



ERP CALCULATION WORKSHEET

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This worksheet may be used to calculate your repeater system's transmit Effective Radiated Power (ERP)
Use this calculation when filing for a repeater coordination.

Repeater Callsign: _____ Repeater Output Frequency: _____ MHz
 Transmitter output power: _____ Watts

Antenna make and model: _____ Antenna gain (in dB over a half-wave dipole): _____ dBd

Type of feed line: _____ Length of feed line: _____ Feet

Duplexer make and model: _____ Duplexer loss: _____ dB

1) SYSTEM GAIN

** Transmitter output power: _____ dBW *

ADD the antenna gain: + _____ dBd

Total System Gain: = _____ dB

** Transmitter Power Output in dBW = 10 x log(watts)

2) SYSTEM LOSS

Length of feed line: _____ Feet

DIVIDE by 100: _____ / _____ 100

EQUALS: = _____ 100ft

Enter the feedline loss factor from Table II: x _____ dB

EQUALS cable loss: = _____ dB/100ft

ADD Duplexer loss: + _____ dB

Total System Loss: = _____ dB

3) Calculate your system ERP by subtracting loss from gain

Total System Gain from above left: _____ dB

MINUS Total System Loss above right: - _____ dB

System Gain in dBW: = _____ dBW

*** SYSTEM ERP: * _____ WATTS

*** ERP = (inverse log) of ((System Gain in dBW) / 10)

* Use Table I to convert from Watts to dBW or from dBW to Watts.

Table I
Watts - dBW Conversion

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

Table II
50 Ohm coaxial feedline loss factors - dB per 100 feet

Freq Band (MHz)	RG-58	RG-8	RG-9	RG-8U	1/2" Foam	7/8" Foam
	-223	-213	-214	9913		
29	2.8	1.0	1.0	0.7	0.4	0.26
52	3.8	1.3	1.4	0.9	0.55	0.36
144	7.0	2.6	2.6	1.5	1.0	0.66
220	9.0	3.4	3.4	1.9	1.3	0.85
440	13.0	5.3	5.1	2.9	1.9	1.3
902	17.5	7.6	7.6	4.2	3.1	2.5
1240	19.0	10.3	10.3	5.1	4.2	3.2