

# 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

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

#### SYSTEM LOSSES

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

50 Ohm Coaxial Cable Feed Line Loss Factors (dB per 100 Feet)					
Freq. Band (MHz)	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	0.28
52	3.8	1.3	1.4	0.55	0.38
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