Sony Walkman TC-50 - TCM-100

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TC-100
(1968)

The first Sony cassette recorder. In appearance, the recorder is neatly organized, made up of nearly straight lines that are subtly rounded at the corners. Convenience was a priority in design. Even beginners could quickly master this unit, which is mainly controlled by piano-like keys and features a large speaker. In particular, the pop-up ejection mechanism is a nice touch that was admired by the developers of the cassette tape.

The TC-100 was Sony's first cassette recorder and so became the first step on the path that would eventually lead to the Walkman a decade later. Sony's choice to adopt the Philips Compact Cassette format rather than developing an incompatible one of their own did much do popularise tape recording, which became an attractive and viable domestic activity with the establishment of the cassette as the single worldwide standard. Had this not happened the market would have probably fragmented, something that occurred with the various mini and micro cassette formats in the following years where at least two European and two Japanese systems competed for recognition, limiting to the medium to business users and ensuring that pre-recorded releases, a key part of any audio format, would never become a marketable reality.

The TC-100 was a trim and attractive machine whose styling set the tone for portable cassette recorders for the next twenty years. The attractive casework was finished with a thick overlay of satin-finished aluminium onto which the various legends were engraved, meaning that they would not wear away with use. Instead of the joystick lever which Philips used for controlling the mechanical functions of their first machines (later copied by Sony for their TC-12), the TC-100 used piano keys, later a universal fitment to all cassette machines. At this stage the keys for winding did not latch, meaning that the user had to hold the key down throughout any winding operation.

The TC-100 was not a basic machine, it included automatic recording level control, inputs for a microphone and a line-level source, a well designed tone control and a built-in mains power unit which could be easily switched to suit the supply voltages found in most countries. For portable use the unit was powered by either 4 "C" sized cells or a rechargeable pack which could be recharged in-situ by connecting the recorder to the mains. There was no automatic stop function but an audible alarm would sound when the tape ran out during recording if Sony's own "auto sensor" cassettes were used.

TC-12
(1971)

The TC-12 represents the typical Japanese cassette recorder product of the early 70's. For this model, Sony used an identical mechanical layout to that employed in early Philips cassette recorders, as can be seen from the familiar control layout. The electronics differed slightly, including the most welcome change that only four batteries were required, instead of five. As a basic model, Sony had not applied their flair for miniaturisation to the TC-12, which was in fact slightly larger than the Philips original. While it would not satisfy the serious listener, the TC-12 gave reasonable results for dictation, speech programmes and popular music.

The TC-12 represents an early commitment by Sony to the Philips Compact Cassette format. Had Sony chosen another type of cassette, or developed their own, it is unlikely that the Walkman would have become as popular as it did so quickly. A later attempt to develop a non-compatible audio cassette format, the "Elcaset", predictably ended in disappointment.

TC-50
(1968)

The smallest cassette recorder at the time, wasn't Sony first cassette recorder but it was Sony's first Walkman, designed for an optimal balance of compactness, recording performance, and reliability. What helped make it the world's smallest was a combination of features: integrated circuits, compact component mounting, and a newly developed built-in mic. The TC-50 was conceived as a recorder for taking dictation with one hand. A simple design makes the most of the natural beauty of the aluminum, and the dazzling reflection of light off the internal mic is also memorable. The popularity of this recorder took off when it was used by astronauts on the Apollo 7 space mission.

An exceptional Cassette-Corder which could be carried everywhere, truly everywhere, with the SonyD-201 motor, exactly like those one could buy to walk in one's garden.

TCM-100
(1968)

THIS is the original Walkman.Only it wasn't named Walkman and didn't benefit from a large marketing coup. Launched more than a year before its very well-known TPS-L2 version (aka Walkman), the TCM-100 was targeted at the press people who needed a lightweight and easy to handle portable cassette recorder for modern times.

Weighing only 400g, operating on batteries and measuring 2,9 x 13,35 x 7,85cm, the TCM-100was to replace big bulky units such as the TC-164SD - only the TCM-100's bandwidth wasn't as good : 90Hz...10Khz. This would be changed in the TPS-L2 but not by much.
As can be seen below, the special capstan drivesystem was also used for another bestseller launched a month after the TCM-100 : TC-D5 !
Redesigned for the TPS-L2 were the output controls (L/R independent controls using linear sliders) and the enlarged "stop" button.On the TCM-100, one of the two minijack slots naturally is a MIC input if one were to prefer not to use the built-in electret microphone ; the other is for remote control (rec/stop).
The famous "talkback" orange button of theTPS-L2 was the record button on the TCM-100 (located on the other side of the top).The TCM-100 was available in silver and, later on, in black (TCM-100B).The difference in weight (400g vs. 300g

of theTPS-L2) was achieved with some internal parts swaps, less functions and more plastic for the L2.

Bar these small differences and the absence of the tape counter, the TCM-100 already sported the same overall design as its much more remembered TPS-L2 sibling - in fact, it was the very same recorder.

TCM-600
(1978)

One of the first pocket voice recorders a sister model to a famous TPS-L2 Walkman and a precursor of the legendary WM-D6 and WM-D6C models

The TCM-600 was a compact, high quality cassette recorder suitable for recording interviews or for dictating notes. It was the latest in a line of similar machines, and enjoyed the distinction at its launch of being the smallest tape recorder in the world which used standard cassettes.

The small metal case housed a well-crafted mechanism that was powered by a miniature core-less FG servo motor. A mechanical device released the play or record keys once the tape ended or if it jammed. The record button acted on its own so it was not necessary to press play as well to start recording. A tape counter was also fitted. As with previous models, there was a pause control, but this worked electrically rather than mechanically, stopping the motor but leaving the recording amplifiers energised and the heads and pinch roller engaged with the tape. Another familiar feature from other Sony recorders was the counter-rotating flywheel. The idea was to have a rotating mass opposing that of the capstan so that the tape speed stayed constant when then machine was rotated on its axis. The densely packed mechanicals of the TCM-600 did not allow for a full-sized second flywheel, so a much smaller one was fitted but was made to rotate proportionally faster to have the same effect. In practice the resulting part looked more like an idler and is best regarded as such!

Recordings could be made from the built-in electret condenser microphone or from an external microphone, which could include a remote stop/start switch. A single LED indicator showed the battery condition as well as giving a rough idea of recording level, which was adjusted automatically. Playback was either through a built-in loudspeaker at the rear of the machine or through an earphone. Playback was possible at a “fast” speed, though recordings could only be made at the normal 1 7/8 i.p.s.

The TCM-600 aroused little interest in the mass market, it was expensive and specialised. Its importance cannot be underestimated however, as it formed the basis for the prototype Walkman models and was used as the basis for the original TPS-L2model. It was also highly influential in the design of the WM-D6/WM-D6C, a long running and very highly regarded machine.

WM-D6
(1982)

A legendary stereo cassette tape recorder and player. Designed to deliver HiFi sound in a portable package the WM-D6C incorporates all the features you might expect in standard size cassette recorder. Undoubtedly the finest portable tape machine ever produced.

The WM-D6 at first looks like a rather large personal stereo, but is really more like a miniaturised TC-D5 portable cassette deck. Although the WM-D6 was not the first Walkman model that could record, it was the first that could do so to such high standards that it was suitable for professional use.

The WM-D6 used a very similar mechanism to that of the TCM-600 and the TPS-L2. The similarity is evident in the layout of the controls and tape transport components. However, to raise the quality to the high level demanded, the mechanism was upgraded by fitting a disc drive capstan servo similar to that of the TC-D5. Inevitably all the parts had to be made smaller, but the principles remained the same. One would have thought that this would be enough, but the designers took the disc drive concept one stage further and made it quartz controlled. At a stroke, this removed any possibility of drift or error, and gave the WM-D6 perfect speed accuracy under all conditions. The system worked by comparing the output of the capstan tacho sensor with the divided-down output of a quartz crystal oscillator. The servo ensured that the two signals were locked together by varying the motor speed. As the quartz crystal frequency never altered, neither did the tape speed. The user was given the option of bypassing the system and setting the tape speed manually by up to 4% using a small dial at the rear of the machine. In this mode, the servo operated as it did in the TC-D5. The switch that controlled the variable speed function was mechanically interlocked to the record key and so was automatically returned to the quartz locked fixed speed mode whenever a recording was made.

Other features carried over form the TC-D5 included the ferrite heads and the DC-DC converter, which enabled the electronics to operate at a higher voltage than the batteries would normally provide, improving the sound quality. There was no room to accommodate the TC-D5's large moving-coil meters so the WM-D6 used a single LED bar graph display instead. This could also be used to give an indication of battery condition. An input was provided for a microphone, though using the switchable attenuator this could also accept signals from an amplifier or second recorder. The limiter function from the TC-D5 was not carried over, so recording level control was manual only. Two pairs of headphones could be connected. A three position tape selector switch allowed normal, chrome and metal tapes to be used for both recording and playback, though the selection was manual, not automatic as it had been with the TC-D5.

Power was usually provided by 4 AA sized cells, though the battery compartment was designed so that the standard Sony Ni-Cd pack could be used too. This could be recharged in situ from the DC input socket.

The WM-D6 was expensive but was also capable of outstanding performance, better than many full-sized cassette decks. It was quickly adopted by radio stations and news organisations as the ideal machine for reporters to use. It also became a favourite for making high quality but discreet “bootleg” recordings at concerts. It was replaced by the improved WM-D6C.

Features

Dolby Noise reduction Off/B/C switchable
Tape type selection - Normal/CrO2/Metal
Record/Playback Level meter doubles as Battery Level indicator
Line In
Line out
Microphone socket
Headphone Socket
Speedtune fine speed adjustment
Record Level adjustment
Playback volume control
Play/Review & Cue
Record/ record pause
Stop & Eject

Power supply 4x AA batteries or mains adaptor (not included)

WM-D6C
(1984-2002)

This updated model added to the strengths of the WM-D6 by offering an important extra feature: Dolby C noise reduction. This system, which operated in playback and record, improved the dynamic range considerably. Including Dolby C noise reduction in a compact portable was not easy, and the integrated circuits which performed most of the functions had to be made by Sony themselves. The fact that this extra function could be fitted to the WM-D6 without making it any larger was amazing, though it forced some changes, for example the second headphone socket was no longer fitted.

Other useful modifications were made at the same time. Most useful of these was the addition of a line-in connector, which allowed direct connection to other audio equipment without having to use the microphone socket. This was a great improvement and helped to reduce the background noise level when recordings were made from line sources, such as a CD player, second tape recorder or a mixing desk. The level meter was also altered so that as well as showing the recording level or the battery condition, it could be switched off to save battery power.

The WM-D6C can easily be identified from the earlier WM-D6 version because the “professional” script on the top cover is green instead of yellow. The WM-D6C could not really be improved upon and so remained in production almost unaltered for many years. However, two significant changes did occur, both in the latter part of the production run. Firstly, the excellent and very effective amorphous head with its distinctive parabolic grind was replaced by a simpler, cheaper permalloy type of a cylindrical section. This later head is noticeably more wear prone and therefore could not be considered an improvement. Only latterly was the “amorphous head” script removed from the badge on the front of the machine so it cannot be used as a reliable guide to which type is fitted. Secondly, the printed circuit was re-drafted to use surface mounted components. These were much smaller than the types used originally, though as the size of the recorder stayed the same the only advantage was a reduction in the cost of assembly. The circuit remained substantially the same as before and offered near identical performance.

Comparison of early (top) and late (bottom) WM-D6C

The underside of the main PCB of the late WM-D6C (bottom) is much more sparsely populated than the early version (top) thanks to the use of surface mounted components.

TPS-L2
(1968)

(Star Lord Guardians of the Galaxy)

The TPS-L2 was the first commercially available personal stereo cassette player. For the next 20 years, such machines became the essential accessory for serious and casual listeners alike, and changed the way that music was listened to and enjoyed. Several names were suggested for this completely new class of machine, includingSoundabout and Stowaway, but it was the third name, Walkman, that stuck. Only later examples had Walkman written on them, early ones (like the example in our photograph above) simply had the word “Stereo” embossed on the cassette door.

The TPS-L2 used the basic case and mechanical parts of the TCM-600 cassette recorder. The only change to the mechanical parts was the fitment of a stereo tape head and the removal of the record key, erase protection lever, erase head and tape counter. The mechanical performance of the deck, which was originally designed more with speech and dictation in mind rather than music, was considered suitable for high-fidelity music reproduction, a clear demonstration of the high quality engineering found in the more upmarket Sony recorders.

Part of the genius of the personal cassette player concept was the elimination of the unnecessary. In the case of the TPS-L2, that meant not only no recording circuitry but no loudspeaker either. The mouldings in the chassis that accommodate the loudspeaker magnet in the TCM-600 are still visible in the TPS-L2 however. Removal of the recording circuit meant removal of the microphone socket too, though the internal microphone remained. This was used for the now famous “hot line” function. Pressing an orange button on the top of the machine (fitted in the place where the record and fast-play controls had been) faded the cassette sound down and mixed in the output of the microphone, so the listener could be talked to without stopping the tape. This was deemed attractive as two headphone sockets (humorously labelled “guys” and “gals” in the versions for some markets) were fitted so that two people could listen at once. The hot line function made a pause control unnecessary, so the arrangement fitted to the TCM-600 was removed.

The TPS-L2 was actually slightly larger than the TCM-600, partly to house the volume controls. The TCM-600 had a small edge-wise rotary control, but miniature volume controls of any type were simply not available in stereo form at the time, so two independent sliders had to be used instead. In addition to this, a two position tone switch was fitted, which allowed chrome tapes or music cassettes encoded with Dolby NR to be played back without excessive treble.

The TPS-L2 initially sold slowly but with skilful marketing demand soon soared. It was not cheap (around £100, with a second set of MDR-3 headphones costing around £15 extra) but gave good performance and created a new way to enjoy music. A whole new market had been created and within a couple of years every major Japanese electronics manufacturer had begun to offer something similar.

TCM-17
(1987)

An improved version of the TCM-12, adding features such as a three digit tape counter, tone switch (high/low) and an electronic variable speed control. Sony’s “Flat Mic” microphone was fitted into the cassette lid, along with an LED battery/record indicator. Mechanically the TCM-17 was one of the last models to use the WM-22mechanism, the quality of which made it equally suitable for music listening (in mono) as well as speech recording.

Predecessors

BM-11
BM-550
TC-12
TC-40
TC-44
TC-50
TC-55
TC-56
TC-100

TC-110
TC-150
TC-153SD
TC-D5
TCM-600
TCS-310