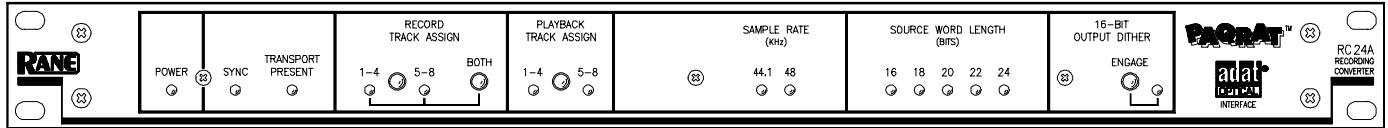
**RC 24T PAQRAT Tascam DA-88™ Recording Converter****RC 24A PAQRAT ADAT™ Compatible Recording Converter****General Description**

The RC 24 “PAQRAT” is a revolutionary device that allows a 16-bit MDM (Modular Digital Multitrack) audio recorder to record and playback digital audio signals with up to 24 bits of resolution. An unfortunate and relatively unknown problem is that it’s very difficult to store digital audio signals with greater than 16-bit resolution. Consequently, the precious extra bits created by your 20-bit analog/digital converter (or other digital audio equipment) are truncated (thrown away). The PAQRAT allows you to keep those bits, and get the most from your 20-bit investment.

The RC 24A is specifically designed to interface to the Alesis ADAT, or other devices using the ADAT Multichannel Optical Digital Interface, such as the Fostex RD-8.

The RC 24T is specifically designed to interface to the Tascam DA-88, or other devices with the TDIF-1 interface.

Operation of the PAQRAT is straightforward. A stereo digital audio signal, with up to 24-bit resolution, is input to the PAQRAT in AES/EBU or SPDIF format. This stereo

signal is divided into four signals, and recorded to four tracks of the tape transport (e.g. ADAT, RD-8 or DA-88). Front panel switches allow you to select whether these four signals are recorded onto tracks 1-4 or 5-8 (or to both groups for redundancy) of the 8-track recorder. During playback, the PAQRAT accepts the four tracks from the tape transport (again, selectable for tracks 1-4 or 5-8 by a front panel switch), and converts these four tracks back to the original high resolution stereo signal. This stereo signal exits the PAQRAT in the AES/EBU format. A front panel switch allows you to selectively add 16-bit dither to this output signal to enable proper truncation to 16 bits.

Front panel indicators include Power, Sync (indicating that the PAQRAT is synchronized to the AES/EBU input), Transport Present (indicating that the PAQRAT is properly connected to a tape transport), Sample Rate of the AES/EBU input (44.1 kHz or 48 kHz), and Word Length of the AES/EBU input (16-24 bits).

**Features**

- 16 to 24-Bit Recording and Playback on a 16-Bit MDM System (ADAT, RD-8 or DA-88)
- RC 24A Supports Alesis ADAT, Fostex RD-8 or Other ADAT Multichannel Optical Interface
- RC 24T Supports Tascam DA-88 or Other Device with the Teac TDIF-1 Interface
- Selectable 16-Bit Dither on AES/EBU Output Allows Proper Truncation to 16 Bits
- Affordable 20-Bit (Up to 24-Bit) Mastering or Archiving

**Applications**

- Record 24-Bit Output from Hard Disk Editing & Mastering Systems
- High Resolution Archival Backup of Critical Masters
- Realize Full Potential from 18-20 Bit A/D Converters
- Produce a Better 16-Bit Master with Higher Resolution
- Ability to Mix Down Master in 20-Bit on Digital Console
- Can Record 2 Channels of 20-Bit and 4 Channels of 16-Bit

# RC 24A / RC 24T

## 24-BIT RECORDING CONVERTER

Professional Audio Products Data Sheet



Parameter	Specification	Limit	Units	Conditions/Comments
Sample Rate	32k - 50k		Hz	Only 44.1k & 48k indicated
Digital Inputs: AES/EBU	Conforms to AES-3 & IEC 958			Professional Data Format
.....Connector	3-Pin (XLR type)			
Digital Inputs: SPDIF	Conforms to EIAJ CP-340			Consumer Data Format
.....Connector	RCA			
Digital Outputs: AES/EBU	Conforms to AES-3 & IEC 958			Professional Data Format
.....Connector	3-Pin (XLR type)			
RC 24T MDM Interface	8-Channel			Conforms to TDIF-1
.....Connector	DB-25			Female
RC 24T Word Sync Out				
.....Connector	BNC			Female
.....Electrical	TTL Level, 75 ohms			Conforms to TDIF-1
RC 24A MDM Interface	8-Channel			Conforms to ADAT Optical
.....Connector	Optical			Female
Quantization				
.....Digital Inputs	24		bits	Maximum
.....Digital Output	24		bits	Maximum, Output Dither Off
.....MDM Interface	16		bits	Split Over Multiple MDM Tracks
Output Dither: Type	Triangular PDF			Optional
.....quantization	16		bits	
Signal-to-Noise Ratio	Unmeasurable			Output Dither Off
THD + Noise	Unmeasurable			Output Dither Off
EMI/RFI Emission Level	Certified FCC Part 15J			Class A Device
	Complies with VDE 0871			Class A Device
Power Supply Input	18 VAC w/center tap	10%	Vrms	
Safety Agency - Unit				
.....Classification	Class 2 Equipment			National Electrical Safety Code
.....Design	Safety Extra-Low Voltage			VDE SELV
.....U.L. Listing	U.L. 813 Exempt			Class 2
.....C.S.A. Certification	C22.2 No. 1 Exempt			Class 2
.....CENELEC	IEC 65 Exempt			Harmonization Doc. HD 195.S4
Remote Power Supply	RS 1 (see data sheet)			Class 2 Equipment
.....U.L. Listed	E90493			
.....C.S.A. Certified	LR91687			
230VAC Export Model	Meets IEC 380/435, VDE 0806			TUV, SEMKO, NEMKO
RC 24T Maximum Current	200		mA	RMS Current from Remote Supply
RC 24A Maximum Current	250		mA	RMS Current from Remote Supply
Unit: Construction	All Steel			
.....Size	1.75"H x 19"W x 8.5"D (1U)			(4.4 cm x 48.3 cm x 21.6 cm)
.....Weight	6 lb (w/o power supply)			(2.7 kg)
Shipping: Size	7" x 22" x 13"			(18 cm x 56 cm x 33 cm)
.....Weight	10 lb			(4.5 kg)

### Architectural Specifications

The unit shall permit recording and playback of up to 24-bit resolution when used with 16-bit multitrack machines. Separate record and playback track assign switches and indicators shall be provided. A 16-bit output dither switch shall be provided. LED indicators shall include sync, transport present, sample rate, and source word length. The interface to the digital multitrack shall be a 25-pin connector conforming to the TDIF-1 standard, or optical connectors conforming to the ADAT multichannel optical interface standard. 24-bit AES/EBU and SPDIF inputs shall be provided. A 24-bit AES/EBU output shall also be provided. The unit shall be exempt from agency safety requirements and powered from a UL listed, CSA certified remote power supply (120 VAC) or CE approved (230 VAC) via a rear panel input modular plug. The unit shall be constructed entirely from cold-rolled steel, and mount into a standard 1U EIA rack.

*The unit shall be a Rane Corporation RC 24A or RC 24T Recording Converter.*

### Operating Notes

by Roger Nichols

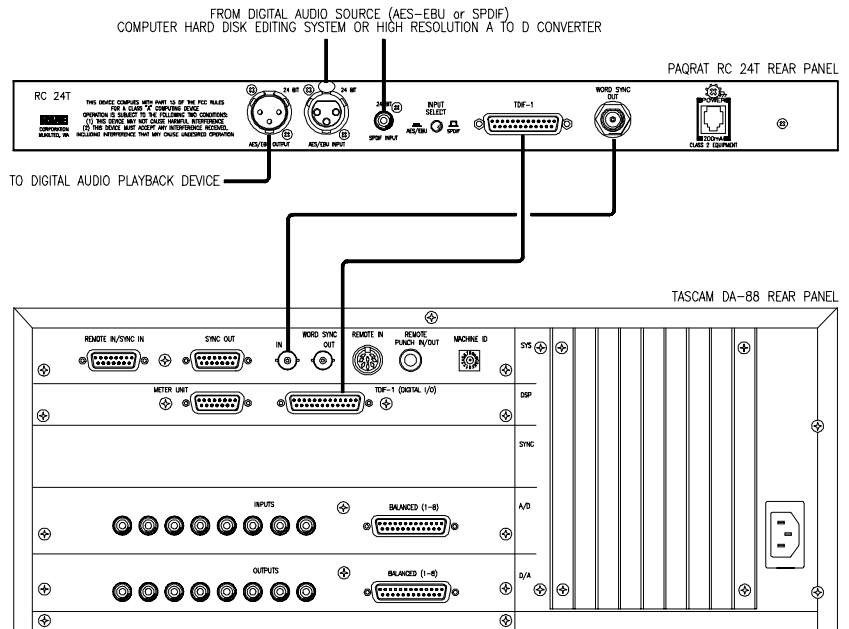
**Mixing to PAQRAT.** The first time I used the PAQRAT was to store 20-bit mixes of Walter Becker's solo album. In mastering, more than once, a drop-out on the optical disk made us scramble for the PAQRAT encoded tape to save the day. If you are printing your mixes to PAQRAT and DAT, connect the DAT machine on the output of the PAQRAT and engage Output Dither on the PAQRAT front panel. This way you will get the benefit of 16-bit dithering for DAT storage. If the DAT machine is connected directly to the 20-bit data, the 16 bits stored on the DAT will be truncated, resulting in lower fidelity.

**Hard Disk Audio.** If you perform DSP operations on hard disk (if the hard disk contains digital audio, should the spelling of disc end in a "C" instead of a "K"?), the highest fidelity would be realized if the resultant file was stored as a 24-bit file. If multiple DSP operations are to be performed, such as noise reduction on one pass, limiting on another pass, EQ on another pass, and then finally digitally mixed with another audio file, then all of the processing should be done in the 24-bit mode. The resultant audio file then needs to be converted to 16-bit only once, and the nasty artifacts are kept to a minimum. The 24-bit files can be backed up through a PAQRAT to maintain the highest quality in the audio data.

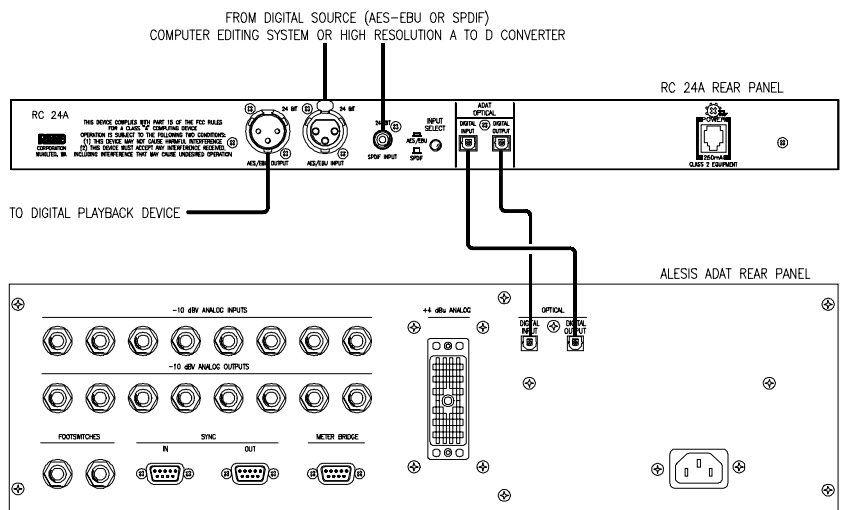
**Mastering with PAQRAT.** When mastering a project that was mixed 16-bit, use the PAQRAT to make an EQ safety. The output from digital mastering consoles is usually 24-bit (the 24-bits is generated by the math used to perform digital EQ, limiting, compression and level changes). If the EQ tape is only 16-bit, the noise floor increases because of the rounded off math.

**Selecting Both.** When using the PAQRAT to store two channel mixes, select "Both" for the Record Track Assign. This provides you with an added level of redundancy. The audio data is recorded twice. If for some reason you were to encounter a drop out on the primary tracks, then it may be possible to retrieve the data from the other set of tracks by switching the Playback Track Assign to the other set of tracks. This method lets you think of the eight track as a giant DAT machine with built-in redundancy.

### RC 24T System Connection with Tascam DA-88



### RC 24A System Connection with Alesis ADAT



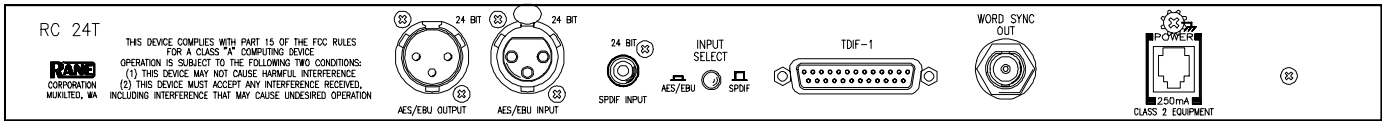
# RC 24A / RC 24T

## 24-BIT RECORDING CONVERTER

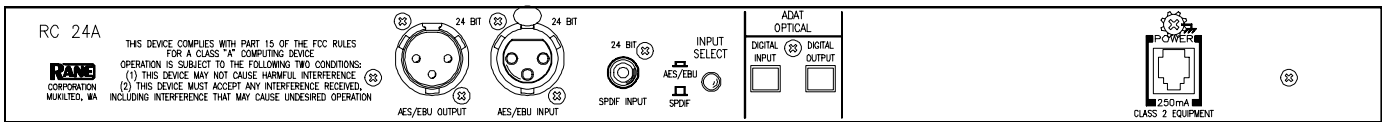
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### RC 24T Rear Panel



### RC 24A Rear Panel



### RC 24 Block Diagram

