

WPRC
WESTERN PENNSYLVANIA REPEATER COUNCIL
FREQUENCY COORDINATING COMMITTEE

ERP CALCULATION WORKSHEET

Use this worksheet to calculate your repeater transmit Effective Radiated Power (ERP).

DO NOT RETURN THIS FORM TO WPRC. IT IS FOR YOUR USE ONLY.

Transmitter Output Power: _____ Watts
 Antenna Make and Model: _____
 Antenna Gain (in dB over a half-wave dipole): _____ dBd
 Type of Antenna Feed Line: _____
 Length of Antenna Feed Line: _____ Feet
 Duplexer Make and Model: (if used) _____

SYSTEM GAINS

SYSTEM LOSSES

Transmitter Output Power: _____ dBW*
 ADD the Antenna Gain: + _____ dBd
 EQUALS System Gain: = _____ dB

Length of Feed Line: _____
 DIVIDE by 100: ÷ _____
 EQUALS: = _____
 MULTIPLY this figure
 by the Cable Loss
 Factor from Table II: x _____ dB
 EQUALS Cable Loss: = _____ dB
 ADD Duplexer Loss: + _____ dB
 (if used)
 EQUALS Total System Loss: _____ dB

NOW CALCULATE YOUR TRANSMIT ERP. SUBTRACT SYSTEM LOSS FROM SYSTEM GAIN.

System Gain: _____ dB
 MINUS System Loss: - _____ dB
 EQUALS ERP in dBW: = _____ dBW
 ANTENNA ERP IN WATTS: _____ ERP*

*Use Table I to convert from watts to dBW and from dBW back to watts (ALWAYS ROUND UP TO THE NEXT HIGHER VALUE).

Table I

Watts=dBW	Watts=dBW	Watts=dBW	Watts=dBW
1 = 0.0	15 = 11.8	100 = 20.0	800 = 29.0
2 = 3.0	20 = 13.0	150 = 21.8	900 = 29.5
3 = 4.8	25 = 14.0	200 = 23.0	1000 = 30.0
4 = 6.0	30 = 14.8	250 = 24.0	1500 = 31.8
5 = 7.0	40 = 16.0	300 = 24.8	2000 = 33.0
6 = 7.8	50 = 17.0	350 = 25.4	2500 = 34.0
7 = 8.5	60 = 17.8	400 = 26.0	3000 = 34.8
8 = 9.0	70 = 18.5	500 = 27.0	4000 = 36.0
9 = 9.5	80 = 19.0	600 = 27.8	5000 = 37.0
10 = 10.0	90 = 19.5	700 = 28.5	6000 = 37.8

Table II

Freq. Band (MHz)	50 Ohm Coaxial Cable Feed Line Loss Factors (dB per 100 Feet)				
	Cable Type				
	RG-58, -223	RG-8, -213	RG-9, -214	1/2" Foam	7/8" Foam
29	2.8	1.0	1.0	0.4	0.26
52	3.8	1.3	1.4	0.55	0.36
144	7.0	2.6	2.6	1.0	0.66
220	9.0	3.4	3.4	1.3	0.85
440	13.0	5.3	5.1	1.9	1.3
1240	19.0	10.3	10.3	4.2	3.2