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Natural Calamity Predictor using Ultrawideb and Communication Technology

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Abstract: Purpouse :this paper aims to provide technical insight Into the sensors systems used to monitor and forecast certain natural hazards using ultrawideband communication technology.

Design/methodology/approach: following a short introduction the paper describes the systems used to monitor and forecast earthquakes, tsunamis, huuricanes And tornadoes.the sensors used in this systems are Considered in detail and some experimental techniques are also discussed.

Since the first assessment of research on natural hazards was completed in 1975, there have been significant improvements in forecasts and warnings for some hazards but only marginal improvements for others. Forecasts for floods, hurricanes, and volcanic eruptions have improved most significantly, and public dissemination of warnings has improved the most for hurricanes. However, a 100% reliable warning system does not exist for any hazard.

1. INTRODUCTION

Warning systems detect impending disaster, give that information to people at risk, and enable those in danger to make decisions and take action. This definition is simple, but warning systems are complex, because they link many specialties and organizations—science (government and private), engineering, technology, government, news media, and the public. The most effective warning systems integrate the subsystems of detection of extreme events, management of hazard information, and public response. These relationships are maintained through preparedness including planning, exercise, and training. This article summarizes advances in warning-related predictions, forecasts, disseminations, and responses over the past 20 years. It does so by addressing four questions:

- How have prediction and forecasting improved?
- How has warning integration improved?
- How has warning dissemination improved
- What do we know about response to warnings?

In addition, three major steps to improve warning systems are offered.

2. PRICIPLE OF OPERATION

At present the need of the hour is to find an effective method for rescuing people buried under rubble (or) collapsed building. Present methods for searching and rescuing victims are not effective. The basic principle is that “when a microwave beam of certain frequency [L (or) S band (or) UHF band] is aimed at a portion under which a person has been trapped, the microwave beam can penetrate through the rubble to reach the person.

When the person is focused by the microwave beam, the reflected wave from the person's body will be modulated (or) changed by his/her movements, which include breathing and heart beat. Simultaneously, reflected waves are also received from the collapsed structures.

So, if these reflected waves from the immovable debris are cancelled and the reflected wave from the person's body is properly distinguished, the breathing and heart beat signals can be detected By proper processing of these signals, the status of the person under trap can be easily judged. Thus a person under debris can be identified”.

3. MAJOR COMPONENTS OFTHE CIRCUIT

The microwave life detection system has four components. They are

1. NE555 TIMER
2. LM386 OP-AMP
3. A microwave circuit which generates amplifies and distributes microwave signals to different microwave components.
4. A microcontroller controlled clutter cancelled system, which creates an optimal signal to cancel the clutter cancellation system from the rubble.
5. Adual antenna system, which consists of two antennas, energized sequentially.

6. APersonal computer that controls the microcontroller and acts as the monitor for the output signal.

4. CIRCUITDESCRIPTION

Phase Locked Oscillator

The phase locked oscillator generates a very stable electromagnetic wave say 1150 MHz with output power say 400mW.

Directional Coupler 1 (10 dB)

This wave is then fed through a 10 dB directional coupler and a circuit before reaching a radio frequency switch, which energizes the dual antenna system. Also, the ten dB directional coupler 2 (3 dB) Directional coupler 2 (3 dB)

One output of the 3 dB directional coupler 2 (20mV) drives the clutter cancellation unit. Other output (20mV) serves as a local reference signal for the double balanced mixer. The dual antenna system has two antennas, which are energized sequentially by an electronic switch. Each antenna acts separately.

Clutter cancellation unit

1. Adigital controlled phase shifter 1
2. Afixed attenuator
3. A RF amplifier
4. Adigitally controlled attenuator.

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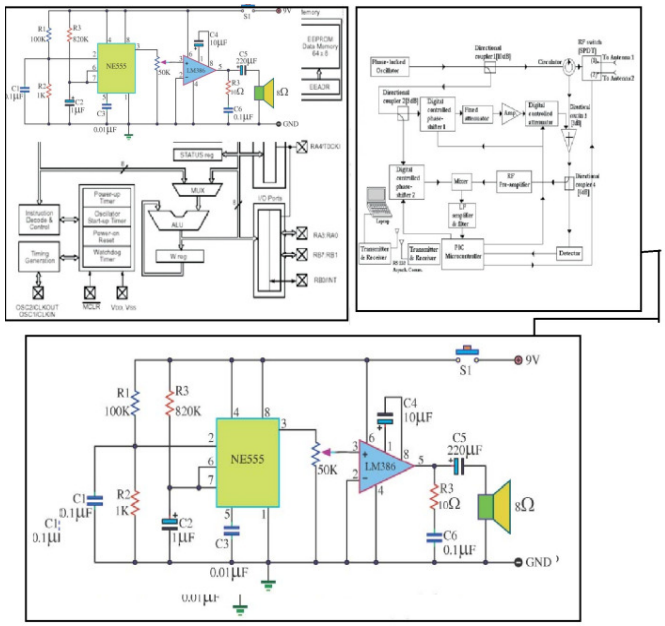
3.1 Figure



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REFERENCES

[1] Microwave devices and circuits" by Samuel. Y. Liao

[2] Microwaves" by K.C. Gupta

[3] Automatic clutter-canceller for microwave life detection system"

[4] IEEE Transactions on "Instrumentation and measurement" & "Biomedical Engineering" PIC Microcontroller-Microchip's reference manual

[5] Vogt, B., and Sorensen, J. (1992). ''Preparing EBS messages.'' *ORNL/ TM-12163*, Oak Ridge National Laboratory, Oak Ridge, Tenn.Williams H. (1964). 6.''Human factors in the warning and response systems.''

[6] *The threat of impending disaster*, G. Grosser et al., ed., MIT Press, Cambridge, Mass. 79–104. Withey, S.(1962). 7.''Reaction to uncertain threat.'' *Man and society in disaster*, G. Baker and D. Chapman, eds., Basic Books, New York, 93–123