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Instructions for the "TES 92" RF Meter

Important Note About the Battery!

Always be sure to turn off your test meter after each use, or the battery will run down quickly and need replacement. To install a new battery, remove the battery door on the lower back of the meter, and insert a fresh 9 Volt battery.

When the battery is getting low, a "battery" symbol will appear in the upper right corner of the display, and you should change the battery then. If the battery is completely dead, nothing will happen when the green ON/OFF button is pressed.

Step 1: Turn ON Your Meter…

To turn the meter ON, simply press the green button, located in the center of the meter. Wait about 30 seconds for the meter to initialize before taking a measurement. To turn the meter OFF, press the same green button again.

Sometimes the meter will turn itself OFF after a certain period of time, to help save the battery. If it does this, just press the green button to turn the meter ON again.

Step 2: Set Up Your Meter…

Most beginners will want to start with the settings I recommend below… (Advanced users, you can read the manufacturer's instructions and set up the meter to take average or maximum measurements, use single axis operation, change the units of measurement, hold and save measurements, or use other special features.)

MAX AVG Button: When you press the MAX/AVG button repeatedly, you will see the words "MAX", then "AVG", and then "MAX AVG", appear at the top of the display. After "MAX AVG", there will be nothing, and then "MAX", "AVG", etc. will repeat again. When nothing is shown, this is the "normal" or "instantaneous" measurement method which I recommend for normal testing. It will give you the best detection of the instantaneous

peak values from digital fields. In other words, simply press the MAX/AVG button until you see none of these words at the top. *The TES 92 will usually begin in the "instantaneous" mode when you first turn the meter ON, but check to be sure.*

MODE Button: Press the MODE button repeatedly until the letters "X", "Y" and "Z" all appear together, on the left of the display. In this setting, the RF meter will measure and compute the total RF field in all three directions. *The TES 92 will usually begin in the triple-axis "XYZ" mode when you first turn the meter ON, but check to make sure.*

UNIT Button: In most cases, you will press this button repeatedly until you see "$\mu W/cm^2$" above the measurement on the display. This stands for "microwatts per centimeter squared" and is the most common unit of measurement in the United States. Note: When you press the UNIT button repeatedly, you will see "mV/m" (or V/m) which is the measurement expressed in units of electric fields, then "µA/m" (or mA/m) which is the same measurement in units of magnetic fields, then $\mu W/m^2$ (or mW/m^2 or W/m^2) which is the same measurement but in units of power density as used in Europe, and finally $\mu W/cm^2$ which is the measurement in power density as in the US.

Step 3: Take a Measurement…

Hold the meter in one hand, with your arm extended to keep the test meter as far from your body as possible. Hold still for a few seconds, and read the number on the display.

On a sheet of paper, note the time and location, and write down the number you see on the display. Pay careful attention to the decimal point!

Also notice carefully the type of "units" that are displayed above the number. If you see the symbol "$\mu W/cm^2$" then your measurement is in units called "microwatts per centimeter squared. If the symbol is "mW/cm^2" then the measurement is in "milliwatts per centimeter squared". (Note: it takes 1,000 $\mu W/cm^2$ to make 1 mW/cm^2!)

Some Testing Advice…

Always hold the meter still for a few seconds before you read the value from the display. (When you move the meter, the earth's field is sometimes detected, giving a false reading.)

The sensor antenna is located in the top round part of the meter. To measure a specific source, point the top round end of the test meter toward the source, and make sure that your body is not located between the source and the test meter.

Take measurements in several locations in each room, because the RF levels can change greatly depending on how the various building materials, appliances and furniture may shield, reflect or shape the RF fields. And often, there is more RF near windows.

And For More Accuracy…

Because the human body can interact with the RF and microwave fields, your body can reflect, absorb or even amplify the RF field, thus altering the measurement shown on the meter! For greater accuracy, try positioning the RF Test Meter on a box, table or counter top, and then step away a few feet to take the reading.

What Types of RF Are Being Detected?

The TES 92 Electrosmog RF Meter measures radio frequency (RF) radiation (including microwaves) from frequencies of 50 MHz up to 3.5 GHz. This includes FM and TV broadcasts, microwave ovens, and most cell towers, cell phones, cordless phones, Wi-Fi and other wireless systems. This meter is particularly helpful for detecting the instantaneous peaks of digital signals, as well as common analog signals.

Please note that the frequency range of this test meter does not include frequencies below 50 MHz such as AM radio broadcasting, or above 3.5 GHz such as the 5.8 GHz frequency of some cordless phones. A special meter with greater frequency range would be needed for these, such as the TES 593 Electrosmog Meter.

Why Measure the RF Electromagnetic Fields?

In our modern world, human exposure to RF/microwave energy is increasing at a rapid pace. While there is still great controversy, many scientific research studies show that Radio Frequency (RF) electromagnetic fields may be linked to important biological changes and adverse health effects.

Typical sources of RF exposure are from the personal use of cell phones, cordless phones, Wi-Fi and wireless computer devices, as well as exposures from cellular antennas, radio and TV broadcast towers, microwave ovens, and the growing number of wireless devices and systems such as Wi-Fi.

What Level is Safe?

There is still great debate about the possible health effects from RF/microwave fields, and the recommended safety limits. Some researchers report important biological effects at low-level exposures, well below the current FCC guidelines for the general public in the United States. For further information on these potential low-level (non-thermal) health effects, go to the BioInitiative Report (www.bioinitiative.org).

The FCC safety limits for RF vary with frequency, and are usually in the range of hundreds of $\mu W/cm^2$ (microwatt per centimeter squared). At the 860 MHz frequency used by many cell phones, the FCC exposure limit for the general public is 573 $\mu W/cm^2$. For RF frequencies at 2.0 GHz or more, the FCC limit is set at 1000 $\mu W/cm^2$.

The average RF levels measured inside homes and buildings can vary greatly – from less than 0.001 μW/cm^2 to more than 1.0 μW/cm^2. In my own professional experience, indoor levels between 0.01 and 0.1 μW/cm^2 are the most common (except within 10 feet of operating cell phones, cordless phone bases, Wi-Fi, and other wireless hardware. Office levels are usually a little higher than in residential areas.

In my professional work with clients, we often use 0.1 μW/cm^2 as the suggested long-term safety level for RF exposures. This is the safety limit suggested by researchers in the independent 2007 BioInitiative Report (www.bioinitiative.org). When there are serious health problems such as cancer, Lyme disease, chronic fatigue or auto-immune disorders, we often try to reduce long-term exposures to 0.01 μW/cm^2 or less.

Anecdotally, some individuals have reported hypersensitivity and symptoms to RF exposures – especially digital microwave signals such as Wi-Fi – at levels of 0.001 μW/cm^2 and even lower. Thus, it might be prudent for sensitive individuals to consider using a safety level of only 0.001 μW/cm^2, or even less. Please refer to the proper health authorities and research literature to decide for yourself what RF level to consider safe.

How to Reduce the RF Fields…

In many homes and offices, certain locations will have higher RF levels, while other areas may be much lower. Using your test meter, you can arrange your environment to avoid the highest RF fields. For example, you can place beds, couches and chairs in the lowest RF areas, and perhaps use the highest RF areas for storage.

You can often determine exactly what is causing the highest RF fields, because the strongest sources are often very close – the devices you use in your own home such as cell phones, cordless telephones, Wi-Fi and wireless computer hardware. The best way to reduce these exposures is to eliminate the hardware, unplug it, or turn it off (especially at night). Whenever possible, use corded (land line) phones and hard-wired computer cables (avoid all wireless). Try to avoid any products that have wireless capabilities, because sometimes, even if the software is turned off, the wireless hardware still emits RF all the time.

In the long term, an important way to reduce your RF exposure would be to use your RF Test Meter to pretest potential new homes or apartments before you decide to buy or rent them. Also test cordless phones to see if they are emitting RF, even when not in use.

Special shielding materials can be used to reduce the RF fields, and shielding can be very effective in some cases. But placement is critical for effectiveness. And since most RF shields act like “mirrors” by reflecting the RF fields away from you, they can also reflect RF sources back towards you. For technical assistance with shielding, please call us for a professional telephone or on-site consultation.

Need Professional Assistance?

The phone consultation fee with Michael Neuert is $120 per hour, prorated for the actual time used. In California, we also provide professional testing services, EMF repairs and shielding, design and installation EMF-Free electrical wiring, and other consulting services. If you need further assistance, please contact our office at 1-800-638-3781.