Radio Equations

Voltage = Current * Resistance

Volts = I "Amp" * R "ohms"

$$\text{Watts} = \frac{\text{Voltage}^2}{\text{Resistance}}$$

$$\text{Watts} = \text{Amps}^2 * \text{Resistance}$$

XL ohms Ω = 2 * Π* freq "Hz"

$$\text{Xc ohms } \Omega = \frac{1}{2 * \Pi * \text{Freq "Hz"}}$$

$$\text{Impedance} = \sqrt{\frac{XL}{Xc}}\ \Omega$$

$$\text{Res Freq} = \frac{1}{2 * \Pi * \sqrt{(C * L)}}\ \text{Hz}$$

$$Q = Xc/R = (½\Pi\ f\ C)/R = 1/(2\ \Pi\ f\ C\ R)$$

$$Q = XL/R = (2\ \Pi\ f\ L)/R$$

Radio Equations

$$\tfrac{1}{2}\lambda_{ant} = (300/MHz) * 0.95$$

$$\tfrac{1}{4}\lambda_{ant} = \tfrac{1}{2}\lambda_{ant} * \tfrac{1}{2}$$

$$Zin = \frac{Zcable^2}{Zout} \quad \text{i.e.} \quad \frac{75*75}{50} = 112\Omega$$

$$SWR = \frac{Vmax}{Vmin} = \frac{Vmax + Vrev}{Vmin - Vrev}$$

$$\text{Return Loss} = 10 \log_{10} \frac{\text{Reflected power}}{\text{Incident Power}}$$

$$\text{Freq 3dB} = 1/(2 * \Pi * R * C) \text{ Hz}$$

$$Zin = Zout * \left(\frac{\text{primary turns}}{\text{Secondary turns}}\right)^2$$

Radio Equations

Dynamic resistance Rd = L/ C R

$$Q = 2 \Pi f C * Rd$$

$$Q = (fo /(f2 - f1)$$

C total = C1 + C2 + C....parallel.

1/C total = 1/C1 + 1/C2 + 1/C...series

C total = (C1 * C2)/ (C1 + C2)....series

L total = L1 + L2 + L..... series

1/L total = 1/L1 + 1/ L2 + 1/L.... parallel

L total = (L1 * L2) / (L1 + L2).....parallel

R total = R1 + R2 + R.....series

R total = 1/R1 + 1/R2 + 1/R.....parallel

R total = (R1 * R2) / (R1 + R2).....parallel