

A Bit Better?

Aiwa HD-S1 Portable DAT Recorder



This is an interesting time for DAT. A launch of the format in the consumer hi-fi market is imminent, a development that should benefit recording users of the technology through lower prices, and new features are appearing on DAT machines specifically in order to tailor them for this new market. The portable Aiwa HD-S1 will be one of the first DAT recorders to be widely available in high street stores, rather than through pro-audio dealers. In some respects, its orientation towards this market is clear, but it also has much to offer more serious DAT users. The most obvious ways in which these two sides of the unit are manifested are the provision of SCMS (Serial Copy

Management System, an anti-pirating measure), and the fact that it has digital ins and outs.

The HD-S1 is a compact portable unit, similar in size and layout to the Casio DA1, which can be powered either from the mains, a rechargeable battery, or from a car cigarette lighter. Besides its portability, digital capability and SCMS implementation, the most notable feature of the machine is its D-to-A conversion system, which uses not 15, 16 or 18-bit convertors, but 1-bit 256-times oversampling Bitstream electronics (an acclaimed Philips development), which is supposed to deliver a much higher quality output. You load DAT cassettes into the HD-S1 via a standard pop-up holder. The mechanism is perhaps a little less smooth than the Sony or Casio portables. The front panel consists of an LCD display, under and to the side of which are the transport controls, and two of the five smaller (rather fiddly, in fact) buttons that control all the sub-code and other aspects of the HD-S1's operation. The front panel has the Display and AARS/Reset buttons, and on the right hand side you'll find ID Erase, ID Mark and Renumber.

DISPLAY

The LCD display has three modes: Absolute Time, Program Time and Tape Counter. As far as sub-code is concerned, the HD-S1 offers the standard basic facilities. Start IDs that mark the start of a piece of music are

recorded automatically during recording, and you can also create your own Start IDs at any point on the tape. Fooling around in this way could, however, lead to a situation where you've created extra IDs in between, say, the original Start IDs numbers 5 and 6, and several numbers might be duplicated. The Renumber function will sort this out, automatically running through the tape and renumbering all IDs so as to carry consecutive numbers.

The AARS function will locate the end of the recorded portion on a tape, so that you can record more material at the end — very important, because with DAT there *is* a difference between recorded blank spaces (formatted) and unrecorded blanks (unformatted). Also around the right-hand side of the unit are the headphones socket and volume control.

The rechargeable battery slots into a compartment at the very back of the case, and will provide around 90 minutes of continuous operation. I've made no mention of analogue inputs yet, and the digital revolution hasn't quite reached the point where we can do without them.

Although the recorder itself has only the single digital socket, you can attach a very compact convertor unit (supplied) to the back, which has stereo inputs and outputs (both via stereo mini-jacks), balance and recording level controls, a mic/line level selector switch, and a 0/20dB mic attenuation switch.

All these mini-jacks (all audio and the one digital connection) are hardly the stuff of which sturdy professional gear is made, but despite these handicaps the HD-S1's audio performance is excellent.

LET'S GO DIGITAL

I tried every playback and recording combination on the HD-S1: recording via the analogue and digital inputs (from a decent CD player), and listening to playback via both the headphones output and the convertor's analogue output. The reason for the latter comparison was that the Bitstream conversion apparently only operates on the headphones output, not on the convertor outputs. So, having acquired the necessary stereo mini-jack leads, I hooked both sets of outputs up to my mixer, and sat back for some good, hard listening.

There *is* a difference in the sound of the two outputs, without a doubt. That of the convertor is good, it's true, but the headphones output delivers a clearer, fuller sound, which is particularly noticeable on bass sounds or bass-heavy music. Although the quoted S-to-N ratio is 85dB+, a little below that of even average non-portables, in all other respects the Bitstream sound of the HD-S1 will stand comparison with much more expensive machines. Having said that, few serious users will put up with mini-jacks in their studios, and quite rightly so. On the input side, digital-to-digital copying of CDs produced a

marginally better sound than recording via the audio inputs. The HD-S1 will automatically select 32, 44.1 or 48kHz sampling rate when dubbing from a digital source, and of course you have no control over recording levels or balance — it's just a straight 16-bit word for 16-bit word copy... well almost. A little extra sub-code gets recorded too, to enable the Serial Copy Management System to work.

A remote control (supplied) can be plugged into the stereo mini-jack headphones socket. You can then plug your headphones into the remote. The remote duplicates all of the tape transport functions. A Key Hold switch (on both remote and right-hand side) will disable all of the transport keys, should you want to ensure that recording or playback will not be accidentally interrupted. A second switch on the side allows you to select whether the digital or analogue inputs are to be used for recording, and further back you'll find the SPDIF digital input/output socket — a mini-jack — and a socket for the PSU. The power switch is on the left, and an auto power-off will turn the unit off after a few minutes if it is stopped or paused.

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SCMS

SCMS is a system that manufacturers of DAT recorders have more or less been forced to adopt, under pressure from record companies to find some way of inhibiting large scale digital-to-digital copying of copyright material. Frankly, there doesn't seem to be any difference in principal between the implications of recording records or CDs to analogue cassettes and recording the same to digital. It's just a matter of the quality of those copies, which is obviously going to be far higher. SCMS works by including, as part of the sub-code on DAT, flags that identify a recording as a copy of a digital recording. An SCMS-equipped DAT recorder will not be able to record any program material that includes such flags via its digital inputs.

So in practice what this means is, firstly, that any recording via a DAT recorder's analogue connections is totally unaffected. Secondly, it means that you can make digital copies of your CD collection on to DAT, but you can't then go on and make digital copies of these tapes. Also, if you make any kind of recordings of your own —

let's say you're using the HD-S1 as a cheap mastering machine — you can make digital copies on to a second DAT recorder, but you can't then make copies of the copies.

I can't help feeling that this is all an awful waste of corporate time and effort. If the intention is to limit the extent of home recording, it's pointless because a recording on DAT made via analogue inputs is still good enough for 95% of home hi-fi users not to care that it's not a digital clone — no difference there. And if the intention is to stop commercial pirating, I find it hard to believe that serious pirates won't find a way around any such system.

Well, there you have it. The HD-S1 is perhaps the first of a new generation of portable DAT machines — cheap, equipped with digital ins and outs, an innovative conversion system and SCMS. Spec and features-wise, it's excellent value for money, with a sound quality that belies its price. It's only a shame that in order to hear it you have to put up with such terrible connectors.

Thanks to Bluemaxx International for supplying the review unit.

FURTHER INFORMATION

£599.99 inc VAT.

Aiwa UK Ltd, (Contact Details).

Bluemaxx International, (Contact Details).

AIWA HD-S1 SPECIFICATIONS

Record sampling rate:	32/44.1/48kHz (digital), 48kHz (analogue)
Data Encoding:	16-bit linear
A-to-D conversion:	Twin 1-bit 64 times oversampling (MASH)
D-to-A conversion:	Single 1-bit 256 times oversampling (Bitstream)
Digital inputs/outputs:	SPDIF
Analogue line inputs:	Stereo mini-jack
Analogue line outputs:	Stereo mini-jack
Mic input:	Stereo mini-jack
THD:	<0.01 %
S-to-N ratio:	>85dB
Weight:	0.75kg
Dimensions:	94 x 34 x 185mm
Supplied accessories:	HD-A1 convertor unit, rechargeable battery, carrying case, mains adapter/charger, wired remote control.