Property Protecting Turret

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Prototype of the PPT
• Robotic Sentry gun
• Protects your property
• Fully autonomous
• Shoots with foam darts
• Friendly user interface
• Fully customizable
Tilt Mechanism

Swivel Mechanism

Loyal to the Key

Simple Operation
Usefulness

• Eliminates need for night shift guards
• Compact, can be placed anywhere
• Angle of scan can be adjusted for maximum flexibility
Mechanical Specifications

• Base and turret mostly constructed with wood
• Lego motor for trigger actuation
• Small DC motors for firing
• 3 Servos for:
  – Distance sensor movement
  – Swivel of the turret
  – Tilt of the gun
Electrical Specifications

- Reed switch for trigger motor feedback
- External potentiometer for tilt feedback
- IR Motion Detector
- Ultrasonic Distance Sensor
- User Interface:
  - Serial LCD Screen
  - Encoder
  - Cancel button
Electronic Specifications

- Atmel ATmega328 microcontroller
- USB Interface
- 16Mhz internal oscillator
- 20 I/O pins with built-in resistors
- 6 Channel A2D
- 32KB of Flash
- 2KB SRAM
- 1KB EEPROM
Speaker for UI
USB for Reprogramming
Darlington Transistor for Firing Motor
Relay and Transistor for Trigger Motor
Arduino Microcontroller Board
Hardware Reset
Main Battery Connector

Breakout Board

Labeled and detangled wires
Operation: Setup Mode

- Currently implemented options include
  - Angle of horizontal scan/activity
  - Maximum number of shots fired per target
  - Cool down period interval
Operation: Scanning Algorithm

• Scans area and saves map
• Saved map includes:
  – Distance to objects
  – Uncertainty of readings
• Saves image of area without motion
Operation: Attack Mode

- Constantly monitors area for movement
- Performs quick scan to see what moved
- Shoots target
- Waits for a cool down period
- Returns to monitoring area for movement
Operation: Sanitizing of Readings

- Multiple readings are recorded per location
- Custom hysteresis set for each reading
- Movement is ignored if within threshold