

# THE THEATRE ORGAN IN STEREO

## PART IV TURNTABLES AND CARTRIDGES

By Ron Musselman

In the first three articles of this series, we've had a glimpse at examples of wide range loudspeakers, discussed what to listen for in other possible speaker choices and defined minimum performance characteristics in choosing an amplifier to power them. This time, we look at what are actually the first two links of the stereo system chain: the turntable and cartridge. If you've already priced out a \$400 receiver and a \$500 pair of loudspeakers, you may wonder just how much over \$1,000 a turntable and cartridge will put the total. The answer is "not too much." Carefully selected from current models, an excellent turntable/cartridge combination can be yours for well under \$200. Of course, there are feature-laden and sometimes over-designed turntables on the market costing \$400-\$500 and more. But comprehensive lab tests generally show such units to perform only marginally better in the three or four areas of primary importance. Of course, if you find a \$600 turntable that performs noticeably better than one selling for \$200, and your budget will allow it, then the extra money would be wisely spent.

A few high quality automatics that will play a stack of records (a.k.a. "record changers") are available. The best of the new automatics are much better at handling records than some notoriously rough and unpredictable older models. But once in a great while, the mechanism may malfunction and decide to drop the next

record in the stack on top of the one in play. This very thing happened with a friend's \$200 automatic. And it was quite disastrous in this case, as the record that jumped the gun came crashing down on his \$90 cartridge as it played a \$15 direct-to-disc recording. A dealer examined the unit, and with a shrug of the shoulders, exclaimed: "It's just one of those intermittent things." The multi-play spindle was quickly removed and the table was then used as a single-play automatic. Such an occurrence is rare with newer models with their improved designs, but consult a knowledgeable salesperson about the reliability of any particular multi-play unit you may be interested in.

A big point in favor of the simpler manual turntable concerns the listening habits of most people. A record is generally listened to all the way through on both sides, one after the other, which means the record must be turned over by hand to play the other side. And how many times have you started out an evening of listening by playing one side of an album and not deciding what to listen to next until it finishes? Selecting records to play "as the changing mood dictates" is something an automatic can't do. But I wouldn't advocate seeking out only the simplest totally manual units for possible purchase: One handy feature found on several \$150-\$200 "semi-automatics" is the automatic return of the arm to its rest after the record finishes playing.

Even though a host of conveniences can be found on some models, the turntable and arm are basically fulfilling their respective purposes if, between the two of them, they can:

- 1.) Rotate the record at the correct speed (revolutions per minute), and
- 2.) Hold the cartridge so its stylus (the "needle") contacts the record at the correct vertical angle and keep the stylus tangent to the record groove with as little deviation as possible as it tracks from the first cut to the final grooves closest to the center of the disc.

While these are the two basic functions of a turntable, there are other criteria used in judging its merits. Freedom from "rumble" refers to the ability of a turntable to isolate its motor noise from the stylus. This is particularly important to the theatre organ enthusiast: If the low frequency noises generated by the motor are allowed to be picked up by the stylus, they will be amplified along with the signal from the record. At higher levels, a considerable amount of amplifier power can be wasted reproducing this bassy "garbage." And if you've invested in a high-powered amp and a pair of speakers with extended, clean bass response, reproduced turntable rumble in significant amounts can be quite audible and will noticeably muddy the sound. If you're playing a record containing a lot of low bass, the addition of rumble can cause the amp to run out of headroom, and you'll hear some rather nasty warning noises on the peaks. Diaphones will take on the tonal property of Bombardiers. Turntable rumble is measured in "minus decibels" (db). If a unit showed a rumble figure of *plus* 5db, it would be completely useless as a device for playing records. Even -15db is a poor figure. Some of the cheaper record changers of 15 years ago produced figures in the area of -35db and were best used with speakers having limited bass response. To put things in total perspective, a turntable with a rumble figure of -90 db would be exceptionally quiet, but -65db certainly isn't too shabby . . . and that's the number you'll find the best \$150 turntables hovering around. Units stating their rumble as being worse than about -55db (like -48db) or making no claim at all can be passed by.

The other main area of concern in turntable quality relates to basic



function #1 mentioned earlier. It's the matter of speed stability. The speed variation (unintentional) found in some lesser players is usually a speeding-up and slowing-down at rate of about 1 to 5 times a second. This condition, known as "wow," varies the pitch of sustained notes, and if pronounced enough, gives the music a "sour" quality. Expressed as a percentage\*, wow is no longer a problem in the better turntables of today that sell for \$100-\$150. A wow figure of .15 percent is the approximate threshold of detection for the average person. The lower the number, the better. .10 percent wow is fairly decent (if the unit does not exceed that amount after prolonged use), and many \$150 turntables check in at less than .08 percent. Several turntables above \$300 have turned out impressive wow measurements as low as .025 percent. And surprisingly, some of the best numbers are now being exhibited by lower-priced units. Since theatre organ music consists largely of sustained melody lines and chords (not to mention an occasional chime and some piano solos), good speed stability is an absolute must.

Before looking over a few models currently found on dealers' shelves, one more thing to consider is whether to buy a belt-driven or direct-drive turntable. Belt-driven units offer generally very good performance in the \$150 range with wow (and flutter) figures in the range of .05 to .08 percent. The belt in these units, which resembles a giant rubber band, costs only a few dollars, so its necessary replacement every few years is nothing major. On the other hand, direct-drive units have no moving parts between the motor and platter. The motor rotates the platter directly. Their wow/flutter figures are even better in the \$150 range than belt-driven types, typically around .03 percent.

A review of today's offerings shows several standouts with remarkable performance in the moderate price category. The Sony PS-T22 is a semi-automatic direct-drive unit with variable pitch and an exceptionally low wow/flutter figure of .025 percent. It sells for \$150, but

I've seen it discounted down to as low as \$110. Pioneer's PL-200 is another direct-drive model and features an electronically controlled auto-return and shutoff. It also boasts a W/F figure of .025 percent and carries a list of \$149, although some discounters offer it for as little as \$107. An excellent manual direct-drive turntable is the Technics SL-D1. It has electronically variable pitch control and a built-in strobe to precisely adjust speed. Its W/F claim is .03 percent. All this for \$125, but again, it can be found in some stores for less than \$90 . . . and at that, it's one of the bargains of the decade. The SL-D2 is a semi-automatic version of the SL-D1 listing for \$150, but commonly discounted to around \$110. There are many other major brands with excellent turntables in this general price range. The ones mentioned here are just a sample. In the over-\$200 category, you'll find still more technical refinement and more features, but again, seek a knowledgeable salesperson who knows the value of the more expensive models and can help you select the one that best meets your needs . . . without over-buying.

To make that turntable a complete component, you need to fit its arm with a cartridge, a tiny, precision-crafted device with the highest cost per-ounce of any part in the entire system. In the "moving magnet" type cartridge, the diamond-tipped stylus traces the wiggles in the record groove and transmits vibrations through a delicate shank with magnets attached to its other end. The movement of these magnets generates a weak signal in nearby coils. The signal then goes to the amplifier. The lowest priced magnetic cartridges start at about \$25, but I would advise spending an extra 50 or 60 dollars for a really good cartridge. In view of the overall system cost, it's a small price to pay for far better performance in a critical area. The cheapest cartridges don't sound bad, but they don't offer the dynamic range, clarity or smoothness of better models. Of course, the figures above are retail and the cartridge with a \$25 list price might be discounted to about \$20, whereas some excellent pickups in

the \$85 range can be found for as little as \$40, making the difference between "cheap" and "very good" only about \$20. Cartridges listing for less than about \$50 often don't have as much detail in the bass, especially in the case of low pedal fundamentals. And during a big power chord containing a loud Posthorn, things get to sound a bit gritty with a "bottom line" model. The same applies to orchestral brass or a large choral group like the Mormon Tabernacle Choir: the sound isn't as clean as it could be, and some finer details are

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\*This percentage usually also contains the amount of "flutter" in the turntable. "Flutter" describes shorter-cycle speed variations at rates up to about 175 variations per second. It imparts a blurred or rough quality to the sound, often obscuring detail. At its worst, flutter gives music an "underwater" sound.



lost. There are several very good-to-excellent cartridges in the \$80 to \$100 price range, but my personal favorite is the Shure M95 IIED. Unless your budget is virtually unlimited, this particular model is hard to beat in the areas of low distortion and clean detail. It has an advertised price of \$80, but discounters generously drop the price to about \$40.

You'll find cartridges selling for \$200, \$300, even \$500 and more, but the improvements found in such devices over the best units around \$100 are often relatively small. Let your ears tell you if the extra expense is necessary to get the most out of the rest of your system (assuming you haven't bought anything yet and are comparing two cartridges through a promising turntable/amp/speakers combination). If the difference between an \$85 cartridge and one costing \$350 can't be resolved by the associated equipment, then there is nothing to be gained by spending the extra \$265.

Once all of the equipment for your system has been brought home and set up, how it all sounds together will depend to a large degree on how carefully everything was selected. It can now be clearly seen that to get reasonably life-like pipe organ sound in the home (reproduced, that is) requires an outlay of at least \$800-\$1,000, with better performance available from a \$1,500-\$2,000 system. Some people with larger budgets may put together a rig costing \$3,000 or \$4,000 . . . and with the best gear in that bracket, the difference *will be heard*, especially in larger rooms. In any case, a good stereo component system is a sizeable investment and not something to be purchased in haste after reading a few magazine ads. Talk with several different salespeople, and do a lot of listening. Examine all possibilities before you reach for the checkbook.

Note: All models, descriptions and prices are the latest available as of Spring, 1981.

Coming: A look at tape decks and a discussion of the pros and cons of the open reel and cassette formats.

Also: For enthusiasts who already own a medium-power amplifier and a pair of robust acoustic suspension speakers that "don't make it down to 16' low C": A method of bass extension that costs much less than buying new speakers. □



## BOOK REVIEW

by Lloyd E. Klos

**TREASURES OF MECHANICAL MUSIC** by Arthur A. Reblitz and Q. David Bowers. 630 pages. Available from Vestal Press, Box 97, Vestal, N.Y. 13850. Price: \$35 plus \$1.50 shipping charge. New York State residents add 7% sales tax.

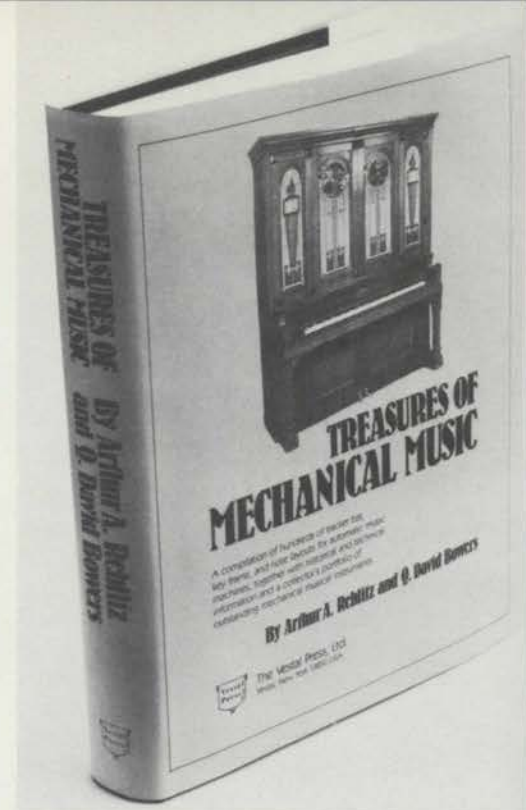
There have been innumerable texts written on the subject of mechanical musical instruments, many of which have been published by the Vestal Press. What has to be the granddaddy of all books is this extensively-researched, beautifully-illustrated volume — the definitive work, we feel.

Of 8½ x 11 size on a top-grade paper, and profusely illustrated with pictures, diagrams, scales, and advertisements, this six-pound, hard-cover reference work must have taken years to research and compile, and is a living memorial to its authors.

The spectrum covered includes disc music boxes, player pianos, expression and reproducing pianos, music roll manufacture, coin pianos and orchestrions; reed, pipe and electronic organs (those with roll players), barrel organs, band, dancehall and fairground organs. There are 450 tuning scales, tracker scales and key-frame layouts for the above varieties of instruments.

There are over 650 pictures and illustrations, most of which never have appeared in previous volumes. Capsule histories of the instruments' manufacturers, arranging for piano rolls, decoding scales, pictorial tours of Q.R.S. and Paly-rite music-roll factories, and a collection of pictures on the renowned carousel organ builder, Charles Looff, are included.

For the theatre organ buff, there is reference to his favorite instrument in the chapter on reed, pipe and electronic organs. Many of the manufacturers made instruments with roll



players: Aeolian, Austin, Estey, Kimball, Link, Moller, Robert Morton, Skinner, Welte, Wicks and Wurlitzer. There are price lists for Wurlitzer unit organs, dated 1920, 1923 and 1927. If an organ had to be divided, we learn, the cost was increased by an extra charge of \$1000 to \$1850.

Reproduced is a two-page letter from Carl M. Welte to ATOS founder, the late Richard C. Simon-ton, and contains a wealth of information on this hitherto little-known organ builder.

Decided assets of this work include a glossary of 287 terms which can be of help to the dedicated enthusiast as well as to the novice; a bibliography of 37 volumes; and an easy-finding index.

Summing up, this volume was written as any text on the subject should have been written. Kudos to Reblitz and Bowers for a magnificent piece of work! □

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