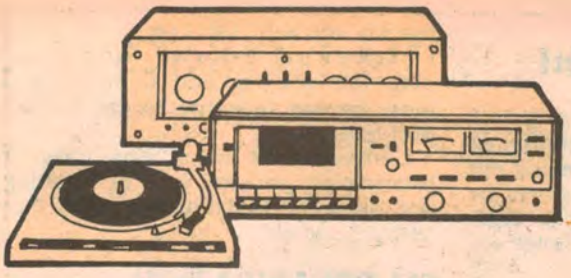


Hi Fi Topics

THE PROBLEM OF SUBJECTIVE REACTIONS: GOLDEN EARS OR A FERTILE IMAGINATION?

A hifi writer needs to be extremely cautious when discussing subjective reactions to equipment, as distinct from objective measurements. It is so easy to discount valid observations or, again, to be guilty of perpetuating rubbish.

by NEVILLE WILLIAMS

Time and again, overseas writers refer to the problems posed by people who claim that they can hear an effect which is not apparent to others and which is at variance with normal expectations. (e.g. Julian D. Hirsch in "Stereo Review" for May 1979).

Hirsch freely concedes that individuals may possess a special acuity of one kind or another but says that, equally, he is often put off by the inconsistencies and the "unbelievable excesses of hyperbole" which sometimes characterise the statements of those who claim to hear what he cannot.

I know only too well what he means. The fact is that, if one were to attempt to prove or disprove such claims, it would be necessary to organise meticulous double-blind tests to probe whether the claimant can indeed hear a difference. But that's only part of the story — in some cases the easy part.

Given that a difference is verified, it is then necessary to establish which aspects of it are "right" and "wrong". This may well involve detailed objective research to establish cause and effect — and findings which may or may not align with the claimant's original ideas. A classical example of all this was provided recently by subjective reactions to those exotic and expensive low-loss, high fidelity loudspeaker cables. Despite the fact that static measurements predicted otherwise, many claimed to hear a quite substantial difference (an improvement, of course) when the cables were installed.

I suspect that some desperately needed to hear a difference, having just spent a considerable number of dollars on the exercise! Perhaps there were others who could indeed detect a slight improvement in level or balance, particulalary if their existing cables were unduly lossy.

But measurements of typical cables established that the most significant difference was not a reduction in resistance and inductance(both steps in the right direction) but a large increase in capacitance (a step in the wrong direction!). It further transpired that this increase in capacitance was sufficient to push some amplifiers towards (or into) an unstable condition in the supersonic region. There was good reason to believe that some of the ultra-subtle "edge", which allegedly appeared on the reproduced sound, was not due to a loss made good but to the presence on the sound envelope of bursts of supersonic oscillation!

In such a case, the "difference" would not represent a subtle improvement but a subtle retreat from real fidelity!

But that statement should not be interpreted to mean that the "golden-ear" boys are always wrong. The reverse can happen, as it did with claims, made some time back, that some phono turntables sounded better than others! Musically, that is . . .

The initial reaction to this claim was one of incredibility. Surely someone had taken leave of their senses in both auditory and logical terms. The role of a turntable was purely mechanical: to spin the disc as accurately and smoothly as possible. Provided it did so with no

A NEW PHILIPS LOUDSPEAKER SYSTEM

As distinct from their unique "motional feedback" loudspeaker system, and others involving conventional passive crossover networks, this latest release employs what the company describes as the "natural crossover" technique. Philips Hifi Product Manager; Arno Reiuwers, explains that it relies on the inherent response and impedance characteristics of the three dirvers to absorb and radiate its share of the drive power across its appropriate portion of the spectrum. Backed up by careful enclosure design, it obviates the need for a comprehensive (and expensive) crossover network which gives place to just a couple of high-pass capacitors. Mr Rieuwers added that the new Philips loudspeaker factory at Dendermonde in Belgium has the necessary research and productions skills to exploit the natural crossover system, leading to a product that will have an immediate appeal to the budget-conscious hifi shopper.

significant wow, or flutter, or rumble, or hum injection into the cartridge, it was doing the job expected of it. How could it possibly colour the musical content of a disc?

But, in due course, an awareness dawned that the golden ear boys could be right. It had long been known that hifi systems could suffer from acoustic instability when sound energy from the loudspeakers was able to vibrate the playing deck sufficently. The end result was a loud rumble or howl which could only be stopped by turning down the volume control, or sometimes the bass control.

It was such an obvious and embarrassing problem that the industry sought to minimise it with measures such as resilient mountings, heavy turntables, dynamically balanced playing arms, and so on. Success was deemed to have been achieved if hifi modules could be strung together and used in a typical domestic situation without obvious signs of acoustic feedback.

But there came the realisation that lack of obvious instability might not be the end of the matter. Even though acoustic feedback may have been reduced well below the oscillation level, the phono deck assembly could still be picking up significant sound from the loudspeakers and feeding it back through the system. Was it not likely that this would colour the final sound?

At this point, thinking seems to have gone somewhat askew, influenced possibly by the existance of some very light turntables and others which produced obvious ringing noises when tapped with a finger. After all, the turntable was a large flat disc, suspended only in the centre and coupled intimately to the stylus. Surely it had the potential to behave like the diaphragm of a rudimentary microphone?

Hence the assumption: some turntables are more "musical" than others!

During 1977, a serious attempt was made by "HiFi Choice" magazine to quantify microphonic effects in turntables. In broad terms, the procedure involved connecting the particular player to a hifi system and setting the controls for normal playing. The turntable was then stopped and the stylus left resting in the stationary groove. At the other end of the system, the loudspeakers were disconnected and the output (if any) monitored by means of a meter, CRO or pen recorder.

Sound, at a selected level from a separate loudspeaker was then directed at the record player and swept across the range 20Hz to 2000Hz. By such means it was possible to plot the amount of sound picked up against frequency and to relate it to the signal and sound pressure levels which would be present in the hifi system during normal listening.

The tests pointed clearly to a measureable amount of "breakthrough" by incident sound particulary in the region below about 400Hz. It suggested that, in a typical hifi installation, the playing deck may well "hear" the sound from the loudspeakers and generate a spurious "echo" signal at a level determined by the acoustic path and the nature of the turntable. This was the stuff of which "colouration" was made.

Point demonstrated: there were firm grounds for claiming that some turntables were more musical than others, because they were less sensitive to breakthrough!

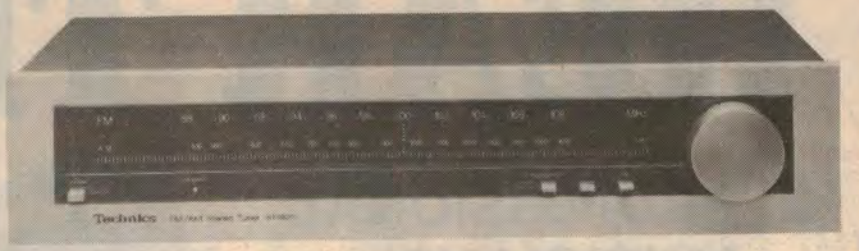
More recently, James Moir and William R. Stevens ("Wireless World", May 1979) have done additional work in this field. They have verified the existance of acoustic breakthrough in record players but have shown that it is simplistic to pin all (or even most) of the blame on the actual turntable. It is only one link in a very complex chain.

They found that the table tops or shelves on which record players are conventionally supported invariably exhibit resonant modes. In a typical listening situation, these are excited by energy coupled to them from floors and walls via legs and brackets. Of necessity, evaluation tests, as outlined previously, should be done with the source loudspeaker and the player under test resting on solid concrete.

Again, they found that results were influenced by standing wave modes in the room itself. These had the ability to reinforce or reduce energy at the turntable, thereby further confusing any observations.

To cut a long story short, Moir and Stevens concluded that just about every

SLIMLINE HIFI FROM TECHNICS



Catering for those who dislike the ponderous "technical" theme in hifi equipment, Technics are now offering the "slimline" components pictured here. All feature brushed aluminium front panels and a presentation of controls which, while adequate, does not seek overtly to impress. At the top is the ST-8011 AM/FM tuner, which gains in simplicity by omitting the usual tuning meters. However, it employs the Technics "Pyrotune" LED pointer, which not only indicates the frequency to which the tuner is set but which serves also as a signal strength and tuning meter. Recommended retail price is $299.

Of the matching amplifiers, the SU-8011 (centre) has a power rating of 24W per channel, all normal facilities and controls, and specifications in line with what would expect of a modern design. The recommended retail price is $229.

The SU-8022 (bottom) offers 35W to 40W per channel, depending on load, high and low filters, extra tape handling facilities and somewhat tighter specifications in other respects. The recommended retail price leaves the buyer with just 5c change from $300. For further information: G.A. Dawes or B.Barber, National Panasonic (Australia) Pty Ltd, 57-59 Anzac Parade, Kensington 2033.

physical element in a typical record player from the framework to the arm (especially the latter) and every physical constant (mass, compliance, resilience, &c) made some contribution to a most complex breakthrough pattern. They were even able to show that closing the perspex lid of a player was able to shield the arm from some of the higher frequency acoustic energy.

They made the point that breakthough could have an affect other than direct colouration. Under high level conditions, where it could build towards an unstable condition (in regions of positive feedback) the exaggerated levels could carry the amplifier closer to overload and hasten the onset of clipping of transient peaks elsewhere in the spectrum.

Summing up, Moir's and Stevens' work confirms the subjective observations about "musical" turntables but shows the original explanation to have been much too simplistic.

For the rest of us, the lesson is clear: don't be content just to achieve formal acoustic stability with controls advanced as far as we are ever likely to want them. See if you can set up the system such that, with the controls advanced and the stylus resting on a stationary disc, tapping the player produces a dull thud rather than a resonant dong!

With that one reasonably under our belt, here's another one to worry about: The May 1979 issue of "Practical HiFi" magazine carries an article on record cleaning gadgetry. Amidst all the talk about the prime job that record cleaners have to do, we were intrigued by the author's remarks about the subjective effect on the sound of brushes which ride the record while it is being played. Not brushes attached to the pickup cartridge, mind you, but brushes attached to entirely separate arms!

One is moved to ask: how on earth can a tiny, dry brush on a separate arm, lightly sweeping the disc and well clear of the stylus . . . how can it possibly affect sound quality?

Quite markedly, according to the magazine in question.

Of one brush the writer says; " the most noticeable degradation of quality concerned some loss of minor detail". This was paralleled by remarks on another brush where the effect on sound quality was said to be "minor with only mild masking of fine detail and ambience".

But, then, a third bush was rated as suffering "some loss of depth in the stereo imagery, but the precision of image placement was retained. Some mild mid-range colouration was noted".

With a fourth brush "some bass impact was lost, stereo imagery was muddled and there was some depth restriction with a minor detail loss".

The fifth was a killer: "woolly bass and a honky and occasionally metallic mid-range. Stereo image placement was spoilt and detail became splashy".

I may be a doubter from way back but I do need convincing about the validity of all this. At the very least, I am tempted to invoke Julian Hirsch's observations about "excesses of hyperbole".

I wonder how a entirely separate brush can change the "ambience" of a recording, ambience being an intrinsic part of the signal.

I am not clear what they mean by "depth of stereo imagery" and how whatever-it-is can be lost if the precision of image placement was retained.

"Honky" and "metallic" mid range worries me; that would signify a quite startling amount of positive feedback in that part of the spectrum — sufficient to boost mid-frequency gain and produce mid-frequency ringing. That's what the opinion would imply.

Yet, at the bottom end, the bass is "woolly" or suffers from loss of "impact". Presumably, here, we are up against a negative feedback effect!

Sorry, but I have yet to be convinced that the acoustic fall-out from trailing brushes is of anything like the magnitude that the aforementioned report implies.

Last but not least, I have been intrigued to read reports, in a number of overseas magazines, about a new Carver C-4000 preamplifier featuring "sonic holography". Like many such

Toshiba's new PC-X6AD cassette deck features their "Automatic Dynamic Expansion System" (referred to as "ADRES"). Toshiba say that it operates over the whole audio spectrum and offers a potential signal/noise ration of 75dB, with a potential dynamic range of 85dB. The swishing sound which can occurr with some noise reduction systems with changing gain — often called "breathing effect" — is said to have been reduced below audibility. Retail price of the PC-X6AD is quoted as $539. Toshiba are also offering the ADRES system as a separate unit which can be used in conjunction with other tape and cassette recorders. (Toshiba Aust. Pty Ltd, 16 Mars Rd, Lane Cove, NSW 2066).

Staff appointments at 3M Australia

To cope with increasing response to their "Scotch" brand tapes, 3M Aust. Pty Ltd announce that Mr. Peter Rose (left) will be Marketing Director for the Audio/Video Products Division of the company. Mr. Graham McCredie, (right) who has also been with 3M for many years, will occupy the position of Market Development Manager for the Division, at 950 Pacific Highway, Pymble, NSW 2073.

terms, "sonic holography" tended to put me right off, on the grounds that it seemed much more fanciful than factual.

That initial bias notwithstanding, I went on the read that the preamplifier included circuitry which could seemingly project the sound sideways beyond the actual loudspeakers and also forward in space towards the listener. It could produce a surround sound effect from many ordinary stereo records with just the two frontal speakers in operation. Listeners found it hard to accept that other loudspeakers around the room were disconnected.

One might have written this down, along with the name, as being yet another elaborate sales spiel. However, I remembered a listening experience in an anechoic chamber at Matsushita in Osaka Japan — reported in these columns in the March 1978 issue.

On that occasion, I was invited to sit on a chair at the apex of a triangle based on two conventional stereo loudspeakers. To my amazement, I heard reproduced voices whispering first in one ear, then the other, and from just behind my head. It was an exact duplication of the sensation one gets when listening to a binaural demonstration record through headphones.

Before the demonstration, if you had asked me whether such a thing was possible, I would have retorted with an emphatic "no".

I gather that it relied on very precise cancellation effects to ensure that each ear was conscious only of the sound from its corresponding loudspeaker — as for headphone listening. In a normal stereo situation, both ears hear signals from both loudspeakers and this tends to establish the line out front, along which the sound sources are dispersed.

In Matsushita's anechoic chamber, the right ear heard the right-hand loudspeaker as normal. It was also capable of hearing the sound from the left-hand speaker, but very slightly delayed in time because of the extra path length around the head. Presumably what Matsushita engineers were doing was to take some of the left-hand signal, delay it by precisely the same interval in a bucket-brigade device, then reverse it in phase, than feed it through the right-hand amplifier.

At the right ear, this delayed out-of-phase signal would exactly cancel the direct left-hand signal, leaving the right-hand signal as the only one audible to the right ear. Similarly, the left hand ear was made to hear only the left-hand speaker. With each speaker heard through only one ear, the sources could no longer be pinpointed and the conditions for conventional binaural listening were satisfied.

While testifying to the effectiveness of the demonstration, I did speculate as to whether the same sensation could be approximated under normal domestic listening conditions.

In the same report I referred also to other demonstrations involving bucket-brigade devices (BBDs) in which Matsushita engineers were able to show enhanced spread and surround, both with headphones and loudspeakers.

Reading the reports on the new Carver preamplifier, it seemed abundantly clear that the designer was exploiting similar techniques — and incidentally answering my speculation about their effectiveness in normal listening environments. Having listened to demonstrations, overseas writers were unanimous that the forward projection of the sound (approaching the binaural condition) was highly dependant on the listening situation, and that it ranged from startling to barely noticeable.

However, when backed up by other measures to spread the apparent sound source and even drive additional and optional "surround" loudspeakers, the Carver was not short of dramatic effects.

But "sonic holography"? I suppose it's okay as marketing term — as long as you don't take it too seriously!