

Understanding the Changes

FCC RF EXPOSURE RULES



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- On May 3, 2021, the FCC issued new rules regarding human exposure to radiated RF energy.
- Stations operating under the exemptions of the 'old rules' must now comply with the changes by May 3, 2022.



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- In 1996, the FCC introduced regulations to set limits for human exposure to RF energy from radio transmitters.
- Ham stations were included, but were not required to be evaluated.



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- Under the new rules, finalized in 2020, Ham stations are still required to comply, but more stations will be required to *conduct a station evaluation* to determine that their station complies with the limits for human exposure.
- Under the 'old rules' there were a variety of exemptions from this requirement, based on operating frequency, power level, and operating mode.



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- If you *performed* a station evaluation under the 'old rules', there's no need to reevaluate – *unless* you made any change that could increase the amount of RF energy present near your station, i.e., changing your antenna, increasing transmitting power, using a new operating mode, or adding a new band to your operations.



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- If you've made any such change, under the new rules you will need to perform a physical assessment of your station - or use an exemption formula to determine *if it needs* to be evaluated.
- You have until May 3, 2022 to complete the assessment or evaluation.



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- ⦿ At any given location, the FCC has clarified that effective radiated power (ERP) is the gain of an antenna compared to the gain of a half-wave dipole.
- ⦿ You'll need to know the frequency and separation distance. If the ERP exceeds the limitation threshold, then the RF source is not exempt, and an evaluation *must* be performed.



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- For example, if you run 100 watts at 3.5 MHz to any antenna, you need to do an evaluation if any human exposure could occur within 45 feet (13.6 m).



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- If you run 100 watts to a dipole at 28.5 MHz then your station is exempt from evaluation on this band.
- But, if you run 500 watts at that same frequency to a Yagi (with a gain of more than 5.25 dBd), your ERP would be 1700+ watts, making you *not exempt* on this band. If this was a new installation*, you would need to do an evaluation – or reduce power, move the antenna, or restrict access.

* Since May 2021



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- If you *have* to perform an evaluation, don't panic!
- In most cases you can do a simple calculation using an online RF calculator.
- Also, the FCC determined that Ham operators (and family) can be evaluated to the higher (Controlled) limits.



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- ⦿ Exposure *must* meet all three limits – power density, electric field strength, and magnetic field strength.
- ⦿ The limits are set for RF exposure averaging over 30 minutes within Uncontrolled (unrestricted) areas and 6 minutes within Controlled areas.



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- The easiest way to do an evaluation is by using ARRL's RF Exposure Calculator. (arrl.org/rf-exposure-calculator)
- The calculator will take your average power, the operating frequency, any antenna gain, and operating mode to calculate the minimum compliance distance from any part of your antenna.



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- ⦿ While the ARRL calculator is the easiest way, it often overestimates the signal from your antenna.
- ⦿ If you *don't pass*, you can use other, more accurate ways to calculate the signals from your station.



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- ◎ The good news is that there is no paperwork.** When you complete your evaluation, you have complied with the requirement.
- ◎ You are not required to submit any proof of evaluation, unless specifically requested by an FCC agent.

** It's always a good idea to keep a copy of your evaluations with your station records.



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- A lot of valuable RFE information is available at ARRL.
- *RF Exposure and You*, by Ed Hare (W1RFI), is a very useful source and clarifies the FCC requirements with figures and tables.
- ARRL Lab can also help: tis@arrl.org

This presentation was adapted from Ed Hare's, September 2021 QST article, pg 60.

