Expose Yourself?

RCC mmm yyyy – Don/NX7J

When talking about exposure, I can't help but think of the poster showing Portland's former Mayor Bud Clark, with open trench coat facing away from the camera, looking back over his shoulder, and a panoramic view of the country-side before him. As you recall, the caption below says "Expose Yourself to Nature". This play on words reminds us of the fact that we live in one of the most scenic areas of the country and there are plenty of things to do outside.

This poster also reminds us that there are different kinds of exposure, and the one that we want to discuss today is the exposure to non-ionizing radiation that we experience when we use our radio transmitters. Ionizing radiation produces changes at the molecular level that can alter the structure of cells in our bodies which can be very dangerous on an uncontrollable basis producing unwanted results such as cancer. Fortunately, the nonionizing radiation that we experience with radio frequency exposure does not produce changes to the cells in our bodies but it can produce unwanted heating of those cells.

The exact threshold between acceptable (safe) and at risk exposure has not been fully defined, but the federal government has published a series of guidelines thought to provide conservative, known safe levels of exposure for everyday use of electromagnetic devices which include amateur radio transmitters.

These safe limits are frequency specific and consider problems associated with the body's natural resonant frequencies where more RF is absorbed more efficiently. These frequencies vary depending if a person is grounded or ungrounded and also have specific sub-bands of resonance associated with certain parts of the body such as the head. Fortunately these parameters have been incorporated into algorithms that are available on the Internet which makes determining safe, acceptable exposure relatively easy in what is otherwise a complex subject. One known site available from authoritative sources on this subject is http://www.arrl.org/news/rfsafety/eval/ .

There are a number of tables available at this site and you only need to find one that best represents your situation.

Finding acceptable "controlled" or finding acceptable "noncontrolled" exposure limits in terms of distances can then be easily obtained from the chart.

The FCC states in their OET BULLETIN 65, Edition 97-01, dated November 1997 that an amateur licensee must perform the routine evaluation if the transmitter power of the station exceeds the levels of 500 watts for amateur bands 160 through 40 meters, 425 watts on 30 meters, 225 watts on 20 meters, 125 watts on 17 meters, 100 watts on 15 meters, 75 watts on 12 meters, 50 watts on 10 meters, 50 watts on all VHF bands and 70 watts on 70CM. Additionally, limitations are provided for 33 CM, 23CM, 13 CM, SHF and EHF bands but are omitted here in the interest of brevity.

Mobile stations are excluded from the requirement but Repeater stations are not. Repeater stations have criteria related to building versus non-building-mounted antennas as well as ERP.

Well, have you unknowingly exposed yourself? Borrowing Bud’s trench coat will not help. Doing the calculations will help and then understanding the minimum distances from any given antenna operating on a specific band of frequencies will help you be safe and, perhaps more importantly, keep your family members safe. Make this evaluation today if you have not already done so. It is free, easy to do, makes you compliant with your license requirements, and is the right thing to do to protect yourself and your family!!!