



AERO-38 series



AERO-38A / AERO-38
AERO-218A / AERO-218Sub
AERO-182A / AERO-182

D.A.S. Audio s.a.

Precauciones de seguridad



El signo de exclamación dentro de un triángulo indica la existencia de componentes internos cuyo reemplazo puede afectar a la seguridad. También indica instrucciones importantes de funcionamiento y mantenimiento.



El signo del rayo con la punta de flecha alerta contra la presencia de voltajes peligrosos no aislados. Para reducir el riesgo de choque eléctrico, no retire la cubierta.

Conserve estas instrucciones. Siga todas las advertencias. Lea todas las instrucciones.

Aparato de Clase I. [AERO-38A, AERO-218A, AERO-182A]

Para una protección continua contra el riesgo de fuego, reemplace el fusible únicamente con otro del mismo tipo, que se indica en la cubierta de la unidad.

Para reducir el riesgo de descarga eléctrica no exponga este equipo a la lluvia, humedad o salpicaduras sin el protector de lluvia suministrado por el fabricante.

No instale el sistema cerca del agua, piscinas y fuentes por ejemplo. No deposite sobre él recipientes que contengan líquidos.

Limpie el aparato sólo con un paño seco. No use limpiadores basados en disolventes.

No instale el aparato cerca de ninguna fuente de calor como radiadores, estufas u otros aparatos que produzcan calor.

El cable de alimentación suministrado con su unidad tiene conector de tres terminales (tipo X). No corte o dañe el terminal de tierra. Si el conector suministrado no puede conectarse en su enchufe, consulte a un electricista para sustituir el enchufe obsoleto. Proteja el cable de alimentación de ser pisado o pellizcado.

Desconecte este aparato durante tormentas eléctricas, lluvia torrencial, terremotos o cuando no se vaya a emplear durante largos periodos.

No existen partes ajustables por el usuario en el interior de este equipo. Cualquier operación de mantenimiento o reparación debe ser realizada por personal cualificado. Es necesario el servicio técnico cuando el aparato se haya dañado de alguna forma, tal como que el cable de corriente o el enchufe se hayan dañado, haya caído líquido o algún objeto en el interior del aparato, el aparato haya sido expuesto a lluvia o humedad, no funcione correctamente o haya recibido un golpe.

El colgado de la caja sólo debe realizarse utilizando los herrajes de colgado y solamente por personal cualificado. No cuelgue la caja de las asas. No reemplace pasadores de seguridad por tornillos.

Nunca cuelgue más cajas de las recomendadas por el fabricante.

Safety Precautions

The exclamation point inside an equilateral triangle indicates the existence of internal components whose substitution may affect safety. Also indicates important operating instructions.

The lightning and arrowhead symbol warns about the presence of uninsulated dangerous voltage. To reduce the risk of electric shock, do not remove the cover.

Keep these instructions. Heed all warnings. Follow all instructions.

Class I device.[AERO-38A, AERO-218A, AERO-182A]

For continued protection against risk of electric fire replace fuse only with same type fuse, which is indicated on the cover of the unit.

Do not expose this device to rain, moisture or splash without using the rain protector supplied by DAS.

Do not use this apparatus near water- for example, swimming pool, fountain. Do not place any object containing liquids as bottles on the top of the unit.

Clean only with a dry cloth. Do not use any solvent based cleaners.

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.

The power cord supplied with your unit has a 3-pin type plug (X type). Do not cut off or damage the grounding pin. If the provided plug does not fit in your outlet, consult an electrician for replacement of the obsolete outlet. Protect the power cord from being walked on or pinched.

Unplug this apparatus during lightning storms, heavy rain, earthquakes or when unused for long periods of time.

No user serviceable parts inside. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

The appliance should be flown only from the rigging points and by qualified personnel. Do not suspend the box from the handles. Do not use instead of quick release pins any other element as fasteners.

Never exceed the maximum number of units to be flown recommended by the manufacturer.

The double square indicates Class 2 device; models : AERO-38, AERO-218Sub and AERO-182.



El doble cuadrado indica equipo de Clase 2 en sistemas de amplificación externa: AERO-38, AERO-218Sub y AERO-182.

1. SYSTEM DESCRIPTION

The D.A.S. Audio AERO series offers two units for applications requiring precise control of the vertical coverage and high sound pressure levels. The AERO-38 is an externally powered, three-way, high efficiency line array module which integrates two 12" low frequency units with 4" voice coils, two 10" mid-range devices which utilize 3" voice coils and one compression driver with 4" coil and 1.5" exit geometry in a single unit. The compression driver is coupled to the Serpis-38 high frequency plane wave adaptor insuring coherent high frequency summing and the generation of a flat, isophasic wave front. When increased sound pressure level in the low frequency range is required, the system can be used in conjunction with the AERO-218Sub or AERO-182 subwoofer units. There are self powered version of each cabinet, AERO-38A, AERO-218A, AERO-182A.

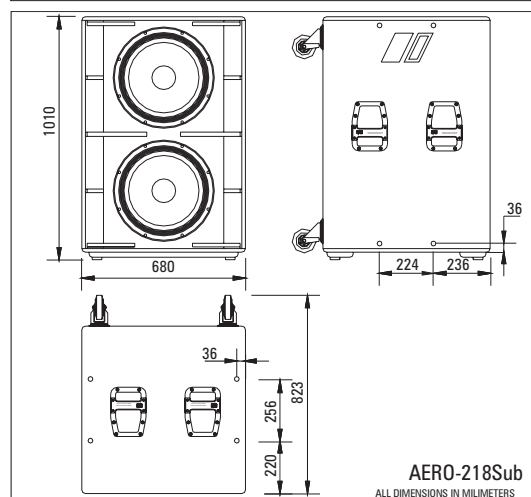
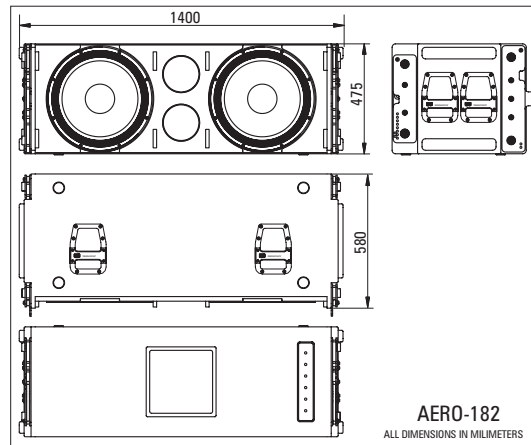
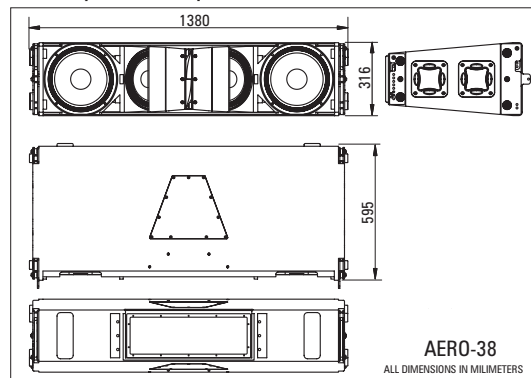
The system is ideal for applications such as large-scale outdoor/indoor events in arenas, stadiums or theaters. Use of the DSP-3VS digital processor is recommended for the AERO-38 and the DSP-1Sub for the subwoofer system (AERO-218Sub or AERO-182). Not using the DSP-3VS digital processor with the AERO-38 will adversely affect the sound quality and may damage system components.

Both units are manufactured using 15/18 mm Finnish Birch plywood. The AERO-38 enclosure shape is trapezoidal with 5° angles. The AERO-218Sub and AERO-182 enclosures are rectangular. The Aero-38 and AERO-182 systems incorporate captive rigging hardware which is compatible with one another and designed to provide a fast, simple and safe rigging by means of quick release safety pins. Splay angles can be changed from 0° to 3.2° in 0.8° increments and from 3.2° to 9.6° in 1.6° increments.

To facilitate transport, the AERO-38 units are equipped with a PL-38 front dolly panel attached by means of the rigging hardware. The front dolly panel is useful when rigging systems. The PL-48S, a metal dolly for vertically stacking 3 to 4 AERO-38 units is available as an accessory. The AERO-218Sub units can be moved by way of the four rear located casters. Also the AERO-182 system incorporates a PL-48 dolly panel usefull to transport the cabinet.

The loudspeakers used in the system feature advanced technologies; new TAF (*total air flow*) cooling systems, Neodymium magnetic circuits which allow for important weight reductions, titanium diaphragms for the high frequency sections, and low-mid frequency cones manufactured using crossed fibers and elastic suspension that provide exceptional stability in the vertical plane.

The model AERO-38 includes two 12GNC 12" cone transducer with 4" EFW voice coils and Neodymium magnet assemblies in a bass-reflex configuration. Two 10LMN16, 10" speakers arranged in a V shape, incorporating 3" EFW voice coils, Neodymium magnet assemblies and TAF cooling system are used for mid-range reproduction. High frequencies are handled by one ND-10 high frequency compression driver with 4" EFW coil, Neodymium magnet and 1.5" exit coupled to one SERPIS-38 plane wave guide. The SERPIS-38 plane wave adaptor also serves as a heat sink for the compression driver. The AERO-218Sub and AERO-182 include two 18GN 18" cone transducers with 4" EFW voice coils and Neodymium magnets. These cabinets are intended for applications when extending the frequency range of the system is required.



2. RIGGING SYSTEM

2.1 WARNING

This manual contains needed information for flying D.A.S. Audio line array systems, description of the elements and safety precautions. To perform any operations related to flying the system, read the present document first, and act on the warnings and advice given. The goal is to allow the user to become familiar with the mechanical elements required to fly the acoustic system, as well as the safety measures to be taken during set-up and teardown.

Only experienced installers with adequate knowledge of the equipment and local safety regulations should fly speaker boxes. It is the user's responsibility to ensure that the systems to be flown (including flying accessories) comply with state and local regulations.

The working load limits in this manual are the results of tests by independent laboratories. It is the user's responsibility to stay within safe limits. It is the user's responsibility to follow and comply with safety factors, resistance values, periodical supervisions and warnings given in this manual. Product improvement by means of research and development is on going at D.A.S. Specifications are subject to change without notice.

To this date, there is no international standard regarding the flying of acoustic systems. However, it is common practice to apply 5:1 safety factors for enclosures and static elements. For slings and elements exposed to material fatigue due to friction and load variation the following ratios must be met; 5:1 for steel cable slings, 4:1 for steel chain slings and 7:1 polyester slings. Thus, an element with a breaking load limit of 1000 kg may be statically loaded with 200 kg (5:1 safety factor) and dynamically loaded with 142 Kg (7:1 safety factor).

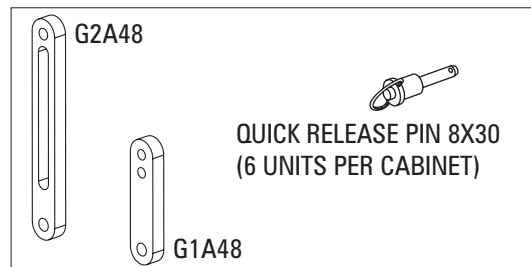
When flying a system, the working load must be lower than the resistance of each individual flying point in the enclosure, as well as each box. Hanging hardware should be regularly inspected and suspect units replaced if in doubt. This is important to avoid injury and absolutely no risks should be taken in this respect. It is highly recommended that you implement an inspection and maintenance program on flying elements, including reports to be filled out by the personnel that will carry out the inspections. Local regulations may exist that, in case of accident, may require you to present evidence of inspection reports and corrective actions after defects were found.

Absolutely no risks should be taken with regards to public safety. When flying enclosures from ceiling support structures, extreme care should be taken to assure the load bearing capabilities of the structures so that the installation is absolutely safe. Do not fly enclosures from unsafe structures. Consult a certified professional if needed. All flying accessories that are not supplied by D.A.S. Audio are the user's responsibility. Use at your own risk.

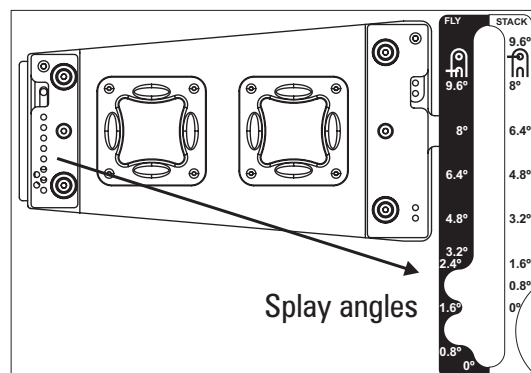
2.2 DESCRIPTION/ACCESSORIES

D.A.S. Audio AERO-38 and AERO-182 line array systems, include 2 rigging structures on each side of the box. Manufactured from zinc plated steel they are painted black and are affixed to an internal plate with special crop resistant screws. Two special stainless steel guides are assembled to each of the structures: G1A48 (front guide) and G2A48 (back guide), allow for stacking or flying of boxes. Splay angles can be changed from 0° to 3.2° in 0.8° increments and from 3.2° to 9.6° in 1.6° increments. To lock both guides, six (6) quick release safety pins (supplied) must be used.

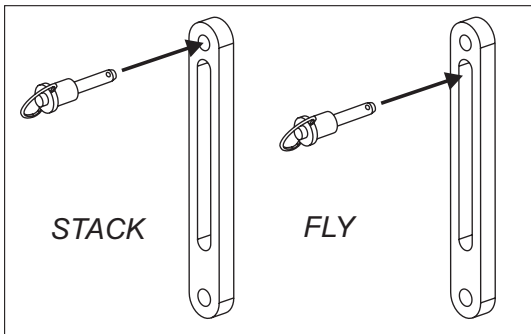
The G1A48 front guide provides a solid connection to the box and whatever is on top of it, while the G2A48 rear guide determines the vertical splay angle (whether stacked or flown), as a function of the hole where the pin gets inserted.



To aid the setting of the G2A48 guide in the corresponding hole in the top box, each hole is labeled with an associated angle, both for stacked and flown applications. To fit the guides into the holes, highly resistant 8 mm quick release pins with a ball safety lock are used.



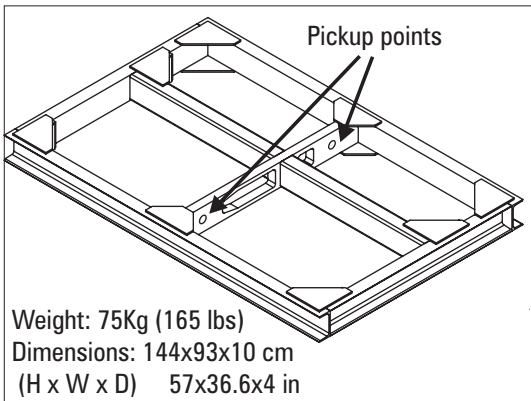
For flying boxes and defining the splay angle, the pins must be inserted in the **slot** of guide 2, G2A48, whereas for stacking (*stacked*), the pin goes through the **top hole** of the guide.



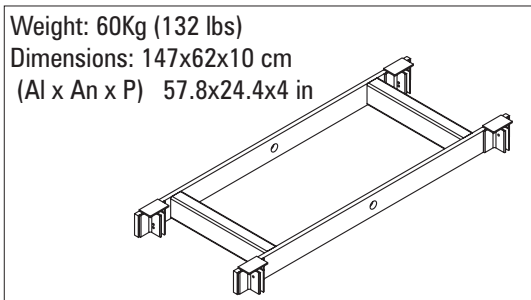
All of the elements needed to rig or stack the systems are integral to the enclosure (G1A48, G2A48 and the quick release safety pins). The additional items needed are the AX-AERO48 or AX-AERO38 flying grids (bumper bars), chains and hoists, the PL-38 or PL-48S dolly platforms and the AX-COMBO

A) AX-AERO48 and AX-AERO38

The AX-AERO48 grid is made from 100 x 50 x 6mm steel beams and is designed to handle great loads. It features a center reinforcement bar that is also used for the lifting slings. The force of both the rear and the front chain hoist will determine the tilt angle of the whole array. The structure will be attached to the first enclosure of the array by means of the guides G1A48, G2A48, and six quick release safety pins.



The AX-AERO38 grid is lighter than the other one, and it is recommended to be used to fly a maximum of 8 cabinets AERO-38A or 6 AERO-48.



B) Chain hoists

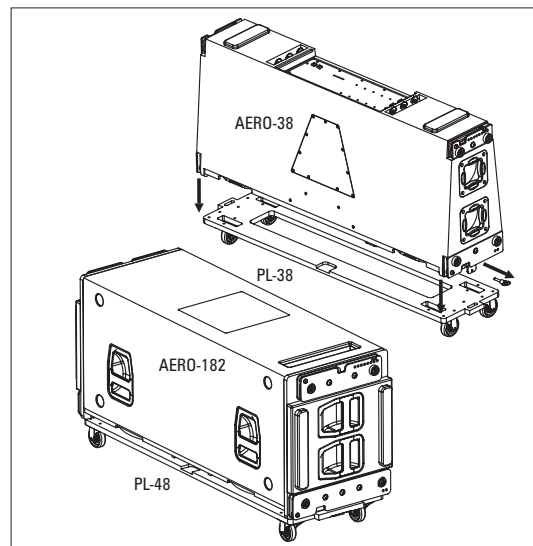
All units in a column will be flown from the AX-AERO48 (AX-AERO38) flying grid (bumper bar), which should be used with two hoists, one located in the front and the other in the rear. Each hoist should have a minimum of 1 Ton load capacity when flying up 8 units and a 2 Ton load capacity when flying 9 to 16 units.

| Load capacity per hoist (safety factor 10:1) | | | | | |
|----------------------------------------------|--------------|-----------|----------|------------|-----------|
| | | AX-AERO48 | | | AX-AERO38 |
| AERO-48 | 1-->8units | >1000Kg | AERO-48 | 1-->6units | >750Kg |
| | 9-->16units | >2000Kg | | | |
| AERO-182 | 1-->8units | >1000Kg | AERO-182 | 1-->6units | >750Kg |
| | 9-->16units | >2000Kg | | | |
| AERO-38 | 1-->10units | >750Kg | AERO-38 | 1-->8units | >750Kg |
| | 11-->20units | >1500Kg | | | |

For example, if 12 units AERO-48 are going to be flown from the AX-AERO48, each hoist to be used should have a load capacity of 2 ton.

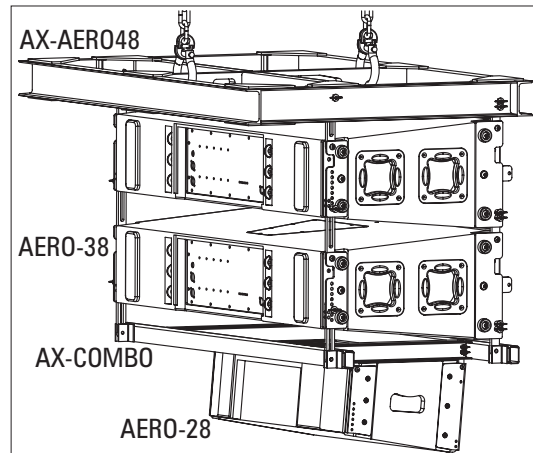
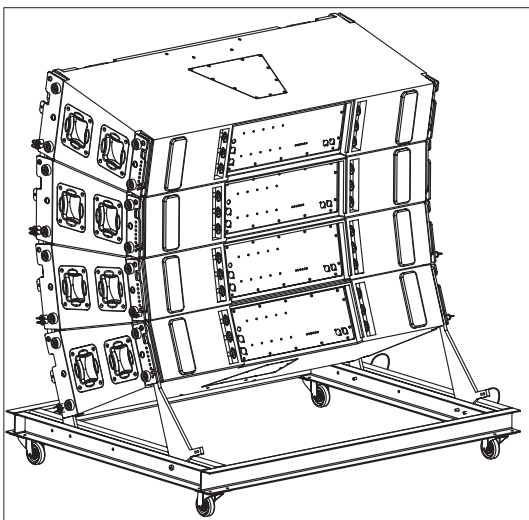
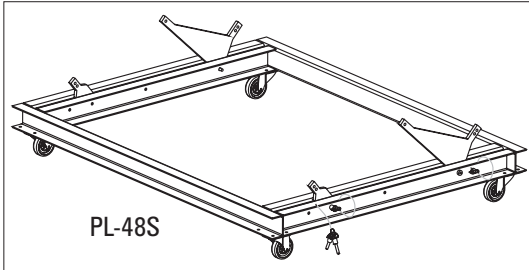
C) Platforms PL-48 and PL-38

The PL-38 dolly panels facilitate transport of the AERO-38 systems. They can also be used to facilitate flying the systems. Each cover is attached to the enclosure by using the flying hardware attached to each box and is fixed with the quick release safety pins. The AERO-182 systems also include one PL-48 dolly panel per cabinet.



D) PL-48S

The PL-48S platform is a valuable accessory which allows up to 4 AERO-38 units to be transported in a stacked position, ready to be flown. The PL-48S is made from steel and has 4 heavy duty casters with locking brakes.

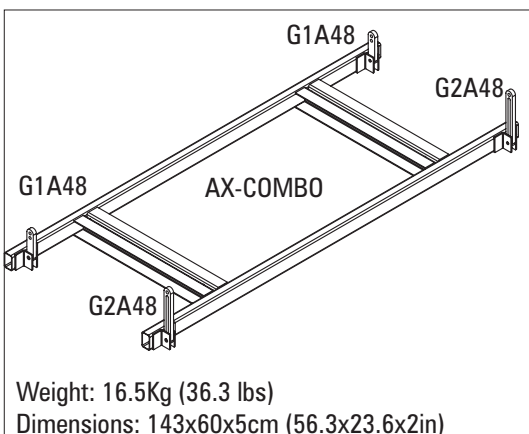


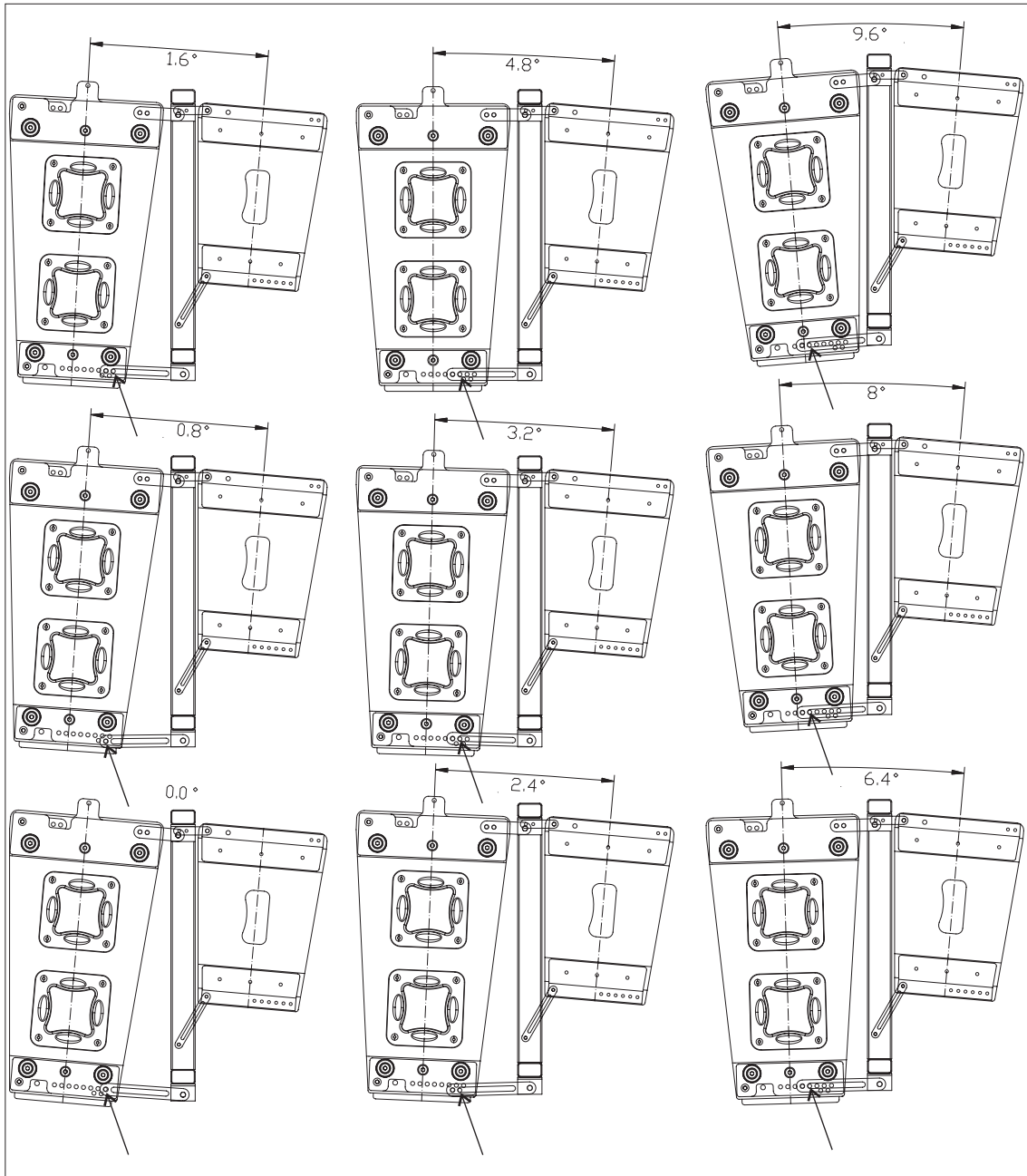
The AX-COMBO is joined to the last AERO-38 cabinet using G1A48 and G2A48 included steel guides and 6 quick release pins. The angle depends on the hole of the rigging structures where the pins are inserted, through the slots of G2A48. The first AERO-28 unit is joined to the AX-COMBO using its G1A and G2A included cam links.

On the next page is a table with the angles between both systems depending on the hole where the quick release pin is being inserted.

E) AX-COMBO

The AX-COMBO is a rigging adapter to be used when Aero-28 units are needed to be flown under AERO-38 units as dowfill systems. Maximum 6 CA-28A units and 8 CA-28/CA-28B units can be flown from this rigging grid. The AX-COMBO includes front and rear steel guides which permit variation of the angle between it and the last AERO-38 cabinet in the cluster. Angles vary from 0.0° to 9.6°.



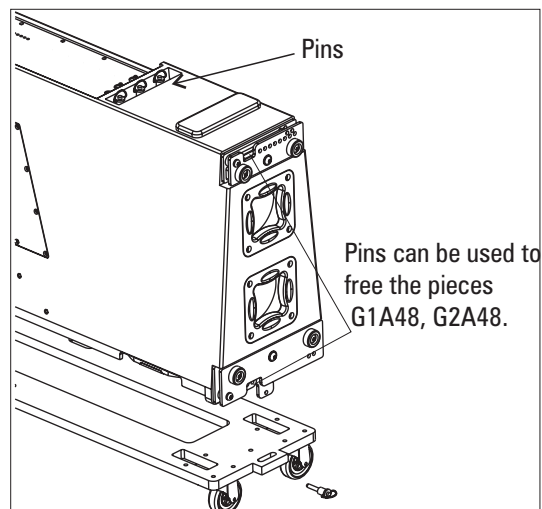


SPLAY ANGLES USING THE AX-COMBO

F) QUICK RELEASE PINS

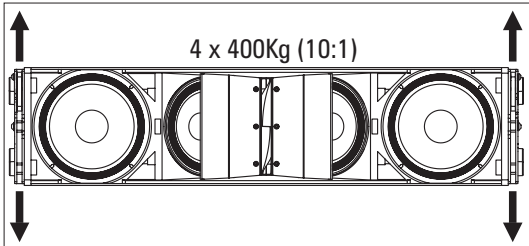
Each cabinet includes 6 steel heavy duty quick release pins stored on the rear panel of the cabinets.

Both systems AERO-38, and AERO-182 can be flown using steel structures located on both sides of the cabinets. **NEVER REPLACE QUICK RELEASE PINS WITH SCREWS OR OTHER ELEMENTS!!!**



2.3 SAFETY FACTORS

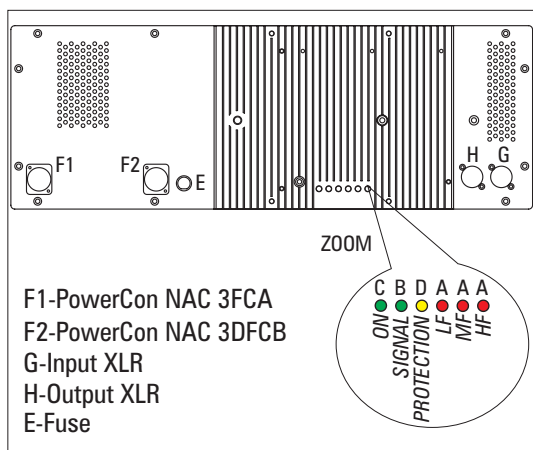
The safety factor is defined as the coefficient between the breaking load limit and the maximum safe working load limit (SWLL). In this case, the breaking load limit of each of the flying points is 4,000 kg (8,820 lbs) as determined by destructive testing in independent laboratories. With a 10:1 safety factor, a total amount of 1,600 kg (3,527 lbs) can be flown from the 4 flying points. Each flying point has a capacity of 400 kg (882 lbs) with a 10:1 safety factor.



The maximum number of AERO-38 units that can be suspended from the AX-AERO48 flying grid is 20 (with 10:1 safety factor). The maximum number of AERO-182 units that can be suspended from the AX-AERO48 flying grid is 16 (10:1). The maximum limits established by the manufacturer should never be exceeded.

The use of two hoists with a load capacity as expressed on the previous page is mandatory. It should be kept in mind that at certain moments, the complete load may be supported by only one of the hoists. This is why the load capacity of the individual hoist must be superior to the weight of the array column.

NOTE: The rigging systems of the AERO-38 and the AERO-48 are compatible. Some accessories (AX-AERO38, AX-AERO48) can be used by both systems.



Rear panel of the AERO-38A amplifier.

3. SELF-POWERED SYSTEMS

3.1 AERO-38A

The Aero-38A is a three way, class D, self powered system.

Nominal amplifier power (RMS) per way:
 LF:1000W MF: 500W HF:500W

Amplifier panel description:

A) *LIMIT*: Amplifier limiter indicator lights. When lit, the level of the signal source should be reduced.

B) *SIGNAL*: Signal presence indicator at the amplifiers' inputs.

C) *ON*: Indicator light for each amplifier channel.

D) *PROTECTION*: Indicates that the amplifier is under protection mode because damage risk due to short circuit or extreme working temperature.

E) *FUSE*.

F1) *AC INPUT*: With PowerCon NAC 3 FCA connector. Only when the connector is inserted and rotated (clicked) into place will the AC turn on. The connector can be used as a switch, rotating the connector to or from the locked position will turn the unit on or off, respectively. Mute the signal feeding the *INPUT* before turning the unit on or off.

F2) *AC OUTPUT*: With (white) PowerCon NAC 3 DFCB connector. This is used as an AC loop thru so that up to 6 boxes (at 230V) can be power from a single AC line.

G) *INPUT*: Balanced signal XLR. Pin assignments as follows :

- 1 = GND (ground)
- 2 = (+) Non inverted input
- 3 = (-) Inverted input

H) *LOOP THRU*: Used for paralleling several units, which will share the same input. The output can also be used to provide signal for an outboard power amplifier.

3.2 AERO-182A

Low frequency mono-amplified system.
Nominal amplifier power (RMS) 1000W.

Amplifier panel description:

A) *LIMIT*: Amplifier limiter indicator lights. When lit, the level of the signal source should be reduced.

B) *SIGNAL*: Signal presence indicator at the amplifiers' inputs.

C) *ON*: Indicator light for each amplifier channel.

D) *FUSE*.

E) *AC INPUT*: With PowerCon NAC 3 FCA connector. Only when the connector is inserted and rotated (clicked) into place will the AC turn on. The connector can be used as a switch, rotating the connector to or from the locked position will turn the unit on or off, respectively. Mute the signal feeding the *INPUT* before turning the unit on or off.

F) *INPUT*: Balanced signal XLR. Pin assignments as follows :

- 1=GND (ground)
- 2=(+) Non inverted input
- 3=(-) Inverted input

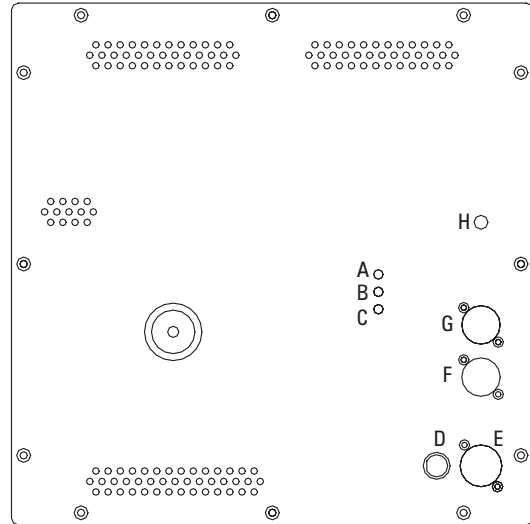
G) *LOOP THRU*: Used for paralleling several units, which will share the same input. Could also be used to provide signal for an outboard power amplifier.

H) *SUB LEVEL*: Used to control the subwoofer level. To prevent accidental mis-setting, a flat-blade screwdriver is needed to rotate the control, which is recessed and detented. Depending on the sensitivity, placement and configuration of your mid-high system, you may need to adjust this control for balanced frequency response.

NOTE: The amplifiers on the AERO-218A and AERO-182A systems do not include a filtered satellite output for AERO-38A systems.

3.3 AERO-218A

The Aero-218A is a low frequency mono-amplified system.
Nominal amplifier power (RMS) 2 x 1000W.



Amplifier panel on AERO-218A and AERO-182A systems.

3.4 AC POWER REQUIREMENTS

The required voltage for all models is:

115V, 50Hz/60Hz - 230V, 50Hz/60Hz

Maximum voltage (divide by 2 for 115V):

264V

Shutdown voltage (divide by 2 for 115V):

Aero-38A: 156V

Aero-182A / Aero-218A: 160V

3.5 CURRENT CONSUMPTION

| AERO-38A | Sine 85Hz | Pink noise |
|---------------|-----------|------------|
| Maximum Power | 8A | 2.5A |
| 1/3 Power | 3.2A | ---- |
| 1/8 Power | 1.6A | ---- |
| Idle | 0.25A | 0.25A |

| AERO-182A / AERO-218A * | | |
|-------------------------|-----------|------------|
| | Sine 50Hz | Pink noise |
| Maximum Power | 7A | 2.5A |
| 1/3 Power | 3.0A | ---- |
| 1/8 Power | 1.1A | ---- |
| Idle | 0.1A | 0.1A |

Data obtained at 230V, multiply per 2 for 115V.

*For 2000W versions multiply per 2.

Maximum power: Measured in conditions of severe clipping.

3.6 SWITCH ON-OFF

A sound system should be switched on sequentially. Switch on the self-powered unit last in your sound system. Switch on the sound sources such as CD players or turntables, then the mixer, then the processors, and finally the self-powered unit. If you have several units, it is recommended that you switch them on sequentially one at a time.

Follow the inverse order when switching off, turning self-powered units off before any other element in the sound system.

Mute all signal sources before switching the unit on or off.

3.7 OVERLOAD (LIMIT) INDICATORS

It is recommended that the red *LIMIT* LED indicators are not lit continuously; at most it should blink only occasionally.

If you wish to have a visual indication at the mix position of whether the LIMIT LEDs are lighting, during equipment set-up, closely observe what mixer VUmeter level corresponds to the level that lights the enclosure's LIMIT LEDs. That level that should not be exceeded during the event.

3.8 OVERHEATING

Due to their high efficiency, the Aero Series amplifiers generate very little residual heat and therefore do not need a fan for cooling. In normal use, the amplifier panel will be warm to the touch.

If the unit stops playing (or just the mid-high or the bass sections), the amplifier's overheating protection may be activated to protect the components from thermal damage.

Overheating may be due to insufficient cooling, or to very aggressive use in extremely hot conditions. Do not use the unit in proximity to high power lights.

Once the amplifier cools down, it switches back on automatically. If the unit should shut down again, try reducing the volume a notch to avoid overheating.

3.9 EQUALIZATION

The units do not need extreme EQ. Avoid high levels of gain on the equalizers. Gain values above +6 dB on a console's EQ are not recommended.

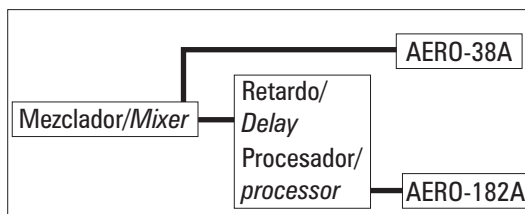
3.10 LOW MAINS VOLTAGE

If mains voltage falls below the shutdown voltage for the unit, it will stop playing. When acceptable levels are regained, the unit will switch back on automatically.

3.11 CONNECTIONS

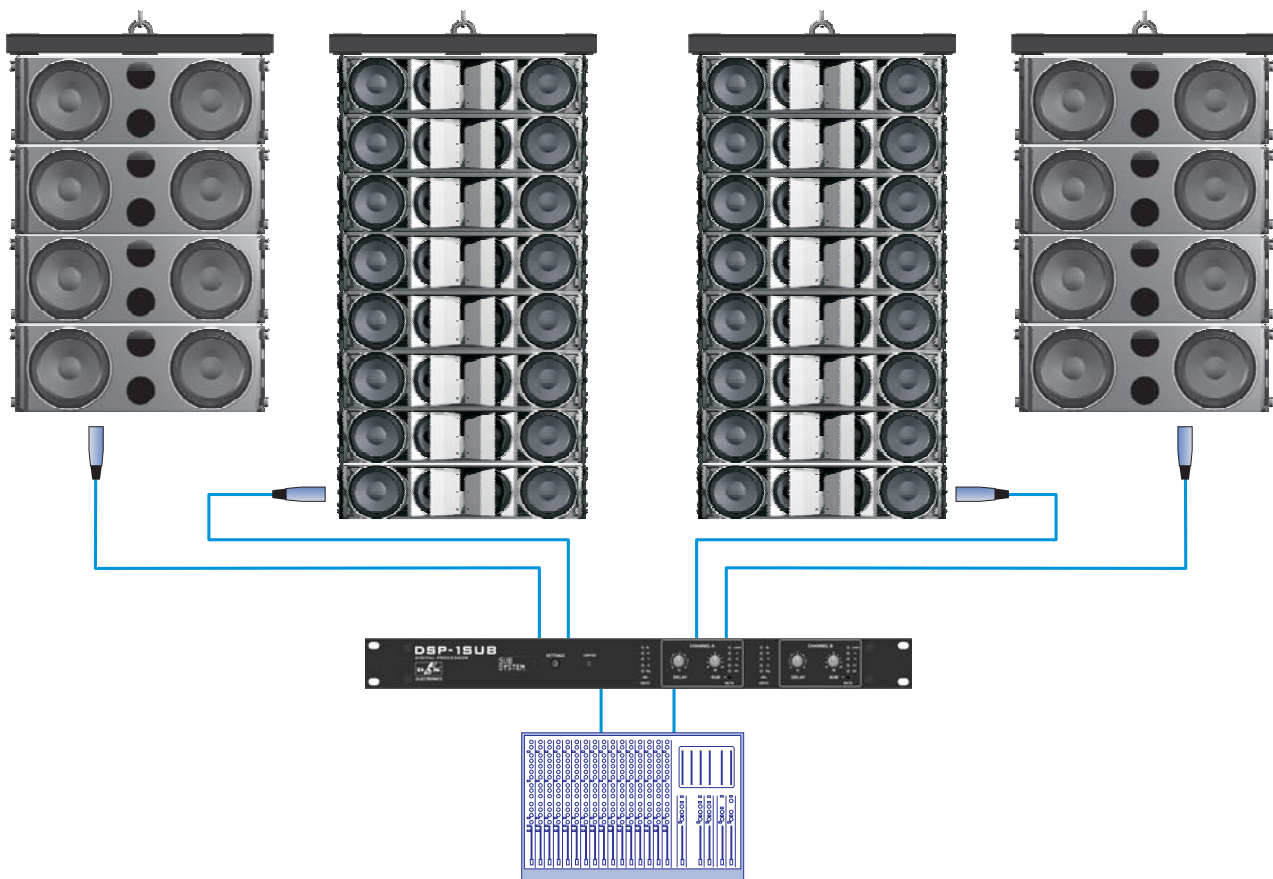
The AERO-38A can be used full-range. Full-range use is only recommended for applications where low SPL level and no bass reinforcement is adequate. To use it in this mode simply plug the mixer into the enclosure's input.

The most common use will be combined with the AERO-218A (AERO-182A). In this case different outputs of the mixing console will be used with the AERO-38A and the SUBS. Both sub systems, AERO-182A and AERO-218A include signal treatment in the amplifiers extending their frequency range up to 85Hz. As well, the amplifier of the AERO-38A incorporates signal treatment which provides frequency range extension down to 60Hz. Due to this overlap between 60-85Hz the use of an **external delay** to control and adjust the phase of the subs is recommended.



The *LOOP THRU* connector is an output XLR in parallel with the input connector and is useful for daisy chaining the input signal to a number of boxes, connecting them in parallel.

The number of units that can be linked this way depends on the output impedance of the equipment driving the enclosure, such as the mixer or processor. Typically, to avoid signal degradation, the maximum number that can be daisy chained is given by the formula $Z_c > 10Z_s$, where Z_c is the load impedance and Z_s is the output impedance of the equipment driving the enclosure (mixer, console, etc). For instance, a mixing console with 100 ohm output impedance allows daisy chaining 20 boxes, when the input impedance of the cabinets is 20K ohm.



As can be seen in the diagram, independent signal lines exist for the subwoofer units, AERO-182A. The signal that goes to the subs is processed by means of the DSP-1Sub to adjust the delay between both systems.

3.1.2 RAIN PROTECTOR

Electronic devices can be damaged when exposed to water or moisture. AERO-38A and AERO-182A/218A amplifiers must be protected when installed outdoors. A rain protector is supplied with each AERO-38A and AERO-182A/218A unit.

The rain protector is specially designed to withstand soft rain and other meteorological conditions for short periods of time. In the case of heavy rains, storms or permanent outdoors installations the sound system must be protected with additional elements.

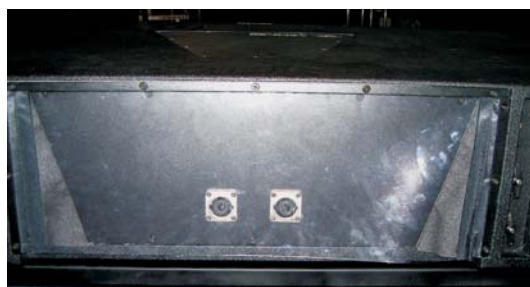
The rain protectors supplied with each unit have been manufactured with fireproof materials.

The AERO-38A's rain protector features several small holes on the top side to allow convection cooling of the amplifier.



AERO-38A rain protector.

NOTE: The rain protector of the AERO-38A is different from the one that includes the AERO-38.



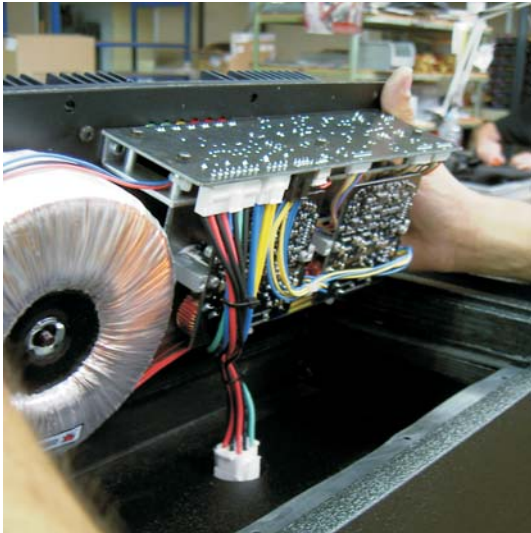
AERO-38 rain protector.

3.13 HOW TO MAKE A PASSIVE SYSTEM INTO A SELF POWERED ONE.

AERO-38 -->AERO-38A:

AERO-38 passive systems come with a metallic back plate, protected by a rain protector, that features two Speakon NL8 connectors. To convert a passive system into an active one, loosen firstly the screws 11x (3.9x19Pv00) and the rain protector. Once this has been done, remove the 14 x M4x20 screws that fix the back plate to the box.

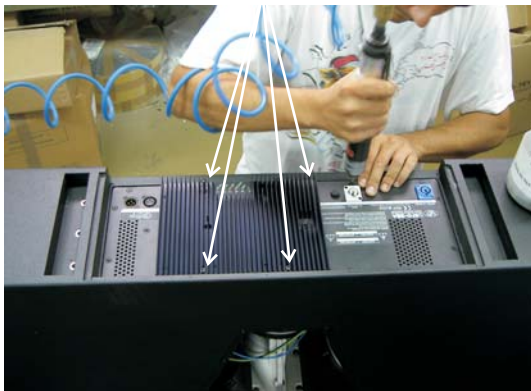
On the rear side of the back plate the cables coming from the Speakon connectors lead to a white male connector, which is inserted in a white female connector attached to the box. Unplug the male connector coming from the Speakon connectors and insert the male connector of the amplifier in the female connector on the box.



The white connector mentioned above can be plugged only in one way, so a mistake in the connections is mechanically impossible. Make sure that the connection is tight enough, then put the amplifier in its receptacle paying attention that wires do not get caught.

The next step will be to fix the amplifier to the box with the screws supplied:

- 10x(M4x20 DIN 965)
- 4x(M4x30 DIN 7985)



The four M4x30 DIN 7985 must be screwed in the four holes that can be seen on the radiator area. The white arrows in the picture above point to the mentioned holes.

Different rain protectors are needed for the passive and the active versions!!!

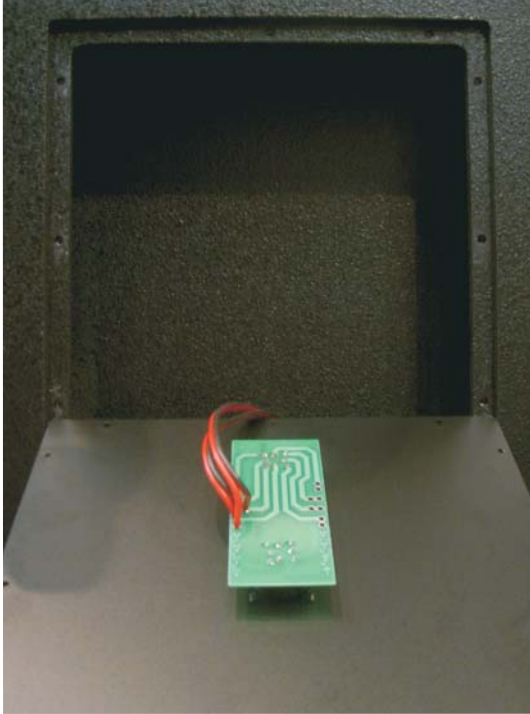
The rain protector for the self powered version is supplied with the amplifier. In order to attach it to the box just rest the protector on the receptacle and retighten the eleven 3.9x19PV00 on.



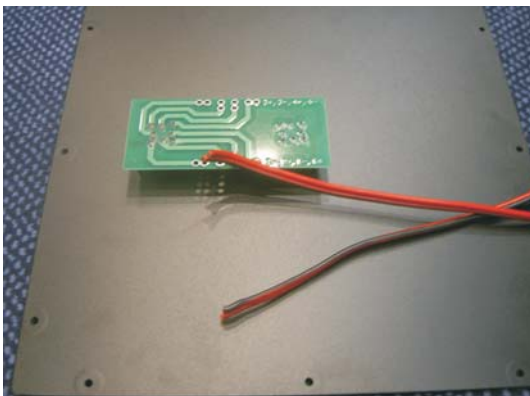
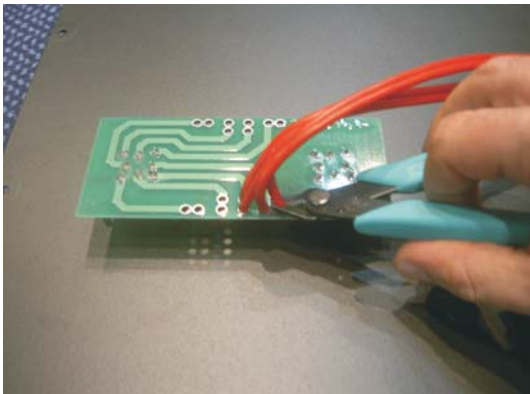
This way the amplifier of the AERO-38A system has been correctly installed in the box.

AERO-218Sub --> AERO-218A

To make a passive system into an active one, firstly the back plate must be removed by unscrewing the 12 M4x20 DIN965.



Then the speaker wires must be cut from the circuit board.

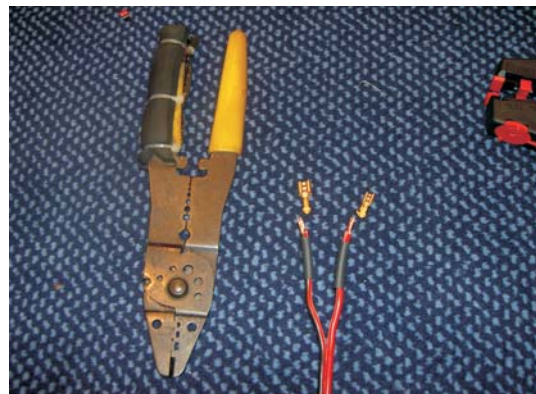
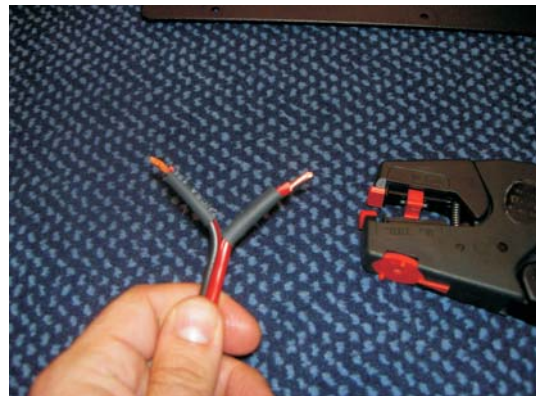


NOTE: As AERO-218A and AERO-182A amplifiers' polarity is inverted referenced to that of conventional external amplifiers, the polarity of the speakers' wires must be changed when switching from a passive to an active Aero Series sub.

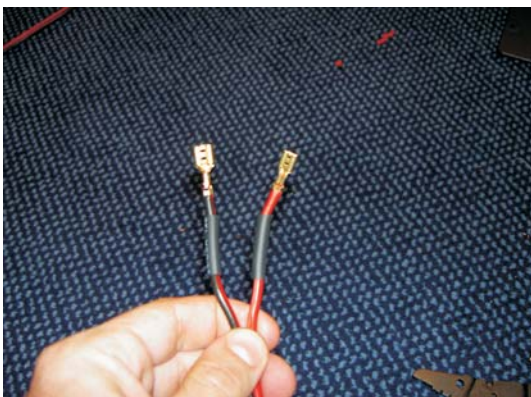
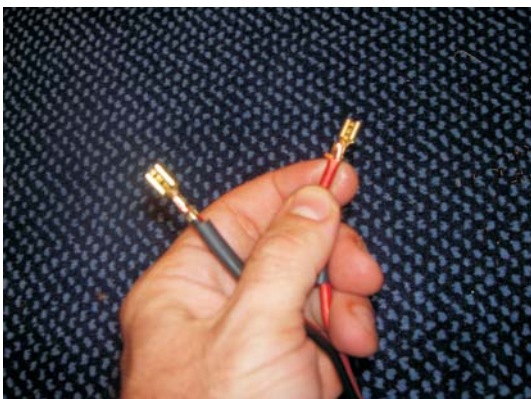
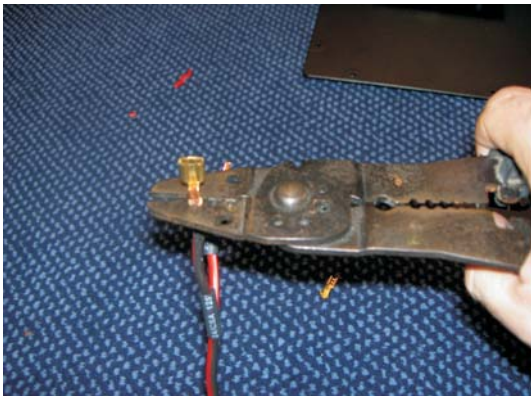
After cutting the speakers' wires on the circuit board, *faston* terminals must be attached to the speakers' wires as follows: to assure current polarity attach large 6.3mm female *faston* terminal, to the black wire, and a smaller 4.8mm female *faston* terminal to the red wire. Connecting the terminals to the correct male terminals on the amplifier circuit board amplifie, the polarity will be correct.



It is highly advisable to shield the terminals with tape or thermoretractable material:



The large 6.3mm wide *faston* terminal should be attached to the black wire, and the small 4.8mm wide *faston* terminal should be attached to the red wire:



In the case of the AERO-218A the same process applies to the second amplifier in the box.

Should you have any problem during this process do not hesitate to contact D.A.S. factory or our regional dealer.

3.1.4 TROUBLESHOOTING

| PROBLEM | CAUSE | SOLUTION |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No sound from the unit. The <i>SIGNAL</i> presence LED indicator(s) do(es) not light up. | 1- The signal source is sending no signal. 2- Defective cable. | 1- Check that the mixer or sound source is sending signal to the UNIT. 2- Check that the cable from the sound source to the UNIT is connected correctly. Replace the cable if defective. |
| Full power cannot be obtained. The <i>LIMIT</i> LED indicator(s) never light(s) up. | 1- The signal source does not have a hot enough output. | 1- If using a mixer, use the balanced output if available. Use a professional mixer with a hotter output. |
| Sound is distorted. The <i>LIMIT</i> LED indicator(s) is/are not on, or only light up occasionally. | 1- The mixer or signal source is distorting. | 1- Turn mixer channel gains down. Check that none of your signal sources are distorting. |
| Sound is distorted and very loud. One or more <i>LIMIT</i> LED indicators light up. | 1- The system is overloaded and has reached maximum power. | 1- Turn down the mixer's output. |
| Hum or buzz when a mixer is connected to the unit. | 1- The console probably has un-balanced outputs. You may be using an incorrect un-balanced to balanced cable. 2- The mixer and the powered speaker are not plugged into the same mains outlet. 3- The audio signal cable is too long or too close to an AC cable. | 1- Read the appendix of this manual to make a correct un-balanced to balanced cable. 2- Connect the mixer and the unit to the same mains outlet. 3- Use a cable that is as short as possible and/or move the audio signal cable away from mains cables. |
| Hum or buzz when using lighting controls in the same building. | 1- The audio signal cable is too long or too close to the lighting cable. 2- On a sound system with three-phase AC, the lighting equipment and the UNIT are connected to the same phase. | 1- Move the audio signal cable away from lighting cables. Try to find out at what point the noise is leaking into the system. 2- Connect the sound system to a different phase than the lights. You may need the help of an electrician |
| The power on LED indicator(s) do(es) not light up when the power connector is rotated and locked at the ON (<i>LOCK</i>) position. | 1 Bad or loose AC connection to the UNIT or the mains outlet. 2 Faulty AC cable. 3 Blown Fuse. | 1- Check you connections. 2- Check the cables, connectors and AC power with a suitable mains tester. 3- Replace fuse on fuse holder with one of the same type. If it blows again, take the unit to a service centre. |

4. ASSEMBLING AN ARRAY

4.1 TRANSPORTING THE CABINETS

AERO-38 units can be transported by using the front panel dolly PL-38 or by using the PL-48S steel dolly which can transport a maximum of 4 AERO-38 stacked.

The AERO-218Sub can be transported on the rear located casters. Their rectangular shape facilitates ground stacking without the use of the rigging hardware. The AERO-182 cabinets can be transported by using the front panel dolly PL-48.

4.2 PLANNING/INSPECTION

Before installing the AERO systems it is a good idea to run a simulation using the AEROWARE program utilizing the venue dimensions. This way we can determine the needs that should be met by the rigging structures such as hoists, cranes, beams, rigging points, etc. Besides providing weight information, the program also provides users with splay angle information, safety pin positions and coverage predictions.

It is extremely important to assure that each and every one of the aforementioned structures is capable of supporting a superior load than that of the complete system.

Inspection is the next step after planning and acquiring all the necessary parts needed to elevate the systems. All parts, including the hardware attached to the enclosure, the safety pins, etc. should be thoroughly inspected before each use. Units exhibiting deformations, cracks or any other defect should be replaced with new units.

It is important to establish an inspection routine for the complete rigging system before each event or installation as well as establishing the maximum load specifications of the hoists to be used.

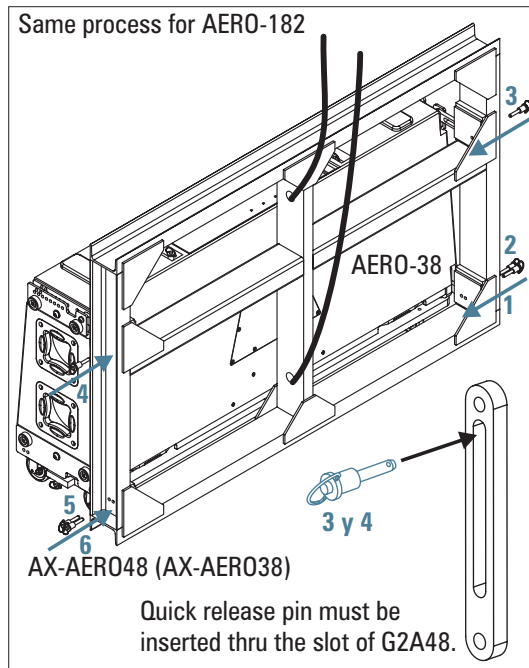
Rigging should be carried out by experts familiar with the way the systems function and their characteristics.

On occasions, it may be convenient to have additional tie down points to impede the array from twisting or swinging.

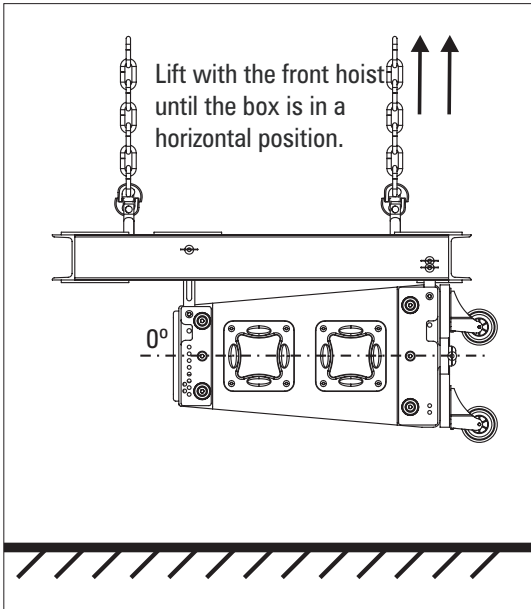
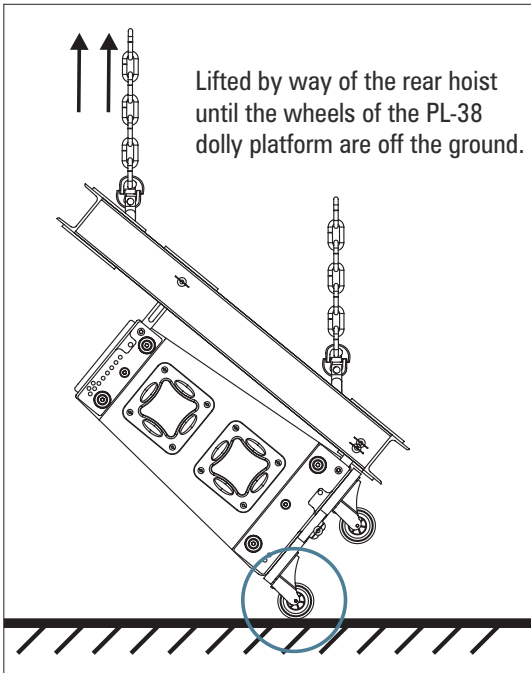
4.3 ASSEMBLING AN ARRAY “ONE BY ONE”

When few units are to be used (minimum systems recommended is 6 units) or when the dolly platforms cannot be used due to a lack of space, the enclosures will have to be hung “one by one”. The first step will be to attach the AX-AERO48 or the AX-AERO38 grid structure to the hoists. The chain slings need to be attached to the structure using the shackles provided with the grid. Once this has been accomplished, the grid structure can be placed in a vertical position by lifting the rear hoist and lowering the front hoist so that the rear of the grid is on top and the front of the grid at the bottom, ready to receive the first box rolled into place by means of the PL-38 dolly platform.

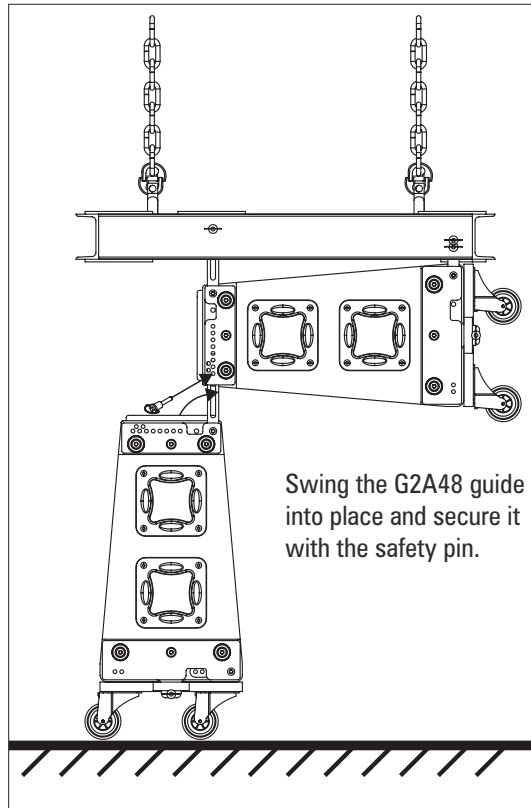
The next step is to attach the first unit to the grid by introducing the G1A48 and G2A48 guides in the receiving points of the grid structure and assuring them with the six safety pins. The safety pins should be inserted in the slot of the G2A48. It is very important to make sure that the pins have been inserted and locked correctly.



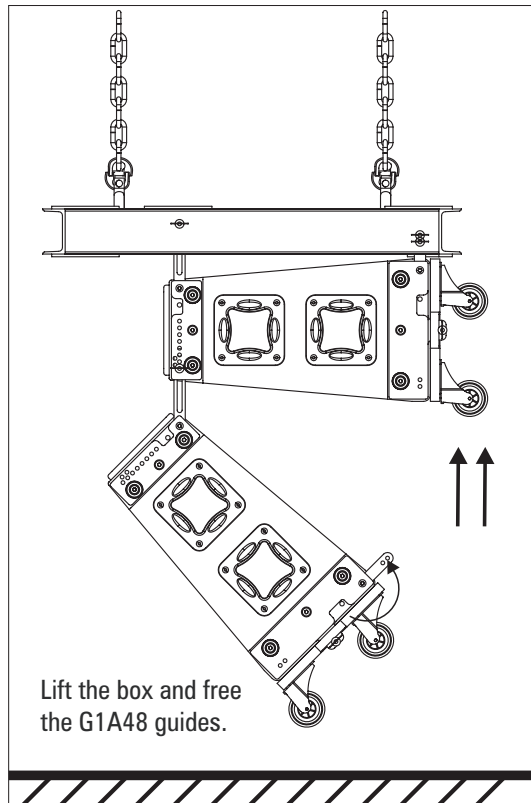
Once the first unit of the array has been attached to the AX-AERO48 or AX-AERO38, the assembly should be lifted by way of the rear hoist until the wheels of the PL-38 dolly platform lift off the ground. From this point on, the front hoist can be used to lift the box into a horizontal position.



Once the first box has been placed at 0° and raised approximately 75cm (30 in) the second box of the array can be rolled into place. Once located in position, the G2A48 guides of the second box should be freed and inserted in the rear located receiving points of the suspended box and secured with the safety pins.



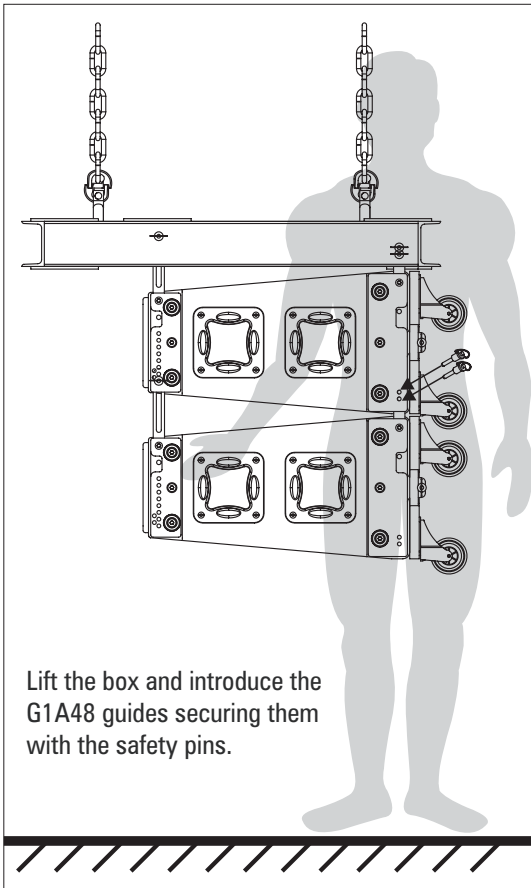
Once the splay angle between the first two boxes has been determined, the front of the box can be lifted into place. Three people will be needed to undertake this operation, two to lift the box and one to fit the G1A48 guide and safety pins into the upper box.



4.4 ASSEMBLING AN ARRAY USING THE PL-38 PLATFORM

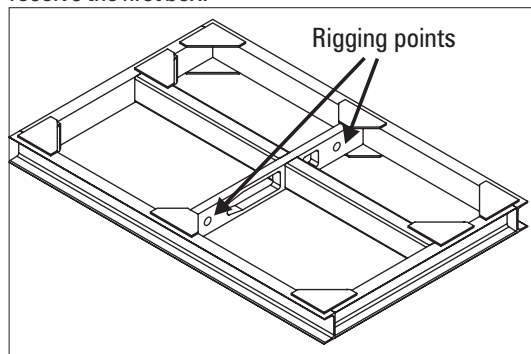
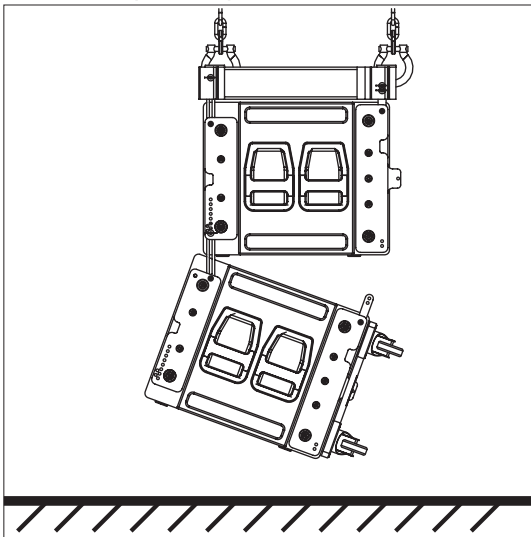
The PL-38 platform can be used to easily transport AERO-38 units to the assembling area. To use this method of assembling and hoisting the array, there must be enough space to permit linking all the boxes from the front of the the rigging hardware.

The first step will be to attach the AX-AERO48 or AX-AERO38 grid and the 2 hoists. Once this has been accomplished, the grid structure can be placed in a vertical position by lifting the rear hoist and lowering the front hoist so that the rear of the grid is on top and the front of the grid at the bottom, ready to receive the first box.

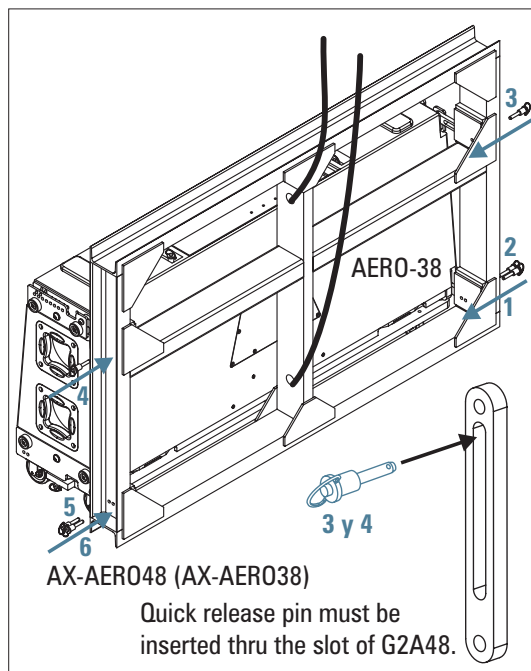


Once the boxes have been joined, the front dolly panels can be removed. The next boxes should be attached "one by one" using the methods described. Finally, the array should be hoisted to the correct height and secured with slings to avoid swinging. This method is more time consuming than assembling an array by the "all at once" procedure, but is appropriate for situations due to a lack of space in which to array the system. During the process, the safety pins should be checked making sure they are secured correctly. Once the complete array has been lifted into place, additional slings should be attached to secure the array and avoid swinging.

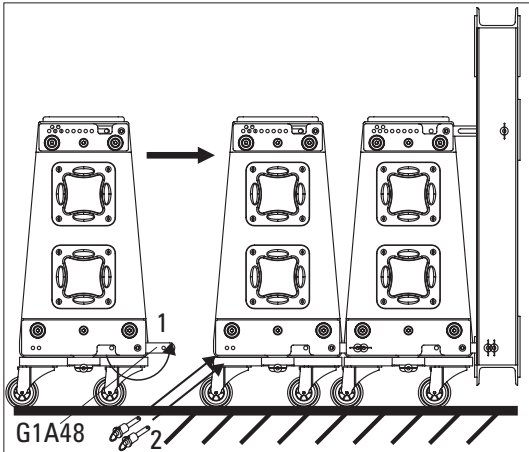
AERO-182 systems can be flown one by one as described previously!!.



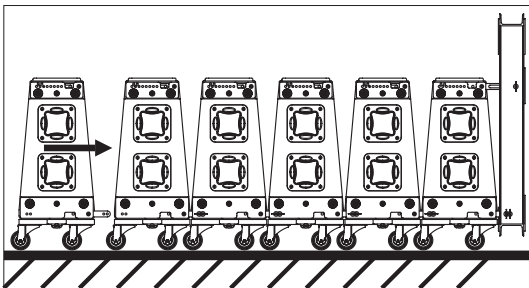
The next step is to attach the first unit to the grid by introducing the G1A48 and G2A48 guides in the receiving points of the grid structure and assuring them with the (6) safety pins. The safety pins should be inserted in the slot of the G2A48. It is very important to make sure that the pins have been inserted and locked correctly.



Once the first box is attached to the structure, the remaining boxes should be brought to the array and attached repeating the previous steps (1 and 2) using G1A48 guides and safety pins per side making sure that the pins have been inserted and locked correctly.



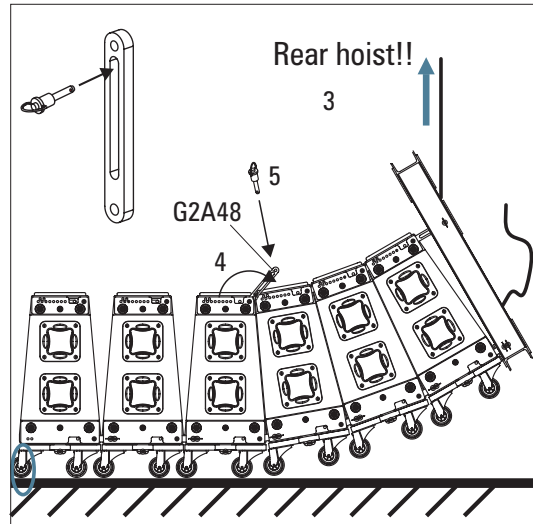
Proceed to attach the remaining units in the same manner until all the array units are attached to one another. For example, if we are assembling a six unit array, the process will be repeated six times. When all the units are attached, the complete array is ready to be hoisted.



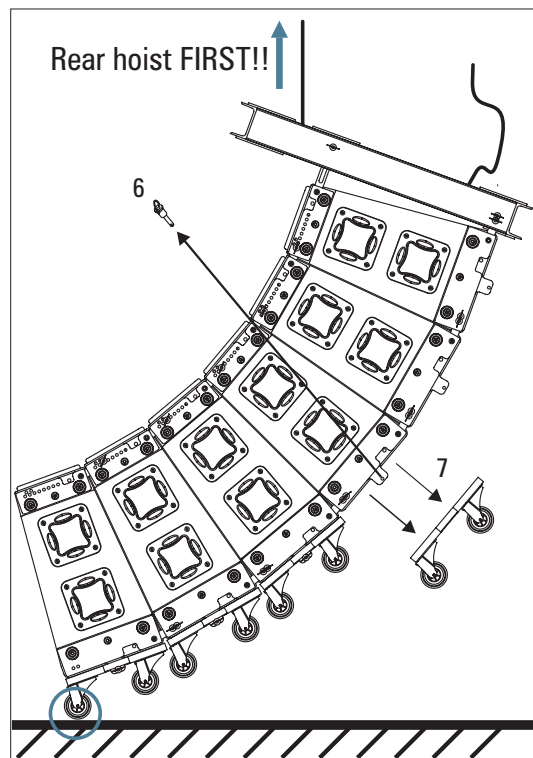
The complete assembly should begin being lifted from the rear hoist (3) so that the rear of the enclosures come together due to their trapezoidal shape. The front motor will be used only to take up slack in the chain, all the weight should be on the rear hoist. Proceed in this manner until the wheels of the last enclosure are off the ground. From here on, the array can now be lifted with both motors.

When the rear of the enclosures come together, the G2A48 rear guides should be positioned (4) into the hardware of the box above, inserting (5) the safety pins in the correct angle position. Since the boxes are flown, the safety pins should be in the slot of the G2A48 guide.

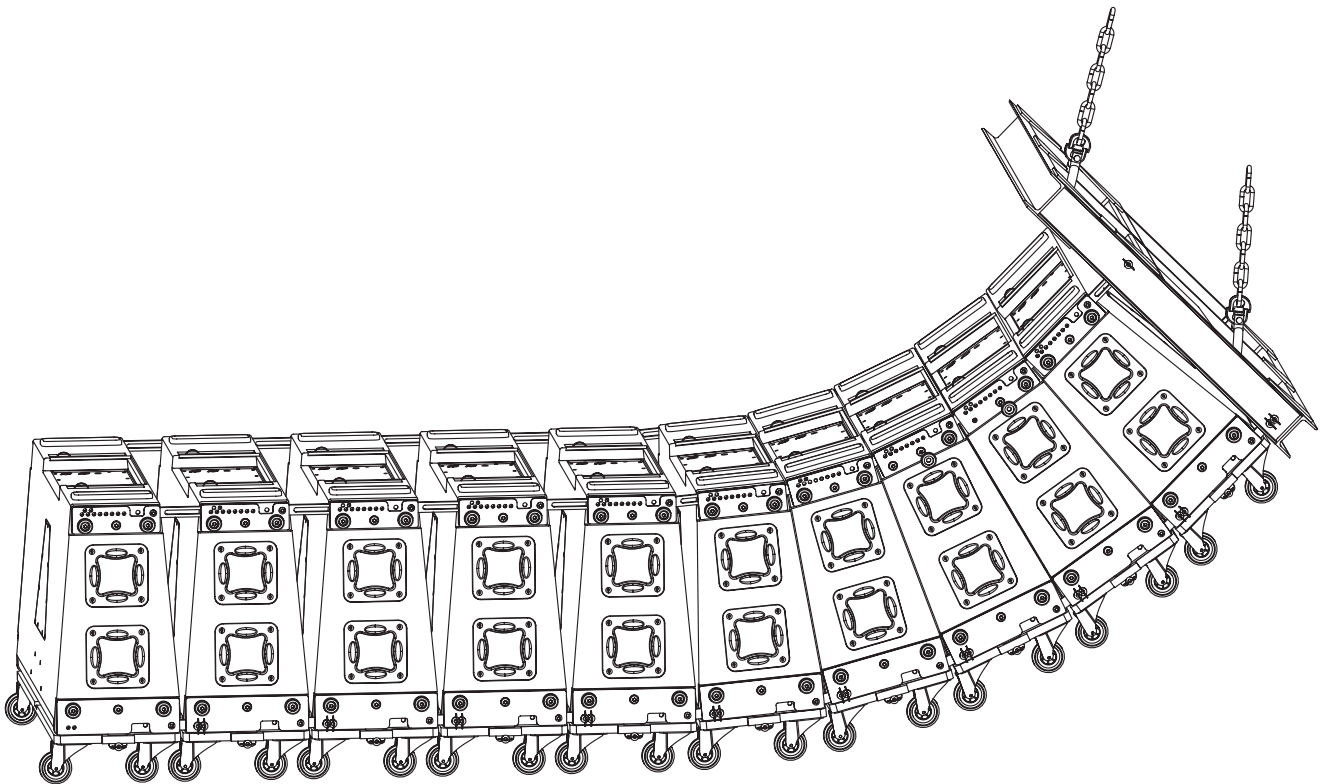
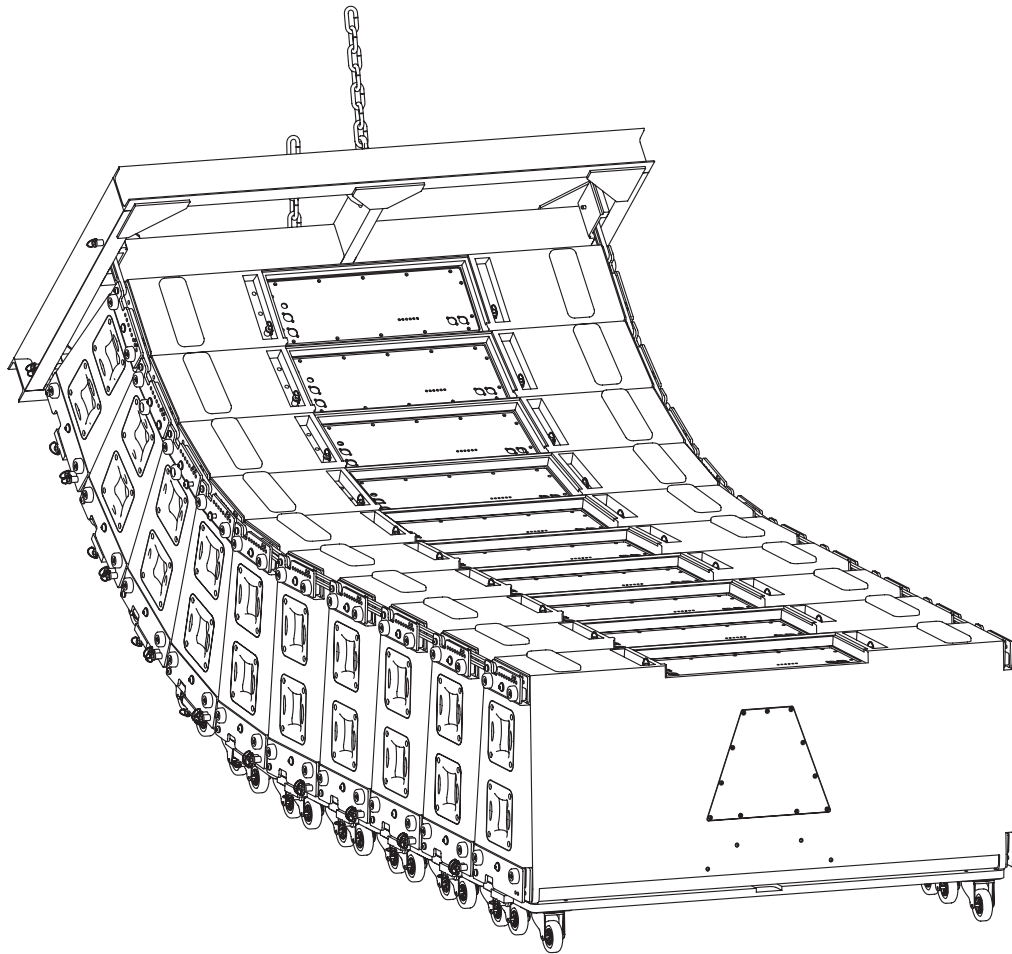
As the array assembly is lifted (6 & 7), the PL-38 platforms should be removed.



The front motor will be used only to take up slack in the chain, all the weight should be on the rear hoist. When the wheels of the last enclosure are off the ground the array can be lifted with both motors.



Once the complete array has been lifted into place, additional slings should be attached to secure the array and avoid swinging.

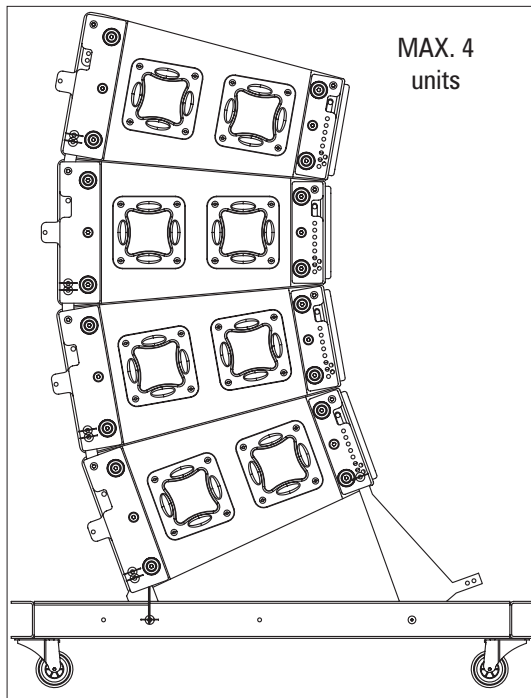


To lower the system, both hoists should be used until the lowest box is about 1 meter from the ground. From there on, only the front hoist should be used so that the array assembly begins to lean forward, at the same time, the PL-38 platforms should be reattached. When the wheels of the lowest enclosure are firmly on the ground, the array assembly can now be lowered using the rear hoist.

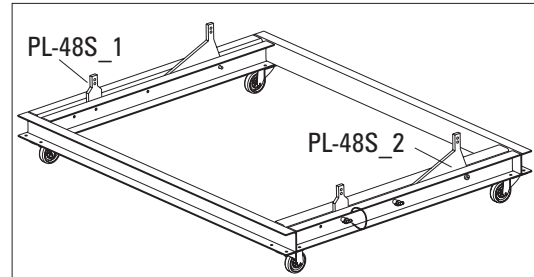
While the array assembly descends, the rear of the enclosures will come together, at that moment, the safety pins which hold the G2A48 guides in place should be removed. Once removed, the guides should be swung back into the box they belong to. Finally, the boxes should be totally detached from one another by releasing the G1A48 guide.

4.5 ASSEMBLING AN ARRAY USING THE PLATFORM PL-48S

The PL-48S platform can be used to easily transport 3/4 units of the AERO-38; in both arc shape or stacked on the platform.



The PL-48S platform has two types of moving pieces. One of them is fixed (PL-48S_2) and can only be swung around, the other is free (PL-48S_1) and is joined to the platform by way of a safety pin. The smaller piece PL-48S_1 attaches to the front enclosure hardware and the larger PL-48S_1 attaches to the back:

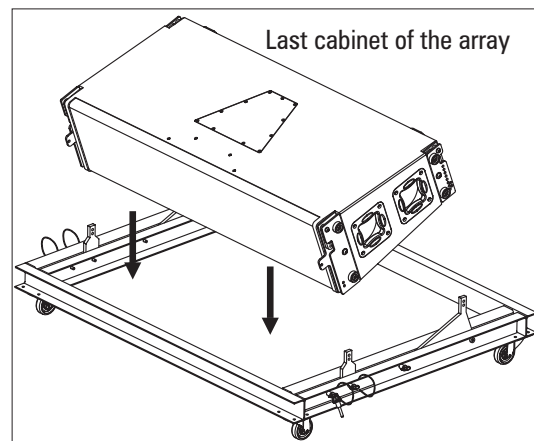


The PL-48S platform can be used to transport boxes forming a vertical arc, ready to be flown or simply stacked.

Either way, due to the weight of the boxes, it is recommended that for the first time, the enclosures be placed on the platform from a flown position. In other words, the array should be suspended (either one by one or using the PL-48S) and then lowered onto the PL-48S in groups.

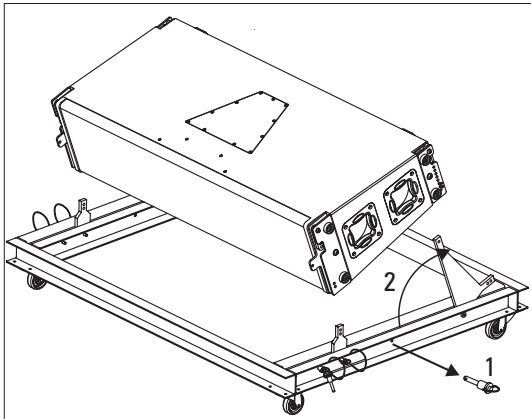
A) Cabinets splayed in arc (MAX. 4 units):

To place eight AERO-38 units on 2 PL-48S, the first step would be to suspend them all, and then lower the array assembly onto the platforms in groups of four.

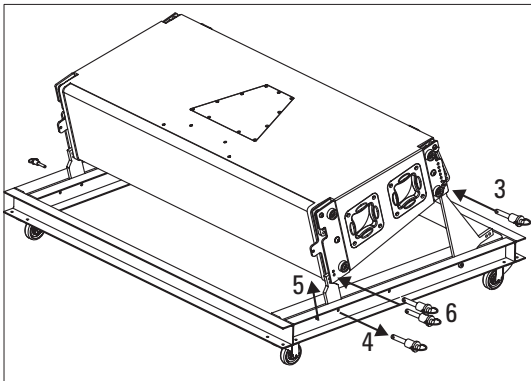


Lower the array until the lowest box is about 15 cm (aprox. 6 in.) above the PL-48S platform.

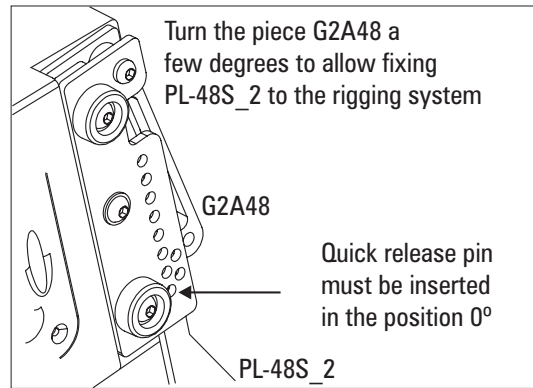
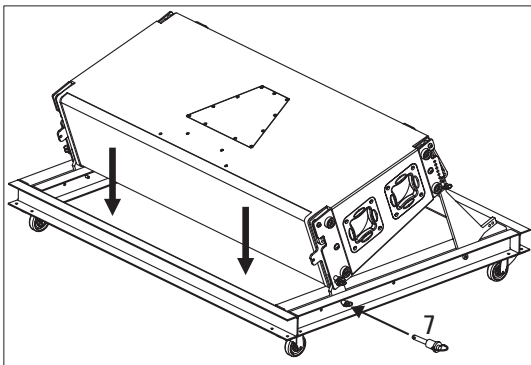
Release the PL-48S_2 piece by removing the safety pins (1). Next, swing the pieces and introduce them (2) into the rear rigging hardware of the lowest box, securing them with the safety pin (3).



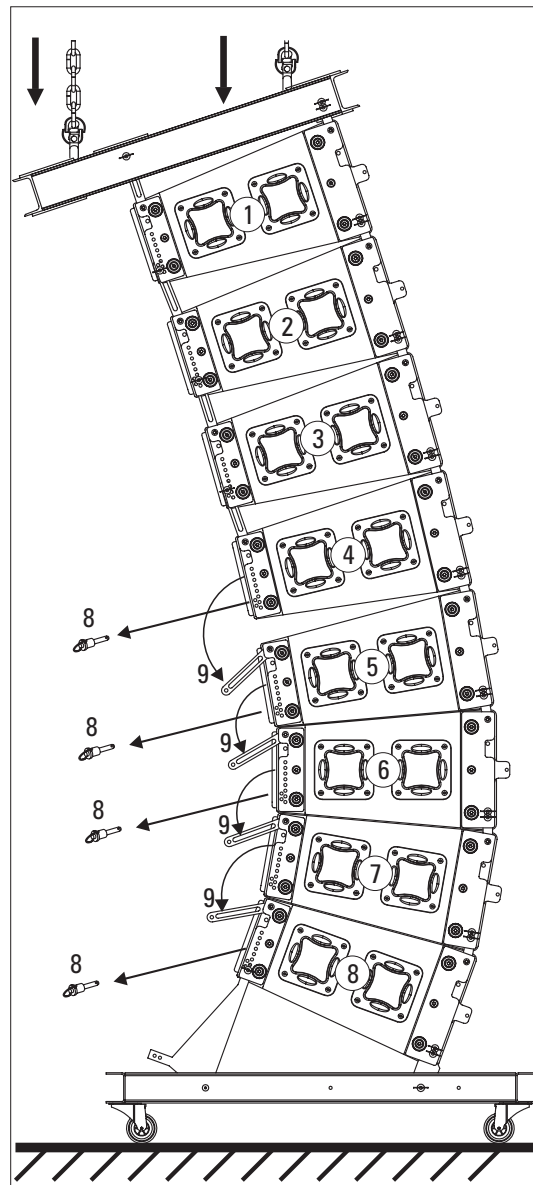
Once the two PL-48S_2 have been attached to the boxes (3) using one safety pin per piece, the PL-48S_1 pieces can be attached. Remove the safety pins (4) and insert the PL-48S_1 pieces into the rigging hardware (5) securing them (6) by using two pins per piece.



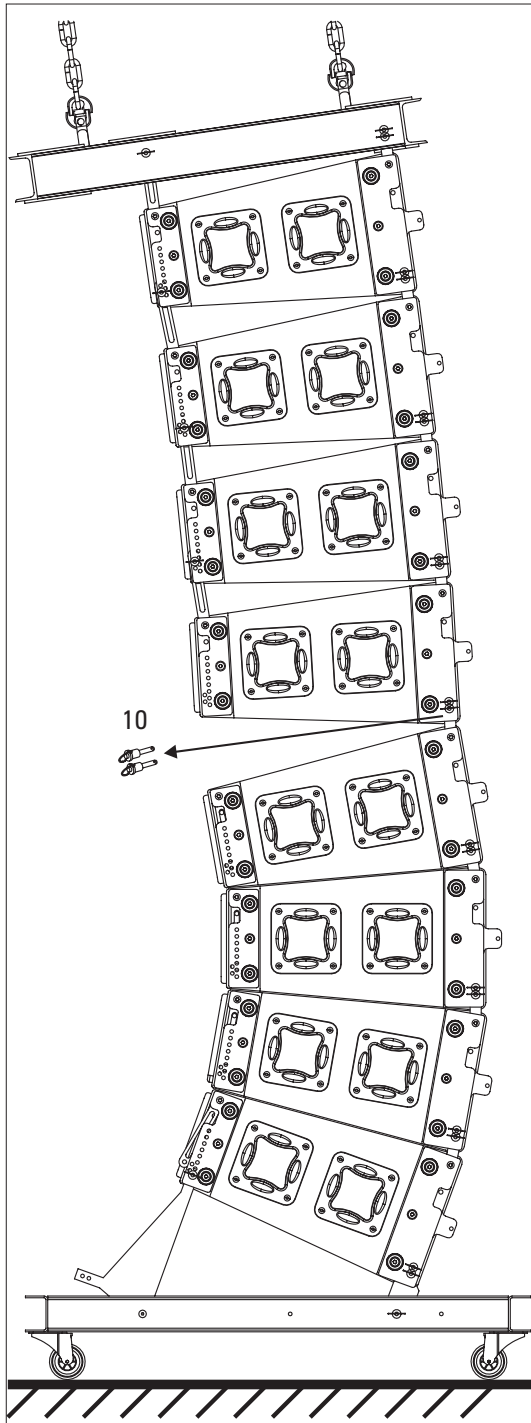
Once the PL-48S_1 and PL-48S_2 have been secured to the lower box, this should be lowered so that the PL-48S_1 piece can be secured to the PL-48S platform (7) using the safety pins.



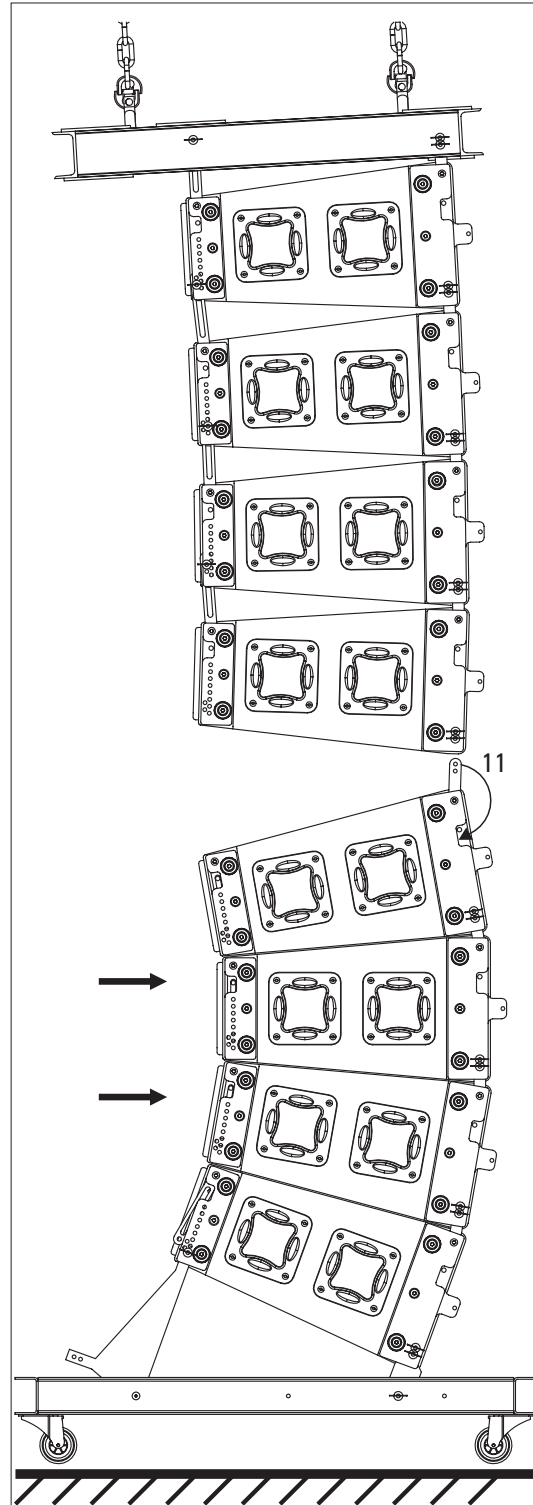
With the number 5, 6, 7 and 8 boxes resting on each other, the safety pins that define the splay angle can be removed (8) and the PL-48S_2 guides can return to their stored position (9). It is mandatory to remove the safety pins between boxes 3-4, but between 4-5, and 5-6, they can be left in place with the angle prepared for the next event.



Boxes 4-5 should be separated at the front by removing the safety pins (10) that secure the G1A48 guides.

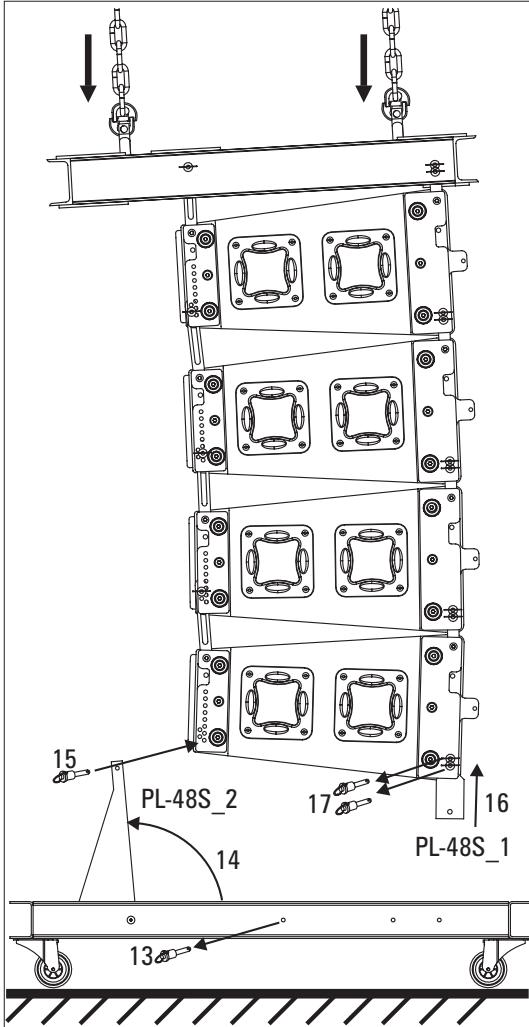


When the G1A48 pieces have been freed, they should be turned (11) and stored (12) within the corresponding box, in this case number 4, using the mechanism included in the rigging hardware.



The first group of boxes has now been freed and is stacked safely on the PL-48S platform. To move the stack, slightly raise the upper group of boxes and roll away the lower group.

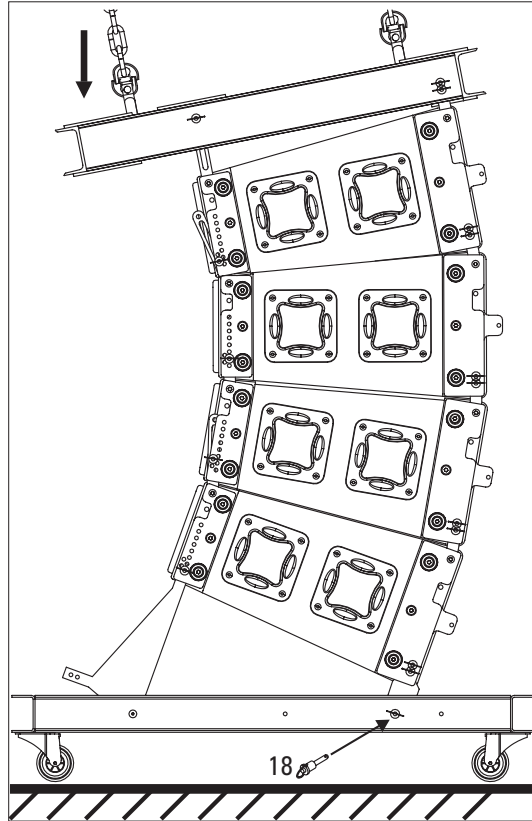
The next step is to roll under the remaining boxes, an empty PL-48S and lower the boxes until they are within close proximity of the platform. The procedure should now be repeated, freeing the PL-48S_2 pieces (13) from the platform, turning them (14) and securing them (15) to the rear rigging hardware of the number 4 box.



Continue lowering the systems and secure (16) the PL-48S_1 pieces to the front rigging points of box 3, inserting 2 safety pins in each (17).

Whenever a safety pin is inserted, it is recommended that they be checked to make sure that they are correctly attached. Pull the safety pin outward to make sure that it is in the locked position.

The last step consists of lowering the remaining array so that the safety pins can be inserted (18) into the holes of the PL-48S_1 pieces and the platform.



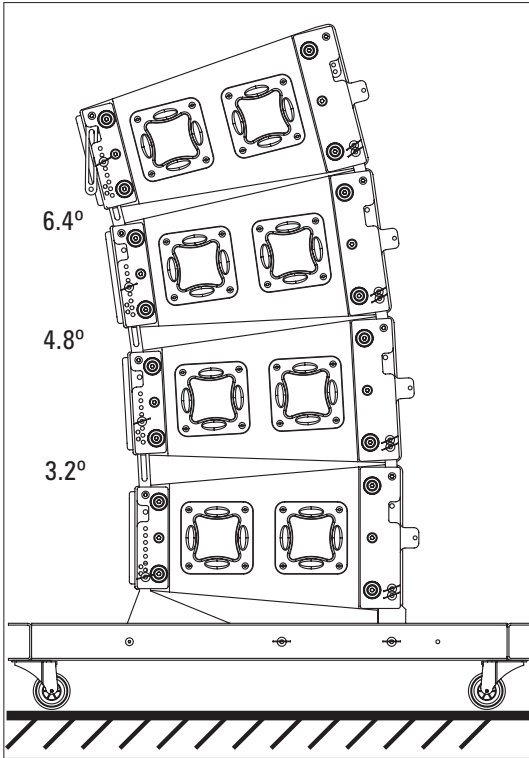
As in the case of the first group of boxes, it is not necessary to remove the safety pins securing the G2A48 guides which determine splay angle. They can remain in as they are, ready for the next event. The same goes for the AX-AERO48 grid.

B) Stacked units (MAX. 4 units):

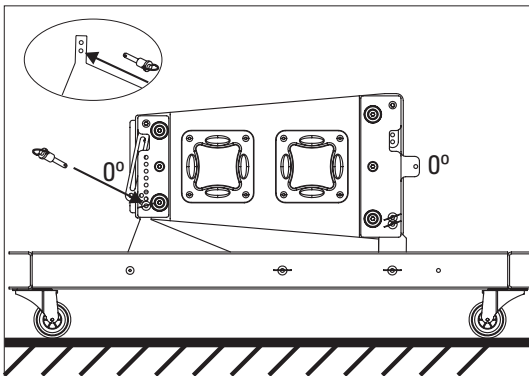
Besides using the PL-48S platform for transporting and flying the systems, it can also be used for ground stacking. Due to the weight of the boxes, it is recommended that they be flown first and then lowered to the platform and stacked. For stability reasons, it is recommended that no more than 4 boxes be stacked. In the event that 4 boxes are used, they should be arranged so that the splay angles do not make the platform unstable. Once the boxes are flown, they can be lowered onto the PL-48S platform by using the hoists to position the array so that the safety pins can be inserted into the G2A48 guides.

The PL-48S_2 piece on the platform has 2 holes, the lower one offers a 0° angle between box and platform and the upper hole offers a -1.6° angle, meaning that the box is leaning forward.

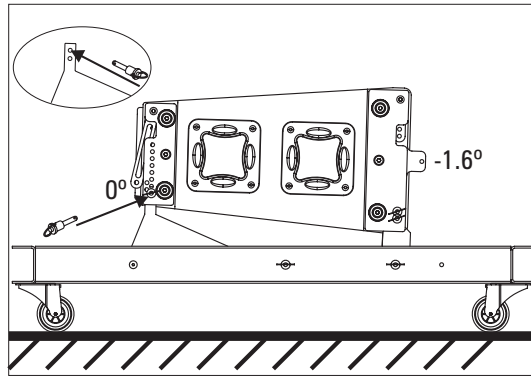
The arrangement in the following picture is an unstable one. The smaller the splay angle between cabinets, the more the stability. Obviously, the most reliable stack in terms of stability is the one when the splay angle between all of the cabinets is 0° .



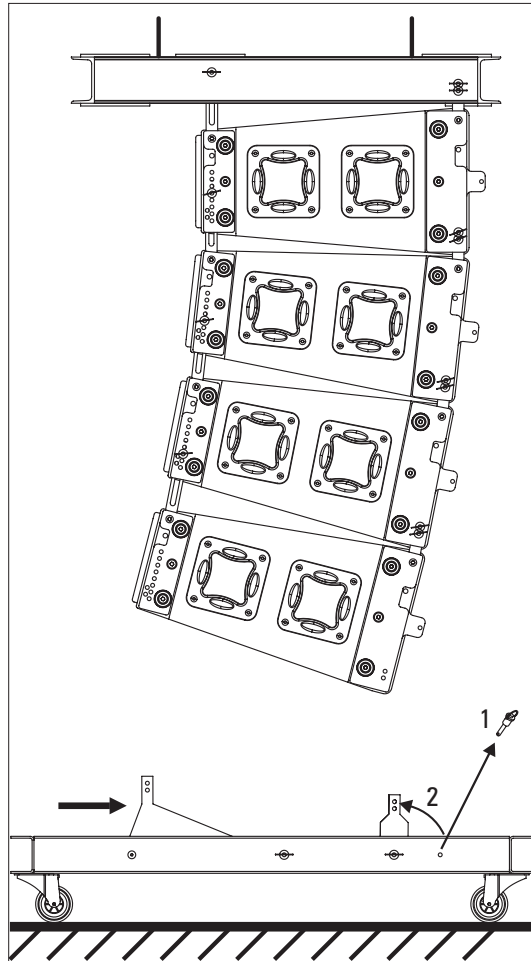
As mentioned above, the hole in which the safety pin is inserted in the PL-48S piece will determine the splay angle of the bottom box, be it 0° or -1.6° . The following pictures will make things more clear.



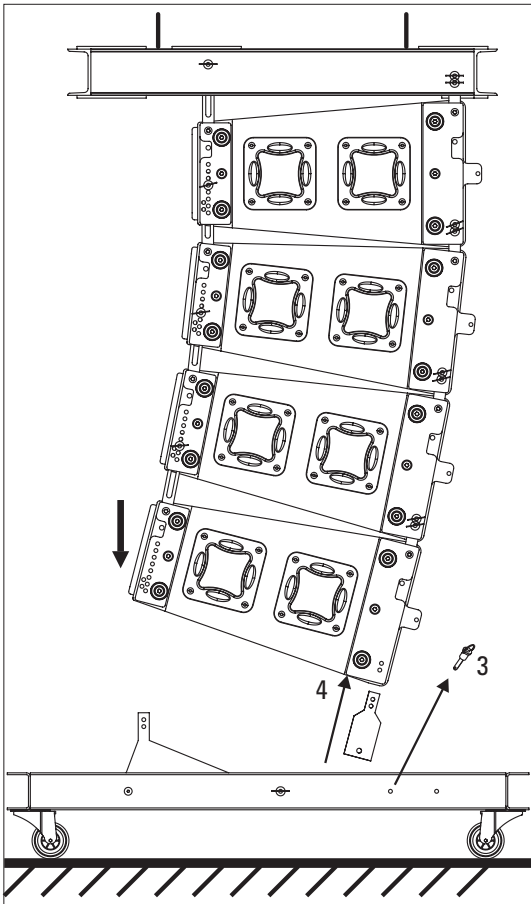
The angle between the box and the platform will be 0° when the safety pin is inserted in the hole on the bottom of the back guide, and the hole on the bottom of the PL-48S_2 piece.



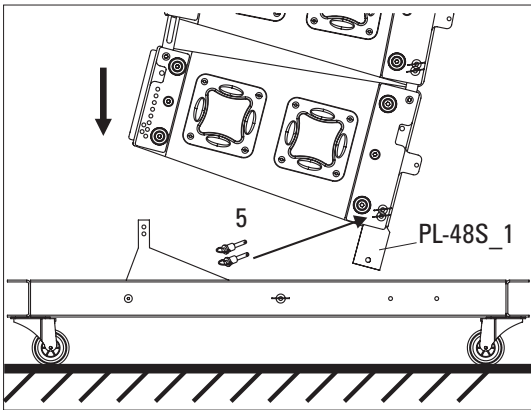
The angle between the box and the platform will be -1.6° when the safety pin is inserted in the hole on the bottom of the back guide, and the hole on top of the PL-48S_2 piece. Let us go now through the complete process of stacking the boxes after they have been previously flown.



After having rolled a PL-48S platform under the array, the PL-48S_1 pieces (1,2 and 3) must be detached from the platform and introduced (4) in the front rigging structure of the lower box.

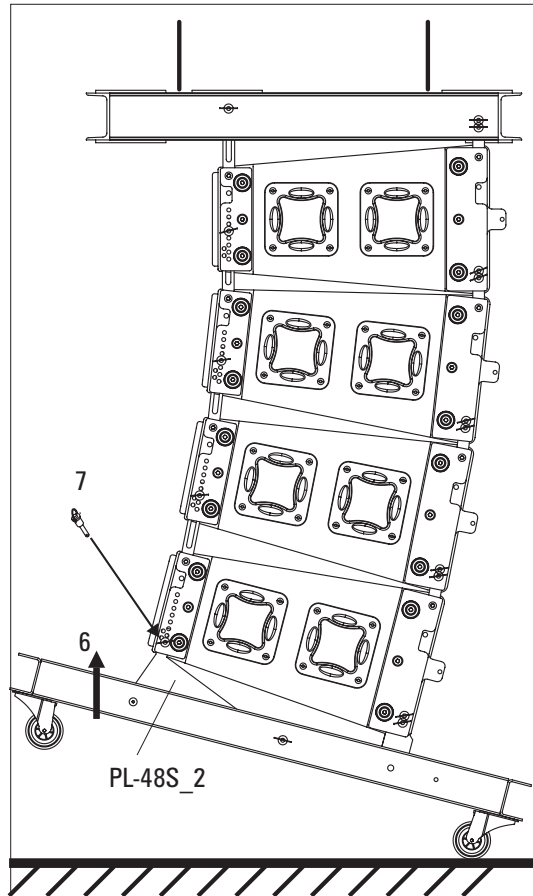


Both PL-48S_1 pieces must now be attached (5) to the box on the bottom by means of two safety pins on each side.



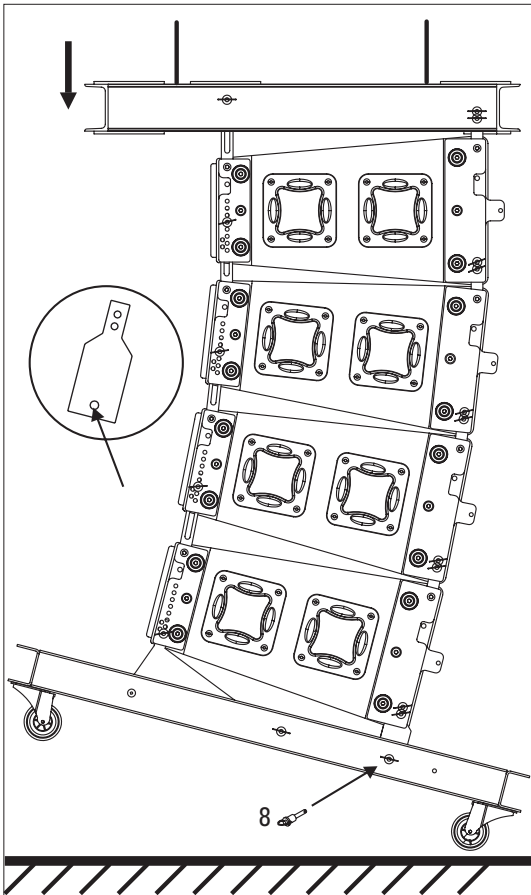
Now the entire cluster can be lowered so the PL-48S_1 pieces get into reach of the platform.

The next step is to fix the PL-48S_2 pieces to the rear rigging hardware of the box. In order to do so, the platform should be raised up (6) till the bottom hole in the rigging hardware and the hole in the PL-48S_2 match together. Then the safety pins can be inserted (7) in the holes. As has been said before, the splay angle between the platform and the box is given by the hole used in the PL-48S_2 piece.

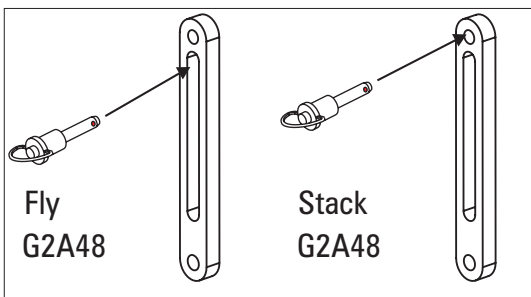


The hole chosen in this example, is the one on the bottom of the PL-48S piece, being 0° the angle.

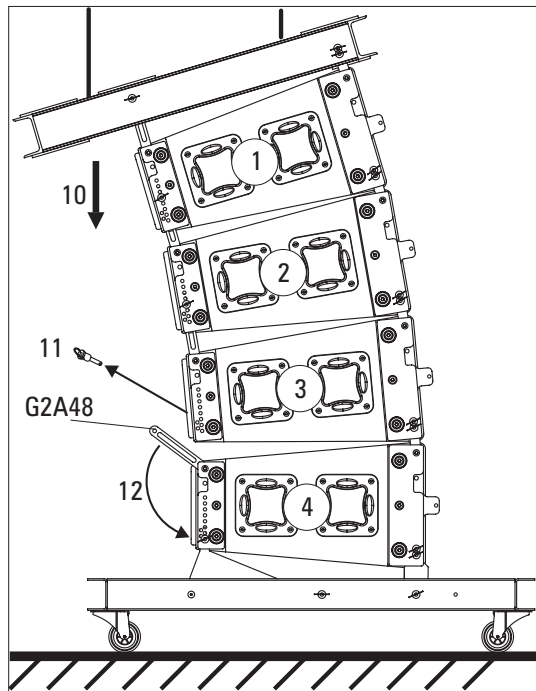
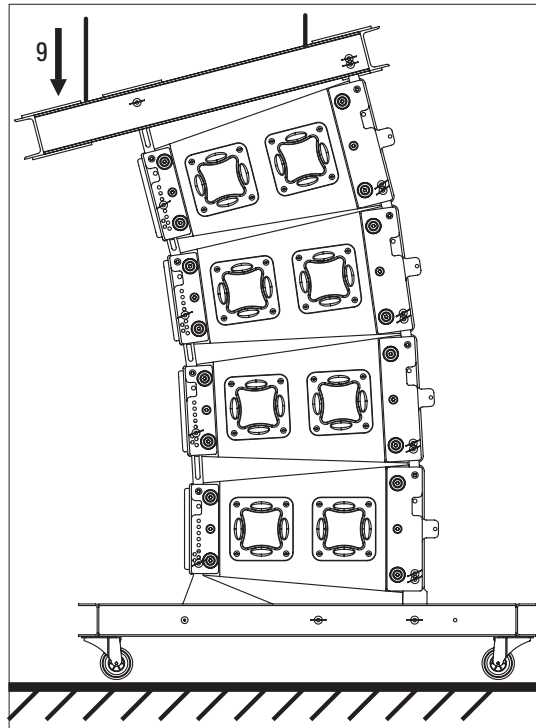
At this point the PL-48S_1 and the PL-48S_2 pieces are both connected to the box. There is only the PL-48S_1 piece left to be attached to the platform. Move the platform upwards till the holes in the PL-48S_1 piece and the holes in the platform match together. Then insert the safety pins (8).



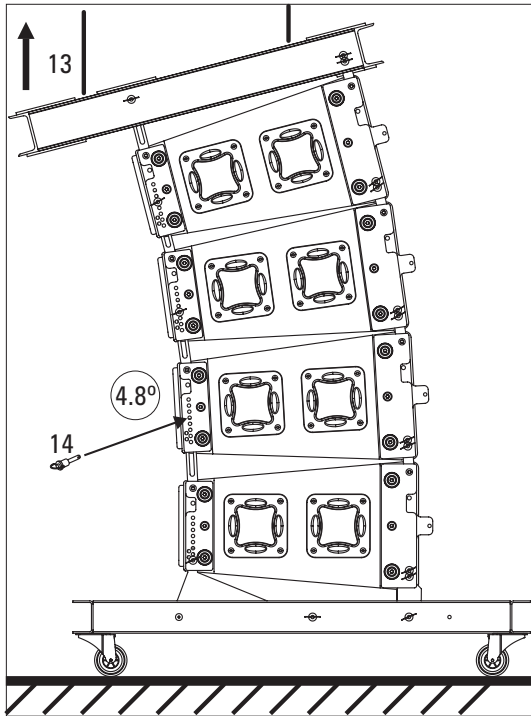
When the boxes are flown the safety pins must be inserted in the G2A48 slots. Now we want to stack the boxes, so the next step is to release the pins from the slots and introduce them in the G2A48 holes. It must be done by first lowering the boxes till the safety pins can be removed, then raise the boxes till the holes fit together and finally insert the safety pins again.



Lower the cluster till the platform is resting on the floor.



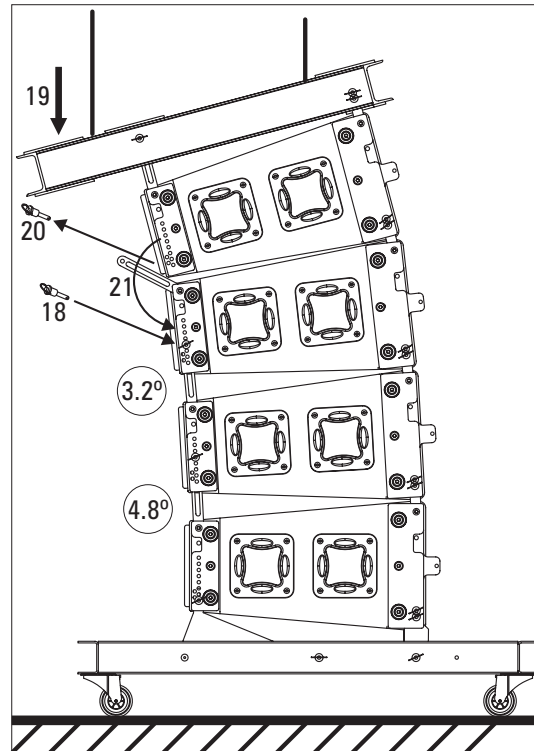
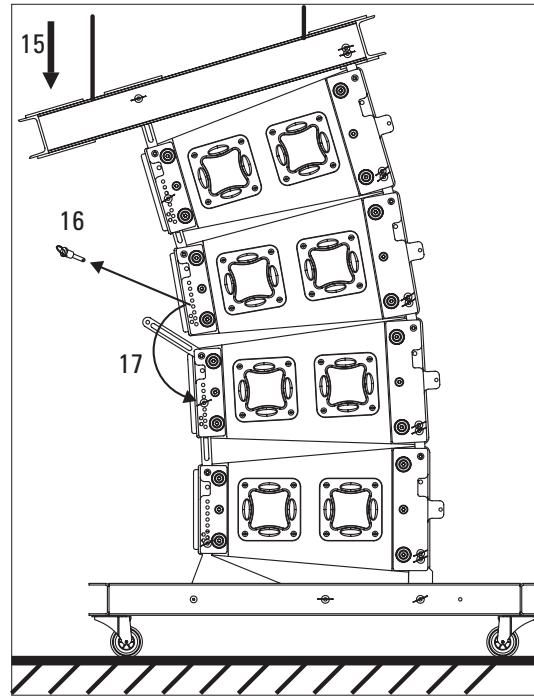
The cluster must now be lowered (10) until the safety pins (11) on the rear side of box number 4 can be removed. Once safety pins have been released the cluster must be raised or lowered (13) until the hole in the G2A48 piece matches with the hole that determines the angle chosen by the user.



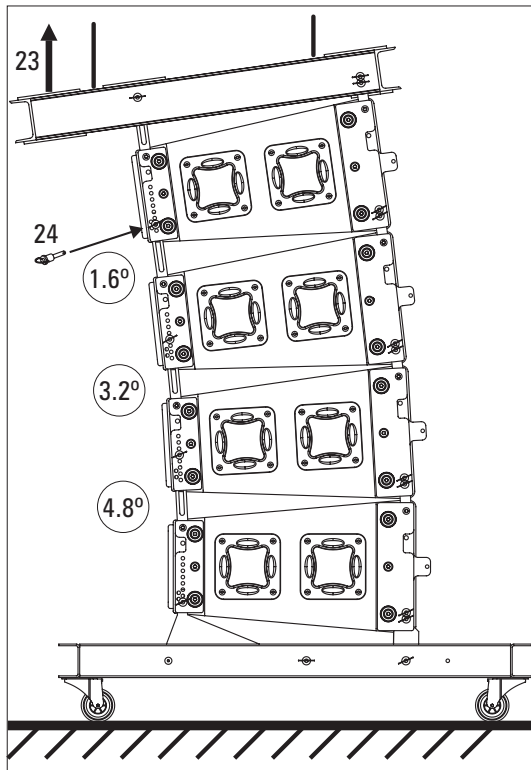
Safety pins can now be inserted (14). In this example, the set up angle between boxes 3 and 4 is 4.8°.

It is important to check that pins cannot be removed by pulling outward and that they have been inserted in the G2A48 hole instead of the guide slot. Otherwise the box would not remain in the expected angle.

The procedure is the same for the next boxes. The cluster must be lowered again (15) until the safety pins of box 3 are loose. Remove the pins (16) so the G2A48 rear guides return to their stored position (17). Insert the safety pins into the holes (18) that determine the angle previously selected for stacking. Repeat the same procedure with box number 1: lower the cluster (19), free the rear guides G2A48 (20 & 21) and select the angle.



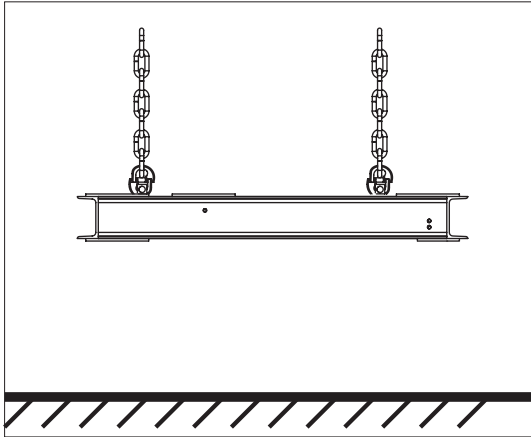
In order to set up the angle between boxes 1 and 2 you must pull up (23) from the grid until the hole in the G2A48 piece fits with the hole that determines the stacking angle. Then insert the safety pins (24).



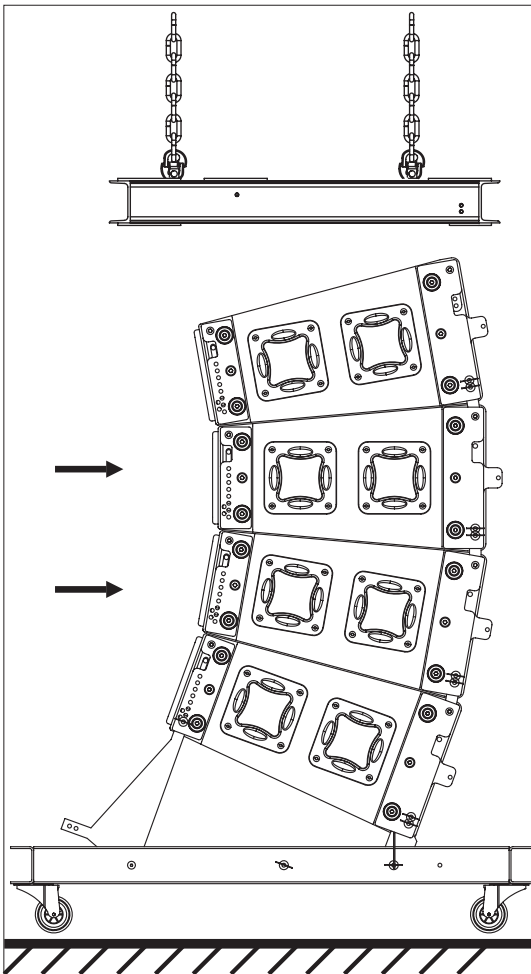
At this point the boxes are safely stacked. Finally, the AX-AERO48 grid should be detached from box number 1.

4.6 ASSEMBLING A CLUSTER USING THE PL-48S PLATFORM

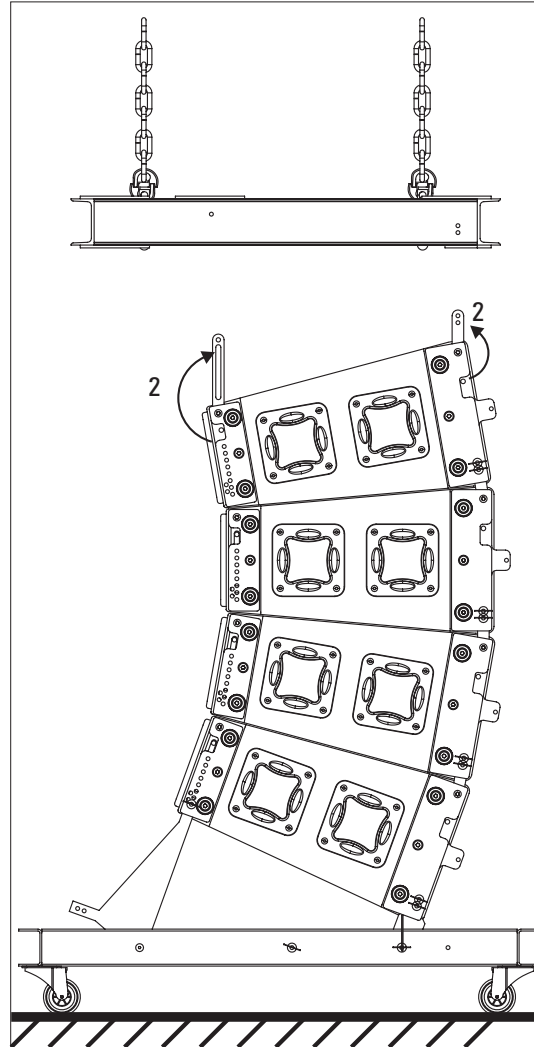
AERO-38 boxes can be easily transported in groups of four when stacked on the PL-48S platform. This arrangement is also useful and saves time when setting up a cluster. Let us see what would the procedure be when flying a six box cluster.



After the AX-AERO48 grid has been attached to the motors, it should be lifted at about 1.8m (5.5 ft) from the ground. Now the platform containing the first three stacked AERO-38 boxes can be rolled under the grid.

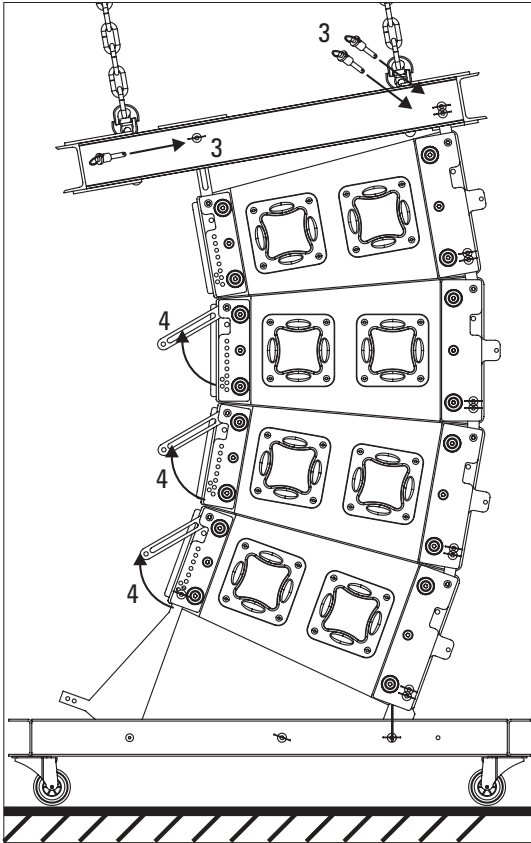


In order to attach the box on top to the grid, front guides G1A48 and rear guides G2A48 must be swung (2) and inserted into the AX-AERO48 grid receiving points. Once this has been done, detach the 6 safety pins from their receptacles and secure the box to the grid.

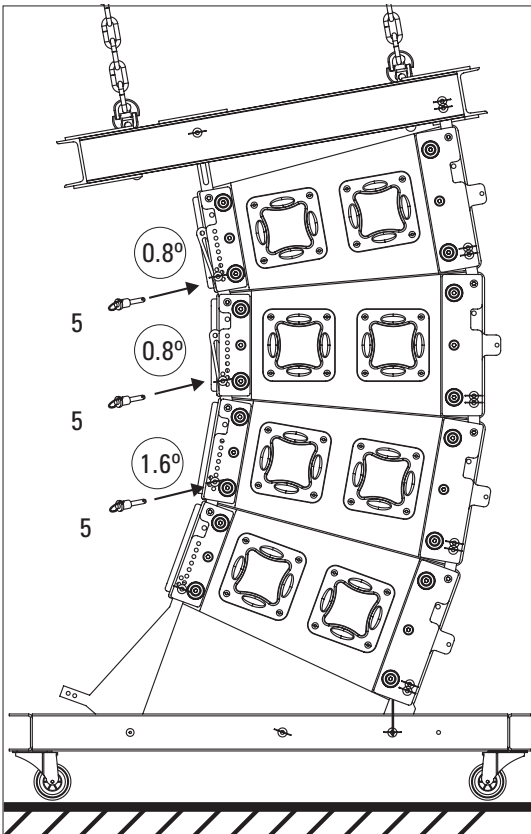


Once G1A48, G2A48 of the top cabinet have been secured (3) to the grid, rotate the G2A48 pieces (4), fit them into the upper box rigging hardware and secure them with the safety pins (5). See next page.

Whenever a safety pin is inserted, it is always advisable to make sure it has been correctly locked by pulling outward.



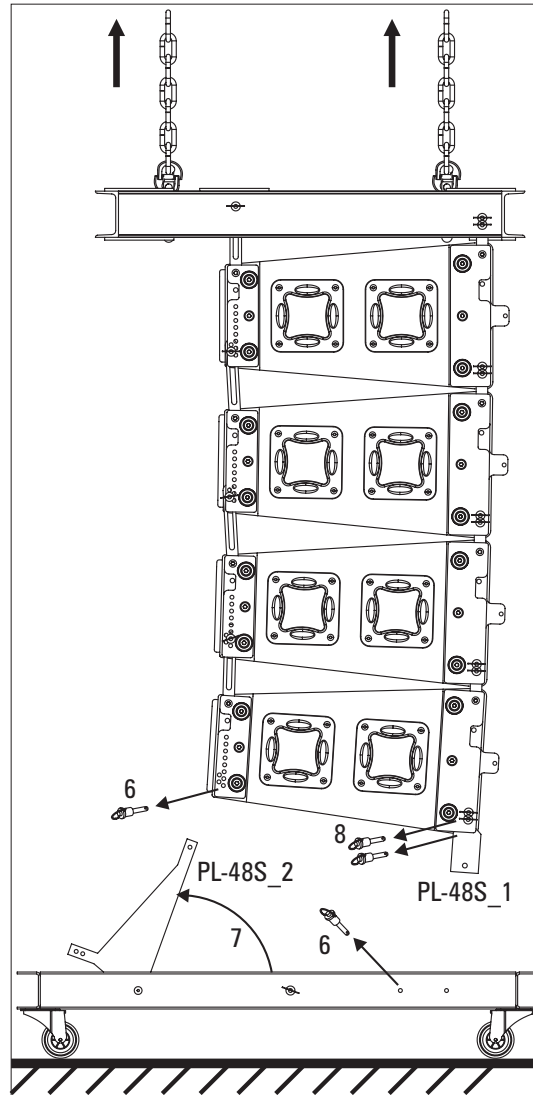
Select the angle between cabinets introducing (5) the pins in the holes of the rigging system through the slot of G2A48.

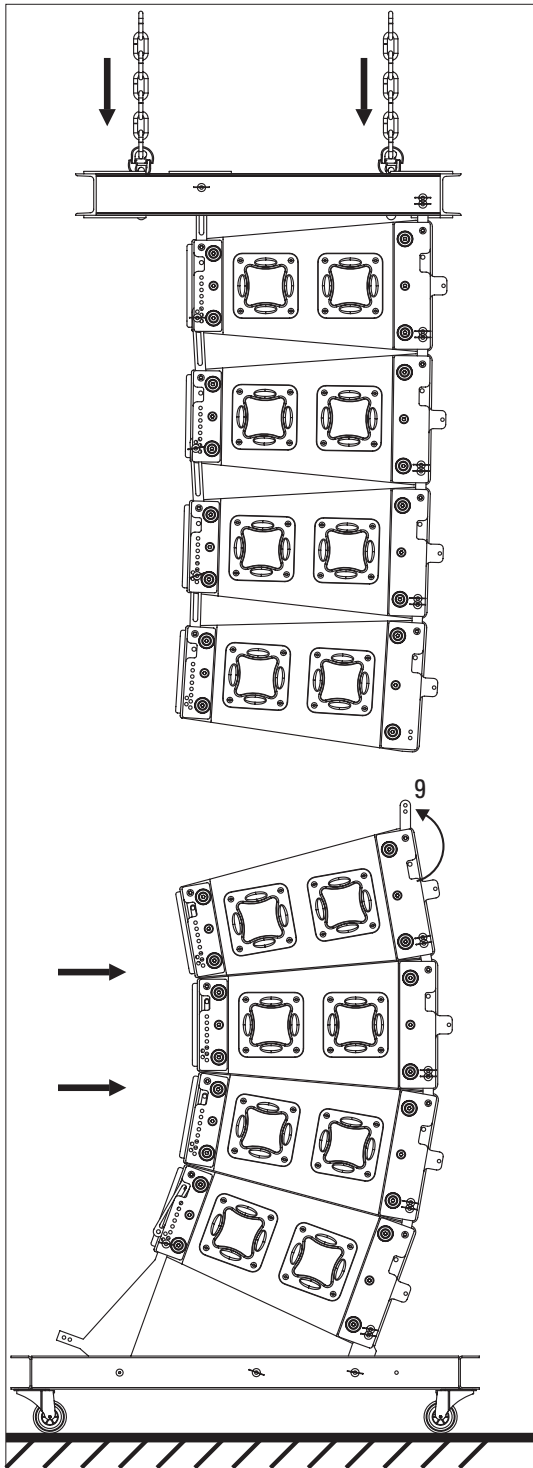


The angles that can be seen in the example are 0.8° between the first and second boxes, and 1.6° between the second and the third boxes. The cluster can now be lifted by the two motors, and the PL-48S platform detached.

The first step to detach the PL-48S platform from the bottom box is to release (6) the safety pins which secure the PL-48S_1 piece to the platform and the PL-48S_2 piece to the box. After raising the cluster a bit, the safety pins which connect the PL-48S_1 piece to the box can be released (8) also. PL-48S_1 piece should now be reattached again to the platform.

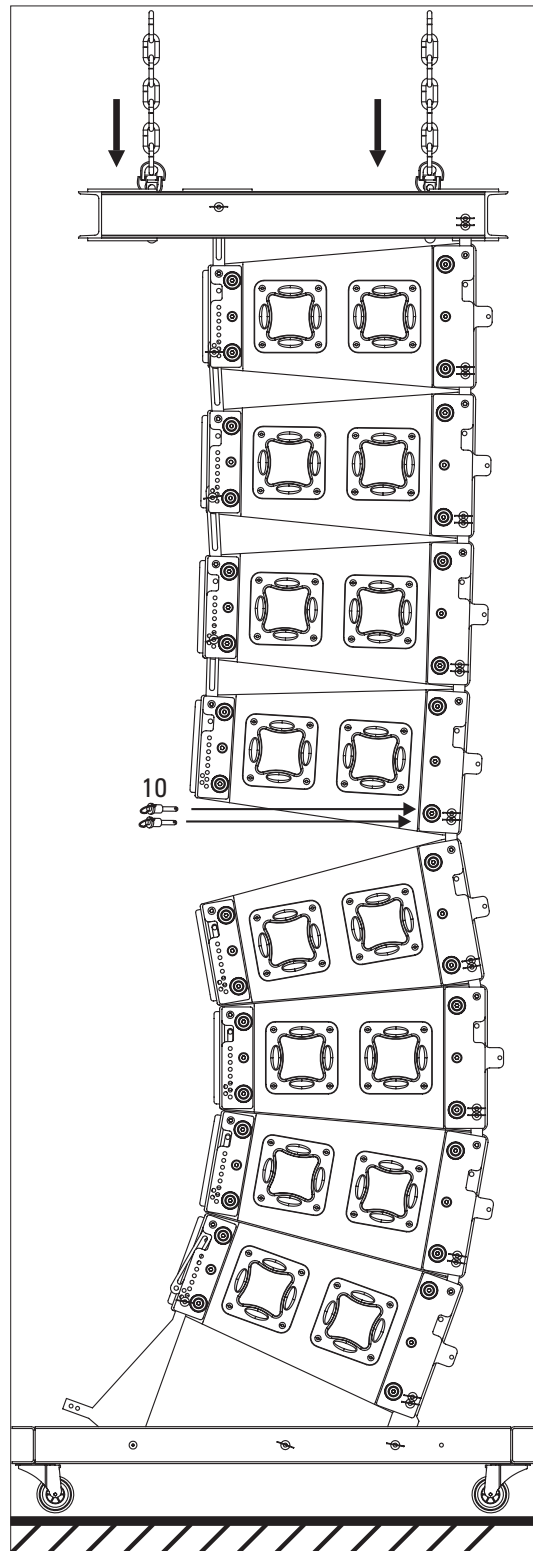
Now that the first three units have been rigged, the entire cluster should be lifted up so there is room enough to roll another stack under the cluster.



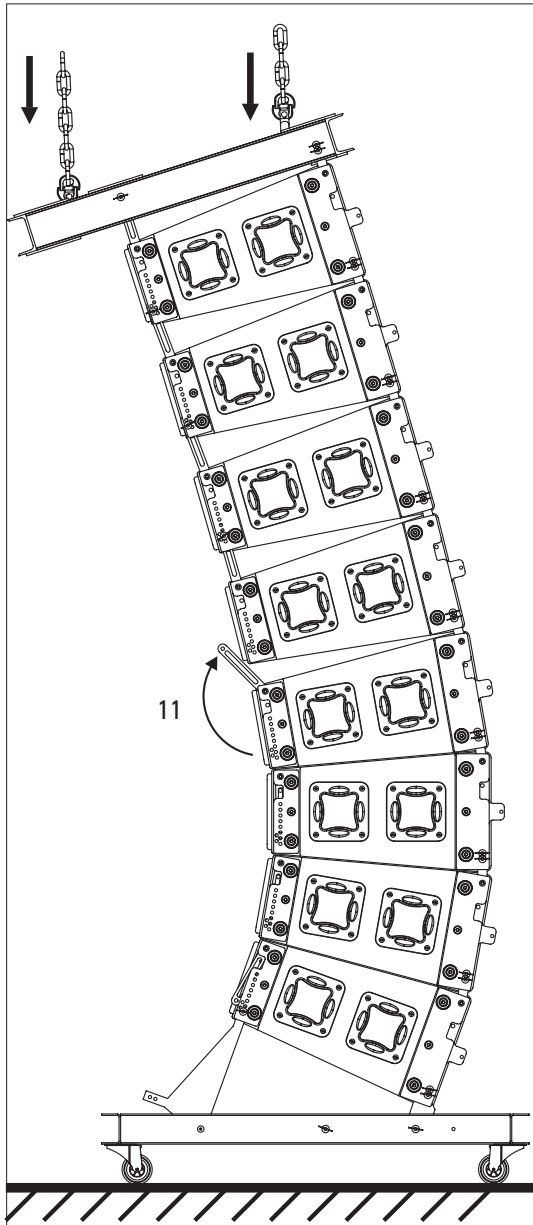


Place the remaining group of boxes under the cluster, then lower the cluster until both front sides are in close proximity. G1A48 front guides (9) of the first box on the platform can now be swung and left in the upright position, ready to be inserted into the front rigging hardware of the next box.

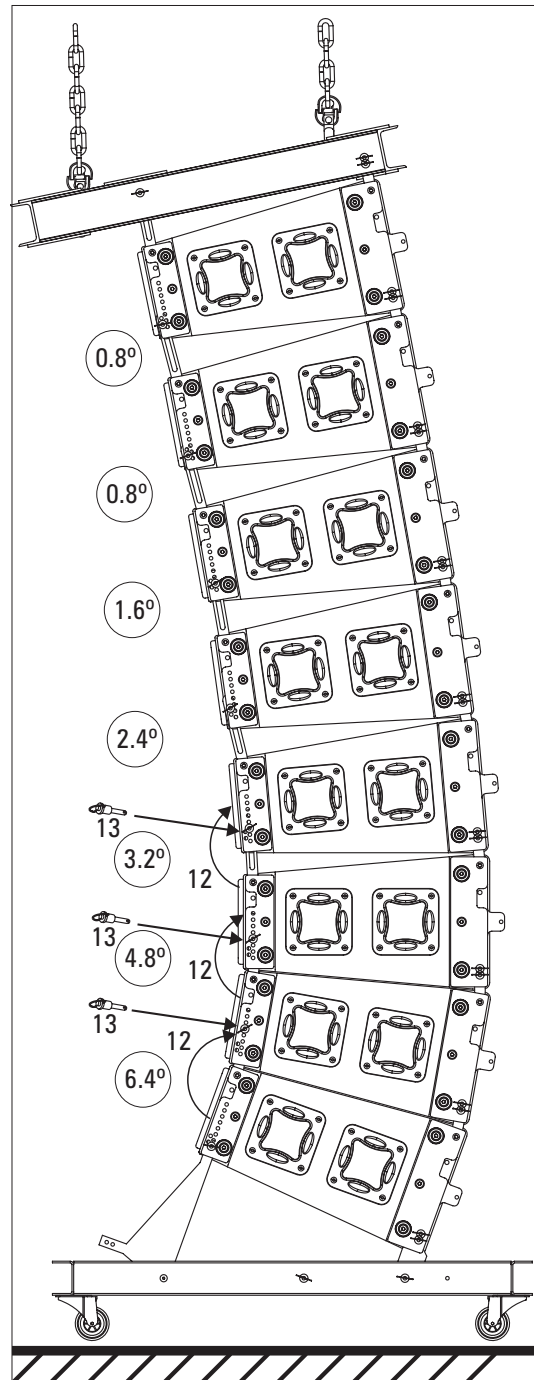
Lower the cluster until the G1A48 front guides fit into the rigging hardware of the bottom box and insert the two safety pins (10) per side.



With the front guides correctly secured, swing the G2A48 (11) rear guides belonging to the box on top of the second group and lower the grid till the guides fit into the rigging hardware of the next box. Set the angle between both boxes by inserting the safety pins in the correct hole.



From here on, the process is similar to the previously described. Detach the safety pins from their receptacles on the sides of the boxes, swing (12) the G2A48 rear guides, place them into the rigging hardware of the next box and insert (13) the safety pins in the holes which define the angle previously selected.

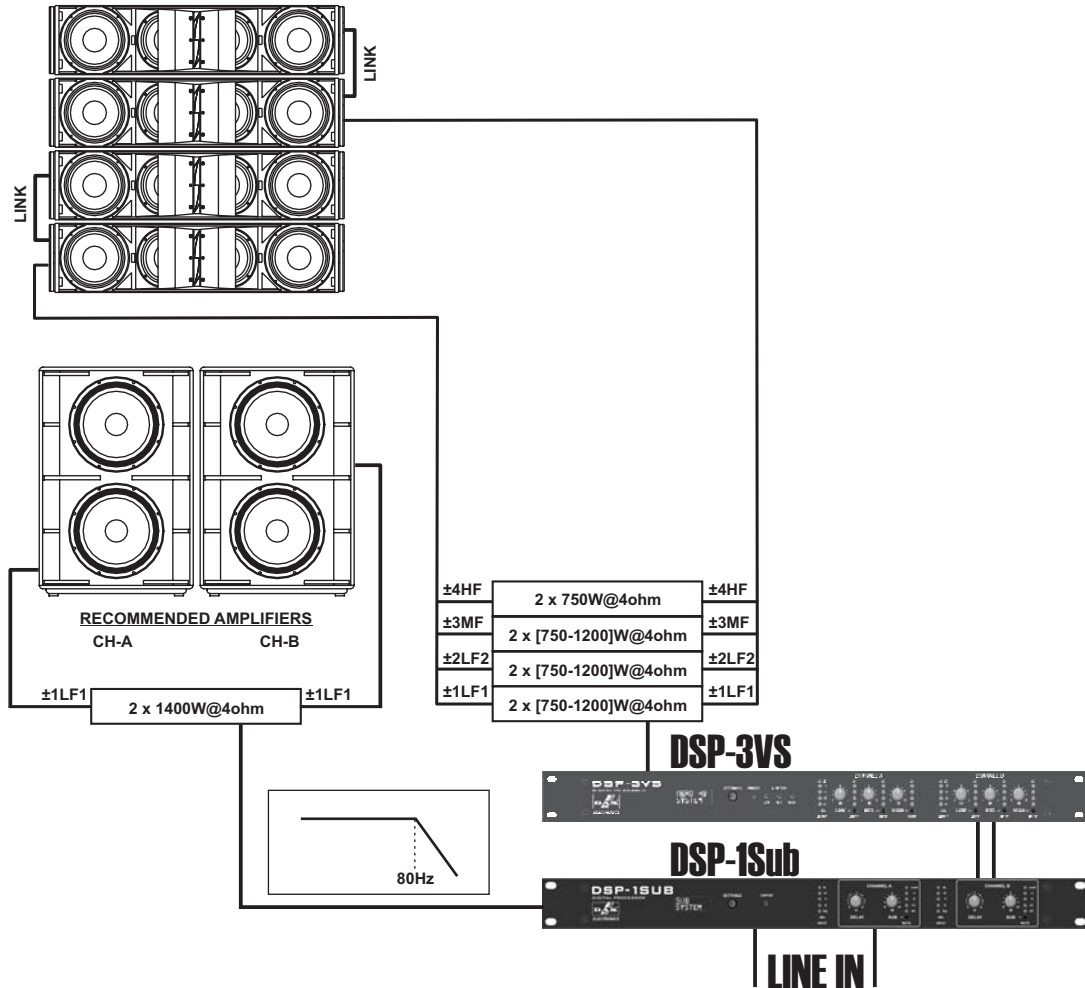


5. SUBWOOFER UNITS

Externally amplified systems:

An AERO-38 unit can reproduce frequencies as low as 60Hz. **AERO-218Sub** is the D.A.S. recommended subwoofer unit to be used along AERO-38 when subwoofers have to be ground stacked. When subwoofers are to be flown, **AERO-182** is the D.A.S. recommended subwoofer.

It is recommended that the **subs' Low Pass Filter be set at 80Hz**, so that the band ranging from 60Hz to 80Hz is reproduced by both the AERO-38 and the subwoofer. The phase of the subs should match that of the Lows around the 60Hz to 80Hz region.



Self powered systems:

High Pass Filter in an AERO-38A system is set at 60Hz. **AERO-218A** is the D.A.S. recommended subwoofer unit to be used along AERO-38A when subwoofers have to be ground stacked. When subwoofers are to be flown, **AERO-182A** is the D.A.S. recommended subwoofer. All self powered units incorporate the necessary signal treatment in the amplifier, including cut off frequencies, limiters settings, etc.!!

Note: Due to the frequency overlap in the region between 60Hz and 80Hz, an external processor (DSP-1Sub) will always be necessary in order to add the necessary delay so the phases of the AERO-38A and the subwoofers match.

6. MAINTENANCE

The following is a discussion on how to access each transducer for maintenance or repair. In order to access the amplifier please refer to 3.11 section in this user's guide.

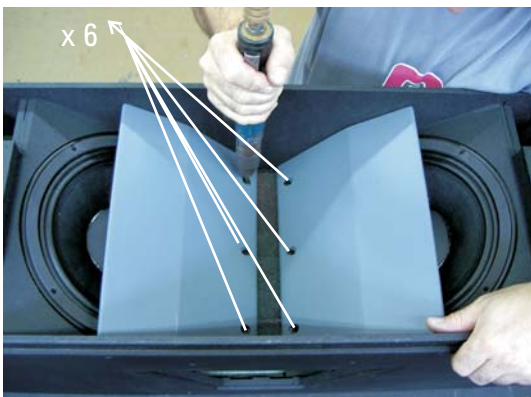
In order to access de 12" speakers, you must first remove the front grill.



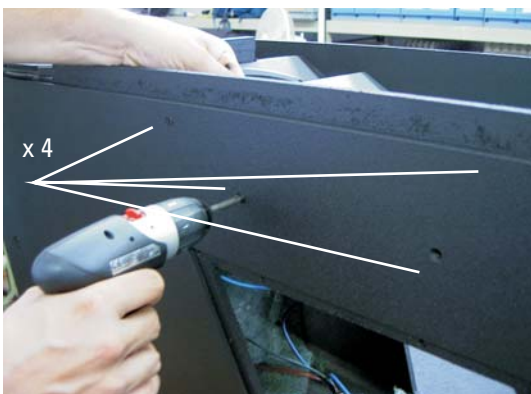
After the front grill has been removed access to the 12GNC speakers is cleared.

In order to access de 10" speakers, you must first remove the front grill, and then unscrew the polyurethane horn pieces from the box.

6x(M5x25 DIN 7985) 3 screws per piece



8x(M5x20 DIN 965) 4 per piece



Once the wings have been removed you can easily access the 10LMN16 speakers.

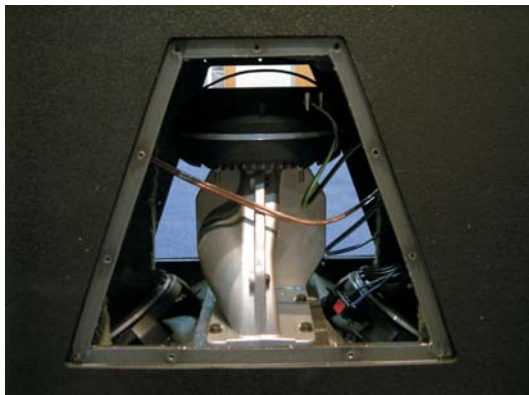
In order to access the high frequency driver, two trapezoidal shape aluminium plates have been disposed on the top and bottom sides of the box. Both plates can be removed, clearing the access to the driver from both sides.

First remove the screws from the aluminium plates:

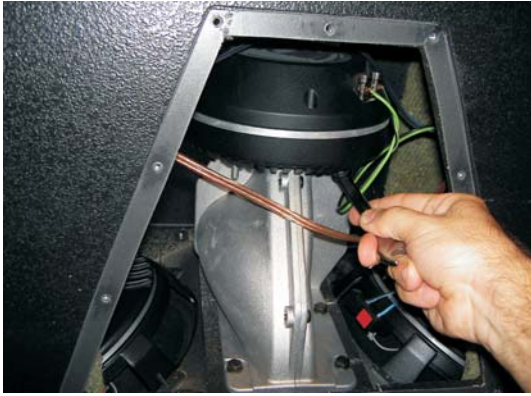
11 x (M5x20 DIN 965) per plate



When the plates have been removed, the speaker's wires must be disconnected from the driver's terminals.



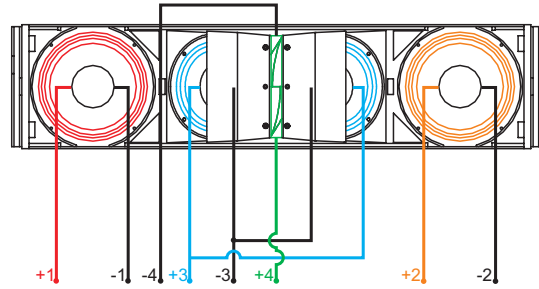
A number 10 metric spanner must be used to get the M6 nuts that fix the ND-10 driver to the SERPIS-38.



All four nuts must get undone so the driver can be taken out from the box through any of the two trapezoidal shape holes.

NOTE: In the AERO systems, each way can be easily identified by the wire colour:

| | | | |
|------------|---------|---------|----|
| LOW FREQ 1 | + RED | - BLACK | ±1 |
| LOW FREQ 2 | + RED | - BLACK | ±2 |
| MID FREQ | + BLUE | - BLACK | ±3 |
| HIGH FREQ | + GREEN | - BLACK | ±4 |



Internal connections in the AERO-38 system.

In order to access the speakers in the AERO-182 and AERO-218Sub subwoofer units, first the grill must be removed from the box. Being AERO-182 and AERO-218Sub double 18" speakers, both speakers are connected in parallel mode resulting in a total impedance of 40hm. To access the amplifier for service it must be removed from the back side of the box.

7. SPECIFICATIONS

| SPECIFICATIONS | | POWERED SYSTEMS | | SPECIFICATIONS | | NON-POWERED SYSTEMS | |
|-------------------------------|------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Model | Aero 38A | Model | Aero 38 | Frequency Range (-10 dB) | 60 Hz-18 kHz | Horizontal Coverage (-6dB) | 90° Nominal |
| Nominal LF Amplifier Power | 1000 W (Class D) | Nominal Impedance | LF: 8+8 ohms, MF: 8 ohms, HF: 16 ohms | RMS (Average) Power Handling | LF: 2 x 600 W, MF: 600 W, HF: 200 W | Vertical Coverage | Splay Dependent |
| Nominal MF Amplifier Power | 500 W (Class D) | Recommended Controller | DSP-3VS | On-Axis Sensitivity 1 W / 1 m | LF: 98 dB SPL, MF: 103 dB SPL, HF: 110 dB SPL | Rated Maximum Peak SPL at 1 m | LF: 135 dB, MF: 137 dB, HF: 139 dB |
| Nominal HF Amplifier Power | 500 W (Class D) | Recommended Amplifier Power (4 units Aero 38) | LF1: 2 x [750-1200] W @ 4 ohms LF2: 2 x [750-1200] W @ 4 ohms MF: 2 x [750-1200] W @ 4 ohms HF: 2 x 750 W @ 4 ohms | Rated Maximum Peak SPL at 1 m | LF: 2 x 12GNC/GM 12G MF: 2 x 10LN16/GM LN16 HF: 1 x ND-10/GM K-8 | Transducers/Replacement Parts | LF: 2 x 12GNC/GM 12G MF: 2 x 10LN16/GM LN16 HF: 1 x ND-10/GM K-8 |
| Input Type | Balanced Differential Line | Enclosure Geometry | Trapezoidal 5° | Transducers/Replacement Parts | LF: 2 x 12GNC/GM 12G MF: 2 x 10LN16/GM LN16 HF: 1 x ND-10/GM K-8 | Enclosure Material | Birch Plywood |
| Input Impedance | Line: 20 kohms | Enclosure Material | Birch Plywood | Enclosure Material | Birch Plywood | Color/Finish | Black Paint |
| Sensitivity | Line: 1.95 V (+8 dBu) | Color/Finish | Black Paint | Color/Finish | Black Paint | Rigging System Splay Angles | 0° to 3.2° in 0.8° increments 3.2° to 9.6° in 1.6° increments |
| Frequency Range (-10 dB) | 60 Hz-18 kHz | Rigging System Splay Angles | 0° to 3.2° in 0.8° increments 3.2° to 9.6° in 1.6° increments | Rigging System | 0° to 3.2° in 0.8° increments 3.2° to 9.6° in 1.6° increments | Safety Factor | Maximum 20 cabinets @ 10:1 |
| Horizontal Coverage (-6dB) | 90° Nominal | Safety Factor | Maximum 20 cabinets @ 10:1 | Safety Factor | Maximum 20 cabinets @ 10:1 | Connectors | INPUT: Female XLR LOOP THRU: Male XLR AC INPUT: PowerCon NAC 3 FCA AC OUTPUT: Powercon NAC 3 DFCB |
| Vertical Coverage | Splay Dependent | Connectors | 2 x NL8 wired LF1±1, LF2±2, MF±3, HF±4 | Connectors | 2 x NL8 wired LF1±1, LF2±2, MF±3, HF±4 | AC Power Requirements | 115 V, 50 Hz/60 Hz, 230 V, 50 Hz/60 Hz |
| Rated Maximum Peak SPL at 1 m | 137 dB | Dimensions (H x W x D) | 31.6 x 140 x 60 cm 12.4 x 55 x 23.6 in | Dimensions (H x W x D) | 31.6 x 140 x 60 cm 12.4 x 55 x 23.6 in | Dimensions (H x W x D) | 31.6 x 140 x 60 cm 12.4 x 55 x 23.6 in |
| Transducers/Replacement Parts | LF: 2 x 12GNC/GM 12G MF: 2 x 10LN16/GM LN16 HF: 1 x ND-10/GM K-8 | Weight | 70 kg (154 lb) | Weight | 70 kg (154 lb) | Weight | 80 kg (176 lb) |
| Enclosure Geometry | Trapezoidal 5° | Accessories | AX-Aero38 Rigging Grid, AX-Aero48 Rigging Grid, AX-Combo Rigging Adapter, PL-38 Dolly Panel (included), PL-48S Steel Stacking Dolly | Accessories | AX-Aero38 Rigging Grid, AX-Aero48 Rigging Grid, AX-Combo Rigging Adapter, PL-38 Dolly Panel (included), PL-48S Steel Stacking Dolly | Accessories | AX-Aero38 Rigging Grid, AX-Aero48 Rigging Grid, AX-Combo Rigging Adapter, PL-38 Dolly Panel (included), PL-48S Steel Stacking Dolly |
| Enclosure Material | Birch Plywood | | | | | | |

| SPECIFICATIONS | | POWERED SYSTEMS | | SPECIFICATIONS | | NON-POWERED SYSTEMS | |
|-------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------|
| Model | Aero 182A | Model | Aero 182 | Frequency Range (-10 dB) | 28 Hz-85 Hz | Horizontal Coverage (-6dB) | 101 dB SPL |
| Nominal LF Amplifier Power | 1000 W (Class D) | Nominal Impedance | 4 ohms | RMS (Average) Power Handling | 1400 W | Vertical Coverage | Integrated in box design |
| Input Type | Balanced Differential Line | Recommended Controller | DSP-1Sub | On-Axis Sensitivity 1 W / 1 m | 101 dB SPL | Rated Maximum Peak SPL at 1 m | Maximum 16 cabinets @ 10:1 |
| Input Impedance | Line: 25 kohms | Recommended Amplifier Power (2 units Aero 182) | LF: 2 x 1400 W @ 4 ohms | Rated Maximum Peak SPL at 1 m | 138 dB | Transducers/Replacement Parts | 2 x NL8 wired LF±1 |
| Sensitivity | Line: 1.95 V (+8 dBu) | Enclosure Geometry | Rectangular | Transducers/Replacement Parts | 138 dB | Enclosure Material | 2 x NL8 wired LF±1 |
| Frequency Range (-10 dB) | 28 Hz-85 Hz | Enclosure Material | Birch Plywood | Nominal Impedance | LF: 2 x 18GN/GM 18G | Color/Finish | 47.5 x 140 x 60 cm 18.7x 55 x 23.6 in |
| Rated Maximum Peak SPL at 1 m | 137 dB | Color/Finish | Black Paint | Recommended Controller | LF: 2 x 18GN/GM 18G | Rigging System | 91 kg (201 lb) |
| Transducers/Replacement Parts | LF: 2 x 18GN/GM 18G | Rigging System | Integrated in box design | Recommended Amplifier Power (2 units Aero 182) | DSP-1Sub | Safety Factor | AX-Aero38 Rigging Grid AX-Aero48 Rigging Grid PL-48 Dolly Panel (included) |
| Enclosure Geometry | Rectangular | Safety Factor | Maximum 16 cabinets @ 10:1 | Enclosure Geometry | LF: 2 x 1400 W @ 4 ohms | Connectors | |
| Enclosure Material | Birch Plywood | Connectors | 2 x NL8 wired LF±1 | Enclosure Material | | Dimensions (H x W x D) | |
| Color/Finish | Black Paint | Dimensions (H x W x D) | 47.5 x 140 x 60 cm 18.7x 55 x 23.6 in | Color/Finish | | Weight | |
| Rigging System | Integrated in box design | Weight | 91 kg (201 lb) | Rigging System | Integrated in box design | Accessories | |
| Safety Factor | Maximum 16 cabinets @ 10:1 | Accessories | AX-Aero38 Rigging Grid AX-Aero48 Rigging Grid PL-48 Dolly Panel (included) | Safety Factor | Maximum 16 cabinets @ 10:1 | | |
| Connectors | INPUT: Female XLR LOOP THRU: Male XLR AC INPUT: PowerCon NAC 3 FCA AC OUTPUT: Powercon NAC 3 DFCB | | | Connectors | 2 x NL8 wired LF±1 | | |
| AC Power Requirements | 115 V, 50 Hz/60 Hz 230 V, 50 Hz/60 Hz | | | Dimensions (H x W x D) | 47.5 x 140 x 60 cm 18.7x 55 x 23.6 in | | |
| Dimensions (H x W x D) | 47.5 x 140 x 60 cm 18.7x 55 x 23.6 in | | | Weight | 91 kg (201 lb) | | |
| Weight | 99 kg (218 lb) | | | Accessories | AX-Aero38 Rigging Grid AX-Aero48 Rigging Grid PL-48 Dolly Panel (included) | | |
| Accessories | AX-Aero38 Rigging Grid AX-Aero48 Rigging Grid PL-48 Dolly Panel (included) | | | | | | |

| SPECIFICATIONS | Powered Systems |
|-------------------------------|------------------------------------------------------------------------------------------------------------|
| Model | Aero 218A |
| Nominal LF Amplifier Power | 2 x 1000 W (Class D) |
| Input Type | Balanced Differential Line |
| Input Impedance | Line: 25 kohms |
| Sensitivity | Line: 1.95 V (+8 dBu) |
| Frequency Range (-10 dB) | 28 Hz-85 Hz |
| Rated Maximum Peak SPL at 1 m | 140 dB |
| Transducers/Replacement Parts | LF: 2 x 18GN/GM 18G |
| Enclosure Geometry | Rectangular |
| Enclosure Material | Birch Plywood |
| Color/Finish | Black Paint |
| Rigging System | Ground Stack Only |
| Connectors | INPUT: Female XLR LOOP THRU: Male XLR AC INPUT: PowerCon NAC 3 FCA AC OUTPUT: Powercon NAC 3 DFCB |
| AC Power Requirements | 115V, 50 Hz/60 Hz 230V, 50 Hz/60 Hz |
| Dimensions (H x W x D) | 101 x 68 x 82.5 cm 39.8 x 26.8 x 32.5 in |
| Weight | 98 kg (215.6 lb) |

| SPECIFICATIONS | Non-Powered Systems |
|----------------------------------------------------|---------------------------------------------|
| Model | Aero 218 Sub |
| Frequency Range (-10 dB) | 28 Hz-85 Hz |
| RMS (Average) Power Handling | 1400 W |
| On-Axis Sensitivity 1 W / 1 m | 103 dB SPL |
| Rated Maximum Peak SPL at 1 m | 140 dB |
| Transducers/Replacement Parts | LF: 2 x 18GN/GM 18G |
| Nominal Impedance | 4 ohms |
| Recommended Controller | DSP-1Sub |
| Recommended Amplifier Power (2 units Aero 218 Sub) | LF: 2 x 1400 W @ 4 ohms |
| Enclosure Geometry | Rectangular |
| Enclosure Material | Birch Plywood |
| Color/Finish | Black Paint |
| Rigging System | Ground Stack Only |
| Connectors | 2 x NL8 wired LF±1 |
| Dimensions (H x W x D) | 101 x 68 x 82.5 cm 39.8 x 26.8 x 32.5 in |
| Weight | 82 kg (181 lb) |

8. SIGNAL PROCESSING

The use of the DSP-3VS digital processor is highly recommended when running the AERO-38 sound system, and the use of the DSP-1Sub when running the AERO-218Sub (AERO-182). Whenever another loudspeaker management system is going to be used, it should be configured with the parameters provided by the manufacturer. Not doing so may damage the system's speaker components and affect the sound quality.

The DSP-3VS digital processor is a three-way crossover with gain controls that offer +/- 6dB variation per way. The processor has two inputs and six outputs with level indication and muting for each of the outputs. The digital processor includes fourth order filters and parametric equalizers. The user adjustable limiters are accessible from the front panel.

The DSP-3VS includes 10 presets that can be selected from the front panel. Each preset memory recalls specific operating parameters for a specific DAS speaker systems. The selected program is visible on the LCD screen located on the front panel.

8.1 DSP-3VS INSTRUCTIONS

To select a program, turn the rotary mini-DIP switch on the front panel labelled "Presets". The name of the recalled preset will appear on the LCD screen. The first time the DSP-3VS is connected, the number 1 program for the AERO-48 system will appear on the front panel screen.

To select the limit levels for each of the ways, turn the rotary mini-DIP switches on the front panel labelled "Limiters". The limit level expressed in Vrms and dBu appears on the front panel screen.

The "Settings" button allows the user to check the saved limit levels. The limit levels appear on the screen and after 5 seconds, the preset program returns to the screen.

The limit levels to be entered should be equal to or lower than the sensitivity of the amplifiers used. Amplifier manuals provide the sensitivity at 8 Ohms and 4 Ohms. Take into account the load impedance at which the amplifiers will be working when adjusting the limit levels.

When using amplifiers with a greater output power than that recommended by the speaker manufacturer, the limit levels should be adjusted so not to exceed the power capabilities of the speakers.

8.2 LIMITER SETTINGS

The following formulas can be used to establish the limiter voltage:

Amplifier Data:

$$V_{rms} = \sqrt{P_{rms} * Z}$$

$$G = V_{rms}/S$$

$$G_{dB} = 20\log(V_{rms}/S)$$

•Where P_{rms} is the amplifier RMS power in watts

- Z is the load impedance in ohms
- G is the amplifier gain
- S is the amplifier sensitivity in volts
- GdB is the amplifier gain in dB

Limiter settings:

$$V_d = \sqrt{P_d * Z}$$

$$\text{Limit level (v)} = V_d/G$$

$$\text{Limit level (dBu)} = 20\log[\text{limit level (v)}/0.775]$$

•Where P_d is the maximum power to be delivered in watts

Example:

| | | |
|------------------|-----------------|-----------------|
| | Amplifier | |
| P _{rms} | 750W@4ohm | 500W@8ohm |
| G _{dB} | 32dB | |
| G | 40 X | |
| S | 1.34 volts@4ohm | 1.58 volts@8ohm |

In this example we are going to feed the highs of two AERO-38 with one amplifier channel. Total impedance of 2 ND-10 high frequency drivers, as wired in the AERO-38, is 8 Ohms. The maximum rms power to be delivered to the highs, or P_d , should be 400W (400/2=200W per driver).

$$P_d = 400W@8ohm$$

$$V_d = \sqrt{400 * 8} = 56.57v$$

$$\text{Limit level (v)} = V_d/G = 56.57/40 = 1.41$$

$$\text{Limit level (dBu)} = 20\log(1.44/0.775) = 5.2$$

Important Notice: The programs stored in the memories of the DSP-3VS have been designed to provide optimum performance and balance between the different ways. In order to maintain this balance, equal gain amplifiers should be used.

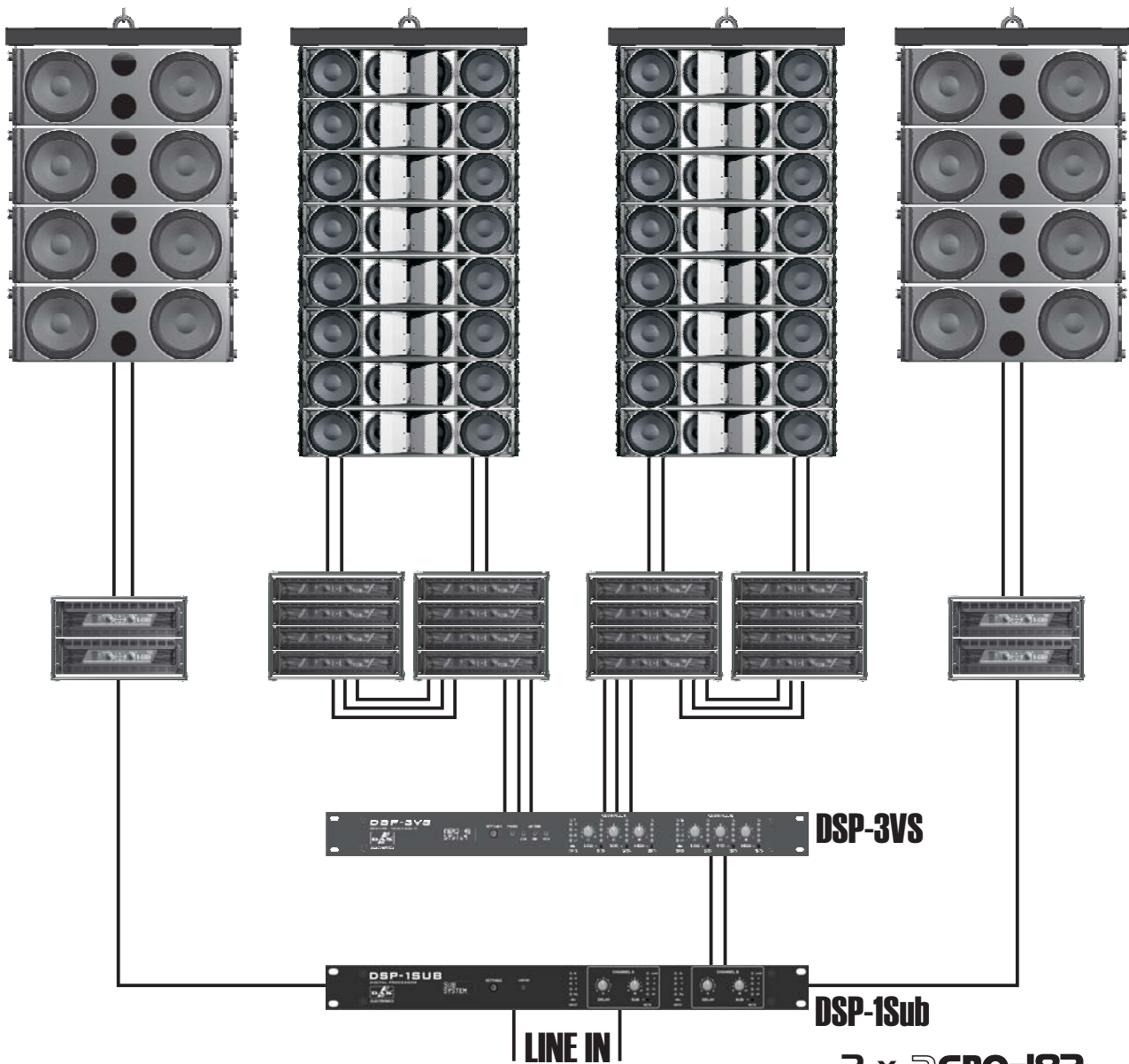
Another formula to calculate the limiters:

$$\text{Limit level (dBu)} = 20\log(V_d/0.775) - G_{dB}$$

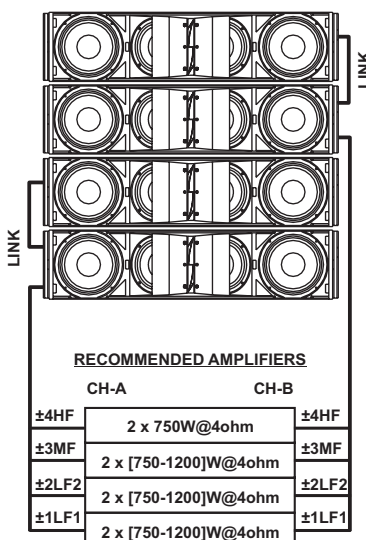
CONFIGURATION 1

AERO-38 (EXTERNAL AMPLIFICATION SYSTEM)

16 x AERO-38 + 8 x AERO-182



4 x AERO-38

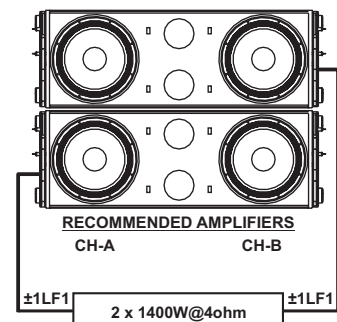


OPERATING PARAMETERS AMPLIFIERS WITH EQUAL GAIN USED

| | LOW | MID | HIGH |
|------------|--------------|--------------|--------------|
| GAIN | 0 dB | -2 dB | -9 dB |
| POLARITY | Normal | Normal | Normal |
| LOW-CUT | 50 Hz LR-24 | 159 Hz LR-24 | 757 Hz LR-24 |
| HIGH-CUT | 159 Hz LR-24 | 757 Hz LR-24 | - |
| EQ.1 FREQ. | 60 Hz | 450 Hz | 1410 Hz |
| EQ.1 LEVEL | +3 dB | -6 dB | -7 dB |
| EQ.1 BW. | 0.3 oct. | 0.4 oct. | 0.9 oct. |
| EQ.2 FREQ. | 125 Hz | | 10 kHz |
| EQ.2 LEVEL | -6 dB | | +7 dB |
| EQ.2 BW. | 0.4 oct. | | 0.7 oct. |
| EQ.3 FREQ. | | | 12.5 kHz |
| EQ.3 LEVEL | | | +11 dB |
| EQ.3 BW. | | | 0.6 oct. |

NOTE: 0.3 oct → Q=4.8 0.7 oct → Q=2
 0.4 oct → Q=3.6 0.9 oct → Q=1.6
 0.6 oct → Q=2.4

2 x AERO-182

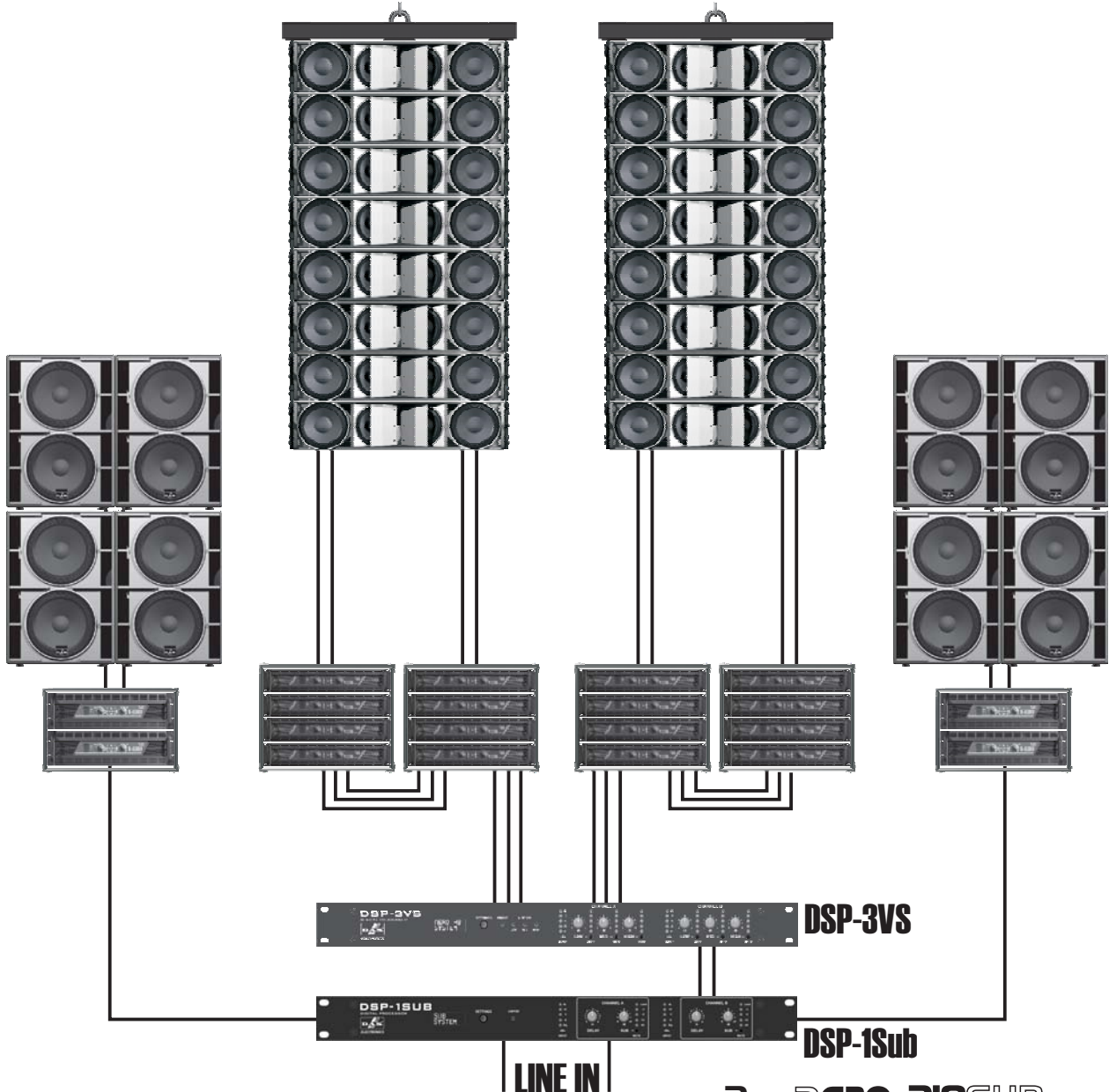


| | SUB |
|-----------|--------------------|
| GAIN | +3 dB |
| DELAY | Position dependent |
| POLARITY | Normal |
| LOW-CUT | 23 Hz LR-24 |
| HIGH-CUT | 85 Hz LR-24 |
| EQ. FREQ. | 36 Hz |
| EQ. LEVEL | +10 dB |
| EQ. BW. | 0.4 oct. (Q=3.6) |

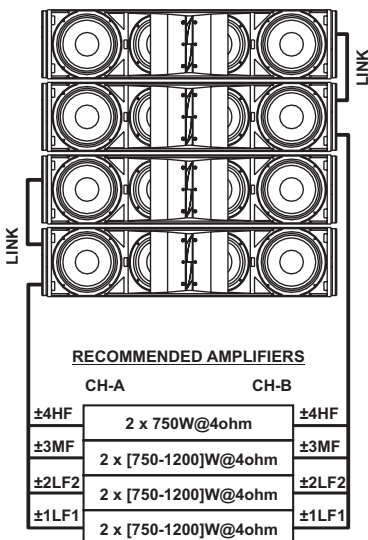
CONFIGURATION 2

aERO-38 (EXTERNAL AMPLIFICATION SYSTEM)

16 x aERO-38 + 8 x aERO-218SUB



4 x aERO-38



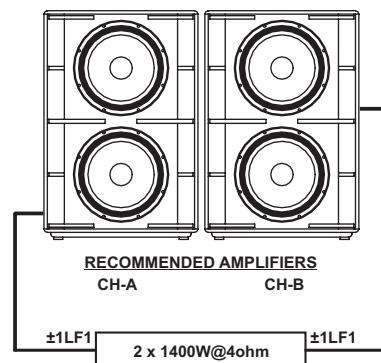
Aero-38

OPERATING PARAMETERS
AMPLIFIERS WITH EQUAL GAIN USED

| | LOW | MID | HIGH |
|------------|--------------|--------------|--------------|
| GAIN | 0 dB | -2 dB | -9 dB |
| POLARITY | Normal | Normal | Normal |
| LOW-CUT | 50 Hz LR-24 | 159 Hz LR-24 | 757 Hz LR-24 |
| HIGH-CUT | 159 Hz LR-24 | 757 Hz LR-24 | - |
| EQ.1 FREQ. | 60 Hz | 450 Hz | 1410 Hz |
| EQ.1 LEVEL | +3 dB | -6 dB | -7 dB |
| EQ.1 BW. | 0.3 oct. | 0.4 oct. | 0.9 oct. |
| EQ.2 FREQ. | 125 Hz | | 10 kHz |
| EQ.2 LEVEL | -6 dB | | +7 dB |
| EQ.2 BW. | 0.4 oct. | | 0.7 oct. |
| EQ.3 FREQ. | | | 12.5 kHz |
| EQ.3 LEVEL | | | +11 dB |
| EQ.3 BW. | | | 0.6 oct. |

NOTE: 0.3 oct → Q=4.8 0.7 oct → Q=2
 0.4 oct → Q=3.6 0.9 oct → Q=1.6
 0.6 oct → Q=2.4

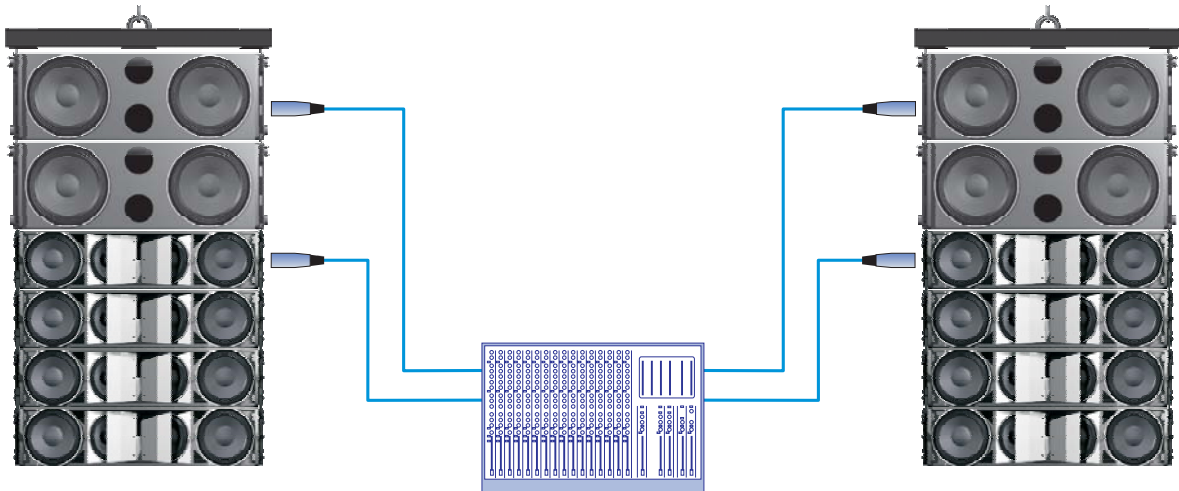
2 x aERO-218SUB



| | SUB |
|-----------|--------------------|
| GAIN | +3 dB |
| DELAY | Position dependent |
| POLARITY | Normal |
| LOW-CUT | 23 Hz LR-24 |
| HIGH-CUT | 85 Hz LR-24 |
| EQ. FREQ. | 36 Hz |
| EQ. LEVEL | +10 dB |
| EQ. BW. | 0.4 oct. (Q=3.6) |

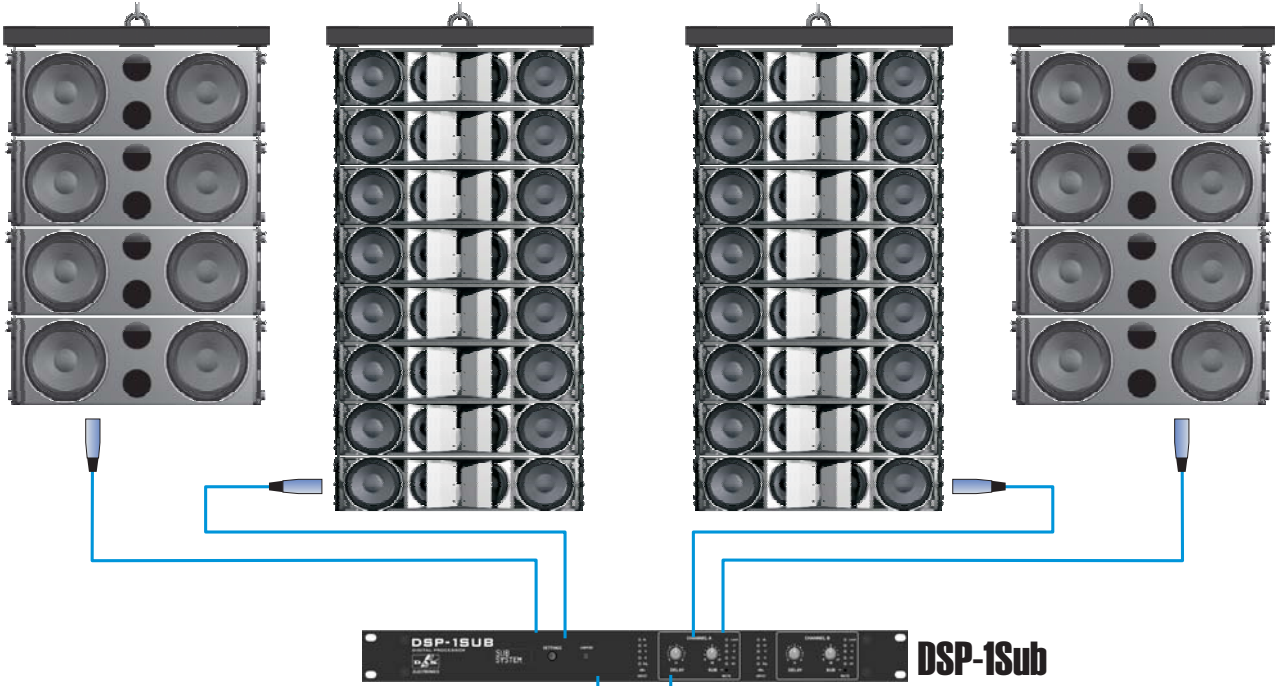
CONFIGURATION 1 **AERO-38A (SELF POWERED SYSTEM)**

8 x AERO-38A + 4 x AERO-182A

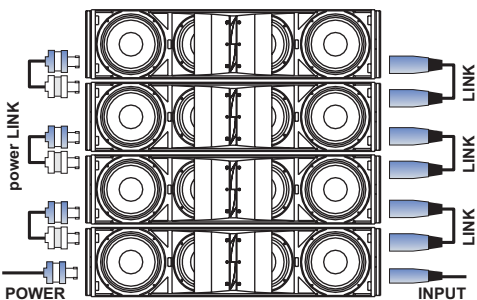


CONFIGURATION 2 **AERO-38A (SELF POWERED SYSTEM)**

16 x AERO-38A + 4 x AERO-182A

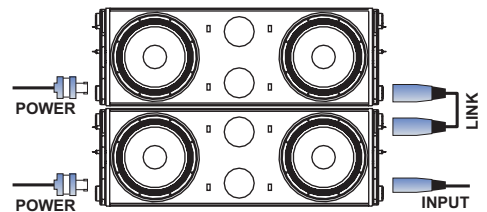


4 x AERO-38A



WARNING! 115V MAX., 3 UNITS IN PARALLEL
AC CONNECTIONS 230V MAX., 6 UNITS IN PARALLEL

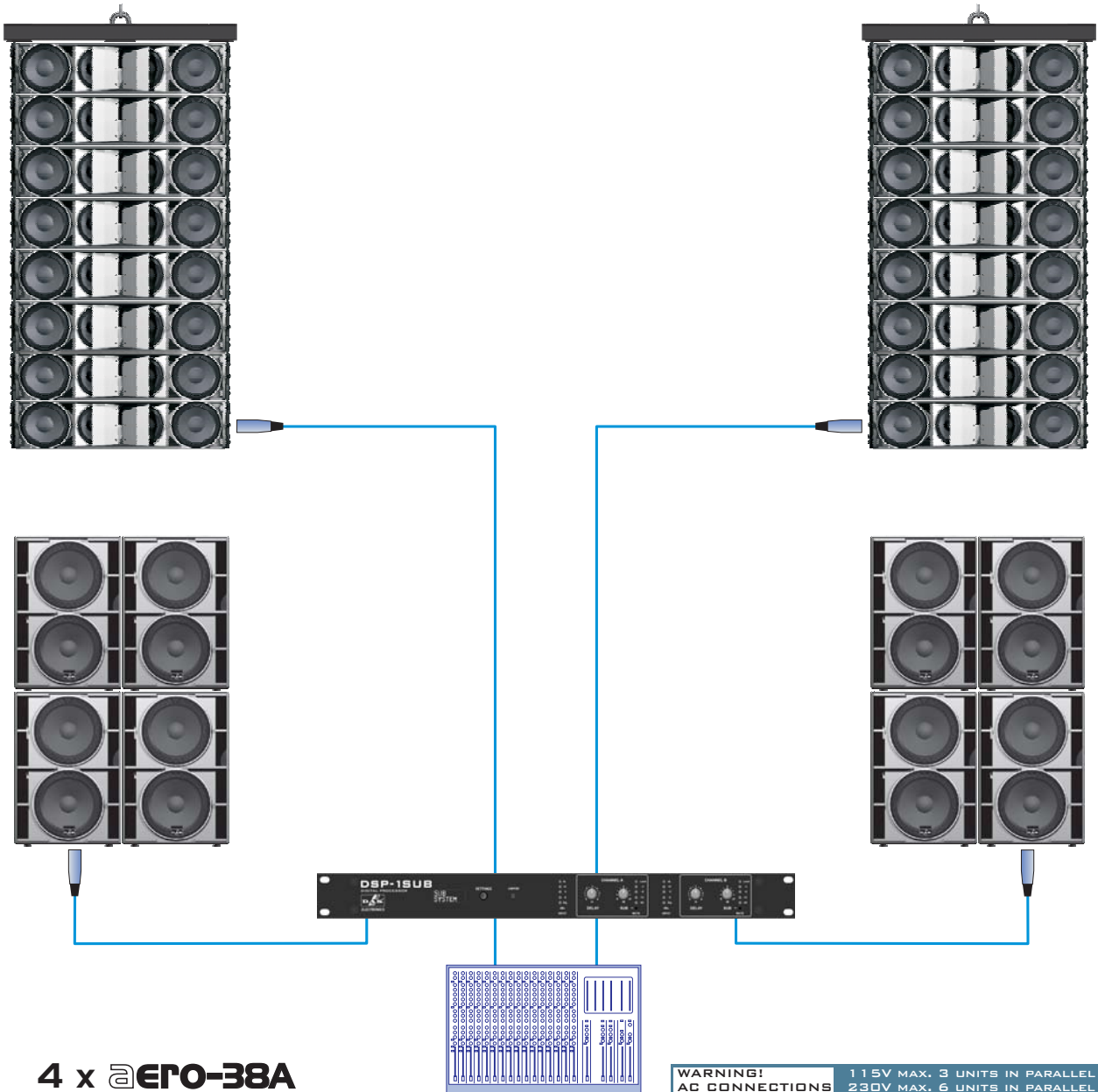
2 x AERO-182A



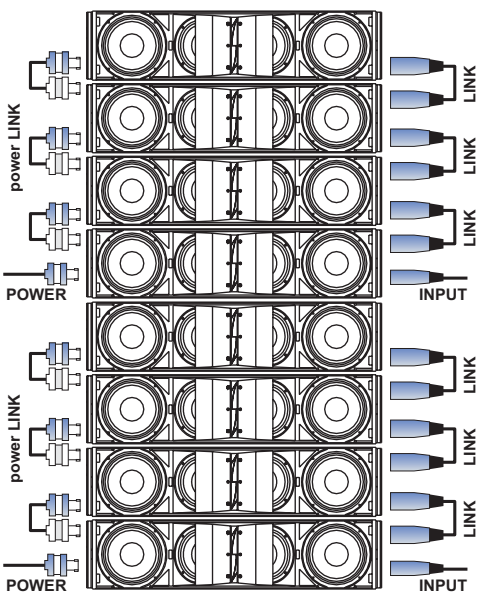
CONFIGURATION 3

aero-38A (SELF POWERED SYSTEM)

16 x **aero-38A** + 8 x **aero-218A**

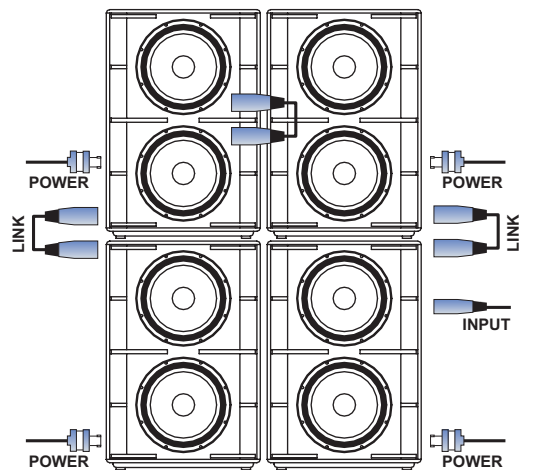


4 x aero-38A



Aero-38

2 x aero-218A

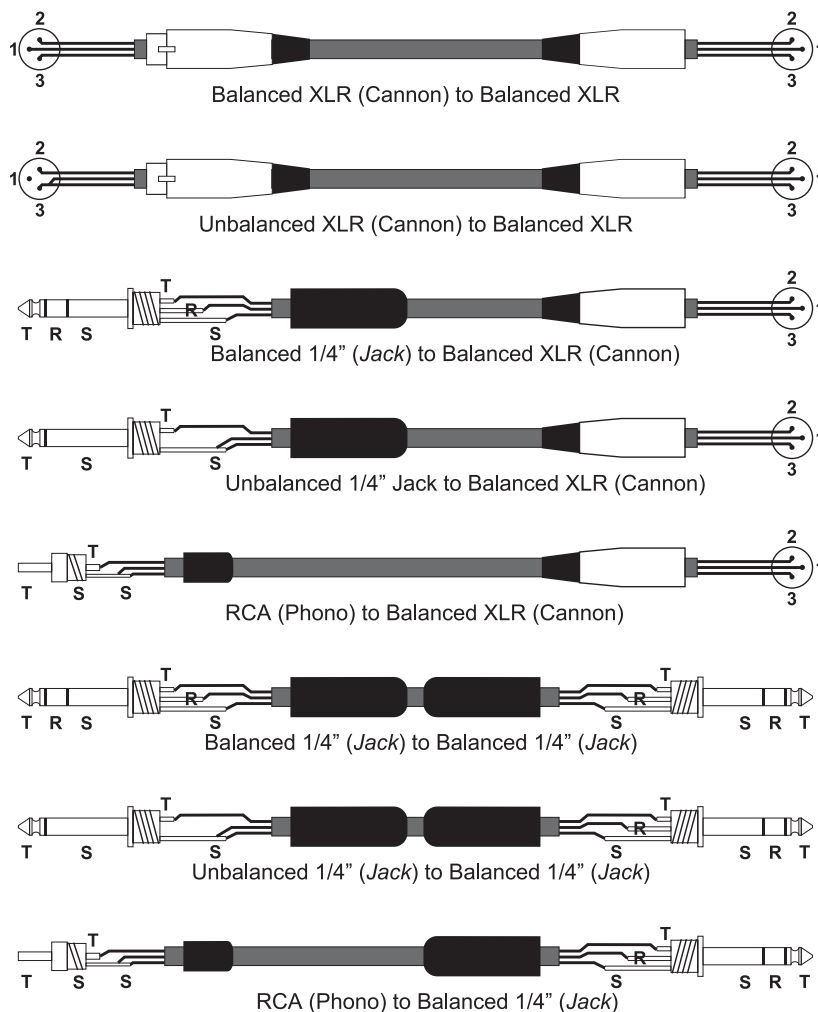


There are two basic ways to transport an audio signal with microphone or line level:

Un-balanced line: Utilizing a two-conductor cable, it transports the signal as the voltage between them. Electro-magnetic interference can get added to the signal as undesired noise. Connectors that carry un-balanced signals have two pins, such as RCA (Phono) and 1/4" (6.35 mm, often referred to as jack) mono. 3-pin connector such as XLR (Cannon) may also carry un-balanced signals if one of the pins is unused.

Balanced line: Utilizing a three-conductor cable, one of them acts as a shield against electro-magnetic noise and is the ground conductor. The other two have the same voltage with respect to the ground conductor but with opposite signs. The noise that cannot be rejected by the shield affects both signal conductors in the same way. At the device's input the two signals get summed with opposite sign, so that noise is cancelled out while the programme signal doubles in level. Most professional audio devices use balanced inputs and outputs. Connectors that can carry balanced signal have three pins, such as XLR (Cannon) and 1/4" (6.35 mm) stereo.

The graphs that follow show the recommended connection with different types of connectors to balanced processor or amplifier inputs. The connectors on the left-hand side come from a signal source, and the ones on the right hand side go to the inputs of the processor or amplifier. Note that on the un-balanced connectors on the left-hand side, two terminals are joined inside the connector. If hum occurs with balanced to balanced connections, try disconnecting the sleeve (ground) on the input connector. Note that the illustrations show what should be connected to what, but that pin locations on an actual XLR connector are different. Also, pin 2 hot is assumed on XLR connectors.



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