

4. FUNCTIONS OF DPH7500z

With the DPH7500z, you can enjoy the DSP and equalizer effects by simulating the sound field using the easy menu with simple operation (easy mode), and also by simulating the sound field by adjusting the sound according to the width of the car interior (professional mode).

- Choose either easy mode or professional mode to adjust the sound field and sound quality.
- The following major functions are available on the DPH7500z:

Functions common to each mode

Spectrum analyzer display, auto loudness, etc.

Easy mode

Graphic equalizer function, DSP function, etc.

Professional mode

Space equalizer function, parametric equalizer function, etc.

- In this manual, graphic equalizer is hereafter referred to as G.EQ, space equalizer referred to as S.EQ, and parametric equalizer referred to as P.EQ.

Functions common to each mode

7-band spectrum analyzer display

Spectrum analyzer display of 7 bands is possible.

Auto Loudness Adjustments

You can vary the amount of compression between 0 and 10 without changing the loudness.

Subwoofer Adjustments

The following adjustments can be made if a subwoofer is connected:

1. You can set the speakers to:
"OFF", "MONO" and "STEREO".
2. You can set the subwoofer volume to:
0 to 14
3. You can set the low-pass filter frequency to:
50Hz, 80Hz or 120Hz.
* The slope of the low-pass filter is 24dB/oct.

High-pass Adjustments

You can select the frequency of the high-pass filter from Through, 50Hz, 80Hz and 120Hz.

- * The slope of the high-pass filter is 18dB/oct.

Test-tone Output

Test tones can be output in the following order to check the speaker connections:

FRONT-LEFT → FRONT-RIGHT → REAR-LEFT → REAR-RIGHT → WOOFER-LEFT → WOOFER-RIGHT → ALL(all speakers) → OFF(no sound)

Title Input

You can assign and display titles for the DSP, G.EQ, S.EQ and P.EQ settings you have set.

4V preout

The preout voltage is raised to 4V, providing characteristics that are resistant to noise during signal transmission.

Note:

- Since noise or sound distortion may occur when an external amplifier is connected to this unit, keep the amplifier gain at a lower level.

Digital signal input terminal

Since 4 digital input signal terminals are provided with this unit, up to 2 units with digital signal output terminals (such as a CD changer) can be connected.

Notes:

- When the DPH7500z and a unit with digital signal output terminal are connected with the digital optical fiber cable, and the digital optical fiber cable is disconnected, no sound is heard. Reconnect the digital optical fiber cable.
- If you want to listen to music from an analogue input, disconnect the digital optical fiber cable and perform a system check by operating the source unit.

Easy-mode functions <G.EQ (Graphic Equalizer) functions>

G.EQ effect ON/OFF switching

You can turn the sound quality effect of the G.EQ ON or OFF by operating the buttons of the source unit.

Selection of the basic G.EQ menus

6 basic G.EQ menus are stored in the DPH7500z. You can select an appropriate sound quality according to the music.

The basic G.EQ menus are as follows:

1. BASS BOOST;
Low frequencies emphasized.
2. HIGH BOOST;
Medium and high frequencies emphasized.
3. ACOUSTICAL;
Medium frequencies (vocals) emphasized.

4. IMPACT;
Low and high frequencies emphasized.
5. SMOOTH;
Medium and high frequencies reduced.
6. FLAT;
Original sound.

Editing the G.EQ

You can adjust the sound quality using the G.EQ menus as you like.

The settings for the basic G.EQ menus are shown in the following table. The adjustment range of each frequency is between -12dB and +12dB.

G.EQ memory (User memory)

You can store 6 kinds of sound quality into the memory which are edited on the basis of the basic G.EQ menus.

Equalizer setting	Graphic equalizer parameter (dB)						
	50Hz	100Hz	200Hz	400Hz	1kHz	3kHz	12kHz
1. BASS BOOST	+5	+6	-4	+2	0	0	0
2. HIGH BOOST	0	0	0	-2	+4	+3	+4
3. ACOUSTICAL	0	+2	+1	+4	+6	+5	+1
4. IMPACT	+4	+4	+3	+1	+3	+5	+5
5. SMOOTH	+2	+2	0	-2	-4	-4	-2
6. FLAT	0	0	0	0	0	0	0

Easy-mode functions <DSP functions>

DSP effect ON/OFF switching

You can turn the sound field effect of the DSP ON or OFF by operating the buttons of the source unit.

Setting of the listening position

You can select one of the preadjusted listening positions according to the seat position.

The following 6 listening positions are available:

FULL SEAT, FRONT-RIGHT, FRONT-LEFT, FRONT, REAR and PASS.

Fine-tuning the Listening Position

The time taken for the sound to leave the speaker and reach you can be fine-tuned to create a natural sound field, no matter where you are sitting in the car.

Selection of the sound field (DSP) menus

12 basic DSP menus are stored in the DPH7500z.

You can select an appropriate sound field according to the music.

The basic DSP menus are as follows:

BASIC 1

1. HALL: Large concert hall.
2. CHURCH: Church with a vaulted ceiling.
3. STADIUM: Large stadium without roof or walls.
4. LIVEHOUSE: Live performance hall, larger than a jazz club.
5. DISCO: Disco with strong bass.
6. JAZZCLUB: Jazz club with a low ceiling.

BASIC 2

1. DOME: Indoor sports arena.
2. CHAMBER: Large, echoing hall.
3. PARK: Vast outdoor area.
4. THEATER: Movie or drama theatre.
5. STUDIO: Listening room in a home.
6. BGM: Vocals cut.

Editing the DSP

You can adjust the sound field using the DSP menus as you like.

- The DSP parameters and their contents are as follows:

EFFECT: Adjusts the percentage of reflected sound.

INITIAL DELAY: Adjusts the distance between sound source and reflecting surfaces.

REAR MIX: Adjusts the ratio of the direct sound output from the rear speaker.

REVERB TIME: Adjusts reverberation length.

ROOM SIZE: Adjusts expansion.

HIGH: Adjusts the percentage of high frequencies in reverberations.

LIVENESS: The sense of the room's dynamics can be adjusted.

- The settings for the basic DSP menus and the adjustment ranges are shown in the following table.

About the sound field system

The DPH7500z divides the sound field into three systems: reverberation, early-reflection and B.G.M. The reverberation system is the part of the sound field where reverberating sound is vivid, while the early-reflection system is the part of the sound field where reflected sound is emphasized.

- DSP menus for the reverberation system: HALL, CHURCH, DOME, CHAMBER
- DSP menus for the early-reflection system: STADIUM, LIVEHOUSE, DISCO, JAZZCLUB, PARK, THEATER, STUDIO
- DSP menus for the B.G.M system: B.G.M

Notes:

- There are some parameters that cannot be adjusted, depending on the sound field system.
- The reverberation system cannot adjust ROOM SIZE and LIVENESS parameters.
- The early-reflection system cannot adjust REVERB TIME and HIGH parameters.
- The B.G.M system can adjust only the EFFECT parameter.

DSP memory (User memory)

You can store 6 sound fields into the memory which, are edited on the basis of the basic DSP menus.

Initial setting		DSP parameter						
		EFFECT	INITIAL DELAY	REAR MIX	ROOM SIZE	LIVENESS	REVERB TIME	HIGH
BASIC 1	1. HALL	50%	50ms	100%			2.5s	0.5
	2. CHURCH	50%	95ms	100%			9.5s	0.5
	3. STADIUM	50%	85ms	100%	2.0	5		
	4. LIVEHOUSE	50%	20ms	100%	2.0	5		
	5. DISCO	50%	3ms	100%	2.0	5		
	6. JAZZCLUB	50%	1ms	100%	2.0	5		
BASIC 2	1. DOME	50%	65ms	100%			7.0s	0.5
	2. CHAMBER	50%	25ms	100%			4.2s	0.5
	3. PARK	50%	100ms	100%	2.0	5		
	4. THEATER	50%	1ms	100%	2.0	5		
	5. STUDIO	50%	1ms	100%	2.0	5		
	6. B.G.M	100%						
Adjustment range		0 to 100%	0 to 100ms	0 to 100%	0.1 to 4	0 to 10	0.3 to 10s	0.1 to 1

Professional-mode functions <S.EQ (Space Equalizer) functions>

S.EQ effect ON/OFF switching

You can turn the sound pressure distribution compensation effect of the S.EQ ON or OFF by operating the buttons of the source unit.

Selection of the S.EQ menus

6 basic S.EQ menus are stored in the DPH7500z according to the car type. The basic S.EQ menus are as follows:

1. SEDAN-L (Large-scale sedan)
2. SEDAN-S (Small-scale sedan)
3. WAGON-L (Large-scale wagon)
4. WAGON-S (Small-scale wagon)
5. 1BOX-L (Large-scale van)
6. 1BOX-S (Small-scale van)

The settings of DIFFUSE, CAR WIDTH and CAR LENGTH for each basic S.EQ menu is the center value (5) that meets each car type.

Editing the S.EQ menus

You can adjust the sound pressure distribution on the basis of the basic S.EQ according to the car type.

- The S.EQ adjustment contents are as follows:
DIFFUSE
Compensates for spacial impression.
CAR WIDTH
Compensates for the width of the car's interior (lateral direction).
CAR LENGTH
Compensates for the length of the car's interior (longitudinal direction).
- The adjustable range of the S.EQ menus are 1 to 10 for each item.

S.EQ memory (User memory)

You can store 6 kinds of sound pressure distribution into the memory which, are edited on the basis of the basic S.EQ menus.

Professional-mode functions <P.EQ (Parametric Equalizer) functions>

P.EQ effect ON/OFF switching

You can turn the transmission frequency characteristics compensation effect of the P.EQ ON or OFF by operating the buttons of the source unit.

Selection of the P.EQ menus

6 basic P.EQ menus are stored in the DPH7500z according to the car type and the speaker installation position.

- The different car types and the speaker installation positions are as follows:

1. SEDAN front: 2WAY rear: Rear parcel
2. SEDAN front: FULL rear: Rear door
3. WAGON front: 2WAY rear: Beside the luggage
4. WAGON front: FULL rear: Rear door
5. 1BOX (Van) front: 2WAY rear: Beside the luggage
6. 1BOX (Van) front: FULL rear: Equivalent to rear door

- The settings of the basic P.EQ menus are as follows:

Vehicle type	Parametric Equalizer Parameter			
	Channel	BAND 1	BAND 2	BAND 3
1. Sedan	Front	250Hz/F, 3/Q, -8dB/G	2kHz/F, 1/Q, -4dB/G	5kHz/F, 1/Q, -4dB/G
	Rear	250Hz/F, 3/Q, -10dB/G	1.25kHz/F, 5/Q, 0dB/G	8kHz/F, 5/Q, 0dB/G
2. Sedan	Front	250Hz/F, 7/Q, -10dB/G	800Hz/F, 3/Q, -4dB/G	8kHz/F, 1/Q, -5dB/G
	Rear	80Hz/F, 7/Q, +3dB/G	125Hz/F, 5/Q, -12dB/G	1.25kHz/F, 5/Q, 0dB/G
3. Wagon	Front	250Hz/F, 3/Q, -8dB/G	1kHz/F, 3/Q, -8dB/G	10kHz/F, 1/Q, -6dB/G
	Rear	250Hz/F, 3/Q, -8dB/G	800Hz/F, 1/Q, -8dB/G	8kHz/F, 5/Q, 0dB/G
4. Wagon	Front	250Hz/F, 7/Q, -8dB/G	400Hz/F, 7/Q, -10dB/G	1.25kHz/F, 7/Q, -8dB/G
	Rear	125Hz/F, 3/Q, -8dB/G	500Hz/F, 5/Q, -5dB/G	1.6kHz/F, 3/Q, 0dB/G
5. 1Box (Van)	Front	125Hz/F, 5/Q, -4dB/G	1.25kHz/F, 3/Q, -4dB/G	2kHz/F, 7/Q, +3dB/G
	Rear	250Hz/F, 1/Q, -6dB/G	630Hz/F, 3/Q, -4dB/G	8kHz/F, 5/Q, 0dB/G
6. 1Box (Van)	Front	250Hz/F, 3/Q, -4dB/G	1.25kHz/F, 3/Q, -8dB/G	80Hz/F, 3/Q, +3dB/G
	Rear	250Hz/F, 3/Q, -8dB/G	500Hz/F, 5/Q, -5dB/G	8kHz/F, 5/Q, 0dB/G

F; Center frequency (Hz), Q; Q curve, G; Gain(dB)

Editing the P.EQ menus

You can compensate for the frequency characteristics using the basic P.EQ according to your car type.

- The P.EQ adjustment contents are as follows:

Channel selection

Select the channel to be compensated (front or rear).

Selection of center frequency

Select the center frequency that you want to compensate from the range of 20Hz to 20kHz. (1/3 octave step, 31 points)

Selection of Q-curve

Set the sharpness of the Q-curve to one of the parameters: 1, 3, 5, 7 and 20.

Gain adjustment

Adjust the gain (output level) in the range of -12dB to +12dB. (1dB step, 25 points)

About the compensation of frequency characteristics

See Figure 1 concerning the relationship of the center frequency, Q-curve (Q) and gain.

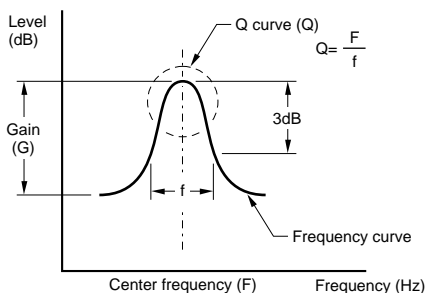


Figure 1

About the Q-curve (Q)

For the Q-curve (Q), setting larger values makes the curve sharper, setting smaller values makes the curve flatter. (Figure 2)

Selecting the Q-curve (Q) opposite to the frequency curve to be compensated makes the frequency characteristics flat.

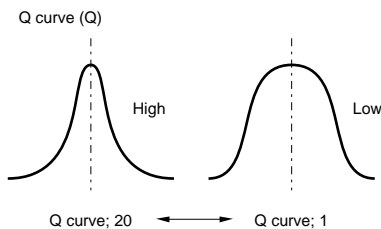


Figure 2

P.EQ memory (User memory)

You can store 6 frequency characteristics into the memory, which are edited on the basis of the basic P.EQ menus.

5. INSTALLATION

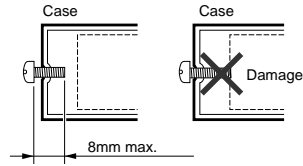
1. Before starting, be sure to disconnect the battery's negative "-" terminal to prevent accidents due to short-circuits.

2. Location

Consider safety and operability when selecting a place for installation. Avoid the following.

- Locations where the unit will hamper driving.
- Locations where the unit could injure passengers if the car stops suddenly.
- Locations exposed to direct sunlight or hot air from the heater, etc.
- Locations where the unit may be exposed to rain or water.

3. Be sure to use the included screws and brackets. Screws other than those supplied could damage the unit.

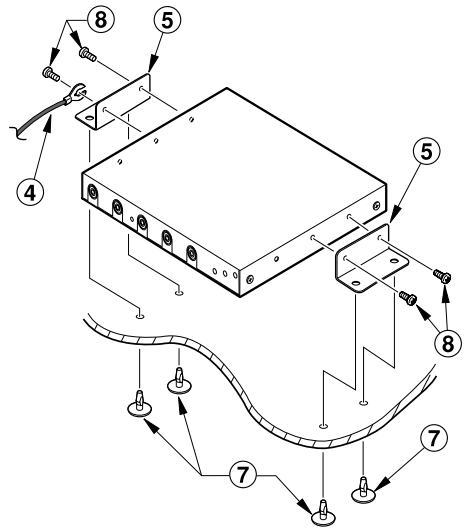


4. When drilling holes in the dashboard, etc., be sure to check beforehand that there are no harnesses or other wires on the inside.

Installation example (Installing the unit under the driver's seat)

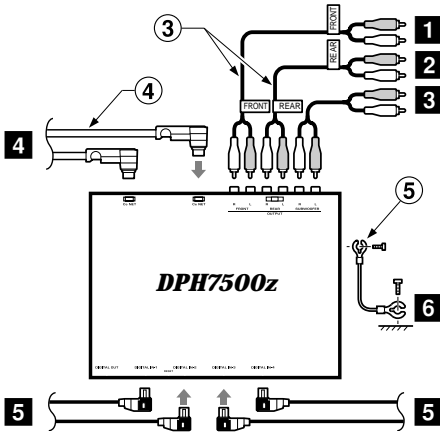
Note: Please read this chapter referring to "4. IDENTIFICATION OF PARTS" at the beginning of this manual.

1. Attach the mounting brackets (5) to the sides of the DPH7500z using the screws (8) provided.
2. Select the location on the floor mat. Drill holes in the floor mat to match the positions of the holes in the mounting brackets (5).
3. Insert the canoe clips (7) from the rear of the floor mat and install the DPH7500z.
 - * There are three mounting holes on each side of the DPH7500z. Select the appropriate holes to match to the installation location.



6. CONNECTIONS

Note: Please read this chapter referring to “4. IDENTIFICATION OF PARTS” at the beginning of this manual.

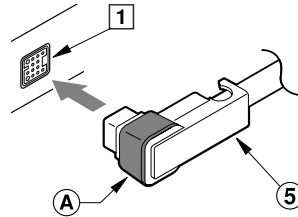


- 1** RCA cable (③)
Connect it to the source unit's front input terminals (grey) to use the source unit's built-in amplifier or to the amplifier's front input terminals.
- 2** RCA cable (③)
Connect it to the source unit's rear input terminals (black) to use the source unit's built-in amplifier or to the amplifier's rear input terminals.
- 3** RCA extension cable (sold separately)
Connect it to the subwoofer amplifier.
- 4** CeNET cable (④)
Connect it to the source unit, CD changer or MD changer.
- 5** Digital optical fiber cable (sold separately)
Connect it to the source unit, CD changer or MD changer.
- 6** Ground lead (⑤)
Connect it to vehicle chassis ground.

How to make wirings

1. CeNET Cable

Orient the CeNET ⑤ cable in the direction shown in the figure and insert it until it is locked in position. To remove the CeNET cable, pull it by lightly grasping the slide cap (A) in your fingers.

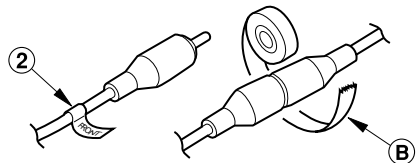


⚠ CAUTION

- Wire the CeNET cable so that there is minimal tension in the cable, and the connection part will not come off.
- To extend the CeNET cable, use either CCA-520 (98.4"/2.5m) or CCA-521 (23.6"/0.6m) (both are separately sold CeNET extension cables.).

2. RCA Cable

Attach the supplied name plate ② on the RCA cable to show where to connect it. After checking where to connect it from the name plate, connect the RCA cable.



⚠ CAUTION

- Do not remove the insulating cap of the RCA cable that is not to be connected, to prevent short-circuit.
- Fix the connection part of the RCA cable with insulating tape (B) so that it will not

How to make wirings

come loose and disconnect.

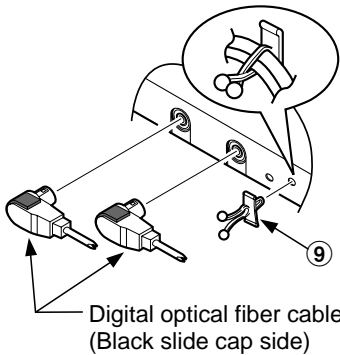
3. Digital Optical Fiber Cable

When you connect the digital optical fiber cable to the digital input terminal or to the digital output terminal, firmly insert it until it is locked in position.

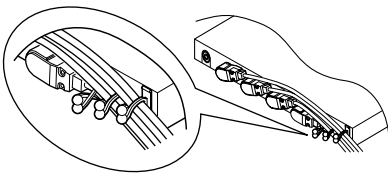
Connect the black slid cap side to the digital input terminal of the DPH 7500z.

Note:

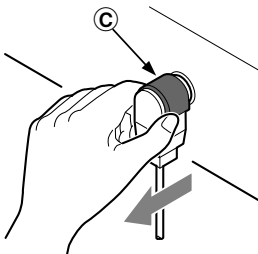
Do not bend the digital optical fiber cable through a loop smaller than 1" (3cm) in radius. Doing so will greatly reduce performance.



After connecting, fasten the cable using the included cable clip (9). One cable clip can fix up to 2 digital optical fiber cables.



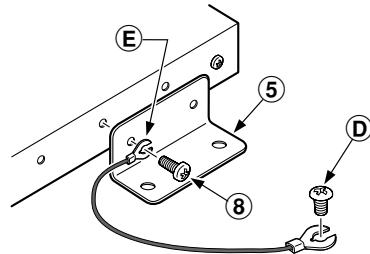
To remove the digital optical fiber cable, pull it by lightly grasping the slide cap (C) of the cable in your fingers.



4. Ground lead

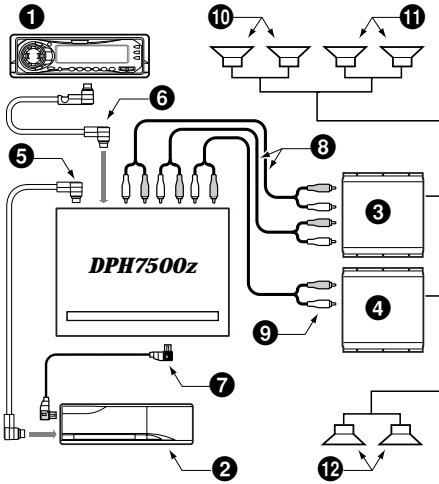
Tighten the small terminal of the ground lead (E) together with the mounting bracket (5), and connect the large terminal to the metal part of the car body using the car screw (D).

If grounding is not achieved, noise results.

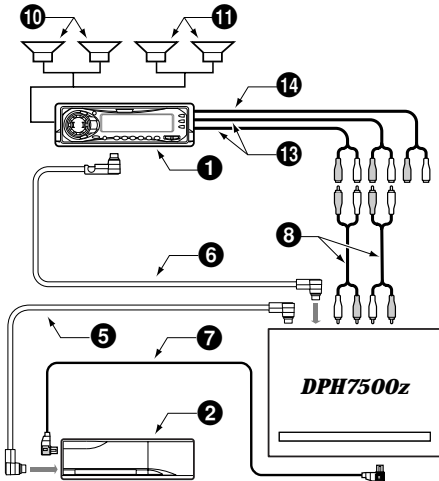


7. SYSTEM EXAMPLES

System with external power amplifier and DSP



System with internal power amplifier and DSP



- ❶ Source unit compatible with CeNET connection
- ❷ CD changer compatible with CeNET connection
- ❸ 4-channel power amplifier
For connection with the front/rear speakers.
- ❹ 2-channel power amplifier
For connection with the subwoofer speakers.
- ❺ CeNET cable (provided with the CD changer)
Using this cable, connect the DPH7500z to the CD changer.
- ❻ CeNET cable (provided with the DPH7500z)
Using this cable, connect the DPH7500z to the source unit.
- ❼ Digital optical fiber cable
Using this cable, connect the DPH7500z to the CD changer.
- ❽ RCA cable (provided with the DPH7500z)
Using this cable, connect the DPH7500z to the 4-channel power amplifier for the front/rear speakers, or connect the DPH7500z to the front /rear line out terminal of the source unit.
- ❾ RCA cable
Using this cable, connect the DPH7500z to the 2-channel power amplifier for the subwoofer speaker.
- ❿ Front speakers
- ⓫ Rear speakers
- ⓬ Subwoofer speakers
- ⓭ RCA cable for front/rear line out
Connect this cable to the DPH7500z.
- ⓮ RCA cable for non-fader line out
This is not used for this system.

Note:

- The longest wiring length of the CeNET cable is less than 65.62ft (20m). When you connect the CeNET cable, be careful not to exceed the wiring length of 65.62ft (20m).

8. SPECIFICATIONS

- S/N ratio: 107 dB (digital input)
100 dB (analogue input)
- Frequency response: 10 Hz to 20 kHz (± 1 dB)
- Separation: 100 dB (digital input)
97 dB (analogue input)
- Harmonic distortion: 0.003% (digital input)(1 kHz)
0.003% (analogue input)(1 kHz)
- Voltage gain: 2.5 dB (Volume max : 4V pre-out)
- Analogue input: 1.5 VRMS (Max.)
- Digital input: 44.1 kHz sampling frequency, 16-bit digital audio data
- A/D conversion: 20-bit linear, 64 times oversampling
- D/A conversion: 20-bit linear, 8 times oversampling
- DSP:
 - Basic: 12 modes
 - User: 6 modes
- Graphic equalizer (7 bands):
 - Basic: 6 modes
 - User: 6 modes
- Space equalizer:
 - Basic: 6 modes
 - User: 6 modes
- Parametric equalizer: 3 bands x 2 (independent front/rear)
 - Center frequency: 20 Hz to 20 kHz, 1/3 octave steps, 31 points
 - Q curve: 1 to 20
 - GAIN: ± 12 dB
 - Preset: 6 types
- Auto loudness: on/off
- Subwoofer:
 - Voltage gain: +12 dB (max. woofer volume)
 - LPF cut off frequency: Through, 50 Hz, 80 Hz, 120 Hz
 - LPF slope: 24 dB/oct
- Front / Rear:
 - HPF cut off frequency: Through, 50 Hz, 80 Hz, 120 Hz
 - HPF slope: 18 dB/oct
- Power supply voltage: DC 14.4V (10.8V to 15.6V), negative ground
- Power consumption: 560 mA
- External dimensions: 9-1/16" (W) x 1" (H) x 6-11/16" (D)
[230 (W) x 25 (H) x 170 (D)mm]
- Weight: 2.091lb. (0.95 kg)