How Long Do Stereo Records Last?

By BOB SWATHMORE

Grooves between arrows were played repeatedly in test, show wear under microscope.

IF you take your phonograph records at all seriously it's likely you feel a little uncomfortable every time someone digs up those statistics about how many tons per square inch a stylus exerts on the groove walls of a record. You can't help wondering how on earth your records manage to survive—particularly if you don't own the latest, fanciest equipment.

Long-time readers of EI will remember that in our November 1959 issue we published results of what has been called the most exhaustive test yet made by anyone of the factors that affect record wear. But how well do those results stand up today? Re-examination of the subject provides a startling conclusion: most of what we said in that article remains true today. Only the names, the model numbers and the details have changed.

In 1959 the stereo record was celebrating its first birthday. Best of the changers then available were the Garrard RC-88, the Collaro TC-99 and the Glaser-Steers GS-77. The first round of stereo cartridges had proved a bust. But new ones introduced a month earlier at the New York High Fidelity Show —the Shure M3D, the Pickering 380 Fluxvalve, the Weathers Ceramic and Fairchild SM-1—promised better results.

The 1959 tests were made with a battery of Glaser-Steers GS-77 changers (shown on the opposite page). A solenoid was attached to each changer so the change cycle could be tripped with the pickup at a point on the record where a wire projecting back from the pickup arm met a movable upright contact bar. By setting the index screw on the changer the point at which the play cycle would begin could be adjusted. Usually about 35 sec. of playing time was allowed between the two points. Evaluation of the completed tests involved an elaborate system of bookkeeping and classification. Variables like stylus force, record cleanliness and interval between plays were evaluated along with the stereo cartridges.

Rule No. 1, laid down on the basis of test results, went as follows: Use a high-compliance, low-mass pickup. In 1959, high compliance meant 4.0×10^{-6} cm/dyne (the rating for the Shure M3D). Today, it may mean as much as 25×10^{-6} cm/dyne (for the Shure V-15 Type II). Low mass in 1959 meant a cartridge that weighed at least ½ oz. (like the GE VR-22), while today's best weigh no more than ¼ oz. (Pickering's XV-15, for example).

Rule 2: Set the stylus force correctly and check it from time to time. In 1959, the best

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transformer using a station as a signal source, and aligning the multiplex circuit with a stereo station as the signal source. No hitches here but we found that instrument alignment of the ratio detector later did lower distortion slightly.

Here are some of our measurements of the tuner portion of the receiver. IHF sensitivity: better than 2 μv (this met Heath's specs). 1-kc stereo separation: better than 35db. 15-kc stereo separation: better than 15db. (Separation figures were limited by our instruments.) Mono total harmonic distortion: 0.4 per cent. Stereo total harmonic distortion: 0.9 per cent. Mono signal-to-noise ratio: 60db. Stereo signal-to-noise ratio: 55db. The mono frequency response was down 1.5db at 20 cps, flat from 40 cps to 5 kc, down 1db at 8 kc and down 3db at 15 kc. The stereo response was down 1.5db at 20 cps, flat to 8 kc, then dropped 3.5db at 15 kc. AM performance met Heath's specs.

The amplifier portion of the receiver performed just as well. In all measurements both channels were driven. This is what we found: total harmonic distortion at 50 watts (rms) output was never greater than 0.2 per cent in either channel from 20 cps to 20 kc. Clipping level for each channel was 55 watts.

The frequency response at 1 watt (both channels) was down 0.5db at 10 cps and virtually flat out to 50 kc, where it dropped only 2.5db. The signal-to-noise ratio was 69db at the *aux* inputs, 68db at *phono*.

But enough of figures. Let's take a look at how the AR-15 performed. Our builder is located 50 mi. from New York City, out on Long Island. Simply touching antenna terminals pulled in almost every major FM station in New York. After we attached an 11-element VHF-TV/FM antenna, stations came in all over the dial from Connecticut, Poughkeepsie, N. Y. and New Jersey. The AR-15's sharp selectivity meant no difficulty tuning closely spaced stations. ●

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teriorate, the capacitors will short to each other. Bridging won't help in these cases because the short is internal and you won't be able to bridge out the short. Disconnecting the filters one at a time also won't help. You must disconnect all of the filters at the same time and substitute new filters for them. This is tedious but purely mechanical.

That's what I did with the filter cans when I found my routine bridging didn't help. Being careful to keep the wires together I labeled each with the appropriate symbol from the filter can (Fig. 2). I connected test filters to see if the trouble would clear. It did. So I replaced the entire can.

When I brought back the set I told the promoter it was fixed.

"I'll tell you when it's fixed," he growled, giving it a jab on the right side. The TV wobbled on its stand but the picture held.

"Okay, it's fixed," he said. ●

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however, still is a subject of argument. Under optimum conditions, with tracking force precisely adjusted, it might create somewhat less wear than a conical stylus tip. When the adjustment is off it might do more harm.

Another point affecting record wear was raised by a recent letter from W. L. Ferrigno, Manager of Product Planning and Market Research at General Electric's Consumer Electronics Division. He says, "In extensive laboratory tests it was found that polyvinyl chloride and polyvinyl acetate, the materials used in making LP records, suffer from a lack of resiliency. It takes about 16 hours for a record groove to recover from the expansion force generated by the stylus and until it returns to its normal configuration the walls are extremely brittle and subject to chipping if the record is played."

Findings of the 1959 test pointed to the same conclusion. Recovery of groove walls was demonstrated several times when a record was evaluated immediately after a test run and then again some time later. Conclusion then, as now: A record played once and put away for a day will last longer than one played over and over, even though total number of plays is the same.

All of which goes to show that no matter how the equipment changes the rules of record care remain the same. And if discs don't seem to last longer maybe it just proves your ear has improved with the gear. ●