



By C.J. Huss

Chapter Four – They Blinded Me With Science (Part 1)

(Wherein your humble techno-repair-o dude explaineth what worketh and what doth not design-wise in Turntableworld. Verily!)

In my last column I tried to provide an overview of the various types of turntables made over the last half-century-plus, reasons they sold for a given price point, and some general things to avoid, like poorly made tonearms or cheap combo units.

This issue I want to begin to go into more detail about some of the things to consider when choosing either a new or used record player and also offer a few hints about how to get the most in terms of performance and reliability if you are on a tight budget. I'll start out with some thoughts on the part of the player that spins the record—the platter—and the motor and other parts behind or under it.*

Regardless of the specific design the machine's engineer has chosen, the key goal is a straightforward one—rotate the platter and the record placed on it at a constant speed, normally either 33^{1/3}, 45, or 78 RPM. Simple, right? Well, it might be except for the fact that the music recorded in the record groove is very, very tiny, and this means that even very small variations in the platter speed can be clearly audible.

If you've ever perused any audio magazines or dropped in to one of the online hobbyist audio forums where turntables are discussed, you may have seen the term "wow & flutter." This is a measurement used to evaluate the deviation(s) from a constant speed that the turntable platter may be prone to. These short-term variations are actually more audibly obnoxious than if the platter speed is constant, but off by a small, continuous amount. Why? Well...

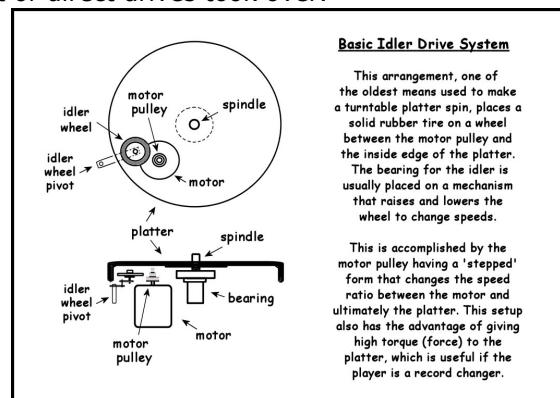
Say, for example, that the platter is turning at 33^{1/10} RPM instead of 33^{1/3}—a tad slowly. You may not even notice this unless you are very pitch-sensitive, as many musicians are. Every note plays just a little flat, but most humans do not have the gift (or curse) of perfect pitch, so the brain simply either ignores or adapts to the error. The same is true if the speed is higher than the correct one, except in that case, the error may even be heard as a positive, giving the music a "perkier", slightly sharp characteristic. (I once had a radio DJ tell me he often played his discs with the machine's pitch control tweaked up a bit faster, because the music "just sounded better, more alive" to him.***

However, if the speed changes up and down as the record plays—either slowly (that's "wow") or quickly (that's "flutter") the brain of nearly everyone per-

ceives that as wrong or annoying. It would be like as I'm typing this, the letters would be spaced apart in some inconsistent way, as opposed to if they were just uniformly pushed closer together or spaced farther apart.

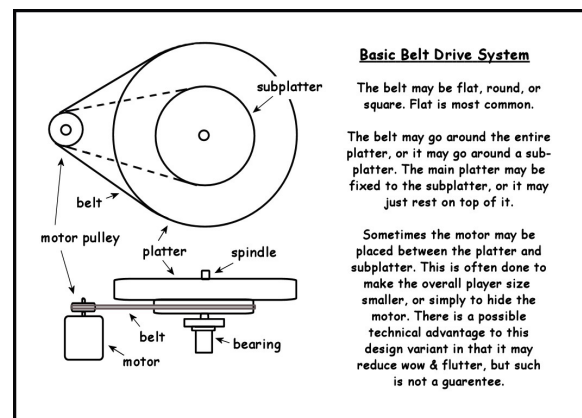
Okay, back to the different drive systems used for turntables. Basically, there are three - idler wheel drive, belt drive, or direct drive. There is no inherent advantage to any of these, with the caveat that they be carefully engineered and manufactured.

Idler drives were used almost universally in the days of record changers because this system can easily deliver the high amount of torque (force) needed to operate the changer mechanism. Once changers largely and then finally vanished from the market, belt or direct drives took over.



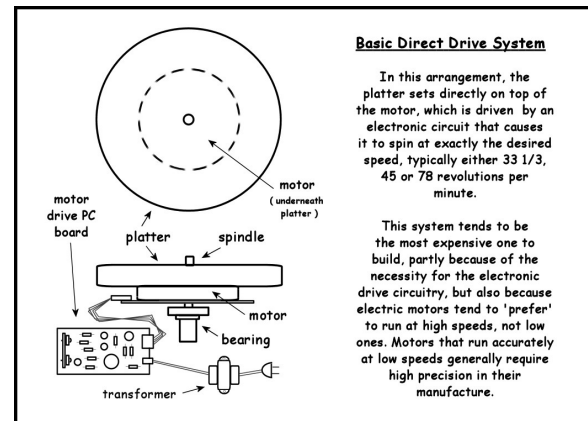
A belt drive is the most mechanically simple system, with rare exception. A flexible belt, usually rubber, is placed between the motor pulley and the platter. A motor spins, which moves the belt, which turns the platter. Besides its simplicity, belt drive can have a second, very important advantage which is the possibility of isolating the platter (and thus the record) from external vibrations. (The importance of that will have to wait for a future installment because that's a big ol' discussion all by itself).

If you're on a budget, and particularly if buying a new machine, this is normally the drive system of choice, and there are plenty of machines out there that utilize it. The mechanical simplicity makes it practical to manufacture a decently performing turntable at a moderate price, and/or shift some costs from the drive system to the tone arm and cartridge, which is often a sensible tradeoff.



Now, if well-engineered and manufactured, a direct drive system nearly always provides the very best in terms of constant speed stability and low wow and flutter. The trade off is that this system, where the

inherently rotates at the same speed, is more technically complex and requires a very high degree of precision to work properly. Also, if it does have repair issues, they may be harder to resolve and so more expensive. (Fortunately, on average, these machines are pretty reliable).

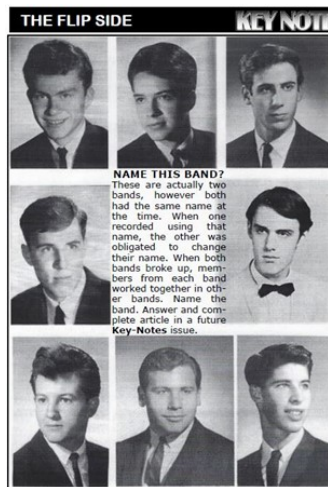


The second potential issue with direct drives is that they can be very prone to picking up external vibration, which muddies the sound or can even cause feedback howls in extreme cases, like when you play your tunes at wicked-high volumes. Most manufacturers work around this by making the player very heavy (and so harder to vibrate/shake) and placing it on soft rubber isolating feet. This works well, but again—adds cost.

So—things to look for when buying new? Go with a belt drive for good performance at a modest price, or a significant overall improvement if you can spare some additional bucks. The latter usually happens because upgrading from the entry-level model will normally get you a better tonearm, more isolation in the suspension, a better cartridge if that's included with the player, etc. If you go for a direct drive, be cautious of anything selling for much less than \$600.00 to \$700.00, and be sure it has some weight to it.

Fred Clemens' COLLECTIVE THOUGHTS...for the Record Senior Moments...

If you recall, in the December issue of **Key-Notes**, #236, there was a picture showing eight Senior High School photos of eight members of two different bands that shared the same name...



Revealing their names (left to right), the top row are Chris Irby, Rick Philp, and Danny Kortchmar. In the middle are Dave Palmer and Joel O'Brien. And at the bottom are Mike Rosa, Dan Mansolino, and Charlie Larkey. It is Kortchmar and O'Brien who were half of a New York band, while the others all from a New Jersey band that shared the same name. Chris Irby who played bass, had dropped out of the NJ band by graduation time (1965) and was replaced by Charlie Larkey. The other half of the New York band were Dickie Frank and John McDuffy. The bands' names...? **The King Bees**

It was the New York band that ended up recording first and had their first record release on RCA Victor in

For used models, the drive system is of lesser concern than the overall performance, since used prices can vary widely, from yard-sale potential bargains to audio shop sourced, fully reconditioned higher-end models. For quick generalities, I'd go with the following:

1. Avoid anything from before about 1970, especially changers, unless you are, or know someone who is a knowledgeable audiophile turntable person. Avoid stereo compact all-in-one systems, or suitcase style players, old or new!
2. How much does it weigh? Heavier is usually better. Lightweight direct drive models in particular should be avoided.
3. How good is the tonearm? (More details on how to tell in the next issue). A quality tonearm on an average drive system is better than the reverse.
4. Does it look well taken care of, or is it rough looking, dusty, dirty, etc.?

5. If the deal seems too good to be true---yep, you know that one already.

Okay, folks, that's all for this time around! I'll be back!***

* Next issue, I'll delve into tonearms and cartridges. Yay! Oh no! No, yay!

** There is an entire field of science known as "psychoacoustics", or how the brain interprets the things that enter it from your ears. It's fascinating, and... annoyingly complex, kinda like calculus but for the perception of music.

*** Worry not, dear readers, the author assures you he is not a killer cyborg from the 22nd century. He is merely an aging audiophile repair guy, although perhaps that's only a mite less scary. YMMV. Bye!

October of 1965. Here is the picture sleeve of their first release, alongside a photo the other King Bees prior to the name change to **The Myddle Class**, that alongside their first release on the Tomorrow label, this copy signed by all of them, released in November 1965.



Both bands broke up by the tail end of 1967 with three records each under their belt. But what makes this fascinating for me is that members of both bands would find a way to come together in other bands later on.

The first time was in January 1968 when Kortchmar and Larkey became 7th generation key members of **The Fugs**. Working with them at the time was another common name to be found later on, Ken Pine. Kortchmar stayed for one Fugs album, while Larkey and Pine were common on two more Fugs albums, including a concert LP recorded in 1968 that was issued in 1970.