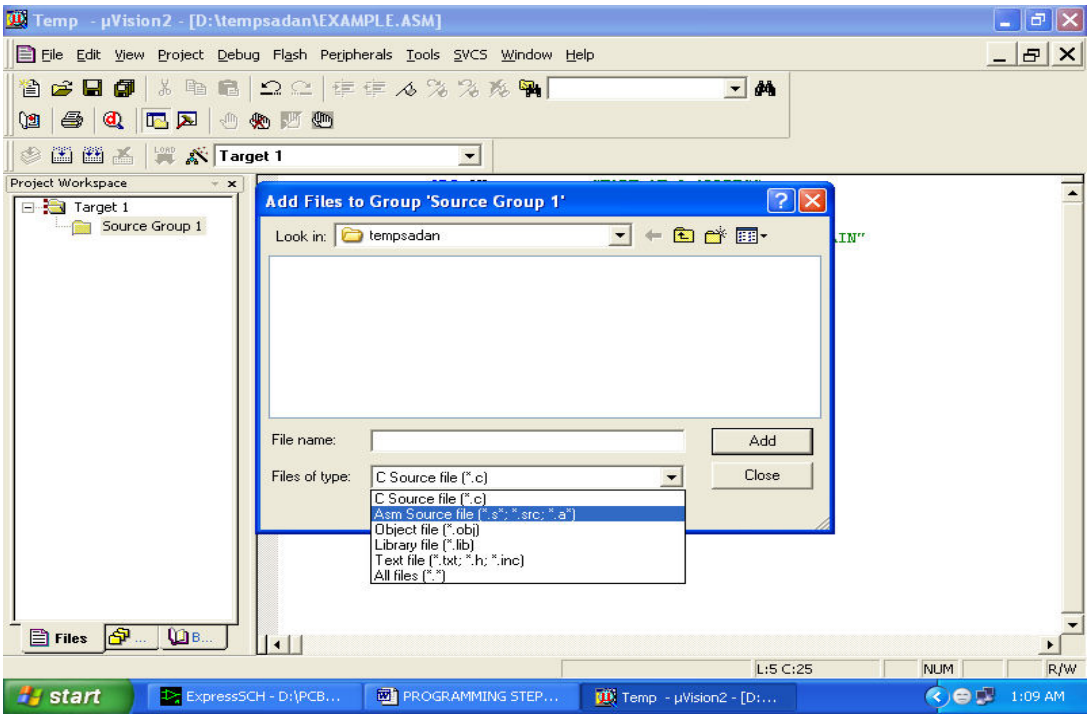
9. Saving a program written in either “C” or “ASM”.



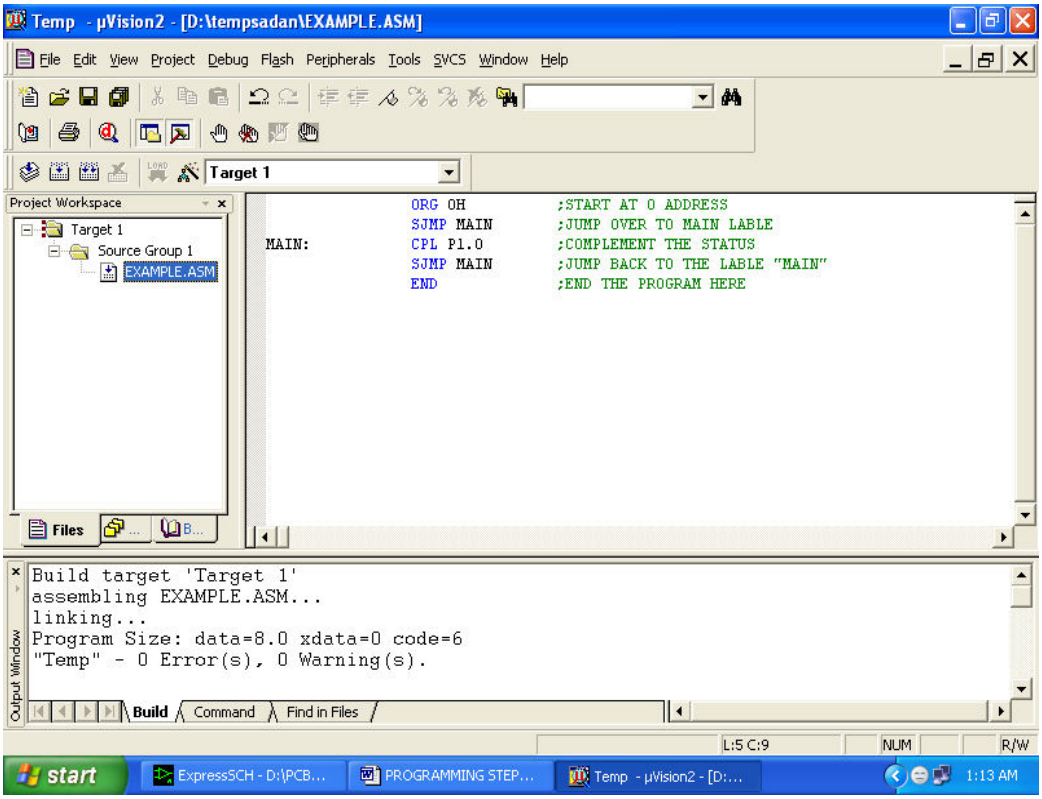
10. Adding files to Group Source.



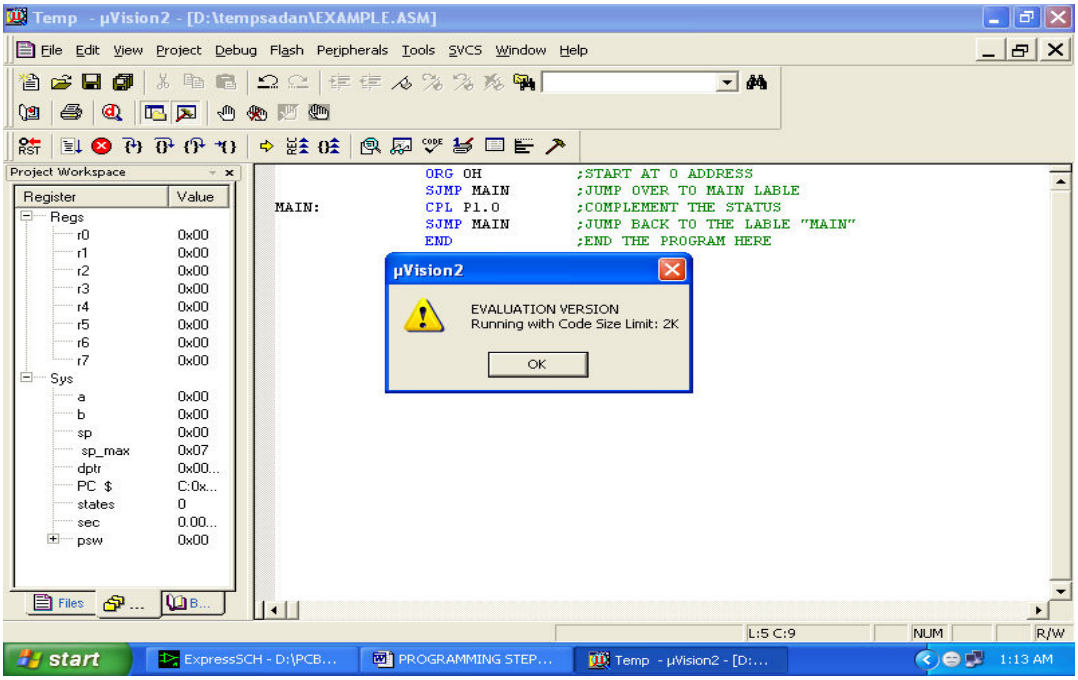
11. Selecting a file to add to group source.



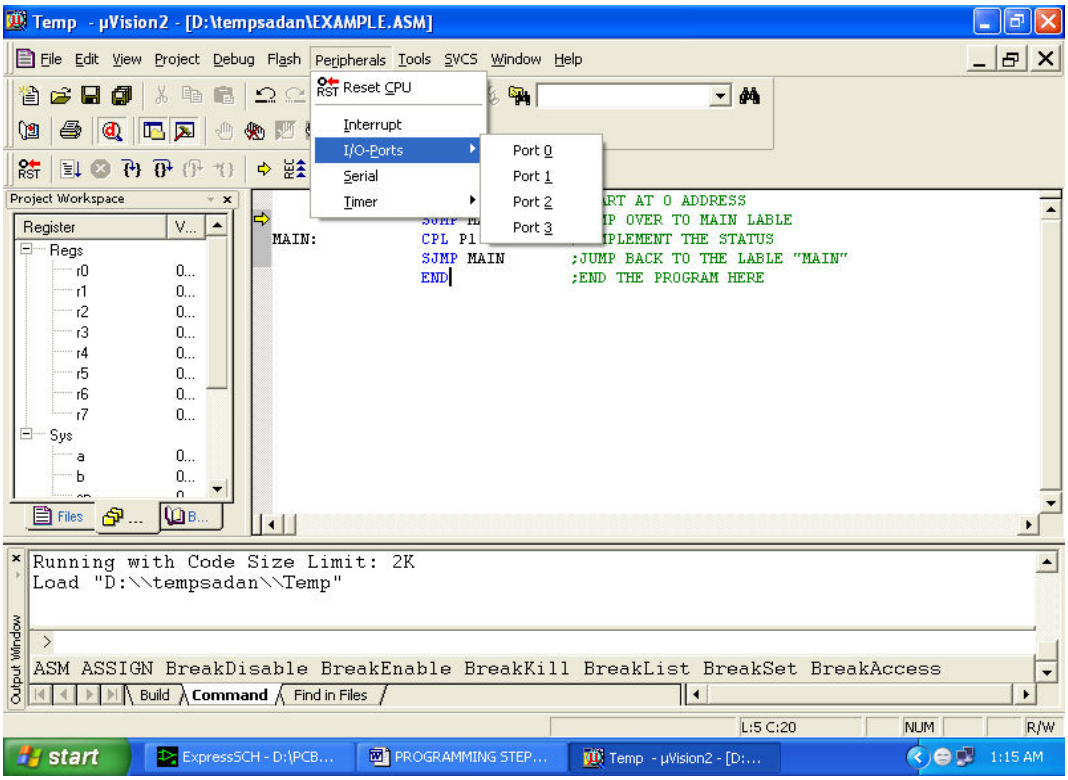
12. Compilation of a program.



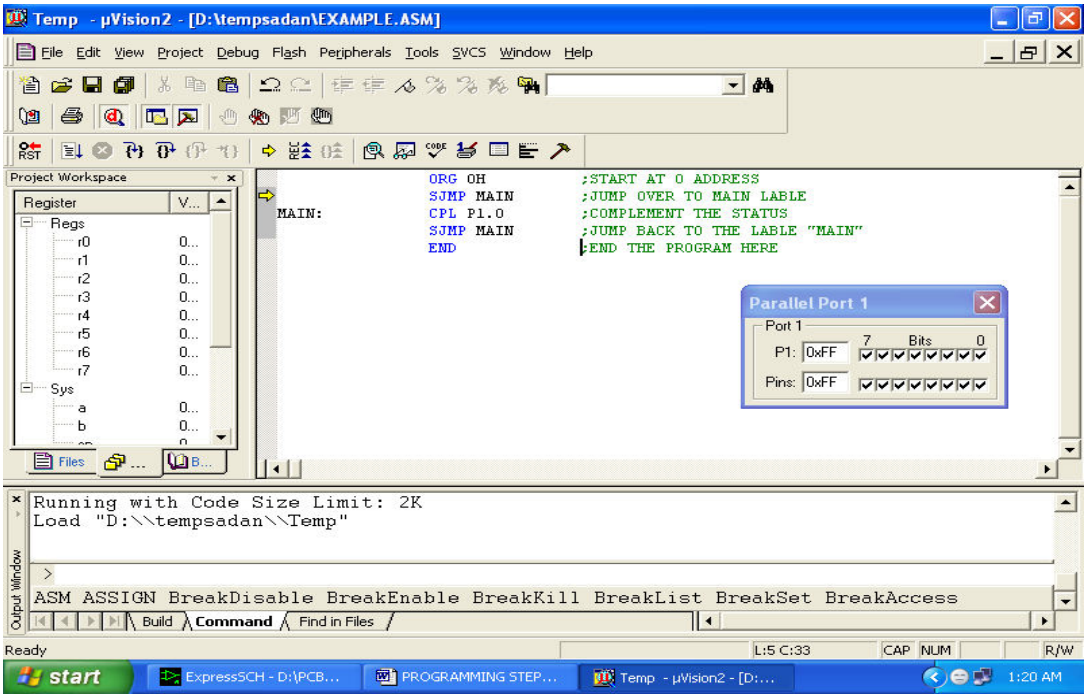
13. Execution of a program.



14. Required port selection



15. Execution



TOP WIN SOFTWARE

Top Win, a type of software developed for TOP series programmers, adapts to the TOP hardware products of a new generation. Top Win has abandoned its method of one type of software matching for one mode of TOP product by operating different mode of hardware units. Top Win supports automatic identification of hardware mode and function.

Once Top Win connects to hardware unit successfully, the name of hardware unit will appear at the bottom of window. The current basic modes that Top Win supported include TOP853, TOP2004, TOP2005 and TOP2048. Product of new mode developed in the future will be supported by new version of Top Win software. Top Win supports multi-window operation, namely, it can connect multiple programmers on a computer to write device without any interference. Mode of programmer can be same or different. Top Win opens all devices in order of alignment. In theory, the number of connected devices is out of limitation. Top Win supports Windows98se/Me/2000/XP.

ANNEXURE -B
SOURCE CODE

```
; THIS IS ALCOHOL- ACCIDENT - ROAD SIGNS FOR VEHICLES
        ; DETECTION WITH SMS
        ; ON 10-03-2017

        ; P2.0 =BUZZER
        ; P2.1 =
        ; P2.2 =
        ; P2.3 =MEM SENSOR
        ; P2.4 =PROTECTION SWITCH


        ; P0 = DISP DATA

        ; P2.7 = RS
        ; P2.6 = R/W
        ; P2.5 = EN


    ; IS D.A.S FOR VOLTAGE/FREQUENCY DT:20-03-2005 LCD

    ; 50H = DISP LOCATION ADD
    ; 51H = DISP VALUE


TXD    MACRO
       JNB TI,$
       CLR TI
       MOV SBUF,R6
       MACEND

  ORG 0
  LJMP START
  ORG 0050H



START: MOV P2,#FFH
      CLR P2.0
      CLR P2.1
      LCALL SPINI
      LCALL LCDINI
      LCALL DEL
```

```
        MOV DPTR,#0900H
        LCALL TLINE
        MOV DPTR,#0910H
        LCALL BLINE

        LCALL SSEC


        MOV DPTR,#0920H
        LCALL TLINE
        MOV DPTR,#0930H
        LCALL BLINE

;********* READ VAL DISP   **********
XX1:   CLR P2.0
       SETB P2.1
       SETB P2.2

ZZ1:   JB P1.0,YY1
       LCALL DEL
       JB P1.0,ZZ1
       MOV 3FH,#01H
       LJMP CCVV


YY1:   JB P1.1,XX2
       LCALL DEL
       JB P1.1,YY1
       MOV 3FH,#02H
       LJMP CCVV

XX2:   JB P1.2,XX1
       LCALL DEL
       JB P1.2,XX2

       MOV DPTR,#09A0H
       LCALL TLINE
       MOV DPTR,#09B0H
       LCALL BLINE
       SETB P2.0
       LCALL SSEC
       CLR P2.0
       LJMP XX1


       MOV 3FH,#03H
```

```
      LJMP CCVV
;***********************************

IRCHK:  MOV R0,#00H
        LCALL DEL

KX0:    JB P1.0,KX1
        LCALL DDEL
        JB P1.0,KX0

KX1:    LCALL SEC
        LCALL SEC
        JB P1.0,KX2
        LCALL DDEL
        JB P1.0,KX1

KX2:    JB P1.0,KX3
        LCALL DDEL
        JB P1.0, KX2

        MOV R0,#01H
        RET

KX3:    MOV R0,#00H
        RET

DDEL:    MOV R5,#04H
EDR:     mov r4, #FFH
Djnz r4, $
Djnz r5, EDR
 RET

;*********************************
CCVV:   MOV DPTR, #0980H
        LCALL TLINE
        MOV DPTR, #0990H
        LCALL BLINE

        SETB P2.0
CLR P2.1

        LCALL SEC3
        LCALL SEC3

        LJMP SMSX
        ;---------
```

```
;***********   *********
SMSX:  MOV DPTR,#0960H
       LCALL TLINE
       MOV DPTR,#0970H
       LCALL BLINE
       ;-----------------
       LCALL SMSP1
       MOV DPTR,#AT_CMGW     ;1-WRITE MES.IN SIMM MEMORY LOCATION
       MOV R2,#14H
       LCALL CMD1
       LCALL ENTER
       LCALL SMSP2

       LCALL SMSP1
       MOV DPTR, #AT_CMGW2     ;2-WRITE MES.IN SIMM MEMORY LOCATION
       MOV R2, #14H
       LCALL CMD1
       LCALL ENTER
       LCALL SMSP2

       LCALL SMSP1
       MOV DPTR,#AT_CMGW3     ;3-WRITE MES.IN SIMM MEMORY LOCATION
       MOV R2,#14H
       LCALL CMD1
       LCALL ENTER
       LCALL SMSP2
       LCALL SMSINFO


       LJMP XX1


SMSP1:;*************************************
       MOV DPTR,#AT_CMGF     ;SMS MODE PDU=0/TEXT=1
       MOV R2,#09H
       LCALL CMD1
       LCALL ENTER

       LCALL SEC

       MOV DPTR,#AT_ERS      ;ERASE OF 1 ST LOCATION
       MOV R2,#09H
       LCALL CMD1
       LCALL ENTER

       LCALL SEC
```

```
      LCALL SEC

      MOV DPTR,#AT_CPMS     ;SIMM MEMORY SELECTION
      MOV R2,#0CH
      LCALL CMD1
      LCALL ENTER
      LCALL SEC                ;BETTER TO PUT ERASE
      RET
      ;--------------

     ;MOV DPTR,#AT_CMGW     ;WRITE MES.IN SIMM MEMORY LOCATION
     ;MOV R2,#14H
; LCALL CMD1
; LCALL ENTER
      ;--------------

SMSP2:
      MOV A,3FH
      CJNE A,#01H,MES2
      LCALL SEC3
      MOV DPTR,#AT_CMD      ; WRITE MES.IN SIMM MEMORY LOCATION
      MOV R2, #32H
      LCALL CMD1
      LJMP BBBM

MES2:  CJNE A,#02H,MES3
      LCALL SEC3
      MOV DPTR,#AT_CMD1     ;WRITE MES.IN SIMM MEMORY LOCATION
      MOV R2,#32H
      LCALL CMD1
      LJMP BBBM

MES3:  CJNE A,#03H,BBBM
      LCALL SEC3
      MOV DPTR,#AT_CMD2     ;WRITE MES.IN SIMM MEMORY LOCATION
      MOV R2,#32H
      LCALL CMD1
      LJMP BBBM



BBBM:  LCALL SEC3
      MOV DPTR,#AT_CMSS      ;SEND COMMAND TO MODEM
      MOV R2,#09H
      LCALL CMD1
      LCALL ENTER
```

```
        RET


SMSINFO:
        ;---------------
        MOV DPTR,#0940H
        LCALL TLINE
        MOV DPTR,#0950H
        LCALL BLINE

       ; JB P2.4,$

        MOV DPTR,#0920H
        LCALL TLINE
        MOV DPTR,#0930H
        LCALL BLINE
        LCALL SSEC

        RET
;*******************************

;********** LCD INI ***********
LCDINI:

        CLR P2.5

        CLR p2.7
        CLR p2.6
        MOV P0,#30H
        LCALL WRI

        CLR p2.7
        CLR p2.6
        MOV P0,#30H
        LCALL WRI

        CLR p2.7
        CLR p2.6

        MOV P0,#30H
        LCALL WRI

        CLR p2.7
        CLR p2.6
        MOV P0,#38H
```

```
LCALL WRI


CLR p2.7
CLR p2.6
MOV P0,#01H
LCALL WRI

CLR p2.7
CLR p2.6
MOV P0,#01H
LCALL WRI

CLR p2.7
CLR p2.6
MOV P0,#01H
LCALL WRI

CLR p2.7
CLR p2.6
MOV P0,#02H
LCALL WRI


CLR p2.7
CLR p2.6
MOV P0,#0CH
LCALL WRI

CLR p2.7
CLR p2.6
MOV P0,#1CH
LCALL WRI

CLR p2.7
CLR p2.6
MOV P0,#38H
LCALL WRI

CLR p2.7
CLR p2.6
MOV P0,#06H
LCALL WRI

CLR p2.7
CLR p2.6
```

```
        MOV P0,#01H
        LCALL WRI

        RET
;----------------------------
TLINE:   CLR p2.7
        CLR p2.6
        MOV P0,#80H
        LCALL WRI
        MOV R7,#00H
TKL:
        CLR A
        MOVC A,@A+DPTR
        MOV P0,A
        LCALL WRD
        INC DPTR
        INC R7
        CJNE R7,#10H,TKL
        RET

BLINE:   CLR p2.7
        CLR p2.6
        MOV P0,#C0H
        LCALL WRI
        MOV R7,#00H
BKL:
        CLR A
        MOVC A,@A+DPTR
        MOV P0,A
        LCALL WRD
        INC DPTR
        INC R7
        CJNE R7, #10H, BKL
        RET

;******** INSTRUCTION /DATA WRITE *********

WRI:   SETB P2.5
      MOV R0, #FFH
      DJNZ R0, $
      CLR P2.5
      MOV R0, #FFH
      DJNZ R0, $

      RET
```

```
WRD:   SETB p2.7; REGISTER
       CLR p2.6; READ WRITE
       SETB P2.5; ENABLE
       MOV R0, #FFH
       DJNZ R0, $
       CLR P2.5
       CLR p2.6
       CLR p2.7
       RET
;*****************************


DEL:       MOV R7, #FFH
           DJNZ R7, $
           RET
DEL1:      MOV R7, #FFH
           DJNZ R7, $
           RET


SEC:       MOV R5,#05H
 M1:       MOV R6,#FFH
 M2:       MOV R7,#FFH
 M3:       DJNZ R7,M3
           DJNZ R6,M2
           DJNZ R5,M1
           RET

SEC3:      MOV R5,#14H
 M13:      MOV R6, #FFH
 M23:      MOV R7, #FFH
 M33:      DJNZ R7, M33
           DJNZ R6, M23
           DJNZ R5, M13
           RET

SSEC:      MOV R5, #1FH
 SM1:      MOV R6, #FFH
 SM2:      MOV R7, #FFH
 SM3:      DJNZ R7, SM3
           DJNZ R6, SM2
           DJNZ R5, SM1
           RET
;*******************************************

XDEL:
```

```
Mov r4, #0FH
Djnz r4, $
      RET

XDEL1:    mov r4, #0FH
Djnz r4, $
       RET

XDEL2:  MOV R5, #5FH
GB:     mov r4, #FFH
Djnz r4, $
      DJNZ R5,GB
      RET
;********** DISPLAY ************

VFDIS:  MOV PSW, #18H
      MOV P0, 50H
      LCALL WRI
      MOV R3, 51H

      MOV DPTR, #0400H     ; DATA BASE
      CJNE R3, #00H, GHH
      LJMP DTX

GHH:    INC DPTR
      INC DPTR
      INC DPTR
      DJNZ R3, GHH

DTX:     CLR A
       MOVC A,@A+DPTR
       MOV R6,A
       MOV P0,A
       TXD
       LCALL WRD

       INC DPTR
       CLR A
       MOVC A,@A+DPTR
       MOV R6,A
       MOV P0,A
       TXD
       LCALL WRD


       INC DPTR
```

```
        CLR A
        MOVC A,@A+DPTR
        MOV R6, A
        MOV P0, A
        TXD
        LCALL WRD


        MOV R6,#0AH
        TXD

        MOV R6, #0DH
        TXD

        MOV PSW, #00H
        RET
;********* VOLTAGE SENSE ************
VSEN:
      Mov p1,#FFH
      ; Mov p3,#FFH
      SETB P3.2
      SETB P3.3
      ; SETB P3.4
      ; SETB P3.5
      SETB P3.6
      SETB P3.7

      CLR P3.2
      CLR P3.3

      LCALL DEL
      ; CLR P3.4
      ; CLR P3.5

      LCALL DEL
      SETB P3.2
      LCALL DEL
      SETB P3.3
      LCALL DEL
      CLR P3.2
      LCALL DEL
      CLR P3.3
      LCALL SEC

      MOV R6, P1
      MOV 51H, R6
```

```
        LCALL XDEL
        RET


;*********************************************
ENTER:  MOV R6, #0DH
        TXD
        RET

CMD1:   CLR A
        MOVC A,@A+DPTR
        MOV R6, A
        TXD
        INC DPTR
        DJNZ R2, CMD1
        RET
;************** UART PORT INT *************

SPINI:
        MOV A,#00H
        MOV TCON, #40H
        MOV TMOD, #20H
        MOV SCON, #52H
        MOV IE, #9AH
        MOV TH1, #FDH
        MOV TL1, #FDH
        RET

;************ VOL COMP *********
;###############################


      ORG 0900H
       ;************ 1 LINE

      DB 'ALCOHOL         '
      DB 'ACCIDENT-SP.BRE.'

      DB 'WAITING FOR     '
      DB 'SENSORS...      '

      DB ‘SMS SENT OK   '
      DB ‘PRESS RESET   '

      DB ‘SMS SENDING... '
      DB '              '
```

```
    DB 'WAITING FOR     '; 0980
    DB 'RESET SWITCH...  '; 0990

    DB 'SPEED BREAKER   ' ;09A0
    DB 'DETECTED..' ;09B0
    ;--------------------------
     ORG 1B00H


AT_CMGF: DB "AT+CMGF=1"

       ORG 1B20H
AT_CPMS: DB "AT+CPMS="
       DB 22H
       DB "SM"

       DB 22H

       ORG 1B40H
AT_CMGW: DB "AT+CMGS="
       DB 22H
       DB "9666614935"
       DB 22H

       ORG 1B60H
AT_CMD:  DB "ACCIDENT DETECTED FOR CAR NO  :AP16A999"
       DB 1AH

       ORG 1BA0H
AT_CMSS: DB "AT+CMSS=1"

       ORG 1BC0H
AT_D:    DB "ATD9052850460;"

       ORG 1C00H
AT_ERS:  DB "AT+CMGD=1"
       ORG 1C10H
AT_ERS2: DB "AT+CMGD=2"
       ORG 1C20H
AT_ERS3: DB "AT+CMGD=3"
       ORG 1C30H
AT_ERS4: DB "AT+CMGD=4"
       ORG 1C40H
AT_ERS5: DB "AT+CMGD=5"
```

```
        ORG 1C50H
AT_CNMI: DB "AT+CNMI=2, 2,0,0,0"

        ORG 1C60H
AT_CNMA: DB "AT+CNMA"

        ORG 1C80H
AT_CMGW2:DB "AT+CMGS="
        DB 22H
        DB "8341522365"
        DB 22H

        ORG 1CA0H
AT_CMGW3: DB "AT+CMGS="
        DB 22H
        DB "9703332286"
        DB 22H
        ORG 1CC0H
AT_CMD1: DB "ALCOHOL TAKEN BY DRIVER IN CAR NO:AP16A 999"
        DB 1AH
AT_CMD2: DB "ROAD SIGN: SPEED BREAKER DETECTED          "
        DB 1AH

        END;
```