TASCAM®

DA-98HR
Technical Documentation

PRODUCT OVERVIEW

The DA-98HR brings the full power of TASCAM's DTRS line into the realm of high resolution recording. The DA-98HR can format, record and play 16 bit tapes for backwards compatibility with the previous DTRS (ie DA-88 or DA-98). For high resolution, you can record 24 bit audio on 8 tracks at 48kHz, 4 tracks at 96kHz, or 2 tracks of 192kHz. On-board professional control and synchronization includes DTRS sync, SMPTE chasing/generating, video sync, RS-422 (Sony P2) control, parallel control, MMC and MTC are all included. TDIF and AES/EBU digital I/O is standard. The optional IF-AN98HR is available for adding 24 bit/96Hz analog I/O. The MU-8824 remote meter bridge is also available.

- 108 Minutes of Record Time on 120 Hi8 Tape
- Records 8 tracks of 24 Bit Audio To Hi8 Tapes
- Reads and Writes 16 and 24 Bit DTRS Tapes
- 8 track/48kHz, 4 track/96kHz, or 2 track/192kHz High Resolution Recording Modes Available
- 16 Machine Sample Accurate Lock with DTRS Sync
- SMPTE Time Code Generation and Chasing
- Sony P2 Compliant (RS-422) Serial Control
- Parallel I/O Port for Control and Tallies
- Responds to MIDI Machine Control
- Generates MIDI Time Code
- Word Sync In/Out/Thru
- Video Sync In/Thru
- AES/EBU Digital I/O provided on DB25 port
- TDIF Digital I/O & SPDIF Digital I/O
- Clear Back-Lit LED Display
- Confidence Monitoring (Read after Write)
- Track Slip from -200 to +7200 Samples
- Meter Bridge Port for Optional MU-8824
- Compatible with Previous RC-828, RC-848 and RC-898* DTRS Remotes
- Optional IF-AN98HR provides 24 bit/96kHz analog I/O

** The RC-898's LCD screen can duplicate the menus of the DA-98HR's with a free firmware update available from TASCAM. Without the update, RC-898 control over the DA-98HR will still be capable of transport control, track arming, locate points, etc.*

APPLICATIONS

TASCAM's line of DTRS machines earned their role as the standard machine for audio in video and film production. The DA-98HR brings the DTRS reliability into the high resolution recording environment.

Production Recorder • Back-up Recorder • Extra Tracks
The DA-98HR is a top quality recorder, well equipped for audio or video applications. The DA-98HR's solid time code chasing capability along with it's parallel and serial control ports allow the machine to efficiently operate as either primary tracks, ancillary tracks, or even as a back-up machine. Plus, the DA-98HR can integrate seamlessly with earlier DTRS machines.

Studio Transfers
The DTRS format is the transfer medium of choice in the business. Since the DA-98HR can read and write 16-bit DTRS tapes that are compatible with older DA-88s, you are assured compatibility with facilities equipped with the older machines. However, if you are working with studios which have DA-98HRs or DA-78HRs, you will be able to take advantage of higher resolution audio.

Live Recording/Mobile Trucks
The DA-98HR offers Confidence Recording which puts the machine into a read-after-write recording mode. This allows monitoring off tape while recording. (Most digital recorders simply allow you to monitor the audio sent to it.) This is ideal for live tracking to ensure your tapes are accepting the information being sent to it.

SPECIFICATIONS

General Specifications:

Format:	DTRS and DTRS-HR
Time to Play from Stop:	< 2 seconds
Shuttle Speeds:	8x, 4x, 2x, 1x, 0.5x, 0.25x
Varispeed:	±6%
Subcode:	Independent ABS and SMPTE TC
Sampling Frequency:	44.1, 48, 88.2, 96, 176.4, 192kHz
Recording Resolution:	16 bit, 24 bit
Crossfade Time:	10ms to 200ms (10ms increments)
Track Delay:	-200 to +7200 samples (set in samples or msec)
Meter Unit Port:	DB15 (For TASCAM MU-8824)

Audio I/O:

Digital I/O:	TDIF (DB25), AES/EBU (DB25)
Reference Level:	-16dB FS, -18dB FS, -20dB FS
Word Sync In and Thru:	BNC, 75 Ohm (auto terminated)
Word Sync Out:	BNC, 75 Ohm
Option Slots:	Accepts IF-AN98HR analog I/O cards

Control I/O:

Remote/Sync:	DTRS Sync DB15 IN/OUT RS-422 Serial (P2 Compliant) DB37 Parallel Port
Time Code In:	XLR balanced, >10kOhm, 0.5V-10V p-p
Time Code Out:	XLR balanced, <100 Ohm, 2V p-p
Video Sync In/Thru:	NTSC or PAL, 1 V p-p, ±0.2V Negative Sync Composite or Sync Composite
SMPTE Frame Rates:	30fps, 30dfps, 29.97fps, 29.97dfps, 25fps, 24fps, pull up and pull down facilities
Timecode Offset:	Up to 24 hours, jamsync capable
MIDI I/O:	In, Out, Thru

Physical and Electrical Specifications:

Dimensions:	482x176x356mm, 19" x 6.9" x 14"
Weight:	11kg, 24 lbs
Power Requirements:	USA/Canada 120VAC, 60Hz UK/Europe 230VAC, 50Hz Australia 240VAC, 50Hz
Power Consumption	62W
Electromagnetic Environment:	E4

DTRS HISTORY

Ever since the introduction of the DA-88 in 1992, users of all levels have been using DTRS machines to create, mix, and transfer their tracks at home and between studios. The DTRS standard has become renowned for top quality sound, top notch reliability, and the fastest transport and machine lock in the business.

The DA-88 was originally intended for the music market, but since it was so full featured, it also found its way into major television and motion picture studios. The DTRS format has long been the standard format to move audio from one studio to the next, due to the affordable nature of the machine and media, as well as the high audio quality. In addition, a number of studios have been using DA-88s to expand their track count by having the DA-88 chase analog machines, or other digital formats.

TASCAM's DA-88, the original DTRS format recorder

With the introduction of the DA-38 and DA-98 in 1996, the DTRS machines added some new features like a digital patchbay, test tone oscillators, and an even faster transport than the original DA-88. Still, the DA-88 had made such an indelible mark on the industry that it's production was continued by popular demand into the year 2000.

The DA-78HR and DA-98HR are following in the footsteps of its heritage, continuing the traditions established and attested to over the years at a new standard - 24 bit.

All in all, the DTRS machines give you the best sound, the most flexibility, and tried and true reliability that has been proven for almost a decade.

THE 24 BIT ACHIEVEMENT

When the 24 bit DTRS format was announced, most users were curious about how we did it. 24 bit audio requires 50% more data than the original 16 bit format, yet the DA-78HR didn't cut back on tracks or record time. Many assumed that the 24 bit format would have been less reliable since more information is written in a smaller space. Well, actually the 24 bit format is even more reliable. Here's why:

When digital information is written to tapes, it isn't like writing a bunch of ones and zeros on a piece of paper. All the data passes through an encoder and decoder (codec) when going to and coming from tape. The coding process utilizes a lossless algorithm allowing a larger amount of data to be stored in the same amount of space.

The original DTRS format utilized a codec based on the 8-10 Modulation Principle used by most all DAT recorders. This format has been around for almost two decades; more efficient encoding schemes have been developed over time.

High resolution DTRS machines utilizes the 1-7 RLL (Run Length Limited) codec commonly used in hard drive and DVD technologies. This format is 66% more space efficient than the codec used in the original DTRS machines. Since only 50% more data was needed to store the audio itself, the other 16% was dedicated to additional data verification beyond the original DTRS machine.

So, the 24 bit DTRS machines do not reduce the print size. The write area is actually about the same size. The 24 bit machine utilizes a better codec which offers more efficient use of the space, as well as increased reliability through more accurate data verification processes.

BACKWARDS COMPATIBILITY

When the high resolution machines were designed, the ability to work with the original 16 bit machines like DA-38s, DA-88s, and DA-98s was a high priority.

Sync Chain
High resolution DTRS machines use the same DTRS Sync line that the previous machines used. So, you can lock any combination of 16 bit machines with 24 bit machines sample accurately in 2 seconds or less.

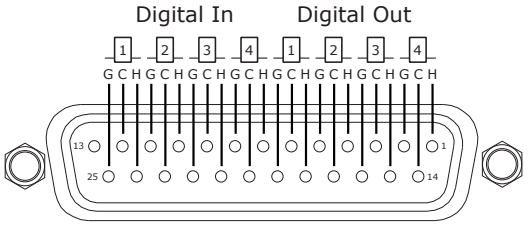
Audio I/O
The new high resolution DTRS machines use the same DB25 plugs for balanced audio, and TDIF lines for transfers and integration into digital studios. This means if you are trading out 16 bit machines for 24 bit machines, there are no new cabling requirements.

Tape Format
The DA-98HR can read and write 16 bit format tapes, allowing HR users to seamlessly work with owners of older DTRS machines. However, 24 bit tapes created on a high resolution DTRS machine will only work on other high resolution DTRS machines.

Time Code Track
In addition to the 8 tracks of audio, DTRS machines can handle two separate time tracks in subcode of the tape. One of the tracks is the tape's absolute time, and the other is an independent SMPTE time code track. The high resolution DTRS machines can read and write this SMPTE time code track in both 16 bit and 24 bit format, so you can continue working the same way you are used to working.

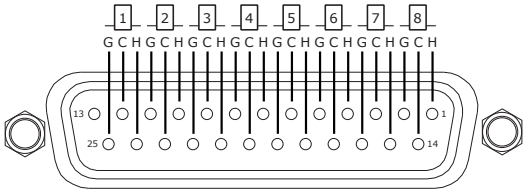
AES/EBU DB25 PINOUT

The AES/EBU DB25 pinout on the DA-98HR is the same as on most recorders, consoles and dubbers. While these cables are readily available in your local retail outlets, the pinout is listed here for users wishing to make custom cables and snakes.



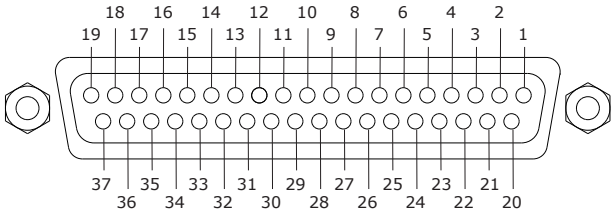
IF-AN98HR DB25 PINOUT

The analog DB25 ports on the IF-AN98HR follow the same standard as previous DTRS machine. The guide is listed below for your convenience:



CONTROL I/O PINOUT

REMOTE (PARALLEL)



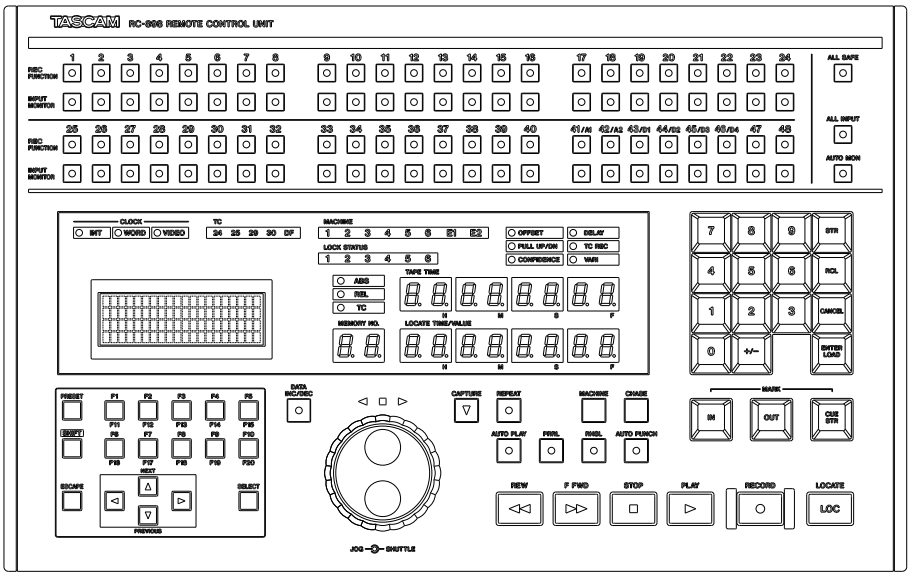
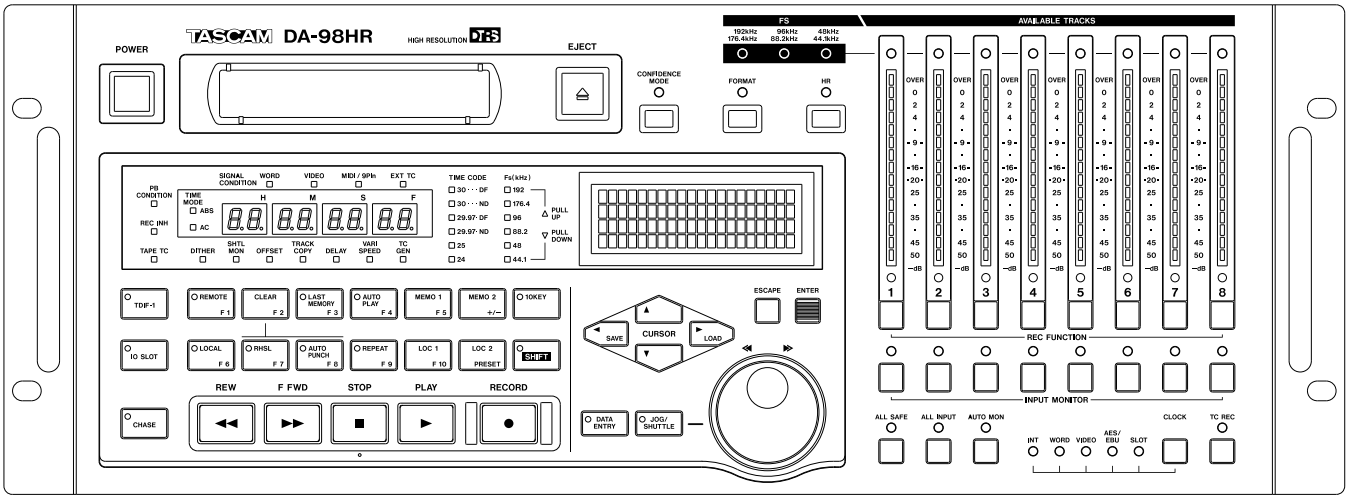
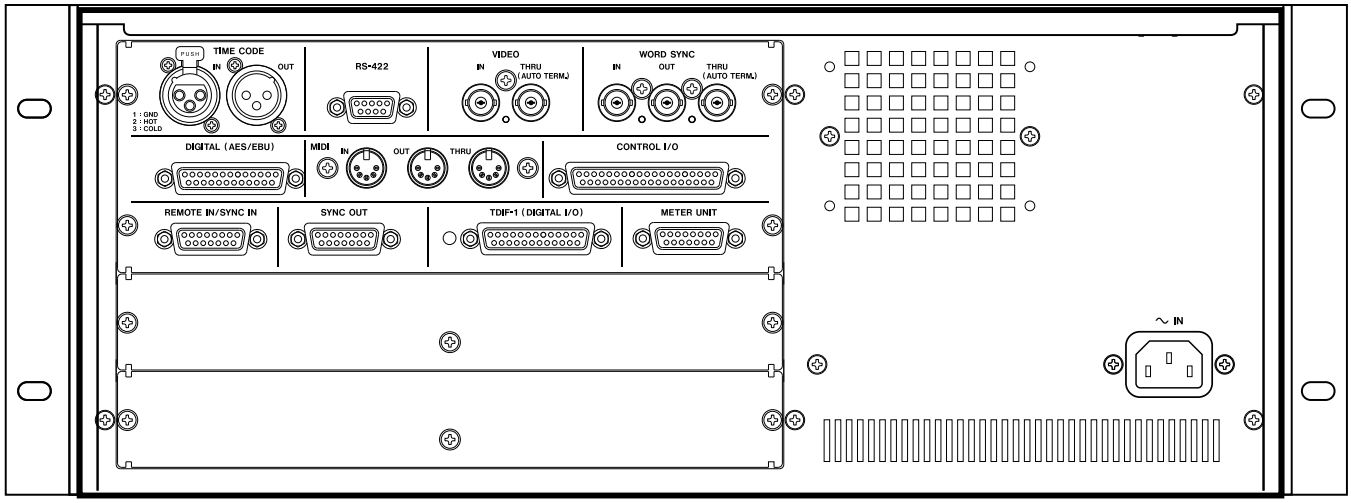
PIN:	FUNCTION:
1	PLAY
2	FFWD
3	REW
4	AUX 1
5	STOP
6	REC
7	AUX2
8	CHASE
9	-
10	SUB GND
11	PLAY TALLY
12	FFWD TALLY
13	REW TALLY
14	STOP TALLY
15	REC TALLY
16	LOCK TALLY
17	AUX 1 TALLY
18	AUX 2 TALLY
19	ACTIVE SENSE

PIN:	FUNCTION:
20	SUB GND
21	SERIAL OUT
22	-
23	SERIAL IN
24	-
25	-
26	-
27	-
28	-
29	-
30	-
31	-
32	SRCK
33	-
34	LOAD
35	-
36	SUB GND
37	SUB 5V (MAX 50mA)

OPTIONAL REMOTE (RC-898)

The RC-898 remote can control up to 6 DTRS machines of any vintage. The LCD screen is makes advanced set-up of machines much easier by offering the same LCD screen menus found on the face of the DA-98 and DA-98HR, and also offers control over DA-38 and DA-78HR menus.

If you have an older RC-898, it may require a firmware update for LCD screen interaction with the DA-78HR and DA-98HR. The firmware update is available from TASCAM. To obtain the update, contact CustSer@teac.com.



FRONT AND BACK PANELS