OTALA DISTORTION

Some 50-odd years ago Dr. Fabian Garcia, director of the Agricultural Experiment Station at New Mexico A & M (Now State University) told the students about his work developing bug-resistant strains of cotton. But at each success, some entomologist would invent a new bug to eat it.

In recent years, solid state amplifiers with 0.01% total harmonic distortion, are so nearly perfect as to defy measurement of the defects. But some of them have compared unfavorably with tube types on listening tests.

Why?

I think Dr. Matti Otala has discovered the bug to eat the new bug-resistant amplifiers.

Dr. Otala calls his discovery Transient Intermodulation Distortion (TIM for short, we'd like to see this called Otala distortion after its discoverer). This is a form of distortion which is exhibited when an amplifier is called on to amplify large amplitude signals with rapidly changing characteristics such as transients. Because of inherent time delays and slew-rate limitations in an early stage of the amplifier, the input stage of the amplifier actually blocks or turns off during the time the signal is rapidly changing. This momentarily blocked characteristic causes audible distortion which imparts a "gritty" or "fuzzy" sound to the high frequencies.

TIM distortion is most often exhibited by amplifiers that use large amounts of negative feedback to flatten response, widen bandwidth, and reduce "ordinary" distortion. This is quite typical of some solid state amplifiers, particularly the ones which use rather slow general-purpose "op amps" that have very high open loop gains of some 80 to 100 dB. Otala points out that feedback in excess of 20 dB may give rise to this type of distortion. This may explain why some solid state amplifiers are regarded as inferior to tubes, but should not be construed to mean that all modern amplifiers are bad.

We are beginning a program of bug hunting with some pretty sophisticated equipment and hope in the not-too-remote future to have some comparative answers. As this is one of our non-profit activities, and it may take a few months to get into the project, I hope you will hold off your questions until summer. We hope to release information as it accumulates.
For those who would study Dr. Otala's work, herewith is a bibliography.


10. Deutsche Industrielle Norm, DIN 45500 B1.6 1.73.


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