

Editorial – More power to you

The simple fact is that we amateurs want to be heard when we transmit. There are good ways to improve your transmission, such as raising your antenna, removing common-mode noise, and speaking clearly and closer to your microphone. Sometimes, we just want more available power. It's been said that *knowledge is power*, but understanding power and power sources can require a little knowledge too.

Calculations

Power can be calculated in several ways, depending on the physical device that's requiring or dissipating the energy. Probably the two most familiar to amateurs are the ones involving electrical components. Because $P = I \times E$ and $E = I \times R$,

$$P = I^2R \text{ and } P = E^2/R$$

Whether you know the voltage or the current quantity, if you know the resistance, you can calculate the power dissipation of a component, whether the voltage and current are AC (alternating current) or DC (direct current).

Complex power

When the opposition to AC current flow is dependent on reactive (by inductors and/or capacitors) components, the power calculations can take on a different form. This is known as **complex power** and starts by replacing resistance R with **impedance** Z :

$$Z = R + jX$$

$$X = X_L - X_C$$

$$X_L = 2\pi fL \text{ and } X_C = 1/(2\pi fC)$$

Because of the dependency on f (frequency), L (inductance), and C (capacitance), the resulting power calculations can become a bit messy very quickly.

Amplifiers

There might be times when a little more transmit power is what you need, to get the attention of that elusive distant station. An **amplifier** can help tremendously by boosting your signal higher than the 100 watts your rig was born to deliver. But, be sure that you've done all you can to optimize your antenna before you start sinking good money into an amp.



Alternative power

It's assumed that most of your amateur station power needs are being met by either batteries or commercial (wall socket) power. Many modern hams are exploring **solar power**, which this issue discusses in the **Strays** column. But alternative means such as wind, hydro-electric, and even pedal (mechanical) power are possible. And if you have the inclination, you can explore how to combine different sources.



In the 1973 movie *Soylent Green*, Edward G. Robinson plays a character in an apartment, for which he must daily pedal his generator-mounted bicycle. Not only does he recharge the batteries, but he also gets a little exercise in the process.

Finally

Keep in mind that more power is not always better, especially when boosting a distorted signal results in a stronger distorted signal. Also, if you're attempting to send your message over the horizon, you might be at the mercy of the current **band conditions**.

Anything to add? Email editor@utaharc.org