



The Professional Audio

SourceBook

Section 4b

Multitrack Recorders

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ADAT Type-II 20-bit Digital Multitrack Recorder

Built with the same 20-bit encoding and expansion capabilities as the rest of the ADAT Type-II line, the LX-20 provides an exceptional value in professional multitrack tape recorders. Also featured on the LX-20 is the 9-pin ADAT Sync interface which allows multiple ADATs to be synced together and the ADAT fiber optic, multi-channel digital interface that has become a standard digital interface found across the ADAT line as well as on a wide range of digital mixers and soundcards. The LX-20 makes the concept of an affordable, all digital tape based recording studio a reality.



ADAT Technology

- ▶ Uses standard S-VHS tapes to provide more than enough bandwidth to record 8 tracks of 20-bit digital audio.
- ▶ ADAT tapes are formatted with a proprietary time code with single sample accuracy (up to 1/48,000th of a second) that is much more precise than SMPTE Time Code (1/30th of a second).
- ▶ ADATs are ideal mixdown decks for surround and theatrical sound applications that require more than two-channels.
- ▶ Because time code is written into the subcode area of the tape you can synchronize ADATs without giving up a track. Up to 16 ADATs can be synchronized together for a total of 128 tracks—with single sample (20 microsecond) accuracy.

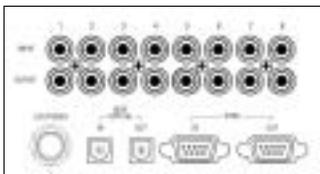
Recording Functions

- ◆ Eight record enable buttons control the input monitor status.
- ◆ Input monitoring is controlled with the Auto Input button which automatically monitors record-enabled tracks. The All Input button monitors all inputs regardless of the record-enable status.
- ◆ Pitch control depends on the current sample rate. +300/-200 cent pitch change is possible when using the 48kHz sample rate, ±200 cent at 44.1kHz.
- ◆ Uses crossfading when punching in and out to make the transition from what's recorded on tape to what is being punched, as smooth as possible. There are four crossfade times available -11, 21, 32 and 43 ms.
- ◆ Analog and digital input select buttons determine how analog and digital signals are routed. When recording from the analog inputs, there are three input modes available to accommodate the different bus architectures of mixing consoles.

Auto Locate

- ◆ There are 5 Locate buttons. Locate buttons 1 through 4 are used for shuttling to specific points on a tape. 0 returns the tape to the zero position. Locate buttons used in conjunction with Auto Play, Auto Return and Auto Record facilitate a number of automated transport functions.

Inputs and Outputs



- ◆ 8 unbalanced RCA inputs and outputs
- ◆ 1/4" TRS jack for supplied LRC (Little Remote Control) or punch pedal
- ◆ ADAT 9-pin female sync input and output allows synchronization and machine control between multiple ADATs and optional BRC remote control.
- ◆ ADAT optical lightpipe I/O carries 8 channels of digital audio between ADATs and compatible devices. Bounce audio from one ADAT to another, mix and edit tracks completely in the digital domain.

Transport Controls

- ◆ Transport controls include REW, FF, stop, play and record. Also offers audible cue and review at 3x normal speed.

Display

- ◆ Time counter shows the current location of the tape in hours, minutes, seconds, hundredths of a second or optionally frames (1/30th of a second).
- ◆ Eight 13-segment meters show either input levels or the levels already recorded on tape. Eight red Record indicators located directly beneath the meters show a track's record status while blue indicators show input monitor status.
- ◆ Three blocks on the lower right hand corner of the display show the active parameter for clock (internal, external, digital) and sample rate (44.1 or 48 kHz), input monitor (all or Auto) and input source (analog, digital or track copy).
- ◆ Status indicators show the bit depth of the current tape (16 or 20-bit), whether various locate functions are enabled, and if a cassette is properly inserted.
- ◆ An interpolation indicator warns that error correction is taking place within the LX-20 and the heads should be cleaned.

ALESIS

HD24/HD24XR

24-track, 24-bit/96kHz Hard Disk Recorders

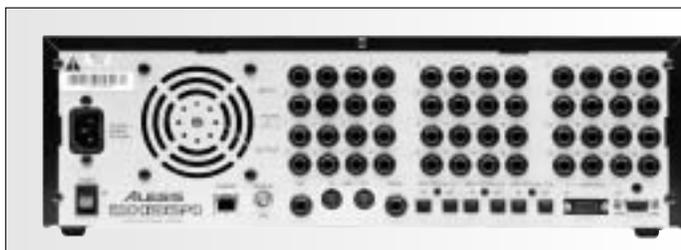
Designed to fit comfortably into any standard ADAT environment and matching ADAT's legendary performance and affordability, the HD24 and HD24XR are hard disk recorders built from the ground up exclusively for the purpose of recording music instead of data — resulting in remarkable stability and performance. And yet, thanks to their use of standard, low-cost IDE

computer drives, the recording media costs no more than traditional ADAT tape on a per track basis. Two hot-swappable media bays provide convenient access to the recording drives, and allow you to backup data in just minutes. You can edit tracks internally or easily transfer to computer via built-in Ethernet. They're the only HD recorders on the market with standard ADAT Optical and ADAT Sync, enabling them to work efficiently with existing systems. Essentially the same, the HD24XR incorporates state-of-the-art 24-bit A-D and D-A converters capable of greater than 110dB dynamic range and providing ultra-low distortion, even at nominal sample rates of 44.1kHz and 48kHz. It is also capable of recording and playing back twelve channels of audio at nominal sample rates of 96kHz and 88.2kHz, as well as 24 channels of audio at standard sample rates of 44.1kHz and 48kHz.



FEATURES

- ◆ The HD24 provides 24 tracks of high-resolution 24-bit recording at standard sample rates of 44.1 and 48 kHz, and supports 12 tracks at 88.2 and 96 kHz when slaved to external digital products. The HD24XR provides 88.2 and 96 kHz analog I/O right from the back panel.
- ◆ Standard connections include 24 analog inputs and outputs (+4dBu, 1/4" TRS), plus 24 channels of ADAT Optical I/O. Also includes MIDI in/out, MTC out, Ethernet, ADAT Sync I/O and external Word Clock input to slave to external clock sources.
- ◆ Internal editing capabilities include cut, copy, paste, and track-move with undo can be done from the front panel, or remote control. Or just send the files (AIFF format) to a computer DAW via the Ethernet ports.
- ◆ Dual recording bays utilize standard low-cost, removable IDE drives so media costs don't break the bank. With custom drive caddies and protective storage cases, affordable IDE drives are hot-swappable, and offer fast back-up (a few minutes for an entire drive, is possible between the two front-panel drive bays)
- ◆ The HD24/HD24XR include a 20GB hard drive which yields 90 minutes of recording time at 24-bit/48 kHz.
- ◆ Instant random access to audio using ADAT/FST (File Streaming Technology). Hit REW or FF and you're there in a flash. The ADAT FST drive format establishes removable drives as the most reliable, easy-to-use multitrack media for pro applications.
- ◆ The HD24/HD24XR offer the digital audio and synchronization connections of the existing ADAT for easy integration into an existing system or to synchronize multiple HD24's to create a larger system. (Up to 5 units can be connected and synchronized to make a 120-track system, simply be daisy-chaining 9-pin sync cables.)
- ◆ The rear panel of HD24/HD24XR includes 24 channels of ADAT optical inputs and outputs and ADAT synchronization I/O connectors to allow them to sample-accurately synchronize with other ADATs or a BRC remote controller. When connected to a BRC, the HD24 "looks-like" three ADATs. (Comes with an Alesis LRC remote control, the BRC remote control is available as an option).



A rear-panel Ethernet port allows the HD24 to be connected as a stand-alone FTP server with its own IP address that can be accessed from a computer network, even over the Internet! Songs appear as folders on any Web browser, containing individual .WAV or AIFF files for each track. You can download and upload files from any HD24 connected to a network. Files can then be processed using computer-based editing applications and moved back to the HD24.

HD24/HD24XR ACCESSORIES

ADAT/FST File Streaming Technology

The HD24 and HD24XR uses a proprietary method of writing to hard disk to provide 24 tracks of 24-bit audio on low-cost IDE hard drives, and drop-in compatibility with over 150,000 ADAT systems worldwide.

- ◆ To give hard disk the same level of utility as tape, Alesis engineered a new method of writing on hard drives, specifically designed for music recording. Unlike the writing schemes employed by computer-based systems, this new method dramatically reduces fragmentation of data and the required "seek time", providing a much greater level of stability in recording and playing back data.
- ◆ Using this method of writing, seek and play functions are much faster than existing systems –under 100ms – and data fragmentation, which can cause crashing, is greatly diminished. As a result, very low-cost, low RPM hard drives can be used with exceptional results. Entire 24-track projects can be stored on a single removable drive, and for the first time the cost of the hard disk storage medium equals that of ADAT tape in cost per GB – less than five dollars.

COMPARING MEDIA COST @48kHz

	Media Unit Price	Recording time per media unit	Qty. req'd for 24 track, 45 min. project	Recording Cost Per track minute	Recording Cost Per 24-track minute	Recording Cost Per Project
ADAT Tape (unformatted)	\$15.00 ea.	42 min. x 8 tracks x 20 bit)	3 tapes	4 cents	\$1.00	\$45.00
Standard IDE Hard Drive 5400 rpm	\$99.00/ 30 GB average	135 min. x 24 track, 24 bit	1/3 of a drive (10 GB)	3 cents	73 cents	\$33.00

HD24 FIREPORT 1394

Easy Connection of HD24 Hard Drives to PC Using Fast "Firewire Interface



The HD24 FirePort 1394 is an affordable interface which allows lightning-fast transfers of audio data from the ADAT HD24 or HD24XR to PC. The

FirePort 1394 allows you to connect the HD24's ADAT/FST hard drives to a computer using a Firewire (IEEE1394) interface, where the audio files can then be incorporated or manipulated using a range of computer software.

- ◆ Comprised of two elements: a hot-swappable docking station for HD24 caddies with an IEEE1394 connection to the PC, and FST/Connect software that allows you to manage ADAT/FST-formatted hard disk drives on the PC. The software not only allows easy audio data transfers to and from the PC, but gives you the ability to manage the file system on the target drive, i.e., creating, deleting, copying songs, and more.
- ◆ The hot-swappable FirePort module allows easy connect/disconnect of HD24 caddies in a convenient and portable desktop design. Once connected, take advantage of up to 400Mb/second transfer rate up. An inline switching power supply eliminates the need for cumbersome "wall warts."
- ◆ With the HD24/HD24XR, the FirePort 1394 offers a complete solution for reliable and expandable cross-platform digital recording.

AI-4

8-Channel AES/EBU to ADAT Optical Interface



The AI-4 is a digital audio interface converter capable of converting AES/EBU and ADAT optical data streams at sample rates of 44.1kHz to 96kHz. Housed in a rack mountable box (1RU high), this powerful converter is the perfect complement for the ADAT owner who needs AES/EBU input, output and conversion. Its simple interface makes this the ideal companion for any ADAT user.

- ◆ The AI-4 is designed to satisfy the requirements of the high-end studio ADAT owner, yet priced so it is just as accessible for the home studio recording engineer. There are many studio applications that require 24-bit ADAT optical to AES/EBU conversion (and vice versa); the AI-4 facilitates the interconnection of systems employing these two very popular digital interface formats.
- ◆ The AI-4 features 8 channels of AES/EBU to ADAT optical as well as 8 channels of ADAT to AES/EBU format conversion. Includes 4 XLR inputs and outputs capable of simultaneous 8-channel full-duplex single-wire transmission and reception. There's separate clocking for each format conversion, BNC wordclock input, and flexible clocking options for optical to AES conversions.

FOSTEX

D2424LV

24-Track Hard Disk Recorder

A computer-based digital multitrack set-up might be fine for studio use, where you can work around limited inputs and complex operational issues, but when it comes to live recording they simply don't cut it. There's only one chance to capture the performance. One chance to capture the magic. You need a solution which is tough, reliable, proven, rack-mountable, expandable and with enough inputs for the whole band—in short, you need the Fostex D2424LV.



Simply the most capable, most flexible, best sounding, easy to use, and affordable digital multitrack ever, the D2424LV is a rackmount digital recorder/editor with removable hard drive and six selectable recording formats, including 24-bit 96kHz. Designed for the live recording/reproduction, the D2424LV features 24-track simultaneous recording capability via 24 switchable balanced/unbalanced 1/4" TRS connectors, 32 virtual tracks, program chain play mode, .WAV file import/export, and non-destructive 99-time Copy/Paste/Move across programs (songs). It also offers MTC/MMC & FEX full implementation, MIDI clock with song position pointer, multiple tempo and signature changes per song, and 'all input'/'all ready' control. Connections include ADAT I/O (S/PDIF switchable) Word I/O, MIDI in/out/thru, ethernet, SCSI-2 and RS422 ports. RS-422 I/O is complemented by the optional Timecode/Sync card, allowing the D2424LV to be used in studio and installation applications. A second drive bay is available for simultaneous back-up via optional second hard drive or DVD-RAM disc, making the D2424LV ideally suited for remote/live recording.

FEATURES

Recording Formats

- ◆ 24 tracks of simultaneous recording and playback is available at 16-bit and 24-bit using sample rates of 44.1 and 48 kHz
- ◆ 8 tracks of simultaneous recording and playback is available at 24-bit using sample rates of 88.2 and 96 kHz
- ◆ 32 additional 'ghost tracks' are available at the 44.1 and 48kHz sample rates for capturing and editing multiple performances
- ◆ 48 additional 'ghost tracks' are available at the 88.2 and 96 kHz sample rates
- ◆ ±6% vari-pitch function by 0.1% step.

Twin Drive Bays

- ◆ Two 3.5" ATAPI BUS compatible drive bays are available for mounting a removable E-IDE hard drive for recording and playback plus an optional 2nd hard drive or DVD-RAM drive for backup and archiving – an optional caddy with mounting kit lets you use the 2nd bay with a removable drive
- ◆ A 50-pin SCSI-2 port is available for backing up recordings to an external hard drive.
- ◆ WAV file import and export is also possible to and from a DOS formatted FAT16 disk via the SCSI-2 interface

Non-Destructive Editing

- ◆ Non-destructive Cut, Copy and Paste editing with multiple chronological UNDOs (limited only by available disk space)
- ◆ Graphical preview function, using level meters, allows you to intuitively pinpoint a desired editing point
- ◆ Tracks can be named and exchanged
- ◆ Program duplication function creates an identical copy of a song program without using additional disk space
- ◆ Editing can be executed across different song programs
- ◆ Jog/Shuttle wheel lets you FF or REW through a recording with full audio monitoring—without altering the pitch. The inner wheel and the audio scrub continuously loops around a very small section of audio allowing you to pinpoint an edit start point precisely.

Comprehensive Editing Functions



Locate Memories

- ◆ 6 point edit memory and up to 99 locate memories can be stored and recalled using the jog/shuttle wheel or by pressing the Prev/Next key
- ◆ The Mark/Stop functions allows you to have the transports automatically stop at a preset Mark point
- ◆ Program Chain Play allows for a compilation of programs to be played back in a certain order

Optional Accessories

9043 Empty Hard Drive Caddy

Robust empty caddy for housing 3rd party IDE hard drives (see Fostex website for the latest drive recommendation)

9044 Drive Caddy & Mounting Kit

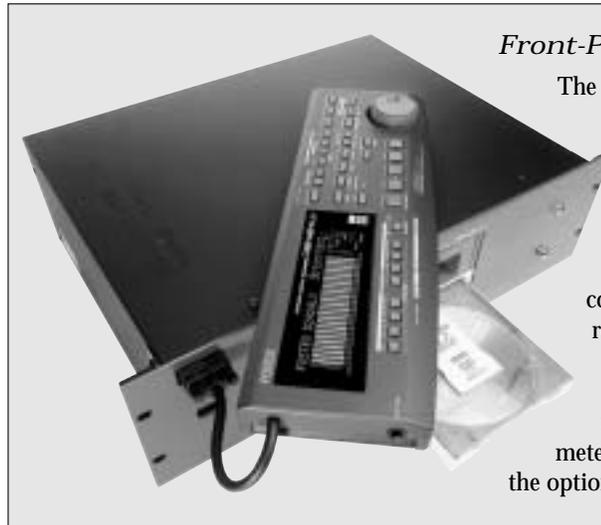
Complete assembly for adding a 2nd caddy-held hard drive for back-up and archive

9046 DVD-RAM Drive

4.7GB DVD-RAM drive (for back-up and archive) fits into the 2nd internal bay

8346 Timecode/Sync Card

- ◆ Sync to external VIDEO/WORD (10 preset sync patterns)
- ◆ Slave to external LTC running across 0h point. Offset can be set to external timecode
- ◆ Timecode can be recorded from internal or external sources to a 'virtual timecode track' keeping all recording tracks free for audio.
- ◆ Internal timecode address can be output as LTC
- ◆ Timecode converted from ABS or recorded timecode can be output as LTC
- ◆ Independent timecode function generates timecode from 24hr clock or any designated timecode address. FORCE JAM also possible. Generated timecode via the output.
- ◆ 24, 25, 30ND, 30DF, 29.97ND & 29.97DF timecode rates
- ◆ Sync to video feature for system integration with various video editors compliant with the P2 protocol



Front-Panel Remote Control

The D2424LV's entire front panel is removable for convenient positioning on the work surface, while the body of the main unit remains in the rack. The front panel controller with its large fluorescent display, transport and locate functions and Jog/Shuttle wheel can be removed and setup up to 10 meters from the main frame using the optional 8551B extension cable.

Synchronization and Control

- ◆ MTC/MMC & FEX implemented for external MIDI control
- ◆ MIDI In, Out and Thru supports MTC and MMC as well as MIDI clock with song position pointer supporting multiple tempo and signature changes per song
- ◆ There is the choice of three time bases (ABS, MTC & bar/beat/clock), up to 64 tempo and signature changes per song.
- ◆ 'All Input' and 'All Ready' functions allow you to check all input signals and make all tracks ready with single button pushes.
- ◆ Word I/O (BNC) is standard for keeping multiple-linked digital devices 'in sync'
- ◆ RS-422 D-sub 9-pin remote in and thru connectors
- ◆ The "Virtual Timecode Track" feature allows recording of timecode from internal or external sources to a 'virtual timecode track' keeping all tracks free for audio.
- ◆ Optional Timecode, Ethernet and timecode cards are available
- ◆ Footswitch control for start/stop as well as punch in/out functions.

Inputs and Outputs



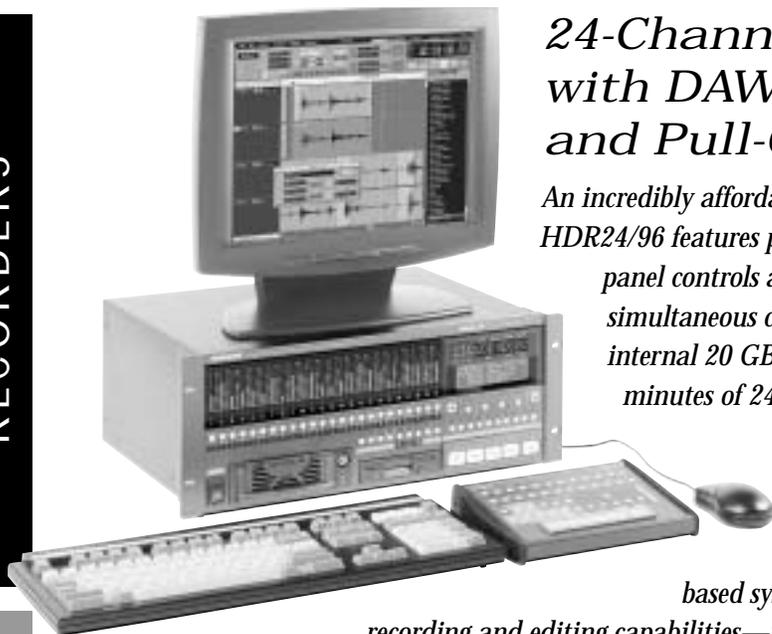
- ◆ 24 balanced 1/4" TRS inputs and outputs using 24-bit 128x oversampling A-to-D and D-to-A converters designed by Asahi Kasei
- ◆ The reference level for the analog I/Os are selectable between -12dB and -20dB.
- ◆ Back up recordings can be to external SCSI-2 media, DAT, ADAT or to an optional secondary internal hard drive or optional DVD-RAM drive
- ◆ Three 8 channel ADAT Optical I/O's (switchable to S/PDIF) are provided for interfacing with a digital mixer, computer-based DAW or any number of multichannel mic preamps with A-to-D converters.

MACKIE

HDR24/96

RECORDERS

500



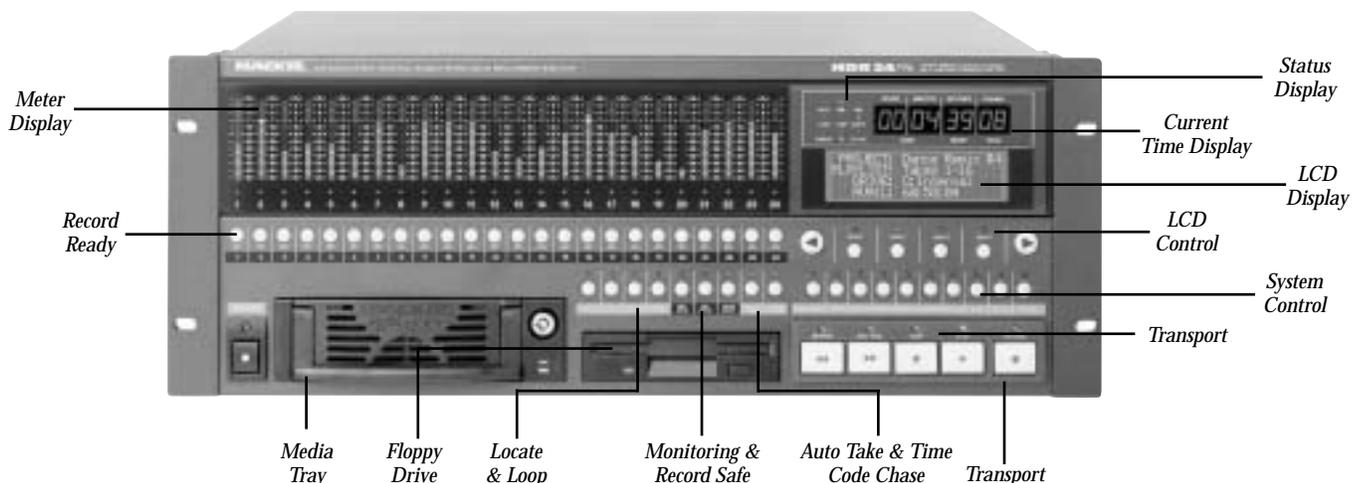
24-Channel 24-Bit Hard Disk Recorder with DAW-Style Editor and Pull-Out Media

An incredibly affordable 24-bit/24-track non-linear hard disk recorder, the HDR24/96 features pristine sonics, pull-out media, intuitive analog-like front panel controls and rugged construction. It has processing power for 24 simultaneous channels at 24-bit/48kHz or 12 channels at 24-bit/96kHz. An internal 20 GB IDE Ultra-DMA hard drive provides storage for up to 90 minutes of 24-track recording while an on-board drive bay accommodates Mackie's Media M-90 pullout disks. Perfect for recordists, as a replacement for older tape-based digital recorders, or in multi-deck, multi-room operation.

Front panel controls are fashioned after familiar tape-based systems. But unlike them, the HDR24/96 offers true, non-linear recording and editing capabilities—record multiple versions of a track or track segment without destroying the original—nothing is lost. All edits are non-destructive as well.

Full-featured DAW-style editing software is accessible by adding an SVGA monitor, two-button mouse, and a standard PC keyboard. No external computer is required to take advantage of the HDR24/96's rich graphic operating interface and editing software. Rear panel ports let you plug the monitor, mouse and keyboard directly into the recorder. The intuitive editing software includes 999 levels of undo, non-destructive drag-and-drop crossfades, regions and super regions, track slipping, audio phase inversion, normalization, pitch shifting, time compression and expansion, audition and scrubbing modes, quantization, one-to-multiple replacement, 192 virtual takes (8 per track), track and take bouncing, and many other familiar features. The SVGA display also provides complete control over recorder functions and features a meter display, virtual transport controls, time code display, scrolling waveforms with 1x/2x/4x/8x/24x display, time bar with user-defined resolution, Punch, Loop, Cue and Tempo Change markers, snap functions, locate, loop and rehearse.

Designed for project studios, live recording, video post production and professional dubbing facilities, the HDR24/96 connects to any console—large or small, analog or digital—using your choice of four optional 8-channel I/O cards including analog, ADAT, TDIF, and AES/EBU (the same ones used for the D8B). It also syncs to SMPTE, MIDI, video black burst, NTSC and PAL clock sources with no additional hardware required, and offers an optional RS-422 (9-pin) card for integration into professional video systems.



www.bhphotovideo.com

MACKIE

HDR24/96

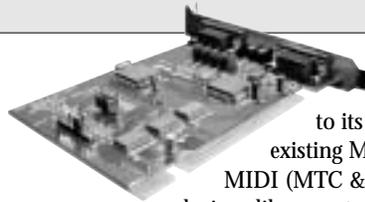
Mackie Media M90

Ideal for studios saving clients projects - or home studios needing to back-up a lot of data, one Mackie Media M90 removable hard drive gives you over 90 minutes of pre-formatted 24-track, 24-bit audio. Consisting of a 20GB UltraDM33 IDE drive, you can back-up from the SDR or HDR24/96's internal drive - or simply record directly to a Media M90 and skip the back-up process altogether. Each Media M90 comes in its own padded storage case, complete with track sheet and project labels for both drive and case.



- ◆ Pre-qualified, pre-formatted, pre-tested
- ◆ Mackie Media drive tray for easy removal
- ◆ Back up entire internal drive at real time
- ◆ Includes padded case with ID label and Mackie track Sheets

Serial•9 RS-422 Card



The Serial•9 is an optional PCI card that installs in the HDR24/96 and adds RS-422 control capabilities to its already-rich feature set. The Serial•9 replaces the existing MIDI card seated inside the HDR24/96 and offers both MIDI (MTC & MMC) and RS-422 communication to/from external devices, like remote controllers and digital audio workstations.

Sony 9-pin Device Protocol

- Slave the HDR24/96 to a wide range of remote controllers
- Have all positional reference in one simple connection
- Expands the applicability of the HDR24/96

MTC and MMC Communication

- Slave the HDR24/96 to a DAW
- Control MMC-compatible devices with the HDR24/96's transport
- Distribute to multiple machines for expanding track count

HDR Pro

With the optional HDR Pro package you can add even greater functionality to the HDR24/96. Using the HDR Pro software you can export HDR Project Files as Digidesign Pro Tools Session files (for 3.x, 4.x, 5.x Mac versions only), and allows Pro Tools Session files to be directly into an HDR Project. In addition, HDR Pro comes with a single-bay Firewire drive that is fitted with a Mackie Media M90 drive frame for direct communication between the M90 and the Mac desktop. This makes backing up projects or swapping to and from the HDR24/96 and Pro Tools a breeze. Easy project storage, too, since you can swap the hard-drives in the Mackie Media M90 drive frame when you need to.



HDR Pro is THE solution for anyone who wants to record with the HDR24/96 and import audio files and session data into Pro Tools.

- ◆ 24-track/24-bit non-linear, non-destructive editing
- ◆ 12-channel 24-bit recording at 96kHz
- ◆ 192 virtual tracks (8 virtual takes per track for overdubs and additional data storage)
- ◆ Use with ANY analog or digital mixer; optional 8-channel cards can be mixed and matched—no converter boxes needed. Choose from ADAT, TDIF, and AES/EBU.
- ◆ Integrates seamlessly with the Mackie d8B for extra functionality
- ◆ 24 individual record ready buttons with LED; transport controls, Track Arm buttons, Locate and Loop
- ◆ Built-in internal IDE hard drive for up to 90-minutes of 24-track recording, plus pullout bay for extra removable Mackie Media hard drives
- ◆ Front panel cut, copy, paste editing with 999 undo's
- ◆ Full meter bridge
- ◆ On-screen graphic interface mirrors front controls and meter bridge
- ◆ Sync to SMPTE, MIDI, Word Clock and video black burst
- ◆ 4 x24 LCD shows operating info, prompts, and selects options via paging buttons
- ◆ 100Base-T Ethernet port for easy file transfer to digital audio workstations
- ◆ The HDR24/96 is an FTP-server as well. Transfer .WAV and AIFF audio files via FTP and Ethernet into a DAW for additional processing and/or editing.
- ◆ 3.5-inch floppy drive bay for importing tempo maps and software upgrades
- ◆ With the optional Remote 48 Controller, you can run 48 simultaneous channels of HDR-24/96s and be assured that all 48 channels will start and stop in unison.
- ◆ Built-in mouse, keyboard and monitor ports—no external computer needed
- ◆ Full-feature editing software built - in
 - Non-destructive cut, copy and paste
 - 999 undo's with real time history list
 - Continuously scrolling track waveforms
 - 2x, 4x, 8x, 12x & 24x track displays
 - Drag and drop crossfades and rack slip
 - Instant drawing and fade in and fade out

MACKIE

HDR24/96, continued

Built-in Editing Software

No expensive Mac or software-laden PC needed. Simply plug an SVGA monitor, PS2 mouse and PC keyboard into the HDR24/96's rear panel ports - and you're ready to go. If desired, the video can be output to a projector or flat screen plasma display. The HDR24/96's software will unleash your creativity allowing you to easily perform the most intricate tasks such as slipping, trimming, looping, fading and cross-fading tracks. In addition to lots of on-screen navigation tools and keyboard short-cuts, the HDR24/96 has an exclusive "Dive Key". Position the mouse anywhere on the track overview and press the 'Z' key on your keyboard. You are instantly zoomed to where you can immediately select, nudge, trim and edit.



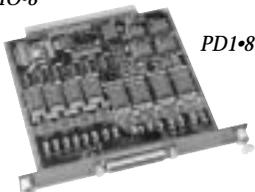
- ◆ Front panel controls are on the screen, and you'll rarely see a menu. 24 track meters display 'plasma-style' peak/hold and averaging levels at the same time. Large 'LED' display shows current time, and the transport controls are right there.
- ◆ Ultra-fast ATI Rage Pro video card allows real-time waveforms to scroll past a fixed 'now' line (instead of jerky page jumps). Select a color palette. View all 24 tracks. Narrow your scope down to a stereo pair. Zoom to view tracks right down to the sample, in real-time - without effecting the HDR24/96's performance.
- ◆ Easily set Cue points, Locates and Punch In/Out points. Capture points on-the-fly from the GUI, keyboard, front panel, or remotes. A pop-out window displays all cue points as you add them. Simply double-click or use the keyboard to locate any point in a project instantly.
- ◆ Easy and powerful drag 'n drop editing. Pull a region out of the region list and drop it onto the track view. Snap the region to Hrs:Min:Sec:Frames or Bars:Beats:Ticks. Pull a region from one track and join it to another to create a new region. Slip regions, trim their beginning or end points. Turn on 'Loop' and drag a region's start or end points as far as you need.
- ◆ Context-sensitive mouse changes from one type of tool to another based on where you move it. The most complex editing tasks become a drag 'n drop breeze. Pull the top right or left corner of a region to create fade-ins and fade-outs. Right click to select the fade curves. Push one region into another and instantly create a cross-fade with your selection of nine fade curve combinations. The HDR24/96 re-draws all waveforms in real-time as you edit.
- ◆ Automate the volume of each region by creating a region volume envelope. Click to add as many volume points as you need. Click again to drag them into position, creating as complex a mix as you can imagine. It mutes, too.
- ◆ Scrub all 24 tracks of audio on the HDR24/96 from the jog/shuttle wheel of Mackie's D8B digital mixer, Remote 48, or any other MMC wheel. But scrubbing gets really cool with the HDR24/96's mouse! Listen to what you're doing as you drag to spot edits and set markers. It's all real-time and designed to make you more creative and productive.

I/O Options for the HDR24/96

Each HDR24/96 holds your choice of four 8-channel I/O cards (the same ones as used in the D8B), as well as a 24-channel card. Mix and match for a wide range of input options.



AIO•8



PD1•8



DIO•8

Opt•24: 24-Channel Digital I/O
Unlike the other I/O cards, the OPT•24 provides 24 channels of ADAT formatted digital audio I/O via three sets of Toslink optical connectors. Because of its unique feature set and design, the OPT•24 is not used in the standard I/O card cage - it is installed in one of the vacant PCI slots inside the HDR24/96 and provides a permanent 24 channel digital I/O platform that can be used in tandem with whatever other I/O cards may be installed - which means you can interface optical and analog/AES formatted signal together without purchasing and swapping I/O cards.

AIO•8: Analog I/O Card
8 balanced line level (+4dBu) outputs and returns for connecting the D8B to analog equipment

DIO•8: Digital I/O Card
ADAT lightpipe and TDIF with format conversion (16/24-bit). Format convert between ADAT and TDIF

OPT•8: Low-cost Digital I/O Card
The low-cost OPT•8 I/O card provides 8 channels of ADAT lightpipe for under \$100!

PD1•8: 24-bit AES/EBU Digital I/O Card
24-bit AES/EBU with sample rate converter on stereo input pair. Plus it has a 96kHz I/O for audiophile-quality recording via esoteric outboard D/A converters

HDR24/96, continued

Remote 48 Controller

Professional hard disk recorders require professional remotes. But Mackie went far beyond just transport controls and record arm buttons when they designed the Remote 48. It fully duplicates the entire front panel of our HDR24/96 Recorder/ Editor—including LCD and LED displays, all function buttons and entry keypad. In fact, the Remote 48 adds features including a weighted jog/shuttle wheel, additional Locate Time display, 10-key keypad and more. Use the Remote 48 to control two HDR24/96s. When connected to an HDR24/96, the Remote 48 controller is fully interactive with the SVGA graphic user interface.



FEATURES

- ◆ Status LEDs show sample rate (44.1, 48 or 96kHz), Bit Depth (16- or 24-bits), Sample Clock, and Time Code status information.
- ◆ LCD display is identical to the one on the front panel of the HDR24/96)
- ◆ Toggle between SMPTE and BBT on the Remote 48 and HDR24/96 front panels
- ◆ Edit Time button lets you edit specific fields within the Locate Time display. Pressing the button once selects the Frames/Ticks field, a second time the Seconds/Beats field, etc.
- ◆ Access LCD display menus such as the Track, Project, Backup, Disk Utility, System, Digi I/O and sync menus
- ◆ Record ready buttons for tracks 1-48
- ◆ Copy the instantaneous value of Tape Time into the Located Time
- ◆ Numeric keypad enters time values or cue numbers into the Locate Time or Cue displays
- ◆ Copy the values of the Locate Time or Tape Time displays into cues, numbered locates, pre-roll time, and loop and punch lengths
- ◆ Record Safe disarms all tracks and disables all recording controls. When enabled, Record Safe prevents you from arming tracks and entering record.
- ◆ Jog/Shuttle/Data Wheel is used for data entry in certain Autolocator operations, such as scrolling through the Cue List or changing time values in edit time operations, in addition to controlling Jog and Shuttle motion.
- ◆ Jog gives precise control over transport cueing by playing audio both forwards and backwards at non real-time speeds in proportion to how the Wheel is rotated. Jog play speed varies continuously between 0x and 1x of normal play speed.
- ◆ Shuttle allows you to play audio both forwards and backwards at non real-time speeds in proportion to how far the Wheel rotated. Shuttle play speed is quantized to 1/32, 1/16, 1/8, 1/4, 1/2, 1x, and 2x the normal play speed.
- ◆ PUNCH automatically punches into Record at the punch in point, and punches out of Record at the punch out point.
- ◆ REHEARSE allows you to practice punching without recording anything to disk, and automatically stores the punch points to the Auto Punch in and out points.
- ◆ AUTOPLAY automatically starts playback when you've jumped to LOC or Cue point.
- ◆ AUTO TAKE automatically increments the active Virtual Take of all armed Tracks at the beginning of each record pass.

Remote 24 *Small Remote*



Designed to work with the HDR24/96, the Remote 24 provides remote control of the most commonly used functions.

- Arm 24 tracks for recording
- Select Record Ready, Auto Input or Rec Safe
- Set up to four locate points
- Select Loop, Punch and Rehearse modes
- Select 8 virtual takes for each of 24 tracks
- Select Auto Take Mode for repetitive virtual track recording
- Delete last record pass button
- 12-segment LED meter for selected track
- Full-size transport controls
- Punch in/out foot switch jack
- Accepts standard Atlas AD-11B flange for mic stand mounting
- Single cable connection to recorder for power and control data

TASCAM

PORTASTUDIO

Since their introduction in 1979, Tascam has sold over 1,000,000 Portastudios, making them some of the most popular tools ever to be embraced by musicians all over the world. Tascam's four models of analog, cassette-based Portastudios—the ultra-affordable MF-P01, the easy-to-use Port02MKII, the 414MKII and the advanced 424MKIII—each offer respective advantages for several levels of musicians and recording hobbyists. However, what they all share is the inexpensive, readily-available cassette tape recording medium, and the integration of simple mixers and recording devices in one portable package.

MF-P01

The simplest and most inexpensive Portastudio ever made, the MF-P01 is ideal if you're just getting into recording your own music. Using the MF-P01 couldn't be easier ... just pop in a standard cassette tape, plug in your instrument, select the track you want and hit "Record". You have four tracks to work with, so recording your drum machine, guitar, vocals and keyboard is no problem.

The MF-P01's easy-to-use recording approach is based on the unit's single Mic/Line input and no buss requirement. To make new songs, simply select the track on which you wish to record by pushing a single button and then adjusting the input level. A 4-dot LED meter allows you to easily identify input signal levels and overloads. During playback, the four-channel mixer section allows users to mix down their songs by simply adjusting each track's output level. To monitoring recordings, the MF-P01 comes complete with both a 1/4" headphone output and an RCA L/R line output. Its small 12 x 8" footprint and light-weight design (a mere 2.5lbs.) means the MF-P01 can be easily carried to and from music lessons, jam sessions or band practice.



- ◆ Perfect for musicians and novice recordists
- ◆ Records one track at a time with classic warm analog sound
- ◆ Includes 1/4" headphone output and an RCA L/R line output.
- ◆ Uses inexpensive standard cassette tapes



Porta 02

A cost-effective self-contained unit designed for the home recording musician, the Porta 02 features two Mic/Line input channels each with a dedicated linear fader, a four channel mixer with LEVEL and PAN controls for each channel, a 4-track cassette recorder with 2-track simultaneous record capability, a headphone monitor output with level control and Mono switch and a Master L-R Line output. Sporting an entirely blue color scheme, the Porta 02's design appearance is especially appealing for today's young musician.

The Porta 02 has a solid and smooth feel to all the knobs and faders - inspiring confidence at every step of the creative process. 2-track simultaneous record capability makes it the perfect tool to capture live performances, as well as multitrack recording. With its mono capability, the headphone monitor output makes it easy to check for phase discrepancies - thus ensuring quality recordings.

- ◆ 4 track 4-channel cassette recorder section
- ◆ Up to 2 tracks simultaneous recording
- ◆ 4-stage LED meters for each track
- ◆ Two 1/4" mic/line inputs for keyboards mics, guitars, drum machines and most other sources
- ◆ Simple 4-track recording with assignable input-to-track routing
- ◆ Headphone monitor out with level control
- ◆ 4-channel Cue mixer for mixing down
- ◆ RCA unbalanced line outputs



EQUIPMENT LEASING AVAILABLE

TASCAM

PORTASTUDIO

414 MKII

Packing high-end features in a convenient, compact and economical package, the 414mkII Portastudio is ideal for newcomers or those experienced in multitrack recording. Use it for demos, as a portable sketch pad, or for practicing recording techniques. A high-speed transport, combined with Hi & Low EQ and dbx noise reduction means great sound.

Four full-function input channels, each with mic/line capability and trim control (two feature XLR inputs and one is a dedicated guitar input). High and low EQ make it easy to capture quality 4-track recordings in any setting. Two effects sends per channel, together with two stereo effects returns, give you plenty flexibility when using effects and external audio sources. Also includes a smooth-action 60mm master fader, 12% pitch control, discrete sync output, and a musician-friendly price.



- ◆ 4-track, 4-channel format
- ◆ Simultaneously 4-track recording
- ◆ 4-mic/line inputs with trim control, supplemented by dedicated stereo inputs
- ◆ Dedicated guitar input with adjustable trim control
- ◆ 2-band High and Low EQ on each input channel
- ◆ ±12% pitch control
- ◆ Zero return function
- ◆ 2 Aux sends for effects processing, one of which is switchable to Tape Cue
- ◆ Separate main and monitor outputs allow mastering and monitoring without repatching Recorder section
- ◆ dbx noise reduction with Sync on/off select
- ◆ 3-3/4 ips tape speed (twice normal speed) for superior reproduction quality
- ◆ Stereo Sub input patches stereo sources, such as mixing consoles direct to L/R busses
- ◆ Sync out terminal for easy MIDI-tape synchronization
- ◆ Optional C-30P foot-switch for hands-free punch in/out control



424 MKIII

A real personal recording studio with a professional mixing console and a logic-controlled cassette deck in a single easy-to-use unit, the 424MKIII is Tascam's finest four track cassette. The 424MKIII is equipped with powerful musical EQ on all six input channels, flexible auxiliary and monitoring systems, and a comprehensive range of inputs and routing options. Advanced feature set includes 2 independent auxiliaries so you can add two separate effects to the same channel. The 3-band sweepable mid band EQ gives you the flexibility to focus on the sweet spot of the sound to help give it a little more life. The 4 XLR mic preamps keep your inputs quieter, and will save you from the hassles of finding the XLR to 1/4" transformers.

- ◆ 4-track 4-channel recording system
- ◆ Simultaneous recording up to 4 tracks
- ◆ 4 assignable XLR mic inputs
- ◆ Logic controlled 4-track tape transport
- ◆ Dedicated stereo inputs (channels 7-8)
- ◆ 6-full-function input channels with Mid-sweepable 3-band EQ
- ◆ 2 Aux sends for effects processing, one of which is assignable to Tape Cue
- ◆ Dual tape speed (3-3/4 and 1-7/8 ips)
- ◆ dbx noise reduction
- ◆ ±12% pitch control
- ◆ Return-to-zero and 2 locate points
- ◆ Repeat function
- ◆ Auto punch I/O with rehearsal function
- ◆ Stereo Sub Input
- ◆ Separate main L-R and monitor outputs
- ◆ Dedicated 4 tape outputs
- ◆ Easy-to-read fluorescent display
- ◆ Optional C-30P foot-switch for hands-free punch in/out control

TASCAM

DA-78HR/DA-98HR/DS-D98

RECORDERS

506

High Resolution Modular DTRS (Digital Tape Recorders)

The DA-78HR is a 24-bit tape-based 8-track modular digital multitrack recorder. Based on Tascam's DTRS (Digital Tape Recording System) technology it provides up to 108 minutes of pristine 24-bit or 16-bit digital audio on a single 120 Hi8 video tape. Designed for project and commercial recording studios as well as video post and field production, it features built-in SMPTE Time Code Reader/Generator, Word Sync In/Out/Thru, MIDI Time Code synchronization. A digital 8 x 2 mixer with pan and level controls and a coaxial S/PDIF digital I/O allows pre-mixed digital bouncing and playback monitoring within a single unit, or externally to another recorder or even a CD recorder. Additional features include 8-channel TDIF-1 digital I/O, pitch control, test tone generator, electronic patchbay, machine offset in sub-frame or sample rate accuracy and Auto Punch I/O in 0.1 frame accuracy. LCD display, set-up data memory on tape, seamless punch I/O with digital cross fade, adjustable peak hold release time level meter and an A/B head playback error rate-display function. Up to 16 DTRS machines can be synchronized together for simultaneous, sample accurate control of 128 tracks of digital audio.



The DA-98HR has all the features of the DA-78HR plus it adds the audio quality and critical features required for high-end post production and commercial recording facilities. As well as 44.1 and 48 kHz sampling frequencies, the DA-98HR can record and playback 24-bit or 16-bit recordings at 88.2/96kHz (4-tracks) and 176.4/192kHz (2-tracks) sampling frequencies. In fact, different sampling frequencies can be recorded simultaneously on different tracks on the same tape, providing the ultimate in flexibility.

Additional step-up features include confidence replay mode, allowing off-tape monitoring while recording is in progress and 9-pin RS-422 control. XLR time-code input/output terminal with an onboard SMPTE synchronizer, Video sync allows the DA-98HR to be used while synchronized to other recorders so that backup tapes can be constructed as the session progresses. Multi-channel AES/EBU digital I/O provides instant integration into digital patchbays, DAWs, and other systems. Also offers a user-friendly setup menu with comprehensive LCD display and direct menu access soft keys.

Identical to the DA-98HR, the DS-D98 is designed to support the Sony Direct Stream Digital format for Super Audio CD (SACD). The DS-D98 can be configured in both a DSD two-track and PCM multitrack format—the only tape-based machine capable of SACD recording as well as the only tape-based system designed for high resolution DSD audio recording that allows multiple units to be synchronized.

In DSD mode, the DS-D98 functions as a 2-track recorder/player with synchronization of up to 16 units and to other DTRS recorders and features Sony's SDIF-3 digital I/O. PCM recordings are backward compatible with existing DTRS recorders.



DA-78HR/DA-98HR/DS-D98

Transport Controls

- ◆ Standard transport controls include Play, Record, Fast Forward, Rewind and Stop
- ◆ Pitch is variable $\pm 6\%$ in 0.1% steps
- ◆ Precision rotary shuttle knob advances or rewinds tape at 1/4 to 8 times normal speed. While shuttling tape, the monitor output level is automatically attenuated by 12dB of the normal playback level.
- ◆ Shuttle monitor button mutes the over-bearing, high pitched squeals associated with high speed shuttling.
- ◆ Fast frame accurate tape location and positioning; end to end winding of a "120" tape is 80 seconds

Synchronization

- ◆ Full SMPTE/EBU operation with on-board time code reader/generator and support for all frame rates including 29.97 DF/NDF 30, 25 and 24 fps.
- ◆ ABS (Absolute Time) can be converted to SMPTE time code. SMPTE time code can also be offset from the ABS time code.
- ◆ When time code is on part of a tape and you want to stripe the rest, an assembly time code function will read a few seconds of the time code and jam sync the generator and stripe the rest of the tape.
- ◆ Re-chase time code is achieved monitoring the internal (Absolute Time Code) and external code and then slowing down or speeding up the transport to ensure consistent sync or it can run freely once the initial sync has been achieved, ignoring incoming time code. The re-chase window settable to 1 or 2 seconds, determines the amount of drift that is tolerated before re-chasing is necessary.
- ◆ Time code errors of 10 or 30 frames can be set up to be bypassed and ignored.
- ◆ The park position of a slaved DTRS machine is the pre-roll time needed for the machine to lock to timecode. Park position can be preset or automatically set to the optimum park position.
- ◆ MTC (MIDI Time Code) support allows synchronization between the DTRS machine and a MIDI compatible device and can be output when the DTRS is playing, in FF, rewind or when stopped.

High Resolution DTRS Technology

- ▶ Selectable 24-bit and 16-bit recording at 44.1 or 48 kHz sampling rate
- ▶ 24-bit, 128x over-sampling analog to digital and digital to analog converters
- ▶ 1 hr. 48 min. recording time on a single 120 Hi8 tape
- ▶ 20Hz - 20kHz frequency response and 104dB dynamic range
- ▶ Fully compatible with DA-88 machines.
- ▶ When synching multiple DTRS units, it is sometimes necessary to offset the time between one or more slaves in relation to the master deck. All DTRS units have frame accurate offset capabilities independent of SMPTE time code functions.
- ▶ Track Advance and Track Delay from -200 to 7200 samples in 1 sample steps can add subtle nuances to a musical groove or tighten the synchronization of a sound effect.
- ▶ Tape formatting process writes subcode information such as ABS (Absolute Time) on the non-audio portions of the Hi-8 tape. This ensures machine to machine compatibility of tape with no potential for loss of timing information due to tape stretching or fraying.
- ▶ Exclusive, interleaving write after read 4-head system provides superior drop out protection and yields significantly more area read on tape.

Editing

- ◆ Digital Track Copy function allows assemble or composite editing between machines or within a single unit. For example, copy tracks 3 and 4 to tracks 5 and 6 within one machine or copy tracks 3 and 4 of one to tracks 5 and 6 of another machine.
- ◆ Highly accurate and reliable transport mechanism features DD brushless motors
- ◆ Built-in digital patchbay allows routing any input to any track digitally. For example input 1 can record to track 2 and input 2 can record to track 1.
- ◆ Offset times between master and slave units(s) can be set on the fly while machines are in the play mode, or by entering a specific offset time

On-Board Stereo Mixdown Functions

- ◆ Level and pan controls for each channel (controllable via MIDI or from the front panel of the unit)
- ◆ They have a read before write feature that allows tracks 1 through 8 to be bounced to tracks 7 and 8
- ◆ Digital direct-track copying within a single unit or between multiple units
- ◆ Coaxial S/PDIF digital I/O accommodates direct mixdown from the DA-78HR multi-track to a compatible digital recorder such as DAT, CDR or DAW

Auto Locate And Punch

- ◆ The points at which recording is started and stopped are automatically stored in memory as punch points.
- ◆ Auto Punch allows hands-free punch in and out recording of a section of audio. A rehearsal function allows setting and auditioning the in and out points before executing the punch.
- ◆ Two Auto Locate points allow one button access to any two positions on a tape, or use for a beginning and end marker for continuously looping a section of audio.
- ◆ The exact position of locate and punch points can be set by min/sec/frames
- ◆ Pre-roll times for locate and punch points are independent and can be set from 0 seconds to 59 minutes and 59 seconds.
- ◆ When executing an edit or punch, the crossfade time between the signal on tape and the input signal to be recorded, can be set from 10 to 90ms (milliseconds)
- ◆ In Auto Play (after rehearsal is complete) the tape automatically rewinds to the pre-roll position before the punch in location

TASCAM

DA-78HR/DA-98HR/DS-D98

Conveniences

- ◆ All Input Monitor Button automatically sets all outputs to monitor the audio inputs, regardless of the transport status. This function is primarily used for alignment purposes and is equivalent to pressing all of the input monitor switches.
- ◆ Auto Input/Auto Monitor switch automatically activates the inputs when shuttling, fast forwarding or rewinding or in stop mode. This is useful for allowing talent to communicate with the engineer when no audio is being played.
- ◆ They can display how many hours are on the drum heads. This is useful for determining when routine maintenance such as head cleaning may be necessary.

Synchronization I/O

- ◆ MIDI in/out/thru allows MIDI timecode (MTC) synchronization as well as MIDI Machine Control (MMC)
- ◆ Remote/ Sync In and Sync out used for connection with optional RC series remote controls as well as allowing the unit to be used in a master/slave system.
- ◆ Word clock in/out and thru (via BNC connector) ensures that digital audio transferred between machines via T/DIF or S/PDIF I/O is synchronized.

Inputs and Outputs

- ◆ Eight unbalanced analog RCA inputs and outputs
- ◆ Two 25-pin connectors provide eight channels of balanced analog inputs and outputs
- ◆ 25-pin T/DIF (Tascam Digital Interface) connector is used for transferring up to 8 channels of digital audio to and from units conforming to the T/DIF format.
- ◆ Remote punch in/out connector for use with the optional RC-30P footswitch
- ◆ RCA in/out allows all SMPTE/EBU time-code frame rates to be read or generated



Additional Features

- ◆ All functions are front panel accessible including, machine ID (used in multi machine configurations), trim and tape locate positions, test tone oscillator and defining pre-roll time.
- ◆ 12-segment LED peak reading level displays
- ◆ Internal digital sine wave generator provides signals of A-440 and 1kHz at the nominal operating level of +4dBu for tuning and meter calibration
- ◆ When recording from a 20- or 24-bit word length to a 16-bit length, dithering can be set to add noise to low level signals to prevent unwanted quantization noise to the signal.
- ◆ There are three dither settings available: No Dither, Triangular and Rectangular which gives 3dB better S/N ratio than triangular but may add noise modulation to the signal.

Optional Remote Control Units for the DA-78HR/DA-98HR/SD-D98



RC-808 Remote Control

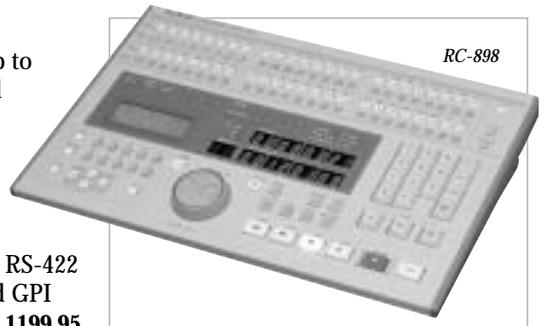
Controls all of the basic transport functions including, record, auto-locate, monitor switching, track arming and punch**179.95**

RC-828 Remote Control

For controlling up to four DTRS machines with transport control, track arming, 12 locate memories, jog/shuttle and more**529.95**

RC-898 Remote Control

Provides accurate control of up to 6 DTRS machines including all basic transport functions, input monitoring and track arming. It also controls the transport functions of external units conforming to the Sony P2 protocol using the RS-422 interface, as well as parallel and GPI controlled devices**1199.95**



- ◆ No power supply, draws power from DTRS units.
- ◆ Up to 99 location memories can be stored and edited with frame accuracy.
- ◆ Time code values are input with a positive feel numeric key pad.
- ◆ Convenient menu system with 20-character by 4-line backlit LCD display.
- ◆ Twenty frequently accessed menu settings can be assigned to function keys for quick and easy recall.

- ◆ All time code formats are supported as well as pull up/pull down.
- ◆ Up to 10 setup configurations of the RC-898 and up to 6 DTRS units can be stored in memory for instant recall.
- ◆ Location memories and configuration settings are stored in battery-backed memory.
- ◆ Includes remote/sync cable and remote/sync terminator

DA-78HR/DA-98HR/DS-D98

DA-98HR and DS-D98 Step-up Features

Not only can the DA-98HR record 8-tracks of 24-bit audio at 44.1 and 48 kHz, it can also record 4 tracks of 24-bit audio at 96kHz and 2 tracks of 24-bit audio at 192kHz making the DA-98HR the ultimate mixdown deck. The DA-98HR builds on the DA-78HR and adds critical features for post production including the availability of AES/EBU digital I/O for instant integration into digital patchbays, DAWs, and more! The DA-98HR can also be controlled with standard DTRS remotes, or via 9-pin serial.



STEP-UP FEATURES FROM THE DA-78HR:

- ◆ Confidence replay mode allows direct monitoring off of tape while recording
- ◆ Input monitor mode allows channel by channel source monitoring regardless of tape transport status
- ◆ Simplified source/tape monitoring functions with automatic switching
- ◆ Edit and punch crossfade times are selectable between 10 to 200ms
- ◆ There are three user setup memory banks for storing setup profiles
- ◆ Menu settings are displayed on a LCD display with cursor and Enter/Escape keys
- ◆ 10-soft key location memories in addition to the basic memo 1 and memo 2 locate points used for looping and punches
- ◆ Pull up and pull down functions are provided to adjust sampling frequencies to drop frame rates. For example, since the frame rate of film (24 FPS) and the frame rate for video (29.97 FPS) don't conform to a simple mathematical ratio, audio sampling frequencies would be affected on transfer back to film
- ◆ Ten most commonly used functions can be assigned to soft keys
- ◆ 15-segment peak level meters have selectable fall ballistics and hold time ranging from 0 to 9 seconds and continuous peak hold
- ◆ Reference levels for the analog I/Os are selectable between three standard values: Tascam (-16dB), SMPTE (-18dB) and European (-20dB)

Inputs/Outputs

- ◆ Four stereo XLR balanced AES/EBU digital I/Os
- ◆ RS-422 port allows the DA-98HR to be controlled from an edit controller
- ◆ Control I/O allows parallel control of the DA-98HR
- ◆ XLR balanced time code In/Out provides connections for SMPTE time code sync functions DA-98
- ◆ Video In/Thru BNC connectors carry video frame sync signals when the DA-98HR is used with professional video equipment

DS-D98



The DS-D98 is the only tape-based recorder that supports Sony's Direct Stream Digital (DSD) for Super Audio CD (SACD) creation. DSD recording uses a 2.8224 MHz sampling frequency for the original 1-bit data to allow

direct recording of a Super Audio CD master, producing possibly the highest fidelity audio available from today's digital technology.

The DSD-98 can be configured in both a DSD two-track and PCM multitrack format: In DSD mode, the unit functions as a 2-track recorder/player with synchronization of up to 16 units and to other DTRS recorders and features Sony's SDIF-3 digital I/O. In PCM multitrack mode, the DS-D98 features a selectable 24-bit or 16-bit recording format with 44.1, 48, 88.2, 96, 176.4, 192kHz sampling frequencies. (44.1/48kHz: 8-tracks, 88.2/96kHz: 4-tracks, 176.4/192kHz: 2-tracks). Recordings made on the DS-D98 are backward compatible with existing DTRS recordings. Additional features include: +/- 6% pitch control, an onboard test tone generator, electronic patchbay, TDIF-1 digital audio interface and 25 pin 8-channel AES/EBU digital I/O.

Otherwise identical to the DA-98HR, the 4U rackmountable DS-D98 features a confidence monitoring function, selectable reference levels, a LCD display on the front panel, set-up data memory on tape, seamless punch I/O with digital cross fade, adjustable peak hold release time level meter and an A/B head playback error rate display function. It also supports RS-422 control (P2 protocol). Its synchronization capabilities include XLR time-code IN/OUT terminal with an onboard SMPTE synchronizer, Word Sync In/Out/Thru, Machine offset in sub-frame or sample rate accuracy, and Auto Punch I/O in 0.1 frame accuracy.

TASCAM

MX-2424/MX-2424SE

RECORDERS

510

24-bit 24-Track Hard Disk Recorder/Editors

One of the most popular 24-track recorders ever made, the MX-2424 offers the winning combination of excellent fidelity, sturdy construction, ease of use and digital audio file compatibility for serious musicians, engineers, studio owners and other production professionals.

Extremely powerful, the MX-2424 is capable of 72 simultaneous tracks of throughput (playing back 24 tracks of audio, recording 24 tracks and doing 24 tracks that are crossfaded together at the punch points) without a glitch. Its hard disk formats and audio file types make it the most compatible standalone hard disk recorder for interoperability with leading DAW applications like Pro Tools and Logic Audio. It features a 9GB internal hard drive as well as a SCSI Wide port that supports external hard drives from up to 40 feet away. And optional analog and digital I/O cards are available so the MX-2424 can be configured to suit any environment. SMPTE synchronization, Word Clock, MIDI Time Code and MIDI Machine Control are all built-in for seamless integration into any studio. Finally, the MX-2424 is more than just a recorder. Bundled with Tascam's MX-View graphic editing software it is also a sophisticated audio editor with the editing capabilities of a digital audio workstation. Exactly the same, the MX-2424SE includes an 18GB removable front-panel SCSI drive.



It features a 9GB internal hard drive as well as a SCSI Wide port that supports external hard drives from up to 40 feet away. And optional analog and digital I/O cards are available so the MX-2424 can be configured to suit any environment. SMPTE synchronization, Word Clock, MIDI Time Code and MIDI Machine Control are all built-in for seamless integration into any studio. Finally, the MX-2424 is more than just a recorder. Bundled with Tascam's MX-View graphic editing software it is also a sophisticated audio editor with the editing capabilities of a digital audio workstation. Exactly the same, the MX-2424SE includes an 18GB removable front-panel SCSI drive.

FEATURES

- ◆ Record up to 24 tracks of 24-bit 44.1/48 kHz audio (or 12 tracks at 88.2/96 kHz) simultaneously using any combination of digital and analog I/O.
- ◆ Supplied 9GB internal drive allows 45 minutes of audio across all 24 tracks.
- ◆ SCSI connector in the back allows you to add external SCSI Ultra2 Wide hard drives or extended recording times and backup. There is also a front panel 5-1/2" bay available for installing an additional drive, or an approved DVD-RAM drive for back-up, using affordable DVD-RAM media.
- ◆ Since every hard disk recorder writes a particular type of audio file format to its particular format of hard disk, Tascam chose two of the most popular formats for use in the MX-2424: Sound Designer II for HFS/HFS+ Mac formatted disks and FAT-32 Broadcast Wave (compatible with .wav files) for PC disks. Because they support time stamping, these formats make it easy to move your audio files from the MX-2424 into audio editing systems like Pro Tools, Digital Performer, Cubase and more.

Transport Controls

Whether you're a novice recordist or an engineer at the top of a commercial recording facilities, you'll appreciate the ways the MX-2424 lets you navigate through a project.

- ◆ MIDI In, Out, and Thru ports are built-in for MIDI Machine Control.
- ◆ A footswitch port lets you use a punch-in pedal, or an Alesis LRC remote control.
- ◆ 100 locate points
- ◆ Pre-roll and post-roll functions for auto-punching
- ◆ Jump ahead and jump back a few seconds with an easy key press
- ◆ Play through, from or to a captured In or Out point for easy edit point previews.
- ◆ Numeric keys that let you enter a time code value and press locate.
- ◆ Last button locates to where you last hit Play and begins playing
- ◆ Scrub/shuttle wheel lets you feel and sound like there are, even scrubbing in reverse

Editing

- ◆ Built-in editing capabilities include cut, copy, paste, split and ripple or overwrite
- ◆ 100 levels of undo from the front panel
- ◆ Offers two recording modes. And while both offer 999 virtual tracks and lightening fast punching performance, each mode provides its respective advantages.
- Loop Mode is a non-destructive recording mode (similar to a DAW) that continuously records new takes without erasing the previous version. This mode is ideal for those who want to take advantage of the extensive onboard editing tools and 100 levels of record/edit Undo.
- TL Tape Mode is a destructive recording mode that rewrites directly over the existing track or tracks during loop recording (just like a tape-based multitrack with a big fat 2" reel of tape.). This mode maintains a predictable amount of disk space while creating single audio files per track that can easily be imported into your Mac or PC DAW and conserving as much disk space as possible.



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TASCAM

MX-2424/MX-2424SE

Integration

- ◆ Any system compatible with SDII or Wave files can import MX-2424 audio files. If that system supports time stamped audio files, they can be placed at their original time code location with sample accuracy.
- ◆ Using a format compatible with digital audio/sequencing programs and digital audio workstations called Open TL, these systems can read and write to/from the disks used in the MX-2424 to offer playlist compatibility and recognition of virtual tracks without have to load, reposition and trim each digital file.

Comprehensive On-Board Synchronization

Designed in conjunction with TimeLine, the acknowledged world leader in synchronization tools, the MX-2424 is able to offer the best sync tools of any hard disk recorder today. With exceptionally low jitter and its capability of frame-accurate lock to incoming SMPTE time code, the MX-2424 leads the way in the integration of standalone hard disk recording into the all-digital studio.

- ◆ Word Clock In, Out and Thru ports ensure that the sampling rate of connected equipment is properly aligned.
- ◆ SMPTE synchronizer for generating or chasing SMPTE time code. This allows the MX-2424 to lock to any device that receives or generates SMPTE time code.
- ◆ MIDI In, Out and Thru for controlling the MX-2424 via MIDI Machine Control and MIDI Time Code.
- ◆ Video In and Thru: Allows the MX-2424 to lock with a blackburst signal from video.
- ◆ TL-Bus synchronization allows up to 32 machines (768 tracks at 48kHz or 384 tracks at 96kHz) to be locked with sample accuracy without any external synchronizer.
- ◆ AES/EBU (with selectable input sample rate conversion) and S/PDIF I/O to automatically clock the MX-2424 or transfer audio to digital devices
- ◆ Updates are available via a Smart Card slot in the front panel, or, downloaded directly from Tascam via the ethernet port.
- ◆ Ethernet port also lets you transfer audio files to your computer and back, as well as letting you back up entire projects.

MX-View Editing Software for the MX-2424

Offering a sophisticated graphic editing interface comparable to full-featured digital audio workstations, MX-View lends powerful editing capabilities to the MX-2424, making it the most comprehensive affordable yet professional recording/editing system ever made.

Running on both Mac and Windows, MX-View is a quick and responsive editor, with the ability to view waveforms down to the sample level. You can repair clicks and pops with the pencil tool, select and nudge audio events to the correct beat, drag and drop audio files with the hand tool, fade, crossfade and trim events on the fly.

The MX-View interface also functions as a complete system interface for as many MX-2424s as you wish. Multiple MX-2424s can be displayed and edited on the screen simultaneously... no need for a separate monitor for each machine. Plus, each machine's 24-track on-screen meters can be clearly seen from the MX-View windows, making it a thorough remote control interface.

Buttons and windows can be hidden as needed, and color-coded edit groups makes editing across multiple tracks a snap. Keyboard command sets can be configured, and windows like the transport, locate markers, and level meter can be moved around freely and stored as a user preference.



24-Channel I/O Options

A variety of optional 24-channel audio interface options including analog and a variety of digital protocols such as TDIF, ADAT optical and AES/EBU, allow you to connect the MX-2424 to any digital or analog console as well as popular digital audio recording/editing system. But that's only half the story... on the MX-2424, you can use both the analog and digital interfaces simultaneously. Using this versatile routing, you could record through the MX-2424's analog converters and monitor via a digital console. And with the exception of the ADAT Optical Interface, all MX-2424 I/O cards support 96kHz sampling rates.

- IF-AN24: 24-channel, 24-bit 96/48kHz A-D/D-A
- IF-TD24: 24-channel TDIF digital I/O
- IF-AD24: 24-channel ADAT digital I/O
- IF-AE24: 24-channel AES/EBU digital I/O

RC-2424 Remote Control for the MX-2424

Offers complete transport control and system set-up with the familiar front panel layout of MX-2424 (controls up to 6 MX-2424 machines)

- ◆ 8 user-definable macros for frequently used keystrokes. Additional functions for controlling the TL-SYNC
- ◆ Status lights offer immediate indication of important functions
- ◆ Additional keys dedicated to editing functions, like capturing and auditioning in/out points for punch-ins or edits, allow you to work faster and more comfortably.

