Those who would audition their audio equipment for the effects of dielectric material in the coupling capacitors and oxygen in their speaker cables have long been ridiculed by the rest of us who merely use our hi-fi to listen to the music. Ultra-sensitive audio measuring instrumentation seems to provide evidence that the golden ears brigade might be right after all. Audio consultant Ben Duncan reports.

PROOF FOR THE GOLDEN EARS HYPOTHESIS?

Audio Precision, a US company founded by ex-Tektronix engineers, presently makes some of the world’s most advanced audio test equipment.

Highly dependent on complex digital signal processing to produce its results, AP’s recent software update has introduced challenging new tests for analogue audio, using DSP sampling at up to 192kHz. This can eke error signals out of the noise through steep but fast settling filtering with a degree of precision not previously possible.

One of the new tests enables individual harmonics up to the 10th to be plotted against frequency, down to some 0.00006% (60ppm). The other prods the DUT with a tone, typically 1kHz, which it cancels to <-130dB, and plots the resulting spectra. This shows both harmonics and intermod products. The sensitivity of the new tests is producing seemingly objective evidence of effects previously held to be utter rubbish by hard line objectivists.

Figure 1 shows the output spectra of a Rauch DVT-50s professional power amp at 13dB below clip into 8Ω. Under these conditions, odd harmonics dominate. In Fig. 2, the 100μF DC blocking capacitor in the grounding arm of the amplifier negative feedback loop has been changed for back-to-back elcaps totalling 165μF. The sonic benefits of doing this have long been recognised. All other conditions remain the same.

Figure 2 clearly documents differences that corroborate the audible change. Looking carefully, one can see that the reversible elcap increases all the even harmonics up to the 8th, making them almost dominant. It also changes the residue so the odd harmonics above the 9th slope off monotonically. The full effect of

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\text{Fig. 1 Before the capacitor change. The output spectra of a Rauch DVT-50s professional power amp at 13dB below clip into 8Ω. Under these conditions, odd harmonics dominate. In Fig. 2, the 100μF DC blocking capacitor in the grounding arm of the amplifier negative feedback loop has been changed for back-to-back elcaps totalling 165μF. The sonic benefits of doing this have long been recognised. All other conditions remain the same.}
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\text{Ben Duncan Research 1KSA(DUT AMPL14dB) vs FREQ(1Hz) 11 JAN 92 23:19:24}
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\text{wires.com}
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Fig. 2. And afterwards... the 100k DC blocking capacitor in the grounding arm of the amplifier negative feedback loop has been changed for back-to-back elcaps totalling 165uF. Looking carefully, one can see that the reversible elcap increases all the even harmonics up to the 8th, making them almost dominant. It also changes the residue so the odd harmonics above the 9th slope off monotonically.

this change can be more fully appreciated by overlaying psychoacoustic weighting, but the principle is clear enough. Figure 3 shows how a traditional THD+N vs frequency measurement misses the point; THD in the modified unit (upper plot) appears to be unchanged below 1kHz and slightly higher above 1kHz, leading to false conclusions. The new tests are so sensitive that the effects of changing and upgrading individual components can be seen.

Reference

Fig. 3 shows how a traditional THD+N vs frequency measurement misses the point: THD in the modified unit (upper plot) appears to be unchanged below 1kHz and slightly higher above 1kHz. Even so, general opinion holds that the modified amplifier with the apparently higher THD levels sounds better.

Many Radio Amateurs and SWL’s are puzzled. Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amtor you’ll know – but what about the many other signals?

Hoka Electronics have the answer! There are some well known CW/RTTY decoders with limited facilities and high prices, complete with expensive PROMS for upgrading etc., but then there is CODE3 from Hoka Electronics! It’s up to you to make the choice – but it will be easy once you know more about Code3. Code3 works on any IBM-compatible computer with MS-DOS 2.0 or later and having at least 640k of RAM. The Code3 hardware includes a digital FSK Convertor unit with built-in 230v ac power supply and RS232 cable, ready to use. You’ll also get the best software ever made to decode all kinds of data transmissions. Code3 is the most sophisticated decoder available and the best news of all is that it only costs £299!

- Morse - Manual/Auto speed follow. On screen WPM indicator
- RTTY/Beautor/Murray/TIA2/COT72 plus all bit inversions
- Sitor - CCM 525/576, ARQ, SBSRS/CBRS FEC, NAVEX etc
- AX25 Packet with selective callling monitoring, 300 Baud
- Fazimare, all RPM/COC (up to 16 shades at 1024x768 pixels)
- Autospec - Mk's i and ll with all known interfaces
- DUP-ARQ Antrac - 125 Baud Simplex ARQ
- Twincube - 100 Baud F7BC Simplex ARQ
- ASCII - COT7 5, variable character length/parity
- ARQ6-90/98 - 200 Baud Simplex ARQ
- SI-ARQ/SI-ARQ - ARQ 1900 simplex
- SWED-ARQ/ARQ-SWE - CCR 518 variant
- ARQ-A/ARQ100/1000 duplex
- ARQ-A/ARQ1000/1000 duplex
- ARQ-E3 - CCR 519 variant
- POL-ARQ - 100 baud Duplex ARQ
- TDMA342/ARQ-262 - CCR 262 with 1/24 channels
- TDMA342/ARQ-M2/4 - CCR 342 2 with 1/24 channels
- F7-ASI - 2 channel FDM RTTY
- FEC-A - FEC 100A/FEC101
- FEC-5 - FEC100 Simplex
- Press DPA - 300 Baud ASCII F7BC
- Wirtschaftstext - 300 Baud ASCII F7BC
- Sports info - 300 Baud ASCII F7BC
- Hellsviolator - Synch/Asynch
- Sitor RAW - (Normal Sitor bit without synchronisation)
- F7 BBN - 2 channel FDM RTTY

All the above modes are preset with the most commonly seen baudrate setting and number of channels which can be easily changed at will whilst decoding. Multi-channel systems display ALL channels on screen at the same time. Split screen with one window continually displaying channel control signal status e.g. Idle Alphas/Beta/RQ’s etc., along with all system parameter settings e.g. Unshift on space, Shift on Space, multiple carriage returns inhibit, auto receiver drift compensation, printer on, system sub-mode. Any transmitted error correction information is used to minimise received errors. Baudot and Sitor both react correctly to third shift signals (e.g. Cyrillic) to generate ungarbled text unlike some other decoders which get ‘stuck’ in figures mode!

Six Options are currently available extra to the above standard specification as follows: 1) Oscilloscope. Displays frequency against time. Split screen storage/replay. Great for tuning and analysis. £29. 2) Coquelet - French multitone system that only we can have at the same time.

NEW VERSION 4.00 JUST RELEASED – Now with improved user interface and even more features!

Please add £5 to the above prices for carriage by fully insured First Class postal delivery (default mode). Call or write for our comprehensive information leaflet – there is just not enough room here to tell you everything about Code3! Professional users – please ask about our new CODE30 DSP unit available soon! (Piccolo down to – 12dB S/N!!)

Prices start from £1250.

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