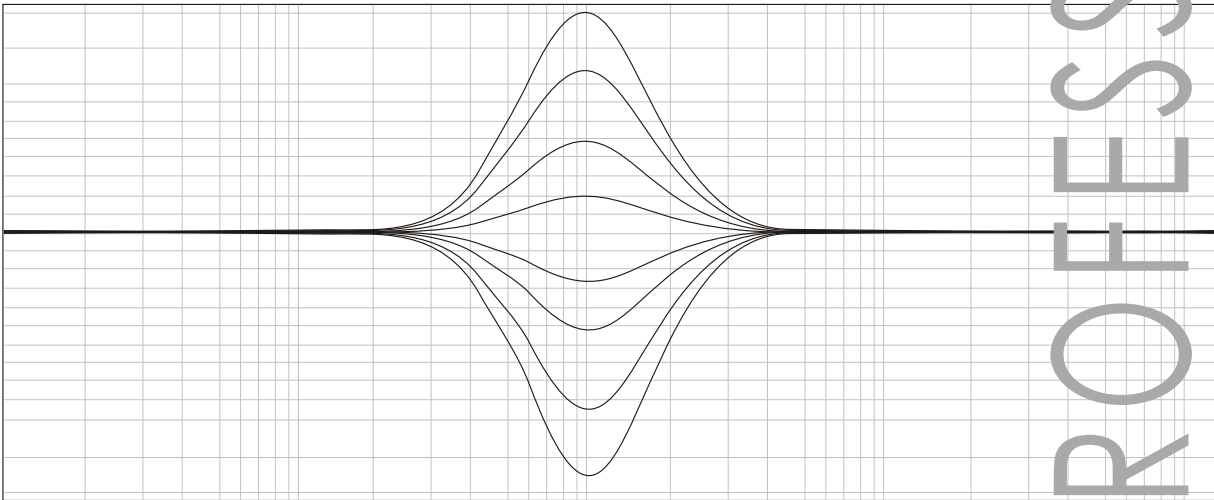
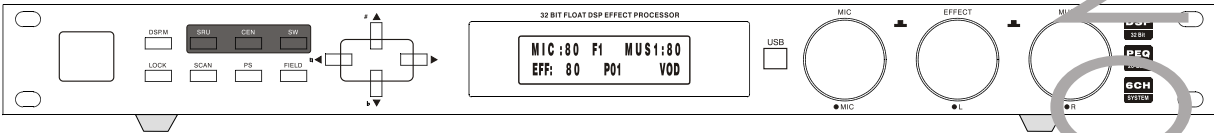


# DSP CORE

DIGITAL EFFECTS PRPCESSOR

## Operating Manual



PROFESSIONAL AUDIO

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Thank you very much for using this processor product!

Please carefully read all the safety and operation instruction before using this machine. Please consult local distributor or directly consult company if there is anything you don't understand.

## Characteristics of this machine:

- ★ Tone quality is transparent and has high fidelity, especially applicable to be used in professional entertainment venues.
- ★ Adopt high quality professional digital DSP chip and have outstanding effect of performance.
- ★ have up to 15 parameter EQ, which can independently adjust parameter of microphone,music,effect,surround,central and subwoofer..
- ★ Have sound field processing function.
- ★ 5.1CH output is flexible for use.

## Precautions for use

- ★ In order to avoid damaging the machine, please don't use it at the following conditions:
  - The place with direct sunlight
  - The place with high temperature and poor ventilation
  - The place with much dust
  - The place with oil fume or thick fog
- ★ Non-technical personnel don't open enclosure and touch its interior,because there is electric shock hazard.
- ★ Please keep the distance between the machine and the wall above 10cm when installing it.
- ★ Please unplug the power plug if don't use it for a long time or there is lightening, so as to avoid accident.
- ★ Never insert a stick-like article into this machine ,so as to avoid damaging it or danger.
- ★ Don't place the articles that is full of liquid on the machine,such as vases.
- ★ Don't spray water or cleanser directly onto this machine when cleaning it, but wipe it by a piece of soft cloth.
- ★ Don't suffer the machine from water drops or water splashing, so as to avoid danger.
- ★ Don't stamp on or pull power line.



### Warning

There is a lightening downward arrow in the triangle and it means to warn the user: There is high voltage equipment within this machine and its voltage is high enough to generate danger.Non-technical ersonnel don't open the machine cover.



### Attention

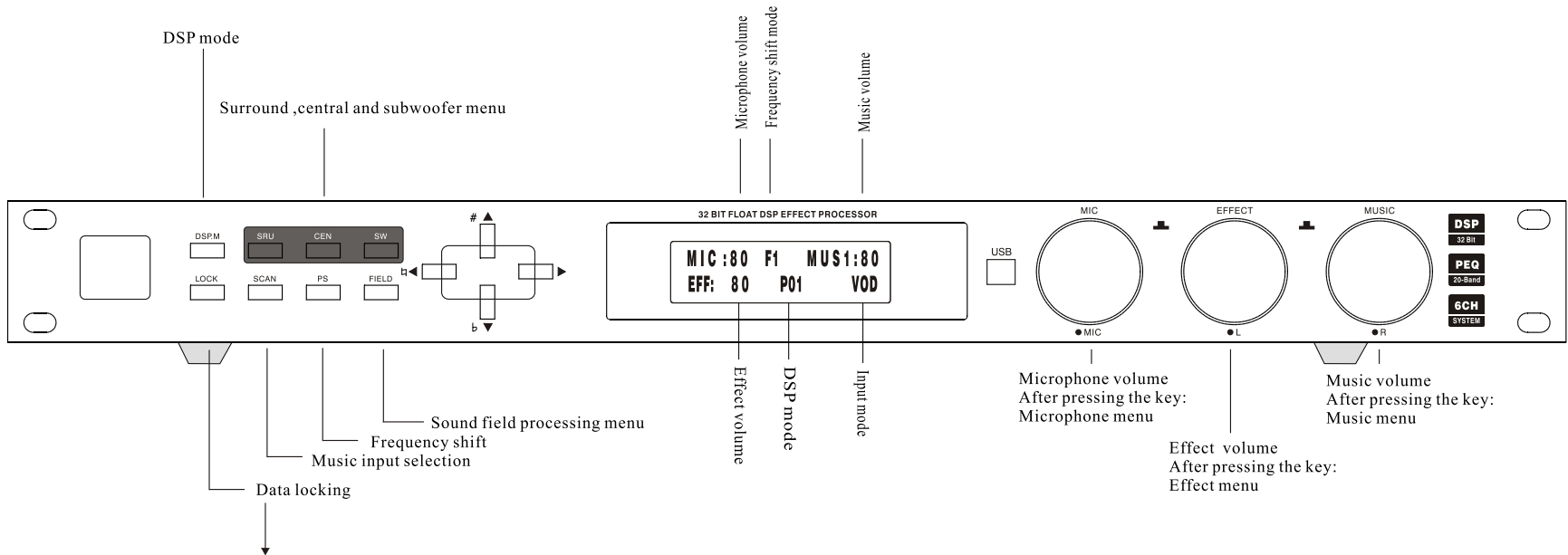
There is an exclamatory mark in the triangle and it means to remind the user: The important operation requirements and specification of this machine.



### Warning

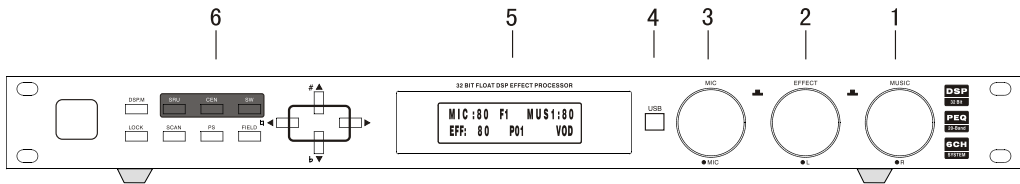
Ventilation fan must be additionally installed at the suitable position if the machine is palced in a home-made equipment cabinet, to avoid overheating and damaging arising from poor ventilation.

## Operating instruction of panel



- ★ Press it continuously for 2s to save current data and the next starting up will recover current status.
- ★ Press LOCK+INPUT simultaneously---lock key or start key.
- ★ Press LOCK+FIELD simultaneously---display user code+times limit of use+ times of use.





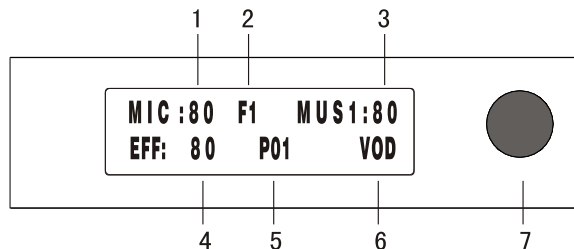
- 1.MUSIC music knob: adjust music volume. Press this knob, including music menu adjusting items.
- 2.EFFECT effect knob : adjust effect volume. Press this knob, including effect menu adjusting items.
- 3.MIC microphone knob: adjust microphone volume. Press this knob, including microphone menu adjusting items.
- 4.PC-USB interface: connect the software used for computers and adjust parameters of machine.
- 5.LCD display screen(see the following screen specification for details).
- 6.Key functions:

DSP.M----call DSP mode  
 SUR----surround menu.  
 CEN----central menu  
 SW----subwoofer menu  
 LOCK----lock existing working status.  
 INPUT----music input selection  
 PS----whistler inhibition adjustment.  
 FIELD----sound field processing

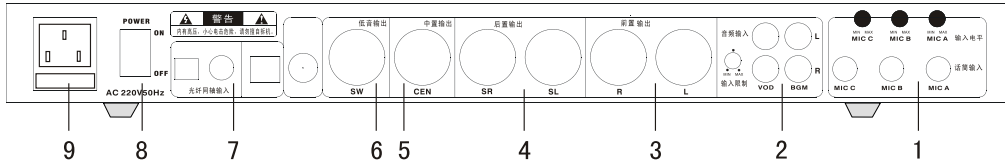
- # ▲ page-up menu. Rise tone when starting music  
 b ▼ page-down menu. Fall tone when starting music.  
 □ ◀ exit submenu.Perform the original tone when starting music.  
 ▶ enter into submenu.

## Indication description of LCD screen

### Indication description of LCD screen

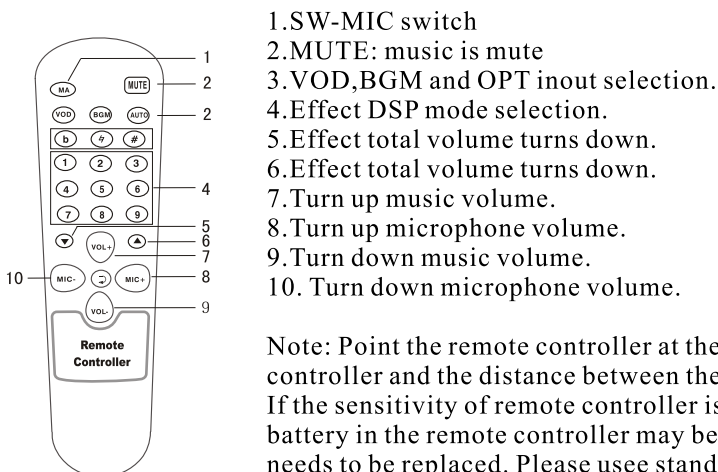


- |  |                                       |
|--|---------------------------------------|
| 1---Microphone value indication(00-86) | 5---DSP mode                          |
| 2---Whistler inhibition mode           | 6---VOD music input status            |
| 3---Music volume indication(00-86)     | 7---Remote controller receive window. |
| 4---Effect volume indication(00-86)    |                                       |



1. Microphone MIC A / MIC B / MIC C input.  
Microphone MIC A / MIC B / MIC C input limit adjustment.
2. Audio VOD and BGM input RCA socket.  
VOD input limit----adjust input level.
3. Preposition audio (XRL) output: used for extraposition power amplifier.
4. Postposition audio (XRL) output: used for extraposition power amplifier.
5. Central audio (XRL) output: used for extraposition power amplifier.
6. Low pitch audio (XRL) output: used for extraposition low pitch power amplifier.
7. Optical fiber coaxial input(optional item).
8. Power switch.
9. AC220 V/50 Hz power socker:insert AC220 V/50 Hz alternating current (AC) voltage through power line and interior fuse is a A/250 V. Please make sure power line is unplugged firstly before replacement.

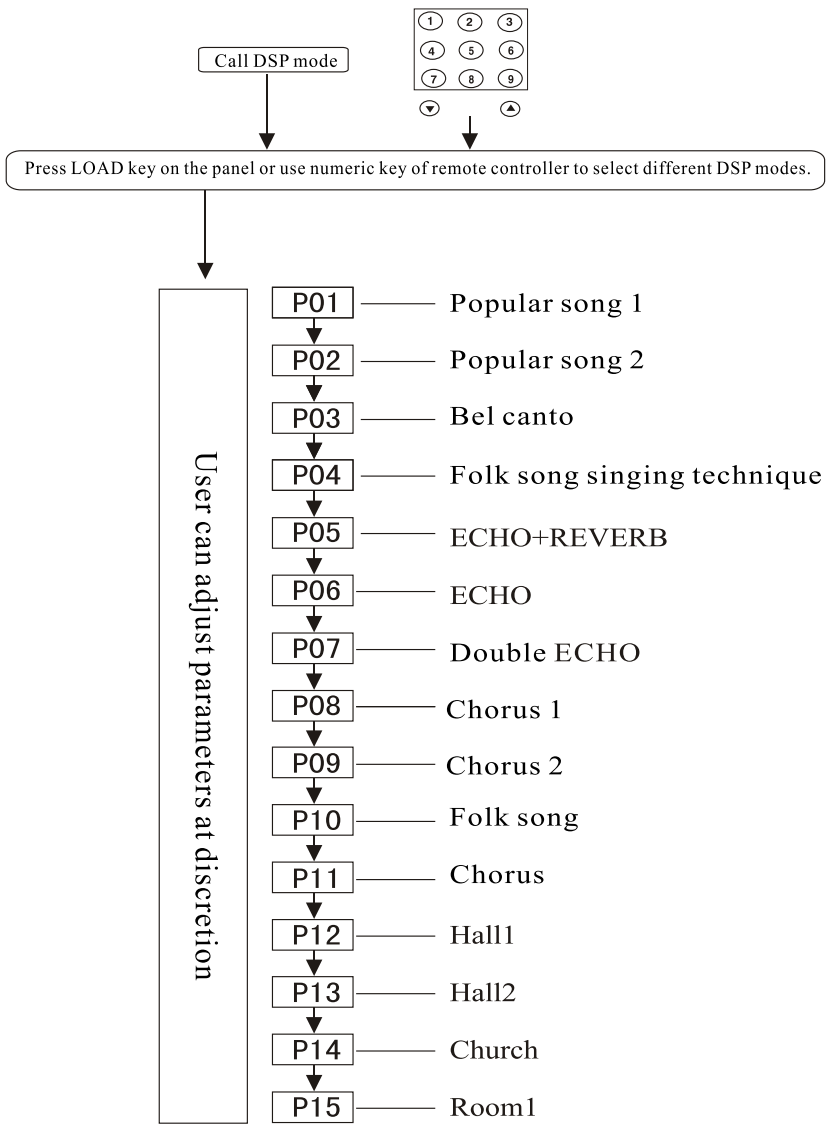
## Application method of remote controller



1. SW-MIC switch
2. MUTE: music is mute
3. VOD,BGM and OPT inout selection.
4. Effect DSP mode selection.
5. Effect total volume turns down.
6. Effect total volume turns down.
7. Turn up music volume.
8. Turn up microphone volume.
9. Turn down music volume.
10. Turn down microphone volume.

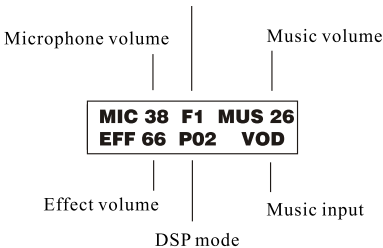
Note: Point the remote controller at the receive window of remote controller and the distance between them shall not be greater than 8m. If the sensitivity of remote controller is too low,electric quantity of battery in the remote controller may be insufficient and the battery needs to be replaced. Please use standard environmental friendly NO.7 battery. Take the battery out if don't use the remote controller for a long time, to avoid damaging the remote controller due to rot of battery.

Description of DSP mode



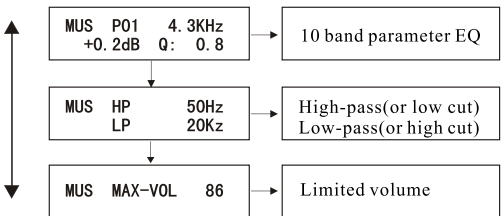
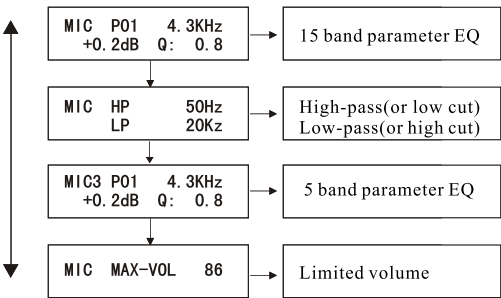
## LCD main menu

Frequency shift status: F10-F1-F0-H1-H10 Corresponding frequency shift -10.2Hz-0Hz-+10.2Hz



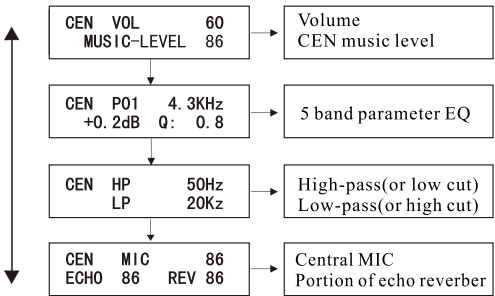
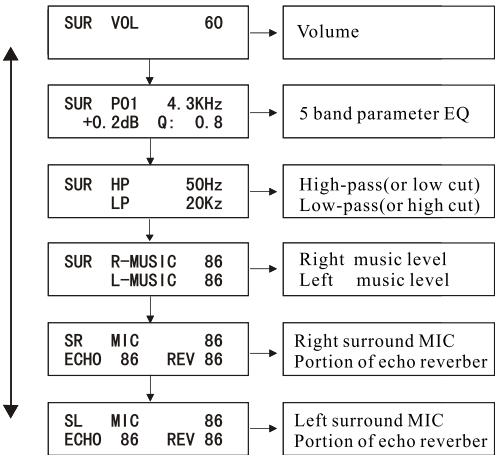
MIC menu  
Press MIC button → Description

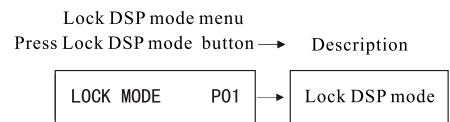
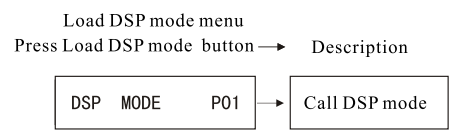
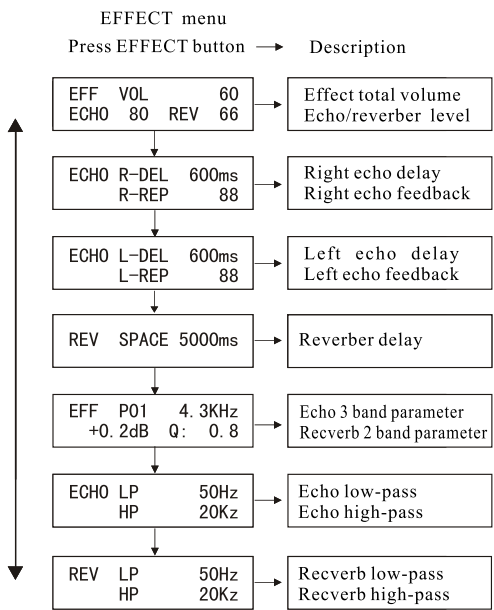
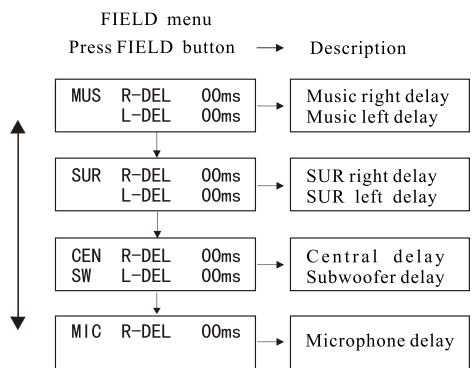
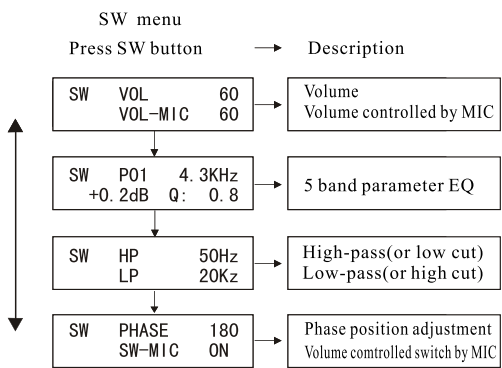
Music menu  
Press Music button → Description



SUR menu  
Press SUR button →

CEN menu  
Press CEN button → Description

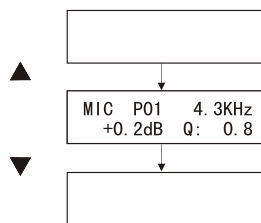




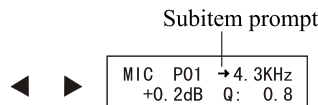
- ★ Press LOCK+INPUT simultaneously---lock key or start key.
- ★ Press LOCK+FIELD simultaneously---inspect user code, times limit of use and times that has been used.

## Adjustment method of menu

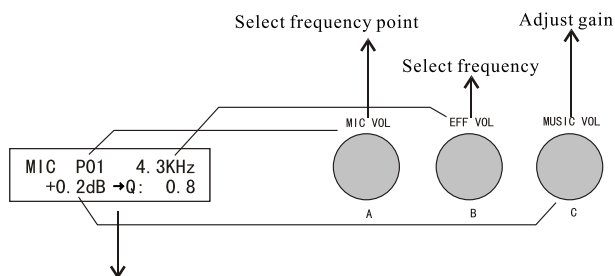
1. Press suitable key according to demand and enter into the selected menu.
2. Press up and down key to select submenu (as shown in the following figure).



3. Press left and right key to select subitem.



4. Rotate knob to adjust parameters.
5. Knob can also be used directly to adjust parameters, as shown in the following figure:



Q value needs to be adjusted through pressing left and right key and enter into this subitem.

1. Press DSP.M key on the panel and LOAD menu displays on the screen.
2. Rotate knob and DSP modes of K01-K04 and P01-P05 can be selected.
3. Then, press DSP.M key and successful call display on the screen.

## Lock of DSP mode

1. Press LOCK key on the panel and LOCK menu displays on the screen.
2. Rotate knob and DSP modes of K01-K04 and P01-P05 can be selected.  
Modes of P01-P05 are user modes, to save current content in a user mode.
3. Then, press LOCK key for 2s and successful lock displays on the screen.

## Measures to prevent whistle of microphone

Whistle of microphone is the sound made by loudspeaker to echo to microphone and form positive feedback. To damage the condition of this positive feedback is to prevent whistle. Generally, methods of whistle frequency point attenuation, frequency shift and phase position shift are used to not only ensure there is no whistle during work, but ensure minimum damage on tone quality.

1. Microphone of this processor has 20 band parameter capacity. This processor can conveniently solve whistle problem by the method of attenuation whistle frequency point. At the same time, Q value can be the maximum as far as possible and attenuation frequency point is very narrow, to reduce the effect on the quality.
2. Use the method of phase displacement. Make the phase deviation of signals output by loudspeaker and microphone and it affect the condition of positive feedback. The method of phase displacement nearly has no damage on tone quality.
3. Use the method of frequency shift. It realizes frequency shift through the DSP algorithm, so it has the advantages of high stability, small temperature drift and small distortion.

This processor can change the amount of frequency shift.

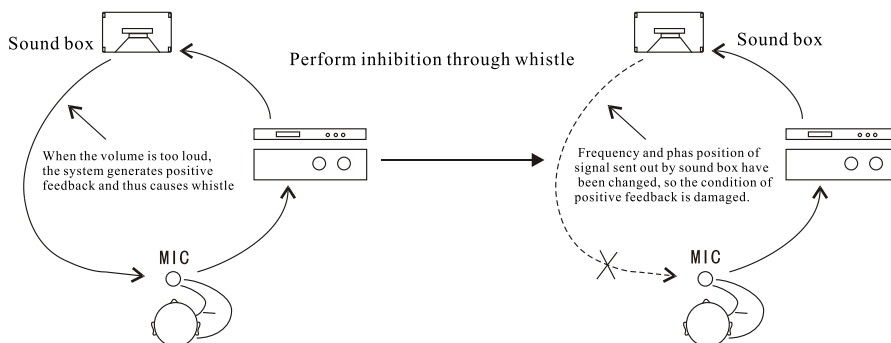
Corresponding frequency shifts of F10-F1

are -10Hz, -8.5Hz, -7.5Hz, -6.5Hz, -5Hz, -3.5Hz, -2.5Hz, and -1.2Hz.

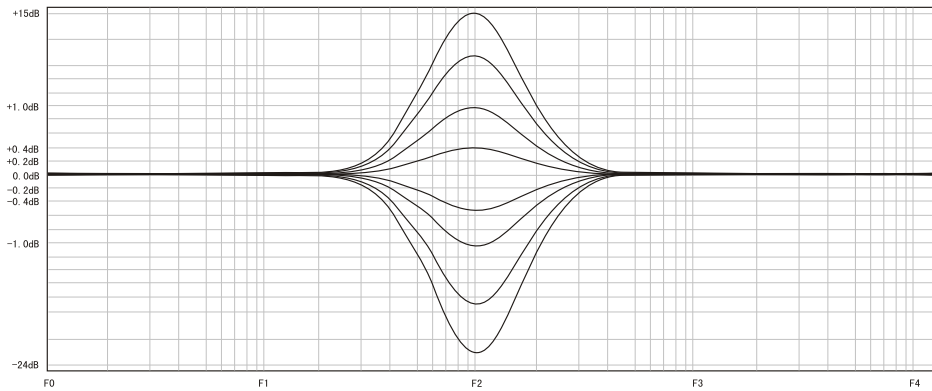
Corresponding frequency shifts of H10-H1

are +10Hz, +8.5Hz, +7.5Hz, +6.5Hz, +5Hz, +3.5Hz, +2.5Hz, and +1.2Hz.

F10 means no frequency shift.



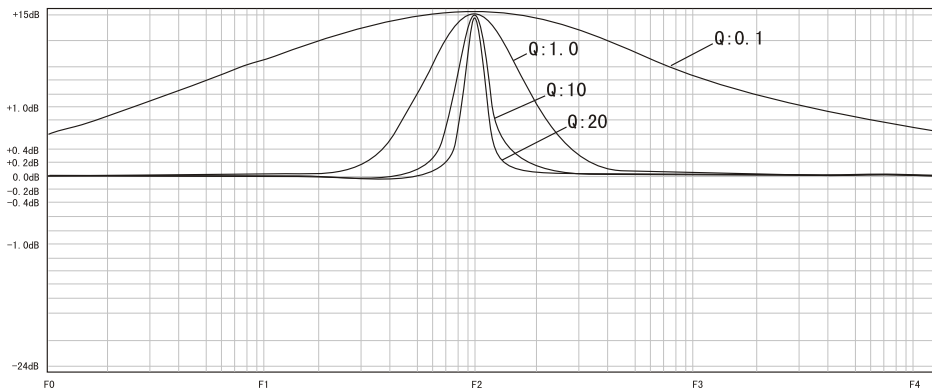
Whistle inhibition schematic diagram



Gain chart of parameter EQ

- 1.This processor has a very wide gain(BOOST) adjustment range, from -24 dB to +15 dB, 0.2 dB/STEP.
- 2.Frequency is adjustable between the range of 18 Hz~20KHz.
- 3.It has 32 digits of floating point high precision calculation, its signal to noise ratio (SNR) is very high and distortion is extremely small.

## About Q value of parameter EQ



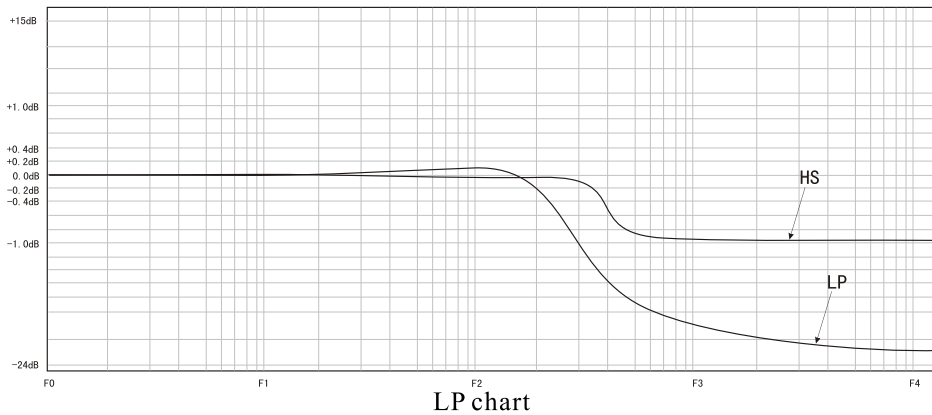
Q value chart of parameter EQ

Q value of parameter EQ which represents the frequency range affected by adjusted central frequency point is an important parameter in the professional audio.

- 1.This processor has a very wide Q value adjustment range. Q value 0.4 central frequency point has the maximum range of influence and Q value 60 has the minimum range of influence.
- 2.Auditory sense of Q value : the smaller the Q value, the more obvious the change we feel, because adjustment range is wide. Appropriate Q value can be selected according to environment and instrument and ideal effect can be reached ( see Q value chart of parameter EQ).  
The greater the Q value, the less obvious the change we feel, because the adjustment range is narrow. It can be widely used in favor of this characteristic. For example: whistle inhibition objective can be reached and it has very little effect on auditory sense by inhibition 3.6 KHz whistle frequency point and attenuating -24dB, Q value 25 Influence range is about 3.58KHz3.62KHz if Q value selects 60.
- 3.Adjustment method of high pitch, middle pitch and low pitch: interior chip of this processor has very excellent mathematical conversion capacity, provides rich parameter frequency point adjustment and parameter EQ can directly conduct wide range adjustment, having no need to perform mode switch.



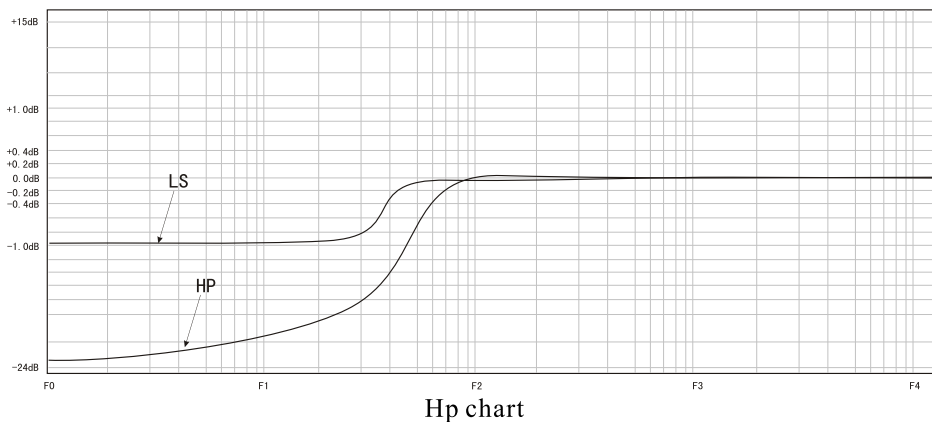
## About low-pass filter (LP) and high frame (HS)



Low-pass filter is the feature of high performance DSP, which mainly filters redundant high frequency portion during signal processing.

- 1.The range between 50 Hz~20 KHz (-12dB) of processor LP adjustment range is the maximum. Microphone, music, effect, surround, central and subwoofer have independent low-pass filter.
- 2.Application of LP: for music or microphone signals, if portion of high frequency is thought too much, decrease central frequency gradually from 20 KHz, to remove the high frequency portion by filtering, and you can feel less and less high frequency (see LP chart). Voice may be felt cleaner and more comfortable if adjust LP of ECHO/REVERB effect appropriately.
- 3.Difference between LP and high pitch attenuation: removal of high frequency by LP is cleaner. If LP is set as 6.3 KHz, the frequency above 6.3KHz will be totally filtered. However, it has little influence on middle frequency. LP is a kind of idea filter method for processing of subwoofer. Yet sometimes we hope to attenuate high frequency but not too thorough ,and we also need some high frequency extension. At this time, LP processing may not be used , but parameter EQ method can be used, because it will obtain better effect.
- 4.Music P7 point and microphone P15 point can be selected for high frame.

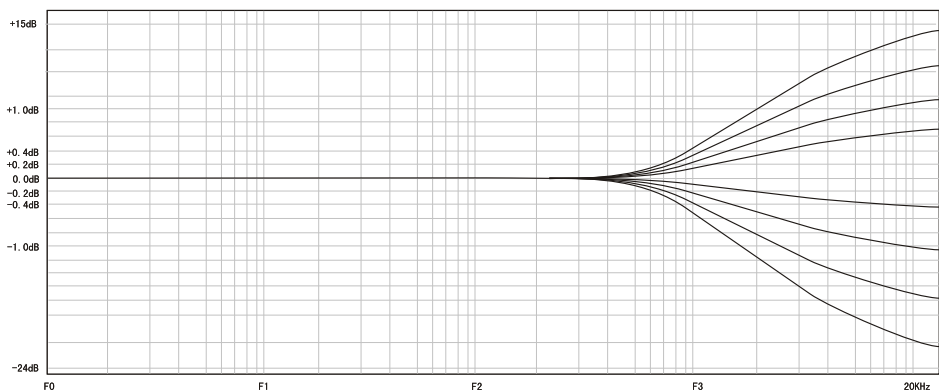
## About high-pass filter (HP) and high frame (LS)



High-pass filter is mainly used to filter redundant low frequency portion during signal processing.

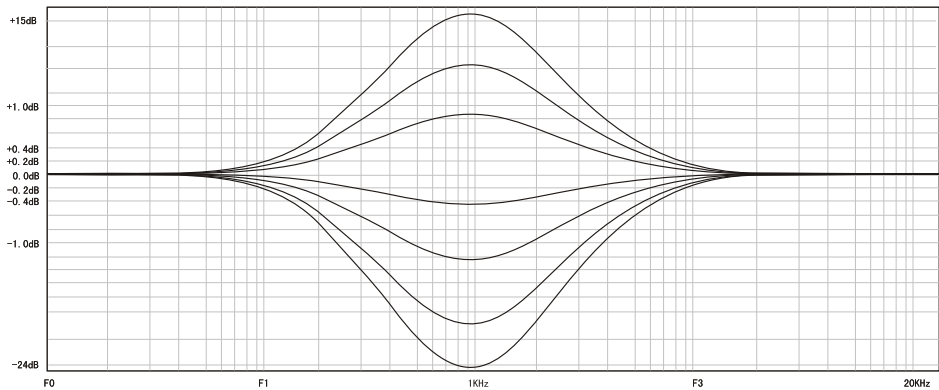
- 1.The range between 50 Hz~20 KHz (-12dB) of processor LP adjustment range is the maximum. Microphone, music, effect, surround, central and subwoofer have independent high-pass filter.
- 2.Application of HP: for music or microphone signals, if portion of low frequency is thought too much, rise central frequency gradually from 18 Hz, to remove the low frequency portion by filtering, and you can feel less and less low frequency (see LP chart). Voice may be felt clearer if adjusting HP of microphone appropriately.
- 3.Difference between HP and low pitch attenuation: removal of low frequency by HP is cleaner. If microphone signal is set as 50 Hz, the frequency below 50 Hz will be totally filtered. And the undesired low frequency of " booming sound " in the voice can be removed. For music or subwoofer, best use of HP can also filter protracted subwoofer portion. Better HP effect can be obtained in combination with the method of parameter EQ.
- 4.Music P01 point and microphone P01 point can be selected for low frame.

# Adjustment of high pitch



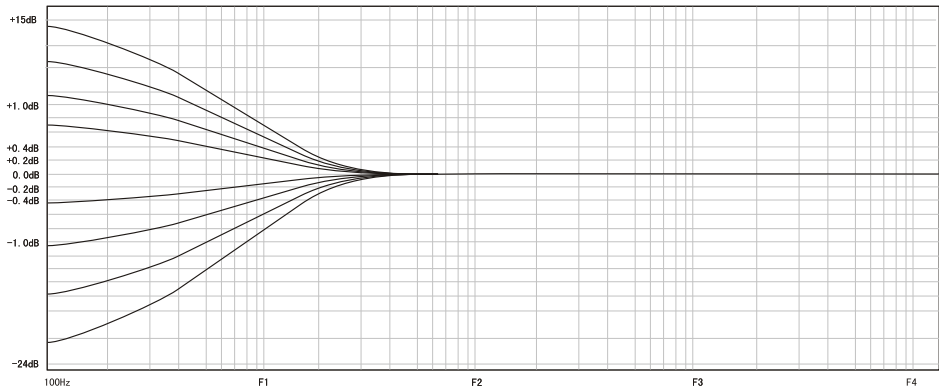
High pitch adjustment chart

# Adjustment of middle pitch



High pitch adjustment chart

# Adjustment of lower pitch

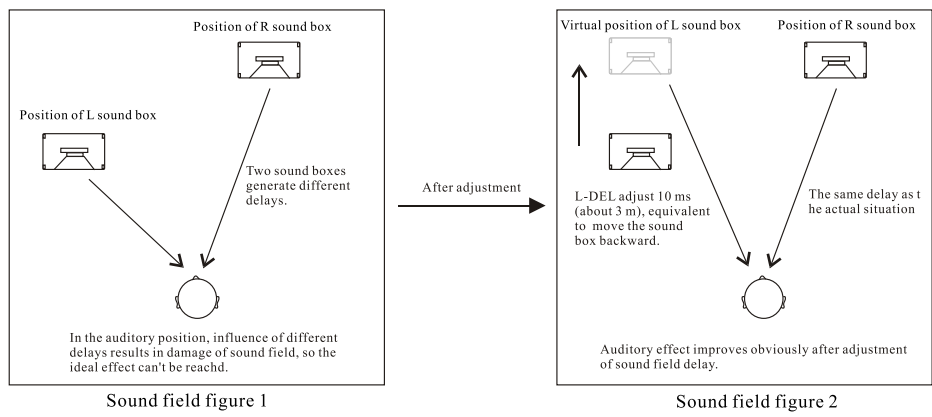


Lower pitch adjustment chart

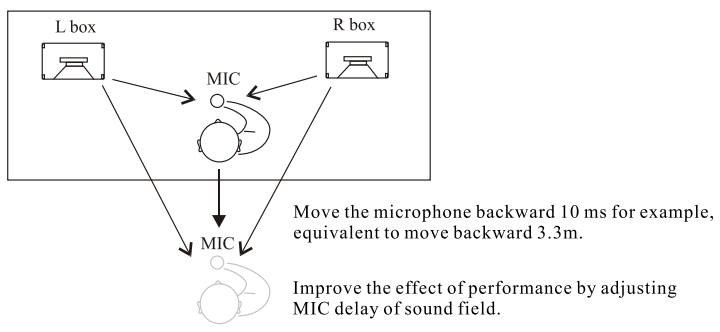
Decrease Q value appropriately by using some a frequency point of parameter EQ and high frequency range can be adjusted in a wider range.

Press the FIELD key on the panel and sound field menu displays on the screen. Adjustment objective is to appropriately adjust the delay of each sound box according to arrangement position of sound boxes to make up the damage of environment on the sound field.

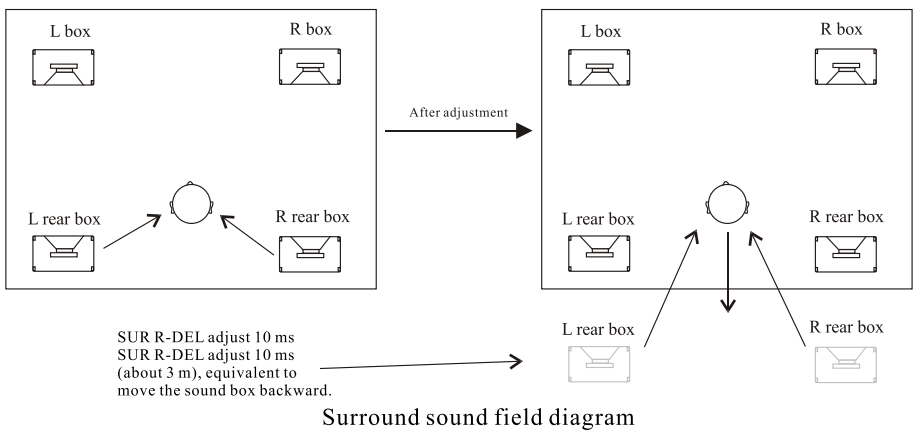
1.As shown in the following figure (sound field diagram), auditory change of production adjustment is reflected from Figure 1 to Figure 2. This product can independently adjust delay parameter of each sound box. The displacement distance can be mastered if delay figures divided by 3.3 according to attribute of conventional sound wave (330m/s). For example: it moves backward 6.6m after 20ms.



2. If microphone is too close to the sound box due to environmental restriction, delay microphone, change virtual distance, improve effect and inhibit whistle to some extent at the same time. Refer to ( microphone sound field diagram).

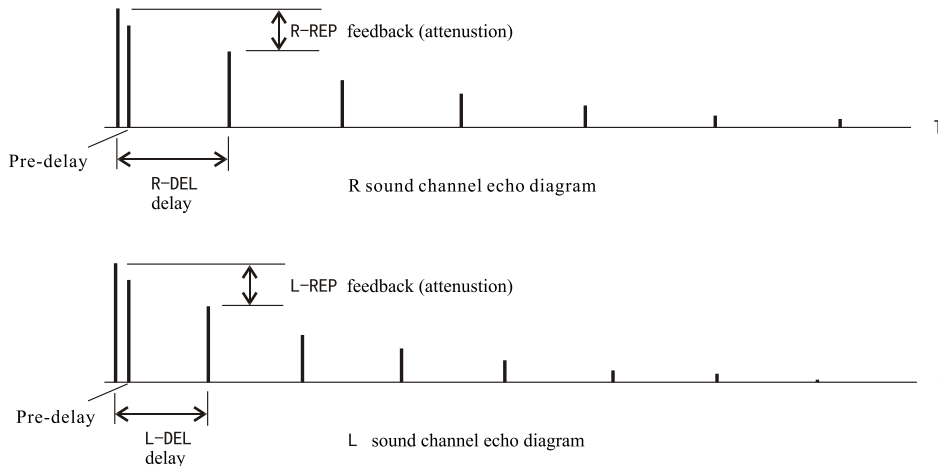


3. Generally, surround sound listens closely, so it's especially necessary to adjust surround sound field (see surround sound field diagram).



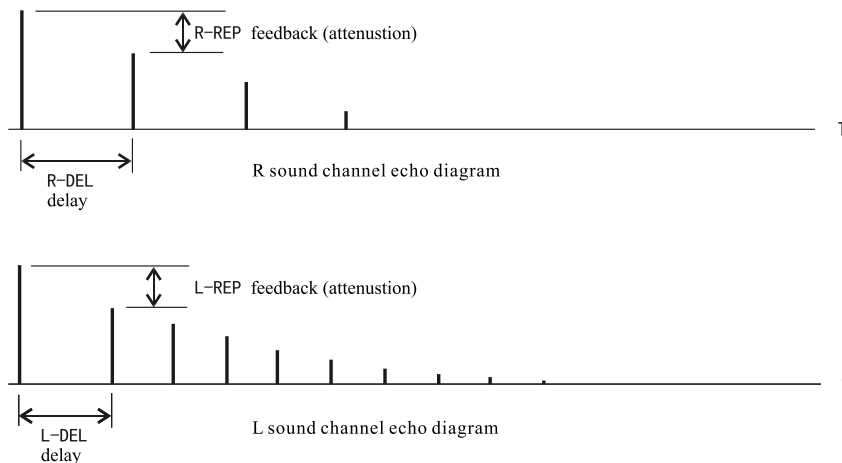
There are selection of MODE 0 and MODE 1 in the ECHO menu and they have different echo methods.

MODE0(stereo): it has independent delay and feedback adjustment of left and right sound channels, its feedback adopts natural echo method, software is used to gets over the distortion of phase position and its sound field is powerful and clear. As shown in the following diagram:



Though respective delay and feedback of left and right sound channels may be different during actual use, their different shall not be too great. Otherwise, it will violate natural environment and can't achieve real effect.

MODE1(alone): it has independent delay and feedback adjustment of left and right sound channels, and sense of space of its sound field is excellent. As shown in the following diagram:



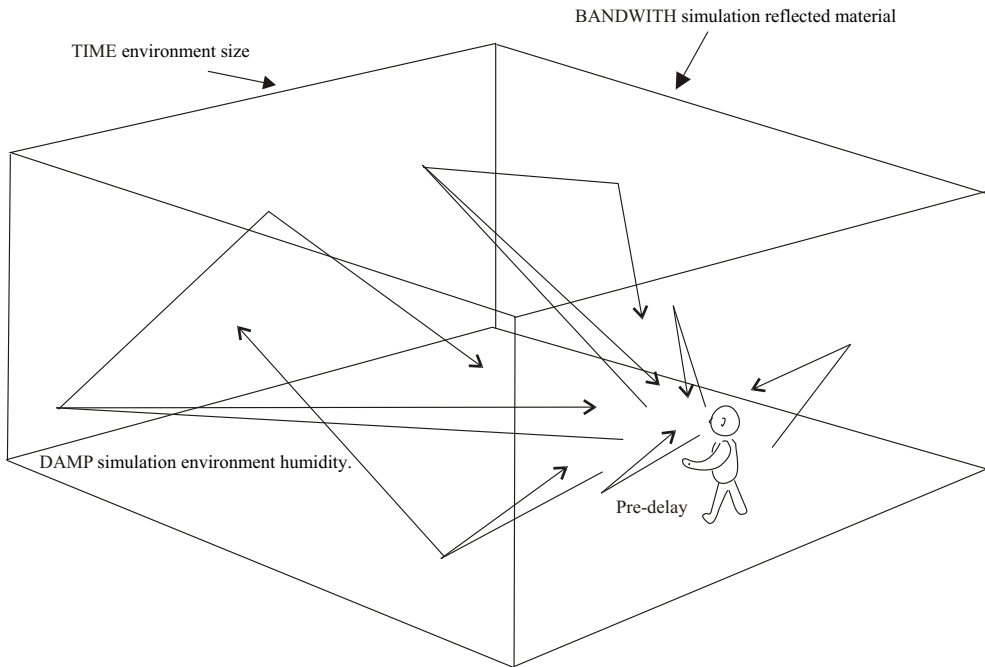
(This function be adjusted with PC software)

## Description of REV (Reverb) item

This processor utilizes powerful DSP function, uses complex algorithm routine and builds up vivid great hall effect. TIME, BANDWIDTH, DAMP and PRE-DELAY items in the REV menu can be adjusted and thus change the environment of great hall.

- 1.TIME: change the space size of environment (such as great hall).
- 2.BANDWIDTH: change the frequency reflected by the environment, such as grassland, desert, church and garage, etc.
- 3.DAMP: change sensitivity of environment diffusion on frequency, such as dry garage and damp mountain stream., etc.
- 4.PRE-DELAY: the distance from the object of the first reflection of environment.
- 5.R-LEVEL and L-LEVEL right and left electrical level: change the symmetry of environment.

As shown in the following diagram:



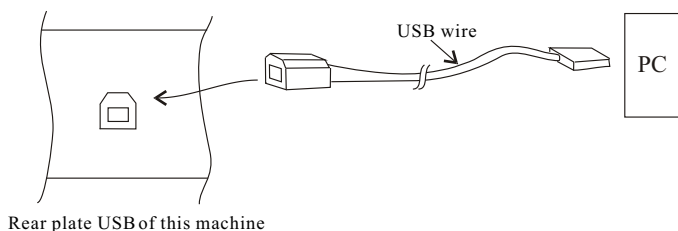
The real environment is very complex. This processor simulates 20 of reflected rays, restores environment of great hall vividly and builds up abundant effect of performance through combing filter.

## Communication with computer

Communication with computer adopts the following two methods, to realize the operations of calling DSP effect mode and adjusting microphone and music volumes.

Realize communication with PC through USB interface.

(Please refer to PC computer interface operation instruction of this machine)



## Music part:

Frequency response.....20Hz-20KHz±2dB  
 SNR....≥90dB  
 Channel separation degree.....≥45dB(1KHz)  
 Distortion (THD) .....≤0.01%  
 Input sensitivity .....≤500mV  
 Maximum output.....4Vpp  
 Input impedance.....>10KΩ

## Microphone part:

Frequency response.....20Hz-20KHz±2dB  
 SNR (turn off effect) .....≥80dB  
 Input sensitivity.....≤15mV  
 Distortion (THD, turn off effect).....≤0.01%  
 Input impedance.....600Ω

## Effect part:

Delay time R/L(Echo Delay): 50ms~950ms  
 Repeated times R/L(Echo Repeat): 1~96%  
 Reverberation time(Reverb Space): 50ms~5s

## High-pass filter:

Range of frequency point f: 18Hz-20KHz(-24dB)

## High-pass filter:

Range of frequency point f: 18Hz-20KHz(-24dB)

Power source .....220VAC±10% 50Hz  
 Power consumption.....30W  
 Weight .....3.5Kg

## Parameter EQ part:

Mic15 BAND parameter, frequency point number P01~P15

Mic3 5 BAND parameter, frequency point number P01~P05

Range of frequency point f: 18Hz-20KHz  
 Range of frequency point Q: 0.4~60  
 Gain range of frequency point: +15 dB ~ 24 dB  
 (0.2 dB/step)

Music 7 BAND parameter, frequency point number P01~P07  
 Range of frequency point f: 18Hz-20KHz  
 Range of frequency point Q: 0.4~60  
 Gain range of frequency point: +15 dB ~ 24 dB  
 (0.2 dB/step)

Central, surround, effect and subwoofer  
 5 BAND parameter, frequency point number P01~P05  
 Range of frequency point f: 18Hz-20KHz  
 Range of frequency point Q: 0.4~60  
 Gain range of frequency point: +15 dB ~ 24 dB  
 (0.2 dB/step)

# Troubleshooting of abnormal phenomena

Abnormal phenomena are caused by the influence of other instruments sometimes. Please carefully read details of owner's instructions of all the instruments before your operation. Incorrect operation often results in abnormal phenomena. Please perform troubleshooting in reference to the following methods if you find any abnormal phenomenon.

Faults	Causes	Troubleshooting methods
LCD screen is not on	Poor connection of power source socket	Connect the power line correctly
Have no sound	No input signal source	Inspect input connection line.
	Connection to power amplifier is not correct	Inspect power amplifier connection line
One sound channel has no sound.	Poor connection of input line of one sound channel	Inspect input audio source connection line
	Connection to power amplifier is not appropriate	Inspect power amplifier connection line
Sound is distorted	Volume is too loud.	Appropriately turn down the volume
	Abnormal power amplifier	Remove power amplifier fault.
Microphone has no sound or Noise is too loud	Use poor quality microphone	Use the microphone with good Performance. Makes sure microphone lead shield is effective.
Be easy to generate whistle when singing karaoke	Microphone volume is too loud	Microphone keeps as far as possible away from sound box. Turn down microphone volume. Or inspect whether noise absorption condition of environment is good.
Remote controller can't perform remote control	Insufficient electric quantity of battery	Replace battery

Note: Please send this machine to the nearby distributor for repair if fault still can't be removed.

# Standard components

Operating Manual. ....	1
Remote controller (optional item). ....	1
Warranty card. ....	1

PROFESSIONAL AUDIO