

## “Aircraft Detection & Missile Firing System”

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**Abstract:** Nowadays PIR Sensor is new research area, in place of RADAR system PIR Sensor is best option in military area. In this paper using PIR Sensor we detect foreign enemy Aircraft and missile and destroy them. Using 8051 PIR sensor laser Diode and stepper motor controller for detecting object in 180° and firing the same in 180°.

The present project relates to scanning of the sky to detect movement of objects in the sky. In the past, radar has been used for scanning the sky from the ground to detect moving target. Radar is an active system that is; it employs transmitted and received signals in its operation. However, passive systems which do not use transmitted signals are preferred they are less vulnerable to detection and jamming. Thus infrared sensing has been employed in detection.

The problem of screening images of the skies to determine whether or not aircraft are present is to both theoretical and practical interest. After the most prominent signal in an infrared image of the sky is extracted, the question is whether the signal corresponds to an aircraft

**Keywords:** PIR Sensor, 89c51 microcontroller.

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### I. Introduction

Radar is an active system that is; it employs transmitted and received signals in its operation. However, passive systems which do not use transmitted signals are preferred because they are less vulnerable to detection and jamming. Thus infrared sensing has been employed in detection.

An aircraft detection system including passive sensing means for receiving electromagnetic radiation from a moving object and generating intensity signals representative of the received radiation, and processing means for subtracting said intensity signals to obtain a differential signature representative of the position of said moving objects.

In this PIR sensor is mounted on motor which continuously rotates to scan presence of aircraft. On detection of aircraft it sends signal to microcontroller to which another motor is attached. On this LASER gun is mounted which activates to indicate launch of missile. Extensive development efforts have been invested in unmanned systems, which are gradually being integrated into modern warfare. This principal of UGS system is used by the US military.

### II. Literature Survey

Extensive development efforts have been invested in unmanned systems, which are gradually being integrated into modern warfare. Many companies displayed unmanned systems technologies at Eurosatory 2006, including small and miniature aerial vehicles (UAVs), unmanned ground vehicles (UGVs) of various sizes. Developers exhibited models of both types designed for carrying remotely operated systems, sensors and weapons. The exhibition provided a venue to introduce several new systems.

This principal unmanned ground system (UGSs) system used by the US military is the AN/GSR-8 i.e. Remotely Monitored Battle field Sensor System (REMBASS II), which detects, classifies and determines the direction of movement of intruding aircrafts and vehicles. The system uses three basic sensor transducers, including a basic seismic/acoustic multi-sensor, which can be fitted with passive infrared (PIR) or magnetic plug-in modules. Each unit has a different coverage.

Radar jamming and deception is the intentional emission of radio frequency signals to interface with the operation of a radar by saturating its receiver with noise or false information. There are two types of radar jamming are there. They are as follows:

- 1) Mechanical Jamming
- 2) Electronic Jamming

**MECHANICAL JAMMING:** Mechanical jamming is caused by devices which reflect or re-reflect radar energy back to the radar to produce false target returns on the operator's scope. Mechanical jamming devices include chaff, corner reflectors and decoys.

**ELECTRONIC JAMMING:** Electronic jamming is a form of Electronic Warfare where jammers radiate interfering signals towards an enemy's radar, blocking the receiver with highly concentrated energy signals. The two main technique styles are noise techniques and repeater techniques. The three types of noise jamming are spot, sweep, and barrage.

### III. Development Of System

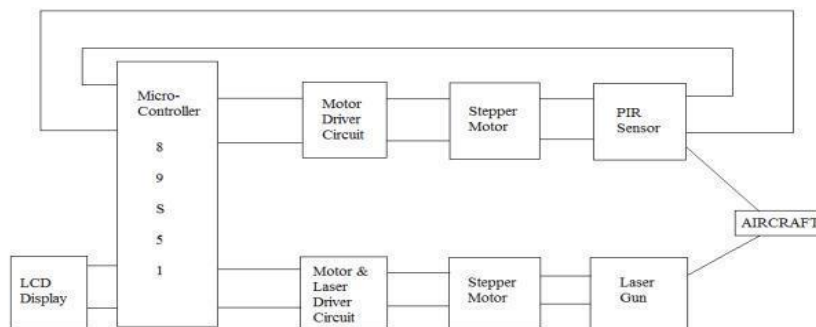


Figure 1. Block diagram of system

#### WORKING OF CIRCUIT:

As shown in block diagram this system is used for aircraft detection purpose. This system consist of PIR(passive infra-red) sensor which detects an object rather aircraft by receiving electromagnetic radiation from a moving object and generating intensity signals representative of the received radiation and a processing system for subtracting the intensity

signals to obtain a differential signature motor. This motor is driven by motor driver circuit which is connected to the microcontroller.

The stepper motor on which PIR sensor is mounted rotates in particular direction. So, that PIR sensor will detect presence of aircraft in its range. When an aircraft gets detected PIR sensor will produce small electrical signals which will activate relay which is attached to it. This relay is connected to microcontroller. On receiving signal from relay microcontroller detects presence of target.

Scanning system mounted along first and second paths with the detectors receiving infrared radiation from objects in the two paths. One path is a small angle ahead of the sensor, and the second path is the same as the first path when the aircraft is directly above it. Electronic circuit means compares the infrared information in the two paths to determine whether "hot" objects are in the same place in both paths, and if they are not, it is known that one or more objects are moving objects.

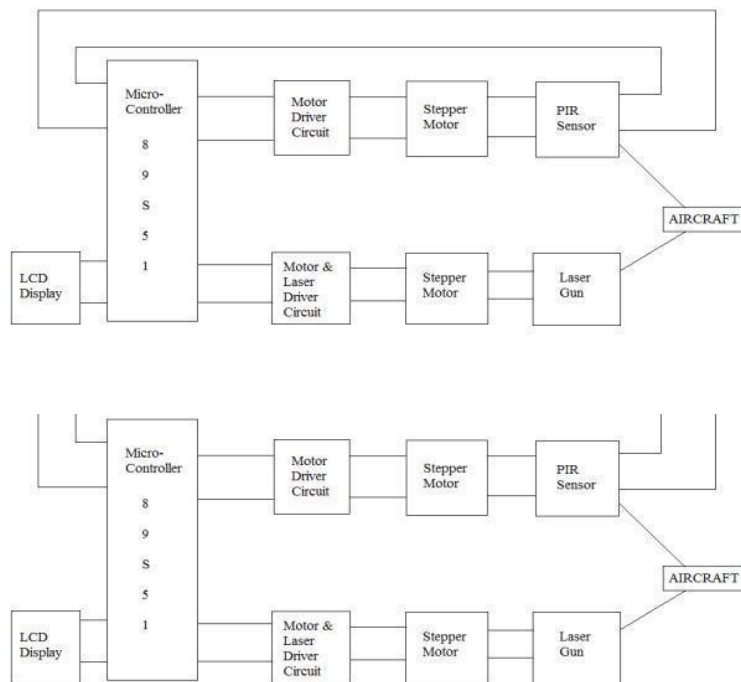
On detection of object a feedback signal will be given to microcontroller by relay. On receiving feedback signal it will display 'target detected' on LCD.

Simultaneously, it will activate another stepper motor in the direction of target which is connected to motor driver circuit to which LASER gun is connected. This LASER gun will be activated by LASER driver circuit which consists of lion makes relay & freewheeling diode, which indicates launching of missile. On activation of LASER it will display on LCD 'missile fired'.

When the missile is fired after that both motors start rotating and gets back to original positions and the process repeats.

### IV. Advantages

1. This system is a passive system.
2. It is an unmanned system.
3. It covers a large area for detection than present system.



## V. Conclusion

It is an actually unmanned system which is mostly useful for security and military applications. Instead of sending the soldier to battlefield we can use this system.

## Applications

1. In Military purposes: To locate air and ground target.
2. In aviation, aircraft are equipped with PIR system.
3. In private sectors for security purposes.

## VI. Future Scope

1. This system can overcome by using Digital signal processing system
2. Such system will Established in Battle field restricted area.

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