



Sound On Sound : Est. 1985

## Transferring Old Multitrack Projects Into Your Software DAW

Sound Workshop

Technique : Recording / Mixing

Published in SOS October 2008

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**With modern DAWs, you can breathe life into the masterpieces you recorded long ago on outdated formats. We offer some advice on making the transfer.**

Tom Flint

Take a peek into the attic of someone who's been recording for many years and you may well find a pile of old multitrack machines gathering dust, alongside some cobweb-covered quarter-inch reels of tape and stacks of Zip drives, compact cassettes and CD-R archives. It's anyone's guess how many hours of recorded material have been abandoned in attics around the world as its creators switched to new and incompatible recording media, and never got around to copying their old work across. From my rather disparate recording activities, for example, I've accumulated a musical archive that spans at least six different formats, and that's not including the recordings I've made on review equipment. Somehow, I've never found the time or motivation to bring it all together, but there are now good reasons for having a go.



For a start, even a basic computer-based setup now makes it easy to edit and compile work for release via services like iTunes, or at least for an airing on MySpace. Noisy tape recordings can be recycled to make sample breaks, and beat-detection algorithms make it easy to develop songs that you recorded with no click. On a more practical level, once audio is encoded in WAV or AIFF format it can be ported into just about any software program, making it extremely future-proof. This being the case, many people are tempted to dig out their old multitrackers and port their archives into a software environment, so in this article I'll take a look at some of the problems and difficulties they're likely to face, and offer some practical advice.

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### The Compact Cassette

Millions of people once owned a four-track cassette recorder/mixer combination (or Portastudio, as Tascam named the concept), as it was a cheap and simple way to produce demos, and in some cases independent releases. The quality may not have been superb, but lo-fi recordings have a certain charm and, when mastered correctly, make perfectly serviceable release material.

The chief problem is that many tape-based multitrackers (other than open-reel types) had more tracks than outputs, so simultaneous transfer of discrete tracks isn't always possible. Having to make multiple passes to transfer one song is a hassle, but it also creates audio problems: unlike a digital recording, which plays back according to a relatively steady clock, tape is prone to small but continuous speed fluctuations, as the assembly of moving mechanical parts spool the tape from one reel to another. If all tracks are playing together, the speed changes are synchronous and not really a problem, but when they're played back separately the results can be unpredictable. In the worst cases the variations can cause phasing, particularly where there's spill, and they may even be severe enough to disturb synchronisation over the length of the track — which can be very difficult to fix.

Some multitracker designs have signal routing that's flexible enough to enable you to extract audio tracks even without dedicated outputs. For example, there might be a monitoring bus that's independent from the main outs, in which case it may be possible to use the headphone socket or associated outputs alongside the main left and right stereo outputs. Effect sends can also potentially carry the signal from individual tracks, although many designs have the send fixed after the master fader, so there's no way they can be isolated from the stereo outs.

If the four-track is unable to deliver four outs in *any* configuration, the pragmatic solution is to find a better second-hand one that does, and eBay is full of them — although bidding madness can mean that vintage gear, no matter how poor or antiquated, often costs more than it should. It's particularly important to match up other things, such as the noise-reduction implementation, because anything recorded with NR may not play back



With analogue transfers, it's important to record all tracks at the same time wherever possible, as shown here, where the four tracks of a Tascam Porta 05 are being recorded to computer via an

properly without, and vice versa. Most cassette systems I've encountered seem to use Dbx's technology rather than Dolby B or C, but all are fairly common. It's very difficult to play back a Dbx-encoded track successfully without decoding, but tracks encoded with the simpler Dolby B system and, to some extent, Dolby C, can be played back successfully with an appropriate EQ curve to counteract the inherent brightness of the encoded signal.

Another thing to check is that the playback speed of the potential purchase matches that of the one used to make the original recordings. The original Tascam Porta 05, for example, ran at standard commercial cassette play-speed of 4.8cm per second (1 7/8 ips, or inches per second), plus or minus one percent. However, the almost identical Porta 05 HS (High Speed) operated at 9.5cm per second (3.75 ips), as this offered better performance. Tascam continued making high-speed models like the 414, as did their rivals Fostex and Yamaha, but implementation varied from one product to another. It's worth noting that even the specified speeds of cassette multitrackers can vary: when we reviewed the Tascam 424 and 414 MkIII in SOS March 2001 ([www.soundonsound.com/sos/mar01/articles/tascamporta.htm](http://www.soundonsound.com/sos/mar01/articles/tascamporta.htm)), we noted that the latter ran marginally slower than the former when in the same high-speed mode — and they were released at the same time by the same manufacturer. It's worth checking an instrument that you know the pitch of (digital synths are good for this) with a tuner and then adjusting the vari-pitch control accordingly. Almost all models offer somewhere in the region of  $\pm 10$ -15 percent adjustment, but you should be aware that significantly changing the pitch can confuse noise-reduction decoders. Tascam's 424 MkII/III and Yamaha's MT4X are possibly the best all-round problem-solving options, as they both offer four individual tape-out sockets, standard and high-speed operation and dbx on/off.

Although four tracks is the ideal number to have on the compact cassette format (it was designed to carry two pairs of stereo tracks), some multitrackers, such as Tascam's 488 and Yamaha's MT8X, squeezed on as many as eight tracks. Getting audio off the Yamaha is easy because it has eight outs, but the 488 is not so well endowed in that department. Fortunately, though, its mixer routing is relatively flexible, and on the web site <http://homerecording.com>, Les Cargill suggests a method for lifting all eight tracks from a 488 simultaneously, by using a combination of insert points, aux channels, master outputs and effect sends.

#### **With Or Without Processing?**

One dilemma facing many people is whether or not they should try to preserve their carefully established mix settings when moving from one system to another. If you're transferring from a digital multitrack via a WAV export facility, levels, effect send, EQ, pan, automation and dynamics settings will all be lost unless the processed tracks are bounced down to virtual tracks beforehand.

Such measures are time-consuming, so perhaps the most pragmatic thing to do is take the opportunity to start the mix afresh within the software, which is likely to offer more options and flexibility than the on-board processors. When doing so, it's still worth keeping a reference mixdown from the multitrack as a reminder of the relative levels of everything, plus some submixes highlighting any neat tricks you used in the original mix.

I tend to jot down any really specific effect settings in a book, so that I can use them as a starting point in software at a later date, but another option is to bounce just the effects return signals to empty stereo pairs. The only problem here is that you need some spare tracks available, otherwise whatever's sacrificed (temporarily shifted to a virtual track) to make way for the spares is then not available to be sent to the effects for recording!

Insert effects and processors are set up within specific tracks, and for these, loading up some free virtual tracks and then bouncing the processed ones across is more straightforward. Other mixer tricks, such as using one track as a gate-trigger to rhythmically chop up another track should be easy to recreate in most software DAWs.

Recording from the machine's outputs, rather than exporting WAVs, offers the option of either turning off all the processing and effect settings or just leaving them as programmed. If there's time, it's best to do both, as that obviously provides the most long-term options, and modern hard drives have the capacity to cope with such extravagance, where your old recorder's drive probably doesn't!

#### **Open Reels**

Fortunately, even the budget open-reel machines, whether eight-track or 16-track, have individual outputs so that they can be used with a mixer, and this means that getting all the audio tracks off in one pass is not problematic. Sansui's cassette six-track machines also fall into this category. Having dedicated outs means that most people will be able to use the same machine for playback as was originally used for recording. The only real issues are ensuring that tape heads, pinch rollers and so on are clean and demagnetised before making the transfers. A build-up of dirt and oxide particle residue can damage the tape wherever there's contact, and a build-up of magnetism on metal parts can degrade recorded high-end frequencies. For cleaning, if no branded products are to hand, dip cotton buds, or something similar, in a bottle of Isopropanol (a form of pure alcohol available at the chemist) and then apply them to the various rollers and tape heads until the buds stop collecting dirt. Isopropanol quickly evaporates without leaving a residue, but some people are of the opinion that it should be used sparingly, if at all, on rubber parts.

A proper mains-powered degausser is essential for demagnetising, but it has to be used exactly as instructed or permanent tape head damage can result. Tapes that haven't been used for a while may benefit from being run back and forth at least once to ensure that nothing is amiss.

#### **Transferring From Tape**

The best advice for making the transfers to tracks in your recording software is to be sensible with the levels. On the one hand, tape compression and the effects of noise-reduction systems will probably enable recording levels to be pushed close to 0dBFS without the application of any extra limiting or compression, but, on the other, leaving a safe amount of headroom shouldn't be detrimental to the results either. And on that note, even though tape has a small dynamic range (somewhere approaching 90dB when a dbx system is active) compared with a modern digital recording system, it's still worth recording at 24-bit if possible.

#### **Digital Multitrackers**

Digital multitrackers have been abundant for at least a decade, so there are many different takes on the same concept. Even more than cassette multitracks, digital machines are supposed to be all-in-one recording devices, so it's understandable that most are not designed with the ability to output individual tracks. Some of the higher-end products had expansion slots for extra output boards, but the boards were usually cost options and may not be easy to source for some models.

As hard drives grew larger, it became more practical for manufacturers to abandon space-efficient proprietary recording formats in favour of saving everything as WAV files, which also makes USB transfers much faster. The best new designs make it possible to drag the raw WAVs from the multitrack's hard drive straight into the software sequencer, as is the case with Zoom's HD16 when it is in its USB Storage Device mode. Others contemporary products, such as the Tascam 2488 MkII, ask the user to export the tracks to a partition on the hard drive, which can take some time, as they also need to be converted from a proprietary format.



Different machines are not always compatible, even those from the same manufacturer. These two Tascam Portastudios, for example, were released at the same time but play at slightly different speeds even when they're in the same high-speed mode.

Unfortunately, earlier digital multitrackers did not offer WAV file formatting at all, but it's always worth taking a look on manufacturers' web sites and user forums to double-check whether the most up to date OS has been given such facilities. My Akai DPS16, for example, gained WAV support during an OS update. On top of that, there are even some bright sparks who write programs capable of extracting WAVs directly from proprietary backup files — such as John Kimble, who created AWExtract for Yamaha's AW-series products (this is free to download from <http://socialentropy.com/aw4416>).

When exporting a track, it's important to establish what the multitracker is going to include in the data file. In some cases, the encoding will ignore areas of silence where audio has been deleted, which can completely mess up the relative time position of the rest of the track! One such example is the Yamaha AW4416's 'Track Export' command, which misses out the silence at the beginning of a track but retains it between any edits made thereafter. Fortunately, the Yamaha's Part and Region Export options allow the user to specify start and end points to include any silence. A further failsafe is to use an Append edit command to combine any areas of silence with the un-edited audio to form one continuous WAV. If in doubt as to how the multitracker in question handles gaps and spaces, experiments are recommended.

When USB is not an option, the files typically have to be recorded to CD-R/W media for transfer. Frustratingly, many multitrackers only allow the export of one WAV track at a time, so when there are lots of tracks to shift it's often preferable to use the analogue and digital outputs instead.

Also, wherever there's a digital (usually S/PDIF) output available, it's well worth using that if you can, instead of the analogue outs, because this will avoid putting the signal through unnecessary stages of A-D/D-A conversion — and thus avoid problems such as jitter from poor-quality clock signals in your multitracker.

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### Digital Track Alignment

As far as analogue outs are concerned, many multitrackers provide no more than two, although there might be a couple of aux buses that can be used simultaneously. Whatever the provision, unless the machine is one of the few that accepts output boards, there are unlikely to be sufficient outputs to cope with eight tracks or more. This means that audio will have to be played out a couple of tracks at a time and then realigned in software. Compared with tape, the digital audio should play back consistently each time, so the main issue is aligning it all correctly in the software sequencer.

Using your software's MIDI synchronisation facilities to trigger playback is one way of getting the multitracker to begin at the same relative instant for each run-through, but there may well still be timing problems, and some hardware can only act as a master MIDI device, not a slave.

My preference is to record a unique audio key in the same place on all tracks, as a means of ensuring that they can be aligned to the nearest sample. The way to do this is to insert about 20 seconds silence at the start of every track (remember to do this for any used virtual track too), in the song project, then set the machine to record for a period of time that expires before the 20 seconds are up. Sometimes, for safety's sake, this is best done by programming the ubiquitous auto punch-in/out facilities. Next, assign the input to record on as many tracks as the OS will allow and hook up a microphone or sound module to that input. It is then important to find something that will make a suitably transient sound (something like a snare hit, or the crack of a pencil being tapped on a tabletop should do the job). Once recorded, the relevant portion of audio can be copied and overwritten to the same position on any remaining tracks. The editing facilities on even the most basic machine should make it possible to copy and place the audio exactly, but the audio has to be overwritten rather than inserted, otherwise the rest of the track will shift along by that amount. Having done all this, it should be possible to use the transient to match the audio tracks inside your software DAW.



Multitrack reel-to-reel tape recorders were designed for use with mixing desks — which means that they generally have an output for each track, making transfers easier. But remember that you have to maintain tape equipment to get the best sound quality when transferring your tracks.

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### The Fun Part

Of course, the fun part of all this is what you do when you've completed the transfer, whether that be

applying a little polish to your antique gems, or giving them a new lease of life with a more contemporary-sounding remix. Either way, hopefully this feature has highlighted the main issues that are encountered when transferring audio from most home recording devices, so that the tedious but important transfer process can be a smooth one. [808](#)

#### [top](#) **Tape Maintenance**

If you're transferring material from tape recorders, don't forget that they require regular cleaning and demagnetising to avoid damage to recordings and general poor performance. Levels of magnetism are measured in Gauss (named after the German mathematician and physicist Carl Friedrich Gauss). Most Tascam Portastudio manuals state that as little as .2 Gauss is enough to cause record head trouble — and Tascam claim that playing as few as 10 cassettes will contribute that level! The Fostex R8 eight-track manual similarly recommends degaussing after every eight hours of use. Tascam's notes also insist that all metal parts in the tape path must be cleaned after every six hours of operation, or before and after every session.

[Published in SOS October 2008](#)

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