

MSP series

Powered Monitor Speaker

MSP7 STUDIO

MSP5 STUDIO

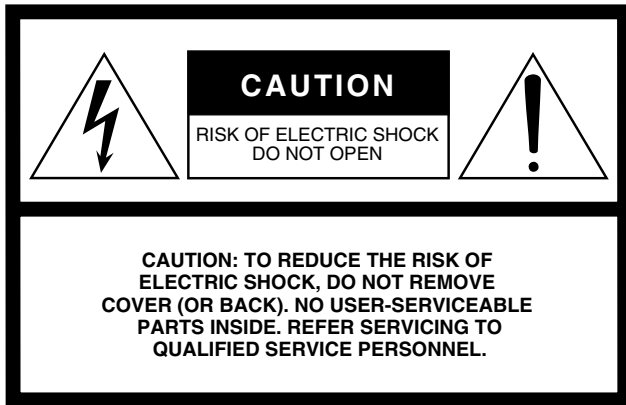
Powered Subwoofer

SW10 STUDIO



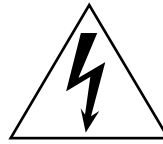
Powered Near-field Reference Monitors & Subwoofer

OWNER'S MANUAL



The above warning is located on the rear of the unit.

Explanation of Graphical Symbols



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

IMPORTANT SAFETY INSTRUCTIONS

- 1 Read these instructions.
- 2 Keep these instructions.
- 3 Heed all warnings.
- 4 Follow all instructions.
- 5 Do not use this apparatus near water.
- 6 Clean only with dry cloth.
- 7 Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
- 8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

- 11 Only use attachments/accessories specified by the manufacturer.
- 12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 13 Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

(98-6500)

IMPORTANT

Please record the serial number of this unit in the space below.

Model:

Serial No.:

The serial number is located on the bottom or rear of the unit.

Retain this Owner’s Manual in a safe place for future reference.


IMPORTANT NOTICE FOR THE UNITED KINGDOM

Connecting the Plug and Cord

WARNING: THIS APPARATUS MUST BE EARTHED IMPORTANT. The wires in this mains lead are coloured in accordance with the following code:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured GREEN-and-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol  or colored GREEN or GREEN-and-YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

(3 wires)



Thank you for choosing a YAMAHA powered monitor speaker or powered subwoofer.
In order to take maximum advantage of the speaker's features and ensure maximum performance and longevity,
please read this manual carefully before using powered monitor speaker or powered subwoofer.
Keep the manual in a safe place for future reference.

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PRECAUTIONS

PLEASE READ CAREFULLY BEFORE PROCEEDING

* Please keep this manual in a safe place for future reference.

WARNING

Always follow the basic precautions listed below to avoid the possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

Power supply/Power cord

- Only use the voltage specified as correct for the device. The required voltage is printed on the name plate of the device.
- Use only the included power cord.
- Do not place the power cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.
- Be sure to connect to an appropriate outlet with a protective grounding connection. Improper grounding can result in electrical shock.

Do not open

- Do not open the device or attempt to disassemble the internal parts or modify them in any way. The device contains no user-serviceable parts. If it should appear to be malfunctioning, discontinue use immediately and have it inspected by qualified Yamaha service personnel.

Water warning

- Do not expose the device to rain, use it near water or in damp or wet conditions, or place containers on it containing liquids which might spill into any openings.
- Never insert or remove an electric plug with wet hands.

If you notice any abnormality

- If the power cord or plug becomes frayed or damaged, or if there is a sudden loss of sound during use of the device, or if any unusual smells or smoke should appear to be caused by it, immediately turn off the power switch, disconnect the electric plug from the outlet, and have the device inspected by qualified Yamaha service personnel.
- If this device should be dropped or damaged, immediately turn off the power switch, disconnect the electric plug from the outlet, and have the device inspected by qualified Yamaha service personnel.

CAUTION

Always follow the basic precautions listed below to avoid the possibility of physical injury to you or others, or damage to the device or other property. These precautions include, but are not limited to, the following:

Power supply/Power cord

- Remove the electric plug from the outlet when the device is not to be used for extended periods of time, or during electrical storms.
- When removing the electric plug from the device or an outlet, always hold the plug itself and not the cord. Pulling by the cord can damage it.

Location

- Before moving the device, remove all connected cables.
- When setting up the device, make sure that the AC outlet you are using is easily accessible. If some trouble or malfunction occurs, immediately turn off the power switch and disconnect the plug from the outlet.
- Do not use the device in a confined, poorly-ventilated location. Make sure that there is adequate space between the device and surrounding walls or other devices: for MSP7 STUDIO and MSP5 STUDIO at least 15cm at the sides, 15cm behind and 15cm above, and for SW10 STUDIO at least 50cm at the sides, 50cm behind and 50 above. Inadequate ventilation can result in overheating, possibly causing damage to the device(s), or even fire.
- Do not expose the device to excessive dust or vibrations, or extreme cold or heat (such as in direct sunlight, near a heater, or in a car during the day) to prevent the possibility of panel disfiguration or damage to the internal components.
- Do not place the device in an unstable position where it might accidentally fall over.

Connections

- Before connecting the device to other devices, turn off the power for all devices. Before turning the power on or off for all devices, set all volume levels to minimum.

Handling caution

- When turning on the AC power in your audio system, always turn on the device LAST, to avoid speaker damage. When turning the power off, the device should be turned off FIRST for the same reason.
- Do not insert your fingers or hands in any gaps or openings on the device (ports, etc.).
- Avoid inserting or dropping foreign objects (paper, plastic, metal, etc.) into any gaps or openings on the device (ports, etc.) If this happens, turn off the power immediately and unplug the power cord from the AC outlet. Then have the device inspected by qualified Yamaha service personnel.
- Do not use the device for a long period of time at a high or uncomfortable volume level, since this can cause permanent hearing loss. If you experience any hearing loss or ringing in the ears, consult a physician.
- Do not operate the device if the sound is distorting. Prolonged use in this condition could cause overheating and result in fire.
- Do not rest your weight on the device or place heavy objects on it, and avoid use excessive force on the buttons, switches or connectors.
- When removing the speaker from the box or handling it at any time, be careful not to touch the tweeter dome with your fingers. Otherwise, the speaker can be damaged.

XLR-type connectors are wired as follows (IEC60268 standard): pin 1: ground, pin 2: hot (+), and pin 3: cold (-).

Even though this speaker system is magnetically shielded, you may need to move the speaker further away from the video monitor, if a nearby video monitor exhibits any distortion or unnatural color shift.

Interference From Cell Phones

Using a cell phone near the speaker system can induce noise. If this occurs, move the cell phone further away from the speaker system.

The rubber feet included in this package can be attached to the MSP5 STUDIO and MSP7 STUDIO to prevent slippage when it is to be used on a slippery surface.

Air blowing out of the bass reflex ports is normal, and often occurs when the speaker is handling program material with heavy bass content.

Yamaha cannot be held responsible for damage caused by improper use or modifications to the device.

Always turn the power off when the device is not in use.

The performance of components with moving contacts, such as switches, volume controls, and connectors, deteriorates over time. Consult qualified Yamaha service personnel about replacing defective components.

- Illustrations in this manual are for explanatory purposes only, and may not match the actual appearance of the product during operation.
- Company names and product names used in this Owner's Manual are trademarks or registered trademarks of their respective owners.
- Specifications and descriptions in this owner's manual are for information purposes only. Yamaha Corp. reserves the right to change or modify products or specifications at any time without prior notice. Since specifications, equipment or options may not be the same in every locale, please check with your Yamaha dealer.

Setting Up for Superior Monitor Sound

Unlike most other audio and production gear, the way speakers are set up in a room has a dramatic effect on the final sound. This short tutorial provides a basic guide to help you maximize the performance of your Yamaha MSP-series monitor speakers.

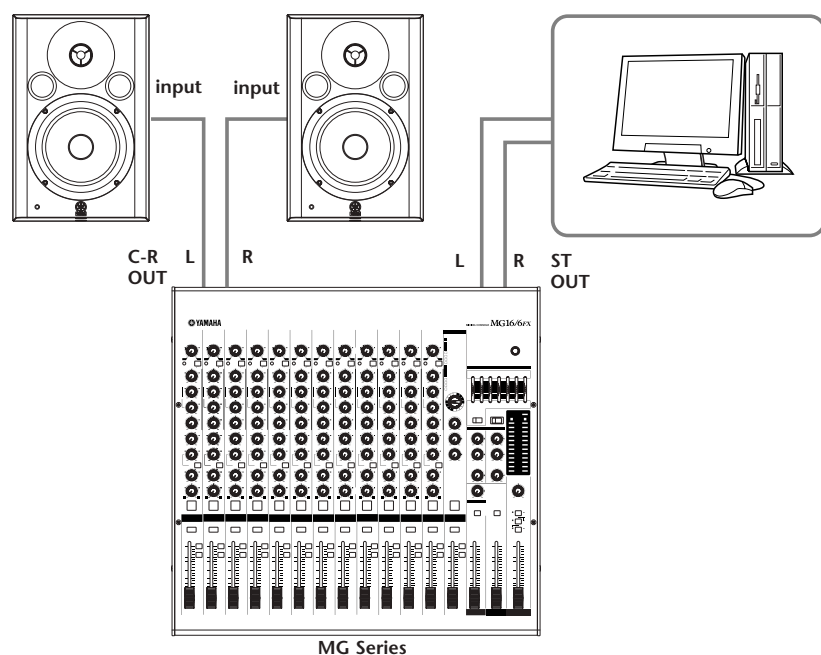
Listening vs. Monitoring

You'd think that the requirements for "listening" and "monitoring" would be the same, but that is not always the case. A great listening system can be a great monitoring system, and vice-versa, but in most cases you'll miss details that are essential to producing the best possible mix on a system that's set up purely for musical enjoyment. The difference is somewhat similar to the difference between a retouched glamour portrait and the original in which every blemish is clearly visible. The model looks a lot better in the retouched photo, but the reality is in the original un-enhanced version. As mixing engineer, or producer, or sonic artist, you'll want to hear the details so that you can create a perfectly balanced mix that will sound good on the widest possible range of audio systems — and that can mean anything from high-ticket boutique audio compo-

nents in a properly-designed listening room right down to the boom box on top of the fridge in the kitchen. You don't want problems hidden by poor monitor performance to sabotage your sound on other systems.

The legendary Yamaha NS10M became a standard monitor in the music and sound industry (and is still in use in many studios throughout the world) for precisely that reason: it offered flat response and excellent resolution that allowed engineers and producers to hear subtle details that make the difference between good and great sound. The MSP-series monitors carry on the tradition with accuracy and detail that can help you make great mixes, while letting you monitor for long stretches with minimum fatigue.

If you're connecting your MSP speakers directly to a mixer such as one of the Yamaha MG-series mixers, they should usually be connected to the mixer's "C-R" outputs or MONITOR outputs so that you can control the monitor level without affecting the level of the signal sent to the mixer's main bus, which will usually be feeding your recorder or DAW (Digital Audio Workstation) in a production type setup.



Speaker Placement

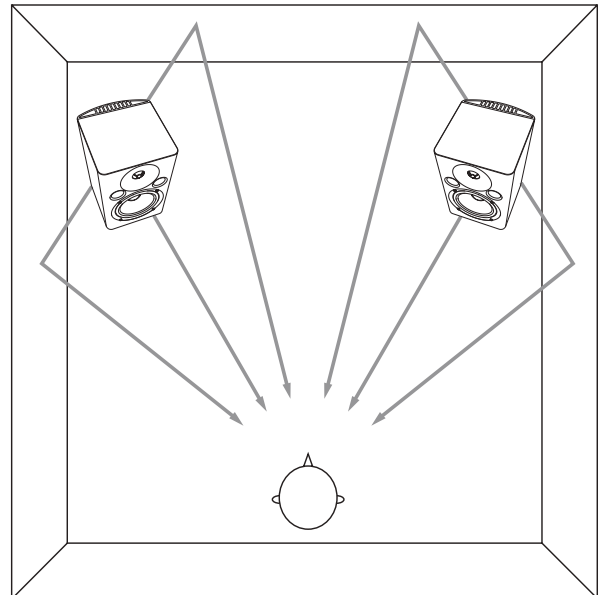
Speaker placement is one of the most important considerations when setting up a monitor system, but it is all too often overlooked with the result that performance is seriously compromised. Admittedly the obstacles to perfect speaker positioning in the small studio are formidable. Having the space available to place your speaker system so that it can provide optimum performance is a luxury, but it

is definitely worth the time spent doing a little experimentation and measuring to make the most of limited resources. The difference can be astounding. The basics are the same whether you're setting up a stereo or 5.1 surround system.

Proximity to Walls and Corners

For the most accurate response your speakers should be positioned away from walls and especially corners, which can play havoc with a speaker's frequency characteristics. A minimum of about 1.5 meters (about 5 feet) away from walls would be ideal, but in reality they'll probably end up being placed on a desktop and pushed up against a wall.

Just keep in mind that fact that the closer you get to walls and corners the more exaggerated the speaker's bass response is likely to become, and some compensation — whether you compensate mentally or use some equalization — will probably be required.



Symmetry

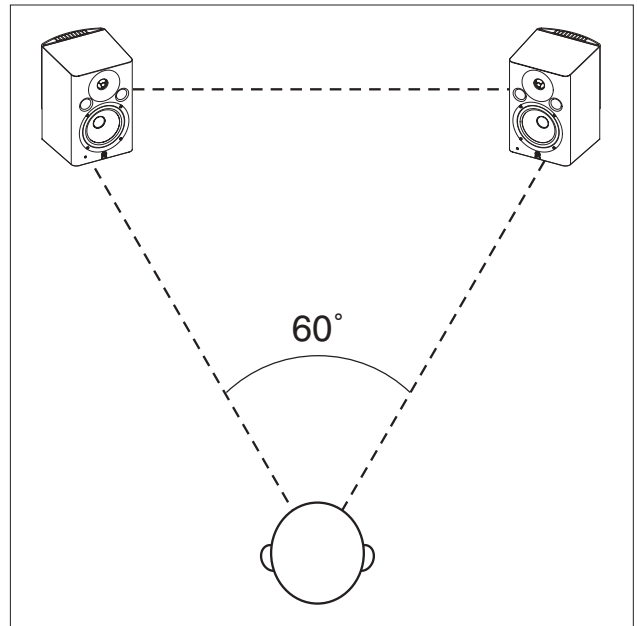
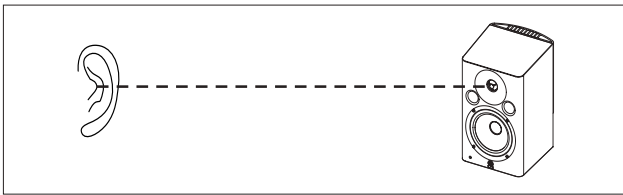
As we've just learned, the response of a speaker can change drastically according to where it is placed in relation to surfaces. So what happens if one of your speakers is up against a wall and the other is out in the open? Rest assured that the results will not be good, and will definitely not be conducive to producing good mixes.

You'll have totally different response from your left and right speakers, making it next to impossible to create a well-balanced mix, or even position tracks accurately in the stereo sound field. So whatever you do, if you're serious about your sound make sure that your speakers are located

as symmetrically within your listening environment as possible. Use a tape measure to ensure that your speakers are the same distance from the side and rear walls. Large objects can throw the acoustic symmetry of a room off balance, too. It's also important to be aware of the location of doors and windows. It is not always possible to achieve ideal symmetry, but it's worth getting as close as possible.

The "Sweet Spot"

For both stereo and surround mixing your position in relation to the main front speakers — the "sweet spot" as it's often called — should be one apex of an equilateral triangle. In other words your distance from either speaker should be the same as the distance between the two speakers. The speakers should also be "toed in" to the corresponding 60° angle so that the drivers are aimed directly at the listening position. The height of the speakers should be such that the tweeters are roughly aligned with your ears (this is because high frequencies are the most directional).



Fine-tuning for Stereo (MSP7 STUDIO or MSP5 STUDIO x 2)

- The speaker LEVEL controls should be set to the same level. A setting of about 12 o'clock corresponds to a nominal input level.
- Since no subwoofer is being used in this setup, if your speakers have a LOW CUT switch, set it to "FLAT" (the MSP7 STUDIO has a LOW CUT switch).
- For accurate monitoring set the LOW TRIM switch to "0". If you want to reduce the low-frequency level a bit set the switch to "-1.5".
- For accurate monitoring set the HIGH TRIM switch to "0". This switch can be set to "-1.5 dB" to attenuate the highs slightly if you find the sound too bright.

Adding a Subwoofer

Even if you don't plan to set up a surround system, adding a subwoofer can be a real advantage for stereo mixing. If you can't hear the extreme low end there's not much you can do to make it sound great. The extended bass response provided by a good subwoofer can indeed help you to improve the overall quality of your mixes.

The location of your subwoofer is not as critical as the main speakers, because frequencies below around 200 Hz — the region your subwoofer will be working in — aren't direc-

tional. To say it another way, the ear can't locate the source of such low frequencies, so in theory the subwoofer can be placed anywhere in the room. In reality it's a good idea to place the subwoofer on the floor somewhere between the main front speakers at the same distance from the listening position as the main speakers, but it doesn't have to be dead center.

Fine-tuning for Stereo + Subwoofer (MSP7 STUDIO or MSP5 STUDIO x 2, SW10 STUDIO x 1)

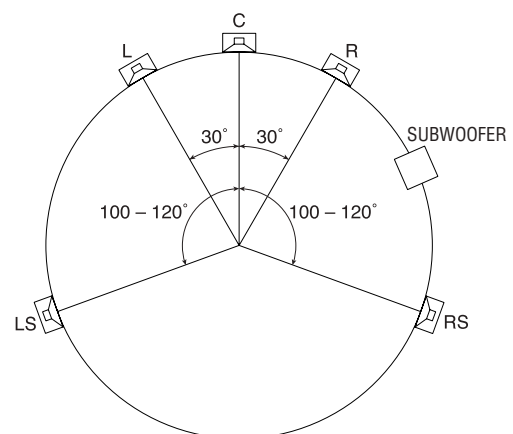
- Set the MSP7 STUDIO or MSP5 STUDIO LEVEL control to about 12 o'clock for nominal input level. If you're using the MSP7 STUDIO set the SW10 STUDIO LEVEL control to about 12 o'clock, and if you're using the MSP5 STUDIO set it to about 10 o'clock. You can then fine-adjust the SW10 STUDIO LEVEL control as required. Another approach would be to adjust the MSP7 STUDIO/MSP5 STUDIO output level to achieve the desired relative balance with the subwoofer.
- Start with the SW10 STUDIO HIGH CUT control set at its center click position, which corresponds to a HPF frequency of about 80 Hz. The HIGH CUT frequency can be adjusted later to achieve the smoothest integration with the MSP7 STUDIO or MSP5 STUDIO speakers.
- If you are using the MSP7 STUDIO, set the LOW CUT switch to "80".
- For accurate monitoring set the MSP7 STUDIO/MSP5 STUDIO LOW TRIM switch to "0". If you want to reduce the level of the low-frequency range, set the switch to "-1.5".
- For accurate monitoring set the MSP7 STUDIO/MSP5 STUDIO HIGH TRIM switch to "0". This switch can be set to "-1.5 dB" to attenuate the highs slightly if you find the sound too bright.

Setting Up for Surround

If you're going to be mixing for surround, obviously you'll need a surround monitoring system. For a 5.1 surround system, for example, you only need to add a center speaker and two rear speakers to the stereo + subwoofer system described in the previous section. Let's see ... two main speakers plus one center speaker plus two rear speakers is a total of five speakers, and ".1" refers to the subwoofer. All present and accounted for!

According to the ITU (International Telecommunications Union) specifications for 5.1 surround setup, the main front speakers are positioned in the 60° equilateral triangle relationship to the listening position described earlier, and the rear speakers should be located at the same distance from the listening position, but at an angle of between 100° and 120°, as shown in the diagram above. The center speaker should be placed precisely midway between the main front speakers, at the same distance from the listen-

ing position as the other speakers (which means that ideally it will be a bit behind the main left and right speakers).



As you may have deduced by now, the main left and right, center, and rear speakers are all located on the circumference of a circle with its center at the listening position. An easy way to get all the distances right is to use a piece of string cut or marked to the exact distance between the main left and right speakers. Attach the string to a mic

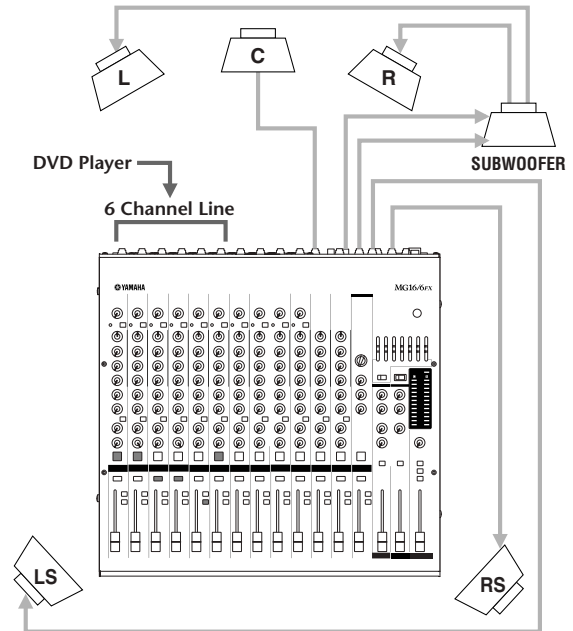
stand or other convenient object at the listening position and use it to measure the distance from the listening position to each of the speakers. Stretched from the listening position to the speaker position the string will also provide a convenient guide for aligning the speakers so that they point directly at the listening position.

MG-series Mixer Setup

If you're connecting to a standard mixer that is not specifically designed for surround production, your main L and R speakers can be connected to any convenient stereo output pair via the SW10 STUDIO subwoofer, while the center and rear speakers will be connected to individual output channels.

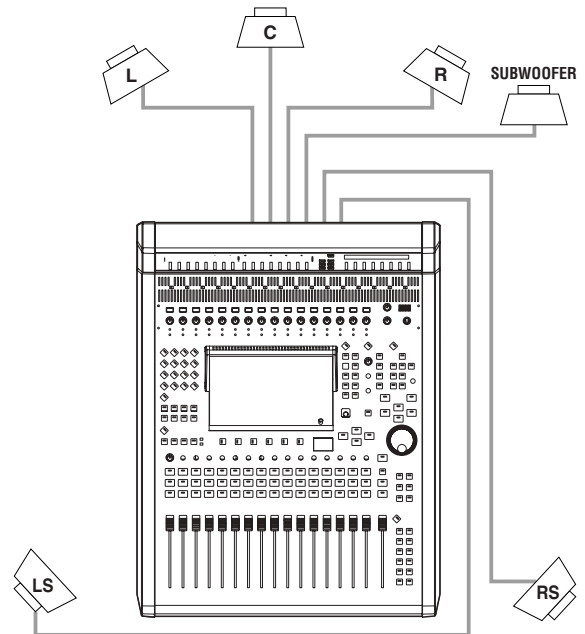
Example: MG16/6FX

DVD Player	Input Channel	Output Connector	Speaker
L	→ Ch1 (ST=ON, PAN → L)	→ ST OUT (L)	→ L
R	→ Ch2 (ST=ON, PAN → R)	→ ST OUT (R)	→ R
LS	→ Ch3 (GRP1-2, PAN → L)	→ GROUP OUT 1(L)	→ LS
RS	→ Ch4 (GRP1-2, PAN → R)	→ GROUP OUT 2(R)	→ RS
C	→ Ch5 (GRP3-4, PAN → L)	→ GROUP OUT 3	→ C
LFE	→ Ch6 (ST=ON, PAN→Center, Fader→+10 dB Boost)	→ ST OUT	→ SUBWOOFER



Digital Mixer Setup

If you're connecting your MSP-series speakers to a mixing console that features built-in surround handling capability — such as the Yamaha DM2000, DM1000, or 02R96 — each speaker will be connected directly to the console output dedicated to handling that particular surround channel. In this type of setup you can take full advantage of the console's advanced surround mixing and bass management facilities.



Fine-tuning for Surround (MSP7 STUDIO or MSP5 STUDIO x 5, SW10 STUDIO x 1)

- Set the MSP7 STUDIO or MSP5 STUDIO LEVEL control to about 12 o'clock for nominal input level. If you're using the MSP7 STUDIO set the SW10 STUDIO LEVEL control to about 1 o'clock*, and if you're using the MSP5 STUDIO set it to about 11 o'clock*. You can then fine-adjust the SW10 STUDIO LEVEL control as required. Another approach would be to adjust the MSP7 STUDIO/MSP5 STUDIO output level to achieve the desired relative balance with the subwoofer.

* If you're using the MSP7 STUDIO with a digital mixer, set the SW10 STUDIO LEVEL control to about 12 o'clock. If you're using the MSP5 STUDIO with a digital mixer set the SW10 STUDIO LEVEL control to about 10 o'clock.

- Start with the HIGH CUT control set at about 2:30, which corresponds to a HPF frequency of about 100 Hz*. The HIGH CUT frequency can be adjusted later to achieve the smoothest integration with the MSP7 STUDIO or MSP5 STUDIO speakers.

* Set to 80 Hz if you're using a digital mixer.

- If you are using the MSP7 STUDIO set the LOW CUT switch to "100 Hz"*.

* Set to 80 Hz if you're using a digital mixer.

- For accurate monitoring set the MSP7 STUDIO/MSP5 STUDIO HIGH TRIM switch to "0". This switch can be set to "-1.5 dB" to attenuate the highs slightly if you find the sound too bright.

Maintain a Consistent Monitoring Level

Another difference between listening and monitoring is that when you're listening for enjoyment you probably listen at significantly different levels at different times: from soft and unobtrusive for background music, right through room-shaking for involved listening or dancing. This is definitely not the case for serious monitoring. The response of your ears changes so drastically according to level, especially in the soft to medium-loud region, that is essential to maintain a consistent monitoring level otherwise you simply won't get consistent mixing results. You'll undoubtedly need to turn up or down a bit at certain points during the production process when listening for specific problems or effects — in fact it is important to listen to your mix at different levels as a final checking process, bringing the levels down very low to check if any elements of the mix disappear and make sure that the vocal continues to maintain its balance in the mix at very low levels — but in general you should stay within a fairly small range.

Just what is the best level to monitor at? Although there is a "standard" monitoring level specification,* the answer for most small studios is "whatever is most comfortable for you." You need to monitor at a level that's loud enough so that you don't miss any soft details, but not so loud that your ears become fatigued (or your neighbors complain). If

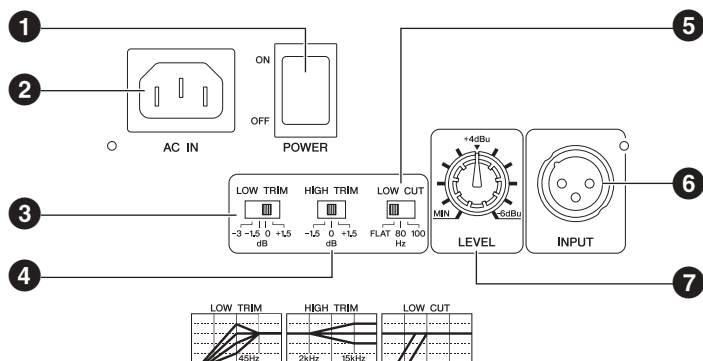
you find yourself turning up the volume after monitoring for a short while, your ears are probably starting to get tired and losing sensitivity. This is obviously bad for your music as well as your ears. So find that "comfort zone" and prepare to make some great music.

*For you techies, the SMPTE RP 200 standard monitoring level is 83 dB SPL (RMS average) at the listening position, or if you're mixing for film you'll need to know that the standard Dolby monitoring level for surround is 85 dB SPL.

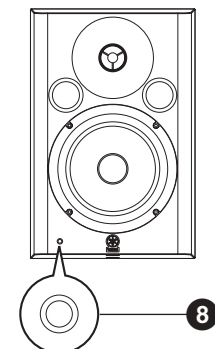
Controls and Functions

MSP7 STUDIO, MSP5 STUDIO

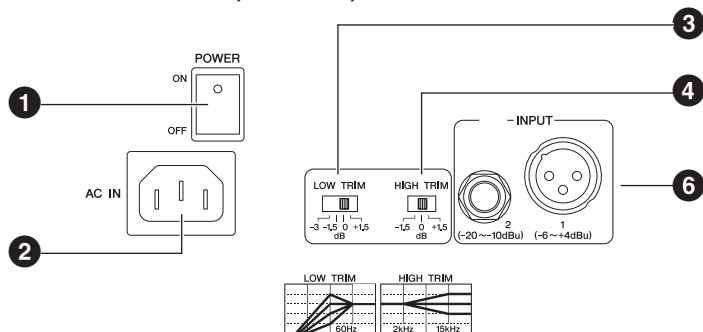
MSP7 STUDIO (Rear Panel)



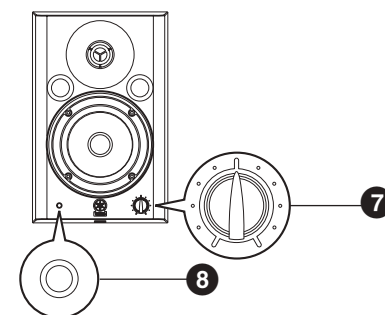
(Front Panel)



MSP5 STUDIO (Rear Panel)



(Front Panel)



1 POWER switch

Turns power to the speaker on or off. When the power is turned on the POWER indicator (8) on the front panel will light green.

2 AC IN Connector

Connect the supplied power cable here. First connect the power cord to the speaker, then insert the power cord plug into the AC outlet.

3 LOW TRIM switch

Adjusts the level of low-frequency range.

MSP7 STUDIO:

With the "+1.5" setting, low frequencies around 45 Hz are boosted by 1.5 dB. With the "-1.5" and "-3" settings the same frequency range is cut by 1.5 dB or 3 dB, respectively.

MSP5 STUDIO:

With the "+1.5" setting, low frequencies around 60 Hz are boosted by 1.5 dB. With the "-1.5" and "-3" settings, the same frequency range is cut by 1.5 dB and 3 dB, respectively.

4 HIGH TRIM switch

Adjusts the level of high-frequency range. With the "+1.5" setting, the range around 15 kHz is boosted by 1.5 dB. With the "-1.5" setting, the range around 15 kHz is cut by 1.5 dB.

5 LOW CUT switch (MSP7 STUDIO)

Cuts the low-frequency range. With the "80 Hz" setting the range below 80 Hz is cut. With the "100 Hz" setting the range below 100 Hz is cut.

6 INPUT 1/2 connector

These are balanced XLR-type and unbalanced phone-type input connectors.

The MSP7 STUDIO only has an XLR-type input connector.



Do NOT use both the XLR and Phone type connector at the same time. Please connect to only one of these connectors.

7 LEVEL control

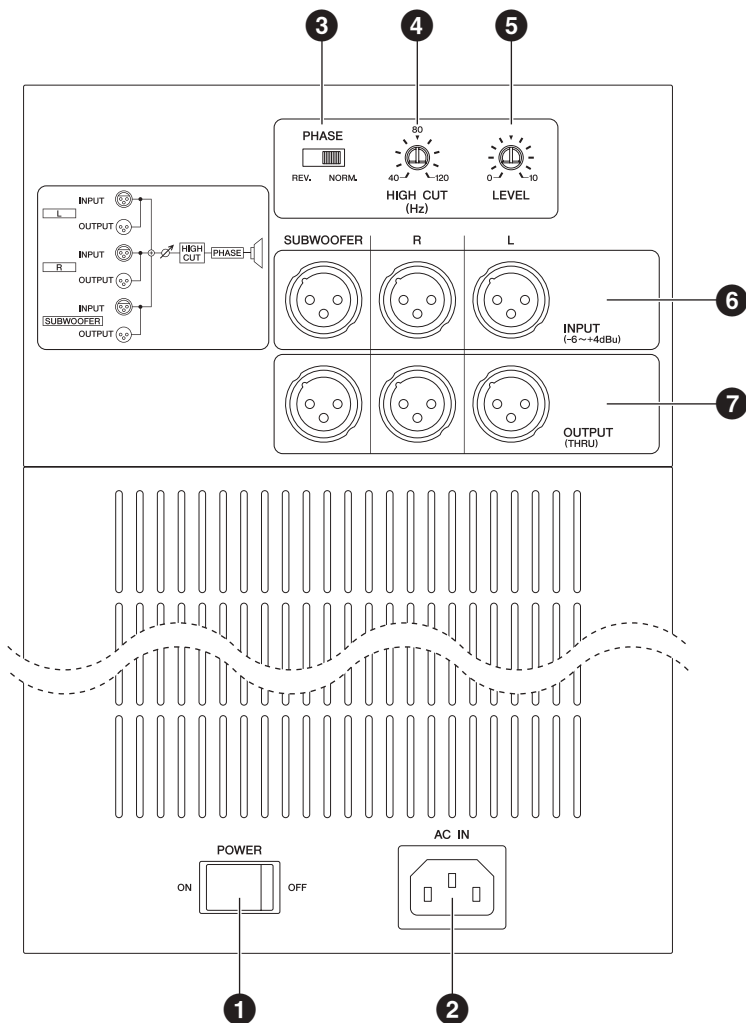
Adjusts the overall output level.

8 POWER indicator

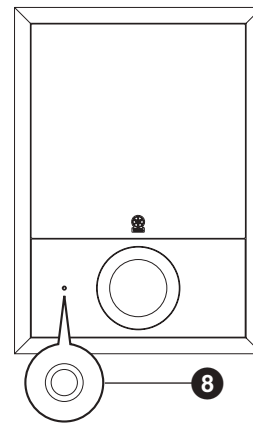
When the power is turned on the POWER indicator will light green. The power indicator will flash red to indicate clipping.

SW10 STUDIO

SW10 STUDIO (Rear Panel)



(Front Panel)



1 POWER switch

Turns power to the speaker on or off. When the power is turned on the POWER indicator (8) on the front panel will light green.

2 AC IN Connector

Connect the supplied power cable here. First connect the power cord to the subwoofer, then insert the power cord plug into the AC outlet.

3 PHASE switch

Selects a phase of output sound from the SW10 STUDIO. You will usually set this switch to "NORM". However, the "REV." setting may improve low-range response, depending on the type and location of the entire speaker system. Try both settings and select the one that produces the best low-end sound.

4 HIGH CUT control

Use the HIGH CUT control to set the cutoff frequency of the signal output from the SW10 STUDIO from 40 Hz to 120 Hz.

5 LEVEL control

Adjusts the overall output level.

6 INPUT L/R/SUBWOOFER connector

These are balanced XLR-type input connectors. Three different signals can be simultaneously input via these connectors. The input signals are mixed before being sent to the subwoofer.

7 OUTPUT L/R/SUBWOOFER connector

These XLR-type balanced output connectors output the signals received at the INPUT L/R/SUBWOOFER connectors, respectively.

8 POWER indicator

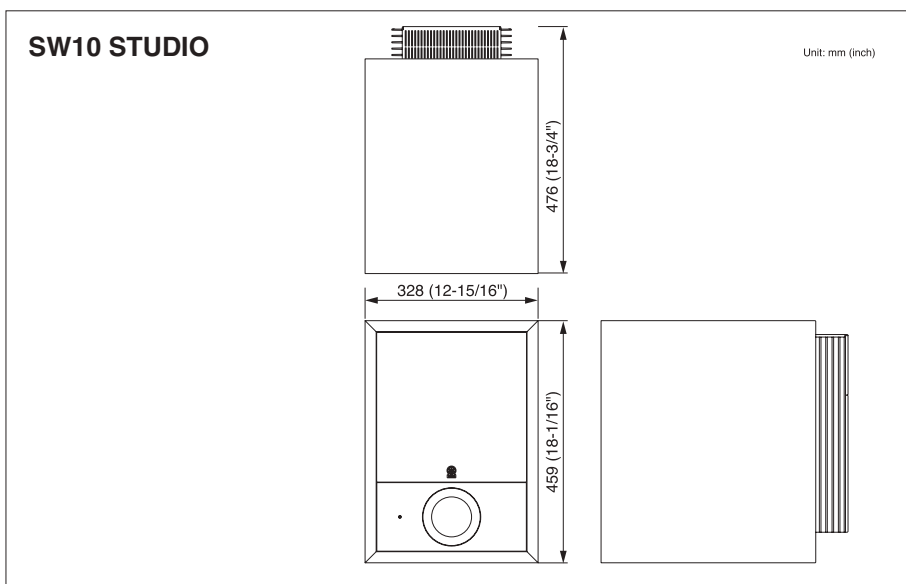
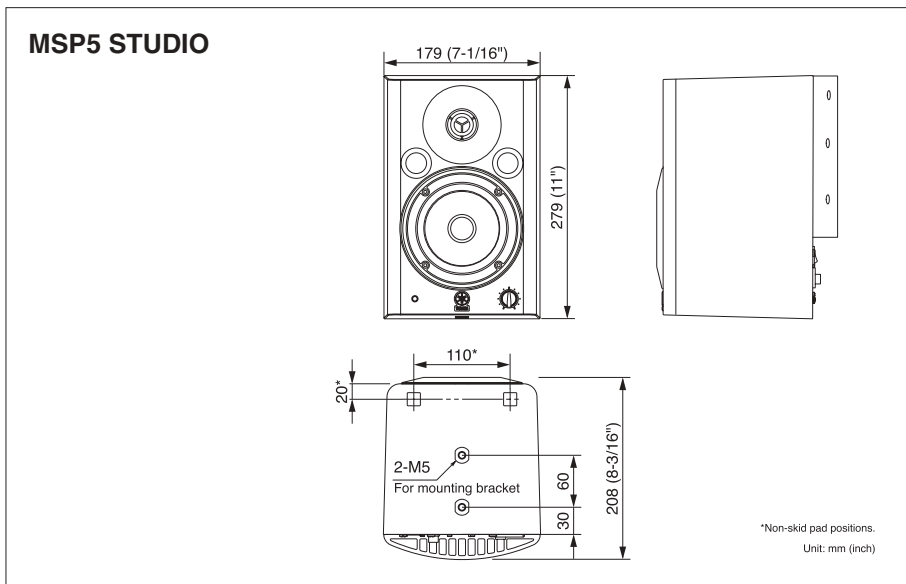
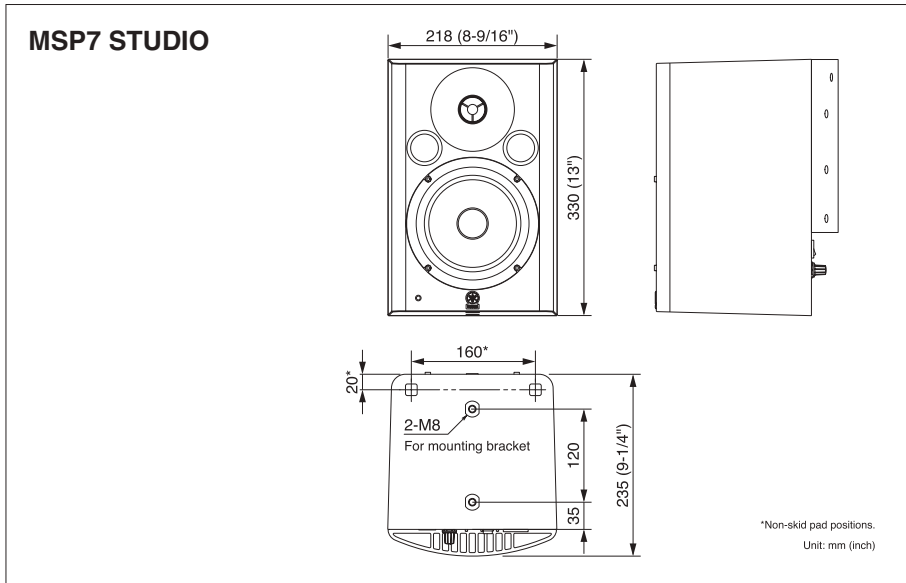
When the power is turned on the POWER indicator will light green. The power indicator will flash red to indicate clipping.

Specifications

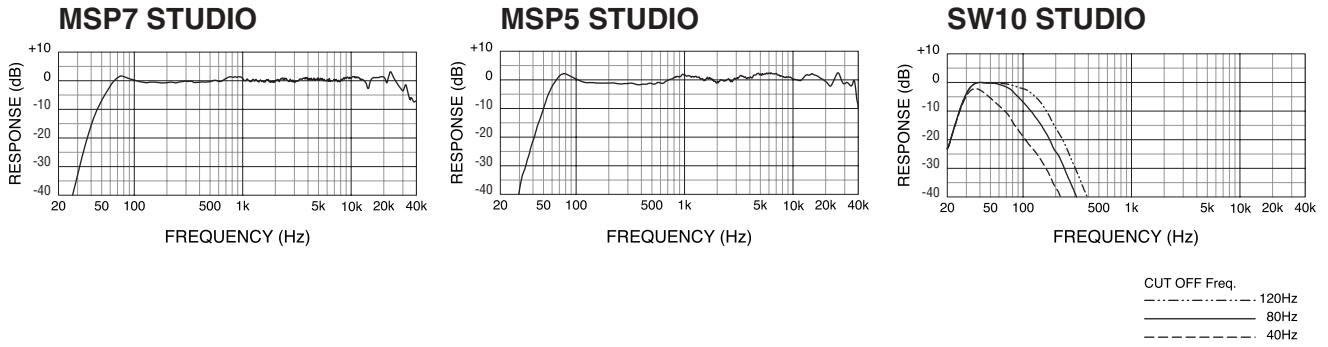
MODEL		MSP7 STUDIO	MSP5 STUDIO	SW10 STUDIO
GENERAL				
Type		Biamp 2-way Powered Speaker	Biamp 2-way Powered speaker	Powered subwoofer
Crossover Frequency		2.5 kHz LF: 30 dB/oct, HF: 30 dB/oct	2.5 kHz LF: 24 dB/oct, HF: 24 dB/oct	—
Overall Frequency Response		45 Hz - 40 kHz (-10 dB)	50 Hz - 40 kHz (-10 dB)	25 Hz - 150 Hz (-10 dB)
Maximum Output Level		106 dB, 1 m on Axis	101 dB, 1 m on Axis	111 dB, 1 m on Axis
Demensions (W x H x D)		218 x 330 x 235 mm	179 x 279 x 208 mm	328 x 459 x 476 mm
Weight		12.2 kg	7.9 kg	26.5 kg
Magnetic Shielding		Yes	Yes	Yes (None covered type)
SPEAKER SECTION				
Components	LF	6.5" cone	5" cone	10" cone
	HF	1.0" dome	1.0" dome	
Enclosure	Type	Bass-Reflex	Bass-Reflex	Bass-Reflex
	Material	PP	PP	MDF
AMPLIFIER SECTION				
Output Power *		LF: 80 W THD = 0.05 %, RL = 4 Ω	LF: 40W THD = 0.02 %, RL = 4 Ω	180W f = 100 Hz, THD = 1 %, RL = 8 Ω
		HF: 50 W THD = 0.05 %, RL = 6 Ω	HF: 27 W THD = 0.02 %, RL = 6 Ω	
S/N, IHF-A filter		≥ 99 dB, LEVEL = Max	≥ 94 dB, LEVEL = Max	≥ 100 dB, LEVEL = Max
Input Sensitivity	XLR-3-31	+4 dBu, LEVEL = Center	+4 dBu, LEVEL = Center	+4 dBu, LEVEL = Center
		-6dBu, LEVEL = Max	-6 dBu, LEVEL = Max	-6 dBu, LEVEL = Max
	PHONE	—	-10 dBu, LEVEL = Center	—
		—	-20 dBu, LEVEL = Max	—
Input Connectors, Impedance		XLR-3-31 (balanced), 10 kΩ	XLR-3-31 (balanced), 10 kΩ PHONE (unbalanced), 10 kΩ	XLR-3-31 x 3 (balanced), 10 kΩ
Output Connectors		—	—	XLR-3-32 x 3 (balanced), Parallel connection with Input
Controls	LEVEL control	31 Positions Detent type VR (Min = - ∞ Attenuation)	31 Positions Detent type VR (Min = - ∞ Attenuation)	Center Click VR (Min = - ∞ Attenuation)
	LOW CUT switch	FLAT/ 80 Hz (12 dB/oct)/ 100 Hz (12 dB/oct)	—	
	HIGH TRIM	+1.5/0/-1.5 dB at 15 kHz	+1.5/0/-1.5 dB at 15 kHz	—
	LOW TRIM	+1.5/0/-1.5/-3 dB at 45 Hz	+1.5/0/-1.5/-3 dB at 60 Hz	—
	POWER switch	on/off	on/off	on/off
	PHASE switch	—	—	Normal/Reverse
LPF control	—	—	40-120 Hz, 80 Hz at Center Click	
Indicators	LED	Green: Power On Red: Clipping	Green: Power On Red: Clipping	Green: Power On Red: Clipping
Power Consumption		100 W	60 W	160 W
AC CORD				
Length		2.5 m	2.5 m	2.5 m

* These specifications apply to rated power supplies of 100, 120, 230 and 240 V.

Dimensions

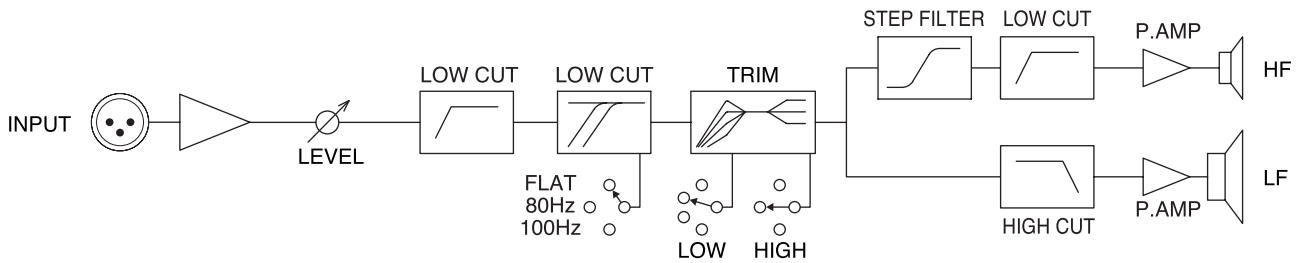


Performance graph

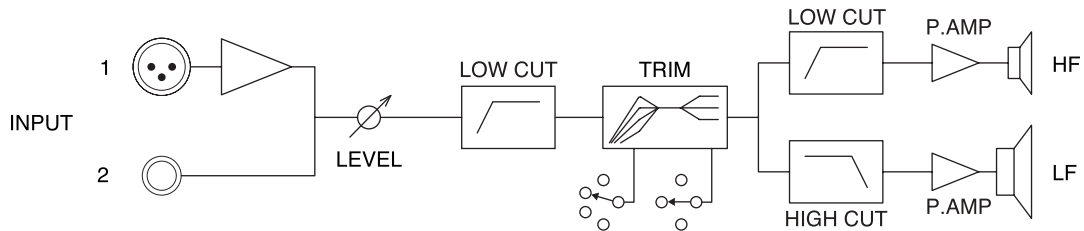


Block Diagram

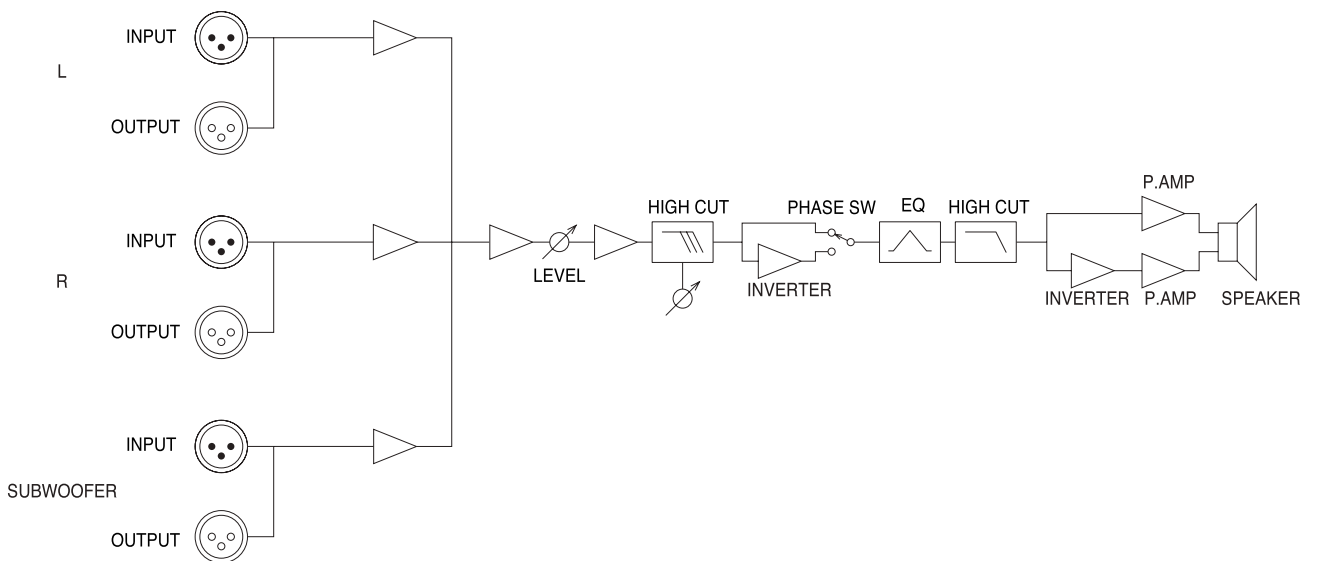
MSP7 STUDIO



MSP5 STUDIO



SW10 STUDIO



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