

A Review on Electricity Generation Using Mobile Network Radiations

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Abstract: *The invention comprises of conserving the energy by means of the simple yet, ingenious circuit. The power wasted in the transmission of the FM signals is not judiciously used and is hence, wasted. And so, with the help of this circuit electricity can be generated from the signal radiations present in the atmosphere. In addition to that, the areas hit by the ill effects of the signal radiations can be protected by minimizing the radiations using array of such circuits!*

Keywords: Excess of radiations, Harmful effects, radiation control, electricity generation while controlling the radiations.

1. Introduction

With the boom in the telecom industry, the atmosphere contains more signal radiations than the oxygen! But not all the frequency modulated radiated signal is used by the operator. Much of the power remains unused and is hence, wasted. In this project using the simple yet ingenious circuit, the Fm radiated signal present in the atmosphere is converted into the direct current signal and hence, the terminal acts as a constant voltage source. With this circuit, the energy can be harvested and can be utilized for different purposes. The circuit comprises of auto stabilizing module that makes it completely independent and hence, no external power source is required to operate the circuit.

2. Literature Survey

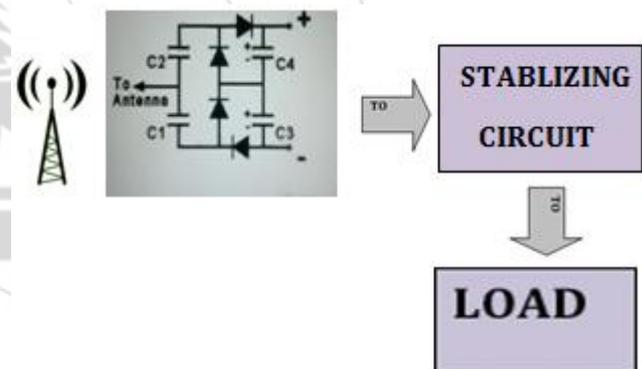
The survey made out shows the exact readings of the real time measurements done in the different localities of Mumbai. From the paper of Prof. Girish Kumar [1] the facts about the number of cell towers in India, the amount of the radiation in the atmosphere, power transmitted per tower and the health hazards was observed and noted down.

Also, the radiation pattern of the cell tower antenna, the power density calculation, the power density for the multiple operators, and the power density with respect to the distance was studied from it. Then the comparison of the radiation exposure norms of the different countries was done. The guidelines on the international exposure standards, human exposure to the RF fields were studied [1]. How exactly the radiation absorption by the human body becomes dangerous was noted down. Various hazards that are being caused by the radiation absorption were also noted down. Then the readings from the live survey held at various locations like the community halls, highways, inside the residential apartments, etc were studied.

Then, from the web journals [2] the evidences that show the real cases of the cancers occurred just within the few years of tower installation were checked and studied. How the radiation causes the cancer was learnt. Other biological complaints which include the sleep disruptions, headaches, concentration issues, cardiovascular diseases, etc and their correlation with cell tower radiation was noted down [3].

Lastly, the environmental effects i.e. how the trees, birds, insects, squirrels, and other wildlife animals are getting badly affected were studied. Then the possible solutions to control the radiations and its ill effects were studied. Before the designing of the circuit, each component and its characteristics were studied in detail [4]. The thresholds, the capacitances, the climatic suit abilities were aptly studied [5] and they were subjected to the experiment iterations.

3. Block Diagram



4. Technology Used

Basic components are being used. The list of components includes germanium diodes, electrolytic capacitors, ceramic capacitors and the antenna. Germanium diodes help in forward biasing at merely low voltages, ceramic capacitors are used for radio reception and electrolytic for charge storage.

5. Working

The radiated power available in the atmosphere is being received through the antenna and the power is being transferred to the ceramic capacitors which serve as a good radio signal receiver, these capacitors on their discharge forward bias the germanium diodes which help in voltage rectification. The charge developed is then stored into electrolytic capacitors and hence this stored charge can be used to operate DC gadgets.

6. Equations

Power density calculations:

Power density P_d at a distance R is given by-

$$P_d = \{P_t \times G_t / (4 \times 3.14 \times R^2)\} \text{ Watt/m}^2$$

P_t = Transmitter power in Watts

G_t = Gain of transmitting antenna

R = Distance from the antenna in meters

India adopts ICNIRP guideline for Power density (P_d) = Frequency /200, frequency is in MHz

For GSM900 (935-960 MHz) $P_d = 4.7 \text{ W/m}^2$

For GSM1800 (1810-1880 MHz) $P_d = 9.2 \text{ W/m}^2$

7. Survey

In 1953, the 10-mW/cm² exposure standard was recommended to the United States Navy and this standard was based on simple thermal models. In 1959, the United States America Standards Institute (USASI) C95 project was chartered and sponsored by the United States Department of the Navy

Majority of cellular or PCS cell sites in urban and suburban areas operate at an ERP of 100 watts per channel or less. An ERP of 100 watts corresponds to an actual radiated power of 5-10 watts, depending on the type of antenna used.

Controlled environments are locations where there is exposure that may be incurred by persons who are aware of the potential for exposure as a concomitant of employment, by other cognizant persons, or as the incidental result of transient passage through areas where analysis shows that the exposure levels may be above the MPEs for the uncontrolled environment, but do not exceed the MPEs for the controlled environment.

Uncontrolled environments are locations where there is exposure of individuals who have no knowledge or control of their exposure. The exposures may occur in living quarters or workplaces where there are no expectations that the exposure levels exceed the MPEs for the uncontrolled environment.

The exposure values (the values that are compared with the appropriate MPEs) in terms of electric and magnetic field strengths are the mean values obtained by spatially averaging the squares of the fields over an area equivalent to the vertical cross-section of the human body. The spatial averaging can be obtained by scanning (with a suitable measurement probe) a planar area equivalent to the area occupied by a standing adult human.

ICNIRP has given following disclosure:

ICNIRP is only intended to protect the public against short term gross heating effects and NOT against 'biological' effects such as cancer and genetic damage from long term low level microwave exposure from mobile phones, masts and many other wireless devices.

EMF Radiation Standards (for GSM900)

Country	Milliwatt/m ²	Watts/m ²
INDIA(adopted ICNIRP)	4500	4.5(f/200)
INDIA(proposed 1/10 th of ICNIRP)	450	0.45(t/20000)

AUSTRALIA (New South Wales proposed)	0.01	0.00
AUSTRIA(Saltzbug city)	4.5 to 1125	0.045 to 1.125
ITALY	100	0.1

Table: Types of EMF Standards - Emission, Exposure, Compliance. There are 3 common types of EMF standards. Emission Standards set limits on the radio signals emitted from transmitters and other devices. The purpose of emission standards is to regulate the amount of radio frequency emission from a device to minimise the possibility of interference to other services or near by equipment. Emission standards are often part of an Electromagnetic Compatibility (EMC) framework.

Exposure Standards (safety) set limits on the amount of radio frequency energy that can be absorbed by people. The purpose of exposure standards is to establish the maximum radio frequency energy level know as Specific Absorption rate (SAR) in watts per kilogram (W/kg) that can be safely absorbed by people.

How are the EMF safety standards established?

Decades of research into EMF and health has produced a large body of scientific literature which national and international standards organisations can review to establish safe exposure limits. The World Health Organisation (WHO) has formally recognised the International Commission on Non-Ionising Radiation Protection (ICNIRP) to develop the international EMF exposure guidelines. The international guidelines developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) are based on a careful analysis of published scientific literature (including evidence for both thermal and non-thermal effects) and offer protection against all identified hazards of RF energy with large safety margins.

8. Best Method To Use

- 1) At the places where there is a lot amount of signal radiations. E.g. Places nearby the cell towers.
- 2) Because of the implementation of this circuit on a large scale the threats caused by the radiations can be minimized and also electricity would get generated.
- 3) At the places where there are continuous number of mobile calls. The places where continuously mobile calls take place in large numbers there the chances of generation of electricity will get increased.
- 4) The circuit can be implemented on the cell phone's battery to maintain it charged. If such circuits are connected to the battery of the cell phones, the phone will itself get charged under the influence of suitable radiation.

9. Future Impacts

On using this method broadly, the radiations can be controlled. This will help in minimizing the threats of extinction of squirrels, sparrows and human disorders like cancer. Other biological disorders like fruit bearing capacity of the trees and some human related problems can also be minimized. The power wasted by the operators can be harvested and hence, would be conserved to serve as an

electricity source to run small devices and to charge mobile phones. Energy would be conserved, as people would opt for free source available to charge mobile phones or to glow couple of LEDs.

Kuribayashi et al., Bioelectromagnetics, 26(7):578-588 at <http://dx.doi.org/10.1002/bem.20138>

10. Conclusion

The major drawbacks of the circuit i.e. the charge drop through the capacitors and the low current readings got rectified and the circuit enhancement is in progress. Without having any specially designed antenna, these were the readings. Now, the main target is employ specially designed antenna for the most efficient reception. Moreover, there is future planning of harvesting the unused Wi-Fi signals, microwave signals, etc. On using this method broadly, the radiations can be controlled. This will help in minimizing the threats of extinction of squirrels, sparrows and human disorders like cancer. Other biological disorders like fruit bearing capacity of the trees and some human related problems can also be minimized. The power wasted by the operators can be harvested and hence, would be conserved to serve as an electricity source to run small devices and to charge mobile phones. Energy would be conserved, as people would opt for free source available to charge mobile phones or to glow couple of LEDs.

Hence, the method mentioned can be successfully used to generate electricity, control radiations and thus, to conserve the energy.

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