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# GREEN ENERGY BASED MOBILE COMMUNICATION SYSTEM

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**ABSTRACT:** Day by day the number of mobile users and the network operators increasing precipitously which fallouts the demand in energy efficiency. Green radio technology prefers environment friendly approach towards the mobile communication. The mobile towers are increasing in an extraordinary manner thereby increasing the radiation of electromagnetic waves as well as the burning of coal to generate the power. The source for towers is based on the power requirement. In our project, depending upon the number of users the sub towers are activated.When enormous amount of power is produced and consumed, the emission of carbon dioxide, sulphur dioxide are increased which harms our environment. So to avoid the problems due to the mobile communication system, we proposed a model in which the power is saved and at the same time the power is produced using solar energy and wind energy which also saves our environment from the harmful effects. The whole thing in our project is monitored using IOT.This project is developed for modification in mobile infrastructure for energy conservation and CO2 reduction (carbon credit).

**KEYWORDS:** $Co_2$ reduction, conservation of power, green radio, mobile users,IoT

## INTRODUCTION:

Now a days usage of power has been increased which therby increases the burning of coal which pollute the environment by releasing the harmful gases such as carbon di oxide, sulphur dioxide etc. Here we implement the concept of reducing the power consumption by a sub tower that provide network for mobiles. As a result we conserve the energy as well as reduction of emission of such gases. There will be a control room consisting of the power amplifier to manage the usage of bandwidth from the tower. The power amplifier gets heated soon by enabling the towers one by one. So to protect the amplifier the control room is fixed with AC and usually a room consists of a light ,fan etc. The operation of an AC is not needed during rainy season where the humidity matters. At that time we can reduce power consumpyion by using a blower.During the night time the number of users will be less compared to the day time, so there we can turn off the towers thereby reducing the power consumption. Thus the main aim of this project is to reduce the power consumption and generation of power using a solar panel and wind mill and it can be used by utilising less power frm power station. This also reduces the cost.

## RELATED WORK:

Markus Gruber, Oliver Blume, Dieter Ferling, Dietrich Zeller, Muhammad Imran, Emilio Calvanese Strinati jointly presented EARTH-Energy aware radio and network technologies. The main technical objective of this project is to achieve the overall energy consumption of mobile broadband networks by 50%.EARTH regards both network aspects and the individual radio components. On the component level this project focuses on base station optimization as power amplifiers consumes the most energy in the system. Power efficient transceiver is developed to adapt changing of traffic load for an energy efficient operation in mobile radio communications. EARTH reduces the cost and carbon dioxide emission.

N. faruk, A.A. Ayeni, M.Y. Muhammad, L.A. Olawoyin, A. Abdulkarim, J.Agbakoba, M.O. Olufemi (2013) presented Techniques for minimizing power consumption of base transceiver station in mobile cellular system. This paper investigates power consumption of base transceivers stations (BTS) schemes that potentially decrease the power consumption and the potential of reusing the conserved power without compromising quality of service of network. MIMO (multiple input multiple output) technique

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is used, power is reserved and optimized and increase reserve power.

JieTang, Daniel k.c, EmadAlsusa, KhairiAshourHamdi, ArmanShojacifard (2015) introduces a Energy efficient optimization with interference alignment in multi-cell MIMO interfering broadcast channels. The important design of green wireless system is characterizing the fundamental energy efficiency (EE) performance of multiple input multiple output interfering broadcast channels (MIMO-IFBC). Here new network architecture proposition based on EE maximization for multi cell MIMO-IFBC within the context of interference alignment. Two schemes are proposed to optimize EE for different signal to noise ratio(SNR) region.

"Power Consumption in Telecommunication Networks: Overview and Reduction Strategies" contributed by Willem Vereecken et al., which gives an overview of typical power consumption figures in a variety of wired and wireless networks, customer premises and core networks. Some key potential directions for power consumption are highlighted and explained.

"Fundamental Trade-offs on Green Wireless Networks" by Yan Chen et al., Presents an insightful design framework for energy-efficiency-oriented mobile wireless networks, which consists of four fundamental trades-offs: deployment efficiency vs. energy efficiency, spectrum efficiency vs. energy efficiency, bandwidth vs. power, and delay vs. power.

"Green Radio: Radio Techniques to Enable Energy-Efficient Wireless Networks" by CongzhengHanetal., provides an in-depth overview of the ongoing Mobile VCE Green Radio project, which aims to establish novel approaches to reducing the energy consumption of wireless links, especially improving the design and operation of wireless base stations.

"Toward Dynamic Energy-Efficient Operation of Cellular Network Infrastructure" by Eunsung Oh et al., depicts how dynamic operation of cellular base stations, in which redundant low-traffic base stations are switched off, can generate significant energy savings advantages. Based on real cellular traffic traces and information regarding base station locations, the authors discuss the first-order approximation of the percentage of power saving that can be expected by turning off base stations during low traffic periods while maintaining coverage and inter operator coordination.

"Energy Consumption in Wired and Wireless Access Networks" by JayantBaliga et al,Provides detailed analyses on the corresponding energy consumptions of digital subscriber line, hybrid fiber coax networks, PONs, fiber to the node, point-to-point optical systems, UMTS (WCDMA), and WiMAX. The authors conclude that PONs and point-to-point optical networks are the most energy-efficient access solutions at high access rates.

## EXISTING SYSTEM

The towers are controlled by the control room by powering it according to the number of users. In some systems they have only generated power using solar panel without managing the tower. One more technology that have been used is the multiple input and multiple output to reserve the power and to use the reserved power

## PROPOSED SYSTEM

Here we propose a model using the green radio concept in terms of mobile communication, which reduces the harmful gases emission and make the efficient usage of bandwidth. And also the generation of power using solar and wind energy and it is consumed which reduces the intake from main power station. The towers of the subsystem are managed by means of wireless . We introduce a method of monitoring the status of the towers using Internet of things.

## HARDWARE REQUIREMENTS

### SINGLE BOARD COMPUTER

Single-board computer (SBC) is a complete computer built on a single circuit board with microprocessor, memory, input/output (I/O) and other features required of a functional computer. Single board computers were made for demo and development purpose, for educational systems, or for use as embedded computer controllers. Many types of home computers or portable computer integrate all their functions onto a single printed circuit board.

A single board computer is different from a personal computer bythe way it is designed. A single board computer has all of the elements of a complete computer contained within one single circuit board. On a desktop computer, the processor, memory, storage, input and output devices and other basic components attach via sockets on the motherboard. On a single board design, everything is self-contained. Single board

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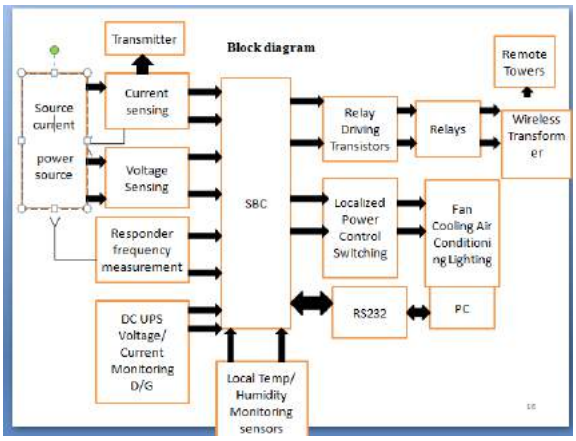
computers are also expanded in their capabilities differently than desktop computers. On a desktop computer, adding capability to the motherboard is typically accomplished by plugging a peripheral device into a slot on the motherboard. Single board computers come in a huge range of different capacities. Because some of them are used to control very simple processes, some single board computers are very slow and limited compared to the average desktop computer.

In many cases, single board computers are plugged into a backplane. The backplane allows for input and output devices to be attached to the computer. Single board computers are frequently used in rack systems, which allows for reliable and fast integration into a system.

Single board computers have all of the capacity required to perform most automation tasks and specialized designs are widely available.Single board computers are very small. This allows them to be embedded in devices where space is very limited. The computers are also very efficient, giving them an edge where saving on power is concerned. In addition to these advantages, single board computers are self-contained, making them very reliable under trying environmental conditions.

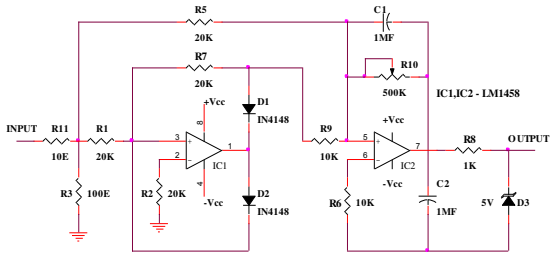
. A single-board configuration reduces a system's overall cost, by reducing the number of circuit boards required, and by eliminating connectors and bus driver circuits that would otherwise be used. By putting all the functions on one board, a smaller overall system can be obtained, for example, as in notebook computers. Single board computers are most commonly used in industrial situations where they are used in rackmount format for process control or embedded within other devices to provide control and interfacing.

**BLOCK DIAGRAM:**




The tower is powered with the help of responder frequency circuit. Here in this circuit an unknown frequency is converted into a known frequency. The unknown signal is generated by the astable multi vibrator.Responder frequency decides the type such as type of a wave which is decided by the Schmitt trigger, the amplitude of the signal and finally the duty cycle. Finally the frequency is converted into an equivalent voltage using the frequency to voltage converter circuit. Finally the responder frequency circuit consists of transistor coupler, Schmitt trigger, differentiator and an F2V converter

Next the voltage sensing circuit,which consists of potential transformer, potential divider, fullwaveprecesion rectifier and filter.The potential transformer for sensing the voltage. Fullwave precision rectifier has an op-amp to produce an efficient output.




Current sensing circuit consists current transformer, shunt resistor, full waveprecision rectifier and finally a filter.The secondary of the current transformer should not be left open if there is any current in the primary, the entire primary voltage become the induced voltage for the secondary.Operation is same as that of voltage sensing circuit except a shunt resistance is used to convert current to voltage

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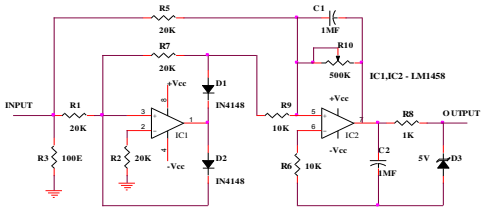
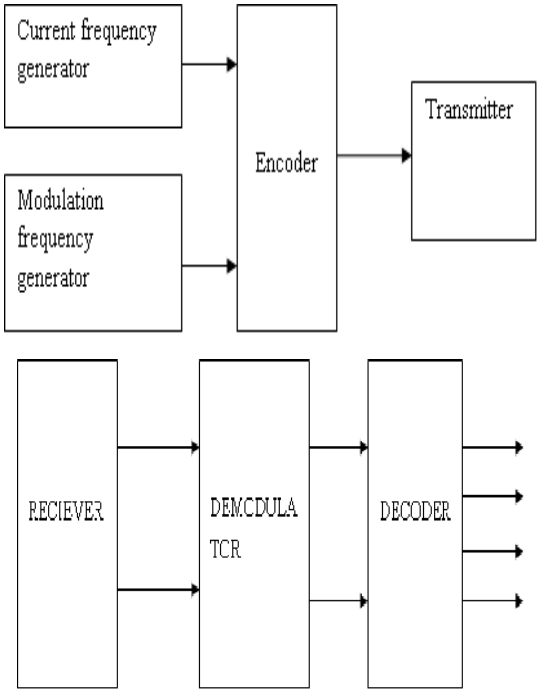



An integrator is used to find the exact number of users and to filter the noise. Zener diode acts as an voltage regulator here to output a 5V which is input to an SBC.

The temperature and humidity sensing unit consistds of a potential divider and a thermistor. The thermistor is a temperature dependent resistor or a passive transducer. This is used to sense the humidity based on which the power is managed for the control room as said before. Likewise during a seasonal change the tower problem will occur probably hence to avoid such uncomfort the humidity sensor will intimate the nearby tower to share its bandwidth so that the users are benefited and will not suffer from a signal problem.

Light sensing circuit uses a main component as a light dependent resistor and a potential divider .

The sub towers are powered on in means of wireless. The block diagram is as follows:




## CONCLUSION

Thus the green radio concept is implemented using the limited bandwidth according to the number of users. The power is generated by means of solar and wind energy thus reducing the burning of coal thereby reducing the CO2 emission.

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