Technics at 78

Tony Bolton finds that all 78s are not created equal as he explores the capabilities of an unusual version the Technics SL-1200 MK2.

As we settle into the 21st century we are used to having a fairly universal standard for most things in our lives from mains voltage through to the speed of revolution of a record. 33 1/3rpm has been a standard since it was first introduced in America in 1948. However, when dealing with 78rpm discs, this consistency only applies from the early 1940s when 78rpm was agreed as a standard. In fact the vast majority of records had been recorded at this speed since the late 1920s, however there had still been a few examples that played at an unusual speed. Prior to the late '20s, the situation was a lot more complex (see Box Out).

With this in mind Timestep have introduced a version of the Technics SL-1200 MK2 turntable (and the black SL-1210 variant), fitted with an outboard speed controller that covers all speeds from 14rpm to 170rpm. The RA (Restore and Archive) deck consists of a standard Technics SL-1200 or 1210 that has the arm replaced with the new SME M2-9RT that is supplied to Timestep without a headshell or arm lead. Timestep then fit their own mounting plate, arm lead and headshells, pre-fitted with the cartridge of your choice from a range of Stanton MMs or an Audio Technica Mono SP MC. The latter has a spherical 2.5mil tip, while the Stanton can be fitted with a

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selection of tips depending upon the age (and therefore the groove size) of the records to be played.

The onboard slider for the pitch control, fitted as standard to the turntable, becomes redundant as soon as the Timestep T-01DDS Speed Controller is plugged in. (DDS stands for Direct Digital Synthesiser.) This freestanding device has a selection of buttons across the front for the four well known speeds, alongside a rotary control and two push buttons (marked 'down' and 'up') to adjust the speed to non-standard settings. This can be done in either 0.01rpm increments or in steps of 1rpm by pressing the 'fast' button on the facia. The speed chosen is indicated in a screen on the facia.

Apart from the arm and the speed controller this deck was also fitted with an Oyaide Tungsten/Butyl Precision mat BR-12 at £90.00, and a new precision Timestep bearing at £249.00.

Each deck is custom made to the purchaser's requirements with quite a range of different options that are too many to list here. For those who wish to play 78s without going to this level of expense, Timestep offer a 78rpm modification to Technics decks for £399.00 including fitting.

This example was set up in place of the Clearaudio on my downstairs system feeding into the Leema Acoustics Agena phonostage. The multiple headshell facility on this made swapping cartridges and matching them electronically a matter of moments, so I was able to work my way through the variety of cartridges and stylus profiles that Timestep supplied with the turntable.

Stylus profiles are of vital importance when reproducing 78s, acoustic ones requiring a 0.0040" tip, 1925 to 1939 editions use a 0.0035" one and 40s and 50s discs need a 0.0028" tip. Playing an acoustic disc with a 1950s profiled tip will result in the needle running on the bottom of the groove and the noise level being unnecessarily intrusive.

A 1911 issue of 'The Valkyrie' demonstrated this very ably. The signal to noise ratio of acoustic discs is always relatively poor but using any other than the 4.0 x 1.0 elliptical stylus on one of the Stanton cartridges put the noise well in front of the music, making it nearly unlistenable to. Whereas the correct profile reversed this to the extent that the noise was present but did not interfere with the music.

Correcting the speed to 79rpm, as advised by the 1911 Gramophone

Co. Ltd. catalogue, had the effect of tightening the beat and the relationship between the performers so that they sounded like a group of professional musicians, rather than talented amateurs.

This became even more obvious when playing a 1927 Columbia recording of the Halle Orchestra performing 'A Trumpet Voluntary'. Played at 78rpm, the trumpet sounded as though it was being played very carefully, by someone who was sight-reading the music unrehearsed. Replayed at the correct speed of 80rpm, the presentation of the music altered to sound like a group of well rehearsed and experienced musicians. The organ accompaniment on this record (recorded in the sadly long gone Free Trade Hall in Manchester) was murky and indistinct at 78. At 80 it still sounded somewhat obscured, but had far better definition

Achieving the correct speed on discs that do not have this marked, is, to some extent, a case of trial and error. However, there is a point where things sound 'right'. The music or voices have a natural sounding flow to them and the words become more intelligible, rather than sounding slightly gabbled or slurred. Harry Welchman's vocals in the 1927 London cast recording of selections from 'The Desert Song' sounded prosaic at 78rpm, but gained urgency and excitement when played at the correct 80rpm.

This is a typical pre September 1927 Columbia record, revolving at 80rpm. After this date Columbia discs were recorded at 78rpm.

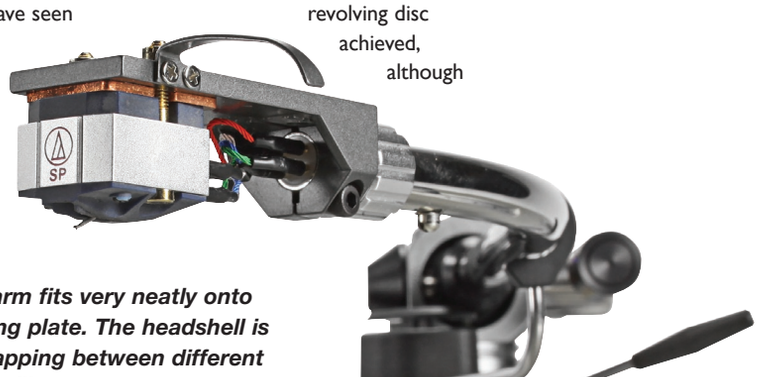
Even small changes in speed can tighten a performance. In the UK, 78 is actually 77.92rpm courtesy of our 50 Hertz mains frequency. In America, the 60 Hertz mains frequency results in a 78.26rpm rotational speed. Prior to the introduction of tape into the studios, which allowed for remastering in different countries, the only way of pressing an American disc in the UK was to ship a stamper across the Atlantic. This means that British releases of American artists such as HMV's 1940 release of Muggsy Spanier's 'I Wish I Could Shimmy Like My Sister Kate' should be played at 78.26rpm. The difference in sound quality, although small is still subtly noticeable, with greater snap to the beat, and a sensation of more precision in the performance.

This does not just apply to standard groove records. I have seen reports that Miles Davis's 'Kind Of Blue', and various Pink Floyd releases are not recorded at 33 1/3rpm, but can be either a semitone high or low at this speed depending upon the disc in question.

This is the Audio Technica Mono SP moving coil cartridge, fitted with a 2.5mil spherical stylus.

This is where a turntable such as the Timestep RA will appeal to purists as well as those who are serious for either personal or professional reasons, about achieving the correct velocity and pitch.

This turntable will also deal with oddities such as the Prestige releases of 'Miles Davis and the Modern Jazz Giants' at 16 2/3rpm. This speed was originally developed by Chrysler for the Highway Hi-Fi in-car system but the machinery was poorly implemented and failed to sell. This speed was eventually used for talking books for the blind until cassette tapes replaced it. I was surprised at the level of fidelity that this slow revolving disc achieved, although



The new SME M2-9RT arm fits very neatly onto Timestep's own mounting plate. The headshell is detachable, making swapping between different cartridges and stylus profiles very easy.

PITCH

It is possible to find the correct speed of a record by using the pitch of the instruments. However, there are traps that are easy to fall into. The note A is nowadays regarded as being 440Hz but over the years different countries have used different pitches to tune to. In England live broadcasts were often tuned to A = 438.5Hz, while in Germany the average was A = 441.2Hz.

Prior to 1939, British Concert Pitch (or New Philharmonic Pitch) was A = 435Hz at 60 degrees Fahrenheit. An international agreement in that year rounded this up to A = 440 at 68 degrees F. In recent years both the Berlin Philharmonic and the Philadelphia Orchestras use A = 444Hz.

British military bands and some others were known to tune to "Old Philharmonic Pitch" or "Sharp Pitch" before 1929 where A could be between 452.5 and 454Hz. Also, acoustic recording studios were usually kept very hot (90 degrees F being not uncommon) to keep the wax masters soft enough to cut properly. This temperature would make a 440Hz pitch rise to over 450Hz.

So comparing a modern recording with the old one to ascertain the correct pitch may result in quite a considerable error.

Miles Davis at 16 2/3rpm. This was part of a limited series of releases at this speed on the Prestige label. This one dates from 1957.

SPEED

From the early days of recorded audio each record company had its own views regarding recording speed and there was sometimes little consistency between discs issued by the same manufacturer.

Prior to 1912, The Gramophone Co. Ltd (also known colloquially as HMV) had used a variety of speeds but rarely marked them on the discs. After that date it stuck pretty much consistently to 78 but later reissues may be incorrectly marked as playing at this speed.

Columbia recorded at 80rpm until 1st September 1927 when 78 was adopted as their standard speed. It should be noted that later reissues of 80rpm recordings were often incorrectly labelled as 78rpm so the matrix numbers offer the best guide as to speed. WA6100 (10 inch) and WAX3036 (12 inch) were the first discs to be issued at 78rpm.

Grammovox, and it's post First World War derivative, Imperial used 77rpm.

Vocalion, and their offshoots, Broadcast, Aco and Coliseum all used 80rpm, as did Actuelle, British, Grafton and Homochord.

Edison-Bell, and their successors Velvet Face and Winner tend to be around 84rpm but can vary.

American Victor discs, certainly in the acoustic era were often recorded at 76rpm but intended to be reproduced at 78rpm so that they would sound "more brilliant" As far as I can ascertain this practice did not continue into the electrical recording era.

All of the above records are laterally cut. The main users of vertical or 'Hill and Dale' cutting were Pathe of France and Edison in America with the Diamond Disc. The former can vary between 90 to 100rpm (pre 1916, usually with embossed labels). Later recordings (with paper labels) run at 80rpm. Diamond Discs also run at 80rpm.

not as good as the 33 1/3rpm versions, it was still of very acceptable sound quality.

I am very impressed with this machine. Having been spinning records at all three speeds for most of my life and on a very wide range of equipment, I can honestly say that this record player has given me the best '78' sound that I have ever heard and has further enhanced my appreciation of the capabilities of the format. It also gives excellent microgroove replay, although the configuration is not optimised for this purpose.

It is aimed at the professional archivist, and several are already in use in national libraries and archives around the world. However, unlike some professional turntables, this one fits physically and aesthetically into the domestic environment and I can thoroughly recommend anyone who takes their standard groove replay seriously to consider investing in one. I have used it at all speeds with excellent results and if you only have funds or space for one deck and want to get the best out of your '78' records and very good reproduction from your microgroove ones, then the Timestep RA is the best turntable that I have yet used for the purpose.

Before 1912, Gramophone Co. Ltd. (HMV) records were recorded at a variety of speeds. They were not displayed on the label but listed in the Company's record catalogues. The 1911 catalogue (available as a PDF here: http://sounds.bl.uk/related-content/TEXTS/029I-HMVGX1911XXX-0000A0.pdf) lists this record on page 9 and advises that the speed is 79rpm. A quick read through shows the wide variety of speeds that The Gramophone Co. Ltd. used at the time.

SYSTEM USED

Leema Acoustics Agena phonostage and Tucana II amplifier.
Chario Ursa Major loudspeakers.

MEASURED PERFORMANCE

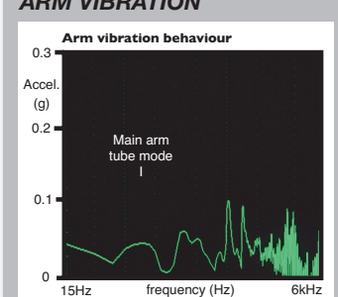
Speed accuracy of the SL-1200 MK2 RA turntable was excellent, a negligibly small +0.1% fast – this is within test disc error. Speed variations were very low at 0.08% wow, the main rotational component at 0.55Hz (33rpm) remaining perfectly stable in level on our spectrum analyser, where it usually fluctuates wildly with belt drives.

Close inspection of our speed variation analysis shows only frequency modulation sidebands at multiples of 0.55Hz and no wow or flutter components, so it is difficult to say there's any measurable speed variation, except that from test disc eccentricity, even though the disc was centred, a superb result.

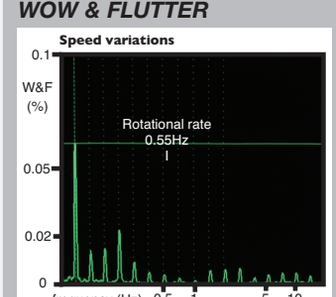
The original SME M2 arm tube rang quite strongly but SME now damp this tube internally and our vibrational analysis clearly shows there are no major vibrational peaks, only a series of low level perturbations. The one piece solid headshell shows little sign of resonant modes.

The modified turntable is remarkably speed-stable and the best we have ever measured in this respect, looking cleaner than standard Technics SL-1200 MK2 Direct Drives. The SME arm reaches a high standard too, both items measuring extremely well. **NK**

ARM VIBRATION



WOW & FLUTTER



Speed	**+0.1%**
W&F (total. weighted)	**0.06%**
Wow	**0.08%**
Flutter	**0.04%**

HI-FI WORLD

TIMESTEP RA TURNTABLE/ SME ARMPLATE/ SME M2 9RT ARM £1685.00

TIMESTEP T-01DDS 14 -170 RPM SPEED CONTROLLER £1995.00

OUTSTANDING - amongst the best.

VERDICT

A re-engineered version of the Technics SL-1200 MK2 with new speed controller and arm providing a superb standard of replay.

FOR

- can play any record at any speed
- detailed and realistic sound from aged recordings
- ease of use
- well engineered

AGAINST

- nothing apart from the price

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