Amateur Radio: Metric Conversion Practice Sheet

Metric prefixes you'll need to know

1 Giga (G) = 1 billion = 10^9 = 1 000 000 000

1 Mega (M) = 1 million = 10^6 = 1 000 000

1 kilo (k) = 1 thousand = 10^3 = 1 000

1 Hertz (or volt, amp, ohm, etc...)

1 milli (m) = 1 thousandth = 10^{-3} = 0.001

1 micro (µ) = 1 millionth = 10^{-6} = 0.000 001

1 nano (n) = 1 billionth = 10^{-9} = 0.000 000 001

1 pico (p) = 1 trillionth = 10^{-12} = 0.000 000 000 001

In amateur radio, you will generally be working with seven different metric prefixes.

The easiest way to remember conversions, is when you increase, you move three decimal points to the right (so 1 would become 1000); when you decrease, you move three decimal points to the left (so 1 would become 0.001)

NOTE: when decreasing, don't think of adding three zeros; think of it as moving three decimal points to the left of the one, which would be 0.001)

Table Conversion (the power of threes)

pico	nano	micro	milli	*base*	kilo	Mega	Giga
10^{-12}	10^{-9}	10^{-6}	10^{-3}	*1*	10^3	10^6	10^9
0.000 000 000 001	0.000 000 001	0.000 001	0.001	*1*	1 000	1 000 000	1 000 000 000

Examples

1,000 Hz = 1 kHz

1,000,000 Hz = 1 MHz

1,000,000,000 Hz = 1 GHz

Your radio is tuned to 7125 kHz; how do we express it in MHz? (1,000 Hz = 1 kHz, so 7125 kHz = 7.125 MHz)

You are transmitting on 1.265 GHz; what is your frequency in MHz? (1,000 MHz = 1 GHz, so 1.265 GHz = 1265 MHz)

If you were to take an ammeter marked in amperes and measure a 3,000 milliampere current, what would your ammeter read? (1,000 mA = 1 A, so 3,000 mA = 3 A)

If you were using a voltmeter marked in volts, and measure a voltage of 3,500 millivolts (mV), how many volts would your meter read? (1,000 mV = 1 V, so 3,500 mV = 3.5 V)

A radio puts out 500 milliwatts (mW). How many watts does it put out? (1,000 mW = 1 W, so 500 mW = .5 W)

Another radio puts out 250 milliwatts (mW). How many watts does it put out? (1,000 mW = 1 W, so 250 mW = .25 W)

Practice Questions

a. If a dial marked in megahertz shows a reading of 3.525 MHz, what would it show if it were marked in kilohertz? _____

b. If an ammeter marked in amperes is used to measure a 3000 milliampere current, what reading would it show? _____

c. If a voltmeter marked in volts is used to measure a 3500 millivolt potential, what reading would it show? _____

d. How many microfarads is 1 000 000 picofarads? _____

e. If you have a hand-held transceiver which puts out 500 milliwatts, how many watts would this be? _____

f. A kilohm is equal to _____ ohms

g. 6.6 kilovolts is equal to _____ volts

h. A current of one quarter ampere may be written as _____ milliamperes

i. How many millivolts are equivalent to two volts? _____

j. One megahertz is equal to _____ kHz

k. An inductance of 10 000 microhenrys may be stated correctly as_____ millihenrys

Answers

a. 3525 kHz b. 3 amperes c. 3.5 volts d. 1 microfarad e. 0.5 watts f. 1000 ohms
g. 6600 volts h. 250 milliamperes i. 2 000 millivolts j. 1 000 kHz k. 10 millihenrys

Version 11.12.2020 https://github.com/wombatbacon/hamsheets