

AQ Series

User's Guide

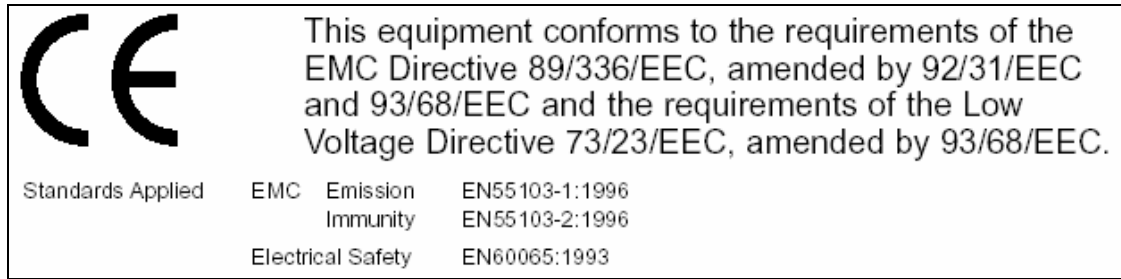


The Martin Experience

AQ Series User Guide

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1. Unpacking

Thank you for purchasing a Martin Audio AQ Series system. Every Martin Audio loudspeaker is built to the highest standard and thoroughly inspected before it leaves the factory. After unpacking the system, examine it carefully for any signs of transit damage and inform your dealer if any such damage is found. It is suggested that you retain the original packaging so that the system can be repacked at a future date if necessary. Please note that Martin Audio and its distributors cannot accept any responsibility for damage to any returned product through the use of non-approved packaging.

2. Warranty

Martin Audio AQ Series products are warranted against manufacturing defects in materials or craftsmanship over a period of 5 years from the date of original purchase.

During the warranty period Martin Audio will, at its discretion, either repair or replace products which prove to be defective provided that the product is returned in its original packaging, shipping prepaid, to an authorised Martin Audio service agent or distributor. Martin Audio Ltd. cannot be held responsible for defects caused by unauthorised modifications, improper use, negligence, exposure to inclement weather conditions, act of God or accident, or any use of this product that is not in accordance with the instructions provided by Martin Audio. Martin Audio is not liable for consequential damages.

This warranty is exclusive and no other warranty is expressed or implied. This warranty does not affect your statutory rights.

3. Introduction

The Martin Audio AQ Series has been designed to fulfil the need for high performance sound in pubs, bars, restaurants, retail premises, nightclubs, conference facilities, post production suites, theatres, educational institutions, places of worship, museums, exhibition centres and cruise ships, in an ultra-compact package.

The series has been conservatively styled to be architecturally unobtrusive. The smaller AQ Series loudspeakers have thick-walled structural ABS foam enclosures with flush, acoustically transparent steel grilles. Larger AQ Series loudspeakers have heavily braced MDF enclosures with tough, acoustically transparent steel grilles. The series comes as standard in RAL7030, textured light grey finish, with other RAL colours available to order.

Six full range enclosures are available to suit a wide range of applications. Ranging from the ultra-compact dual 5.25" (130mm) ICT™ AQ5 to the very high power AQ15 with its 400W AES (1600W peak) 15" (380mm) direct radiator and high efficiency HF compression driver, AQ Series products may be used individually, in multiples or in distributed systems to cover an incredible variety of applications.

AQ Series loudspeakers are equipped with high current, low profile input and link connectors and supplied with easy-to-fit mating plugs for ease of installation. Specially designed wall, ceiling and barrel clamp brackets are available for AQ5, AQ6, AQ8, AQ10 and AQ12 loudspeakers to cater for construction industry standard 1st and 2nd fix installation methods. This allows installers to pull cables and prefix wall or ceiling mounts during building construction without having to bring the loudspeakers to site until the more secure pre-opening phase of a project.

In true Martin Audio fashion, AQ Series loudspeakers are designed to be acoustically correct. All AQ Series loudspeakers are powerful, efficient and easy to drive.

Horn loaded AQ Series loudspeakers feature generously sized high frequency horns and high order crossovers for superior pattern control down into the low midrange and smooth off-axis characteristics. Passive crossovers feature air-cored inductors and high quality capacitors for exceptional precision and low distortion. The precise acoustical performance of these loudspeakers makes them equally at home as signal quality control monitors in sound studios and post production suites.

AQ Series low frequency sections feature efficient, wide bandwidth, high excursion drivers with generously proportioned voice coils for high power handling. The smaller AQ Series loudspeakers feature acoustically stiff industrial foam enclosures whilst the larger enclosures in the series are well damped for accurate, non-resonant operation.

The six full range AQ Series loudspeakers are complemented by four dedicated, high power sub-bass enclosures ranging from the ultra-compact, 400W AES (1600W peak) single 12" (300mm) AQ112 to the very high power, 1000W AES (4000W peak) dual 15" (380mm) AQ215.

A high performance AQX controller has been specially designed to manage AQ Series loudspeakers. The controller is housed in a single rack unit and provides user-selectable active crossover, limiter and trim functions for all AQ system combinations.

4. Main features

AQ5 (standard)

AQ5TX30 (100V or 70V line version)



Main features

- ✚ Very wide 120° x 60° dispersion
- ✚ 120Hz – 20kHz
- ✚ 75W AES (300W peak)
- ✚ 4 ohms or 16 ohms (low profile switch on rear)
- ✚ Dual 5.25" (130mm) ICT™

The ultra-compact Martin Audio AQ5 is equipped with two 5.25" (130mm) ICT™ - Inductively Coupled Transducer - drivers optimally splayed for smooth, very wide coverage. The AQ5's HF diaphragms are driven via inductive coupling, avoiding the tweeter burn-out commonly associated with miniature loudspeakers. ICT™ technology also obviates the need for a crossover as the inductive coupling provides a complementary transfer function for the tweeter.

AQ6 (standard)

AQ6 (16 ohm version)

AQ6TX30 (100V or 70V line version)



Main features

- ✚ Wide 90° conical dispersion
- ✚ 80Hz – 20kHz
- ✚ 100W AES (400W peak)
- ✚ Two-way 8 ohm passive (16 ohm to special order)
- ✚ 6.5" (165mm) direct radiating LF cone + 1" (25mm) horn-loaded dome tweeter

The Martin Audio AQ6 is a two-way passive loudspeaker designed to fulfil the requirement for dynamic performance from a very small, architecturally friendly, vented enclosure. It features a 6.5" direct radiating, long-throw bass unit and a 1" doped fabric dome driver coupled to a constant directivity square coverage HF horn.

AQ8 (standard) AQ8TX30 (100V or 70V line versions)



Main features

- ✚ Wide 90° x 50° dispersion
- ✚ Rotatable HF horn
- ✚ 75Hz – 20kHz
- ✚ 150W AES (600W peak)
- ✚ Two-way 8 ohm passive
- ✚ 8" (200mm) direct radiating LF cone + 1" (25mm) horn-loaded HF compression driver

The Martin Audio AQ8 is a two-way passive loudspeaker designed to give excellent sonic performance from a compact and architecturally neutral, vented enclosure. It features an 8" (200mm) long-throw, direct radiating bass unit with a 2" (50mm) voice coil and a 1" (25mm) diaphragm, 1" (25mm) exit compression driver coupled to a constant directivity HF horn.

AQ10 (standard) AQ10TX150 (100V or 70V line version)



Main features

- ✚ Wide 90° x 50° dispersion
- ✚ Rotatable HF horn
- ✚ 65Hz – 20kHz
- ✚ 300W AES (1200W peak)
- ✚ Two-way 8 ohm passive
- ✚ 10" (250mm) direct radiating LF cone + 1" (25mm) exit horn-loaded HF compression driver

The Martin Audio AQ10 is a two-way passive loudspeaker designed to provide high sound pressure levels from a compact, architecturally friendly, heavily braced, vented enclosure. It features a 10" (250mm) long-throw, direct radiating bass driver with a 2.5" (63mm) voice coil and a 1.4" (35mm) diaphragm, 1" (25mm) exit compression driver coupled to a true constant directivity HF horn.

AQ12 (standard) AQ12TX150 (100V or 70V line version)



Main features

- ✚ Wide 80° x 50° dispersion
- ✚ Rotatable HF horn
- ✚ 62Hz – 18kHz
- ✚ 300W AES (1200W peak)
- ✚ Two-way 8 ohm passive
- ✚ 12" (300mm) direct radiating LF cone + 1" (25mm) exit horn-loaded HF compression driver

The Martin Audio AQ12 is a two-way passive loudspeaker designed to provide high sound pressure levels from an architecturally friendly, heavily braced, vented enclosure. It features a 12" (300mm) long-throw, direct radiating bass driver with a 2.5" (63mm) voice coil and a 1.7" (43mm) diaphragm, 1" (25mm) exit compression driver coupled to a true constant directivity HF horn.

AQ15 (standard) AQ15TX150 (100V or 70V line option)



Main features

- ✚ Wide 80° x 50° dispersion
- ✚ Rotatable HF horn
- ✚ 55Hz – 18kHz
- ✚ 400W AES (1600W peak)
- ✚ Two-way 8 ohm passive
- ✚ 15" (380mm) direct radiating LF cone + 1.4" (35mm) exit horn-loaded HF compression driver

The Martin Audio AQ15 is a two-way passive loudspeaker designed to provide very high sound pressure levels from an architecturally friendly, heavily braced, vented enclosure. It features a 15" (380mm) long-throw, direct radiating bass driver with a 3" (75mm) voice coil and a 2.5" (63mm) diaphragm, 1.4" (35mm) exit compression driver coupled to a true constant directivity HF horn.

AQ112



Main features

- ✚ 48Hz – 150Hz
- ✚ 400W AES (1600W peak)
- ✚ Easy 8 ohm load
- ✚ 12" (300mm) direct radiating LF cone with 3" (75mm) voice coil

The Martin Audio AQ112 is a direct radiating subwoofer in an ultra-compact heavily braced, vented enclosure. It features a very efficient 12" (300mm) long-throw bass driver with a high power 3" (75mm) voice coil and generously sized low frequency ports for low noise, high power operation.

AQ210



Main features

- ✚ 50Hz – 150Hz
- ✚ 600W AES (2400W peak)
- ✚ 4 ohm
- ✚ Dual 10" (250mm) direct radiating LF cones with 3" (75mm) voice coils

The Martin Audio AQ210 is a dual driver, direct radiating subwoofer in an ultra-compact heavily braced, vented enclosure. It features two very efficient 10" (250mm) long-throw bass drivers with high power 3" (75mm) voice coils and generously sized low frequency ports for low noise, high power operation.

AQ212



Main features

- ✚ 48Hz – 150Hz
- ✚ 800W AES (3200W peak)
- ✚ 4 ohm
- ✚ Dual 12" (300mm) direct radiating LF cones with 3" (75mm) voice coils

The Martin Audio AQ212 is a dual driver, direct radiating subwoofer in a heavily braced, vented enclosure. It features two very efficient 12" (300mm) long-throw bass drivers with high power 3" (75mm) voice coils and generously sized low frequency ports for low noise, high power operation.

AQ215



Main features

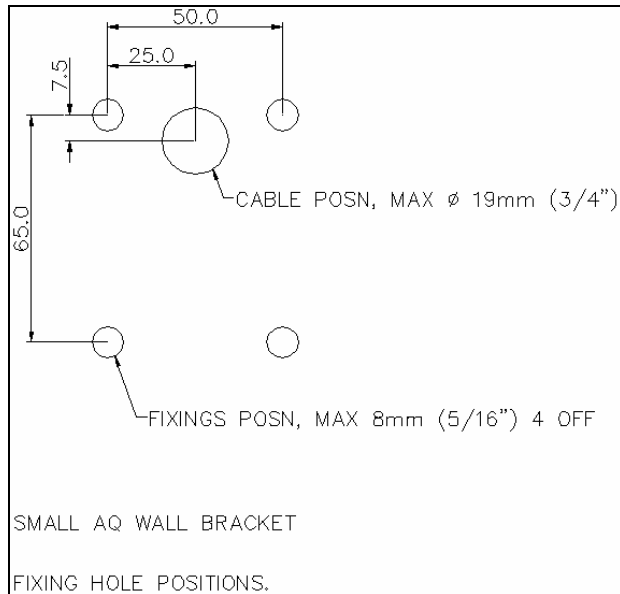
- ✚ 40Hz – 120Hz
- ✚ 1000W AES (400W peak)
- ✚ 4 ohm
- ✚ Dual 15" (380mm) direct radiating LF cones with 4" (100mm) voice coils

The Martin Audio AQ215 is a dual driver, direct radiating subwoofer in a heavily braced, vented enclosure. It features two very efficient 15" (380mm) long-throw bass drivers with high power 4" (100mm) voice coils and generously sized low frequency ports for low noise, high power operation.

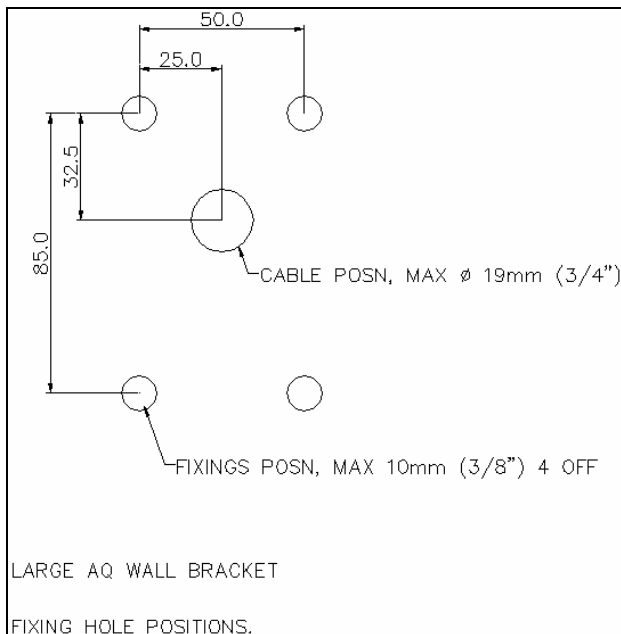
5. Mounting bracket options

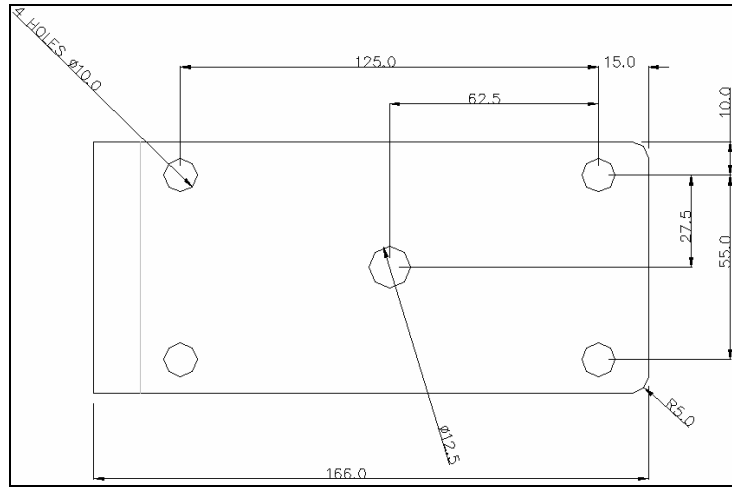


AQWB6
Wall bracket for AQ5, AQ6

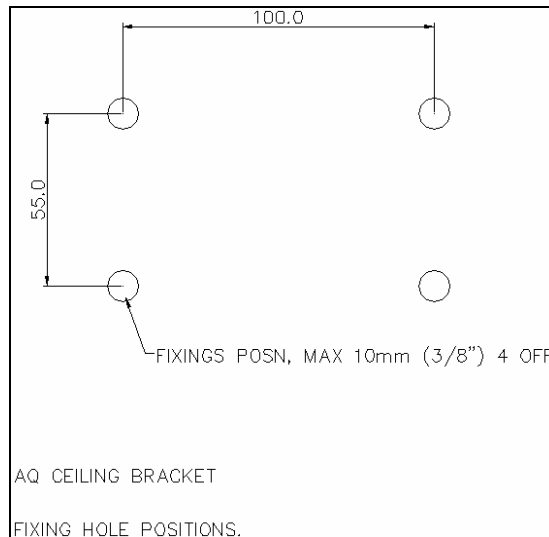


AQWB8
Wall bracket for AQ8, AQ10, AQ12





AQCB6
Ceiling Bracket for AQ5, AQ6



AQCS **AQCL**
Ceiling Brackets – AQCS (short) for AQ8, AQ10, AQCL (long) for AQ8, AQ10, AQ12

Note that the short bracket may also be used with a horizontally mounted AQ12



AQFB

Flying Bracket – allows AQ8, AQ10, AQ12 to be flown at a choice of vertical angles depending on which pair of pick-up holes are used

6. Installing with AQ Series brackets

Consult a qualified structural engineer with a full knowledge of the building, its load ratings and your intended loudspeaker installation plans before commencing any installation.

All AQ Series wall and ceiling brackets are mounted and adjusted in a similar manner. The brackets are designed for 1st & 2nd fit installation.

1st fit: Wall bracket or ceiling bracket

2nd fit: Speaker bracket if the system is to be wall mounted or ceiling mounted on an AQCB6
–or–
Speaker bracket/tube assembly if the system is to be ceiling mounted using AQCS or AQCL.

Important note:

To avoid excessive leverage, ceiling brackets should never be used for wall mounting!

1st Fit the fixed wall or ceiling bracket before loudspeakers are brought to site. Cables (not shown) may be pulled and terminated at this stage. Loudspeaker/bracket/tube assemblies may be fitted later.



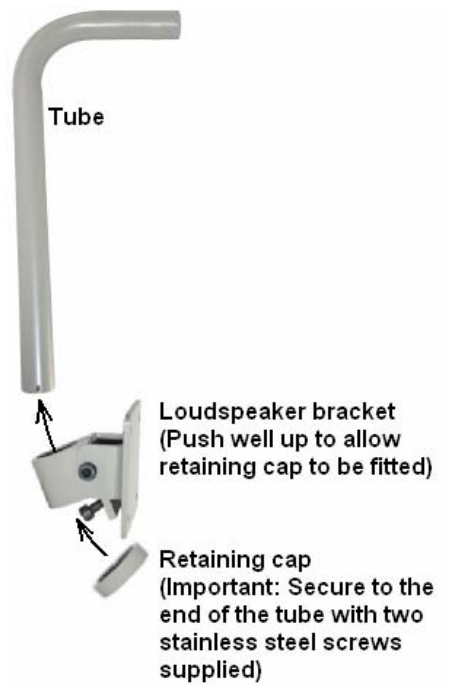
Wall bracket



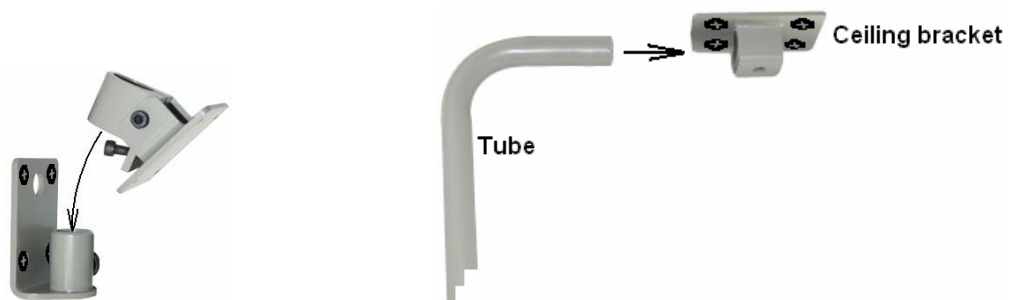
Ceiling bracket

2nd Fit the loudspeaker brackets to the loudspeakers (not shown).

If the loudspeakers are to be ceiling mounted, attach the tube to the loudspeaker/bracket assembly. Vertical loudspeaker angles may be preset at this stage if required.

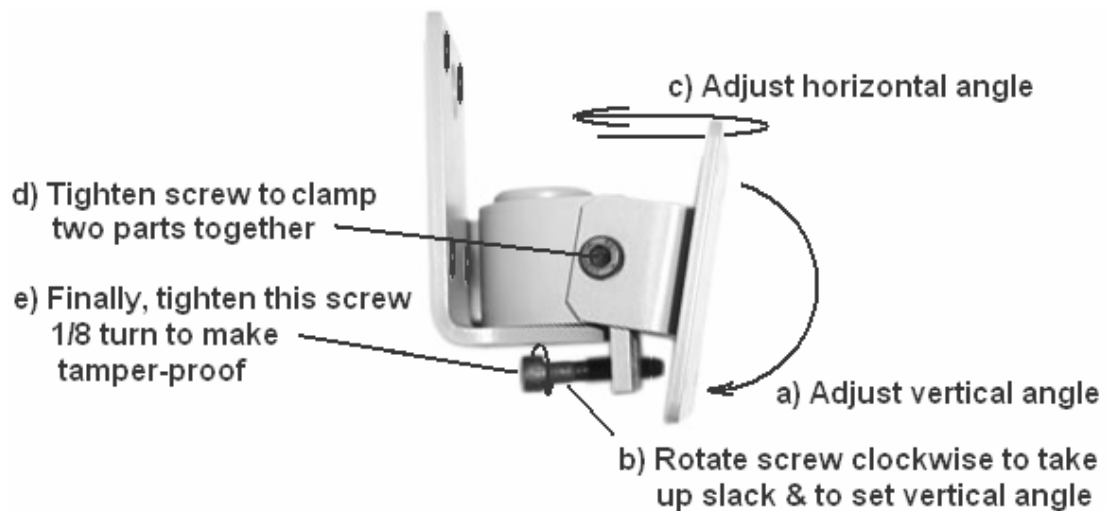


Once the site is secure, attach the speaker/bracket assembly – or speaker/bracket/tube



**Loudspeaker brackets are attached to ceiling or wall brackets as required
(cables and loudspeakers not shown for clarity)**

1) Adjust as follows ...

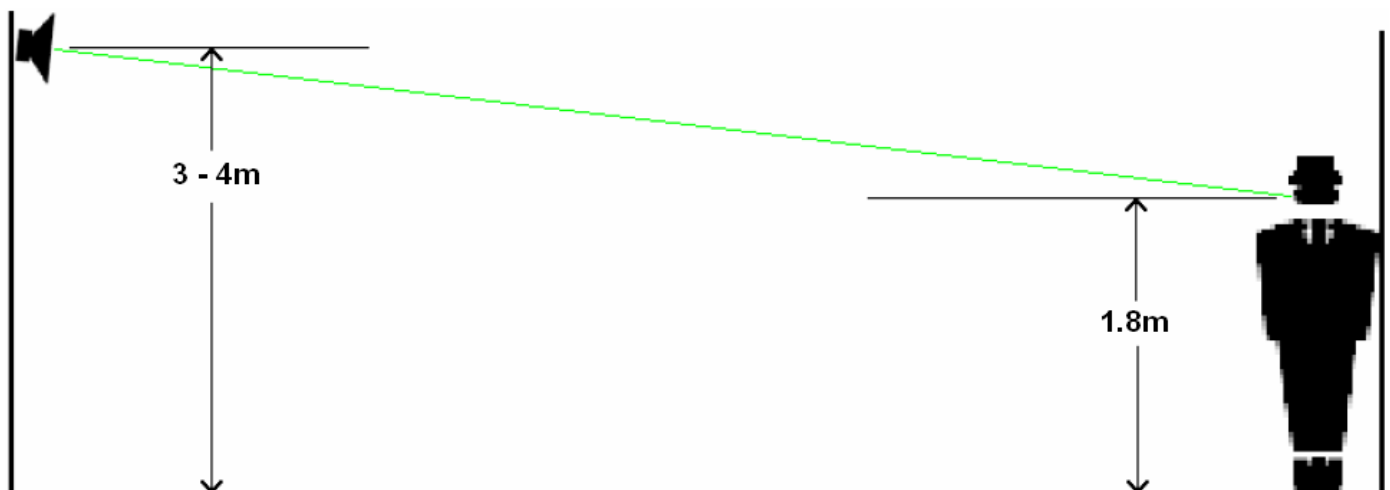


The complete installation should be checked and approved by a qualified structural engineer and a qualified electrical safety consultant before being signed off.

7. Vertical aiming

AQ Series loudspeakers should be mounted above head height – high enough to clear peoples' heads for clean coverage but low enough to avoid over-exciting room resonances.

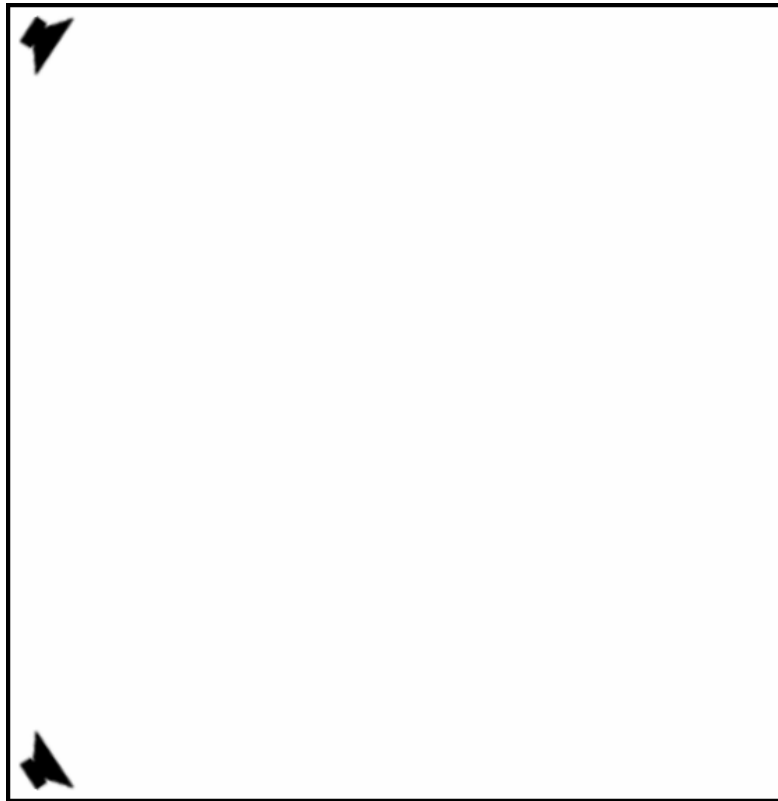
Tilt angles should be set so that the loudspeaker's maximum output (usually on-axis of the loudspeaker centre) is aimed at the furthest listener across the room.



8. Horizontal aiming

Horizontal angles should be set so that the loudspeaker's main horizontal coverage is directed towards the main listening area. Avoid excessive reflections from nearby side walls.

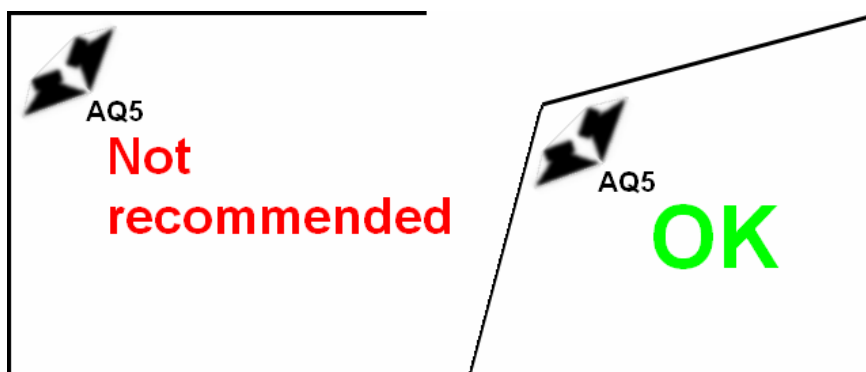
The following example shows AQ Series loudspeakers with 80 - 90° horizontal dispersion (all except AQ5) toed in 40 - 45° from the side walls



AQ6, AQ8, AQ10, AQ12, AQ15 aiming

AQ5 placement

For the cleanest coverage, AQ5 dual-driver loudspeakers are best kept away from tight corners that open to less than 100°.



The AQ5 is not recommended for use in tight corners

9. Distributed AQ Series systems

AQ Series loudspeakers are ideal for distributed sound systems in places like sports stadium concourses, exhibition centre walkways etc...

Distributed systems can provide superb sonic results as long as the following simple steps are taken in the system design process:

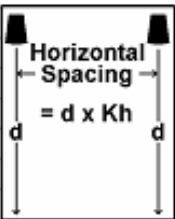
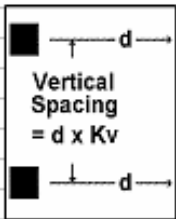
- 1) Choose the AQ Series loudspeaker to suit the maximum distance to be covered. The chart below indicates the maximum distance covered by AQ Series loudspeaker pairs:

AQ Series loudspeaker	Open space projection (throw) vs peak spl for a loudspeaker pair		
	97dB	103dB	109dB
AQ5	11.2m	5.6m	2.8m
AQ6	10m	5m	2.5m
AQ8	18m	9m	4.5m
AQ10	36m	18m	9m
AQ12	40m	20m	10m
AQ15	56m	28m	14m

Open space projection (throw) vs peak sound pressure level for a loudspeaker pair

- 2) Choose the loudspeaker-to-loudspeaker spacing for smooth coverage. This spacing will depend on the distance to the **nearest** listener. Loudspeakers spaced too far apart may leave coverage gaps.

The following chart will help you to work out loudspeaker-to-loudspeaker spacing for very smooth coverage as a function of the minimum listener distance.

	Distributed System Horizontal Spacing as a function of minimum on-axis listener distance	Distributed System Vertical Spacing as a function of minimum on-axis listener distance
		
	Multiplier Kh	Multiplier Kv
AQ5	1.73	0.58
AQ6	1	1
AQ8	1	0.47
AQ10	1	0.47
AQ12	0.84	0.47
AQ15	0.84	0.47

Example 1: Horizontally distributed **AQ5** loudspeakers are required to cover smoothly from a **minimum listener distance of 3m**. The spacing required is **1.73 x 3m = 5.19m** for very smooth coverage.

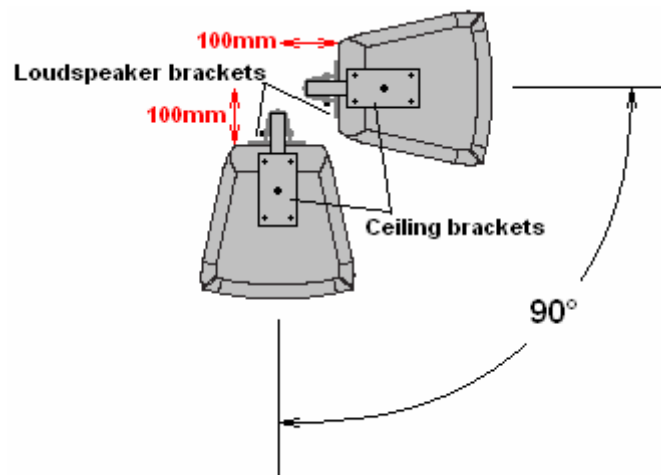
Example 2: Horizontally distributed **AQ12** loudspeakers are required to cover smoothly from a **minimum listener distance of 6m**. The spacing required is **0.84 x 6m = 5.04m** for very smooth coverage.

The above calculations will provide very smooth coverage with approximately 3dB mid-band sound pressure level summation. Wider spacing (up to 2 x the above figures) may be acceptable where budgets are tight... but with slight tonal inconsistencies and less useable summation.

10. AQ Series arrays

AQ Series loudspeakers may be arrayed to increase coverage or sound pressure level.

When arraying AQ8, AQ10 or AQ12 loudspeakers from ceiling brackets, allow approximately 100mm behind each loudspeaker for loudspeaker bracket clearance.



2 x AQ10 array viewed from above

Recommended maximum and minimum AQ Series loudspeaker centre-to-centre splay angles are shown in the following table. Maximum splay angles will provide maximum coverage. Minimum splay angles provide an element of summation – typically 3dB between loudspeaker centres.

Loudspeaker	Horizontal splay angle (Loudspeaker centre-to-centre)		Vertical splay angle (Loudspeaker centre-to-centre)	
	Minimum	Maximum	Minimum	Maximum
AQ5	*100°	120°	50°	60°
AQ6	45°	90°	45°	90°
AQ8	45°	90°	25°	50°
AQ10	45°	90°	25°	50°
AQ12	40°	80°	25°	50°
AQ15	40°	80°	25°	50°

(*Note that the AQ5 is a wide coverage, dual driver system. Each AQ5 has two full-range ICT™ devices horizontally arrayed at 50°. A 100° horizontal splay angle **between AQ5 cabinet centres** continues the array and provides very smooth coverage)

Useful high frequency coverage for pairs of AQ Series loudspeakers

Horizontally arrayed pair (minimum – maximum centre-to-centre splay)	Total horizontal coverage
2 x AQ5 (100 - 120°)	220 - 240°
2 x AQ6 (45 - 90°)	135 - 180°
2 x AQ8 (45 - 90°)	135 - 180°
2 x AQ10 (45 - 90°)	135 - 180°
2 x AQ12 (45 - 80°)	125 - 160°
2 x AQ15 (45 - 80°)	125 - 160°

Vertically arrayed pair (minimum – maximum centre-to-centre splay)	Total vertical coverage
2 x AQ5 (50 - 60°)	110 - 120°
2 x AQ6 (45 - 90°)	135 - 180°
2 x AQ8 (25 - 50°)	75 - 100°
2 x AQ10 (25 - 50°)	75 - 100°
2 x AQ12 (25 - 50°)	75 - 100°
2 x AQ15 (25 - 50°)	75 - 100°

11. Choosing a power amplifier

The high efficiency and impressive power handling of AQ series loudspeakers combine to produce a system capable of very high sound pressure levels and impact.

To realise full AQ Series performance use a power amplifier capable of delivering **Peak Power*** without excessive clipping. Power amplifier clipping should be avoided. A heavily clipped amplifier will deliver twice its rated power to the loudspeaker. Much of this excess power will be dissipated in the HF section causing premature ageing and, possibly, driver failure.

AES Power

This is the long-term power capacity of the loudspeaker taking into account the loudspeaker's bandwidth and minimum impedance. It is measured to Audio Engineering Society standards using band-limited pink noise as the test source and is regarded as a reliable indication of the loudspeaker's long-term power handling before thermal damage is caused.

*Peak Power

This is the short-term power capacity of the loudspeaker and is typically 4x (6dB) higher than the quoted AES power. Martin Audio loudspeakers are designed to handle this short-term peak power. This allows speech and percussion transients to be produced without hindrance whilst a correctly configured AQX controller protects the loudspeaker from accidental long-term overload (e.g. howl-round).

AQX limiter time constants are optimized to permit the faithful production of short-term transients at peak power whilst protecting the system from long-term thermal damage.

AQ Loudspeaker	Rated Peak Power	Suggested Martin Audio Power Amplifier (Note: Set rear gain switches to 32dB, any MLS switches to 0 and any Clip Limiters to Off – AQX controller must be used for optimum limiter characteristics)
AQ5 (4ohms mode)	300W	MA200Q or MA900
AQ5 (16ohms mode)	300W	MA2.8S (for high voltage 16ohm drive)
AQ6 standard (8ohms)	400W	E1300 or MA1400
AQ6 16 ohm (16ohms)	400W	MA4.2s
AQ8 (8ohms)	600W	MA1400 or MA1.6s
AQ10 (8ohms)	1.2KW	MA2.8s
AQ12 (8ohms)	1.2KW	MA2.8s
AQ15 (8ohms)	1.6KW	MA4.2s
AQ112 (8ohms)	1.6KW	MA4.2s
AQ210 (4ohms)	2.4KW	MA4.2s
AQ212 (4ohms)	3.6KW	MA4.2s
AQ215 (4ohms)	4.0KW	MA4.2s
AQ5TX30, AQ6TX30, AQ8TX30	-	High quality 100V or 70V line amplifier rated at 30W x number of spkrs on the line.
AQ10TX150, AQ12TX150, AQ15TX150	-	High quality 100V or 70V line amplifier rated at 150W x number of spkrs on the line

Suggested amplifiers for the AQ Series to ensure peak output without excessive clipping
(MA and E Series power amplifiers will comfortably drive parallel AQ Series loudspeakers and subwoofers.
See Section 15 for further information)

Important note! Always set the AQX limiters to suit the power amplifier gain. This will ensure that the AQX controller protects the loudspeaker against long term overload whilst allowing full power amplifier performance on transients.

(Martin Audio MA and E Series amplifiers are supplied set to 32dB as standard).

12. AQX System Controller

AQ Series loudspeakers have passive crossovers and are designed to be acoustically correct without excessive equalization. We do, however, recommend that you use the Martin Audio AQX analogue 2-input/ 4-output system controller to provide “with sub”/“full range” switching, system limiting and fine frequency response alignment.



AQX System Controller

The Martin Audio AQX is a versatile analogue system controller, housed in a single 1.75" x 19" rack unit, which has been specifically designed to enhance the performance of AQ Series loudspeakers.

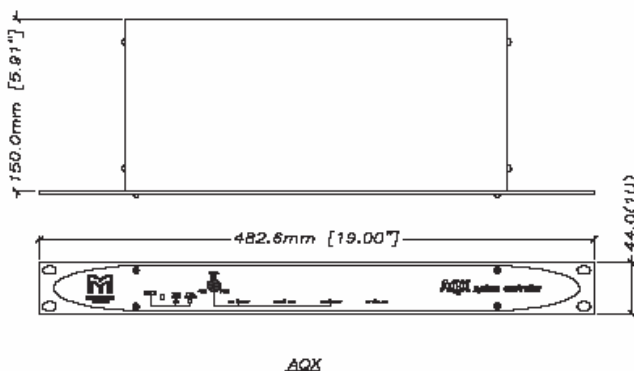
It provides stereo 2-way active crossover functions for integrating AQ5, AQ6, AQ8, AQ10, AQ12 and AQ15 full range loudspeakers with AQ112, AQ210, AQ212 and AQ215 subwoofers. The controller also acts as an advanced system limiter to protect AQ Series loudspeakers and subwoofers from accidental damage or premature ageing. Limiter thresholds may be user-selected to cater for a wide range of amplifier topologies.

The AQX's 20kohm balanced input impedance is suitable for both professional and music industry signal sources whilst its low 62ohm output impedance makes it suitable for driving long cables or multiple amplifier inputs in distributed system designs.

AQX features

- ✚ Dedicated AQ Series System Controller
- ✚ User configurable for specific AQ Series combinations
- ✚ 2-way stereo operation
- ✚ 2 electronically balanced XLR inputs
- ✚ 4 electronically balanced low impedance XLR line driver outputs
- ✚ Individual +/-6dB subwoofer level trims on outputs 1 and 3
- ✚ Low distortion (better than 0.01% THD ref 2Vrms output)
- ✚ Low noise (better than -100dB ref 2Vrms output)
- ✚ Advanced limiter design
- ✚ Captive mains lead
- ✚ 100-120Vac and 220-240Vac mains operation, 50/60Hz
- ✚ 19" 1U (1.75") standard rack-mount

overall dimensions

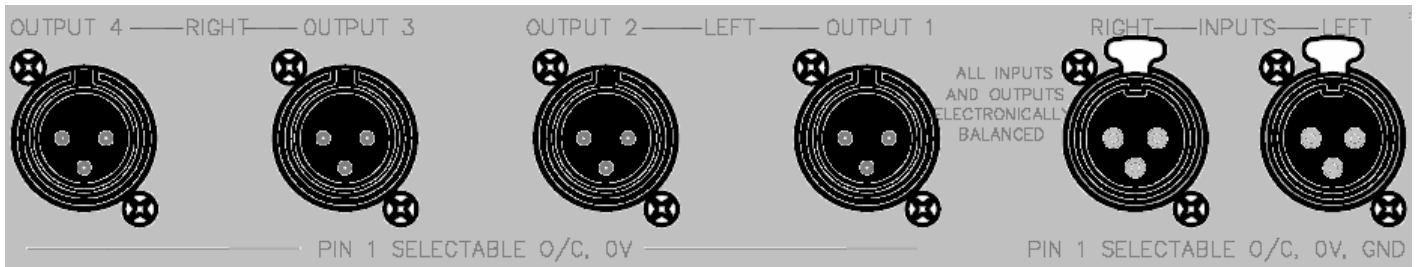


INPUTS	2 x XLR3 20k ohms electronically balanced, CMRR 60dB 20Hz – 10kHz
OUTPUTS	4 x XLR3 electronically balanced Max output +20dBu into 600 ohms
FREQUENCY RESPONSE	-3dB @ 18Hz 12dB/octave -3dB @ 45kHz 12dB/octave (ultimately set by system parameters)
SYSTEM PARAMETERS	User configurable for specific AQ Series combinations
LIMITERS	Individual for each channel Ratio 20:1. Threshold range -12dBu to +12dBu in 16 steps
DIMENSIONS	
WIDTH	483mm (19ins)
HEIGHT	44mm (1.75ins) 1U
DEPTH	155mm (6.1ins)
WEIGHT	2.4kg (5.3lbs)

Details



AQX front panel detail



AQX rear panel detail

AQX System Controller configuration

AQX controllers must be configured by qualified technicians. Switch off the AQX controller and ensure that the mains plug is removed from the power socket.

The AQX controller contains internal jumpers to cater for all common AQ Series configurations.

(AQX limiter settings are shown later in this section. Limiter settings will vary depending on the voltage gain of the power amplifier to be used – see table at the end of this section. The 32dB line is highlighted for Martin Audio power amplifiers)

Remove the lid to locate the jumper positions on the upper pcb (printed circuit board) – J1, J2, J5 & J6 to configure the AQX for AQ5, AQ6, AQ8, AQ10, AQ12 and AQ15 loudspeakers and J3, J4, J7 and J8 to configure the AQX for AQ112, AQ210, AQ212 and AQ215 subwoofers.

Configure the AQX System Controller as indicated in the table and illustrations below – or refer to the appropriate illustration over the next few pages.

AQX jumpers	J1,J5	J2,J6		J3,J7	J4,J8
AQ5	IN*	B&C	AQ112,210,212	A	A
AQ6,8,10	IN*	A&D**	AQ215	B	A
AQ12,15	OUT	A&D**	AQ112,210,212 WITH AQ5	A	B
			AQ215 WITH AQ5	B	B
*FIT JUMPER 'OUT' WHEN USING IN 'WITH SUB' MODE, ** FIT JUMPER IN 'C' IF HF BOOST REQUIRED					

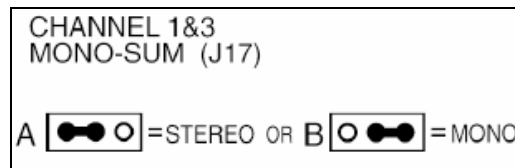
**“With Sub” mode

There are two HPFs (High Pass Filters) in the signal path – one on the mother board and one on the top pcb.

The HPF on the top pcb sets the lowest operating frequency for the AQ5, AQ6, AQ8, AQ10, AQ12 or AQ15 loudspeaker in “Full Range” mode. The motherboard HPF operates in “With Sub” mode to provide a main loudspeaker-to-subwoofer crossover function. The top pcb HPF should be disabled in “With Sub” mode as the lowest operating frequency for the main AQ5, AQ6, AQ8, AQ10, AQ12 or AQ15 loudspeaker is set by the main-to-sub crossover function.

Mono Subwoofer

Move the mother board jumper J17 to the B position for mono subwoofer operation.



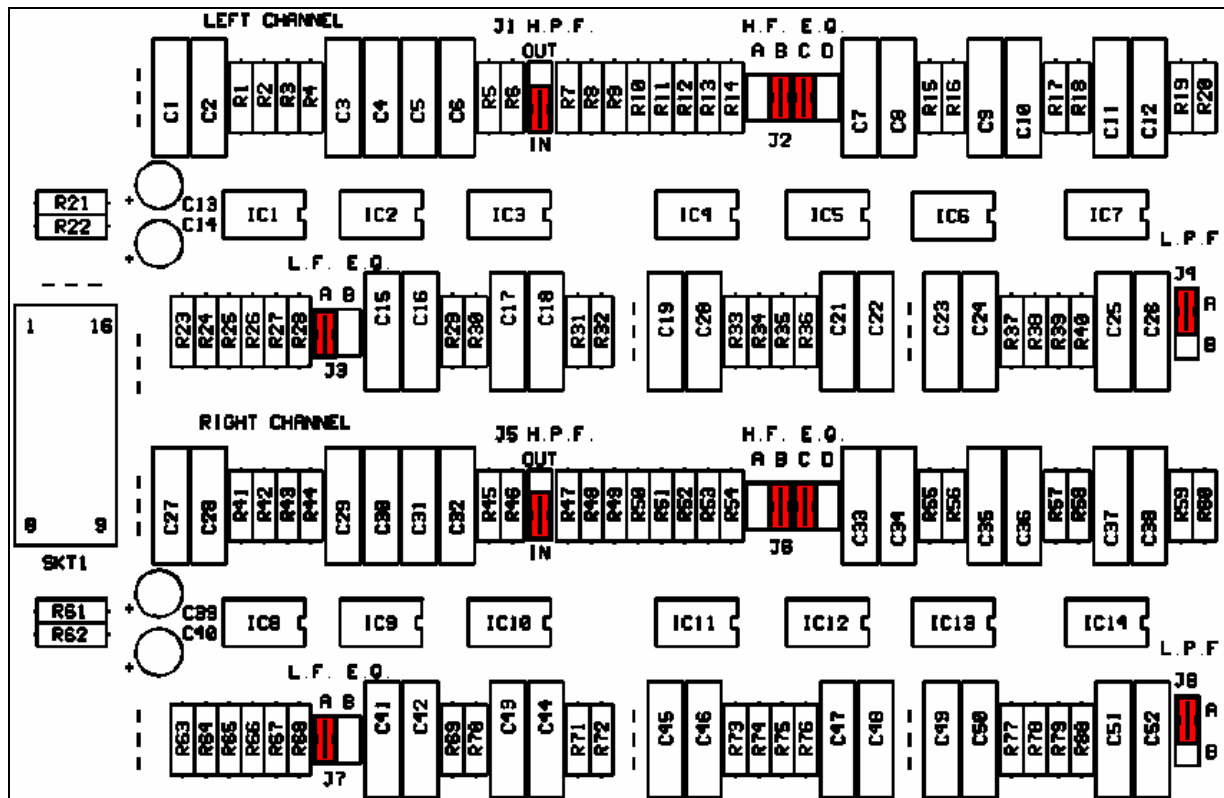
**HF boost

Simply move the J2 and J6 jumpers to the C position if HF boost is required.

Limiter configuration

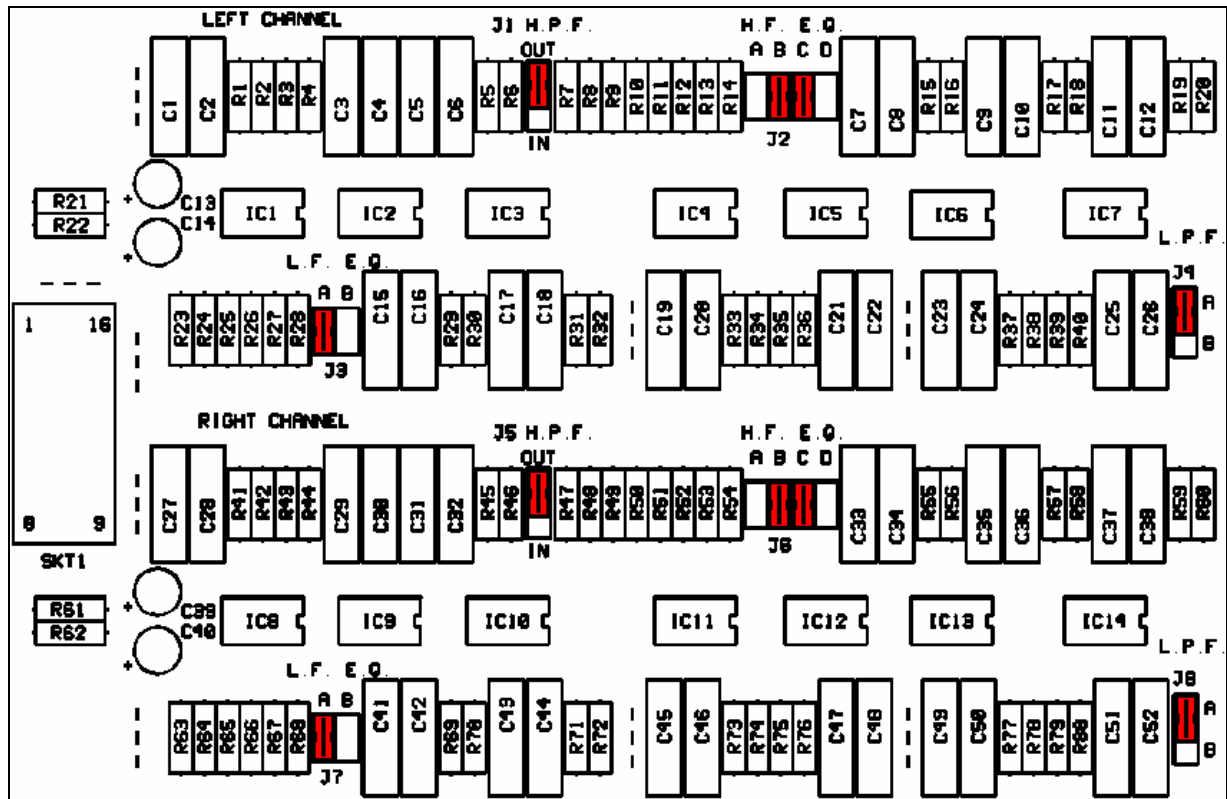
Motherboard jumpers J11, J12, J13 & J14 must be set for safe operation – see end of this manual section for details.

See the main [AQX System Controller User Guide](#) (on Martin Audio User Guides CD – May 2005 or later) for input & output pin 1 links, limiter in/out links and Ch2 & 4 polarity links.

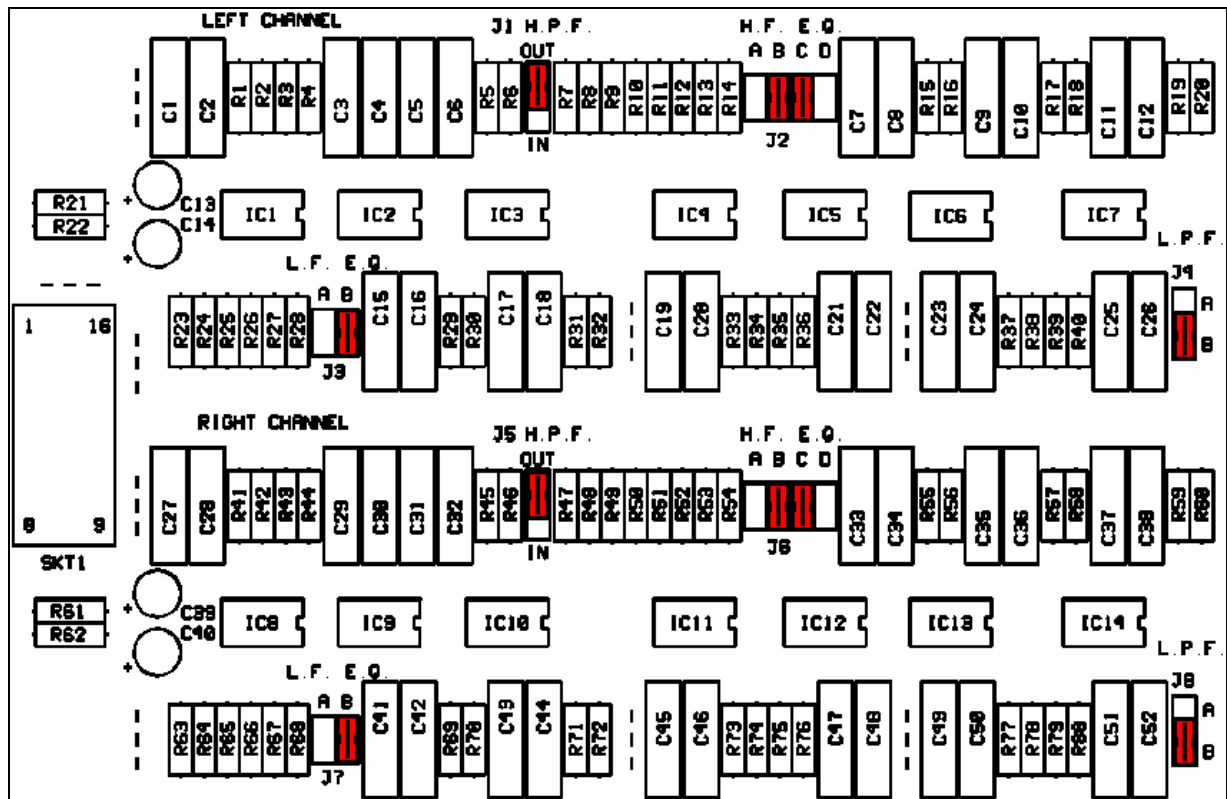


AQ5 full range

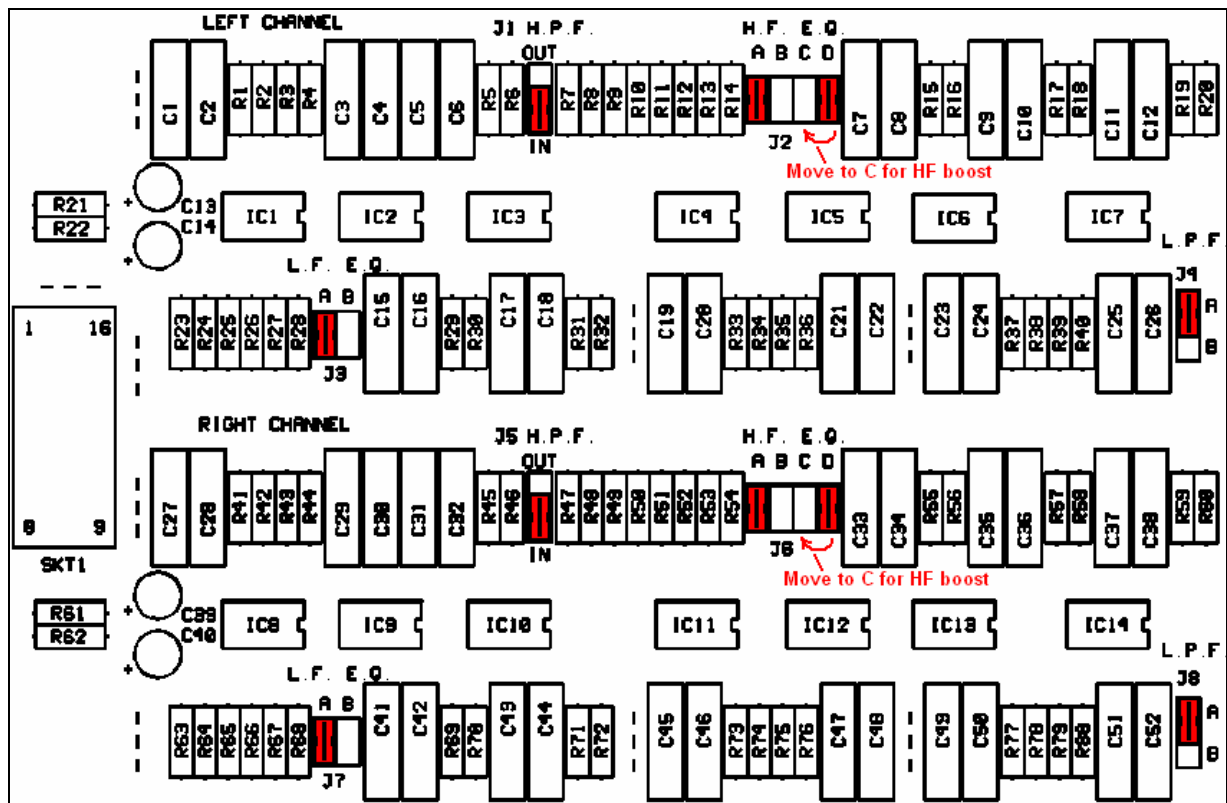
Remember to select “Full range” mode on the front panel



AQ5 with AQ112, AQ210 or AQ212 subwoofer
Remember to select "With Sub" mode on the front panel

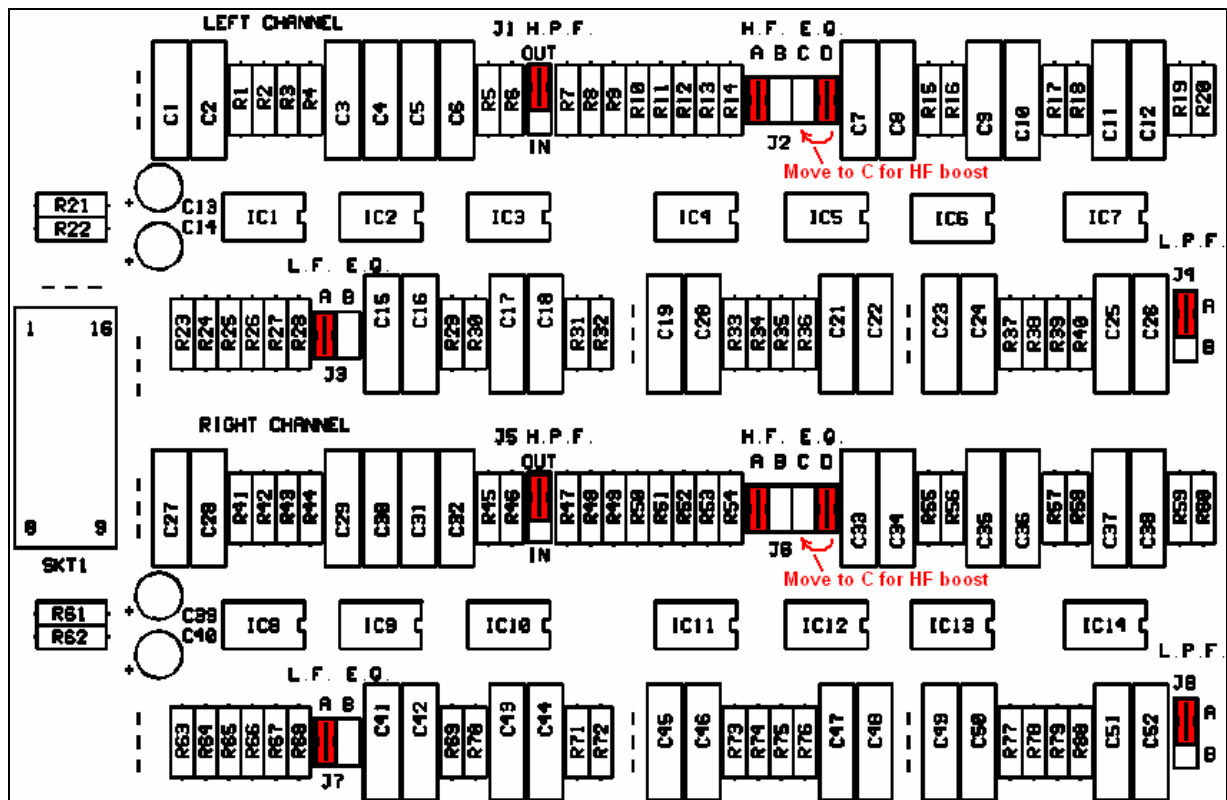


AQ5 with AQ215 subwoofer
Remember to select "With Sub" mode on the front panel



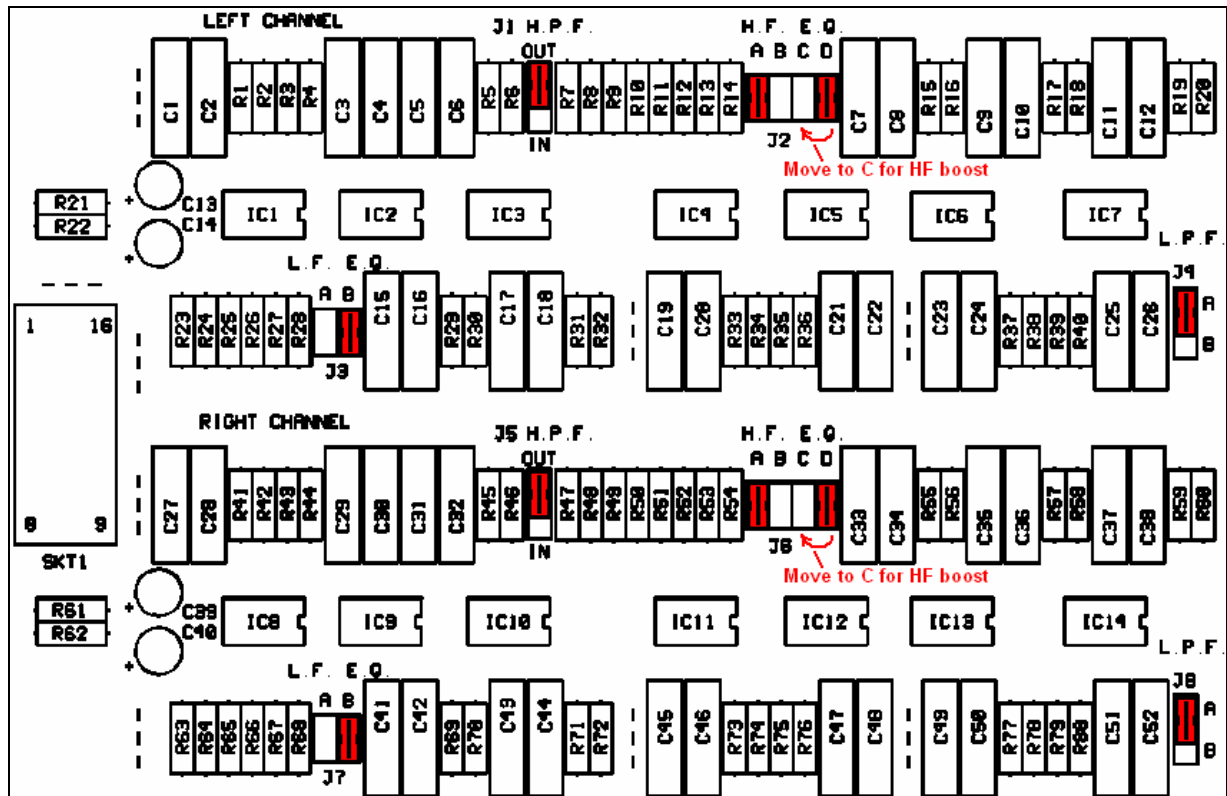
AQ6, AQ8 or AQ10 full range

Remember to select "Full range" mode on the front panel



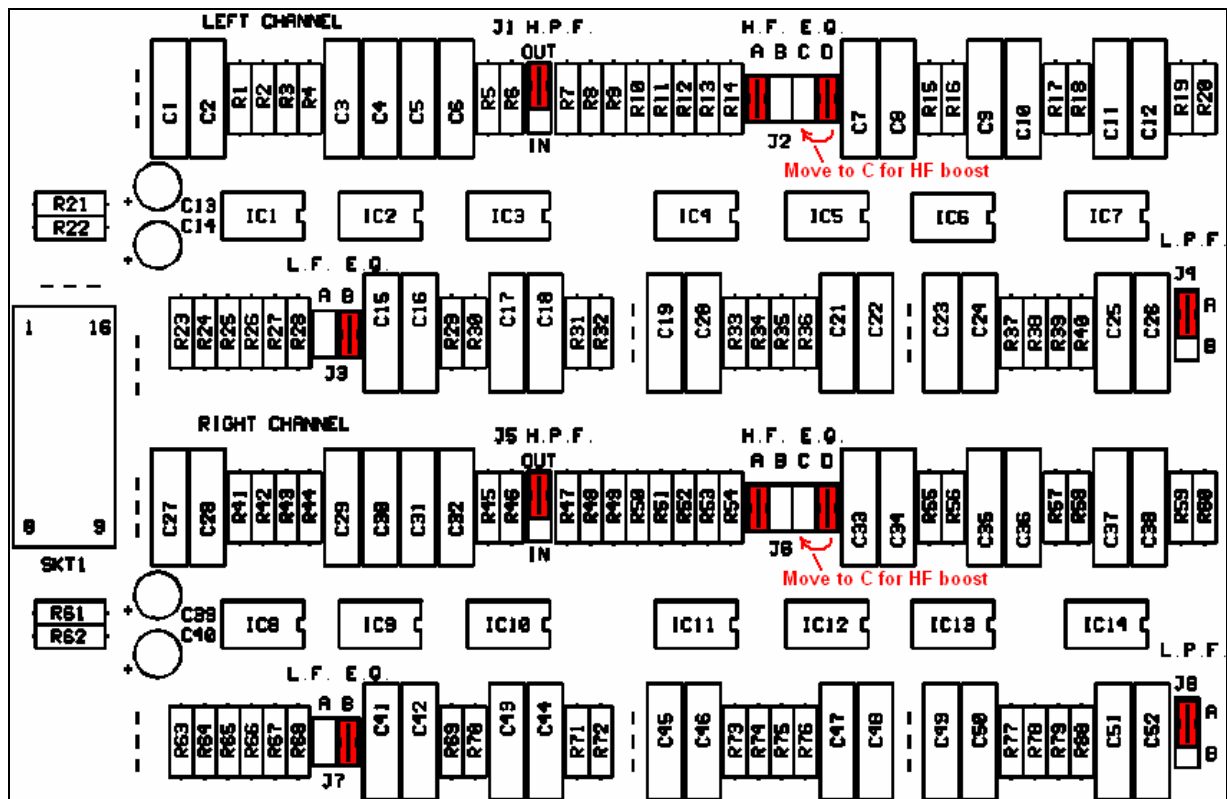
AQ6, AQ8 or AQ10 with AQ112, AQ210 or AQ212 subwoofer

Remember to select "With Sub" mode on the front panel



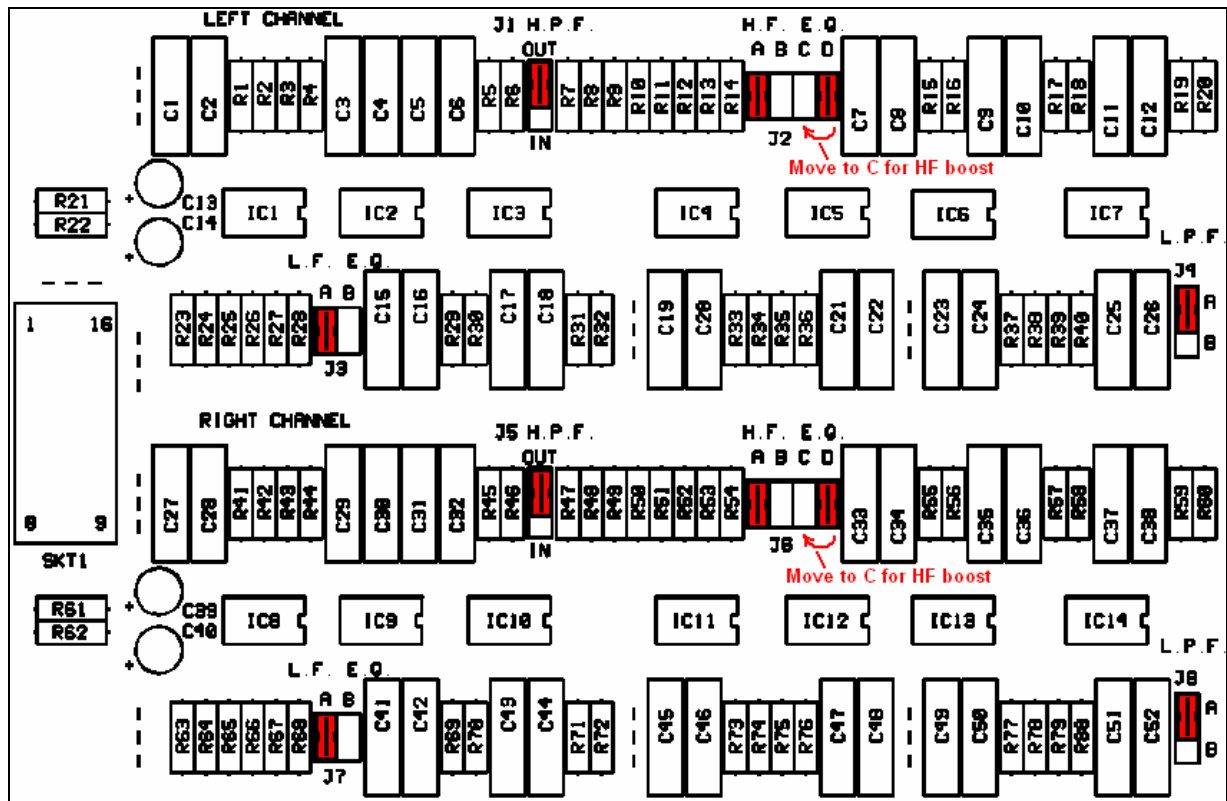
AQ6, AQ8 or AQ10 with AQ215 subwoofer

Remember to select "With Sub" mode on the front panel



AQ12 or AQ15 full range

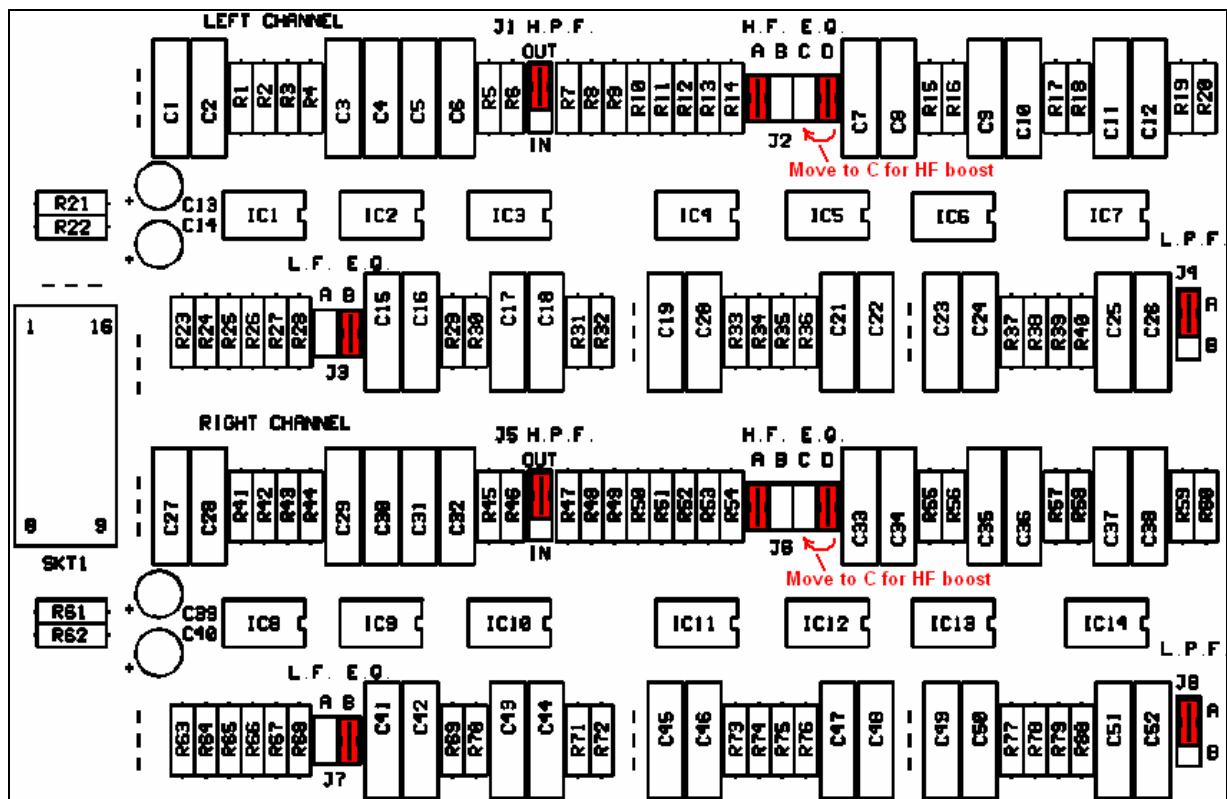
Remember to select "Full range" mode on the front panel



AQ12 or AQ15^{*} with AQ112, AQ210 or AQ212 subwoofer**

Remember to select "With Sub" mode on the front panel

(^{***} Probably best to use SQ215 subwoofer unless there are architectural restrictions – see below)



AQ12 or AQ15 with AQ215 subwoofer

Remember to select "With Sub" mode on the front panel

AQX System Controller limiter settings

Reminder:

AQX controllers must only be configured by fully qualified electro-acoustics technicians as mistakes could prove costly. Switch off the AQX controller and ensure that the mains plug is removed from the power socket.

To set AQX limiters correctly:

- 1) Remove the AQX controller lid
- 2) Unplug and temporarily remove the AQX top pcb (printed circuit board). You will need to squeeze the nylon pillar latches gently with a small pair of pliers taking care not to damage adjacent components

Configure the 4-way links J11, J12, J13 & J14 on the AQX motherboard - one 4-way link for each output. Configure the links to suit the relevant power amplifier gain – see the table overleaf.

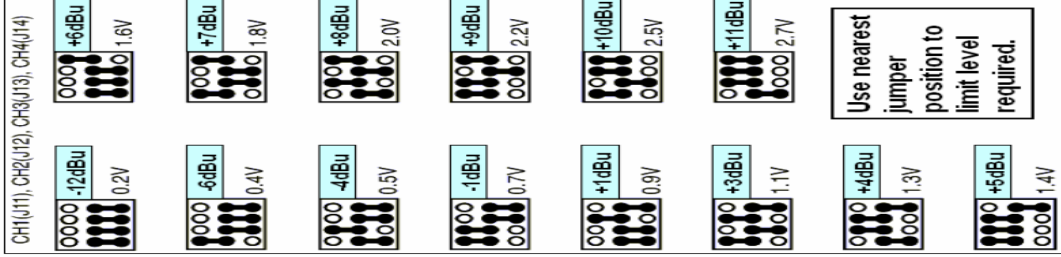
**Jumper allocation: J11 = Ch1 (left sub), J12 = Ch2 (left main)
 J13 = Ch3 (right sub), J14 = Ch4 (right main)**

For your convenience, Martin Audio power amplifiers are supplied set to 32dB gain. See the 32dB line on the following table for suitable limiter settings.

Click [here](#) for the original spreadsheet that also includes a page for working out your amplifier's gain based on its maximum output and sensitivity figures. This spreadsheet also includes a handy table for converting rms voltages to dBu or dBV.

		Loudspeaker	AQ5 (4Ω)	AQ5 (16Ω)	AQ6 (8Ω)	AQ6 (16Ω)	AQ8	AQ10	AQ12	AQ15	AQ112	AQ210	AQ212	AQ215	70V	100V	
Nearest recommended power amplifier >>>>	*Note: MA2.8S recommended for AQ5 when set for 16 ohm operation. (up to 4 x 16 ohm AQ5s may be used in parallel)	MA or E Series Amplifiers	MA200Q MA900	MA2.8S	MA1400	MA2.8s	MA1400 MA1.6S	MA2.8S	MA2.8S	MA4.2S	MA4.2S	MA4.2S	MA4.2S	MA4.2S	LINE TX	LINE TX	
		Rated Power	75W 300W	75W 300W	100W 400W	100W 400W	150W 600W	300W 1200W	300W 1200W	400W 1600W	400W 1600W	600W 2400W	800W 3200W	1000W 4000W			
All recommended power amplifiers set for 32dB gain		Nominal Z (ohms)	4ohms	16ohms	8ohms	16ohms	8ohms	8ohms	8ohms	8ohms	8ohms	4ohms	4ohms	4ohms			
		Rated continuous voltage	17.3Vrms	34.6Vrms	28.3Vrms	40Vrms	34.6Vrms	49Vrms	49Vrms	56.6Vrms	56.6Vrms	49Vrms	56.6Vrms	56.6Vrms	70.0Vrms	100.0Vrms	
Limiter Threshold Controller output limiter threshold voltage vs rated amplifier gain		Amplifier gain in dB															
		(if amplifier gain not known see gain vs power and sensitivity sheet)															
		Amplifier gain															
		(if amplifier gain not known see gain vs power and sensitivity sheet)															
		X126	42dB	-9dBu	-11dBu	-8dBu	-9dBu	-8dBu	-7dBu	-6dBu	-5dBu	-6dBu	-5dBu	-4dBu	-4dBu	-3dBu	0dBu
		X112	41dB	-8dBu	-10dBu	-7dBu	-8dBu	-7dBu	-6dBu	-5dBu	-4dBu	-5dBu	-4dBu	-3dBu	-3dBu	-2dBu	+1dBu
		X100	40dB	-7dBu	-9dBu	-6dBu	-7dBu	-6dBu	-5dBu	-4dBu	-3dBu	-4dBu	-3dBu	-2dBu	-2dBu	-1dBu	+2dBu
		X89	39dB	-6dBu	-8dBu	-5dBu	-6dBu	-5dBu	-4dBu	-3dBu	-2dBu	-3dBu	-2dBu	-1dBu	-1dBu	0dBu	+3dBu
		X79	38dB	-5dBu	-7dBu	-4dBu	-5dBu	-4dBu	-3dBu	-2dBu	-1dBu	-2dBu	-1dBu	0dBu	0dBu	+1dBu	+4dBu
		X71	37dB	-4dBu	-6dBu	-3dBu	-4dBu	-3dBu	-2dBu	-1dBu	0dBu	-1dBu	0dBu	+1dBu	+1dBu	+2dBu	+5dBu
		X63	36dB	-3dBu	-5dBu	-2dBu	-3dBu	-2dBu	-1dBu	0dBu	+1dBu	+1dBu	0dBu	+1dBu	+2dBu	+3dBu	+6dBu
		X56	35dB	-2dBu	-4dBu	-1dBu	-2dBu	-1dBu	0dBu	+1dBu	+2dBu	+2dBu	+1dBu	+2dBu	+3dBu	+4dBu	+7dBu
		X50	34dB	-1dBu	-3dBu	0dBu	-1dBu	0dBu	+1dBu	+2dBu	+3dBu	+3dBu	+2dBu	+3dBu	+4dBu	+5dBu	+8dBu
		X45	33dB	0dBu	-2dBu	+1dBu	+1dBu	0dBu	+2dBu	+3dBu	+4dBu	+4dBu	+3dBu	+4dBu	+5dBu	+6dBu	+9dBu
		X40	32dB	+1dBu	+1dBu	+2dBu	+2dBu	+1dBu	+3dBu	+4dBu	+5dBu	+5dBu	+4dBu	+5dBu	+6dBu	+7dBu	+10dBu
		X35	31dB	+2dBu	+2dBu	+3dBu	+3dBu	+2dBu	+4dBu	+5dBu	+6dBu	+6dBu	+5dBu	+6dBu	+7dBu	+8dBu	+11dBu
X32	30dB	+3dBu	+3dBu	+4dBu	+4dBu	+3dBu	+5dBu	+6dBu	+7dBu	+7dBu	+6dBu	+7dBu	+8dBu	+9dBu	+12dBu		
X28	29dB	+4dBu	+4dBu	+5dBu	+5dBu	+4dBu	+6dBu	+7dBu	+8dBu	+8dBu	+7dBu	+8dBu	+9dBu	+10dBu	+13dBu		
X25	28dB	+5dBu	+5dBu	+6dBu	+6dBu	+5dBu	+7dBu	+8dBu	+9dBu	+9dBu	+8dBu	+9dBu	+10dBu	+11dBu	+14dBu		
X22	27dB	+6dBu	+6dBu	+7dBu	+7dBu	+6dBu	+8dBu	+9dBu	+10dBu	+10dBu	+9dBu	+10dBu	+11dBu	+12dBu	+15dBu		
X20	26dB	+7dBu	+7dBu	+8dBu	+8dBu	+7dBu	+9dBu	+10dBu	+11dBu	+11dBu	+10dBu	+11dBu	+12dBu	+13dBu	+16dBu		
X18	25dB	+8dBu	+8dBu	+9dBu	+9dBu	+8dBu	+10dBu	+11dBu	+12dBu	+12dBu	+11dBu	+12dBu	+13dBu	+14dBu	+17dBu		
X16	24dB	+9dBu	+9dBu	+10dBu	+10dBu	+9dBu	+11dBu	+12dBu	+13dBu	+13dBu	+12dBu	+13dBu	+14dBu	+15dBu	+18dBu		

Limiter links vs output threshold voltage



- 3) Replace the top pcb making sure that it is properly latched onto all four pillars
- 4) Replace the AQX lid making sure all four screws are in place and properly tightened.

Notes:

The above table includes limiter settings for systems driven via 70V & 100V line transformers.

See [Section 15](#) for typical loudspeaker wiring schemes.

13. DX1 Speaker Management System

For convenience, the general use DX1 Speaker Management System is supplied ready-loaded with presets for all common AQ Series configurations starting at preset position 75.

These presets will also be included as binary files on the new Martin Audio User Guides CD (May 2005 or later). They may be transferred to Martin Audio DX1 or XTA DP226 controllers via a 9-pin serial cable from a pc running Microsoft Windows™ - simple click through the following links:



then...



then...



and follow the instructions.

Note: If you are reading this manual from the Martin Audio User Guides Supplement CD (April 2005):

- ✚ Click [here](#) to locate the AQpresets.zip folder on the CD
- ✚ Extract the contents of the AQpresets.zip folder to a suitable place on your hard drive

Use the MarLoad.exe software to “Load a Preset File” and select MARR0005. MARR0005 contains all non-W8L Series presets – including the following for AQ Series:

Preset	Name	Output allocation
75	AQ5	(L = o/p1, R = o/p3)
76	AQ5 + AQ Sub	(AQ112/AQ210/AQ212 on o/ps 1&3, AQ5s on o/ps 2&4)
77	AQ5 + AQ215	(AQ215s on o/ps 1&3, AQ5s on o/ps 2&4)
78	AQ6/8/10	(L = o/p1, R = o/p3)
79	AQ6/8/10 + AQ Sub	(AQ112/AQ210/AQ212 on o/ps 1&3, AQ6/8/10s on o/ps 2&4)
80	AQ6/8/10 + AQ215	(AQ215s on o/ps 1&3, AQ6/8/10s on o/ps 2&4)
81	AQ12	(L = o/p1, R = o/p3)
82	AQ12 + AQ Sub	(AQ112/AQ210/AQ212 on o/ps 1&3, AQ12s on o/ps 2&4)
83	AQ12 + AQ215	(AQ215s on o/ps 1&3, AQ12s on o/ps 2&4)
84	AQ15	(L = o/p1, R = o/p3)
85	AQ15 + AQ Sub	(AQ112/AQ210/AQ212 on o/ps 1&3, AQ15s on o/ps 2&4)
86	AQ15 + AQ215	(AQ215s on o/ps 1&3, AQ15s on o/ps 2&4)

Please note: DX1 output limiters will need to be fine adjusted for safe operation with your particular choice of power amplifier. See the AQX limiter chart towards the end of Section 12 and transpose the appropriate setting to your DX1 to suit your amplifier gain. Use the automatic attack/release timings.

14. Using alternative controllers

Alternative high quality digital controller may be used by entering these spreadsheet settings:

AQ digital settings													
Dec-04	Driver	Delay	Gain	Phase	X-Over	LR=Linkwitz	Riley		Eg	BSS	XTA		
					HPF	Slope	LPF	Slope	Freq.	(Width/Oct)	(Q)	Gain	
AQ5	2x5"ICT	0ms	0dB	In	40Hz	24dB/Oct LR	22kHz	24dB/Oct LR	101Hz	1.65	0.84	+6dB	
AQ5 with sub	2x5"ICT	0ms	0dB	In	85Hz	24dB/Oct LR	22kHz	24dB/Oct LR	10kHz	2.55	0.5	+3dB	
									101Hz	1.65	0.84	+6dB	
									10kHz	2.55	0.5	+3dB	
AQ6	6"+1"	0ms	0dB	In	40Hz	24dB/Oct LR	22kHz	24dB/Oct LR	66Hz	1.4	1	+6dB	
AQ6 with sub		0ms	0dB	In	85Hz	24dB/Oct LR	22kHz	24dB/Oct LR	66Hz	1.4	1	+6dB	
AQ8	8"+1"	0ms	0dB	In	40Hz	24dB/Oct LR	22kHz	24dB/Oct LR	66Hz	1.4	1	+6dB	
AQ8 with sub		0ms	0dB	In	85Hz	24dB/Oct LR	22kHz	24dB/Oct LR	66Hz	1.4	1	+6dB	
AQ10	10"+1"	0ms	0dB	In	40Hz	24dB/Oct LR	22kHz	24dB/Oct LR	66Hz	1.4	1	+6dB	
AQ10 with sub		0ms	0dB	In	85Hz	24dB/Oct LR	22kHz	24dB/Oct LR	66Hz	1.4	1	+6dB	
AQ12	12"+1"	0ms	0dB	In	20Hz	24dB/Oct LR	22kHz	24dB/Oct LR	66Hz	1.4	1	+6dB	
AQ12 with sub	12"+1"	0ms	0dB	In	85Hz	24dB/Oct LR	22kHz	24dB/Oct LR	667Hz	0.5	3	-3dB	
									66Hz	1.4	1	+6dB	
									667Hz	0.5	3	-3dB	
AQ15	15"+1.4"	0ms	0dB	In	20Hz	24dB/Oct LR	22kHz	24dB/Oct LR	66Hz	1.4	1	+6dB	
AQ15 with sub		0ms	0dB	In	85Hz	24dB/Oct LR	22kHz	24dB/Oct LR	66Hz	1.4	1	+6dB	
AQ112 with AQ5	1x12"	0ms	0dB	In	20Hz	24dB/Oct LR	140Hz	24dB/Oct LR	54.6Hz	0.85	1.7	+6dB	
AQ112 with AQ6,8,10,12		0ms	0dB	In	20Hz	24dB/Oct LR	100Hz	24dB/Oct LR	54.6Hz	0.85	1.7	+6dB	
AQ210 with AQ5	2x10"	0ms	0dB	In	20Hz	24dB/Oct LR	140Hz	24dB/Oct LR	54.6Hz	0.85	1.7	+6dB	
AQ210 with AQ6,8,10,12						24dB/Oct LR	100Hz	24dB/Oct LR	54.6Hz	0.85	1.7	+6dB	
AQ212 with AQ5	2x12"	0ms	0dB	In	20Hz	24dB/Oct LR	140Hz	24dB/Oct LR	54.6Hz	0.85	1.7	+6dB	
AQ212 with AQ6,8,10,12,15						24dB/Oct LR	100Hz	24dB/Oct LR	54.6Hz	0.85	1.7	+6dB	
AQ215 with AQ5	2x15"	0ms	0dB	In	20Hz	24dB/Oct LR	140Hz	24dB/Oct LR	49.6Hz	1.4	1	+6dB	
AQ215 with AQ6,8,10,12,15		0ms	0dB	In	20Hz	24dB/Oct LR	100Hz	24dB/Oct LR	49.6Hz	1.4	1	+6dB	

For mono sub use channel 5 of DX1 or move jumper J17 to position B in AQX controller

Binary preset files and a full .xbl library file will be found on the latest User Guides CD for XTA DP226 Loudspeaker Management Systems. Please see the Martin Audio User Guides CD (May 2005 or later) for further details.

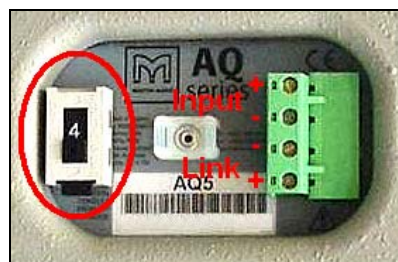
Please note: Output limiters will need to be fine adjusted for safe operation with your particular choice of power amplifier. See the AQX limiter chart towards the end of Section 12 and transpose the appropriate setting to your DX1 to suit your amplifier gain. Use the automatic attack/release timings.

15. AQ Series system wiring

A high current, low profile, 2-part **Input** and **Link** connector will also be found on the rear panel (see AQ5 rear panel illustration below). The input and link positions are parallel-connected inside the cabinet for easy parallel speaker wiring. Convention dictates that the incoming signal cable is connected to the **Input + & -** and that the **Link + & -** is used as the output to the next loudspeaker in the system. **The loudspeaker pinout is printed near the rear connector. Remove the plug to see it!**

AQ5

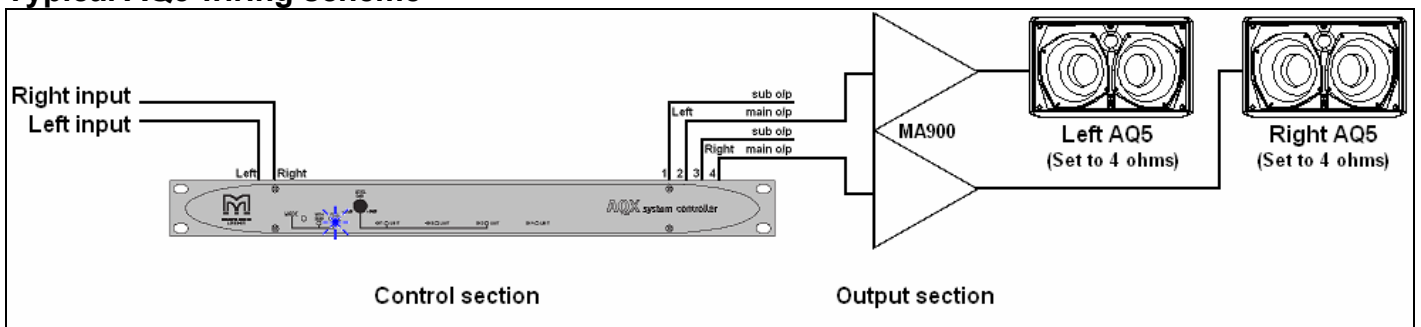
AQ5s are dual-driver systems for wide coverage. The two 8 ohm drivers are identical and may be driven in series (16 ohm) or parallel (4 ohm).



AQ5 rear panel
(4 ohm operation selected)

There is an impedance selector switch (**circled**) on the rear panel to enable 4 or 16 ohm operation. The above illustration shows the switch in the 4 ohm position.

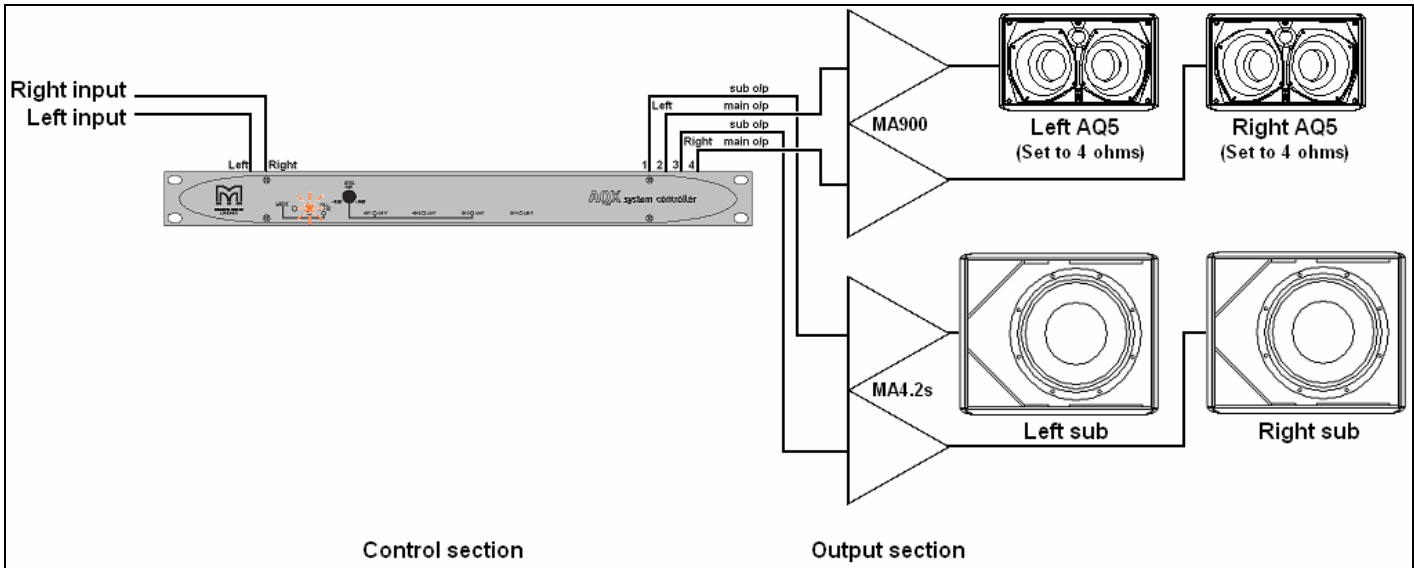
Typical AQ5 wiring scheme



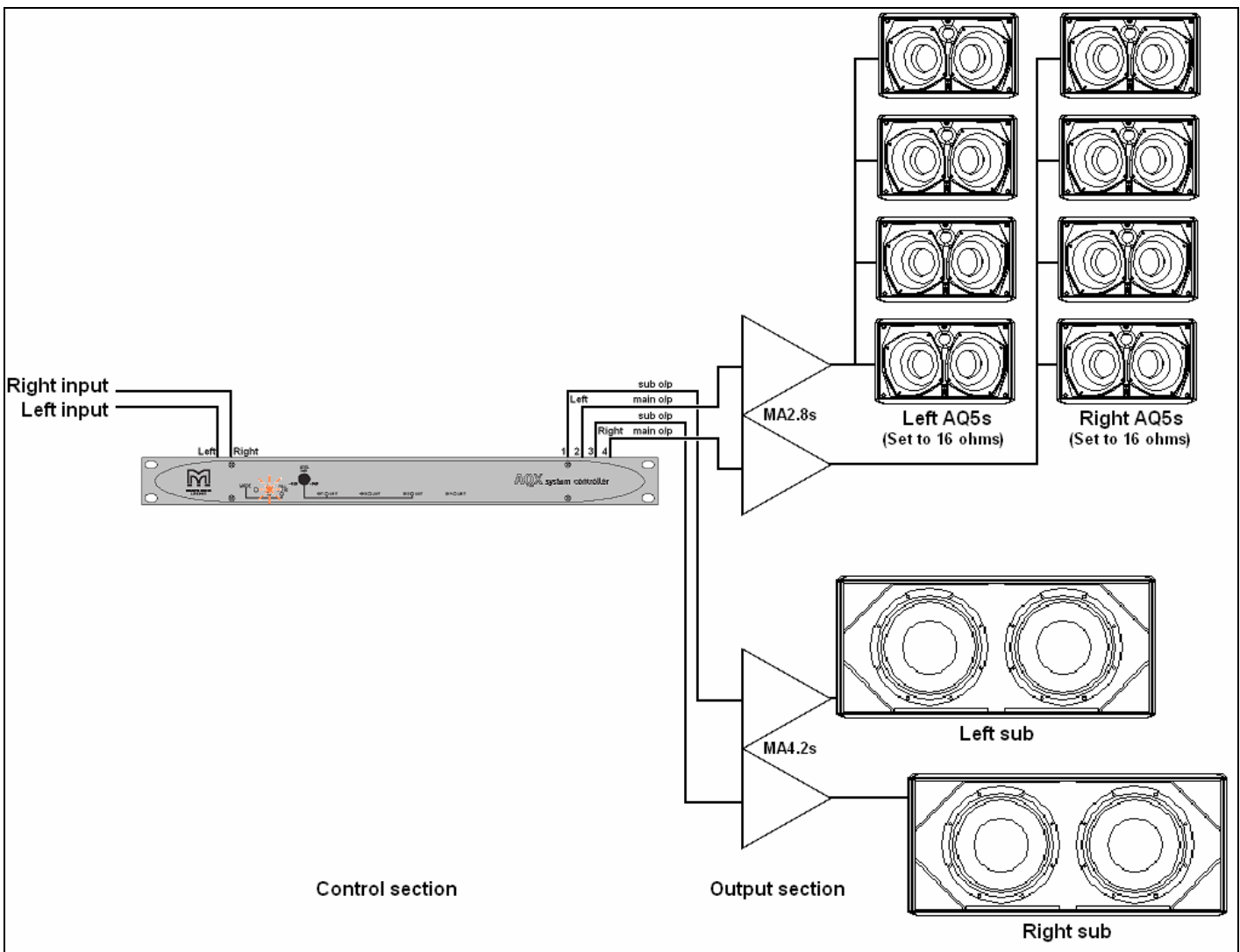
Simple full range AQ5 system using AQX controller and MA900 power amplifier

Note:

Always make sure that the AQX internal jumpers are set for the proposed system and that the appropriate mode (**Full range – blue indicator**, **With Sub – orange indicator**) is selected on the AQX front panel.



AQ5/AQ112 system using AQX controller plus MA900 & MA4.2s power amplifiers



Multiple AQ5/AQ212 system using AQX controller plus MA2.8s & MA4.2s power amplifiers

Note: MA2.8s amplifier is used to provide adequate amplifier voltage to the AQ5's series-connected drivers in 16 ohm mode.

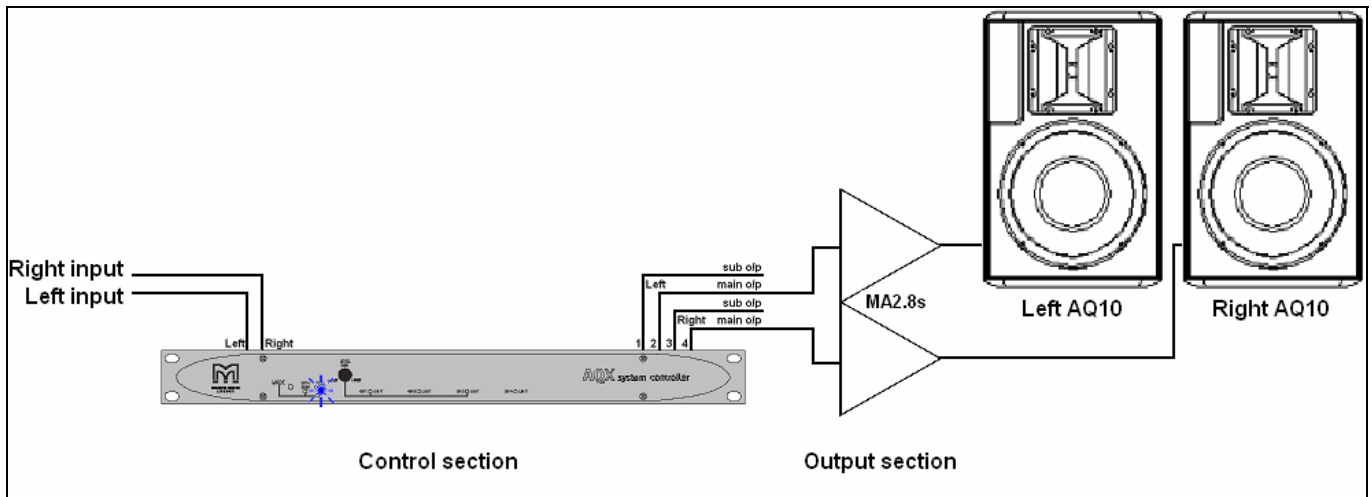
AQ Series powering recommendations (See later for line transformer versions)

AQ Series Loudspeaker	Quantity	Recommended amp	Nominal impedance	Minimum impedance
AQ5 (set for 4 ohms)	1	MA200Q or MA900	4 ohms	3.2 ohms
	2 in parallel	MA200Q or MA900	2 ohms	1.6 ohms
AQ5 (set for 16 ohms)	1	MA2.8s	16 ohms	12.8 ohms
	2 in parallel	MA2.8s	8 ohms	6.4 ohms
	3 in parallel	MA2.8s	5.3 ohms	4.2 ohms
	4 in parallel	MA2.8s	4 ohms	3.2 ohms
	5 in parallel	MA2.8s	3.2 ohms	2.6 ohms
	6 in parallel	MA2.8s	2.67 ohms	2.1 ohms
	7 in parallel	MA2.8s	2.29 ohms	1.8 ohms
	8 in parallel	MA2.8s	2 ohms	1.6 ohms
AQ6 (standard)	1	E1300 or MA1400	8 ohms	6.4 ohms
	2 in parallel	E1300 or MA1400	4 ohms	3.2 ohms
	3 in parallel	E1300 or MA1400	2.67 ohms	2.1 ohms
	4 in parallel	E1300 or MA1400	2 ohms	1.6 ohms
AQ6 (16ohm version)	1	MA2.8s	16 ohms	12.8 ohms
	2 in parallel	MA2.8s	8 ohms	6.4 ohms
	3 in parallel	MA2.8s	5.3 ohms	4.2 ohms
	4 in parallel	MA2.8s	4 ohms	3.2 ohms
	5 in parallel	MA2.8s	3.2 ohms	2.6 ohms
	6 in parallel	MA2.8s	2.67 ohms	2.1 ohms
	7 in parallel	MA2.8s	2.29 ohms	1.8 ohms
	8 in parallel	MA2.8s	2 ohms	1.6 ohms
AQ8	1	MA1400 or MA1.6s	8 ohms	6.4 ohms
	2 in parallel	MA1400 or MA1.6s	4 ohms	3.2 ohms
	3 in parallel	MA1400 or MA1.6s	2.67 ohms	2.1 ohms
	4 in parallel	MA1400 or MA1.6s	2 ohms	1.6 ohms
AQ10, AQ12	1	MA2.8s	8 ohms	6.4 ohms
	2 in parallel	MA2.8s	4 ohms	3.2 ohms
	3 in parallel	MA2.8s	2.67 ohms	2.1 ohms
	4 in parallel	MA2.8s	2 ohms	1.6 ohms
AQ15	1	MA4.2S	8 ohms	6.4 ohms
	2 in parallel	MA4.2S	4 ohms	3.2 ohms
	3 in parallel	MA4.2S	2.67 ohms	2.1 ohms
	4 in parallel	MA4.2S	2 ohms	1.6 ohms
AQ210 subwoofer	1	MA2.8s	4 ohms	3.2 ohms
	2	MA2.8s	2 ohms	1.6 ohms
AQ112 subwoofer	1	MA4.2s	8 ohms	6.4 ohms
	2 in parallel	MA4.2s	4 ohms	3.2 ohms
	3 in parallel	MA4.2s	2.67 ohms	2.1 ohms
	4 in parallel	MA4.2s	2 ohms	1.6 ohms
AQ212, AQ215 subwoofer	1	MA4.2s	4 ohms	3.2 ohms
	2 in parallel	MA4.2s	2 ohms	1.6 ohms

For best performance, configurations shown in **red** should be avoided unless a strict budget dictates otherwise.

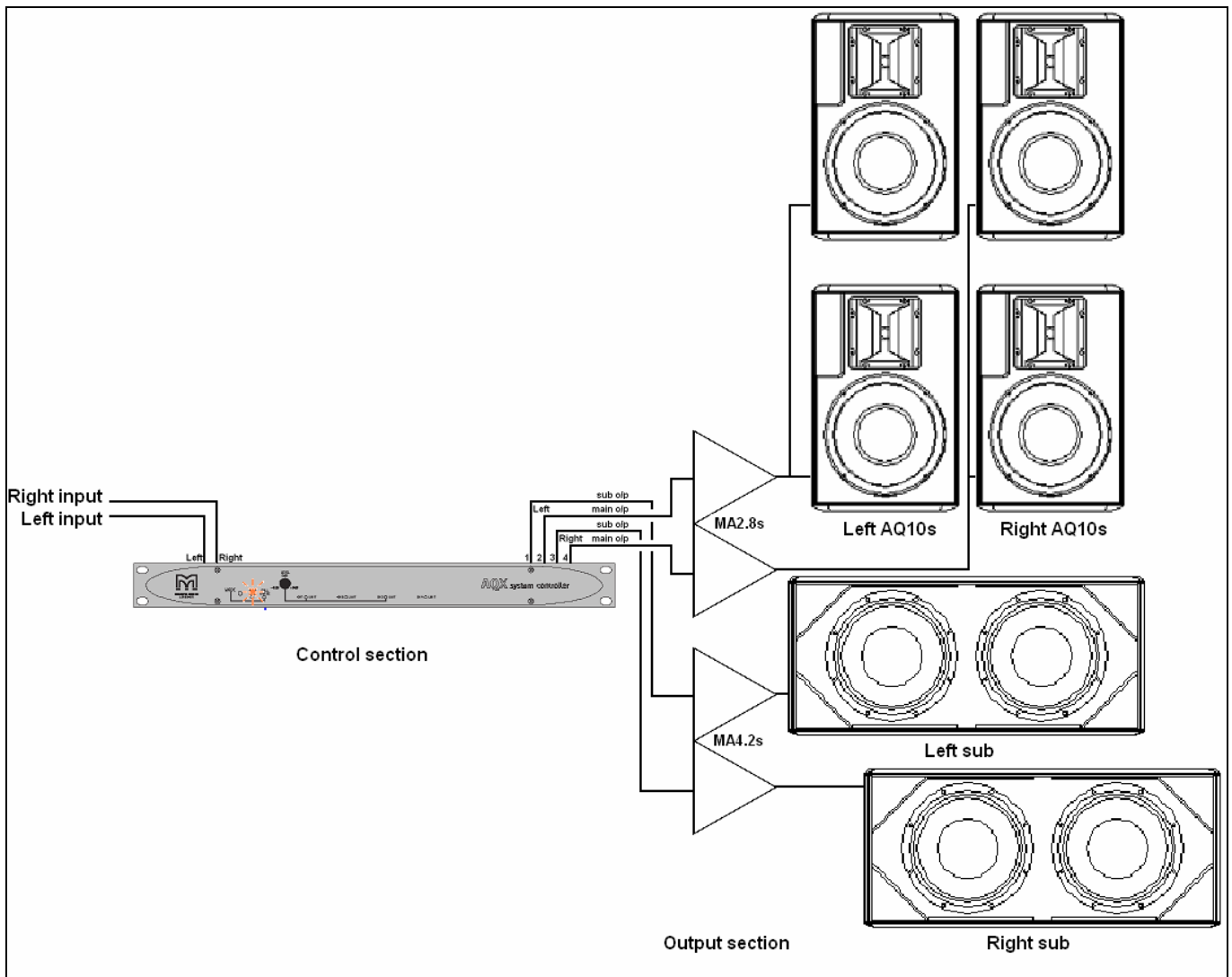
Although Martin Audio MA and E Series power amplifiers work well down to 2 ohms, other power amplifiers often suffer sonic degradation or, worse still, shut down into low impedances. Always check your intended power amplifier's specifications and conduct listening tests before committing to a very low impedance system design.

Typical AQ6, AQ8, AQ10, AQ12 or AQ15 wiring schemes



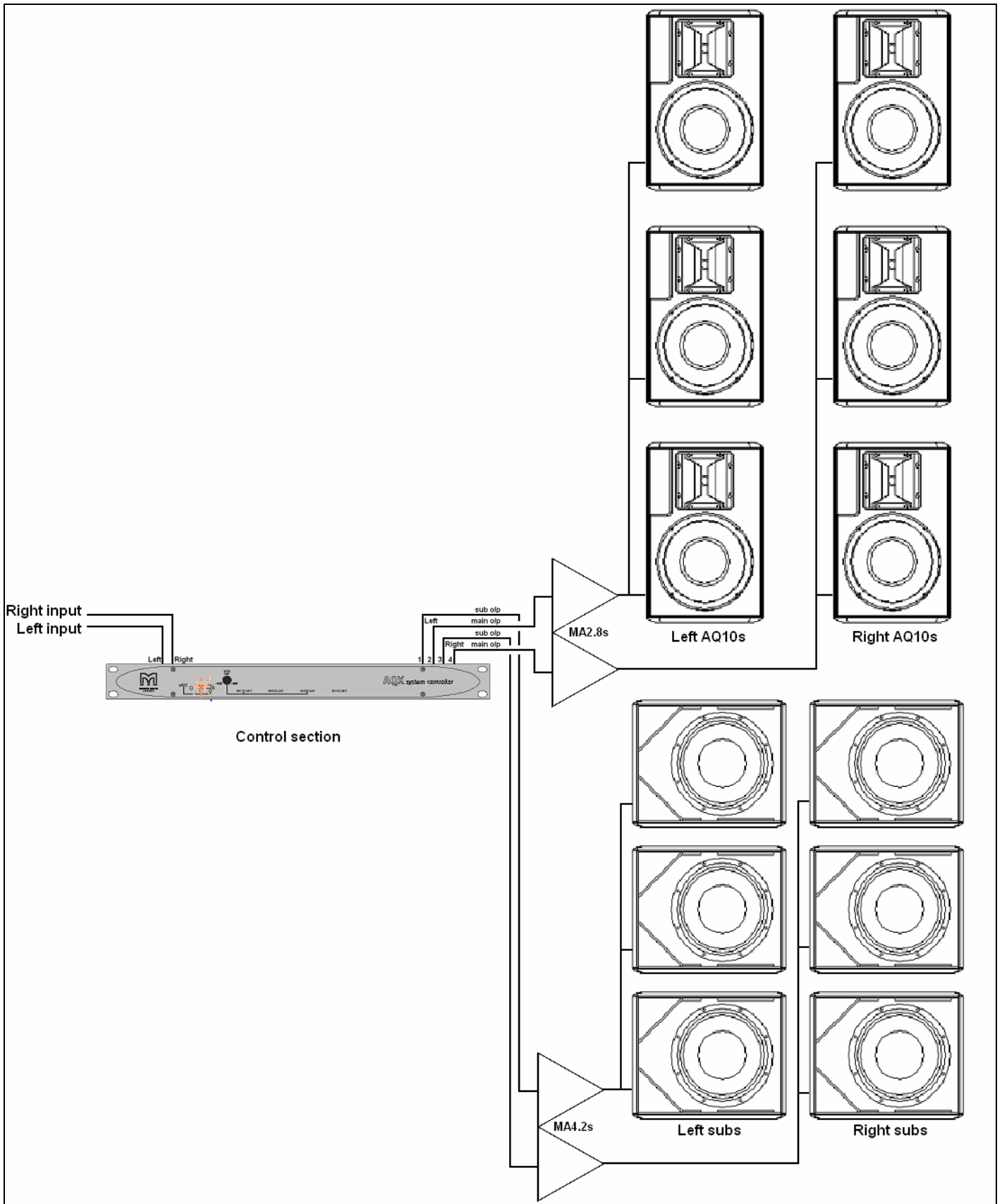
Simple stereo full range system (AQ10/MA2.8s shown)

Identical wiring schemes are used for AQ6 (E1300 or MA1400 amplifier), AQ6 16ohm AQ8 (MA1400 or MA1.6s), AQ10 (MA2.8s), AQ12 (MA2.8s) or AQ15 (MA4.2s).



Typical foreground music system with subs (AQ10/MA2.8s + AQ212/MA4.2s shown)

Identical wiring schemes are used to add any AQ Series subwoofers.



Typical distributed system with subs (AQ10/MA2.8s + AQ112/MA4.2s shown)

Subwoofers may be switched to mono operation by setting AQX jumper J17 – see section 12.

70V or 100V line transformer systems

AQ5TX30, AQ6TX30 and AQ8TX30 loudspeakers are supplied with integral 30W line matching transformers.

AQ10TX150, AQ12TX150, AQ15TX150 loudspeakers are supplied with integral 150W line matching transformers.

TX30 or TX150 loudspeakers are supplied pre-wired, to customer order, for 70V or 100V operation.

Please note:

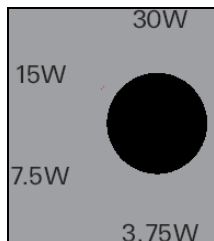
70V loudspeaker systems should not be connected to 100V line amplifiers as this could cause their transformers to saturate resulting in gross distortion and possible line amplifier damage.

The line voltage for your TX30 or TX150 loudspeaker is clearly marked on the loudspeaker connector panel.

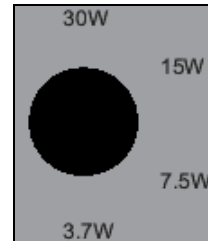
Power taps

Various power taps are available via a rear screwdriver access hole as follows:

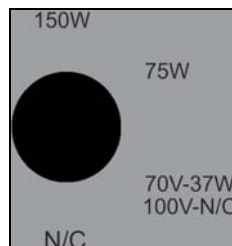
AQ Series loudspeaker	Line voltage	Transformer	Available taps
AQ5TX30, AQ6TX30, AQ8TX30	70V, 100V	30W	3.7W, 7.5W, 15W, 30W
AQ10TX150, AQ12TX150, AQ15TX150	70V	150W	37W, 75W, 150W
AQ10TX150, AQ12TX150, AQ15TX150	100V	150W	75W, 150W



AQ5TX30, AQ6TX30 tap settings



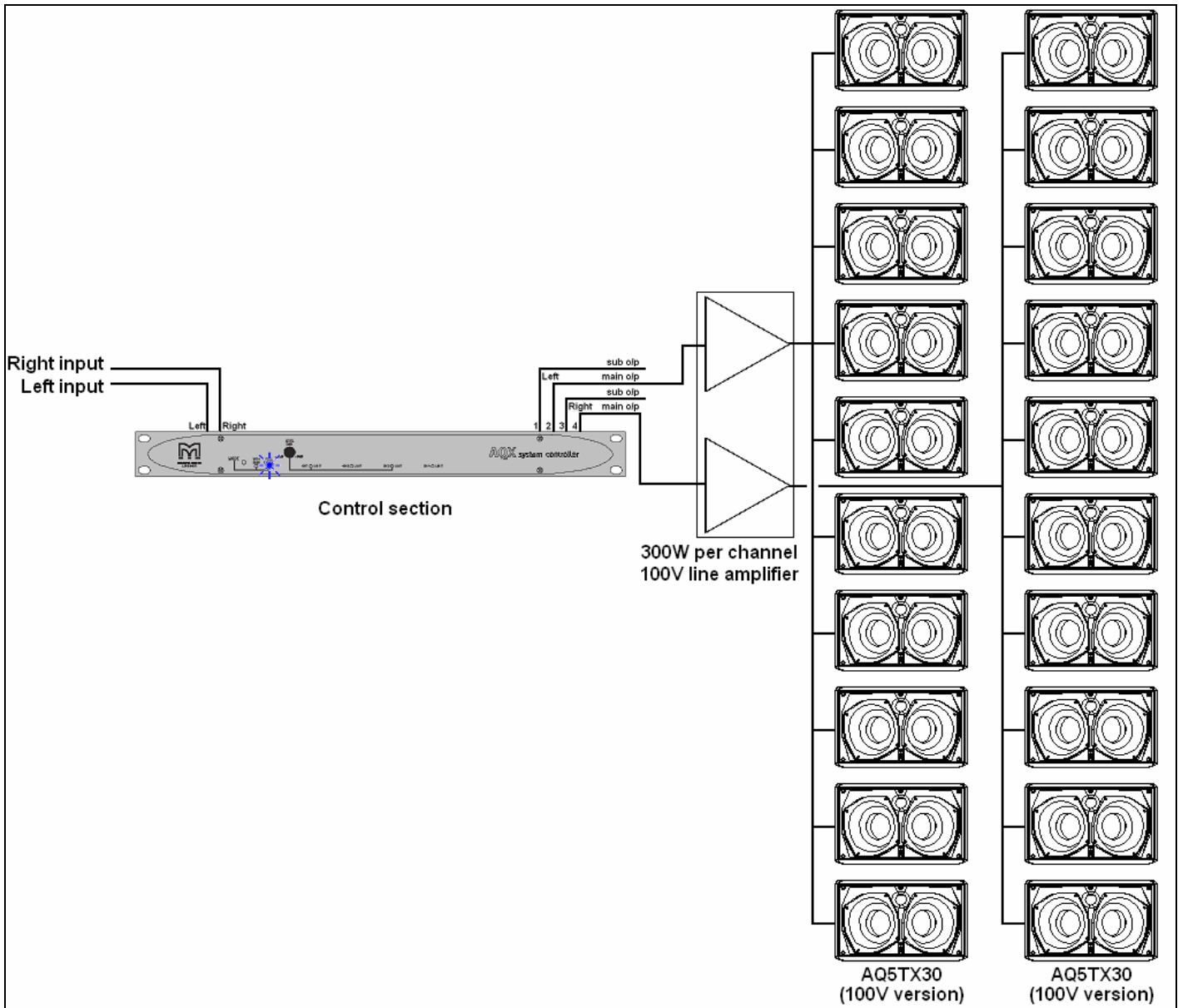
AQ8TX30 tap settings



AQ10TX150, AQ12TX150,
AQ15TX150 tap settings

(1/8 power position not connected for 70V operation.
1/8 and 1/4 power positions not connected for 100V operation)

Typical 100V line system



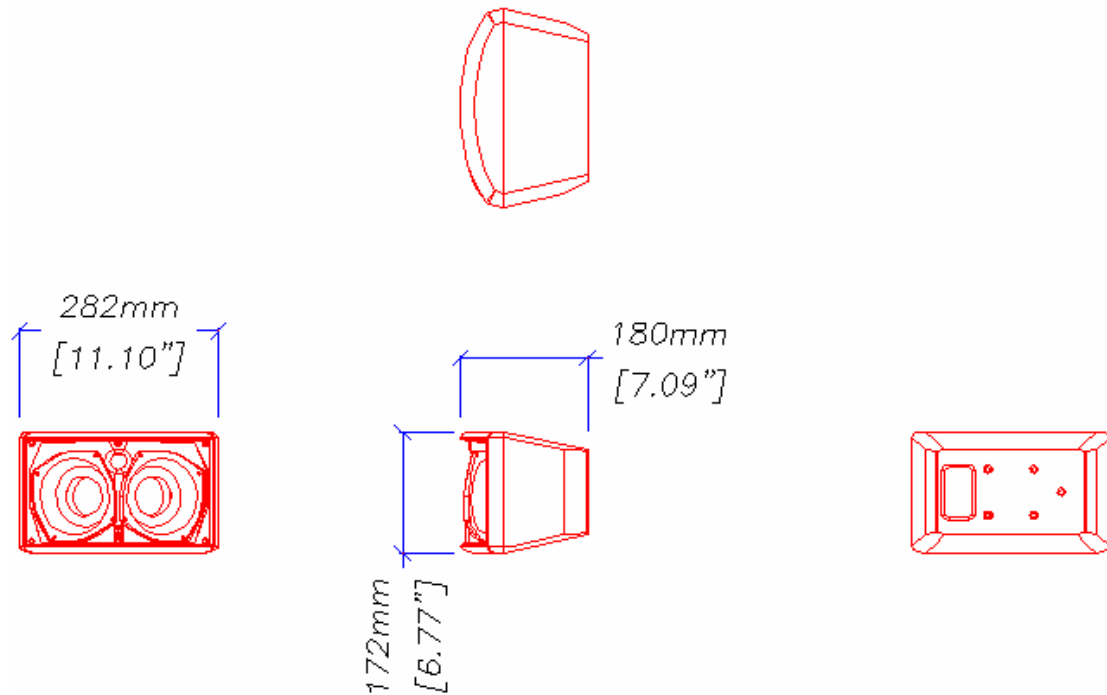
Note that each channel of the line amplifier should be capable of delivering power equal to the sum of all loudspeaker transformers connected to that channel.

In the above example, there are ten 100V, 30W AQ5TX30s connected to each channel so the amplifier must be capable of delivering $10 \times 30W$ per channel = 300W per channel in 100V line operation mode.

If the loudspeakers there were ten AQ10TX150s connected to each channel, the amplifier would need to be capable of delivering $10 \times 150W$ per channel = 1500W per channel in 100V line operation mode.

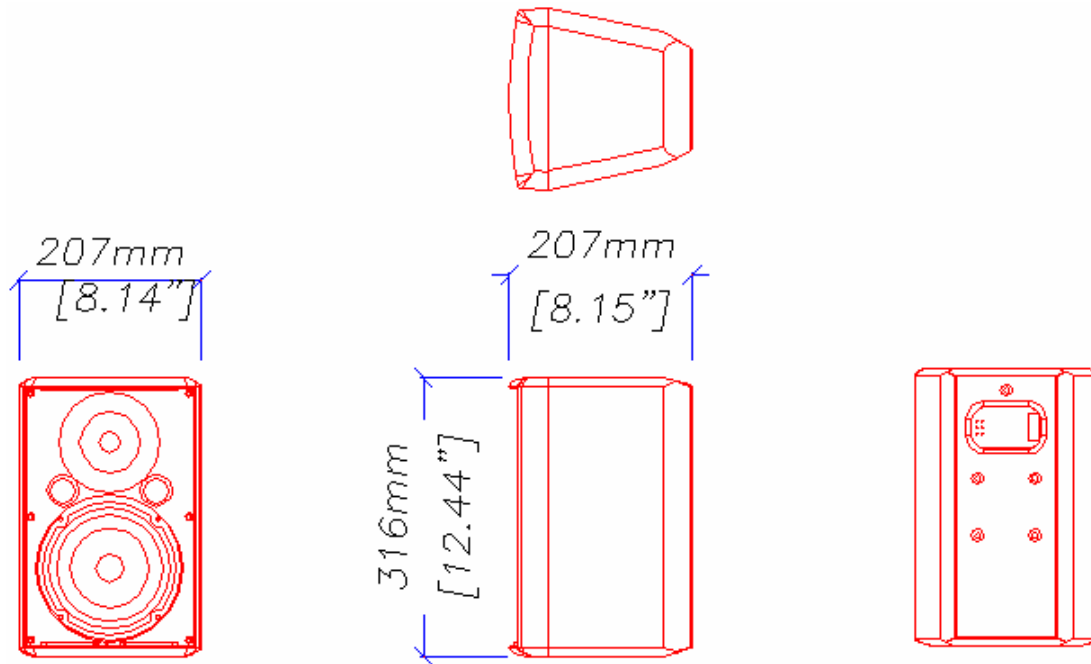
16. Loudspeaker dimensions and specifications

AQ5 Technical Specifications



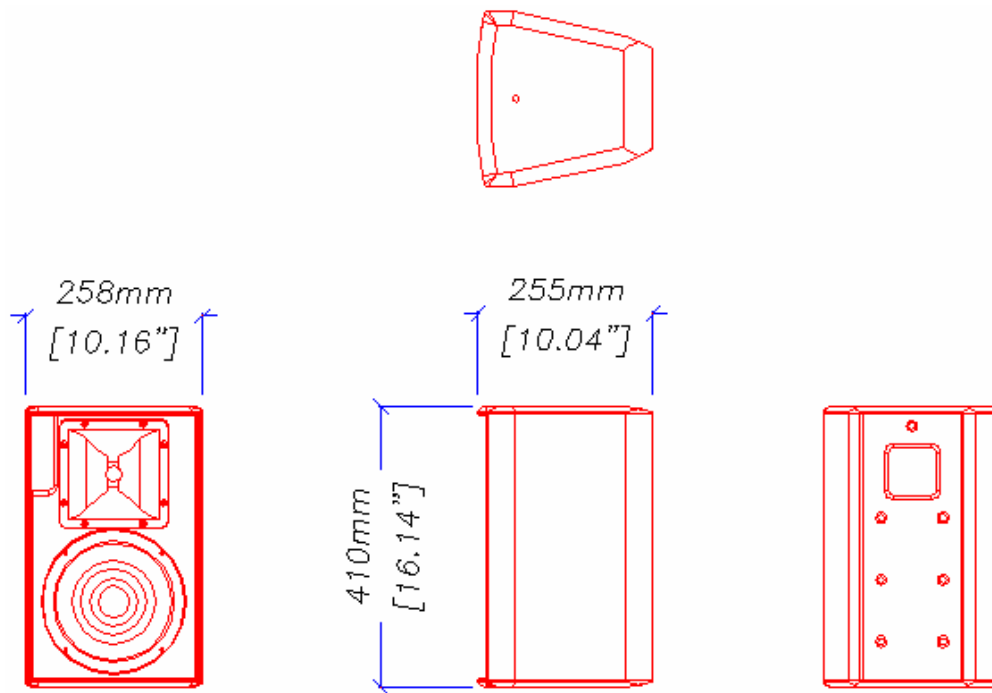
TYPE	Ultra-compact, Dual ICT™, wide dispersion vented trapezoid
FREQUENCY RESPONSE (1)	120Hz-20kHz ± 3dB
DRIVERS	2 x 5.25" (130mm) ICT™ full-range drivers
RATED POWER (2)	75W AES, 300W peak
RECOMMENDED AMPLIFIER	75-150W into 4 ohms
SENSITIVITY (6)	91dB
MAXIMUM SPL (7)	109dB continuous, 115dB peak
NOMINAL IMPEDANCE	Externally switchable 4 or 16 ohms
DISPERSION (-6dB)	120° horizontal, 60° vertical
CROSSOVER	ICT™
ENCLOSURE	5 litre, structural foamed ABS
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 12 amp push-lock
FITTINGS	4 x M6 inserts for bracket 1 x M6 insert for safety point
OPTIONS	30W 100/70V line transformer
DIMENSIONS	(W) 282mm x (H) 172mm x (D) 180mm (W) 11.1ins x (H) 6.8ins x (D) 7.1ins
WEIGHT	3.5kg (8lbs)

AQ6 Technical Specifications



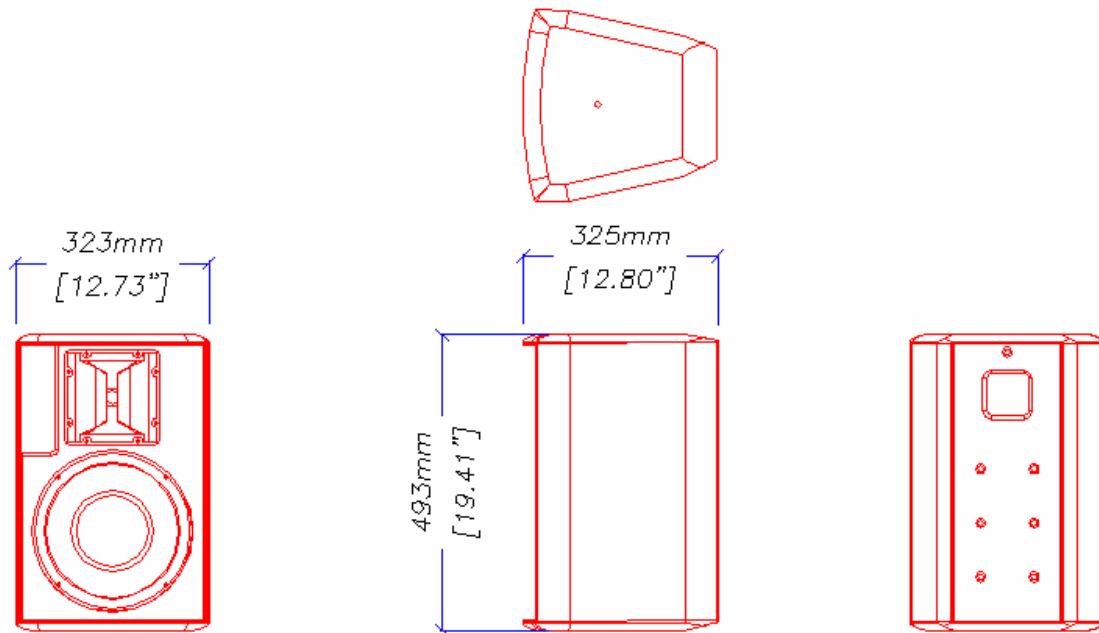
TYPE	Ultra-compact, two-way passive, vented trapezoid
FREQUENCY RESPONSE (1)	80Hz-20kHz \pm 3dB
DRIVERS	6.5" (165mm) bass driver 1" (25mm) horn loaded dome tweeter
RATED POWER (2)	100W AES, 400W peak
RECOMMENDED AMPLIFIER	100-200W into 4 ohms
SENSITIVITY (6)	90dB
MAXIMUM SPL (7)	108dB continuous, 114dB peak
NOMINAL IMPEDANCE	8 ohms (16 ohms optional)
DISPERSION (-6dB)	90° horizontal, 90° vertical
CROSSOVER	3.5kHz passive
ENCLOSURE	9 litre, structural foamed ABS
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 12 amp push-lock
FITTINGS	4 x M6 inserts for bracket 1 x M6 insert for safety point
OPTIONS	30W 100/70V line transformer
DIMENSIONS	(W) 207mm x (H) 316mm x (D) 207mm (W) 8.2ins x (H) 12.5ins x (D) 8.2ins
WEIGHT	6kg (13.2lbs)

AQ8 Technical Specifications



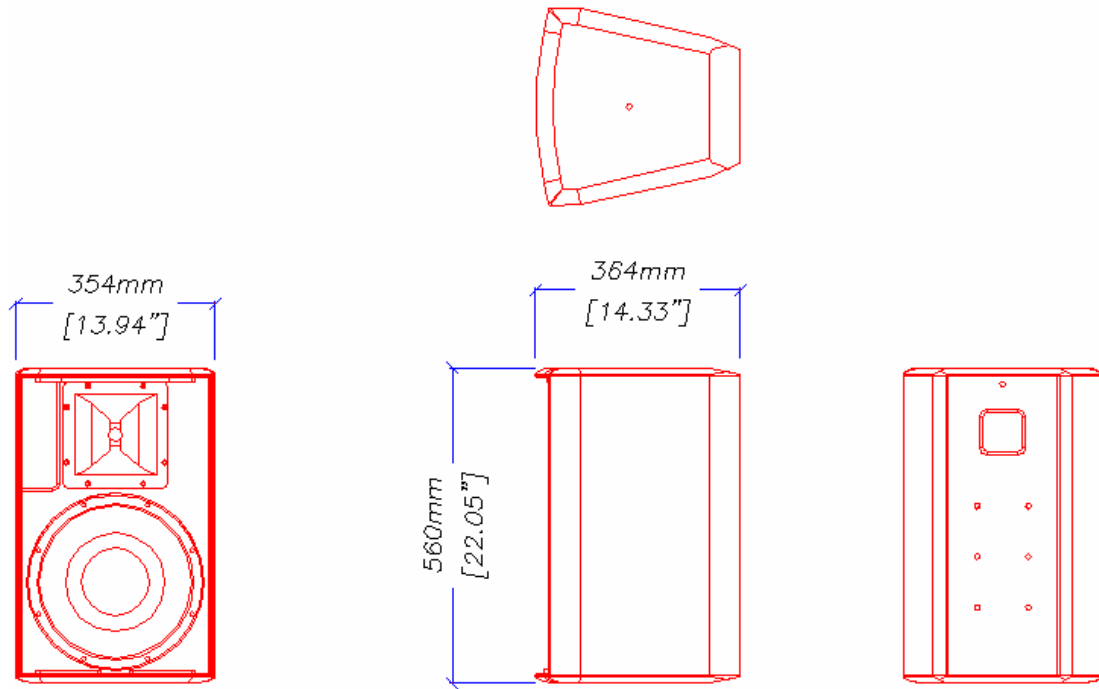
TYPE	Ultra-compact, two-way passive, vented trapezoid
FREQUENCY RESPONSE (1)	75Hz-20kHz \pm 3dB
DRIVERS	8" (200mm) bass driver 1" (25mm) exit HF compression driver
RATED POWER (2)	150W AES, 600W peak
RECOMMENDED AMPLIFIER	150-300W into 4 ohms
SENSITIVITY (6)	93dB
MAXIMUM SPL (7)	113dB continuous, 119dB peak
NOMINAL IMPEDANCE	8 ohms
DISPERSION (-6dB)	90° horizontal, 50° vertical
CROSSOVER	3kHz passive
ENCLOSURE	14 litre, 15/18mm MDF
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 20 amp push-lock
FITTINGS	6 x M8 inserts for bracket 1 x M8 insert for safety point
OPTIONS	30W 100/70V line transformer
DIMENSIONS	(W) 258mm x (H) 410mm x (D) 255mm (W) 10.2ins x (H) 16.2ins x (D) 10ins
WEIGHT	12kg (26lbs)

AQ10 Technical Specifications



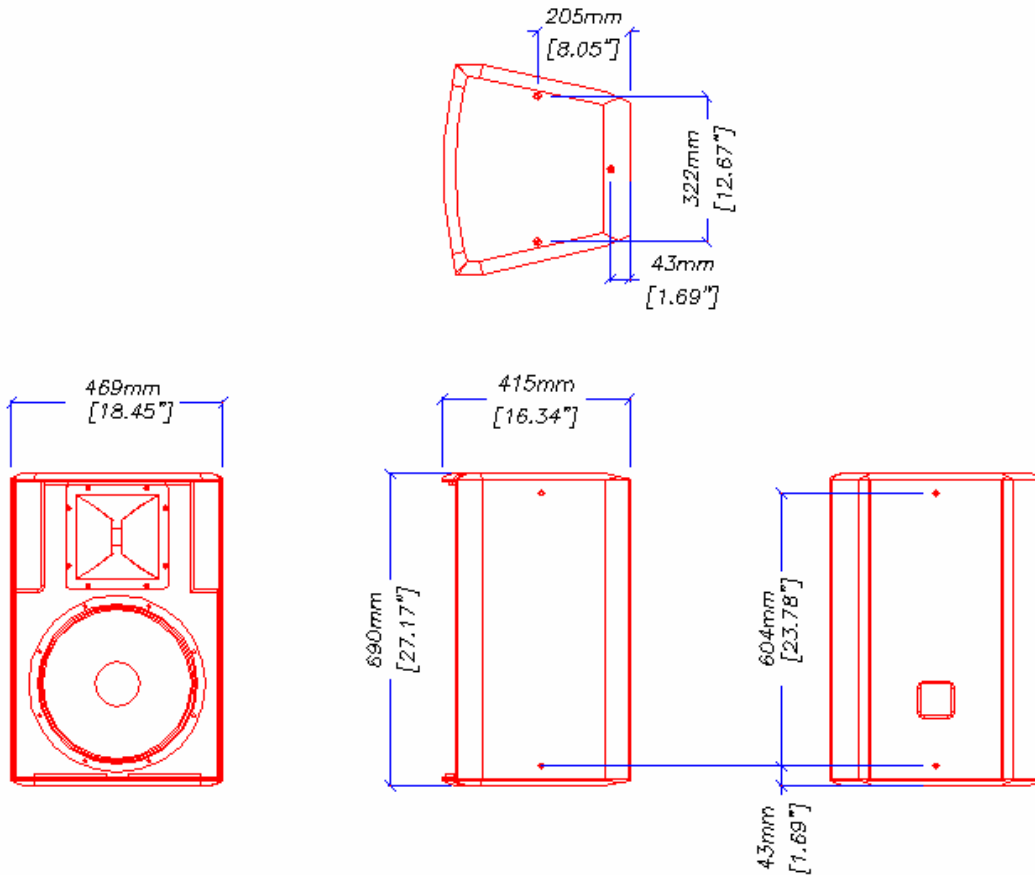
TYPE	Compact, two-way passive, vented trapezoid
FREQUENCY RESPONSE (1)	65Hz-20kHz \pm 3dB
DRIVERS	10" (250mm) bass driver 1" (25mm) exit HF compression driver
RATED POWER (2)	300W AES, 1200W peak
RECOMMENDED AMPLIFIER	300-600W into 4 ohms
SENSITIVITY (6)	96dB
MAXIMUM SPL (7)	119dB continuous, 125dB peak
NOMINAL IMPEDANCE	8 ohms
DISPERSION (-6dB)	90° horizontal, 50° vertical
CROSSOVER	2.7kHz passive
ENCLOSURE	27 litre, braced 18mm MDF
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 20 amp push-lock
FITTINGS	6 x M8 inserts for bracket 1 x M8 insert for safety point
OPTIONS	150W 100/70V line transformer
DIMENSIONS	(W) 323mm x (H) 493mm x (D) 325mm (W) 12.7ins x (H) 19.4ins x (D) 12.8ins
WEIGHT	17kg (37lbs)

AQ12 Technical Specification



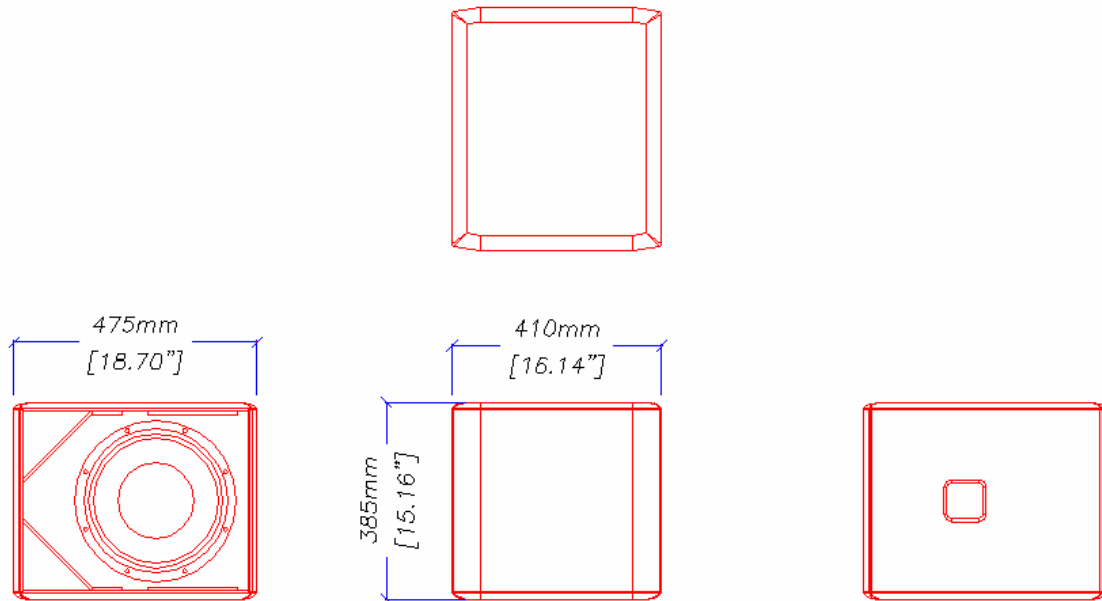
TYPE	Compact, two-way passive, vented trapezoid
FREQUENCY RESPONSE (1)	62Hz-18kHz \pm 3dB
DRIVERS	12" (300mm) bass driver 1" (25mm) exit HF compression driver
RATED POWER (2)	300W AES, 1200W peak
RECOMMENDED AMPLIFIER	300-800W into 4 ohms
SENSITIVITY (6)	97dB
MAXIMUM SPL (7)	120dB continuous, 126dB peak
NOMINAL IMPEDANCE	8 ohms
DISPERSION (-6dB)	80° horizontal, 50° vertical
CROSSOVER	2.2kHz passive
ENCLOSURE	36 litre, braced 18mm MDF
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 20 amp push-lock
FITTINGS	6 x M8 inserts for bracket 1 x M8 insert for safety point
OPTIONS	150W 100/70V line transformer
DIMENSIONS	(W) 354mm x (H) 560mm x (D) 364mm (W) 14ins x (H) 22ins x (D) 14.3ins
WEIGHT	20kg (44lbs)

AQ15 Technical Specifications



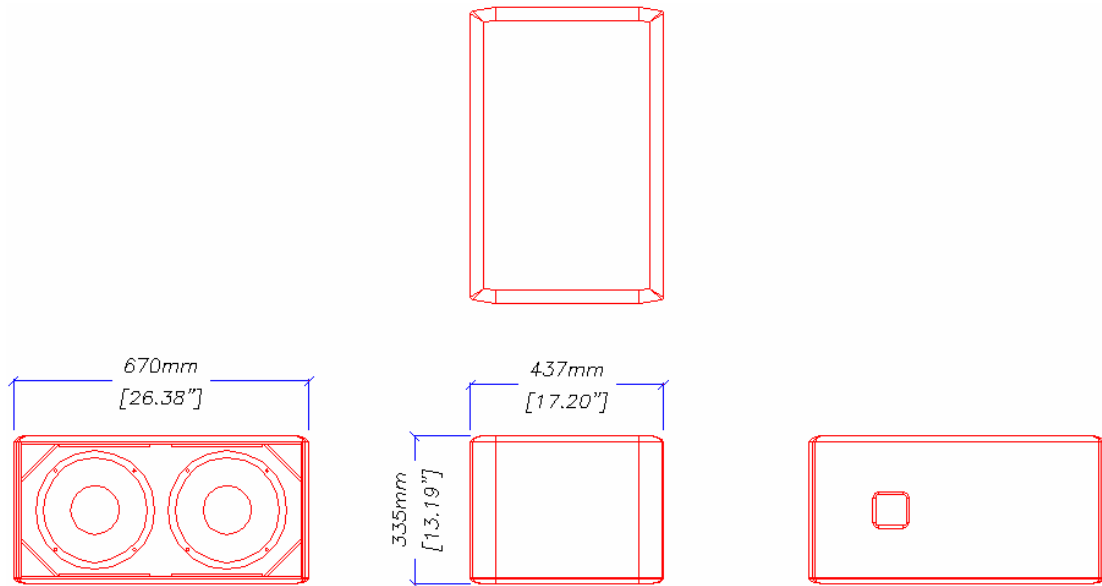
TYPE	Compact, two-way passive, vented trapezoid
FREQUENCY RESPONSE (1)	55Hz-18kHz \pm 3dB
DRIVERS	15" (380mm) bass driver 1.4" (35mm) exit HF compression driver
RATED POWER (2)	400W AES, 1600W peak
RECOMMENDED AMPLIFIER	400-1000W into 4 ohms
SENSITIVITY (6)	99dB
MAXIMUM SPL (7)	123dB continuous, 129dB peak
NOMINAL IMPEDANCE	8 ohms
DISPERSION (-6dB)	80° horizontal, 50° vertical
CROSSOVER	1.6kHz passive
ENCLOSURE	63 litre, braced 18/24mm MDF
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 20 amp push-lock
FITTINGS	12 x M8 inserts for flyware
OPTIONS	150W 100/70V line transformer
DIMENSIONS	(W) 469mm x (H) 690mm x (D) 415mm (W) 18.5ins x (H) 27.2ins x (D) 16.4ins
WEIGHT	33.5kg (74lbs)

AQ112 Technical Specifications



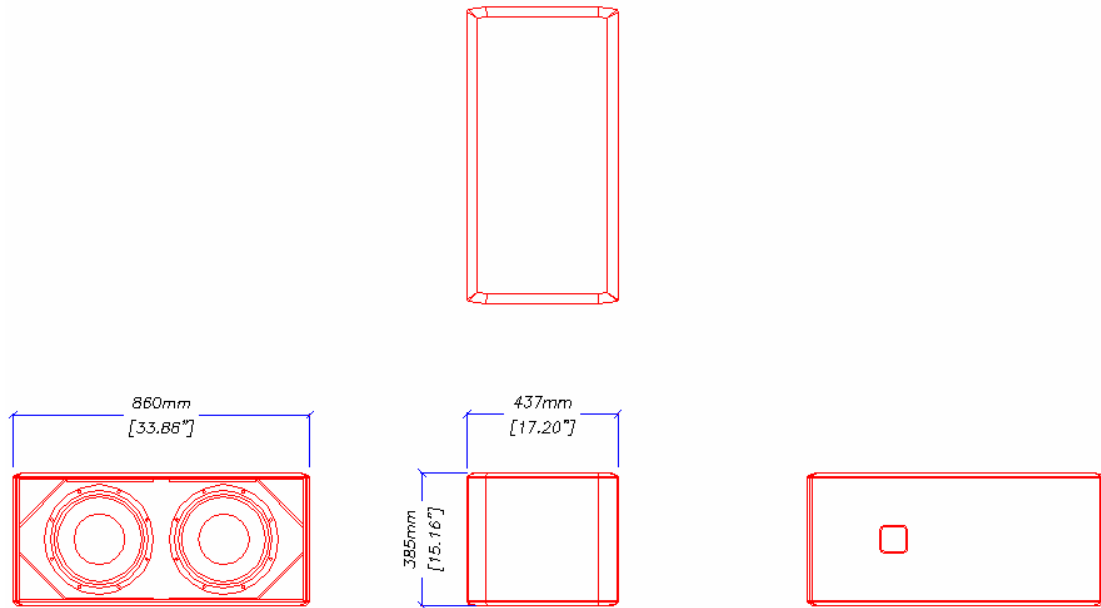
TYPE	Ultra-compact, vented sub-bass
FREQUENCY RESPONSE (1)	48Hz-150Hz \pm 3dB
DRIVERS	12" (300mm)/3" (75mm) voice coil LF driver
RATED POWER (2)	400W AES, 1600W peak
RECOMMENDED AMPLIFIER	400-800W into 4 ohms
SENSITIVITY (6), (3)	96dB (open space), 102dB (half space)
MAXIMUM SPL (calculated @ 1m)	120dB continuous, 126dB peak (open space) 126dB continuous, 132dB peak (half space)
NOMINAL IMPEDANCE	8 ohms
CROSSOVER	120Hz active (via AQX controller)
ENCLOSURE	52 litre, braced 18mm MDF
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 20 amp push-lock
FITTINGS	
OPTIONS	Passive low pass filter
DIMENSIONS	(W) 475mm x (H) 385mm x (D) 410mm (W) 18.7ins x (H) 15.2ins x (D) 16.2ins
WEIGHT	21.5kg (47lbs)

AQ210 Technical Specifications



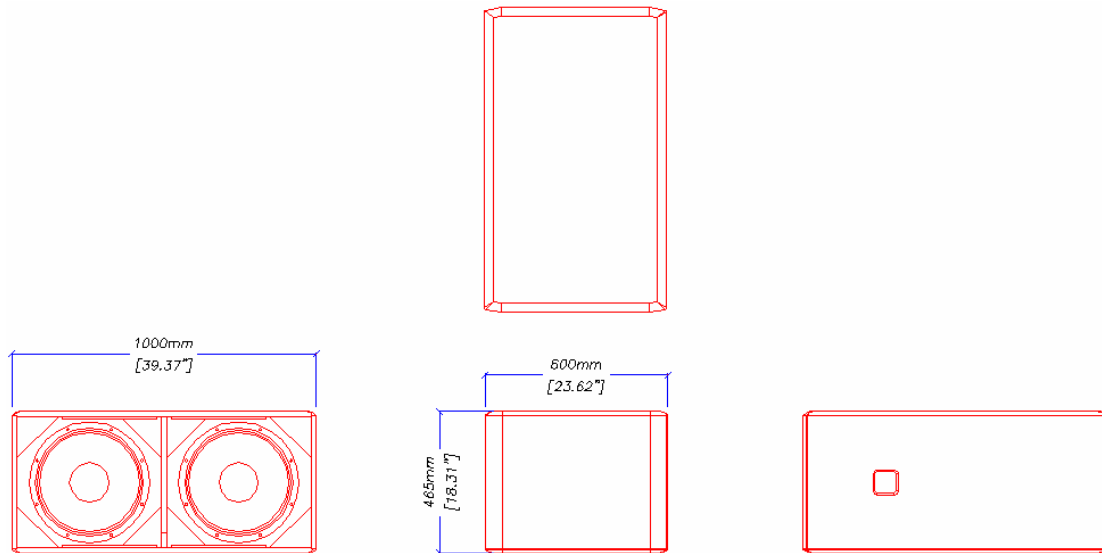
TYPE	Ultra-compact, dual driver, low profile, vented sub-bass
FREQUENCY RESPONSE (1)	50Hz-150Hz \pm 3dB
DRIVERS	2 x 10" (250mm)/3" (75mm) voice coil LF drivers
RATED POWER (2)	600W AES, 2400W peak
RECOMMENDED AMPLIFIER	400-800W into 4 ohms
SENSITIVITY (6), (3)	98dB (open space), 104dB (half space)
MAXIMUM SPL (calculated @ 1m)	122dB continuous, 128dB peak (open space) 128dB continuous, 134dB peak (half space)
NOMINAL IMPEDANCE	4 ohms
CROSSOVER	120Hz active (via AQX controller)
ENCLOSURE	60 litre, braced 18mm MDF
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 20 amp push-lock
FITTINGS	
OPTIONS	Passive low pass filter
DIMENSIONS	(W) 670mm x (H) 335mm x (D) 437mm (W) 26.4ins x (H) 13.2ins x (D) 17.2ins
WEIGHT	30kg (66lbs)

AQ212 Technical Specifications



TYPE	Compact, dual driver, low profile, vented sub-bass
FREQUENCY RESPONSE (1)	48Hz-150Hz \pm 3dB
DRIVERS	2 x 12" (300mm)/3" (75mm) voice coil LF drivers
RATED POWER (2)	800W AES, 3200W peak
RECOMMENDED AMPLIFIER	400-1200W into 4 ohms
SENSITIVITY (6), (3)	99dB (open space), 105dB (half space)
MAXIMUM SPL (calculated @ 1m)	123dB continuous, 129dB peak (open space) 129dB continuous, 135dB peak (half space)
NOMINAL IMPEDANCE	4 ohms
CROSSOVER	120Hz active (via AQX controller)
ENCLOSURE	100 litre, braced 18mm MDF
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 20 amp push-lock
FITTINGS	
OPTIONS	Passive low pass filter
DIMENSIONS	(W) 860mm x (H) 385mm x (D) 437mm (W) 33.9ins x (H) 15.2ins x (D) 17.2ins
WEIGHT	39kg (86lbs)

AQ215 Technical Specifications



TYPE	Compact, dual driver, low profile, vented sub-bass
FREQUENCY RESPONSE (1)	40Hz-120Hz \pm 3dB
DRIVERS	2 x 15" (380mm)/4" (100mm) voice coil LF drivers
RATED POWER (2)	1000W AES, 4000W peak
RECOMMENDED AMPLIFIER	500-1600W into 4 ohms
SENSITIVITY (6), (3)	101dB (open space), 107dB (half space)
MAXIMUM SPL (calculated @ 1m)	126dB continuous, 132dB peak (open space) 132dB continuous, 138dB peak (half space)
NOMINAL IMPEDANCE	4 ohms
CROSSOVER	120Hz active (via AQX controller)
ENCLOSURE	207 litre, braced 18/24mm MDF
FINISH	Textured light grey paint
PROTECTIVE GRILLE	Light grey perforated steel
CONNECTORS	Low profile 20 amp push-lock
FITTINGS	
OPTIONS	Passive low pass filter
DIMENSIONS	(W) 1000mm x (H) 465mm x (D) 600mm (W) 39.4ins x (H) 18.3ins x (D) 23.6ins
WEIGHT	67.5kg (149lbs)

17. Links to AQ Series polar responses

Full range AQ Series loudspeaker polar plots are available in multi-page Microsoft Excel spreadsheets. To view these, click on the appropriate link:

[AQ5 Horizontal](#)

[AQ5 Vertical](#)

[AQ6 Horizontal](#)

[AQ6 Vertical](#)

[AQ8 Horizontal](#)

[AQ8 Vertical](#)

[AQ10 Horizontal](#)

[AQ10 Vertical](#)

[AQ12 Horizontal](#)

[AQ12 Vertical](#)

[AQ15 Horizontal](#)

[AQ15 Vertical](#)