TITLE: A DESIGN OF BURGLAR ALARM SYSTEM

PROJECT NO. 053

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INTRODUCTION

˝ In the field of Burglar Alarm Systems using modern approaches has become a major means of providing security in all applications, both military and civilian.

˝ Due to the high state of insecurity being experienced in the entire world, the need to keep the occupants of the houses /offices aware of any intrusion in to their premises forms part of my project.

PROJECT OBJECTIVE

˝ Designing, simulating and implementing a cheap and reliable alarm system using SSI and MSI chips that can detect and warn on external intrusion.

SYSTEM DESIGN

˝The ATmega168 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture.

˝Low Power Consumption thus cheap to maintain can be run by batteries

˝Easy to debug because of few copheriperial components.

˝ Easy to upgrade due to compatibility of AVR microcontrollers

˝Can be produced in small packages that users can be able to configure on their own

˝From the above features of the microcontroller, it is clear that it's easily applicable in security systems as one can store passwords, implement delays with use of timers, connect to computer to monitor status; implement real time clock and many more.
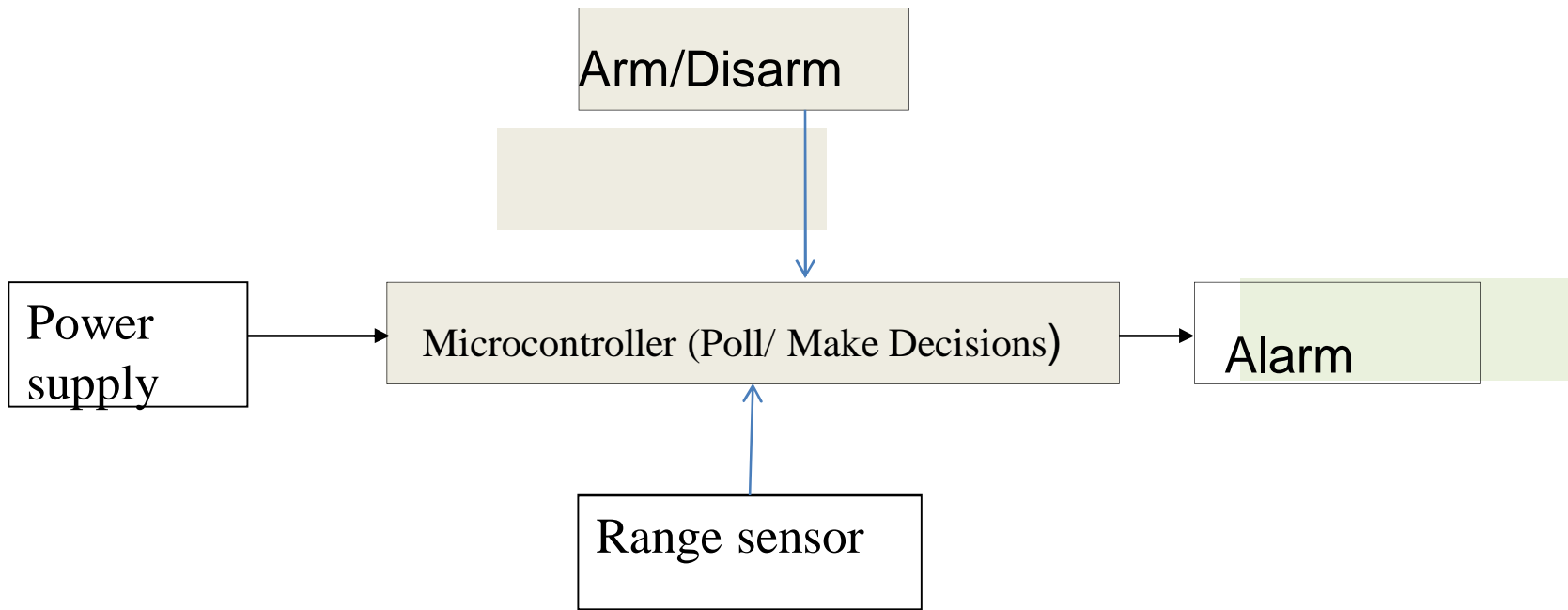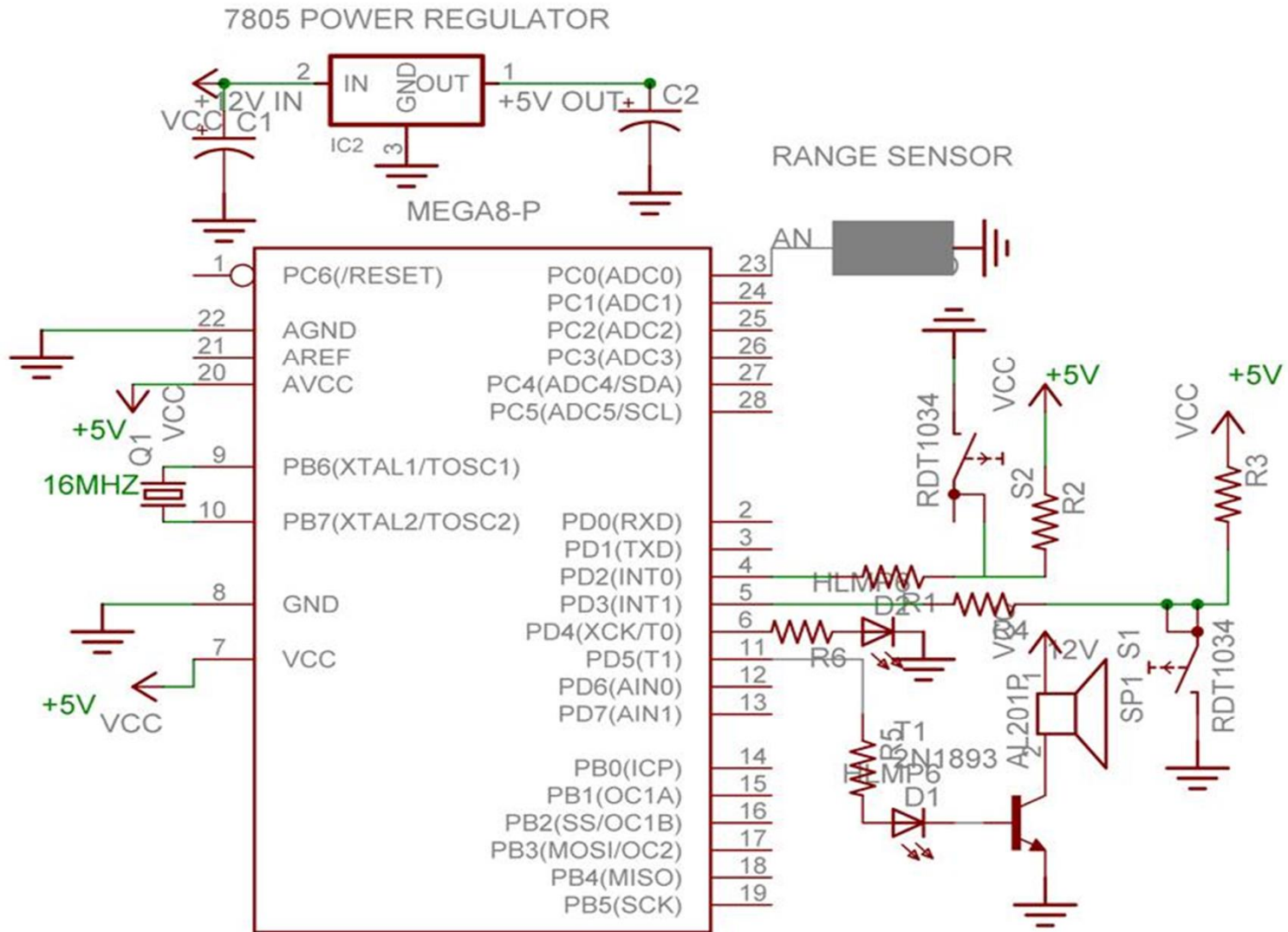
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PROJECT STRUCTURE

˝ Microcontroller

˝ Range Sensor

˝ Arm/Disarm

˝ Alarm

˝ Power supply

PROJECT STRUCTURE

BLOCK DIAGRAM

SCHEMATIC DIAGRAM

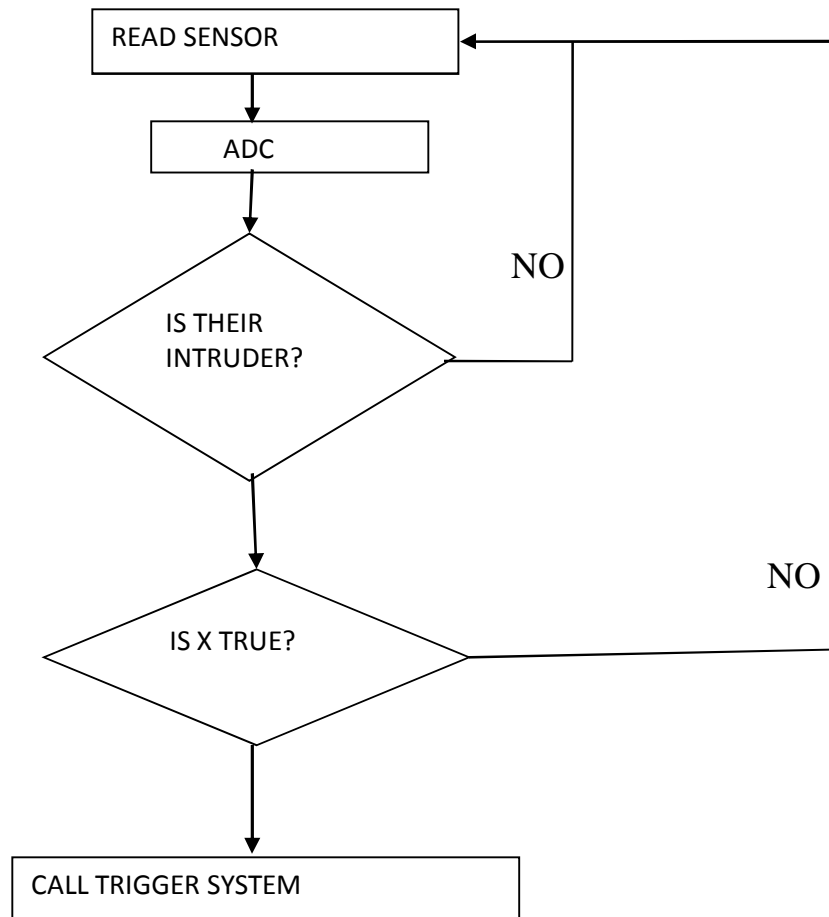7805 POWER REGULATOR

MEGA8-P

RANGE SENSOR

IC1

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SYSTEM DETAILS

˝ Disarming, no LED∮s are activated, so only the IC devices activated. There is some slight variation because the microcontroller∮s current consumption is not constant and fluctuates with the program section being executed.

˝ If the user then presses the Arm button, the armed LED (Green) lights to indicate the change in state. The current consumption at this point increases ,which is predictable as the only increase in load is that of the LED and protective resistor.

˝ In this armed state, if any one causes disturbance within the proximity range, then the microcontroller triggers the Alarm output pin. This is connected to the second status LED(the Alarm LED), and also to the base of the transistor. This fully saturates the transistor and allows enough current to flow to activate the load, which switches ON the load (Alarm)

FLOW CHART

```
READ SENSOR
    │
    ▼
   ADC
    │
    ▼
IS THEIR
INTRUDER?  ──── NO ────┐
    │                  │
    ▼                  │
IS X TRUE?  ──── NO ───┘
    │
    ▼
CALL TRIGGER SYSTEM
```

DESCRIPTION OF FLOW CHART

″ Loop

″ Read sensor

″ Perform analog digital conversion.

″ Compare value read, with a fixed value that determines the proximity of intruder.

″ If value is less than the give value go to loop.

″ If the value is greater check if the system is armed

″ If the system is not armed go to loop. (PD3(INT1) is LOW)

″ If system is armed activate alarm system ó set pin PD5 high

″ Go to loop

″ Interrupts

″ If a signal (HIGH to LOW(Pulse)) is detected at INT0 an interrupt is generated and arms the system

″ If the signal (Pulse)(HIGH to LOW) at INT1 an interrupt is

RESULTS

˝The hex file was Loaded to the microcontroller AT mega 168 then PD2 set LOW

˝In this case there was no effect on the output pins regardless of the condition of the PC0, PD4and PD5 pins.

˝Then setting PD2 HIGH ,PD3 went HIGH simulating a condition that the system is armed. In the same case if PC0 is HIGH then PD5 went high simulating a condition that someone is near the protected area and alarm went on to deter the intruder and warn the occupant.

CONCLUSION

˝ The ideal security system is yet to be designed so far. In this project an attempt has been made to come up with a cheap but effective security for small homes/offices.

˝ Despite all the odds and difficulties encountered in regard to resource availability, all the project objectives were achieved.

˝ The design type chosen here was mainly to deal with average standard Kenyan home/office. To secure large building and compounds this type of design needs to be improved. This could be by use of **addressed sensors** that would be sending information to control unit instead of use of **polling the sensors**. This would enable many sensors to be connected to the microcontroller thus resulting in a stable complex system that cover huge building and include other features such as fire alarm, employee clocking in and out, chemical gas warning and much more.

˝ The design needs a lot of improvement and development before such system can commercially be available.

FUTURE WORK

˝ Use of SMS (short massage services) to send control command as for example to arm or disarm the system.

˝ Use of addressed remote sensors that sends request to the control unit instead of polling damp sensors.

END

˝ QUESTIONS