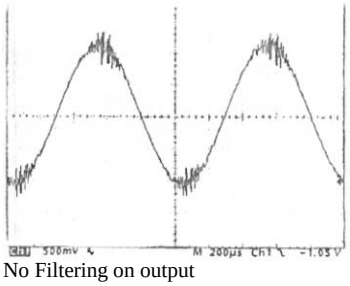
CA Series Power Amplifiers

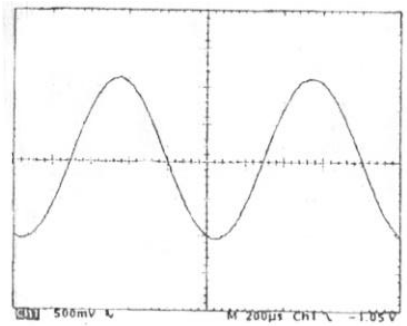
Traditionally, Class A and Class A-B amplifiers have dominated the amplifier marketplace. These purely analogue devices have low power efficiency and most integrated circuit Class A-B amplifiers fall short of true high-fidelity audio quality.
Class D amplifiers however, solve the efficiency problem by using switching pulse-width modulation technology. However, this produces audio quality that is far inferior to class A or AB, so efficiency is gained at the expense of audio fidelity. The 'Holy Grail' of amplification: High audio quality AND high power efficiency has long eluded the market. Enter the CA range of power amplifiers delivering audiophile performance and very high efficiency.

If you have measured the output waveforms of CA amplifiers using traditional equipment and methods, you may have observed an unusual characteristic in the output waveform when the amplifier is driven close its maximum output. This characteristic appears to be a high frequency oscillation near the waveform peaks.
In reality, this apparent oscillation is an audio quality enhancement characteristic of the CA amplifier. The apparent oscillations are well outside the audio bandwidth, and are a unique feature of the digital power processor.


No Filtering on output

As the input signal, to any conventional amplifier is increased, at some point the output of the amplifier will distort/clip i.e. 'Square' off. This is bad news because the for a split second the loudspeaker is not moving at all but still dissipating potentially huge power levels, this is the main cause of (expensive) compression driver failure.
When the CA power amplifier goes into this distortion region, it exhibits high frequency break-up of the peaks as shown above. This is actually the amplifier resetting the control processor overloads at a ***frequency far above the audible range.*** This is not instability or oscillation, nor does it degrade the performance of the amplifier in any way. In addition the CA series power amplifiers also have the ability to run almost rail-to-rail, and thus will not lose negative feedback. In other words, it will retain control of the load at all times.

Measurement of THD%+N
Unless your distortion analyser is designed to reject out of band noise when measuring THD (And very few are), the THD measurement actually reflects harmonic distortion plus any noise present up to the bandwidth of the analyser and so is actually a measurement of THD+N. Since the CA range of amplifiers have energy far outside the audible frequency range (As do inferior class D amplifiers), a test designed for linear amplifiers (such as class A, AB) will not yield valid results when applied to a CA amplifier. A sharp cut-off low-pass filter must be inserted between the amplifiers outputs and the test equipment's inputs prior to making any distortion measurements. Some measurement equipment (Such as Audio Precision2) have high quality low pass filters which can be used to limit the test bandwidth. Using these filters (as shown below) you will achieve what 'looks' like a high quality linear amplifier. Even though there appears to be 'lots going on' outside the audio bandwidth, the CA amplifier is designed to be well within current and future EMC guidelines, and as such is quieter than most linear amplifiers.


Output with 30Khz Low-pass filter