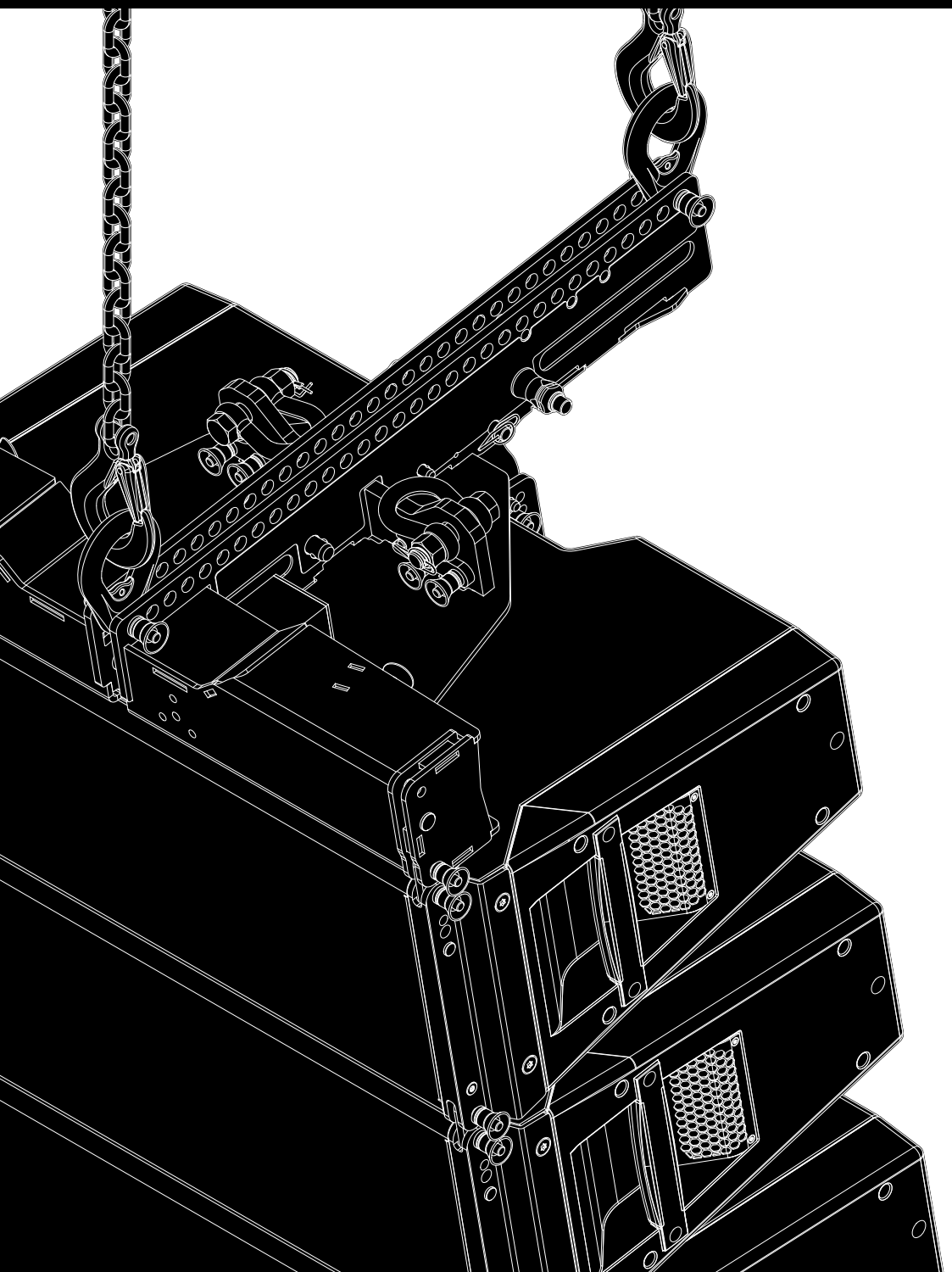
# CL

## CCL
## Rigging manual
## 1.3 en



d&b audiotechnik

**Notes on document version**
All previous versions of this document are hereby no longer valid.

**Version 1.3:**

- Section "CCLFlying frame center beam and Beam extension" revised.
  **Refer to:**
  ⇒ Chapter 2.2.1 “Flying frame center beam and Beam extension” on page 10.
- Note on "Inspection plate - Chains" added.
  **Refer to:**
  ⇒ Chapter 2.4 “Lifting and safety devices” on page 14.

**General information**

CCL Rigging manual

Version: 1.3 en, 06/2026, D2782.EN .01

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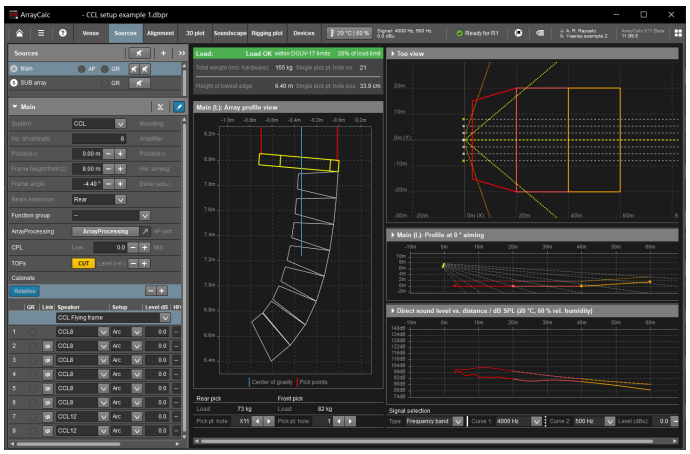
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**d&b ArrayCalc**

## 1.1 Intended use

The CCL rigging components must only be used in conjunction with d&b CCL loudspeakers as described in this manual.

### 1.1.1 d&b ArrayCalc

For both safety and acoustic reasons, d&b line arrays must be designed using the d&b ArrayCalc simulation software. The software is available as a native stand-alone application for both Microsoft Windows and Mac OS X operating systems and can be downloaded at www.dbaudio.com.

Detailed information on how to use and operate ArrayCalc is provided by the Help system of the software. To access the Help system, press F1 or select the Help button (  ) from the ArrayCalc toolbar. This will launch the HelpViewer which provides an overview of the program as well as a search function and direct access to the related topics.

In addition, ArrayCalc will provide you with typical array configurations within the permitted load limits and will help you get familiar with the mechanical load conditions and limitations.

### d&b TI 385

Further information on line array design can be found in "TI 385 d&b Line array design, ArrayCalc". The TI is supplied with the software or can be downloaded from the d&b website at www.dbaudio.com.

### d&b Seminar

We also recommend you to attend the regularly hosted d&b Line array training seminars. Further information regarding the d&b seminars and a seminar schedule can also be found on the d&b website at www.dbaudio.com.

### d&b Video tutorials

In addition, d&b provides related video tutorials which can also be found on the d&b website at www.dbaudio.com.

## 1.2 General safety

- Installation and setup should only be carried out by qualified and authorized personnel observing the valid national Rules for the Prevention of Accidents (RPA).
- It is the responsibility of the person installing the assembly to ensure that the suspension/fixing points are suitable for the intended use.
- Always carry out a visual and functional inspection of the items before use. In case there is any doubt as to the proper functioning and safety of the items, these must be withdrawn from use immediately.

Please also refer to ⇒ Chapter 14 “Care and maintenance” on page 65.

## 1.3 Components and weights/Load capacity

### System components and weights

**Loudspeaker**

Z0880/Z0882 CCL8/CCL12 cabinets ..... 17.6 kg (38.8 lb)
Z0884 CCL-SUB cabinet ..... 44.5 kg (98 lb)

**Rigging components**

Z5820 CCL Flying frame ..... 12.5 kg (27.6 lb)
Z5820 CCL Flying frame - Beam extension ..... 3 kg (6.6 lb)
Z5824 CCL Pullback frame ..... 4.7 kg (10 lb)

### Load capacity

**NOTICE!**

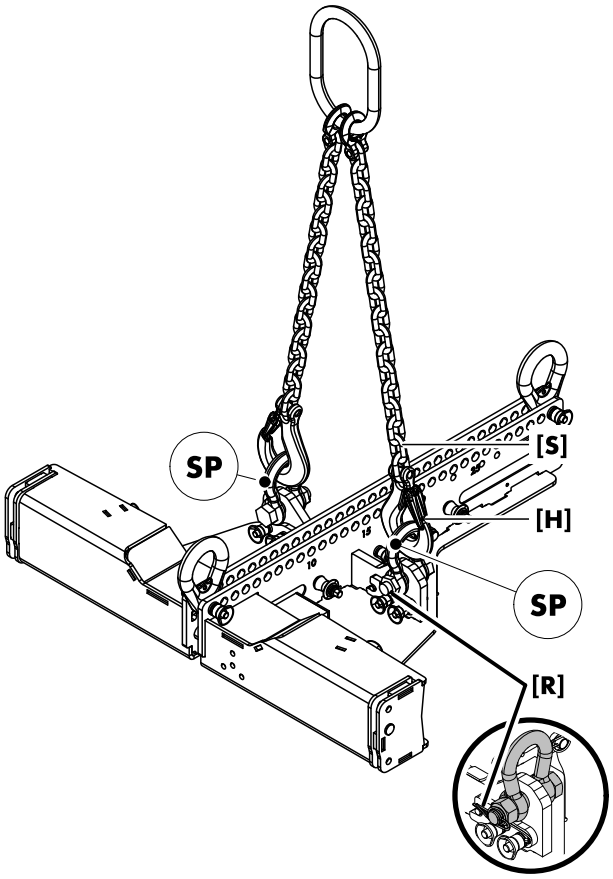
**Z5820 CCL Flying frame**
The Z5820 CCL Flying frame including Beam extension is designed to support a total system weight of 500 kg (1100 lb) - SWL including all rigging components.

**General**
All d&b rigging systems are inherently safe up to their uppermost suspension point. According to the "German regulation DGUV Information 215-313", hence they do not require a secondary safety device.

However, the user is solely responsible for ensuring that suspension devices which connect the uppermost suspension point of a d&b rigging system to a structure or building are properly dimensioned and single-fault safe.
If this additional equipment is not single-fault safe, a secondary safety device must be used.

**Example**
When the array is suspended with D8 Plus electric chain hoists only, it does not require a secondary safety device.

When using multiple electric chain hoists to suspend an array, each individual chain hoist must be capable of lifting the entire weight of the array.




## 1.4 Secondary safety

**d&b Rigging systems**
d&b rigging systems offer dedicated safety connection points for a secondary safety device and are delivered with a matching safety chain. The dedicated connection points must be used under all circumstances.
Any third-party safety devices must be dimensioned for the intended load.

Any secondary safety device must be mounted in a way that prevents the array from dropping and swinging should the primary suspension device fail.

Secondary safety devices must be suspended independently from the primary suspension device and must have a load capacity which is at least equal to the total weight of the entire system.

The CCL Flying frame is equipped with two connection points (Safety Point - (SP)) fitted with two 1.5 t shackles to accept a secondary safety device.

For this purpose, use the d&b Z5831 Safety chain set 1.4 t which is supplied with the flying frame or an appropriate equivalent according to the specifications which are detailed in ⇒ Chapter 2.4.2 “Z5831 Safety chain set 1.4 t” on page 14.

**Assembly**
1. Before attaching the safety device, ensure the two shackles **(SP)** are properly fitted to the corresponding frame's connection points and secured against loosening using a locked ring cotter **[R]**, as shown in the graphic opposite (please also refer to ⇒ Chapter 2.6 “Ring cotters” on page 16).
2. Attach the safety chain set **[S]** and ensure the chains are not twisted and the hooks **[H]** are in the right direction, as shown in the graphic opposite.

## 1.5 Wind loads

**WARNING!**
**Potential risk of personal injury and material damage!**

Flying loudspeakers overhead at wind forces higher than 6 bft (22-27 knots, 39-49 km/h, 25-31 mph) is not recommended.

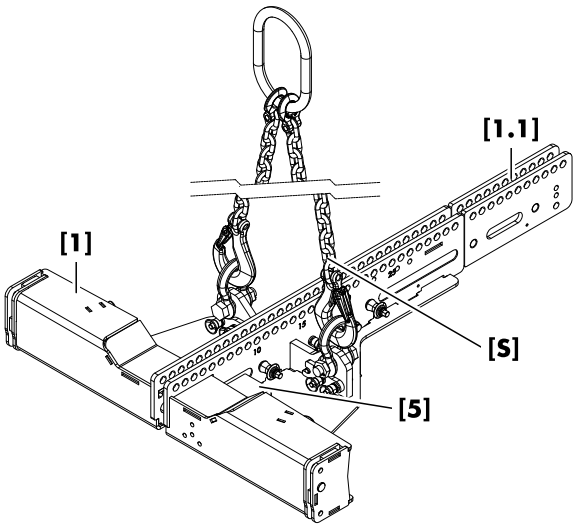
**If the wind force exceeds 8 bft (34-40 knots, 62-74 km/h, 39-46 mph):**

- Make sure that no person remains in the vicinity of the array.
- Lower and secure the array.

## 1.6 Operational safety



- The assembly should always be carried out by two persons.
- During assembly, pay attention to the possible risk of crushing. Wear suitable protective clothing.
- Observe all instructions given on the respective instruction labels of the rigging components, such as load beams, flying and compression frames, touring carts, and loudspeaker cabinets.
- In connection with the d&b Z5711 ArraySight sender unit (laser inclinometer), take precautions to prevent anyone from looking directly into the laser beam, and wear appropriate eye protection.
- Be aware that any object or tool left on the top of the array during setup may fall when the array is operated. Always check that no tools or other objects are left on the array before final hoisting.
- When chain hoists are in operation, ensure that there is nobody directly underneath or in the vicinity of the load.




## 2.1 Z5820.000/Z5820.001 CCL Flying frame set

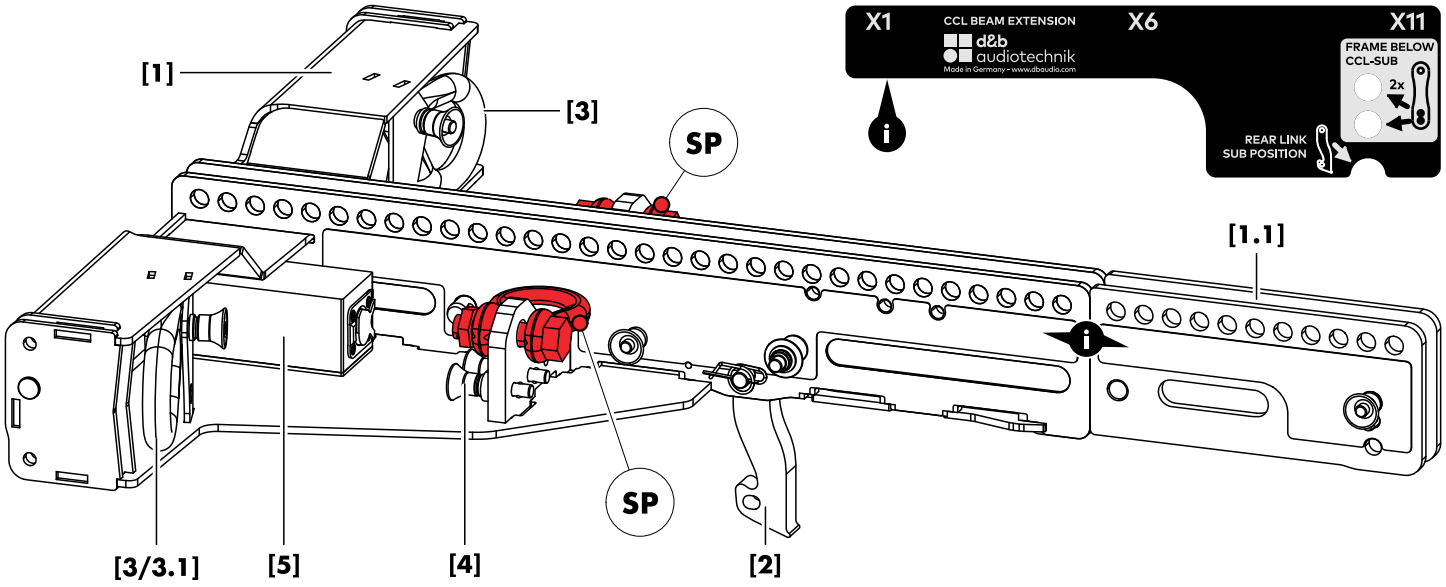
The following individual rigging components described in this section are included in the Z5820.000 CCL Flying frame set.

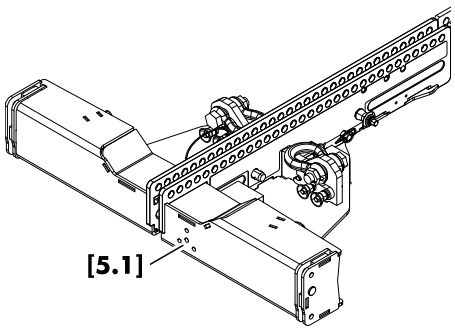
Please verify the shipment for completeness and proper condition of the items.

**Z5820.000** CCL Flying frame set (15.5 kg/34.2 lb) - consisting of:

- **[1] Z5820** CCL Flying frame (12.5 kg/27.6 lb) with Beam extension **[1.1]** (3 kg/6.6 lb),
  optionally including (Z5820.001 CCL Flying frame set AS):
  **Z5711** ArraySight sender unit **[S]** (⇒ Z5820.001) with enclosed shielded CAT5e 1:1 cable (K6006.200.00), 30 m (100 ft).
- **[S] Z5831** Safety chain set 1.4 t.

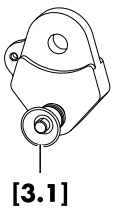
## 2.2 Z5820 CCL Flying frame components

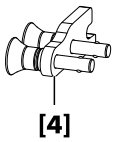


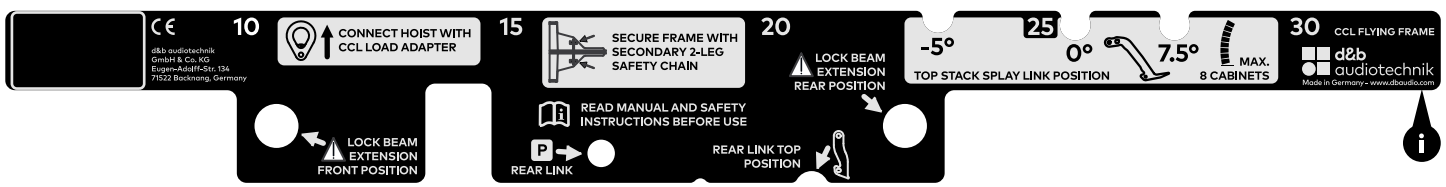





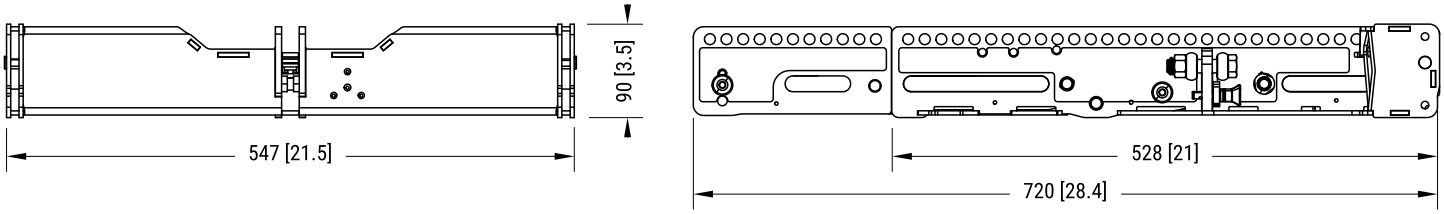




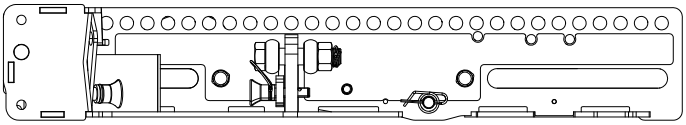



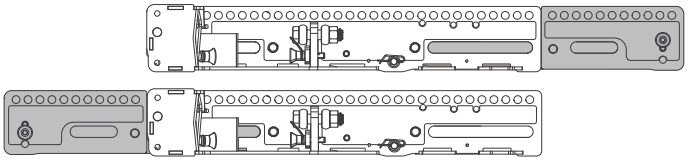
| Pos. | Component | Description |
|---|---|---|
| **[1]**<br><br><br><br><br><br><br><br>**[1.1]** | Z5820<br>CCL Flying frame | The **CCL Flying frame** together with its extender is constructed from high-grade steel with a total dead weight of 15.5 kg (34.2 lb).<br><br>It is designed to support arrays (columns) consisting of:<br>▪ Pure TOP or SUB arrays/columns of up to 24 x CCL-TOP (CCL8/CCL12) or up to 10x CCL-SUB cabinets with a total system weight of 500 kg (1100 lb) - SWL including all rigging components.<br>▪ Mixed array configurations with CCL-SUB cabinets at the top of the array and a total system weight of 500 kg (1100 lb) - SWL.<br>▪ As ground support or adapter frame in pure CCL-TOP or mixed CCL ground stack setups.<br><br>**Beam extension** (3 kg/6.6 lb).<br>The Beam extension can be attached either:<br>▪ To the rear serving as an extension of the hole grid to allow an increased downtilt of the entire array.<br>This position is also used for pure CCL-SUB columns or mixed array configurations with CCL-SUB cabinets at the top of the array.<br>▪ To the front serving as an extension of the hole grid to allow an increased uptilt of the entire array.<br><br>Please also refer to ⇒ Chapter 2.2.1 "Flying frame center beam and Beam extension" on page 10. |
| **[2]** | Rear link (Frame) | The rear link of the frame is used to attach the first TOP cabinet to the frame.<br>In connection with the Flying frame extender, the Rear link can be swapped to the rear to attach CCL-SUB cabinets. |
| **[3]**<br>**[3.1]** | Parking slots for:<br><br>2 x CCL Load adapter **[3]**<br><br>1 x CCL Load adapter Rota clamp **[3.1]** | The Flying frame is supplied with two Load adapters (**[3]**) to allow either Single or Dual pick point operation. Each Load adapter is supplied with a corresponding Locking pin (10 x 32 mm).<br><br>In addition, the enclosed CCL Load adapter Rota clamp with corresponding Locking pin (10 x 32 mm) (**[3.1]**) allows Single pick point operation in combination with the d&b Z5147 Rota clamp for a maximum system weight of up to 500 kg/1100 lb. |
| **[4]** | Front link (Frame) | Two additional Front links together with a pair of Locking pins each are supplied with the Flying frame. They are used to mount CCL-TOP cabinets on top of the Flying frame or underneath CCL-SUB cabinets for the following setups:<br>▪ Mixed CCL array configurations with CCL-SUB cabinets at the top of the array.<br>▪ CCL-TOP ground stacks with the Flying frame as ground support either on the ground or on top of CCL-SUB cabinets in a mixed ground stack setup. |
| SP | Safety point(s) | The flying frame is fitted with two connection points, each equipped with a 1.5 t shackle **(SP)** to attach a secondary safety device using the enclosed Z5831 Safety chain set (please refer to ⇒ Chapter 1.4 "Secondary safety" on page 6). |
| **[5]**<br><br><br><br>**[5.1]** | Z5711 (AS option)<br>ArraySight sender unit | With the Z5820.001 Flying frame set AS, the flying frame is equipped with a calibrated and adjusted d&b Z5711 ArraySight sender unit (laser inclinometer). An appropriate shielded CAT5e 1:1 cable, 30 m (100 ft) is also provided (K6006.200.00) to allow read out either via the d&b Z5712 ArraySight meter unit (single operation) or via R1 in connection with the d&b Remote control network (remote operation - OCA/AES70).<br><br>Four dedicated holes are provided at the front of the frame.<br>The center hole serves as the exit for the laser beam, while the three surrounding holes allow for the adjustment of the ArraySight sender unit **[5]**, if necessary.<br><br>For detailed information on the d&b ArraySight inclinometer system, please refer to the ArraySight manual. |
| i | | Instruction labels providing vital safety and rigging instructions. |




**Z5820 CCL Flying frame dimensions in mm [inch]**



**Flying frame center beam - Hole grid**



**Beam extension: REAR or FRONT POSITION**

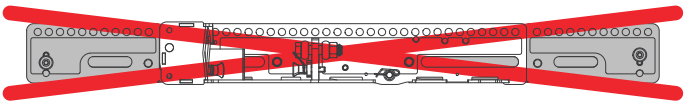
### 2.2.1 Flying frame center beam and Beam extension

The center beam of the Flying frame provides a hole grid consisting of up to 32 holes with a one (1) hole detent to allow either Dual or Single pick point operation.

For certain applications, the Beam extension provides additional 11 holes (X1 to X11) with the same detent of one (1) hole and can be attached to the frame in two positions:

- **REAR POSITION:**
  For the extension of the hole grid towards the rear to allow increased downtilt of the entire array.
  This position is also used for pure CCL-SUB columns or mixed array configurations with CCL-SUB cabinet at the top of the array.
- **FRONT POSITION:**
  For the extension of the hole grid towards the front to allow increased uptilt of the entire array.

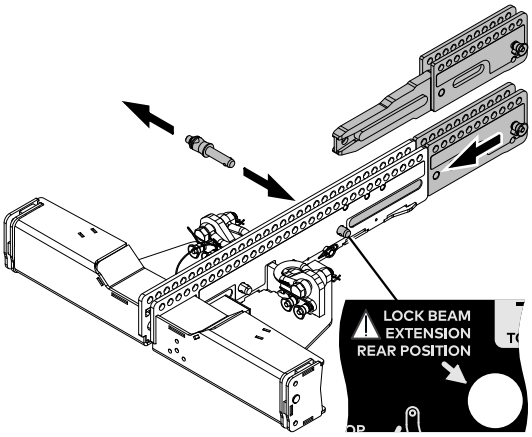
  **Note:** Only applicable for pure CCL-TOP arrays/columns.



**WARNING!**
**Potential risk of personal injury and damage to the rigging components!**

The Beam extension must only be attached to the **top frame** which acts as the **suspension device**.

- Do not, under any circumstances, attach two Beam extensions to the frame.
- Do not, under any circumstances, attach a Beam extension to the bottom frame in pullback mode setup.




**Assembly procedure**
**Shown:** REAR POSITION

**Assembly**

1. On the Flying frame, release the corresponding Locking pin (12 x 35 mm).
2. Fully insert the Beam extension into the rear slot of the frame.
3. Reinsert the Locking pin on the frame.
4. To remove the Beam extension, proceed in reverse order.

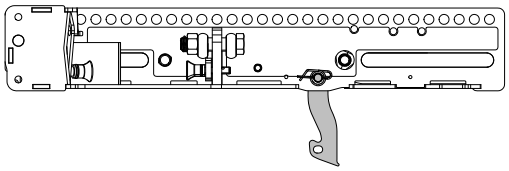
To attach the Beam extension to its FRONT POSITION, proceed in the same manner.

### 2.2.2 Rear link of the Flying frame

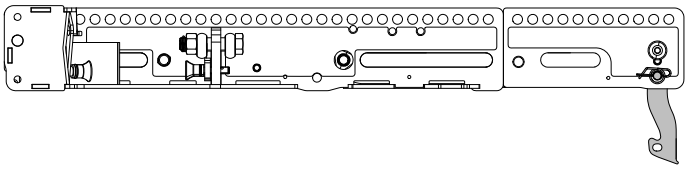
**Rear link position**

By factory default, the Rear link is attached to the flying frame for the deployment of CCL-TOP cabinets (TOP POSITION).

To deploy CCL-SUB cabinets and for mixed groundstack setups with the Flying frame as ground support, the Beam extension needs to be attached to the frame and the Rear link position has to be changed to the dedicated hole position (SUB POSITION) on the Beam extension.

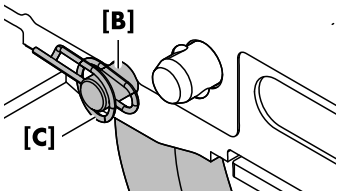


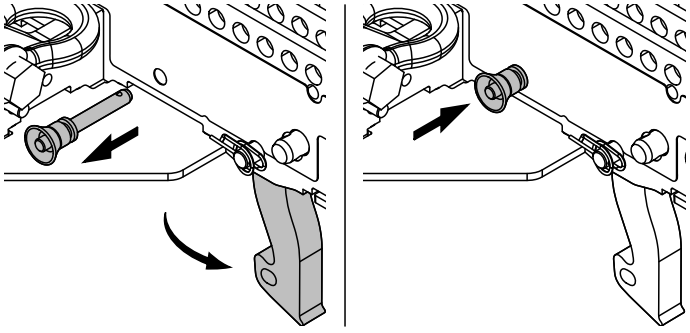
**Rear link of the frame in default position (TOP POSITION)**



**Rear link of the frame in SUB POSITION on the attached Beam extension**

**Changing the Rear link position**



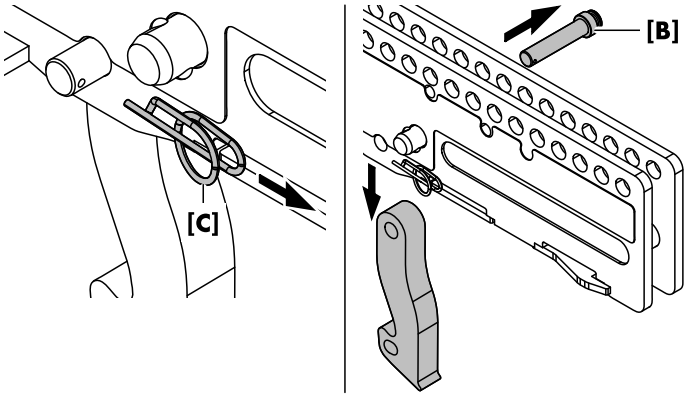
**WARNING!**
**Potential risk of personal injury and/or damage to material!**

The fixing bolt **[B]** of the frame's Rear link bears the full load of the array.

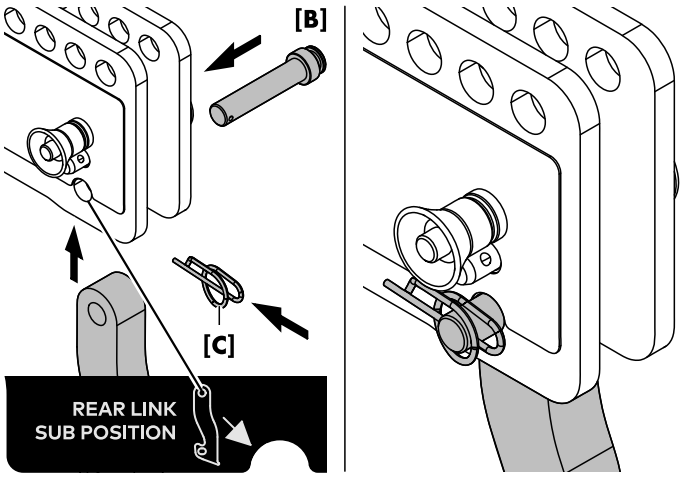
It is essential that the bolt is fitted correctly and secured by a locked ring cotter **[C]**.

Provided the Beam extension is already attached, proceed as follows:

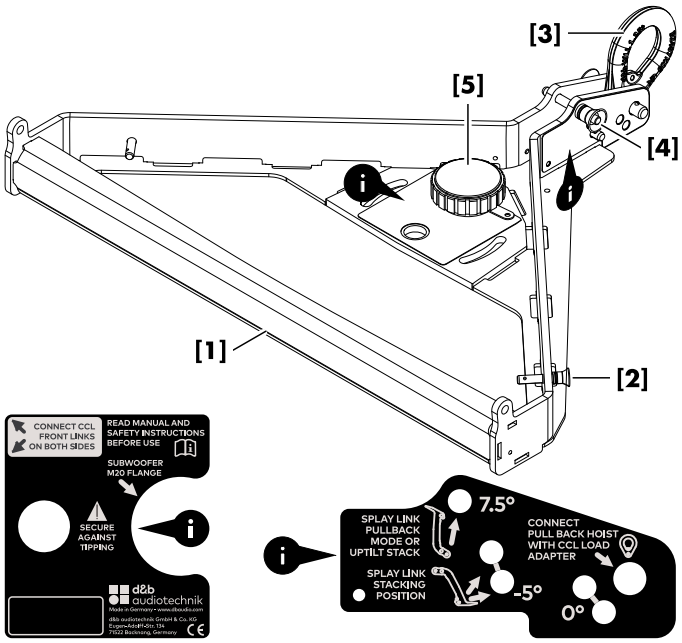
1. On the frame, release the Locking pin holding the frame's Rear link in its park position.
2. Fold out the Rear link and reinsert the Locking pin.




3. Release the ring cotter **[C]** of the fixing bolt **[B]** and remove the fixing bolt.
4. Take off the Rear link.




5. Attach the Rear link to the dedicated hole position (SUB POSITION) on the Beam extension.
6. Insert the fixing bolt.
7. Secure the fixing bolt using the ring cotter and ensure the ring cotter is properly locked.



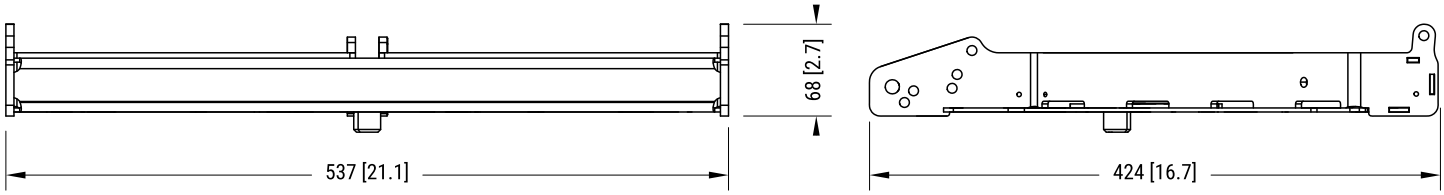

## 2.3 Z5824 CCL Pullback frame

The CCL Pullback frame is intended as a pullback device attached to the last cabinet of a pure CCL -TOP (CCL8/CCL12) array.
It can also be used as ground support or adapter frame in pure CCL-TOP or mixed CCL ground stack setups.

The Z5824 CCL Pullback frame is equipped and supplied with the following rigging components.

Please verify the shipment for completeness and proper condition of the items.

| Pos. | Component | Description |
|---|---|---|
| **[1]** | Z5824 | CCL Pullback frame (4.7 kg/10 lb). |
| **[2]** | | Two Locking pins (7 x 18 mm) front - stored in park position. |
| **[3]** | | CCL Load adapter as pullback device with corresponding Locking pin. |
| **[4]** | | Two Locking pins (7 x 32 mm):<br>▪ One pin is used to connect the frame to the Splay link of the last cabinet of a CCL-TOP array in pullback mode setup.<br>▪ Both pins are used to fix and aim the first CCL-TOP on top of a CCL-SUB cabinet in mixed ground stack setups. |
| **[5]** | | The CCL Pullback frame is also used in mixed groundstack setups to allow CCL-TOP cabinets to be deployed on top of applicable d&b subwoofers such as the CCL-SUB cabinet.<br>For this purpose, the M20 bolt **[5]** is used to fix the frame on top of the SUB cabinet in conjunction with its M20 threaded flange. |
| ⓘ | | Instruction labels providing vital safety and rigging instructions. |




**Z5824 CCL Pullback frame dimensions in mm [inch]**

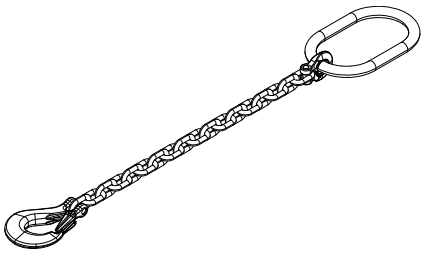
## 2.4 Lifting and safety devices

**NOTICE!**
**Inspection plate – Chains**

Hoist connector chains and safety chains are safety-relevant equipment and are subject to specific inspection and monitoring requirements.
For new chains purchased through d&b, an unmarked inspection plate is supplied.

- Deboss this inspection plate with the date of the next required periodic safety and functionality inspection relative to your first use.
- Inspect chains at defined intervals for signs of wear and tear, damage, or malfunction.
- Use the supplied inspection plate and check the inspection sheet for chain monitoring to document these inspections.
  Refer to ⇒ Chapter 14 “Care and maintenance” on page 65 for details on inspection intervals.
- Observe local regulations on specific legal monitoring or inspection requirements for chain systems. Users are responsible for obtaining information about applicable regulations in the country of use.
- Carefully read and follow all safety instructions and information provided by the chain manufacturer.

Proper initial marking and consistent documentation of inspections significantly contribute to operational safety and help reduce potential damage and liability risks.

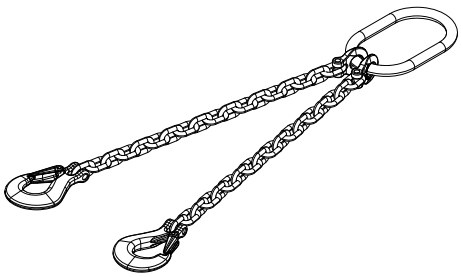


### 2.4.1 Z5832 Hoist connector chain 1.4 t

The Z5832 Hoist connector chain is used to connect the lifting motor(s) to the CCL Flying frame using the CCL Load adapter. Its length of 53 cm (21") allows enough space for the hang of most 2 t motor chain containers and avoids any impact on the vertical balance of the array when suspended from a single pickpoint.

**Specification**

| | |
|---|---|
| Lifting chain (DIN EN 818) | 1-leg, 6 mm |
| Grade | 10 |
| Nominal length incl. hook | 534 mm (21") |
| Load rating | 1.4 t (WLL) |

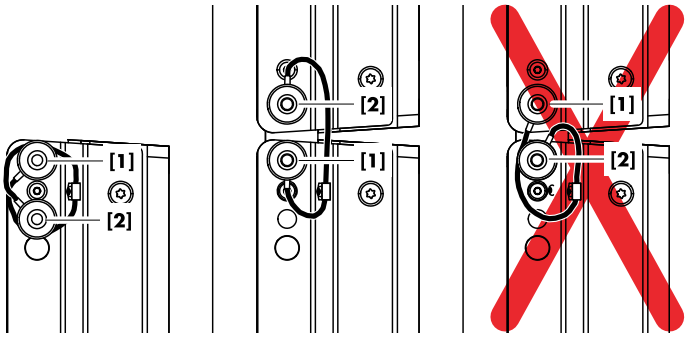


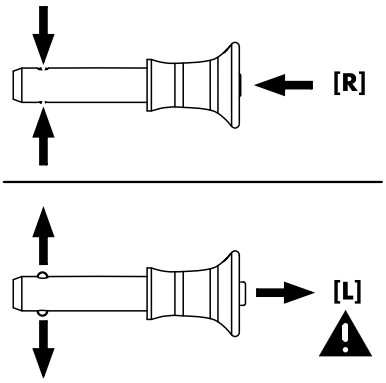
### 2.4.2 Z5831 Safety chain set 1.4 t

The Z5831 Safety chain set 1.4 t is supplied with the Flying frame and is used as a secondary safety device, if applicable. Please also refer to ⇒ Chapter 1.4 “Secondary safety” on page 6.

**Specification**

| | |
|---|---|
| Lifting chain (DIN EN 818) | 1-leg, 6 mm |
| Grade | 10 |
| Nominal length incl. hook | 534 mm (21") |
| Load rating | 1.4 t (WLL) |




## 2.5 Locking pins

**WARNING!**
**Potential risk of personal injury and/or damage to material!**

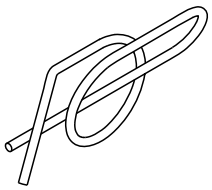
The steel wires between the Locking pins of the cabinets and rigging components are not intended to carry any load. The cabinet's weight must only be carried by the Front and Splay/Rear links in connection with the front and rear rigging strands of the loudspeaker cabinets and the Flying frame.

Please observe the following:

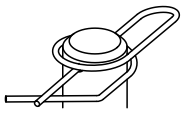
- The steel wire must run from the upper to the lower Locking pin.
- Do not cross the Locking pins to avoid twisting of the steel wires.
- Ensure all Locking pins are fully inserted and securely locked before lifting any load by briefly pulling the Locking pin towards you.

**Functionality (Quick lock mechanism)**
The quick lock mechanism applies to all types of Locking pins. Proceed as follows:

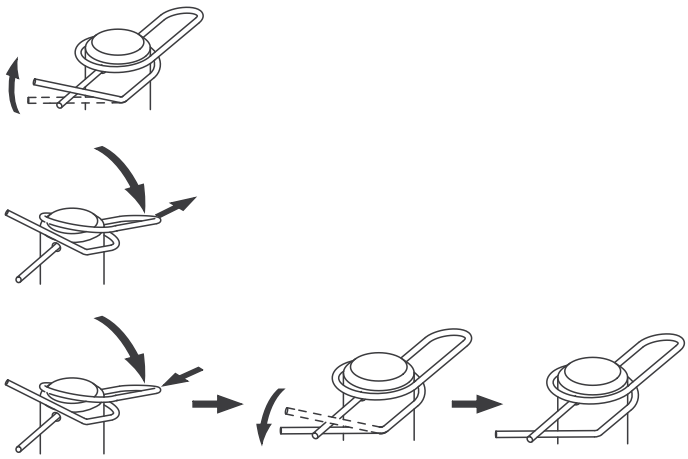
1. Press the button to **R**elease the locking mechanism (◀ **[R]**).
2. Remove the Locking pin through the respective link or socket.
3. Insert the Locking pin through the respective link or socket until it is fixed in place.
4. Release the button to **L**ock the pin (▶ **[L]**).
5. ⚠ Recheck the Locking pin is securely locked by briefly pulling the Locking pin towards you.



**Ring cotter**



**Ring cotter locked**



## 2.6 Ring cotters

In connection with the CL-Series rigging systems (CCL/CCLi), ring cotters are used ring cotters are used for the following items to prevent the respective item from slackening and/or loosening:

### Function of the ring cotter

By default, the ring cotters are "locked" to prevent them from loosening.

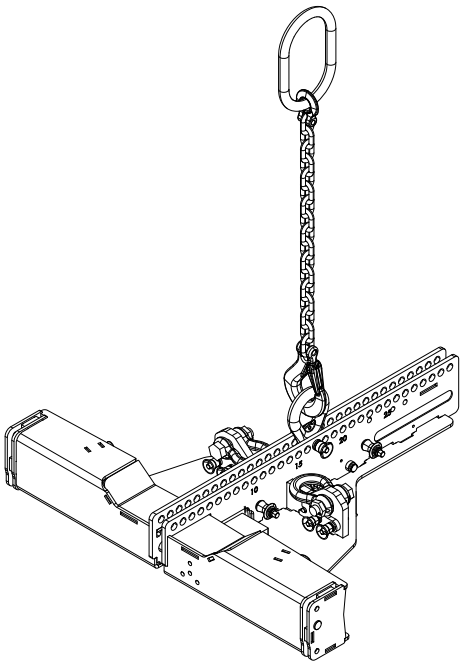
For modification reasons such as altering a position or exchanging a rigging component, it may be necessary to temporarily remove the ring cotter and reattach it afterwards.

For this purpose, proceed as follows:

1. **Unlock**
   Unlock the ring cotter by pushing up the front wire loop over the straight wire shaft.

2. **Release and remove**
   Push down the rear wire loop until the ring cotter snaps over the edge of the bolt and remove the ring cotter.

3. **Refit and lock**
   Refit the ring cotter by pushing the straight wire shaft through the hole and pressing the front wire loop underneath the straight wire shaft.



## 2.7 Suspension of the Flying frame

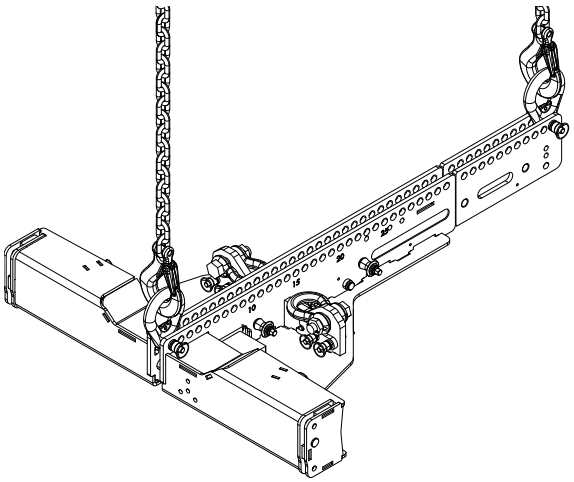
The suspension of the CCL Flying frame is performed using the center beam hole grid. This allows for either Single or Dual pick point operation. For this purpose, the corresponding enclosed CCL Load adapters are used.

### 2.7.1 Single pick point operation

With "Single pick point operation", the position of the Load adapter defines the vertical aiming of the entire array.

The corresponding hole position (one hole detent) is calculated using ArrayCalc.

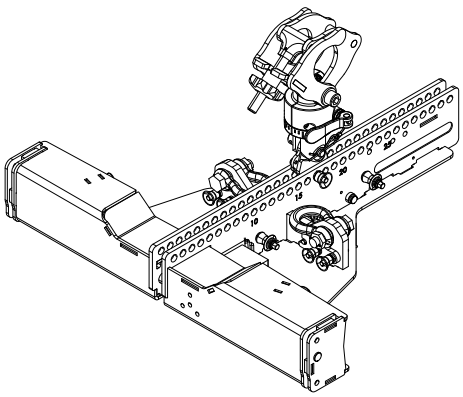
> **Note:** The target angle of the entire array is achieved when the array is fully set up, hoisted, and secured as intended.



### 2.7.2 Dual pick point operation

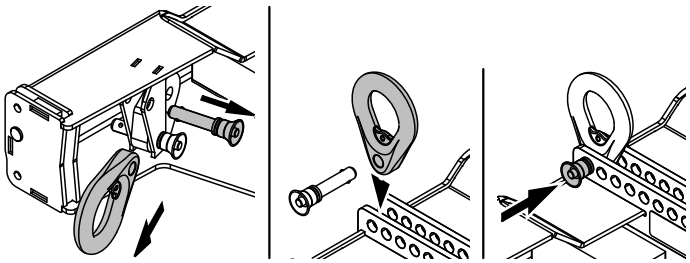
With "Dual pick point operation", the vertical aiming of the array is set by trimming the hoist motors after the array has been fully assembled and lifted to its operating position.

The corresponding hole positions are selected according to ArrayCalc.

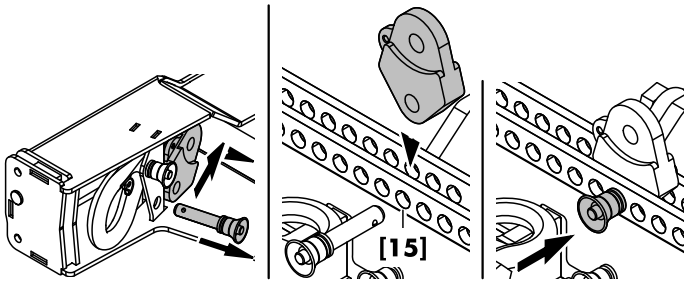


### 2.7.3 Z5147 Rota clamp option

Alternatively, a CCL array with a total system weight of up to 500 kg (1100 lb) can be suspended and horizontally aligned from a single flying point using the d&b Z5147 Rota clamp. The clamp allows the load to be attached to overhead bars or truss with a tube diameter of up to 50 mm (2″).
The corresponding hole position is calculated using ArrayCalc.








### 2.7.4 CCL Load adapter

With the CCL Flying frame two CCL Load adapters and the additional CCL Load adapter Rota clamp are provided.

**Attaching the CCL Load adapter**

1. On the frame, release the corresponding Locking pin that holds the Load adapter in its park position and take off the adapter.
2. Choose the appropriate hole position(s) on the center beam of the frame according to your ArrayCalc calculation and attach the adapter correspondingly.
3. Finally connect the hoist connector chain or motor hook to the Load adapter respectively and tension them.

**Attaching the CCL Load adapter Rota clamp**

1. On the frame, release the corresponding Locking pin holding the Load adapter in its park position and take off the adapter.
2. Choose the appropriate hole position on the center beam (e.g. hole **[15]**) of the frame according to your ArrayCalc calculation and attach the adapter correspondingly.

   **Note:** Please observe the relevant mounting instructions which are enclosed with the Rota clamp.

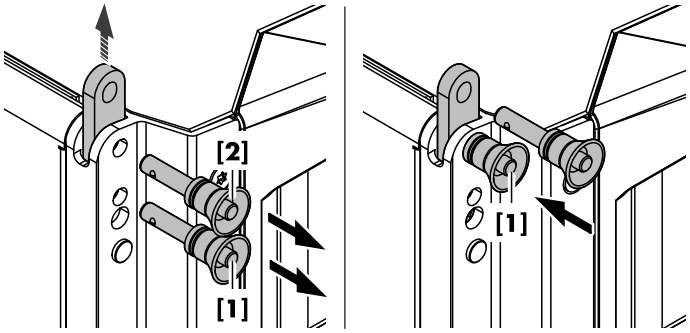
## 2.8 Cabinet rigging mechanism

The cabinets are mechanically connected to the Flying frame and subsequent loudspeakers using the Front links attached to both sides of the cabinet front and the central Splay/Rear link at the rear of the cabinet.

All necessary rigging components are mounted to the cabinet and slide out when needed.

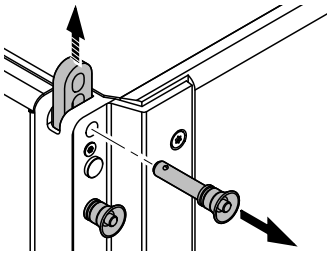
In principle, the Front link mechanism applies to both the TOP and SUB cabinets. The Front links are spring loaded and therefore extend automatically as soon as the respective Locking pins are released and pulled out.

### 2.8.1 Front link mechanism




**TOP cabinets**

1. Release both Locking pins.
   ↳ The Front link extends automatically.
2. Reinsert and lock Locking pin **[1]** to fix the Front link in place.



**SUB cabinets**

⇒ Release the upper Locking pin.
↳ The Front link extends automatically.

The Front link mechanism of the SUB cabinets provides four different settings:

1. SUB to Frame (⇒ Fig. 1).
2. SUB to SUB with 0° splay between the cabinets (⇒ Fig. 2).
3. SUB to SUB with 2.5° splay (free) between the cabinets (⇒ Fig. 3).
4. SUB to SUB with 2.5° splay (blocked) between the cabinets (⇒ Fig. 4).
   This setting is used to prevent the cabinets from folding up.

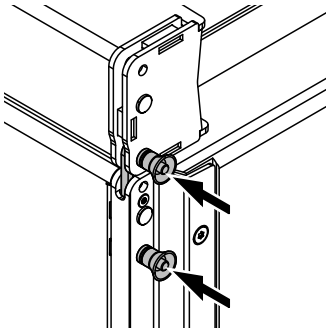


**Fig. 1: SUB to Frame**

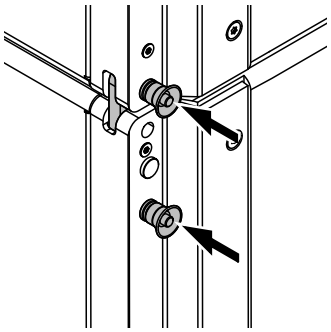


**Fig. 2: SUB to SUB 0° splay**

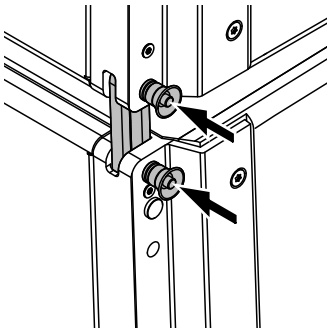


**Fig. 3: SUB to SUB 2.5° splay, free**

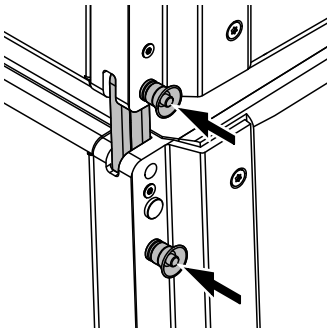
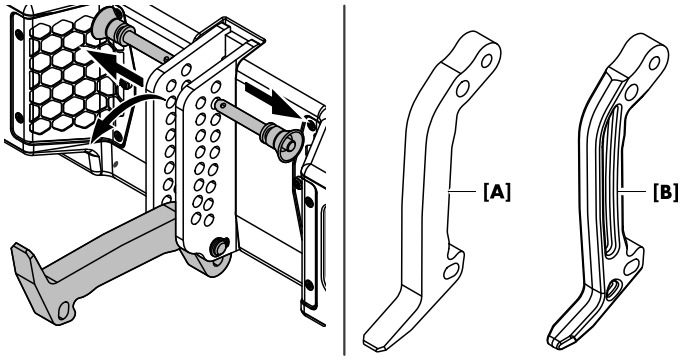


**Fig. 4: SUB to SUB 2.5° splay, blocked**

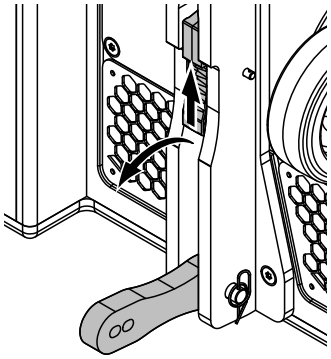



### 2.8.2 Splay/Rear link mechanism

**TOP cabinets**

On CCL-TOP cabinets, release the respective Locking pins and fold out the Splay link.

> **Note:** For CCL-TOP speakers of the first series batch, the Splay link is cut from solid steel **[A]** (high pressure water jet cut), while for the following series batches, the Splay link will be a forged variant **[B]**.
>
> As function and handling of both variants are identical, the Splay link is shown in its solid metal variant throughout this manual **[A]**.



**SUB cabinets**

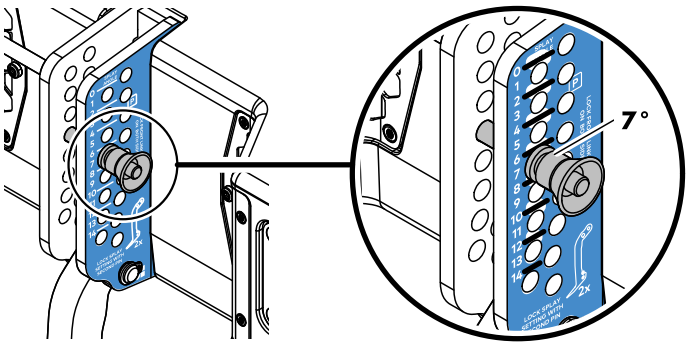
The Rear link of the CCL-SUB cabinets is fixed in its park position by a spring loaded slider mechanism.

To release the link, simply push the slider upwards.

### 2.8.3 Preset splay angles on CCL8/CCL12 cabinets

The splay angles are set on the central rear rigging strands of the cabinets and can be set in the range from 0° to 14° in 1° detends.

⇒ Insert and lock the Locking pin to the respective hole.

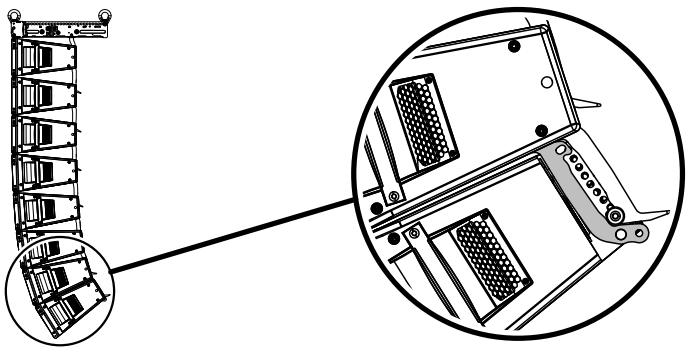


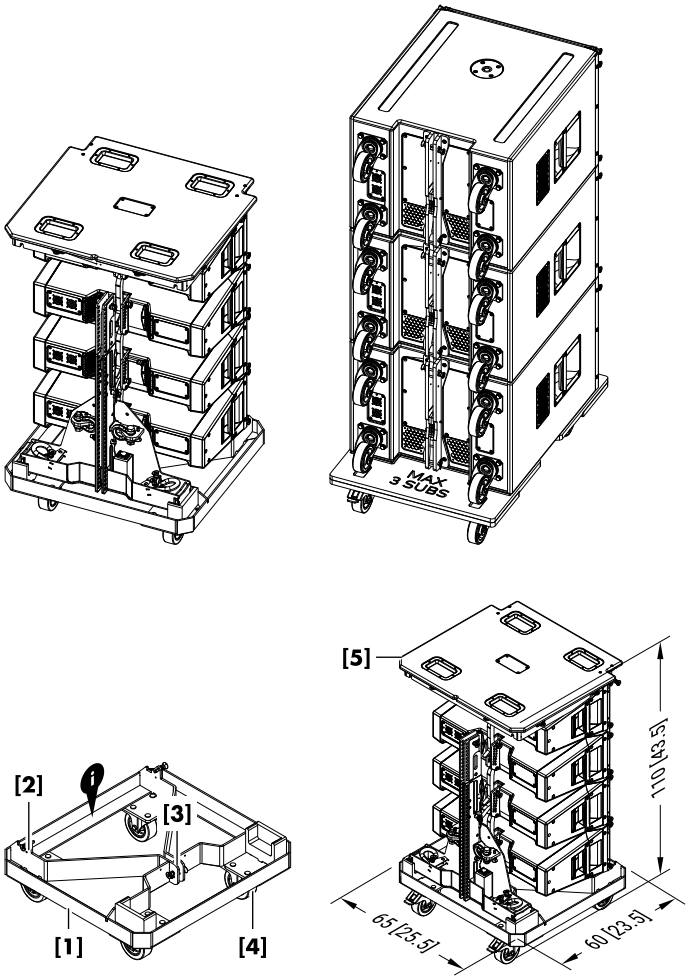

**Preset splay angle (for example 7°)**

### 2.8.4 Park position CCL8/CCL12 Splay link

The Splay link of the last cabinet of an array can be kept in its park position.

> **Note:** In this case, splay angles of 0...3° for the cabinet above are not applicable.






**E7840 Touring cart 4 x CCL8/CCL12**
Loudspeaker not included. Only shown for illustration purposes.

## 2.9 CCL Touring cart/ Wheel board

### Intended use

The d&b CCL Touring carts are an integrated part of the CCL rigging system. They serve for transport purposes as well as for setup, requiring less space on-site.

In addition, either the CCL Flying frame and its Beam extension or the CCL Pullback frame or the CCL Mounting frame top can alternatively be stored in the cart.

The CCL-SUB Wheel board is also intended as ground support for CCL-SUB ground stacks. Please refer to ⇒ Chapter 10 "Ground stack setups" on page 48.

The CCL Touring cart and Wheel board are equipped and supplied with the following components.

Please verify the shipment for completeness and proper condition of the items.

### 2.9.1 E7840 Touring cart 4 x CCL8/CCL12

**NOTICE!**
**Maximum top load: 70 kg (150 lb)**

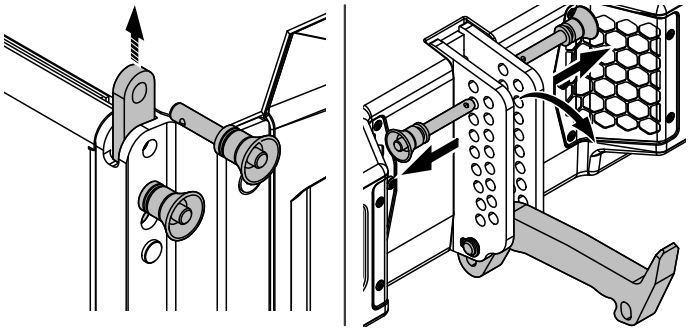
**Do not stack loaded carts!**

| Pos. | Component | Description |
|---|---|---|
| [1] | E7840* | Touring cart 4 x CCL8/CCL12.<br>*A dedicated protective soft cover (not shown) is enclosed with the touring cart.<br>**Total weight:**<br>112 kg (247 lb),<br>incl. applicable frames.<br>**Dimensions:**<br>H x W x D (cm) 110 x 65 x 60<br>H x W x D (inch) 43.5 x 25.5 x 23.5 |
| [2] | | Dedicated supports on the front left and right with 2 x Locking pins in park positions. |
| [3] | | Splay link slot incl. 2 x Locking pins. |
| [4] | | Four heavy duty wheels, two of them as brake wheels. |
| [5] | | Top lid. |
| ⓘ | | Touring cart instruction labels providing vital safety and rigging instructions. |

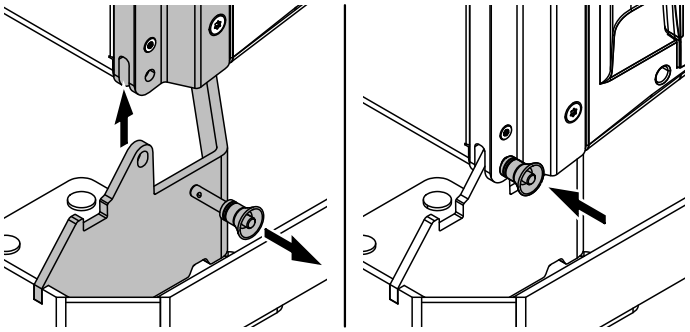
### Loading the cart



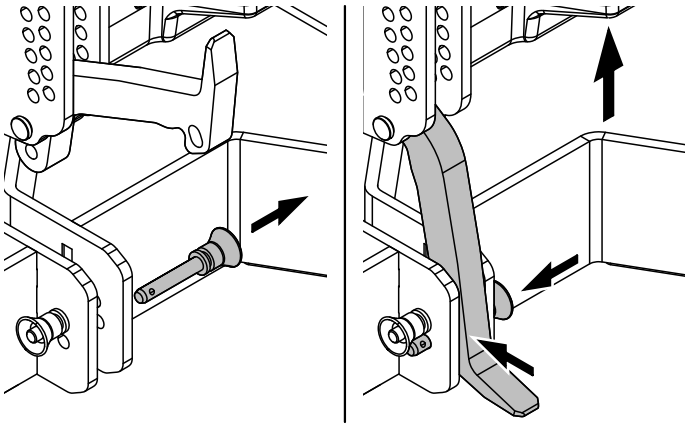

**Note:** All cabinets have to be set to **0°** splay.



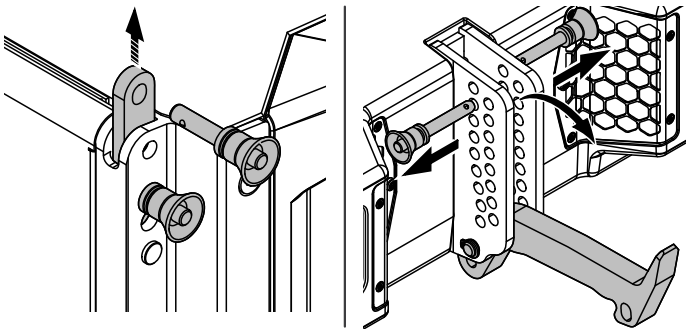
1. Extend the Front links and release the Splay link of the first cabinet.



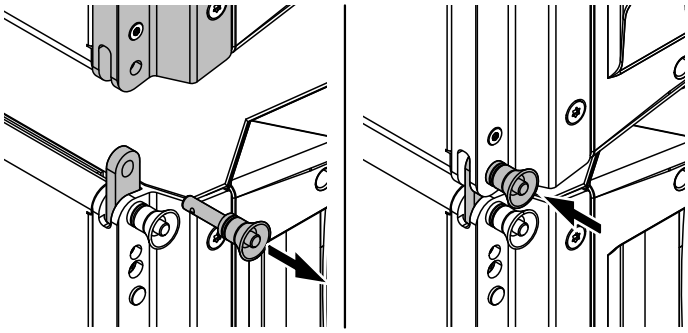
2. At the front of the cart, release the Locking pins from their park positions on both sides.
3. Attach the first cabinet to the front supports of the cart, reinsert the Locking pins on both sides and ensure both pins are fully inserted and locked.



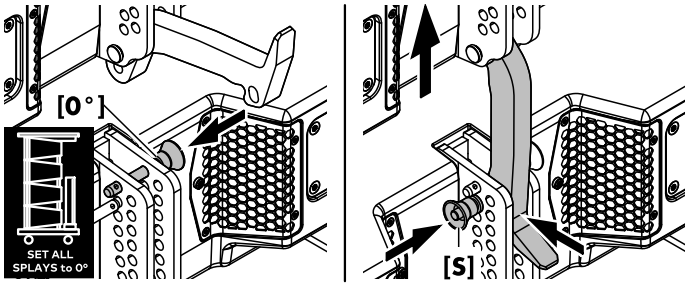
4. On the rear Splay link slot, release the bottom Locking pin.
5. Insert the Splay link into the Splay link slot.
6. Raise the back of the cabinet until the Splay link has engaged to the remaining pin and reinsert the bottom Locking pin to fix the link in place.
7. Ensure the pin is fully inserted and locked.



8. Extend the Front links and release the Splay link of the next cabinet.

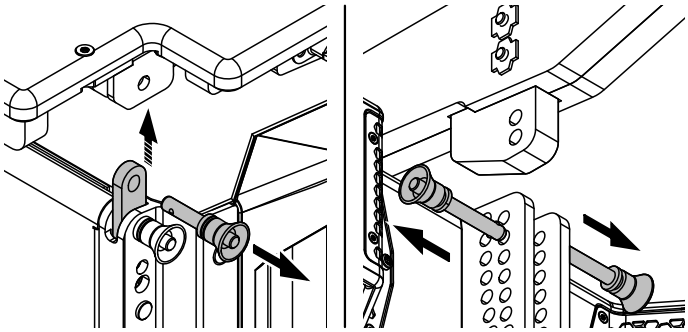


9. Attach the next cabinet to the previously extended Front links of the first cabinet, reinsert its Locking pins on both sides and ensure the pins are fully inserted and locked.

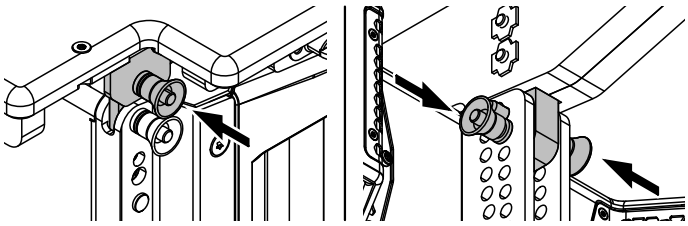



10. At the rear of the bottom cabinet, insert one Locking pin to the **[0°]** hole of the center rigging strand.
11. Fold the Splay link of the upper cabinet into the rigging strand of the bottom cabinet.
12. Raise the back of the upper cabinet until the Splay link has engaged and reinsert the second Locking pin (Safety pin **[S]**).

**Attaching the top lid**



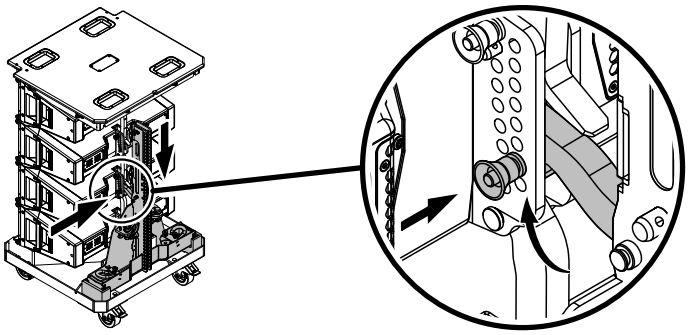
1. Extend the Front links of the last cabinet on both sides.
2. At the rear, release both Locking pins.



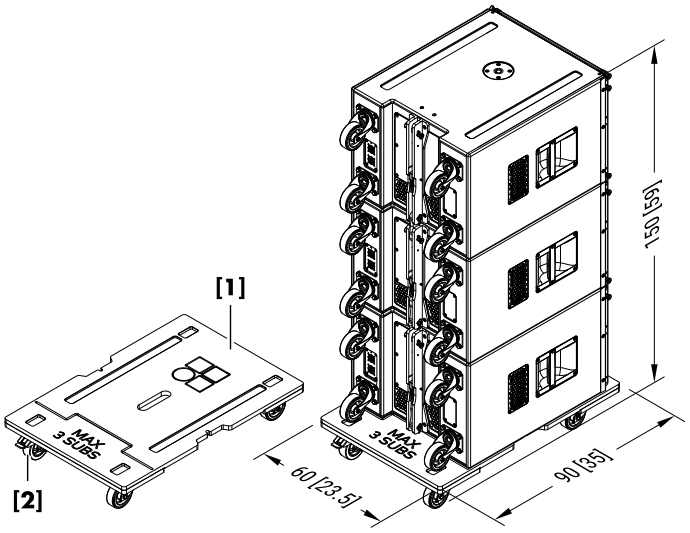
3. Attach the lid to the Front links of the cabinet, reinsert the Locking pins on both sides and ensure both pins are fully inserted and locked.
4. At the rear, reinsert both Locking pins and ensure both pins are fully inserted and locked.

**Storing the Flying frame**

During transport, the Flying frame (including its Beam extension) can be stored in the dedicated tray at the rear of the cart.
For this purpose, proceed as follows:



1. Attach the frame upside down into the tray.
2. Release its Rear link from its park position.
3. Attach the Rear link to the rear rigging strand of the second (from bottom up) cabinet.
4. Fix the Rear link using the Locking pin that holds the Rear link of the frame in its park position.




### 2.9.2 E7842 Wheel board 3 x CCL-SUB

**NOTICE!**
**Maximum load: 140 kg (310 lb)**

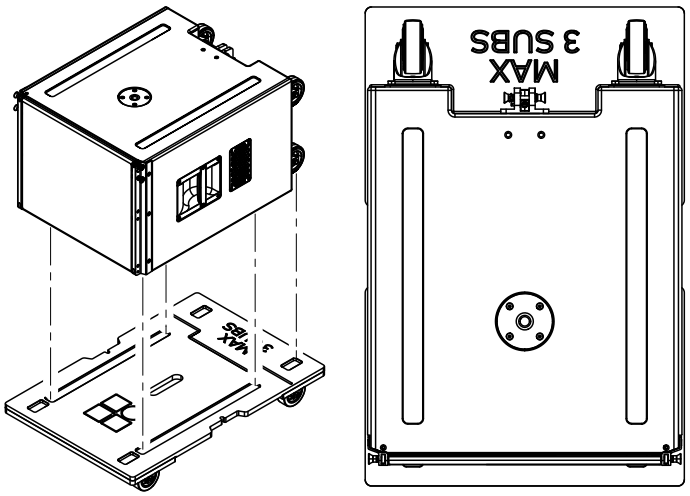
**Do not exeed the maximum load-capacity!**

| Pos. | Component | Description |
|---|---|---|
| **[1]** | E7842 | Wheel board 3 x CCL-SUB<br>**Dead weight:**<br>14.2 kg (31 lb)<br>**Total weight:**<br>148 kg (326 lb)<br>**Dimensions:**<br>H x W x D (cm): 150 x 60 x 90<br>H x W x D (inch): 59 x 23.5 x 35 |
| **[2]** | | Four heavy duty wheels, two of them as brake wheels. |

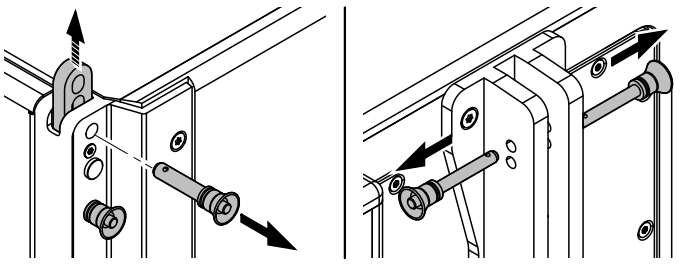
**Loading the board**

**NOTICE!**

A maximum of **3 x SUB cabinets** is allowed to be stacked onto the wheel board.




**Direction of the wheel board**

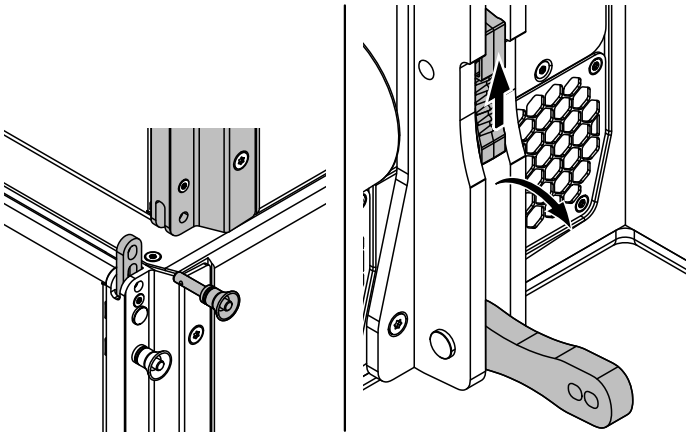


On the bottom panel of the SUB cabinets, two runners extend from the rear to the front panel.
Two correspondingly shaped recesses are incorporated in the top panel of the cabinet to accept these runners and prevent cabinet movement when stacking.
Two correspondingly shaped recesses are also incorporated in the wheel board.

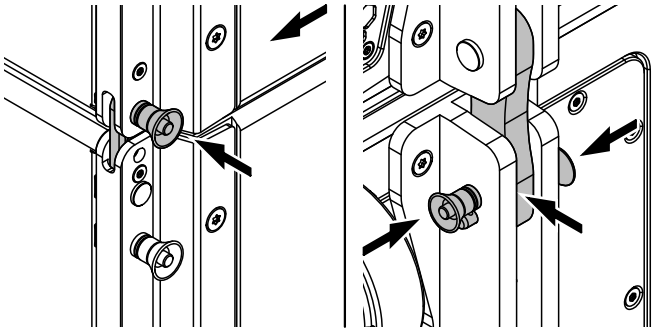
It is recommended to interconnect the SUB cabinets with their Front and Rear links.

To load the board, simply stack the cabinets onto the board as follows:

1. Stack the first cabinet onto the wheel board.
   ↳ Observe the direction of the wheel board as shown in the graphic opposite.
2. Extend the Front links and at the rear, release the Locking pins of the first cabinet.



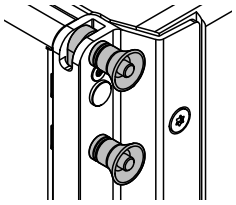
3. Stack the next cabinet onto the top panel of the first cabinet.
4. On the upper cabinet, release the Rear link.



5. Move the upper cabinet towards the front until the Front links of the lower cabinet fit into the slots at the front of the upper cabinet.
6. Reinsert the Locking pins of the Front links on both sides and both Locking pins at the rear and ensure both pins are fully inserted and locked.
7. At the rear, insert the Rear link of the upper cabinet into the rear rigging strand of the bottom cabinet.
8. Reinsert the Locking pins and ensure both pins are fully inserted and locked.

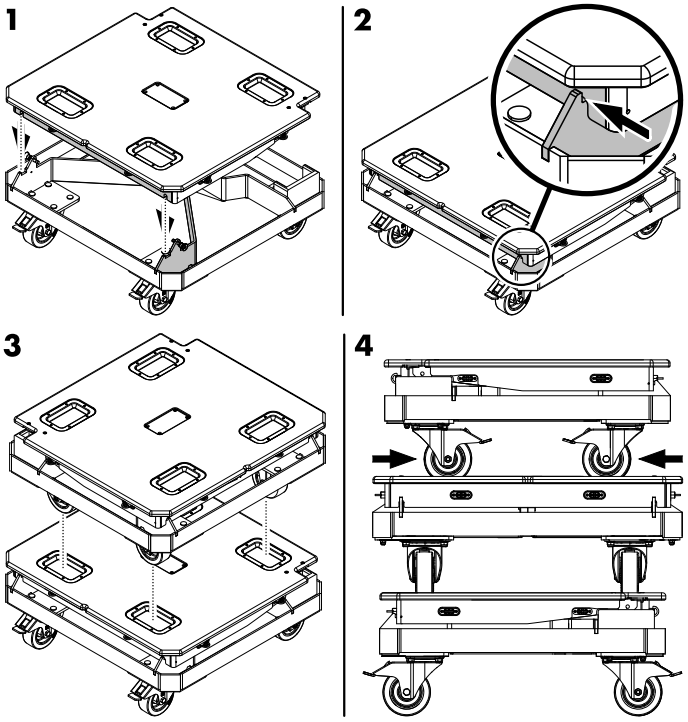
To add the third cabinet, proceed in the same manner until the assembly is completed.

**Front links of the last (uppermost) cabinet**



**NOTICE!**
**Potential risk of damage to the rigging components.**

To avoid any damage to the Front links of the uppermost cabinet of the assembly, ensure its Front links are kept in their park positions on both sides.



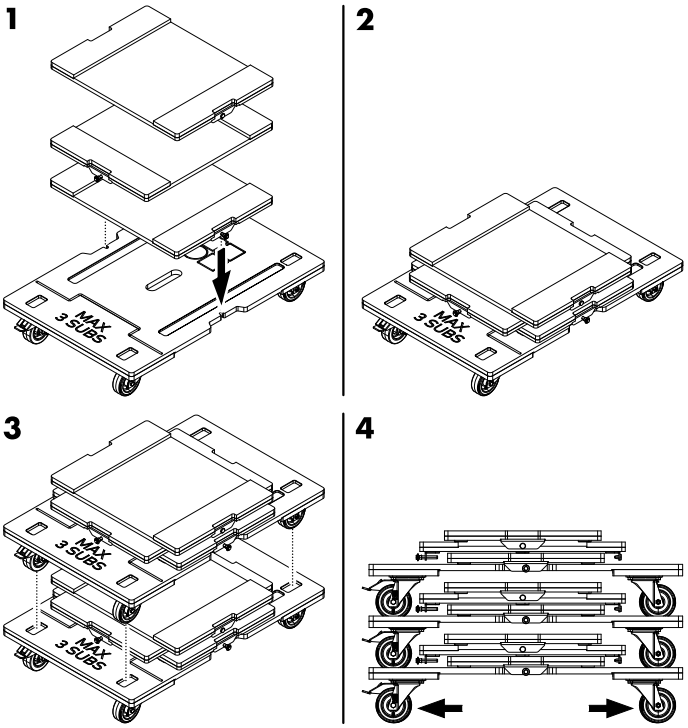

### 2.9.3 Temporary storage

**Touring cart**

Once the assemblies are set up, the touring carts can be packed and stacked for temporary storage.

The top lid of the cart can be stored in the cart tray itself.
For this purpose, proceed as follows:

1. Rotate the top lid through 180° as shown in the graphic opposite.
2. Attach the lid to the cart until the two recesses of the lip located underneath the lid fit into the dedicated slots on the cart tray.
3. Once the lid is attached, the next cart packages can be stacked on top by alternately rotating the packages through 90°.
4. Make sure that the wheels are turned towards the inside.

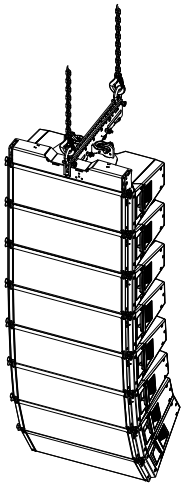



**Wheel board and Transport lids**

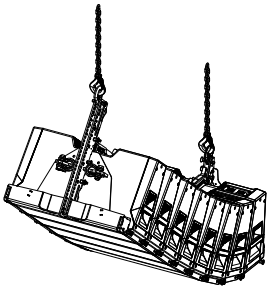
Once the assemblies are set up, the wheel boards together with the E7843 CCL-SUB Transport lid can be packed and stacked for temporary storage.

For this purpose, up to three transport lids are attached to the wheel board.
Proceed as follows:

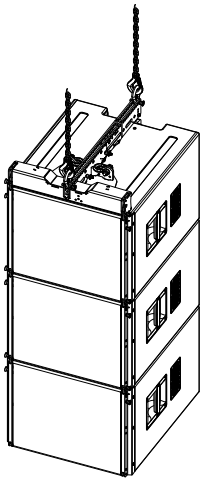
1. Rotate the first transport lid through 90° as shown in the graphic opposite.
2. Attach the next two lids by alternately rotating them through 90°.
3. Once the lids are attached, the next board package can be stacked on top.
4. Make sure that the wheels are turned towards the outside.



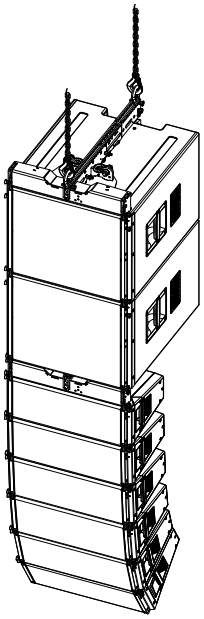
**CCL8/CCL12 Line array 8-deep**
Refer to:
⇒ Chapter 5 “CCL8/CCL12 array assembly” on page 29.



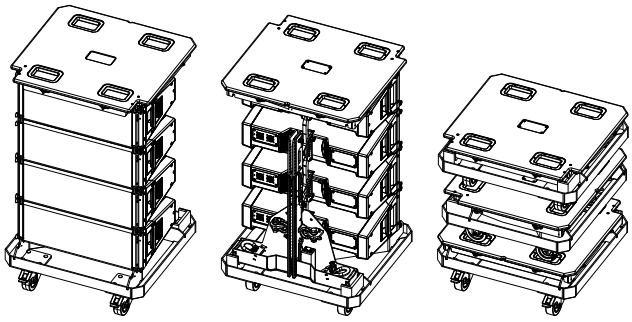
**CCL8/CCL12 Line array 8-deep, Pullback mode setup**
Refer to:
⇒ Chapter 6 “Pullback mode setup” on page 31.



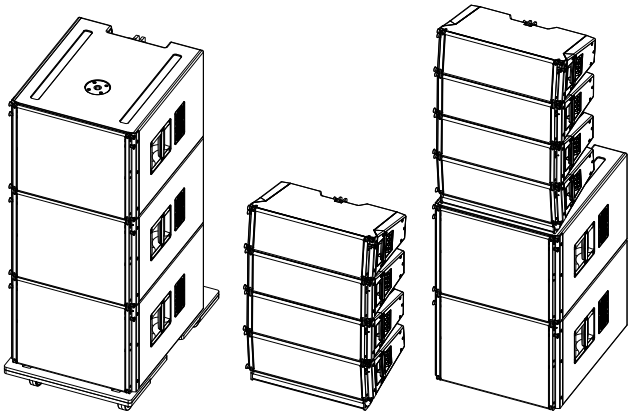
**CCL-SUB Column**
Refer to:
⇒ Chapter 7 “ CCL-SUB Column” on page 33.



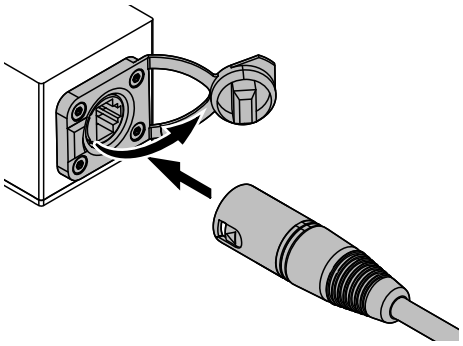
**Mixed CCL array configuration**
Refer to:
⇒ Chapter 8 “ Mixed array setup” on page 37.



**CCL Touring cart setup**
Refer to:
⇒ Chapter 9 “CCL Touring cart setup - The cart race” on page 41.



**CCL-SUB Ground stack setups**
Refer to:
⇒ Chapter 10 “Ground stack setups” on page 48.



## 4.1 Setup preparations

**Notes**

- It is assumed that the Touring carts are appropriately loaded and the Flying frame is already attached as described in ⇒ Chapter 2.9 “CCL Touring cart/ Wheel board” on page 21.
- The following rigging procedures describe the individual setup, cabinet by cabinet.
  For rigging directly from the touring cart, follow the procedures described in ⇒ Chapter 9 “CCL Touring cart setup - The cart race” on page 41.

**Preparatory steps**

Check the acoustical and mechanical setup using ArrayCalc and prepare enough printouts for each array. Alternatively, the ArrayCalc Viewer App can be used for this purpose.

The plan enables the riggers to set up the suspension points, the securing points, and the chain hoists.

**When on site, first:**

- Clear the working areas and ensure there is enough space to set up and lift the array.
- Check that the hoists are exactly in the specified position.
- Ensure the chains are not twisted.

**Inspections before setup**

Before setting up the array, carry out a visual inspection of all system components for faults. This also includes the loudspeakers and in particular the rigging parts of the cabinets (Front and Splay/Rear links).
Damaged components must be withdrawn from use immediately.

Please also follow the instructions given in ⇒ Chapter 14 “Care and maintenance” on page 65.

### 4.1.1 Connecting the d&b ArraySight sender unit



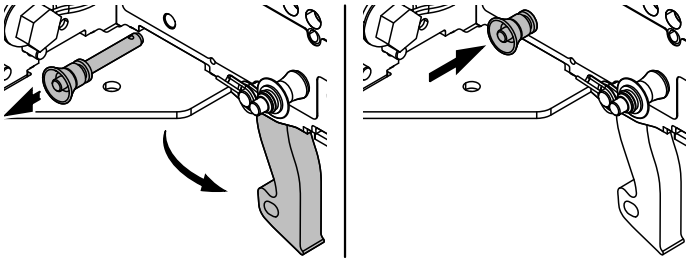
**WARNING!**
**Potential risk of personal injury!**

Please observe the safety instructions provided in the ArraySight manual.

If in use (applicable), proceed as follows:

⇒ Connect the ArraySight sender unit using the enclosed d&b K6006.200.00 CAT5e 1:1 cable (or an appropriate similar cable) and perform a basic test of the laser unit.

↳ For detailed information on the d&b ArraySight laser inclinometer system, please refer to the ArraySight manual.

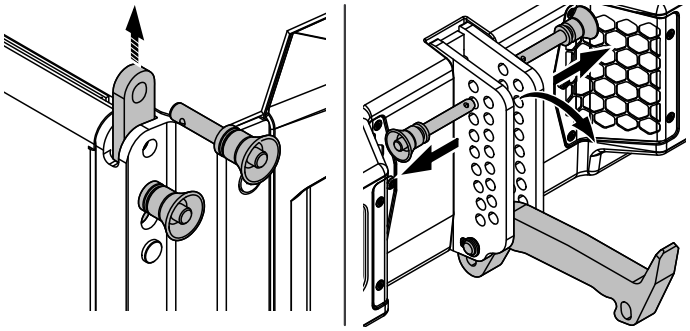


**1. Suspend the Flying frame**

1. Suspend the Flying frame according to your onsite requirements.
2. Lift the frame to a suitable working height.

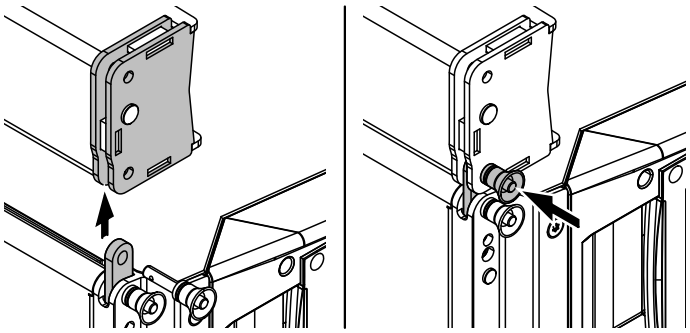
**2. Prepare the Flying frame**

1. On the Flying frame, release the Locking pin that holds the Rear link in its park position to release the Rear link.
2. Reinsert the Locking pin to the frame.



**3. Prepare the first cabinet**

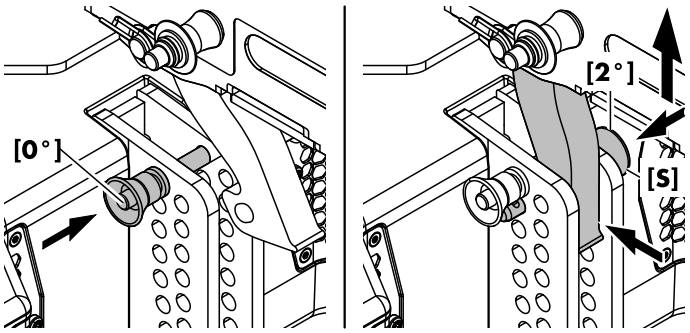
⇒ Extend the Front links and release the Splay link of the first cabinet.



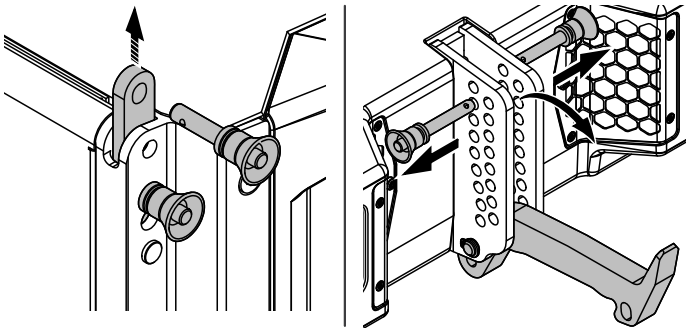
**4. Attach the Flying frame to the first cabinet**

To attach the frame to the first cabinet, proceed as follows:

1. Lower the frame onto the cabinet until the Front links of the cabinet fit into the slots at the front of the frame's tie bar on both sides.
2. Insert the Locking pins to the frame on both sides and ensure both pins are fully inserted and locked.

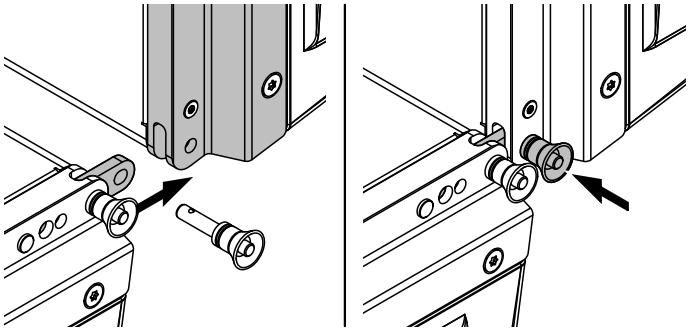



3. At the rear, insert the first Locking pin into the **[0°]** hole.
4. Insert the second Locking pin (Safety pin **[S]**) into the hole below (**[2°]** hole) and ensure both pins are fully inserted and locked.

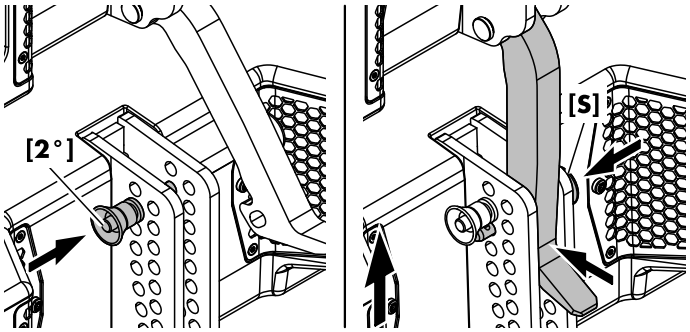


### 5. Add the next TOP cabinet

1. Extend the Front links and release the Splay link of the next cabinet.

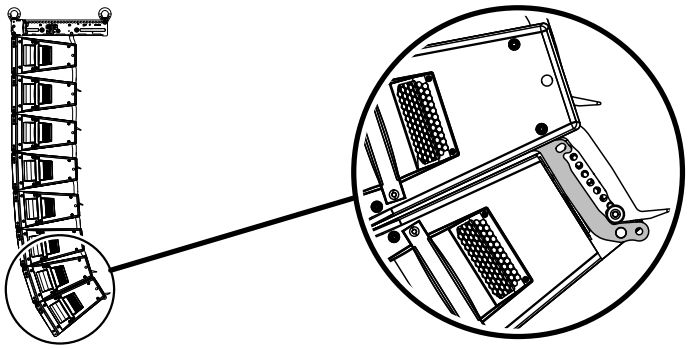


2. With the front grill facing upwards, attach the front links of the prepared cabinet to the corresponding slots at the front of the upper cabinet on both sides.
3. Insert the Locking pins to the upper cabinet's front rigging strands on both sides and ensure both pins are fully inserted and locked.




4. On the second cabinet, preset the desired splay angle (e.g. **[2°]**).
5. Raise the bottom cabinet until the Splay link of the upper cabinet has engaged into the preset Locking pin of the bottom cabinet.
6. Insert the second Locking pin (Safety pin **[S]**) and ensure both pins are fully inserted and locked.

To add further cabinets, proceed in the same manner until the assembly is completed.



### 6. Splay link of the last TOP cabinet

The Splay link of the last cabinet of an array can be kept in its park position.

> **Note:** In this case, splay angles of 0...3° for the cabinet above are not applicable.

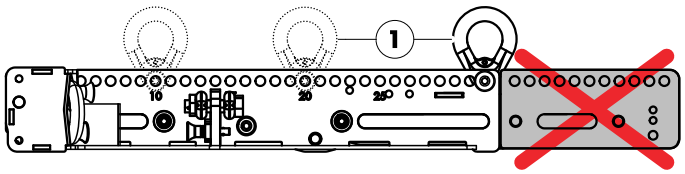
### 7. Check the assembly

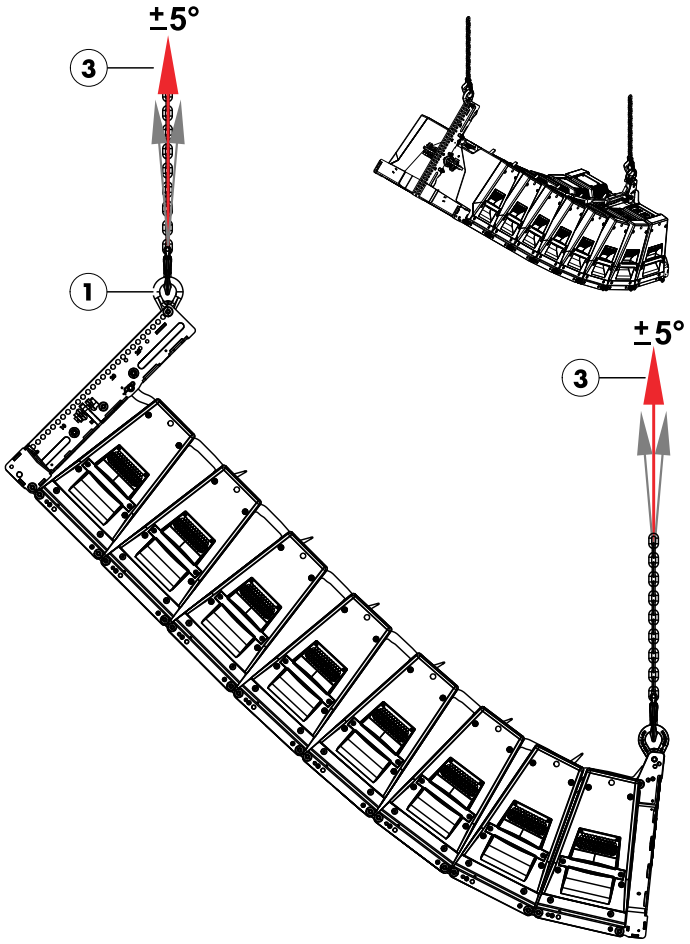
Before hoisting the array to its operating position, recheck the actual status of the entire assembly according to the check list given in ⇒ Chapter 11 “Safety and system checks” on page 61.

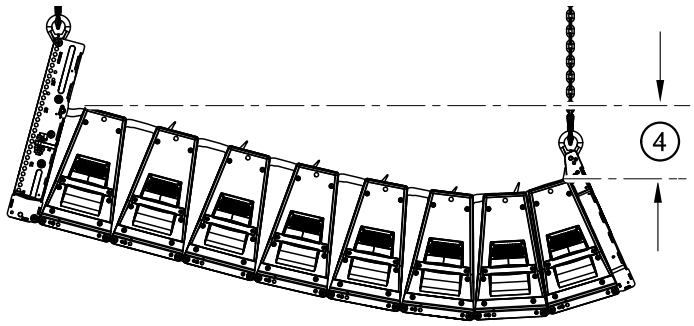
### 8. Rig the cabling

Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.




## 6.1 Specifications and recommendations

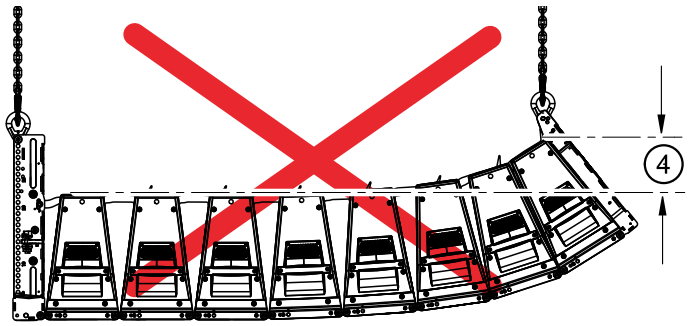
**NOTICE!**
**Load safety information**

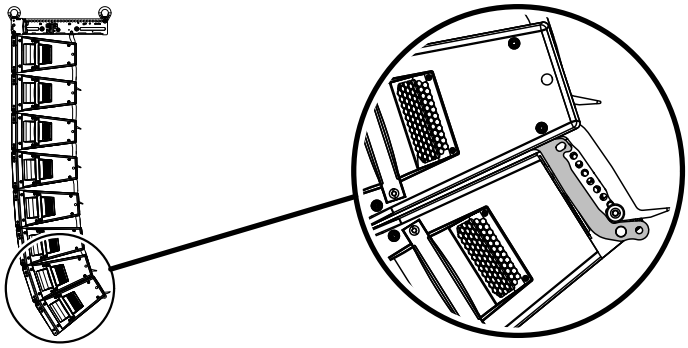
Only CCL-TOP cabinets can be deployed with any splay angle combination and any total vertical inclination of the entire array using an additional pullback point at the bottom of the array, as long as the conditions described below are met.

For this purpose, the d&b Z5824 CCL Pullback frame is used.

On the Flying frame, the **Beam extension must not be used** in Pullback mode setup.

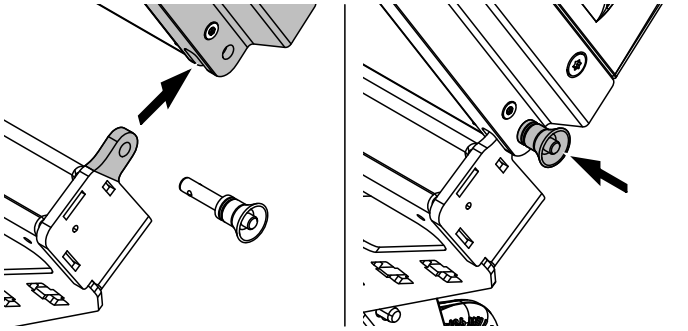
1. The array is suspended directly from the center beam of the CCL Flying frame using one of the frame's Load adapters. Any hole of the hole grid may be used for this purpose. The graphic shows an example of the suspension directly from the rear pick point of the frame.
   ↳ This ensures a maximum angle range between the array and the hoist chain without any hooks or shackles touching the frame, something which could cause unsafe load conditions for these components.
2. In ArrayCalc, select the «**flown pullback**» mounting method.
   ↳ ArrayCalc calculates the load conditions and force direction of each individual connection. Based on these results, the actual resulting angles are chosen depending on the force direction of each interconnection.
3. The hoist connector and pullback chain must always lift the array straight upwards (⇒ max. diagonal pull: **±5°**).
4. The height of the first cabinet must always be greater than the height of the last cabinet.



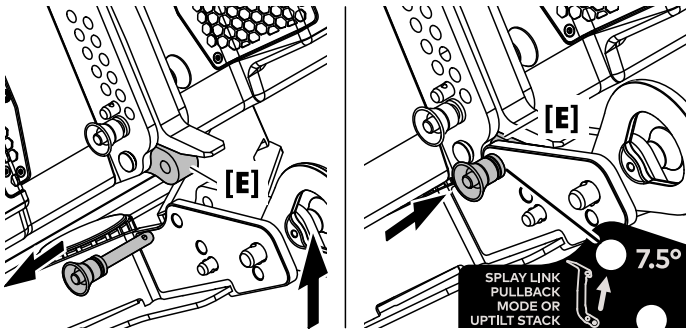


### 6.2 Attaching the Pullback frame

The pullback frame is attached on the bottom cabinet, while the Splay link of the cabinet must be in its park position (fully folded in).



1. Lift the assembly to a suitable working height.
2. Attach the frame to the lowest cabinet until its front links fit into the slots at the front of the cabinet on both sides.
3. Insert the frame's Locking pins to the cabinet on both sides and ensure the pins are fully inserted and locked.
4. Swing the frame towards the rear.




5. At the rear of the frame, release one Locking pin.
6. Slightly lift the frame until the eyelet **[E]** of the cabinet's Splay link fits into the slot of the frame and is aligned with the **7.5°** hole.
7. Reinsert the Locking pin and ensure the pin is fully inserted and locked.

## 7.1 Limitations

**NOTICE!**

A maximum of 10 x CCL-SUB cabinets is allowed to be suspended, including all rigging components.

## 7.2 SUB column setup

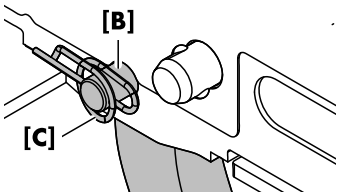
### 1. Prepare the Flying frame

For this type of setup, the Beam extension of the Flying frame has to be attached to its REAR POSITION and the frame's Rear link has to be attached to the SUB POSITION on the Beam extension

### Attaching the Beam extension to REAR POSITION

1. On the Flying frame, release the corresponding Locking pin.
2. Fully insert the Beam extension into the rear slot of the frame.
3. Reinsert the Locking pin on the frame.

### Changing the Rear link position

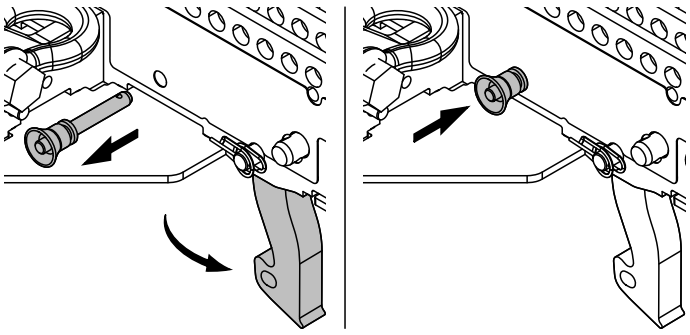



**WARNING!**
**Potential risk of personal injury and/or damage to material!**

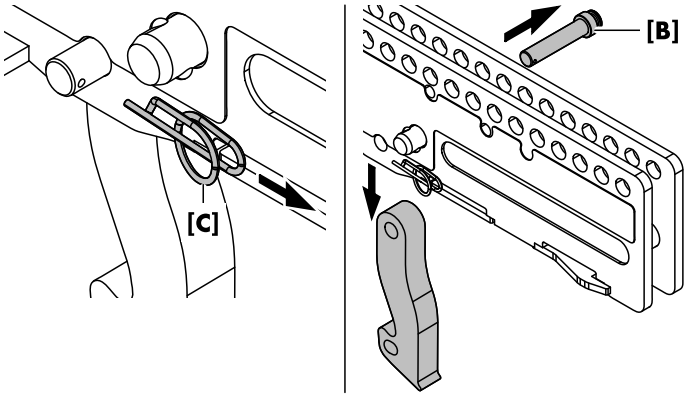
The fixing bolt **[B]** of the frame's Rear link bears the full load of the array.

It is essential that the bolt is fitted correctly and secured by a locked ring cotter **[C]**.

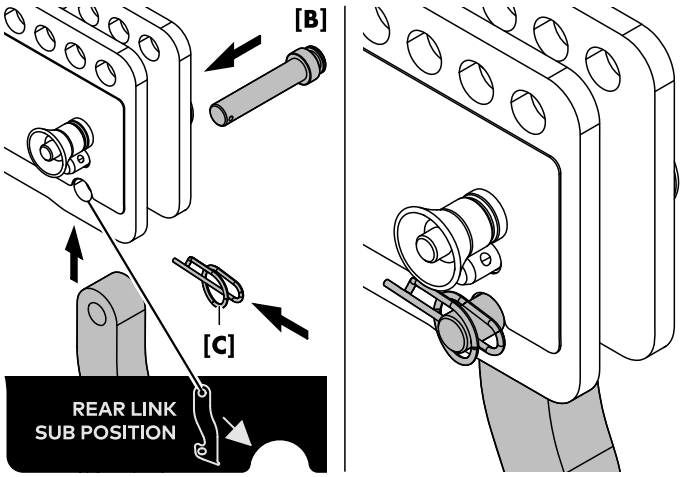
Provided the Beam extension is already attached, proceed as follows:



1. On the frame, release the Locking pin holding the frame's Rear link in its park position.
2. Fold out the Rear link and reinsert the Locking pin.




3. Release the ring cotter **[C]** of the fixing bolt **[B]** and remove the fixing bolt.
4. Take off the Rear link.



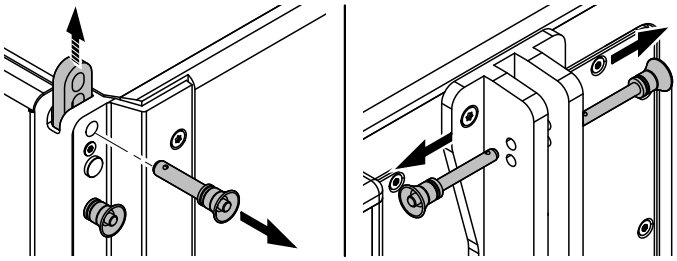

5. Attach the Rear link to the dedicated hole position (SUB POSITION) on the Beam extension.
6. Insert the fixing bolt.
7. Secure the fixing bolt using the ring cotter and ensure the ring cotter is properly locked.

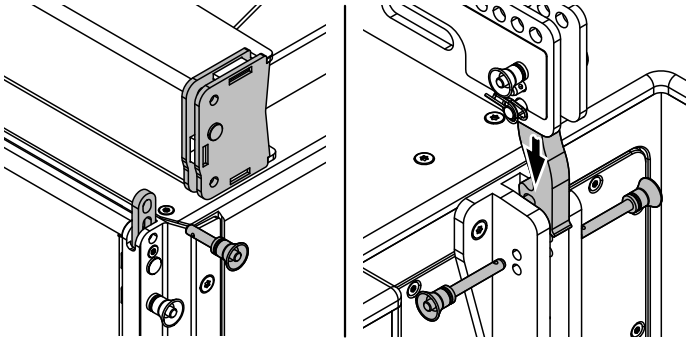
**2. Suspend the Flying frame**

1. Suspend the Flying frame according to your onsite requirements.
2. Lift the frame to a suitable working height.

**3. Prepare the first cabinet**

Extend the Front links and at the rear, release the upper Locking pins of the first cabinet.

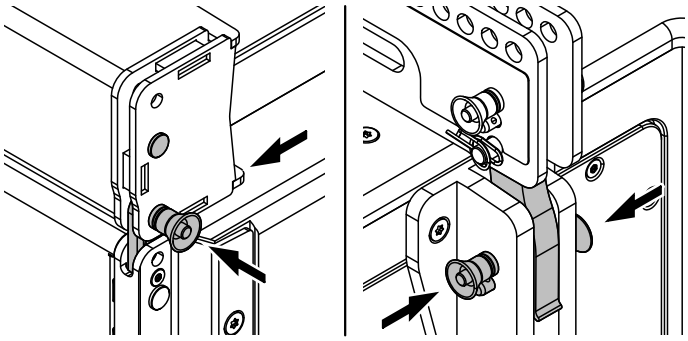




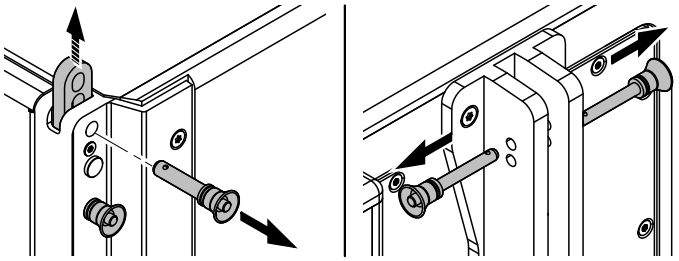
**4. Attach the Flying frame to the first SUB cabinet**

To attach the frame onto the first cabinet, proceed as follows:

1. Attach the frame onto the top panel of the cabinet.

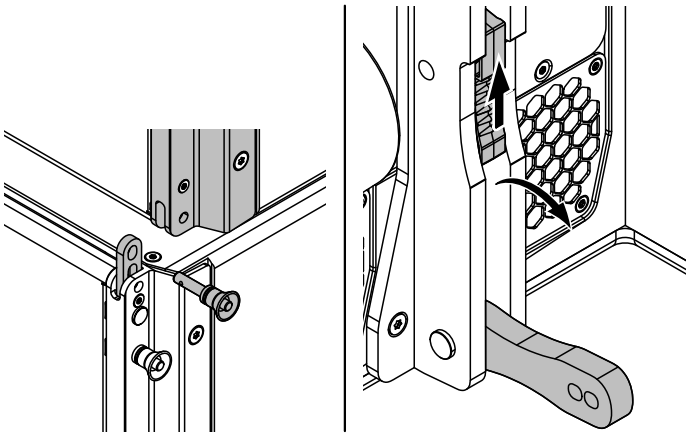


2. Move the frame towards the front until the Front links of the cabinet fit into the slots at the front of the frame and the Rear link of the frame fits into the rear rigging strand of the cabinet.
3. Reinsert the Locking pins of the Front links on both sides and ensure both pins are fully inserted and locked.
4. At the rear, reinsert the Locking pins and ensure both pins are fully inserted and locked.

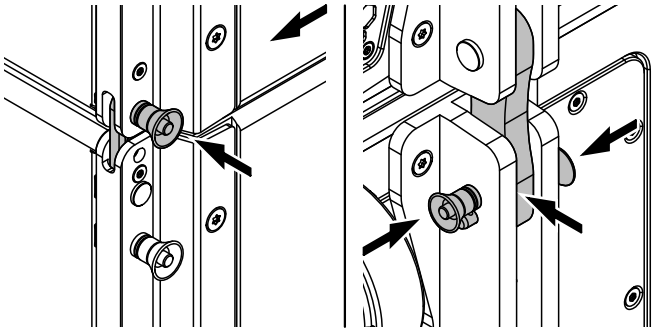


**5. Add further SUB cabinets**

1. Lift the first SUB cabinet to a suitable working height and position the next SUB cabinet underneath.
2. Extend the Front links and at the rear, release the upper Locking pins of the next cabinet.



3. Lower the assembly onto the bottom cabinet.
4. On the upper cabinet, release the Rear link.



5. Move the upper cabinet towards the front until the Front links of the bottom cabinet fit into the slots at the front of the upper cabinet
6. Reinsert the Locking pins of the Front links on both sides and both Locking pins at the rear and ensure both pins are fully inserted and locked.
7. At the rear, insert the Rear link of the upper cabinet into the rear rigging strand of the bottom cabinet.
8. Reinsert the Locking pins and ensure both pins are fully inserted and locked.

To add further cabinets, proceed in the same manner until the assembly is completed.

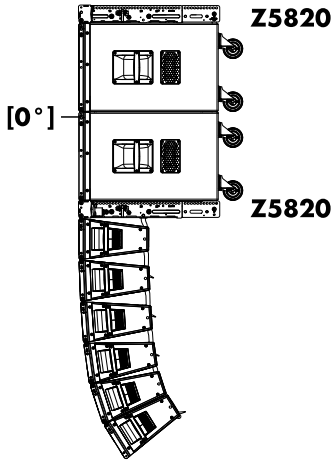
**6. Check the assembly**

Before hoisting the array to its operating position, recheck the actual status of the entire assembly according to the check list given in ⇒ Chapter 11 "Safety and system checks" on page 61.

**7. Rig the cabling**

Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.




## 8.1 Remarks and limitations

**NOTICE!**

For a mixed setup, the Z5820 CCL Flying frame is used as a suspension device while a second CCL Flying frame is additionally required as adapter frame between SUB and TOP cabinets.

The CCL Flying frame allows mixed array configurations with a maximum total system weight of 500 kg (1100 lb) - SWL including all rigging components.

The SUB cabinets must always be interconnected with **0°** splay. Please also refer to ⇒ Chapter 2.8.1 "Front link mechanism" on page 19.

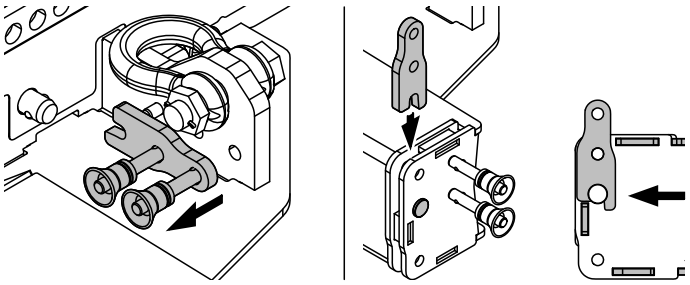
## 8.2 Preparing the second Flying frame

### Attaching the Beam extension to REAR POSITION

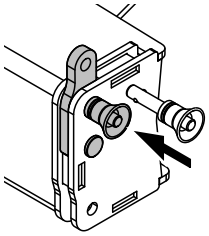
1. On the Flying frame, release the corresponding Locking pin.
2. Fully insert the Beam extension into the rear slot of the frame.
3. Reinsert the Locking pin on the frame.

### Additional Front links

To allow the Flying frame to be mounted underneath SUB cabinets in a mixed array configuration, two additional Front links together with corresponding Locking pins are enclosed with the Flying frame.



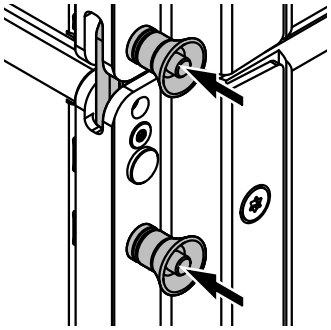
1. Release the Locking pins and take off the Front links from their park position.
2. Insert the Front links to the corresponding slots on the front tie bar of the frame on both sides.
   ↳ Observe the direction of the Front links as shown in the graphic opposite.
3. Finally insert one Locking pin to fix the Front link in place and ensure the pin is fully inserted and locked.
   ↳ The second Locking pin is used to fix the frame to the front rigging strand of the SUB cabinet.



## 8.3 Order of assembly

The assembly of a mixed array configuration is divided into the following three main procedures:

1. Suspending the desired number of SUB cabinets.
2. Attaching the adapter frame.
3. Attaching the TOP cabinets.

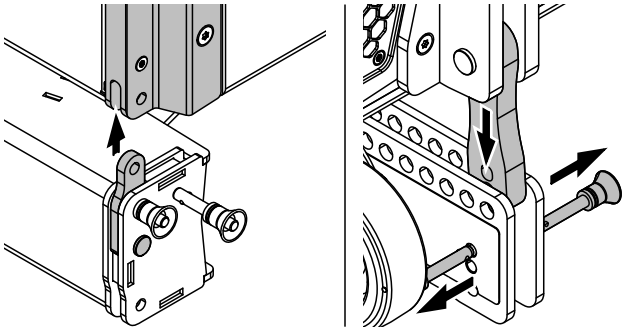


### 1. Set up the SUB assembly

**NOTICE!**

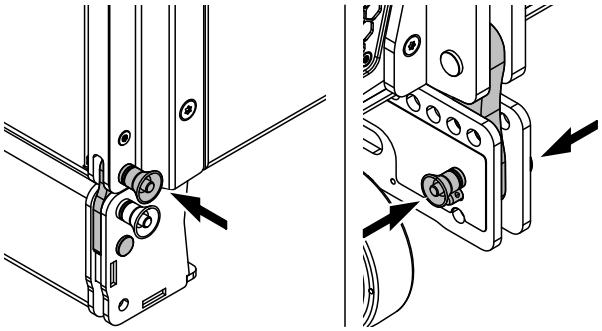
In connection with a mixed array configuration with SUB cabinets at the top of the array, subsequent SUB cabinets must always be connected with **0°** splay.

Setting up the SUB assembly is performed in the same manner as described in ⇒ Chapter 7 " CCL-SUB Column" on page 33.



### 2. Attach the Flying frame underneath SUB cabinet

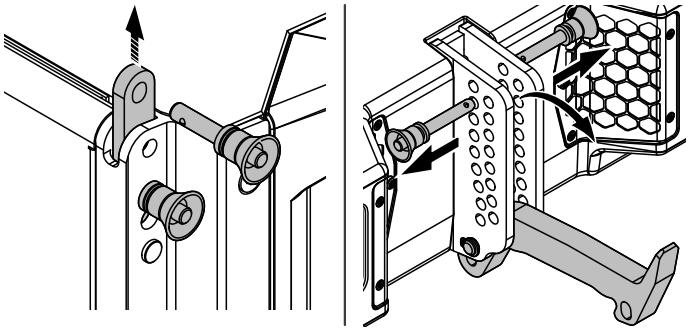
1. Attach the frame underneath the SUB cabinet until the additional Front links of the frame fit into the slots on the front rigging strands of the cabinet.
2. At the rear, release both Locking pins of the Beam extension and align the Rear link of the SUB cabinet.



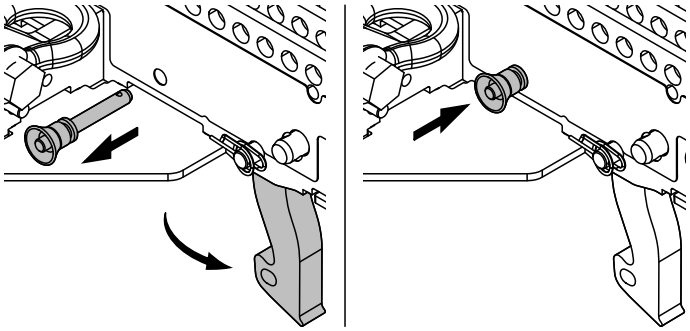
3. At the front, reinsert the Locking pins on both sides and ensure both pins are fully inserted and locked.
4. At the rear, reinsert both Locking pins on the Beam extension and ensure both pins are fully inserted and locked.

### 3. Attach the first TOP cabinet to the Flying frame

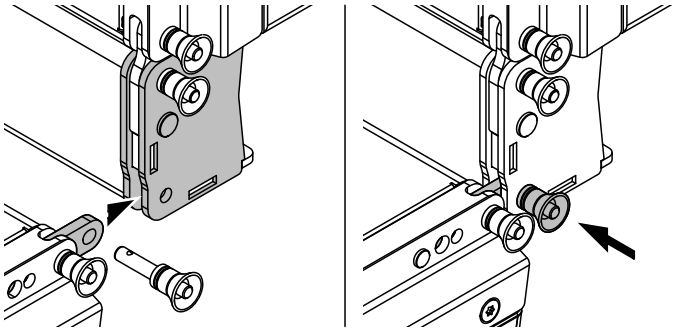
To attach the first cabinet to the frame, proceed as follows:



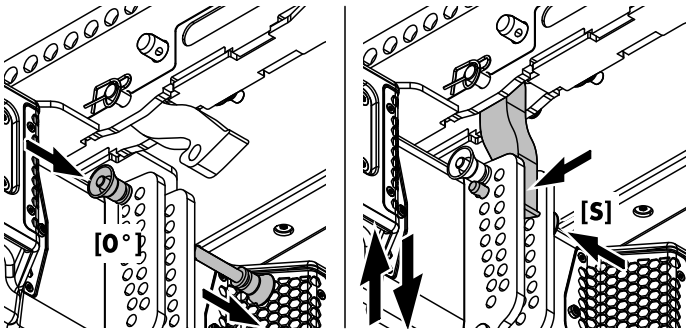
1. Lift the assembly to a suitable working height.
2. Extend the Front links and release the Splay link of the first cabinet.



3. On the frame, release the Locking pin that holds the frame's Rear link in its park position.
4. Fold out the Rear link and reinsert the Locking pin.

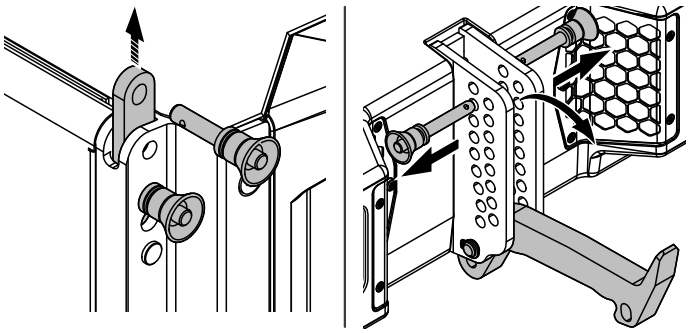


5. With the front grill facing upwards, attach the front links of the prepared cabinet to the corresponding slots at the front of the frame on both sides.
6. Insert the Locking pins to the frame's front slots on both sides and ensure both pins are fully inserted and locked.

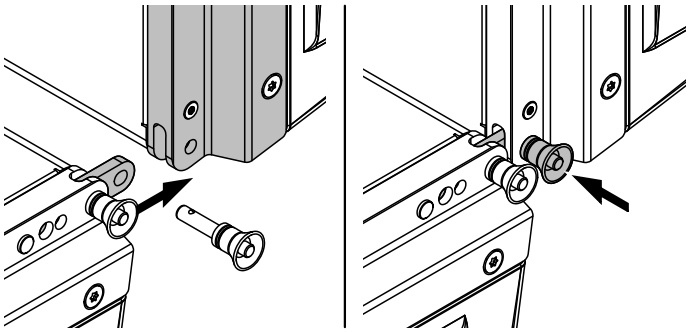



7. At the rear of the cabinet, reinsert one Locking pin into the **[0°]** hole and ensure the pin is fully inserted and locked.
8. Raise the bottom cabinet until the Rear link of the frame has engaged into the preset Locking pin of the cabinet.
9. Lower the cabinet and insert the second Locking pin (Safety pin **[S]**) into the **[2°]** hole and ensure the pin is fully inserted and locked.

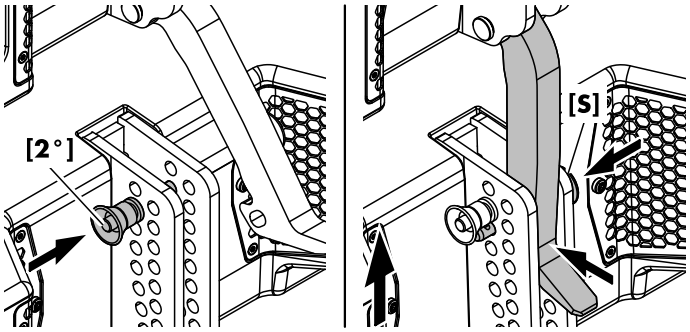
**4. Add the next TOP cabinet**

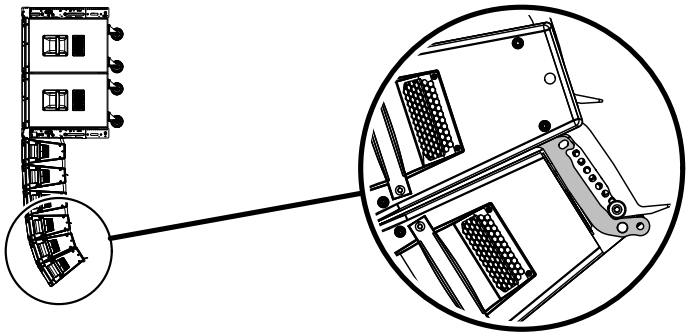


1. Extend the Front links and release the Splay link of the next cabinet.



2. With the front grill facing upwards, attach the front links of the prepared cabinet to the corresponding slots at the front of the upper cabinet on both sides.
3. Insert the Locking pins to the upper cabinet's front rigging strands on both sides and ensure both pins are fully inserted and locked.



4. On the second cabinet, preset the desired splay angle (e.g. **[2°]**).
5. Raise the bottom cabinet until the Splay link of the upper cabinet has engaged into the preset Locking pin of the bottom cabinet.
6. Insert the second Locking pin (Safety pin **[S]**) and ensure both pins are fully inserted and locked.

To add further cabinets, proceed in the same manner until the assembly is completed.

### 5. Splay link of the last TOP cabinet

The Splay link of the last cabinet of an array can be kept in its park position.

> **Note:** In this case, splay angles of 0...3° for the cabinet above are not applicable.

### 6. Check the assembly

Before hoisting the array to its operating position, recheck the actual status of the entire assembly according to the check list given in .

### 7. Rig the cabling

Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.

The CCL Touring cart allows for a quick and easy setup of arrays as the entire cabinet assembly stored in the cart can be directly connected to the CCL Flying frame or mounted below already suspended CCL8/CCL12 or CCL-SUB cabinets.

This type of setup is also very efficient when working space is restricted.

## 9.1 Assembly

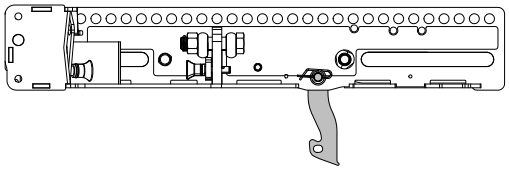
### Remarks

For the assembly, the same general preparations are made as described in ⇒ Chapter 4 "Array assembly - Preassembly" on page 28.

The setup should always be carried out by two persons.

### Splay link of the frame

For this type of setup, the Rear link of the frame must be attached to «TOP POSITION». Check the position and alter it, if necessary, as described in ⇒ Chapter 2.2.2 "Rear link of the Flying frame" on page 11.

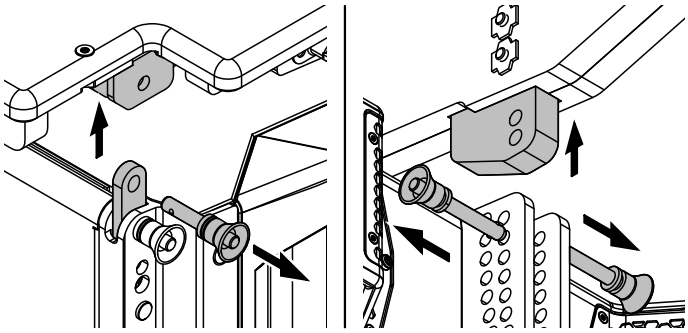


**Rear link of the frame – TOP POSITION**

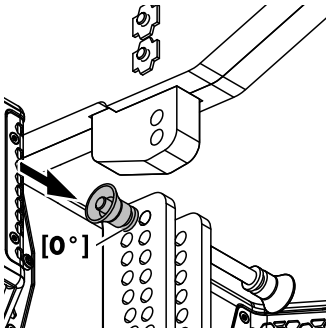
### 9.1.1 CCL-TOP assembly to Flying frame

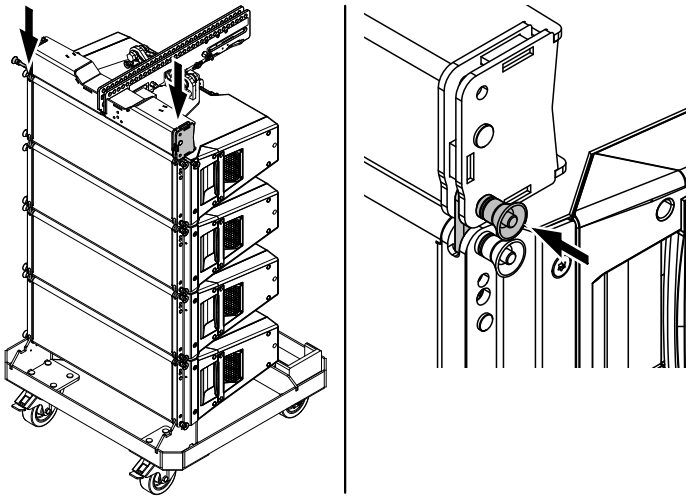
**1. Prepare the touring cart**

1. Move the cart to its assembly position.
2. Remove the protective soft cover.
3. On the top lid, release the front and rear Locking pins.
4. Take off the top lid.



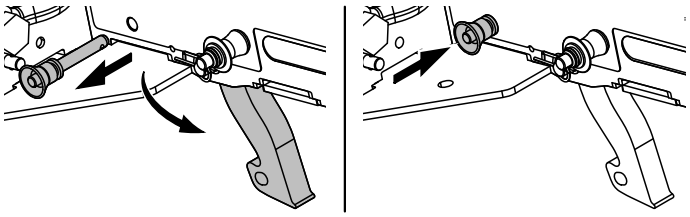
5. Reinsert one of the Locking pins to the **[0°]** hole of the rear rigging strand of the first cabinet.



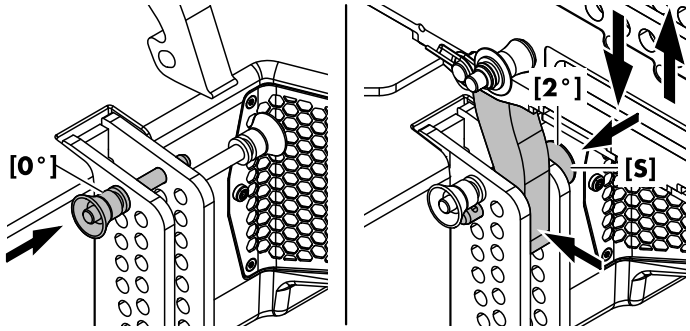


**2. Attach the Flying frame**

1. On the cart, take the Flying frame out of its transport position.
2. Attach the frame onto the first cabinet of the assembly until the Front links fit into the slots at the front of the frame.
3. Reinsert the Locking pins of the cabinet's Front links on both sides and ensure both pins are fully inserted and locked.

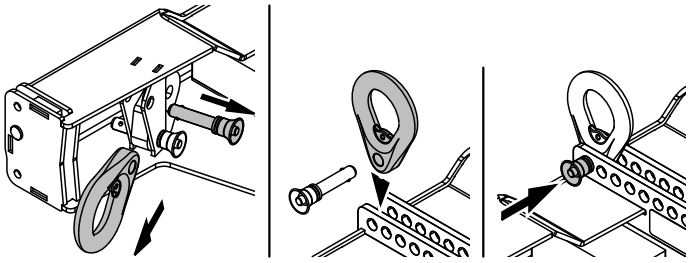


4. At the rear, release the Locking pin that keeps the frame's Rear link in its park position.
5. Fold out the Rear link and reinsert the Locking pin.

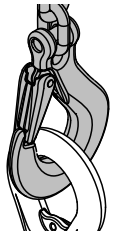



6. Slightly lower the frame and fold in the Rear link into the strand.
7. Lift the frame until the hook has engaged into the preset Locking pin.
8. Insert and lock the second Locking pin (Safety pin **[S]**) into the hole below (**[2°]** hole) and ensure both pins are fully inserted and locked.

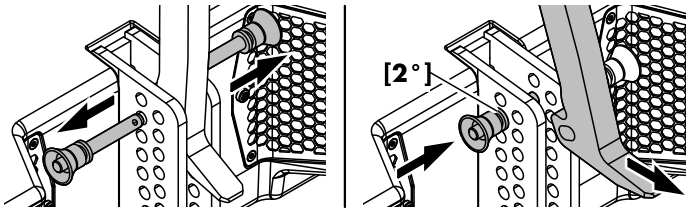
**3. Attach the Load adapter**

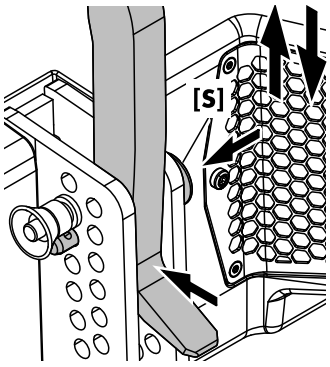


1. On the frame, release the corresponding Locking pin that holds the Load adapter in its park position and take off the adapter.
2. Choose the appropriate hole position(s) on the center beam of the frame according to your ArrayCalc calculation and attach the adapter correspondingly.



3. Finally connect the hoist connector chain or motor hook to the Load adapter respectively and tension them.



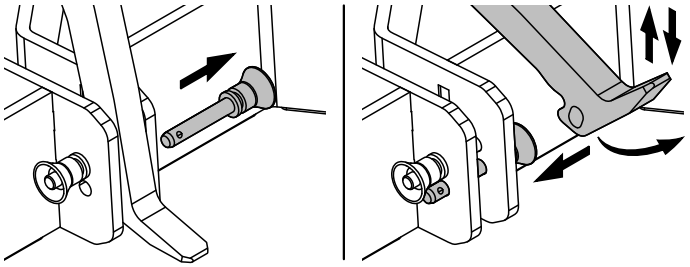




**4. Manually apply and fix the splay angles**

Due to the compact size and light weight of the cabinets, setting the splay angles is performed cabinet by cabinet while the cart can be kept still fitted.

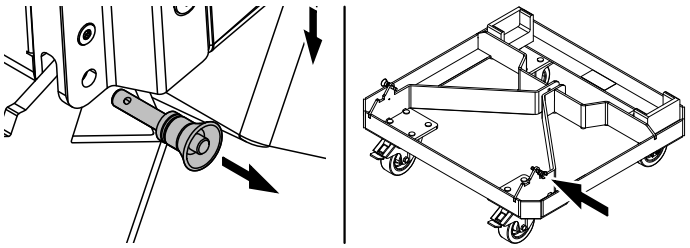
1. Slightly lift the frame to remove the Safety pin of the first cabinet on the second cabinet.
2. On the second cabinet, set the desired splay angle (for example **[2°]**) using one Locking pin and ensure the pin is fully inserted and locked.
3. Raise the back of the cabinet until the Splay link fits into the rear rigging strand.
4. Lower the cabinet until the Splay link has engaged to the preset pin, reinsert the second Locking pin (Safety pin **[S]**) and ensure the pin is fully inserted and locked.

For the remaining two cabinets, proceed in the same manner.

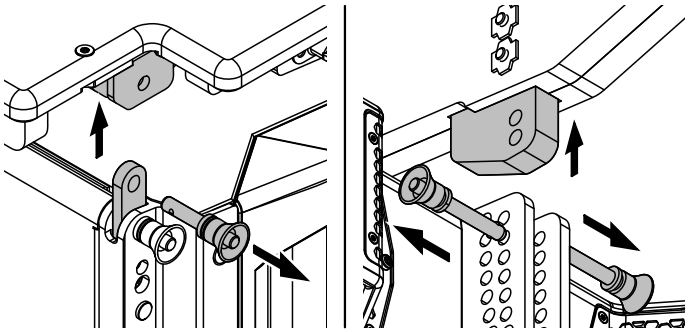


**5. Remove the cart**

1. On the center rear Splay link slot of the cart, release the bottom Locking pin.
2. Slightly lift the cart and disengage the Splay link.
3. Reinsert the bottom Locking pin.

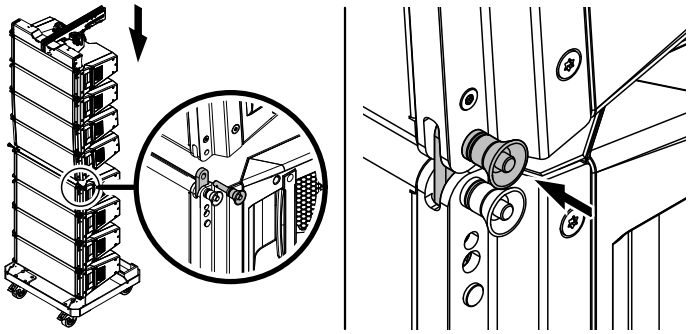


4. Lower the back of the cart and release the Locking pins at the front on both sides.
5. Finally lower the cart and reinsert the front Locking pins to the front supports of the cart on both sides.

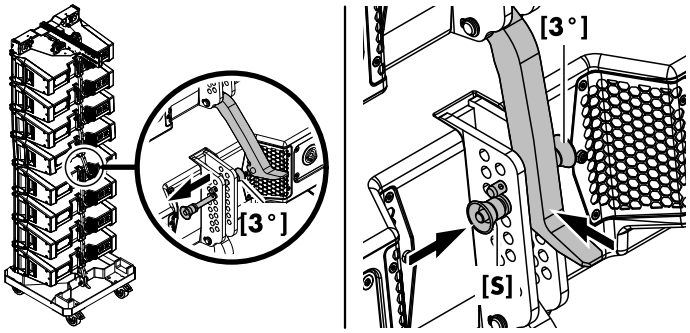


**6. Attach the next assembly**
To attach the next cabinet assembly below already suspended cabinets, prepare the next touring cart in the same manner.

1. Move the cart to its assembly position.
2. On the top lid release the front and rear Locking pins.
3. Take off the top lid.



4. Lower the array until the Front links of the top cabinet in the cart fit into the slots at the front of the bottom cabinet in the array while a second person secures the cart against moving and tipping over.
5. Reinsert the Locking pins of the cabinet's Front links on both sides and ensure both pins are fully inserted and locked.

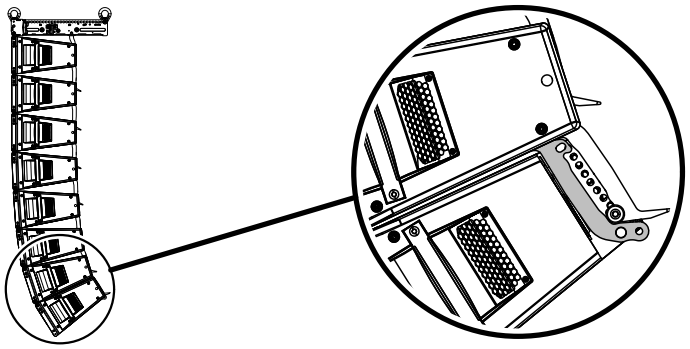



6. At the rear, preset the required splay angle (for example **[3°]**) on the first (upper) cabinet of the second assembly.
7. Raise the entire assembly with two persons until the Splay link of the array's bottom cabinet has engaged into the preset Locking pin.
8. Slightly lower the assembly to allow the second Locking pin (Safety pin **[S]**) to be inserted.

**7. Apply and fix the splay angles**
Once both cabinet assemblies are interconnected, setting the splay angles is performed in the same manner as with the first assembly.

**8. Remove the cart**
Proceed in the same manner as done with the first assembly.

**9. Splay link of the last TOP cabinet**
The Splay link of the last cabinet of an array can be kept in its park position.



**Note:** In this case, splay angles of 0...3° for the cabinet above are not applicable.

1. In connection with this touring cart setup, loosen the Splay link of the above (second last) cabinet again by releasing both Locking pins.
2. Fold the Splay link of the last cabinet into its park position.
3. Reapply the splay setting of the above (second last) cabinet and ensure both Locking pins are fully reinserted and locked.

**10. Check the assembly**
Before hoisting the array to its operating position, recheck the actual status of the entire assembly according to the check list given in ⇒ Chapter 11 “Safety and system checks” on page 61.

**11. Rig the cabling**
Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.

### 9.1.2 CCL-TOPs below CCL-SUBs (mixed setup)

Mounting the CCL-TOP cabinet assembly below CCL-SUB cabinets is similar to the procedure described in ⇒ Chapter 8 " Mixed array setup" on page 37.

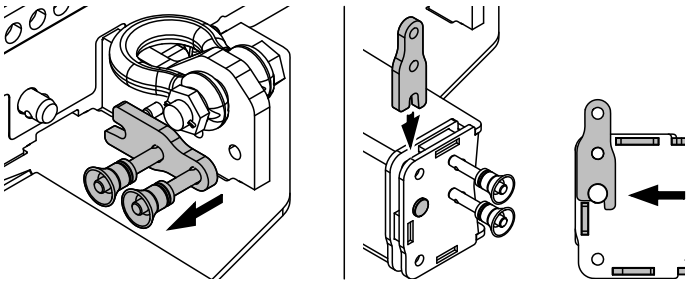
However, due to the possible size and weight of the suspended SUB assembly, carry out the assembly very carefully and considerably.

**1. Prepare the Flying frame**
Provided the Flying frame is already mounted on top of the CCL-TOP touring cart assembly, now the Beam extension must be mounted to its REAR POSITION and the additional Front links of the frame must be attached to their dedicated slots on the front tie bar of the frame.

Proceed as follows:

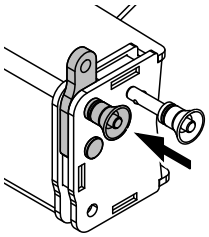
**Attaching the Beam extension to REAR POSITION**

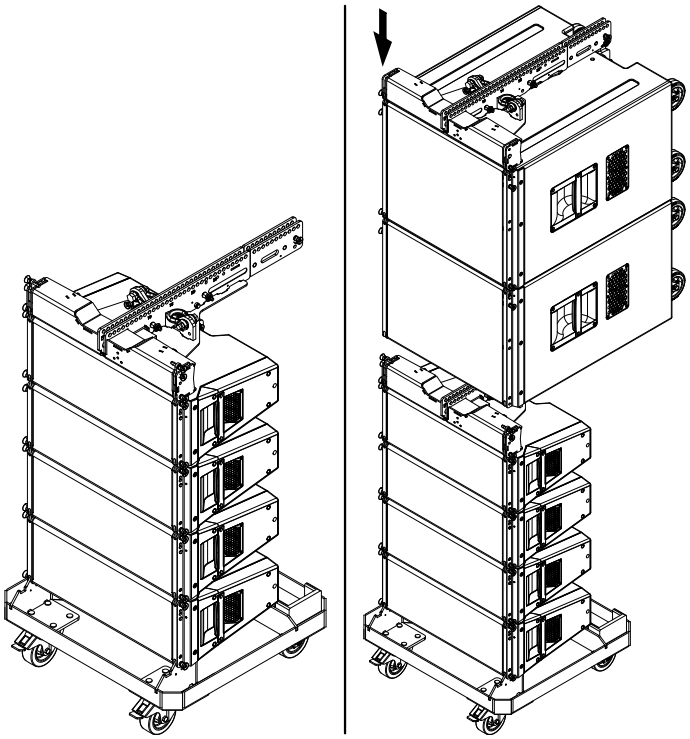
1. On the Flying frame, release the corresponding Locking pin.
2. Fully insert the Beam extension into the rear slot of the frame.
3. Reinsert the Locking pin on the frame.

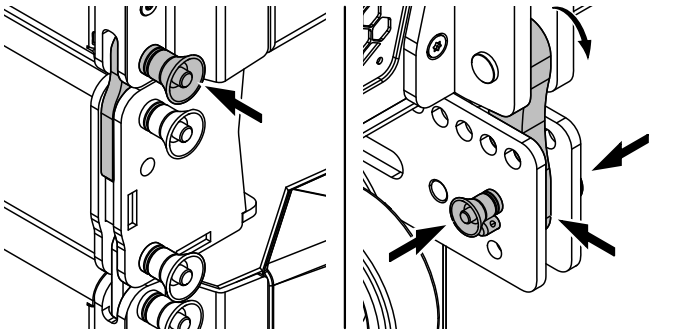


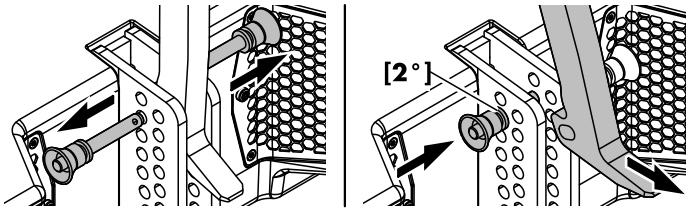
**Additional Front links**
To allow the Flying frame to be mounted underneath SUB cabinets in a mixed array configuration, two additional Front links together with corresponding Locking pins are enclosed with the Flying frame.

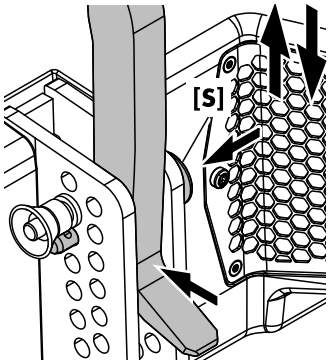
1. Release the Locking pins and take off the Front links from their park position.
2. Insert the Front links to the corresponding slots on the front tie bar of the frame on both sides.
   ↳ Observe the direction of the Front links as shown in the graphic opposite.
3. Finally insert one Locking pin to fix the Front link in place and ensure the pin is fully inserted and locked.
   ↳ The second Locking pin is used to fix the frame to the front rigging strand of the SUB cabinet.










**2. Connect the TOPs to the SUBs**

Provided the SUB assembly is already set up as described in ⇒ Chapter 7 " CCL-SUB Column" on page 33, connect the TOP assembly to the SUB assembly in the following way:

**CAUTION!**

Always be careful when operating the chain hoists.

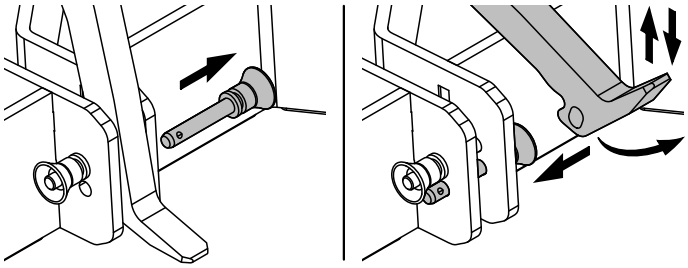
1. Suspend the SUB assembly.
2. Position the TOP assembly underneath the SUB assembly.
3. Lower the SUB assembly onto the TOP assembly.
4. Connect the TOP assembly by starting with the Front links.
5. At the rear, release the Rear link of the SUB cabinet and connect it to the frame.
   ↳ You might need to lower the rear hoist sightly to enable the connection.

**3. Apply and fix the splay angles manually**

Due to the compact size and light weight of the cabinets, setting the splay angles can be performed while the cart is still fitted.

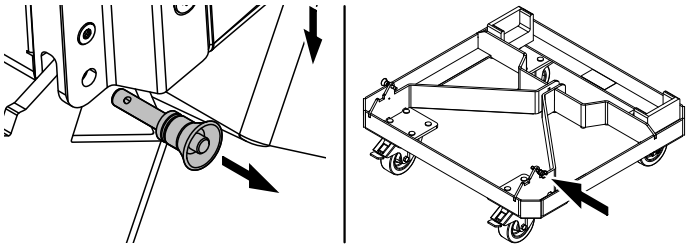
1. On the second cabinet, release both Looking pins.
2. Slightly raise the back of the cabinet and disengage the Splay link.
3. Set the desired splay angle (for example **[2°]**) using one Locking pin and ensure the pin is fully inserted and locked.
4. Lower the back of the cabinet until the Splay link has engaged and reinsert the second Locking pin (Safety pin **[S]**).

For the remaining two cabinets proceed in the same manner.

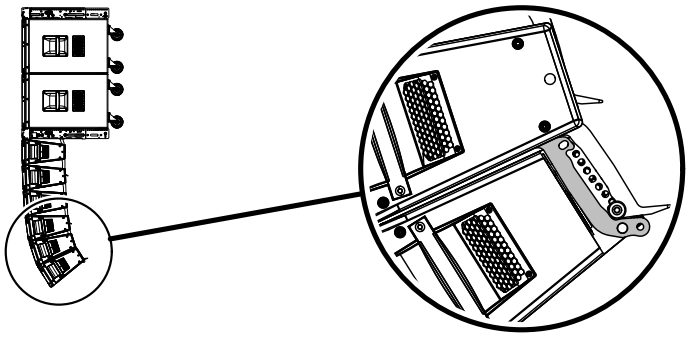


**4. Remove the cart**

1. On the center rear Splay link slot of the cart, release the bottom Locking pin.
2. Slightly lift the cart and disengage the Splay link.
3. Reinsert the bottom Locking pin.



4. Lower the back of the cart and release the Locking pins at the front on both sides.
5. Finally lower the cart and reinsert the front Locking pins to the front supports of the cart on both sides.



**5. Splay link of the last TOP cabinet**

The Splay link of the last cabinet of an array can be kept in its park position.

**Note:** In this case, splay angles of 0...3° for the cabinet above are not applicable.

1. In connection with this touring cart setup, loosen the Splay link of the above (second last) cabinet again by releasing both Locking pins.
2. Fold the Splay link of the last cabinet into its park position.
3. Reapply the splay setting of the above (second last) cabinet and ensure both Locking pins are fully reinserted and locked.

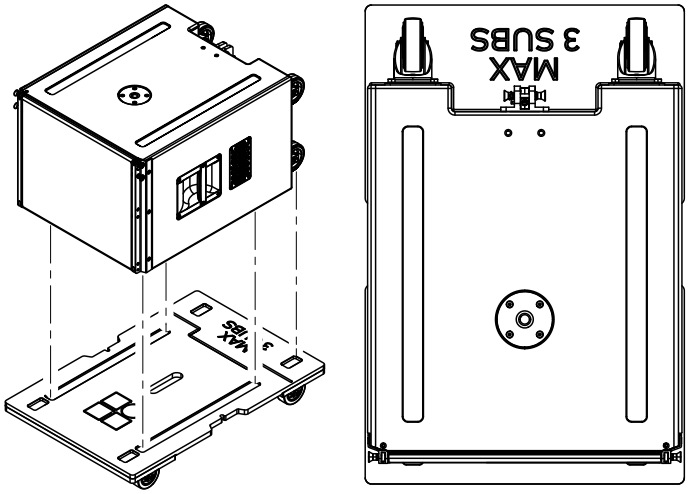
**6. Check the assembly**

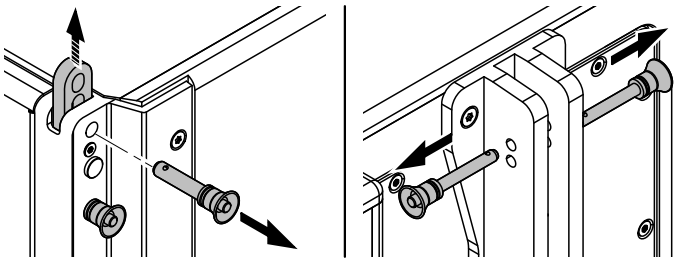
Before hoisting the array to its operating position, recheck the actual status of the entire assembly according to the check list given in ⇒ Chapter 11 “Safety and system checks” on page 61.

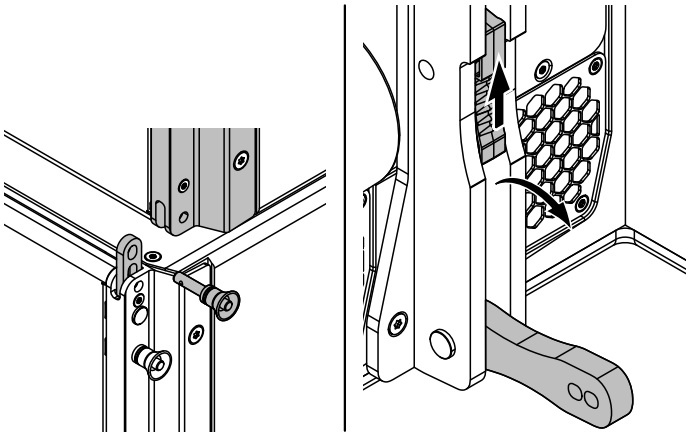
**7. Rig the cabling**

Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.





**WARNING!**
**Potential risk of personal injury and/or damage to material!**

- Do not set up ground stacks on uneven ground.
- Always secure ground stacked setups against movement and possible tipping over.

## 10.1 CCL-SUB ground stack

### 1. Stack the cabinets

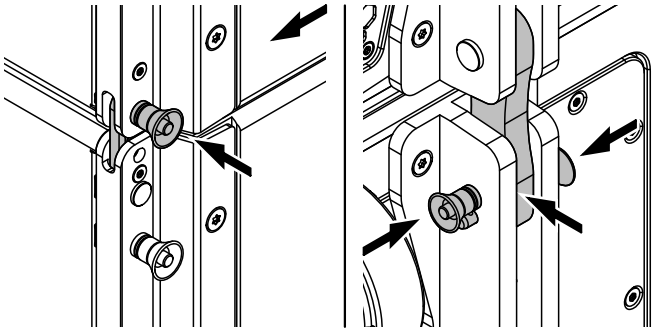
Apart from the usual way of setting up SUB ground stacks the optional E7842 CCL-SUB Wheel board with a maximum capacity of **3 x SUB cabinets** can also be used as ground support.

On the bottom panel of the SUB cabinets, two runners extend from the rear to the front panel.
Two correspondingly shaped recesses are incorporated in the top panel of the cabinet to accept these runners and prevent cabinet movement when stacking.
Two correspondingly shaped recesses are also incorporated in the wheel board.

It is recommended to interconnect the SUB cabinets with their Front and Rear links.

With the wheel board serving as ground support, simply follow the stacking procedure below:

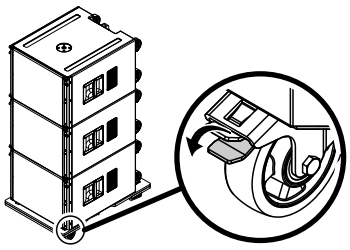
1. Stack the first cabinet onto the wheel board.
   ↳ Observe the direction of the wheel board as shown in the graphic opposite.
2. Extend the Front links and at the rear, release the Locking pins of the first cabinet.
3. Stack the next cabinet onto the top panel of the first cabinet.
4. On the upper cabinet, release the Rear link.



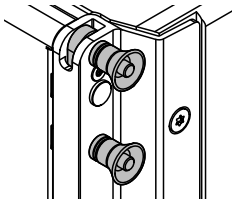
5. Move the upper cabinet towards the front until the Front links of the lower cabinet fit into the slots at the front of the upper cabinet.
6. Reinsert the Locking pins of the Front links on both sides and both Locking pins at the rear and ensure both pins are fully inserted and locked.
7. At the rear, insert the Rear link of the upper cabinet into the rear rigging strand of the bottom cabinet.
8. Reinsert the Locking pins and ensure both pins are fully inserted and locked.

To add the third cabinet, proceed in the same manner until the assembly is completed.

⇒ Finally move the stack to its operating position and lock all wheel brakes.



**2. Front links of the last (uppermost) cabinet**



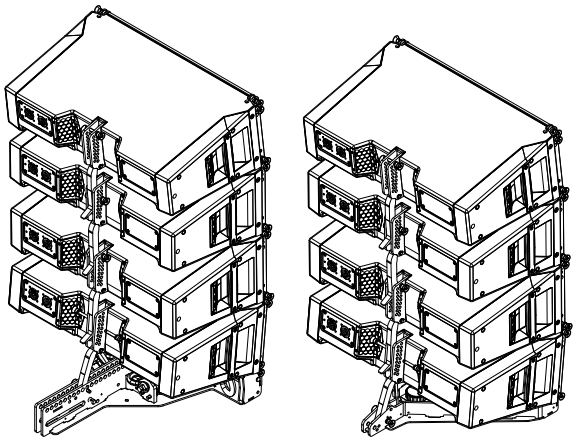
**NOTICE!**
**Potential risk of damage to the rigging components.**

To avoid any damage to the Front links of the uppermost cabinet of the assembly, ensure its Front links are kept in their park positions on both sides.

**3. Check the assembly**
Recheck the actual status of the entire assembly according to the checklist given in ⇒ Chapter 11 "Safety and system checks" on page 61.

**4. Rig the cabling**
Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.



## 10.2 CCL-TOP ground stack

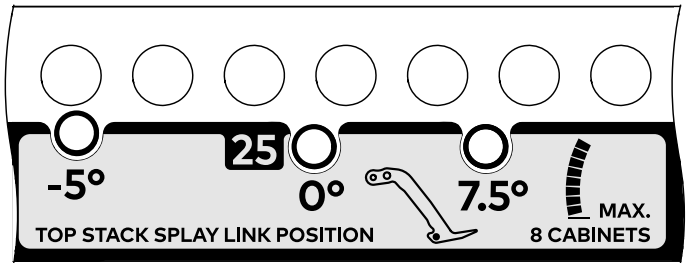
### Limitations

**NOTICE!**

A maximum of **8 x CCL-TOP cabinets** is allowed to be set up as a ground stack either as a pure CCL-TOP stack or on top of applicable subwoofers.

For this purpose, the Z5820 CCL Flying frame or the Z5824 CCL Pullback frame can be used as ground support.

### 10.2.1 CCL Flying frame as ground support




**Splay angles of the first cabinet**
The Flying frame's center beam hole grid provides dedicated holes to allow the first cabinet to be set to tilt angles of –5° (downtilt), 0° or 7.5° (uptilt).

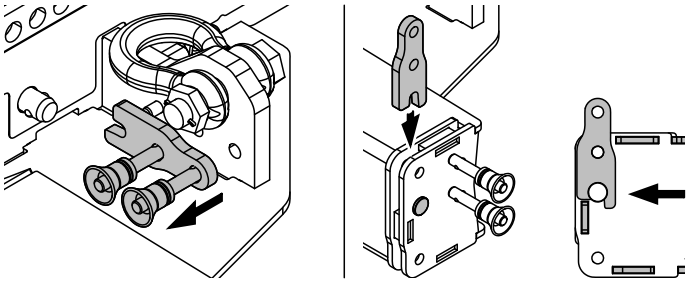
**–5°** No restriction.

**0°** With the 0° setting, the splay angle of the next (second) cabinet can be set in the range of 0...13°.

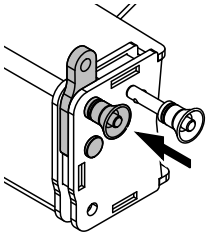
**7.5°** With the 7.5° setting, the splay angle of the next (second) cabinet can be set in the range of 1...9°.

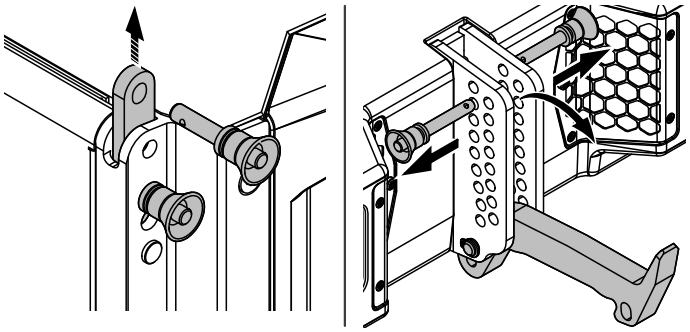
**1. Prepare the Flying frame**

**Additional Front links**
To allow the first cabinet to be mounted onto the Flying frame, two additional Front links together with corresponding Locking pins are enclosed with the Flying frame.



1. Release the Locking pins and take off the Front links from their park positions.
2. Insert the Front links to the corresponding slots on the front tie bar of the frame on both sides.
   ↳ Observe the direction of the Front links as shown in the graphic opposite.
3. Finally insert one Locking pin to fix the Front link in place and ensure the pin is fully inserted and locked.
   ↳ The second Locking pin is used to fix the cabinet to the frame.

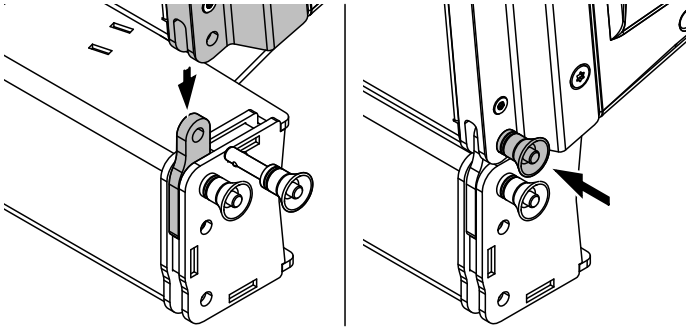




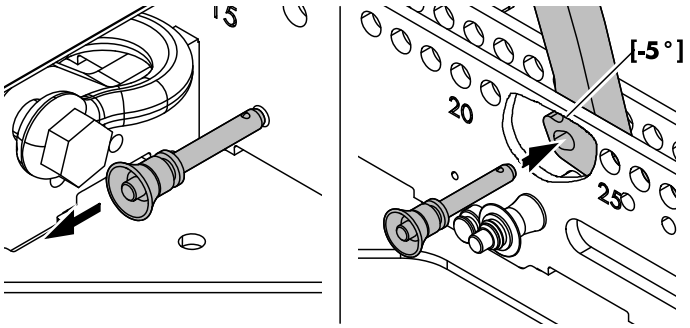
**2. First cabinet to frame**

To attach the first cabinet to the frame, proceed as follows:

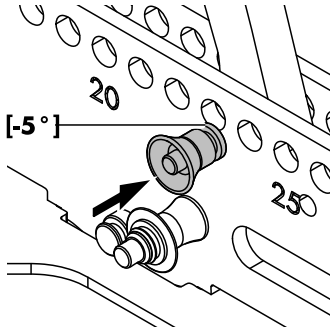
1. Extend the Front links and release the Splay link of the first cabinet.



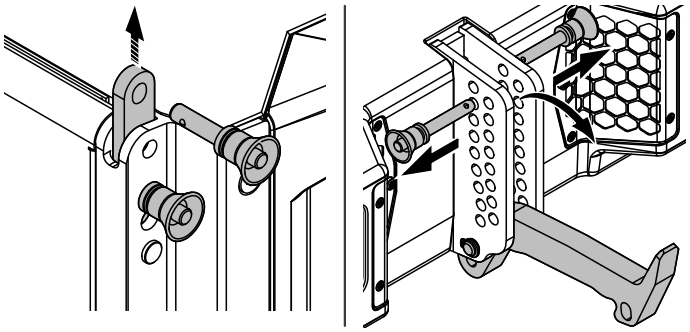
2. Attach the first cabinet until the additional Front links of the frame fit into the slots at the front of the TOP cabinet.
3. Insert the Locking pins of the frame on both sides and ensure both pins are fully inserted and locked.




4. On the center beam, release the Locking pin that holds the frame's Rear link in its park position.
5. Lower the back of the cabinet and insert the Splay link into the center beam until the Splay link's safety hole is in line with the, for example, –5° hole.

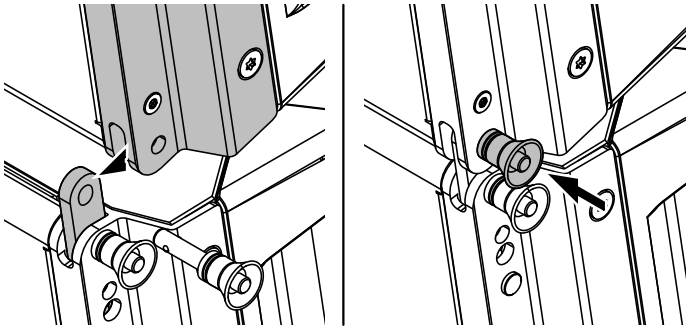



6. Reinsert the Locking pin and ensure the pin is fully inserted and locked.

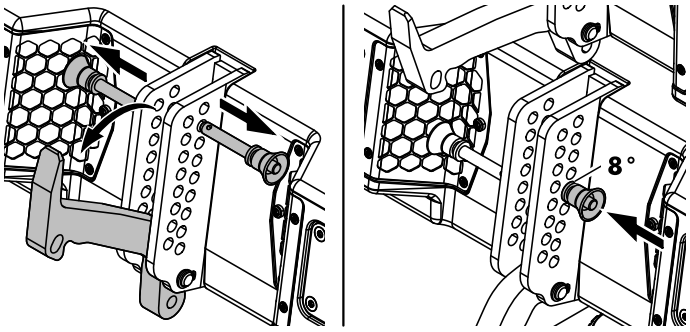


**3. Attach the next (second) cabinet**

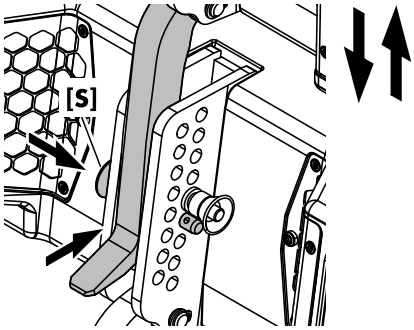
1. Extend the Front links and release the Splay link of the second cabinet.



2. Attach the second cabinet until the Front links of the first cabinet fit into the slots at the front of the second cabinet.
3. Insert the Locking pins of the Front links on both sides and ensure all pins are fully inserted and locked.



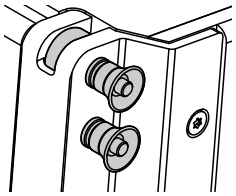

4. At the rear, fold out the Splay link of the second cabinet.
5. On the bottom cabinet, preset the desired splay angle (e.g. 8°) by inserting one Locking pin into the corresponding hole of the rear rigging strand.




6. Lower the upper cabinet and insert the Splay link into the rear rigging strand of the bottom cabinet.
7. Raise the back of the upper cabinet until the Splay link has engaged and reinsert the second Locking pin (Safety pin - **[S]**).

To add further cabinets, proceed in the same manner until the assembly is completed.

**4. Front links of the last (uppermost) cabinet**



**NOTICE!**
**Potential risk of damage to the rigging components.**

To avoid any damage to the Front links of the uppermost cabinet of the assembly, ensure its Front links are kept in their park positions on both sides.

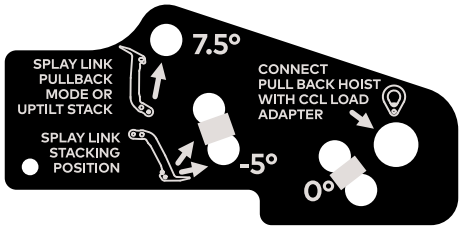
**5. Check the assembly**
Recheck the actual status of the entire assembly according to the checklist given in ⇒ Chapter 11 "Safety and system checks" on page 61.

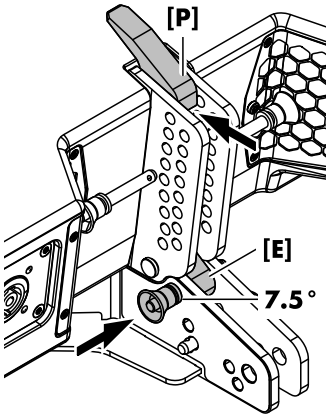
**5. Rig the cabling**
Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.

### 10.2.2 CCL Pullback frame as ground support

**Splay angles of the first cabinet**
The Splay link slot at the rear Pullback frame provides a dedicated hole grid to allow the first cabinet to be set to tilt angles of 7.5° (uptilt), –5° (downtilt) or 0°.

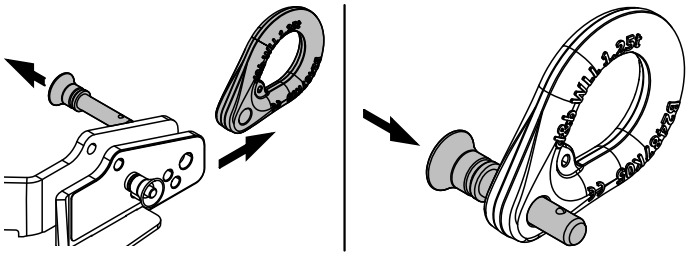


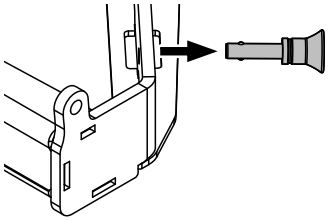

**7.5°**
- For the 7.5° setting, the Splay link of the cabinet must be in its park position **[P]** (fully folded in) while the eyelet **[E]** of the cabinet's Splay link fits into the slot of the frame and is aligned with the **7.5°** hole.
- Finally the Splay link is fixed with one of the Locking pins while the second pin is stored in one of the remaining holes.
- With the 7.5° setting, the splay angle of the next (second) cabinet can be set in the range of 1...14°.

**–5°** With the –5° setting, the splay angle of the next (second) cabinet can be set in the range of 0...14°.

**0°** With the 0° setting, the splay angle of the next (second) cabinet can be set in the range of 0...13°.



**1. Prepare the Pullback frame**
1. Release the Locking pin that holds the frame's Load adapter in place and remove the Load adapter.
2. Reinsert the Locking pin to the Load adapter and store the adapter in a safe place.

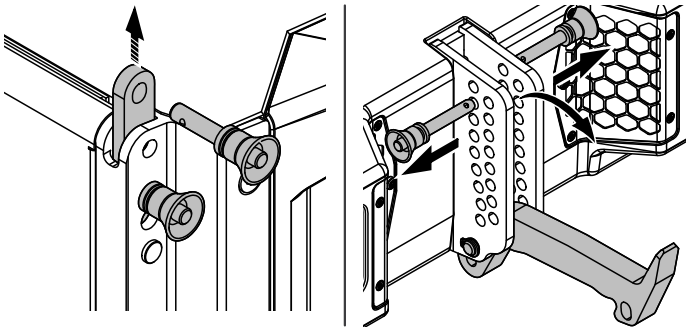


**2. First cabinet to frame**

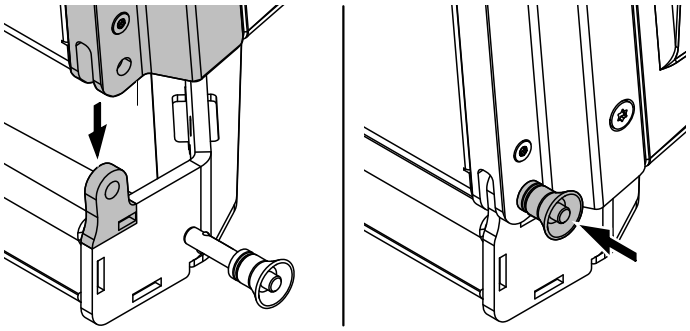
To attach the first cabinet to the frame, proceed as follows:

The required front Locking pins are stored in their park positions on both sides of the Pullback frame.

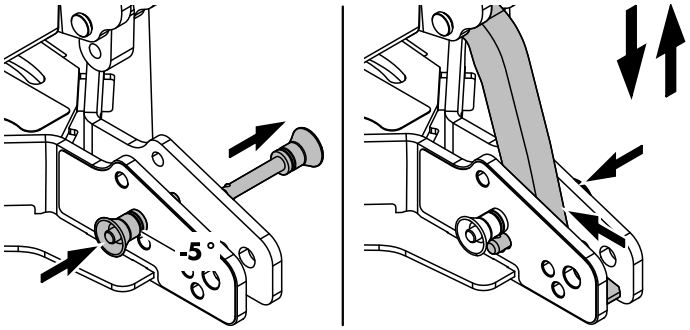
1. Take off the Locking pins from their park positions.



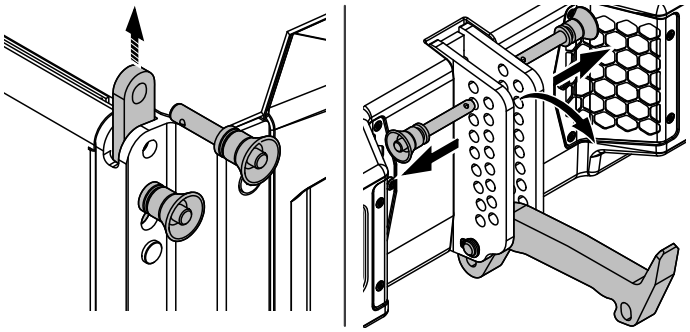
2. Extend the Front links and release the Splay link of the first cabinet.



3. Attach the first cabinet until the Front supports of the frame fit into the slots at the front of the TOP cabinet.
4. Insert the Locking pins of the frame on both sides and ensure both pins are fully inserted and locked.

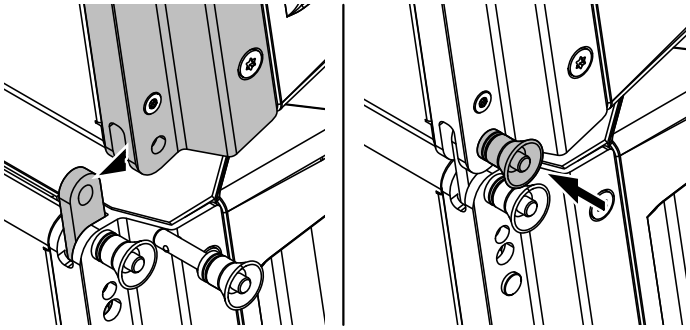



5. On the rear Splay link slot of the frame, release both Locking pins.
6. Preset the desired tilt angle (e.g. **–5°**) with one Locking pin to which the hook of the Splay link will engage.
7. Lower the cabinet and insert the Splay link into the slot.
8. Raise the back of the cabinet until the Splay link has engaged and insert the second Locking pin (⇒ Safety pin).

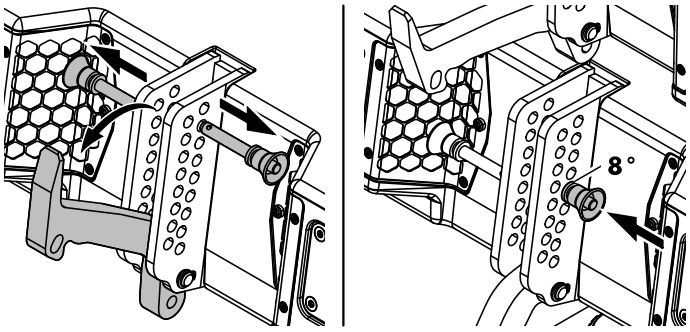


**3. Attach the next (second) cabinet**

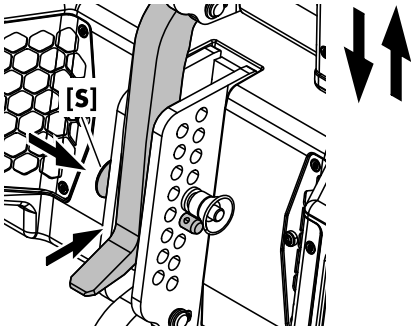
1. Extend the Front links and release the Splay link of the second cabinet.



2. Attach the second cabinet until the Front links of the first cabinet fit into the slots at the front of the second cabinet.
3. Insert the Locking pins of the Front links on both sides and ensure all pins are fully inserted and locked.



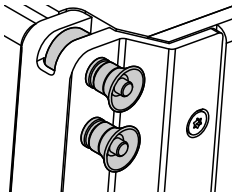

4. At the rear, fold out the Splay link of the second cabinet.
5. On the bottom cabinet, preset the desired splay angle (e.g. 8°) by inserting one Locking pin into the corresponding hole of the rear rigging strand.




6. Lower the upper cabinet and insert the Splay link into the rear rigging strand of the bottom cabinet.
7. Raise the back of the upper cabinet until the Splay link has engaged and reinsert the second Locking pin (Safety pin - **[S]**).

To add further cabinets, proceed in the same manner until the assembly is completed.

**4. Front links of the last (uppermost) cabinet**



**NOTICE!**
**Potential risk of damage to the rigging components.**

To avoid any damage to the Front links of the uppermost cabinet of the assembly, ensure its Front links are kept in their park positions on both sides.

**5. Check the assembly**
Recheck the actual status of the entire assembly according to the checklist given in ⇒ Chapter 11 “Safety and system checks” on page 61.

**6. Rig the cabling**
Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.

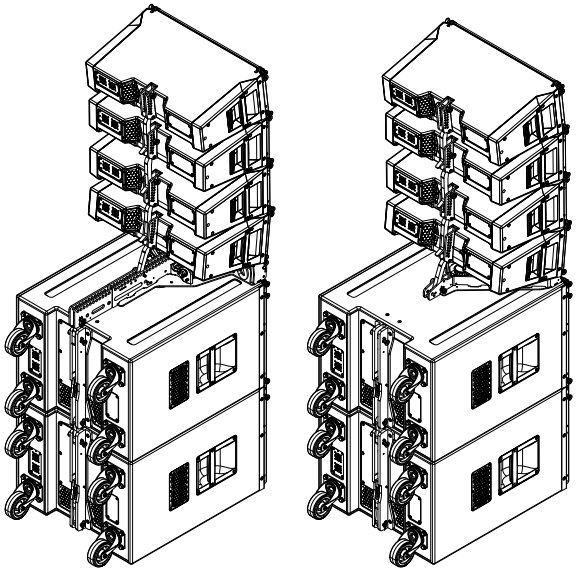
## 10.3 Mixed CCL ground stack setup

### Limitations

**NOTICE!**

A maximum of **8 x CCL-TOP cabinets** is allowed to be set up as a ground stack either as a pure CCL-TOP stack or on top of applicable subwoofers.

For this purpose, the Z5820 CCL Flying frame or the Z5824 CCL Pullback frame can be used as ground support.

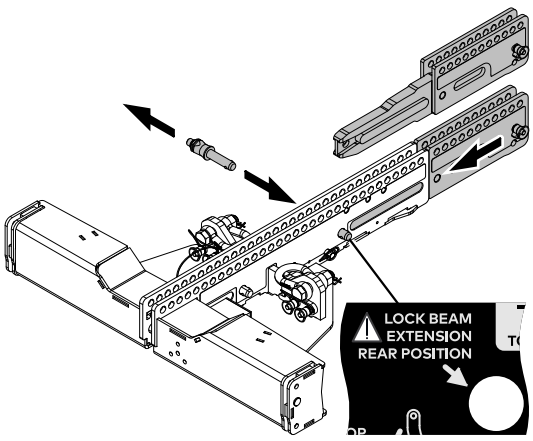


### 10.3.1 CCL Flying frame as ground support

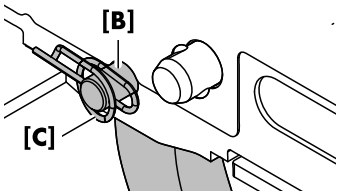
**1. Prepare the Flying frame**
For this type of setup, the Beam extension of the Flying frame has to be attached to its REAR POSITION and the frame's Rear link has to be attached to the SUB POSITION on the Beam extension

**Attaching the Beam extension to REAR POSITION**

1. On the Flying frame, release the corresponding Locking pin.
2. Fully insert the Beam extension into the rear slot of the frame.
3. Reinsert the Locking pin on the frame.




**Assembly procedure**
Beam extension in REAR POSITION



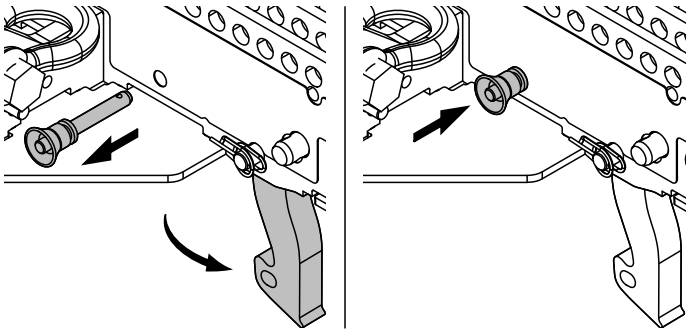

### Changing the Rear link position

**WARNING!**
**Potential risk of personal injury and/or damage to material!**

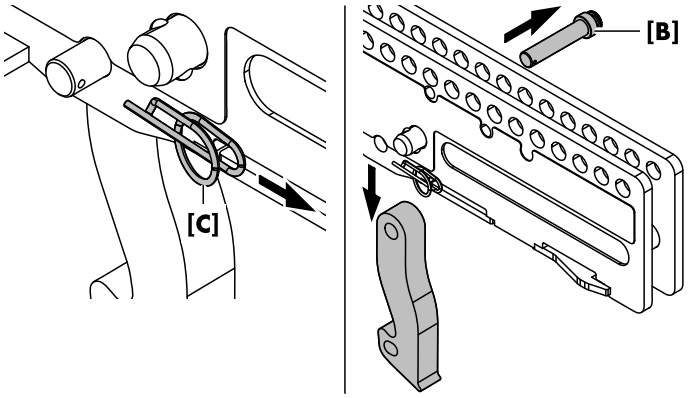
The fixing bolt **[B]** of the frame's Rear link bears the full load of the array.

It is essential that the bolt is fitted correctly and secured by a locked ring cotter **[C]**.

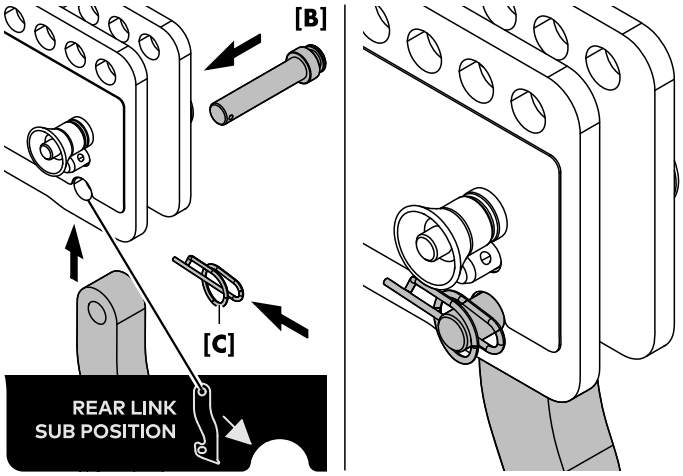
Provided the Beam extension is already attached, proceed as follows:



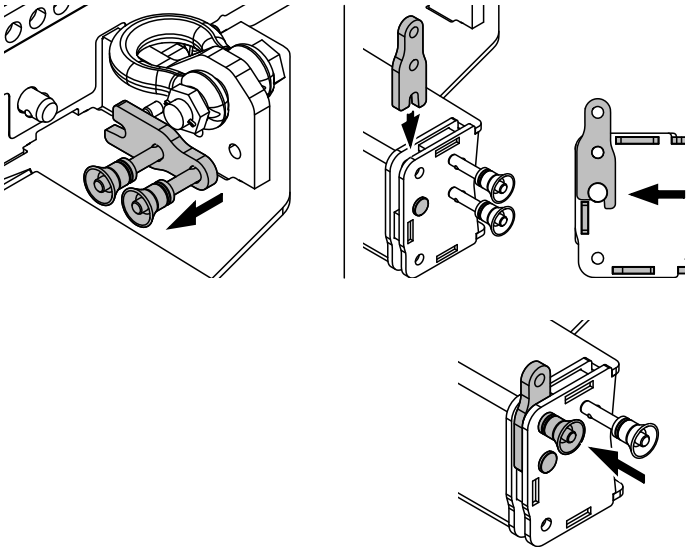
1. On the frame, release the Locking pin holding the frame's Rear link in its park position.
2. Fold out the Rear link and reinsert the Locking pin.




3. Release the ring cotter **[C]** of the fixing bolt **[B]** and remove the fixing bolt.
4. Take off the Rear link.

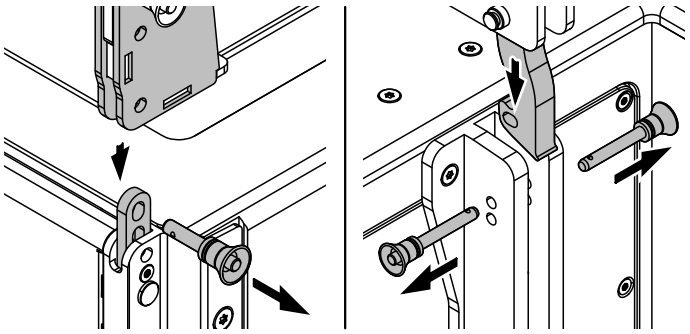



5. Attach the Rear link to the dedicated hole position (SUB POSITION) on the Beam extension.
6. Insert the fixing bolt.
7. Secure the fixing bolt using the ring cotter and ensure the ring cotter is properly locked.



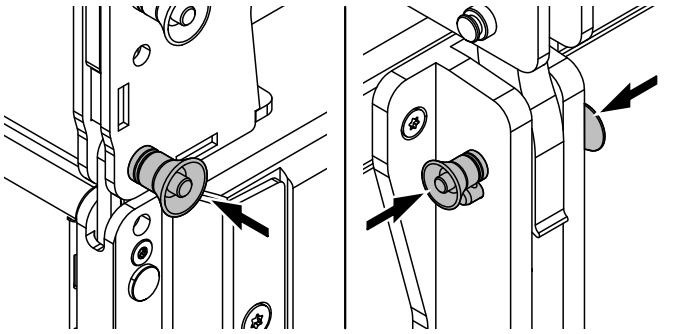
**Additional Front links**
To allow the first cabinet to be mounted onto the Flying frame, two additional Front links together with corresponding Locking pins are enclosed with the Flying frame.

1. Release the Locking pins and take off the Front links from their park positions.
2. Insert the Front links to the corresponding slots on the front tie bar of the frame on both sides.
   ↳ Observe the direction of the Front links as shown in the graphic opposite.
3. Finally insert one Locking pin to fix the Front link in place and ensure the pin is fully inserted and locked.
   ↳ The second Locking pin is used to fix the cabinet to the frame.



**2. Attach the Flying frame to the first SUB cabinet**
To attach the frame to the first cabinet, proceed as follows:

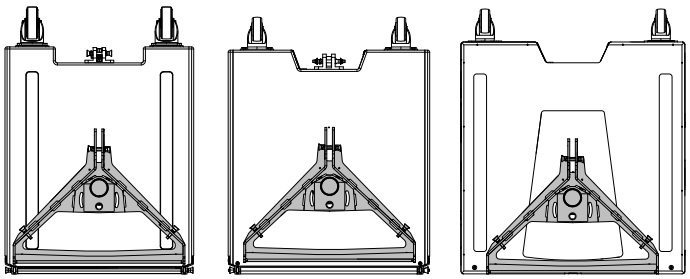
1. Attach the frame onto the cabinet until the Front links of the cabinet fit into the slots at the front of the frame and the Rear link of the frame fits into the rear rigging strand of the cabinet.



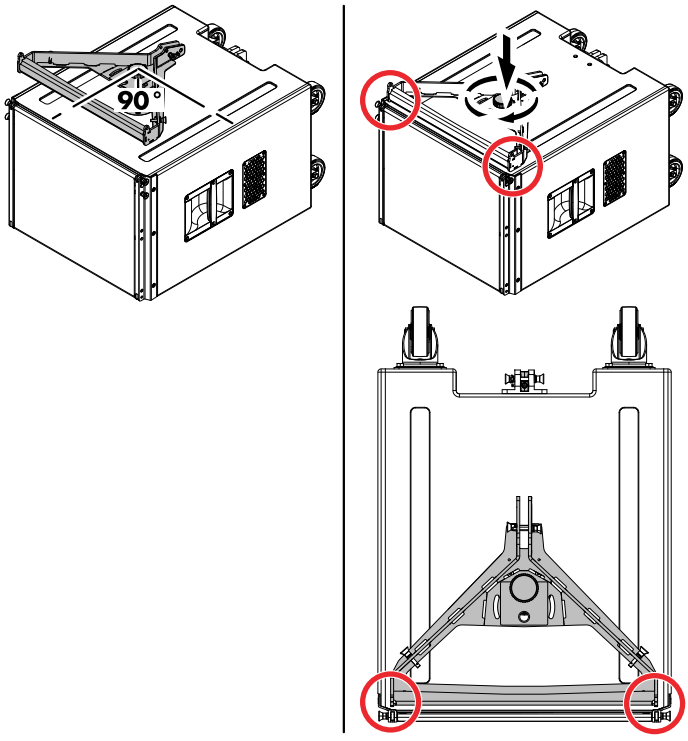
2. Insert the Locking pins of the Front links on both sides and both Locking pins at the rear and ensure all pins are fully inserted and locked.

**3. Attach the TOP cabinets**
Attaching the TOP cabinets is performed in the same manner as described in ⇒ Chapter 10.2 “CCL-TOP ground stack” on page 50 following ⇒ Chapter 10.2.1 “CCL Flying frame as ground support” on page 50.

**4. Check the assembly**
Recheck the actual status of the entire assembly according to the checklist given in ⇒ Chapter 11 “Safety and system checks” on page 61.



**Applicable d&b subwoofers**
**Shown** (left to right)**:** CCL-SUB | Y-SUB | V-GSUB




**5. Rig the cabling**
Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.

### 10.3.2 CCL Pullback frame as ground support

The Z5824 CCL Pullback frame allows CCL-TOP cabinets to be mounted on top of applicable d&b subwoofers which are equipped with an M20 flange in their top panels.

In this manual, the assembly procedure is described for the CCL-SUB.
The graphic opposite shows examples of applicable d&b subwoofers that can be used for this purpose.

**Assembly**
The assembly of a mixed ground stack is divided into the following three main procedures:

1. Setting up the SUB ground stack.
2. Attaching the Pullback frame.
3. Attaching the TOP cabinets.

**1. Set up the SUB ground stack**
Setting up the SUB assembly is performed in the same manner as described in ⇒ Chapter 10.1 “CCL-SUB ground stack” on page 48.

**2. Attach the Pullback frame**
Provided the SUB cabinets are already stacked in position, proceed as follows:

1. Align the frame as shown in the graphic opposite.
2. Attach the frame to the M20 flange of the SUB cabinet as shown in the graphic opposite.
   ↳ Make sure that the frame with its two front supports for the locking pins rests completely on the top panel of the SUB cabinet and does not overlap it in any direction, as shown in the graphic opposite.
3. Hand-tighten the hand wheel.

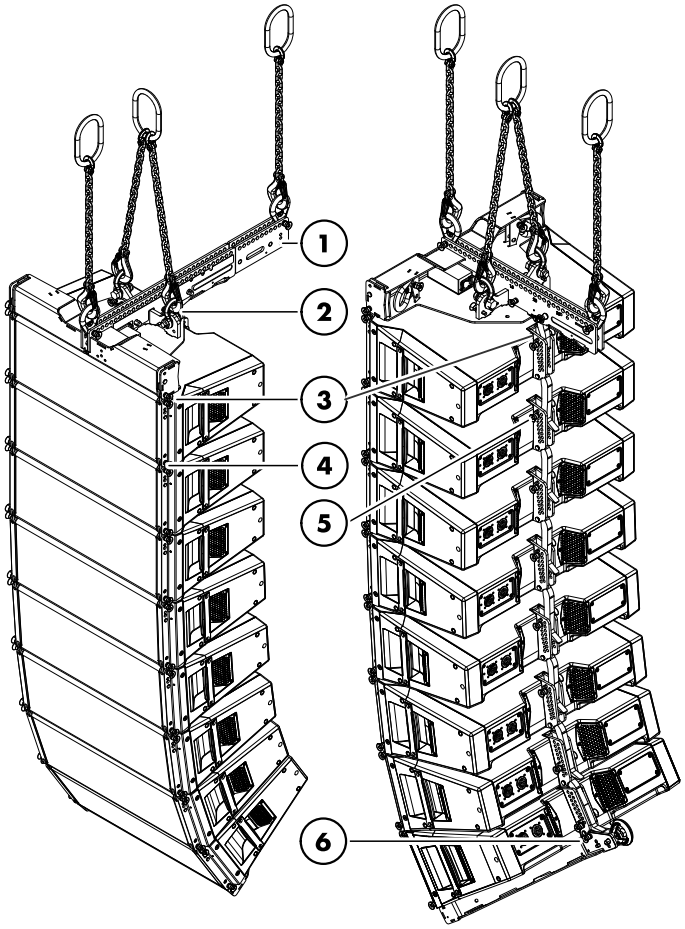
**3. Attach the TOP cabinets**
Attaching the TOP cabinets is performed in the same manner as described in ⇒ Chapter 10.2 “CCL-TOP ground stack” on page 50 following ⇒ Chapter 10.2.2 “CCL Pullback frame as ground support” on page 53.

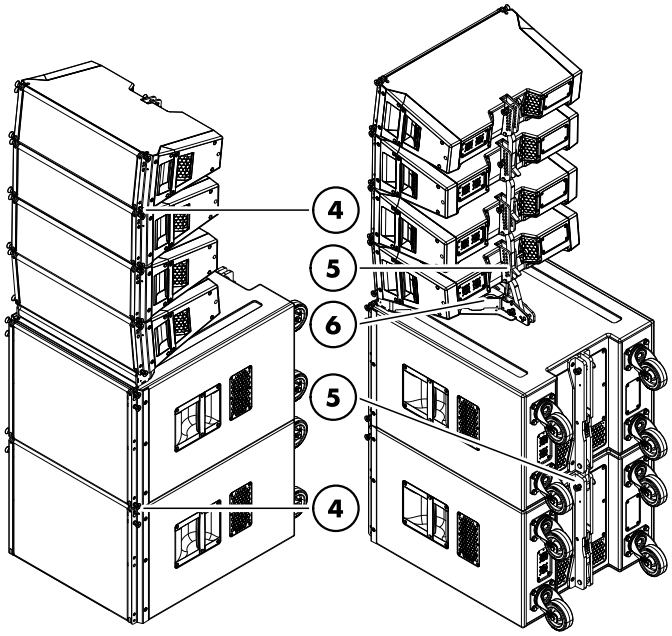
**4. Check the assembly**
Recheck the actual status of the entire assembly according to the checklist given in ⇒ Chapter 11 “Safety and system checks” on page 61.

**5. Rig the cabling**

Connect the cables and link cables according to the number of amplifier channels and cabinets used.

- If the amplifiers are already wired and powered on, use their System check functions or Channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.




Before hoisting the array to its operating position, recheck the actual status of the assembly.

When applicable, the same safety and system checks also apply to mixed array configuration and/or ground stack assemblies.

## 11.1 Mechanical setup

### General

Be aware that any object or tool left on the top of the array during setup may fall down when the array is operated. Always check that no tools or other objects are left on the array before final hoisting.

1. When applicable, check the attachment of the Beam extension to the Flying frame and ensure all Locking pins are fully inserted and locked.
2. When applicable, check the attachment of the secondary safety device on the flying frame (refer to ⇒ Chapter 1.4 “Secondary safety” on page 6).
3. Check the attachment of the Flying frame to the first cabinet and ensure all Locking pins are fully inserted and locked.
4. Check the attachment of all Front links on both sides of the cabinets and ensure all Locking pins are fully inserted and locked.
5. Check the splay angles and the attachment of the Splay/Rear links at the rear of the cabinets and ensure all Locking pins are fully inserted and locked ⇒ according to the famous d&b rigging advice: «***And don't forget the Safety pin!***»
6. – When applicable, check the assembly of the Pullback frame correspondingly (applicable for "Pullback mode setup" and "Ground stack setup").
   – When applicable, check the assembly of the Flying frame correspondingly when used as ground support in connection with "Ground stack setups".

## 11.2 Wiring

- If the amplifiers are already wired and powered on, use their System check functions or channel mute switches and a test signal to check the correct operation and routing of all channels and cabinets.
- Alternatively, check the wiring using the Array verification function in R1.

## 12.1 Hoisting the array

**WARNING!**
**Potential risk of personal injury and/or damage to material!**

Always ensure that each of the hoists is able to carry the total weight of the array.

When hoisting the array, unpredictable dynamic forces as well as swinging of the array must be taken into account. This may lead to personal injury and/or damage to the rigging components and loudspeaker cabinets.

Ensure there is nobody directly underneath or in the vicinity of the load who is not involved in the setup.

When all the mechanical adjustments, safety and system checks have been made, the array can be hoisted up to its operating position.

When hoisting the array, ensure that the loudspeaker cables do not get caught anywhere. The cables can be strapped together with the motor cables to form a loom while the system is hoisted.

The chain hoist motors must raise the system slowly and evenly so that it does not swing or move from side to side during hoisting.

## 12.2 Aiming the array

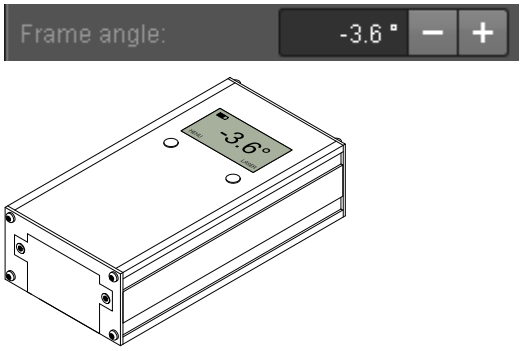
In connection with the Z5711 ArraySight sender unit (laser inclinometer), the horizontal and vertical aiming of the array can be sufficiently and easily adjusted.



**CAUTION!**
**Laser beam**
**Potential risk of personal injury.**

The high brightness laser of the d&b ArraySight sender unit requires additional safety considerations.

1. Take precautions to prevent anyone from looking directly into the laser beam.
2. Wear appropriate eye protection.
3. When making adjustments to the array with motor hoists, watch the hoist - **not** the meter unit!
4. Check the measurement only when you are sure that the hoist has finished moving.
5. However, the chain hoist motors must raise the array slowly and evenly.




### 12.2.1 Vertical aiming

**Application example**
To take an example: ArrayCalc indicates a frame angle of –3.6° vertically.

1. When you use ArraySight to measure this angle, you raise the first array to its operating height and then check the meter unit screen.
2. The figures displayed settle as the meter compensates for the swing of the array. When the settled display shows +0.5°, you then use the hoists to lift the rear or lower the front of the array. Make small adjustments and allow the meter unit to calculate the new angle. Continue to make adjustments until you achieve the angle of –3.6°.
3. Once the first array is complete, disconnect the meter unit from the first sender unit and reconnect it to the sender unit of the second array.
4. Repeat the procedure, starting with resetting the angle to zero for the second sender unit. Raise the second array, check the angle and adjust the angle as necessary.
5. If subsequent re-adjustment of the first array is required the meter unit can be re-connected to the first sender unit and the correct offset will be recalled.

## 12.3 Securing the array

**WARNING!**
**Potential risk of personal injury and/or damage to material!**

If required, once the array is in its final operating position, the secondary safety must be applied to its dedicated suspension points.
A detailed description is given in ⇒ Chapter 1.4 “Secondary safety” on page 6.

The secondary safety suspension must be independent of the primary suspension points and capable of carrying the total system weight.

The additional safety device must be mounted in a way that the array is caught by the safety device without any drop and swing in the event that the primary suspension fails.

**Mixed array setup**
The derigging procedure follows the setup procedure in reverse order. That means the Splay links have to be disengaged and reset to 0° manually cabinet by cabinet.

As most of the steps are applicable to any type of flown setup, in the following the derigging procedure of a mixed array setup is described as an example:

1. Lower the array to a suitable working height.
2. Fold out the Splay link of the lowest cabinet and reset its splay angle to 0°.
3. Reattach the touring cart, starting at the front.
4. Set the remaining three cabinets to 0° splay.
5. Gently lower and land the array.
6. Disengage the rear Locking pins of the Flying frame.
7. Slightly lift the rear hoist and fold back the Rear link of the SUB cabinet.
8. Reinsert the Locking pins on the frame.
9. Release the front Locking pins and slightly lift the SUB assembly.
10. On the Flying frame, restore the additional Front links to their park positions.
11. Place the CCL-SUB Wheel board underneath the assembly.
12. Lower the SUB assembly onto the board.
13. Disengage the hoists and move their hooks out of the way.

**WARNING!**
**Potential risk of personal injury and/or damage to material!**

In particular, make sure that when lowering the array nobody is directly underneath or in the vicinity of the array.

When lowering the array, **avoid diagonal pull**.
This could lead to the potential risk of the array tipping over towards the front.

**SUB column**
To derig CCL-SUBs individually, proceed as follows:

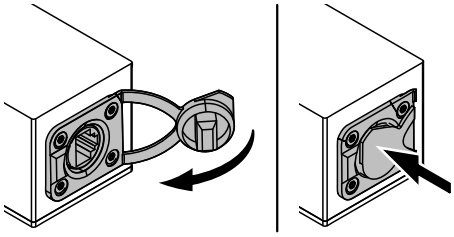
1. Lower and gently land the assembly onto the ground.
2. Disengage the hoists and move their hooks out of the way.
3. On the Flying frame, release the rear Locking pins and disengage the Rear link.
4. Remove the Load adapters and store them in their park positions on the frame.
5. At the front, release the Locking pins on both sides and take off the Flying frame.
6. Store the Front links of the upper SUB cabinet and unpin it from the cabinet below.
7. Disengage and store the Rear link of the SUB cabinets and reinsert the Locking pins correspondingly.
8. Unstack the upper cabinet.
9. Repeat as necessary for all remaining SUB cabinets.
   ↳ Always ensure all links are stored and all pins are reinserted.

**Ground stack setups**

**CAUTION!**
**The same safety rules apply!**

The derigging procedure follows the setup procedure in reverse order.

After dismantling the ground stacks, always ensure all links are stored and all pins are reinserted.



## 14.1 Transport/Storing

During transport ensure the rigging components are not stressed or damaged by mechanical forces.

Due to their surface treatment the rigging components are temporarily protected against moisture. However, ensure the components are in a dry state while stored or during transport.

## 14.2 ArraySight etherCON® protection

To prevent corrosion of the etherCON® connector socket's spring contacts, always make sure to properly attach (close) the connector socket's dust cap during transport or when it is not in use.

## 14.3 Visual and functional inspection

**WARNING!**
**Potential risk of personal injury and/or damage to material.**

To eliminate the risk of accident due to malfunctioning of a component, regularly inspect all system components.

**Cabinet enclosure**

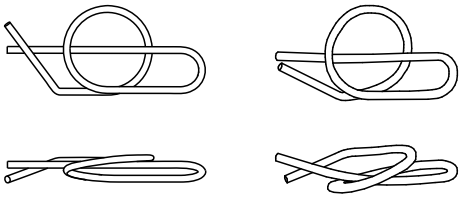
- Visual inspection of all fitting plates for obvious damage (e.g. cracks or corrosion).
- Visual inspection of the rear rigging strand for obvious damage (e.g. cracks, deformation or corrosion) including all drilled holes of the component.
- Inspection of all fitting plates including front grills to ensure they are securely attached.

**Front and Splay/Rear links**

Visual inspection regarding deformation and damage (e.g. cracks and corrosion) including all drilled holes of the component.

**Locking pins**

- Visual inspection for deformation, cracks and corrosion of the component.
- Inspection for missing ball bearings and damage.
- Functional inspection of the release mechanism to ensure it operates properly.



**[a]** **[b]**

**Condition of the ring cotter**
**[a]:** Ring cotter OK
**[b]:** Exchange the ring cotter

**Ring cotters**

- Visual inspection for obvious damage and deformation.
- Functional test of the locking mechanism as described in ⇒ Chapter 2.6 “Ring cotters” on page 16.
  If a ring cotter can no longer be properly fitted to the fixing bolt and locked, it must be exchanged.

**CCL Flying frame, Beam extension and Pull back frame**

- Visual inspection regarding any indication of deformation and damage (e.g. cracks and corrosion) including all drilled holes of the component.
- Visual inspection regarding the attachment and securing of the shackles.
- Regularly check the flatness of the frames. For this purpose, position the frames on a flat surface and visually check the frames for deformation and/or torsion. For obvious deformation and/or torsion contact d&b audiotechnik for further advice on how to proceed.

**Z5831 Safety chain set 1.4 t**
**Z5832 Hoist connector chain 1.4 t**

Inspection according to the appropriate regulations for lifting devices (EN 818-6:2000).

- Regularly inspect within a 12 months period.
- Regularly inspect for cracks within a 36 months period.

## 15.1 Conformity of rigging components

This declaration applies to:

**d&b CCL loudspeaker cabinets**
(with integrated rigging components.)

- Z0880 CCL8
- Z0882 CCL12
- Z0884 CCL-SUB

**d&b CCL rigging components**
(including all additional components)

- Z5820 CCL Flying frame
  - B2487.K07.00 CCL Load adapter (enclosed item)
  - B2487.K08.00 CCL Load adapter Rota Clamp (enclosed item)
  - E5041.300.00 CCL Load adapter (spare part)
  - E5041.310.00 CCL Load adapter Rota Clamp (spare part)
- Z5824 CCL Pullback frame
- Z5831 Safety chain set 1.4 t.
- Z5832 Hoist connector chain 1.4 t.

by d&b audiotechnik GmbH & Co. KG.

All product variants are included, provided they correspond to the original technical version and have not been subject to any later design or electromechanical modifications.

We herewith declare that said products are in conformity with the provisions of the respective directives including all applicable amendments.

Detailed and applicable declarations are available on request and can be ordered from d&b or downloaded from the d&b website at www.dbaudio.com.

## 15.2 Disposal

When out of use, the rigging components must be disposed of in accordance with the national environmental regulations.

Ensure that damaged rigging components are disposed of in a way that they cannot be used again.

**WEEE-Reg.-Nr. DE: 13421928**

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