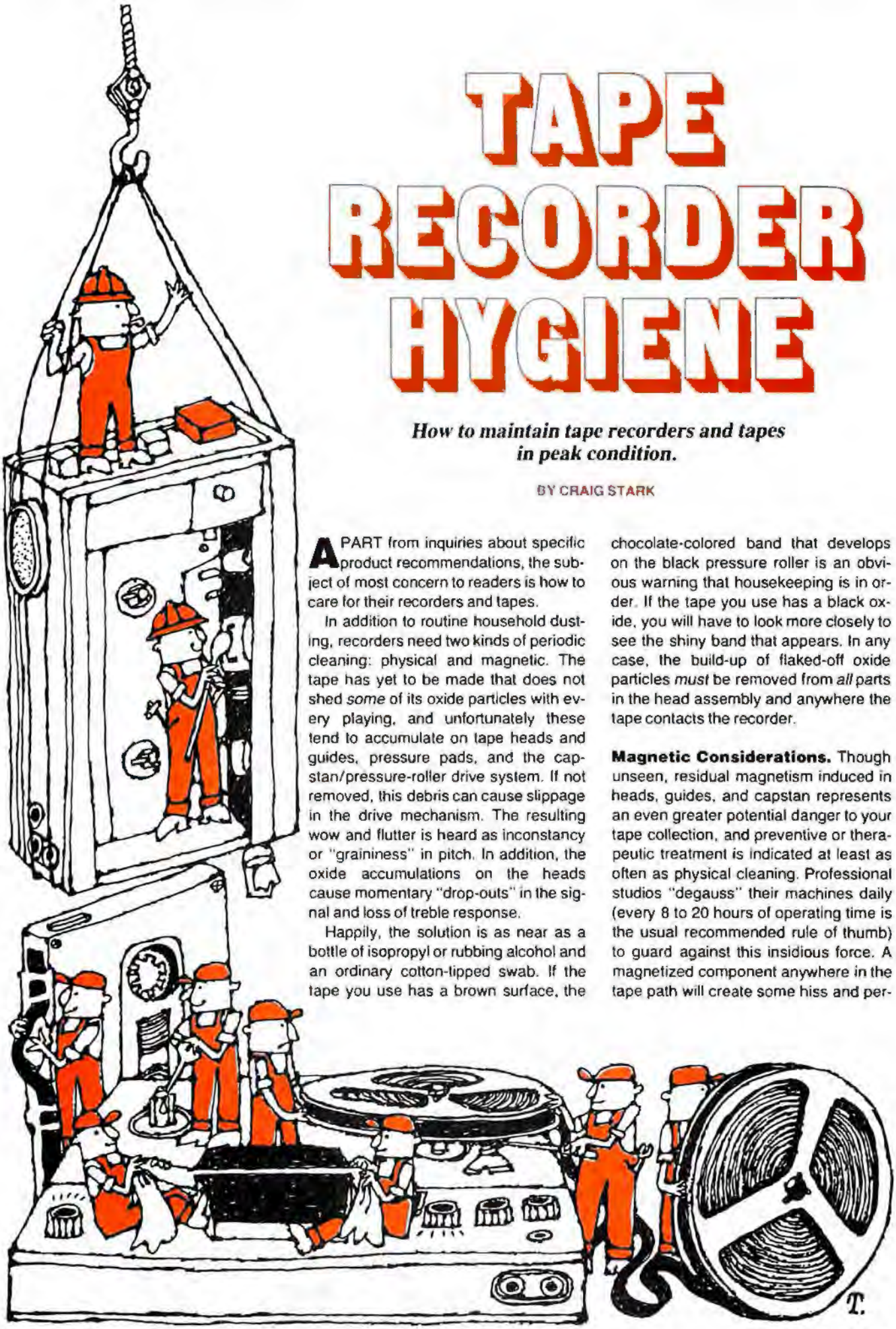
TAPE RECORDER HYGIENE

How to maintain tape recorders and tapes in peak condition.

BY CRAIG STARK



APART from inquiries about specific product recommendations, the subject of most concern to readers is how to care for their recorders and tapes.

In addition to routine household dusting, recorders need two kinds of periodic cleaning: physical and magnetic. The tape has yet to be made that does not shed *some* of its oxide particles with every playing, and unfortunately these tend to accumulate on tape heads and guides, pressure pads, and the capstan/pressure-roller drive system. If not removed, this debris can cause slippage in the drive mechanism. The resulting wow and flutter is heard as inconstancy or "graininess" in pitch. In addition, the oxide accumulations on the heads cause momentary "drop-outs" in the signal and loss of treble response.

Happily, the solution is as near as a bottle of isopropyl or rubbing alcohol and an ordinary cotton-tipped swab. If the tape you use has a brown surface, the chocolate-colored band that develops on the black pressure roller is an obvious warning that housekeeping is in order. If the tape you use has a black oxide, you will have to look more closely to see the shiny band that appears. In any case, the build-up of flaked-off oxide particles *must* be removed from *all* parts in the head assembly and anywhere the tape contacts the recorder.

Magnetic Considerations. Though unseen, residual magnetism induced in heads, guides, and capstan represents an even greater potential danger to your tape collection, and preventive or therapeutic treatment is indicated at least as often as physical cleaning. Professional studios "degauss" their machines daily (every 8 to 20 hours of operating time is the usual recommended rule of thumb) to guard against this insidious force. A magnetized component anywhere in the tape path will create some hiss and per-

manent loss of high-frequency signal whether you're recording or simply playing back a tape.

Fortunately, head demagnetizers are inexpensive accessories available from all dealers, and using one properly takes less than a minute. Start by turning your recorder off and removing all tapes from the immediate vicinity. Remove the head covers (you should have done this already for the physical cleaning); and, holding the tape-head degausser at arm's length, plug it in, push its "on" button (if it has one), and bring it in close proximity to each of the surfaces that contact the flowing tape. Then, with the demagnetizer still on, withdraw it slowly and smoothly. Turn it off when it is at arm's length from the machine and the job is done. *Note:* to avoid any danger of scratching the tape heads, it is a good idea to put a piece of plastic tape over the tip(s) of the degausser. (Because of differences in physical design, it is not possible to get every tape-head demagnetizer to the heads of every recorder. Check with your dealer to make sure there will be no problem.)

For most audiophiles, lubrication of a recorder is best left to a yearly visit to the service technician. Too much is as great a danger as too little! Obviously, though, bearings and sliding and rotating surfaces must have lubricants. If you want to do the job yourself, follow the manufacturer's instructions carefully.

Caring for Tape. Tape care is no less important. Always keep tapes in their containers when not in use, and put tape reels on edge—*not* piled atop one another. I recommend the professional practice of leaving tapes in a *played*, not a *fast-wound* condition, for the latter tends not only to create an unevenly wound tape "pack," but also to put internal stresses on the tape layers that may cause damage. For the same reason, it's a good idea to play—not rewind—a tape at least twice a year. Avoid storing tapes next to a radiator, in the immediate vicinity (within 2 to 3 feet) of strong magnetic fields (loudspeakers, motors, or power transformers in hi-fi equipment), or in a car trunk during warm weather. Given proper care, your tapes should outlast their owner!

Accidental erasure, especially of the high frequencies, *is* something to worry about. I once ruined a $35 test tape by using a screwdriver, that I didn't know was magnetized, for some head adjustments; and a friend once tearfully played for me a master tape on which his five-year-old had momentarily placed a magnet from the kitchen memo board, "to see if it would stick." The magnet didn't, but the once-around blip did.

To assess the potential dangers, I consulted several experts and found they agreed that most fears about accidental damage from magnetic fields—generated by radar, house wiring, home appliances, power transformers, and even loudspeakers—are exaggerated.

The reasons are two formidable-sounding but relatively straightforward factors: "tape coercivity" and "the inverse square law." Coercivity is simply an index of the amount of magnetic energy necessary to erase a tape and is measured in oersteds (Oe). Tapes generally have a coercivity in the 280- to 450-Oe range, but this value is a kind of an average (some oxide particles require more field, some less, for erasure). The consensus among the experts was: a good rule for general tape safety is to keep the absolute peak level of stray fields to less than 10 per cent of the tape coercivity. For ferric-oxide tapes, this amounts to 25 to 30 Oe, and for chromium-dioxide tapes, 45 Oe. One gentleman reported measuring a magnetic field of only 10 Oe at the case of an electric drill, so it surely would be safe to use in the vicinity of most tapes. (In fact, home-appliance motors aren't that different in principle from those used in tape decks.) However, for really critical tapes, it was suggested that external fields should be kept below about 10 and 15 Oe for iron and chrome tapes, respectively, since high frequencies tend to be more easily erased.

The other factor is a function of distance. Even a bulk tape eraser that may generate a powerful 1,000-Oe field measured at a distance of ½ inch measures only one fourth that field at one inch, and one sixteenth at two inches. That's the effect of the inverse square law, and it holds, generally, for magnetic recordings. Thus, even a few inches of separation from potentially damaging fields—magnetic latches on cabinets for example—can prevent signal damage.

You can measure *steady-state* or "permanent" fields (around a speaker cabinet or from magnetized tape heads, guides, and capstans) with an inexpensive ($6.80) magnetometer from R. B. Annis, 1101 N. Delaware St., Indianapolis, Ind. 46202. Multiply your readings by ten or even a bit more on recorder parts that touch the tape directly. You'll find with speakers that the magnetic "leakage" field varies from model to model and, of course, the point on the cabinet at which it is measured. ◇