

# THE THEATRE ORGAN IN STEREO

## PART V: TAPE MACHINES

by Ron Musselman

Although the first four articles in this series constitute a fairly complete primer for evaluating and purchasing audio equipment which would form a playback system of high quality, we have had numerous requests for an article on the medium of tape and some facts on its associated hardware. Most audiophiles spend about 90 percent of their listening time with discs or the radio tuner, but some of us prefer tape for a variety of reasons, while others occasionally turn to it for material not available on records.

Prior to the emergence of the cassette as a true high-fidelity tape format in the mid-1970's, open reel was the dominant configuration. Professional open reel machines of the '50s were ponderous affairs with tube record and playback electronics, and they were built like a Sherman tank. The standard "pro" tape speed of that era was 30 inches per second (meaning that the transport ran almost a yard of tape over the heads every second) for say, mastering a record album, and this high speed was necessary for maximum performance. As electronics, tape formulations, and the heads themselves were improved through research over the years, the tape speed required to obtain optimum performance was lowered considerably. The highest speed now in widespread use in the broadcast industry and in many recording studios is 15 inches per second (i.p.s.). And superb performance can be had from today's

moderately-priced open reel decks at 7.5 i.p.s. In fact, when I recently purchased a machine in this category (under \$600), I was pleasantly surprised to find that its high end (treble) response at 3.75 i.p.s. extended beyond 20,000 c.p.s. Many 1950's pro machines barely made it to 20,000 c.p.s. racing along at 30 i.p.s.! And the high end at 7.5 i.p.s., which used to be "acceptable" for music on "home machines," runs up to a stratospheric 28,000 c.p.s. This remarkable performance is typical of open reel decks that list from about \$600 to \$900. What you generally get for your money in this price range is a fairly compact machine which records and plays back, handles reel sizes up to 7" in diameter, and operates at 3.75 and 7.5 i.p.s. The transport controls are usually "feather touch," operated by solenoids rather than the direct mechanical linkage of cheaper decks. (I would avoid the lowest priced open reel machines around \$300, as their performance is not as good, and the mechanical controls sometimes develop problems.)

The best \$600 machines are well made and offer many desirable features, such as "logic control" circuitry, which prevents tape snarling or breakage due to operator error. A few inquiries have been received as to the suitability of professional machines for home use. My answer to this question is that a \$6,000 machine may look impressive sitting in your living room equipment cabinet, but the average stereo buff would be wise

to put the extra \$4,000 or \$5,000 elsewhere. The aforementioned \$600 deck will perform just as well, in the areas of frequency response and speed stability, as the pro machine selling for about ten times that amount. After unpacking my new recorder, I took it down to the production room of the radio studios where I work and connected it to the console. I was curious to see just how well this "home" unit would stack up against a professional unit costing more than many compact cars. Excerpts of several high-quality discs were fed through the console (custom built for the studio and having extremely low distortion) into both machines, which were recording on Scotch 207 at 7.5 i.p.s. Comparing the two on playback, I was astonished to find that they sounded virtually identical. So, for consumer applications where a deck will be used one or two hours an evening, three evenings a week, a professional recorder cannot be justified. Then what justifies the price of a pro deck? In a word, durability. A recorder designed for home use just wouldn't stand up under the long hours of use and abuse it would face in a studio situation. The heavy-duty professional machine will withstand a great deal of wear and tear, and it will tend to stay in adjustment and maintain its excellent performance characteristics over thousands of hours of use. For those of you who have theatre organs installed in your residences and are considering doing some recording that might possibly be used as the master for a record album, a recorder in the \$6,000 class is still probably more than you need. There are a number of semi-pro machines in the \$1,500-\$2,000 bracket that record and play back with excellent fidelity and are ruggedly constructed.

All of the recorders discussed so far are referred to most accurately as "decks," which means they record and play back, but don't have speakers for playback listening, or microphones. A true "recorder" has built-in power amplifiers and speakers, and includes microphones, which may be built in. A deck can be used in conjunction with your receiver or amplifier for playback. Unless you plan to do live recording, microphones aren't necessary. Tapping off your receiver, a deck can record broadcasts or from disc.



Now, we don't intend to do any sermonizing on ethics in this article, but there are a couple of points about recording off the air or from records that should be made here. If a person records a broadcast of a record he can buy, or borrows a friend's record album and tapes it (to keep from buying it), nobody can stop him from doing either, but it isn't right and amounts to piracy. Literally millions of dollars a year are "stolen" from the recording industry in this manner. And when you stop to give it a little thought, you'll see that it isn't fair to the artist, the record company, or for that matter, the retailer. In the case of borrowing an out-of-print record that obviously won't be re-issued, making a dub for your collection is justified if another copy of the disc just can't be found. Another situation where copying a record is not wrong: Let's say you've just bought a \$17 direct-to-disc record, a super-clean pressing that you want to play dozens of times but keep in mint condition. We all know what an uphill battle it is to keep records free of the ticks and pops which appear with repeated use and exposure to dust. If you tape that album, then file the album away to keep it fresh and use the tape for 600 or 700 plays instead of the disc, you will enjoy much better sound the last 200 or 300 plays, and no one has been cheated.

As for recording organ concerts, there are two main problem areas: 1) the "stealing" mentioned above, particularly if the concert is being professionally recorded for an album; and 2) the noise that an amateur "recording engineer" often makes, which irritates the other concertgoers and possibly the organist. If you're recording your Aunt Elsie's concert on the 2/4 Foonman Special for the local chapter meeting, chances are she'd be delighted to have someone record her performance for posterity. But if the organist is an "up-'n-comer" who's starting to play the national circuit and sells his recordings at his concerts, he's bound to object, and rightly so. Prior arrangements should be made. But even if there are no legal or moral objections to recording a concert, there remains the problem of operating the machine without bothering others. If the hall has an area where recorders can be

isolated, such as a booth (or the balcony if it's not being used), this would be much appreciated by those who are interested only in the live performance experience. People with recorders have caused commotions at concerts more than once. The worst case I've ever heard of occurred at the ATOS Los Angeles convention in 1979, when a gentleman fell asleep during a concert, leaving his cassette recorder running. The machine had an "end of tape" alarm. While he slept, the tape reached its end and the thing began to squeal loudly. At first, some people thought the organ had ciphered. But one of the rather angry persons seated next to him had to wake up this enthralled listener to get him to turn his "studio" off. Even if the recordist manages to stay awake, recording at concerts puts him in a very precarious position with his neighbors.

As we mentioned before, cassettes had reached a point of development by the '70s that qualified them as high fidelity components, and they were refined even more late in the decade. Some giant strides were made with the battery-powered portable, which was formerly thought of as a carry-along for junior to listen to rock-and-roll. With their light weight and ease of tape handling, the self-contained cassette unit had tremendous potential for making quality recordings in the field in situations where AC power was not to be had. This is especially true in radio news, and now that good portable units are a reality, many reporters use high-grade cassette recorders for location work. One unit popular in this application is a monaural recorder made by Superscope (a division of Marantz) selling for about \$150. I bought one about three years ago and it has given a lot of good service

since then. This compact machine is literally crammed with valuable features, and it's all self-contained, including the built-in condenser mike. I've recorded samples of home organ installations, several interesting church instruments, and some very informal "open console" events with friends where things can get somewhat carried away. When played back over a decent stereo system, the quality of recordings this unit makes is amazing. I first tried it out by recording the local pizza parlor Wurlitzer, then bringing the tape home and listening to it over my house system. It was surprising how crisp and clean the cymbals were, with most of the harmonics intact. The Glockenspiel had its characteristic crystal-clear "ring," and there was very good delineation of the various stops in combinations. Also, the bass was quite passable. The 16' Tibia was strong down to about low "E," and low "C" was audible, although down a bit in level. Considering its many features, sophisticated circuitry (including a very steady servo system for the transport motor) and the overall high quality of workmanship, this Superscope Model C-204 is an absolute bargain, even at its full list price. For those who don't want to invest in an open reel machine, it may be all the recorder you need. It can be used for a number of non-organ-related activities, too. The day our son was born, I hauled it to the hospital with us and recorded some of his first cooing just two hours after he was born. Last year, we spent a weekend with our last grandparents on either side of the family and recorded a series of candid conversations with them. Both of them passed away a few months ago and these tapes are priceless. If you don't plan on recording things that require stereo, such a por-

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table recorder is your best bet. Other companies offer similar machines, so shop around, but to get the kind of performance described, be sure the recorder has these minimum specs: Wow and Flutter: no greater than .12%. Frequency response: 40-12,000 c.p.s. (down no more than 3 db at either extreme). Built in condenser mike (as opposed to a dynamic mike). Signal-to-noise ratio: 45-50 db (no Dolby). A large, usable VU meter (approx. 1½" high and 3" wide). Battery life: at least 4 hrs. (usually 4 "D" cells). Price range: \$140-\$190 (list). Also: defeatable automatic level control (uncompressed recordings of music sound better).

That top end of 12,000 c.p.s. may seem a little restricted, but it gives far more openness of sound than you would think. And remember, in a cassette, the tiny 1/8" wide tape is crawling across the heads at less than 2 i.p.s.! Similar stereo units are on the market, but these generally entail the extra purchase of 2 mikes. The total investment can run to about \$400 if you go that route.

In the realm of component cassette decks (non-portable), many makers have models in the \$200 range that are very good performers, but the theatre organ enthusiast may find them lacking for his purposes. If you spot one that looks promising, go to the store with a pipe organ recording with some percussion (cymbals, triangles, etc.) and well-recorded 16's (Tibia, Diaphone, etc.) to check both the highs and response down into the region of 30 c.p.s. Using a pair of loudspeakers with clean, wide-range response, a solid 80-watt amplifier and a good turntable/

cartridge combination, have the salesman record portions of your record on the deck to be tested, using a better-quality cassette. If the recorder has any "noise reduction" circuitry, leave it *off* for both recording and playback. Most of these devices tend to introduce side effects. With the improvements in both machinery and tape in the past few years, these "hiss killers" aren't as necessary as they once were. My personal opinion, generally speaking, is that the less signal processing, the better. Most moderate priced cassette decks have a good high end for the format, but pedal fundamentals don't always get through too well. Listen very carefully before making a decision.

Cassette vs. open reel; which one? It all depends on your demands. Cassettes offer ease of handling, portable models are light to carry around, but because of the smaller size of the heads, guides and tape, along with slower running speed, alignment is more critical than with open reel, and the frequency response and dynamic range are not as wide. Some cassette decks are turning in very impressive wow/flutter figures, but tests using continuous tones indicate that open reel still has the edge in speed stability. Some very expensive cassette decks are now being offered, but you could buy an open reel machine with superior performance and durability for the same price. With open reel, a greater area of tape is running past the heads per second (a function of both wider tape and higher speed), giving that format a better signal-to-noise ratio (which is why you don't see many open reel units with noise reduction circuits). Being larger and generally more robust physically, they tend to keep their "sharp edge" longer with regard to speed stability and frequency response. So if your budget imposes a limit of about \$200, and you need portability, go cassette. If you can spend more and want top performance, you'll probably be more satisfied with open reel. Cassette machines have become quite good, but open reel will remain the preference of professionals and serious amateurs for the foreseeable future.

**NEXT: Getting more bass from your loudspeakers . . . without muddying up everything else.** □

## For The Records



*Manufacturers, distributors or individuals sponsoring or merchandising theatre pipe organ records are encouraged to send pressings to the Record Reviewer, Box 3564, Granada Hills, California 91344. Be sure to include purchasing information (post-paid price, ordering address,) if applicable, and a black and white photo of the artist which need not be returned.*

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Both albums are reissues of considerable historical and musical value. Both were recorded about 20 years ago and released on the Hi-Fi label. That was during a period when the resurgence of interest in the theatre organ was burgeoning rapidly. It was all new, especially the improved recording quality (over the old '78s) of an instrument difficult to capture in grooves. Emory Cook had pioneered on the east coast with his Reg. Foort series played on the Richmond Mosque Wurlitzer. Richard Vaughn was not far behind with his Hi-Fi label. The first George Wright organ release by Hi-Fi created a sensation among enthusiasts. It was played on the 5/21 Wurlitzer

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