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Robert Fabris
ARCADIAN
3626 Morrie Drive
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Dear Robert:

I am enclosing the attached article on Archival Storage and Basic Maintenance as a cure-all for most of the problems related to loss of programs after a period of time (page 84, last issue).

While the article is rather lengthy, it is critical to the owner of a computer with cassette storage, and since nothing has been published on the topic in either of the newsletters, it is certainly worth devoting considerable space to. You may feel free to edit and condense it to suit your space requirements.

We'll be ordering our Blue Ram shortly...I can't wait to see the vocabulary capability that 2000 extra string locations will give the COMPUTER EAR system.

Keep up the excellent work; we deeply appreciate ARCADIAN and the effort you expend in keeping it up-and-running.

Most sincerely yours,

C Anderson

Craig J. Anderson

ARCHIVAL STORAGE AND BASIC MAINTENANCE

by C. J. Anderson, Anderson Research and Design, Burnsville, Minnesota.

I noticed with interest the problem of the subscriber who reported that he was losing programs after six months or so.

Today's tape cassette is a very stable medium. Most of the problems of old, such as stretch, print-through and oxide flaking do not exist anymore, and when tape engineers speak of "archival storage" they are talking of periods of ten years or more...not six months. Even the cheap drug-store variety tapes (a package of three C-60's for $1.99) are not likely to cause problems, with one exception: many of the bargain tapes are poorly slit from the master roll, and have rough edges which will flake off after several plays. These oxide particles, called "debris", then imbed themselves in the tape causing head separation and a resultant occasional drop-out. The result will be an occasional "?" in the program, but never the loss of an entire program.

Print-through can also be ruled out. Low frequency tones on thin tape have a tendency to "print through" to the next layer after a period of years, but the high-frequency bit pulses from a digital tape are very unlikely to do so, especially not in a mere six months.

Dust, and dirt and smoke are obvious enemies of cassettes, and can be eliminated by buying only cassettes with plastic "windows" in the center (instead of the open hole variety), and by keeping recorded tapes in plastic storage boxes when not in use.

This brings us to the major cause of lost programs: routine maintenance of the recorder/player unit itself.

There are three things that must be kept in mind: head cleanliness, head height and head azimuth. Speed is a lesser factor and I'll cover that later.

Clean your tape heads at least once a month, more frequently if you use the machine several hours a day. Use a cotton swab or Q-Tip dipped in any commercially available head cleaning solution. Clean both the record/playback head and the erase head. Also the capstan: that little silver thing that goes around when you start the recorder. While you're at it, clean the pinch roller: that little rubber wheel that presses against the capstan in the "play" position. You can actually see the brown stripe that forms there.

Head height is the position of the head in respect to the horizontal axis of the tape. When head height goes out of adjustment, the result is either a weak signal (if it goes up) or "cross-talk" (if it goes down) in which the head is actually "hearing" both tracks of the tape, one forwards and the other backwards. Computers don't care for this at all, and will give you a screen full of "?" when it happens. This is also the reason that tapes recorded on Joe's machine in Cincinnati will sometimes not play on Bill's machine in Los Angeles: different head heights. The older the recorder, the more likely the problem.

All cassette recorder/players have head height and azimuth adjusting screws, even the cheap $19.98 units! Getting to them is another problem. More expensive units have access panels or holes for head alignment, but the less expensive ones must be partially disassembled to get at the screws. Read your owner's manual.

You will need to buy an alignment tape in order to do a really professional job, but a pre-recorded audio tape from the record store will do. Play the tape and adjust the head height for a nice, strong, clean signal with no trace of "cross-talk" from the opposite track. Once you've got it set, put a dab of nail polish or Duco cement on the edge of the screw to "lock" it against the metal plate and prevent it from vibrating loose.

Azimuth is the position of the head in respect to the vertical axis of the tape. When azimuth goes out of adjustment, frequency response (especially those all-important high frequencies around 5 KHz that we're concerned with) drops off. A really bad azimuth adjustment can actually result in "cross-talk" also, like if the head is at a 30 to 45 degree angle in its mounting!

To adjust azimuth, you need a steady high-frequency tone (alignment tapes have one). Play the tape and adjust the azimuth screw until the tone is cleanest, then lock the screw as described above. If you don't have an alignment tape, you can "eyeball" the azimuth adjustment by turning the screw until the head is perfectly parallel to the base plate (the plane of travel of the tape).

Speed becomes a problem only when it is erratic. The most common causes of speed changes are brittle rubber components and dirt. The two rubber components I refer to are the pinch roller and the drive belt. These items become stiff with age (after five years or so) and must be replaced. Belts are easily replaced, but you may have to take the recorder to a repair station to have the pinch roller replaced.

A big no-no is leaving the recorder in the "play" position when it is not running for a period of time. This puts a dent in the pinch roller from the pressure of the capstan, and will give you a nasty "wow" in your program that the computer won't like one bit.

With all the concern being directed at the computer itself, it is easy to forget that the cassette recorder/player is an integral part of the system and needs constant care. It is the only moving part of the system, and therefore the most likely to give you trouble.

AB Computers, 115 E. Stump Road, Montgomeryville, PA 18936, has excellent prices on C-10 cassettes (and longer) loaded with high-quality AGFA PE-611 tape (the best, most agree) and on plastic cassette storage boxes (a dime or less apiece, depending on quantity.) Write for their catalog.

Anderson Research and Design has a good supply of drive belts for most makes of recorders, although you'll have to send the old belt in for us to match it.

Finally, a word on head demagnetizing. We demagnetize our tape heads routinely, although I have yet to see this problem seriously affect reproduction of a program to any significant degree. A magnetized head does lose frequency response, so if you've tried everything else, buy a head demagnetizer and go to it.

Now that your recorder is "fine-tuned", you'll probably find that most of your old programs won't run on it. The breaks of the game: they weren't running anyway so you're just as well off. Routine maintenance will prevent the nasty prospect of having to redo your entire library because you let your recorder/player go out of whack by ignoring it for a year or two.

A final caution: now that you have your library re-recorded and your recorder/player re-aligned, where are you storing your tapes? While it takes a strong magnetic field in close proximity to a cassette to accidentally degauss (erase or scramble) it, you should not store your tapes near your TV set (heat and a giant AC transformer will not help them any) or near any type of magnetic field (motors, fans, magnets, etc.) Keep them clean, keep them cool. And if you're planning to keep them for ten years or more, keep them in a dust free metal cabinet. Be sure to wind and rewind them at least once or twice a year to prevent any possibility of print-through.