COMPONENT NUMBERING SYSTEMS

I enjoy reading your department, "Antique Radios." It's brought back memories of our first Atwater-Kent, and how I first began in radio around 1938.

Some of the history of those days is, I fear, becoming lost. One of the things that distresses me is when I hear someone refer to a diode, such as a 1N914 as an "eye-en" 914.

Did you know that the XN (1N, 2N, 3N, 4N) system of numbering semiconductor devices was actually invented before there were transistors? Before there were transistors (prior to 1948) there were tubes and solid-state "crystal" diodes. During World War II solid-state diodes, the venerable 1N21, IN23, IN23A, and 1N23B among them, were used as mixers in radar receivers. Their function was to downconvert the incoming RF energy so that it could be amplified at a lower frequency.

The tube-numbering system most in favor at the time was of the form nXn; for example a 6L6. The first number indicated the nominal filament or heater voltage. The letter indicated whether the device was an amplifier or a rectifier. Letter designations in the first half of the alphabet were amplifiers; letter designation in the second half of the alphabet were rectifiers. (From that, we see that the L in the tube number indicated that the 6L6 was an amplifier.) The final number indicated the number of active electrodes.

With CRT's, the first number in-

dicated the maximum screen dimension in inches instead of the heater (or filament) voltage. Thus BP1 was a tube with a 5-inch screen. The final "P1" indicates the phosphor type. That numbering system for CRT's is still used today, by and large, for both oscilloscope and TV CRT's.

Because solid-state diodes had no filament or heater, a different numbering system was called for. Using a zero designation would not work because there were tubes that had no filament or heater; the 0Z4, for example.) Although the specific origins of the nNxxxx numbering system are obscure (at least to this writer), the following seems clear:

The prefix 1N was chosen to be distinctive from the tube designations. The initial 1 indicated one less than the number of electrodes or contacts; even though, at the time, all semiconductor devices had only two contacts. Perhaps the numbering system was chosen with an eye to a possible future where more contacts would be added. In any event, it was a fortuitous choice, because when the transistor came along, a ready-made numbering system was already in place!

It is true that as far back as 1925 (some would say even earlier) researchers had dreamed of transistor-like devices. However, the fact remains that there were no such devices generally available until sometime after the work of Shockley, Bardeen, and Brattain that culminated in the invention of the transistor in 1948. Nor was it generally believed, prior to that time, that such a device was even possible.

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FM COMMERCIAL KILLER

Here's another idea for the FM commercial killer that works on at least one station in my area:

Subtract the left and right channel from each other using a differential amp. When the station is broadcasting anything but music, the left and right channels will be identical (mono), and that can be used to kill the audio output.

There are several ways to find out if that will work with a particular station. One is to connect one side of a speaker to the positive terminal of the left-channel output and the other to the positive terminal of the right-channel output. The signal produced will be the difference between the two channels. Adjust the balance control for no output with a mono signal, and then listen for while. If the commercials can't be heard, the technique will probably work. A more traditional way to see if the technique will work is to examine the the left and right outputs with a dual-channel oscilloscope to see if the commercials are mono or to measure the voltage between the center conductors of the left and right tape-output jacks; for a mono signal, the voltage seen on an AC voltmeter during commercials should be near zero.

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