

Serious inconsistencies in Beardens MEG and his other theories

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Abstract

Tom Bearden announced a device called MEG (“Motionless Electromagnetic Generator”) [1, 2, 3] which is supposed to draw energy “from the vacuum”. However, the results of simple experiments reveal that the claimed effect is nothing but a measurement error. This paper is a discussion of the MEG experiment and its theory proposed by Bearden. Other devices found on the Tom Bearden Web page [5] are also examined and misunderstandings or misleading interpretations are explained correctly according to the standard theory of electrodynamics.

1 The MEG experiment

The MEG experiment [1, 2, 3] consists of a transformer core made from nanocrystalline material (a material which has the property of normal iron transformer material up to frequencies of about 100kHz, namely a very high μr which allows high power high frequency transformers to be built) with one or more input coils and one or more output coils. The classical setup (as shown in Fig. 1) has two input

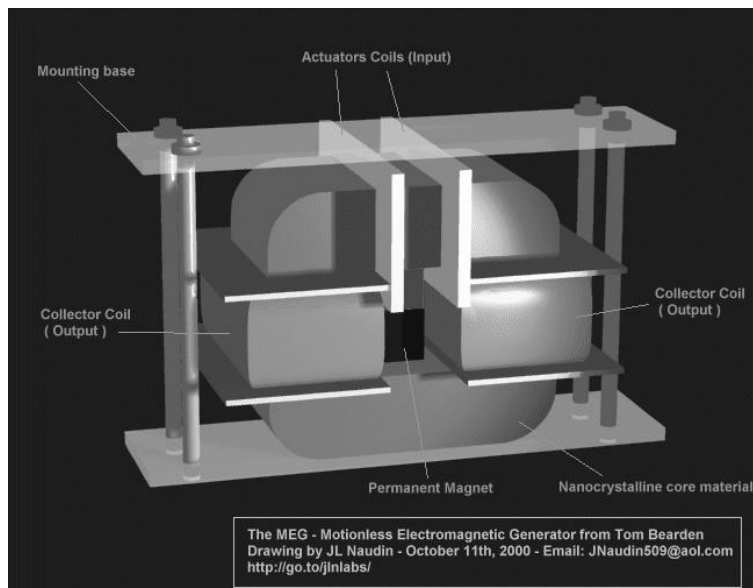


Figure 1: The MEG

coils and two output coils. A permanent magnet is placed in the middle of the core, which should allow

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energy conversion from the “active vacuum”. The secondary coils have a much higher number of turns compared to the primary coils, thereby producing a voltage of $1000V_{eff}$ - $3000V_{eff}$ with a typical input voltage of 30V which is applied as a pulsed voltage to the primary coils. Under these circumstances, a well known effect takes place. Displacement currents flowing from and to places of charge concentration add up to the normal flow of current. Therefore, a normal measurement of the current also adds up the displacement currents, which however do not power the load. In this case this current takes place between the secondary coil and the oscilloscope ground. Figure 2 shows the classical measurement setup used to measure the MEG output power which produces the documented but wrong results. The probe

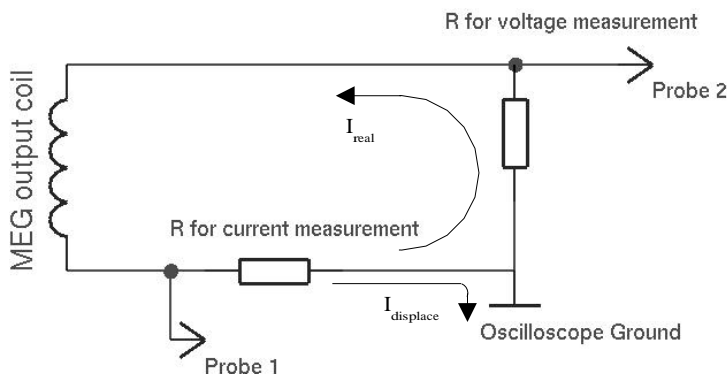


Figure 2: MEG measurement circuit diagram resulting in wrong values for the current

used for current measurement measures the displacement current together with the real current flowing through the load. This produces the results that were interpreted as “energy from the vacuum”. To show the effect of the displacement currents a simple experimental setup can be used. If only one output of the MEG is connected to the current measurement resistor which is connected to the ground the value of displacement currents can be measured straightforward. Figure 3 shows the diagram of this setup. For low voltages, the probe should not measure any voltage. In this case however, the result is nearly the same as Probe 1 measures in Figure 2. The difference in value between the measurements is the real current flowing through the load. If the measurement circuit is now adapted accordingly, as shown

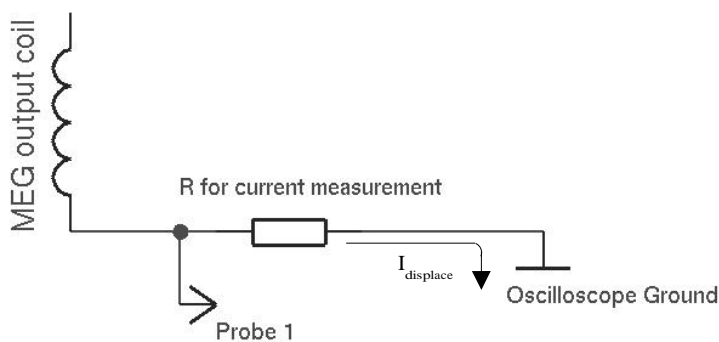


Figure 3: Displacement current measurement circuit

in Figure 4, the correct value of the current can be measured. Normally, the results obtained from the circuits shown in Fig. 2 and Fig. 4 differ only by some percent because only the error distribution has changed, but in this case the results are completely different. Using the measurement circuit shown in Fig. 4, it is easily shown that the output power is a typical value for a transformer in this mode of operation. Therefore, no energy from the “active vacuum” was tapped or converted.

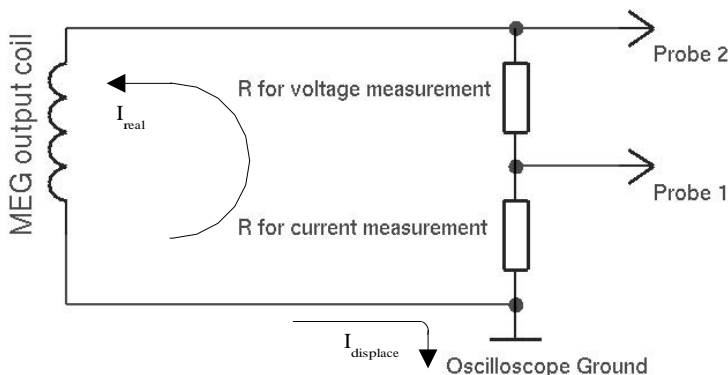


Figure 4: MEG measurement circuit diagram with correct results

2 The MEG theory

The additional power from the MEG is supposed to come from the A potential surrounding a core material having a magnetic flux B flowing inside it [3]. The fundamental relation between the vector potential and the magnetic field is $B = \nabla \times A = rot A$. Bearden follows that the A potential around the core can be used to extract energy from changes of flux in the core. The A potential will then be replenished for free by a curl-free A potential outside the core. Besides a fundamental error in the quantities involved here, the basic field-potential relation given here (also given by Bearden correctly in the same way) shows that the A potential is fully described by the field and is not replenished by anything, because such a term is simply not present in the equation (also in Beardens paper such a term does not exist). All changes in potential are caused by changes in flux and vice versa, with no “active vacuum” whatsoever. Also all further explanations (also said to involve quantum mechanics) are therefore simply wrong. In a later paper [4], Bearden argues that the additional energy is drawn as an electric field from the potential around the core. The fundamental relation between the electric field and the A potential is $E = \frac{dA}{dt}$, again given correctly by Bearden. Also, the electric field is not replenished by the “active vacuum”, the relation between electric field and potential does not include vacuum interaction, there is a fixed relation between fields and potentials for every moment given by the fundamental equations. In a related matter, Bearden argues that the principle of gauge freedom is not correct. However, it can already be seen from the equations given here (and in Beardens papers) that any fixed vector can be added to the potential without changing the result, because both equations connecting the potential with the field only include differential operators, which is why the principle of gauge freedom holds as predicted by classical electromagnetic theory.

3 Other “over-unity devices” shown on the Bearden page

On Beardens Web page [5] exists a section with a list of “working over-unity devices”. Some are pure myth, some are technically explained. Two of those “devices” are now explained using classic electrodynamics, thereby showing that these devices do not show any surprising results.

3.1 The “Static Poynting Generator”

A classic is the “Static Poynting Generator” [6] proposed by Bearden, which is shown in Fig. 5. It is supposed to produce energy by the well-known Poynting theorem $S = E \times H$. What Bearden forgets is that the Poynting theorem can only be used in form of an integral over a surface or volume. Calculations using the correct integral form of this “generator” easily show that every volume integral over the vectors S results in the value 0 (zero). There value of energy flowing inside and outside a specific volume is always the same in this geometric setup. Therefore, no energy is created by this “generator”. The nonzero values for single vectors are only a result of the more complex calculation with quadrupole radiation, where those nonzero results are required for consistency. Another claim of Bearden (found in the “correspondence” section of [5]) is that the energy travels and “reaches beyond the solar system within a year of operation”. In this case he does not realize that the Poynting vectors are located only where the fields are, and that they do not travel around “with the speed of light” in any way.

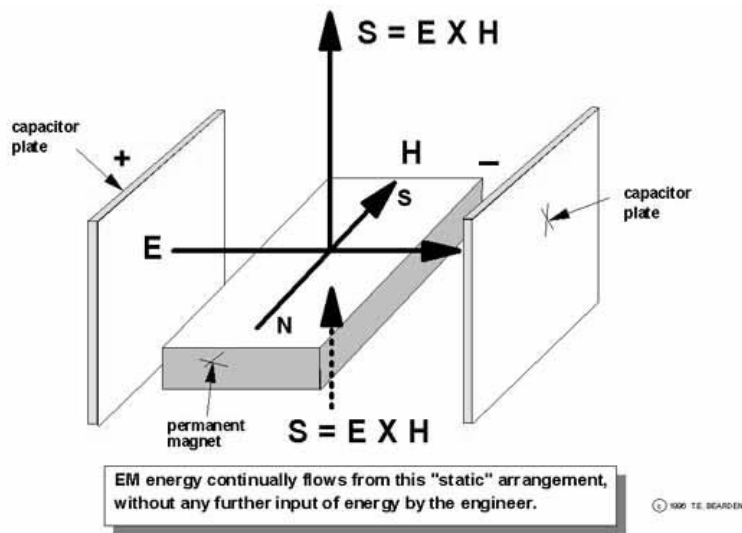


Figure 18. A "static" Poynting S-flow free-energy generator.

Figure 5: Beardens “Static Poynting Generator”

3.2 Teslas single wire energy transmission

Here, Bearden tells us that Tesla knew properties of fields beyond the classical interpretation and proves that with a Tesla patent about a single wire transmission of energy shown in Fig. 6 [7]. He also argues that quaternion calculus is required to describe the effects, which is why it was not realized by engineers yet. First of all, this has nothing to do with the paper of Barrett cited on the same page as a related paper, which analyses a more general form of charge displacement, and which is calculated in classical algebra. Barrett introduces quaternions in his paper as an *equivalent* of his equations given in classical calculus, so that there is a choice between complex equations with simple algebra or simple equations

with complex algebra. Beardens assumption that “vector analysis cannot see the effects involved here” is not true, since Barret first derived the equations in classical vector algebra, and Teslas single wire transmission is also described by classical calculus. The Tesla patent cited on the Bearden page then is now explained easily by the classical TEM wire model. When a high frequency wave passes along a wire, the wave travels along it. Therefore, on a fixed position the wave can be tapped and the voltage used to power a load. All cases shown in Fig. 6 can be derived from the classical wave equation of a wire, which results in a Voltage of $U = \frac{dU_{in}}{dt}$, for a fixed coordinate, of course delayed by time it takes for the wave to travel there (typically $v = \frac{2}{3}c$). It can be followed that this method of energy transport is not secret in any way but it would hardly pass a test for electromagnetic compatibility required for every product on the market, which is why it is not used today.

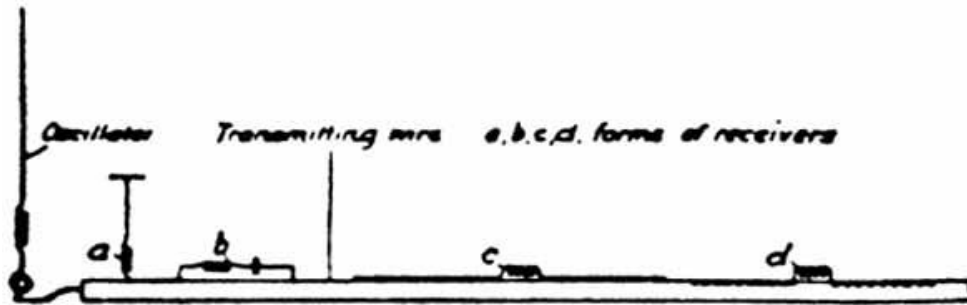


Figure 6: Teslas single wire transmission

4 Conclusion

It has been shown that there are several flaws in Beardens work that suggest that his device which is supposed to convert energy from the “active vacuum” does not work as predicted. Other fundamental flaws suggest that Bearden lacks the knowledge and theoretical understanding of the concepts involved in electrodynamics which led him to propose basic errors as perpetual motion devices and revolutionary theories.

References

- [1] jnaudin.free.fr/meg/megv21.htm
- [2] US Patent Nr. 6,362,718
- [3] www.help4all.de/energy/MEGpaper.pdf or www.aw-verlag.ch/Others/Bearden - MotionlessElectromagneticGenerator.pdf
- [4] Unpublished paper sent to the board of “Foundation of Physics letters” after a submitted paper by Bearden was refused
- [5] www.cheniere.org
- [6] www.cheniere.org/misc/static%20poynting%20gen.htm
- [7] www.cheniere.org/misc/tesla%20single%20wire.htm