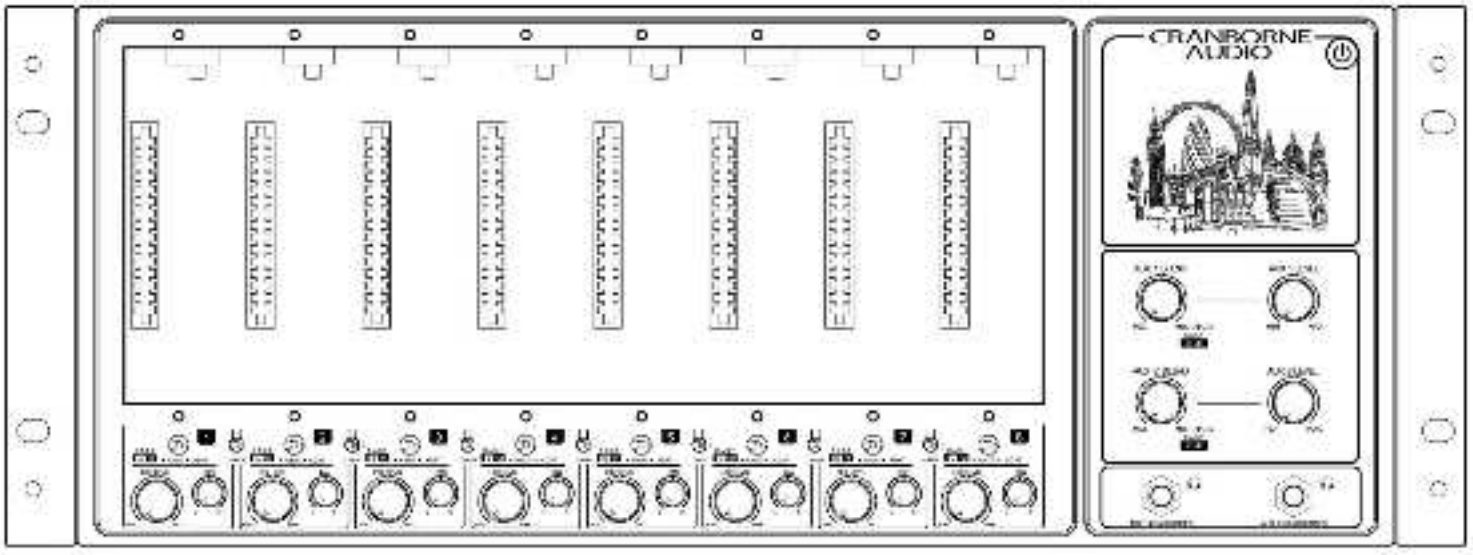
CRANBORNE AUDIO



500ADAT - Analogue/Digital Hybrid ADAT Expander, Summing Mixer, and 500 Series Rack

User Manual

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Welcome to our family

Cranborne Audio represents a commitment by four product designers to build an audio brand that does things the right way. We don't take shortcuts. We don't compromise. We don't accept "good enough."

We're just like you. We're musicians. We're audio engineers.

We make products that we want to use. We create, innovate, and design with passion, purpose, and belief. We strive to design products that remain accessible whilst offering the highest quality and truly innovative new ways of working and achieving that sound that we all desire.

Cranborne Audio, for us, means so much more than metal boxes with components in them. These are our labours of love that embody and demonstrate our demand for excellence. By distilling what matters and putting our soul into these tools, we hope to help other people make magic and express themselves, and in some way, become part of our Cranborne Audio family.

So welcome to our family. We care for our family. And we care about making your tracks, albums, scores sound as good as they should.



Sean Karpowicz



Edward Holmes



Elliott Thomas



Andrew Pat

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Cranborne Audio 500ADAT

Congratulations on your purchase of 500ADAT and thank you for selecting Cranborne Audio to be a part of your music creation process.

What we set out to achieve with 500ADAT was putting control back into the hands of musicians and engineers. In a sea of products that rely on computer integration and a “virtual emulation” mentality, we set out to offer an alternative that places a true, customisable, and flexible analogue front-end at the forefront of music creation - after all, the feel and touch of a musician is analogue and that’s where the music begins.

Working in harmony with 500ADAT’s analogue stages is its high-performance digital stages. Each and every component inside 500ADAT has been carefully considered to ensure that every nuance of your 500 series module is translated into the best possible digital signal to be processed. We employ converters with specifications that rival that of the best standalone units whilst being governed by our master reference-grade clock featuring less than 0.5 picoseconds of jitter.

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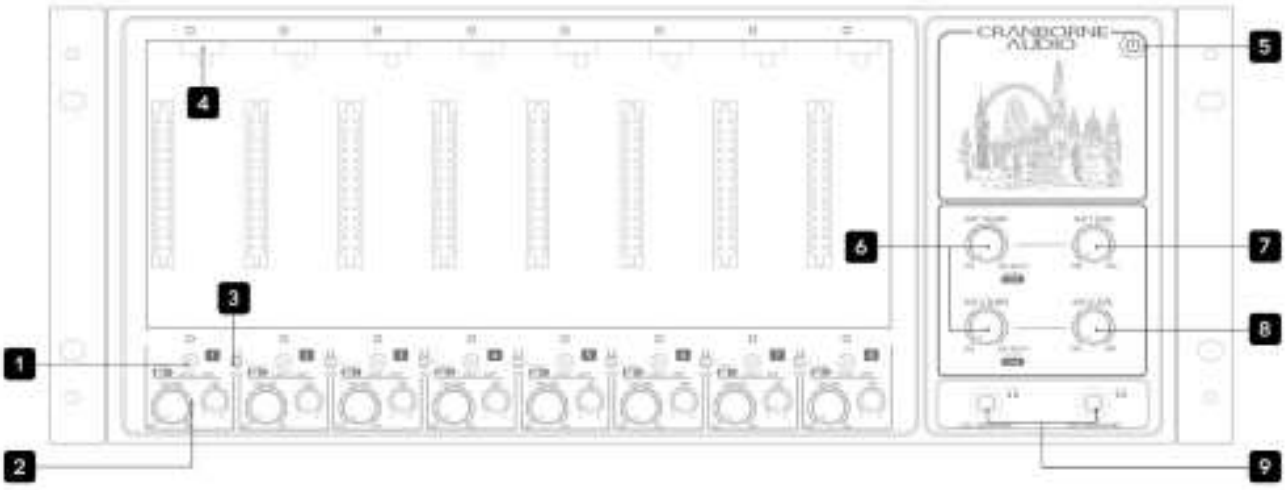
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Getting Started

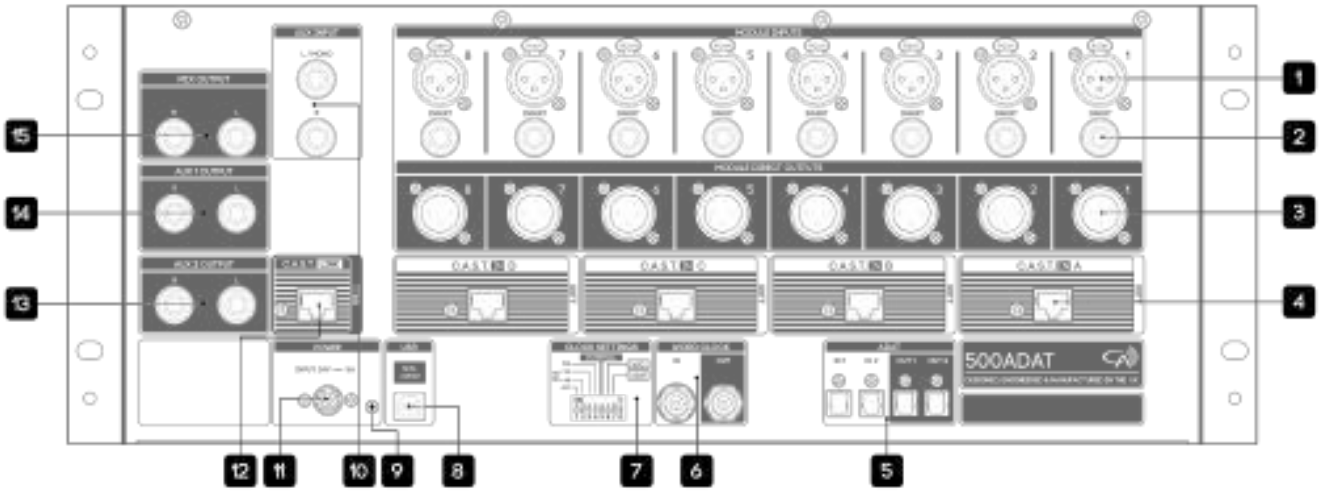
Controls, Switches, and Connectors



[1] Source Switch: Toggles the input source of each 500 series slot between C.A.S.T., Analogue, and ADAT sources.	**[5] Power Switch:** Safely powers on and off 500ADAT as well as any inserted 500 series module. Tap to power on, press and hold to power off.
[2] Mix Level & Pan Controls: Adjusts the level and pan position of each 500 series slot into the built-in Summing Mixer.	**[6] Aux 1 & 2 Blend Controls:** Blends the Summing Mixer and Aux Input together into the Aux 1 and 2 Busses independently.
[3] Chain Switch: Sends the output of the preceding module into the input of the next. (1 into 2, 2 into 3, 3 into 4 etc).	**[7+8] Aux 1 & 2 Level Controls:** Adjusts the main level of Aux 1 and 2 to their discrete headphones and Aux Output 1/4" jack outputs on the rear panel.
[4] Slot Bypass Switch: Bypasses the 500 series slot to enable recording without a module installed. All other features function normally when slot bypass is engaged.	**[9] Aux 1 & 2 Headphones Outputs*:** Used for connecting Independent headphones to Auxes 1 and 2.

Note:
****Only connect headphones to 500ADAT's headphones outputs. Unbalanced and/or line connections could short leg to ground and cause a spike in power consumption. Any damage caused to the unit as a result of unsupported connections is <u>not covered</u> under the Cranborne Audio warranty.***

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[1] Module Input: Connects balanced XLR analogue inputs into each 500 series slot. Input sensitivity varies depending on the type of module inserted.	**[8] USB 2.0:** Used for software updating and non-audio purposes only. Cannot be used as an audio interface.
[2] Insert: Connects external equipment in-line after the 500 series module but before the A/D of each 500 series slot. Utilises a standard Y-split or insert cable. (Tip=send, Ring=return).	**[9] Grounding Post:** Enables direct binding to chassis ground to help eliminate ground loops in specific setups.
[3] Module Direct Outputs: Sends balanced, line-level outputs of each 500 series slot for connection to external converters and equipment. Module Direct Outputs are positioned post-insert point, pre Mix Level.	**[10] Aux Input:** Connects analogue playback sources from external audio interfaces directly into 500ADAT's monitoring paths.
[4] C.A.S.T. A, B, C, & D Inputs: Enables I/O relocation and expansion via Cranborne Audio C.A.S.T. enabled breakout boxes.	**[11] Power:** Provides 500ADAT with power via the provided external 24v 5A DC power supply. No other power supply should be used.
[5] ADAT I/O: Interfaces 500ADAT's 8-in/8-out ADAT optical lightpipe channels directly into your audio interface of choice.	**[12] C.A.S.T. Link:** Enables linking of the Summing Mixers between 500ADAT and a 500R8. C.A.S.T. link transmits the Summing Mixer into the connected 500R8 for monitoring.
[6] Word Clock I/O: Enables sending and/or receiving word clock information to/from external digital devices.	**[13+14] Aux 1 & 2 Outputs:** Connects balanced line outputs of 500ADAT's Aux 1 and 2 Busses to external monitoring devices or similar via 1/4" jacks.
[10] Clock Settings: Adjusts 500ADAT's Clock Settings including Clock Source and Sample Rate.	**[15] Mix Output:** Connects line outputs of 500ADAT's built-in Summing Mixer directly to external converters or similar via 1/4" jacks.

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Package Contents

So now your 500ADAT is out of it's packaging, you're probably itching to get it powered on and making music! But before you get started, please read the sections below that will help guide you through the process of getting 500ADAT setup, plugged in, and ready-to-record as quickly as possible!

The following items can be found in the packaging alongside 500ADAT:

- External power adapter
- IEC cable
- 16 module fixing screws (crosshead, 4-40 thread size)
- Allen key (2.5mm)
- Quickstart Guide

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Rack-Ear Orientations

There's more to 500ADAT's rack ears than meets the eye. The default shipping configuration features the rack ears mounted flush to the front panel of 500ADAT - the most common method for rack-mounting.

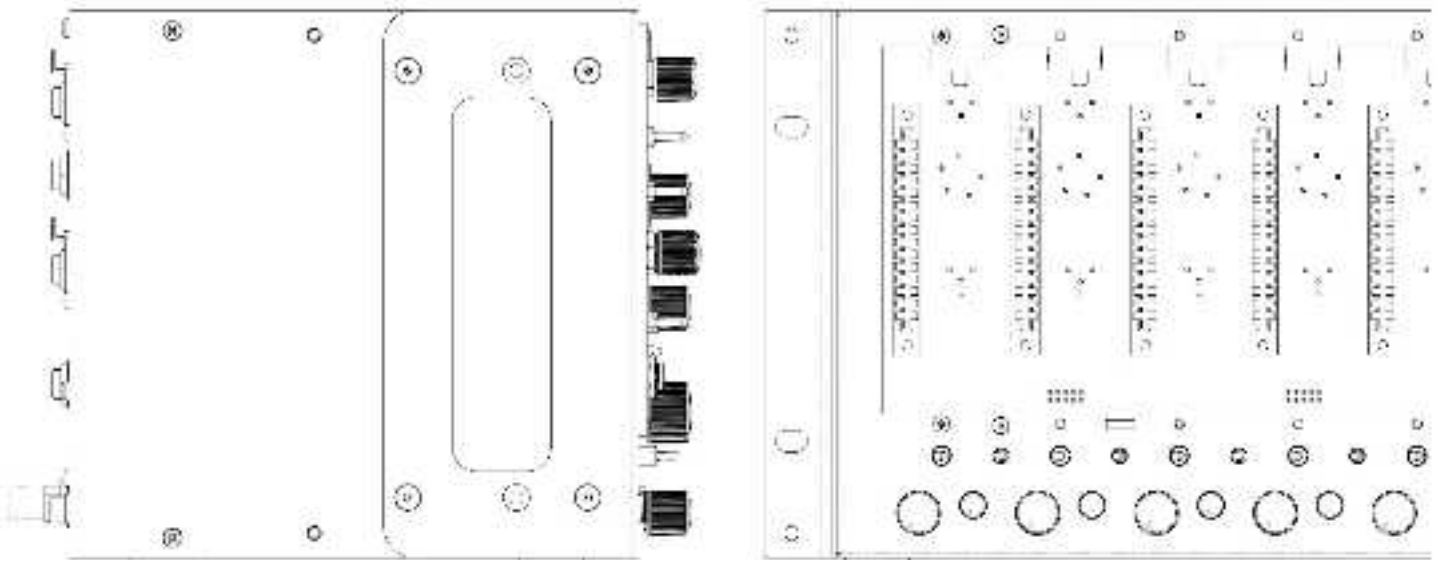
500ADAT can also be set backwards into its rack ears to allow the front panel controls to sit behind the front of the rack for protection during travelling and location recording.

Finally, both of 500ADAT's rack ears can be removed, placed back-to-back, and attached to 500R8 as a convenient carry-handle for travelling.

Depending on your desired use case, you may need to reorientate the rack ears and position the rubber feet to best suit your application by using the supplied 2.5mm allen key.

Default Shipping Configuration

Standard rack-ear configuration used for rack-mounting 500ADAT into standard 19" rack. If you would like to secure 500ADAT into a 19" rack, the rubber feet should be removed from the unit using the allen key provided.



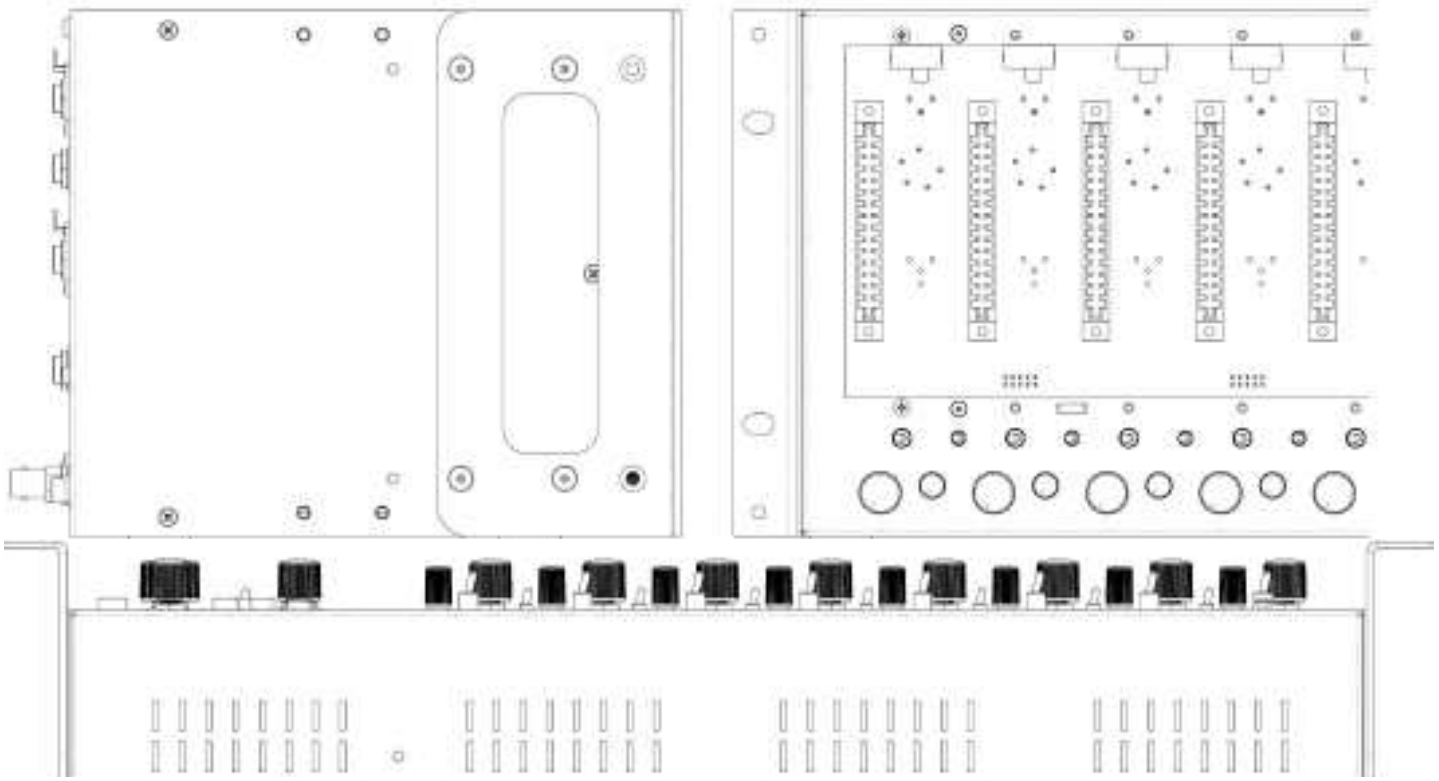
Note:

Whilst 500ADAT features plenty of ventilation to ensure that it remains cool during operation, some 500 series modules (and valve-based modules in particular) can run extremely hot and will cause 500ADAT to heat up quickly. When rack mounting 500R8, please leave a 1u space above and below the unit to ensure that the ventilation is clear and fully-effective.

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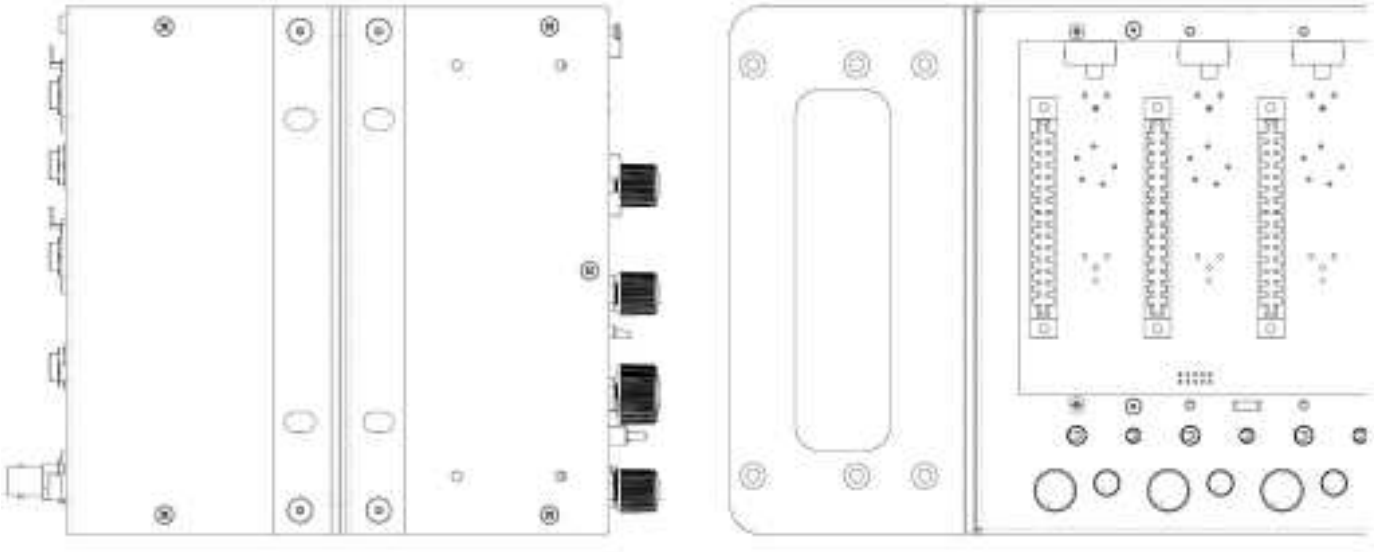
Recessed Configuration

Recesses 500ADAT into a 19” rack to protect all of its front panel controls during transportation. To position the rack ears in this configuration, remove both rack-ears and slide them forward until the holes align with a second set of thread posts on 500ADAT. Once aligned, secure the rack-ears with the 8x rack ear screws using the allen key provided.



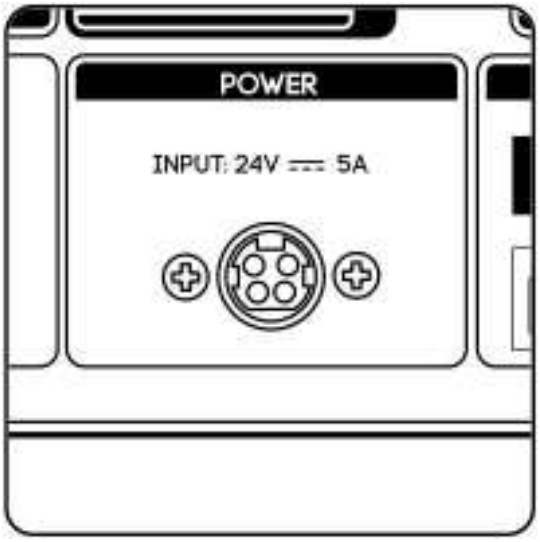
Handle Configuration

Creates a convenient carry-handle for short-distance transportation. To position the rack ears in this configuration, remove both of the rack ears and reposition them back-to-back onto the *left* side of 500ADAT. Secure them into place using 4x rack ear screws and the allen key provided. Store the leftover rack-ear screws in a safe place for future use.



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Power Supply



500ADAT is powered via an external 24v 5A DC switch-mode power supply that supports any operating voltage from 100 to 240v.

Switch mode power supplies can exhibit switching noise but 500ADAT features linear regulation on the DC inlet to ensure that power noise and intermodulation distortion doesn't find itself on the audio rails.

Each 500 series slot features 250mA of power as well as extra headroom if a module is drawing even more current for a maximum of 2A across all 8 slots.

500ADAT's Power delivery is also made via a latching 4-pin connector that is designed to provide a secure connection to the chassis with protection against accidental removal.

Connecting Power

Align the metal pins and plastic locator of the plug with the power inlet. Once located, push the connector firmly into the socket whilst holding the plug's outer housing and not the cable itself.

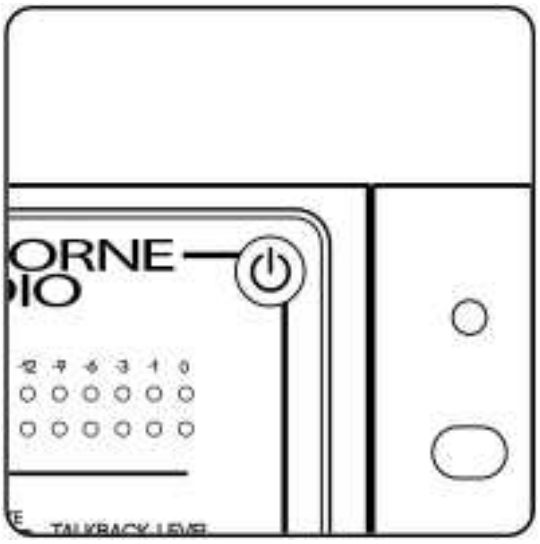
Disconnecting Power

Grip the body of the plug firmly and pull the body of the connector back from the socket. The plug's outer casing will pull back and release the safety latch to allow the plug to be pulled out of the socket.

Note:
Excessive strain or a sudden tug/shock to the power cable could cause damage to the cable strain relief as well as the hardware contact points associated with the power input and power supply.

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Powering Procedures



Powering On

First, make sure your speakers are switched off and any headphones are disconnected. Briefly tap the power button located on the top right of 500ADAT's front panel. The power icon will illuminate blue and you will hear soft 'clicking' as 500ADAT's internal relays actuate. You may now switch on your external equipment sequentially, leaving your speakers until last.

Powering Off

First, make sure your speakers are switched off and any headphones are disconnected. Press and hold the power button for approximately 3 seconds. The power icon will deluminate and you will hear the soft 'clicking' of the relays indicating that the unit has been powered off.

Note:
Please follow these safe powering sequences carefully in order to prevent any unwanted pops and spikes causing damage to downstream audio components including speakers and headphones.

Installing and Removing 500 Series Modules

Installing Modules

1. Ensure 500ADAT is *powered off* and the power connector has been *removed*. Wait 30 seconds before continuing.
2. Firmly touch the metal chassis of 500ADAT to discharge any built-up static electricity.
3. Carefully pick up your 500 series module and locate its conductive edge into the backplane connector of 500ADAT.
4. Once located, push the module into place and secure the module into the rack using the supplied 4-40 screws - be careful not to over tighten and strip the screw or thread.

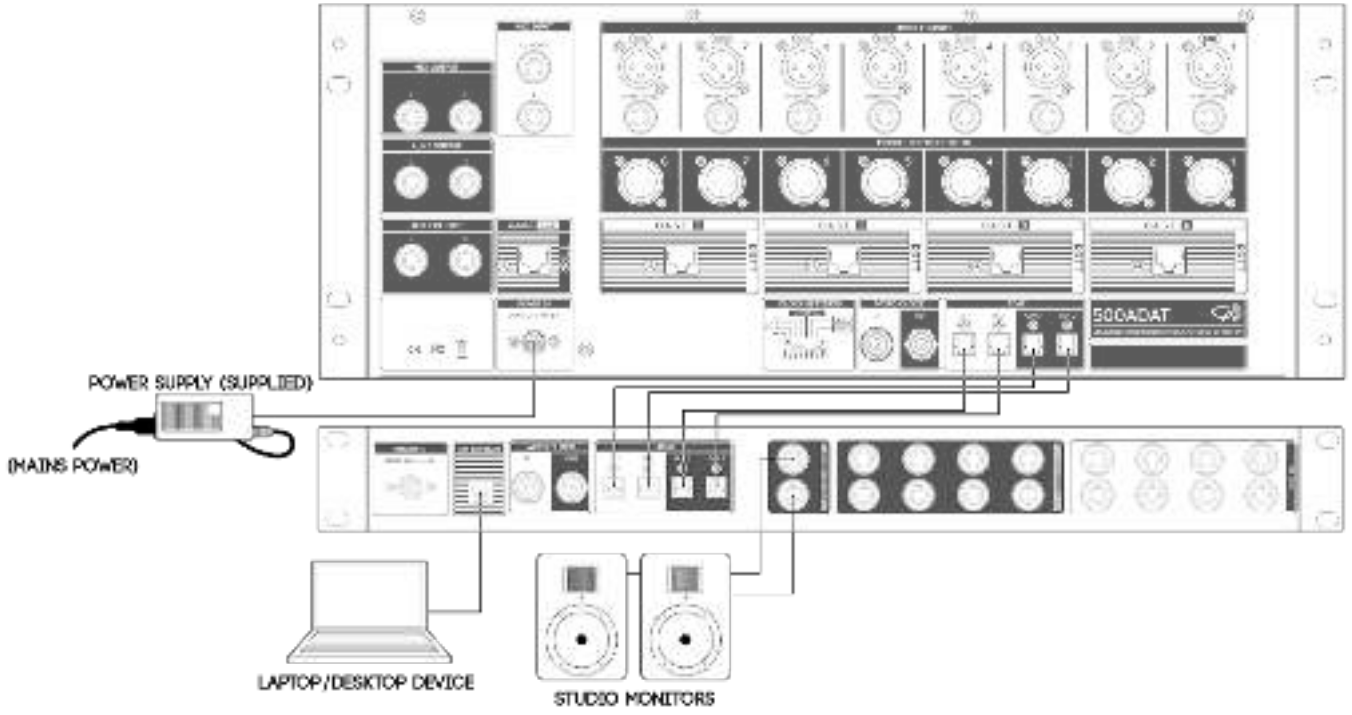
Removing Modules

1. Ensure 500ADAT is *powered off* and the power connector has been *removed*. Wait 30 seconds before continuing.
2. Firmly touch the metal chassis of 500ADAT to discharge any built-up static electricity.
3. Remove the 4-40 module fixing screws and store them in a safe place for future use.
4. Firmly pull the 500 series module to release the module from the backplane connector of 500ADAT and then carefully remove the module from the rack itself.

Note:
Removing or installing modules when any 500 series rack is powered on can cause irreparable damage to the backplane connector, supporting circuitry, and the 500 series module. Damage caused when "Hot Swapping" or installing/removing modules whilst 500ADAT is powered on is not covered under Cranborne Audio's Warranty.

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Hardware Setup



This hardware setup diagram will get 500ADAT connected to your audio interface and ready for recording.

1) Connect mains power into the external PSU supplied in 500ADAT's packaging and connect the power connector into 500ADAT's power inlet.
2) Connect 500ADAT to your audio interface using Optical Cables with Toslink connectors:
    a) 500ADAT's ADAT *outputs* should be connected to your audio interface's ADAT *Inputs*.
    b) 500ADAT's ADAT *inputs* should be connected to your audio interface's ADAT *outputs*.
2) Configure 500ADAT's rear panel Clock Settings DIP switches:
    a) Select your desired Sample Rate using DIP switches 1-4.
    b) Configure DIP switch 5 into its UP/ON position.
    c) All other DIP switches should be DOWN/OFF.
3) Power On 500ADAT using a brief tap of the Power button.
4) Configure your audio interface to clock from via ADAT and ensure your project's Sample Rate matches the Sample Rate set on 500ADAT's Clock Settings DIP switch.
    a) Consult the manufacturer of your audio interface for instructions on how to clock externally via ADAT.

    Note:
    To achieve 500ADAT's best performance, 500ADAT should be set as the clock master of your system and the project sample rate should match 500ADAT's.

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Feature Overview

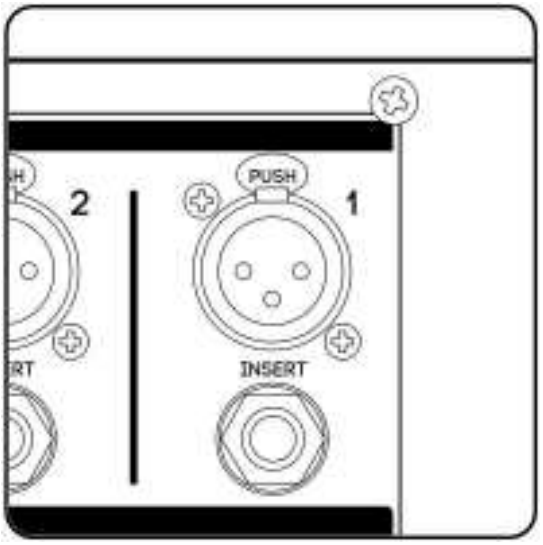
500 Series Rack

The centrepiece of 500ADAT is it's 8-slot, high-current 500 series rack. Each slot features an abundance of I/O located on the rear panel that allows analogue input, insert, and output connectivity per-slot much like a standard standalone 500 series rack.

Each 500 series slot is tightly integrated with 500ADAT's converters and ADAT interface for recording each inserted 500 series module as well as playing back ADAT sources through each 500 series module. Each 500 series slot features front-panel switches that determine its input source and enable deeper integration with 500ADAT's Summing Mixer and ADAT Audio Interface.

Module Inputs

Each 500 series slot features a dedicated balanced XLR input that is used to connect analogue signals into each 500 series module. The module input XLR can accept mic, line, or hi-z sources depending on what module is inserted and it's input sensitivity options.



Note:
In instances where the 500 series module features it's own XLR/Jack input on the front panel, it is advised to check with the manufacturer of the module to determine which input should be used for your desired application.

Inserts

Each 500 series slot features a dedicated Insert connection that utilises a TRS jack socket in a similar configuration that is commonly found on mixing consoles. This Insert point allows external audio equipment such as 19" rackmount compressors and EQs to be inserted into the audio path and recorded. The Insert is situated after the 500 series slot but before the ADC and ADAT output path in the signal which means that the effect Inserted will be heard on the ADAT output, Module Direct Outputs, and internal Summing Mixer.

Insert Wiring
Tip= Send, Ring= Return, Sleeve= Ground

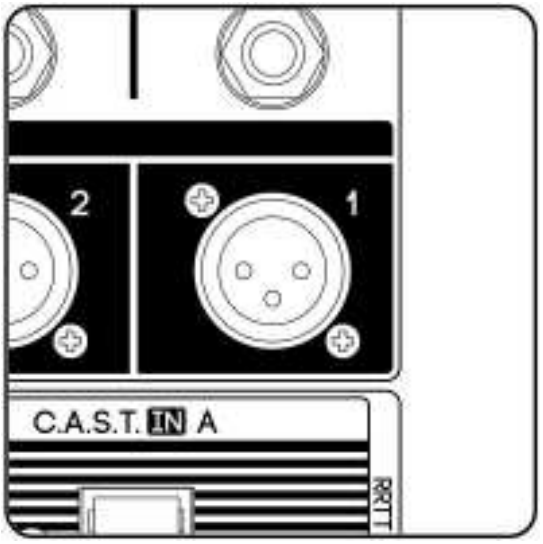
To connect external audio equipment into 500ADAT via its Insert, you will need to use a standard Y-split or insert cable that splits a TRS jack into 2 separate connections - a send and return - to two mono ¼ jacks or male/female XLRs.

The 'Send' connector (Tip + Sleeve) should be connected to the input of your outboard equipment and the 'Return' connector (Ring + Sleeve) should be connected to the output of your outboard equipment.

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Note:
500ADAT does not feature a dedicated switch to engage the insert point and so to fully bypass the insert point during recording/mixing you will need to bypass Inserted effect itself or disconnect the insert point.

Module Direct Outputs

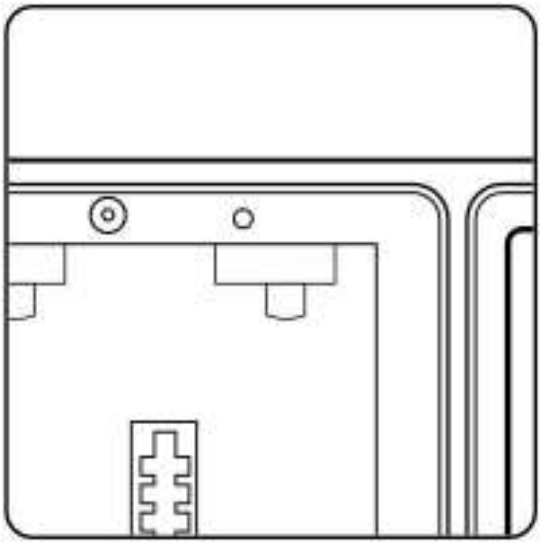


Each 500 series slot features its own Module Direct Output that is a fully balanced XLR line-level output of each 500 series module that can be used to connect to external A/D converters or advanced monitoring systems. The Module Direct Outputs are positioned PRE the Mix Level controls for each 500 series slot and mirror what is sent into the ADAT interface.

You can also use the Module Direct Outputs to send audio from one slot to another by simply using an XLR cable.

Note:
For advanced patching combinations, you can connect the module inputs and outputs of 500ADAT to a patchbay to allow convenient re-ordering of modules as well as advanced channel strip creation without accessing the rear panel.

Slot Bypass Switch



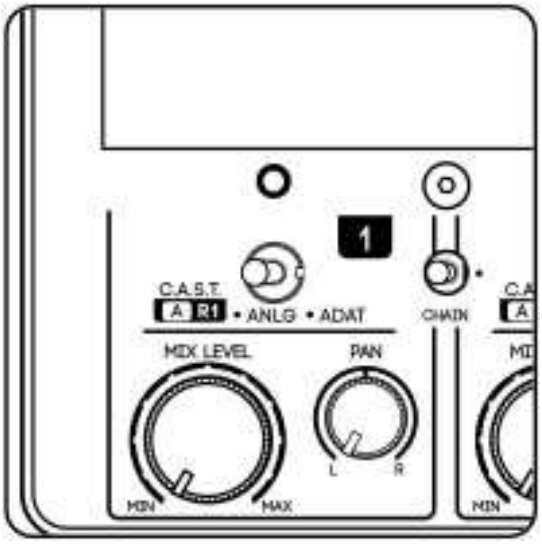
The Slot Bypass switch is located on the backplane connector by each 500 series slot and can be used to bypass the slot if no 500 series modules are inserted. Bypassing the slot allows you to connect line-level sources such as external mic preamps and effects units directly into the rear panel inputs of 500ADAT and record those signals directly into the DAW via it's ADAT connections.

The Slot Bypass switch is available per-slot which allows you to occupy some of 500ADAT's 500 series slots with modules whilst using the others to record line-level sources.

The Module Source, Insert, Module Direct Output, and Summing Mixer features function as normal for each slot that has the Slot Bypass switch active.

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Source Switch



Each 500 series slot on 500ADAT features a Source Select switch on the front panel that is used to determine which audio signal is sent into the input of the inserted 500 series module.

These source options include:

C.A.S.T.
This configures the 500 series slot to receive signal via the corresponding C.A.S.T. inputs. There are 4 C.A.S.T. Inputs on the rear panel and they correspond to pairs of 500 series slots. This port is intended for expansion via C.A.S.T. enabled breakout boxes.

For a detailed explanation of C.A.S.T., please read the "C.A.S.T. IN A, B, C, & D (RRTT)" section of this manual.

ANLG
This configures the 500 series slot to receive signal via the corresponding rear Module Input XLR connection.

ADAT
This configures the 500 series module to receive signal via the corresponding ADAT channel from 500ADAT's built-in ADAT Interface.

Note:
Switching between source selections whilst monitoring the 500 series slots can cause audible "clicks and pops" through your audio system depending on what module is inserted and its input/output gain. Please take care and reduce the listening volume prior to switching the Source Selector switch.

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Chain Switch

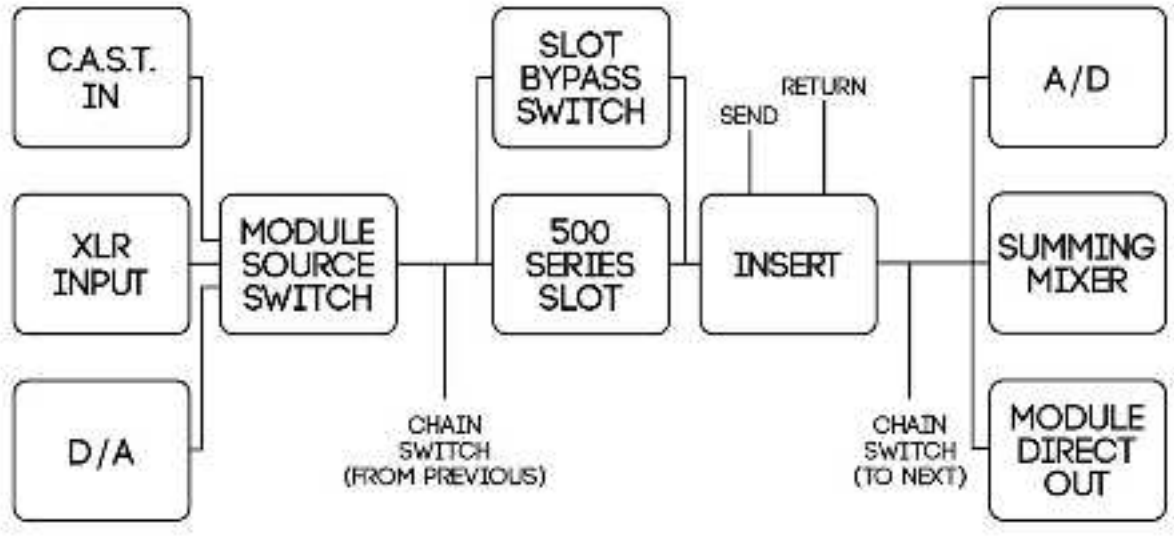
The Chain Switch overrides the Source Select switch and sends the audio signal from one 500 series slot into the next 500 series slot. This can be used to create chains of modules for advanced tonal shaping and channel strip creation during tracking and mixing.

Slots can be chained from left to right and can be created independently from one another for a total of 4 chains of 2, 2 chains of 4, 1 chain of 8, or any configuration in between.

Note:
When chaining channels, all existing Module Direct Outputs and ADAT outputs work as normal for all contributions in the chain. For example, if you have a mic preamp in slot 1, an EQ in slot 2, and a compressor in slot 3, you can record the ADAT output of slot 3 to record the summed result of all 3 modules, record the ADAT output of slot 2 to record just the preamp and EQ, or record the ADAT output of slot 1 to print the dry effect. You can also record all 3 parts of the chain simultaneously for more flexibility later on in the mix stage.

500 Series Signal Flow

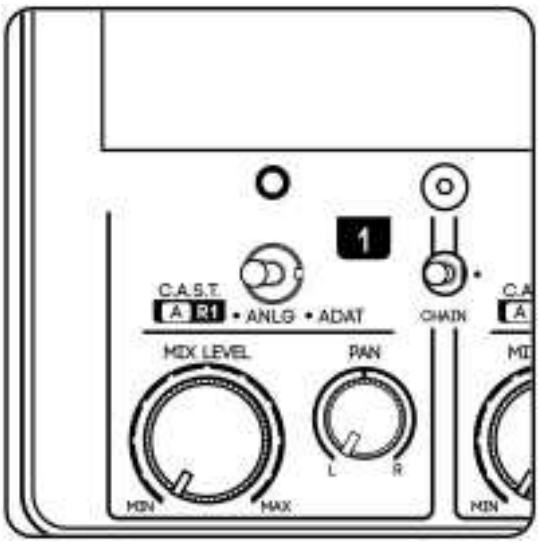
Each 500 series slot is connected to multiple sources and destinations that facilitate all of the complex internal recording and mixing aspects of 500ADAT. To better understand where each slot is positioned in the signal path in relation to its converters, the below diagram displays a rough overview of the signal flow of one 500 series slot to its possible destinations.



Note:
The output of each module is sent to 3 destinations at all times irrespective of the Module Source or Chain switches.

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Summing Mixer



500ADAT features a high-headroom 8-to-2 analogue Summing Mixer that can be used to sum eight analogue audio paths from the 500 series slots into a single stereo track for recording back into your DAW.

You can use the eight 500 series slots as well as their insert points to apply analogue colouration and processing onto your audio tracks/stems before they are summed using the Summing Mixer. The input sources Summing Mixer are determined by the source switches below each 500 series slot to allow for summing Analogue, C.A.S.T., or ADAT sources.

The Summing Mixer has a headroom of +24dBu to allow you to drive transformer/valve-based equipment to get the most range of colouration available without fear of overdriving the Summing Mixer.

Mix Level & Pan

The Mix Level and Pan controls are used to balance the volume and pan position of each 500 series slot within the Summing Mixer.

Mix Level
Adjusts the level of the 500 series slot into the Summing Mixer. Mix Level is a variable control with a range of -∞ to +10dB

Pan
Adjusts the pan position of the 500 series slot into the Summing Mixer. Pan is a variable control with a centre detent that operates a -4.5dB pan law.

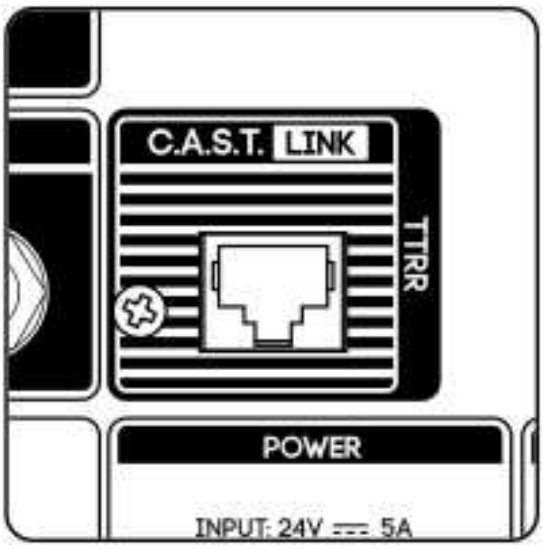
Mix Output

The Summing Mixer and its stereo output is sent directly to two dedicated ¼" jack outputs on the rear panel of 500ADAT labelled 'Mix Output'. These connections can be used to send the summed stereo mix onwards to the line inputs of the connected audio interface or monitoring systems.

The Summing Mixer does not feature its own master volume control. This in order keep the analogue path as pure as possible and ratain the maximum headroom and lowest THD. Use the individual Mix Level and Pan controls for each 500 series slot to reduce the overall level of the Summing Mixer and prevent clipping its A /D converter or internal signal paths.

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Summing Mixer Expansion Via C.A.S.T. LINK



The C.A.S.T. LINK port on the rear panel of 500ADAT can be connected to the corresponding C.A.S.T. LINK port on 500R8 to double the channel count of available analogue summing from 8 to 16 channels.

The C.A.S.T. LINK connection Transmits 500ADAT's stereo summing mixer (TT) whilst simultaneously receiving the stereo Aux Mix (RR) from the connected 500R8 via the same shielded Cat5 cable. Those four audio paths are broken down as follows:

Receive 1 + 2
Receives 500R8's Stereo Aux Mix

The two receive paths of the C.A.S.T. LINK connector are sent to 500ADAT's Aux Blend controls to enable the user to blend-in 500R8's Aux mix with 500ADAT's summing mixer for monitoring via 500ADAT's 2 headphones outputs.

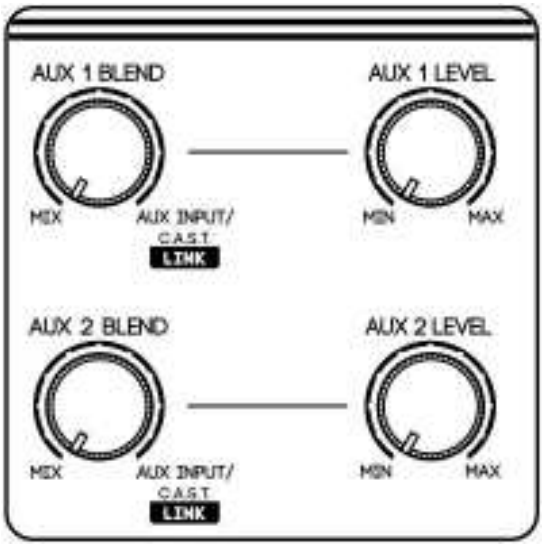
The Receive path from the connected 500R8 also features the talkback that has been generated on 500R8 so that the engineer operating the session can communicate with musicians connected to the headphones outputs of 500ADAT.

Transmit 1 + 2
Transmits 500ADAT's Summing Mixer (*Pre Aux Blend controls)*

The two transmit paths of the C.A.S.T. LINK connector featuring 500ADAT's Summing Mixer output are combined with 500R8's own Summing Mixer and sent directly to USB Inputs 9/10 and physical Mix Outputs of 500R8. In this configuration, 500ADAT doubles the system's available Summing Mixer channels to 16.

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Artist Monitoring Section



There are two identical monitoring paths on 500ADAT; Aux 1 and Aux 2. Each path has its own Blend controls that are used to adjust the balance between the analogue Summing Mixer and incoming Aux Input/C.A.S.T. Link connector.

500ADAT features dedicated reference-quality Aux and Monitor headphones outputs on the front panel as well as various line output options on the rear panel to distribute monitoring wherever it is needed.

Aux/Monitor Blend

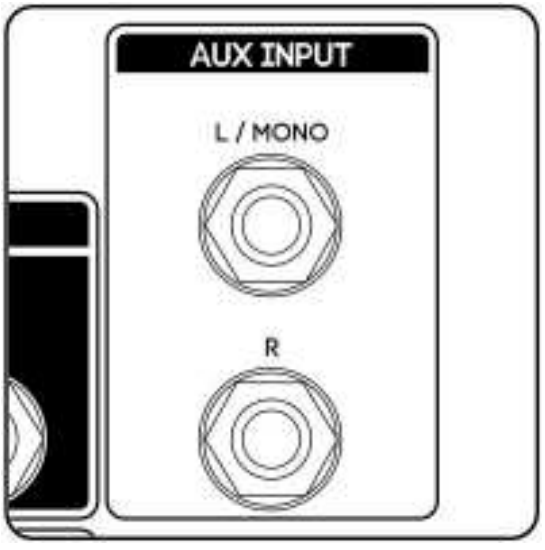
The Blend controls are the main contributing factor for creating great sounding artist monitor mixes. These blend controls adjust the balance of the mix between two different elements:

Mix
Comprises of the analogue Summing Mixer and is created using the Mix Level and Pan controls located below each 500 series slot. The Mix is typically comprised of live sources but can also feature channels being sent into the modules via ADAT.

DAW
Comprises of a stereo playback source that is incoming from the DAW and sent into 500ADAT via it's Aux Input 1/4" Jack returns. The Aux Input is typically comprised of pre recorded elements, click tracks, and VSTs from within the connected audio interface but can also feature live instruments by utilising software monitoring within the DAW.

The Blend controls can be set anti-clockwise to listen to the Summing Mixer directly, clockwise to listen to the Aux input directly or anywhere in-between to create a custom balance of the two sources.

Aux Input Jacks



The Aux Input jacks on the rear panel of 500ADAT can be used to send stereo playback from the connected audio interface into 500ADAT's Aux 1 & 2 mixers and headphones outputs.

The Aux Input jacks are *unbalanced* connections to facilitate the L/Mono normalling circuit and enable the analogue Aux Input Input to operate in mono if just the left jack is inserted.

Note:
Please consult the user manual of your external playback device to find out the best procedure for connecting its balanced outputs into the Aux Input unbalanced ¼" jack inputs.

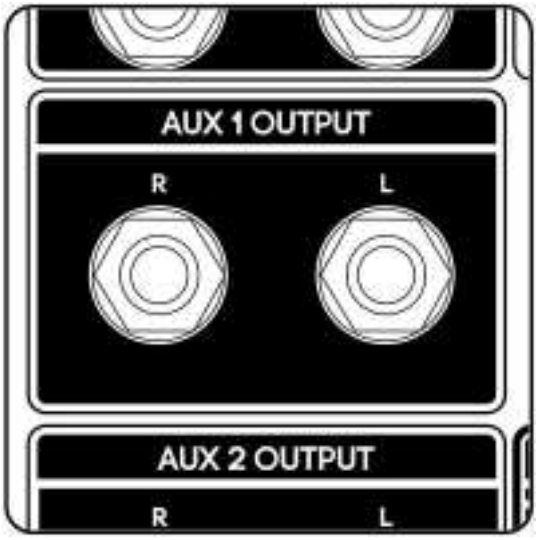
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Aux Level

Aux 1 & 2 Level
Adjusts the overall level of each Aux bus including the Aux Headphones outputs and the Aux Output ¼" jacks on the rear panel.

Aux Outputs

The Aux Bus is fed to multiple locations to enable deeper connectivity with monitoring systems depending on your desired use case:



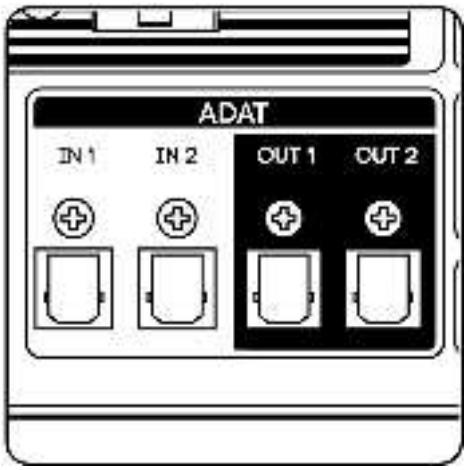
Aux 1 & 2 Headphones
Beneath the artist monitoring section are dedicated Aux Headphones outputs. These headphones outputs are driven after the Aux Blend and Aux Level controls for each Aux and are primarily used by musicians who are placed in the control room when a silent monitoring environment is required.

Note:
****Only connect headphones to 500ADAT's headphones outputs. Unbalanced and/or line connections could short leg to ground and cause a spike in power consumption. Any damage caused to the unit as a result of unsupported connections is <u>not covered</u> under the Cranborne Audio warranty.***

Aux Outputs
Each Aux Bus features dedicated stereo line outputs on the rear panel which can be used to drive monitor wedges, monitor distribution systems, or IEM systems. These outputs are also driven after the Aux Blend and Aux Level controls on the front panel.

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ADAT



500ADAT implements an in-depth integration of ADAT with SMUX II and IV to allow recording at high sample rates.

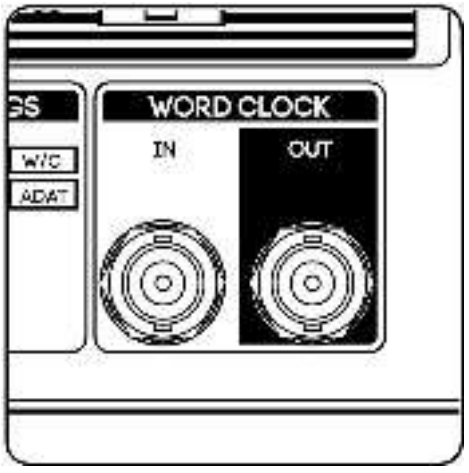
2 ADAT Input and 2 ADAT Output ports enable expansion of up to 8 channels at 44.1 - 96kHz, or 4 channels at 176.4 - 192kHz.

The below table details the routing of ADAT I/O between the 4 ADAT ports and 500ADAT's 500 series slots including the tradeoffs between high sample rates and the available I/O count:

Sample Rate	In 1	In 2	Out 1	Out 2
44.1/48kHz	Slot Input 1 - 8	N/A	Slot Output 1 - 8	N/A
88.2/96kHz	Slot Input 1 - 4	Slot Input 5 - 8	Slot Output 1 - 4	Slot Output 5 - 8
176.4/192kHz	Slot Input 1 - 2	Slot Input 3 - 4	Slot Output 1 - 2	Slot Output 3 - 4

Note:
In order to achieve the full channel count at the highest sample rates, the audio interface connected to 500ADAT needs to be compatible with SMUX II and IV protocols and both ADAT I/O ports need to be connected.

Low-Jitter Internal Clock



500ADAT features an extremely accurate internal clock that is the governor for all of the AD/DA conversion throughout the unit. This clock is responsible for making sure all of the internal converters are in sync to prevent distortion artifacts, grittiness, and to improve stereo imaging.

It is not uncommon to find professional studios utilising a standalone master clock to sync all peripheral equipment. The facts and figures of 500ADAT's built-in clock are good enough to stand up against - and in some ways exceed - the performance of what you would find in expensive standalone units.

Word Clock Input

The Word Clock Input connector is used to slave 500ADAT from an external clock source via a BNC cable. In this application, word clock must be connected to the Word Clock Input port of 500ADAT and the 'Word Clock' DIP switch set to the ON position on 500ADAT's Clock Settings DIP switch.

Note:
When slaving 500ADAT from an external clock, its own internal clock syncs to the incoming timing information and recovers its own improved clock. For the best results and the highest quality conversion, we recommend using 500ADAT as the clock master of your studio.

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Word Clock Output

The Word Clock Output connector sends out 500ADAT's current timing information in order to slave other digital units off of 500ADAT's internal clock. If 500R8 is slaving from another source, the Word Clock Output passes through the recovery clock information to sync further downstream equipment.

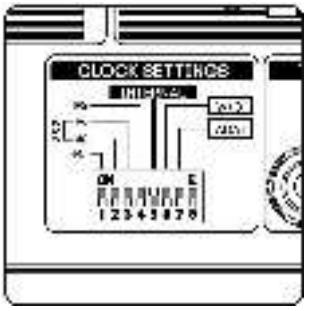
> ***Note:***
> ***When possible, use a clock distribution device to distribute word clock accurately and reliably to all devices. When possible, use 500ADAT as the master clock to your system.***

Clock Settings DIP switches

500ADAT can be integrated into your studio as either a master or slave device by configuring its Clock Settings DIP switches. These DIP switches allow for direct control over 500ADAT's internal clock and are divided into Sample Rate selection (switches 1-4) and Clock Source selection (switches 5-8).

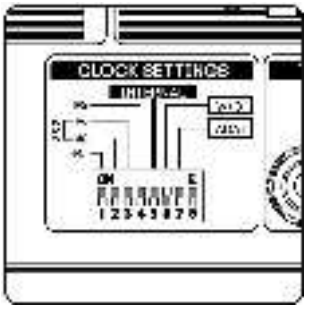
The clock source can be assigned to 3 different options to allow for maximum integration into your studio space.

Internal Clock (default, recommended)
Configures 500ADAT to generate its own ultra-low jitter clock. This setting should be used when 500ADAT is set as the clock master of your system. This setting guarantees the best performance from 500ADAT's converters.

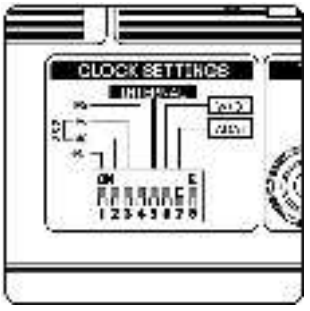


> ***Note:***
> ***When using 500ADAT as the clock master and clocking using it's Internal Clock, the connected audio interface must be configured to receive it's clock via it's ADAT or Word Clock input.***

Word Clock
Configures 500ADAT to slave from a device connected to its Word Clock Input connector. This setting should be used if you need 500ADAT to slave off of your audio interface via word clock.



ADAT Recovered
Configures 500ADAT to slave from a device connected to its ADAT IN 1 connector. This setting should be used if you need 500ADAT to slave off of your audio interface via ADAT.



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Note:
Please take care to mute your ADAT connections on your audio interface before configuring 500ADAT's clock source as sync noises can be present on the ADAT outputs when the recovery clock is reconfiguring and resyncing. This process takes approximately 3-5 seconds.

If the Sample Rate selected on 500ADAT's DIP switches does not match the Sample Rate of the connected audio interface, 500ADAT's ADAT outputs are automatically muted until the Sample Rate is matched between 500ADAT and the connected audio interface.

Configuring Sample Rate

The Clock Settings DIP switches are also used to assign 500ADAT's operating Sample Rate. DIP switches 1-4 can be configured in up to 6 ways to achieve the major Sample Rates from 44.1kHz to 192kHz. The Sample Rate selected on the Clock Settings DIP switches needs to match the Sample Rate selected on the connected audio interface to prevent clocking errors, dropouts, and audio artefacts.

Sample Rate	DIP switch
44.1kHz	
48kHz	
88.2kHz	
96kHz	
176.4kHz	
192kHz	

Note:
500ADAT's Sample Rate DIP switches must be set to match the sample rate currently assigned on the connected audio interface. A Sample Rate mismatch between 500ADAT and the connected audio interface could cause issues with synchronisation and audio artefacts.

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C.A.S.T.

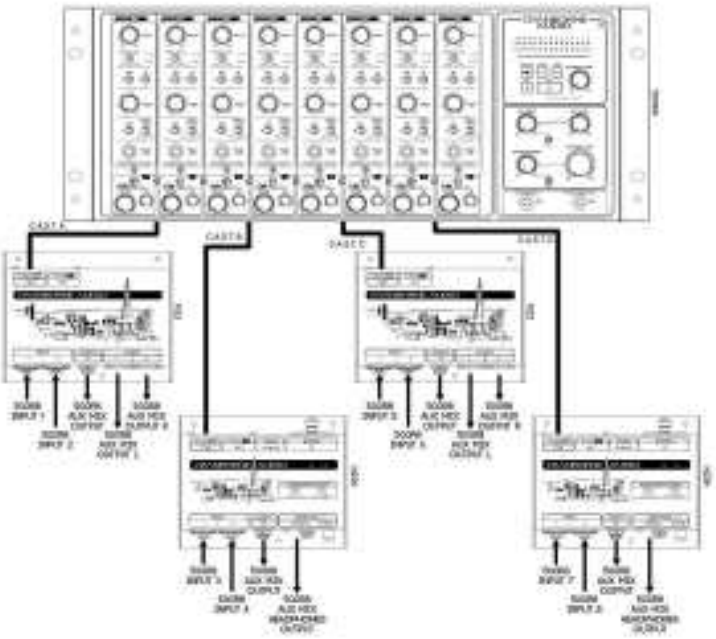


C.A.S.T. stands for Cat5 Analogue Snake Transport. C.A.S.T. is Cranborne Audio's way of repurposing off-the-shelf Cat5 Networking cables to transport 4 channels of balanced analogue audio over a single cable. C.A.S.T. not only allows you to put input and output connectivity where you need it, but thanks to our clever impedance matching, the signal quality can exceed that of a mic cable for a fraction of the price and over a distance of up to 100m.

By utilising C.A.S.T. for audio transport rather than ethernet-based digital audio alternatives such as AES67, AVB, and Dante, we can provide a zero-latency, all-analogue audio transportation system that can be used to facilitate artist monitoring solutions as well as I/O relocation without sacrificing signal quality.

C.A.S.T. IN A,B,C & D (RRTT)

The C.A.S.T. IN A, B, C, & D ports are designed to relocate the rear connections of 500ADAT around the studio space and enable convenient access to 500ADAT's I/O from remote locations. The four available paths are divided into two discrete mono receive paths as well as a stereo transmit path.



Receive
Receives two mic/line sources from the connected C.A.S.T. breakout box and routes them directly into the inputs of 500ADAT's 500 series slots when the Slot Source switches are set to "C.A.S.T."

A detailed view of these C.A.S.T. assignments can be seen below:

C.A.S.T. A		**C.A.S.T. B**		**C.A.S.T. C**		**C.A.S.T. D**	
C.A.S.T. A R1	C.A.S.T. A R2	C.A.S.T. B R1	C.A.S.T. B R2	C.A.S.T. C R1	C.A.S.T. C R2	C.A.S.T. D R1	C.A.S.T. D R2
SLOT 1	SLOT 2	SLOT 3	SLOT 4	SLOT 5	SLOT 6	SLOT 7	SLOT 8

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Transmit
Transmits the stereo Aux 1 mix generated from 500ADAT into C.A.S.T. and directly to the breakout boxes connected to 500ADAT to enable monitor mixes to be distributed where they are needed around the studio space.

The stereo signal transmitted from 500ADAT into the C.A.S.T. Transmit path is ***Post*** Aux 1 Blend and ***Pre*** Aux 1 Level.

C.A.S.T. Requirements

In order for C.A.S.T. to be as fool-proof as we wanted, we worked hard to make sure that the system would work perfectly using the standard and common off-the-shelf cat 5 cables without any loss of audio quality.

As a recommendation, we suggest using shielded Cat5 cables with robust connectors to ensure that the C.A.S.T. connection is secure and will remain impervious to RF and crosstalk.

For improved performance, you can consider Cat 6 or Cat 7 cabling which features individual shields for each twisted pair resulting in even greater crosstalk performance for very little extra financial investment.

Note:
C.A.S.T. is not a proprietary system, however any equipment that should support C.A.S.T. or similar in the future that has not had our involvement cannot be guaranteed to work to our exacting specifications and could suffer a loss in signal quality.

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Application Guides

Using 500ADAT without 500 series modules

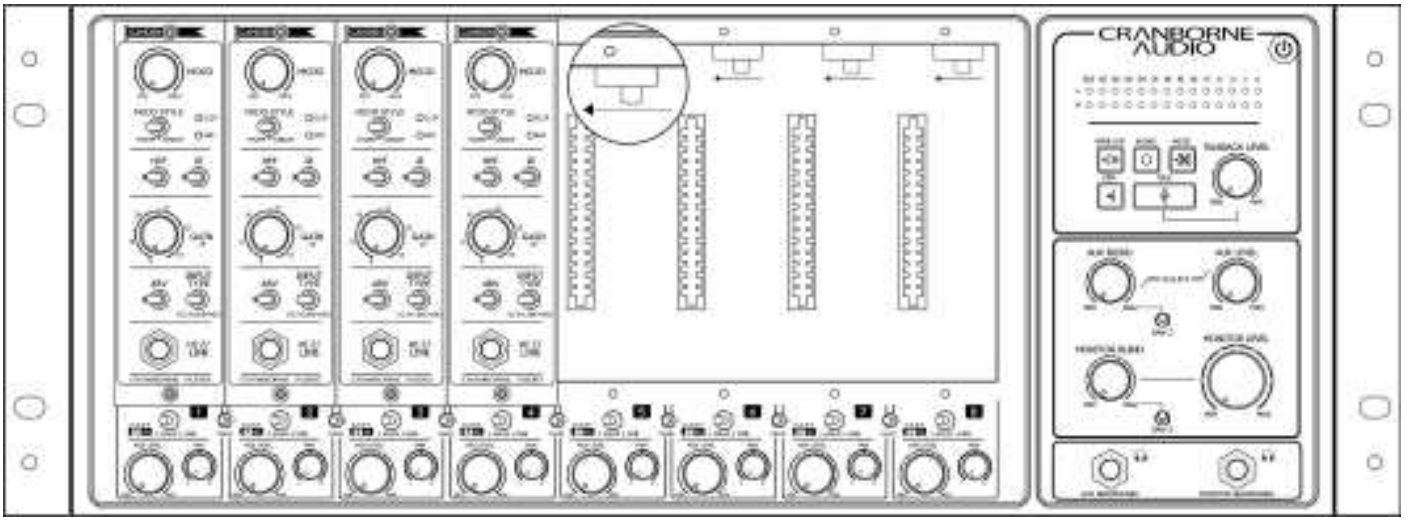
If you are new to the 500 series format and have yet to purchase any 500 series modules, you can still utilise all possible recording channels on 500ADAT.

Each 500 series slot features a dedicated Slot Bypass switch located beside the backplane connector which can be used to bypass the slot if no 500 series modules are inserted. Bypassing the slot allows you to connect line-level sources into the module inputs and send those signals onwards to your DAW via 500ADAT's ADAT interface. For example, if you bypass slots 4-8, you can still connect line-level sources such as keyboards, the output of a mixing console, or an external preamp into the XLR sockets of each module. Even if a slot is bypassed, the Input XLR, Insert, Module Direct Output, and Mix Level/Pan controls are still active and can be used as normal.

The Slot Bypass switch is positioned after the Source switches on the front panel. If you switch the Source switch to ADAT, you are then able to send audio out from your DAW and into the 500 series slot, apply outboard processing using the module insert points, and then record the output into your DAW via ADAT without any 500 series module inserted.

Simply switch the Slot Bypass switch to the left and into it's 'Bypassed' position and then you are good to go!

> ***Note:***
> ***Remember to disable the 'Slot Bypass' switch when you wish to install a module into the 500 series slot! If you forget, the module will receive input signal form our selected source, but you will not hear the output of the module in the summing mixer or elsewhere through the signal path.***



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Inserting 500 Series modules into DAW Sessions via ADAT

The advantage of combining a 500 series rack and ADAT audio interface is that inserting analogue hardware via ADAT is now easier than ever. Any module inserted into 500ADAT can receive its input via an incoming ADAT channel at the flick of a switch.

As an example, let's pretend we have a bus compressor in 500 series slots 7 & 8 of 500ADAT that we want to insert across a stereo mix within our DAW.

1. In the DAW, set the output of the stereo audio track to ADAT Outputs 7 & 8 on your audio interface.
2. On 500DAT, set the Module Source switches beneath 500 series slots 7 & 8 to their 'ADAT' option.
3. Create a new stereo track in your DAW and set its input to receive ADAT Inputs 7 & 8.
4. With the stereo track playing from the DAW, adjust the compressor settings to taste.
    - Set the output level of the compressor just low enough to avoid clipping on the input meter in the DAW to get the maximum level before clipping.
5. Now rewind the cursor to the beginning of your stereo track, record-arm the newly created audio track, and hit the master record.

You should see the waveforms begin to form on the return track - this new audio track will feature your bus compressor settings applied.

Hardware Inserts

Some DAW's such as Logic, Pro Tools, and Cubase, have their own plug-ins/facilities that allow for inserting hardware directly into a channel strip within your DAW. If your DAW supports this, then you can simply Insert the 'hardware' plug in on your desired track and set the Send and Return options of the plug in to correspond with your desired 500 series slots. You can use the below table to work out the correct Send and Return points to insert modules 1-8 into your session.

ADAT Send	ADAT Out 1	ADAT Out 2	ADAT Out 3	ADAT Out 4	ADAT Out 5	ADAT Out 6	ADAT Out 7	ADAT Out 8
500 Series Modules	**Module 1**	**Module 2**	**Module 3**	**Module 4**	**Module 5**	**Module 6**	**Module 7**	**Module 8**
ADAT Return	ADAT In 1	ADAT In 2	ADAT In 3	ADAT In 4	ADAT In 5	ADAT In 6	ADAT In 7	ADAT In 8

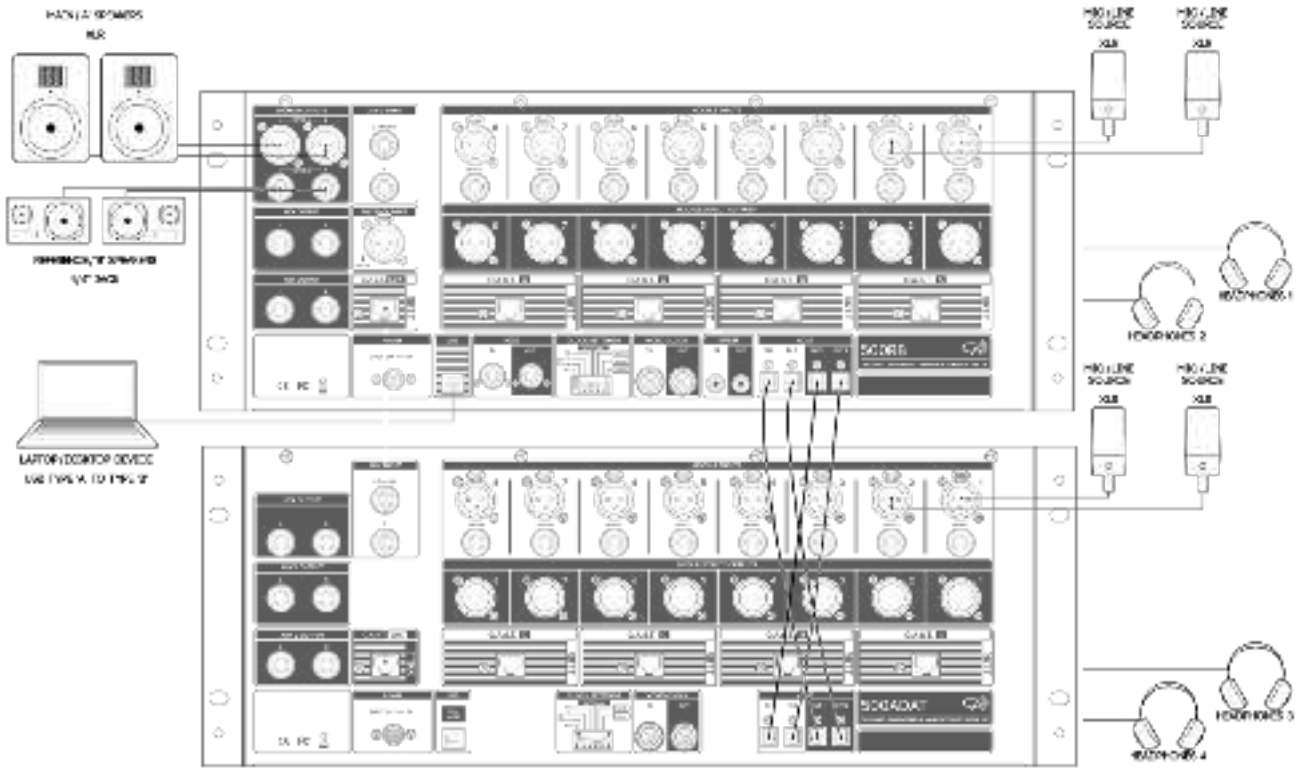
Note:
Some dedicated 'hardware insert' plug-ins have an automatic calibration tool that can be used to determine the roundtrip latency and apply that time delay to the other DAW tracks to ensure that everything remains in phase and in time throughout your project and external hardware. If the DAW does not facilitate this, you may be able to enter the delay in manually.

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Using 500R8 and 500ADAT Together

500R8 and 500ADAT have been designed with two purposes in mind. 500R8 is for those looking to build a new or portable studio setup around the 500 series format, whilst 500ADAT is for those who are looking to add 500 series connectivity onto their existing studio setup and audio interface. But 500R8 and 500ADAT have also been designed to form a symbiotic relationship when being used together to enable larger recording channel counts and more options during the mix phase.

500ADAT adds a lot more functionality to 500R8 than just increased channel count using ADAT. Both 500ADAT and 500R8's Summing Mixers can be linked, their Aux Mixes can be merged, Talkback is cleverly managed between the two units, and there are some advanced routing capabilities that allow more monitoring facilities.



Each unit features 2 ADAT IN and 2 ADAT OUT ports that can be used to achieve 8 channels of expansion from 44.1kHz to 96kHz. When the two units are connected, you are able to patch to and from 500ADAT by using the ADAT I/O from within your DAW I/O routing.

Inputs
The ADAT Inputs correspond with the 500 series slots on the 500ADAT and enable you to record the output of 500ADAT's slots into your DAW as individual channels.

Outputs
The ADAT Outputs correspond with the 500 series slots on 500ADAT and enable you to send audio out from your DAW and into the modules that occupy 500ADAT 500 series slots.

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C.A.S.T. LINK

It is possible to integrate a wide variety of analogue paths between 500R8 and 500ADAT by using their C.A.S.T. LINK ports.

Summing Mixer
When C.A.S.T. LINK is connected between the two units, the output of 500ADAT's Summing Mixer are sent straight out of the C.A.S.T. LINK port and summed with 500R8's own Summing Mixer. This doubles the Summing Mixer contributions to 16 possible channels and enables the engineer to create a full 16 channel, stereo summing mix by using the Mix Level and Pan controls beneath the modules on the 500ADAT and 500R8. In this instance all 16 channels are summed and sent out of USB output 9/10 as well as the physical Mix Output of 500R8.

Artist Monitoring
The Aux bus on 500R8 is also sent via the C.A.S.T. LINK port and directly into 500ADAT's Aux 1 and Aux 2 Blend controls. This enables musicians connected to 500ADAT to blend the 500R8's Aux mix (featuring the DAW returns, Summing Mixer, and Talkback signals) with 500ADAT's own summing mixer directly into their headphone outputs.

Talkback Integration
When the Talkback facility is used on the 500R8, the talkback signal is sent through C.A.S.T. LINK and directly the headphone outputs of 500ADAT as well as any N22/N22H's connected to the system. This means that you can communicate with your musicians easily wherever they are situated in your studio.

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Understanding C.A.S.T.

As C.A.S.T. is all analogue, it cannot be reconfigured depending on what task is required by the end user. As such, it is important to recognise what C.A.S.T. port does what on the 500ADAT. To Aid in this process, Cranborne Audio's product and graphic design team has taken great care to add visual cues that will assist in their recognition.

Each of the 4 paths on all C.A.S.T. ports are labelled either T (Transmit), or R (Receive) depending on their function relating to the featured device. A socket that is labelled TTRR will transmit balanced audio over its first two paths (TT), and will receive balanced audio on its second two paths (RR). The box will also have a white header colour to display that it is an output.

Other C.A.S.T. ports labelled RRTT will receive balanced audio on its first two paths (RR) and will transmit balanced audio over its second two paths (TT). These boxes will have a clear header to display that it is an input. In addition to the path labelling, C.A.S.T. ports may also feature identification labels such as A, B,C, or D, or 'link' to provide further clarity as to their function or provide differentiation between several C.A.S.T. ports on the same product.

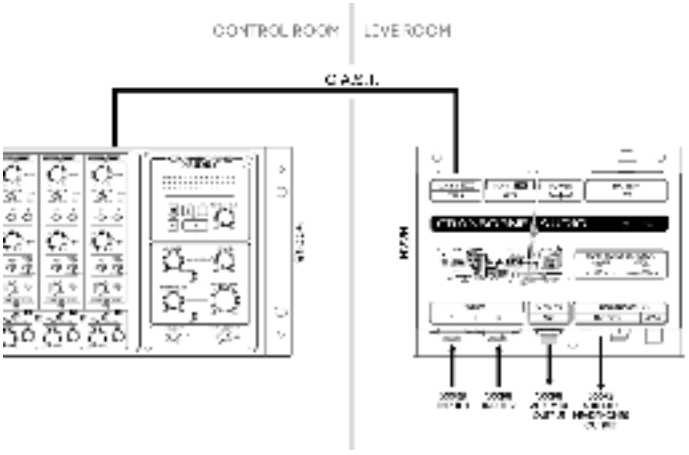
500ADAT can integrate with a number of our C.A.S.T. enabled products. These products allow you to relocate the I/O where it's needed as well as headphone and monitoring capabilities for you musicians.

N22

N22 is our simplest C.A.S.T. device and provides connectivity to C.A.S.T. A, B, C, or D ports onboard the 500ADAT. N22 features 2 combi jack inputs that feed directly into modules 'x' and 'x+1' on 500ADAT as well as XLR outputs to receive the Aux bus generated from 500ADAT.

N22 can also be used as a standalone device by connecting 2 together using both C.A.S.T. In and Out ports. This will enable you to connect analogue I/O from one location into one N22 and run it to another N22 elsewhere in your studio/venue. N22 is completely passive and requires no power in order to be used.

N22H



N22H is very similar to N22 in that is can be used passively to send audio into the modules of a connected 500ADAT. N22H however features a built-in headphone amp as well as a level control that receives the Aux 1 bus of a connected 500ADAT and amplifies it to the correct level and impedance for driving headphones.

N22H allows you to distribute input and headphone connectivity to and from a remote location using just a single Cat 5 cable. It is powered via a standard 'pedalboard-friendly' 9v DC power supply or via an internal 9v battery. Power is only drawn when the headphone output has been plugged-in to preserve battery life and when the headphone amp is not required, you can simply use the combi jack inputs as passive input connections.

When the C.A.S.T. port of N22H is not connected, it acts as a standard headphone amp by sending the two built-in inputs to L and R respectively of the headphone amp.

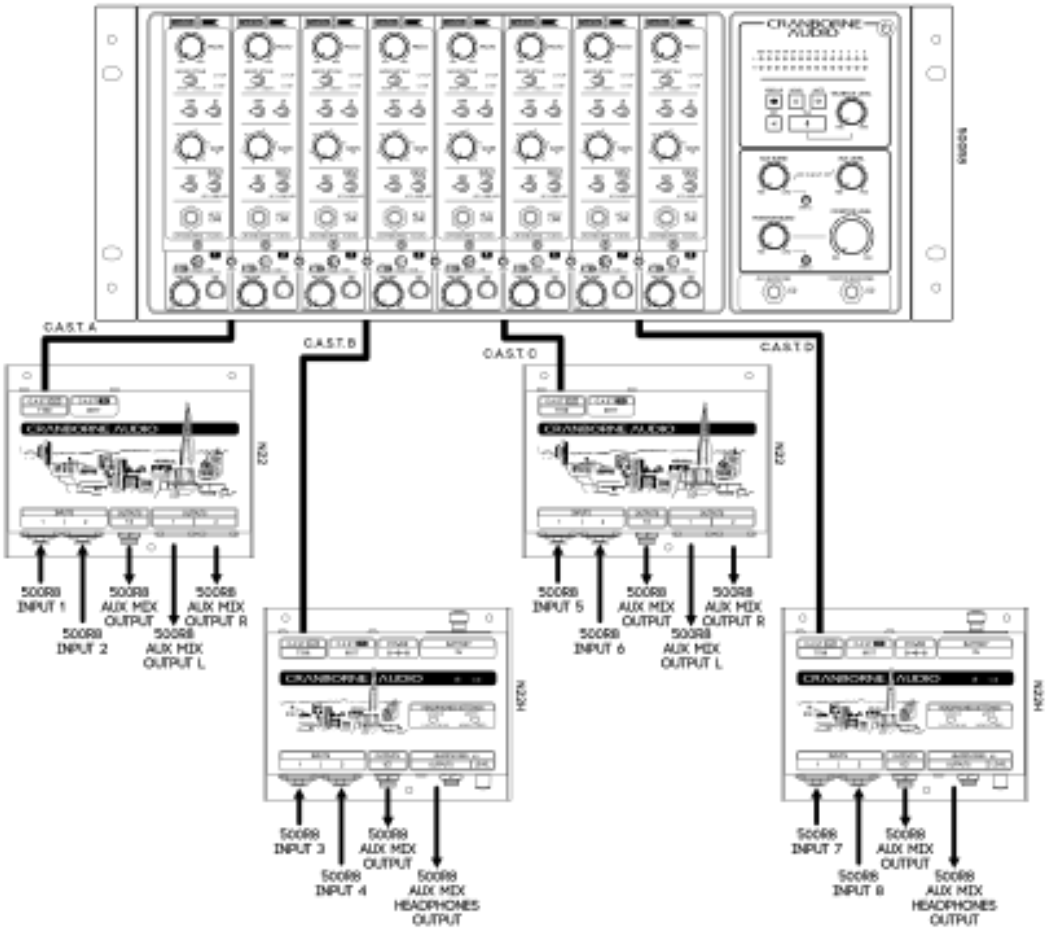
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Using N22 and N22H with 500ADAT

500ADAT features 4 C.A.S.T. RRTT ports that enable cost effective and organised cable management around your studio by repurposing off-the-shelf Cat5/6/7 Networking cables to transport 4 channels of balanced analogue audio (mic, Line, or Instrument level) over a single cable.

Connect an N22 or N22H to one of 500ADAT's C.A.S.T. ports and you can place analogue I/O where you need it - whether it's in the live room, vocal booth, or the bedroom next door!

By connecting an N22H to the C.A.S.T. A port on the rear panel of 500ADAT, you can send a headphone mix out to the connected N22H whilst also receiving 2 inputs via N22H's combi connections. These inputs can then be directly fed into the front of modules 1 and 2 respectively by switching the Input source switch to C.A.S.T. A R1/R2 on slots 1 and 2.



This is the perfect setup when a 'vocal booth' or 'isolation booth' is required as you can send the monitor mix to the vocalist whilst also receiving 2 analogue inputs by using just a single Cat 5 cable. Talkback is also managed by C.A.S.T. as 500R8 sends the talkback signal down C.A.S.T. to enable you to speak to the musician at the other end at the touch of a button. N22H can also be powered via a 9v battery which allows you to place the musician in any environment without power being a necessity.

By connecting up to 4 N22/N22H's to the back of a 500ADAT, you can create a completely plug and play, cost effective, all-analogue cabling distribution network that can be used to build up your studio and maximise your available space in the best possible way. Why not place the vocalist in the bathroom? Or the drums in the hall?

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Technical Specifications

Here is the comprehensive set of 500ADAT's technical specifications. We try to keep our specifications as real-world measurements. Each test has been carried out in a particular way to replicate how each element of 500ADAT would perform in day-to-day operation.

All specifications are typical performance unless otherwise noted. All specifications are subject to change at any time. Tested with Audio Precision APx555 at 192 kHz internal sample rate and internal clock. HF response of digital measurements will vary depending on sample rate selected during recording.	
Digital Performance	
A/D Conversion	
Test Signal Path	XLR Input - 500 Series A/D Converter - APx555 (ASIO)
Frequency Response	-1dB, 2.2Hz to >80kHz
	-0.05dB, 20Hz to 20kHz
THD+N	<0.00032% (-110dB) @ -4dBFS, 20Hz - 40kHz, 1kHz, A-weighted
	<0.00065% (-104dB) @ -1dBFS, 20Hz - 40kHz, 1kHz, A-weighted
THD	<0.00014% (-117.5dB) @ -8dBFS, 20Hz - 40kHz, 1kHz, A-weighted
	<0.00023% (-113dB) @ -4dBFS, 20Hz - 40kHz, 1kHz, A-weighted
	<0.0006% (-105dB) @ -1dBFS, 20Hz - 40kHz, 1kHz, A-weighted
Dynamic Range	121dB A-weighted, AES17 method, 20Hz - 20kHz
Max Input Level	+24dBu
D/A Conversion	
Test Signal Path	500 Series D/A Converter - Insert Send - APx555 (ASIO)
Frequency Response	-1dB, <1Hz to >61kHz
	-0.05dB, 20Hz to 20kHz
THD+N	<0.0003% (-110.5dB) @ -4dBFS, 20Hz - 40kHz, 1kHz, A-weighted
	<0.0004% (-108dB) @ -1dBFS, 20Hz - 40kHz, 1kHz, A-weighted
THD	<0.00014% (-117.5dB) @ -8dBFS, 20Hz - 40kHz, 1kHz, A-weighted
	<0.00018% (-115dB) @ -4dBFS, 20Hz - 40kHz, 1kHz, A-weighted
	<0.00036% (-109dB) @ -1dBFS, 20Hz - 40kHz, 1kHz, A-weighted
Dynamic Range	121dB A-weighted, AES17 method, 20Hz - 20kHz
Max Output Level	+24dBu
Clocking	
Jitter	<0.5ps

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Analogue Performance	
Line Outputs (Aux 1+2, Mix)	
Test Signal Path	Aux Input - Line Outputs - APx555 (Line In)
Connection Type	1/4" Jack, Impedance Balanced
Output Impedance	150ohm balanced, 75ohm unbalanced
Max Output Level	<+22dBu
Freq Response	-1dB, 1.4Hz to >80kHz
THD+N	<0.003% @ +18dBu, 1kHz
Dynamic Range	105dB A-weighted, AES17 method, 20Hz - 20kHz
Noise Floor	<-93dBu A-weighted, 20Hz - 20kHz, (Unity Gain)
Summing Mixer	
Test Signal Path	XLR Input - Summing Mixer Bus (Unity) - Mix Output - APx555 (Line In)
Freq Response	-1dB, 2.25Hz to >80kHz
	-3dB, 1.2Hz
	-0.5dB, 3Hz
THD+N	<0.0007% @ +23dBu, 1kHz
THD	<0.0003% @ +14dBu, 1kHz
	<0.0004% @ +20dBu, 1kHz
	<0.00055% @ +23dBu, 1kHz
Dynamic Range	108dB A-weighted, AES17 method, 20Hz - 20kHz
Max Contribution Level	+28dBu
Pan Law	-4dB
Noise Floor	-90dBu, A-weighted, No channels routed
	-89.5dBu, A-weighted, 1 channel routed (Unity)
	-84dBu, A-weighted, 8 channels routed (Unity)
Headphone Amp	
Test Signal Path	Aux Input - Headphone Output - APx555 (Line In)
Frequency Response	-1dB, <1Hz to >70kHz
THD	<0.0006% (-104.4dB) @ 20dBu, 1kHz, A-weighted, 300ohm load
THD+N	<0.00085% (-101.4dB) @ 20dBu, 1kHz, A-weighted, 300ohm load
Output Impedance	0.33 Ohms
Output Wattage	250mW x 2 @ 600 ohms, 1kHz
	650mW x 2 @ 220 ohms, 1kHz
	1.21W x 2 @ 100 ohms, 1kHz
	500mW x 2 @ 32 ohms, 1kHz
Dynamic Range	114.5dB A-weighted, AES17 method, 20Hz - 20kHz, 300ohm load
Noise Floor	-93.5dBu A-weighted, 20Hz - 20kHz, 300ohm load

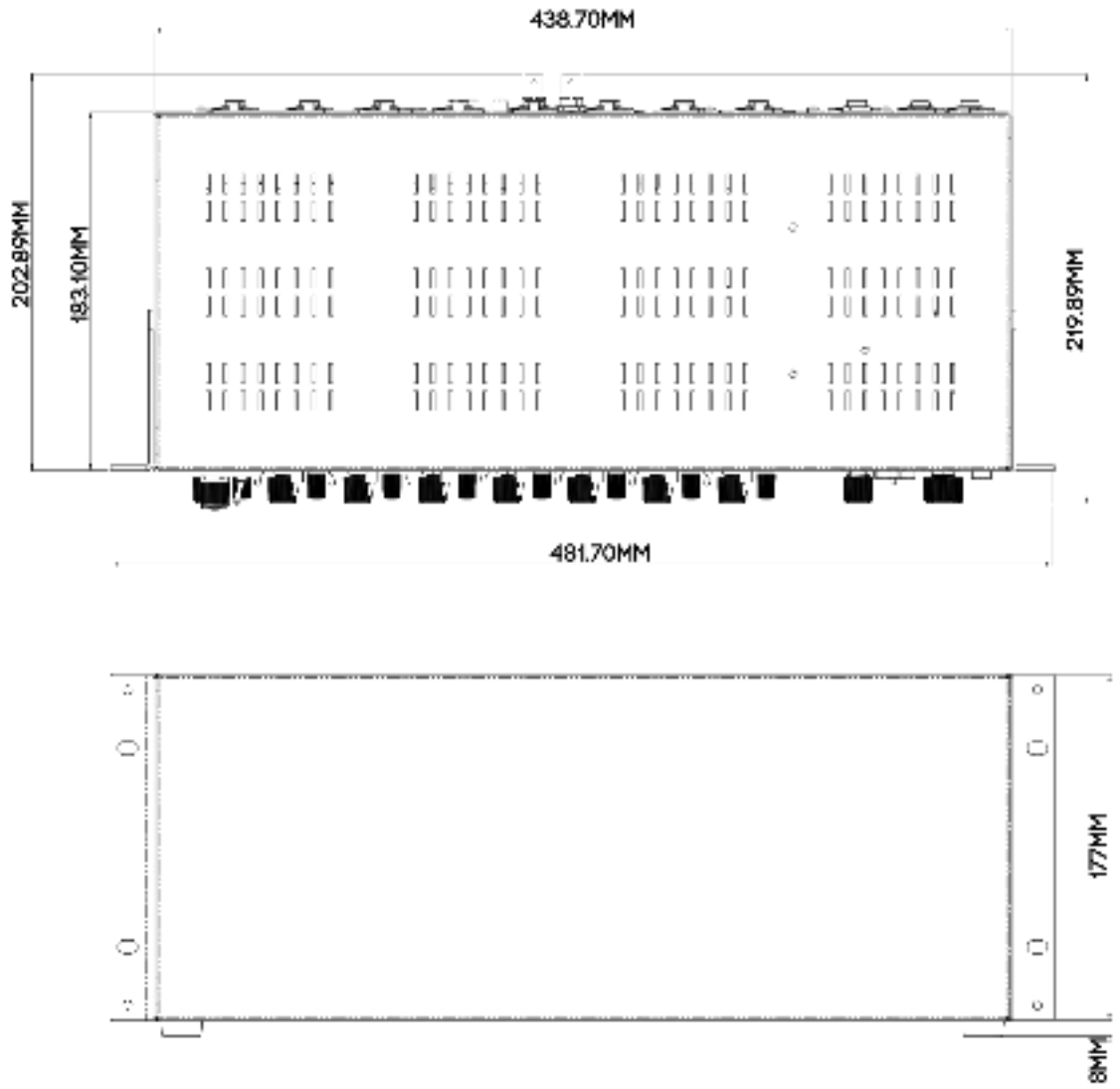
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System Performance	
Analogue Path Phase Performance	
Test Signal Path	XLR Input - Empty 500 Series Slot - Summing Mixer Bus (unity) - Mix Output - APx555 (Line In)
Phase	<1.5° @ 20Hz, <11° @ 20kHz
Test Signal Path	XLR Input - Camden 500 Preamp (Mic Mode, 6dB Gain) - Summing Mixer Bus (unity) - Speaker A Output - APx555 (Line In)
Phase	<3° @ 20Hz, <13.5° @ 20kHz (Preamp mic mode, 6dB Gain)
Digital Round-trip Performance	
Test Condition	500 Series D/A Converter - 500 Series A/D Converter - APx555 (ASIO)
Dynamic Range	118dB A-weighted, AES17 method, 20Hz - 20kHz
THD+N	<0.0004% (-108dB) @ -4dBFS, 20Hz - 40kHz, 1kHz, A-weighted

Power	
AC Requirements	100V – 240V AC, 50 – 60 Hz
Total Power Consumption	24v, 5A DC, 120w
500 Series Slot Current	250mA per rail
Total Available 500 Series Slot Current	2A

Environmental	
Operating Temperature	+1 to 30 degrees Celsius
Storage Conditions	-20 to 50 degrees Celsius
Dims/Weights	
Unit	
Width	481mm(19"), Rackmount
Height	185mm(7"), 4u
Depth	219m(8.6")
Unit Weight	7kg
Shipping Carton	
Width	550mm(21.7")
Height	280mm(11")
Depth	335m(13.2")
Weight	7.5kg

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Troubleshooting

Question	Solution(s)
I can hear 'pop's and 'clicks' through 500ADAT when I am using it with my audio interface.	• Ensure that the Sample Rate on 500ADAT and your audio interface are matching. • Ensure the Clock source hierarchy is set correctly - If 500ADAT is the 'master' make sure 500ADATs clock settings DIP switch is set to Internal and your audio interface is set to clock from it's ADAT or Word Clock Input connections. • Ensure that Buffer Size of your audio interface is set to around 128 samples or higher (the stability of your audio interface will depend on your CPU performance). In general practise, the higher the buffer size, the better. (low NBuffer sizes are only required when software monitoring is required!) • Finally, restart your system by booting the clock master first, followed by your clock slave. It's not uncommon for audio interfaces to have difficulty syncing to external clocks. The correct boot order should help.
My audio sounds like it is being 'pitch shifted;	• Ensure that the Sample Rate on 500ADAT and your audio interface are matching. *Please follow the detailed guide to configure 500ADAT's sample rate in the "Clock Settings DIP switches" and "Configuring Sample Rate" sections of this manual.*

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Important Safety Instructions

General Safety

- Read these instructions carefully
- Keep these instructions
- Heed all warnings
- Follow all instructions
- Do not use this apparatus near water
- Clean only with a dry cloth
- Do not block any ventilation openings and install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades with a third grounding prong. The wide blade or the 3rd prong are provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories recommended by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Do NOT modify this unit, altercations may affect performance, safety and/or international compliance standards.
- Cranborne Audio does not accept liability for damage caused by maintenance, repair or modification by unauthorized personnel.

Installation notes

- When installing the apparatus either fit it into a standard 19" rack or place it on a secure level surface.
- If the unit is rack mounted, fit all rack screws.
- When rack mounting, allow a 1U gap above and below the unit for cooling.
- Ensure that no strain is placed on any cables connected to this apparatus. Ensure that all such cables are not placed where they can be stepped on, pulled, or tripped over.



WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

ATTENTION: Afin de réduire les risques de choc électrique, ne pas exposer cet appareil à l'humidité ou à la pluie.

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Power Safety

- The unit is supplied with an external power supply and suitable mains lead. Only use the supplied external power supply, however if you decide to use a mains lead of your choice, bear in mind the following:
    - Refer to the rating label of the unit and always use a suitable mains cords.
    - The unit should ALWAYS be earthed with the earth on the IEC socket.
    - Please use compliant 60320 C13 TYPE SOCKET. When connecting to supply outlets ensure that appropriate sized conductors and plugs are used to suit local electrical requirements.
    - Maximum cord length should be 4.5m (15')
    - The cord should bear the approval mark of the country it is to be used.
- Connect only to an AC power source that contains a protective earthing (PE) conductor.
- Only connect unit to single phase supplies with the neutral conductor at earth potential.

GB The apparatus shall be connected to mains socket outlets with a protective earthing connection.
DEN Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord.
FIN Laite on lilettävä sojamaadoituskoskettimilla varustettuun pistorasiaan.
NOR Apparatet må tilkoples jordet stikkontakt.
SWE Apparaten skall anslutas till jordat uttag.



ATTENTION: Un-earthed metal parts may be present inside the enclosure. No user serviceable parts inside - to be serviced only by qualified personnel. When servicing, disconnect all power sources before removing any panels.

CE Certification



This unit is CE compliant. Note that any cables supplied with Cranborne Audio equipment may be fitted with ferrite rings at each end. This is to comply with the current regulations and these ferrites should not be removed.

FCC Certification

- Do not modify this unit! This product, when installed as indicated in the instructions contained in the installation manual, meets FCC requirements.
- Important: this product satisfies FCC regulations when high quality shielded cables are used to connect with other equipment. Failure to use high quality shielded cables or to follow the installation instructions may cause magnetic interference appliances such as radios televisions and will void your FCC authorisation to use this product in the USA.
- This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

RoHS Notice

Cranborne Audio complies with and this product conforms to European Union's directive 2011/165/EU on Restrictions of Hazardous Substances (RoHS) as well as the following sections of California law which refer to RoHS, namely sections 25214.10, 25214.10.2, and 58012, Health and Safety Code Section 42475.2, Public Resources Code.

Instructions for disposal of WEEE by end users in the European Union



The symbol shown here, which is on the product or on its packaging indicates that this product must not be disposed of with other waste. It is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling waste electrical equipment and electronic equipment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.



WARNING: cancer and reproductive harm - www.P65Warnings.ca.gov



Evaluation of apparatus based on altitude not exceeding 2000m. There may be some potential safety hazard if the apparatus is operated at altitude exceeding 2000m.



Evaluation of apparatus based on the temperate climate conditions only. There may be some potential safety hazard if the apparatus is operated in tropical climate conditions.

Electromagnetic Compatibility

EN 55032:2015, Class B, EN 55016-2-1:2009 A1 2011. EN 55016-2-3:2010 A1 2010, EN 55035:2017, EN 61000-4-2:2009, EN 61000-4-3:2006 A1 2008 A2 2010, EN 61000-4-4:2012, EN 61000-4-5:2014 A1 2017, EN 61000-4-6:2014, EN 6100-4-11:2004 A1 2017, EN 61000-3-2:2014, EN 61000-3-2:2013, FCC Part 15B Class B, ANSI C63.4:2014, ICES-003 Issue 6: Class B

Audio input and output ports are screened cable ports and any connections to them should be made using braid-screened cable and metal conductor shells in order to provide a low impedance connection between the cable screen and the equipment.

WARNING: Operation of this equipment in a residential environment could cause radio interference.

Environmental

- Operating Temperature:: +1 to 30 degrees Celsius.
- Storage: -20 to 50 degrees Celsius.

For more information and guidance, please read your devices' User Manual or visit the Cranborne Audio website:

www.cranborne-audio.com

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