

# AUTOMATIC TENNIS BALL COLLECTOR

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## ABSTRACT

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The automatic tennis ball collector is first designed to reduce the job and energy usage of the tennis players and coaches while they are having their training sessions. This project aims to create a self directed tennis ball collecting device. It sweeps through the tennis court with the help of two DC geared motors and fetches the tennis balls along its way with a rotary blade pickup mechanism using another DC geared motor. The collected tennis balls will then be stored in the robot inventory.

At the heart of this project is the PIC16F877A microcontroller which controls every part of the robot operations. The inputs and outputs of all the sensors and motors are paired with the microcontroller to perform specific actions. In the ball collecting system, a counter is built to calculate the number of balls entering and exiting the inventory. When the inventory is full, a buzzer and an LED are used to alert the user. The project also has a crash prevention system to avoid the robot crashing into the obstacles. In this system, an ultrasonic sensor is used to sense obstacles or blockings. It will signal the microcontroller and turn the robot away from the obstacles and take the next straight path. Additionally, a wireless control camera is installed onto a DC geared motor for visual monitoring.

The project is separated into smaller parts for testing. The testing is done first on the breadboard then on PCB. Each separate part is checked and verified before combining them into one main circuit for final testing. The testing is done successfully and the prototype works well.

*Keywords: DC geared motor, PIC16F877A microcontroller, robot inventory, crash prevention system, obstacles, ultrasonic sensors, wireless control camera, visual monitoring*