



ENGLISH D-Line

MANUAL

Safety Regulations

1. Please read these instructions before using this device, which cover the safety and operation of the D-Series powered speaker system. All tips and instructions explained in this manual will maximize your results when using the monitors.
2. Please keep these instructions, as you may need them in the future.
3. All warnings mentioned on the product or in this manual should be respected for your own protection—please heed all warnings!
4. This product should not be operated in humid environments, or near water or moisture (for example, in bathrooms or next to a swimming pool, etc.) as there is danger of electric shock.
5. This KSdigital product must be installed to allow the necessary ventilation (for example, the device may not be operated on a bed, sofa, rug, or similar surfaces which may cover the heat sink).
6. Do not place this unit on or near a radiator or similar heat sources.
7. The unit is designed for use with an AC voltage of AC230V / 50Hz or AC115V / 60Hz (excluded D808). Never operate the unit with a different voltage.
8. Power supply cords should be routed so that you do not step on them or bend them. In particular, pay attention to the transitions between the cable and the plug.
9. Make sure no objects or liquids penetrate the enclosure.
10. This KSdigital product should be serviced or repaired only by qualified service personnel.
11. Please do not attempt to open, service, or repair the device, unless described in this manual. Any unauthorized opening of the unit voids any guarantee / warranty claims. Please contact KSdigital for any service needs.
12. To prevent electric shocks do not operate the power cord with an extension cord, as there may be current-carrying contacts accessible.
13. Please ensure the electrical outlet and circuit used to power this KSdigital product has proper grounding.
14. This product is designed for the playback of analog audio signals. Any form of operation that does not conform with this product's intention and original design will void the warranty and may result in danger to life from electric shock.



Warning: To prevent electric shock, these speakers must not be exposed to rain or moisture.

KS Digital Non-Transferrable Limited Warranty

Warranty: KS Digital warrants the product to be free from defects in material and workmanship for a period of one (1) year from the original date of purchase.

If the product fails within the warranty period, KS Digital will repair or, at our discretion, replace the product at no cost to the original purchaser.

Exclusions: This warranty covers defects in manufacturing discovered while using this product as recommended by KS Digital. This warranty does not cover loss or theft, or does the coverage extend to damage caused by misuse, abuse, unauthorized modification, improper storage, lightning, or natural disasters.

Limits of Liability: In the case of malfunction, the purchaser's sole recourse shall be repair or replacement, as described in the preceding paragraphs. KS Digital will not be held liable to any party for damages that result from the failure of this product. Damages excluded include, but are not limited to, the following: lost profits, lost savings, damage to other equipment, and incidental or consequential damages arising from the use, or inability to use this product. In no event will KS Digital be liable for more than the amount of the purchase price, not to exceed the current retail price of the product. KS Digital disclaims any other warranties, express or implied. By using the product, the user accepts all terms herein.

How to obtain service under this warranty: For international customers: contact the KS Digital dealer from which the product was purchased from in order to arrange warranty repair service.

Table of Contents

Safety regulations / Warranty.....	2
Table of Contents.....	3
D-Line conception and performance.....	4
Controls.....	6
Technical Specifications D60 / D606.....	8
Technical Specifications D80 / D808.....	10
Signal path diagram.....	12
Recommended Speaker Set Up.....	13

D-Line conception and performance

Thank you very much for choosing a KSdigital monitor

For nearly 20 years, KSdigital has been designing world-class studio monitors, with the goal of reproducing only the transparent, undistorted, true impulse of the music signal. KSdigital products can be found in the control rooms of top producers, broadcast studios, and mixing / mastering facilities worldwide. Designed to the utmost specifications of absolute sound neutrality, the monitors of the ADM Series, C Series, and the new D-Line are uncompromising tools for judging your audio productions in the studio.

Consistency in Design

With the development of the new D-Line, KS has designed monitors that are 100% accurate to the correct time transmission of the audio signal. When an impulse is accurately reproduced over time, this is equivalent to a linear frequency and phase response. This high level of accuracy in the impulse response comes from drivers specifically developed by KSdigital, in combination with our FIRTEC™ advanced FIR filtering found in our own proprietary onboard DSP. The result is that KS has achieved complete sound neutrality and accuracy in speaker reproduction.

The Coax Series - The Concept

As already established in the successful C Series, the key design feature in the D-Line is the coaxial construction of the mid-bass driver and high-performance tweeter. This design creates the ideal point source—without any offset in the horizontal or vertical planes, the listening position achieves the optimal frequency and phase response. The high frequency horn directs the upper frequency energy directly to the ear and avoids to a large extent any room reflections. In addition, the reference-quality low frequency driver prevents any frequency or phase anomalies across the bass range, so the D-Line can reproduce incredibly high volumes without any of the typical distortion or fatigue found in similar nearfield or mid-field studio monitors. By using high quality materials such as carbon fiber for the low / mid drivers, a D-Line monitor provides an exceptionally accurate reproduction of music and speech for its given size. The powerful built-in amplifiers provide a direct conversion of the electrical signal into pure sound performance. The additional bass driver, with its own dedicated amplifier in the D606 and D808 models, transmits absolutely accurate bass signals with wavelengths between 10m and 3m (roughly 30 feet and 10 feet). In these larger monitors, the offset between the coaxial chassis and woofer is negligibly small (only 20cm, or 8"), so even this added component supports the principle of the coax design. The additional amplifier and extended membrane surface in the CAD-tuned 606 / 808 enclosure create an extremely accurate, distortion-free, transient-true low bass that allows for the optimal judgement of the sub frequency range of a mix. Whether used as a high quality nearfield monitor in an audio or video editing suite, as a bridge monitor at a mixing console, or even as a main monitor, the speakers of the D-Line Coax Series are the ideal tools of choice.

The Digital Signal Processing Aspect

The digital signal processing of the D-Line is based on three filter levels:

1. A phase and impulse EQ filter system: FIRTEC™, to correct the frequency and phase response of each studio monitor to exacting phase linear standards
2. A ruler-flat digital crossover stage which decouples the woofer / midrange and tweeter at 1.6 kHz
3. A high-pass filter which protects the chassis of the bass / midrange from potentially damaging frequencies that are too low.

This combination ensures the greatest linearity in frequency and phase response, and best supports the concept of a true point source.

D-Line conception and performance

The Chassis

The principle design—the coaxial chassis—creates the ideal point source. It allows all frequencies to radiate from one location, without internal phase shifts and regardless of where you are located within the defined dispersion angle. The carbon fiber cone of the 8" mid / woofer in the D80 and D808 contributes to this maxim. Carbon fiber is both an extremely stiff and incredibly light material—it ensures clean bass and high impulse fidelity, without any distortion. For it's size, the 6.5" mid / woofer of the D60 and D606 reproduces incredibly accurate and deep low frequencies. This low-frequency coated paper driver is highly damped internally to prevent partial oscillations. The 1" high frequency compression driver operates through the "pierced heart" of the woofer directly to a stationary horn. This construction prevents any modulation of the high frequency signal by the movement of the woofer (the Doppler effect). At the same time, this accurately directs the sound energy toward the listening position, leading to a considerable improvement of the direct sound to room reflection ratio. The mechanical structure of the 1" HF driver is designed for high volume reproduction, which is no challenge for the D-Line—they can be run extremely loud with extremely low distortion.

The Amplifiers

In the D-Line, the "KSd Class A" type PWM power amplifiers are directly connected to the DSP. By this direct coupling of the output stages of the DSP to the power amps, a separate D to A conversion is avoided. A standard D/A converter section is not needed (as is done by other manufacturers in their DSP speakers), as KS utilizes its own proprietary design that happens between the amp and speaker stage.

„KSd Class A“ Operation

Conventional PWM amplifier designs produce non-linearities even at their lowest volumes. This means that in each zero crossing of the signal, the distortion increases. The technology and implementation of the KS PWM design in the D-Line avoids this disadvantage and reverses this ratio. At zero modulation, the output stage will work with the least distortion values and lowest THD. While this design slightly increases the heat loss of the amplifier, it leads to a significantly better audiophile quality in the playback.

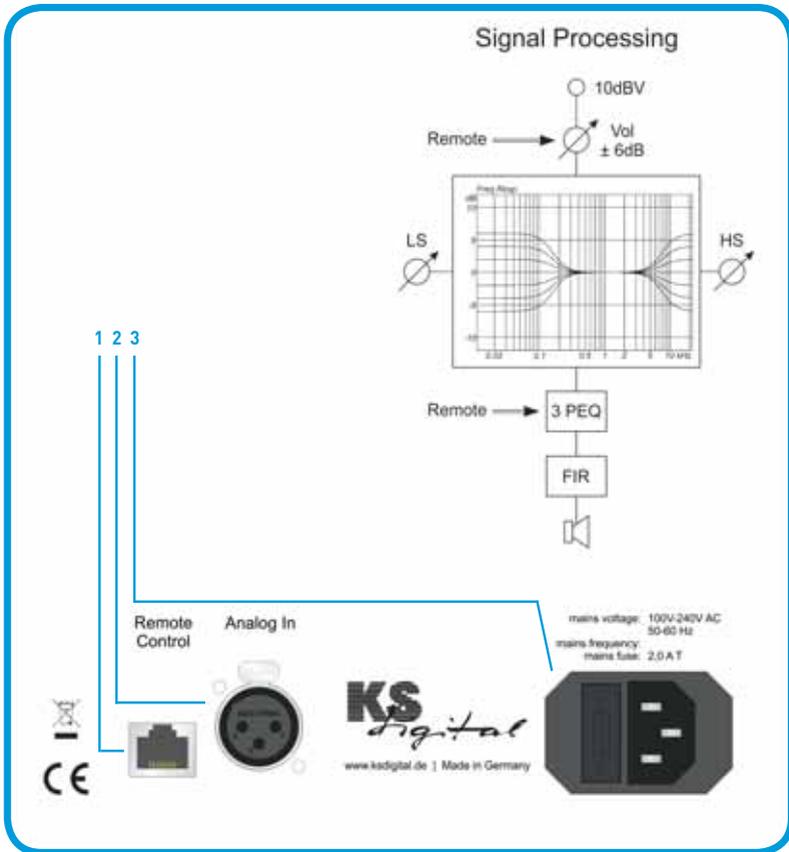
RESET:

The monitors of the D-Line have a total of five filters that are adjustable by the user. The two on the front panel give direct access to the High and Low shelving equalizers. Three additional parametric EQs are accessible and adjustable through the optional RC-100 Remote Control, or the optional FIR W-Lan software. To return all filters to their linear position, one can reset the speakers to their default factory setting. Switch the speaker off and turn all three rotary knobs on the front panel all the way to the left. Switching the speaker on will now reset the parameters. Turning the knobs to the 12 o'clock position will then reset the speaker to the default factory (neutral) setting.

Controls

Controls on the back:

1. Remote Control: Remote Control RJ45 socket to connect KSdigital's proprietary remote control RC-100 or FIR W-Lan remote control software (an exclusive KS 2-to-1 connection cable is used to connect two speakers to one remote control).
2. Analog In: Analog signal input, XLR balanced with +4dBv input sensitivity.



3. Power supply: 230V IEC power socket with wide input voltage range, between 100V and 240V AC, suitable for use world-wide. **Excluded the D808. The D808 is only usable with the voltage labeled at the back plate.**

Heat Sink:

The D-Line studio monitor has two [D60, D80] or three [D606, D808] powerful amplifiers with a maximum output power of more than 200 Watts per amplifier. The heat sink will be warm during operation, and must not be blocked or covered—please provide good ventilation around the speaker, especially the back section. Depending on the operating time, the ambient temperature, and the volume levels, the heat sink may reach up to 45 degrees Celsius (113 degrees Fahrenheit).



Controls on the front:

1. High – adjust to compensate for shortcomings in the high frequency (treble) range of your room acoustics. This controller provides a range of +/- 6dB and is designed as a shelving filter (see the graphic on the back of the speaker for reference).
2. Low – adjust to compensate for shortcomings in the low frequency (bass) range of your room acoustics. This controller provides a range of +/- 6dB and is designed as a shelving filter (again, see the graphic on the back of the speaker for reference).
3. Vol – the volume sensitivity control has a range of +/- 6dB, to adjust your studio monitor to different input levels if needed. Turning clockwise increases the volume.
4. LED – the blue LED indicates that your studio monitor is turned on.
5. Main switch – the On / Off switch disconnects your studio monitor fully from power. No power is consumed when the switch is in the 0 position.



D606

Three-way Coaxial Studio Monitor

The **D606** is the #1 tool for covering ranges from midfield to main nearfield monitor. From the deepest, most accurate bass to brilliant, transparent treble, it also features the most accurate panoramic imaging available today. This is studio monitoring at the highest resolution!



D60

The most compact of the new D-Line, featuring fully digital linear phase **FIRTEC™** equalization. For use in the mobile studio, and suitable as a console meter bridge monitor or nearfield at your workstation.

Technical Specifications:

Acoustic Advantages of the Coaxial Systems of the D-Line:

- ➔ No misalignment in the timing between the acoustic centers of the individual chassis.
- ➔ No run-time differences between the chassis in the crossover range of the individual paths.
- ➔ The directional radiation of the high tone horn prevents unwanted reflections in the listening area.



TECHNICAL SPECIFICATIONS:

Model	D60	D606
Construction	coaxial, digital	coaxial, digital
Coaxial Chassis	6,5"/1" coaxial	6,5"/1" coaxial
Bass Chassis		6,6" paper
Process	FIRTEC™ equalization 5 user filter	FIRTEC™ equalization 5 user filter
AD / DA converter	24 Bit/ 192 KHz	24 Bit/ 192 KHz
Analogue IN	XLR symmetric	XLR symmetric
Amplifier	280W-Peak/150W RMS each way	280W-Peak/150W RMS each way
Frequency Range	48-22000 Hz (+/3dB)	38-22000 Hz (+/3dB)
Dimensions:	27,5 x 24,5 x 26 cm 11" x 10" x 10.3"	45,0 x 24,5 x 26 cm 17 2/3" x 10" x 10.3"
Weight:	7.5 kg / 16.5 lbs	12.5 kg / 27.5 lbs
Remotable:	yes	yes



D808

Three-way Coaxial Reference Studio Monitor

The **D808** is the premier monitor in the D Line, which operates as the ultimate nearfield or midfield studio monitor, commanding an impressive presence even at extended listening distances. In every application, the **D808-Coax** performs with pinpoint precision, even at high volumes due to its immense membrane surface. The bass response is incredibly accurate at any level, and the high-performance tweeter ensures extremely low distortion and a perfectly defined high frequency range. In conjunction with its KS phase-linear **FIRTEC™** technology, the **D808** is the pinnacle of the D-Line.



D80

The **D80-Coax**, with substantially more volume and membrane surface than the **D60**, allows for an extended low frequency response and higher volume. The **D80** may look like a compact speaker, but it functions perfectly as a full-range nearfield monitor. Its extreme accuracy lets you make the proper mixing decisions, across any genre of music or post work.

Technical Specifications:

Acoustic Advantages of the Coaxial Systems of the D-Line:

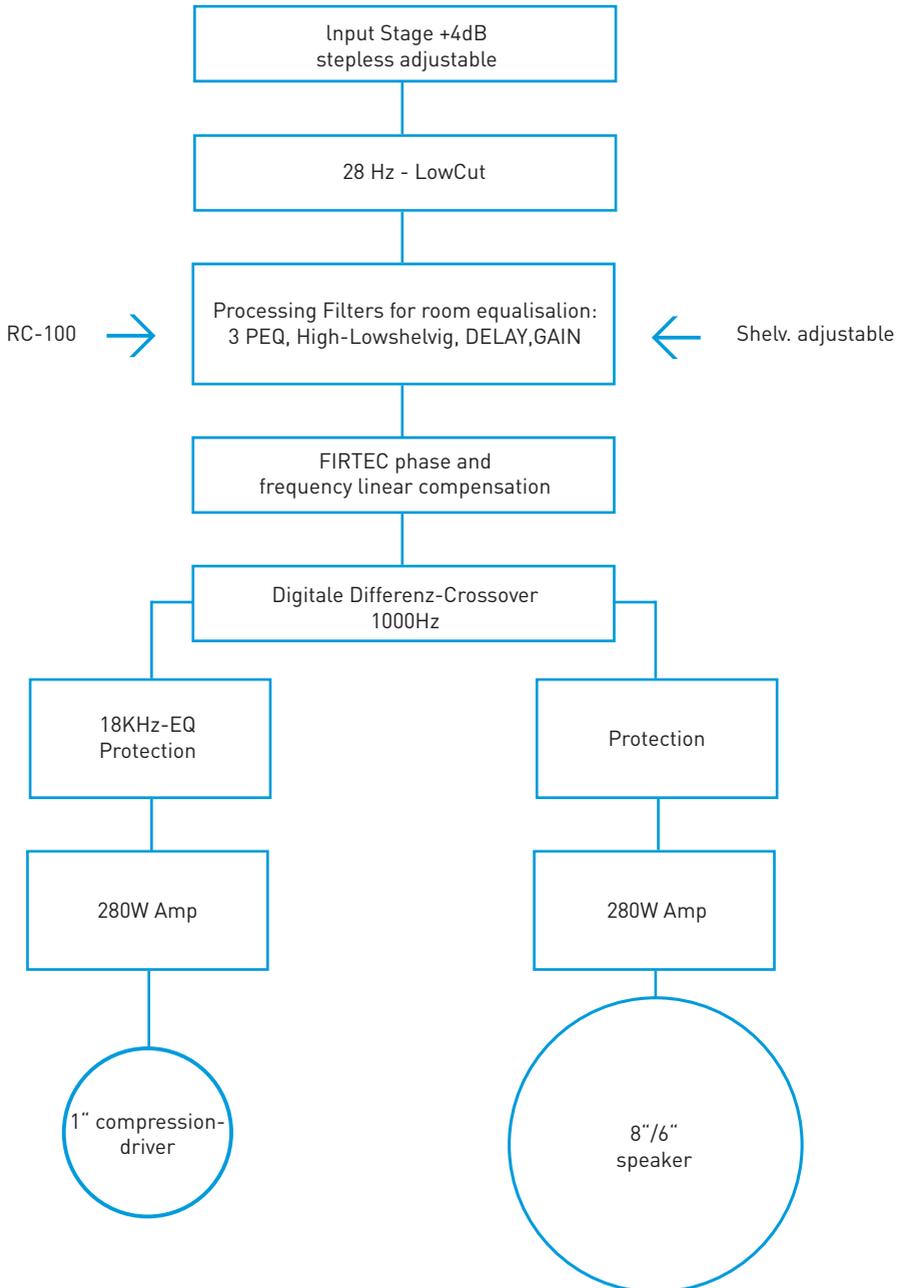
- ➔ No misalignment in the timing between the acoustic centers of the individual chassis.
- ➔ No run-time differences between the chassis in the crossover range of the individual paths.
- ➔ The directional radiation of the high tone horn prevents unwanted reflections in the listening area.



TECHNICAL SPECIFICATIONS:

Model	D80	D808
Construction	coaxial, digital	coaxial, digital
Coaxial Chassis	8"/1" coaxial	8"/1" coaxial
Bass Chassis		8" carbon cone
Process	FIRTEC™ equalization 5 user filter	FIRTEC™ equalization 5 user filter
AD / DA converter	24 Bit/ 192 KHz	24 Bit/ 192 KHz
Analogue IN	XLR symmetric	XLR symmetric
Amplifier	280W-Peak/150W RMS each way	280W-Peak/150W RMS each way
Frequency Range	40-22000 Hz (+/3dB)	35-22000 Hz (+/3dB)
Dimensions:	34,5 x 28,0 x 28,5 cm	58,0 x 28,0 x 28,5 cm
Weight:	8,5 kg	16,5 kg
Remotable:	yes	yes

Signal Flow Diagram



Recommended Speaker Set Up

THE OPTIMUM SPEAKER PLACEMENT - GUIDELINES FOR OPTIMAL INSTALLATION

To ensure proper stereo imaging, for the speaker placement you should consider the following points:

1. Construction of an isosceles triangle between the speakers and listener, the “stereo triangle.”
2. Create balanced, symmetrical acoustic conditions for the first reflection.
3. The greatest possible proportion of the sound energy to the ear should be formed by the direct sound.
4. Select the optimal distance and space for the back wall and the sides.
5. Handle the buildup of modes in the bass range.

Establishing the optimization of the positioning of the speaker should begin with the left and right stereo information arriving to the ears of the listener in a way that brings together these two signals so a balanced, natural sound image is perceived. The basis for creating this is symmetry. Only in the case of an acoustically symmetrical position can the listener expect an exact reproduction of the mids, a balanced distribution of the sound in the panoramic field, and an appropriate depth of space in the imaging. The reward for this “extra” information is an authentic music experience, with a visual placement of a “stage” in front of the eyes of the listener, which will not be artificially wide or unnaturally flat.

1. Construction of an isosceles triangle between both speakers and listener, the “stereo triangle.”

This symmetry can be achieved by placing the speakers and the listening position in the stereo triangle. The base width means the distance from speaker to speaker is identical to the distance between each speaker and the listener.

The distance from listener to left speaker = the distance from listener to the right speaker = the distance from the left speaker to the right speaker.

Therefore, the music signal from the right speaker takes just as long to reach the ear of the listener as the music signal from the left speaker. This is an important prerequisite for accurate location of each signal in a complex mix. Our hearing is extremely trained on the perception of the first wave front, meaning the initial sound from the source direct to the ears. Any small temporal offset of this wavefront between the left and right source is perceived and addressed acoustically—where the initial wavefront is heard first is where the location of the sound source is identified. Among other things, this is why the exact same distances between the listening position and the two speakers is so important.

2. Create balanced, symmetrical acoustic conditions for the first reflection.

The side reflections are essential for the stable formation of the “virtual stage” before the eyes of the listener. Ideally, there are no reflections from the side walls to add on to the direct sound. This is completely unrealistic, since most control rooms have side walls! However, if the space is big enough so that the distance to the back wall and the side walls exceeds 3 meters (10 ft), then it is called a “free field installation.” This means nothing more than to position the speakers, acoustically considered, in the open space. In this case the side walls do not disturb the sound very much, and the reproduction is not significantly influenced by the character of the room. Unfortunately, very large rooms will often have excessively long reverberation, which also leads to sound distortion. A way out of this dilemma is again offered by the above-mentioned symmetry. When the reflections of the left lateral boundary are equal to the right, this no longer leads to a tilting of the sound image in one direction. So, it is important that your studio acoustics not only have a uniformly short reverberation time, but also that the same reflection conditions are represented between each studio monitor and the side wall on the left as well as the right side.

Speaker set up

3. The greatest possible proportion of the sound energy to the ear should be formed by the direct sound.

Do not choose a listening distance that is too large, and always choose one relative to the size of the speaker. For example, a small 70cm speaker listened to at a 5m distance leads to an increased perception of the acoustics of the listening room. The dispersion of the speaker plays a major role in the determination of the optimum listening distance. A KSDigital cylindrical wave emitter, CD-Horn or D' Appolito wave guide design achieves more direct sound to your ears than a classic omni-directional emitter used in conventional speaker building. Therefore a somewhat larger distance can be achieved. It is important before any purchase to discuss these aspects with a professional, so you get the optimal speaker at the optimal listening distance!

4. Select the optimal distance and space for the back wall and the sides.

If the distance between the rear and side walls (behind or to the side from the speakers) is not infinitely far away (more than 5m (15 ft)), then the effect of these walls has to be considered. The physical basis of these considerations is the wavelength. If two waves of the same size are added in phase with each other, the result is 6dB louder. If they meet in reverse phase (180 degree phase shift), there is a complete cancellation. Side walls as well as back walls make an ideal reflecting surface for low frequencies with wavelengths from 10m (30 ft) to 3m (10 ft). All woofer drivers disperse omnidirectionally, regardless of being mounted on the front, the side, or the back of a box. The low-frequency wave will always reach directly from the monitor to the ear. At the same time, this wave is radiated to the walls and reflected from there to the ear. The wave travels a detour to the wall, in that it reaches our ears "on the rebound." The detour creates a phase shift in the wave.

An example:

A 3 meter (10 ft) long wave

a) Will be emitted directly to the ear, and

b) Reflected to the ear from a rear wall. For this example, let's say the distance of the speaker from the rear wall is 0.75 meter = 30". Now, in the ear of the listener, both waves are added, the direct one and the wave which did the detour—and the detour is 1.5 meter = 5 ft (detour: speaker to back wall = 0.75m = 30" + rear wall to the speaker = 0.75 meter = 30," so in total 1.5 meter = 5 ft). But 1.5 meter = 5 ft is exactly half the wavelength, leading to cancellation with the directly emitted wave, as seen in the graphic.

In reality, this does not lead to a complete cancellation, as the wave reflected from the rear wall is a bit dampened, and many other reflections somewhat weaken this cancellation. Nevertheless, this tone at the listening position is quieter than its neighboring tones. Things can get more extreme if the side wall is also 0.75m = 30" away, so possibly the same conditions prevail for both speakers. A simple recommendation is as follows:

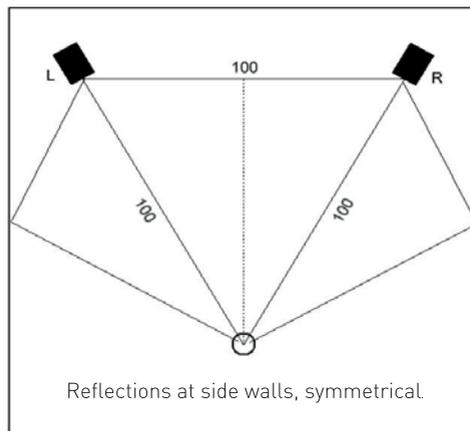
The distances of the speakers from the rear wall and side wall should never be the same, and the same counts for the distance of the left speaker to the left side wall, which should be different from the right speaker to the right wall. The symmetry mentioned in #2 above relates most ideally to smaller speakers (such as the D60 or D80), as the room will be larger than the wavelengths of the high and mid frequencies being output. For low frequencies, symmetry becomes more of a problem, as there will be standing waves that occur in the mathematically-related spots of the room (for example, the exact middle of a square

Speaker set up

room will have the most problems with standing waves). With a separate subwoofer, it can be asymmetrically placed to help with this issue, but with a sub built into the speaker, bass trapping may be necessary, as well as offsetting the speakers as explained in this section. The stereo triangle between the listener and both speakers (explained in #1 above) should still be maintained.

Low and High Shelving

As we show above, the reflected energy of the walls does matter. If the speakers are positioned anywhere in an open room, the settings of all filters should be in the “neutral line-up” which is 12 o’clock position. If the installation is close to walls (the distance from wall to speakers is under 2m = 7 ft), it leads to an increase in bass energy, which can be reduced in our speakers with the help of the Low Shelving controller. A corner installation leads to a further increase in bass energy, which can be handled by using the Low Shelf to greater extent. In the same sense, you can adjust the treble energy with the High Shelf, based on the spatial conditions of the room.



5. Handle the buildup of nodes in the bass range.

Finally, a few comments on the buildup of nodes in the listening room. Nodes are standing waves that are created because the control room forms too narrow of a shape for the emitted wavelengths in the low frequencies. Basically, there isn’t much that can be done about it. You should try to build the room so that the most unpleasant consequences do not appear too intensely at the listening position. It does not matter if the back of the room has a considerable bass boost from a loud bass reflection—this is not our listening position. A good node distribution is obtained if the room nodes aren’t excited in only one place. Therefore, KS has designed many speakers wherein the bass diaphragms are mounted at different heights, so the nodes become excited in a more chaotic state and are not as pronounced. The advice described under topic 4, regarding the distances from the rear and side walls, affects the node distribution and intensity favorably. One or more additional subwoofers can also significantly reduce the problem with nodes at the exact listening position, as well.



D-LINE MANUAL

KSdigital GmbH

Altenkesslerstr. 17/D1, D-66115 Saarbrücken,
Telefon 0681 - 7618-0463, www.ksdigital.de, info@ksdigital.de