# ELET 4308/4108 Senior Project

## Motion Sensor Security System

By

(TEAM 4)
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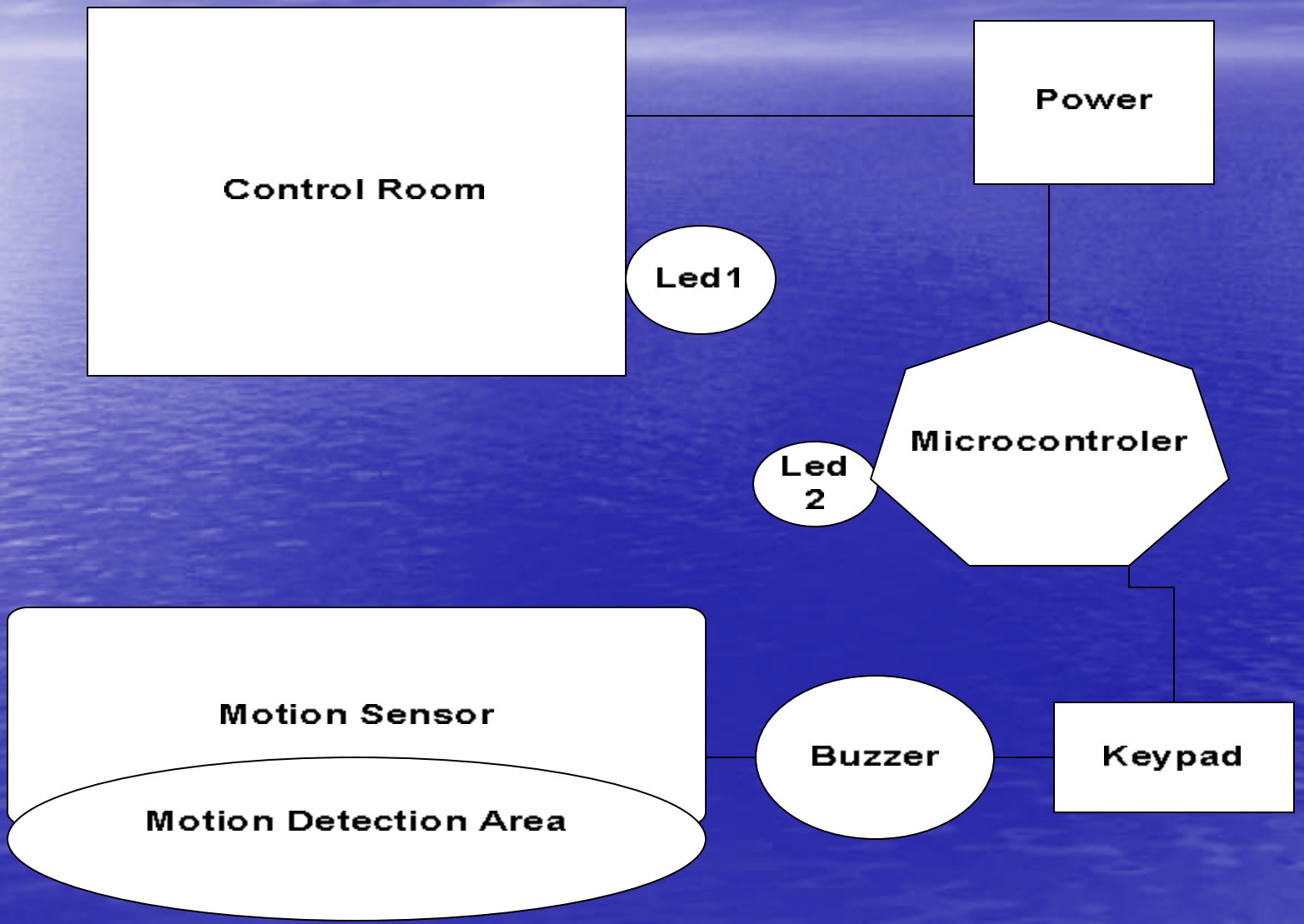
# Introduction

- The project itself is a motion sensor security system capable of detecting the presence of body heat in any designated area.
- State of the art motion detectors use the most modern techniques to eliminate factors causing interference, which affect reliability, to guarantee superior long-term performance and reduce false alarms.
- A few companies that use this state of the art technology are ADEMCO, DSC, VISONIC, IntelliSense, and PARADOX.

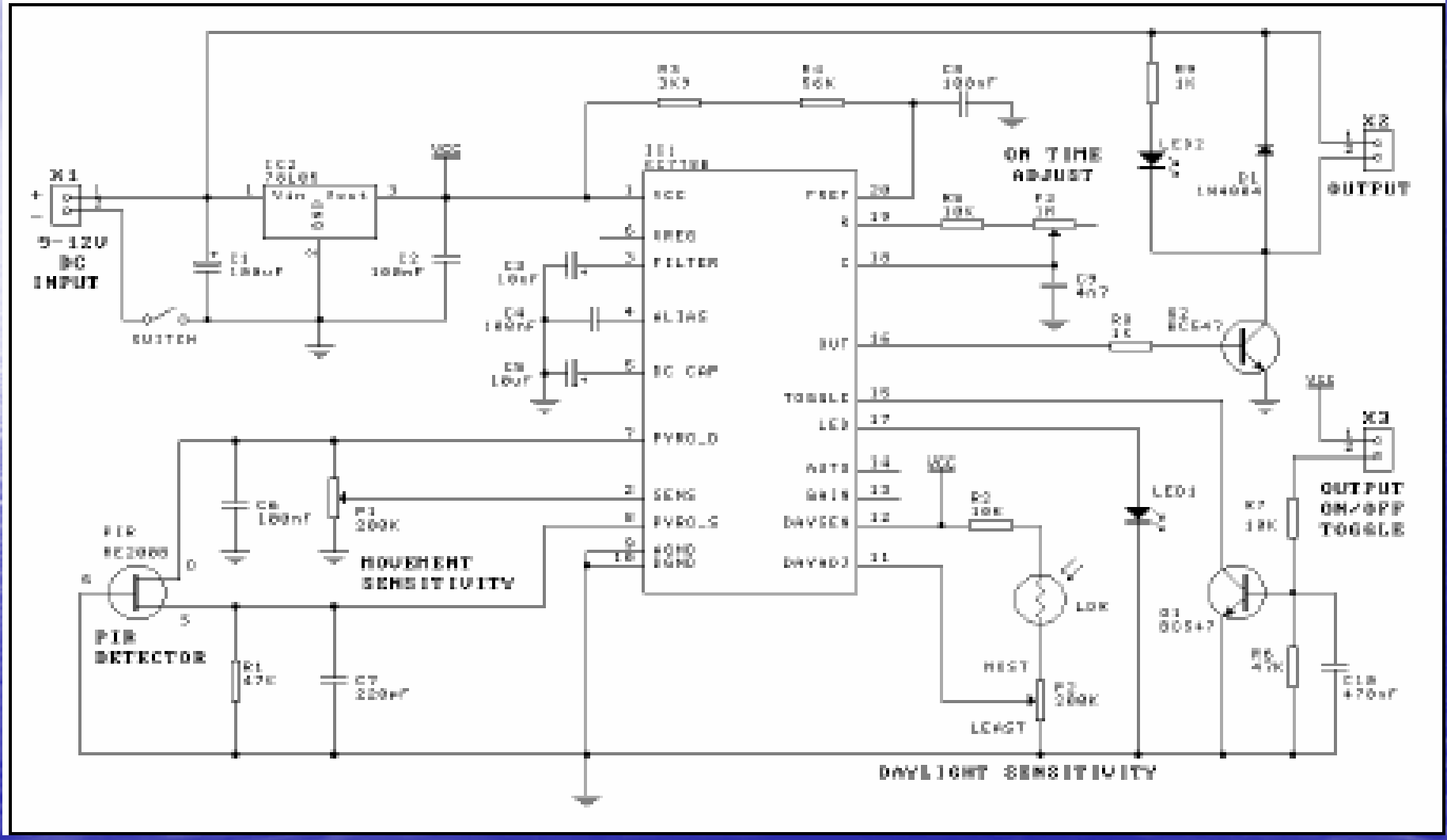
# Project Objective

- The goals of the alarm system are to detect heat movements in a specified area triggering a siren/buzzer to sound.
- Critical design parameters include interfacing the microcontroller (8051) with the PIR integrated circuit.
- This design promotes added control to the crime rate of the regulated work environment after hours of work operation. It also cuts down on expenditure costs on human resources.

# Block Diagram



# Circuit Diagram



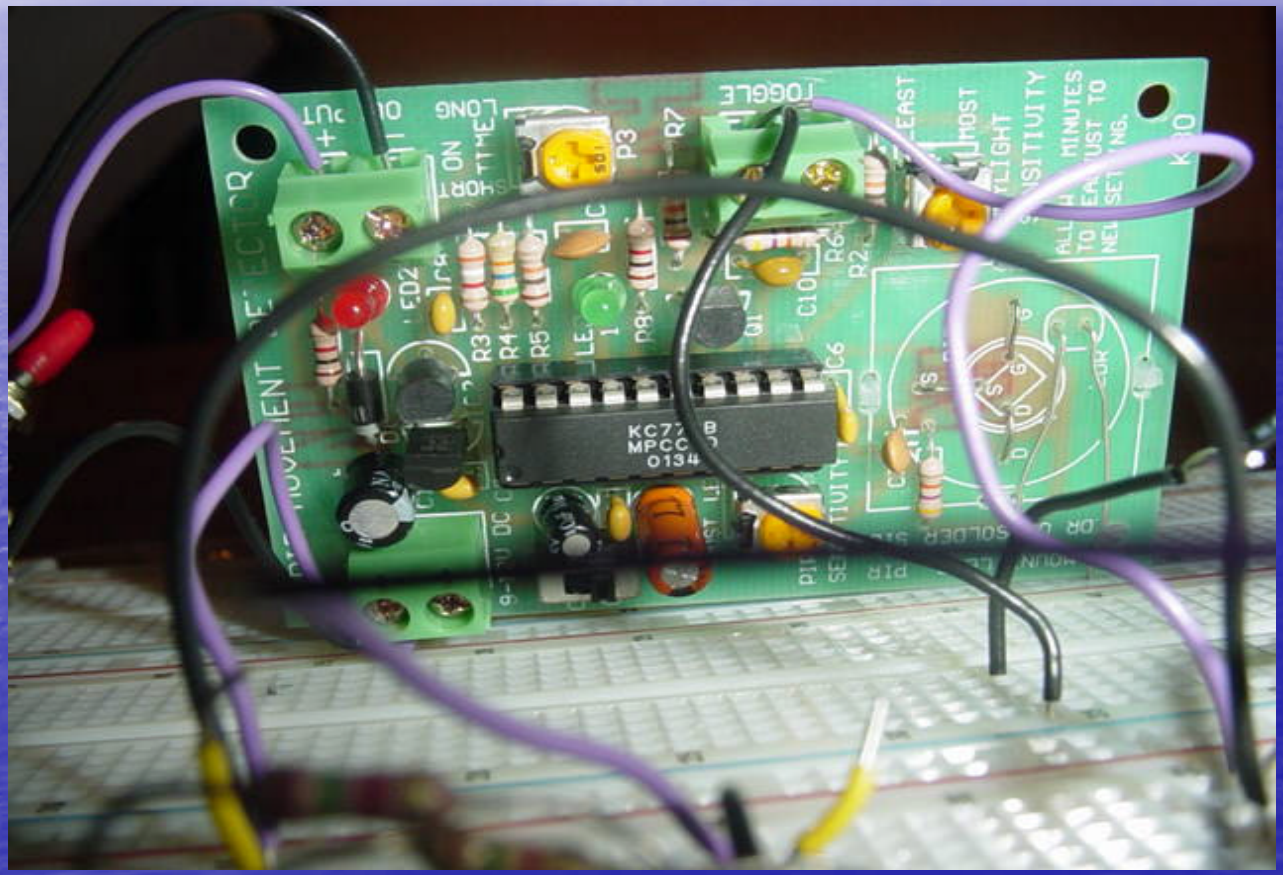
# Project Specifications

- Motion Sensor operates on 9 -12 volts
- Buzzer operates on 4-15 volts
- Micro-controller operated on 5 volts during testing.
- 3-4 meter detection range
- PIR detector has a field  view from 125° to 138°

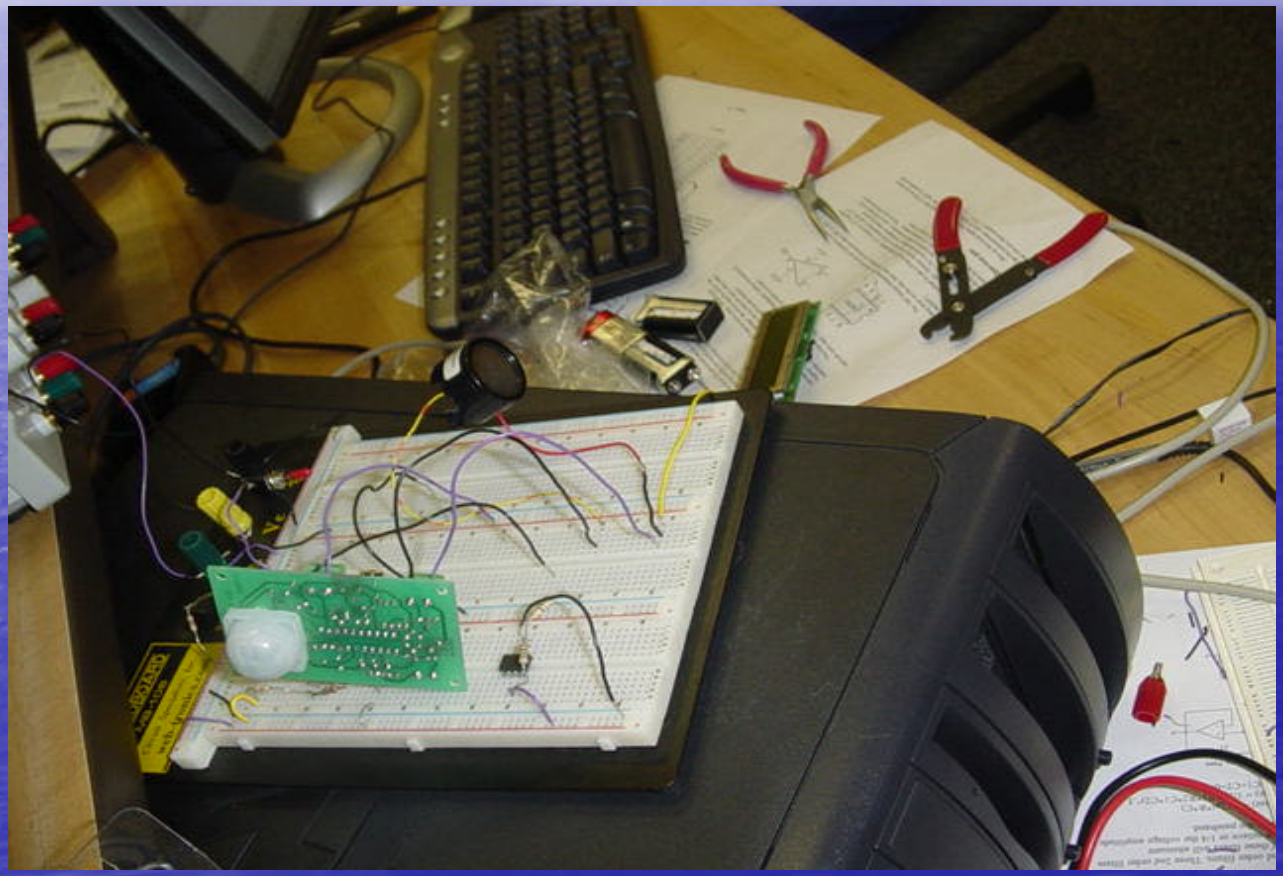
# Project Description

- Infrared motion sensor
- Led indicators inform of an alarm present and designate when motion has been detected
- Switch control will turn on system .
- Keypad will disarm the system.
- (IC KC778B) that contains the pin configuration to control the actual motion detection

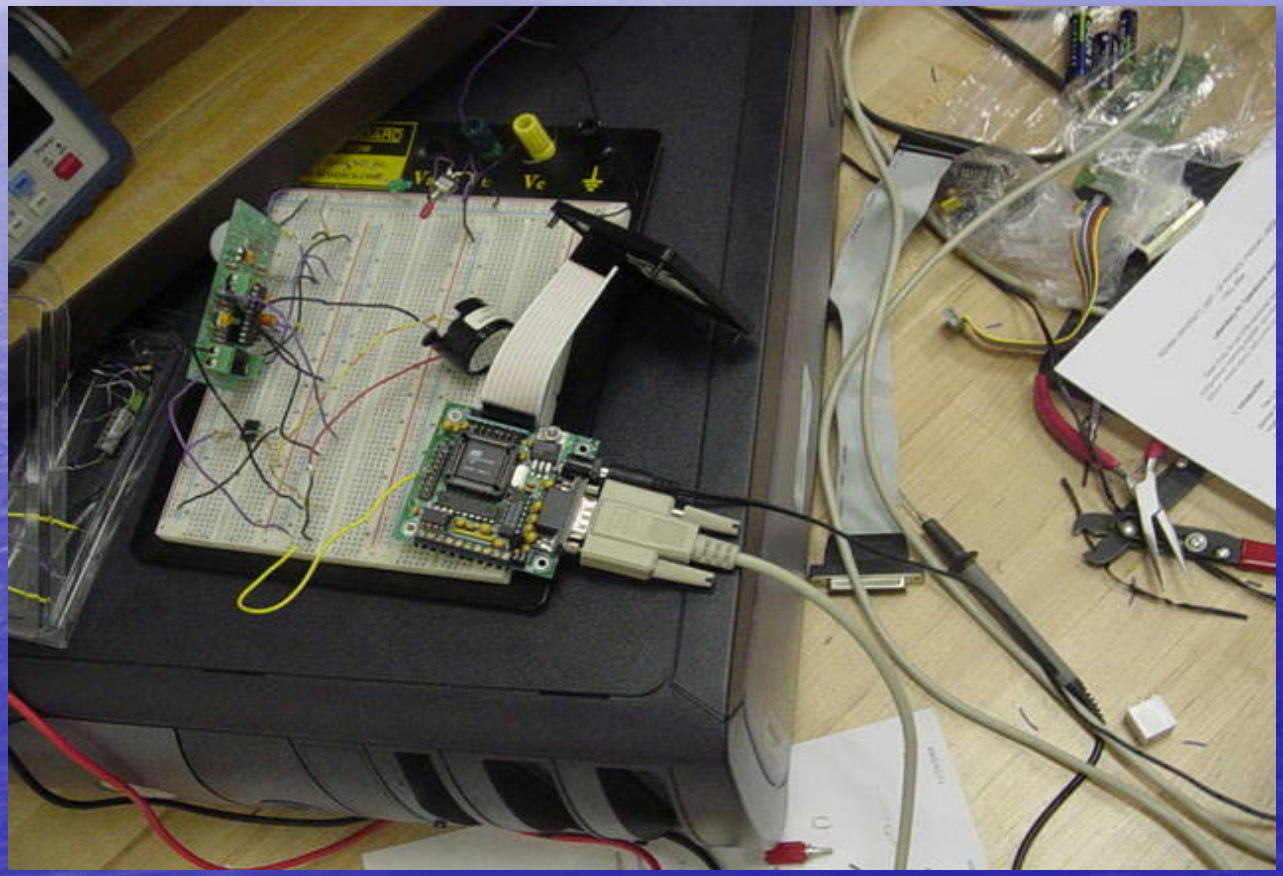
# Motion Sensor Prior to Assembly



# More of Motion Sensor



# Micro-Controller Before Assembly



# Motion Sensor Assembled to Security Area


# Software Design

- Software application entails the use of a microcontroller which will utilize the handling of the program instruction to the system built.  Microcontroller involved will be the 8051 microcontrollers.

- The program will be used to disarm the alarm system after the buzzer is triggered.

# Plan of action

- Brainstorming
- Analysis
- Implementation i.e. hardware construction
- Simulation  i.e.  software testing
- Overall testing

# Project Components

- Micro controller ( 8051 )
- PIR  Detector (RE200B)
- Master PIR Control Chip (KC778B)
- Power supply
- Wires
- 2 Led’s
- Bread board
- Resistors
- Capacitors
- Toggle Switches

# Benefits

- Increased security control
- Convenience
- Relatively inexpensive.
- Provides reliable and efficient  results.

# Testing and Procedures

- Set up a dummy security area
- Turn power supply on
- Allow 1 to 3 minutes for the PIR sensor to warm up
- Walk into the detecting range across the PIR beam and observe the LED indicator. The LED indicator will light up whenever you enter or exit under detecting beams.
- Check if the corresponding ZONE LED on the control panel lights up when you activate the PIR detector set to that zone.

# Project Schedule For Hardware

| | | | |
|---|---|---|---|
| • Brainstorming | 5d | Tue 9/28/04 | Mon 10/4/04 |
| • Idea Concept | 2d | Tue 9/28/04 | Wed 9/29/04 |
| • Idea Preparation | 2d | Thu 9/30/04 | Fri 10/1/04 |
| • Hardware | 7d | Tue 10/5/04 | Wed 10/13/04 |
| • Preparation | 3d | Tue 10/5/04 | Thu 10/7/04 |
| • Assembly | 4d | Fri 10/8/04 | Wed 10/13/04 |
| • Wiring | 1d | Fri 10/8/04 | Fri 10/8/04 |
| • Testing | 2d | Tue 10/12/04 | Wed 10/13/04 |

# Project Schedule For Software

| | | | |
|---|---|---|---|
| • Software | 7d | Thu 10/14/04 | Fri 10/22/04 |
| • Software Design | 3d | Thu 10/14/04 | Mon 10/18/04 |
| • Software Impl. | 2d | Tue 10/19/04 | Wed 10/20/04 |
| • Software testing | 2d | Thu 10/21/04 | Fri 10/22/04 |
| • Completion | 3d | Mon 10/25/04 | Wed 10/27/04 |
| • Final Assembly | 2d | Mon 10/25/04 | Tue 10/26/04 |
| • Final Test | 1d | Wed 10/29/04 | Wed 10/29/04 |

# Cost Analysis

| | |
|---|---|
| Wires | $5.00 |
| LED's | $1.00 |
| Breadboard | $20.00 |
| Motion Sensor | $35.00 |
| Capacitors | $3.00 |
| Resistors | $2.00 |
| Siren | $10.00 |
| Relay | $4.00 |
| Wood | $14.00 |
| Microcontroller | $0.00 (donated) |
| **Total Cost** | **$93.00** |

# Problems Encountered

- Configuring microcontroller to disengage alarm
- Supplying sufficient voltage to properly function the buzzer

# References


- http://www.ami.ac.uk/courses/ami4655_micros/u01/micro01hist.asp
- 8051 Microcontroller and Embedded Systems, The
  by Muhammad Ali Mazidi, Janice Gillispie Mazidi, Muhammed Ali Mazidi
- http://www.aesecurity.com/pir.htm

# Thank you for your time

Questions