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**EMERGENCY COMMUNICATIONAL
PROTOCOL & THERMAL SENSING
VIA V-LEO SAT
(VERY LOW EARTH ORBIT SKY
APERTURE TERMINAL)**

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1. ABSTRACT: - This paper deals about the communication, assigning of emergency radio call sign and thermal sensing of human locations on land surface via a temporary flying tower called V-LEO SAT (Very Low Earth Orbit Sky Aperture Terminal). V-LEO SAT is basically a multi copter which has six arms and a motor mounted on each arm in to lift or propel it. It is also referred to as UAV (Unmanned Air Vehicle). This paper describes about a satellite model, and it's placed below the lower orbital level (about 800 feet beyond from sea level). Through this V-LEO SAT we can communicate, air-borne image, counter terrorism, anti-poaching etc.

KEYWORDS: - V-LEO SAT, Emergency protocol, Temporary tower, Repeater

2. INTRODUCTION

In military the communication system at borders is carried out via RADAR signals and even via micro signal by placing signal towers in and around the LOC (Line of Control). But in some situations while footing in the areas beyond the LOC the military troops are lagging in communicational signal because of the inability of RADAR and signal towers and the other barrier is during night timings in the military people will be viewing via an infra red and thermal camera on ground surface only. Not only because of that, it may occur also due to the dense forest areas that lead to back log in signal and the view of opponents will also be barred. This signal lagging in communication may let the group to divert in commands while their approach towards the enemy troops. Not only in such areas, the draw back in signals, will also take place in inland areas during some natural disasters such as floods, tsunami, earthquakes etc, because these disasters will lead to ruin of our cell phone and radio towers and people stuck under the

destroyed buildings cannot be found easily. Due to this, the recovery actions are getting delayed at very high rate. To avoid such problems, this project can be implemented. Now-a-days we all would have crossed through the word drones (automated quad and hexa copters) and technically it is said to be UAV's. Here in this paper a UAV is used as a vehicle to carry a repeater (a device to boost radio signals from one port to another) and thermal locators these devices with the UAV is accordingly said as V-LEO SAT - a temporary tower for communication and thermal sensing. This V-LEO SAT is made to aviate at an attitude of nearly 800mts beyond the sea level, then the transceivers are used for communication. This repeater that is being placed in the UAV takes the input signal from the transmitter and boosts the signal up to the transferable percentage and again retransmits the output to the other transceiver in the receiver's side and the thermal locating device placed with the UAV which gives a human heat map image in the monitor at the ground station. In such a way a communicational linkage is made during such crucial situations and also the opponent troupes in the military can be easily located. Even during disasters the alive humans under the destruction can also be found out. The working feature of this V-LEO Sat and the communication linkages are described in upcoming pages.

3. COMPONENTS

The major few components used in this emergency protocol system are listed and described as follows

- ✚ **Transceiver**
- ✚ **Repeater**
- ✚ **Hexa copter**

3.1 TRANSCEIVER

It is the one which a military man carries with him at all time to communicate with others in his troupe; in known words the transceiver can be said as "walkie-talkie" each and every person could have gone through this word in his life time. Not only in military, now-a-days widely used as an emergency communication device in a short range with the help of radio signals. This transmits and also receives RF signal. A transceiver is a combination transmitter/receiver in a single package. The term applies to wireless communications devices such as cellular telephones, cordless telephone sets, handheld two-way radios, and mobile two-way radios. Occasionally the term is used in reference to transmitter/receiver devices in cable or optical fiber systems.

3.1.1 WORKING

In a radio transceiver, the receiver is silenced while transmitting. An electronic switch allows the transmitter and receiver to be connected to the same antenna, and prevents the transmitter output from damaging the receiver. With a transceiver of this kind, it is impossible to receive signals while transmitting. This mode is called half duplex. Transmission and reception often, but not always, are done on the same frequency.

Some transceivers are designed to allow reception of signals during transmission periods. This mode is known as full duplex, and requires that the transmitter and receiver operate on substantially different frequencies so the transmitted signal does not interfere with reception. Cellular and cordless telephone sets use this mode. Satellite communications networks often employ full-duplex transceivers at the surface-based subscriber points. The transmitted signal (transceiver-to-satellite) is called the uplink, and the received signal (satellite-to-transceiver) is called the downlink.

3.2 REPEATER

The Name repeater will give the fact about this, that is the repeater garbs the signal from on port i.e., form one transceiver and amplifies the signal and again it repeats to other transceivers which another person in the army

troupe or a communicator may hold. In digital communication systems, a repeater is a device that receives a digital signal on an electromagnetic or optical transmission medium and regenerates the signal along the next leg of the medium. In electromagnetic media, repeaters overcome the attenuation caused by free-space electromagnetic-field divergence or cable loss. A series of repeaters make possible the extension of a signal over a distance. Repeaters remove the unwanted noise in an incoming signal. Unlike an analog signal, the original digital signal, even if weak or distorted, can be clearly perceived and restored. With analog transmission, signals are re-strengthened with amplifiers which unfortunately also amplify noise as well as information. Because digital signals depend on the presence or absence of voltage, they tend to dissipate more quickly than analog signals and need more frequent repeating. Whereas analog signal amplifiers are spaced at 18,000 meter intervals, digital signal repeaters are typically placed at 2,000 to 6,000 meter intervals.

3.2.1 WORKING

In a wireless communications system, a repeater consists of a radio receiver, an amplifier, a transmitter, an isolator, and two antennas. The transmitter produces a signal on a frequency that differs from the received signal. This so-called frequency offset is necessary to prevent the strong transmitted signal from disabling the receiver. The isolator provides additional protection in this respect. A repeater, when strategically located on top of a high building or a mountain, can greatly enhance the performance of a wireless network by allowing communications over distances much greater than would be possible without it. In satellite wireless, a repeater (more frequently called a transponder) receives uplink signals and retransmits them, often on different frequencies, to destination locations. In a cellular telephone system, a repeater is one of a group of transceivers in a geographic area that collectively serve a system user. Repeaters are commonly used by commercial and amateur radio operators to extend signals in the radio frequency range from one receiver to another. These consist of drop repeaters, similar to the cells in cellular radio, and hub repeaters, which receive and retransmit signals from and to a number of directions.

3.3 HEXA-COPTER

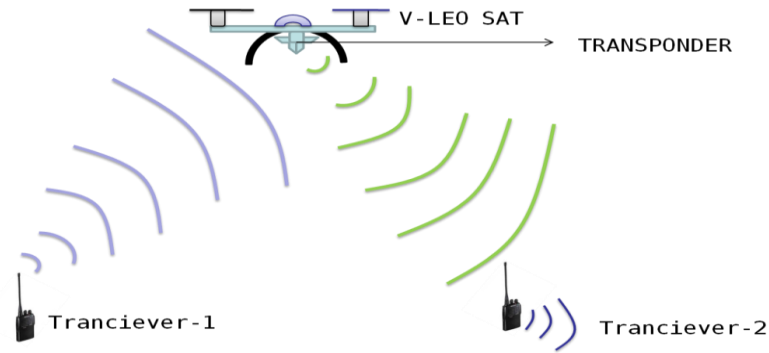
The hexa copter also said to be the unmanned air vehicle (UAV), with six arms with six brushless motors mounted on it to propel it. The reason to use hexa-copter here is that it provides more thrust and stability than a quad. The hexa-copter can be made auto piloted via gps integration, the repeater or the transponder is attached to this copter. The total integrated setup is named to be the V-LEO SAT.

4. WORKING OF V-LEO SAT

The V-LEO SAT is automated and using GPS co-ordinate it can be placed at the right region. When the V-LEO achieves more and more attitudes the coverage area will also be increased hence the communicational linkage will also be enabled for a large range. The thermal imaging devices placed in the UAV enables us to find the spot of human locations on the ground surface. This will help us in military approach and also in finding humans under the destruction.

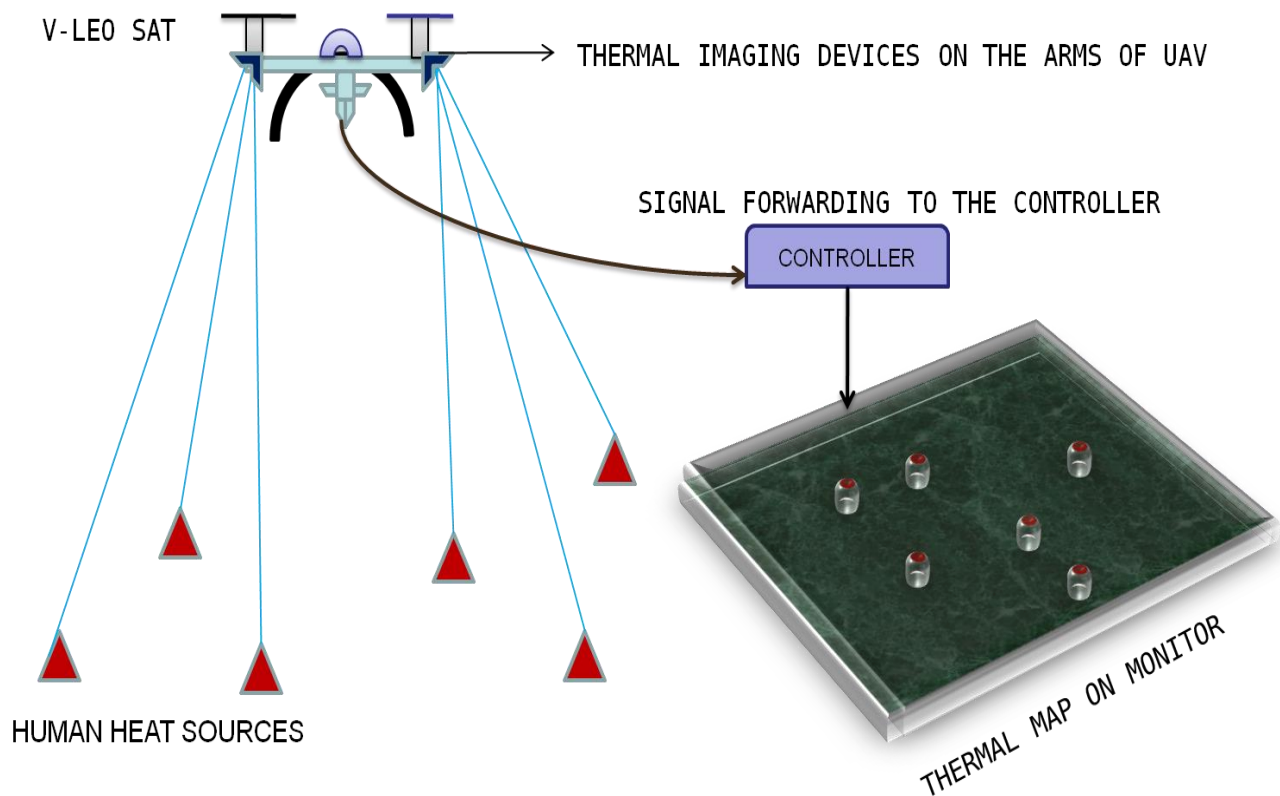
5. COMMUNICATIONAL LINKAGE

The repeater module integrated with the V-LEO SAT is placed at the certain attitude 750mts (say), this can be made through a GPS enabled system or even through a laptop computers or it can also be made manually with the help of remote controller. After placing the terminal at such a height the transponder gets activated, i.e., the temporary fling tower is set ready on its location co-ordinates. Now, if the signal is passes out from the trancier-1 is grabbed by the repeater in the air and the signal received is boosted to a certain percentage and then sent to the tranceiver- 2 at the other end, by increasing the ports in a repeater the call sign can also be increased. By this manner the communicational linkage can be satisfied without the help of stationary RADAR towers.



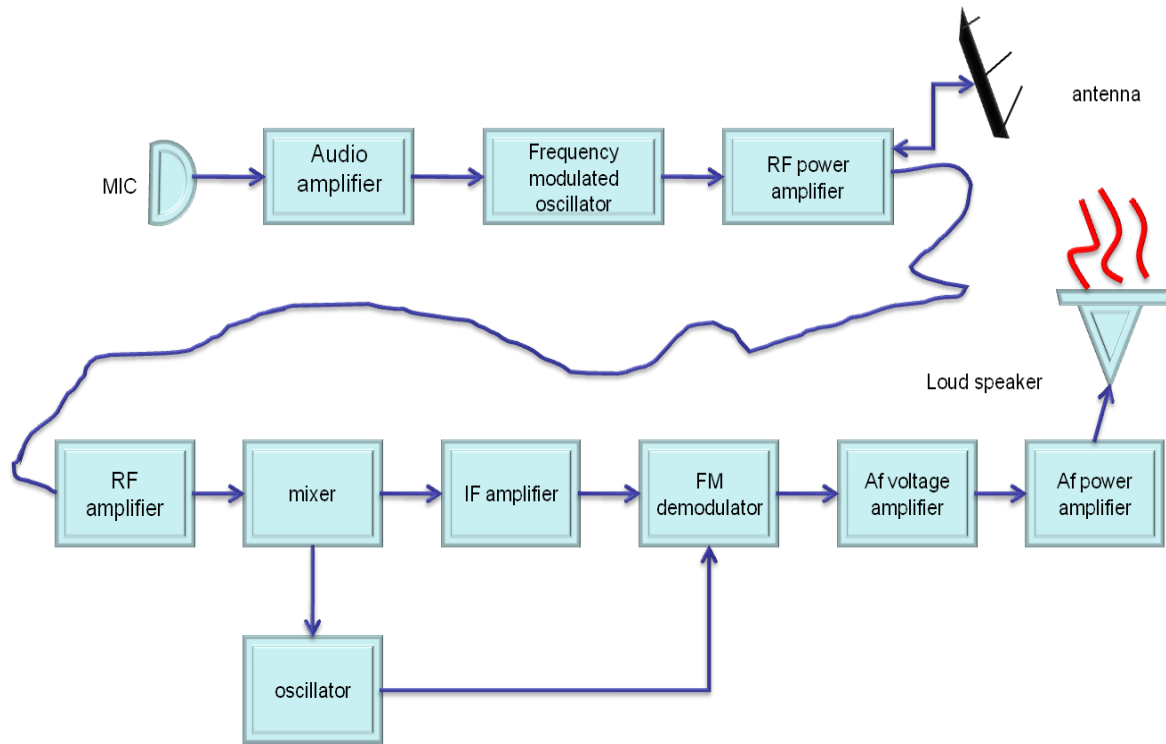
6. THERMAL MAPPING

Next to the communicational linkage the thermal Mapping plays a main role in this paper. The thermal imaging devices coupled with the V-LEO SAT enables the thermal locating system. This sensing device senses the thermal radiation from the human phase, and it locates the human locations on the ground surface. These thermal coordinates are sent to the controller monitor of the V-LEO SAT as heat map as a live source. this will be very much help full in military to examine the foreign bodies movements in and around our LOC this will also be help full in shoot out invading during night were day light is not available. This is also used to detect the live humans; those who have stuck under destructed areas while a natural disaster. This will also be very much helping in recovery of those human lives as soon as we could.

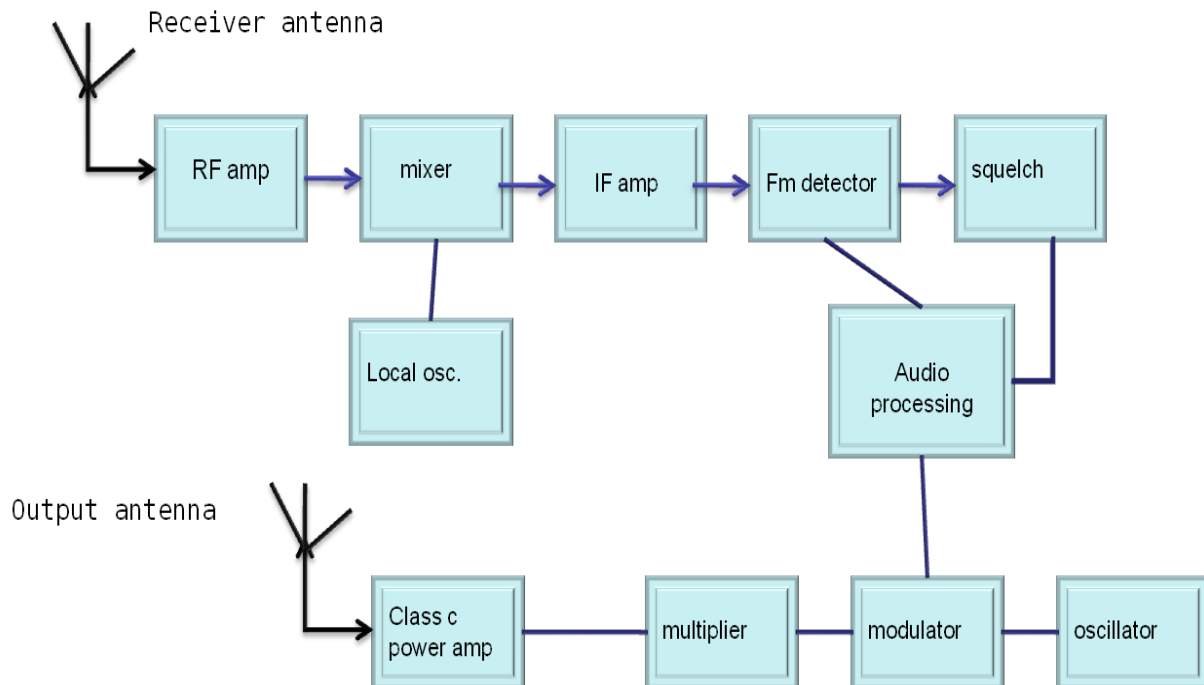


7. BLOCK DIAGRAMS

7.1 BLOCK OF TRANCIEVER



7.2 BLOCK OF REPEATER



8. CONCLUSION

This research enables easier operation of communication during emergency situations and in military it helps much more than an ordinary examining system of the LOC, this helps a lot in finding the exact spots of the enemy troupes while shoot outs towards them and also illegal forgiven invaders through the borders. Not only this it also makes an easier way of recovery of human resources while disasters. Both manual and automated control system will be use full in all kind of situations and locations. As this entire set up (V-LEO SAT) weighs only up to 2 kg in approx would be very easy to carry and launch. We present this as a tribute to INDIAN army.

9. REFERENCES

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