

Thrane & Thrane

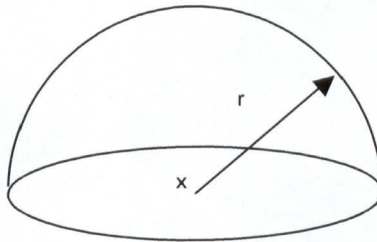
Calculations of the safety distance due to the Rf emission from the VHF dipole antenna connected to the VHF transmitter

According to the FCC rules described in "A local Government Official's Guide to Transmitting antenna Rf Emission safety: Rules, Procedures and Practical Guidance" the limits for General Population/Unprotected Exposure is stated to 1.0 mW/cm²

This value is basis for the calculation of the safety distance of the VHF antenna under all conditions.

Technical data.

Maximum output Rf power	25 W
Antenna gain	3 dB equals 2 times
Antenna pattern	Hemispherical
Frequency	150 MHz to 165 MHz



r = safety distance from the antenna placed at x emitting Rf radiation in an hemispherical pattern

Surface area of the hemisphere $S = 2 \pi r^2$

The calculation is absolutely worst case situation due to the fact that the output RF power is lower due to the pulsing (TDMA system) transmission. The calculation uses the case if the transmission was a continuous operation.

$$\text{Formula: } r = \sqrt{\frac{\text{Power} \times \text{Antenna gain}}{\text{Surface} \times \text{Rf limit}}} = \sqrt{\frac{25000 \times 2}{2 \times \pi \times 1}} = \underline{0.89\text{m}}$$

The safety distance is therefore stated as **3 feet** equals 0.92m > 0.89m

HH
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