IMPLEMENTATION OF BORDER ALERT SYSTEM BY USING INVISIBLE TANKER IN MILITARY FIELD

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ABSTRACT:

As the potential for disastrous consequences from threats increases in prevalence, the speed which such cyber threats can occur presents new challenges to understandings of self-defense. This paper first examines the prevention of threats nations could face. It next looks at existing concepts of self-defense with particular focus on anticipatory and preemptiveself-defense, and then moves to a review of the underlying criteria which govern the right to resort to such actions. Highly sophisticated electronic sensors attached to the tank's hull will project images of the surrounding environment back onto the outside of the vehicle enabling it to merge into the landscape and evade attack . The electronic camouflage will enable the vehicle to blend into the surrounding countryside in much the same way that a squid uses ink to help as a disguise . Unlike conventional forms of camouflage, the images on the hull would change in concert with the changing environment always insuring that the vehicle remains disguised.

KEY WORDS: sophisticated tanker, militarytanking, findingobjects, automatic field controller.

I.INTRODUCTION

In this proposed system,the tanker is used to detect the obstacle by capturing the border alert using camera and there is a need of man power to control the machinery.The major dis advantage is the machine is visible and need an man power to control the machine.Our aim is to construct an invisible sophisticated tanker.we are introducing a sophisticated tanker which senses the movement in border area without manpower and launches its tube towards the target. Also by using screen and lens over the machine, it has been invisible by adapting towards the environment.

II.SYSTEM OVERVIEW

In this project,We design a tanker that will be change the color pattern depends on the environment . Every process will be handled and controlled by microcontroller(PIC series).Field instruments such as ultrasonic sensor used to find object movement and range . Depends on the feedback of ultrasonic sensor , the servo motor will turn the launching tube towards the target .Metal sensor used to find the landmine . Selection switch will design the mode to be operated. The proposed system helps to prevent maintenance and human loss by providing invisible mechanism.It senses the obstacles by sensor and allows the launching tube towards the target. In this system we are introducing a sophisticated tanker which senses the movement in border area without manpower and launches its tube towards the target. Also by using screen and lens over the machine, it has been invisible by adapting towards the environment.

III.PROPOSED SYSTEM

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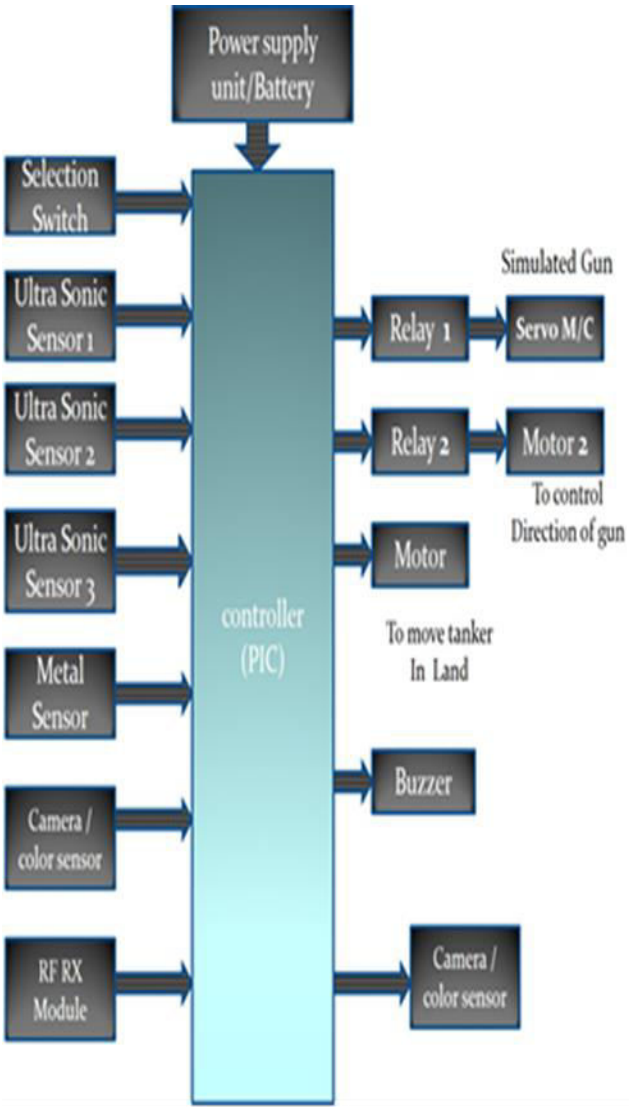


Fig.Block Diagram

IV: HARDWARE DETAILS

1.PIC MICROCONTROLLER

PIC is a family of Harvard architecture microcontrollers made by Microchip Technology, derived from the PIC1650 originally developed by General Instrument's Microelectronics Division. The name PIC initially referred to "Peripheral Interface Controller".
PICs are popular with both industrial developers and hobbyists alike due to their low cost, wide availability, large user base, extensive collection of application notes, availability of low cost or free development tools, and serial programming (and re-programming with flash memory) capability.

1.1DEVICEOVERVIEW

This document contains device specific information about the following devices:

PIC16F873A/876A devices are available only in 28-pin packages, while PIC16F874A/877A devices are available in 40-pin and 44-pin packages. All devices in the PIC16F87XA family share common architecture with the following differences:

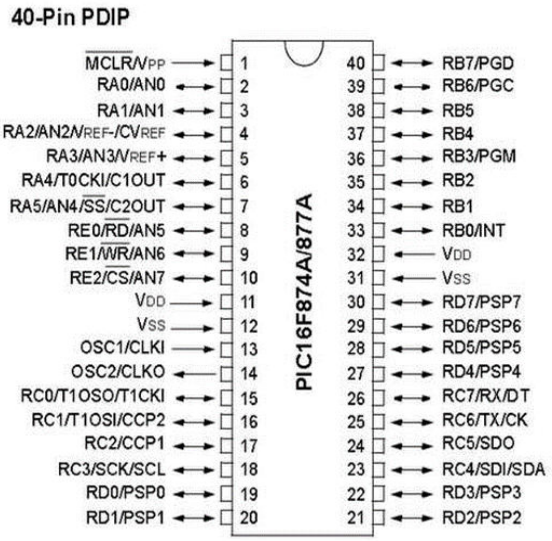
- The PIC16F873A and PIC16F874A have one-half of the total on-chip memory of the PIC16F876A and PIC16F877A.
- The 28-pin devices have three I/O ports, while the 40/44-pin devices have five.
- The 28-pin devices have fourteen interrupts, while the 40/44-pin devices have fifteen.
- The 28-pin devices have five A/D input channels, while the 40/44-pin devices have eight.
- The Parallel Slave Port is implemented only on the 40/44-pin devices

1.2.MEMORY ORGANIZATION

Program Memory Organization

The PIC16F87XA devices have a 13-bit program counter capable of addressing an 8K word x 14 bit program memory space. The PIC16F876A/877A devices have 8K words x 14 bits of Flash program memory. Accessing a location above the physically implemented address will cause a wraparound.The Reset vector is at 0000h and the interrupt vector is at 0004h.

1.3.PIN CONFIGURATION



2.ULTRASONIC SENSOR

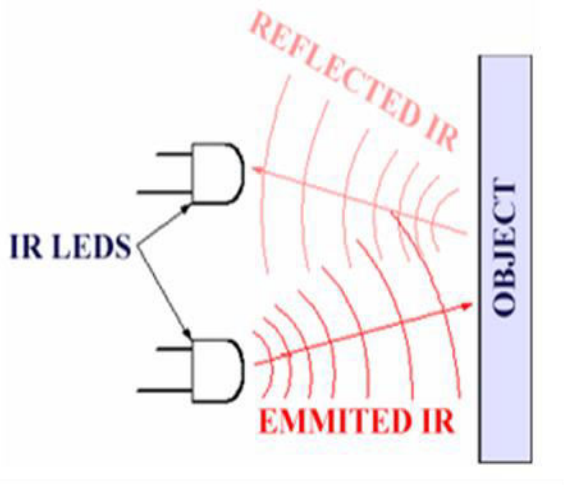
Infrared (IR) light is electromagnetic radiation with a wavelength longer than that of visible light, measured from the nominal edge of visible red light at 0.74 micrometers (μm), and extending conventionally to 300 μm. These wavelengths correspond to a frequency range of approximately 1 to 400 THz, and include most of the thermal radiation emitted by objects near room temperature. Microscopically, IR light is typically emitted or absorbed by molecules when they change their rotational-vibration movements.

Infrared light is used in industrial, scientific, and medical applications. Night-vision devices using infrared illumination allow people or animals to be observed without the observer being detected. In astronomy, imaging at infrared wavelengths allows observation of objects obscured by interstellar dust. Infrared imaging cameras are used to detect heat loss in insulated systems, observe changing blood flow in the skin, and overheating of electrical apparatus.

An infrared sensor is an electronic device that emits and/or detects infrared radiation in order to sense some aspect of its surroundings. Infrared sensors can measure the heat of an object, as well as detect motion. Many of these types of sensors only measure infrared radiation, rather than emitting it, and thus are known as passive infrared (PIR) sensors.

Most motion detectors are fitted with a special type of lens, called a Fresnel lens, on the sensor face. A set of these lenses on a motion detector can focus light from many directions, giving the sensor a view of the whole area. Instead of Fresnel lenses, some motion detectors are fitted with small parabolic mirrors which serve the same purpose.

An infrared sensor can be thought of as a camera that briefly remembers how an area's infrared radiation appears. A sudden change in one area of the field of view, especially one that moves, will change the way electricity goes from the pyroelectric materials through the rest of the circuit.



This will trigger the motion detector to activate an alarm. If the whole field of view changes temperature, this will not trigger the device. This makes it so that sudden flashes

of light and natural changes in temperature do not activate the sensor and cause false alarms.

Infrared motion detectors used in residential security systems are also desensitized somewhat, with the goal of preventing false alarms. Typically, a motion detector like these will not register movement by any object weighing less than 40 pounds (18 kg). With this modification, household pets will be able to move freely around the house without their owners needing to worry about a false alarm. For households with large pets, sensors with an 80-pound (36 kg) allowance are also made.

3.SERVO MOTOR

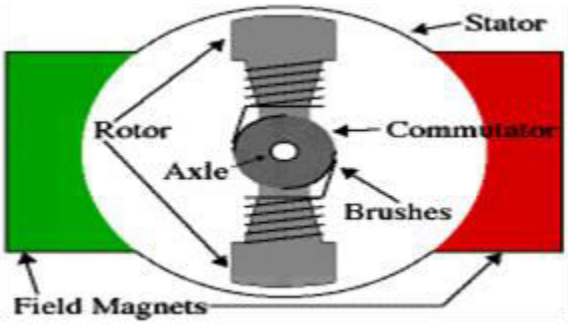
A DC motor is an electric motor that runs on direct current (DC) electricity. DC motors were used to run machinery, often eliminating the need for a local steam engine or internal combustion engine. DC motors can operate directly from rechargeable batteries, providing the motive power for the first electric vehicles. Today DC motors are still found in applications as small as toys and disk drives, or in large sizes to operate steel rolling mills and paper machines. Modern DC motors are nearly always operated in conjunction with power electronic devices.

Fig.servo motor

3.1. MOTOR PRINCIPLES OF OPERATION

In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. As you are well aware of from playing with magnets as a kid, opposite (North and South) polarities attract, while like polaritiesrepel. The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion.

Every DC motor has six basic parts -- axle, rotor (a.k.a., armature), stator, commutator, field magnet(s), and brushes. In most common DC motors (and all that Beamers' will see), the external magnetic field is produced by high-strength permanent magnets1. The stator is the stationary part of the motor -- this includes the motor casing, as well as two or more permanent magnet pole pieces. The rotor (together with the axle and attached commutator) rotates with respect to the stator. The rotor consists of windings (generally on a core), the windings being electrically connected to the commutator. The above diagram shows a common motor layout -- with the rotor inside the stator (field) magnets.



The geometry of the brushes, commutator contacts, and rotor windings are such that when power is applied, the polarities of the energized winding and the stator magnet(s) are misaligned, and the rotor will rotate until it is almost aligned with the stator's field magnets. As the rotor reaches alignment, the brushes move to the next commutator contacts, and energize the next winding. Given our example two-pole motor, the rotation reverses the direction of current through the rotor winding, leading to a "flip" of the rotor's magnetic field, driving it to continue rotating.

The use of an iron core armature (as in the Mabuchi, above) is quite common, and has a number of advantages2. First off, the iron core provides a strong, rigid support for the windings -- a particularly important consideration for high-torque motors. The core also conducts heat away from the rotor windings, allowing the motor to be driven harder than might otherwise be the case. Iron core construction is also relatively inexpensive compared with other construction types.

But iron core construction also has several disadvantages. The iron armature has a relatively high inertia which limits motor acceleration. This construction also results in high winding inductances which limit brush and commutator life.

In small motors, an alternative design is often used which features a 'coreless' armature winding. This design depends upon the coil wire itself for structural integrity. As a result, the armature is hollow, and the permanent magnet can be mounted inside the rotor coil.

Coreless DC motors have much lower armature inductance than iron-core motors of comparable size, extending brush and commutator life.

4. RELAY

A relay is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism mechanically, but other operating principles are also used. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits, repeating the signal coming in from one circuit and re-transmitting it to another. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contactor. Solid-state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults; in modern electric power systems these functions are performed by digital instruments still called "protective relays".

4.1. Relay Working Principle:

When a coil of wire is wound on a non magnetic material such as plastic, paper etc., it is called a air-core solenoid or simply a solenoid .if a soft iron core is inserted into the coil, it becomes an electromagnet. This electromagnet is the basic component for relay and many other electromechanical devices such as electric bell, circuit breaker etc,.

5.METAL DETECTOR SENSOR

Here is a simple metal detector with TDA2822 and few NPN transistors. There is a small arrow connected from the Emitter of the T3 to the 10n Capacitor C4. That arrow is simply indicating signal flow as right to left

in that particular wire, which is different from the remaining circuit's left to right.

1) The most critical component is the coil L1. The text says 15 turns and the schematic says 20 turns. I suppose either will work, but VC1 will be different. I would try 15 turns first.

2) VC1 is 0-22pF. A 0pF minimum is unnecessary, and it would be a difficult to find part. With a 15 turn coil, the nominal setting for VC1 is about 18pF, so a 5-15pF part in parallel with a 5 or 10pF fixed capacitor will be easier to find and easier to adjust.

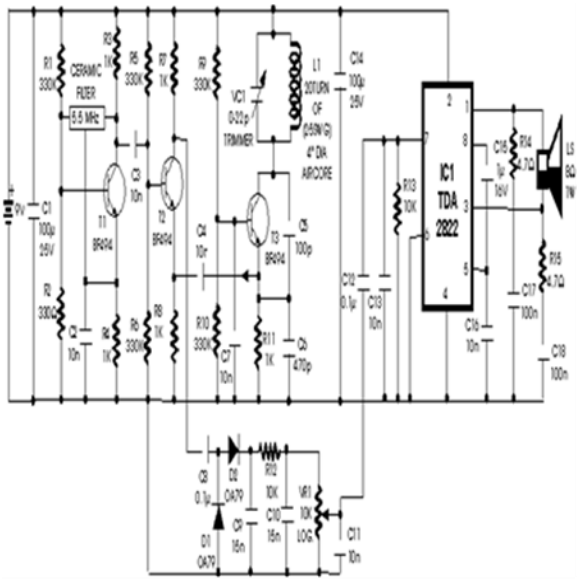
3) The 4 inch coil and 5.5MHz operating frequency will give a very limited detection distance. Might be good for finding nails in the wall, behind the plaster.

4) The oscillator V+ should be regulated and isolated from the audio amplifier. Otherwise zero beat will interact with the audio, since the audio amplifier can draw a few hundred mA.

5) R2 value (330R) is wrong. It would prevent T1 from ever conducting. Maybeit's 330K.

6) C11 and C13 are basically in parallel. VR1/C11/C13 low pass frequency varies from infinity to 5 kHz with the volume setting.

7) The power bypass capacitors C1 and C14 are unlikely to be effective at the 5.5MHz operating frequency. The detection oscillator will tend to lock on the ceramic filter's frequency. The circuit needs a few 0.1uF (100n) caps to filter the oscillator V+.



V. APPLICATION

- To reduce human loss in battle field.

- Fully automated and decision making based on sensor.
- To provide good alternative solution for battle field.
- Making invisible depends on the environment.
- Sophisticated field instrument

VI.ADVANTAGES

- Automatic decision making.
- Less man power.
- Prevents loss of human in battle field.
- Survillance and monitoring

VII . RESULT

In this project, we design a tanker that will be change the colour pattern depends on the environment . Every process will be handled and controlled by microcontroller(PIC series).Field instruments such as ultrasonic sensor used to find object movement and range . Depends on the feedback of ultrasonic sensor , the servo motor will turn the launching tube towards the target .Metal sensor used to find the landmine . Selection switch will design the mode to be operated.

VIII. CONCLUSION

In this project, design and implementation of invisible border alert system in military system were presented .A prototype was successfully developed and tested to establish the proof of concept. The algorithms were tested and found to be accurate and reliable at thisdeveloped/development stage. The novel aspect of the design is its low cost. This is an enormous improvement over existing
commercial products. It is very easy to save our country.

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