**HAM RADIO INFORMATION**

**FOR STUDENTS & EXPERIENCED HAMS ALIKE**

**DIPOLE CALCULATIONS**

492 / f in MHz = starting length for ½ λ DIPOLE (both sides) IN FEET

246 / f in MHz = starting length for ¼ λ VERTICAL IN FEET

**COAX INFO**

50 Ω COAX: RG-58, RG-8, RG-8X, RG-213, RG-174

75 Ω COAX: RG-59, RG-6, RG-11



**GAIN**

Isotropic (theoretical) antenna dBi

Dipole antenna dBd

Dipole is typically 2.15dBi i.e. has 2.15dB gain over the Isotropic antenna.

**dB**

½ or 2 times POWER is 3 Db (up or down)

½ or 2 times VOLTAGE is 6 Db (up or down)

|  |  |  |
| --- | --- | --- |
|  | POWER RATIO | VOLTAGE RATIO |
| **-1** | **0.794** | **0.89** |
| **-3** | **0.501** | **0.707** |
| -6 | 0.250 | 0.501 |
| **+1** | **1.259** | **1.122** |
| **+3** | **1.995** | **1.414** |
| +6 | 4.0 | 1.995 |
|  |  |  |

1 S unit ≈ 6dB increase or decrease in input VOLTAGE (doubling or halving)

S9 ≈ 50 µV at antenna input (50 MILLIONTHS of a volt)

**BATTERY CHARGE CHART**

|  |  |  |
| --- | --- | --- |
| **VOLTAGE** | **% OF CHARGE** | **NOTES** |
| 12.6 | 100 | APPROXIMATE – Temp and other factors influence readings and charge level.  Readings after some idle time i.e. not on charger, no drains |
| 12.5 | 90 |
| 12.4 | 80 |
| 12.3 | 70 |
| 12.2 | 60 |
| 12.1 | 50 |
| ----------------- | ----------------------- | ---------------------------------------------------------------------- |
| 11.9 | 40 | Repeated discharge to these levels WILL shorten battery life. |
| 11.8 | 30 |
| 11.6 | 20 |
| ----------------- | ----------------------- | ---------------------------------------------------------------------- |
| 11.3 | 10 | Permanent damage will occur |
| 10.5 | 0 |

**UNITS SCALE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Terra | T | 10**12** | 1,000,000,000,000 | Trillion |
| Giga | G | 10**9** | 1,000,000,000 | Billion |
| Mega | M | 10**6** | 1,000,000 | Million |
| Kilo | k | 10**3** | 1,000 | Thousand |
| Hecto | h | 10**2** | 100 | Hundred |
| Deca | D | 10**1** | 10 | Ten |
| --------- | ------- | ------- | ------------------------- | ---------------- |
| Deci | d | 10**-1** | 1 / 10 | Tenth |
| Centi | c | 10**-2** | 1 / 100 | Hundredth |
| Mill | m | 10**-3** | 1 / 1,000 | Thousandth |
| Micro | **µ** | 10**-6** | 1 / 1,000,000 | Millionth |
| Nano | n | 10**-9** | 1 / 1,000,000,000 | Billionth |
| Pico | p | 10**-12** | 1 / 1,000,000,000,000 | Trillionth |