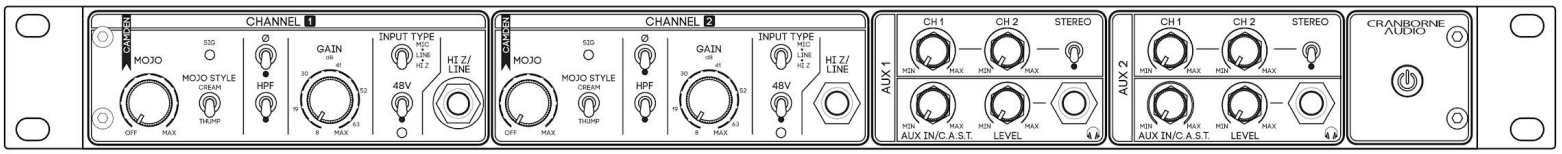
CRANBORNE AUDIO



Camden EC2 - Two Channel Preamp, Mojo Processor, and Dual Headphone Mixer

User Manual

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.

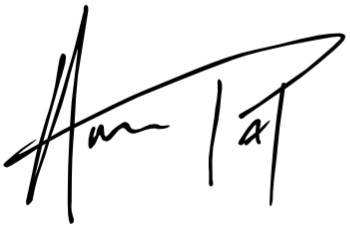
Cranborne Audio, for us, means so much more than metal boxes with components in them. These are our labours of love that embody and demonstrate our demand for excellence. By distilling what matters and putting our soul into these tools, we hope to help other people make magic and express themselves,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

Cranborne Audio Camden EC2

Congratulations on your purchase of Camden EC2 and thank you for selecting Cranborne Audio to be a part of your music creation process.

Camden EC2 is an evolution of our Multi Award-Winning Camden 500 Preamp technology developed into a 19”, rackmount format. From the beginning, we promised ourselves that Camden EC2 would be more than just two Camden 500’s in a box. We set out to analyse, critique, and improve every last detail of Camden EC2’s preamp design whilst packing it into a complete recording and playback solution that would add much more functionality to any studio with advanced, local monitoring and our C.A.S.T. cable management system.

The Camden preamps themselves are capable of being the most delicate and natural preamps you’ve ever heard but at the turn of a dial, can transform into the fattest, warmest, and the most character of any preamp in your arsenal. To partner the preamps, we added two discrete line mixers with reference-grade headphone amplifiers that allow you to monitor the local preamps directly during mic placement or blend live sources with pre-recorded sources during tracking.

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.

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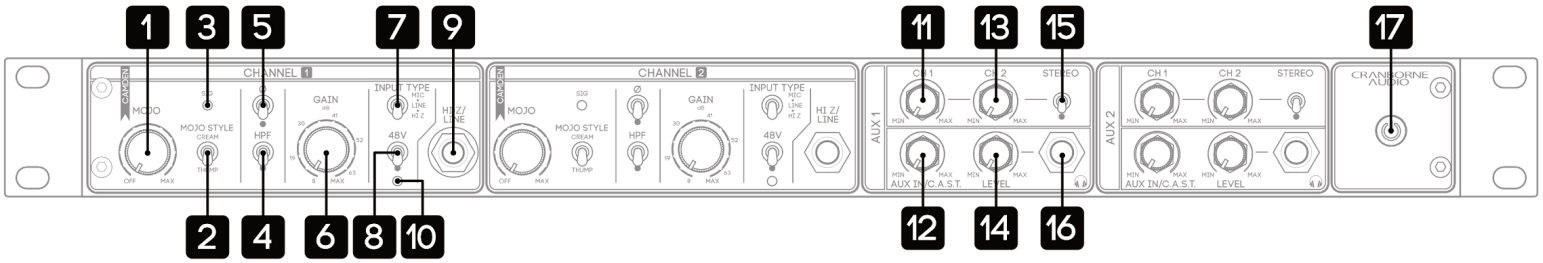
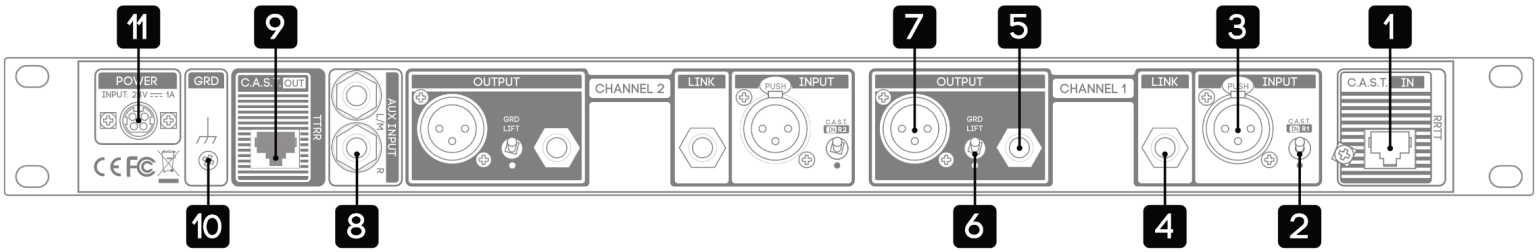
Getting Started

Controls and Connectors



[F1] Mojo Control: Adjusts the level of Mojo analogue saturation. Bypasses Mojo and clicks off when it's turned fully anti-clockwise.	**[F10] 48v Status Indicator:** Bicolour LED that displays 48v status. Off = 48v Off, voltage fully discharged Amber = 48v voltage charging/discharging Red = 48v fully charged
[F2] Mojo Style Switch: Toggles the Mojo style between 2 discrete styles: Thump & Cream.	**[F11] Ch1 Level Control:** Adjusts the level of the Channel 1 preamp into the Aux Bus.
[F3] Signal Indicator: Bicolour LED that displays incoming signal level and clip status. Blue = -40dBu to -1dBu Green = 0dBu to +20dBu Amber = +21dBu to +23dBu Red = +24dBu	**[F12] Aux In/C.A.S.T. Level Control:** Adjusts the level of the rear Aux Inputs and C.A.S.T. OUT RR into the Aux bus.
[F4] HPF Switch: Engages the 80Hz High Pass (Low Cut) filter. -3dB @ 80Hz. ***(Switch Down = ON)***	**[F13] Ch2 Level Control:** Adjusts the level of the Channel 2 preamp into the Aux bus.
[F5] Polarity Switch: Inverts the polarity of the input signal by 180°. ***(Switch Down = ON)***	**[F14] Aux Headphone Level:** Adjusts the main level of the Aux bus to the Aux Headphones output.
[F6] Gain Control: 12 position switched pot. Adjusts the input sensitivity of the preamp from 8 to 68.5dB in 5.5dB increments.	**[F15] Stereo Pan Switch:** Sets the Pan position of Ch 1 and Ch 2 to the Left and Right sides of the Aux headphone output for monitoring stereo signals. ***(Switch Down = ON)***
[F7] Input Type Switch: 3-way switch. Adjusts the input Impedance and pad status of the preamp Input to match the desired input type; hi-z, line, or mic.	**[F16] Aux Headphone Output:** Used for connecting Independent headphones to the Aux and Monitor busses.
[F8] 48v Switch: Engages 48v phantom power for the rear XLR connector onboard the 500 series chassis being used with Camden 500. ***(Switch Down = ON)***	**[F17] Power Switch:** Safely powers on and off Camden EC2. Tap to power on, press and hold to power off.
[F9] Hi-Z/Line Input: Used to connect Line or Hi-Z instruments directly into the preamp's front panel. Hi-Z/Line input interrupts rear XLR or C.A.S.T. Input connections.	



[R1] C.A.S.T. Input: Enables I/O relocation and expansion via Cranborne Audio C.A.S.T. enabled breakout boxes.	**[R7] Preamp Output (+24dBu):** Sends balanced, line-level outputs of each Preamp for connection to external converters and equipment.
[R2] Source Switch: Toggles the input source of each preamp between C.A.S.T. Input and XLR. ***(Switch Down = C.A.S.T. ON)***	**[R8] Aux Input:** Connects analogue playback sources from external audio interfaces directly into Camden EC2's monitoring paths. Inputs are summed with the C.A.S.T. OUT RR Paths.
[R3] Preamp Input: Connects balanced XLR analogue inputs into each Preamp. Input sensitivity varies depending on the Input Type Switch on the front of the preamp.	**[R10] Grounding Post:** Enables direct binding to chassis ground to help eliminate ground loops in specific setups.
[R4] Link Output: Outputs an unaffected, buffered output to connect downstream equipment such as guitar amplifiers in parallel to Camden EC2's Hi-Z and Line inputs.	**[R15] C.A.S.T. Output:** Enables Camden EC'2 Preamp signals to be sent directly to the C.A.S.T. Inputs on another Cranborne Audio device. C.A.S.T. Out also receives the Aux Mix (inc Talkback) from the connected 500ADAT/500R8 for monitoring on Camden EC2's Aux mixers.
[R5] Preamp Output (+18dBu): Sends balanced, line-level outputs of each Preamp for connection to external converters and equipment.	**[R11] Power:** Provides Camden EC2 with power via the provided external 24v 1A DC power supply. No other power supply should be used.
[R6] Ground Lift: Lifts the ground of the preamp's XLR output to remove ground hum in applicable setups. ***(Switch Down = Ground Lift ON)***	

Package Contents

So now your Camden EC2 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 Camden EC2 setup, plugged in, and ready-to-record as quickly as possible!

The following items can be found in the packaging alongside Camden EC2:

- External power adapter
- IEC cable
- Allen key (2mm)
- Quickstart Guide

Rack-Ear Orientations

There's more to Camden EC2's rack ears than meets the eye. Camden EC2's rack ears can be repositioned in 2 ways to suit particular applications and offer greater protection during transport.

Standard (Default) - Standard rack ear configuration where the rack ears are mounted flush to the front panel of Camden EC2.

Recessed - Protective rack ear configuration where the rack ears are brought forward allowing Camden EC2 to sit backwards into the rack to protect front panel controls during travelling and location recording.

Depending on your desired use case, you will need to remove the 3 screws securing each rack ear using the supplied 2mm allen key, realign the rack ears with the correct set of holes, and fix them firmly back into place.

Power Supply

Camden EC2 is powered via an external **24v 1A DC** switch-mode power supply that supports any global operating voltage from 100 to 240v.

Switch mode power supplies can exhibit switching noise during operation, but Camden EC2 features linear regulation on the DC inlet to ensure that power noise and intermodulation distortion doesn't find itself on the audio rails.

Camden EC2's Power delivery is made via a latching 4-pin connector that is designed to provide a secure connection to the chassis with protection against accidental removal.

> ***Note:***
> ***Please only use the supplied power supply with Camden EC2. Damage caused using an improper PSU with incorrect polarity or voltage is not covered under warranty.***

Connecting Power

Align the metal pins and plastic locator of the plug with Camden EC2's Power Inlet **[R11]**. Once located, push the connector firmly into the socket whilst holding the plug's outer housing and not the cable itself.

Disconnecting Power

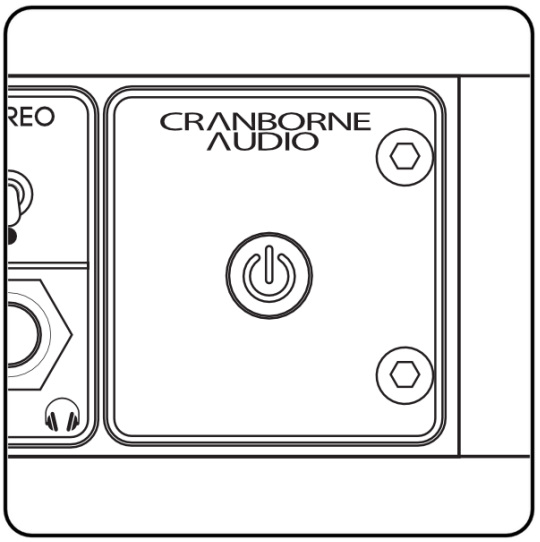
Grip the body of the plug firmly and pull the body of the connector back from the Power Inlet **[R11]**. The plug's outer casing will pull back and release the safety latch to allow the plug to be pulled out of the socket.

> ***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.***

Powering Procedures

Powering On

First, make sure that any connected speakers/audio interfaces are switched off and any headphones have been disconnected from Camden EC2.



Briefly tap the Power Switch **[F17]** located on Camden EC2's front panel. The power icon will illuminate blue indiactoring Camden EC2 is powered on and ready for use.

Powering Off

First, make sure that any connected speakers/audio interfaces are switched off and any headphones have been disconnected from Camden EC2.

Press and hold the Power Switch for approximately 3 seconds. The power icon will deluminate and you will hear the soft 'clicking' of the relays indicating that Camden EC2 has been safely 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.

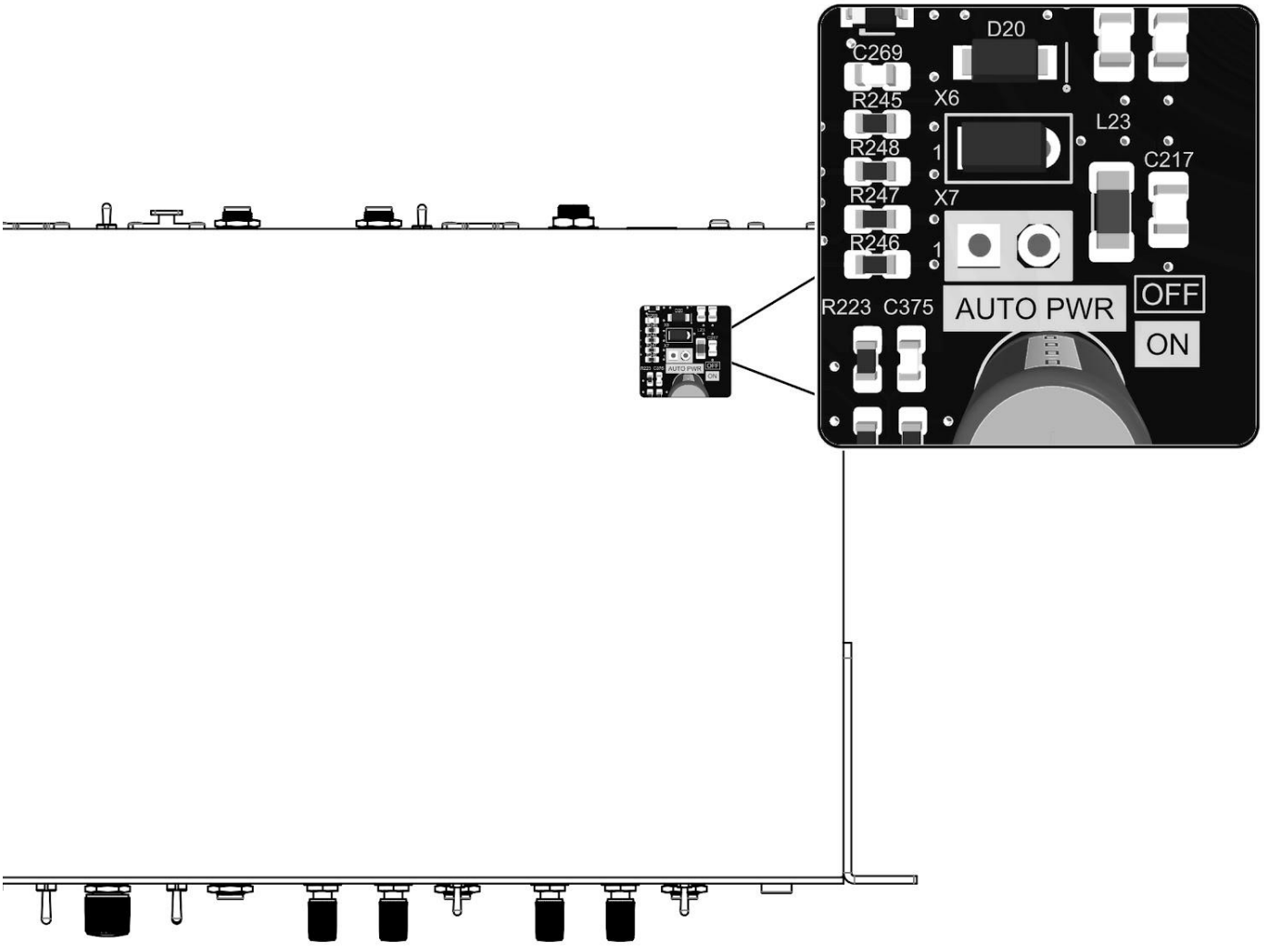
Auto Power

If Camden EC2 is situated in a rack full of other outboard equipment and preamps, it can be configured to automatically power on/off when power is switched on from a central location from inside the rack or a power conditioner when power is detected at its Power Inlet **[R11]**.

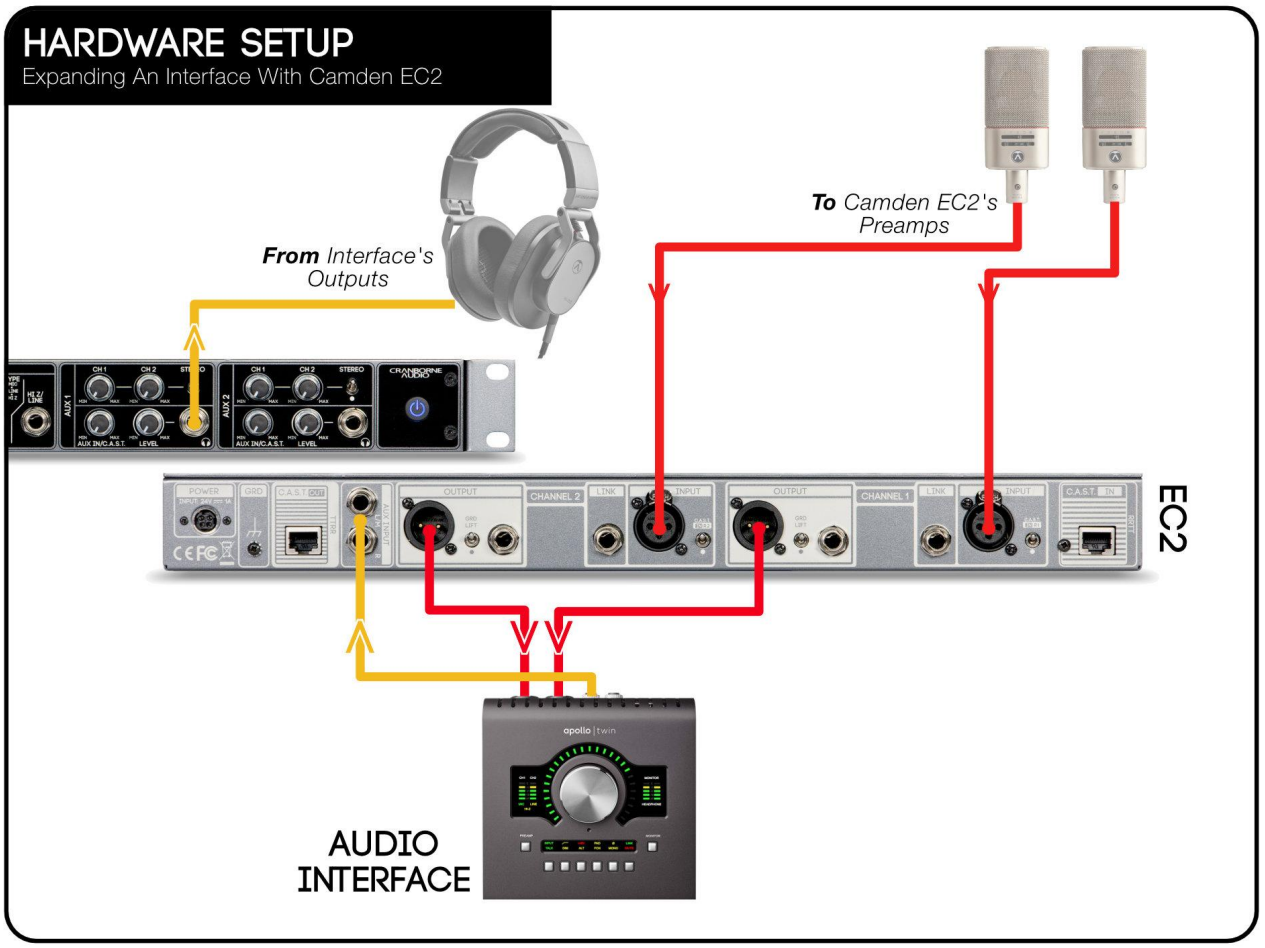
To enable Auto Power, you will need to remove Camden EC2's top panel and move a specific jumper.

1. Ensure Camden EC2 is *powered off* and the power connector has been *removed*. Wait 30 seconds before continuing.
2. Place Camden EC2 on a flat surface and carefully remove the screws fixing the top panel.
3. Locate the 'Auto Power' label on the PCB.
4. Carefully remove the black plastic jumper that is installed over the OFF legs, and reposition it over the ON legs. This jumper will then bridge the connection and enable Auto Power On/Off.
5. Re-fix the top panel back onto your Camden EC2.

Auto Power will now be enabled and Camden EC2 will power on/off automatically when power is detected at the Power Inlet **[R11].**



Hardware Setup: Audio Interface



This hardware setup diagram will get Camden EC2 connected to your audio interface and ready for recording.

1) Connect mains power into the external PSU supplied in Camden EC2's packaging and connect the Power Connector into Camden EC2's Power Inlet **[R11]**.

2) Connect the line outputs of Camden EC2's Preamps to two available line inputs on the Audio Interface. Use either Camden EC2's balanced ¼" jack **[R5]** or XLR outputs **[R7]** depending on your audio interface's connections.

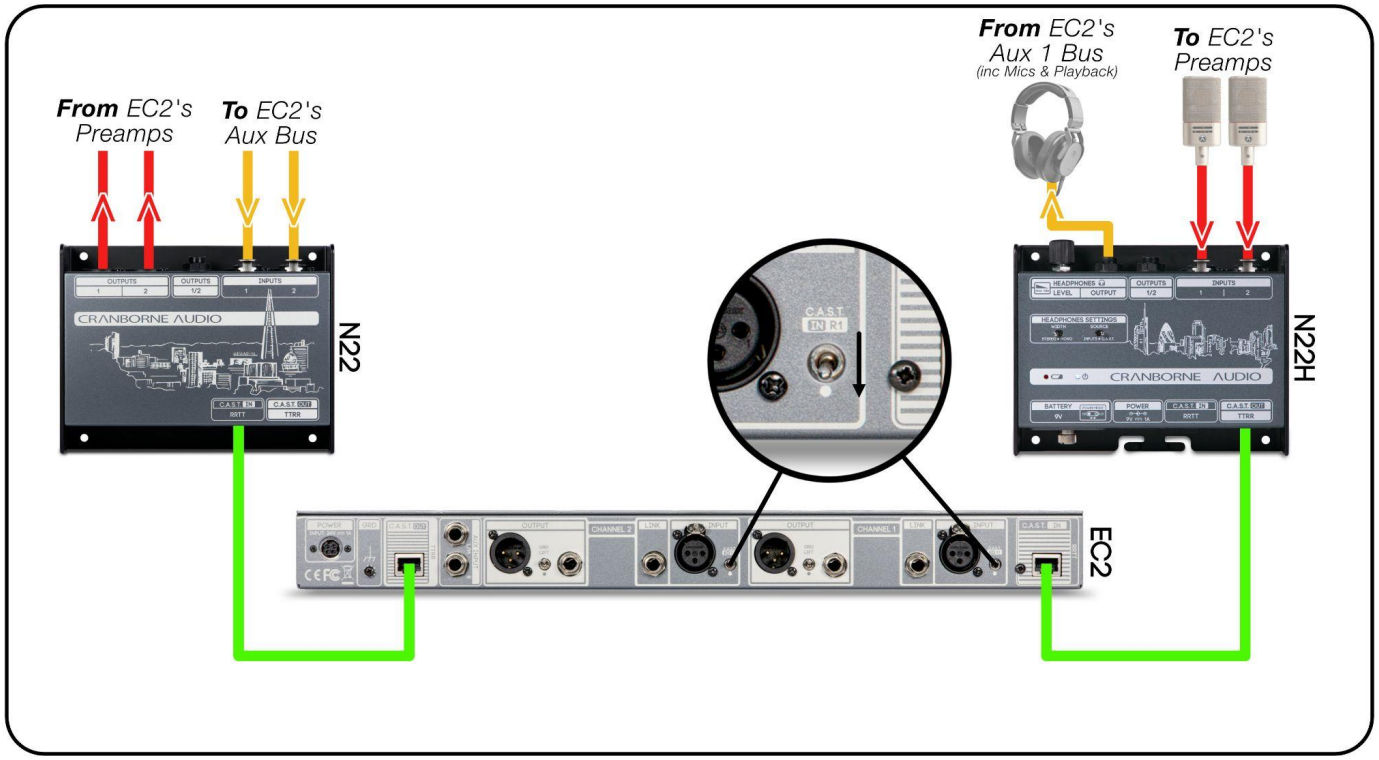
   Note:
   Ensure that the inputs on the Audio Interface can accept balanced, line level signals at +4dBu or higher reference level for best performance.

3) Power On Camden EC2 using a brief tap of the Power Switch **[F17]**. Then power on your Audio Interface.

4) Connect two available line outputs on the Audio Interface to the Aux Inputs **[R8]** on the rear panel of Camden EC2's.

Now, your Camden EC2 is fully patched with your Audio Interface. Mic/Line/Hi-z sources connected to Camden EC2 can be recorded by the Audio Interface, and audio signals sent from the Audio Interface will arrive at Camden EC2's Aux In/C.A.S.T. Level Control **[F12]**.

Hardware Setup: Using C.A.S.T.



This hardware setup diagram will get Camden EC2 connected within a C.A.S.T.-enabled system alongside an N22 and N22H breakout box.

1. Connect mains power into the external PSU supplied in Camden EC2's packaging and connect the Power Connector into Camden EC2's Power Inlet **[R11]**.

2. Connect Camden EC2's C.A.S.T. Output **[R9]** to a C.A.S.T. Input on N22 using a shielded Cat 5e, Cat 6, or Cat 7 cable.

3. Connect N22H's C.A.S.T. Output to Camden EC2's C.A.S.T. Input **[R1]** using a shielded Cat 5e, Cat 6, or Cat 7 cable.

4. Power on Camden EC2, followed by other downstream equipment.

5. On Camden EC2, set Source Switch **[R2]** on the rear panel to C.A.S.T.

Now Camden EC2 is fully integrated into a C.A.S.T. system. Mic/Line sources connected to N22H will arrive at Camden EC2's preamps ready for processing before travelling through C.A.S.T. directly to N22 for further processing and recording.

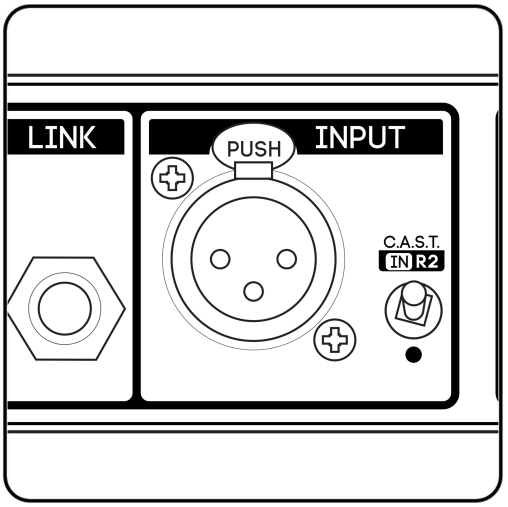
At the same time, audio connected to N22 is sent through C.A.S.T. and into Camden EC2's Aux In/C.A.S.T. Level **[F12]**. Then the Aux 1 mix created on Camden EC2 is sent through C.A.S.T. and onwards to the outputs of the connected N22/N22H.

Feature Overview

Camden Preamps

The preamps inside Camden EC2 are derived from our Multi-Award Winning Camden preamp topology that has quickly become one of the most renowned preamp designs on the market. Celebrated thanks to its superior transparency and detail, as well as its Mojo variable harmonic saturation, the preamps inside Camden EC2 feature the same core design but with a few extra features that we have implemented to refine the preamp design further and make it even more effective in the modern studio environment.

Channel Inputs



Each of Camden EC2's preamps have 3 possible input sources with various rules/conditions for each to allow for the most intuitive operation possible. The input sources include the XLR and C.A.S.T. inputs on the rear of Camden EC2 as well as a 1/4" jack on the front.

When connecting inputs, pay close attention to Camden 500's input type switch to ensure that the correct input pad and impedance settings are being used for your desired source.

XLR Input [R3]
The rear XLR input accepts both Mic and balanced Line inputs. The XLR is engaged by default however it may need to be selected by using the rear panel Source Switch **[R2]** and switching it to its UP position.

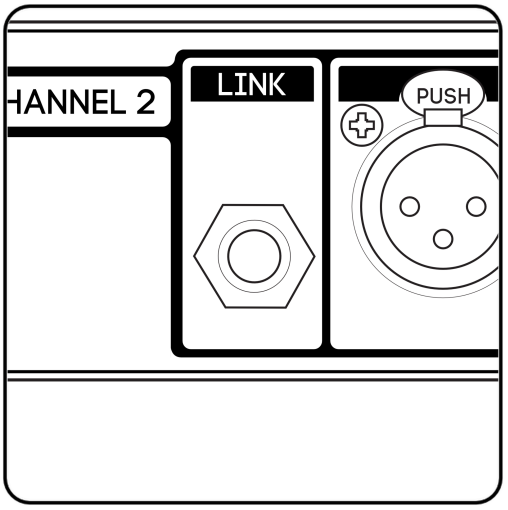
¼" Jack Input [F9]
The ¼" Jack input can accept balanced Line sources or unbalanced/balanced Hi-Z sources via ¼" jack. Microphones cannot be connected directly to this ¼" jack input.

Note:
The 1/4" Jack input takes precedence over all other input connections and the preamp will default to the front Jack when it is connected irrespective of which other input is connected and the status of the Source Switch [R2].

C.A.S.T. Input
The C.A.S.T. Input accepts both Mic and balanced Line inputs connected via another Cranborne Audio C.A.S.T. enabled products such as an N22 or N22H. The C.A.S.T. Input is not engaged by default and needs to be selected by using the rear panel Source Switch **[R2]** and switching it to its DOWN position.

Note:
When the Source Switch [R2] is set to C.A.S.T. and the C.A.S.T. Input is being used, the rear XLR input is deactivated and cannot be used until the switch is set to its UP position.

Link Output [R3]



The Link Output **[R3]** sends out a dry, unaffected version of the audio source connected to the front panel ¼" hi-z/line input jack **[F9]**. The Link Output behaves in the same way as a Link/Thru port on a DI box.

The Link Output **[R3]** is fed directly after the input stage of the preamp and is a dry, unaffected version of the instrument connected to Camden EC2's hi-z/line input jack **[F9].** The signal is fed *before* the preamp but it is buffered to maintain signal integrity.

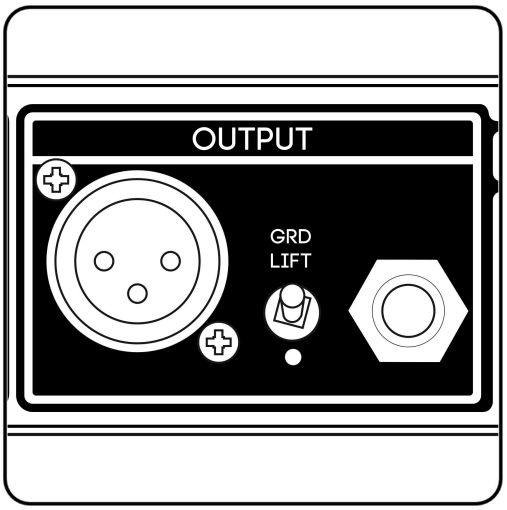
You can connect the Link Output directly to the input of a Bass Amp, Guitar Amps, Pedal, Preamp or other inputs for parallel dry/wet recording and guitar reamping.

For more information on how to use the Link Output for when reamping, check out our "Using the Link Output For Reamping" application guide.

Tip:
Wait, did we just say buffered?! Yes we did. Buffers are a dirty word in guitar kingdom, but there is no need to fear them. The Link Output has an output impedance of 75 Ohms, which is the exact same as many high-quality guitar buffers and the value of some pedals when they are switched on. This will not have any detrimental effect on almost any guitar pedal and amp combination.

The only time where the output Impedance of the Link Output may be an issue is when connecting it directly to a Fuzz pedal or similar that needs to see a high impedance guitar pickup. If you want to connect the link output to a pedal such as this, you will need a reamp box or similar to convert the signal to high impedance.

Preamp Outputs



Each of Camden EC2's preamps have 2 discrete outputs that can be used simultaneously for multi-routing scenarios and splitting capabilities in the studio or on stage.

Balanced XLR Preamp Output [R7] - The XLR output is a fully balanced line output with a maximum output level of +24dBu. This connection should be used when connecting Camden EC2 to an audio interface line-input for recording. This connection can also be safely connected to an unbalanced input without damage using the correct cable.

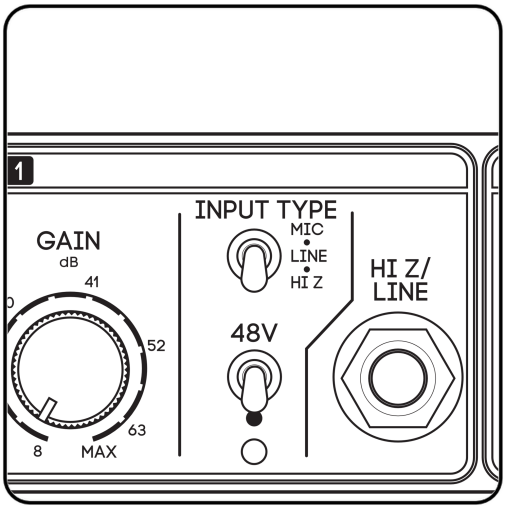
Impedance Balanced ¼" Jack Preamp Output [R5] - The ¼" Jack output is an impedance balanced output that can be connected to both balanced and unbalanced sources using a TRS or TS, guitar-style jack cable. The output has a maximum output level of +18dBu.

Ground Lift [R6]

The Ground Lift [R6] switch lifts the ground of Pin 1 on the preamp's XLR output to remove ground hum and buzz in applicable setups. The Ground Lift only applies to the XLR output and is activated when the switch is Down.

The Ground Lift should only be necessary in circumstances where your audio equipment is not sharing a common ground - such as live use and in studios where different AC power circuits are used in the same space. Otherwise, the Ground Lift should only be set once and left until Camden EC2 is connected to another piece of equipment.

Input Type Switch [F7]

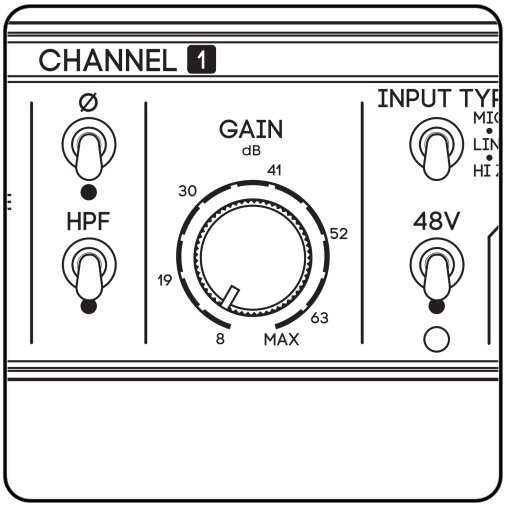


The Input type **[F7]** switch configures the front-end of Camden EC2's preamp to create the best possible environment for mic, line, and hi-z sources. Each switch position determines the input impedance, active input connector, and pad status of the preamp for each input type setting.

Mic - Switches Camden EC2's input impedance to 8.9kOhms (48v Off, 5.4kOhms 48v ON). Mic input type has a maximum input level of +17.6dBu.

Line - Switches Camden EC2's input impedance to 23.4kOhms and engages the -8dB pad. The line mode has a maximum input level of +26.5dBu.

Hi-Z - Switches Camden EC2's input impedance to 1.5MOhms (unbalanced, 3MOhms balanced). The Hi-Z mode has a maximum input level of +24dBu.



Gain Control [F6]

The Gain control **[F6]** is used to adjust the input sensitivity of the preamp to boost incoming signals to optimum operating level and achieve the best signal-to-noise ratio. The gain control is a 12-position, stepped-switch that adjusts the input sensitivity in steps of 5.5dB.

Mic Mode Gain Range

Position	Min	2	3	4	5	6	7	8	9	10	11	Max
Gain (dB)	8	13.5	19	24	30	35.5	41	46.5	52	57.5	63	68.5

Line Mode Gain Range

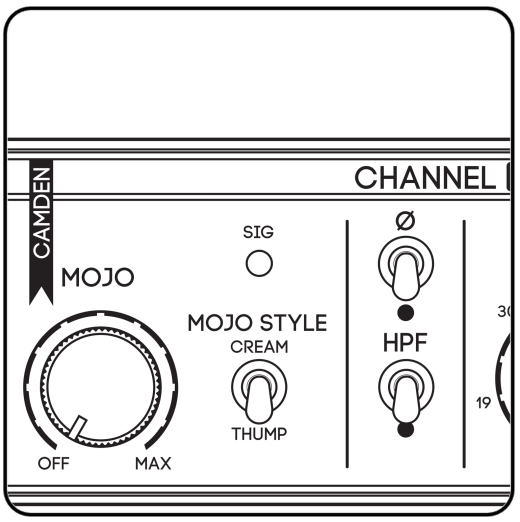
In line mode, Camden EC2 engages an 8dB pad to enable a maximum input level of +26.5dBu and a gain range of 0dB to 60.5dB in 5.5dB steps.

Position	Min	2	3	4	5	6	7	8	9	10	11	Max
Gain (dB)	0	5.5	11	16.5	22	35.5	33	38.5	44	49.5	55	60.5

Hi-Z Mode Gain Range

Position	Min	2	3	4	5	6	7	8	9	10	11	Max
Gain (dB)	0	5.5	11	16.5	22	35.5	33	38.5	44	49.5	55	60.5

Signal Indicator [F3]



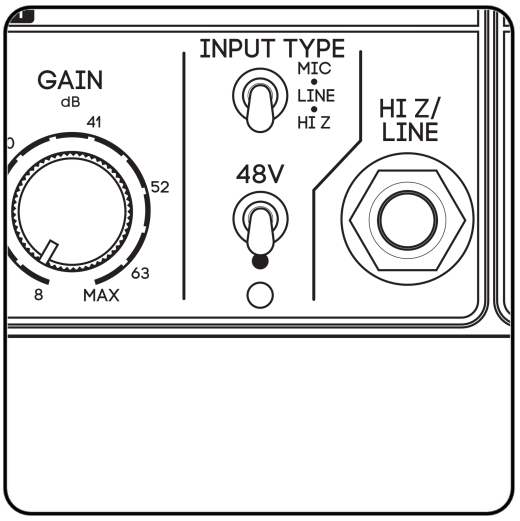
The signal indicator **[F3]** is a visual aid to help achieve the best performance and highest possible signal-to-noise ratio during the recording process. Correct gain staging will also get Mojo working at its best.

The signal LED is an RGB LED and is calibrated to have the following thresholds for input level:

Blue	-40dBu to -1dBu
Green	0dBu to +20dBu
Amber	+21dBu to +23dBu
Red (clip)	+24dBu

Tip:
To get the maximum effect out of Camden EC2's Mojo control, the Gain Control should be run as high as possible without the Signal Indicator lighting RED.

48v Switch [F8]



The 48v switch **[F8]** engages 48v phantom power and sends supply voltage down pin 1 of the chassis' XLR input socket to power condenser microphones and Di boxes if required. Phantom power is off when in the 'up' position. Phantom power is on and ready when in the 'down' position and the LED is lit up red.

Note:
Do not engage 48v with vintage ribbon mics connected to Camden EC2 as sending voltages through to the ribbon can cause permanent damage to the microphone.

Be careful when connecting line-level instruments (such as interfaces, keyboards) to Camden EC2 via XLR when 48v is engaged. Sending 48v through to the line-level outputs of instruments and playback devices can cause irreparable damage to their internal components and is not covered under warranty.

48v Status Indicator [F10]

The 48v Status LED **[F10]** is a Bicolour LED that displays the full 48v status of the preamp. Due to the design of Camden EC2's preamps and its internal circuitry, the 48v can take a while to charge and discharge during use. As a safety feature and to prevent damage to your microphones, Camden EC2 displays the voltage status of the 48v using a 3rd, 'Amber', colour.

Off	48v Off, voltage fully discharged
Amber	48v voltage charging/discharging
Red	48v fully charged

Engaging 48v
When first engaged, the 48v Status Indicator LED lights Amber whilst the voltage is reaching the full 48v. During this time, do not adjust the Gain control as doing so may cause pops and clicks through the preamp output as the caps are still charging.

When the 48v Status Indicator lights RED, the 48v is fully charged and the preamp is ready for use.

Disengaging 48v
When disengaged, the 48v Status Indicator LED lights Amber whilst current is discharged from the XLR connector. During this time, do not disconnect the microphone/DI Box or connect a ribbon mics to the XLR as voltage is still present.

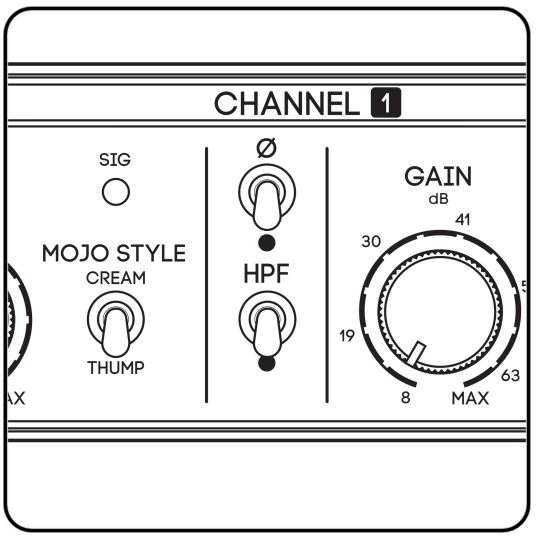
Once the LED has turned off, there is no longer any voltage present on the XLR connector and the preamp is ready to use.

Note:
Some microphones may take longer to charge/discharge than others and so the duration of the Amber LED status may change depending on what device is being used.

<u>Warning</u>:
Do not connect/disconnect microphones from Camden EC2 when 48v Phantom Power is engaged as doing so could cause damage to Camden EC2 or your connected microphone. Damage caused during improper 48v usage is not covered under warranty.

Polarity (Ø) Switch [F5]

The Polarity Switch **[F5]** inverts the polarity of the incoming audio by 180° in order to optimise the phase interaction of the preamp's signal with other audio tracks also being recorded.



Tip:
In isolation, flipping the polarity of the mic preamp will not result in any audible effects, however the polarity switch is a useful tool when Camden EC2 is being used as part of a multi-mic recording setup, or instances where other instruments - also being mic'd and recorded - are bleeding into the microphone.

HPF Switch [F4]

The HPF Switch **[F4]** engages a filter that removes low-end rumble from sources that do not require low frequency extension. The filter is set to achieve 3dB of attenuation at 80Hz and features a 12dB per octave slope.

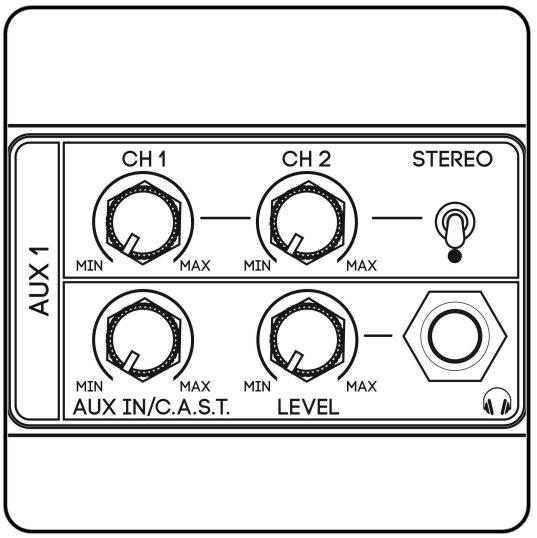
Camden EC2's High Pass Filter has been tuned to achieve a smoother onset but more dramatic roll-off than standard filters resulting in a more natural-sounding low-frequency attenuation.

Tip:
As the HPF is positioned after the Mojo circuit in the signal path it can also be used in conjunction with Mojo to create even more tonal-shaping possibilities.

Try using Thump on a vocal track alongside the HPF to introduce rich and intimate low-mid harmonics without excessive plosive or rumble effects in the lower frequencies.

Try using Cream on an electric guitar mic alongside the HPF to achieve more high-mid harmonic focus. Dynamically remove mid-range boxiness, allowing the guitar to cut through a mix whilst using the HPF to trim the low-end 'woof' coming from the cabinet itself.

Headphone Amplifiers



Headphone amplifiers are often overlooked. Many of us engineers are willing to invest significant amounts of money on the latest and greatest headphones in the hope that it could be the silver bullet to more accurate monitoring. However, all too often, it is the headphone amplifier itself that fails to deliver. That inability to drive 'those' headphones properly, will only leave you wondering, 'what's missing?'.

When we designed the headphone amplifier in our flagship 500R8, we quickly realised that we had something special. It's low distortion, high power, and frequency linear performance 'lifted the veil' on any set of headphones we used with it - our customers agreed.

The Headphone amplifiers in Camden EC2 feature the same reference grade design found in the 500R8. Whether you're tracking with high-impedance, over-ear headphones or low-impedance, in-ear monitors, Camden EC2 delivers maximum performance and zero latency monitoring.

Channel Level Controls

The Channel Level Controls **[F11, F13]** are analogue level controls that adjust the volume of Camden EC2's preamp channels in its Aux busses and headphone outputs. The controls are fed directly from the analogue output of the preamps and so enable the headphone outputs to monitor the preamps in zero latency.

Ch1 Level [F11] - Adjusts the level of preamp channel 1.

Ch2 Level [F13] - Adjusts the level of preamp channel 2.

Stereo Pan Switch [F15]

The Stereo Pan Switch **[F15]** sets the Pan position of Ch 1 and Ch 2 in the Aux Headphone output. When the switch is off (Up), Ch1 and Ch2 are panned to the Centre of the Aux Headphone bus, When the switch is on (Down), Ch1 and Ch2 are panned to the left and right sides of the headphone outputs respectively.

This is ideal when Camden EC2 is being used in stereo mic'ing applications and you want to monitor the recording in true stereo through the headphone outputs built-in to the unit.

Aux Headphone Level Control [F14]

The Headphones Level Control **[F14]** controls the overall level of Camden EC2's Headphone Outputs.

Warning:
Camden EC2's Headphone Output is extremely loud! Prolonged exposure to loud music can cause permanent hearing loss. Please exercise caution when using N22H and reduce the Headphones Level Control [F14] when listening for long periods of time.

Aux In/C.A.S.T. Level Control [F12]

The Aux In/C.A.S.T. Level Control **[F12]** adjusts the overall level of the Aux Inputs **[R8]** and C.A.S.T. OUT **[R9]** RR into the Aux headphone bus. In application, this control would adjust the level of the stereo playback incoming from an external playback source such as an audio interface or mixer into the Aux Bus and headphone outputs.

The signal incoming from the Aux Input jacks **[R8]** and the C.A.S.T. Output **[R9]** RR Paths are summed together before reaching this control and so can be used in tandem if required to sum two discrete playback paths.

For more information how to use the Aux Input and C.A.S.T. Output simultaneously for advanced monitoring, check out the "Monitoring Two Playback Sources Using C.A.S.T." application guides

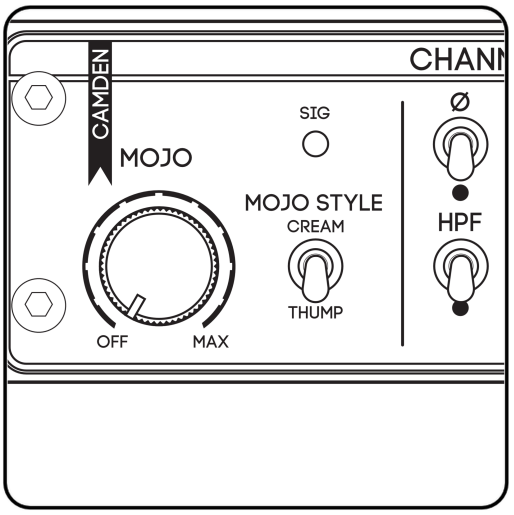
Aux Headphones Output [F16]

The Headphones Output [F16] is used for connecting headphones to Camden EC2's headphone amplifiers. The connection is made by a ¼" TRS connector that is found on popular professional and prosumer headphones. For consumer headphones or earbuds with smaller ⅛" connectors, you can connect a suitable adapter to convert the ⅛" jack to a larger ¼" jack.

Splitters and headphone extenders can be used with Camden EC2 but please exercise caution when connecting them to Camden EC2 as improper connections can cause damage to the unit or degrade Camden EC2's headphone performance.

> ***Note:***
> ***Do not connect unbalanced ¼" TS cables such as guitar cables to Camden EC2's Headphones Output. These connections could short the leg to ground and cause a spike in power consumption. Any damage caused to the unit as a result of unsupported connections is not covered under the Cranborne Audio warranty.***

Mojo



A perfectly clean preamp is great for capturing sources that need the utmost clarity and detail, however, being audio engineers and musicians ourselves - we know that some of the best records ever made had grit, character, and were recorded on preamps that imparted their own colour onto the signal - that's the sound we all hear when we say the word 'vintage'.

Transformers are big, bold, and impart a lot of character onto the sound. Both vintage and modern equipment feature transformers and they can sound great... but transformers can often cause issues. Transformers are noisy, they exhibit huge phase shifts - as much 90° at 50Hz (which equates to 5ms) - and they impart an EQ onto the audio.

Also, as transformers are integral to the way that a preamp works - they cannot be bypassed to reveal the pure signal. Our Mojo circuit is an analogue emulation of the desirable effects of transformers but without the downsides such as dramatic phase shifts and excess noise. Unlike transformer-based designs, Mojo's effects live on a variable control that can be dialed to taste on some sources, and bypassed for others.

We built a brand-new type of saturation circuit consisting of an array of different filters (some of which are inductive) and discrete second and third order harmonic generators that allow precise emulation of the saturation and low-end reinforcement behaviours of vintage equipment. Mojo can even be dialed-in to well-beyond the point that destructive clipping would usually occur with transformer-based designs for a wider palette of saturation effects.

By manipulating these filters and harmonic generators; we can create two discrete Mojo styles; Cream and Thump - both turn the impeccably clean and transparent Camden topology into the fattest, warmest, and most characterful preamp in your arsenal - all at the turn of a dial.

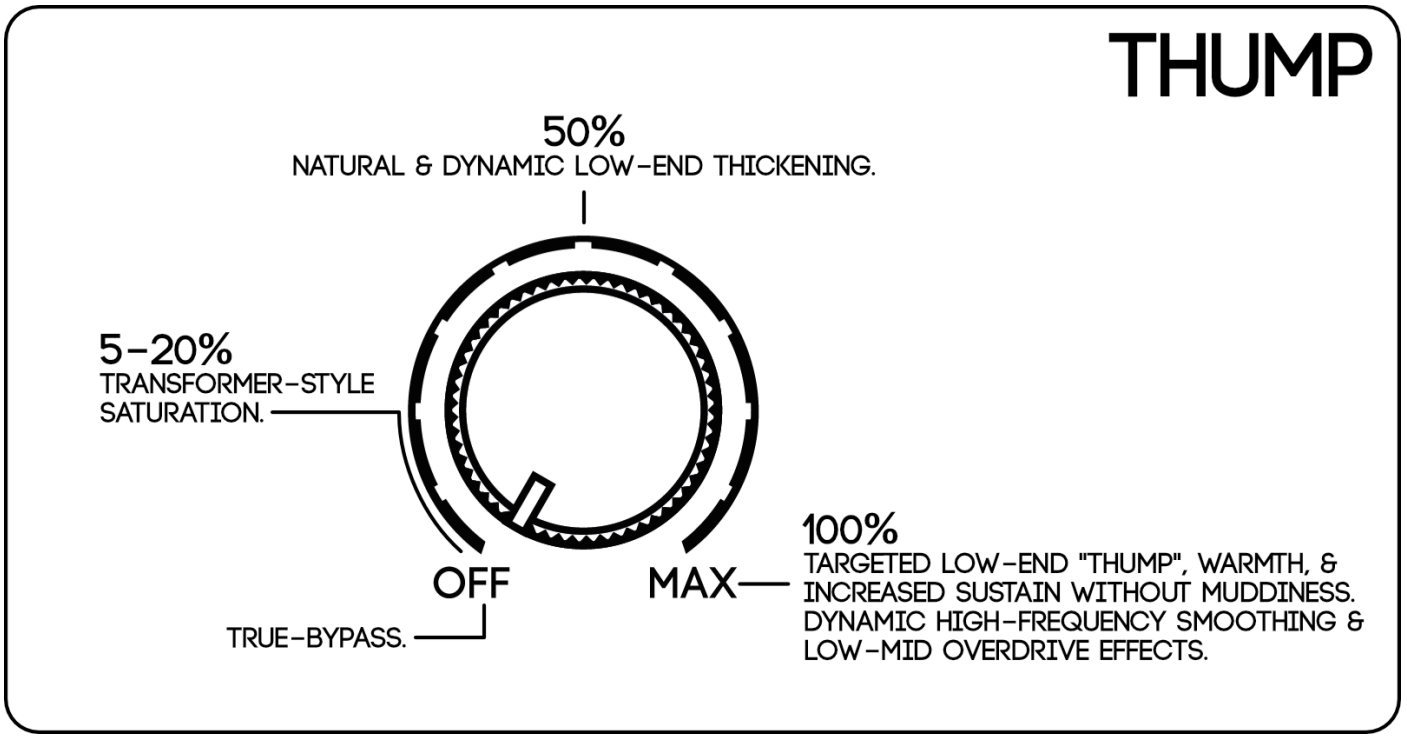
Mojo Control [F1]

The Mojo Control **[F1]** adjusts the level of the Mojo effect that is being mixed-in with the dry signal. The pot is variable to enable the best possible blend of the Mojo character to be dialed-in. When turned fully anti-clockwise, the pot switches off in order to completely bypass Mojo from the signal path.

Mojo Style Switch [F2]

The Mojo Style Switch **[F2]** selects which Mojo circuit is currently active; Thump or Cream. Each Mojo style suits a variety of different instruments in different ways and for different effects.

Thump

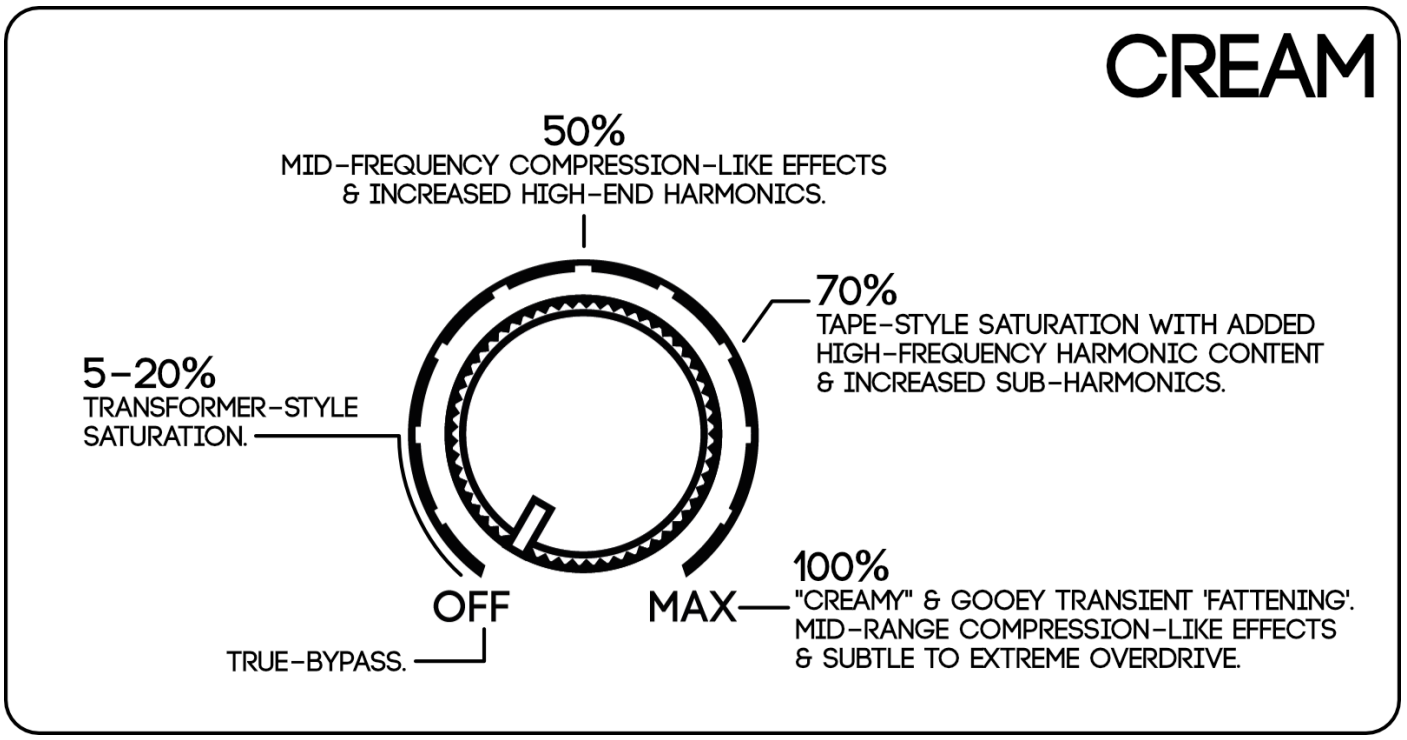


Thump is a style that works best on - but not limited to - low-frequency based instruments. Thump excites low-end content by boosting harmonics in the range of ~100Hz to 20Hz and below without increasing the fundamental frequencies - resulting in fuller low-end on all reproduction mediums. As Thump is not EQ-based, the additional harmonic content is shaped by the source and it's existing low-end frequency content resulting in a natural addition of extra "Thump". Similar-sounding EQ moves will result in extreme wooliness as all sonic energy is boosted - even unwanted audio in-between the hits.

On sources such as Kick drum, Thump will add the desired amount of low-end thickness required to provide the foundation for the rest of the mix to sit on. As Thump is NOT EQ-based, the content added is controlled by the hits unlike EQ.

On Snare, Vocals, and Guitar - sources that are traditionally filtered at around 80 Hz - Thump can still be used in conjunction with the Camden's HPF to add low harmonics to the low-mid frequencies without adding extraneous low-end that could cause havoc during the mix phase.

Cream



Cream introduces a vintage smoothness that enables tracks to sit deep within a complex mix in a way that cannot be replicated with EQ. The Cream setting drastically increases THD whilst smoothing out the low-mids.

As with Thump, Cream is not EQ based and is achieved by blending 2 saturation stages with the dry signal and additional harmonics. Cream varies entirely on the harmonic signature of the incoming source. It will increase high-end forwardness and create unique harmonic-based tonal shaping effects on mid-range instruments, but it will also add low-end on full range sources as well as unique “compression-style” effect on transients.

On vocals, a delicate amount of Cream will add high-end harmonics that will bring the vocals forward whilst also taming the midrange ‘honkiness’ of an unprocessed vocal track. Higher Cream settings will take a clean vocal track through to a warm vintage saturation with subtle overdrive effects that have the effect of smoothing-out ‘esses’ and adding up-front warmth.

On drums you will notice a 'fattening' of transients resulting in more emphasis on the sustain and shell of the drum itself as well as a subtle low-end boost. Overheads in particular will sound as if they were recorded in a bigger room.

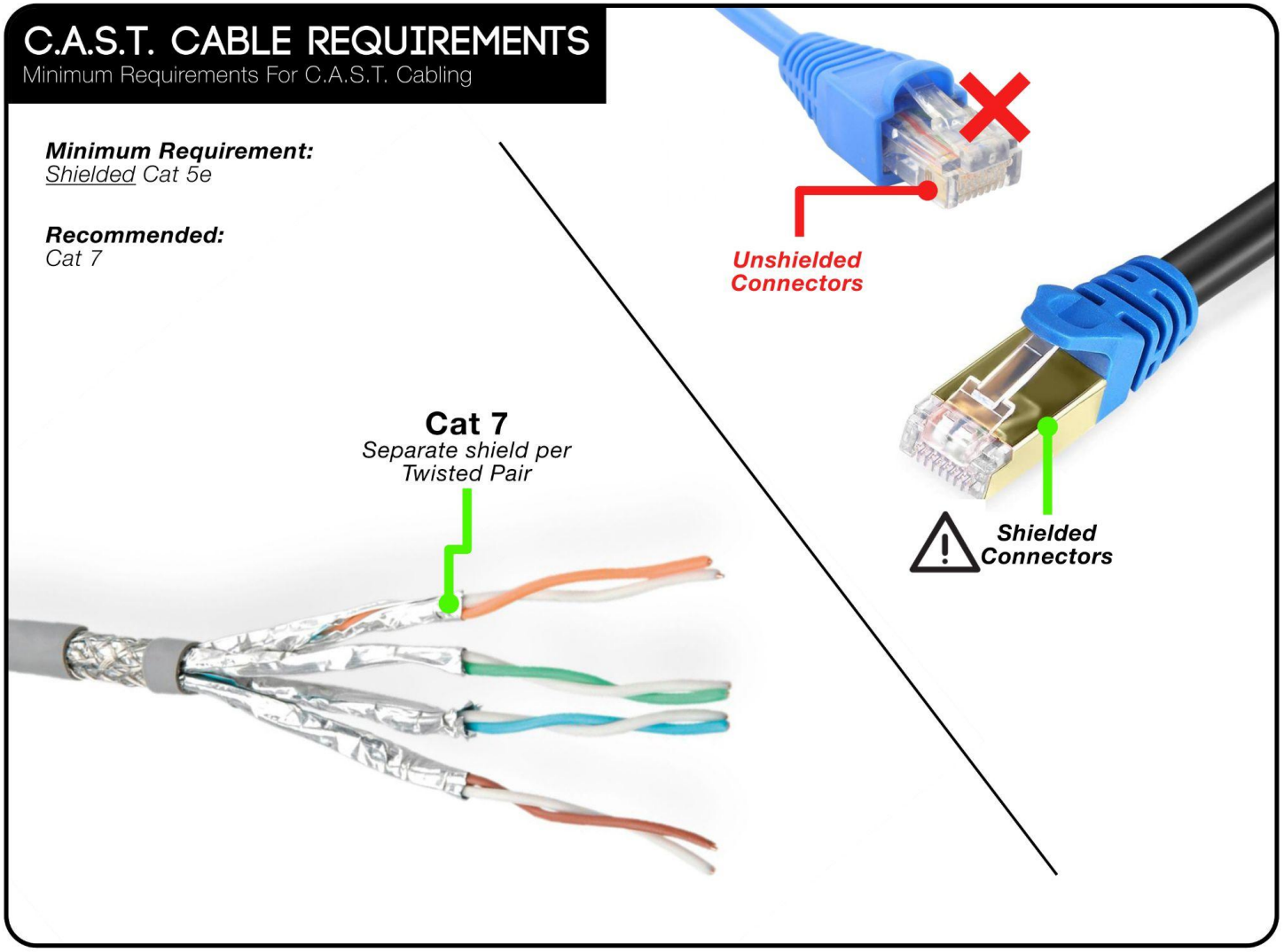
On distorted electric guitars, a generous amount of Cream will turn a dull recording into a speaker-busting, harmonically rich, mix-cutting masterpiece that stands shoulder to shoulder with any commercial recording.

C.A.S.T.

Cable Requirements

C.A.S.T. is a system that we use to transport balanced, analogue audio using standard network cabling. Using a shielded Cat 5e, Cat 6, or Cat 7 cable instead of 4 XLRs allows you to not only reduce cable spaghetti in your studio but also distribute audio around studios or stages using affordable, readily available cabling whilst achieving the highest sonic results

Each C.A.S.T. connection on a Cranborne Audio product features unique optimisation to ensure that the maximum signal integrity is transmitted over shielded Cat 5, Cat 6, and Cat 7 cables for distances of up to 100m(330ft) without high-end roll-off and with very low-crosstalk.



Recommendation - For best possible performance over maximum distances, we recommend using **Cat 7** cables with robust connectors to ensure that the C.A.S.T. connection is secure and will remain impervious to RF and crosstalk.

Minimum Requirement - As a minimum requirement, you can consider using Shielded Cat 5e or Cat 6 cabling provided that the cables and connectors themselves are fully shielded and are not needed at distances above 20m.

Note:

Many Cat 7 cables are marketed as Cat 7 but feature plastic connectors on either end. In order for C.A.S.T. to work correctly, the cable as well as the connectors themselves need to be shielded. Cables with incorrect shielding will not perform as expected and 48v Phantom Power will not pass through correctly. Any damage caused to the unit as a result of unsupported cabling is not covered under the Cranborne Audio warranty.

C.A.S.T. Wiring

Below is the wiring table that is used in both TTRR Output and RRTT Input paths of C.A.S.T. Using this diagram, you are able to create your own C.A.S.T devices if desired.

	TTRR		**RRTT**
Pin	**Signal**	**Pin**	**Signal**
1	C.A.S.T. IN 1-	1	C.A.S.T. OUT 1-
2	C.A.S.T. IN 1+	2	C.A.S.T. OUT 1+
3	C.A.S.T. IN 2-	3	C.A.S.T. OUT 2-
4	C.A.S.T. OUT 1-	4	C.A.S.T. IN1-
5	C.A.S.T. OUT 1+	5	C.A.S.T. IN 1+
6	C.A.S.T IN 2+	6	C.A.S.T. OUT 2+
7	C.A.S.T. OUT 2-	7	C.A.S.T. IN 2-
8	C.A.S.T. OUT 2+	8	C.A.S.T. IN 2+

Note:
Any equipment designed by users or 3rd parties that supports C.A.S.T. that has not had our direct involvement cannot be guaranteed to work to our exacting specifications and could suffer a loss in signal quality. Any damage caused to the unit as a result of unsupported cabling made by the user is not covered under the Cranborne Audio warranty.

C.A.S.T. Warnings

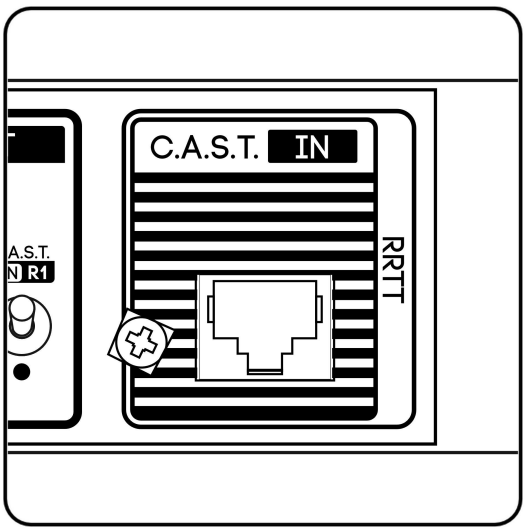
C.A.S.T. is designed to be a simple, plug and play solution for total cable management however there are a number of warnings that you should heed in order to prevent causing damage to your Cranborne Audio product or instrument/device connected to each end.

Do NOT connect a C.A.S.T. device to your home network or router	C.A.S.T. is a point-to-point connection and can not be used on any network hardware of any kind. The voltages that pass through C.A.S.T. including 48v phantom power is easily high enough to cause *permanent* damage to home routers or computers.
Only connect C.A.S.T. Outputs to Input and Vice Versa	Connecting a C.A.S.T. Input to another C.A.S.T. Input can cause irreparable damage to microphones, speakers, and Cranborne Audio gear.
Ensure the Cat 5e, Cat 6, and Cat 7 cable used is fully shielded	C.A.S.T. 's performance is limited when non-shielded cables are used and 48v will not work through a cable that is not fully shielded.
Ensure that all breakout panels/through connectors are also fully shielded	If you have RJ45 patch points on the wall of your studio, please ensure the connectors and internal cabling is fully shielded.

C.A.S.T. Input [1]

The C.A.S.T. Input **[1]** is used to connect Camden EC2 to the C.A.S.T. Output of another C.A.S.T.-enabled device.

The single C.A.S.T. connector transports 4 channels of balanced analogue audio in both directions (2-In, 2-Out) and each path is labelled as either a 'Receive' path (for signals *received* by Camden EC2) or 'Transmit' path (for signals *transmitted* from Camden EC2).

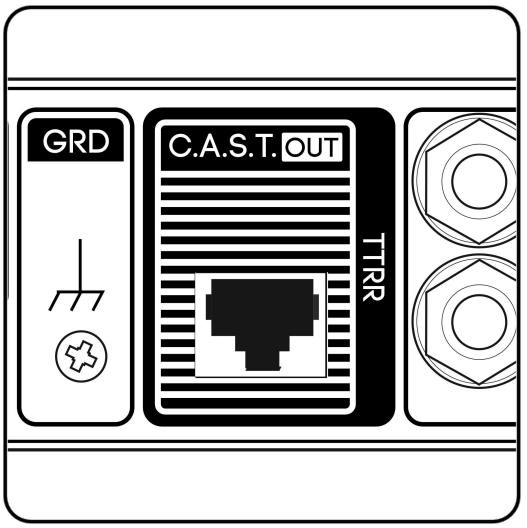


C.A.S.T. Input (RRTT)			
Receive (R)	Receive (R)	Transmit (T)	Transmit (T)
To Preamp 1 Input	To Preamp 2 Input	Aux 1 Mix Output L	Aux 1 Mix Output R

C.A.S.T. Output [9]

The C.A.S.T. Output **[9]** is used to connect Camden EC2 to the C.A.S.T. Input of another C.A.S.T.-enabled device.

The single C.A.S.T. connector transports 4 channels of balanced analogue audio in both directions (2-In, 2-Out) and each path is labelled as either a 'Receive' path (for signals *received* by Camden EC2) or 'Transmit' path (for signals *transmitted* from Camden EC2).



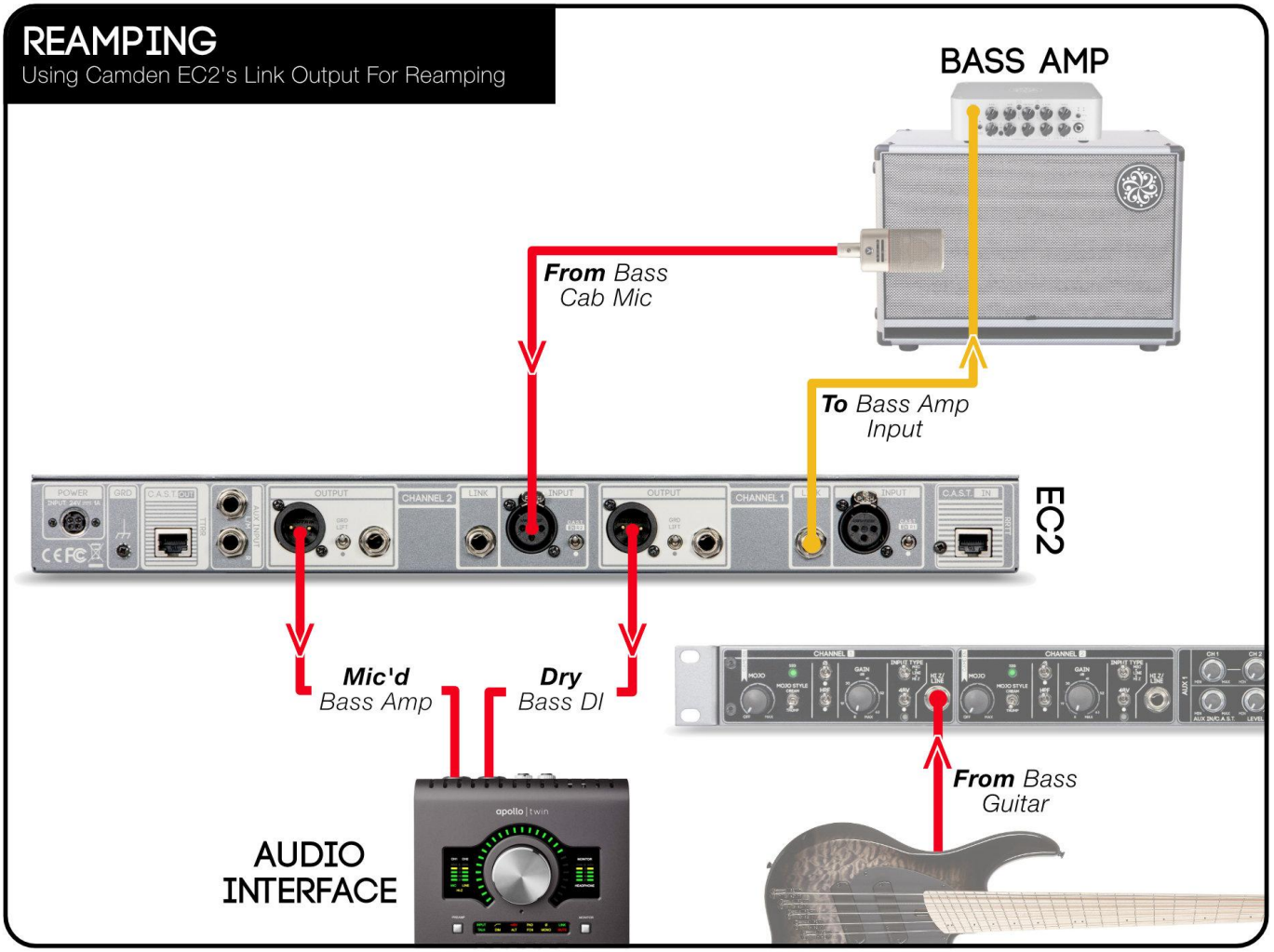
C.A.S.T. Input (RRTT)			
Transmit (T)	Transmit (T)	Receive (R)	Receive (R)
From Preamp 1 Output	From Preamp 2 Output	To Aux In/C.A.S.T. Level Control L	To Aux In/C.A.S.T. Level Control R

Application Guides

Using the Link Output For Reamping.

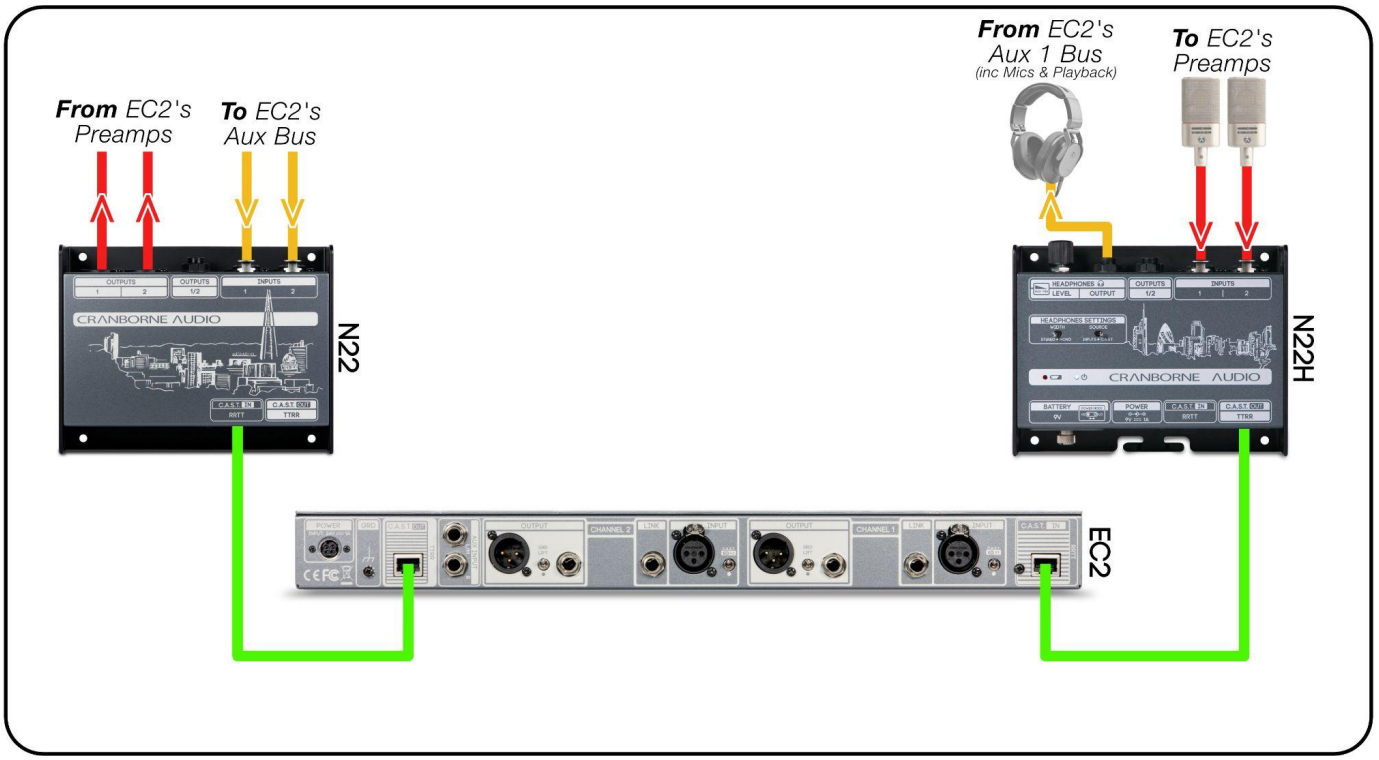
This Hardware setup diagram displays an application of the Link Output when used with a Bass Guitar. In this example, the Bass Guitar is connected directly to Preamp One using the front panel Hi-Z ¼" Jack input and the Link Output of channel one is connected directly to the input of a bass guitar amp. Preamp Two on Camden EC2 is then used to mic up the Bass Guitar amp.

By connecting Camden EC2 to your Audio Interface in the way displayed below, you will be able to record both the completely clean, DI signal of the bass guitar as well as the mic'd up, Cabinet sound for mixing later.



Using N22H with Camden EC2

C.A.S.T. comes alive when you start to pair it with other Cranborne Audio products. Products such as Camden EC1/EC2 and 500R8/500ADAT are all designed to facilitate deep integration into the C.A.S.T. system for useful routing around your studio space.



This hardware setup diagram will get N22H connected within a C.A.S.T. enabled system alongside a Camden EC2 and a passive N22 breakout box for advanced remote recording and monitoring possibilities.

Connecting N22H to Camden EC2

1. Connect N22H's C.A.S.T. Output **[13]** to the C.A.S.T. Input on Camden EC2 using a shielded Cat 5e, Cat 6, or Cat 7 cable.
    i. ***Note: A fully shielded connector is required in order to pass 48v correctly.***

2. Connect Camden EC2's C.A.S.T. Output to the C.A.S.T. Input on N22 using a shielded Cat 5e, Cat 6, or Cat 7 cable.

3. On N22H, set the Source Switch **[6]** to C.A.S.T. and connect your headphones to the Headphone Output **[2].**
    i. If using battery power, the unit will power on automatically when headphones are connected.
    ii. If using mains power, N22H powers on automatically when power is detected.

4. On Camden EC2, set the rear panel Source Switches for each Preamp to C.A.S.T. to enable Camden EC2's preamps to receive their input via the C.A.S.T. connection.

5. Connect balanced Mic/Line sources to either of N22H's Inputs **[4]**
    i. If you'd like to connect an instrument, you will need to either use a DI Box, or connect an instrument directly to Camden EC2's Hi-Z DI Input.

You can then apply preamp Gain, HPF, Polarity, and other preamp functions using Camden EC2.

6. Create a monitor mix using the Aux 1 level controls on Camden EC2.
    i. The Ch 1 Lvl control corresponds with the first preamp and source connected to N22H's Input 1.
    ii. This mix will then be sent through C.A.S.T. and to the Headphone output on N22H.

With this setup, you are able to position Camden EC2 in your control room and use N22H in the live room/vocal booth as a remote stagebox for your artist to connect their microphones and headphones.

Adding N22 To The System

Next, we will connect an N22 to the C.A.S.T. system to enable even more remote mixing possibilities.

7. Connect Camden EC2's C.A.S.T. Output to the C.A.S.T. Input on N22 using a shielded Cat 5e, Cat 6, or Cat 7 cable.

8. Connect the outputs of N22 to the inputs of your recording device.
    i. Output 1 = Camden EC2's Channel 1 output
    ii. Output 2 = Camden EC2's Channel 2 output

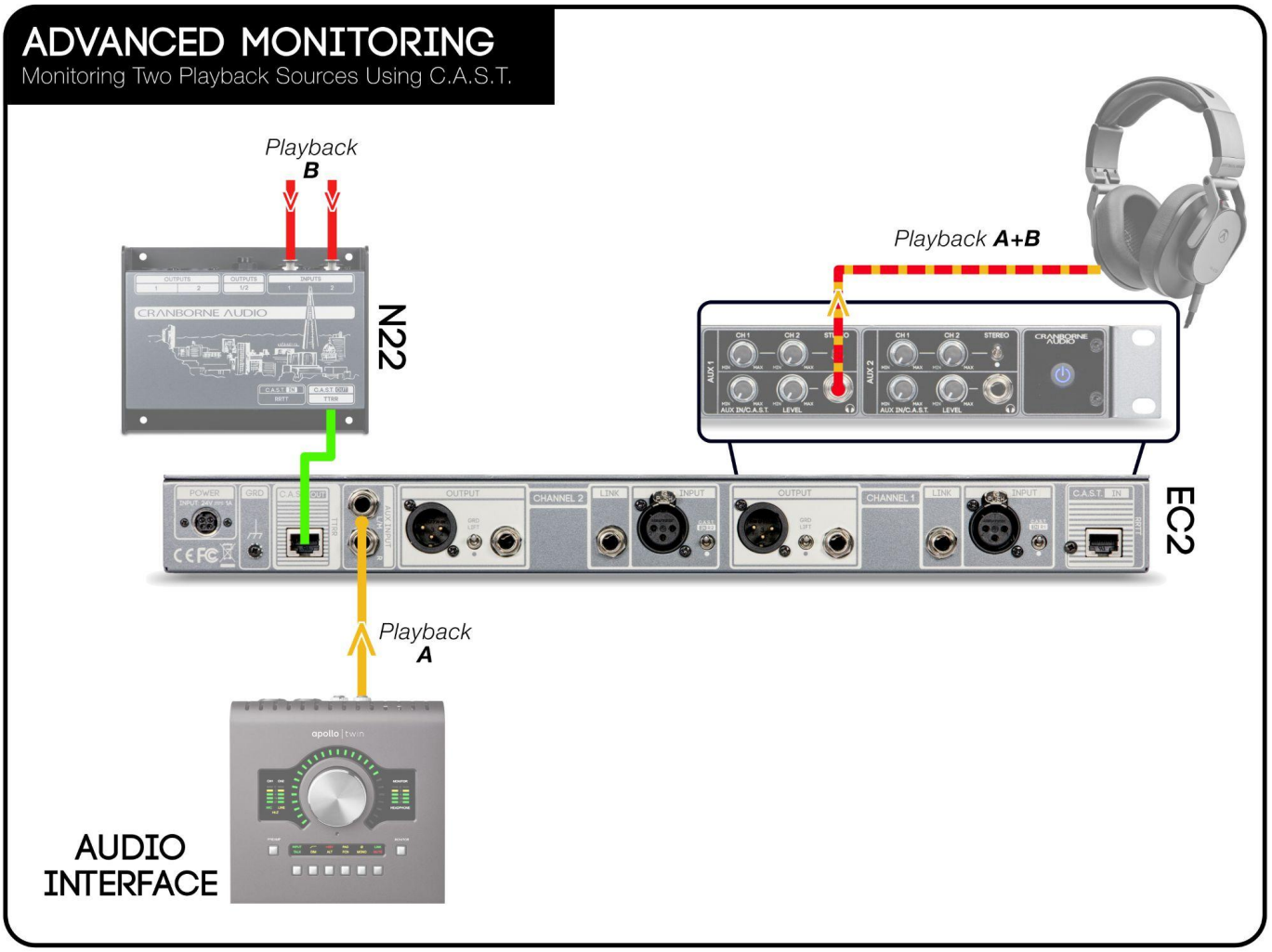
9. Connect the outputs of your recording device to N22's inputs. These connections are sent through C.A.S.T. and to Camden EC2's Aux In/C.A.S.T. level control.
    i. Input 1 = Camden EC2's Aux Input L
    ii. Input 2 = Camden EC2's Aux Input R

You can then send a click track, backing track, or similar from your recording device and that audio signal will pass from through N22, into Camden EC2, and then onwards to N22H's headphone output. At the same time, sources connected to N22H will pass through Camden EC2, to N22's outputs, and then onwards to the recording device's inputs for recording.

Both C.A.S.T. connections can be 100m long and enables the user to position each device where it is needed in the studio or live space for more flexible recording in the studio, on stage, or on location.

Monitoring Two Playback Sources Using C.A.S.T.

Using C.A.S.T. and a connected N22, it is possible to combine a stereo playback source coming from C.A.S.T. with the Aux Input for increased flexibility during tracking and monitoring. This is especially useful if you want to combine playback from an audio interface and an external source such as a mixer or metronome and monitor both sources alongside the preamps from Camden EC2's headphone outputs.



This hardware setup diagram will get two playback sources connected to Camden EC2 in a C.A.S.T.- enabled system with N22 ready for monitoring and mixing.

1. Connect the stereo outputs of your desired audio interface into Camden EC2's Aux Inputs **[R8]**.

2. Connect Camden EC2's C.A.S.T. Output **[R9]** to N22's C.A.S.T. Input using a shielded Cat 5e, Cat 6, or Cat 7 cable.

3. Connect the stereo outputs of your external source to N22's inputs.
    i. Any balanced, Line-level sources can be connected to N22 via ¼" jack or XLR.

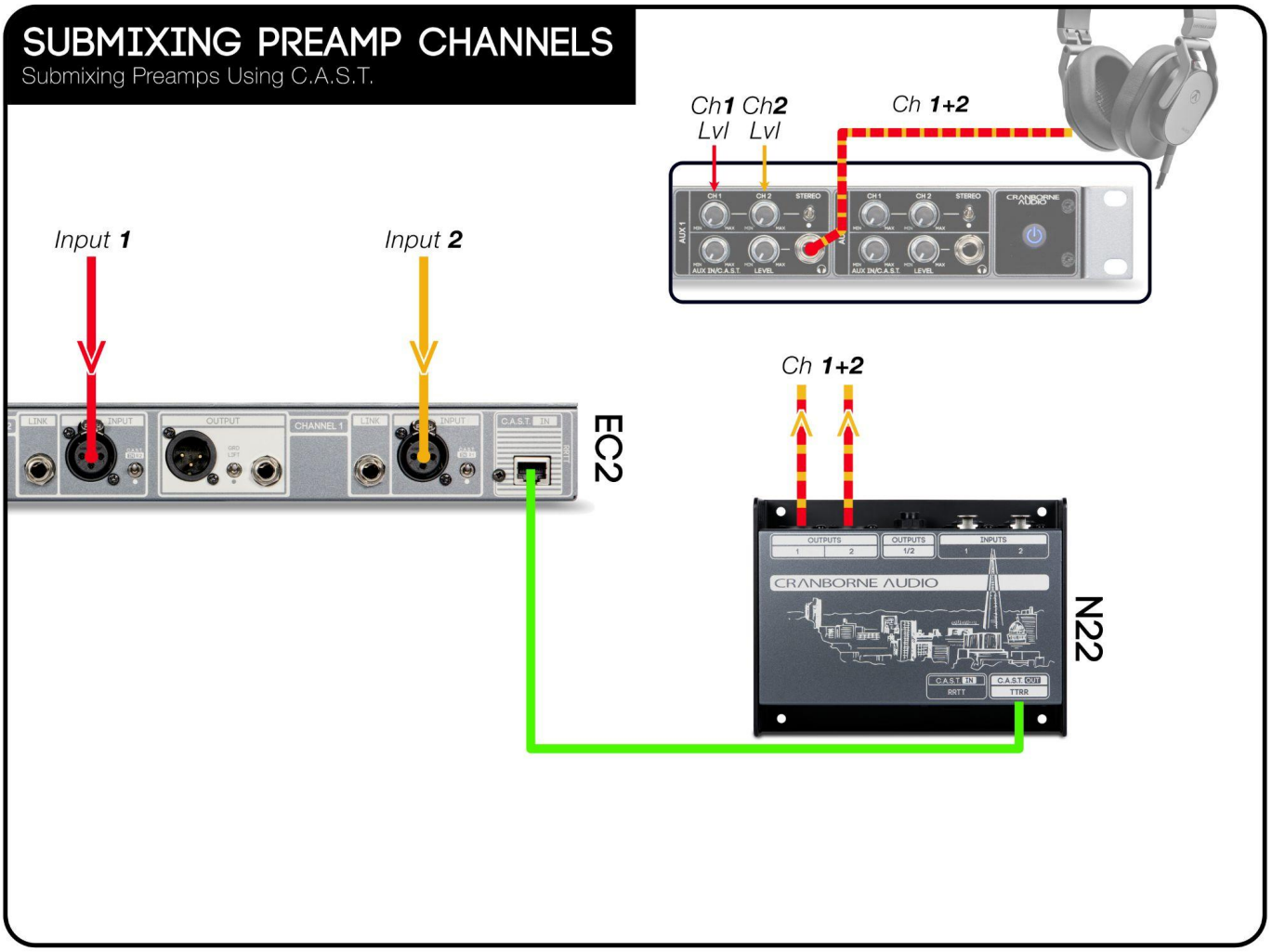
4. Connect your headphones to Camden EC2's Aux Headphone output **[F16]**

Once connected, you can use the Aux In/C.A.S.T. Level Control **[F12]** to adjust the level of both playback sources into the headphones connected to Camden EC2. Both sources are summed inside Camden EC2 and so the balance in their levels should be adjusted from the devices themselves.

Submixing Preamp Channels

Being able to submix preamp channels is a really useful tool when you need to combine two mic'd sources into a single line output for recording or live use. For example, you could mic up a guitar cabinet with two mics and then mix/sum them together into a mono line output before connecting them to a recording device.

The Aux 1 mixer of Camden EC2 can be used to mix together up to 6 sources from Camden EC2 to a single mono output on a true stereo output if required using a simple N22 passive breakout box.



This hardware setup diagram will get N22 connected to a Camden EC2 in a C.A.S.T. enabled system for advanced submixing and summing during and recording.

Submixing 2 to 1

1. Connect N22's C.A.S.T. Output to the C.A.S.T. Input on Camden EC2 **[R1]** using a shielded Cat 5e, Cat 6, or Cat 7 cable.
    i. ***Note: A fully shielded connector is recommended***

2. Connect your microphones/sources to Camden EC2's preamps.
    i. You can use the rear panel XLR Preamp Inputs **[R3]**, or the front panel Hi-Z/Line Input **[F9].**

ii. You can also use the Inputs of the connected N22. To do this, simply connect your sources to the N22, and set the Source Switch **[R2]** down to the C.A.S.T. position.

3. Connect the Outputs of the connected N22 to the inputs of your desired recording device.
   i. Note: These outputs will be line level outputs and so connect them to a source that can handle a fully balanced, line level signal.

4. Adjust the preamps to taste using the Gain, 48v, and Mojo controls.

5. Using the Aux 1 Mixer controls, adjust the submix of both preamp channels to create your ideal blend of input sources.
   i. The Ch1 Level Control **[F11]** and the Ch2 Level Control **[F13]** adjust the level of Camden EC2's preamp channels 1 and 2 respectively to the outputs of the connected N22.

With this setup, both of N22's output will receive the same mix from Camden EC2's Aux 1 Mixer for redundant recording. If you engage the Stereo Pan Switch **[F15]**, Channel 1 and 2 on Camden EC2 will be sent to Outputs 1 and 2 on the connected N22.

Submixing 4 to 1

After you have followed the steps above to submix 2 channels into 1, you can also add another stereo source to the system that will allow you to submix 4 channels into a single output if desired.

1. Connect a stereo source to Camden EC2's Aux Input **[R8].**

2. Now you can use the Aux In/C.A.S.T. Level Control **[F12]** to adjust the level of the Aux Input **[R8]** to the connected N22's output.

You can then use all of the Aux 1's level controls to create a custom mix of your choosing and sum 4 channels of audio into a stereo output for advanced recording.

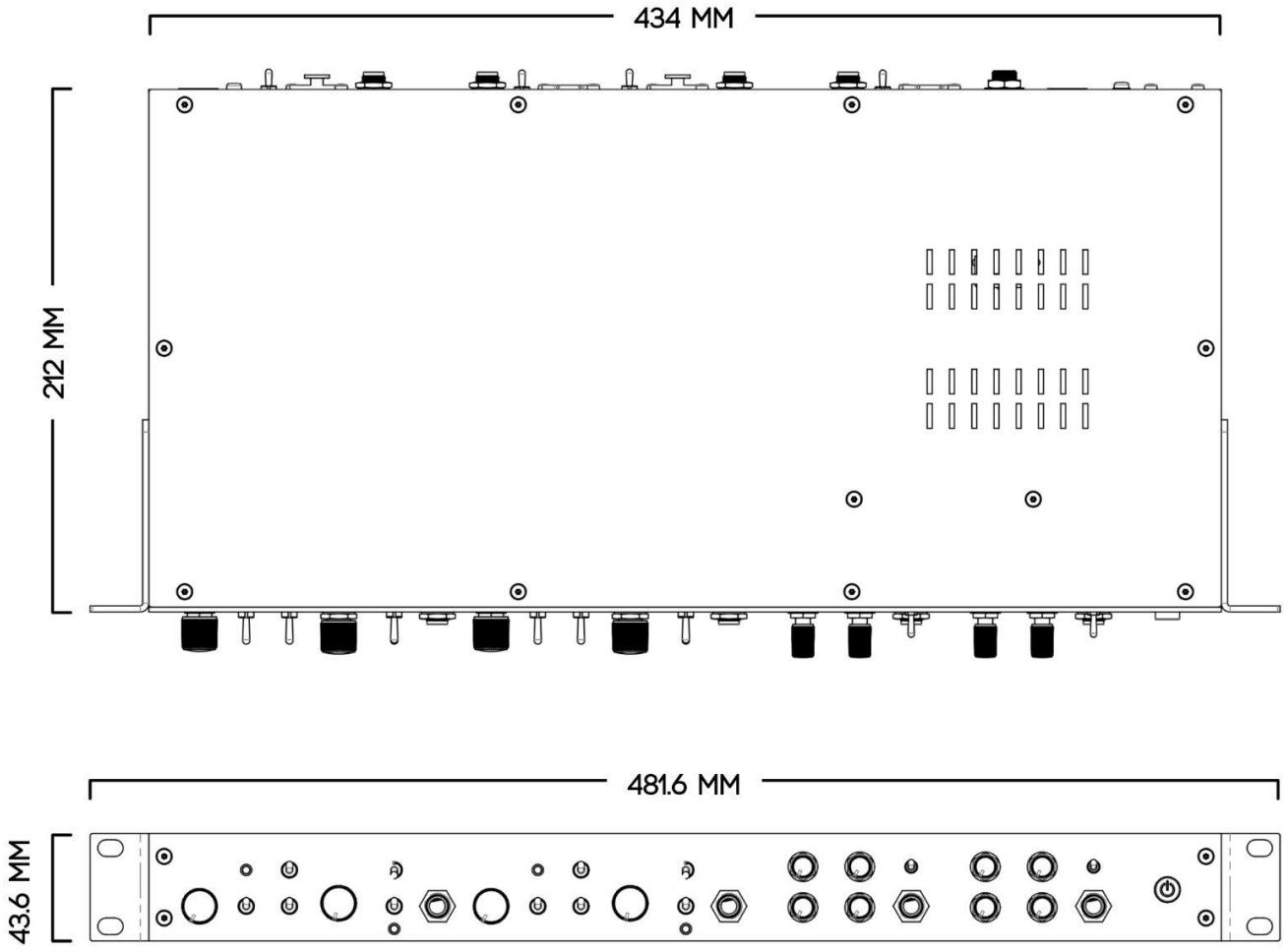
Note:
The TT paths of the C.A.S.T. Input on Camden EC2 are fed before Aux Level [F14] and so that control will have no effect on the overall level of the N22's output. To adjust the overall output of the N22, adjust each level control separately.

Technical Specifications

Here is the comprehensive set of Camden EC2'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 Camden EC2 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.	
Preamp	
Test Signal Path	APx555 (Line Out) - Input 1 - Line Output - APx555 (Line In)
Input Impedance	Mic= 8.9 kOhms 48v Off, 5.4 kOhms 48v ON, Line = 24.3 kOhms, Hi-Z= 1.5 MOhm Unbalanced, 3 MOhm Balanced
Max Input Level	Mic = +17.6dBu (<0.003% THD), Line = +26.5dBu (<0.02% THD), Hi-Z = +24dBu (<0.02% THD)
Minimum Gain	Mic= 8dB, Line = 0dB, Hi-Z = 3dB
Maximum Gain	Mic = 68dB, Line = 60dB, Hi-Z = 63dB
Equivalent Input Noise (EIN)	<-129.5dBu (150 Ohm source, unweighted), <-131dBu (150 Ohm source, A-weighted), <-135.5dBu (Inputs common, unweighted)
Frequency Response	±0.7dB (<1 Hz to >1000 kHz, Min Gain), ±0.7dB (<1 Hz to >1000 kHz, 35dB Gain), ±1dB (<1.5 Hz to 900 kHz, 63dB Gain), ±1dB (<5 Hz to >200 kHz, Max Gain)
Phase Shift	<2.75° (20Hz to 20kHz, 40dB Gain), <4° (20Hz to 20kHz, 63dB Gain), <6° (20Hz to 20kHz, Max Gain)
THD+N	<0.00025% (1kHz, 35dB Gain, +24dBu out)
Intermodulation DIstortion	<0.0006% (50Hz and 7kHz, 35dB gain, +20dBu out), <0.0005% (50Hz and 7kHz, 35dB gain, +15dBu out)
Hi-Pass Filter (HPF)	80Hz, -3dB, 12dB/Oct
CMRR	>70dB, typ >85dB, 35dB gain, 10-20kHz, 100mV Common mode
Slew Rate	20V/uS, 35dB gain, +25dBu out
48v LED Thresholds	Off = 48v Off, voltage fully discharged Amber = 48v voltage charging/discharging Red = 48v fully charged
Signal LED Meter Thresholds	Blue = -20dBu Green = -12dBu Amber = +21dBu Red = +24dBu
Max Output Level	Balanced XLR = +27.5dBu (<0.002% THD, 30dB Gain) Impedance Balanced ¼" Jack = +21.5dBu (<0.002% THD, 30dB Gain)
Output Impedance	Balanced XLR = 150 Ohm Impedance Balanced 1/4" Jack = 150Ohm Balanced, 75 Ohm Unbalanced
Link Max Output Level	Impedance Balanced 1/4" Jack = +21.8dBu (<0.006% THD)
Link Output Impedance	Impedance Balanced 1/4" Jack = 75 Ohm Unbalanced, 150 Ohm Balanced (Buffered Output)

Headphone Amplifier	
Test Signal Path	APx555 (Line Out) - AUX Input - Headphone Output - APx555 (Line In)
Frequency Response	-1dB, <1Hz to >70kHz
THD	<0.0006% (-104.4dB) @ +20dBu, 1kHz, A-weighted, 300 Ohm load
THD+N	<0.00085% (-101.4dB) @ +20dBu, 1kHz, A-weighted, 300 Ohm 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, 300 Ohm load
Noise Floor	-93.5dBu A-weighted, 20Hz - 20kHz, 300 Ohm load
Power	
AC Requirements	100V – 240V AC, 50 – 60 Hz
Total Power Consumption	24v, 1.25A DC, 30W
Environmental	
Operating Temperature	+1 to 35 degrees Celsius
Storage Conditions	-20 to 50 degrees Celsius
Dims/Weights	
Unit	
Width	481mm (19") (Rackmount)
Height	44.45mm (1.75") (1u)
Depth	240mm (9.5")
Unit Weight	2.8kg (6.2lb)
Shipping Carton	
Width	600mm (23.6")
Height	120mm (4.7")
Depth	350mm (13.8")
Carton Weight	4.1kg (9lb)



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.

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 cord.
    - 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

CE 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 authorization 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

