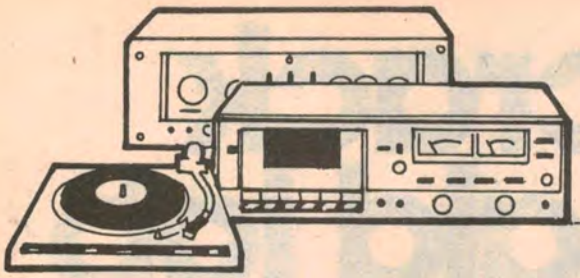


Hi Fi Topics

ZAPP, CRACKLE AND POP! THE PROBLEM(?) OF STATIC CHARGES ON DISCS

The very act of withdrawing a vinyl phono disc from its polythene sleeve may produce a substantial static electrical charge on the surface of the disc. Many audiophiles go to great lengths to combat the effect but how important is it — really — to the average home music enthusiast?

by NEVILLE WILLIAMS

To read about the possible deleterious effects of static charges on phono record reproduction, one does not need to search too far in popular hifi literature. It receives frequent mention in articles and advertisements devoted to record care.

One discovers, for example, that the static charge on the surface of a phono disc can be either positive or negative — although usually the latter — and that it can build up to many thousands of volts in certain circumstances.

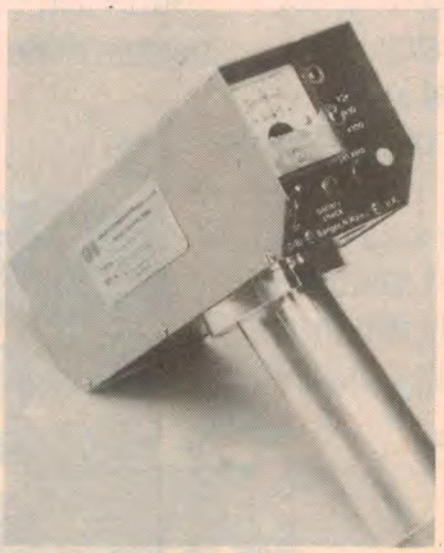
Such a charge will provide a strong attraction for any particles of dust or lint in the vicinity, which may lodge in the grooves and become a source of background noise during replay. Unless the static charge is somehow dispelled, the record will simply go on accumulating dust for the rest of its life, despite normal care in handling.

In addition, charges in excess of about 4000 volts can produce playback noise in a more direct way, by discharging along the stylus into the body of the cartridge as it passes. It is the equivalent of what often happens when one reaches for a metal knob or railing after walking across a nylon carpet!

As a further complication, charges on the surface of the vinyl can attract the body of the cartridge and add to the effective playing weight. If the charge was uniform, and it proved necessary to do so, the effect could conceivably be offset by re-adjusting the counterweight. However, the charge is likely to vary from disc to disc and even across the surface of the same disc. The end result is a frequent and even cyclic variation on tracking weight, typically of the order of 0.3 to 0.4gm.

Some of these effects have been investigated recently by Stanton Magnetics Inc. Amongst other things, they set up a "dust" chamber, in which discs could be exposed to a swirling mist of oppositely charged pigment particles. How the particles settled on the disc provided a visual display of the charge patterns, making it easy to observe the effectiveness of various anti-static treatments.

While the existence of static charges on vinyl phono discs has not been in much doubt, actual measurement of the potentials involved has been something of a problem. Not only do the charges occur in random patterns on both surfaces of a disc, but they can also be disturbed and falsified by the very act of measurement.



Completely self-contained, the IDB Field Mill makes it very easy to measure the electrostatic charges on the surface of a vinyl disc. The charge is equal to the meter reading (up to 10kV) multiplied by the measurement distance in cm.

One instrument that does give easy and credible answers is the Hand Held Field Mill Model 107, designed by Professor Secker of "Zerostat" fame, and a recognised authority on static electrical effects. It is manufactured by Industrial Development Bangor (UCNW) Ltd, of Dean St, Bangor, Gwynedd, North Wales, U.K. It was a couple of days spent with this instrument, as pictured, that focused our attention on the whole subject. The instrument was loaned to us by Concept Audio Pty Ltd, of 22 Wattle St, Brookvale, NSW 2100.

Near the front of the instrument, which is normally held about 4cm from the surface to be measured, is an electrode which senses the presence of an electrostatic field. In front of the electrode is a motor-driven rotor plate which acts as a "chopper", transforming the electric field into a pulsed signal. This is amplified and processed within the instrument to give a meter readout, which indicates the average charge voltage over a few square centimetres directly in front of the sensing electrode.

At the rear of the instrument, and facing the operator, is a centre-scale meter calibrated to plus and minus 100V. A range switch extends this to plus and minus 1000 and 10,000 volts. The instrument is self-contained, with rechargeable batteries in the handle and it is supplied in a carrying case, with charger and instruction book.

At a cost of a thousand dollars or so, it is obviously beyond the means of the average audiophile. However, it could be a useful investment for anyone concerned with electrostatic problems generally, and with the effectiveness of anti-static measures.

Sufficient to say that, armed with the Field Mill, we attacked the rather random assortment of records that seems to have collected on the shelf in our

audio room over a period of years. But, alas, we were disappointed (?) to find nothing very spectacular in the way of static voltages. Instead of "up to 15,000 volts" we had heard about, most of the discs were hard put to it to do better than about 500-800 volts, irrespective of how withdrawn from their sleeves. Nor did it seem to matter much whether they were laid on their sleeves, or put on the turntable, or played or not played.

At this voltage level, the attraction for dust particles would be much reduced, the effect on tracking weight would be negligible and the chance of voltage flashovers virtually nil.

Somewhat disillusioned, we did a canvass of our staff and asked them how concerned they were about electrostatic problems in their home record-playing systems. Yes, they took reasonable care with their discs, they variously used anti-static mats, records brushes, dust-bugs, etc, but none were up-tight about static electricity, as such.

It was hard to reconcile this lack of evidence and concern with the almost crusading zeal of some (particularly overseas) audiophiles. There had to be some modifying factors which affected the severity of the problem, as seen by different individuals.

Seeking a second opinion, we called up Harry Mauger, a long-time acquaintance and pressing plant engineer in the Philips/Astor record factory in Melbourne. Some of his remarks proved to be quite enlightening:

"Yes", said Harry, "as they come out of the presses, our discs have a very high surface charge.

"If you try to play them on the spot, the charges will flash over so vigourously that it is difficult to judge whether you're listening to electrostatic zapps, or to crackles and pops due to surface faults.

"But the charges tend to dissipate fairly rapidly and spontaneously, and become less apparent as the pressing ages."

Bound up in this remark was one possible explanation for our own observations. None of the records we had tested were in any sense new. They had spent their days ageing, or curing, (or whatever) in a modestly conditioned Sydney atmosphere.

Our next question concerned disc formulations — a query raised by the fact that, of the discs on hand, a couple of imported pressings tended to have a somewhat higher charge than average.

No, we were told, disc formulations were not necessarily uniform. The PVA/PVC ratio may vary from one source to another, as may also the content of lubricant and carbon black. In fact, some manufacturers eliminated the carbon black altogether, using a dye, instead. Most Australian pressings would use a similar formulation but some overseas pressings may well use a different mix, possibly with a different behaviour pattern in terms of static charges. Add to this differences in packaging materials and there is obvious scope for variation from one brand of disc to another.

But Harry Mauger went on: "Static charges don't just involve records.

"They involve the weather, the environment, people (including) our operators, their clothing — and even how they wriggle their bottoms on the stools!"

The Permastat "anti-static record preservative kit". It contains the liquid, a spray fitting and a pad which is used to buff the record surface.

He went on to outline a case where a customer returned a record to the Astor factory with a bitter complaint that it was "a brand new record, subject to awful crackles". Tested in the factory, there was no sign of untoward noise but, when returned to the customer's home, it behaved as alleged. Perhaps, significantly, the listening room was heavily carpeted, generously heated and probably very dry.

Which brings us to another important consideration:

A large proportion of the Australian population (including audiophiles) live along the coastal fringe where, on average, the humidity level is reasonably high, even allowing for a modest degree of heating or air conditioning at various times during the year. It is in this environment that records are stored and used.

Add a fairly high proportion of natural fibres in carpets, furnishings and clothing and the overall environment is not all that provocative in terms of static electricity. These remarks would certainly hold for the writer's home and those of the staff members whom we questioned. Ordinary care is

NEW SONY DIGITAL AUDIO SYSTEM

At a recent function in Sydney, Sony (Australia) Pty Ltd officially introduced their range of PCM digital audio equipment.

At the heart of the range are two "Digital Audio Processors" which can virtually transform audio signals into a TV signal format capable of being recorded on dard video recorders, with all the performance potential of a modern digital system. The PCM-100 is intended for use with the Sony Betamax or U-matic video cassette recorders, while the PCM-1600 can take advantage of professional level machines. Another interesting unit is the PCM-3224, a fully self-contained 24-channel digital audio recorder.

Other ancillary items include a Digital Editing Controller, a Digital Sampling Rate Converter, and a Digital Reverberator, as pictured above. With this equipment and other back-up facilities which may be available to video tequipment operators, a highly sophisticated approach to audio recording and processing becomes available, combined with state of the art specifications.

Included in the literature, also, was a leaflet on the Sony DAD-1X Digital Audio Disc System. While still in prototype form, it indicates the way in which Sony can move when the time for launch is considered appropriate.

For further details: Mr Gary Beauchamp, Sony (Australia) Pty Ltd, 453 Kent St, Sydney, 2000. Phone (02) 2 0221, Ext 314.

sufficient to ensure substantially noise-free sound reproduction.

But such conditions are not universal. In many parts of Europe and America, the prevailing humidity is notably low and premises are continuously heated for many months of the year. Even in Australia, where premises are permanently air-conditioned and dehumidified, the whole environment will be drier and more conducive to electrostatic effects.

In short, there is a number of reasons why some audiophiles are really bugged by static charges and dust on their discs, while others are scarcely aware of the problem.

As we have already suggested, the latter group can generally manage quite well with dry cloths, brushes, dust-bugs etc — plus care and commonsense. It is as the problem mounts that the inadequacy of some of these measures may become evident — and are criticised as a result!

This situation has led to the release of various fluids and "goos" which can be applied to record surfaces with the idea of counteracting static charges and maybe lubricating and preserving the surface as well. However, while it would be inappropriate to group and to damn all these products in one sentence, there is also a tendency on the part of audiophiles to suspect any "Wet" treatment which leaves a discernable residue in the grooves.

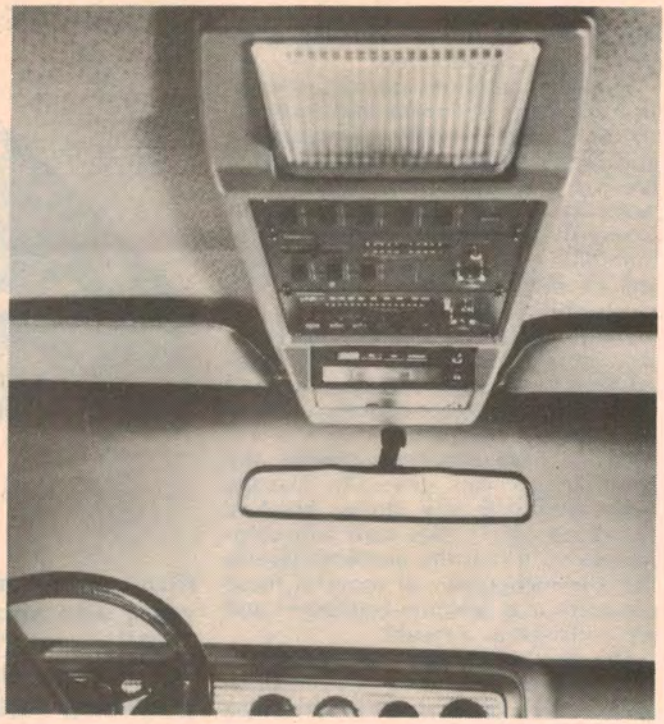
If I might quote Harry Mauger again: "We apply these things to a sheet of glass and let them dry. If you can write your name in what's left, we tend not to like it!"

Availability of the Field Mill makes it possible to check on the validity of claims for all anti-static treatments — whether they neutralise static effects completely, partially temporarily, or not at all. Or whether there is justification in the claims of some who contend that sweeping the surface of a disc with some so-called "anti-static" products actually increases the surface charge!

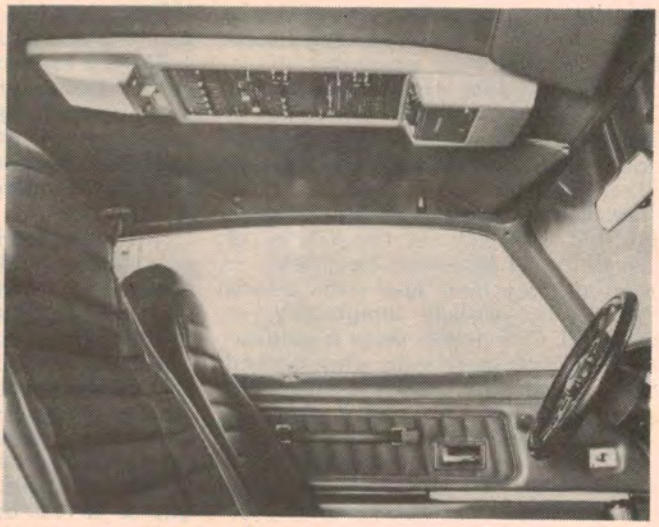
While preparing this article, we were given a copy of a lengthy report from the Leonard Feldman Laboratories (in Great Neck NY, USA) commissioned by Milty Products of Cheshire, UK. The report parallels material which was published subsequently by Feldman in "Radio-Electronics" magazine, and concerns tests carries out with the Milty Company's "Permostat" anti-static record preservative.

Feldman confirmed that treatment with Permostat lowered the average static charge on a typical disc from 2000V to 0V, and that it remained consistently at 0V after 100 playings and after normal storage in its jacket for 10 days, and subsequent removal. Further

(Continued overleaf)



With his parcel of copy and pictures for last month's show report, George Tillett enclosed these two photographs endorsed simply "How's this for your Rolls?" (My Rolls!) They show Panasonic's new RM-610 "Cockpit" overhead stereo console.



Zapp, crackle and pop — continued

observation, up to the time the report was delivered gave no hint of any new charge build-up.

No less important, extensive comparisons of treated and untreated discs, up to 100 playings, showed no loss of playback quality, in either objective or subjective assessment, as a result of treatment with Permostat. On the contrary, the treated disc emerged from the 100 playings in better shape than its counterpart, with less burnishing of the very high frequency components and with certainly less noise due to airborne dust particles.

Stanton Magnetics Inc have also conducted their own tests with Permostat and are now marketing it in the United States. In Australia it is being marketed by Concept Audio Pty Ltd.

Permostat comes in a kit containing a 3oz bottle of a clear, slightly greasy liquid, a spray attachment, a hand buff and adhesive labels to distinguish treated discs. When the liquid is used up, a "refill" provides a new bottle at somewhat less cost than the original kit.

In use, a new or freshly cleaned disc should be laid on a clean surface and sprayed, as evenly as possible, with about eight squirts of Permostat. It is then buffed for about 30-40 seconds to distribute the liquid and until all visual trace of it has disappeared. The other side is treated similarly. The disc should then remain static-free for a lengthy period and should not spontaneously attract or retain dust particles.

Yes, there is a catch: at the moment, Permostat is not a cheap product.

In December, last, the UK price was quoted as £4.65 for the kit and £3.15 for a refill — with one bottle providing sufficient liquid to treat 25-30 discs, both sides.

The current price in the U.S. is $19.95 and $15.96, which runs out at about 67c per disc from the kit and 53c per disc using refills.

Which lends point to our earlier remarks: if you're not one of those troubled by static and noise, you won't be lining up for Permostat at its present price.

But, if your record playing is punctuated by lots of Zapp, crackle and pop, you probably won't begrudge the 60 odd cents necessary to buy some silence!

And where do you get it? Try your local hifi dealer but, failing that, get in touch with Concept Audio Pty Ltd, of 22 Wattle St, Brookvale, NSW. Telephone (02) 938 3700. Recommended retail price for the complete kit is $15.95 and $9.95 for the refill.

IN BRIEF . . .

SANSUI ELECTRIC Co Ltd have added a receiver to their range, model G-7700, which features what they describe as the "World's first digitally quartz-locked tuning system". While the tuning system uses a conventional knob and dial, it references to an internal quartz-locked signal, such that it remains locked on the precise frequency displayed on a digital readout. With the G-7700, tuning error and drift should be things of the past. The power amplifier features DC coupling and state of the art facilities and specifications. Power output is 120W RMS per channel (both driven) with harmonic and intermodulation distortion below 0.025%. Hum and noise from phono input is -78dB (IHF) and RIAA compensation within +&- 0.2dB. For further information: Vanfi (Aust) Pty Ltd, 162 Albert Rd, South Melbourne 3205. Tel. (03) 699 5473.

HARMAN AUSTRALIA Managing Director, Mr Bill Martin, has advised from Chicago that Harman Kardon Inc has been sold by Beatrice Foods Co to the Shin-Shirasuna Electric Corp of Japan. In fact, Shin Shirasuna manufacture the present Harman Kardon range and now plan to expand it with additional products, including a new Citation range. The same design team, with Dr Matti Otola, will design the new products.

Harman Australia will continue to distribute Harman Kardon.

AUDIO TELEX COMMUNICATIONS Pty Ltd have purchased new premises and are now located at 1 Little St, Parramatta, near Sydney. Their telephone number is (02) 633 4344.

They began operations in Milsons Point, NSW, in January 1976 marketing the Telex (USA) range of broadcast, educational and industrial products and the Bogen (USA) range of public address and professional audio. During the past three years, the company has established branches in Melbourne and Brisbane, and added to their range Telex compact cassettes and DI series public address amplifiers, both manufactured in New Zealand. Telex general Manager Rod Craig says that the new premises should meet their needs for the next 10 years, their trade service counter already having proved very popular. Audio Telex also represents Switchcraft components, Hy-Gain antennas, Astatic microphones and Nortronics heads.

ETONE PTY LTD have a new range of high power speakers for professional P.A. and musical instruments. Model 801 is a 38cm super high efficiency type for use in horn loaded cabinets, while the 805 is for use in vented systems requiring high efficiency and extended bass. The 807, also 38cm, has an aluminium voice coild and extended response to suit musical instruments. All the above use ceramic magnets and 100mm voice coils. Other drivers in the range include the 38cm model 484 for bass guitar and the 40W 15cm model 601 for use in multiple driver arrays. (53 Stanley St, Peakhurst 2210).