

The Molybdenum Anode 211 re-born

AFTER CHECKING OUT THIS NEW/OLD VALVE, KF BOUGHT THE REVIEW SAMPLES

Students of valves/tubes will recognise a *VT4C/211* triode at ten paces. It's large: around 20cm from base to top, with a glass envelope some 8cm in diameter. A cruciform anode is formed of extruded or machined carbon, typically between 3-4mm thick, and the thoriated tungsten filament works at over 1,700 degrees C, giving off an intense whitish-amber light and a lot of heat. It requires a scary 1,250V on the anode, and 10V at 3.25A on the filaments (when capable of a maximum Class A dissipation of 75W).

This very versatile tube saw widespread service in audio frequency power amps and modulators, and Classes B and C RF amplifiers and oscillators. Manufactured by (among others) GE, RCA, Taylor, Westinghouse, United Electronics and Western Electric in the US, and Standard Telephone & Cable in the UK, thousands of *VT4Cs* flew with the US Air Force during WW2, fitted to the radio transmitter sets that equipped *B-17* bombers and other aircraft. The valve was still in limited military service during the Korean war. Military record aside, the *211s* still merit our interest as an audio output tube. With a μ (amplification) of 12 and exceptionally linear low distortion (anode) curves, the *211* continues to be used by a select number of amplifier manufacturers undaunted by its demanding operating requirements.

I have long been a fan of well-implemented *211* amplification. I own and use just such an amplifier as one of my two primary reviewing references, and it's always the *211* that's lit up when I want entertainment. To my ears, the *211* almost matches the speed, sophistication and resolution of the connoisseurs' *2A3* valve, but has much more grunt – more than enough to drive horns to very high volume levels, and even work well with some speakers of sub-90dB sensitivity, such as the Dynaudio and Pro-Ac stand-mounts.

Audio Note (UK) founder Peter Qvortrup is a fan of the *211* too; so much so that he has sunk an undisclosed sum into having a notable variant of the *211* brought up to date and manufactured. It's the *4242A* variant, which was originally produced by STC in the UK in small quantities, and few of the original pairs remain in existence. This particular variation used molybdenum plate rather than machined carbon for the anode, but was electrically equivalent to a regular *211*. Western Electric also made limited runs of a molybdenum-plated *211*,

called the *242C*. A frustrating lack of historical record surrounds both British and American variants: it would be interesting to know why the molybdenum experiments took place – perhaps to reduce secondary emission – and why this version was ultimately abandoned. (Google and the other search engines remain mute on the subject.)

Nevertheless, it was long rumoured in valve enthusiast circles that the original molybdenum *211s* sounded superior to the carbon anode varieties. Qvortrup spent years trying to find an electrically viable pair of either the US or British molybdenum tubes to try, and when he eventually found two that were sufficiently well matched, he plugged them into one of his amplifiers. As he tells it, he was quite unprepared for what happened: “My jaw almost hit the floor. Those rumours didn't tell half of it. At that point I made a long-term plan to get some made.”

Fast-forward some years and that plan is coming to fruition. Qvortrup struck a deal with the tube manufacturer Psvane, under which the Chinese company would do the development work and manufacturing, if Audio Note would secure and pay for the molybdenum sheet, the tooling, and commit to buying 1,000 tubes at a time.

I was sent a pair of the molybdenums from that production batch to try, in exchange for a report on their performance. Others to whom tubes from that batch were sent included record collectors, producers and musicians of Qvortrup's acquaintance. The production version – more than likely unchanged from these samples – will be sold by Audio Note for £800/pr (plus VAT).

Physically the Audio Note tube is not a strict replica of the STC original. In a nod to expediency and practicality, it uses the same glass bulb as Psvane's mid-price *211 TII* valve (which, by happy coincidence is similar to the bulb used by STC). It also uses the same internal scaffolding employed in the *TII*, with six support rods rather than the *4242A's* four. (A similar six-rod structure was used by RCA and Amperex in what are judged to be among the best-sounding carbon plate variants of the *211*; it may well be that the extra rigidity was partly responsible for the superior sound.)

Continuing the internal tour, whereas the *TII* has four 'getters' (which mop up residual gases during manufacture to maximise the vacuum inside), following the STC original, the new Audio Note

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tube has two. The anode is a press-formed assembly of two 1mm molybdenum sheets, pierced, folded and spot-welded together for robust and repeatable joint integrity. The valve base is polished brass, and screen printing on the glass tells us that the valve is an Audio Note 4242E. Inside each valve, welded to two support rods, is a tiny metal plate with the same text and a serial number.

Sound Quality

Some 16 years ago I heard an amplifier built with silver wire end-to-end for the first time. It blew asunder my cosy belief that wires make zero difference, and left me baffled and somewhat disturbed.

It was apparent within seconds of the stylus dropping into the groove that the 4242E posed a similar challenge to my equilibrium. The 4242E has a dynamic immediacy and a density of musical information that is truly shocking for those used to the sound of even the best carbon 211s. So much faster does the anode seem able to react to the modulated flow of electrons, that recordings I thought I knew well came with fresh insights, more vivid and truer-to-life tonal colours, and greatly enhanced levels of dynamics and timing.

That’s not to suggest that this is the kind of amped-up hyper-forensic presentation of the type that plagues many contemporary audio components, but an altogether more sophisticated sonic result, more liquid, more natural, more *analogue*. The 4242Es initially sound less weighty than carbon 211s, but are

trading a relatively tuneless thump and boom for a much more insightful and tuneful bass.

Gains are apparent over the entire audio band. Voices have a greater sense of expression, strings a more rosin bite, cymbals a more metallic shimmer and a longer decay. As is always the case with the best audio kit, the 4242Es are notably un-fatiguing to listen to, perhaps because they require the brain to join fewer sonic dots in order to be reconciled to the illusion of musical performance.

The 4242Es look jolly funky too, as the anodes glow orange during operation. In almost any other valve type, such ‘red-plating’ is a sign of acute distress, but in the 4242E it is simply a result of the relative thinness of the molybdenum anode compared to carbon and the designed operating power. (Molybdenum’s melting point is 2,623 degrees centigrade, so there should be no concerns about failure!)

Conclusions

What this does to the market for 211 tubes could be interesting. Audio Note’s proposed price for the 4242Es is (perhaps deliberately) disruptive, undercutting by some margin the current crop of new production premium carbon 211 tubes from the likes of Elrog, and perhaps making the purchase of NoS (New old Stock) 211s pointless, except as collectors’ curios. Whether the molybdenum-plated 300B valves that Audio Note (UK) is currently developing with manufacturer Psvane will be as keenly priced remains to be seen.