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**MITIGATION OF ELECTRICAL
POLLUTION IN THE HOME**

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THE MITIGATION OF ELECTRICAL POLLUTION IN THE HOME

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ABSTRACT

The electrical pollution that is mitigated is the electric fields produced by the ubiquitous Marconi Transmitters present in today's high technology environment. Individuals should be able to determine if this mitigation in their home is beneficial to them.

THE MITIGATION OF ELECTRICAL POLLUTION IN THE HOME

The electrical pollution considered in this report is electrostatic fields that vary rapidly in a random or noiselike pattern. When Guglielmo Marconi transmitted wireless signals from Polphu, England to St. John's, New Foundland on December 12, 1901 he used a spark transmitter that generated fields of this type. The antenna and the ground were connected to the spark gap. The wireless signals used today are much more orderly, since this is the basic way to enable multiple communication channels that share a common medium [1]. These modern signals have sinusoidal waveforms that are similar to those in the electrical distribution systems. However, there are millions of transmitters in the electrical power system that are the equivalent of Marconi's transmitter, and the power distribution wires are the antennas and grounds that couple these noiselike signals to humans. An inexpensive hand held AM radio receiver will detect these signals. Tune the receiver to the lowest frequency on the dial (about 500 kilohertz) which is below the lowest frequency broadcast station, turn up the volume, and you will hear a noise. As the receiver comes closer to a transmitter, the noise becomes louder. Try it near dimmer switches at various settings, personal computer displays and keyboards, fax machines, microwave ovens, electronic telephones, high efficiency fluorescent lamp bulbs, video tape recorders, and hand held hair dryers. The effects on humans depend on the path the currents produced by these fields takes through the humans, on the sensitivity of the individual, and on the amplitude, waveform, and duration of the fields. There is strong evidence that these currents may cause cancers, but this report is concerned with reducing the symptoms that humans can directly observe in themselves, such as poor short-term memory, chronic fatigue, depression, nausea, and rashes.

The Marconi Transmitters may be there because of the customer, or they may be there because of the utility. Some of the transmitters belonging to the customer are

- Hair dryers
- Dimmer switches
- Electronic transformers in low voltage halogen reading lamps
- Loose electrical connections
- High efficiency electronic systems

Some transmitters belonging to the utility are

- Switches controlling the power factor correction capacitors
- Tap switches on transformers for voltage regulation
- Deteriorated wires and connectors

There are transmitters which belong to other customers that are connected by the utility distribution system to your house. One such case is the strobe lights located on radio towers for aircraft warning purposes. The signals generated by these transmitters can travel considerable distances. The electric fields produced by these noise voltages between the power wires in a home can be reduced by lowering the impedance between the wires. Connecting a large capacitance between the wires has been effective in many cases in reducing the symptoms experienced by the occupants of the home. The capacitances used in these tests were about 200 microfarads across each 120 Volt circuit in the usual 240 Volt utility distribution system. In most cases these were installed at the main distribution in the home by a licensed electrician. Appendix A describes how an individual can evaluate the effectiveness of this mitigation technique on their symptoms.

APPENDIX A

An individual can install a capacitor across the 120 Volt circuit by electrically connecting it to a plug that is inserted into a 120 Volt electrical outlet, which is the type used in homes for appliances such as lamps, television sets, toasters, etc. A good arrangement for individuals is to plug in ten to twenty 20 microfarad motor run AC capacitors into a number of different outlets. Suppliers of these capacitors can be found in the telephone yellow pages under electric motors and/or electrical supplies. The newer A.C. dry film capacitors in epoxy cases are better for this use by nonprofessionals than the older style oil filled capacitors in metal cases, but either will mitigate the pollution. The mitigation is somewhat more effective if the capacitors are plugged into outlets used for appliances that individuals are close to for extended periods of time, such as reading lamps, radios and television receivers, and kitchen appliances.

Particular attention should be paid to safety.

- There should be no exposed electrical conductors.
- The components should be in an enclosure that prevents children from tampering with the device.
- Whenever a capacitor is disconnected from the outlet, it may have energy stored in it which will remain there for hours. A 27 kilohm 2 watt resistor permanently connected directly across the 20-microfarad capacitor will remove the stored energy within a few seconds without wasting appreciable power while the capacitor is connected to the outlet. Some sparking may occur at the plug when the capacitor is connected. This is normal.

REFERENCE

- [1] Sungook Hong, *Wireless (from Marconi's black-box to the audion)*, The MIT Press, Massachusetts Institute of Technology, Cambridge, MA 02142, 2001.