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Macintosh: Performance in High-RFI Environments

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TOPIC -----

A user wants to put a Macintosh within three meters of medical equipment that generates sound waves up to 27.12 MHz. Can a Macintosh and an peripheral, like an ImageWriter or LaserWriter, work under these conditions without malfunctioning within a specified period?

The device is a CURAPULS 419; it generates HF signals as follows:

Generator frequency: 27.12 MHz

Intensity (continuous): HF max 400W

(pulsing): HF max 1000W

Pulse rate: about 400 microseconds

Pulse modulation: adjustable in 10 steps from 15-200 Hz

DISCUSSION -----

The frequency and wattage of the CURAPULS are not unlike that of high-frequency radio waves output by ham radios. Ham radio high-frequency waves are approximately 15 meters peak-to-peak at 21 MHz, or 10 meters at 28 MHz; whereas, the CURAPULS is 12 meters peak-to-peak at 27 MHz (27.12 MHz). Typical ham radio power output is 2,000 watts PEP (peak envelope power) and 1,000 watts DC (direct current), while the CARAPULS's appears to be 1,000 watts PEP and 400 watts DC.

Many ham operators are also computer enthusiasts and successfully use both electronic devices simultaneously. The key to the CURAPULS's impact on the Macintosh is how the radio waves are radiated. That is, will waves radiate from a roof antenna, or (because it is a medical instrument) contained within a shielded space or focused wand? If the waves are directly focused at the Macintosh with a high volts-per-meter intensity, you may have difficulties.

Less hazardous symptoms of the high-frequency waves include distortion of the screen. Potentially more damaging symptoms include interference with reading and writing to disk drives.

Good shielding and grounding of the Macintosh and peripherals will reduce the effects of any symptoms. For instance, Macintoshes with internal drives are less susceptible to radio interference than external drives. Internal hard disks are less susceptible than external hard disks, which tend to have poorer shielding. External devices also have their own power cords, thereby making for a greater chance of ground loop interference.

Because Macintoshes aren't tested for susceptibility to external RFI, we cannot definitively state the amount of interference a Macintosh tolerates before problems may occur. Given the number of ham radio operators using computers near their antennas, and the similarity of the ham radio waves and the CURAPULS radio waves, it is not likely that there will be any major problems using the Macintosh while using the CURAPULS. However, be cautious; experiment with the location of the equipment using nonessential data. Such experiments might include a high number of read/write cycles to disks, followed by verification of data integrity.
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