



DESIGN GUIDE

JBL CONTROL CONTRACTOR SERIES DESIGN GUIDE



ABOUT JBL CONTROL CONTRACTOR

JBL Control Contractor is the overall brand that covers many lines of JBL's installation-focused loudspeakers, including wall, ceiling and pendant offerings.

It's a comprehensive range, with the intent of giving the designers and integrators a one-series-fits-all palette of products to cover all install eventualities for speech, background music or higher performance audio. Control Contractor offers a premium experience with loudspeakers to fit with the aesthetics of any room. Whatever your project requires, there is a suitable product in the Control Contractor range.

INTRODUCTION

This guide is intended to offer audio system specifiers an introduction to designing sound systems using the various JBL Control Series across the wide variety of installation projects that they may operate in.

Offering a huge selection of loudspeakers, Control Contractor covers all eventualities for speech, background music or higher performance audio.



ARCHITECTURAL & ENVIRONMENTAL CONSIDERATIONS

One of the largest influences on the available choices you will have as an audio system designer is the physical space in which the system is required to be installed and operated.

WHERE ARE YOUR MOUNTING POSITIONS (WALL/CEILING/FLOOR/HANGING)?

You need to consider how you'll mount your loudspeakers, and can you get cables to them.



WHAT IS THE AMBIENT ENVIRONMENT (INDOOR/OUTDOOR)?



Indoor



Outdoor

HOW HIDDEN DO YOUR DEVICES HAVE TO BE?



In-Ceiling



In-Wall

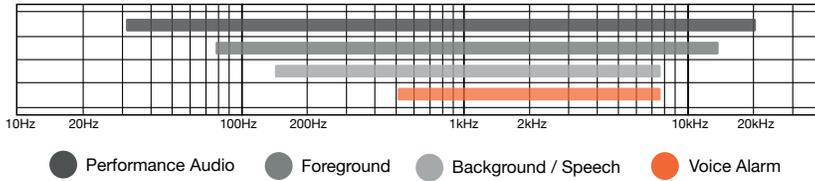
All these different factors will influence what palette of devices are suitable for your project and which Control Series is appropriate.

If operating indoors, it is also worth noting how reverberant the space is/will be. To provide clarity in music and/or speech, you need to minimise audio reflections off the walls and ceilings. In reverberant spaces it is often better to use a larger number of smaller loudspeakers so you are not pushing too much audio energy into the room from a single point. In extremely reverberant spaces JBL offers specialised loudspeakers with beam steering capabilities. Contact your dealer for more details.

Remember when you choose a loudspeaker location, you need to ensure you can get access and cables to it.

SYSTEM PERFORMANCE - FREQUENCY RESPONSE

Having defined the space, you then need to consider the type of system you are being asked to design. Essentially this boils down to four choices: performance audio, foreground music, background music/speech or voice alarm.



Depending on the application, the frequency response you need to achieve will vary

SPEECH ONLY

If a system is only intended for speech, e.g. paging announcements, small devices are probably suitable as they don't need extended low frequencies and are easier to place. Remember that the human voice is in the range of 125 Hz to 4 kHz.



VOICE ALARM

If your system is to be used for voice alarm you will need to use certified devices to maintain compliance with EN 54-24 alarm standards.



BACKGROUND MUSIC

Background music will typically have a wider frequency range than speech, extending a little lower for more rounded music tones and higher to catch the detail of some instruments. Background music is often used in basic retail or hospitality spaces to create an ambience and a sense of privacy.



FOREGROUND MUSIC

Foreground music will have the wider frequency range. How wide will depend on the type of music you will be playing but often the frequency range will be in the order of 50 Hz to 16 kHz. This is the type of system that may require a sub-bass cabinet to reinforce the lower frequencies.





When you want a premium audio experience, the Control 40 range of ceiling loudspeakers and the corresponding Control 60 range of pendant loudspeakers deliver elevated evenness and clarity.

Higher performance audio can be delivered by several larger models of Control Contractor wall-mounted cabinets. In addition the Control 200 range delivers similar performance in a ceiling loudspeaker format and borrows innovative technology advances from JBL Professional's performance audio products.

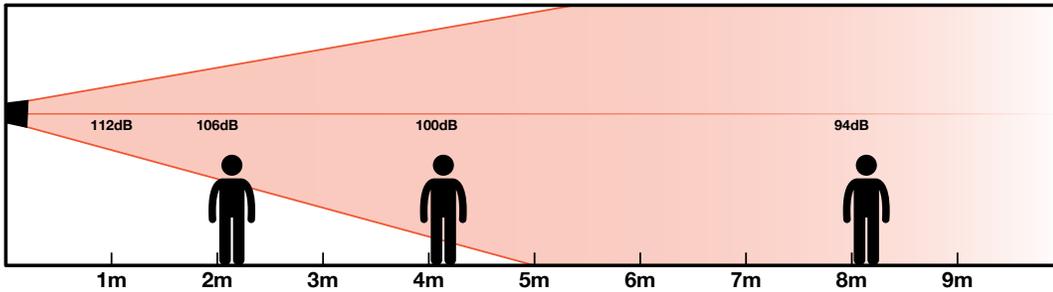


UNDERSTANDING SPEC SHEETS

All Control Contractor models publish a datasheet setting out the performance of the loudspeaker. Three of the parameters are key for establishing if the loudspeakers are suitable for your desired purpose.

- 1. Frequency Response** - determines whether you can use it for speech, background music or foreground music applications and whether sub-bass loudspeakers are required.
- 2. Maximum SPL** - determines the maximum sound pressure level the loudspeaker can deliver. This number is measured at 1m distance. So you need to consider the maximum level you need at the furthest listening distance. Every time you double the distance you lose 6dB.

So imagine you want to achieve 84dB listening level and the maximum listening distance is 8m away. You can calculate the level over distance based on the maximum SPL of the loudspeaker.



In the above example the loudspeaker can deliver 112dB at 1m and thus 94dB at 8m, which is above the 84dB desired level, so the loudspeaker can do the job.

There are just three key parameters that will establish if the loudspeakers are suitable for your desired purpose.

Control[®] 28-1
Professional Series – High-Output Indoor/Outdoor Background/Foreground Speaker

Specifications:

System
Frequency Range (-10 dB)¹ 45 Hz – 20 kHz
Frequency Response (±3 dB) 62 Hz – 16 kHz
Power Rating² 240W Continuous Program (2 hrs)
120W (480W peak), Continuous Pink Noise (2 hrs)
90W (360W peak) Continuous Pink Noise (100 hrs)

Maximum Input Voltage 27.5 V RMS (2 hrs), 55.0 V peak
Maximum SPL³ 112 dB ave. Continuous Pink Noise (118 dB peak)
Sensitivity⁴ 91 dB, 1W/1m (ave. 100 Hz – 10 kHz)
Coverage Angle⁵ 100° x 100°
Directivity Factor (Q) 7.3 (averaged 1kHz – 16kHz)
Directivity Index (DI) 8.3dB (averaged 1kHz – 16kHz)
Nominal Impedance 8 ohms (THRU setting)
Crossover Type 2nd order low-pass, 1st order high-pass, plus conjugate shaping

Environment IP-44 per IEC60529 (IP-55 when installed with the optional MFC-2000G-1 BlowerFilter™ grille and either MFC-200 or MFC-400 panel cover) (except M1000: 010 for humidity, salt spray, temperature & UV) (Passes MIL-STD-883C for salt spray and MIL-STD-883B for acid or alkali spray. Optional MFC-2000G-1 BlowerFilter™ grille for tracking or strong salt and for especially difficult environments.)

Termination Chrome chrome-plated steel, zinc-plated galvanized, nickel-plated metal screws and washers. Accepts up to 8 terminable 4 mm wide open tagg 00, 005, or #10 tagg, plus bare wire tagg to 12 AWG (2.5 mm). (Optional MFC-200 and MFC-400 protective panel covers available to provide sealed enclosure for additional weather protection.)

Agency Rating IEC60529-compliant, Transducer UK, Recognized per BS 1363

Colors Black (R4000) or white (R10, R40, R70)

Dimensions (H x W x D)⁶ 200 x 102 x 273 mm (7.9 x 4.0 x 10.7 in.) (L x B x D) 273 mm (10.7 in.) deep total when mounted on a freestanding wall-mount bracket.

Net Weight 6.8 kg (15.0 lbs)

Shipping Weight 14.2 kg (31.3 lbs) (packaged for 1 standard)

Included Accessories 1 x 100° x 100° wall-mounting system, 6 mm x 150 mm (0.25 in. x 6 in.) screws, 1 x 100° x 100° bracket (S-100)

Optional Accessories MFC-2000G-1 - 100° x 100° bracket (S-100) with backing (S-100)
MFC-2000G-1 - Washdown grille with backing (S-100)
MFC-2000G-1 - Ceiling Mount (Hanging) Bracket (S-100)

¹ In half space (90° x 90°).
² At 1m setting. Continuous Pink Noise rating is EC-weighted pink noise with a 6 dB crest factor. Continuous Program Power is defined as 3 dB above the Continuous Pink Noise rating and is a conservative expression of the system's ability to handle normal speech and music program material.
³ Calculated from sensitivity and power handling, including effects of power compression, at 1kHz setting.
⁴ At 1m setting. Continuous Pink Noise rating is EC-weighted pink noise with a 6 dB crest factor. Continuous Program Power is defined as 3 dB above the Continuous Pink Noise rating and is a conservative expression of the system's ability to handle normal speech and music program material.
⁵ For protection against energy below resonant frequency and to keep transmitter out of distortion.
⁶ In vertical orientation.
JBL continually engages in research related to product improvement. Changes introduced into existing products without notice are an expression of that philosophy.

Specifications:

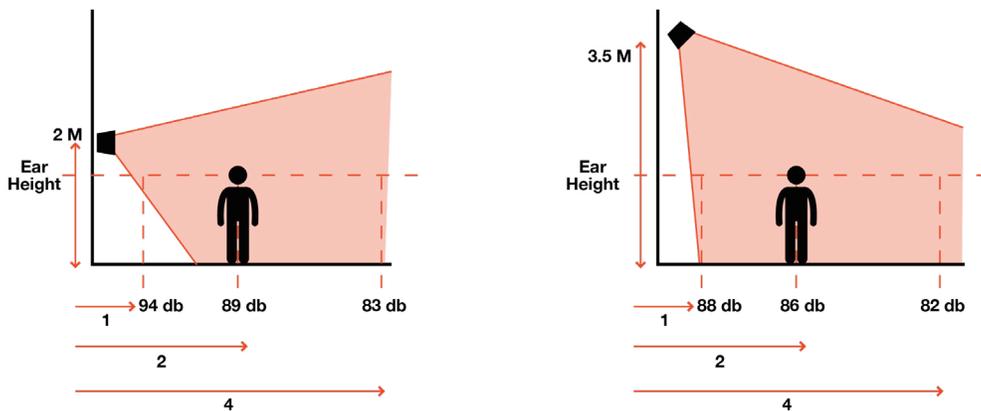
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	Coverage Angle ⁵ 100° x 100°
	Directivity Factor (Q) 7.3 (averaged 1kHz – 16kHz)
	Directivity Index (DI) 8.3dB (averaged 1kHz – 16kHz)
	Nominal Impedance 8 ohms (THRU setting)
	Crossover Type 2nd order low-pass, 1st order high-pass, plus conjugate shaping

PLANNING COVERAGE

Once you know about the physical constraints of your space and what sort of frequency response you need from the system, you now need to consider how even the coverage needs to be. Does everyone in the space need to clearly hear your message? Is the system creating an ambience where some areas can be quieter or louder than others? Do you wish to engage people at the front of a performance area but still allow drinks to be ordered at the bar? If the answer is anything other than even coverage everywhere, it is worth sketching out on a plan which areas require different sound levels.

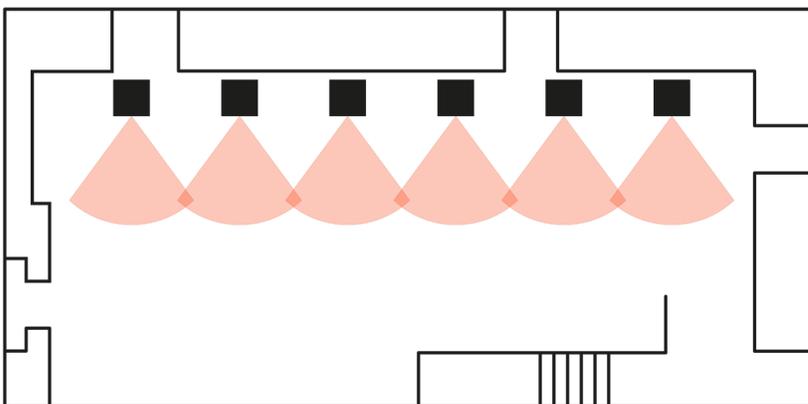
COVERAGE FROM WALL-MOUNTED LOUSPEAKERS

As you get further away from the loudspeaker the level reduces. For wall-mounted loudspeakers, you need to be careful that the audio level for those nearest the loudspeaker is not too high in order to achieve a reasonable level for those further away. Mounting the loudspeaker higher can deliver more even coverage across the room.



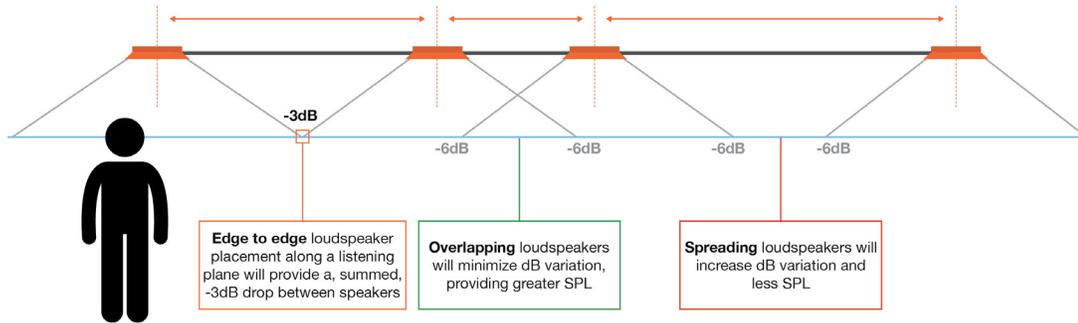
Carefully planning your audio coverage and loudspeaker spacing is key to any successful loudspeaker design.

Spacing can be calculated by drawing a plan of your room and by placing the loudspeakers onto the plan and marking out their coverage angle. You can then calculate whether additional loudspeakers are required further down the room.



SPACING CEILING LOUDSPEAKERS

Ceiling loudspeakers are frequently used to provide even coverage across a room. Spacing is determined by the ceiling height and the coverage angle of the loudspeaker. Coverage can be calculated by drawing a section view of the room and plotting in the loudspeaker coverage angle based on the ceiling height. Remember that you are designing the coverage for the typical listening height, standing or seated, not coverage on the floor.



In applications with very high ceilings a single loudspeaker may cover too wide an area. Control Contractor offers the Control 47HC, a specially designed ceiling loudspeaker with a much narrower wave guide, so the energy covers a smaller area. Alternatively there is also a series of Control Contractor Pendant loudspeakers so you have the option of hanging them at a height that is closer to the listeners.

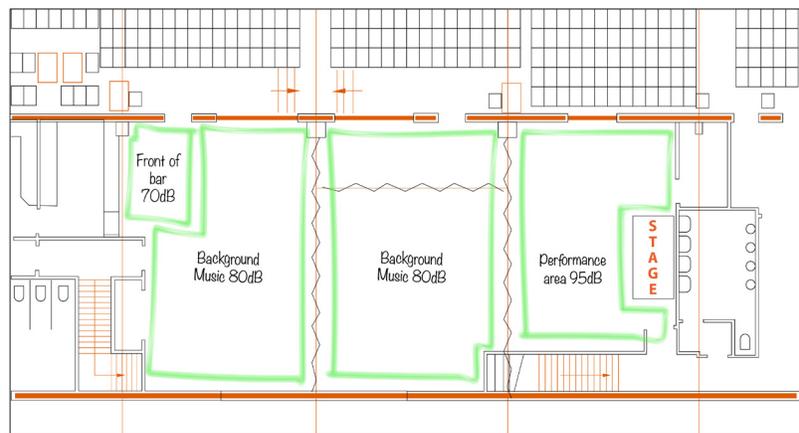
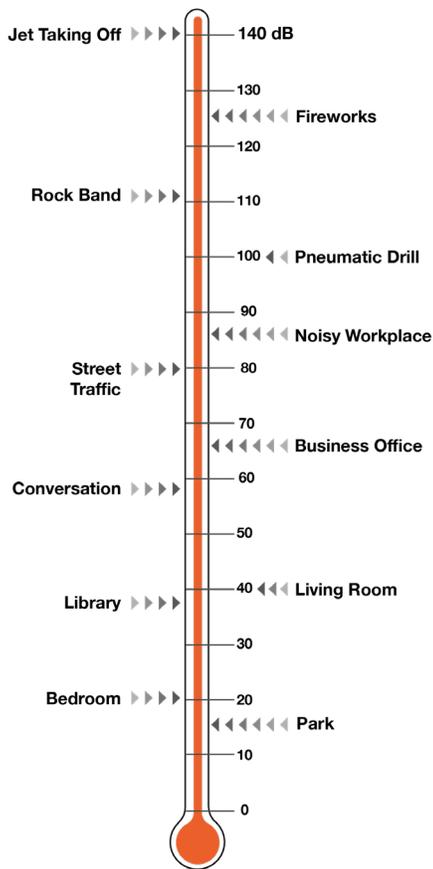


SYSTEM PERFORMANCE - SPL

Now we know what type of signal will be replayed through the loudspeakers, we need to determine how loud the system needs to be before we can finish our design.

On the sketch plan you made previously, make a note of the target sound pressure levels (SPL) that you need in each area. Bear in mind any local codes or licence restrictions that may limit what you are allowed to do as well as any sources of noise that you may have to overcome.

You should also note that it is good practice to include some headroom in these figures for when your client changes their mind (I know, never happens!), or to ensure that the chosen loudspeaker is not operating on the limit of its ability which will shorten its working life and lead to increased maintenance costs.

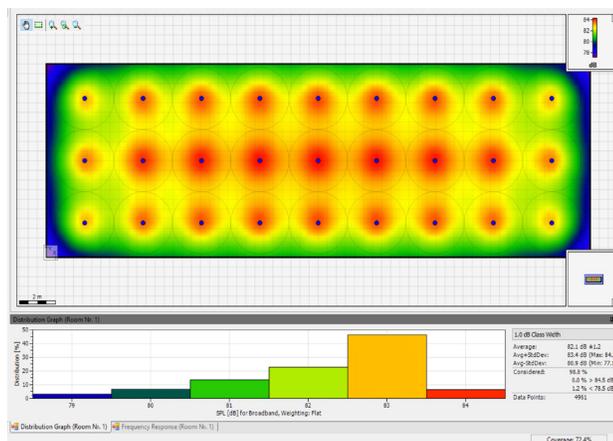
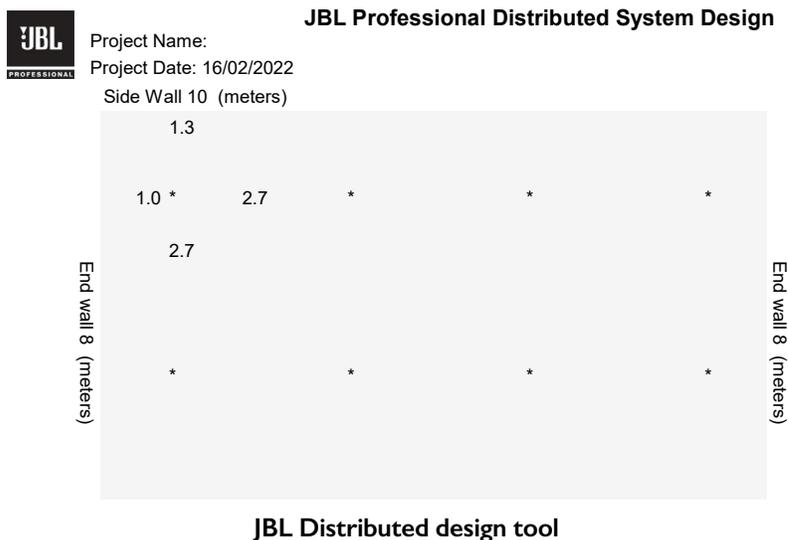


DESIGN TOOLS

Having assembled your notes, you may have years of experience and can then quickly turn those notes into a bill of materials just by looking at the room. For the rest of us; however, there are several design tools available which can validate your thoughts and usually give you some pretty pictures to help convince your client.

JBL Distributed System Design (DSD) tool helps you calculate and display the number of ceiling and/or pendant loudspeakers needed to cover a room: <https://jblpro.com/en-US/software/distributed-system-design-dsd-v3-6-2-v3-6-2-windows>. EASE Address is also ideal for calculating ceiling coverage: https://jblpro.com/en-US/site_elements/full-ease-address-software-with-jbl-speaker-data

Both of these free tools will allow you to quickly build a room and drop some loudspeakers in. You will then get a prediction of the evenness of coverage as well as the SPL. Remember to stipulate if your audience is seated or standing (ear height).



JBL HAS GOT YOU COVERED

The range of JBL Control Contractor series loudspeakers is deliberately large, but as you explore the range you will see that each one has been developed with care in order to solve almost any audio problem. The entire range is tested and documented in the same way, so you know you can trust the specifications. No matter where you need to place your loudspeakers, it's likely there's a Control Contractor model for you. Yet, with the enormous variety of loudspeakers, they have been designed with a consistent sound, building on their original studio quality heritage, allowing you to mix and match with confidence.

AVAILABLE PRODUCTS

There are a wide range of different loudspeakers available from JBL to help you tackle your next project. Our at-a-glance guide gives you details on some of the most popular loudspeakers in the Control Contractor range.

For the latest information on every product available please consult our website.



Control 10 Series

A range of small to medium ceiling loudspeakers with a choice of sizes that provide a cost-effective, easy-to-install entry to the Control Range. Three models have been certified for use in EN54-24 Voice Alarm applications.

Learn more at our [website](#)



Control Contractor 20 Series - Ceiling Loudspeakers

The 'classic' range of ceiling loudspeakers available in a range of sizes - up to 6inch.

Learn more on our [website](#)



Control Contractor 20 Series - Wall-mount Loudspeakers

The standard for countless applications, flexibility that delivers. Models feature weather-resistant transducers and enclosures, and are available in black and white, and are designed to be painted.

Learn more on our [website](#)



Control 40 Series

A range of premium ceiling loudspeakers with patented RBITM technology for outstanding pattern control and performance.

Learn more on our [website](#)



Control 50 Series

A surface-mount subwoofer-satellite loudspeaker system for foreground and background applications.

Learn more on our [website](#)



Control 60 Series

The same premium components as the Control 40 Series in a hanging pendant format.

Learn more on our [website](#)



Control 80 Series

Designed for outdoor applications, the highly weather-resistant Control 80 Series Landscape loudspeakers provide excellent full-range sound quality and 360-degree coverage.

Learn more on our [website](#)



Control Contractor 100 Series

A range of in-wall loudspeakers allowing discrete positioning.

Learn more on our [website](#)



Control 200 Series

The Control 200 Series is a medium format (6.5") coaxial ceiling loudspeaker.

Learn more on our [website](#)



Control 300 Series

The Control 300 Series is the flagship large format (8" and 12") coaxial ceiling loudspeaker range. Professional performance for larger projects.

Learn more on our [website](#)



Control CRV

A potential problem solver in a contemporary curved cabinet.

Learn more on our [website](#)



Control HST

Another potential problem solver offering wide-angle coverage.

Learn more on our [website](#)



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