

Technics SP-10 turntable

The first direct-drive turntable used advanced electronics to create one of the most technically competent decks of all time. But how does it measure up to today's best?
 Review: **Haden Boardman** Lab: **Paul Miller**

As a teenager, the first serious turntable that I paid hard cash for was a Technics direct-drive SL-1200/II. As my hi-fi knowledge grew, the deck was replaced by a much more expensive 'audiophile' offering. Frankly, it was nowhere near as good, but badge snobbery took over. How could a Japanese deck, and a direct drive deck at that, sound inferior to the best of British?

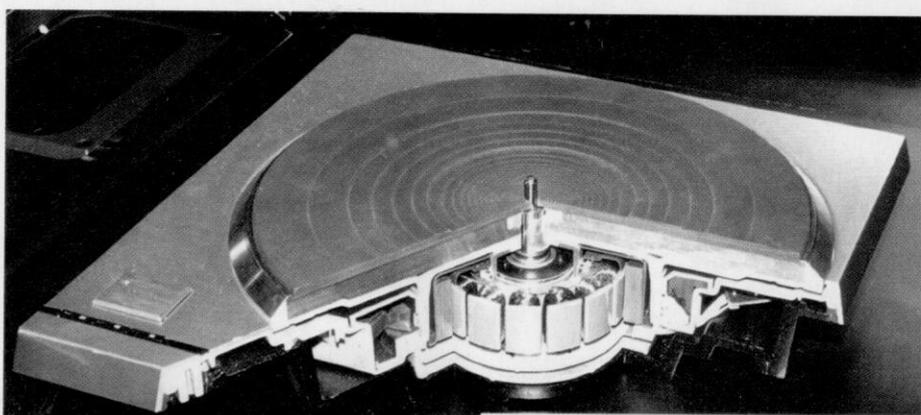
I blamed everything, from the cartridge to the phase of the moon – apart from the deck itself and its supplied tonearm. Dazed and confused, I had yet to realise the superiority of direct-drive systems over belt drive. I had not yet had my moment of turntable enlightenment, courtesy of a Garrard 401 [see *HFN* July '10].

MOTOR UNIT

The SP-10 motor unit was launched in 1969 and was one of the first direct-drive decks to be marketed by the giant Matsushita Corporation of Osaka Japan. Branded 'Technics, by National' or 'Panasonic', or a combination thereof, the



ABOVE: Fully specified BBC 'Gramophone Unit' based on the MKII and incorporating RIAA preamp, fader and BBC's own pantograph arm



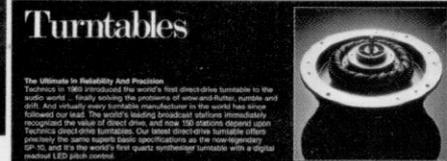
ABOVE: Cut away showing the incredibly complex motor system, and unique construction

deck made its UK appearance in 1974, later going through MKII and MKIII guises before disappearing in the mid to late '80s.

The earliest model could be purchased with a basic (crude) sprung wooden plywood plinth, supplied in matt black plastic or in real tree wood – which looks like plastic, in that nice 1970s way!

The decks were also available as a complete turntable system – the SL1000 – which comprised the deck and the ruby bearing EPA100 tonearm along with a hybrid constructed plinth – the SH10B3. This was manufactured from rosewood and obsidian glass.

A thin-walled aluminium casting provides a base for the DC brushless direct drive motor. The motor itself was truly revolutionary: the rotor was fashioned from a manganese-aluminium alloy with 20 poles while the stator windings were fed from an elegantly designed transistor control circuit. Extra coils on the motor stators fed a control voltage back to the simple circuit, locking the motor's revolutions. Speed selection is achieved by simply varying the DC power supply to the complete motor assembly.



SL-1000MKII
 Quartz Phase-Locked Control Direct-Drive Turntable with Variable Dynamic Damping System and Obsidian Base

SP-10MK2
 Quartz-Controlled Direct-Drive Turntable

EPA-100 Universal Tonearm

SH-10B3 Turntable Base

The MKI deck has the power supply built in, 'suspended' on rubber bushes underneath the main aluminium chassis. Speed is selected via a switch, two preset controls within the main motor assembly and two 'fine controls' on top of the chassis. These allow the user to set the speed accurately via stroboscope markings on the neon-lit platter. Once set, it maintains accurate speed with little drift.

However, Matsushita's engineering team was clearly not satisfied. Based on the success of the original deck, and technical developments offered by rivals EMT, the MKII gained a much more sophisticated speed control and power supply arrangement. The new power



supply was larger, off board and connected to the deck via a four-pin XLR-style cable, providing the smooth DC and 140V for the neon strobe lamp. Final speed control was now via a servo-controlled system in a bid for greater accuracy. A Quartz reference was used for absolute accuracy and, in addition to the 33.3 and 45rpm speeds of the MKI, 78rpm was also offered. In 'consumer' guise the MKII offered no pitch control, the deck being 'locked' precisely to the selected speed.

INSTANT STOP

As well as the electronic advancements, which resulted in a faster start up time (one quarter of a revolution on the later decks compared with half a revolution on the early decks), a mechanical brake band was fitted for 'instant stops'. An electronic, hard-wired remote start/stop switch was also made available. The MKI start/stop was achieved quite crudely by turning the mains AC supply on and off. Extra rubber damping was fitted to the MKII deck's platter and its

'Even with a plywood plinth I was knocked out by the sound'

physical mounting was made more secure, via three screws. It simply rests in place on the motor on the MKI.

The final MKIII variant had an even bigger power supply, offered pitch control as standard, plus a massively more powerful motor with heroic levels of torque. And all this was combined with massive platter mass. A small elephant balanced atop the platter would not stop it revolving at precisely the desired speed!

In the UK, the vast majority of SP-10s on the secondhand market are ex-broadcast MKII decks from the BBC or IBA.

Most have been modified back for domestic use now, but are instantly recognisable

as they have a larger outboard power supply (or sometimes a home made power supply), the start/stop switch has usually been removed, and larger tell-tale lamps are mounted around the platter to indicate the selected speed.

Some of these ex-broadcast samples can be in a shocking state. With the start/stop control located on the control desk fader, and with some decks custom made for specific tasks, it can be a hard job to get the deck just to rotate.



ABOVE: The author's SP-10 MKII housed in a home made 'light' plywood plinth with Audio-Technica AT1503/II broadcast arm

Paramount to the Technics' sonic performance is the plinth (more on this later). Famously Technics developed the SH10B3 obsidian-based solid plinth, though in my opinion, it's a bit overrated.

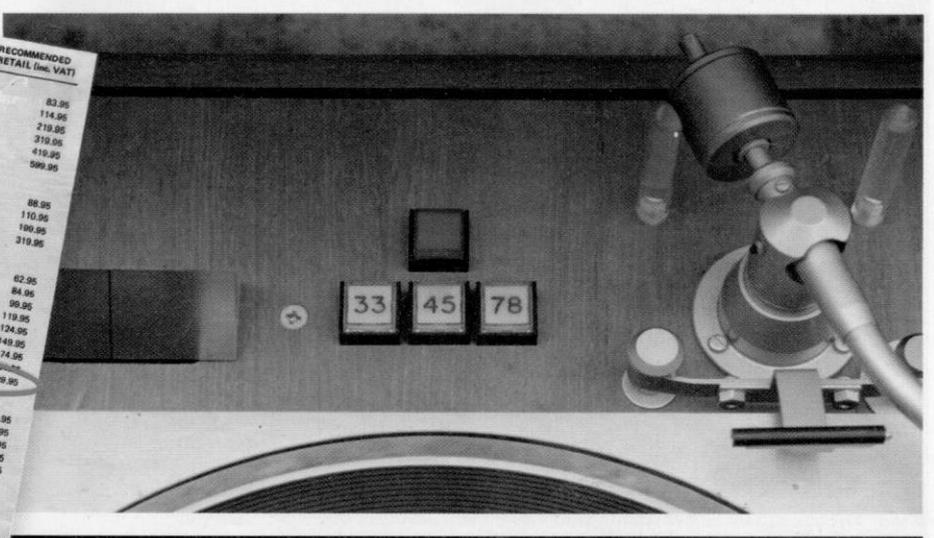
Most ex-broadcast samples have now been de-centered from their radiogram-style wooden record player cabinets and DJ consoles into home made plinths but some have been truly appalling – MDF boxes housing both the deck and the huge power supply, for example. Luckily, it is not rocket science to make a reasonable enough plinth following Technics' own paperwork.

CLEAN MACHINE

The one time I experienced at home the 'full monty' SL1000 obsidian plinth and EPA100 arm set up I found the sound to be

BELOW: Price list from 1977; MKII is £499.95
BELOW RIGHT: Square buttons on the BBC plinth illuminate to show the speed selected

MODEL	RECOMMENDED RETAIL (inc. VAT)
AMPLIFIERS	
SU 7200	82.95
SU 7800	114.95
SU 8000	219.95
SU 8600	319.95
SU 9000	419.95
SE 9000	599.95
TUNERS	
ST 7200	88.95
ST 7800	119.95
ST 3800	184.95
ST 9000	349.95
TURNTABLES (Excluding Cartridge)	
SL 20	62.95
SL 23	84.95
SL 2000	96.95
SL 150	119.95
SL 1800	124.95
SL 1700	149.95
SL 1800	174.95
SP-10 Mark II	499.95
RECEIVERS	
SA 5060	119.95
SA 5180	172.95
SA 5160L	184.95
SA 5360	234.95
SA 5460	349.95
DOLBY CASSETTE DECKS	
RS 263AUSD	109.95
RS 018US	129.95
RS 273USD	152.95
RS 630USD	149.95
RS 640USD (Perapex Cover Inc.)	199.95
RS 671USD	229.95
RS 876USD	284.95
RS 9000US	599.95



Technics
High fidelity audio equip

VINTAGE HI-FI

incredibly detailed, but almost clinically clean. In fact I would describe the presentation as on the thin side, lacking in bass authority and decidedly uninvolved. It sounded almost like an early Japanese CD player. For the record, in 1978 an SL1000 set-up cost £1000 while a Linn LP12 complete with Grace G707 tonearm was priced £250.

IT'S A KNOCKOUT

Around two years ago I purchased a domestic SP-10 MKII chassis and set about building a lightweight solid plywood plinth for it along Technics' recommended design. The intention was to make a direct comparison between an SP-10 MKII and a similarly mounted Garrard 401 with identical arm and cartridge. (Sadly, to date this comparison has not been fully realised, both decks ending up with totally different plinths and different arms!)

Arm and cartridge choice for this set-up was a Fidelity Research FR64x of similar vintage and slightly newer Ortofon MC30 Super cartridge (the late '80s metal body version). The results were simply staggering. Even with a basic plywood plinth I was knocked out by the sound.

On old favourites, such as *The Jacques Loussier Trio Plays Bach* the superbly simple piano, bass and drums captured in classic early Decca stereo underlined the clean and precise direct-drive sound with all three instruments superbly located within an incredible soundstage. Total realism! Two other slightly contrasting jazz recordings from the same year – Dave Brubeck's 'Take Five' and Miles Davis's 'Kind Of Blue' sounded breathtaking.

Moving forward 50 years, some white label Drum & Bass tracks, at 45rpm, underlined the SP-10's spectacular dynamics further – as did some early '80s

BELOW: Rear serial number plate; note 'Technics by Panasonic' and the different shaped platter on this, the less familiar MKI deck



LEFT: Original SP10, start/stop is mains on-off, speed change a slide switch, on right is stroboscope window



ABOVE: The MKII featured a separate power supply, electronic start/stop switch, electronic speed change, and narrow stroboscope window

Duran Duran, and disco beats courtesy of Grace Jones. Compared to a Garrard, there was a slight absence of weight, while the bass possessed a slightly resonant quality. Also, I felt the Garrard's more traditional cast chassis provided a more realistic foundation for the low-end than the thin-walled aluminium construction of the Technics. Being ultra picky, I was also able to pinpoint a high pitched 'wowwowow' noise in the background. It was only noticeable in between tracks, and on the most silent of pressings.

As with the Garrards, the plinth is fundamental to the sound of these decks. Too high a mass can kill life and openness while a low mass plinth can give a sound that's too resonant and coloured. Professor Akito Kaneta, in Japan, developed

what must be considered the ultimate plinth system for the SP-10. Measuring 600x500x960mm (wdh), Kaneta's plinth is constructed from four layers of solid lime wood strips, is very heavy, and quite complex to construct. Additionally, the direct-drive motor is removed from the thin-walled aluminium base and mounted directly into the lime wood.

MKI decks are considered to be the poor cousin of a MKII or MKIII. Curiosity got the better of me so I ended up buying two MKI decks for not a lot of money (admittedly one was faulty!) in order to compare them directly to a MKII. I have to say I did not feel the overall sound quality to be inferior.

POWER PLAYS

A very simple tweak on the MKI is to remove the entire power supply from underneath the deck and locate it elsewhere. Technically the MKII electronics are a lot more complicated than those of the MKI. While both iterations can suffer from flat capacitors in the power supply and on the motor itself, both MKI and MKII decks are bullet-proof reliable – especially given that there is no belt or idler to break or wear out. My faulty MKI deck was fixed inexpensively with a new mains

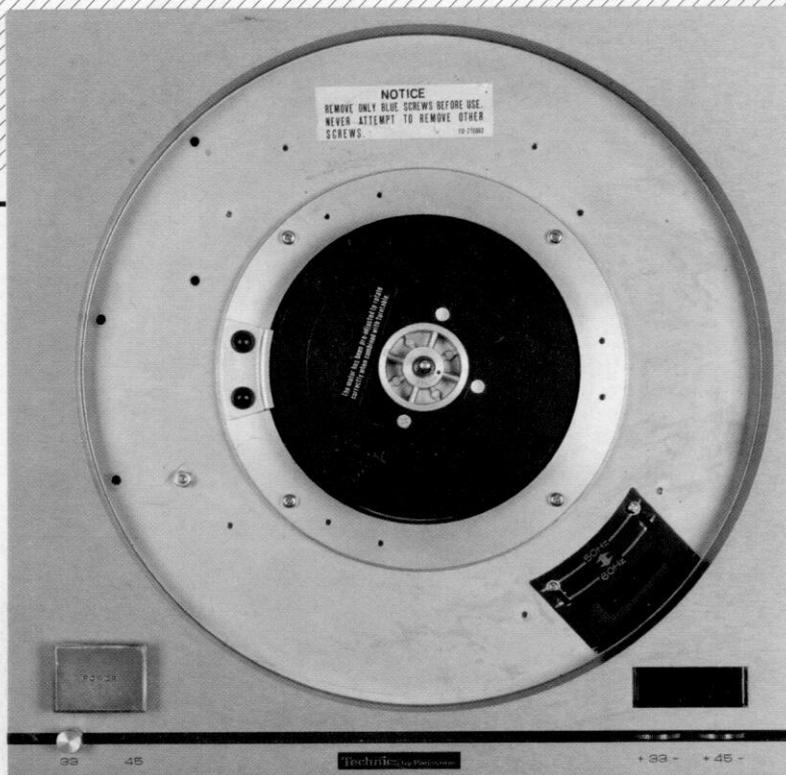
LAB REPORT

TECHNICS SP-10 MKII (Vintage)

Sadly, they don't make 'em like this any more. Technics' massive 20-pole direct-drive motor is clamped via three bolts to the alloy platter of this MKII player, the huge 6kg/cm starting torque bringing both motor and table up to speed within one half of a second. Such is the stability of this combined motor/platter that you can cue up a track on a *stationary* LP and only then hit the start/stop button. Your vinyl will be pitch-perfect (or at least within $\pm 0.12\%$) before you could reach to wind up the volume control...

Pitch stability in this instance refers to the deck's absolute speed accuracy, measured as 33.29rpm at the 33.33rpm setting. This would be perfectly acceptable in a deck made yesterday, but for one that rolled off the production line over 30 years ago it's nothing short of incredible. Any cyclical speed variations – wow and flutter to you and I – are also kept low with a peak figure of 0.09%. In common with Garrard's idler-driven 401 [see *HFN* July '10] the modes are largely discrete with wow appearing at $\pm 2.8\text{Hz}$ (every four poles of the motor) and flutter at $\pm 50\text{Hz}$ [see Graph 2, below].

Although the motor is driven from Technics' outboard DC power supply there's clearly a suggestion of mains-related breakthrough visible as 50Hz, 100Hz, 150Hz peaks on the unweighted rumble plots [see Graph 1, below]. To a degree, these peaks will be influenced by the choice and wiring of Haden's AT tonearm, so might be considerably lower in other installations. The through-bearing rumble remains impressively low at just -69.5dB (re. cartridge output at 5cm/sec) – again more than a match for modern turntable bearings. PM



ABOVE: Plan view showing the thin-wall aluminium construction common to both the MKI and MKII decks. The decks' chassis were the same size

transformer and mains switch (the original being 110V, I suspect the deck had been accidentally plugged into a 240V mains supply).

PRICE GUIDE

The MKI decks are few and far between in the UK. They sell in the US, either as a pure chassis or on the simple sprung plinth for \$300-\$500. Any imported deck will need to be used with a small autotransformer – they all seem to be 110V.

Domestic MKII decks usually come complete with the SH10E power supply. Most are universal mains voltage. Ex-broadcast decks can come with all sorts of variations, from a home made power supply to

modified factory rack mount units. However, a clean MKII with SH10E power supply will cost you between £600-£800 for just a chassis, and around double that if mounted on the obsidian SH10B3 plinth.

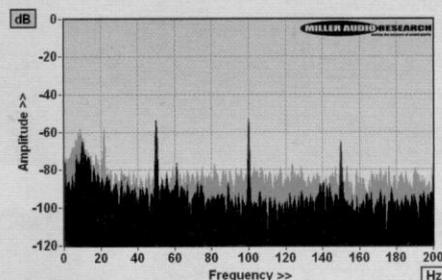
A broadcast deck is worth around £300-£400 for a clean example and decidedly less for one in rough condition. 'New' solid wood plinths can be purchased for around the £300 mark to suit either the MKI or MKII. Like the solid Garrard decks, arm choice is totally unrestricted.

Compared with many modern decks the Technics is underrated. Indeed, on paper its technical performance is outstanding and given its performance on a decent plinth, it's massively undervalued. The MKII is a sound investment; the MKI is an out-and-out bargain. ☺

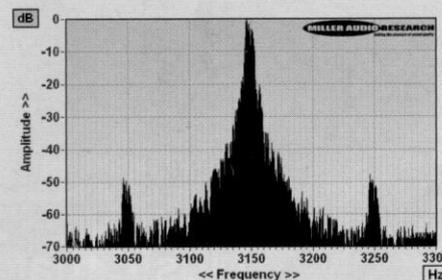
HI-FI NEWS VERDICT

Matsushita's revolutionary turntable still proves valid some 40 years after it made its first appearance. Its technical performance is without question state of the art, with the MKII and MKIII decks raising the bar to the highest possible levels. Sound quality is also at the top of the game, though the plinth system is the final arbiter when it comes to absolute performance. A classic deck and strongly recommended.

Sound Quality: 89%



ABOVE: Unweighted bearing rumble from DC-200Hz (black infill) versus silent LP groove (blue infill) re. 1kHz at 5cm/sec. Tested with AT1503II tonearm



ABOVE: Wow and flutter re. 3150Hz tone at 5cm/sec (plotted $\pm 150\text{Hz}$, 5Hz per minor division). A $\pm 2.8\text{Hz}$ wow is seen alongside 50Hz flutter sidebands

HI-FI NEWS SPECIFICATIONS

Turntable speed error at 33.33rpm	33.29rpm (-0.12%)
Time to audible stabilisation	<1sec
Peak Wow/Flutter	0.02% 0.07%
Rumble (silent groove, DIN B wtd)	-66.6dB
Rumble (through bearing, DIN B wtd)	-69.5dB
Hum & Noise (unwtd, rel. to 5cm/sec)	-52.8dB
Power Consumption	18W
Dimensions (WHD)	369x103x369mm



ABOVE: Not a multi-changer version but a demo of the powerful motor torque