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## Methods for Lucid Dream Induction

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### Abstract

Lucid dreaming is self-consciousness or self-awareness while dreaming. Normally, we are self-conscious or self-aware in our ordinary waking state, but not during dreams, when we are conscious but not self-conscious. In the usual dreaming sleep, the left brain hemisphere is closed down, leaving the right hemisphere active. The right hemisphere employs emotional, gestaltic, intuitive, present-oriented thinking, in contrast with the linear, reasoned, sequential, rule-bound and time-bound (past, present and future) logic of the left hemisphere. This explains why dreams are often bizarre, as there is no logic filter, which in our normal waking state, filters out illogical scenarios before they reach our normal self-consciousness. Methods for having lucid dreams are given, including a new method that requires no sensor of any type to be worn during sleep.

Key words: lucid dream, dream, consciousness, lucid dream method, stroboscope, brain hemisphere

### Lucid dreaming

Lucid dreaming is self-consciousness or self-awareness in the dream-world. The dream-world may be a part of the so-called “astral” world, named as such for its self-luminous appearance, like dreams have. This is discussed below. We are self-conscious or self-aware in our normal, waking state of consciousness, but not in the dream state. That is, in the dream state we are only conscious but not self-aware, so we cannot direct our dreams. This is because our left brain hemisphere, which provides logical functions, appears to be shut down during sleep and the right brain then gives us bizarre dreams – bizarre because they are uncensored for logic by our waking-state, logical filter.

It is helpful to place lucid dreaming within a spectrum of states of consciousness:

1. Normal waking state
2. Hypnagogia: the experience of the transitional state to or from sleep.
3. Normal dreams: These are usually in colour. The dreamer is unable to direct the events in the dream, nor to filter out absurdities, which often occur. Normal dreams are often forgotten unless one keeps a dream diary on waking up.
4. Vivid dreams: These are much more striking and memorable than normal dreams and sometimes include sounds. But the dreamer is still unable to direct the dream, nor to filter out absurdities. Both ordinary dreams and vivid dreams are remembered much better if one writes down what is remembered as soon as one wakes up. By this method, one can pass from hardly recalling any dreams, to detailed frequent dream recall.

5. Lucid dreams: One becomes self-conscious, just like in one's waking state, and have the ability to consciously direct the unfolding of the dream process. The dreamer is fully self-conscious or self-aware and can direct the course of the dream. A lucid dream may be quite short, such as perceiving oneself in another room in one's house which is bright as if in full daylight, even though the actual time may be midnight. One can look around the room at one's own will. A lucid dream may end abruptly, with loss of consciousness. Vivid dreams transition only rarely to lucid dreams. A lucid dream is accompanied by a sudden feeling of exhilaration, which a vivid dream does not have. The mind continues to create or add hallucinatory images to both types of dreams.
6. Out of body experiences (OBEs): One may observe one's physical body, lying asleep. OBEs may also occur when under anaesthesia and after brain injury. They can sometimes also be a part of "near death experiences" (NDEs).
7. Inspirational flashes of intuition for problem-solving: In dreams that provide solutions to problems the dreamer has been pondering, we often have the factual report of the images and actions that appeared in the dream which provided answers to previously unsolved challenges. Rarely are there clear indications that the dreamer volitionally directed the dream towards the solution, or in any other way directed other portions of the dream so that the dream could be identified with reasonable certainty as a lucid dream. In many of these cases, however, the person had a strongly held compelling desire to find a solution to a problem prior to entering the dream state. In some cases the quest for an answer had been present for months or even years. The reports of these dreams containing creative solutions were clearly very helpful and even inspirational to the dreamers. In this respect they demonstrate some of the qualities of a lucid dream.
8. Past life memories.

Everyone experiences the first four states, but lucid dreams are very rare unless one takes steps to induce them.

The different states of consciousness listed above can sometimes overlap as mixed experiences. For instance, hypnagogia may involve no imagery, but has been variously described as characterised by visions of half-sleep, 'faces in the dark', 'oneiragogic images,' etc. (Mavromatis, 2010).

An example of a vivid dream transitioning into a lucid dream is given by Celia Green (1968) in her classic book on lucid dreaming. It begins as a vivid dream that turns into a lucid dream. She quotes from Delage (1919):

I find myself in Paris, on Rue Soufflot, where it meets Boulevard Saint-Michel. I am standing on the pavement, which is on one's right when going towards the Pantheon and I am looking towards the other side of the road, where I see an enormous second-hand bookshop. Long counters stretch along the shop-front under arcades, and there are assistants perched on ladders arranging the books. On the ground between the pillars there are tables loaded with books, and there are passers-by browsing through them and even people sitting to read. I look at this spectacle with a certain surprise, but without remembering in my dream that this is not in accord with reality. I know very well that in that position there is no second-hand bookshop but a large café. But in my dream I do not remember this.

I move away, and a short distance away on the boulevard, between the street corner and the Medici fountain, I join a group of loiterers who are gathered around a contortionist. At this moment I become analytical. I remember coming to Paris the day before, which was a Saturday, and it occurs to me that the next day, Monday, I shall come again to Paris, as usual, for the meeting of the Academy. And from this I conclude that today is a Sunday. Then I say to myself, 'How is it that I came here on a Sunday? This is hardly ever the case.' And at once it

dawns on me: 'If it is Sunday and I think I am in Paris, I must be dreaming.' The dream immediately becomes completely lucid, without losing any of its hallucinatory character nor any of its vividness.

Thus, the consideration that brought me to the conviction I was dreaming was not the weighty argument that the corner of the Rue Soufflot seems to be occupied by a shop which (in reality, but not in my dream, for the memory does not occur to me) I know very well is not there, but in this very feeble argument I find myself in Paris on a day when I am not usually there.

Celia Green (1968) gives many typical lucid dream examples. She comments it may be hard to classify whether one is experiencing a lucid dream or an OBE. An example is given below.

Oliver Fox (1968) asked a friend to appear in his room during a dream and reports:

"The following evening we met and I found Elsie very excited and triumphant. 'I did come to you!' she greeted me. 'I really did. I went to sleep willing that I would, and all at once I was there! This morning I knew just how everything was, in your room, but I've been forgetting it all day – it's been slipping away.' She described in detail the following:

- (i) Relative positions of door, bed, window, fireplace, wash-stand, chest of drawers, dressing table.
- (ii) The window had some small panes instead of the usual larger ones.
- (iii) That I was lying, eyes open, on the left side of a double bed and seemed dazed.
- (iv) An old-fashioned pin cushion, unusual for a man's room.
- (v) A black Japanese box covered with red raised figures.
- (vi) A leather-covered desk lined with gilt, sunk plate on top for handle to fall back into, standing on the chest of drawers. She described how she was running her fingers along a projection ridge on the front of this desk."

Green adds:

It is of interest that Fox initially thought that the last of these details was incorrect, and that what the subject had taken for a projecting ridge was merely a gilt line on the leather. However, having asserted that there was no projecting ridge anywhere on his desk, he later discovered that Elsie was correct: Fox noted: "The desk was placed to front the wall, and the hinges (which I had quite forgotten) made a continuous projecting gilt ridge just as she had described. Owing to its position she had naturally mistaken the back of the desk for the front."

Here is another short example from Green, classed as a lucid dream:

Dreaming that I was walking along a road – straight and I think walled on one side – I realised I was dreaming. I knew this was a thing I had been trying to do and thought, 'Now I can make something happen'. I thought I would like to have an apple. I saw a patch on the road ahead and thought, 'By the time that I reach that, it will be an apple'. Before reaching it, I found I had another apple in my hand. I examined it, thinking, 'Quite a creditable imitation of an apple'.

Lamberton, in a state of hypnagogia at the end of a sleep, had a lucid vision of a blackboard of geometric drawings on it, which solved a problem he had been trying to solve by a different method. This is an example of a vivid vision/dream from which a scientific proof (invention) arose. Another example is that of the mathematician Poincare who invented Fuschian Functions. Probably they were still in a dream-type of mental state as they awoke, or they would not have seen these in a vision/image, for example as a blackboard.

It seems most promising to develop a state which may expand one's faculties in ways that are beyond normal self-consciousness, as an exploratory quest, perhaps even leading to out of the body experiences (OBEs). While associations are sometimes noted between lucid dreams and OBEs, a discussion of the link between these is beyond the scope of this paper and for more on this the reader is referred to Yushak (2009) and Green (1968).

## **Methods for deliberately entering a lucid dreaming state**

Various mind-body methods have been employed to induce a lucid dreaming state.

### ***Non-electronic methods***

1. A fast, easy method to achieve lucid dreams is to use a flotation tank (Hutchison, 1984), but may require several sessions. This is typically an 8 ft x 4 ft tank holding 10 inches of nearly saturated solution of magnesium sulphate (BP or USP grade), at 35 degrees C (skin temperature). This creates an ambience where there is no sense of touch. The room is dark and soundproof, so all five senses receive no normal input. This causes the brain to "turn up its automatic gain control", which brings forward normally-subliminal inputs into one's consciousness – a very unusual state to be in. Also, an electroencephalograph (EEG) trace shows that bi-laterally symmetrical beta, alpha and theta brainwaves are spontaneously produced, normally associated with advanced meditation. After less than an hour, spontaneous bright images may appear, like a vivid dream, except that one is fully awake and self-conscious. These may be scenes from long-past memories, or cartoon characters. Several sessions may be needed to reach this state. Some call this a "WILD" (Waking-state Induced Lucid Dream).

A flotation-tank-induced state of consciousness has a wide range of uses, including achieving self-hypnosis for difficult subjects; pain relief (e.g., arthritis) achieved by endorphin release caused by the tank experience; super-learning for students, used, for example, by lawyers preparing mentally for court case presentations and used by baseball team members before a game; improving athletic performance; reducing smoking and drug use; achieving weight-loss; giving access to the right-brain for creativity and enhancement of inventiveness; reducing stress and anxiety; and it appears beneficial in prevention of heart disease (Hutchison, 1984).

2. A simple method, needing no equipment, is to look at one's hands very frequently throughout the day and try to make them disappear, as a test of whether one is awake or dreaming. If this simple test is made habitual by being done very frequently during the day (which is surprisingly difficult to remember to do!), this will then automatically be continued during dreams but then one's hands will disappear and this will trigger a realisation that one is dreaming, and at that moment of self-consciousness the dream may become lucid. Through this process, one is inviting the left hemisphere to become active during dreaming. The dream can then be consciously directed.

A simpler variant is just to look at one hand frequently during the day and then, when going to sleep, decide to do the same in any dream. This action can trigger a lucid dream.

Another similar daytime exercise is to continually ask if one is dreaming or not by looking away and back again and see if the scene has changed. If it has, you are dreaming.

Other such trigger methods are described in books on lucid dreaming by the Lucidity Institute (LaBerge and Rheingold, 1990; Levitan and LaBerge, 1993).

3. Namkhai Norbu (1992) describes a retreat into a dark room for two or three days, which has been used by western psychologists to produce vivid dreams. But the same production of visual imagery

can be obtained in hours instead of days by using a flotation tank, described in (1) above. See also Appendix C.

### **Electronic methods**

1. The “Dreamlight”® (Lucidity, web reference) utilizes a face mask containing LEDs which flash when dreaming is detected by rapid eye movements (REM). This series of flashes alerts the dreamer, within the dream, that he/she is dreaming, and this can trigger self-awareness. However, wearing a face mask has the disadvantage that it may be hard to sleep while wearing it.

2. A thermistor (a resistor that changes with temperature) is taped to a nostril to monitor breathing rate. Its resistance varies with temperature. One’s in-breaths are colder than out-breaths. One’s breathing frequency increases during dreaming sleep, triggering a frequency meter to send tiny electric shocks to the sleeper’s wrist, or to flashes of a bright strobe lamp. The dreamer perceives the flashes in the dream as part of the dream, and then realises he is dreaming and a lucid dream is thus triggered. People with epilepsy should not use the strobe flashing method because it can precipitate seizures.

3. A simple lucid dreaming method is to make a recording of fifteen minutes of silence, followed by one’s voice saying, “This is a dream. You are dreaming.” If this is played late at night when one is sleepy and seated in an easy chair, one may fall into hypnagogia within fifteen minutes and this may transfer into a lucid dream. A free program called “Audacity” to make this recording, is available from Audacity (web reference) and the recording can be copied to an I-pod or other recording device and listened to with earphones. In addition, earphones may be uncomfortable in bed, but perfectly alright when sitting in an easy chair.

*4. Applications (“Apps”) are now available on the I-pod Touch and I-phone, which wake one up during rapid eye movement (REM) sleep - the best state for lucid dreams.*

a. One App is called “Sleep Cycle Alarm Clock” and is meant to wake you up only during a dream, giving a better wake-up feeling than an ordinary alarm clock, which may wake you in non-dreaming deep sleep and can leave you feeling disgruntled. This App detects dreaming sleep from the fact that one moves position slightly when dreaming, and then it sounds an alarm. Instead of using the programmed audible alarm, which would just wake one up, the output socket on the I-pod Touch can be taken off as in Figure 1 and used as shown in Figures 2 and 3 to trigger lucid dreams. (See further details and explanations in Appendix B, and the Sleep Cycle Alarm Clock display in Figure 5.)

For the Sleep Cycle Alarm Clock, the I-pod Touch can be used to detect REM sleep by using the accelerometer which is built into an I-pod Touch or an I-phone. This allows dreaming to be detected with nothing worn on the face and no sensor connected anywhere on the person while sleeping. Nothing is in contact with the body. This is a very major advantage, as one can sleep quite normally, unencumbered by attached sensors. The author of this article found the system works well for its user. A potential drawback is the use of strobe light flashes, but in this case another person sleeping nearby was not disturbed by the light flashes. (See Appendix B, Figure 2 for the strobe setup.)

b. An alternative to a strobe for the same method is to use a device intended as a “Snore Stopper” which can also be run from an I-pod. The type tested by the author is shown in a separate article (Hocking, web reference). It is worn like a wristwatch and is less convenient than the strobe, because it requires a sensor to be worn. The only advantage of the snore stopper method is that it would not cause epileptic seizures. When the I-pod is triggered by REM sleep, its signal can power either the strobe or the “snore stopper” device. The latter has an electret microphone which is meant to pick up sounds of snoring that persist for more than about 8 seconds, and then it delivers tiny electric shocks to the wrist, which rouses the snorer just enough to make him/her stop snoring, but without waking

him/her up. This has been found to alert a dreaming sleeper sufficiently to become lucid in his/her dream.

### **Herbal methods for lucid dreams**

The author has found that if one eats a vegetarian dish in the evening called Lo Han (“Buddha’s delight”) with soy sauce, available in some Chinese Restaurants, one may have unusually vivid dreams in that night. The constituents of this dish, listed in Google, include lily buds and soy sauce.

Lily contains galantamine, which is known to cause lucid dreams. Choline or Alpha GPC may enhance this effect. In the author’s experience, there are no effects during the day in the normal waking state, so this seems to be a morally acceptable herb/drug in that it is non-addictive and will not alter the user’s behaviour in any ways that may affect others.

The extract from plantation-grown Red Spider Lily (*Lycoris radiata*) has a long history as an herbal treatment. For thousands of years people have used it for dream enhancement, as a headache treatment and for its positive effect on memory recall.

An herbal extract from the common snowdrop plant has long been used for improving memory in Eastern Europe. In experiments for the USA Food and Drug Administration (FDA), a synthetic version of this extract known as galantamine improves the memory of those with Alzheimers disease. These studies revealed an odd side effect, namely that those in the study reported significantly more dreams and enhanced dream recall. (See Appendix A for further practical details on the use of Galantamine.)

### **Other methods**

The author has experienced what were undistinguishable from lucid dreams but which also seemed like OBEs, leading me to suggest that the dream state involves some aspect of the astral. On returning from Hawaii to the UK, the author had considerable jet lag and while waking from the first night’s sleep back in the UK, the author’s bedroom appeared as it is, except that garlands of flowers were hanging on the walls. The field of view was a full 360 degrees, but at the instant of waking, the field of view snapped back to the normal 170 degrees and the garlands vanished.

Sleeping at unusual times has been cited as a method for lucid dream induction, such as getting up at the usual time in the morning and then going back to bed to sleep again (LaBerge & Rheingold, 1980).

The following reports are included on a possible link between OBEs and lucid dreams. On such a link, see also Green (1968) who says lucid dreams are closely related to OBEs and gives many examples, and Yuschak (2009).

Appolonius of Tyana (Hocking, 2011) wrapped wool around himself to obtain out-of-the-body experiences (OBEs), which possibly relates to one of the flotation tank features of making the environment temperature equal to the skin temperature. A flotation tank (Hocking, 2011) can produce spontaneous “WILDs” (wake induced lucid dreams) but this is beyond the scope of this paper.

It is also reported that wrapping oneself up completely like an Egyptian mummy, also causes out-of-the-body experiences.

Ashcroft-Nowicki (1980s) recommends that we might use the following exercise: Imagine an old wooden door, with massive hinges (which will appear – depending on the depth of one’s degree of visualisation). Through the doorway you see a wild moorland on one side and on the other side a set of cliffs, washed by a grey wind-swept sea. You exit and lock the door behind you, placing the key in your pocket. A detailed “pathworking” journey follows. Ancient archetypal paths can be used, defined

by scenes on Tarot cards (for example, Tarot trump card XXI is an “astral doorway” – a path between Malkuth (Earth) and Yesod (“Astral”) in Kabbalistic terms (Z’ev ben Shimon Halevi [Warren Kenton], 1979). After such journeys, return through the door and lock it behind you. It is important to ensure that you are fully back in your own space and time (Hocking, 1993). Surprising revelations from your subconscious may be obtained by this method.

See also references (Hocking, 1993; and Hocking, web reference) for more information on brain hemisphere activity, EEG usage, biofeedback, light and sound devices, cranial electrical stimulators, Ganzfeld, pathworking, and flotation tanks and for a free download of related information by the author.

### **Inspirations during dream states of various sorts**

An indication that a hypnagogic state (which is the precursor of the full sleep state) can yield valuable applied results is evidenced by a procedure used by Thomas Edison, who was an incredibly prolific inventor. He used to relax in an easy chair while holding a rubber ball in his hand, and dozed towards sleep. Falling asleep caused him to release the ball, which then fell onto a metal sheet on the floor that caused a noise sufficient to jar his consciousness enough for him to bring into his waking state many ideas for inventions. I would speculate that Edison’s method may have led him into the theta brainwave dream-state which has many possibilities for creative consciousness. Cade and Coxhead (1989), using the Mind Mirror EEG (web reference), found that theta brainwaves increased in amplitude in the hypnagogic and dreaming states. Theta brainwaves (about 6 Hz) are associated with dreaming and meditative states, and are produced by experienced meditators but are absent in the normal waking state. Edison developed over a thousand inventions that were patented, many of which he obtained by his above special hypnagogic relaxation method, which he had devised for that purpose.

It is not known if Edison’s hypnagogic reveries came only as ideas or as dream imagery, but many others report distinct imagery during hypnagogic states, which generated important literary and scientific contributions. Of note is Coleridge’s “Kubla Khan”; in writing this, Coleridge experienced a daydream in which ‘all the images rose up as things’ (Koestler, 1981).

Poems, ideas for novels and entire novels have arisen in hypnagogic states (Mavromatis, 2010). Emily Bronte describes hypnagogic imagery in writing *Wuthering Heights* and *Villette* (Mavromatis, 2010). Charles Dickens derived many of his stories during hypnagogia, but it is not known if this generated ideas only, or imagery (Mavromatis, 2010). The author F. Miller (1906) describes in detail how a novel arose, with her eyes closed, from imagery involving the Incas (Mavromatis, 2010).

Jean Cocteau, on waking, visualised a play, as if he were watching it in a theatre, which he later published as “The Knights of the Round Table” (Mavromatis, 2010). Mavromatis gives many other such examples of dreaming, sometimes lucid dreaming, of material useful for various purposes. Other examples are given by Green & Green (1977), but too detailed to summarise here.

Probably the best-known example of a dream-state which yielded valuable scientific information was that of the organic chemist, Friedrich Kekule, who reported, “I fell into a reverie, and lo!, the atoms were gambolling before my eyes ... I saw how, frequently, two smaller atoms united to form a pair, how a larger one embraced two smaller ones ... I saw the larger ones form a chain ... I spent part of the night putting on paper the sketches of these dream forms.” Kekule had a series of such visions, the most famous one being on the ring structure of benzene. He did not ‘direct’ the dream, nor use the term ‘lucid dreaming.’

Numerous other examples are given by Celia Green (1968) in her classic book on lucid dreaming.

A wide variety of examples demonstrate the broad spectrum of dreaming and inspirational mental states, particularly in the spectrum of vivid and lucid dreaming. If one considers that there are other zones of consciousness besides our normal three dimensional world and our ordinary conscious state, it seems worthwhile expanding our own consciousness to include these. Such exploration would increase one's inner knowledge.

## Acknowledgement

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Lucidity [www.lucidity.com](http://www.lucidity.com)

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Mind Mirror EEG:

[www.mindmirroreeg.com/w/equipment/mm1and2.htm](http://www.mindmirroreeg.com/w/equipment/mm1and2.htm)

[www.mindmirroreeg.com/w/GeoffreyBlundell.htm](http://www.mindmirroreeg.com/w/GeoffreyBlundell.htm)

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For a free download of more information related to the topic of the present paper see [www.4-D.org.uk/Books](http://www.4-D.org.uk/Books)

## APPENDIX A: Resources

Yuschak (2009) has published research papers and a book on galantamine, which is essential reading on this topic. He covers use of herbal supplements (which, unlike narcotic drugs, do not alter one's waking behaviour) to produce immediate lucid dreams and out of body experiences (OBEs), including seamless transition from waking awareness to induced lucid dreamstate consciousness ('WILD'). Herbal supplements are also discussed by Hocking (2011).

### Internet links on galantamine:

Memeron (galantamine compound website): [www.memeron.com](http://www.memeron.com)

Razadyne (manufacturer's website): [www.razadyne.com](http://www.razadyne.com)

Galantamine (patient information): [www.meds-help.com/galantamine/](http://www.meds-help.com/galantamine/)

### Useful websites on galantamine:

<http://dreamstudies.org>

<http://dreamstudies.org/galantamine-review-lucid-dreaming-pill/>

<http://www.dreamviews.com>

Internet suppliers of galantamine include:

[www.smartnutrition.info/brain.html#Galantamine](http://www.smartnutrition.info/brain.html#Galantamine)

[www.dreamamins.com](http://www.dreamamins.com)

Vitamin Express, who call it Galantamind: [www.life-enhancement.com](http://www.life-enhancement.com)

See "Galantamine" in Wikipedia for more information.

**Note:** These are herbal products and so have no purity standard such as BP or USP. The author cannot recommend their use. The above details are given for information only. If preferred, natural lily buds as an ingredient of Buddha's Delight (see in Wikipedia) can be bought from a Chinese food store.

In addition to [www.saltcube.com](http://www.saltcube.com) and [www.lucidology.net](http://www.lucidology.net), another useful website is <http://www.twoweekluciddreamer.com> but the writer (MGH) has not tested this.

## **APPENDIX B: Instructions for I-pod device to trigger lucid dreams**

This appendix explains the simple electronics for those who wish to put together a practical I-pod device for triggering lucid dreams.

The required application programme (“App”) is called “Sleep Cycle Alarm Clock” (v. 3.0.1) (Maciek Drejak Labs AB, 2010), and is available from the I-Tunes on-line shop (Health & Fitness section) for only £0.69 or US\$1.00.

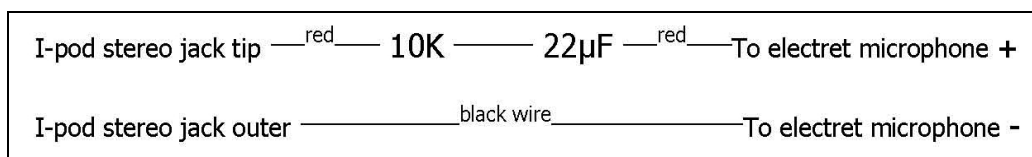
The App allows a “song” of one’s own to be inserted and used as the wake-up alarm, which is played by the App only when REM dreaming is detected, within a 45 minute window immediately before a chosen wake-up time. To trigger the audio switch, 3 claps at about half-second intervals are recommended by the audio switch manufacturer, but it was more reliable to make up one’s own recording with 3 sounds (not claps), half a second apart, such as: “pah, pah, pah”, spoken staccato and very loud, which the I-pod voice recorder will record. A recording is available from the writer if there is difficulty with this. This recording has never failed to trigger the audio switch.

When using this, set the volume (when in the App programme) to maximum.

The aim is to convert the “song” output from the I-pod’s App, into a signal that will switch on a strobe light at a settable flash frequency for a (settable) time interval of about 10 seconds, after which the circuit will switch the strobe off and lock out any further strobe activations.

The audio output socket on the I-pod was used (see Figure 1) to activate the relays in the circuit of Figure 2.

**Figure 1. Connection from I-pod to electret microphone in audio switch**

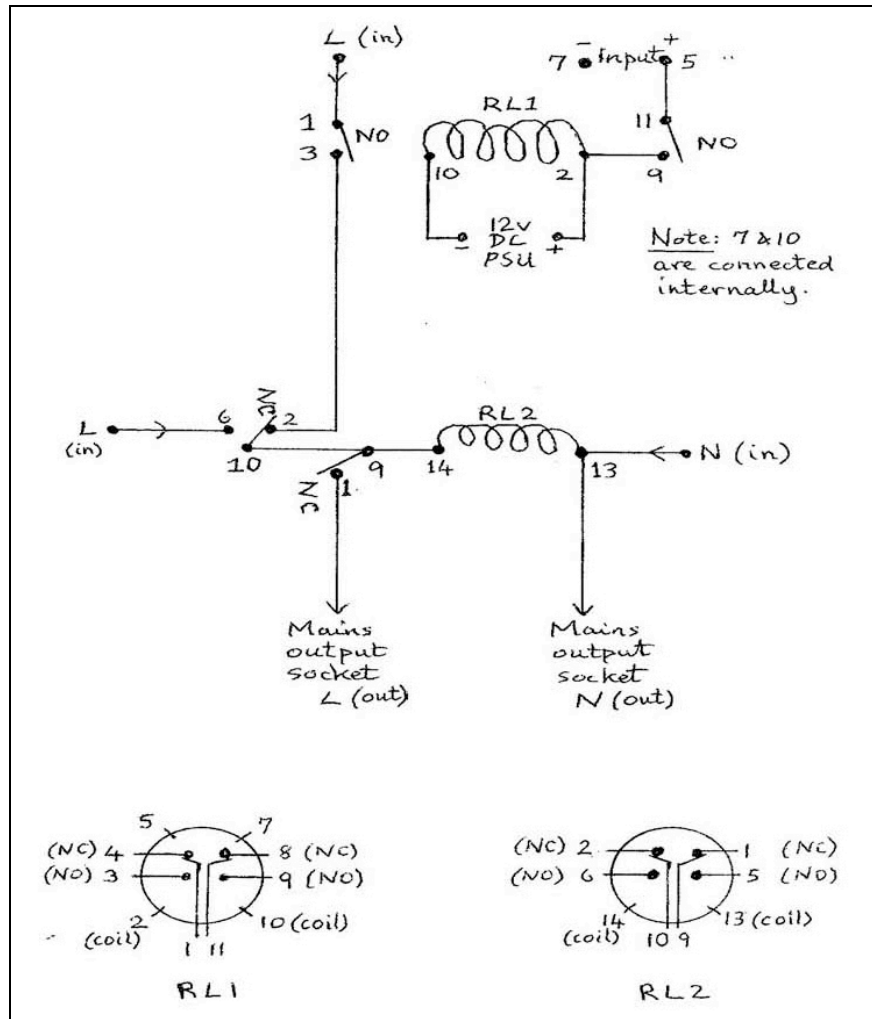


*Notes: Observe polarity! This is a 2 metre twin wire from the I-pod stereo jack socket, to the electret microphone in the audio switch shown in Figure 3.*

*This is the only item in this paper that needs soldering.*

*The 22 $\mu$ F electrolytic capacitor has its negative end connected to the 10K quarter-watt resistor and its function is to block the low DC voltage which exists across the electret microphone terminals. (Electret microphones have about 3 volts DC across their terminals, to work.)*

Figure 2. Relay circuit



**Notes:** This setup uses two relays: RL1 is RS Type 348-245, a high sensitivity type with a 12 volt DC input into pins 5 & 7, which switches the relay RL1 contacts.

RL1 has a 12 volt DC coil (pins 2 & 10), powered by a second 12 volt DC output PSU, which was plugged into the mains socket strip (see Figure 6). NB: Correct DC polarities are observed for both of the PSUs. See Figure 6 for block diagram of all connections.

The first 12 volt DC PSU (observe correct polarity) is plugged into the output socket of the audio switch, and when it is switched on, it sends a 12 volt DC signal to the input pins (5 & 7) of RL1 which activates the Figure 2 circuit, which powers the strobe for the time period set on the time delay relay RL2.

RL2 is RS Type 340-617 time delay relay with a 240 volt AC coil. RL2 pins 13 & 14 are its mains 240 volts AC coil, and the other pins are self-explanatory from the diagram. The base for RL2 is RS 493-6341. This schematic of Figure 2 shows the base to be round, but it is oblong in fact.

For 115 volts AC mains, equivalent components are available. An Earth (Ground) connection is needed (not shown) – see caption of Figure 6.

**Figure 3. Audio Switch (examples from eBay international sellers).**



Notes: The 230 or 240 volt version is for UK use.

Some models are triggered by 3 claps (or staccato noises), but others require only 2 claps.

Neither will work with the wrong number of claps.

The audio switch early versions had a reputation for overheating and starting to smoke! This was probably because high wattage appliances were plugged into them, but the small transformer used in this application takes an extremely low power. Nevertheless, the author did not leave the audio switch powered if no-one was in the room.

### **Safety:**

We live in an increasingly litigious age. The author stresses that everything throughout this paper must be taken as an account of what the author did (even if it may appear otherwise from the local text in the articles) and cannot be used as the basis for any claim against the author, that is the author does not intend the articles in this document to be a suggestion for anyone else to copy what he did. For instance, if an author writes an article on bungee jumping, then he cannot be sued if someone copies what he did and then claims to have been injured. (Note: Never try bungee jumping – the deceleration can detach your retinas!)

(1) The circuit design (Figure 2) of this unit uses relays to keep it simple by needing only a screwdriver. But if a user has any doubt about safety, advice from a qualified electrician should be sought or the assembly job done by a qualified electrician.

(2) There should be no electrical hazard from the I-pod, as it is meant to be usable while connected to its mains charger, but as an extra essential safeguard, the 4-outlet mains strip which powers everything was plugged into an RCD (residual current detector) safety switch, which are commonly used for electric lawnmower safety.

This also allowed everything to be turned on and off together by just pressing the red test button on the RCD. A block diagram of all the interconnections is in Figure 6.

The mains output socket (to power the strobe light) must have a surge protector plugged into it, because RL2 switch contacts are rated at 3 A resistive load, and could be damaged if an inductive load is switched. The system was not left on all day (because the time delay relay coil would remain “on”). To prevent this, everything was always switched off after waking, hopefully after a lucid dream.

(3) Any electric blanket was switched off.

(4) A non-electrical safety aspect is possible stroboscopic effects on people with epilepsy, including as-yet un-diagnosed epilepsy. This requires the author to say that no-one with a history of epilepsy,

seizure dysfunction, or psychiatric or neurological disorders, should use flashing lights without taking medical advice from a qualified practitioner. But the strobe is only on for about 10 seconds and when the user is expected to be asleep.

**IMPORTANT:** If the author happened to be awake when the strobe light flashed, he kept his eyes closed – as it is important not to look directly at powerful flashing lights. Never look at a strobe with eyes open.

**Note:** A baby's eyes can be damaged by photoflash lights – never use a strobe in their presence, and never take photoflash camera pictures of babies.

#### **Instructions used:**

The “App” Alarm was set to a time about 30 minutes before normal waking-up time. It would then respond to the REM sleep periods which are likely to occur within the 45 minutes before this set time.

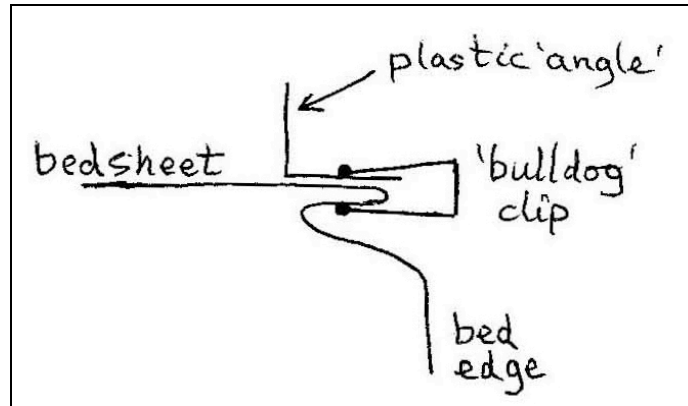
The time delay relay (RL2) was set at first to 6 seconds, but if this did not trigger a lucid dream, this delay time was increased. But if it woke the user up, instead of triggering a lucid dream, the delay time was decreased. The delay time is the time for which the strobe is powered on. The strobe was set to an (optimum) flash frequency (Levitan & LaBerge, 1993) between 2 and 4 flashes per second; this can also be varied (at the strobe unit).

Useful reading: references (LaBerge & Rheingold, 1990) and (Levitan & LaBerge, 1993).

To stop the I-pod falling off the corner of the bed, the best method is to use a “bulldog” clip as in Figure 4 to secure the plastic angle.

The relay switch contacts are wired such that further trigger signals (if any occur) are locked out (so that no further unwanted strobe activations occur).

**Figure 4. Method of preventing I-pod from falling off the bed-edge**

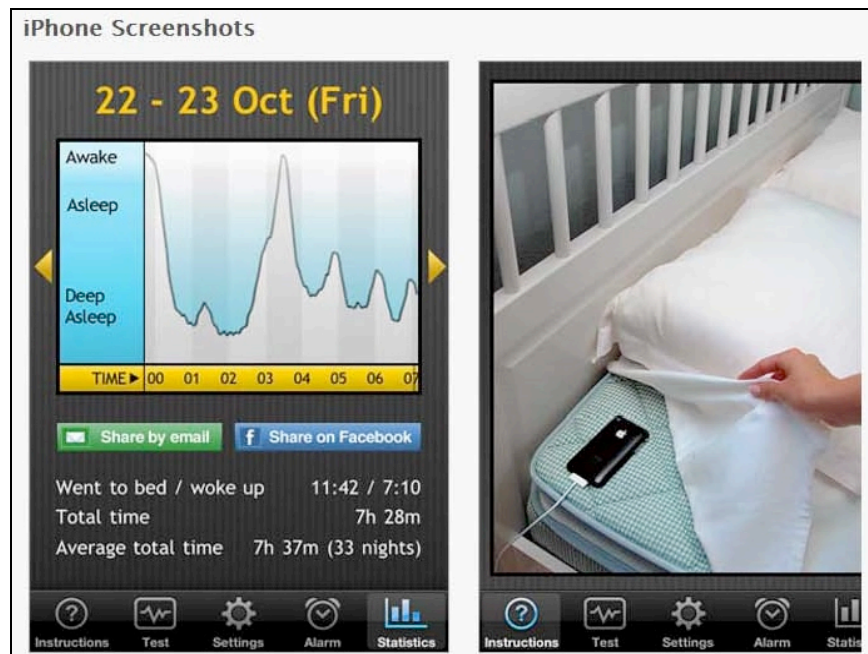


Place the I-pod face down where the words “bedsheet” are written in this figure.

The plastic angle (from DIY shops) is about 1 inch x 1 inch x 6 inch. Round off the upper corners to avoid being scratched by it.

The bulldog clip stops the angle from slipping. Use two clips, spaced apart.

**Figure 5. I-pod Touch, or I-phone, in use with the Sleep Cycle Alarm Clock APP**



**IMPORTANT:** The I-pod as is wrongly shown about to be covered in Figure 5! It will overheat: see text on this point. (The APP will probably not work with Tempur® mattresses which are very compliant to body contours, but a piece of hardboard could be tried, under the pillow and extending under the I-pod.)

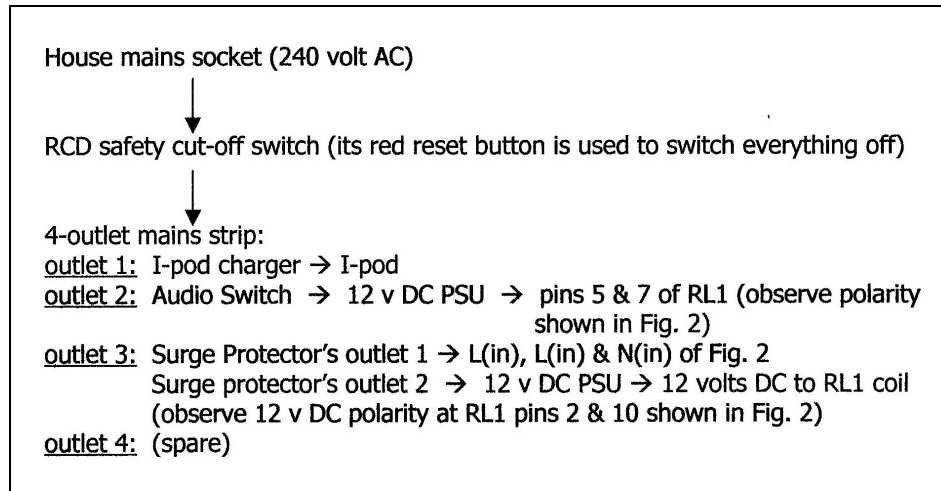
Website: <http://itunes.apple.com/gb/app/sleep-cycle-alarm-clock/id320606217?mt=8&ls=1>  
Cost of the "App" is £0.69

NOTE: Airplane Mode must be set, to avoid unhealthy radiation from aerial all through the night when asleep!

REM (light sleep) periods are peaks on the graph. When sleeping, small body movements are made only in REM sleep periods and are then detected. The slightest movement of the I-Pod Touch activates its internal detector (accelerometer), which then sounds music as an alarm to wake you up. But instead of waking one with music, three sharp sounds can be used to trigger an audio switch which triggers a strobe light. This alerts one within the dream. One then becomes aware that one is dreaming and one's dream-state changes to lucid.



**Figure 6. “Block diagram” of all connections for the strobe method**



PSU = Power Supply Unit (mains to 12 volts DC output).

RCD = Residual Current Detector safety switch.

Important: The mains supply has 3 wires: Live (L), Neutral (N) and Earth or Ground (not shown). The Earth (Ground) connection is essential for the safety RCD to work.

Outlet 3 has a surge protector adapter plugged into it, with 2 outlet sockets on it.

The strobe was plugged into the output socket of Figure 2 (“Mains output socket” in Figure 2), and that output socket must have a surge protector plugged into it.

### **Circuit Notes:**

Figure 2: Two points marked L (in): Connection for 240 volt AC mains power input from the RCD via a surge protector (e.g. RS 209-112). See Figure 6.

Figure 2: One point marked N (in): Connection for mains neutral power input from the RCD (via surge protector as above).

Figure 2 “Mains output socket” L (out) & N (out): These wires connect to a single mains output socket, containing (another) surge protector into which the strobe (or other device) plugs in, and so becomes powered by the relay circuit shown above.

Figure 2 “Input”: This is for a 12 volt DC input from a 12 volt DC PSU plugged into an audio switch, which triggers the relays in circuit of Figure 2, to activate the strobe for a fixed time interval set by the time delay relay, RL2.

“NO” means these relay contacts are “**N**ormally **O**pen” and they close only if the relay coil is energised.

“NC” means these relay contacts are “**N**ormally **C**losed” and they open only when the relay coil is energised. Both relay switches are “double throw” types, DPDT (double pole double throw). DP means there are two separate sets of switch contacts.

Note that pins 7 & 10 of RL1 are connected together internally (not shown on above diagram).

Figure 2 “PSU”: is a +12 volt DC power supply unit, of the commonly available type which powers many small electronic appliances. It is plugged into the same 240 volt mains power supply strip that powers the above Figure 2 circuit and its +12 volt output is connected to pins 2 & 10 of RL1 (coil). It is on, for all of the time that the mains supply to the relays is on.

Note that there are two separate +12 volt DC power supply units: one is plugged into the audio switch, and another which is connected to pins 5 & 7 of RL1.

A detailed technical explanation of the relay switching logic is given on the author’s website, with other information: [www.4-D.org.uk/Books](http://www.4-D.org.uk/Books) and click on UPDATE for a free download.

A suitable strobe is the 45 watt Maplin LG38R, which is £30 and mains powered. It was placed on some furniture near the bed. A cheaper (£18) strobe (Maplin N97JB) should suffice if placed only 2 feet away.

### Testing:

After recording the “song” (pah, pah, pah) in an I-pod or I-phone, it was loaded into the Sleep Cycle Alarm Clock App, which allows one’s own “song” to be used instead of the list they provide. For testing purposes, this “song” (3 loud “pah” sounds, to trigger the audio switch) can also be played outside of the App by just selecting it from the playlist or wherever it is stored in the I-pod.

Or, instead of using the I-pod, the user simply says 3 loud “pah” sounds into the audio switch direct (it has an internal microphone) and watches its 3 LEDs light up in sequence, and this should flash the strobe and it should stop flashing after the set delay time has elapsed.

Or, just tap the side of the audio switch 3 times at half-second intervals.

There are 3 LED lights on the audio switch (Figure 3) and each light should illuminate on each of the 3 “pah” sounds. Only if all 3 LEDs light up, will the audio switch be triggered. This is to reject spurious sounds.

If the audio switch is triggered, the LED light on the mains to 12 volt DC adapter which is plugged into it, will light. This adapter activates the first relay, RL1 in Figure2. Relay 1’s coil is powered by a separate 12 volt DC adapter.

**Parts List:**

RL1 is RS part no 348-245, @ £20, and base 342-569, @ £3.

Web reference: <http://docs-europe.electrocomponents.com/webdocs/10ea/0900766b810ea7bb.pdf>

RL2 is a time delay relay such as RS type part no 340-617, and base RS 493-6341.

Web reference: <http://docs-europe.electrocomponents.com/webdocs/002b/0900766b8002b957.pdf>

These are from RS Components UK (see internet catalogue).

Two surge protectors are required, e.g. RS part no 209-112, which is also a 3-way 13 amp plug adapter, convenient to plug into. Alternatively, a similar device which contains a varistor (rated at 360 volts) can be used. See Figure 6.

PSU (Power supply unit): AC-to-DC type, e.g. from Maplin, P/N L82BF. This type has a rather bright LED showing it is on. Some other types have a dimmer LED, but some indicator lamp is desirable to easily show if it is on or off. **Two** such regulated PSUs are needed, each giving 12 volts DC output. A low current output is needed, so no need for a high current model.

STROBE: Maplin LG38R, 45 watt, 240 volt AC, which is £30; or N97JB (£18).

AUDIO SWITCH: See Figure 3.

**APPENDIX C**

The so-called "Dream Yogis" of Tibet report the ability of maintaining continuous unbroken consciousness, day and night. Namkhai Norbu (1992) suggests visualisation of a letter A on a blackboard before sleeping and again on waking, and other methods for lucid dream induction. Tenzin Wangyal Rinpoche (1998) provides a similar approach, too detailed to summarise here. Lama Surya Das (2000) has produced an audio course on achieving lucid dreaming which is a worthwhile approach.

**Michael Gwyn Hocking** is a Professor of Materials Chemistry, University of London. He published 150 scientific papers, and a major reference book on metallic and ceramic protective coatings. Books on topics relevant to the present paper are in the References list above.

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