VSX™ 26

Digital Loudspeaker Processor



Operating Manual

www.peavey.com



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.



Intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

CAUTION: Risk of electrical shock — DO NOT OPEN!
CAUTION: To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

WARNING: To prevent electrical shock or fire hazard, this apparatus should not be exposed to rain or moisture, and objects filled with liquids, such as vases, should not be placed on this apparatus. Before using this apparatus, read the operating guide for further warnings.



Este símbolo tiene el propósito, de alertar al usuario de la presencia de “(voltaje) peligroso” sin aislamiento dentro de la caja del producto y que puede tener una magnitud suficiente como para constituir riesgo de descarga eléctrica.



Este símbolo tiene el propósito de alertar al usario de la presencia de instruccones importantes sobre la operación y mantenimiento en la información que viene con el producto.

PRECAUCION: Riesgo de descarga eléctrica iNO ABRIR!
PRECAUCION: Para disminuír el riesgo de descarga eléctrica, no abra la cubierta. No hay piezas útiles dentro. Deje todo mantenimiento en manos del personal técnico cualificado.

ADVERTENCIA: Para prevenir choque electrico o riesgo de incendios, este aparato no se debe exponer a la lluvia o a la humedad. Los objetos llenos de liquidos, como los floreros, no se deben colocar encima de este aparato. Antes de usar este aparato, lea la guia de funcionamiento para otras advertencias.



Ce symbole est utilisé dans ce manuel pour indiquer à l’utilisateur la présence d’une tension dangereuse pouvant être d’amplitude suffisante pour constituer un risque de choc électrique.



Ce symbole est utilisé dans ce manuel pour indiquer à l’utilisateur qu’il ou qu’elle trouvera d’importantes instructions concernant l’utilisation et l’entretien de l’appareil dans le paragraphe signalé.

ATTENTION: Risques de choc électrique — NE PAS OUVRIR!
ATTENTION: Afin de réduire le risque de choc électrique, ne pas enlever le couvercle. Il ne se trouve à l’intérieur aucune pièce pouvant être reparée par l’utilisateur. Confiez l’entretien et la réparation de l’appareil à un réparateur Peavey agréé.

AVIS: Dans le but de reduire les risques d’incendie ou de decharge electrique, cet appareil ne doit pas etre expose a la pluie ou a l’humidite et aucun objet rempli de liquide, tel qu’un vase, ne doit etre pose sur celui-ci. Avant d’utiliser de cet appareil, lisez attentivement le guide fonctionnant pour avertissements supplémentaires.



Dieses Symbol soll den Anwender vor unisolierten gefährlichen Spannungen innerhalb des Gehäuses warnen, die von Ausreichender Stärke sind, um einen elektrischen Schlag verursachen zu können.



Dieses Symbol soll den Benutzer auf wichtige Instruktionen in der Bedienungsanleitung aufmerksam machen, die Handhabung und Wartung des Produkts betreffen.

VORSICHT: Risiko — Elektrischer Schlag! Nicht öffnen!
VORSICHT: Um das Risiko eines elektrischen Schlages zu vermeiden, nicht die Abdeckung enfernen. Es befinden sich keine Teile darin, die vom Anwender repariert werden könnten. Reparaturen nur von qualifiziertem Fachpersonal durchführen lassen.

WARNUNG: Um elektrischen Schlag oder Brandgefahr zu verhindern, sollte dieser Apparat nicht Regen oder Feuchtigkeit ausgesetzt werden und Gegenstände mit Flüssigkeiten gefuellt, wie Vasen, nicht auf diesen Apparat gesetzt werden. Bevor dieser Apparat verwendet wird, lesen Sie bitte den Funktionsführer für weitere Warnungen.

IMPORTANT SAFETY INSTRUCTIONS

WARNING: When using electrical products, basic cautions should always be followed, including the following:

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 a dry cloth.
7. Do not block any of the ventilation openings. Install in accordance with 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 plug. The wide blade or third prong is 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 they exit from the apparatus.
11. Only use attachments/accessories provided by the manufacturer.
12. Use only with a 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.
15. Never break off the ground pin. Write for our free booklet "Shock Hazard and Grounding." Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
16. If this product is to be mounted in an equipment rack, rear support should be provided.
17. Note for UK only: If the colors of the wires in the mains lead of this unit do not correspond with the terminals in your plug, proceed as follows:

    a) The wire that is colored green and yellow must be connected to the terminal that is marked by the letter E, the earth symbol, colored green or colored green and yellow.

    b) The wire that is colored blue must be connected to the terminal that is marked with the letter N or the color black.

    c) The wire that is colored brown must be connected to the terminal that is marked with the letter L or the color red.
18. This electrical apparatus should not be exposed to dripping or splashing and care should be taken not to place objects containing liquids, such as vases, upon the apparatus.
19. Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise-induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures:

Duration Per Day In Hours	Sound Level dBA, Slow Response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss. Ear plugs or protectors to the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss, if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.

SAVE THESE INSTRUCTIONS!

ENGLISH

VSX™ 26

Digital Loudspeaker Processor

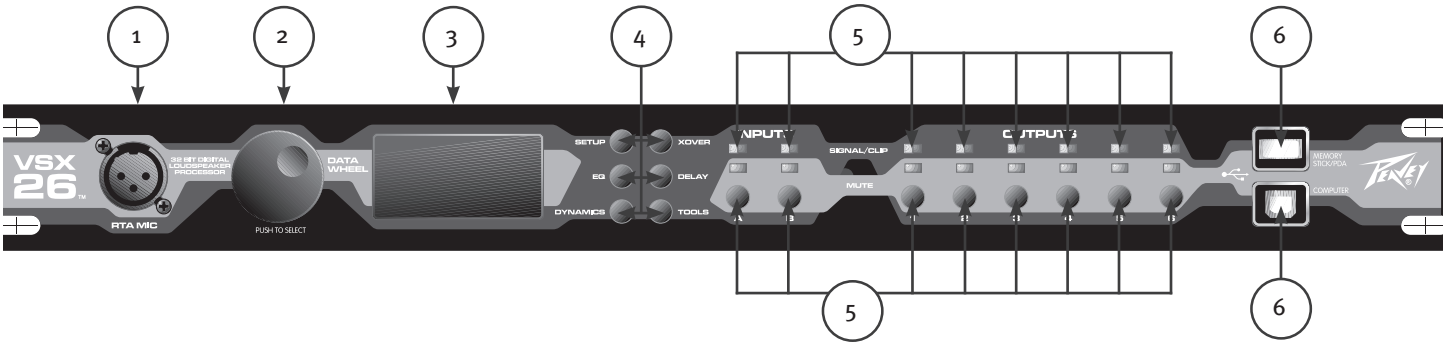
The VSX 26 is a fully progammable 32-bit audio processing and louspeaker management control system. Considerably more powerful than similarly priced units, the VSX 26 provides a versatile and economical alternative for system designers.

Please read this guide carefully to ensure your personal safety as well as the safety of your equipment.

Features

- 3 inputs/6 outputs
- 48 kHz sample rate – 24-bit 256x over-sampled Delta-Sigma AD, DA
- USB A and B ports for memory storage and computer interface
- XLR inputs and outputs
- +24 dBu inputs and outputs
- Phantom power +48V

Front Panel



Input Section

(1) RTA MIC INPUT
Mic level input for measuring mic. Phantom power may be selected in software. May be used as a extra input and routed through the system.

(2) DATA WHEEL
Rotate clockwise or counter clockwise to scroll through screens. Push to enter or confirm selection.

(3) LCD DISPLAY
This screen gives a graphical representation of unit configuration and parameter settings. The layout of the screen and the information displayed will depend on the function being monitored or set.

(4) Parameter Select Buttons

Setup:
Configurations are selected here. Parameter selection for inputs, signal generator, stereo/mono, routing matrix, and outputs.

EQ: parameter selection of input or output equalizers

DYNAMICS: parameter selection of input or output compressor/limiters

XOVER: parameters of the bandpass modules for each output or configured crossover

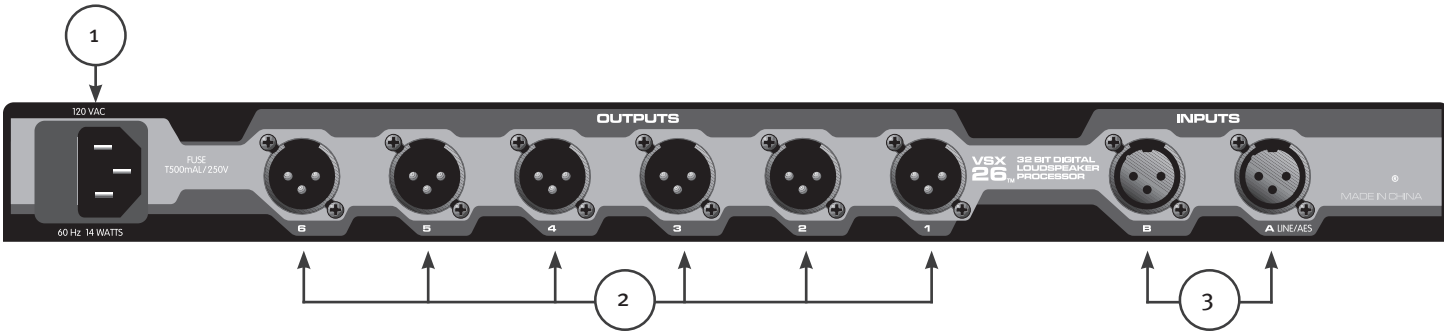
DELAY: delay time and polarity for each input or output

TOOLS: saving and loading of presets as well as default configuration

(5) Input/Output Monitoring:
LEDs indicate active or muted channel conditions. Mute switches are provided to manually mute inputs or outputs. Signal LEDs are Green for normal signal level, Yellow at +18 dBu output and Red at +20 dBu, just before the onset of clipping.

(6) USB ports:
Connection of memory stick/jump drive for preset storage and system update and computer connection for controlling the unit from the GUI. The slot supports USB 2.0 memory sticks whose current draw is 150 ma or less.

Rear Panel

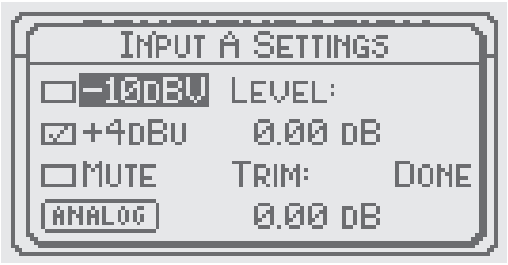


(1) IEC POWER INPUT and FUSE HOLDER

(2) OUTPUTS
XLR male line level outputs

(3) INPUTS
XLR female line level inputs. Input A may be switched to AES digital input via software.

Setup/Configuration Screen



Rotate the data wheel to scroll across the screen and push the wheel to select and confirm.

A & B INPUTS:

Input sensitivity switchs between –10 dBV or +4 dBV inputs. The +4 dB position should be considered the "normal" position and should be used with professional systems. The -10 dB position allows the unit to be driven with "hi-fi" level equipment or directly from a CD player.

Mute toggle on/off.

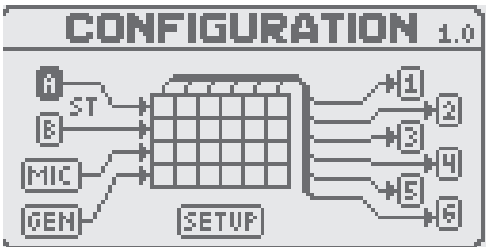
Analog/digital operation is selectable on input A.

Level controls digital processing headroom and is adjustable from 0 dB through –100 dB. This adjustment is best left as high as possible but may be adjusted as necessary.

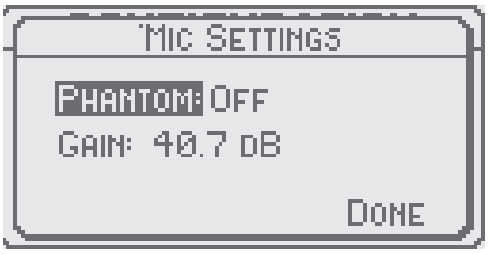
Trim is variable from –6 dB to +6 dB and is used to match analog input sensitivity as necessary.

Exit this screen by selecting "**Done**" and pressing the data wheel or pressing the "setup" button.

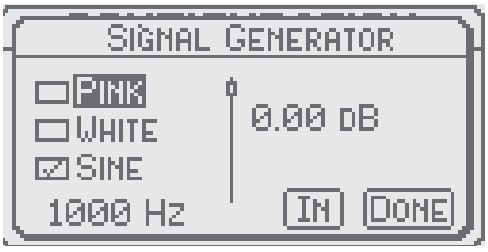
ST/M:
Toggles between Stereo and Mono. Selecting Stereo associates the A/B channel inputs. It does not affect the output channels. When engaged in "stereo" adjusting a parameter on channel A will make a corresponding adjustment on Ch B. This may be most useful when adjusting GEQs, Delay or Dynamic settings. Preliminary adjustments can be made to both channels in this manner and then the switch can be toggled to mono allowing further independent adjustment of single inputs. The switch may be toggled again to link up the dynamic sections for stereo tracking of the comp/limiters.



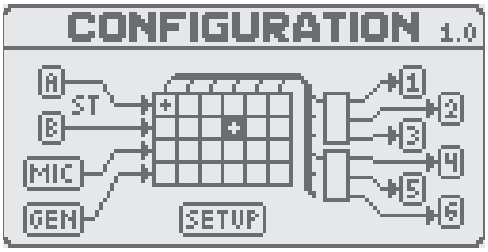
MIC:
Allows engaging the +48 V phantom power as well as adjusting the Mic gain range from 23 dB to 67 dB of gain. Select "done" or press "setup" to escape to the main screen.



GEN:
This screen selects the parameters for the signal generator. Pink, White or Sine may be selected. When Sine is selected the frequency of the sine wave may be adjusted for 20 Hz to 20 kHz. The output level may be adjusted by highlighting the fader graphic and adjusting the Level control. An In/Out button is provided to turn on and off the generator. The screen may be exited by selecting "done" or pressing the "setup button. The Generator must be assigned to an output of your choice with the Matrix. A single B and pass filter can also be assigned to that output and the skirts may be adjusted to provide limited bandwidth noise for testing purposes.

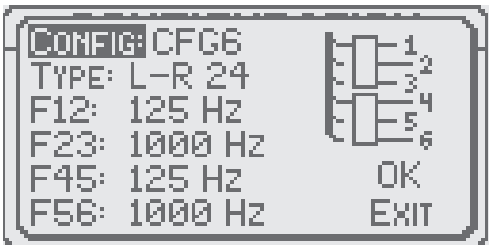


MATRIX:
The matrix provides the method to assign inputs to outputs. In the default configuration NO SIGNAL IS PASSED through the unit until some selection in the matrix is made. This prevents potentially destructive signals from reaching the wrong outputs. The inputs are represented by the rows and the outputs by the columns. Most users will commonly assign crossovers in the setup screen so that only a single input assignment will be necessary. In addition to the line inputs the RTA and GEN inputs are assigned in this screen. To continue from the matrix you must exit from the upper left or the lower right squares.



Setup/Configuration Screen

SETUP:
Selecting this button takes you to the preset configuration page. The VSX™ is pre-programmed with eight configuration templates representing the most frequently used crossover possibilities. As you scroll through the configuration presets you will see and can adjust the basic filter types (only symmetrical choices may be made here). Center frequencies of those filters and a graphic representation of the filters will be displayed. You must enter "OK" to accept the selection. Selecting and pressing Exit or pressing the Setup button will return you to the main screen. Upon returning to the main screen you will see the graphic representation of your selection.

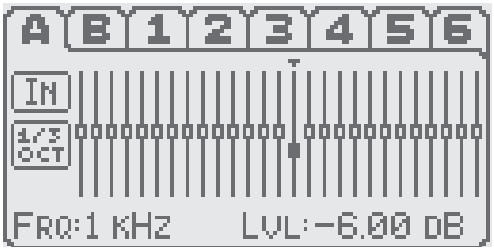


OUTPUT 1-6:
Output levels may be adjusted on this page. Press "done" or push the setup button to return to the main screen.



EQ Screen

Inputs A & B or outputs 1-6 should be selected on the top of the screen. While on the top of the screen push the data wheel and an arrow appears. Rotate the wheel to select which input or output you wish to adjust.



GRAPHIC EQs on inputs

BANDWIDTH SELECT:
This switch gives a paragraphic action to the 27 band equalizer. It toggles between 1/6, 1/3, 1/2 and 1 octave bandwidth for the width of the individual filters. Bandwidth is defined 3 dB from the peak or minimum amplitude and greatly affects the way the adjacent filters combine or stay independent. Wider bandwidth is most useful when adjusting the overall curve of the speaker to the room or tone control as ripple is minimized. The 1/6th bandwidth has the least filter skirt combining and should be used for feedback control only.

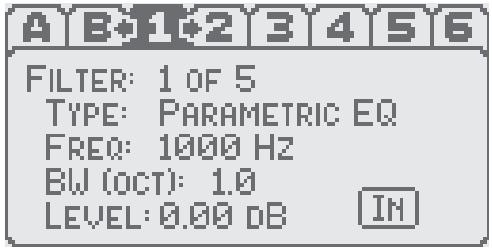
FREQUENCY:
As you scroll through the 27 positions the knob graphic becomes filled and the corresponding frequency is listed on the bottom left. Press the data wheel to select a frequency to adjust.

LEVEL:
After selecting a frequency, rotating the data wheel allows boosting or cutting the amplitude of the selected frequency +/- 15 dB in .5 dB increments.

Power user tip: *Pressing the EQ button is a short cut to return to the top of the screen.*

EQ Screen

OUTPUT EQUALIZERS
Select 1-6 on the top of the EQ screen.

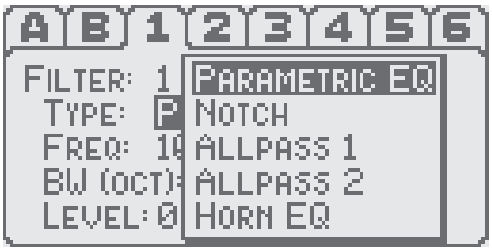


FILTER:
Select any of the five independent filters to use.

TYPE:
Choices are: Parametric, Notch, Allpass1, Allpass2, Horn EQ, LPF-6, LPF-12, HPF-6, HPF-12, Low Shelf, High Shelf and Bandpass. Depending on the filter selected various options for adjustment are presented in the window.

Parametric: Frequency, BW (in oct), Level

Notch: Frequency, BW (in oct). Notch has a fixed attenuation on minus infinity and the BW is defined 3 dB from unity.



All Pass1: Frequency

All Pass2: Frequency and Bandwidth

Horn EQ: Turnover Frequency and Level

LPF6 and HPF6: Frequency

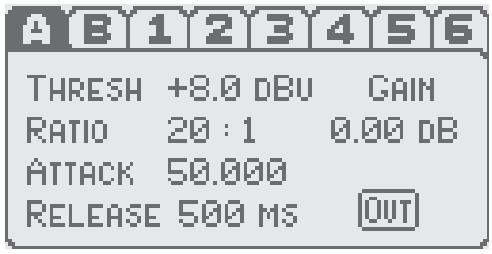
LPF12 and HPF12: Frequency and Q

Low and High Shelf: Frequency and Level

Bandpass: Center Frequency and Bandwidth

DYNAMICS:
Inputs A and B or outputs 1-6 should be selected on the top of the screen. While on the top of the screen push the data wheel and an arrow appears. Rotate the wheel to select which input or output you wish to adjust and press the data wheel. Dynamics in the input channels may be linked in pairs for stereo tracking on the Input pages on the Setup/Configuration screen. Most users should use the dynamics on the outputs as Limiters to protect speakers and amplifiers and as compressors on the inputs should this type of tonal modification be necessary.

THRESHOLD:
The threshold is adjustable in .5 dB steps from –76 dBu to +24 dBu. This control determines the minimum level when the compressor begins to limit the dynamic range. The compressor has no affect on the signal as long as the signal strength is below the threshold point. Once it passes the threshold point, the compressor begins to limit the dynamic range of the output according to the value set by the Ratio control.



RATIO:
The ratio determines how strong the limiting becomes once the threshold is crossed. Values of 1:1 (no compression) to 20:1 are possible. Ratios of 10:1 and above should be selected for speaker protection.

ATTACK:
The attack function sets the amount of time for the compressor to respond once the threshold has been crossed. Specifying this value allows the user to determine whether the compressor responds as a peak or RMS unit as very short attack times consider only peaks while times above 50 ms average these peaks and result in RMS response. We recommend attack times of between 50 ms - 100 ms be used when setting the limiters to protect the speakers from being overdriven by the power amps. It is the average power long term that causes speaker burn out. The transient peaks usually cause little damage if kept inside the speaker's band limits.

EQ Screen

RELEASE:
The Release value sets the amount of time for the compressor to recover from the compressed state once the level falls below the threshold level. We recommend release times of 5x to 10x the Attack time in normal use.

GAIN:
This adjustment serves to compensate for the loss in average signal strength due to compression. The range is –100 dB to + 30 dB.

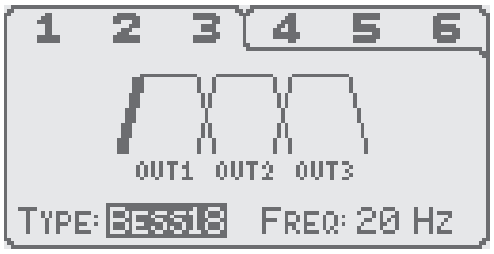
IN/OUT:
This button toggles to bypass the dynamics section.

XOver Screen

The output channel numbers appear across the top of the screen. Depending on the configuration template chosen they may appear together as blocks representing 2-way, 3-way or 4-way crossovers or singly as a Bandpass filter. After making a selection rotate the data wheel to adjust parameters.

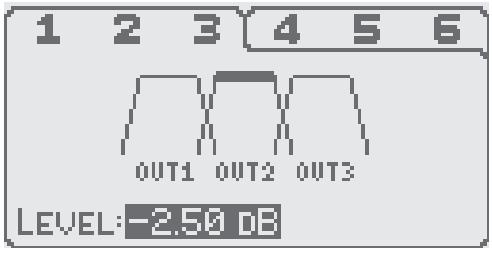
Each bandpass filter associated with the crossover is represented graphically on the screen. The two slopes represent the lower and upper frequencies of the bandpass and the plateau represents the level of the bandpass. The intersection of slopes represents the electrical crossover point(s).

TYPE:
Available filters are: Flat, Butterworth 6, 12, 18, 24, 30, 36, 42, and 48 dB/oct.; Bessell 12, 18, 24, 30, 36, 42 and 48 dB/oct; Linkwitz-Riley 12, 24, 36 and 48 dB/oct. The user is free to mix and match filter types to create symmetrical or asymmetrical crossovers.



FREQUENCY:
The VSX™ 26 is a very powerful tool and as such the frequency points are independent, allowing over-lapping or under-lapping as the system may require. The lowest and highest slopes in the chain are useful as high and low system cutoff filters to prevent low frequency rumble and speaker over excursion as well as high frequency interference. The filter points are selectable in 1 Hz steps from 20 Hz to 20kHz. They may also be selected in the setup/configuration screen.

LEVEL:
The levels of the crossover sections are independently adjustable from –15 dB to +15 db in .5 dB steps. Move the indicator to the plateau and the level parameter appears.



Delay Screen



Inputs A and B or outputs 1-6 should be selected on the top of the screen. While on the top of the screen push the data wheel and an arrow appears. Rotate the wheel to select which input or output you wish to adjust. Push the data wheel to accept. Normally the output delays are used to align the phase response of the drivers in a system while the input delays are useful for adding delay to the entire system(s).

IN/OUT:
Toggles to engage or bypass the delay

NORM/REVERSE:
Toggles to invert the polarity from the present state. It may become necessary to flip the polarity many times while adjusting the delay time or adjusting the cut-off rate of the filters. It is conveniently located on this page for that purpose.

DELAY:
Adds delay to the selected input or output. The delay is displayed in milliseconds, feet and meters and automatically calculates each as the data wheel is rotated. The range of each delay is 340 ms, 379.09 feet and 115.59 meters. The input delay amount will be added to the output delay amount for a possible 680 ms, 758.18 feet and 231.18 meters should a very long delay be necessary. One example would be for use with delay towers.

SAVE PRESET
Allows saving the current configuration to one of 8 internal memory positions or to an external USB memory stick. If external USB is selected the VSX™ will automatically write a folder and file to the stick without disturbing other files/folders that may be present on the stick. It is not necessary to dedicate a memory stick to the exclusive service of the VSX. Files from the stick may be transferred to a PC or MAC computer.





Note: *Configuration presets are stored in the folder:* **VSX26/presets** *on the memory stick.*

NAME:
Selecting this function opens a alpha numeric keyboard. The VSX allows 8 characters to name the file. The {Right Arrow} button on the bottom right returns to the Save screen.



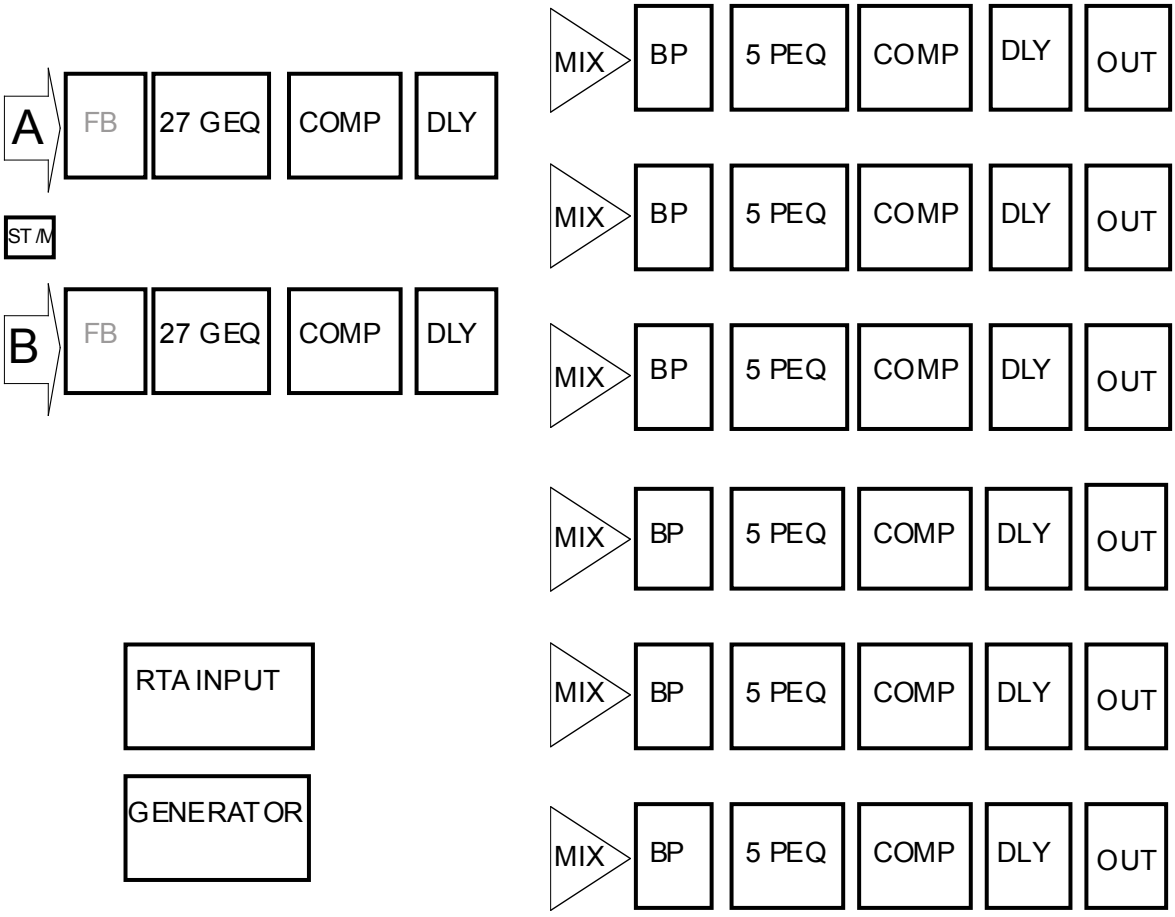
OK:
Must be selected and the data wheel pushed to actually save the preset. You will be asked to confirm this on the next screen.

LOAD PRESET:
Rotate the data wheel to select from the eight internal presets and from an external memory stick, if it is plugged in. Press OK and it will load the preset to the current preset. A confirmation screen will appear before overwriting the current preset.



INSTALLING SOFTWARE UPDATES:
Press and hold in the data wheel while powering up. Insert a memory stick or connect via USB to a computer. The VSX will search for files and will display a list. Select the desired version by highlighting it and press the Data Wheel. A confirmation screen will appear. Cursor over to “yes” and press the Data Wheel. The VSX will automatically perform the upgrade from here. When downloading the upgrade from the web place it in a folder: **VSX26/firmware**. The upgrade file will be a .bin file.

VSX™ 26
BLOCK DIAGRAM



VSX™ 26
SPECIFICATIONS

		Comments
Audio Channels	3 inputs/6 outputs	RTA Mic input can be summed with Line inputs.
LED Metering	2 inputs/6 outputs	LED STATUS: Red = -0.5 dBFS and higher (Clip) Red & Green = -4 to -0.5 dBFS Green = -4 to -40 dBFS Off = below -40 dBFS
Mute Function	Front panel switch and LED for each input and output	LED STATUS: Red = Muted Off = On
ANALOG INPUTS		
Input Trim Range	-6 to +6 dB	Software controlled
Line Sens Settings	+24 dBu or -10 dBV	Software selectable
Line Input Impedance	4.4 k ohms	Electronically balanced
Line Max In	24 dB	
Line Input CMRR	55 dB	
Line Input Crosstalk	-90 dB	20 Hz to 20 kHz
Line Input Dynamic Range	110 dB A-weighted	150 ohm input termination
RTA Mic Gain Range	+20 to +60 dB	Approximately 1/2 dB steps
RTA Max In	+2 dBu (.98Vrms)	Gain = 60 dB, 22K BW
RTA Input Impedance	2.2 k ohm	Electronically balanced
RTA Input CMRR	55 dB	
RTA Input EIN	-128 dB A-weighted	150 ohm input termination
RTA Phantom Power	+48 volts	Software controlled
AES Input	On XLR 1	Software selectable between left channel analog line input
OUTPUTS		
Output Full Scale	+24 dBu	Balanced
Output Impedance	150 ohms	Electronically balanced
Minimum Load Impedance	600 ohms	Maximum output @ 600 ohms = 22.5 dBu
Dynamic Range	105 dB	A-weighted
ANALOG INPUT-TO-OUTPUT		
Total Harmonic Distortion (+ Noise)	0.007 %	20 Hz to 20 kHz, 22 kHz BW filter, +4 dBu signal with 20 dB headroom
Frequency Response	20 Hz to 20 kHz	± 0.5 dBr referenced at 1 kHz
Dynamic Range	105 dB	A-weighted, 150 ohm input termination
Latency	‹ 1 mS	Propagation delay from input to output

VSX™ 26
SPECIFICATIONS

		Comments
DIGITAL		
Sample Rate	48 kHz	QUANTIZATION 24-bit 256 x-over-sampled Delta-Sigma AD, DA
Digital Processing	~100 32-bit MIP	Uses Analog Devices BLACKFIN processors, 40-bit accumulators
DSP Cycle Speed	500 MHZ	
CONTROL/MEMORY		
USB	2.0 PC, Memory Stick, PDA Connection	
GENERAL		
Dimensions	19" (48.26 cm) W 12.25" (31.12 cm) D 3.5" (8.89 cm) H	without connectors
Net Weight	11.6 lbs. (5.26 kg)	
AC Power Input Voltage	100 ~ 240 VAC	47 ~ 63 Hz Universal Power Supply
Power Consumption	14 watts @120 V	163 mA
Power Dissipation	47 Btu (11.8 kcal)	@ 120 V
Agency Compliance Listings	UL, CUL, CE, FCC part 15, Class B	Pending

Unless otherwise noted:

1. All specifications are typical for any channel(s).
2. All measurements are made in the digital domain.
3. All specifications are for an AC line input of 120 volts RMS.
4. All input measurements are made using a 40 ohm balanced source impedance at +24 dBu full scale.
5. All measurements are made with gain/attenuation set for unity.