

# The Radio Hotel – NEC and The Smith Chart

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Some of us know people who have done great things for the world around us and in particular great things in the world of ham radio. Rarely, IMHO, do we show our appreciation for what they have done. (Hopefully you have). I'd like to try and set things right, just a bit, in the Ham Radio world of antennas.

**NEC**-- The Numerical Electromagnetic Code was developed by Gerald Burke, Alan Poggio and Earl Miller who wrote the NEC/MOM family of programs at Lawrence Livermore Labs in 1981, under contract to the US Navy. NEC2 was later released to the public and is now available on most computing platforms. Hams take advantage of this NEC code by using EZNEC, MMANA or the 4NEC2 antenna modeling programs.

The 3 authors gave a presentation at the 2004 IEEE AP-S International Symposium – “NEC – A Brief History”. Find a copy of this NEC history on the BVARC Tech-pages:

<http://bvarc.org/home/tech-pages/> Thank you Eddie!

*Please note that Jerry Burke, the primary author of the antenna-modeling software NEC, died this year on February 14. He had been suffering from cancer. NEC (Numerical Electromagnetics Code) evolved out of a program called BRACKT, which Burke and others developed in 1967. The most common public version is NEC-2. Thank you Jerry Burke!*

If you are interested, more NEC information can be had at <https://www.nec2.org/>

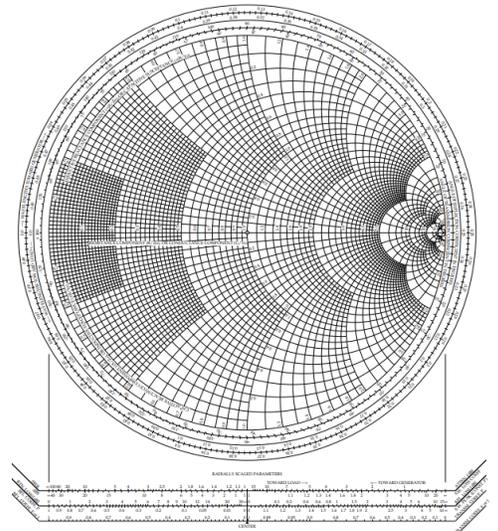
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## **The Smith Chart**

It was invented by Phillip H. Smith and T. Mizuhashi. It's a graphical calculator and nomogram designed for engineers and hams that specialize in radio frequency (RF) transmission lines and matching circuits. Yes, looking like a spider created it after doing acid, it was a marvelous tool to help solve transmission line matching problems, etc. What enabled Smith and Mizuhashi to do this is the fact that transmission lines, impedances and matching are simply an exercise in circular mathematics. And, if you can describe it in an equation you can graph it and you can even write software to make a tool for the rest of us.

**Thank you, Phillip!**

And write software someone did. **Sim Smith**, a **free** product of Ward Harriman, AE6TY, combines the calculating and graphics power of a PC to create a very complex, but straight forward to use tool to solve your antenna matching problems. It allows you to concentrate on solving your antenna matching problem and not on the math behind the complicated calculations.



The March 18<sup>th</sup> meeting of the Texas DX Society included a comprehensive presentation about Sim Smith by Robie Elms, AJ4F. Go to <http://www.tdxs.net/> and find the **TDXS Meeting Videos -- March 18<sup>th</sup> Meeting**. It is a 1 hour 59 minute You Tube video of the Zoom meeting. If the Smith Chart, impedance matching and transmission lines grab your fancy, you will thoroughly enjoy Robie's presentation.