$dBm := 1$ $dB := 1$

$$G_{dish}(f, D, e_A) := 10 \cdot \log\left(\left(\frac{\pi \cdot f \cdot D}{c}\right)^2 \cdot e_A\right)$$

Ratio of power intercepted by an isotropic receiving antenna to the total power emitted by an isotropically radiating transmitter antenna. "Isotropic" means "in all directions" so this formula assumes the power emitted by the transmitter antenna is completely unfocused, and distributed evenly in all directions and the receiving antenna is likewise unfocused .The actual antenna may be directional, focusing all of its power over a more limited range of directions. This is accounted for by the antenna gain factor.

$$l_{fs}(d, f) := \left(\frac{4 \cdot \pi \cdot f \cdot d}{c}\right)^2$$

$$P_r(d, f, P_t, G_t, G_r) := P_t + G_t - 10 \cdot \log\left(l_{fs}(d, f)\right) + G_r$$

Two-Way Comm: $f := 915 \cdot MHz$ $P_t := 25 \cdot dBm$ $G_t := 0 \cdot dB$

Chase Vehicle: $G_r := 0 \cdot dB$ $d := 55\ mi$ $P_r(d, f, P_t, G_t, G_r) = -105.616$

Adler Mission Control: $G_r := 9 \cdot dB$ $d := 150\ mi$ $P_r(d, f, P_t, G_t, G_r) = -105.331$

Test: $G_r := 0 \cdot dB$ $d := 38\ ft$ $P_r(d, f, P_t, G_t, G_r) = -27.952$

Live Video: $f := 1280 \cdot MHz$ $P_t := 33 \cdot dBm$ $G_t := 0 \cdot dB$

Chase Vehicle: $G_r := 0 \cdot dB$ $d := 10\ mi$ $P_r(d, f, P_t, G_t, G_r) = -85.725$

Adler Mission Control: $G_r := 20 \cdot dB$ $d := 100\ mi$ $P_r(d, f, P_t, G_t, G_r) = -85.725$

Satellite: $f = 435\ MHz$ $P_t := 30\ dBm$ $G_t := 6\ dB$

Adler Mission Control: $G_r := 9 \cdot dB$ $d := 600\ km$ $P_r(d, f, P_t, G_t, G_r) = -105.155$

$P_t(915 \cdot MHz, 400 \cdot km) = ?$