



automatic or manual turntables which one to buy?

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As soon as you decide you'd like to buy components, the next step probably depends on whether you know someone who's knowledgeable about high fidelity. If you do, the rest is easy. You just follow the advice that's offered. But if you don't, and try to learn by yourself, you must be prepared to learn more than you want to know. Just flip through some of the pages in this particular issue, for example, and see how many ways of playing records there are. That is, how many makes and models of record playing equipment are available. All you really want to know is: Which one best suits my purpose?

As the writer is associated with one of the manufacturers, it would be easy for us to tell you. But that wouldn't be fair to you or the editors. Nor would it be as interesting a challenge to us as the task we've undertaken: to be as objective as our human frailty will allow.

Now, back to your question: Which one to buy? To decide that, you should know what to look for. And to know what to look for, you should pause to consider some fundamentals, obvious as they may be, about what happens from the time you place a record on the platter and the time you return it to its jacket.

After a record is placed on the platter, the next thing that happens is the movement of the tonearm from its resting post to the lead-in groove. What you have to decide is whether you want the tonearm to move by hand or whether you prefer to move a switch and let it all happen automatically.

That choice brings us all the way back to the tired old subject of record changer vs. manual turntable. We won't get into that one again, other than to point out that this question has long since become one of convenience, not quality.

Actually, it's more than a simple question of convenience. If you've recently handled a tonearm set to track at one gram, you may well have felt uneasy about it. One gram feels like no weight at all, and it's no easy matter to handle it with confidence. What's more, one-gram tracking means there's a very fragile suspension between the body of the cartridge and the tiny diamond tip at the end.

So even if you don't really need a "changer" per se, you may well need the security of an automatic start. (And stop, for that matter.) Fortunately, most manual turntables are provided with a "cueing" device that takes care of the set-down and lift-off function, leaving you only the job of moving the tonearm to and from the record. Plus, of course, remembering to set the cueing lever for the action needed. And finally, hoping that anyone else in your family who uses your system will also remember, and use it properly.

OK. One way or another, the tonearm has descended to the rotating record, and the diamond stylus is now in the groove. You can now walk away and enjoy the music for the next twenty minutes or so. But to be sure you're enjoying the same music every time you play the same record, you want to be sure that the stylus and the record are getting along together just fine.

You know, of course, that the diamond stylus is the hardest substance on earth, and that the vinyl record is anything but. In fact, a crude but homey comparison might be something like dragging a rounded end of a stick along the surface of a bowl of jello. The parallel object of that little example would be to avoid breaking the thin skin of the jello.

In principle, what you hope will

happen to your record is: nothing. The stylus will move this way and that way, very obligingly, as the contours of the record groove direct. And, of course, their "directions" occur at a rate of something up to fifteen thousand a second.

For "nothing" to happen, the tonearm holding your cartridge should 1) be precisely balanced, 2) have the correct stylus pressure applied to meet the stylus compliance requirements and 3) apply that pressure equally on both walls of the stereo groove. (Not every one agrees with the importance of that last criterion, which refers to anti-skating, but their ranks have noticeably thinned as more has become known about the need for balanced tracking.)

Just one other thought for you about the actual action of a record in play. Quickly now, what makes the tonearm move across the record from lead-in groove to run-out groove? Did the answer come to you right away? Many people have never given it any thought. Answer: pressure of the outer wall of the record groove as the groove spirals inward.

Another quick question: What resists that inward movement of the tonearm? Answer: the friction of the bearings in the tonearm pivots. When you consider that the stylus might be riding in the groove with perhaps one gram of pressure, it does not require much friction in the pivot to unbalance the tracking on the two walls and even cause occasional skipping. And worse, permanent damage to the recorded material in the groove.

If all this seems academic to you and more than you want to know, take a moment right now and add up the money you've already spent on records, and the money you're likely to spend

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in the future. Chances are you've already spent more on records than on all your other components combined. Assuming we're in agreement on that score, we can now turn to the question of evaluating the record playing equipment available at the typical audio dealer.

Unlike receivers and speakers, whose insides are effectively sealed, record players are accessible to the eye and hand. Most elements of their design, materials and workmanship are exposed, either above or below.

As you look up and down the shelves, you'll see a sampling of the products described in this magazine, ranging from very low-priced to fairly high-priced record changers and automatic and manual turntables. It's fair and accurate to say that price and quality go together, and we think it's clear that we hope you will put quality first and not short-change yourself or your records with false economy. After all, damage or premature wear on a record is permanent.

With the salesman's permission, you should operate each prospective turntable a few times, using whatever start and stop switches are provided, and using the cueing device on those units which have them. Note how smoothly and quietly everything works (or doesn't).

Now pay attention to the various tonearm settings: for balance, tracking pressure and anti-skating. Again, if the salesman allows, you should place all the settings back to neutral and unbalance the tonearm. Then start all over again, just as you would in your own home. Balance the tonearm with the weight of the cartridge. Apply tracking force, then anti-skating. Just performing these functions will give you a sense of how well the machine is made.

You might now pay attention to some of the features and refinements that each model offers. Although the "experts" might disagree on the importance of each, the more seriously minded turntable manufacturers prefer to include refinements that they consider necessary. For example, some models have two settings for anti-skating: one for conical styli, the other for elliptical styli. This refinement recognizes the fact that the narrower tracing edge of the elliptical

stylus penetrates slightly deeper into the groove wall, resulting in more frictional pull and hence more skating. So the "elliptical" calibration applies a bit more anti-skating than the equivalent "conical" calibration.

One refinement the better record changers have adopted from single-play units is a single-play spindle that fits snugly into the platter and rotates with it. This type of spindle centers the record more precisely and helps reduce wow and flutter. Also, it certainly makes good sense for a spindle to rotate with the record instead of presenting potential resistance which can enlarge center holes and increase eccentricity.

When you operate the cueing lever, pay particular attention to the way the tonearm responds. The better cueing systems are damped, so the tonearm floats down at a constant slow rate of speed no matter how fast you move the lever. And the best systems also damp the tonearm on the way up, so it won't bounce. If you don't think you will really use the cueing feature much, consider the problem when you're listening to a record when the phone rings. Without cueing, you have the choice of turning the record off or paying little attention to it. With cueing, you can lift the tonearm off the record, then resume where you left off when the call is over.

So much for the tonearm. Now for the platter and what makes it go around. Lower priced models have a stamped steel platter. Higher priced ones have nonferrous cast platters. The highest-priced ones also have cast platters which are dynamically balanced. In addition, all things being equal, the heavier the platter the better its flywheel action in smoothing out the fluctuations of the motor itself.

Any acceptable record changer has a four-pole motor, as the two-pole motor belongs to the "toy" category. But there are differences among four-pole motors. The better ones are able to resist line voltage changes and thus maintain speed constancy, which is the special virtue of the synchronous motor. The best of the conventional motors is the type which is both inductive and synchronous. These motors use their induction elements to provide the torque required to get the

platter up to speed quickly, then the synchronous element takes over to lock the speed into the 60Hz frequency of the AC power line.

A new kind of motor has recently appeared in a very few of the highest-priced single-play turntables. This motor is electronic and is energized by a regulated DC power supply. Its particular advantage is its low rotational speed which reduces vibration (hence rumble). Even electronic motors differ from each other, as the best of them not only rotate at low speed, but at the exact speed required for the record, 33 $\frac{1}{3}$ or 45 rpm. Thus, these motors don't require any speed-reduction system, such as friction-idler or rim-belt, and can drive the platter directly. Be forewarned that such motors come with turntables priced at over \$300.

One useful feature associated with motors and drive systems is a variable speed control. Since records are made to rotate at certain fixed speeds, whether 33 $\frac{1}{3}$ or 45 rpm, you may wonder why the platter shouldn't always rotate at these speeds and let it go at that. For one thing, your taste may lead you to prefer a certain record that's pitched slightly higher or slightly lower. If you ever want to play a live instrument along with a record, you'll find it easier to tune the record to a piano, for example, than vice versa. And camera buffs also find this feature useful in timing a recording to a length of film.

In case you haven't noticed the absence of any comment about wow, flutter and rumble, we'll mention them right now. All record players have some wow and flutter measurements below 0.1%. And rumble (weighted) should be below 50 dB. But it will take a very good ear to detect either one unless they are grossly evident, and any record player good enough to be submitted for published test reports, such as in *Audio*, will be adequately quiet.

At this point, we hope we haven't told you more about record players than you really want to know. And if you remember nothing else, please remember that only one component handles your precious records. You want that component to be a very good one. Æ