Team 9
The Tennis Ball Gatherer

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Presentation Outline

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Introduction

- Team nine wanted to create an easier way for tennis ball retrieval
- Provide a better way to keep track of tennis balls

Introduction

- Project Objective : To create a mechanical device that electronically count tennis balls that were gathered by the device

Background

Concerns:

- The team realized that tennis players need a way to gather tennis balls quickly and easily

- Players also need a way to keep track of how many tennis balls that they have, especially when players on adjacent courts are playing at the same time.

- Current devices only allow players to gather tennis balls quickly but do not help them keep track of how many they have.

Product Requirements

- AMTEL 8051 microcontroller
- LCD screen
- 555 timer
- Sharp GP1U581Y Infrared remote receiver
- High-output 5mm Infrared LED
- 6- volt battery
- TB-1 board
- Keypad

Design Alternatives

Mechanical alternatives

- The steel blades could have been made from plastic or wood
- A single handle could have been used
- The steel arms could be made of wood to save cost

Electrical/Software alternatives

- Instead of using a IR diode and photo-transistor a photo-resistor or ultrasonic sensor could be used
- The 40kHz frequency could be developed using assembly rather than using the 555 timer circuit

Design Specifications

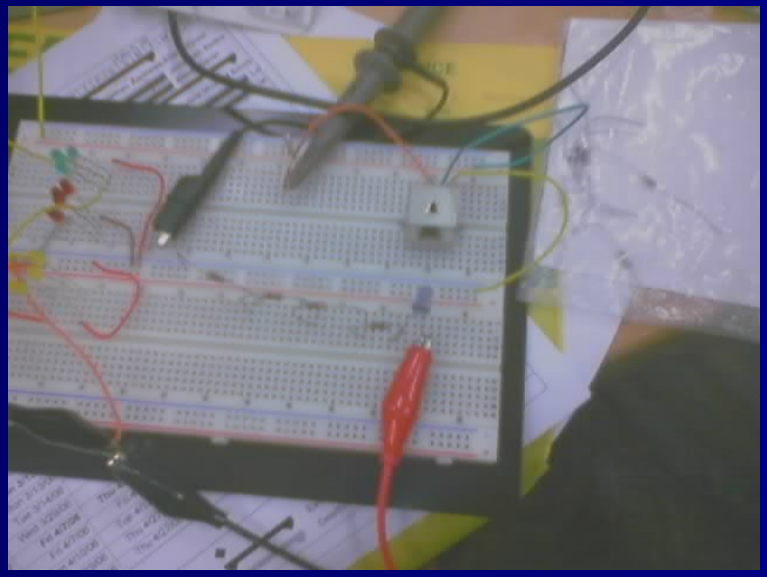

Figure 1 picture of circuitry

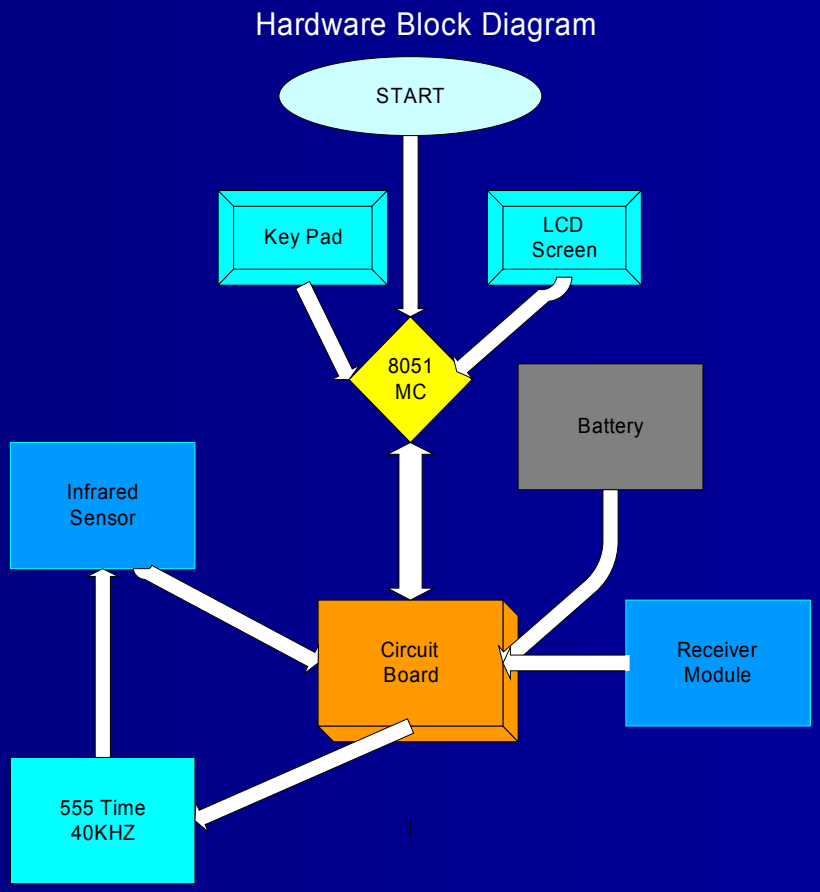

Figure 2 Hardware Block Diagram

Project Description

8051 voltage : 6 Volts

8051 current: .5 Amps

555 IC Vcc : 6 Volts

555 IC output : 39kHz

R1 = 3k ohms

R2 = 2.2k ohms

C = .0047 micro Farads

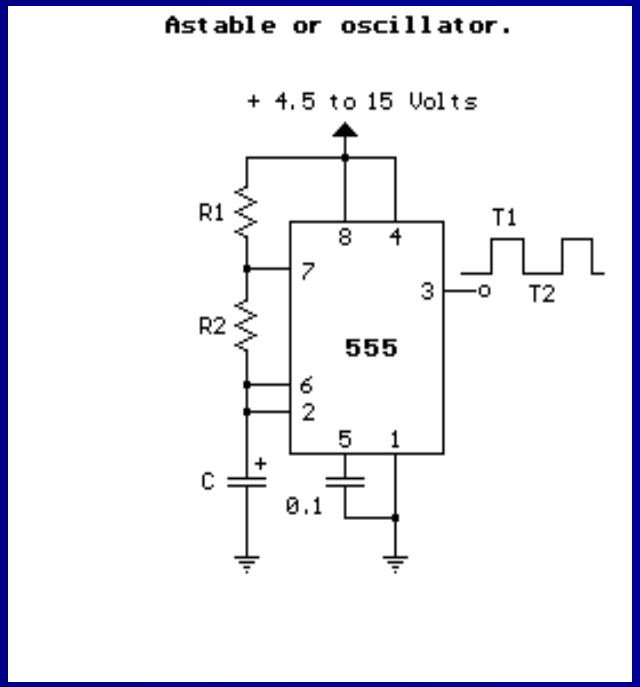

Figure 3 picture of circuitry

Construction Details

- Software
  - Micro-IDE
  - C – language
- Frame
  - See pictures…

Constructions Detail Cont.

Figure 4 Front Bottom View

Constructions Detail Cont.

Figure 5 Front View

Constructions Detail Cont.

Figure 6 Top Frame View

Physical Project

Figure 7 Physical Project

Costs

Estimated project cost: $259.17
Actual project cost: $357.6

Major costs

- 8051 Microcontroller, LCD screen, Keypad: $75
- TB1 training board: $49.95
- 14” Wheel x 2 : $25.16

Barrowed Support tools

- Table saw
- Hand held grinder
- Electric welding unit
- Rivet gun
- Leaf Break (sheet metal press)

References

- Lowes www.Lowes.com
- EPO www.epo-houston.com
- BiPOM
- University of Houston
- United States Patent Office. www.uspto.gov

Questions