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GEOMAGNETIC SLEEP INDUCER

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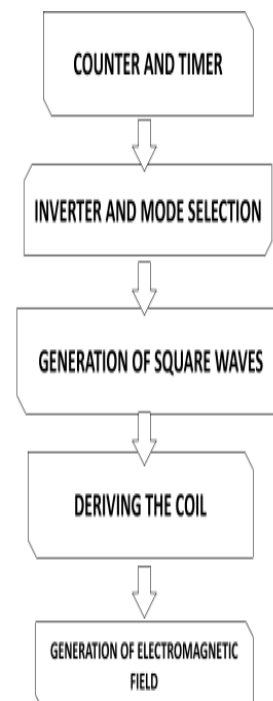
ABSTRACT

Sleeping difficulty is called insomnia, which involves difficulty in sleeping at night, waking up too early in the morning and waking up often during night. Sleeplessness can affect your ability to perform one's daily responsibilities. All types of insomnia can cause daytime drowsiness, poor concentration, and therefore the inability to feel refreshed and rested in the morning. Stress, a common occurrence and affecting almost all the ages of humans due to several external and internal factors like workload, relationship difficulties, chronic worry etc, which has developed as a threat to physiological factors influencing human beings. Magnetic flux related to the planet is termed geo-magnetic fields. It is necessarily dipolar on the surface. People

experience a sound sleep under natural environmental conditions. This is because of fact that our unconscious ability to perceive natural earth's magnetic fields. This project is designing a circuit, which radiates an electromagnetic field of low frequency through a radiator coil. The aim is to perceive these waves so that our brain is surrounded by a perfect environment required for a sound sleep. This paper describes the model developed for an inexpensive and accessible system that aids one to overcome insomnia.

INTRODUCTION:

Even in this new modern era where we have more medical discoveries people suffers mentally and also physically tired, and ill. One of the main reasons for this due to the lack of sleep. And why this sleeplessness is common in this new technological world is because of those



technology itself. Yes, electrical gadgets reduce our ability to perceive Earth magnetic field which is very helpful in putting us into sleep. Our aim is to produce Earth magnetic fields artificially and design a device so that anybody can use it without medication, drugs or side effects. This device will have an oscillator to drive counter as well as timer. Then amplified at last and with the help of radiator coil to produce the required geo-magnetic field. With these features and design, this device will be helpful for the people having sleeping disorder and sleep problem.

RELATED WORKS:

Insomnia is a serious sleeping disorder which not only affects us by sleeplessness, but also the quality of life that we live on daytime too. It is a disorder which makes you difficult to fall asleep or stay asleep or both. Because of this people are forced to have less productive day life and hard night life. There are different methods followed for making people to sleep.

- a) Drs. Leduc and Rouxeau experimented people by electrical stimulation of brain method to put people into sleep in 1902
- b) In 1933 Electroconvulsive therapy by Cerletti and Bibiwas another method by giving electric current with different frequencies tried to make people sleep as long as the current is on.
- c) Later in first half of 1990's nerve excitation method was used by several scientist and it is helpful in making us understand the excitation of nerves and magnetic stimulations.
- d) Now in modern era of twenty first century people use different methods like music therapy, Breath control techniques to induce sleep but uses mostly the medication techniques where pills and drugs are used to make people sleep but it has lot of side effects in long view.
- e) Modern scientists also researching on natural geo-magnetism which is produced on earth as one of the ways which induce sleep. And the research on how to make it more advanced way is still going on.

PROPOSED WORK:

In our project we built a circuit which induces geo magnetic waves which will be very useful for the insomnia patients and also for the people who can't be able to sleep due to stress, anxiety etc. and help them sleep. The working of the circuit in explained below.

IC2C and IC2D produce two square waves at approximately 1.2 and 5 Hz, respectively. By using C5 and C6, these waveforms are converted into 60 μ S pulses at the same frequencies and mixed at Q1 Base. This transistor provides a scalar series of pulses of 60 μ S length and 9V to the radiator coil. Amplitude. The timer section is made up of IC1, IC2A, and IC2B. When the switch is turned on, C1 and R2 automatically reset IC1. The internal oscillator of IC1 drives the 14-stage ripple counter, and output pin 1 goes high after about 15 minutes. Pin 3 of IC2A goes low, preventing IC2C and IC2D from oscillating. If SW2 is left open for 15 minutes (Alternate mode operation), pin 1 of IC1 drops too low, pin 3 of IC2A goes high, and oscillators are enabled again. If SW2 is closed (Stop mode operation), the first-time output pin 1 of IC1 gets higher, and the IC's internal oscillator is disabled via D1As a result, the circuit remains turned off until a reset pulse is applied to pin 12 or until the entire device is switched off and then restarted. The same thing happens when SW1 is set to 30 or 60 minutes, obviously changing the time. Length

IC2B moves pilot LED D2, which works in three modes: flashes rapidly and almost randomly when the Radiator coil is driven, flashes somewhat gradually and regularly when the Radiator coil is pausing during Alternate mode operation, and flashes somewhat slowly and regularly when the Radiator coil is pausing during Alternate mode operation. Is turned off when the circuit shuts down (Stop mode operation).

Using the rotary switch SW1, select a timing option. Now Choose between 15-, 30-, and 60-minute operations. Using SW2, select "Stop" or "Alternate" mode operation. When SW2 is closed (in Stop mode), electromagnetic radiation ceases after the predetermined time. • When SW2 is activated (Alternate mode operation), the device operates for the predetermined amount of time, then pauses for the same amount of time: this cycle continues indefinitely. Sleep like a log with

the unit under your pillow. P1 push button is used to reset a cycle.

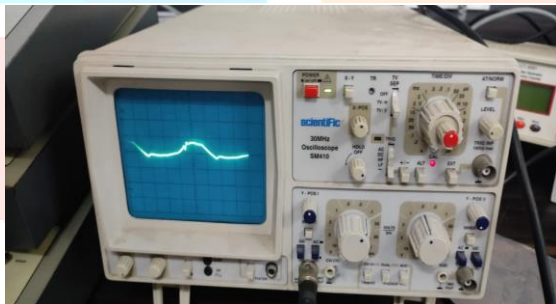
Important Points About Circuit:

The following points should be noted.

- L1 is made by winding 600 turns of 0.2 mm enamelled wire at irregular intervals on a 6 mm diameter, 40 mm long steel bolt. Insulating tape should be used to protect the winding.
- When in Alternate mode, the average current draw is around 7mA, dropping to less than 4mA during pauses.
- By omitting LED D2 and its associated resistor R5, battery life can be significantly increased.
- To enclose the circuit, a plastic box will be used: Metal cases can significantly reduce electromagnetic radiation.

RESULTS:

After the following procedure, the circuit will start emitting electromagnetic field with a frequency which induces sleep.



Measured frequency using oscilloscope

The above image shows the electromagnetic waves which we obtained using oscilloscope

Calculation of operation time:

Operation time, $t = 2.5 * 2n * R4 * C2$

Here, n= Output number (On),

2.5 = Multiplier,

R4 = Resistor connected to oscillator pin 10 C2 = External Capacitor connected to in 9 Now, consider pin 1

i.e O11 (n = 11),

R4 = 2.2 MΩ, C2 = 100Nf

So, $t = (2.5 * 211 * 2.2 * 10^6 * 100 * 10^{-9})$ sec

= 1126.4 sec

≈ 18 min

Similarly, for output pin 2 (O12) &

pin 3(o13) operation time are 36 minutes and 72 minutes respectively.

Power calculation using simulation:

$P = 0.35 * 10^{-3} * 8.8 = 3.08mW$ (without coil)

$P = 0.35 * 10^{-3} * 0.09 = 31.5\mu W$ (with coil)

Power calculation using oscilloscope: (practical):

$P = 8.82 * 0.35 * 10^{-3} = 3.09mW$ (without coil)

$P = 0.397 * 0.35 * 10^{-3} = 139 \mu W$ (with coil)

SLEEP INDUCED SIGNAL PARAMETERS:

OUTPUT	VOLTAGE	FREQUENCY
Signal induced by sleep (to the base transistor)	6.20	3
RF coil excitation	8.45	2.5

The above table represents the output we obtained which in turn the radiator coil on the circuit radiates electromagnetic field with the specified frequency which induces sleep.

As a result, the circuit we designed is capable of producing the desired signal in accordance with the standard specifications. The generated sleep-inducing waves' voltage (in volts) and frequency (Hz) parameters are also displayed. The induced

waveform clearly falls in the low frequency band of EEG signals.

This project aids in the treatment of insomnia. Apart from that, it facilitates relaxation, stress management, and sleep induction. This project creates geomagnetic fields, which surround the brain and provide an ideal environment for sound sleep.

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