Terrorist Scanner Radar with Military Headquarter Informing System

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Abstract: - Mainly for defense industries, Government is spending a lot of money for the security of the border of the nation, at the sea boundary and in air. For security purpose pilot lamps are also used but maintenance of it is very difficult i.e. to rotate them in all directions is very difficult. Thus in any entry restricted area like defense, military it is difficult to provide twenty-four hours security. To tackle all these types of problem there is a need of automatic firing equipment or system like "Terrorist Scanner Radar with Military Headquarter Informing system" in `the border of defense. Thus by scanning the entry-restricted area on the border if any obstacle is found it will fire automatically. In today's world, security system is becoming more advanced. There are various security systems available such as cordless transmitter and receiver, long-range firing equipment, Auto bomb blaster etc.Mainly our project " Terrorist Scanner Radar with Military Headquarter Informing system " consists of the concept of designing security system for the border. Here keeping the view of security system require for the border, is to scan the border of the entry restricted area in the border and if it found any obstacle, it will fire automatically.

I. INTRODUCTION

In today's world, security system is becoming more advanced. There are various security systems available such as cordless transmitter and receiver, long-range firing equipment, Auto bomb blaster etc. Mainly our project " Terrorist Scanner Radar with Military Headquarter informing system" consists of the concept of designing security system for the border. Here keeping the view of security system require for the border, is to scan the border of the entry restricted area in the border and if it found any obstacle, it will fire automatically .The hardware of the project mainly consists of ultra wave transmitter, receiver. Motor control circuit, firing and display circuit for the display of the found obstacles. Mainly ultrasonic transmitter and receiver are designed for 40 KHz frequency range because these range of frequencies can by easily used for long distance communication. To keep watch on the border area, continuous scanning is very essential. By rotating the motor throughout the range of border along with limit switches the area can be scanned. The range used is up to 1 to 1.5 meters scanning of the border area is continuous .In the scanning path, if any obstacle or enemy found or detected then firing starts & control action takes place. In the control action; at the particular instant the motor automatically stops and the firing circuit comes in to picture and it continuously starts firing depending upon the time constant. Firing will continue and this time period is much larger so there is no possibility that any obstacle or enemy will remain in existence.

II. AIM OF THE PROJECT

Mainly for defense industries, Government is spending a lot of money for the security of the border of the nation, at the sea boundary and in air. For security purpose pilot lamps are also used but maintenance of it is very difficult i.e. to rotate them in all directions is very difficult. Thus in any entry restricted area like defense, military it is difficult to provide twenty-four hours security. To tackle all these types of problem there is a need of automatic firing equipment or system like "Terrorist Scanner Radar with Military Headquarter Informing system" in `the border of defense. Thus by scanning the entry-restricted area on the border if any obstacle is found it will fire automatically.

III. SCOPE OF THE PROJECT

There is saying "Necessity is the mother of invention". Which, in a more advanced version would read "Application drives the Technology". Going by those lines, we would like to highlight some area of work where our project has potential use. Our project is mainly based on radar principle. RADAR is a system that uses radio waves to detect, determine the direction and distance and/or speed of objects such as aircraft, ships, terrain or rain and map them. A transmitter emits radio waves, which are reflected by the target, and detected by a receiver, typically in the same location as the transmitter. Although the radio signal returned is usually very weak, radio signals can easily be amplified, so radar can detect objects at ranges where other emission, such as sound or visible light, would be too weak to detect. Radar is used in many contexts, including meteorological detection of precipitation, air traffic control, police detection of speeding traffic, and by the military.

These applications are possible due to some of the advantages of our work. They are as follows:

1. A number of parameter can be controlled at a same time.
2. There is reduction in wiring due to ultrasonic frequency.
3. With this system it is possible to avoid the problems like keeping the watch at every security point, which is very difficult.
4. Cost of the system is less as compared to other security systems like auto bomb blaster, cordless transmitter and receiver etc.
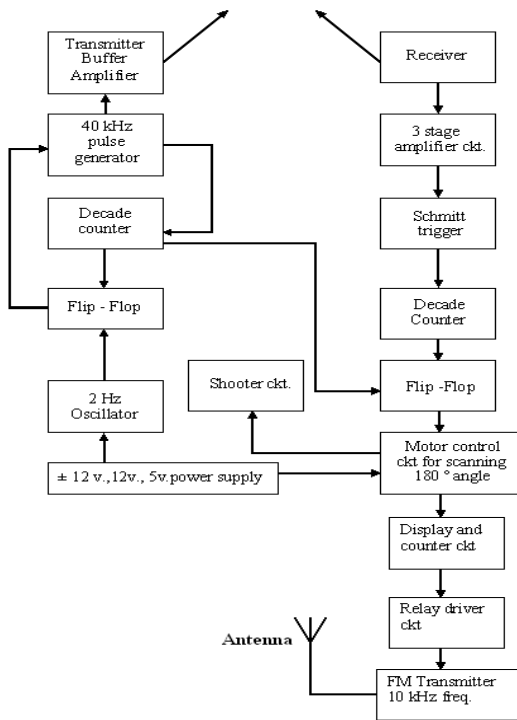
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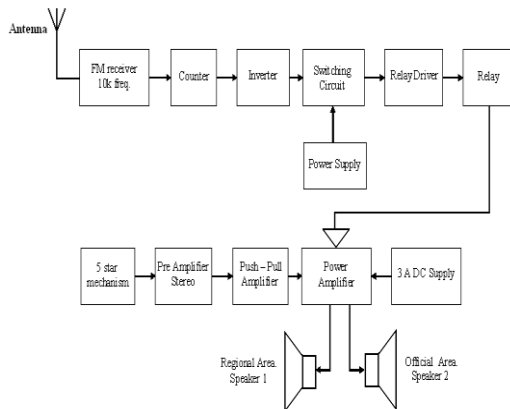

Fig 1 (A)Ultrasonic Transmitter Section

Fig 1 (B) Reciver section

V. BLOCK DIAGRAM DESCRIPTION

Block diagram of the project mainly consists of

- **Ultrasonic transmitter section :-**

Ultrasonic transmitter section mainly uses various blocks

such as-

1. 2Hz oscillator: -

This 2Hz oscillator is used to generate the 2Hz frequencies i.e. 2 scans/ sec. It is a circuit formed by using IC CD 4001 i.e. NOR gate IC. Main function of 2Hz oscillator is a synchronizer between the transmitter and receiver

2. Decade Counter*: -*

Decade counter is Johnson counter. This decade counter is used to count the required number of burst and when count completes it sets the flip-flop. This counter is mainly designed in the modules & mode i.e. the counter gets reset after six counts. For this IC CD 4017 Johnson Decade Counter IC is used.

3. Flip-Flop: -

The flip-flop used here is mainly set-reset flip-flop. When counter sets the flip-flop after completing count, it stops oscillator from generating the frequencies. Simultaneously the flip-flop at the transmitter also sets the flip-flop at the receiver. Main purpose of the counter and flip-flop is to introduce a pause of some time so that the transmitted signal is detected at the receiver.

4. Oscillator: -

The Oscillator generates the frequency, which are in the ultrasonic range. IC 555 is used to generate frequencies of 40 KHz and it operates in a stable multvibrator mode.

5. Ultrasonic transmitter: -

Ultrasonic transmitters as the name suggest it continuously transmits the frequencies. The frequencies are in the range of ultrasonic range. The transmitter transmits the frequencies of 40 KHz. The ultrasonic receiver can easily detect these frequencies. Oscillator and various succeeding blocks can control the transmission of the frequencies.

- **Ultrasonic Receiver and control circuit:**

1. Ultrasonic receiver: -

Ultrasonic receiver receives the transmitted pulses from the ultrasonic transmitter. Receiver receives these pulses only if any obstacle is found. Using various blocks as shown in the diagram processes these received pulses.

2. Three Stage amplifier: -

Mainly the receiver receives the transmitted pulses. These are echo signals. These signals are very weak due to various reasons such as interference of noises various losses etc. So to increase the level of these detected signals 3 Stage amplifiers is used. Mainly the circuit is formed by using op-amp and gain of each is adjusted to 10. So total gain provided is 1000.

3. Schmitt trigger or comparator circuit: -

After amplification from 3 Stage amplifiers, the signal is fed to the Schmitt trigger circuit. This circuit is nothing but a comparator circuit. This is used to set the amplitude levels of the signal same as that at the transmitter. Thus Schmitt trigger reshapes the received signals.

4. Decade Counter Circuit: -

This counter circuit performs same function as that in transmitter. This is used to count the received bursts. It is also Johnson decade counter &used in Modulus 6 mode

5. Flip-flop: -

When all the transmitted pulses are received, the counter stops counting and sets the flip-flop. This flip-flop is set reset flip-flop, usually it is formed by using NOR Gate IC

• Motor Control Circuit: -

To scan the area, motor is continuously rotating. When any obstacle is found in the scanning area, at that time motor will stops rotating. For motor control circuit hardware uses the IC 555 timer in monocot mode. For rotating the motor in forward and reverse direction IC 555 is used in Bitable mode.

• Shooter/Firing Circuit: -

When the motor stops rotating i.e. when obstacle is found, the firing circuit comes into picture. It starts firing when motor stops. Firing time depends upon RC time constant we are using Cob kit U31 for shooter circuit.

• Display Circuit: -

When the obstacle is fired, the numbers of obstacles or enemies fired are counted and counted obstacles can be displayed on the display by using display circuit. It can display up to 9999 count. Display circuit uses IC 74C926 display driver and counter. By cascading one of IC74C926 number of counts can be increased.

• FM Transmitter & Receiver Circuit: -

Fm TX at border side and FM Rx at army head quarter main office. Receiver circuit is Using LC oscillator circuit with 10 KHZ frequencies. The supply has been given +12V for operating the circuit. The transmitter has transmitting power is 2 watt. Two stage amplifier using FM transmitter used in our project

• Switching Circuit:-

This circuit is used for after receiving data from FM transmitter it will convert high to low output for turn on and off condition for relay driver circuit.

• Counter: -

Using 5 stages Johnson counter to count 5 obstacles & o/p of decade counter CD4017 o/p connected next circuit.

• Inverter: -

Using IC CD4069 to invert the counter output and provide to 555 circuits.

• Timer IC 555: -

Timer is in mono stable mode after 5 phases if provide RC time constant for complete speech at residential and official area and relay will be activate for 45 sec.

• Speech Driver Circuit:-

Stereo mechanism with stereo pre amplifier and 40+40 watt stereo are used for amplification purpose at residential and official area the speaker used for passing message to military and take necessary action.

• Relay Driver Circuit: -

Using VL2003 to drive relay 12V for speech recorded transmitting purpose.

V. ADVANTAGES

1. Cost of the system is less as compared to other security systems like auto bomb blaster, cordless transmitter and receiver etc.
2. With this system it is possible to avoid the problems like keeping the watch at every security point, which is very difficult.
3. Firing of the obstacle is done instantly without any delay.
4. Display circuit easily displays the fired obstacles.

VI. APPLICATIONS

1. Mainly used for the navigational aids for the security of the boarder.
2. This system can be used for Defense, Military applications.
3. Also in industries to provide security at night this system can be used.
4. It may be used for home security.
5. Also it may be used in banks or some offices.
6. With slight variation in the circuitry it can be used for distance measurement. There is one limitation of this system is the requirement of plane surface. Receiver receives echo signals from obstacles, so for proper echo, surface should be plane.

VII. CONCLUSION

The main objective of our project was to prepare ourselves to examine any design/ process, phenomenon from all aspects and thus to acquaint with the actual manufacturing & the problems involved therein. During the course of degree, we have studied subjects like Electronics Circuits & Applications, Electronic Circuits& Machines, Analog Communication etc, but during our project, we found an amazing interrogation of all subjects.

REFERENCES

[1] Industrial & Electronics Measurements; By A.K.Sawhney.

[2] Industrial Instrumentation; By S.K.Singh.

[3] Feedback Control System; By Jalgaonkar.

[4] Linear Integrated Circuit; By Ramakant Gayakwad.

[5] Communication System; By George Kennedy.