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Body Voltage Meter Instructions

For Measuring "ELF Electric Fields"

Important Note About the Batteries!

Always be sure to turn off the test meter after use, or the batteries will run down quickly. The batteries need to be changed when the small picture of a "battery" appears in the display.

To replace the batteries, remove the two small screws at the back of the meter with a small Phillips screwdriver. Pull off the back cover, and replace with two fresh AAA batteries.

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Part A. The Body Voltage Meter

A1. Introduction

The *electric field* component of electromagnetic fields creates a measurable electrical voltage on your skin. This is what a *Body Voltage Meter* measures – the actual AC voltage induced onto the surface of your body from the *ELF electric fields* near you.

Because our bodies are very conductive to electricity, they are always attracting and picking up electromagnetic fields (EMFs), similar to how the antenna for a car radio picks up the radio frequencies emitted by a radio station.

Your Body Voltage Meter is already assembled for you to use…

1. The *multimeter* is the red handheld digital meter that will measure and display the AC voltage.

2. The *skin probe* is the red probe that is plugged into the upper plug-in on the *multimeter*. You will touch the bare metal end of this probe to your skin to take a measurement.

3. The *ground rod* is the long screwdriver that you will drive into some moist soil outside to make to make an electrical grounding connection with the earth.

4. The *ground wire assembly* is the long set of black wires used to connect the *multimeter* to the *ground rod*. (The black probe is plugged into the lower plug-in on the *multimeter*. Its other end is coupled to a 50 foot long black telephone cord. The other end of this 50 foot telephone cord is then coupled to a shorter black wire with an alligator clip at the end. The alligator clip will then be attached to the metal shank of the *ground rod.*)

A2. Set Up the Meter

Step 1. Place the *multimeter* in a location where you wish to test for *electric fields* – e.g., in your bedroom, on the couch, at your computer, in the kitchen, etc.

Step 2. Find the nearest location outside the building where there is a good patch of exposed earth – real dirt that goes down deep. Ideally, this will be close to a door or window that can be opened, so that the long *black ground wire* can be easily run from the *multimeter* inside to the *ground rod* outside. If the soil is dry, moisten it with water to improve conductivity. Then push the *ground rod* (the long screwdriver) into the earth until only an inch of the metal shank is left exposed above the ground.

(Important Note: If there is no accessible patch of soil within about 100 feet of the test location – for example in a large commercial building or tall apartment building – see item #A5 for an alternative method.)

Step 3*.* Carefully unwind the entire *black ground wire assembly*, extending it from the *multimeter* in the room to be tested, out through the open door or window, to the *ground rod* (screwdriver) in the earth. If the 50 feet of phone wire already attached to the long *ground wire* is not long enough to reach all the way, you can add another long piece of phone wire to double the total length. There is an extra 50 feet of phone wire and couplings provided with this kit.

Step 4. Outside, attach the *alligator clip* at the end of the long *black ground wire assembly* to the metal shank of the *ground rod* (screw driver) in the soil. Make sure that the *alligator clip* is well connected to the metal shank of the *ground rod.* It's a good idea to wrap some tape around this connection to make sure that it does not get pulled off during the tests.

Step 5. Back inside, check that the red and black probe wires are still plugged securely into the *multimeter*. Turn the meter on by turning the dial from "Off" to the black "V" with the squiggly line over it. This stands for AC Voltage. It is outlined in black.

A3. Take a Measurement

Step 6. Position your body just as you would normally be in this location. For example, in the bedroom, lay down on your bed. At your computer, sit in the chair.

Step 7. Grasp the bare metal end of the red *skin probe* between two of your fingers, or place it firmly against your skin anywhere. Hold still for several seconds, and then read the voltage measurement displayed on the multimeter. The voltage may jump around a little bit – this is normal. Just hold still for a few seconds and write down the average number.

Step 8. Always be sure to turn off the meter when you are finished, or the battery will run down. You can check that the meter is working properly, by following the steps in the next section.

A4. Check That the Meter is Working Properly

You can verify that the Body Voltage Meter is working properly in two ways. Find a table lamp (or any other electrical device) with a power cord plugged into an electrical outlet. Lay the power cord over your lap, or across your body. Unplug the power cord from the wall, and take a body voltage measurement. Then, plug the cord back in to the wall (still keeping the cord on your lap) and take a second measurement. You should see the body voltage measurement go up significantly when you do this, usually by 1.0 Volt or more.

Another method, if you are comfortable with electricity and feel safe doing this, is to insert the bare end of the red *skin probe* directly into the "hot" prong of any standard wall outlet. The "hot" is usually the smaller of the two vertical slots of the outlet, and usually on the right. The reading should be around 120 Volts, typically between 115 to 125 volts. *But do not do this test if you are unsure of safety. Specifically, do not touch your skin to the bare end of the red skin probe during this test.*

In general, the body voltage measurement should go up when you get closer to power cords and hidden electrical wires, and down when you move away. If this is not so, check that…

1. the *ground rod* is driven securely into the soil,
2. the soil is wet (moisten if necessary),
3. the alligator clip is well secured to the metal shank of the *ground rod*,
4. the red and black probes are both inserted firmly into the *multimeter*,
5. all telephone cord connections for the long *ground wire* are good and secure,
6. the *multimeter* is set to AC Volts (the black "V" with the squiggle over it),
7. the batteries are okay (e.g., there is no little picture of a battery in the display).

A5. What If There is No Soil Accessible for the Ground Rod, for Example in a Large Commercial Building or Tall Apartment Building?

For accuracy, a clean reference for "zero" voltage is needed. Since the earth is always "zero" volts, the preferred test method is to use a ground rod driven into the soil as described above. This set-up above will work well for most homes and offices where there is accessible soil within 100 feet of each room.

If necessary, you can extend the length of the *black ground wire assembly* even further, by adding more pieces of telephone wire and couplings (commonly available at hardware stores) as needed. On the second floor of buildings, the long ground wire can usually be fed out of a window and down to the ground.

However, this may be difficult in certain offices and apartments over two stories tall, and in some commercial and office buildings. And in some urban settings, there are no nearby places with uncovered soil. If this is the case, you can use the grounded prong of a standard three-prong electrical outlet to substitute for the *ground rod*. We can sell you an additional grounding cord that will plug into a grounded wall outlet. Perform the rest of the testing as described above. But keep in mind that this alternate method is less accurate, because the voltage of the electrical ground is often not exactly zero.

Part B. Information About Electric Fields

B1. What Are the Health Concerns?

Researchers have linked electromagnetic fields (EMFs) in the "ELF" range to a variety of health effects – including leukemia, lymphoma, brain and nervous system tumors, and other cancers. EMFs have also been linked to suppression of the immune system, Alzheimer's Disease, Lou Gehrig's Disease, depression and suicide.

Extremely-low-frequency (ELF) fields are the 60 Hertz fields commonly emitted from power lines, electrical wiring, lights, appliances, and other electrical sources. These EMFs have two main components. While most of the research has been focused on *ELF magnetic fields,* the *ELF electric fields* can also have important health effects.

A wealth of anecdotal evidence suggests that many people who are "sensitive" to electrical sources – often reporting symptoms such as headache, fatigue, nausea, dizziness, mental confusion, memory problems, skin burning and itching, irritating sounds, sleep problems, and other health issues – may be affected by these *electric fields*.

B2. What Levels Are Safe?

It is difficult to define any specific level as safe or unsafe, and there is still great controversy about the potential health effects, if any, from exposure to electromagnetic fields. The information below is based on anecdotal experience from myself and other professionals. You will have to decide for yourself what levels to consider safe or unsafe.

In my work, I generally try to keep my clients' long-term electric field exposures below 0.5 Volt as measured on the skin. And at night, I usually try to reduce the bedrooms down to 0.1 Volt or less, since sleep is such a critical time for the rest and rejuvenation of the body.

For individuals who are hypersensitive to EMFs or have a severe illness, cancer, chronic fatigue, chemical sensitivity, poor immune function, etc., I generally try to reduce all long-term exposures down to 0.1 Volt or less.

In nature – for example outside under the trees, at the beach, or anywhere far away from electrical devices – the body voltage measurement is usually 0.0 Volts AC. For millions of years before the invention of electricity, the body voltage measurement would almost always have been 0.0 Volts AC.

Today, the average body voltage level in US homes is probably between 0.5 to 2.0 Volts AC. In most homes, levels will vary greatly from 0.1 to 5.0 volts or more, depending on the exact location and the position of the person being tested.

Anecdotally, a level of 1.0 volt or higher seems to be enough to trigger "symptoms" in many sensitive people, and some will report troubles at even lower levels. In my work, I find that I usually need to reduce the levels down to 0.1 Volt or less to significantly reduce their complaints.

The highest body voltage measurement I have ever recorded was 34.5 Volts AC. My client was young and otherwise healthy, but she suddenly couldn't concentrate or work, and she would literally lapse into what she called an "unconscious state" for hours at a time each day. She suspected something environmental because her problems began immediately after moving into a new home. Once the wiring issues in her new home (reversed polarity and lack of grounding) were repaired, she recovered fully in just a few days.

B3. What Are the Common Sources?

While power lines can be a very strong source of *electric fields* outside, especially near the metal towers and wooden poles, they are usually not a significant source of exposure inside the home (due to the distance, and the shielding by common building materials).

For most people, the biggest exposure to *ELF electric fields* is usually from hidden electrical wiring in nearby walls, floors and ceilings. Another common source is from nearby power cords for lamps, computers, appliances, clocks at the bed, etc.

Certain electrical wiring conditions can also cause high exposures. For example, if you plug a computer into a wall outlet that is not properly grounded, that computer will usually emit much stronger electric fields than if it was grounded. Electrical devices that can emit high levels of electric fields include computers, televisions, fluorescent lights and electric blankets.

B4. Determine What the Sources Are

Electric fields are emitted from a variety of sources, many of which may be unknown, unseen or unexpected. The following procedures can help you track down and determine the exact sources of the electric fields you are measuring.

In general, the strength of the field will increase as you approach the source, and decrease as you move away from it. But be aware that if there are several sources, the

complex field patterns can mix in surprising and unpredictable ways, making it more difficult to determine the sources clearly.

Step 1. Turn "OFF" the main electrical breaker or switch for the whole building, so that all electricity inside the home is off. Measure and record the body voltage in several locations, especially the bedrooms. This gives you a very good idea of the *electric fields* that are coming from everything *external* to the house, such as power lines, neighboring homes, etc.

Step 2. Turn the main power switch back "ON" again. Also turn on all the lights and appliances that you would normally have on. Measure and record the body voltage in the exact same locations as you did in Step 1. This gives you a very good idea of the total *electric fields* coming from *external* sources such as power lines, plus all the *internal* sources such as electrical wiring, lights, power cords and appliances.

Step 3. Then for each location, subtract the measurement in *Step 1* from the measurement in *Step 2*. This new number will give you a good estimate of the electric fields emitted from only the *internal* sources – e.g., electrical wiring, lights, cords and appliances.

Step 4. To test if a particular item (such as a lamp or clock next to your bed) is a significant source, take a body voltage measurement near the item. Then without moving or changing your position, unplug the item completely and retest the body voltage to see if there is a significant reduction.

Step 5. Perhaps most helpful, is to determine which particular electrical circuits are causing the electric fields where you sleep. Lay on your bed to take the measurements, while someone else turns the breakers on and off. Turn off all the breakers, but keep the main breaker switch on of course. Then turn on one circuit breaker at a time (with all the others off) and take a body voltage measurement. Do this for each circuit breaker. You will quickly see which particular circuit breakers are causing the strongest electric fields at your bed.

B5. How to Reduce the Electric Fields

Sometimes you can simply move a bed, couch or table to a new location in the same room to reduce the exposure greatly. You can unplug electrical cords for lights and appliances, especially those near the beds. At night, some people turn off the particular circuit breakers that are causing high electric fields in the bedrooms. An electrician can install remote switches to make this more convenient.

An electrician can also install proper grounding or repair wiring problems that are causing high *electric fields*. If the wiring is accessible, it can be shielded at a relatively low cost. For new and remodel construction, special "EMF-Free" electrical wiring can be installed using certain shielded materials. And shielded cords can be added to lamps and appliances, especially for those near beds.

B6. Why Use the Body Voltage Method?

Electric fields abound in our modern environments. And because the surface of the body is so electrically conductive, we are always attracting and absorbing the *electric fields* around us. This is similar to how the radio antenna in your car picks up radio station signals. Our bodies are antennas too.

In fact, your skin is so conductive that it will interfere with the accuracy of most *electric field* meters. Therefore, since your body is already acting as an antenna, the most direct and useful method is to simply measure the voltage on your skin due to the *electric fields*.

This is exactly what the Body Voltage Meter is doing – measuring the artificial AC voltages induced onto your skin from the *ELF electric fields* around you. This is commonly called "Body Voltage Testing" or "Skin Voltage Testing".

If you need further assistance, I provide professional phone consultations at the rate of $120 per hour, prorated for actual time used. For example, 15 minutes would cost $30.

In northern California, I also provide a full line of onsite EMF services, including testing, troubleshooting, shielding, and the design/installation of shielded Low-EMF wiring.

If I can be of further assistance, please contact my office.

Thank you.

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