

TANKER ROBO FOR VISION BASED SURVEILLANCE SYSTEM

WITH REMOTE ACCESS TO SENSOR IMAGERY

Aim: This project aims at designing control system for a robot such that the unmanned vehicle is controlled using PC and wireless RF communication. In this project the controlling is done depending on the feedback provided by the IR sensor, which is the part of object detection circuit.

Description:

The project contains different modules such as

- Object detection and angle determination in the path using IR sensor.
- Obstacle avoidance and enemy detection.
- Design of RF circuits for data transfer and camera interface.

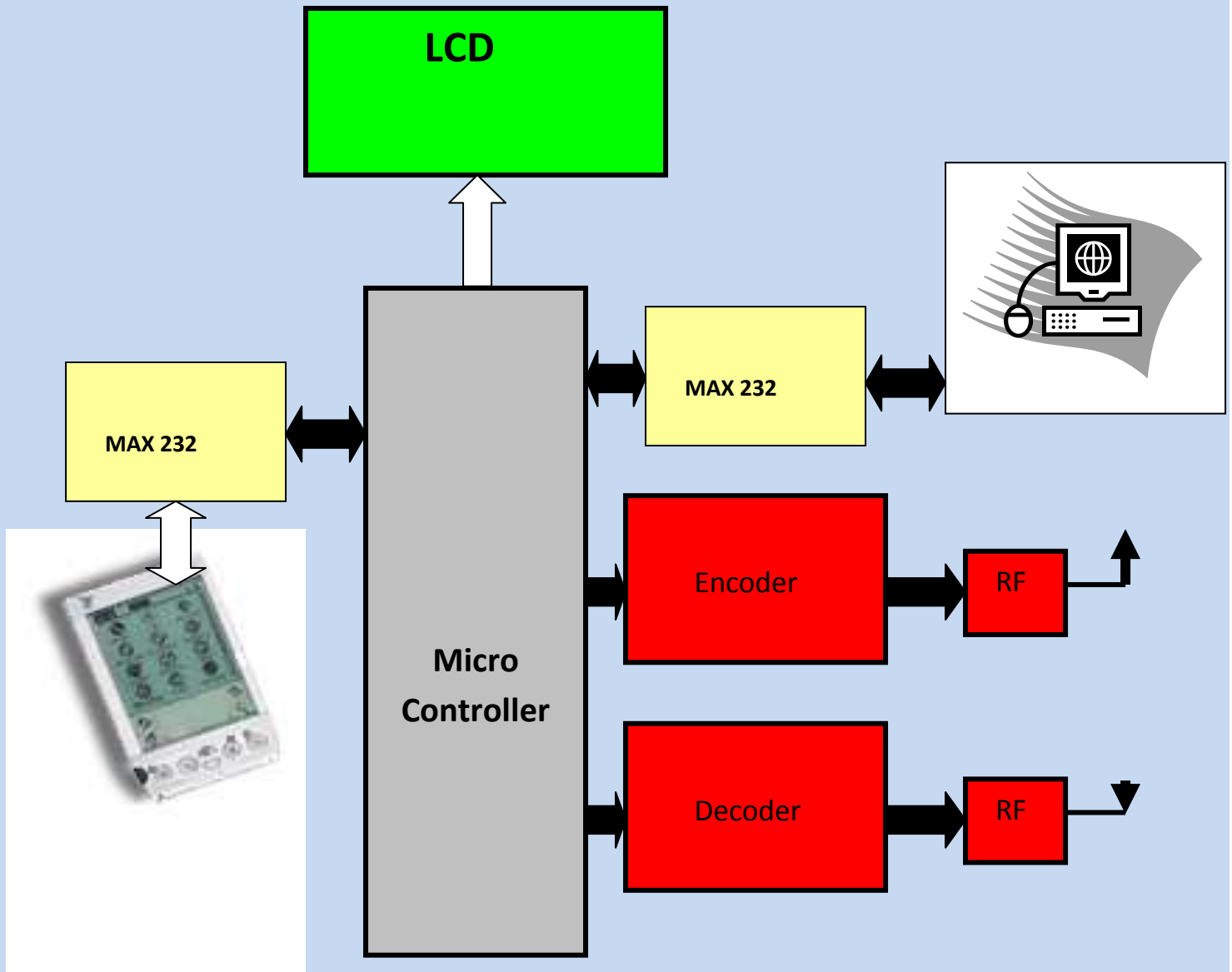
In the object detection module when the AT89c2051 micro controller is powered up the stepper motor starts rotating at 360-degree arc. The IR sensor is mounted on stepper motor. When an object is detected by the IR sensor the microcontroller stops the robot and stepper motor.

The video camera mounted on the stepper motor starts transmitting the object picture continuously. Here the IR sensor consists of IR transmitter and receiver .the IR transmitter is a led and receiver is detected the object and receive the IR pulse. Here the frequency used is 38 kHz. The angle detected is sent to PC using RF communication. The rotation of each step is calculated in to each step. From PC keyboard to control the speed, left and right control key value is sending through Serial port. The printer port is connected into RF Encoder circuits and RF Transmitter.

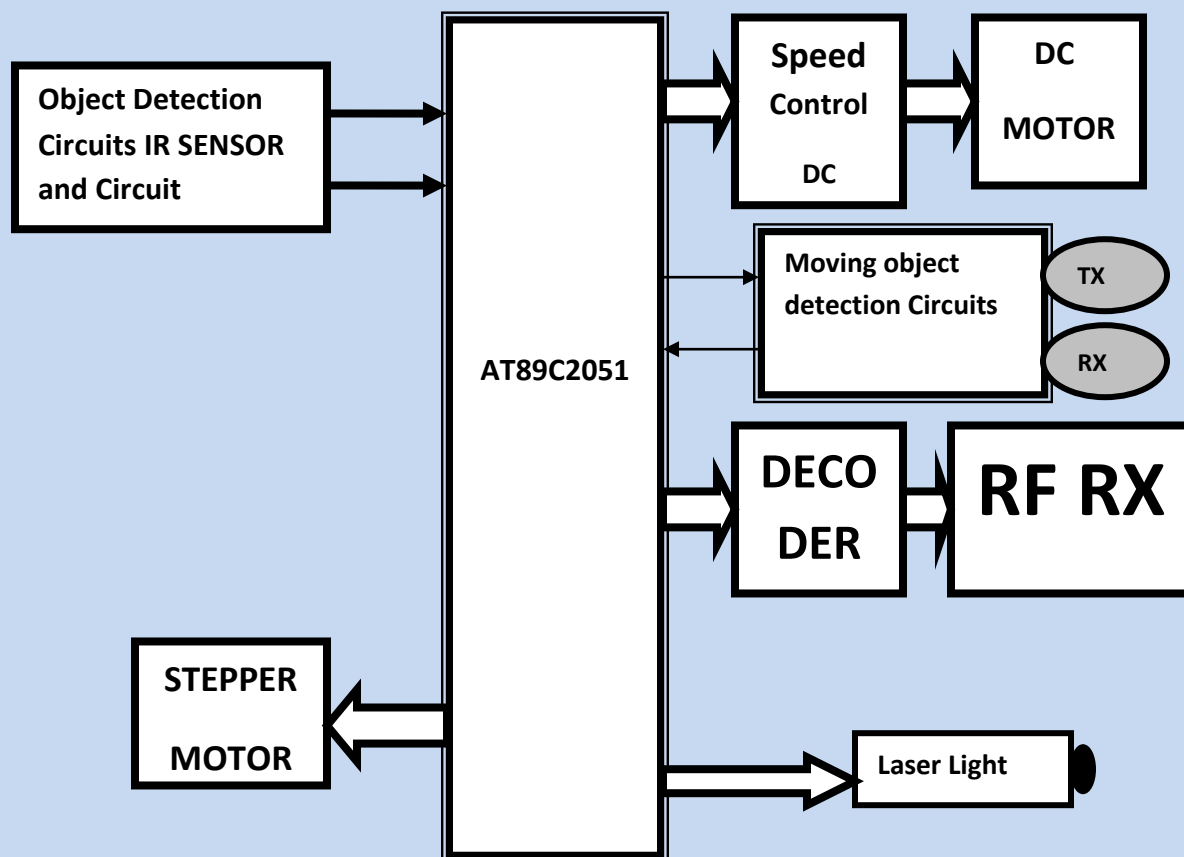
The data transmission is happened in 4-bit communication. PC key entering value is sending to RF. The value will receive into the RX-RF and compare of each value and control all steps. But IR it will work under object detection and controller will shoot or enable the Laser Light.

In the RF circuit design two pairs of RF transmitter and receiver are used. One set is used for communication between AT89c2051 micro controllers.

Block Diagram of PC Control Unit:



BLOCK DIAGRAM OF VEHICLE CONTROLLER CIRCUITS:

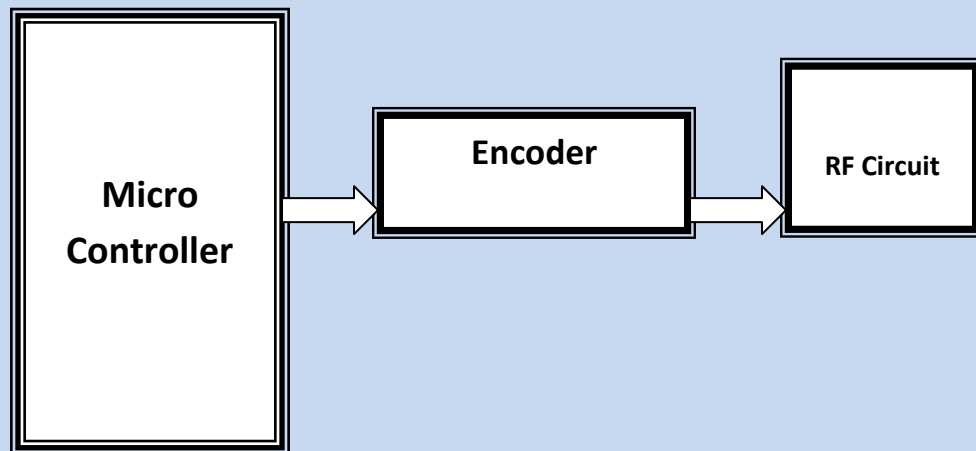


FUNCTIONING OVERVIEW OF VEHICLE CONTROLLER CIRCUITS:

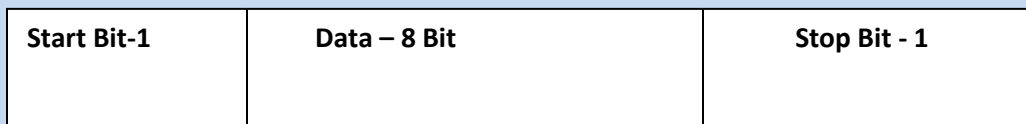
The Main Micro Controller is Connected into Object detect circuits, Moving Object Detect circuits, Speed Control Circuits, Video Camera with Angle detection of 360 degree circuits, Laser control circuits and RF Receiver circuits, Which is communicating to PC Using RF Communication.

- When the vehicle will move in the any area automatically will detect the object through object detect IR circuits. If Object is detected it will track the other path.
- When Moving Object is detected then it will decide which is enemy or our army person.
- If its enemy, the object is moving object then the micro control will read the data if the RFID is not matching else no enemy (RFID value is matched) detected the vehicle will moving to detect other object, Which contains IR TX and RX using 38KHZ and 40KHZ.
- If the enemy is detected then it will shoot to the moving object / enemy through Laser beam and it will pass sleeping Gas.
- The stepper motor will rotate 360-degree angle, when the object is detected then it will send the angle to PC using RF communication.
- DC motor Driver used to control the RPM (Speed), forward and Reverse of the Vehicle.
- Another DC motor is used to Control the Left and Right controller.
- When the object will detect, then the Sensor will sense the object and where ever the object will move the motor will move in to the object moving places.
- All control Data will controlling from PC using RF Communication.

RF ID:



Here will store ID number then always will send the ID value through RF TX in 433MHZ frequency.



Frame format of RFID

Advantages:

- 1) Moving Object Detection of Enemy and Obstacle.
- 2) Auto Detect and Shooting
- 3) Angle Detection
- 4) Speed Control
- 5) Wireless image TX and RX system.
- 6) RFID for Enemy detection
- 7) Compact Vehicle
- 8) Real Time mode.

Future of this System:

- 1) Image Process of Enemy detection
- 2) Path finding and Tracking