

**Masterflow**

**DC2496**

**HIGH RESOLUTION  
ANALOGUE TO DIGITAL  
CONVERTER**

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**In the interests of product development, Drawmer reserve the right to modify or improve specifications of this product at any time, without prior notice.**

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# DRAWMER DC2496

## HIGH RESOLUTION ANALOGUE TO DIGITAL CONVERTER

### SAFETY CONSIDERATIONS

#### CAUTION - MAINS FUSE

TO REDUCE THE RISK OF FIRE REPLACE THE MAINS FUSE ONLY WITH A FUSE THAT **CONFORMS TO EIC 127-2**. 250 VOLT WORKING, TIME DELAY TYPE AND BODY SIZE OF 20mm x 5mm.  
THE MAINS INPUT FUSE MUST BE RATED AT T500mA.

#### CAUTION - MAINS CABLE

DO NOT ATTEMPT TO CHANGE OR TAMPER WITH THE SUPPLIED MAINS CABLE.

#### CAUTION - SERVICING

DO NOT PERFORM ANY SERVICING. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL.

#### WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.



For the USA

#### FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, then the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorised changes or modification to this system can void the users' authority to operate this equipment.  
This equipment requires shielded interface cables in order to meet FCC class B limit.

For Canada

#### CLASS B

#### NOTICE

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

#### CLASSE B

#### AVIS

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Règlement des signaux parasites par le ministère Canadien des Communications.

# CHAPTER 1

## DRAWMER DC2496 HIGH RESOLUTION ANALOGUE TO DIGITAL CONVERTER

### INTRODUCTION

The Drawmer DC2496 is an extremely sophisticated, high resolution analogue to digital converter designed for use in demanding recording and broadcast applications. Both analogue (balanced XLR) and digital (AES/EBU, S/PDIF, ADAT 8 Channel light pipe and TDIF 8 Channel) I/O is provided as standard. The audio converters are 24-bit and the digital output can be either 16, 18, 20, 22 or 24-bit at sample rates of up to 96kHz. Noise shaped dithering is included and Word Clock input and output is available.

#### **NOT JUST AN A/D CONVERTER BUT ALSO DIGITAL INTERFACE FOR RECORDING FROM ONE UNIT TO ANOTHER - WITH A BACKUP AT THE SAME TIME!**

#### **Why 96kHz?**

Digital processing has until now been confined to 48kHz sampling frequency. In order to achieve the required bandwidth for professional audio, a very severe low pass filter at 23kHz is required to separate analogue signal frequencies from the clock frequency otherwise unpleasant aliasing will occur. This requires the use of a FIR digital filter which is part of the A/D and D/A converters. Unfortunately these filters cause what is known as 'time smear', where short transients are smeared over a longer time period giving loss of HF detail. At 96kHz sample frequency, the low pass filter is less severe and at twice the frequency, so time smear is considerably reduced.

A second important consideration is the increased audio bandwidth up to 40kHz. This allows harmonics which extend above human hearing to be generated and preserved. These harmonics, although not audible themselves, make a contribution to the sound quality.

#### **Key Features**

96k 24bit A/D with 130dB dynamic range and very low THD.

Simultaneously record 96k/48k 24bit stereo input to 48K (three) or 96K (six) tracks to ADAT or TDIF 8 track digital tape recorder and stereo 48k 16bit backup (to tracks 7/8) and record an independant backup copy at 48/44.1 20/16bits to DAT (using internal Sample Rate Converter)

Sample Rate Converter with bit reduction and dither to reduce 96/88.2K 24bit recordings to 48/44.1K 16/20bit for CD masters.

Built in 96/48K high quality D/A to monitor digital signals or record to analog tape.

Dual time constant Stereo Limiter with variable time constants can apply up to 18dB stereo gain to any input signal.

100dB range 64 element stereo signal meter with peak hold.

Selection of Noise shaped dither and bit rounding to reduce 96/48/44.1K recordings to 22, 20, 18 or 16 bits.

Digitally copy 8 track stereo or Hi-Res ADAT/TDIF recordings to or from TDIF/ADAT.

Auto identify Stereo or Hi-Res recordings upon ADAT or TDIF replay.

Inputs from A/D ADAT optical, TDIF, AES, SPDIF, Outputs to D/A ADAT optical, TDIF, AES, SPDIF.

Seperate Digital Word Sync from D/A TDIF, ADAT, AES, SPDIF or BNC .

Rear panel show which sockets are active for easy hookup using Green (for input signal) and Yellow (for word clock inputs) LEDs.

Built in 100Hz, 1kHz, 10kHz and dual sine wave generator (100Hz Left Ch, 1K Right Ch) sine tone at -40dB, -20dB and variable -24db to -6dB output level to aid connection difficulties and troubleshooting.

Dual PLL for low jitter

## AUDIO CONNECTIONS

### Analogue Inputs

The inputs and outputs to the DC2496 are electronically balanced and would normally be connected to your system via a patchbay. Should unbalanced operation be required, simply ground pin 3 on the XLR connectors.

If earth loop hum problems are encountered, **do not** disconnect the mains earth but instead, try disconnecting one end of the signal screen on the cables connecting the DC2496 to the patchbay. If such measures are necessary, balanced operation is recommended.

### AES/EBU

Is via an XLR connector designed to be used with standard balanced microphone cable (20 metres maximum), wired pin 1 screen, pin 2 and 3 balanced data, and the XLR shell connected to the chassis. Having many short cables joined together is not advisable as each connector can cause undesirable signal reflections.

The output socket fully conforms to the EMC standards; if the unit is to be used where it may be exposed to high levels of disturbance, such as found close to a TV or radio transmitter, it is suggested that the screen of the data cable be connected to the chassis connection on the XLR type connector rather than to pin 1.

If ground loop problems are encountered, never disconnect the mains ground, but instead, try disconnecting the signal screen on one end of each cable connecting the outputs.

### S/PDIF

Is via a high quality RCA type phono jack where the data conforms to the Sony™ Phillips™ Digital InterFace format. Because this connector only provides an unbalanced termination, the recommended maximum length for this cable is 3 metres, even with very high quality cable.

### Word Clock

For external clock synchronisation or when the DC2496 is providing the clock to another source, this is carried out via the 50Ω BNC connector.

### ADAT

Connect via an Optical Cable (Light Pipe) with a maximum recommended length of three metres. The cable supports 8 channels at a 24 Bit word resolution. The Drawmer DC2496 provides separate ADAT input and output as standard.

### TDIF

Is via a 25 pin D connector. This is a unique cross-wired cable, supplied by Tascam. It has 8 inputs, 8 outputs all at 24 Bit word resolution as well as TDIF word clock in and out all in the one connector. The maximum recommended length is three metres.

Note: When the TDIF D plug is inserted the main BNC Word Clock out is shifted by 90 degrees for TDIF use only.

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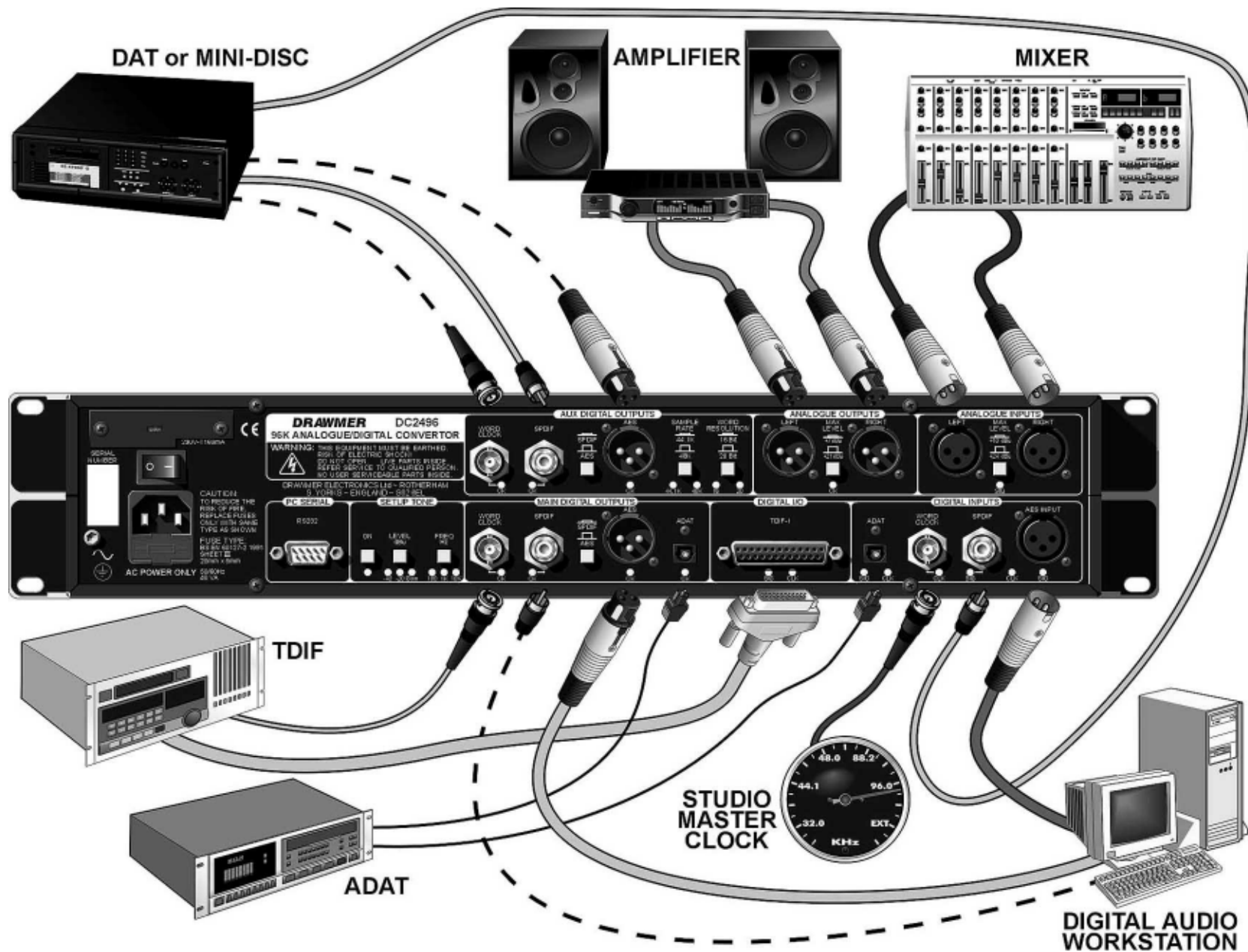
## INSTALLATION PRECAUTIONS

Should a fuse blow, replace it only with the same type and value as the one fitted.

When installing the DC2496, ensure that it is allowed sufficient ventilation and avoid mounting it next to excessively hot pieces of equipment or devices emitting a strong magnetic field such as is often the case with power amplifiers. If the unit is to be used in a mobile situation, it is strongly recommended that the rear of the unit is supported in the carrying rack to avoid bending the front panel rack mounting 'ears'.

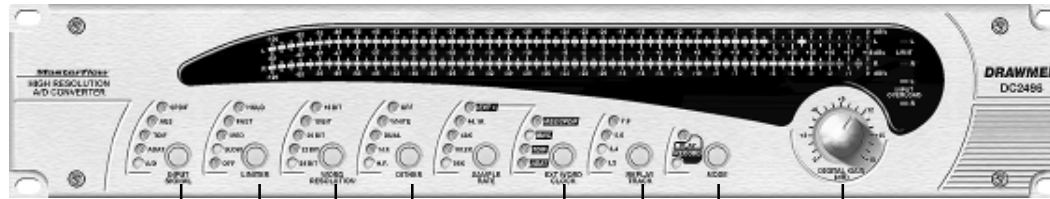
Should the unit require cleaning, use a damp cloth with a little liquid detergent; do not use thinners or spirit cleaners as these may attack the finish.

# INSTALLATION AND CONNECTION GUIDE

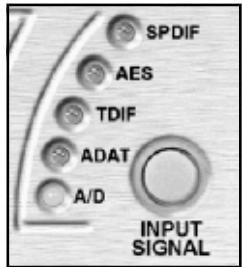


# CHAPTER 2

## BASIC EFFECTS



### Input Signal

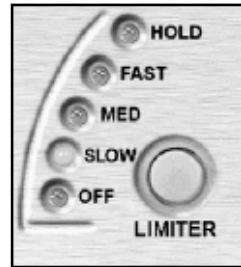


INPUT SIGNAL shows the selected input source. This signal is also indicated on the rear panel by lighting the selected signal Green LED.

The WORD CLOCK must be set to the appropriate source otherwise clicks, pops or even loud white noise may be heard. When setting up for a new signal source firstly select the mode for RECORD or PLAY (each mode has its own set of input, Limiter, Word Res etc. settings)

ALWAYS reduce to monitor volume before changing the input signal or word clock source to prevent damage to ears or speakers.

### Limiter



The limiter will only have any effect when 'DIGITAL GAIN' is set greater than 0dB.

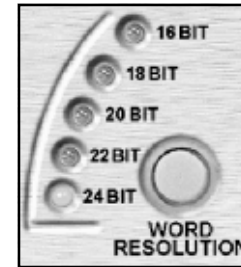
There are several attack/decay settings: use 'SLOW' for least intrusive signal leveling with up to 18dB of gain, 'MED' to increase to perceived volume with up to +12dB of gain, 'FAST' for transient capture.

Note: if more than +9dB of 'DIGITAL GAIN' is applied then it is possible hear the limiter pumping,

use 'HOLD' to normalise the signal to exactly 0dB. Select 'HOLD', play the track using +18dB of 'DIGITAL GAIN' then rewind and the track will be ready to play with its max peaks unlimited at 0dB. Re-select the 'HOLD' LED to re-set the hold level.

The 'LIMIT' meter LED will remain lit when 'HOLD' is selected and the input signal has been limited, until the 'LIMITER' button is pressed. The 'LIMIT' LED will also remain lit for up to 10 seconds as the limiter releases when 'SLOW' and the input signal has been severely limited.

### Word Resolution



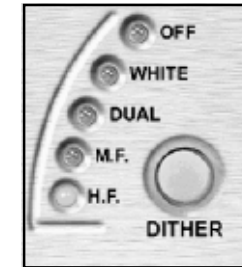
WORD RESOLUTION defines the number of bits per audio sample, ie: Standard audio CD is 16bits.

This must match the recording medium otherwise 'Truncation' distortion will occur. Truncation distortion cannot be removed after recording by adding dither to a truncated signal.

When word resolution is reduced to less bits than the original then dither must be added to mask the distortion that is caused when the bits are lost.

If the DC2496 A/D is 24bit resolution, when reducing this to 16bits for a DAT recording normally best results are obtained with HF dither.

### Dither



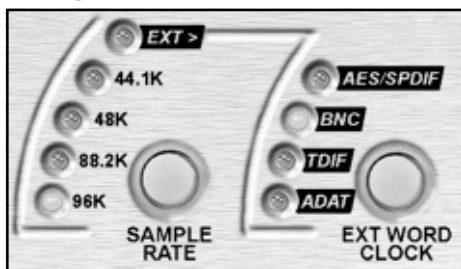
H.F dither generally removes the low level distortion on low signal levels with the least noticeable noise.

M.F dither produces the lower distortion with a slight increase in noise over H.F dither. DUAL dither produces the lowest distortion but still has much less perceived noise than White noise dither.

White noise is the standard dither added to prevent distortion on low level signals when the WORD RESOLUTION of a signal is reduced, ie. 24bit recording reduced to 16bits. It offers poor performance in terms of perceived noise.



### Sample Rate / Ext Word Clock



SAMPLE RATE selects the required highly accurate internal crystal controlled dual PLL clock signal. This can be 44.1, 48, 88.2, 96k or EXT which can use an external Word Clock signal.

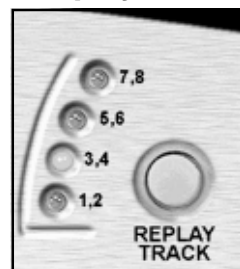
EXT WORD CLOCK selects the source for the word clock (indicated by a yellow LED on the rear panel). It must be within the range 30kHz to 100kHz. The signal will be sent to the DC2496 dual PLL for clock cleaning to reduce distortion that can be caused by jitter on the clock signals.

The Front panel yellow 'EXT WORK CLOCK' LED will flash quickly if a clock is unstable or will flash slowly if clock not connected.

Ensure the correct Sample Rate & EXT WORD CLOCK are selected otherwise a small amount of distortion on the signal, regular click, pops or a repeating 'Zwang' type sound may occur (this applies to all digital equipment).

Note: after the sample rate has been changed, the A/D will require an audio signal for 1 minute to settle back to its full dynamic range.

### Replay Track



REPLAY TRACK is only lit when ADAT or TDIF input signal has been selected.

The number of LEDs lit depends on the tracks being replayed from the multitrack tape recorder: Normal stereo signals light one LED allowing 4 pairs of stereo signals to be monitored.

When 2 LEDs are lit (only when the tape is playing) then a Hi-Res triple track has been detected which will be replayed as stereo output of 24bits at 48kHz.

When 3 LEDs are lit then a 96 or 88.2kHz 'Hex' track has been detected which will be replayed at 96kHz from the Main digital outputs and D/A but 48Khz from the Sample Rate Converter digital outputs and the Multitrack outputs.

If the replay track changes from normal 16/20 bit mode to Hi-Res mode there will be a short burst of white noise for a couple of hundred mS. This is due to tracks 3/4 which sound like 0dB white noise being audible while the DC2496 auto detects the Hi-Res mode.

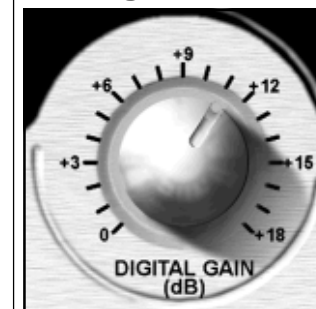
### Mode



RECORD/PLAY selects between two sets of all the other button settings.

Select this before altering any other parameter.

### Digital Gain



GAIN of up to +18dB can be applied.

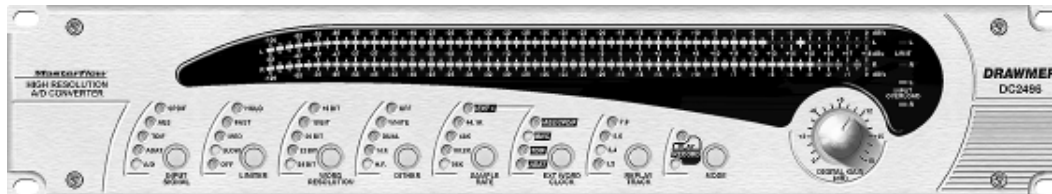
Be aware that digital distortion can occur whenever gain is applied therefore the Limiter should be switched on (see LIMITER section).

# CHAPTER 3

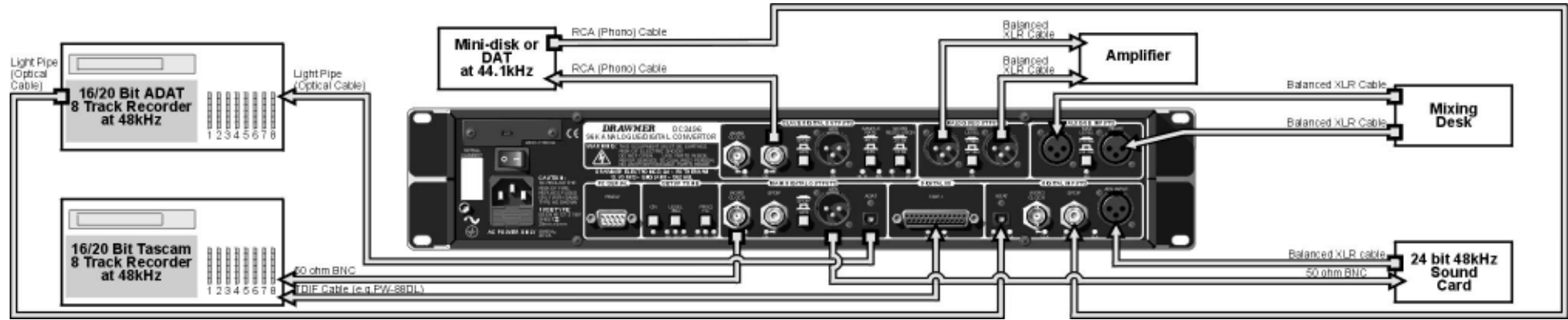
## Setup System using Internal Sine Wave Generator

**OPERATION**

Use the internal sine wave generator to confirm output signals and to identify left/right channels. A 100Hz, 1kHz or 10kHz internally generated sine wave at -40dB, -20dB or -26dB to -6dB variable will be sent to all outputs. When the input signal button is pressed the setup tone stops.



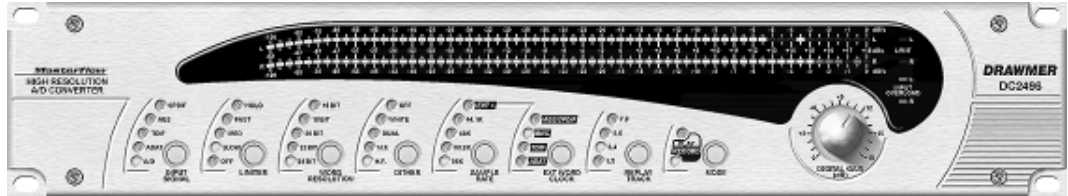
FRONT PANEL		FRONT PANEL									
SETUP TONE		OPERATION	INPUT SIGNAL	LIMITER	WORD RESOLUTION	DITHER	SAMPLE RATE	EXTENDED WORK CLOCK	REPLAY TRACK	MODE	DIGITAL GAIN
<p><b>ON</b></p> <p>LEVEL dBu</p> <p>FREQ Hz</p> <p>ON</p> <p>-40 -20 Gain</p> <p>100 1K 10K</p>	<p><b>100Hz and 1kHz Setup Tone at 48kHz sample rate to All Outputs</b></p> <p>A 100Hz tone at -20dB will be sent to all left channels outputs.</p> <p>A 1kHz tone at -26dB will be sent to all right channel outputs.</p>	<p><input type="radio"/> SPDIF</p> <p><input type="radio"/> AES</p> <p><input type="radio"/> TDIF</p> <p><input type="radio"/> ADAT</p> <p><input type="radio"/> A/D</p> <p>all these leds are off while setup tone is generated</p>	<p><input type="radio"/> HOLD</p> <p><input type="radio"/> FAST</p> <p><input type="radio"/> MED</p> <p><input type="radio"/> SLOW</p> <p><input checked="" type="radio"/> OFF</p> <p>not active</p>	<p><input type="radio"/> 16 BIT</p> <p><input type="radio"/> 18 BIT</p> <p><input type="radio"/> 20 BIT</p> <p><input type="radio"/> 22 BIT</p> <p><input checked="" type="radio"/> 24 BIT</p> <p>as required</p>	<p><input type="radio"/> OFF</p> <p><input type="radio"/> WHITE</p> <p><input type="radio"/> DUAL</p> <p><input type="radio"/> MF.</p> <p><input checked="" type="radio"/> HF.</p> <p>as required</p>	<p><input checked="" type="radio"/> EXT</p> <p><input type="radio"/> 44.1K</p> <p><input checked="" type="radio"/> 48K</p> <p><input type="radio"/> 88.2K</p> <p><input type="radio"/> 96K</p> <p>as required</p>	<p><input type="radio"/> AES/SPDIF</p> <p><input checked="" type="radio"/> BNC</p> <p><input type="radio"/> TDIF</p> <p><input type="radio"/> ADAT</p> <p>as required</p>	<p><input type="radio"/> 7.8</p> <p><input type="radio"/> 5.6</p> <p><input type="radio"/> 3.4</p> <p><input type="radio"/> 1.2</p> <p>not active</p>	<p><input type="radio"/> PLAY</p> <p><input checked="" type="radio"/> RECORD</p> <p>as required</p>	<p>not active</p>	
<p><b>ON</b></p> <p>LEVEL dBu</p> <p>FREQ Hz</p> <p>ON</p> <p>-40 -20 Gain</p> <p>100 1K 10K</p>	<p><b>1kHz Setup Tone at -40dB to All Outputs</b></p> <p>A 1kHz tone at -40dB will be sent to all outputs.</p>	<p><input type="radio"/> SPDIF</p> <p><input type="radio"/> AES</p> <p><input type="radio"/> TDIF</p> <p><input type="radio"/> ADAT</p> <p><input type="radio"/> A/D</p> <p>all these leds are off while setup tone is generated</p>	<p><input type="radio"/> HOLD</p> <p><input type="radio"/> FAST</p> <p><input checked="" type="radio"/> MED</p> <p><input type="radio"/> SLOW</p> <p><input type="radio"/> OFF</p> <p>not active</p>	<p><input type="radio"/> 16 BIT</p> <p><input type="radio"/> 18 BIT</p> <p><input type="radio"/> 20 BIT</p> <p><input type="radio"/> 22 BIT</p> <p><input checked="" type="radio"/> 24 BIT</p> <p>as required</p>	<p><input type="radio"/> OFF</p> <p><input type="radio"/> WHITE</p> <p><input type="radio"/> DUAL</p> <p><input type="radio"/> MF.</p> <p><input checked="" type="radio"/> HF.</p> <p>as required</p>	<p><input checked="" type="radio"/> EXT</p> <p><input type="radio"/> 44.1K</p> <p><input checked="" type="radio"/> 48K</p> <p><input type="radio"/> 88.2K</p> <p><input type="radio"/> 96K</p> <p>as required</p>	<p><input type="radio"/> AES/SPDIF</p> <p><input checked="" type="radio"/> BNC</p> <p><input type="radio"/> TDIF</p> <p><input type="radio"/> ADAT</p> <p>as required</p>	<p><input type="radio"/> 7.8</p> <p><input type="radio"/> 5.6</p> <p><input type="radio"/> 3.4</p> <p><input type="radio"/> 1.2</p> <p>not active</p>	<p><input type="radio"/> PLAY</p> <p><input checked="" type="radio"/> RECORD</p> <p>as required</p>	<p>not active</p>	
<p><b>ON</b></p> <p>LEVEL dBu</p> <p>FREQ Hz</p> <p>ON</p> <p>-40 -20 Gain</p> <p>100 1K 10K</p>	<p><b>100Hz Setup Tone at -6dB to All Outputs</b></p> <p>A 100Hz tone at -6dB will be sent to all outputs.</p> <p>Use the Gain control to set the output level from -26dB to -6dB.</p>	<p><input type="radio"/> SPDIF</p> <p><input type="radio"/> AES</p> <p><input type="radio"/> TDIF</p> <p><input type="radio"/> ADAT</p> <p><input type="radio"/> A/D</p> <p>all these leds are off while setup tone is generated</p>	<p><input type="radio"/> HOLD</p> <p><input type="radio"/> FAST</p> <p><input checked="" type="radio"/> MED</p> <p><input type="radio"/> SLOW</p> <p><input type="radio"/> OFF</p> <p>not active</p>	<p><input type="radio"/> 16 BIT</p> <p><input type="radio"/> 18 BIT</p> <p><input type="radio"/> 20 BIT</p> <p><input type="radio"/> 22 BIT</p> <p><input checked="" type="radio"/> 24 BIT</p> <p>as required</p>	<p><input type="radio"/> OFF</p> <p><input type="radio"/> WHITE</p> <p><input type="radio"/> DUAL</p> <p><input type="radio"/> MF.</p> <p><input checked="" type="radio"/> HF.</p> <p>as required</p>	<p><input checked="" type="radio"/> EXT</p> <p><input type="radio"/> 44.1K</p> <p><input checked="" type="radio"/> 48K</p> <p><input type="radio"/> 88.2K</p> <p><input type="radio"/> 96K</p> <p>as required</p>	<p><input type="radio"/> AES/SPDIF</p> <p><input type="radio"/> BNC</p> <p><input type="radio"/> TDIF</p> <p><input type="radio"/> ADAT</p> <p>as required</p>	<p><input type="radio"/> 7.8</p> <p><input type="radio"/> 5.6</p> <p><input type="radio"/> 3.4</p> <p><input type="radio"/> 1.2</p> <p>not active</p>	<p><input type="radio"/> PLAY</p> <p><input checked="" type="radio"/> RECORD</p> <p>as required</p>	<p>Sine wave output level = -6dB</p>	
<p><b>ON</b></p> <p>LEVEL dBu</p> <p>FREQ Hz</p> <p>ON</p> <p>-40 -20 Gain</p> <p>100 1K 10K</p>	<p><b>Troubleshooting - 1kHz Setup Tone will not be sent to any Outputs</b></p> <p>AES external clock is selected but no AES input is connected to the unit</p> <p>Note the flashing AES / SPDIF Ext word clock led.</p>	<p><input type="radio"/> SPDIF</p> <p><input type="radio"/> AES</p> <p><input type="radio"/> TDIF</p> <p><input type="radio"/> ADAT</p> <p><input type="radio"/> A/D</p> <p>all these leds are off while setup tone is generated</p>	<p><input type="radio"/> HOLD</p> <p><input type="radio"/> FAST</p> <p><input type="radio"/> MED</p> <p><input type="radio"/> SLOW</p> <p><input checked="" type="radio"/> OFF</p> <p>not active</p>	<p><input type="radio"/> 16 BIT</p> <p><input type="radio"/> 18 BIT</p> <p><input type="radio"/> 20 BIT</p> <p><input type="radio"/> 22 BIT</p> <p><input checked="" type="radio"/> 24 BIT</p> <p>as required</p>	<p><input type="radio"/> OFF</p> <p><input type="radio"/> WHITE</p> <p><input type="radio"/> DUAL</p> <p><input type="radio"/> MF.</p> <p><input checked="" type="radio"/> HF.</p> <p>as required</p>	<p><input checked="" type="radio"/> EXT</p> <p><input type="radio"/> 44.1K</p> <p><input checked="" type="radio"/> 48K</p> <p><input type="radio"/> 88.2K</p> <p><input type="radio"/> 96K</p> <p>external word clock</p>	<p><input checked="" type="radio"/> AES/SPDIF</p> <p><input type="radio"/> BNC</p> <p><input type="radio"/> TDIF</p> <p><input type="radio"/> ADAT</p> <p>AES/SPDIF (led flashing)</p>	<p><input type="radio"/> 7.8</p> <p><input type="radio"/> 5.6</p> <p><input type="radio"/> 3.4</p> <p><input type="radio"/> 1.2</p> <p>not active</p>	<p><input type="radio"/> PLAY</p> <p><input checked="" type="radio"/> RECORD</p> <p>as required</p>	<p>not active</p>	



REAR PANEL - BOTTOM ROW					REAR PANEL - TOP ROW																
MAIN DIGITAL OUTPUTS					DIGITAL I/O					AUX DIGITAL OUTPUTS					ANALOGUE OUTPUTS			ANALOGUE INPUTS			
WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	ADAT	TDIF-1	ADAT	WORD CLOCK	SPDIF	AES	WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	SAMPLE RATE	WORD RES	LEFT	MAX LEVEL	RIGHT	LEFT	MAX LEVEL	RIGHT
word clock output	Not connected	AES	sine wave output	sine output on all 8 tracks	sine wave will be output on all 8 tracks	Not active	Not active	Not active	Not active	word clock output	not used	AES	sine wave input	48K	16Bit	sine wave output	+21dBu max output signal level	sine wave output	Not Active	Not Active	Not Active
word clock output	Not connected	AES	sine wave output	sine output on all 8 tracks	sine wave will be output on all 8 tracks	Not active	word clock input	Not active	Not active	word clock output	sine wave output	SPDIF	Not used	48K	16Bit	sine wave output	+21dBu max output signal level	sine wave output	Not Active	Not Active	Not Active
to Tascam word clock in	Not connected	AES	sine wave output	sine output on all 8 tracks	sine wave will be output on all 8 tracks	Not active	Not active	Not active	Not active	word clock output	sine wave output	SPDIF	Not used	48K	16Bit	sine wave output	+21dBu max output signal level	sine wave output	Not Active	Not Active	Not Active
no output	no output	AES	no output	no output	no output	Not active	Not active	Not active	Ext clock source is not connected	word clock output	Not active	SPDIF	Not active	48K	16Bit	no output	+21dBu max output signal level	no output	Not Active	Not Active?	Not Active

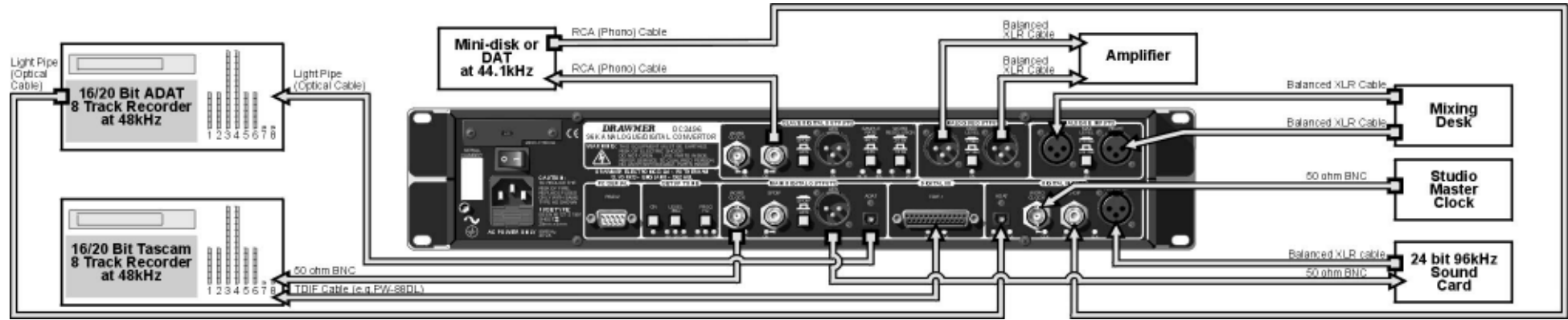
# 96K 24Bit Recording and Replay

**OPERATION** 96K 24Bit A/D conversion with monitor speakers recording and replaying, 8 Track digital tape recorders, DAT and 24Bit 96K hard disk recorder, also recording 44.1K 16 Bit to Mini-disc, all simultaneously.



- COMMENTS**
- 1) Ensure that the A/D input signal does not light the overload leds - analogue clipping will occur. Reduce the mixer output level as required. Apply DC2496 digital gain with limiter to allow more A/D input headroom whilst preserving 0dBFS digital level.
  - 2) If the peak noise level from the mixing desk is above -100dB then the bottom leds of the meter will remain lit.
  - 3) If the mixer has a -10dBu output level then the analogue input switch should be pressed (+4dBu max input signal level).
  - 4) To ensure a 0dBFS digital signal level add a few dB's of digital gain and set the limiter to fast.
  - 5) If digital gain is applied with the limiter off then unpleasant digital distortion can occur on peaks.
  - 6) When the DC2496 is running at 96K or 88.2K and the main digital output is connected to a 48K digital input no signal will be received!
  - 7) The A/D noise floor is 6dB higher at 96/88.2K than at 48/44.1K.
  - 8) When recording hex (6) tracks, tracks 7 and 8 will only monitor at 16Bit resolution from the Sample Rate Converter (upper) digital outputs.
  - 9) When the TDIF plug is inserted into the rear of the DC2496 the main digital output word clock BNC socket will be at 44.1K when recording at 88.2K and 48K when recording at 96K - and only suitable for TDIF word sync input.
  - 10) Always reduce monitor volume when selecting different word clocks or sample rates.
  - 11) ADAT and TDIF recordings will always be at 44.1/48K when recording 88.2/96K A/D or digital input signals.

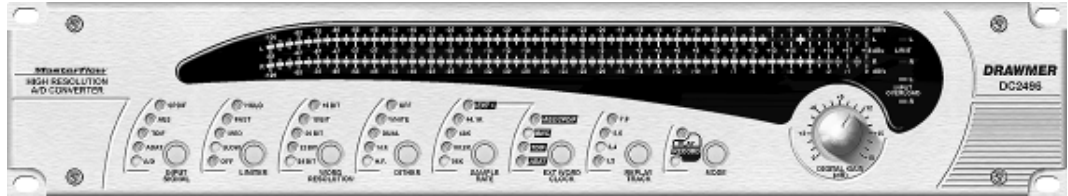
FRONT PANEL									
OPERATION	INPUT SIGNAL	LIMITER	WORD RESOLUTION	DITHER	SAMPLE RATE	EXTENDED WORK CLOCK	REPLAY TRACK	MODE	DIGITAL GAIN
<b>96K 24 Bit A/D Input Recording</b> Record a stereo signal as hex (6) tracks 1,2,3,4,5,6 on an ADAT or Tascam 16/20Bit digital multi-track tape recorder - and 7,8 stereo pair as 48K backup if required. ADAT machines must be set to EXT Clock. Tascam machines must be set to WORD clock and a BNC lead from DC2496 main word clock to Tascam Word Clock in.	<input type="radio"/> SPDF <input type="radio"/> AES <input type="radio"/> TDIF <input type="radio"/> ADAT <input checked="" type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input type="radio"/> MED <input type="radio"/> SLOW <input checked="" type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input type="radio"/> 48K <input type="radio"/> 88.2K <input checked="" type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input type="radio"/> TDIF <input type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input type="radio"/> 3.4 <input type="radio"/> 1.2	<input checked="" type="radio"/> PLAY RECORD	<p>0 dB If gain is applied limiter must be used</p>
<b>96K 24 Bit A/D Input Replay from ADAT</b> Replay hex (6) tracks 1,2,3,4,5,6, or 7,8 48K stereo pair.  ADAT must be set to INT Clock.	<input type="radio"/> SPDF <input type="radio"/> AES <input type="radio"/> TDIF <input type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input checked="" type="radio"/> MED <input type="radio"/> SLOW <input type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input type="radio"/> 48K <input type="radio"/> 88.2K <input checked="" type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input type="radio"/> TDIF <input checked="" type="radio"/> ADAT	<input type="radio"/> 7.8 <input checked="" type="radio"/> 5.6 <input type="radio"/> 3.4 <input type="radio"/> 1.2	<input checked="" type="radio"/> PLAY RECORD	<p>6 dB of gain with limit use as required</p>
<b>96K 24 Bit A/D Input Replay from TDIF i.e. DA-88</b> Replay hex (6) tracks 1,2,3,4,5,6, or 7,8 48K stereo pair.  Tascam machines must be set to INT clock.	<input type="radio"/> SPDF <input type="radio"/> AES <input checked="" type="radio"/> TDIF <input type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input checked="" type="radio"/> MED <input type="radio"/> SLOW <input type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input type="radio"/> 48K <input type="radio"/> 88.2K <input checked="" type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input checked="" type="radio"/> TDIF <input type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input type="radio"/> 3.4 <input type="radio"/> 1.2	<input checked="" type="radio"/> PLAY RECORD	<p>6 dB of gain with limit use as required</p>
<b>96K 24 Bit Replay from Hard Disk recorder or other AES Digital Input</b> Monitor on D/A whilst recording to mini-disc, ADAT and TDIF simultaneously (All recording devices must use external word clock)	<input type="radio"/> SPDF <input checked="" type="radio"/> AES <input type="radio"/> TDIF <input type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input checked="" type="radio"/> MED <input type="radio"/> SLOW <input type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input type="radio"/> 48K <input type="radio"/> 88.2K <input checked="" type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input type="radio"/> TDIF <input type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input type="radio"/> 3.4 <input type="radio"/> 1.2	<input checked="" type="radio"/> PLAY RECORD	<p>6 dB of gain with limit use as required</p>



REAR PANEL - BOTTOM ROW					REAR PANEL - TOP ROW																
MAIN DIGITAL OUTPUTS					DIGITAL I/O					AUX DIGITAL OUTPUTS					ANALOGUE OUTPUTS						
WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	ADAT	ADAT	WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	SAMPLE RATE	WORD RES	LEFT	MAX LEVEL	RIGHT	LEFT	MAX LEVEL	RIGHT
to Tascam word clock in	Not connected	AES	to Hard Disk Recorder	to ADAT Recorder	to Tascam Recorder	Not active	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	Not used	44.1K	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	from Monitor Desk output	+21dBu max output signal level	from Monitor Desk output
to Tascam word clock in	Not connected	AES	to Hard Disk Recorder	to ADAT Recorder	to Tascam TDIF digital I/O Copy ADAT recording to Tascam	Optical light pipe from ADAT digital out	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	Not used	44.1K	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active
to Tascam word clock in	Not connected	AES	to Hard Disk Recorder	copy to ADAT digital input	25 pin D plug from Tascam digital I/O	Not active	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	Not used	44.1K	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active
to Tascam word clock in	Not connected	AES	to Hard Disk Recorder	copy to ADAT as hex tracks at 48K	to Tascam TDIF digital I/O Copy hard disk recording to Tascam as hex tracks at 48K	Not active	Not active	Not active	Digital input from hard disk recorder	Not used	to Mini-disc recorder	SPDIF	Not used	44.1K	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active

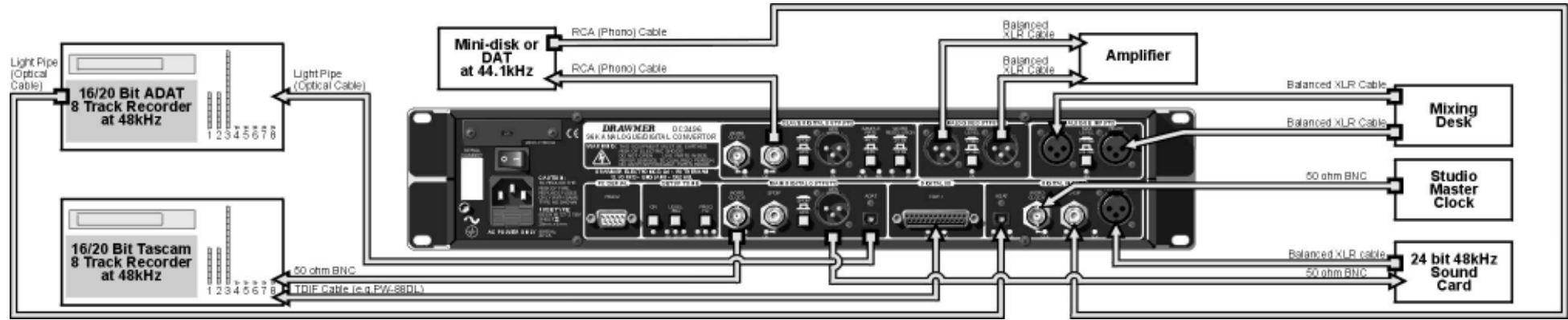
# 48K 24Bit Recording and Replay

**OPERATION** 48K 24Bit A/D conversion with monitor speakers recording and replaying, 8 Track digital tape recorders, DAT and 24Bit 48K hard disk recorder, also recording 44.1K 16 Bit to Mini-disc, all simultaneously.



- COMMENTS**
- 1) Ensure that the A/D input signal does not light the overload leds - analogue clipping will occur. Reduce the mixer output level as required. Apply DC2496 digital gain with limiter to allow more A/D input headroom whilst preserving 0dBFS digital level.
  - 2) If the peak noise level from the mixing desk is above -100dB then the bottom leds of the meter will remain lit.
  - 3) If the mixer has a -10dBu output level then the analogue input switch should be pressed (+4dBu max input signal level).
  - 4) To ensure a 0dBFS digital signal level add a few dB's of digital gain and set the limiter to fast.
  - 5) If digital gain is applied with the limiter off then unpleasant digital distortion can occur on peaks.
  - 6) When recording triple (3) tracks, tracks 7 and 8 will only monitor at 16Bit resolution from the Sample Rate Converter (upper) digital outputs.
  - 7) When the TDIF plug is inserted into the rear of the DC2496 the main digital output word clock BNC is only suitable for TDIF word sync input.
  - 8) When monitoring using the Slave Digital Output white noise bursts at 0dB may be heard when changing sample rate.
  - 9) Always reduce monitor volume when selecting different word clocks or sample rates.

FRONT PANEL									
OPERATION	INPUT SIGNAL	LIMITER	WORD RESOLUTION	DITHER	SAMPLE RATE	EXTENDED WORK CLOCK	REPLAY TRACK	MODE	DIGITAL GAIN
<b>48K 24 Bit A/D Input Recording</b> Record a stereo signal on triple (3) tracks either as tracks 1,2,3 or 4,5,6 or both on an ADAT or Tascam 16/20Bit digital multi-track tape recorder - and 7,8 stereo pair as a backup if required. ADAT machines must be set to EXT Clock. Tascam machines must be set to WORD clock, and a BNC lead from DC2496 main word clock to Tascam Word Clock in.	<input type="radio"/> SPDIF <input type="radio"/> AES <input type="radio"/> TDIF <input type="radio"/> ADAT <input checked="" type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input type="radio"/> MED <input type="radio"/> SLOW <input checked="" type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input checked="" type="radio"/> 48K <input type="radio"/> 88.2K <input type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input type="radio"/> TDIF <input type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input type="radio"/> 3.4 <input type="radio"/> 1.2		
XLR balanced inputs. Use as required. 24 bit bit splitting mode to record 6 tracks. High Frequency Noise shaped dither. 48K internal sample rate. none. none. SELECT THIS RECORD LED FIRST. 0 dB. If gain is applied limiter must be used.									
<b>48K 24 Bit A/D Input Replay from ADAT</b> Replay triple (3) tracks 1,2,3 or 4,5,6, or tracks 7,8 stereo pair. ADAT must be set to INT Clock. There will be a short burst of white noise at 0dB if a replay track changes from normal 16/20 Bit mode to High-Res mode whilst replaying.	<input type="radio"/> SPDIF <input type="radio"/> AES <input type="radio"/> TDIF <input checked="" type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input checked="" type="radio"/> MED <input type="radio"/> SLOW <input type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input checked="" type="radio"/> 48K <input type="radio"/> 88.2K <input type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input type="radio"/> TDIF <input checked="" type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input checked="" type="radio"/> 3.4 <input type="radio"/> 1.2		
Light Pipe ADAT optical in. Use as required. 24 bit stereo mode. High Frequency Noise shaped dither. 96K or 88.2K lit when hex track recording is replayed. ADAT external optical input word clock. Lit when hex track recording is replayed. SELECT THIS PLAY LED FIRST. 6 dB of gain with limit use as required.									
<b>48K 24 Bit A/D Input Replay from TDIF i.e. DA-88</b> Replay triple (3) tracks 1,2,3 or 4,5,6, or tracks 7,8 stereo pair. Tascam must be set to INT Clock. There will be a short burst of white noise at 0dB if a replay track changes from normal 16/20 Bit mode to High-Res mode whilst replaying.	<input type="radio"/> SPDIF <input type="radio"/> AES <input checked="" type="radio"/> TDIF <input type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input checked="" type="radio"/> MED <input type="radio"/> SLOW <input type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input checked="" type="radio"/> 48K <input type="radio"/> 88.2K <input type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input checked="" type="radio"/> TDIF <input type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input checked="" type="radio"/> 3.4 <input type="radio"/> 1.2		
TDIF digital input from 25 pin D plug. Use as required. 24 bit stereo mode. High Frequency Noise shaped dither. 96K or 88.2K lit when hex track recording is replayed. TDIF external 25 pin D plug word clock. Lit when hex track recording is replayed. SELECT THIS PLAY LED FIRST. 6 dB of gain with limit use as required.									
<b>48K 24 Bit Replay from Hard Disk recorder or other AES Digital Input</b> Monitor on D/A whilst recording to mini-disc, ADAT and TDIF simultaneously (All recording devices must use external word clock)	<input type="radio"/> SPDIF <input checked="" type="radio"/> AES <input type="radio"/> TDIF <input type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input checked="" type="radio"/> MED <input type="radio"/> SLOW <input type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input type="radio"/> EXT-> <input type="radio"/> 44.1K <input checked="" type="radio"/> 48K <input type="radio"/> 88.2K <input type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input type="radio"/> TDIF <input type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input type="radio"/> 3.4 <input type="radio"/> 1.2		
AES (XLR) digital input. Use as required. 24 bit stereo mode. High Frequency Noise shaped dither. 96K or 88.2K lit depending on replay sample rate. AES (XLR) word clock. Not Active. SELECT THIS PLAY LED FIRST. 6 dB of gain with limit use as required.									

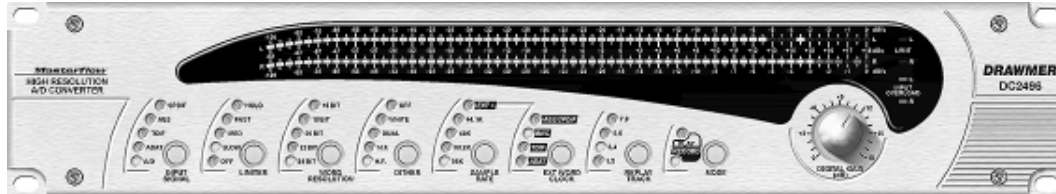


REAR PANEL - BOTTOM ROW					REAR PANEL - TOP ROW																
MAIN DIGITAL OUTPUTS				DIGITAL I/O	DIGITAL INPUTS				AUX DIGITAL OUTPUTS				ANALOGUE OUTPUTS			ANALOGUE INPUTS					
WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	ADAT	ADAT	WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	SAMPLE RATE	WORD RES	LEFT	MAX LEVEL	RIGHT	LEFT	MAX LEVEL	RIGHT
to Tascam word clock in	Not connected	AES	to Hard Disk Recorder	to ADAT Recorder	to Tascam Recorder	Not active	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	Not used	44.1K	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	from Monitor Desk output	+21dBu max output signal level	from Monitor Desk output
to Tascam word clock in	Not connected	AES	to Hard Disk Recorder	to ADAT Recorder	to Tascam TDIF digital I/O Copy ADAT recording to Tascam	Optical light pipe from ADAT digital out	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	Not used	44.1K	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active
to Tascam word clock in	Not connected	AES	to Hard Disk Recorder	copy to ADAT digital input	25 pin D plug from Tascam digital I/O	Not active	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	Not used	44.1K	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active
to Tascam word clock in	Not connected	AES	to Hard Disk Recorder	copy to ADAT as triple tracks 48K	to Tascam TDIF digital I/O Copy hard disk recording to Tascam as triple tracks at 48K	Not active	Not active	Not active	Digital input from hard disk recorder	Not used	to Mini-disc recorder	SPDIF	Not used	44.1K	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active

# Multi-Track Copy

**OPERATION**

Digitally copy ADAT to TDIF or TDIF to ADAT 44.1/48K or 88.2/96K recordings. Also reduce 48K 24Bit triple tracks to 48K 16 Bit stereo with optimum dither, without using sample rate conversion.

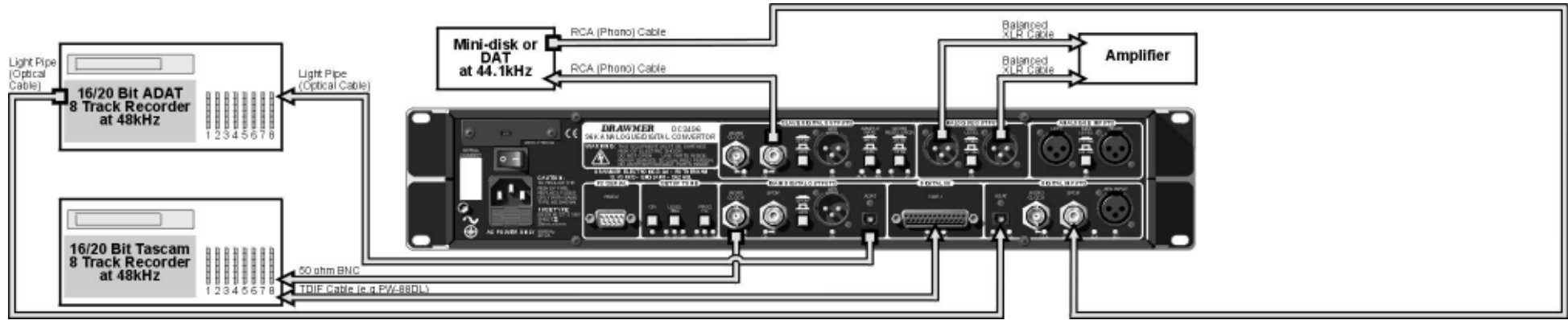


**COMMENTS**

- 1) When the TDIF plug is inserted into the rear of the DC2496 the main digital output word clock BNC is only suitable for TDIF word sync input.
- 2) If digital gain is applied with the limiter off then unpleasant digital distortion can occur on peaks.
- 3) When monitoring using the Slave Digital Output white noise bursts at 0dB may be heard when changing sample rate.
- 4) Always reduce monitor volume when selecting different word clocks or sample rates.
- 5) Triple and Hex Tracks (tracks 1 to 6) can be digitally copied in the same way as normal stereo recording. Tracks 7 & 8 will be a stereo processed signal with gain limit and dither.

FRONT PANEL									
OPERATION	INPUT SIGNAL	LIMITER	WORD RESOLUTION	DITHER	SAMPLE RATE	EXTENDED WORK CLOCK	REPLAY TRACK	MODE	DIGITAL GAIN
<p><b>Copy ADAT Recording to TDIF</b></p> <p>Make a digital copy of normal stereo tracks or hi-res 48K triple or 96K hex tracks.</p> <p>Set ADAT to INT Clock. Set TDIF to WORD Clock and Digital Input.</p>	<input type="radio"/> SPDIF <input type="radio"/> AES <input type="radio"/> TDIF <input checked="" type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input type="radio"/> MED <input type="radio"/> SLOW <input checked="" type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input checked="" type="radio"/> 48K <input type="radio"/> 88.2K <input type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input type="radio"/> TDIF <input checked="" type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input type="radio"/> 3.4 <input checked="" type="radio"/> 1.2	<input type="radio"/> PLAY <input checked="" type="radio"/> RECORD	
<p><b>Copy TDIF to ADAT</b></p> <p>Make a digital copy of normal stereo tracks or hi-res 48K triple or 96K hex tracks.</p> <p>Set TDIF to WORD Clock. Set ADAT to DIG Clock and Digital Input.</p>	<input type="radio"/> SPDIF <input type="radio"/> AES <input checked="" type="radio"/> TDIF <input type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input checked="" type="radio"/> MED <input type="radio"/> SLOW <input type="radio"/> OFF	<input type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input checked="" type="radio"/> 48K <input type="radio"/> 88.2K <input type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input checked="" type="radio"/> TDIF <input type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input type="radio"/> 3.4 <input type="radio"/> 1.2	<input type="radio"/> PLAY <input checked="" type="radio"/> RECORD	
<p><b>Copy TDIF or ADAT Hi-Res Recording to tracks 7,8 as stereo master</b></p> <p>Reduce a hex or triple track 96/48K 24 Bit recording to 48K 16 Bit with optimum noise shaped dither on tracks 7,8 slave and main outputs.</p>	<input type="radio"/> SPDIF <input type="radio"/> AES <input checked="" type="radio"/> TDIF <input type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input checked="" type="radio"/> MED <input type="radio"/> SLOW <input type="radio"/> OFF	<input checked="" type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input checked="" type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input checked="" type="radio"/> 48K <input type="radio"/> 88.2K <input type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input checked="" type="radio"/> TDIF <input type="radio"/> ADAT	<input type="radio"/> 7.8 <input checked="" type="radio"/> 5.6 <input checked="" type="radio"/> 3.4 <input checked="" type="radio"/> 1.2	<input checked="" type="radio"/> PLAY <input checked="" type="radio"/> RECORD	
<p><b>Reduce 48K 24Bit triple tracks to 16 Bit stereo.</b></p> <p>Replay a ADAT or TDIF triple track reduced to 16 Bit stereo.</p>	<input type="radio"/> SPDIF <input type="radio"/> AES <input checked="" type="radio"/> TDIF <input checked="" type="radio"/> ADAT <input type="radio"/> A/D	<input type="radio"/> HOLD <input type="radio"/> FAST <input checked="" type="radio"/> MED <input type="radio"/> SLOW <input type="radio"/> OFF	<input checked="" type="radio"/> 16 BIT <input type="radio"/> 18 BIT <input type="radio"/> 20 BIT <input type="radio"/> 22 BIT <input type="radio"/> 24 BIT	<input type="radio"/> OFF <input type="radio"/> WHITE <input type="radio"/> DUAL <input type="radio"/> MF. <input checked="" type="radio"/> HF.	<input checked="" type="radio"/> EXT-> <input type="radio"/> 44.1K <input checked="" type="radio"/> 48K <input type="radio"/> 88.2K <input type="radio"/> 96K	<input type="radio"/> AES/SPDIF <input type="radio"/> BNC <input checked="" type="radio"/> TDIF <input type="radio"/> ADAT	<input type="radio"/> 7.8 <input type="radio"/> 5.6 <input checked="" type="radio"/> 3.4 <input type="radio"/> 1.2	<input type="radio"/> PLAY <input checked="" type="radio"/> RECORD	





REAR PANEL - BOTTOM ROW					REAR PANEL - TOP ROW																
MAIN DIGITAL OUTPUTS					DIGITAL I/O					AUX DIGITAL OUTPUTS					ANALOGUE OUTPUTS			ANALOGUE INPUTS			
WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	ADAT	TDIF-1	ADAT	WORD CLOCK	SPDIF	AES	WORD CLOCK	SPDIF	SPDIF/AES TOGGLE	AES	SAMPLE RATE	WORD RES	LEFT	MAX LEVEL	RIGHT	LEFT	MAX LEVEL	RIGHT
to Tascam word clock in	Not connected	AES	use if required	not active	to Tascam Recorder	ADAT optical input & word clock	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	Not used	44.1KHz	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active
to Tascam word clock in	Not connected	AES	use if required	Optical light pipe to ADAT digital in	to Tascam TDIF digital I/O	Not active	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	Not used	44.1KHz	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active
to Tascam word clock in	Not connected	AES	use if required	copy to ADAT digital input	25 pin D plug from Tascam digital I/O	light pipe from ADAT digital output	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	Not used	44.1KHz	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active
to Tascam word clock in	Not connected	AES	use if required	copy to ADAT digital input	25 pin D plug Tascam digital I/O	light pipe from ADAT digital output	Not active	Not active	Not active	Not used	to Mini-disc recorder	SPDIF	—	44.1KHz	16Bit	to Monitor Amplifier	+21dBu max output signal level	to Monitor Amplifier	Not Active	Not Active	Not Active

## CHAPTER 4

### HELPFULL HINTS

#### Recording Hi-Resolution 'Bit splitting' tracks on a Digital Tape Recorder (ADAT or TDIF)

When recording Triple (48k) or Hex (96k) Hi-Resolution tracks to tape the SRC (upper) AES & SPDIF digital outputs will monitor tracks 7/8 @ 20 or 16bit resolution depending on the rear panel push switch.

When TDIF 'D' plug is inserted the DC2496 BNC Word Clock output will be phase shifted by 90 degrees at a rated 44.1k @ 88.2k and 48k @ 96khz. This is the clock for TDIF Word Sync.

When using A/D, ADAT or TDIF as the input signal and SAMPLE RATE is set to EXT with AES/SPDIF then the DC2496 will get its EXT word clock from the AES digital input (XLR socket), not the SPDIF digital input socket.

The main (lower) SPDIF and AES output sockets both support 88.1 and 96K 24bit signals if selected on the front panel. The EXT SPDIF word clock input is only available when SPDIF input signal is also selected.

The Sample Rate Converted AES & SPDIF output sockets are rounded to 16/20bits and HF dither added regardless of front panel settings according to the rear panel switch.

The 'Setup tone' frequency will only be accurate to a few percent of its correct value when an EXT clock source is used.

The Rear panel 'Green audio signals OK' LEDs are lit when the PLL is locked and signals are output.

ADAT and TDIF track outputs will always be at 44.12/48Khz even if A/D or Digital input is at 88.2 or 96K

There are two Hi-Resolution recording modes:

Triple (3) track 24bit 44.1 or 48Khz on either or both tracks 123 or 456, or, Hex (6) track 24bit 88.2 or 96Khz on tracks 123456.

Both triple and hex track modes also have a stereo backup 16bit 44.1 or 48k recording on tracks 7/8

When recording a 48/44.1K Hi-Res triple track it is preferable to use tracks 4,5,6.

If tracks 123 only are recorded then there noise will be heard when monitoring tracks 5,6. This is correct and is the 'Remainder' track of the Hi-Res signal.

If track triple 4,5,6 is recorded or both sets of Triple tracks then this noise will not be heard.

#### Special Digital Tape Recorder (ADAT or TDIF) Play cases:

When replaying a normal ADAT or TDIF recording, all 8 tracks will be directly copied to the 8 TDIF and ADAT output tracks. Limiter, Gain, Word resolution, dither etc will not modify the 8 track signals. The Main digital output will have Gain, Limit etc. and will monitor the selected replay track LEDs. The 48/44.1Khz SRC digital output will exactly monitor the selected replay track LEDs (without Gain, Limiter etc).

When replaying a Hi resolution triple or hex track recording (made when both 24 and 16 bit WORD RESOLUTION LEDs are lit) the Sample Rate Convertor digital AES/SPDIF, the Main AES/SPDIF digital output and TDIF and ADAT track outputs 7/8 will replay the stereo signal from the tracks shown by the REPLAY TRACK LEDs. Gain, limiter, Bit rounding & dither can all be applied.

The TDIF and ADAT output tracks 1 thru 6 will be an exact bit copy of the triple or hex track Hi-res recording.

For best results when reducing a 96K 24bit recording to 44.1 @ 16 bits leave the front panel LED set to 24bits and reduce the signal to 16bits @ 44.1Khz on the SRC rear panel grey push switches.

The DC2496 cannot record or play normal stereo signals @ 96k to ADAT or TDIF. You must select the WORD RESOLUTION as 2 LED (16 and 24) bit splitting mode and Sample Rate as 44.1/48K.

Up to 4 x DC2496 can be used to simultaneous record 48K 24bit signals (if the recorder allows) to TDIF using a special splitter lead. The Word Clock must be EXT TDIF on the DC2496's with the TDIF machine providing the Word Clock. This cannot be done using ADAT light pipe

Several DC2496 units can be synchronised to sample accuracy (better than 0.2uS) by setting the master unit SAMPLE RATE to Internal clock 96/88.2/48/44.1 FS then setting the other units as EXT BNC word clock slaves.

## CHAPTER 5

# DC2496 INFORMATION

## SOFTWARE UPGRADES

Periodically there may be additions to the DC2496 software that will be made available.

In order to carry out a software upgrade to the DC2496 the following parts will be required:

- 486 or better PC computer running Win95 or late.
- Cable - RS232 9 pin to RS232 9 pin. Connected to Com 1 on the P.C. and into the RS232 port on the rear of the DC2496.
- DRAWMER 'Masterflow DC2496 upgrade' software - available free from our web site.

The 'Masterflow Upgrade' programme can be obtained by two methods:

- 1 Contact your main dealer to receive the upgrade on 2 x floppy disks.
- 2 Download the new version of software from the internet.  
Website address [www.drawmer.co.uk](http://www.drawmer.co.uk)

To Install the software onto the PC

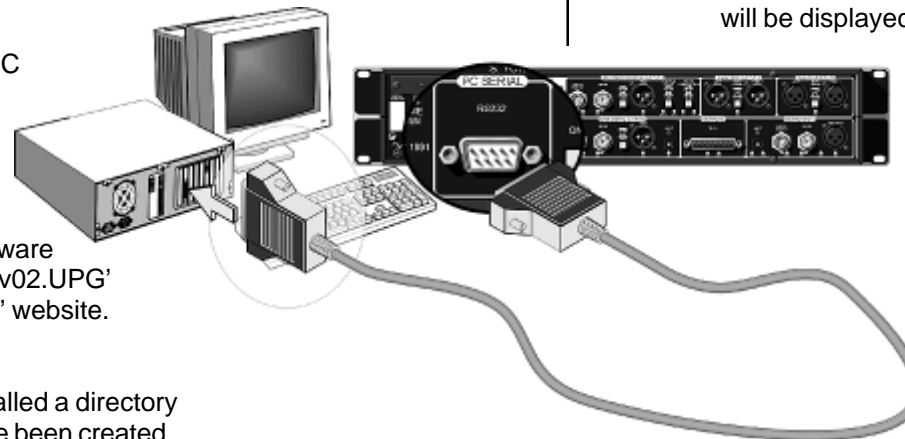
- 1 Press START  
Select RUN  
Choose setup.exe

- 2 Download the latest software upgrade e.g.: 'DC2496 1v02.UPG' from the 'drawmer.co.uk' website.

Technical Notes:

When the software is installed a directory called c:\drawmer will have been created.

*upgrade.exe* is the programme to execute.



Once the software has been obtained the unit can be upgraded. This is achieved by the following method:

Plug the RS232 cable into the Com 1 port on your PC.

Connect the other end of the RS232 into the RS232 slot on the rear of the DC2496.

Click START.

Select PROGRAMMES.

Click on the Upgrade icon.

Wait a few seconds until the DC2496 unit has been recognised.

The installed software will be compared and if required the unit will be upgraded. (This will take approximately 2 minutes)

A Screen message will indicate the software version number.

Once the software has been upgraded, the latest 'Features' notes will be displayed and also the 'Reset factory patches' button.

Click the 'Reset Factory Patches' button to overwrite all factory patches with the ones contained in the latest software

Click 'EXIT' to leave the upgrade programme.

Note:

Once the DRAWMER unit has been recognised a 'Force Upgrade' button will appear. Click this button to select a particular software version number to send to the unit.

## CHAPTER 6

### GENERAL INFORMATION

#### IF A FAULT DEVELOPS

For warranty service please call Drawmer Electronics Ltd. or their nearest authorised service facility, giving full details of the difficulty.

A list of all main dealers can be found on the Drawmer webpages.

On receipt of this information, service or shipping instructions will be forwarded to you.

No equipment should be returned under the warranty without prior consent from Drawmer or their authorised representative.

For service claims under the warranty agreement a service Returns Authorisation (RA) number will be issued.

Write this RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem.

Authorised returns should be prepaid and must be insured.

All Drawmer products are packaged in specially designed containers for protection. If the unit is to be returned, the original container must be used. If this container is not available, then the equipment should be packaged in substantial shock-proof material, capable of withstanding the handling for the transit.

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#### CONTACTING DRAWMER

Drawmer Electronics Ltd., will be pleased to answer all application questions to enhance your usage of this equipment. Please address correspondence to:

Drawmer (Technical Help line)  
Coleman Street  
Parkgate  
Rotherham  
S62 6EL  
UK

Alternatively contact us by E-mail on :

[tech@drawmer.co.uk](mailto:tech@drawmer.co.uk)

Further information on all Drawmer dealers, Authorised service departments and other contact information can be obtained from our web pages on:

<http://www.drawmer.co.uk>

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## CHAPTER 7

## DC2496 DATA

## SPECIFICATION

**Analogue Input**

Connectors	XLR Balanced (Pin 2 Hot)
Impedance	10 K $\Omega$
Max. Input Level	+24 dBu
Input CMR	Better than -50dB
A to D Conversion	24 Bit
Dynamic Range	A/D >129dBFs A Weighted at 48KHz
Crosstalk	-100dB @ 1kHz -90dB @ 10kHz
Sample Rate	44.1, 48, 88.2, 96kHz, EXT

**Analogue Output**

Connectors	XLR Balanced (Pin 2 Hot)
Impedance	50 $\Omega$
Max. Output Level	+21 dBu
Output Balance	-35dB @ 1KHz
D to A Conversion	24 Bit
Dynamic Range	-108dB Unweighted
THD	<0.008% @ 1KHz, +10dBu
Frequency Response @ -1dB	96kHz 7Hz - 44kHz 88.2kHz 7Hz - 41kHz 48kHz 7Hz - 22kHz 44.1kHz 7Hz - 20kHz

**Digital Inputs and Outputs**

Main AES/EBU In/Out	XLR
Main S/PDIF In/Out	Coaxial, RCA Type
TDIF	25 pin D plug. 8 Channel
ADAT	Light Pipe (Optical Cable).8 Channel
Sample Rates	44.1, 48, 88.2 and 96KHz
Word Length	16, 18, 20, 22, 24 Bits

**Aux Digital Outputs (SRC)**

Aux AES/EBU In/Out	XLR
Aux S/PDIF In/Out	Coaxial, RCA Type
Sample Rates	44.1kHz, 48kHz
Word Length	16, 20 Bits

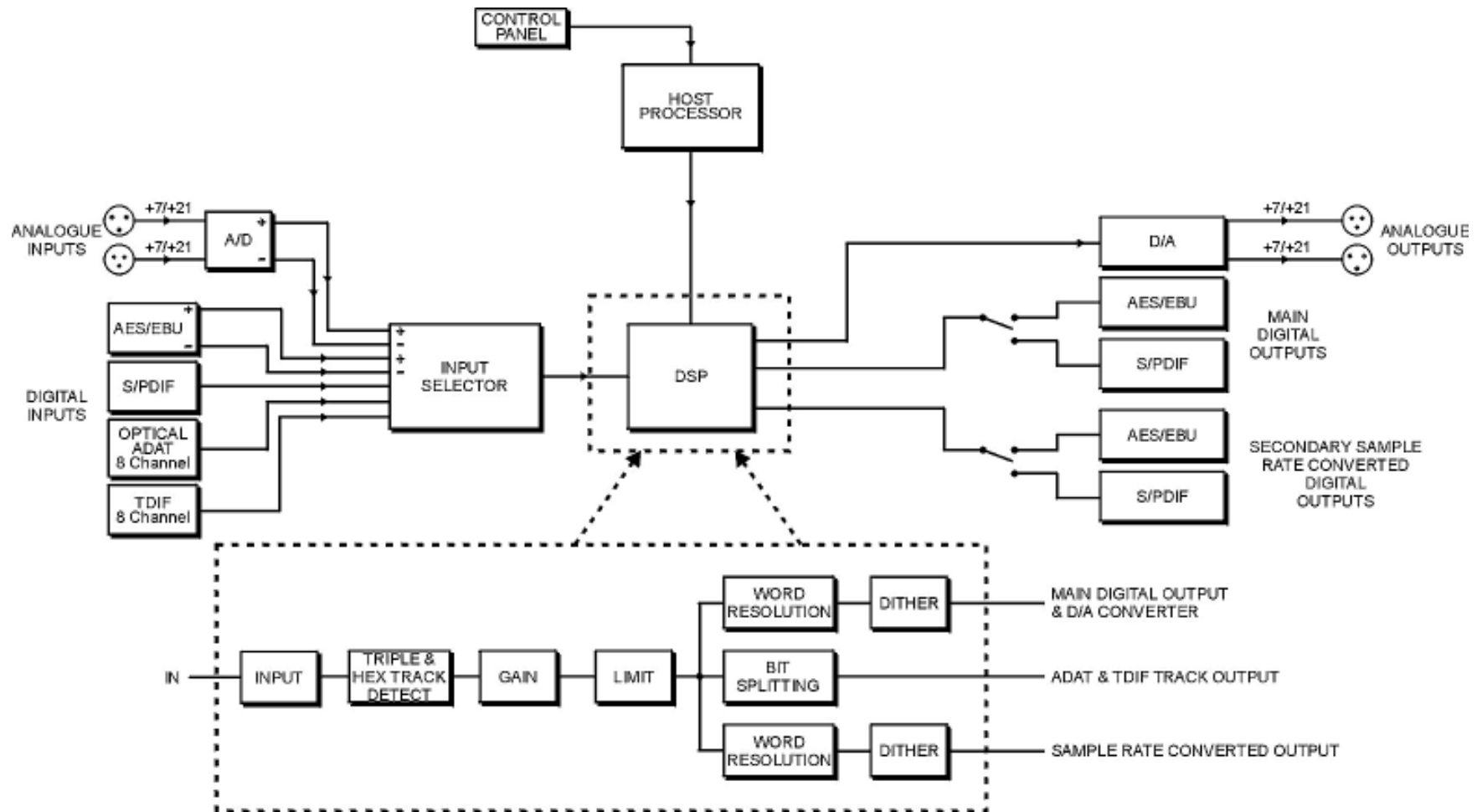
**Multi-Track I/O**

<b>ADAT Optical</b>	In and Out on all eight channels using Light Pipe
<b>TDIF</b>	In and Out on all eight channels using Tascam Digital Interface (25 pin DSUB)

**General**

Power Requirements	40VA
Fuse Rating	T160mA at 220 Volts, T320mA at 110Volts CONFORMING TO: IEC 127-2
Fuse Type	20mm x 5mm, Class 3 Slow - Blow 250Volt working
Case Size (mm)	482(w) x 88(h) x 250(d)
Weight (incl packaging)	5KG

## BLOCK DIAGRAM



Ref:1v02 A 30-09-04