RIGGING AND CURVING COHEDRA® MID/HIGH CABINETS

Please read these instructions carefully before you begin setting up the system!

1 USE

1.1 INTENDED USE

Specifications for intended use include the following:

- When mounting mid/high range enclosures, make sure that the load is centreed directly under the suspension point on the rigging frame.
- The rigging frame may not be tilted more than 10% (that is, at angles greater than 6°). Note that the specifications for intended use require you to read and heed all of the operating instructions and comply with inspection and maintenance requirements.

Any use other than specified is unintended.
The manufacturer shall not be liable for damages resulting from unintended use.

1.2 UNINTENDED USE

Improper use of rigging frames and incorrect handling of this load-carrying equipment can pose a serious danger.
Never

- use rigging frames to exert diagonal force or tension on loads,
- use a crane to dislodge stuck or immovable loads,
- lift people,
- strike, knock or dent rigging frames,
- heat-treat or weld rigging frames,
- exceed the truss's maximum load-carrying capacity

Note that in addition to the above specifications, the operational safety regulations of VBG 9 (the German employers' liability insurance association accident prevention regulations) apply.

2 WARRANTY AND LIABILITY

HK AUDIO® cannot be held responsible for damages due to improper use or non-compliance with the safety specifications for setup and operation. All warranty and liability claims for personal injury and property damages are excluded if attributable to one or several of the following:

- non-compliance with operating manual instructions, voiding product liability and warranty claims
- unintended use of rigging frames
- non-compliance with operating manual instructions regarding transportation, storage, initial setup, operation, maintenance and repair of rigging frames
- unauthorized structural modifications performed on rigging frames
- unauthorized modification of the parameters indicated in the operating manual
- inadequate or improper repairs

3 IMPORTANT NOTES ON SAFETY

Original COHEDRA® rigging accessories have been certified as a complete and cohesive system by the safety standards authority TÜV. The directions for use of the COHEDRA® rigging system require that it be installed in accordance with the following specifications. Before you begin installation, ensure that the mounting points (for example, a chain hoist) on the stage roof or the venue's ceiling comply with BGV-C1 accident prevention regulations and that the safety standards authority TÜV has certified them for the full load (see table 1). Prior to every installation, inspect all components to ensure they are in good operating condition, taking particular care to confirm that all quick-release pins and hardware connectors are undamaged.

The principle requirement for safe handling and trouble-free operation of rigging frames is a thorough understanding of the basic notes on safety and the safety regulations.
This operating manual contains key rules on safe handling.

3.1 RESPONSIBILITIES OF THE OPERATOR

As the operator, you are legally bound to allow only those persons to work with rigging frames who are

- 16 years of age or older,
- physically and mentally able, familiar with the basic rules of industrial safety and accident prevention, and trained in the handling of rigging frames.

Be sure to regularly review and confirm personnel's safety awareness.
In addition, task personnel with specific responsibilities for setting up, putting into service, operating, maintaining, and repairing equipment. Ensure that personnel are trained to work with the rigging frame only under the supervision of a proficient and experienced technician. Ensure also that defects, flaws and other damage that could impede safety are repaired immediately.

3.2 STORAGE, MAINTENANCE, INSPECTION AND REPAIR OF COHEDRA® RIGGING HARDWARE

Storage, temporary and long-term
When not in use store the truss indoors in a safe place where it cannot be tipped over and is protect from exposure to the elements.

Inspections
§ 39, VBG 9 A of the German employers' liability insurance association accident prevention regulations requires that load-carrying equipment be inspected by a qualified expert and possible defects be eliminated prior to initial commissioning by the recipient.

§ 40, VBG 9 A requires that load-carrying equipment be inspected at least annually for cracks. When used in dynamic applications, equipment must be inspected for cracks every six months.

Maintenance
You are authorized to replace easily serviceable wearing or standard parts in accordance with the manufacturer's instructions. Use original parts for this purpose. If necessary, tighten screws and screwed connections.

Repair
In the event that parts of the load-carrying equipment have been deformed, it is up to the manufacturer to determine if they are repairable. Solely the manufacturer is authorized to perform welding and repair jobs on load-carrying equipment.

3.3 TECHNICAL SPECIFICATIONS OF THE COHEDRA® RIGGING HARDWARE

Load-carrying capacity of standard rigging frames: 800 kg
Test load: 3,200 kg
Ambient temperature when in operation:
min. -10° C, max. + 60° C

3.4 MAXIMUM PERMISSIBLE NUMBER OF FLOWN COHEDRA® MID/HIGH UNITS

- You may fly up to 32 mid/high range enclosures in a stacked array.
- You may fly up to 24 mid/high enclosures in a stacked array when using the standard rigging frame.
- If you want to fly up to 32 mid/high enclosures, you must use the high-load rigging frame! It is available on demand.

Warning: Flying more than 24 enclosures in a stacked array from the standard rigging frame voids the safety standards authority TÜV's certification!

Refer to table 1 to determine flown loads. The sum of the weights of COHEDRA® mid/high enclosures plus the weight of the rigging frames equals the total load.

Note: Ensure that you add the weights of chain hoists, motors, cables and further stops to determine total weight!

Quantity	Weight [kg]	Weight [lbs.]
1	30	66
2	60	132
3	90	198
4	120	264
5	150	330
6	180	396
7	210	462
8	240	528
9	270	594
10	300	660
11	330	726
12	360	792
13	390	858
14	420	924
15	450	990
16	480	1056
17	510	1122
18	540	1188
19	570	1254
20	600	1320
21	630	1386
22	660	1452
23	690	1518
24	720	1584
25	750	1650
26	780	1716
27	810	1782
28	840	1848
29	870	1914
30	900	1980
31	930	2046
32	960	2112
Top and bottom rigging frame with shackle: 30 kg/ 66 lbs.		

Table 1: Weight of mid/high enclosures

3.5 MAXIMUM NUMBER OF FLOWN COHEDRA® CDR 210 F SUBWOOFERS

The standard rigging frame can fly up to 20 vertically arrayed CDR 210 F Subs.
If you are using a combination of CDR 208 S/T cabinets and CDR 210 F Sub bins on one rigging frame, calculate the total load using both tables. Ensure the rigging frame's maximum permissible load is never exceeded.

Number	Weight [kg]	Weight [lbs.]
1	40	88
2	80	176
3	120	264
4	160	352
5	200	440
6	240	528
7	270	616
8	310	704
9	350	792
10	390	880
11	430	968
12	470	1056
13	510	1144
14	550	1232
15	590	1320
16	630	1408
17	670	1496
18	710	1584
19	750	1672
20	790	1760

Table 2: Weight of the CDR 210 F Sub

3.6 GROUND-STACKED MID/HIGH ENCLOSURES

Ensure that the (inverted) top rigging frame is placed securely on the ground or stage. Secure the mid/high stack to prevent slippage!

3.7 PICK POINTS FOR FLYING COHEDRA® MID/HIGH ENCLOSURES

Use only the top rigging frame's shackles to attach motors, chain hoists and straps. Insert them into the eyelets in the centre rail designed to accept shackles!

Never use the round pole on the top rigging frame to attach shackles or mount motors! This pole is used only for guiding and securing cables.
Use only the bottom rigging frame to curve the array.
Clear the area immediately below arrays of people before raising or lowering loads.
Lift and lower flown mid/high enclosures smoothly, avoiding abrupt stops or jerky motions.
Secure the flown mid/high array in place with straps so that it remains immovable, for example, despite gusts of wind. Use the eyelets in the bottom rigging frame to affix straps.

3.8 STRUCTURAL MODIFICATIONS OF COHEDRA® RIGGING HARDWARE

No structural modifications may be made without the manufacturer's permission. This also applies to welding work performed on supporting parts. Structural alterations require the manufacturer's written approval. Use original replacement and wearing parts only.

3.9 ORIGINAL HK AUDIO® ACCESSORIES

Use original HK AUDIO® parts only (see section 4)! The safety standards authority TÜV has not certified any other parts for use! Always install parts in accordance with these installation instructions! Compile and store all documents pertaining to the system in a safe place!

3.10 INITIATION AND OPERATION

§ 39, VBG 9 A of the German employers' liability insurance association accident prevention regulations requires that load-carrying equipment be inspected by a qualified expert and possible defects be eliminated prior to initial commissioning by the recipient.

§ 41 VBG 9a requires that load-carrying equipment be subjected to a non-routine inspection following damage, repair work and other incidents that can affect load-carrying capacity.

Figure 1: 12 COHEDRA® mid/high enclosures

Figure 2: Mid/high enclosure with integrated flight attachments

Figure 3: Top rigging frame

Figure 4: Shackles for attaching motors, straps

Figure 5: Bottom rigging frame

Figure 6: Lashing strap for curving the array

Figure 7: Quick-release pin

4 COMPONENTS OF THE COHEDRA® RIGGING HARDWARE

COHEDRA® rigging hardware consists of the following parts:

- a top rigging frame with three shackles for attaching motors, lashing straps or chain hoists. The top rigging frame also serves as the base for ground stacks.
- a bottom rigging frame for attaching a lashing strap, chain hoist or motor for curving the array
- a two-part lashing strap for curving arrays of up to eight COHEDRA® mid/high enclosures
- integrated attachments on the side and back for flying COHEDRA® mid/high enclosures
- four quick-release pins per mid/high enclosure for connecting enclosures to the rigging frames

5 DETERMINING THE CURVING ANGLE BETWEEN TWO COHEDRA® MID/HIGH ENCLOSURES

The curving angle between two enclosures is set by simply adjusting one pin. One person can easily carry out the entire process of curving cabinets.

The maximum adjustable angle depends on how the mid/high range enclosures are configured in a flown stacked array. Two different housing designs are available for optimizing the gap between two mid/high range enclosures, the straight variant CDR 208 S (S stands for straight) and the slanted variant CDR 208 T (T is short for trapezoidal). Both COHEDRA® mid/high enclosures (the CDR 208 T and the CDR 208 S) are labeled uniformly to provide information on the adjustable angle: The left side of the connector panel designates the angle if the top enclosure is a CDR 208 S. On the right is designated the angle if the top enclosure is a CDR 208 T (see Figure 8 a, b).
If two CDR 208 S enclosures are configured in a flown stacked array, your only option is 0°.
If one CDR 208 S and one CDR 208 T enclosure each are configured in a flown stacked array, you can opt for 0 °, 1.5°, 3 °, or 4.5 °.
If two CDR 208 T enclosures are configured in a flown stacked array, you can opt for 4.5°, 6°, 7.5° or 9 °. This variant is an excellent choice when you want to configure sharply curving down-fills.

The rigging equipment is designed so that the curving angle can still be adjusted when COHEDRA® mid/high arrays are flown (see Fig. 9).

How is this done?
The pin that determines the curving angle (the top pin on the mid/high unit) is merely a predefined stop for the flexible connector component when the entire COHEDRA® mid/high array is pulled together accordion-style and thereby adjusted using a lashing strap, chain hoist or motor attached at the back. If no force is exerted, the entire mid/high array is suspended at a 0° angle, meaning that the pin is easily repositioned!

Important notes on safety when curving the array with lashing straps and chain hoists: When tightening the lashing strap or using a chain hoist, ensure that just enough force is exerted to curve the array to the desired extent along the rear of the housings. Use a chain hoist with a maximum load of 250 kg (8 m in length). This also suffices for configurations with up to 24 Mid / High units. If possible, choose a pick-point for the chain hoist shackle near the top rigging frame's rear connector.

Do not use powerful chain hoists with low gear ratios (that is, a powerful force action and a long lashing strap)! A chain hoist that exerts too much force relieves the load on the rigging system's rear pick-point, which means the pick-point's force action is distributed unfavorably across the full length of the rigging frame. This can permanently warp the rigging frame, thereby voiding the operating permit

Never place or use motors between the rigging frames for this purpose! This will overload the top flight frame and impair operating safety!

Important note: If you first mount a CDR 208 S enclosure to the top rigging frame - that is, configure two CDR 208 S mid/high enclosures in a flown stacked array - you must insert the back pin into both the eyelet labeled 0° and through the connector component's slot (see Fig. 10)! Otherwise, the angle will be set incorrectly and you will not be able to curve the array as desired!
For every other configuration, do not insert the pin into the slot!

6 PREPARATIONS

The following section describes how to set up a basic mid/high array. Use the COHEDRA® CAPS software to select on the top rigging frame pick points for determining the angles between the mid/high enclosures.

Move the open case with the four mid/high enclosures in position.

Figure 8: The curvature between two COHEDRA® mid/high enclosures

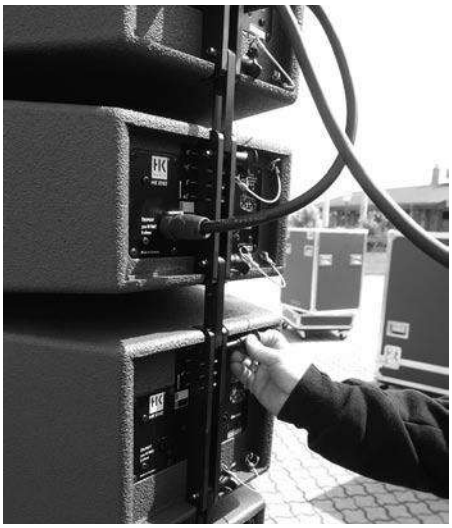

Figure 9: Setting the curving angle on a flown array

Figure 10: Connector component attached o the top rigging frame for a 0 ° curving angle

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Figure 11: Open case with four mid/high range enclosures

Figure 12 a

Figure 12 b

Figure 12 c

Figure 12 d

Figure 12 e

Figure 12 f

Figure 12 g

7 MOUNTING THE TOP RIGGING FRAME

The tasks described below require two people. Remove all three quick-release pins from their receptacles on the top rigging frame and the top pin on the back of the top mid/high range enclosure (preferably CDR 208 S). Set the top rigging frame on the topmost enclosure. First attach the two front connectors. Turn the connector component so that the rounded side of the component faces forward (see Fig. 12 a – g). Insert the pin of the top mid/high enclosure through the slot on the connector component and into the eyelet labeled 0°.

Figure 13: Mounting the top rigging frame

Figure 14: Mounting the main motor to the top rigging frame

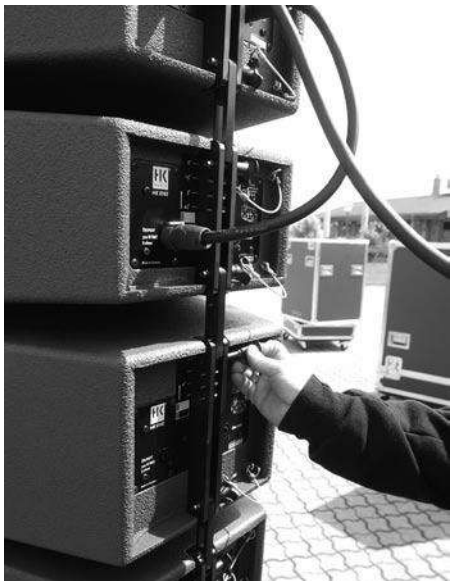

Figure 15: Setting the curving angle between COHEDRA® mid/high enclosures

Now connect the back of the top rigging frame to the enclosure (see Fig. 13).

Important note: For this purpose, the pin must be inserted through the slot and into the 0 °s position! Always on the CDR 208 S. See Figure 10.

Attach to the top rigging frame the shackle destined to accept the motor hook (see Fig. 14).
Your choice of pick point depends on how sharply you aim to curve the COHEDRA® mid/high array.

Note: Use the third eyelet (from the front) to set the array to a curving angle of about 0°.
Check all pins on the top rigging frame to ensure they are firmly seated and attach the motor to the shackle.

Hoist the enclosures from the case using the motor and roll the case off to the side.
Set the pins on the back of the top four mid/high enclosures in accordance with the desired application and curving angle.

This is also a good time to connect the speaker cables to the four mid/high range enclosures, which will later be the top cabinets in your array. You can use the round pole on the top rigging frame to secure the cables.
Bear in mind that you must attach one of the shackles on the top rigging frame to the lashing strap, chain hoist or motor that will later pull in the back of the array to curve out its front face. Do this now.

Tip: If you intend to mount additional mid/high enclosures, it is recommended that you attach all the required speaker cables to the top rigging frame now because this task is made more difficult as the height of the array increases. Be sure to use cables of sufficient length!

Figure 16: Hoisting the top four COHEDRA® mid/high enclosures

Figure 17 a: Mounting additional mid/high enclosures

Figure 17 b

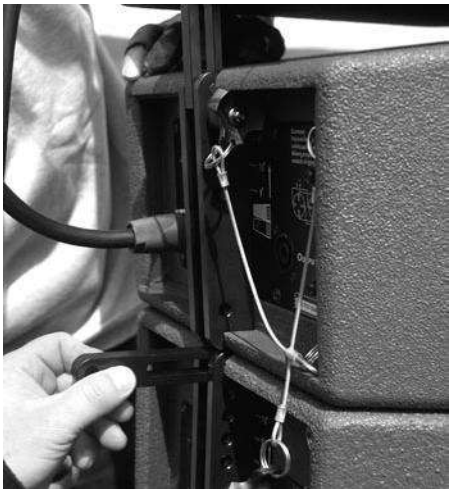

Figure 17 c

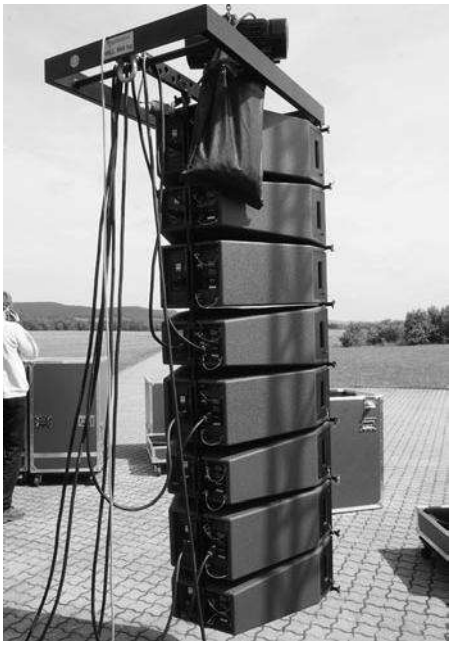

Figure 17 d

8 MOUNTING ADDITIONAL COHEDRA® MID/HIGH ENCLOSURES

Hoist the cabinets to a height that allows you to roll a second case with four mid/high range enclosures under the array. Remove both front pins from the lowest flown enclosure and the bottom pin on the back (see Fig. 16).
Tip: Insert the front pins into the carrying handles on the sides of the mid/high range enclosure. This ensures that they are out of the way when the bottom enclosures are placed in position.

Move the second case with four additional mid/high enclosures into position. Slowly hoist the top four cabinets until the two front connectors engage (see Fig. 17 a). Insert both front pins first, ensuring that they engage fully and securely. You may have to shift the two enclosures slightly to ease the pins into position (see Fig. 17 b). In order to attach the rear connector component, you must swivel it out of the rail so that the round end faces up and the slot faces down (see Fig. 12 a – g for details and Fig. 17 c)

Tip: Use the motor to slowly hoist the array, creating a gap of about 60 to 80 mm at the back between the two enclosures. This makes it easier to insert the pin into the top enclosure.

Hoist the COHEDRA® mid/high array with the eight enclosures just enough to remove it from the case.
Configure the pins on the back of the bottom four enclosures to achieve the desired curving angle.
Connect the remaining speaker cables.
Repeat the above procedure to configure even more mid/high enclosures in a flown stacked array.

9 ATTACHING THE BOTTOM RIGGING FRAME AND RAISING THE MID/HIGH ARRAY

Once all COHEDRA® mid/high enclosures have been assembled in the desired array, you must attach the bottom rigging frame to the lowest enclosure. To do this, remove all three pins from the lowest enclosure. First attach the front of the bottom rigging frame and secure it using the pins, and then insert the rear pin.

Now the enclosures are mounted, speaker cables are all connected, and the pins are inserted in the required configuration.
If you want to use the lashing strap to curve the COHEDRA® mid/high array, connect its hooks to the bottom rigging frame and, using a shackle, to the top rigging frame (see Figure 20). Tighten the strap until it exerts enough force to curve the array as desired.

The pin that determines the curving angle (the top pin on the mid/high unit) is merely a predefined stop for the flexible connector component when the entire COHEDRA® mid/high array is pulled together accordion-style and thereby adjusted using a lashing strap, chain hoist or motor attached at the back. If no force is exerted, the entire mid/high array is suspended at a 0° angle, meaning that the pin is easily repositioned!

Do not use powerful chain hoists with low gear ratios (that is, a powerful force action and a long lashing strap)! A chain hoist that exerts too much force relieves the load on the rigging system's rear pick-point, which means the pick-point's force action is distributed unfavorably across the full length of the rigging frame. This can permanently warp the rigging frame, thereby voiding the operating permit.

Important notes on safety when curving the array with lashing straps and chain hoists: When tightening the lashing strap or using a chain hoist, ensure that just enough force is exerted to curve the array to the desired extent along the rear of the housings. Use a chain hoist with a maximum load of 250 kg (8 m in length). This also suffices for configurations with up to 24 Mid / High units. If possible, choose a pick-point for the chain hoist shackle near the top rigging frame's rear connector.

Never place or use motors between the rigging frames for this purpose! This will overload the top flight frame and impair operating safety!

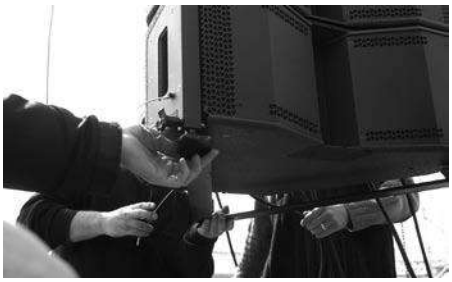

Figure 18: Mounting the bottom rigging frame

Figure 19: Attaching the lashing strap between the top and bottom rigging frames

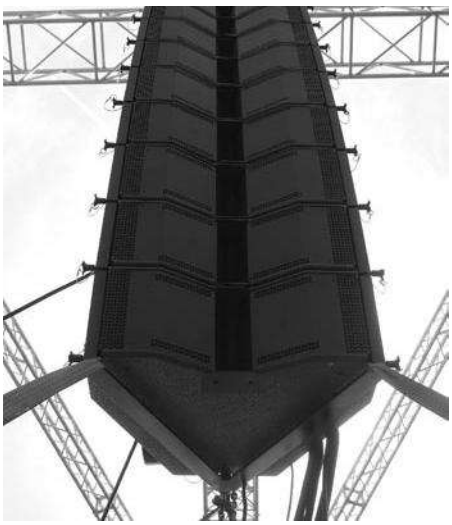

Figure 20: Hoisting the fully assembled COHEDRA® mid/high array

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Figure 21: Groundstack with CDR 210 F Sub and CDR 208 S/T enclosures

10 GROUND STACKING

10.1 GROUND STACKING WITH THE STACK FRAME

The stack frame was developed especially for ground-stacking CDR 208 S/T and CDR 210 F Sub enclosures. If you are unable to fly the top units or bass bins, the stack frame provides the underpinning for setting up stacked mid/high arrays or a fullrange stacks comprised of CDR 210 F subwoofers and CDR 210 S/T mid/high units.
The stack frame is equipped with four extendible, height-adjustable feet. This lets you adjust the stack to suit the underlying surface. In addition, the feet are infinitely variable, allowing you tilt the entire stack forward or back to align the system to the audience. The stack frame is readily set up and stowed away in a case. Its removable feet facilitate handling and transport.

Technical data (preliminary):
Weight: approx. 30 kg / 66 lbs
Base dimensions (with feet fully extended):
approx. 200 cm x 160 cm
Dimensions (dismantled):
approx. 80 cm x 80 cm x 40 cm
Material: Steel w. black enamel coating

10.2 GROUND STACKING WITH THE RIGGING FRAME

This option is recommended for smaller (four mid/high units) configurations in venues that do not allow enclosures to be flown, or when you want to cover galleries, terraces or balconies.

Place the top rigging frame on the ground or stage without shackles so that the connector components for the mid/high enclosures face up. If necessary, place wooden wedges under the rigging frame to ensure a stable, secure and level position.

Remove all three pins from the rigging frame and mount the mid/high enclosures one after another. The procedure is the same as for a flown system, apart from the fact that enclosures are stacked upside down and, due to the weight of the enclosures, a lashing strap is not required for curving purposes.

Caution: Always secure ground stacks with a suitable lashing strap to prevent slippage!

11 SETTING UP SUBWOOFERS

11.1 SUB ARRAY

In a sub array, individual subwoofers are arranged side by side. This configuration creates a horizontal cylindrical wave that makes use of the floor contact. Space two CDR 210 Sub bins about 0.60 m apart. Spacing them at distances greater than 0.60 m, lowers the sub array's upper frequency limit. This can be advantageous when you are consciously aiming to thin out the 100-to-150 Hz frequency range.

Advantages:
A cylindrical wave loses just 3 dB over twice a given distance, while a spherical wave loses 6 dB, suffering twice the loss of effective sound pressure.
A cylindrical wave yields the most uniform low frequency diffusion (comb filtering is not a problem).

Disadvantages:
The bass floor array's vertical angle of projection is 0° in its near field. In practice, this means you must ensure that the signal is also projected to the targeted area on the horizontal plane (that is, to the right and left). To do this, you may have to add bass bins to the right and left of the array.
Alternatively, you can spread the cylindrical wave somewhat by delaying the outside subwoofers (for example, by using a DFC Sub only rack).

Figure 22: CDR 210 sub array

Figure 23: CDR 210 sub cluster

11.2 BASS CLUSTER/ STACKING

In the classic right/left stacked configuration, one half of the bass bins is arrayed to the right of the stage, the other to the left.

Advantages:
The stacked bass bin configuration depicted above is a conventional and widely accepted option.
It is very easy to deal with (short cables and walking distances).

Disadvantages:
Massive comb filtering effects sweep from right to left, creating peaks and valleys in frequency amplitude and typical low end drop-outs.

11.3 BASS CLUSTERS IN BLOCKS

If you want to deploy many bass bins, arraying them in blocks is a good option. Note that it is important to maintain varying distances between individual blocks.

Advantages:
Different frequencies are cancelled or boosted. The sum of the comb filters creates a relatively uniform soundscape. This setup's horizontal directivity is quite wide, as is typical for bass signals.

Disadvantages:
Though slight, comb filtering effects remain a problem. Cables and walking distances are longer than for right/left stacked configurations.

Figure 24: CDR 210 sub cluster in blocks

Figure 25: Flown CDR 210 F bass array next to a mid/high array

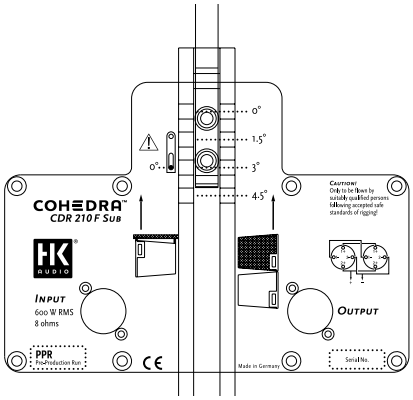

Figure 26: The CDR 210 F Sub's curving angle

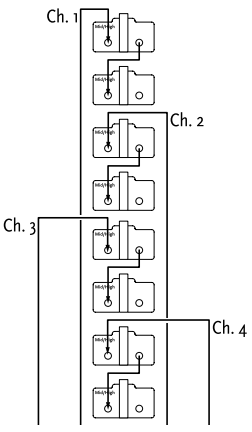

Figure 27: Pin assignment of channels 1-4

12. Flying CDR 210 F Subs

12.1 As an Independent Bass Array Using A Second Rigging Frame

Up to 20 CDR 210 F enclosures may be flown in a stacked array using the standard rigging frame. Please also read and heed the safety rules discussed in chapter D of the manual.
The procedure for setting up and mounting subwoofer arrays is the same as the procedure for CDR 208 T and CDR 208 S mid/high cabinets described in the chapter on rigging and curving COHEDRA® systems. Your choices of curving angles (or splay) between two flown CDR 210 F Sub cabinets are 0°, 1.5°, 3° and 4.5°.
The array's overall curving will be oriented on the mid/high array's curving. However, the bass array may not project beyond the front edge of the mid/high array to ensure the former does not negatively influence the latter's response.

Important note:
If you first mount a CDR 210 F Sub enclosure to the top rigging frame, you must insert the back pin into both the eyelet labeled 0° and through the connector component's slot (see Figure 26)! Otherwise, the angle will be set incorrectly and you will not be able to curve the array as desired! If you are configuring two CDR 210 F Sub enclosures in a stacked array and want the angle to be 0°, do not insert the connector component through the eyelet (see figure 26)!

12.2 In Combination with a Mid/High Array on One Rigging Frame

Flying the subwoofers and mid/high units together on one rigging frame can be a workable option, depending on the application. In these cases, the subwoofers should be mounted on top.
Mind the rigging frame's maximum permissible load. Be sure to check the system's overall weight; you'll find weights listed in the tables 1 and 2 in chapter D on rigging and curving the system.
The first cabinet to be mounted under the CDR 210 F Sub should be a CDR 208 S. Use the 0° option for this cabinet.

13. The SL 218 as a Bass Supplement

The SL 218 is well-suited for enhancing sub bass response of both flown and stacked subwoofers. It is arrayed in a center block or in line between CDR 210 blocks, depending on the given requirements and application scenario.

14. Operating the System

We recommend the following procedure to help prevent errors and troubleshoot problems quickly. The adverse affect of a mid/high cabinet dropping out or an incorrect connection can seriously degrade a line array's performance!

14.1 Connecting Speaker Cords or Multi-core Cables

Always ensure cables are laid clearly and orderly! You should be able to attribute enclosures to their connected power amp channel and/or amp rack at any time. This ensures flaws such as defective cords can be pinpointed and repaired swiftly.
Also ensure LSM multi core speaker cables (mid/high and sub adapters) are labeled appropriately, that is, from channel 1 to 4 (see the chapter on the PB 5 in the manual and figure 27).
For example, channel 1 drives the array's two top mid/high units, channel 2 the two units below to top pair, and so forth. An LSM mid/high adapter can serve to drive a total of eight mid/high units. If more than 8 cabinets are connected, they are addressed by an additional PB 5, and the channel 1-to-4 numbering system is repeated. See the chapter on the PB 5 in the manual to learn more about how to assign power amp channels to the PB 5's channels 1 to 4.
Follow the same systematic approach when connecting CDR 210 (F) Sub enclosures.

14.2 Activating the PR 8 and PR 16 Amp Racks

Ensure the VX 2400s' power switches are off and the gain knobs are turned all the way down. Check the PB 5's phase switches. They must all be set to +2 (or +3)! Once you have done this, switch on the PS 32's circuit breakers on the back of the amp racks. The DFCs and the PB 5 patch bays are now supplied with power. First select the appropriate filter for your set-up on all DFCs (making sure you select the same set on each!). If you are unsure of how the amp rack or DFC was used in the previous application (delays, EQ, etc.), as a precaution execute a hot reset on all DFCs and then select the filter set on the DFCs! Read the chapter on the DFC in the

manual to learn more about how to do this.
Before you can procedure further, you must first connect to the amp racks the DFCs' remote line and all of the system's audio cords.

14.3 CHECKING INDIVIDUAL MID/HIGH CABINETS

The best method of checking cabinets is to play a familiar song on a CD, routing the signal into the mixer and out via the master channel. Set the master level to a low-to-medium setting.

- Turn up the channel's gain knob. You will hear the signal rendered by the array's two top mid/high cabinets. The display of the DFC assigned to this pair should indicate an incoming signal level.

Important:
If you are located outside the high frequency signal's directivity radius, you will not be able to hear this signal! Your best bet is to perform this system check with a helper position a suitable distance from the array.

Note: If you can see the bottom of the mid/high unit as a plane surface, you are outside its directivity radius!

- Turn the channel 1 gain knob back down after hearing the signal!
- Follow the same procedure for all other power amp channels that you want to use.
  Be sure to turn the gain knob down after each successful test!

Note:
With this procedure, you are checking mid/high cabinets in descending order; that is, from the top to the bottom. A cabinet's height affects its directivity, so the lower the cabinets, the closer the listener should move in towards the array.

- Follow the same procedure for the subwoofers.
- Once you have checked all cabinets successfully, turn up all gain knobs, one after the other.
- Start with the channel 1 gain knob for the two top mid/high units, and then turn up the channel 2 gain knob, and so forth. With every additional channel that you activate, you should hear a boost in low midrange response. If not, this may be due to a phase inversion in the NF (or in extreme cases, in the speaker cords)! Also check the PB 5's phase switch again.
- Proceed in the same manner for the subwoofer channels.

14.4 CONFIGURING THE CONTROLLER NETWORK WITH THE AUDIO CONTROLLER SOFTWARE

Once you have performed these tests, you can configure the controller network. The type and size of the configuration of course depends on the given sound reinforcement task (PA left/right, center, outfills, etc.)
Read the chapter G about the DFC software in the manual to learn more about networking controllers, creating groups and setting delays and levels.

15. DISASSEMBLING AND REMOVING THE SYSTEM

As the saying goes: To disassemble the system, proceed in the reverse order of assembly.
These ten tips should make the job of dismantling the mid/high array easier:

1. Lower the array until the caster-equipped bottom of the mid/high case fits under it.
2. Engage the motor or chain hoist to relax the tension on the strap that is curving the array.
   Caution: The array may belly out towards the front!
3. Disconnect the four lower cabinets' cords.
4. Set these cabinets' curving pins to the maximum angle! This ensures that the array will not buckle quite as drastically when lowering and setting it on the bottom of the case. This also makes it easier to dismantle the four-cabinet block.
5. Remove the lower rigging frame.
6. Always insert the front pins into the rigging connector receptacles to ensure that they are not damaged or torn off when the array is lowered onto the case!
7. Adjust the angle of the mid/high case's bottom. Set it to 0° if the lower cabinet of the four-cabinet block is a CDR 208 S, and to 4.5° if it is a CDR 208 T.
8. Carefully lower the array into the case. First remove the rear pin connecting the two mid/high units. Then remove both front pins and place them in the recessed grips so they're out of your way and out of harm's way.
9. Raise the array slightly so that the lower four-bin block can be rolled away.
10. Do not leave the connector component of the rear rigging rail (which is now on the top cabinet of the four-bin block in the case) extended! Remove the pin that sets the curving angle, fold down the connector component, and insert the pin through the connector component and eyelet.