

Thoughts on owning/operating old Ampex tape machines¹

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General thoughts

If you properly overhaul an Ampex 350 or 351 they work fine. The problem is that almost nobody using them has properly overhauled their machine (or had it done). This includes both mechanical and electrical overhaul. A lot can happen in over 50 years of improper servicing as well, so there are frequently legacy issues with improper mods, etc. Most machines I see need at least 20 to 40 hours of careful maintenance/repair/restoration, often twice that or more.

And they need fresh rubber. Getting pinch wheels rebuilt is not cheap and has to be done in bulk-buys for decent prices. And don't tell me about vendors who can do it cheap but don't even know what type of material they are using. Installing new rubber on a pinch-wheel core is not easy and needs to be done with great precision to produce not only properly-ground parts but also to ensure consistent density of the synthetic rubber (Nitrile/Buna-N, typically 70 durometer Shore A scale for pinch wheels).

Head alignment on the old 350 and 351 machines is solid if you know how to set up the heads. You need to loc-tite (using small-thread lock, not the permanent type) the long screws going into the heads so that when you do an azimuth alignment, you are only moving the nylock nut, not backing the screw out of the head (the same goes for the other nut, which snugs against the two set screws to set head height). This is why these machines have a bad reputation for not staying aligned. Same goes for the AG-350 and AG-440.

The Ampex ATR-series machines are not practical for most folks. They are uncommon, expensive, and very complex machines that are really not user-repairable for most people. They are magnificent machines in many ways, but not very practical. Some of you reading this might have the chops to care for an ATR-102. Most of you reading this, I assure you, do not. If you are new to the world of magnetic recording, an Ampex ATR-102 should not be your first machine. These machines have become fetishized in recent years for a number of reasons.

At the older end of the Ampex timeline, the Ampex 300 (or multichannel machines such as the 300-3 or 300-4 that use the same transport) should also be on your "avoid at all cost" list. These transports use a highly-problematic indirect capstan drives that require good rubber on the flywheel and is difficult to maintain.

For most people, a well-maintained 440 (if set up correctly) will do just fine. Or an AG-350 though these are much less common machines. Still, even solid-state machines need a complete mechanical overhaul and a complete electrical overhaul as well.

The real problem is that there is much too much "magical thinking" among those who fetishize magnetic recording. Professional Ampex machines are like old cars. If you want them to work as good as new, plan to drop some serious money. Otherwise, you're just driving an old beater that burns a quart every 300 miles. And learn to drive the machine correctly. This means learning how to bias the tape for correct recording and learning how to read a VU meter. The needle does not go

¹ Adapted from a posting on the Ampex Mailing List, Mar 2016

into the red. Transients are typically 8 to 13 dB higher than what the meter is reading for live acoustic music and your headroom is likely half that. And you don't overload the mike inputs if you are using machines that have them.

And forget about the 600 series machines. They do not age well and were already proving troublesome after just a few years in service. Now indeed, the 600 was an amazing recorder in its day (the original 600 was introduced in 1954 when no other good portable machines were available) but now it's just a hot mess in a Samsonite case gone sticky. AVOID.

Also avoid the 354 electronics. They have poor-quality switches and controls and are typically heat-damaged from years of abuse with way too many components jammed into a small case. The 354 electronics are nearly impossible to service with flying leads that go intermittent due to poor-quality interconnects.

Let's talk about flutter

To quote my good friend Scott Dorsey, "I have never, ever heard a 350 machine that did not have audible flutter artifacts. Even the 440 has a pronounced 'blend' effect where individual instruments fuse together in a mix, even when the flutter is within specs and the scrape flutter idlers are set up properly."

I have no argument with this. Without question, critical listening can reveal scrape-flutter artifacts on some material recorded with the older machines. The 440 is better in this regard but yes, it's not perfect either. Those of you who have recorded piano will undoubtedly be well aware of this.

The older machines are still enjoyable to use if they are restored properly and operated correctly. And with tremendous work, they can perform as good today as they did 50 years ago (the operative statement is that they will perform as well as any recorder did 50 years ago). That said, most folks do not have the time, energy, budget, or patience to restore an older Ampex to original factory specs. Nor do typical owners read the manual and perform even the most basic tension setups and pinch-roller pressure tests.... or even have a good pinch roller on the machine! Many owners of vintage machines today are in total denial about care and feeding of the older machines and to put it charitably, are disinclined to pay what it costs to restore and maintain a vintage Ampex.

However, even well-restored machines are in no way superior to carefully-used/well-designed modern digital recording equipment. Rest assured, when I get a call to do location recording, I'll be doing that with a digital recorder and a near-coincident pair.

On the other hand, it's still fun to use a restored older machine and enjoy what it can do. That's why enthusiasts still take antique cars out for Sunday drives.

My apologies if I have stated the obvious or offended anyone.

-dave