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