Versions of API 550 Equalizer
this info was originally by Paul Wolff and later editing and additions were done by John Klett - May 2000

The api 550 series equalizer, with the exception of the 550A-1, has a family of boost cut curves that are referred to as "Proportional Q". Proportional Q describes a relationship between the energy that is added or removed by boost and cut and the range of frequencies (bandwidth) effected by differing degrees of equalization.

If you look graphically at the the lines representing flat response and the lines in the family of curves describing the equalized boost or cut responses you'll find that the area enclosed by those lines remains reasonably constant despite the boost or cut amount. The enclosed area represents the amount of energy being added in boost or subtracted in cut.

With small amounts of boost or cut the equalization curve is low and very wide and, as the amount of boost or cut is increased, the Q increases and the equalized response curve becomes narrow or sharper. The bandwidth and the boost/cut amounts are proportionally related - WIDER at 2dB and NARROWER at 12dB.

The API 550:

Proportional Q Equalizer with three frequency selections on the top band, three frequency selections on the bottom band and five frequency selections in the middle band, four discrete transistor buffers each using two transistors, a two pole filter for the high/low pass switch (different than 550A), the EQ is switched out by tying all the filters together and taking them to ground through the in/out switch, two 2520 opamps, and long frequency knobs.

The API 550A:

Proportional Q equalizer with five frequency selections on the top band, five frequency selections on the bottom band and five frequency selections in the middle band, four discrete transistor buffers each using three transistors, 1x-10x high and low pass filters with same frequencies as the 550 (50 HZ to 15KHz band pass), each band went through it's own in/out switch, two 2520s and short frequency knobs.

The API 550A-1:

Constant Q equalizer... the bandwidth remains constant regardless of boost or cut amount. The 550A-1 was essentially the same circuit as used in the API 560 graphic equalizer but the frequency selections are distributed over three boost cut "bands" having the same frequency center points as the 550A. That's why it sounds so different. This model had an IC opamp based input and filter stages and one 2520 on the output.

The design change has been explained two ways... one explanation was that API simply wanted to lower the cost of making EQ's and the other was that a customer was ordering several large consoles and expressed that he really liked sound of the 560 EQ but wanted the stepped controls and center points of the 550A... since this represented a large sale and involved about a hundred equalizers API made that change and then kept making them that way because they were less costly to replicate. API never checked the Q other than full up at 12 dB, so they never knew that they were different. They actually did not realize that the original 550 was proportional Q. By that time they figured this out 2500 550A-1's were manufactured and sold and everyone was flipping out, mostly not in a good way.

The Datatronix 550A:

Proportional Q equalizer - a re-engineered reissued of the original 550A. After a lot of flak from end users, and specifically Sunset Sound, who paid for the redesign, the proportional Q version of 550A was reworked to make the switches and transistor buffers removable. That is the circuit board you see in some 550A equalizer modules made by Datatronix. Sunset Sound got the rights to the first 500 and then Datatronix could sell them. These were used in the Sunset custom console originally installed in Studio 1.

For a time both 550A-1 and the Sunset version 550A equalizers were in manufacture.

Then Paul Wolff buys api from Datatronix... (was that 1988? - something like that)

The "Paul" 550A:

Paul Wolff built about 250 of the redesigned 550A's, and shit-canned the 550A-1

The "Paul" 5502:

Two Proportional Q equalizers in a 2RU rack mount package. Paul redesigned the proportional Q 550 circuit into a four band version called the 5502. Eighty-Five of them were manufactured.

The "Paul" 550B:

Proportional Q equalizer - Henry Sanicola of O'Henry Studios asked Paul to build seventy-five four-band 550 type equalizers that would fit in a regular 550. Each of the four bands had seven frequency selections.

Paul "When I released the original 550B, Allen Sides got ahold of the prototype and did not like it. It turned out that it was oscillating and sounded bad. He, to this day, still thinks they all sound that way, but every one else likes them. I never discontinued the 550A, and after the release of the 550B, up until this day [May 2000], have only sold seven 550A's and over 3000 550B's. Everyone bitches at me about them, but didn't buy the new 550As. Go figure. The 'Experts' like Brent [Averill] feed the industry about how bad the new stuff is so they can sell old ones and support their uninspired lives."

Klett notes that several years after this was written another difference between old and new was finally quantified and that was regarding the steel used in the output transformer laminations - grain-oriented vs non-grain-oriented steel... Paul figured this out and made the correction, it was a subtle change sonically and few noticed. More recently (2006 onward) we see DIY people like Eisen Audio and Ed Andersen delving into transformer designs for api and other product and recreating very good versions of the original parts that really do sound authentic.

Paul "You will never be able to "simulate" a 550 Eq in a plug in. It's like a blow up sex toy. It's either real or it's not. If you think you have or can, then you should, because you can't hear anywayzzz...."
