



T E S S E N

TNA-2120SA-G3

USER MANUAL

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OVERVIEW

The TNA-2120SA-G3 is a high-performance dual 12-inch active subwoofer that delivers exceptional low-frequency output. Featuring an integrated 3-channel Class-D amplifier with a system power rating of 1200W RMS, the TNA-2120SA-G3 is capable of self driving up to six TNA-2051-G3 line array modules as well as the two internal 12-inch HH-designed LF drivers.

- FEATURES

- 2 x 12-inch HH-Designed LF Drivers.
- Integrated 3-channel Class-D amplifier, Direct drive up to 6x TNA-2051
- System Power: 1200RMS, 4800W Peak
- Integrated pin-based rigging system.
- 56-bit DSP controlling crossover, EQ, phase and time optimisation.
- 6 built in DSP presets.
- Universal switched mode power supply with power factor correction and global mains voltage operation.

- APPLICATIONS

- Live Music
- Nightclubs
- Auditoriums
- Theatres
- Houses of Worship



CONTROL PANEL

2. INPUT

Accepts a balanced/unbalanced line level XLR terminated signal. A balanced signal feed is recommended for improved audio performance

3. VOLUME

Controls the overall output level of the onboard loudspeakers and the FULL RANGE A and B OUTPUTS.

4. MUTE / PROTECT INDICATOR

This illuminates if a fault condition occurs. The amplifier will shut down to prevent further damage. Normal operation will resume once the fault condition has been rectified. On power down, the MUTE/PROT indicator will illuminate to indicate the system is muted. At this point it is safe to disconnect any cables.

5. POWER INDICATOR

Illuminates when the unit is connection to the main supply and switched on.

6. CLIP

The led illuminates if any of the in-circuit limiters are triggered. It is fine for this to light on peaks, but shouldn't be on continuously for best performance.

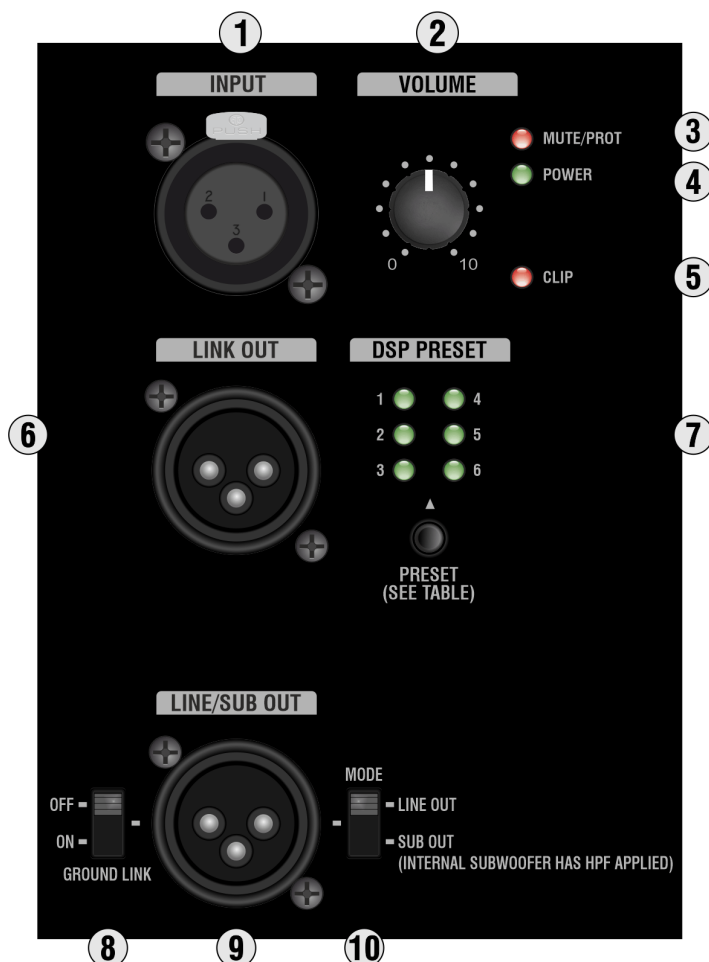
7. LINK OUT

A balanced output linked directly from the INPUT

8. PRESET SELECT AND STATUS INDUCATORS

A series of LEDs to indicate the current DSP mode. The onboard DSP optimises the equalisation characteristics for both **FULL RANGE-A** and **FULL RANGE-B** outputs. Cycle through the presets via the PRESET button, in conjunction with the DSP PRESET chart.

1. SYSTEM OPTIMISED FOR 4x TNA-2051 ALL SET TO STRAIGHT 0° tilt.
2. SYSTEM OPTIMISED FOR 4x TNA-2051 ALL SET TO 8° tilt.
3. SYSTEM OPTIMISED FOR 4x TNA-2051 OUTPUT A SET TO 0° tilt AND OUTPUT B SET TO 8° tilt.
4. SYSTEM OPTIMISED FOR 6x TNA-2051 ALL SET TO STRAIGHT 0° tilt.
5. SYSTEM OPTIMISED FOR 6x TNA-2051 OUTPUT A SET TO 0° tilt AND OUTPUT B SET TO 8° tilt.
6. FULL RANGE OUTPUT ON BOTH A AND B TO SUIT ANY FULL RANGE CABINET.



		PRESET SELECTION					
OUTPUT CONNECTION		1	2	3	4	5	6
	A						
	B						

(A) ALWAYS CLOSEST TO SUBWOOFER

9. GROUND LINK

Is used to reduce the potential problem of earth loops when connecting to other equipment via the LINK OUT. This is done by connecting/isolating the link between signal and safety on pin 1 of the LINK OUT XLR.

10. LINE/ SUB OUT

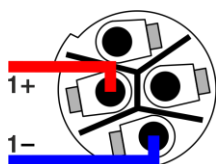
A balanced line level signal for connecting additional active cabinets or a feed to an in-house PA system. This is a line level output and cannot directly drive a loudspeaker.

11. MODE

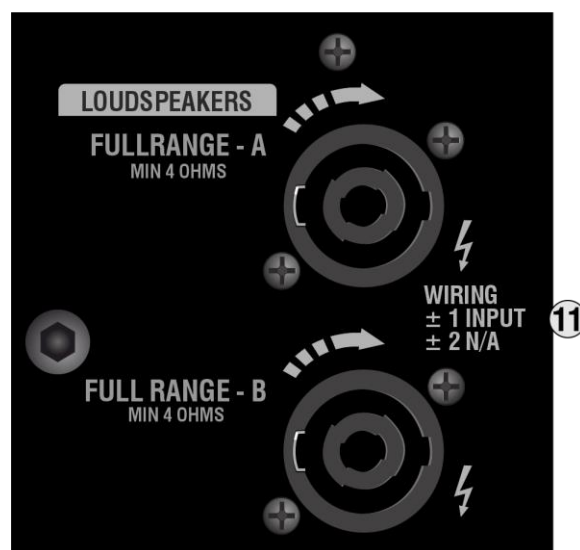
It is **VITAL** to set the mode switch properly to get the best performance from the system. When MODE is set to **SUB OUT** the internal woofers also have a Hi-pass filter applied, effectively making a true three-way system. In this configuration, ultra low sub frequencies are handled by an external sub such as the TNA-2800SA, the TNA-2120SA-G2 becomes a midrange sub. If no external subwoofer is used, be sure to leave this switch set to LINE OUT mode.

- When the mode switch is set to **LINE OUT**, the XLR line/sub out is a full range line level signal, internal sub handles all bass frequencies
- When the mode switch is set to **Sub Out**, the XLR line/sub out has a low pass filter applied for direct connection to another powered subwoofer and the internal sub has a bandpass filter applied.

12. FULL RANGE OUTPUTS A + B



- Two high power outputs via speakON® compatible connectors.
- Each output is driven via its own amplifier channel and is capable of driving into a 4 Ohm load or greater.
- Always connect the **FULL RANGE A OUTPUT** to the Input of the TNA-205I-G3 which is physically closest to the TNA-2120SA-G3. The DSP Presets have taken proximity into account and offer subtle differences in the FULLRANGE A and B outputs.

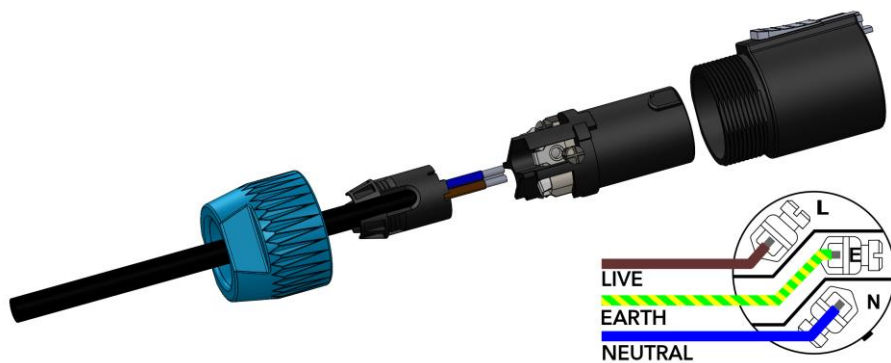


13. POWER SWITCH

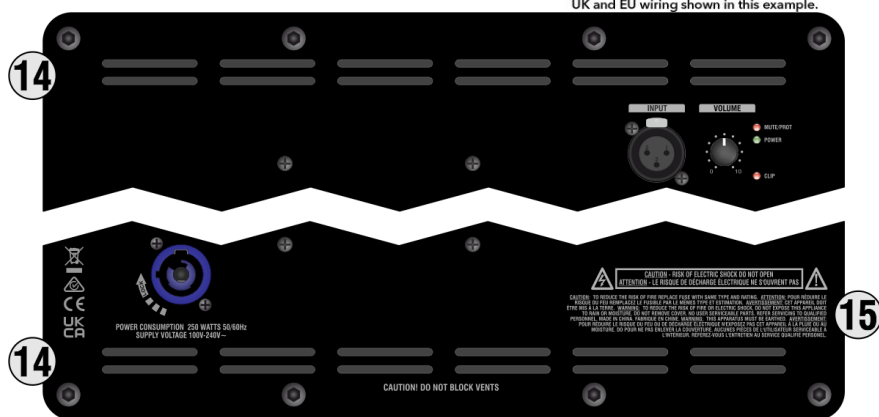
Turns the system On and Off. It is good practice to ensure the VOLUME control is set to minimum when switching the unit On or Off

14. TWIST LOCK MAINS POWER INLET

- The TNA-2120SA comes with a powerCON® compatible mains plug. It is up to the installer to terminate the plug with the correct mains connection. Mains cable terminations are only to be made by qualified personnel, if in doubt get qualified electrician.
- The TNA-2120SA-G3 contains a universal mains power supply and will operate from 100V to 240V~ 50/60Hz. Ensure the mains cable is earthed.



UK and EU wiring shown in this example.



15. VENTILATION SLOTS

- To ensure prolonged and reliable use, DO NOT block or obstruct the ventilation slots on the rear panel.

16. SAFETY WARNINGS

- PLEASE OBSERVE THE PANEL.

speakON® and powerCON® are registered trademarks of Neutrik AG.

PIN SYSTEM

The integrated pin system offers quick and convenient setup to additional TNA cabinets in the range.

In all cases, ensure the pin is pushed all the way into the bracket, and that the locking ball is securely on the outside and locked in place.

For safe loading and further information on suspended mounting, please read the TNA-BRK1-G3 manual available at HHAUDIO.com, or by scanning the QR Code



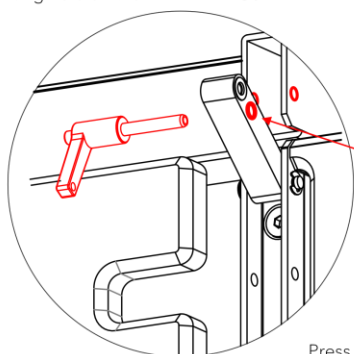
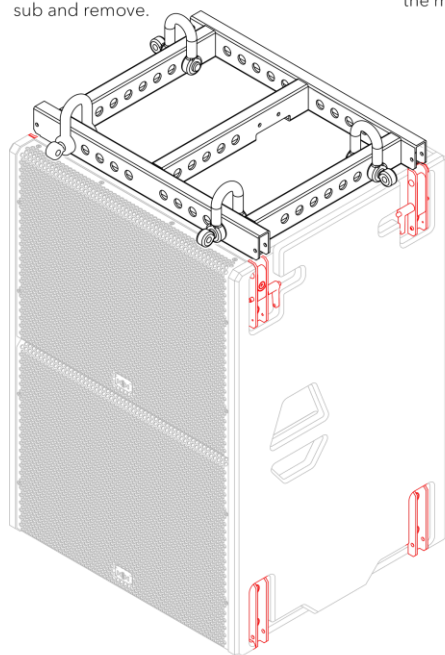
Further examples are shown in the TNA-1200S-G3, TNA-2051SA-G3 and TNA-BRK1-G3 manuals available at HH Audio.com

TNA-2120SA-G3 > TNA-BRK1-G3

For a suspended setup, the TNA-2120SA-G3 may be attached to a TNA-BRK1-G3 Flying bracket as shown.

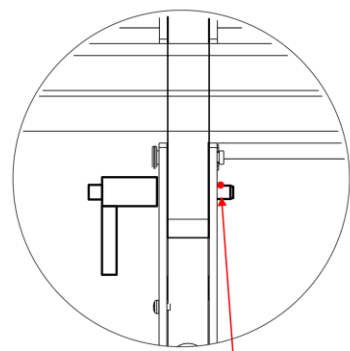
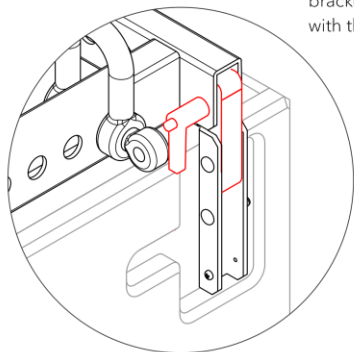
Push to release the locking pin on the sub and remove.

Rotate the pin mechanism to align with the mounting hole on the TNA-BRK1-G3



For the two rear fixing, the BOTTOM hole on pivot pin must be used. Secure with the locking pin and repeat for the remaining fixing points.

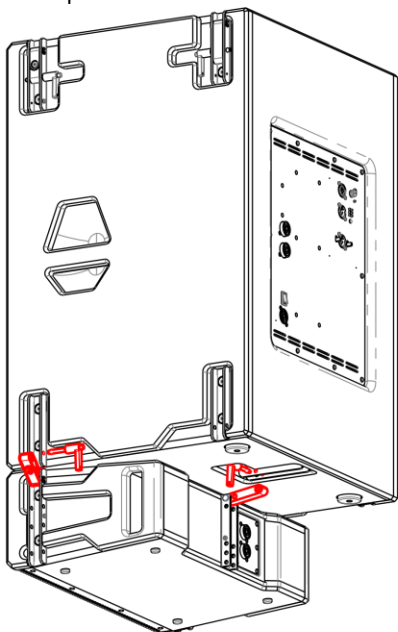
Press the locking pin button then insert into the bracket ensuring it is all the way home. Repeat with the remaining side locking pins.



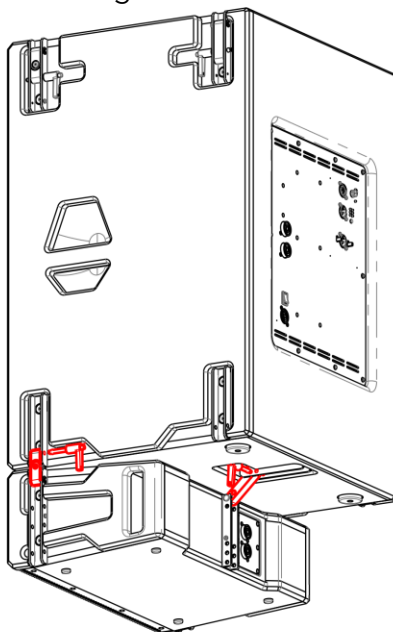
Ensure the locking ball is fully on the outside of the extrusion and check it is secure. Pull to check.

TNA-2120SA-G3 > TNA-2051-G3 SUSPENDED

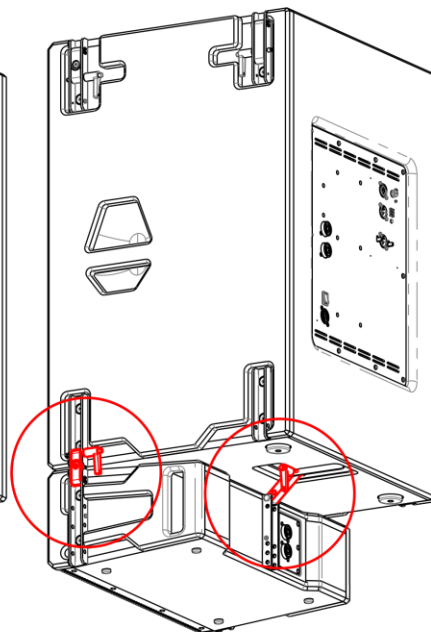
In a flown configuration, the bottom fixings are used. First connect the front two supports, then use these to pivot the rear and set the desired angle.



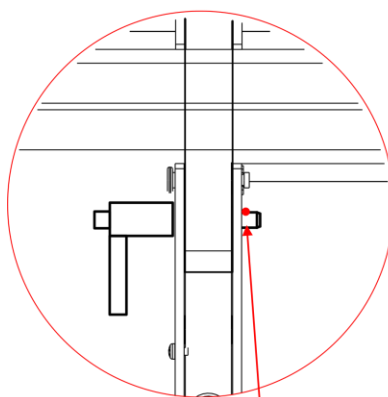
Push to release the locking pin on the sub and remove.



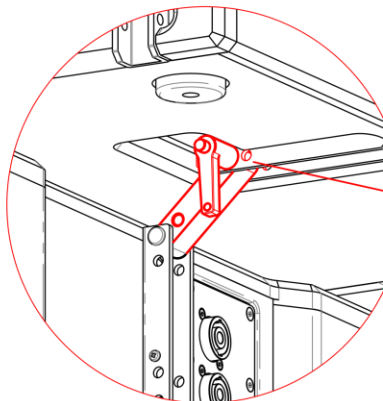
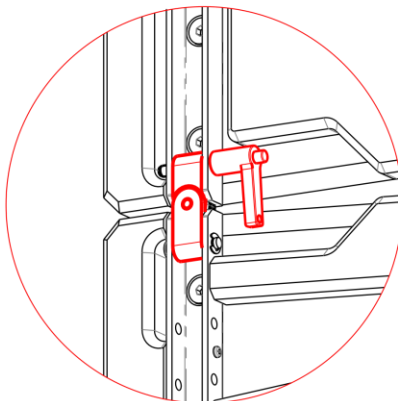
Rotate the pin mechanism to align with the mounting hole on the TNA-2051-G3



Press the locking pin button then insert into the bracket ensuring it is all the way home. Repeat with the remaining side locking pin.



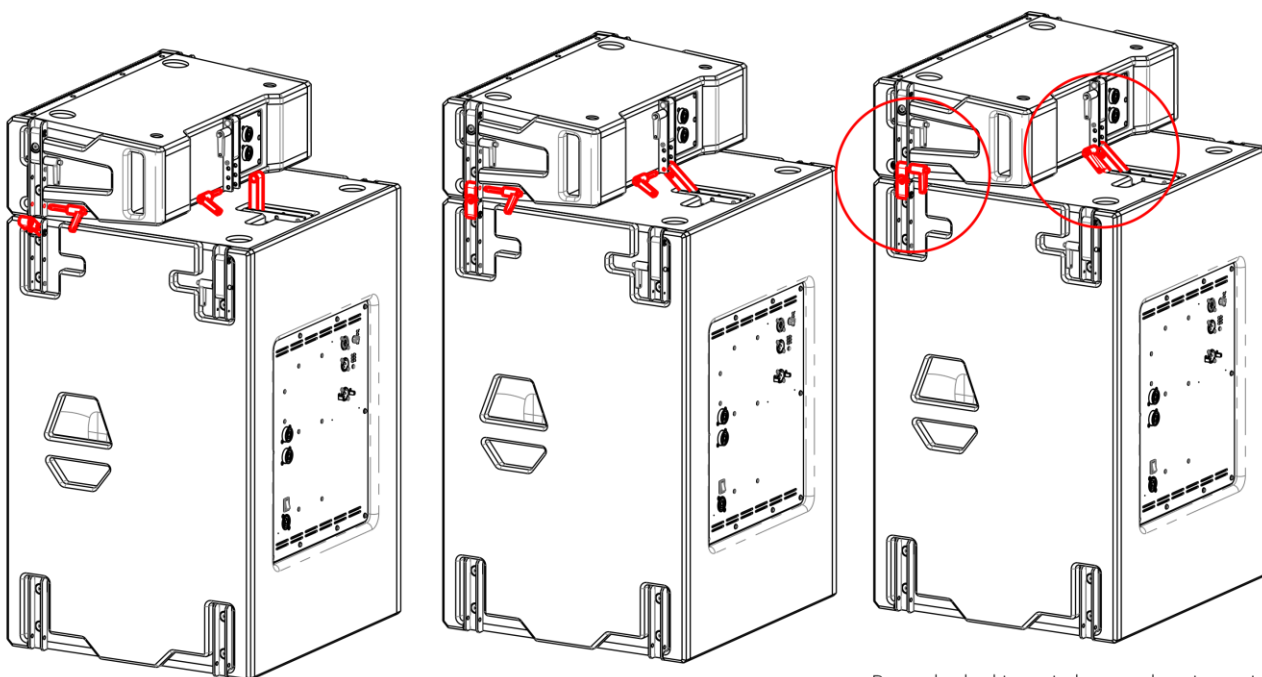
Ensure the locking ball is fully on the outside of the extrusion and check it is secure. Pull to check.



Angle adjustment is achieved with the rear locking pin and location holes. Typically the first sat cab is set for 0 degrees

TNA-2120SA-G3 > TNA-2051-G3 STACKED

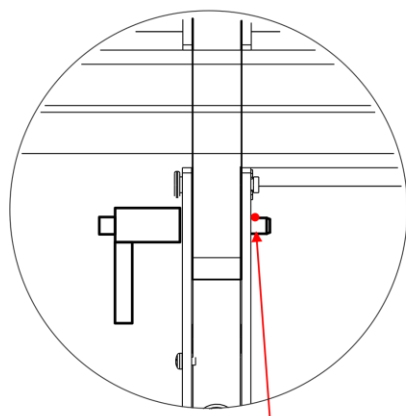
Place the TNA-2051-G3 on top of the sub. First connect the front two supports, then use these to pivot the rear and set the desired angle.



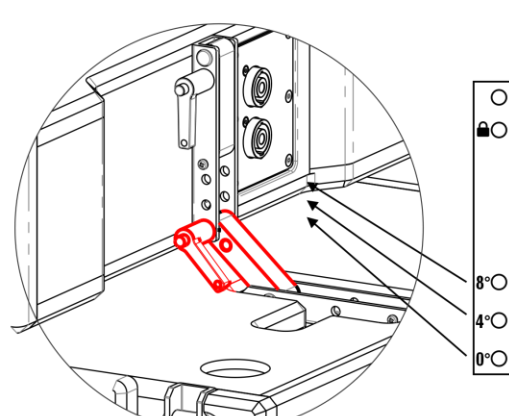
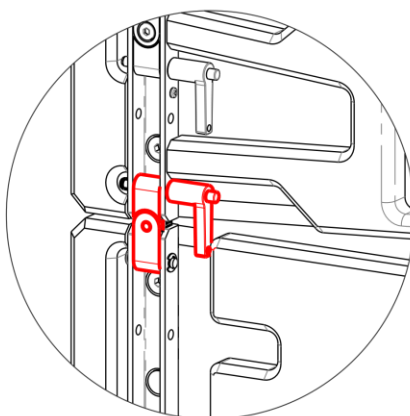
Push to release the locking pin on the sub and remove.

Rotate the pin mechanism to align with the mounting hole on the TNA-2051-G3

Press the locking pin button then insert into the bracket ensuring it is all the way home. Repeat with the remaining side locking pin.



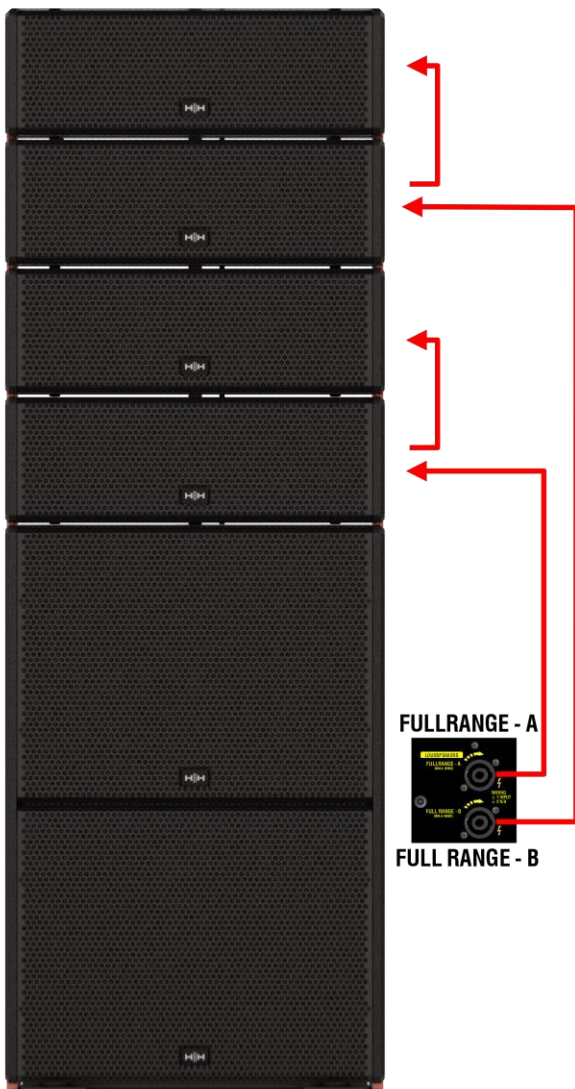
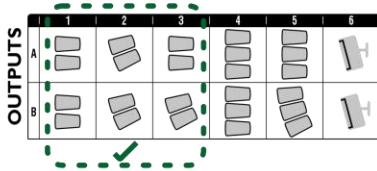
Ensure the locking ball is fully on the outside of the extrusion and check it is secure. Pull to check.



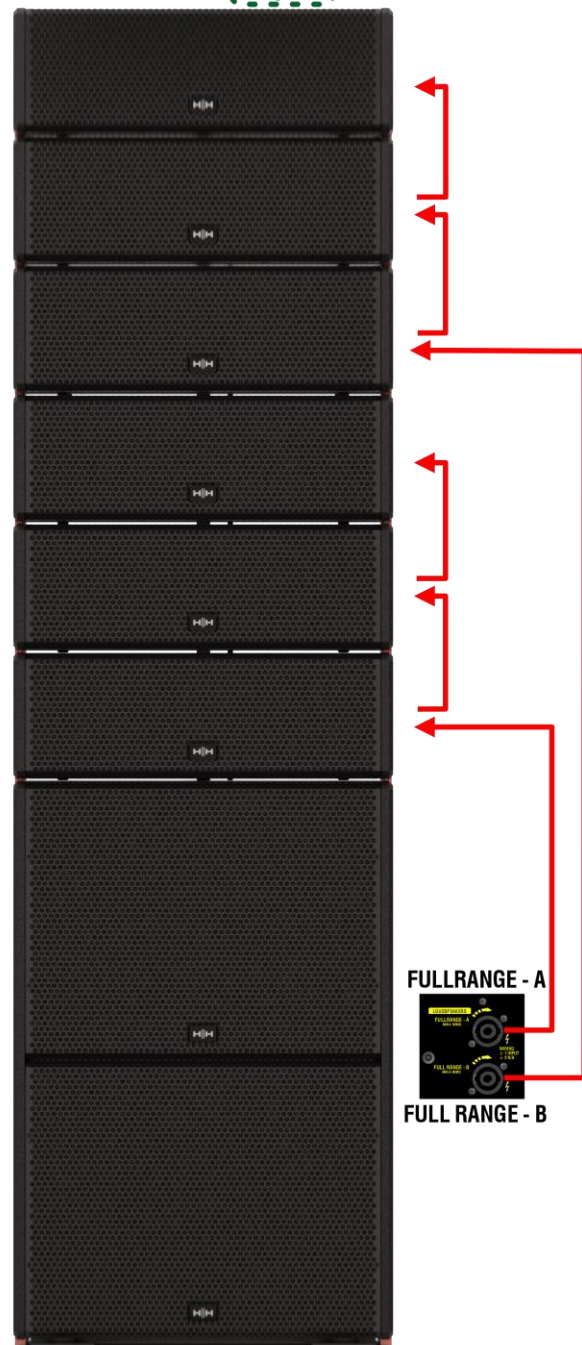
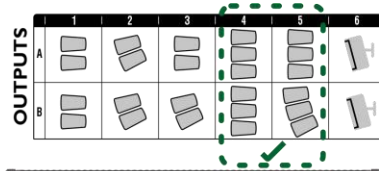
Angle adjustment is achieved with the rear locking pin and location holes.

EXAMPLE - GROUND STACKED

Always ensure the system is stable, especially when using multiple top cabinets. Locking straps may be required.



4x TNA-2051



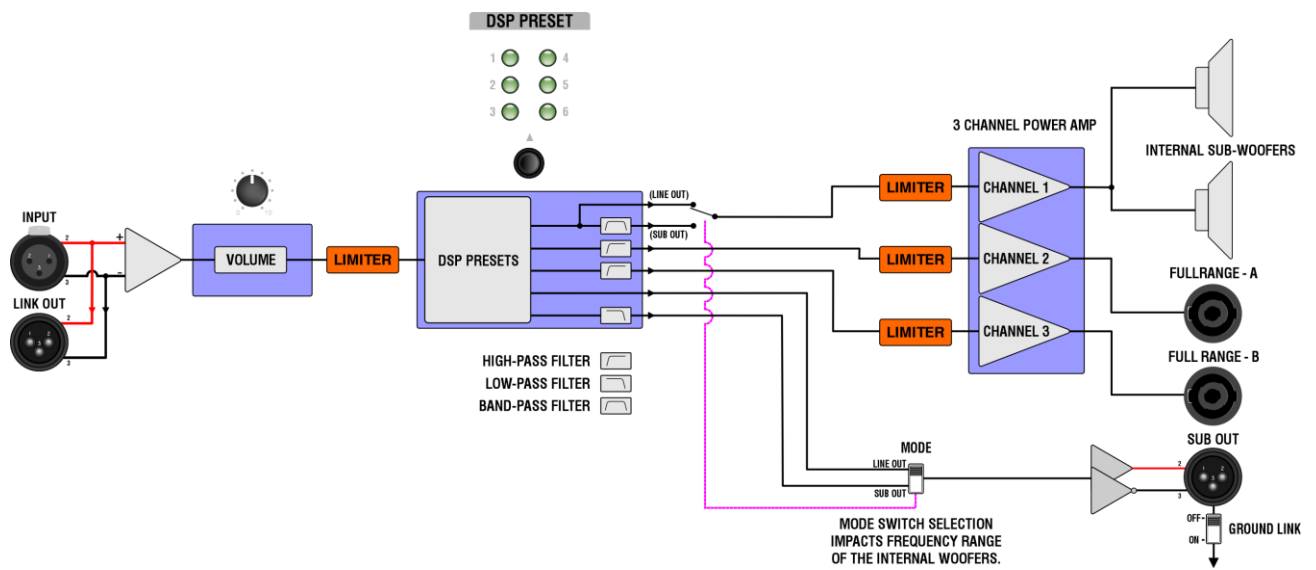
6x TNA-2051

SPECIFICATIONS

Model	TNA-2120SA-G3
System Type	2 x 12" Active Subwoofer, Bass Reflex, with Three channel internal amplifier (Two HF Amplifier Channels for external satellites).
Frequency Response	52Hz - 200Hz (-10dB).
	52Hz - 150Hz (-3dB) * Tuned with internal DSP Presets.
LF Driver	2 x 12-inch HH designed high performance driver.
Sensitivity (1W/1m)	104dB SPL.
Max SPL 1m	134dB SPL Continuous, 137dB SPL Peak.
Amplifier	
System Amplifier Power Rating	4800W Peak, 2400W Continuous, 1200W RMS.
Subwoofer Amplifier Power Rating	2400W Peak, 1200W Continuous, 600W RMS.
Satellite Amplifier Power Rating	Two Channels Each of 1200W Peak, 600W Continuous, 300W RMS.
Input Connectors	Balanced XLR Connector.
Output Connectors	1x Balanced XLR Link Out, 1x Balanced XLR Sub out with 2 way /3 way mode switch and Ground Lift Switch. 2 x locking speakON connectors for external TNA-2051 cabinets. speakON® is a registered trademark of Neutrik AG.
Signal Indicators	Power, Mute/Protect, Clip Indicator, Preset Mode.
DSP	56-bit DSP controlling Crossover, EQ, phase and time optimisation for array cabinets. Six built in DSP presets for typical use cases.
Protection	Comprehensive protection and clip free limiting + clip indicator.
Controls	Master Volume, DSP Preset Switch.
Input Impedance	22K Balanced, 10K unbalanced.
Power Requirements	
AC Power	~100V-240V 50/60Hz (Locking powerCON). powerCON® is a registered trademark of Neutrik AG.
Typical Power Consumption	250W (1/8th Power) 1200W Maximum.
Enclosure	
Cabinet	15mm/18mm Plywood.
Finish	Painted Black.
Mounting Bracket	TNA-BRK1-G3.
Mounting Points	20 x M8 Mounting Points for rigging system. (2 top, 2 bottom, 8 left, 8 right).
Grille	1.5mm Thickness, Hexagonal mesh.
Unit dimensions (HWD)	727 x 496 x 455mm, 28.6" x 19.5" x 17.9".
Unit weight	37Kg, 81.6 lbs.
Carton dimensions (HWD)	810 x 595 x 555mm, 31.9" x 23.4" x 21.9", 0.267 M3.
Packed weight	42.5Kg, 93.7 lbs.
EAN13 Code	5060109459685

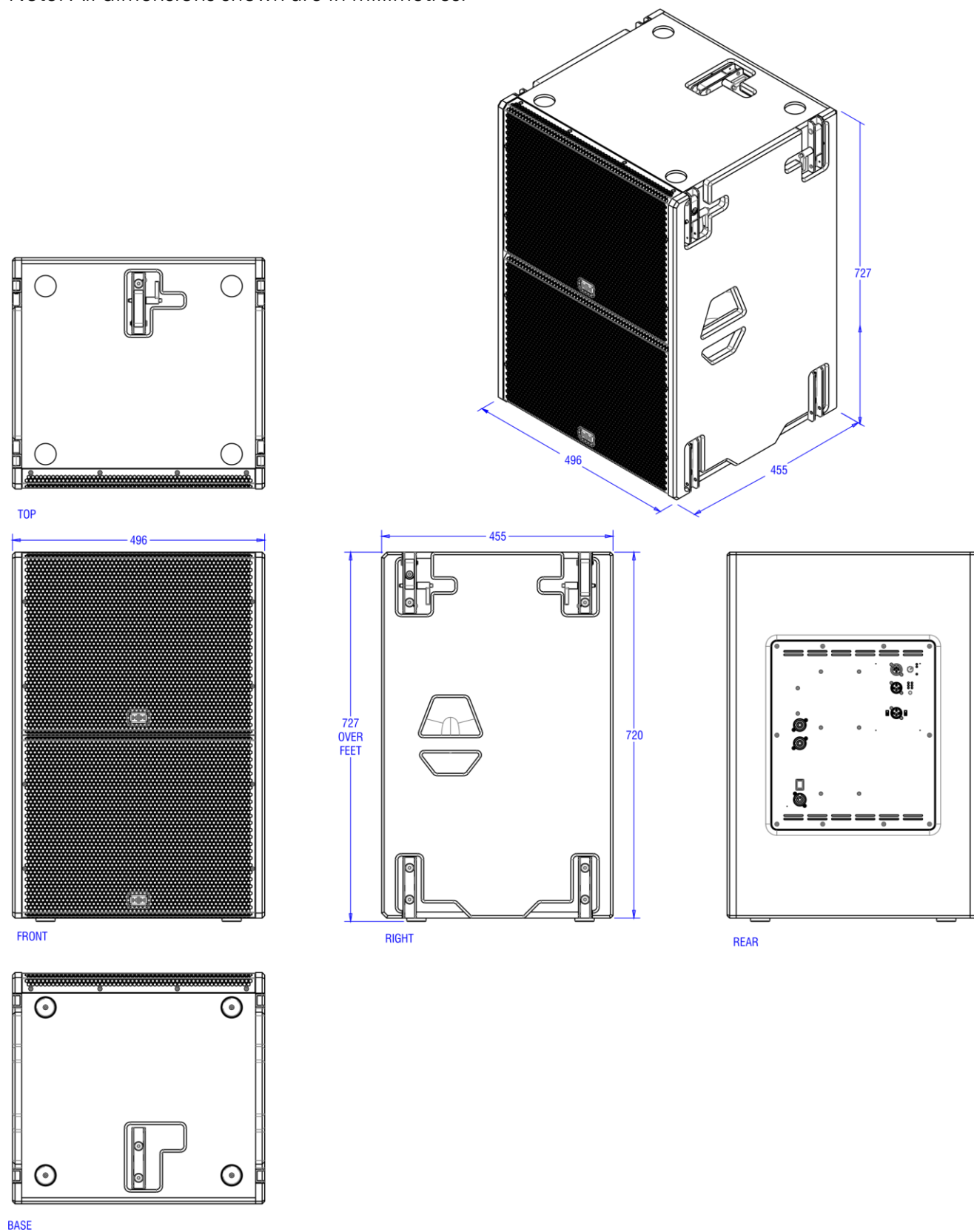
In the interest of continued development, HH Audio reserves the right to amend product specifications without prior notification.

BLOCK DIAGRAM



DIMENSIONS

Note: All dimensions shown are in millimetres.









SAFETY AND WARNINGS

To take full advantage of your new product and enjoy long and trouble-free performance, please read this owner's manual carefully, and keep it in a safe place for future reference.

MANUFACTURER: HEADSTOCK DISTRIBUTION LTD. STEELPARK ROAD,
COOMBS WOOD BUSINESS PARK WEST, HALESOWEN, B62 8HD, UK

- 1) Unpacking: On unpacking your product, please check carefully for any signs of damage that may have occurred whilst in transit from the HH factory to your dealer. In the unlikely event that there has been damage, please re-pack your unit in its original carton and consult your dealer. We strongly advise you to keep your original transit carton, since in the unlikely event that your unit should develop a fault, you will be able to return it to your dealer for rectification securely packed.
- 2) Amplifier Connection: To avoid damage, generally it is advisable to establish and follow a pattern for turning on and off your system. With all system parts connected, turn on source equipment, mixers, effects processors etc, BEFORE turning on your amplifier. Many products have large transient surges at turn on and off which can cause damage to your speakers. By turning on your amplifier LAST and making sure its level control is set to a minimum, any transients from other equipment should not reach your loudspeakers. Wait till all system parts have stabilised, usually a couple of seconds. Similarly, when turning off your system always turn down the level controls on your amplifier and then turn off its power before turning off other equipment.
- 3) Cables: Never use shielded or microphone cable for any speaker connections as this will not be substantial enough to handle the amplifier load and could cause damage to your complete system. Use good quality shielded cables everywhere else.
- 4) Servicing: The user should not attempt to service these products. Refer all servicing to qualified service personnel.
- 5) Heed all warnings.
- 6) Follow all instructions.
- 7) Do not use this apparatus near water.
- 8) Clean only with a dry cloth.
- 9) Do not block any of the ventilation openings. Install in accordance with manufacturer's instructions.
- 10) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 11) An apparatus with Class I construction shall be connected to a mains socket outlet with a protective connection. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 12) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point they exit from the apparatus.
- 13) Only use attachments/accessories provided by the manufacturer.
- 14) Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 15) The mains plug or appliance coupler is used as the disconnect device and shall remain readily operable. The user should allow easy access to any mains plug, mains coupler and mains switch used in conjunction with this unit thus making it readily operable. Unplug this apparatus during lightning storms or when unused for long periods of time.
- 16) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when 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.
- 17) Never break off the ground pin. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
- 18) If this product is to be mounted in an equipment rack, rear support should be provided.
- 19) Note for UK only: If the colours of the wires in the mains lead of this unit do not correspond with the terminals in your plug, proceed as follows:
 - o The wire that is coloured green and yellow must be connected to the terminal that is marked by the letter E, the earth symbol, coloured green or coloured green and yellow.
 - o The wire that is coloured blue must be connected to the terminal that is marked with the letter N or the colour black.
 - o The wire that is coloured brown must be connected to the terminal that is marked with the letter L or the colour red.
- 20) This electrical apparatus should not be exposed to dripping or splashing and care should be taken not to place objects containing liquids, such as vases, upon the apparatus.
- 21) Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise-induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures: According to OSHA, any exposure more than the above permissible limits could result in some hearing loss. Earplugs or protectors to the ear canals or over the ears must be worn when operating this amplification system to prevent a permanent hearing loss, if exposure is more than the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.
- 22) If your appliance features a tilting mechanism or a kickback style cabinet, please use this design feature with caution. Due to the ease with which the amplifier can be moved between straight and tilted back positions, only use the amplifier on a level, stable surface. DO NOT operate the amplifier on a desk, table, shelf or otherwise unsuitable non-stable platform.
- 23) Symbols & nomenclature used on the product and in the product manuals, intended to alert the operator to areas where extra caution may be necessary, are as follows:

Duration Per Day in Hours	Sound Level dBA, slow response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 ou inférieur	115

 CAUTION:	<p>Intended to alert the user to the presence of uninsulated 'Dangerous Voltage' within the products enclosure that may be sufficient to constitute a risk of electrical shock to persons.</p> <p>Ce symbole est utilisé pur indiquer a l'utilisateur de ce produit de tension non-isolée dangereuse pouvant être d'intensité suffisante pour constituer un risque de choc électrique.</p> <p>Este símbolo tiene el propósito de alertar al usuario de la presencia de '(voltaje) peligroso' que no tiene aislamiento dentro de la caja del producto que puede tener una magnitud suficiente como para constituir riesgo de corrientazo.</p> <p>Dieses Symbol soll den Anwender vor unisolierten gefährlichen Spannungen innerhalb des Gehäuses warnen, die von ausreichender Stärke sind, um einen elektrischen Schlag verursachen zu können.</p>
 WARNING:	<p>Intended to alert the user of the presence of important operating and maintenance (Servicing) instructions in the literature accompanying the product.</p> <p>Destiné à alerter l'utilisateur de la présence d'instructions importantes d'exploitation et de maintenance (entretien) dans la documentation accompagnant le produit.</p> <p>Este símbolo tiene el propósito de la alertar al usuario de las presencias de instrucciones importantes sobre la operación y mantenimiento en la literatura que viene con el producto.</p> <p>Dieses Symbol soll den Benutzer auf wichtige Instruktionen in der Bedienungsanleitung aufmerksam machen, die Handhabung und Wartung des Produkts betreffen.</p>
CAUTION:	<p>Risk of electrical shock - DO NOT OPEN. To reduce the risk of electrical shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified personnel.</p>
WARNING:	<p>To prevent electrical shock or fire hazard, do not expose this appliance to rain or moisture. Before using this appliance, please read the operating instructions for further warnings.</p>
	<p>This device complies with Part 15 of the FCC rules Operation is subject to the following two conditions:</p> <ol style="list-style-type: none"> 1) This device may not cause harmful interference. 2) This device must accept any interference received, that may cause undesired operation. <p>Warning: Changes or modification to the equipment not approved by HH can void the user's authority to use the equipment.</p> <p>Note: This equipment has been tested and found to comply with the limits for Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures. Reorient or relocate the receiving antenna. Increase the separation between the equipment and receiver. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help.</p>
	<p>This product conforms to the requirements of the following European Regulations, Directives & Rules: CE Mark (93/68/EEC), Low Voltage (2014/35/EU), EMC (2014/30/EU), RoHS (2011/65/EU), ErP (2009/125/EU)</p> <p>SIMPLIFIED EU DECLARATION OF CONFORMITY</p> <p>Full text of the EU declaration of conformity is available at the following internet address:</p> <p>http://support.hhelectronics.com/approvals</p>
	<p>The object of the declaration described above is in conformity with the relevant statutory requirement Electrical Equipment (Safety) Regulations 2016, Electromagnetic Compatibility Regulations 2016, The Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012, The Ecodesign for Energy-Related Products and Energy Information, (Amendment) (EU Exit) Regulations 2012</p>
	<p>In order to reduce environmental damage, at the end of its useful life, this product must not be disposed of along with normal household waste to landfill sites. It must be taken to an approved recycling centre according to the recommendations of the WEEE (Waste Electrical and Electronic Equipment) directive applicable in your country.</p>



HH AUDIO
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HH AUDIO PART OF HEADSTOCK GROUP
FOR THE LATEST INFORMATION PLEASE VISIT

WWW.HHAUDIO.COM

IN THE INTEREST OF CONTINUED DEVELOPMENT, HH RESERVES THE RIGHT TO AMEND PRODUCT SPECIFICATION WITHOUT PRIOR NOTIFICATION