UNDERSTANDING DECIBELS dB Prepared by Gary Davis KD9SB 10-16-19

E or I Ratio Power Ratio Log 10 = 1

E or I²/E or I¹ P²/P¹ 1 10 ͯ = 10 (Antilog)

+ GAIN - LOSS +GAIN - LOSS E or I Ratio

1 dB 1.122 .8913 1.259 .7943 E or I²/E or I¹ = √(P²/P¹)

3 dB 1.413 .7079 1.995 .5012 Power Ratio

P²/P¹ = (E or I²/E or I¹)²

5 dB 1.778 .5623 3.162 .3162

SCIENTIFIC CALCULATOR SOLUTIONS:

+GAIN -LOSS +GAIN -LOSS

(dB/20)10˟ 1/(dB/20)10˟ (dB/10)10˟ 1/(dB/10)10˟

E or I Ratio Power Ratio

Decibel (Use Common Log Base 10) +Gain -Loss

dB = 10LOG P²/P¹ dB = 20LOG E²/E¹ dB = 20LOG I²/I¹

Z in = Z out

dBi -------isotropic radiator, which sends out equal amounts of energy in all directions (reference dipole)

dBd -------actual dipole ( + 2.14dB) above isotropic radiator

dBk -------1 kilowatt

dBm ------1 milliwatt, 600 ohms = .775²/600

dBv -------1 volt

dBw ------1 watt

dBvg ------voltage gain

dBrap -----decibels above a reference acoustical power of 10 -¹⁶ watts

VU ---------1 milliwatt, 600 ohms = .775²/600 (complex waveforms varying in both amplitude and frequency)