BD 1: Class D Amplifiers *"Briefest Commentary"*

It's a feature of audio that inept electronics & defective schemes can sound good at first, (simply) because what's not actually right, sounds fresh. But, in time, "truth will out".

Masters of analog engineering can appreciate Class D as an 'interesting solution' to fill the planet with mid-fi, musically-anodyning sound. It is interestingly solely peddled by digital 'types' with negligible prior knowledge of audio or it seems, sense for musicality. So, all that was learnt painstakingly over 40 years about making good audio amplifiers, has been forgotten. A top electronics scientist once said 'digital is for analog school drop-outs'.

Efficiency is exaggerated with technical vapidity. Analog amplifiers can have x100 lower distortion, and when a given power supply is factored-in, are only 28% or so less efficient, and put in context, are over *200% more efficient* than any vehicles.

To the unblind, Class D is high on short term-ist makers' convenience seeking 'competitive' advantage of lower weight and a lowered parts cost. But, dare we ask, ***what*** have 'low weight' or 'low parts cost' or 'more efficiency', to do, with musical quality ?

Also what happens when the specialised ICs inside, fail after a few years, is not revealed. High end hi-fi reduced to the 5 year throwaway cycle of computerland.

Those considering Class D sonics revelatory, may not have been able to hear the analog amplification that's possible, with what's known today.

by Ben Duncan

Notes for the above:

A. *SONICS*
*"Immediately good/refreshing sound" (how Class D is commonly described... at **first**) can be a very superficial thing. How many times was the sound of some gear (or music) you are long term happy with NOT necessarily so good at **first** ?*

B. *NEW TEAM - SUSPICIOUS NEWBISM*
"Good" (sic) Class D is a massive Analog/audio/RF/Digital engineering tangle problem, & analog engineers are sage enough to know to leave such a vipers' nest alone. Seriously clever people and the biggest corporations have all thrown "brains and bucks" at, and into Class D, since the early 1960s. Over 40 years of trying! With still very few results

on the high end stage, and, very late results all round.
People playing with overly-mathemeticised plans of reality may need to write out 1000 lines :
"Digital knowledge is not power amplifier engineering." !
Not a single master of analogue power amplifier engineering has turned to Class D. Shouldn't one know this, and, ask 'Why?'
By their nature, electronic engineers are usually eager to "migrate into the future technology".

***C**. Because the people who make Class D amplifiers are somewhat "ignorant", let alone their advertising copy-writers, they forget that the ACTUAL efficiency of an amp has to be multiplied by the power supply's efficiency, to arrive at the nett, realistic sum. This down-plays their rather spurious/overstated claims of high efficiency, once the comparison is made on an apples/apples basis.*
In other words, taking best case practical round figures, an analog amp (70% efficient) is only a tad less efficient than a Class D amplifier (90%), whether they both use a mains frequency power supply of nominally 70% efficiency (70% x 70% = 49%; 70% x 90% = 63%); Here, Class D's 63% is only "28% ahead" of 49%.
Or, if both amps use a high-frequency (switching) power supply, then 70% x 90%, and 90% x 90%, are 63% & 81%. Again, 'D' is only some "28%" better. Do you wreck high-end sound for that? But, even the average 63% (of both) is FAR more than 200% more efficient than the most efficient car or indeed, power station.
If we dare include the power station efficiency (circa 28%), then any eco benefit from just one final part of the total energy loop, acting efficiently in Class D, is further reduced!

***D.** To anyone with an understanding of what makes existing good high-end hi-fi amplifiers, it is hard to see **WHAT** Class D achieves, that is useful. No one has ever announced it or written it down. It is not a logical next step. **ONLY IF** manufacturing convenience, cost, and material usage were put at the head of the list, before sonic quality.*

If that is the concern, then logically we should consider the reduction of all musical instruments to 3/4 size, and made from recycled plastics, with ISO-standardised sizes - so all makes are identical. On similar grounds to the above - convenience and making profit with less, without ANY regard to purpose or quality.

(photos by Norma Lewis)
(We are advised that further material - such as the 10 yearly update of the index of Ben Duncan's audio articles - is in the pipeline.)