

# Operation Manual



## The Vertigo Sound VSC-2

### Quad Discrete Compressor

Thank you for purchasing a VERTIGO SOUND PRODUCT!

The VSC-2 is VERTIGO SOUNDS first BIG IMPACT DESIGN and is setting a new standard for Tracking, Mix-Bus and Mastering applications. Unlike other compressors on the market the VSC-2 is equipped with four discrete VCAs and lots of matchless detailed features. This unique set-up makes the real analog sound from 1979 plus a bunch of versatile extras available in todays studio environment.



#### *The basic idea and concept of the VSC-2*

The Vertigo Sound Limiter incorporates four discrete 1979 VCAs for two channels. Each channel has one VCA in the Audio Path and another one inside the sidechain. In stereo mode both sidechains are active (they are not summed together) and the higher signal peak on any of both channels results in the compression of both (Stereo SC in Stereo Mode).

Therefore the VSC-2 is reacting also on out of phase signals ("peaks") without image shift. Moreover, the detector (a Peak Forward Design) of each channel works in such away, that stereo compression can be achieved even without stereolinking. This precision makes the VSC-2 also the first choice for mastering applications. Although the VSC-2 was developed as a "BUS COMPRESSOR" each channel provides all controls separately which makes it also a "Must Have" for processing while recording.



### *Installation & Hook Up*

The VSC-2 generates very little heat so it is not necessary to leave an empty space for ventilation above or below the unit. **But: Discrete Vcas are sensitive for all heating influences (especially differences in temperature). Don't put heat generating devices below and above inside your rack.**

The unit can be used with either balanced or unbalanced sources and the outputs can be loaded either balanced or unbalanced:

**Input:** The audio input is totally isolated by a "JENSEN" input line transformer. The primary winding of the transformer is wired to Pin 2 and Pin 3.  
Max. Input Level is +22 dbu.

**Output:** The audio output is of the type "electronically floating balanced" with "BURR BROWN® or 1646 IC-Type. The output load should not be less than 600 Ohms. If one of the output pin 2 or 3 is grounded, the signal level on the other pin raises by +6 dB.  
Max Output Level is +25 dbu at 600 Ohms.

#### **Balanced IN/OUT**

**Pin 1 = Ground/Shield**  
**Pin 2 = Audio + (hot)**  
**Pin 3 = Audio - (cold)**

#### **Unbalanced IN/OUT**

**Pin 1 = Ground/Shield**  
**Pin 2 = Audio + (hot)**  
**Pin 3 = Audio common/Ground/Shield**

### *The Threshold*

Sets the level above which signals will be compressed or limited. Rotating the control clockwise raises the threshold. The Threshold is adjustable from -22 to +22 dBu. We incorporated a "Zoom In" between -6 and +6 dBu to give you a more sensitive control and resolution between this commonly used "Level Area".

#### **> HINT**

**Start with threshold fully clockwise-then turn the control slowly anticlockw. until the right amount of compression is processed-re-adjust setting if other parameters are changed.**



## The Ratio

Sets the compression slope, which determines how the output signal will change in relation to the input signal once the input signal exceeds the threshold. The higher the ratio, the greater the compression, and the more "squeezed" the sound.

**Examples:** With a setting of 2:1, a 2dB input change for signals above the threshold results in a 1dB output change.

Soft: This is not the commonly known soft knee characteristic!

Soft is better described with Tip Toe – a Ratio which increases with level – a Threshold related Ratio from 1:1 up to 8:1.

The compressor tiptoes into compression with very low ratios getting higher, analogue to the signal, providing an inaudible start of compression.

### > HINT

Use the "Soft-TipToe Modus" for all applications where a harsh start of gain reduction or audible compression is unwanted. Please feel free to experiment! Try e.g. on Snare!

This characteristic comes close to the sound of some classic Opto-Compressors.

### Medium to Hard Knee Characteristics:

"Hard knee" or "soft knee" response. Each type of response gives a different limiting action. The hard knee response is generally considered more *severe but punchy* and the soft knee response, more *musical but limp*.

2:1 / 4:1 / 8:1 / 10:1 / Brick (40:1) = compressing from medium to hard knee

Brick = Limit

Ratio selection switch compensates to provide equal loudness, allowing immediate comparison.

### > HINT

Use both compressor channels for one signal. Connect Output A to Input B and use it for processing a mono signal (e.g. vocals). Put channel A in Soft Mode and channel B to 8:1. Use channel B controls (Attack and Theshold) to create your own compression curves.

## The Attack

The parameter "Attack" of the peak detector sets how fast the limiter's internal circuitry reacts to changes in input level. The longer the attack time, the more of a signal's dynamics are "let through" before the limiting action kicks in. With slower attack times, the limiter responds more to average signal level – the VSC-2 acts more like common RMS Detectors. This produces a smoother sound that tends to retain dynamic character, but the trade-off is that the VSC-2 cannot react as rapidly to sudden level shifts.

**Examples:** Setting a longer attack time with a bass guitar allows more of the picking attack to come through. The Attack times can be set fast enough to use the VSC-2 as an "overload protector" but in common musical use slower attacks like 3ms leave transients unprocessed and offer a quite "musical squeezing".

There's a right setting for all situations:  
0,1 ms · 0,3 ms · 1,0 ms · 3,0 ms · 10,0 ms · 30,0 ms

> **HINT**

**Start from 3ms setting-shorter Attacks may be musical in soft mode-just find your sound!**

## The Release

This control determines how long it takes for the VSC-2 to return to unity gain after going into limiting. With short release times, the limiter tracks every little change in level, producing a potentially uneven or "nervous & rippling" but "fresh" effect that decreases dynamics but increases the average output level. Longer release times tend to "squash" the signal more, producing less overall output but retaining more of the signal's dynamics. Excessive release times can be used as an effect. In the 60s the use of lots of limiting with a long release time e.g. on drums was a popular recording technique. (Fairchild 670-Release)

There's a right setting for all situations:  
0,1 s · 0,3 s · 0,6 s · 0,9 s · 1,2 s · Auto Mode

> **HINT**

**Start from 0,6s setting but don't stop to experiment-please don't be afraid of short release times-your program material may allow it!**

> **HINT**

**Put a big amount of compression (10db gain reduction) onto your mix and search for the best musical and rhythm action of your compressor when changing the Attack or Release setting! Reduce the amount of gain reduction to a sensible amount (2–4 dB) with the threshold knob. Try this strategy with both time constants and maybe jump back to this procedure either "Attack or Release" again. This approach is close to using an EQ – where unwanted signals are spotted with a high boost when switching & sweeping through the frequency band.**

### *The Make up*

The process of reducing dynamics lowers the signal's overall level. Use this control to compensate by adding output gain. The 1979 VCAs offer + 22 dBu of make up. We incorporated a "Zoom In" between 0 dBu and + 6 dBu to give you a more sensitive control and resolution between this commonly used "Level Area".

> **HINT**

Use the right portion of make up to get the same loudness impression on *system out/ system in* setting-compare if compression provides a sonic benefit or not.

### *SC Filter*

If the VSC-2 should react too much to kickdrum, bass or other bass signals (pumping effect) you can activate the SC Filter inside each sidechain. This Low Cut makes the VSC-2 react less sensitively to those signals. Both filter curves were set very gently, smoothly and musically to avoid a complete cut off which would leave some parts of the bass audio material unprocessed. So, the low end of your mix will be processed with less compression. The use of SC-Filters elevates the low end & bass of your audio material. You can choose between two different settings. These frequencies were chosen to provide larger flexibility and a maximum musical treatment & balance of the complete mix.

> **HINT**

Search for the limit where the VSC-2 begins to pump-then activate your SC-Filter

### *Stereo Mode*

The detector of each channel works so precisely that compression can be done without stereolinking but in stereo mode all upper Channel A knobs, Bypass or SC Filter A switches become the masters for Left and Right. (All controls B are switched off). So there's no complicated L-R trimming! In stereo mode both sidechains are active (they are not summed together) and the higher signal peak on any of both channels results in the compression of both (Stereo Mode). Both channels can be the compressor's Master. Therefore the VSC-2 is reacting also on out of phase signals ("peaks") without image shift.

> **HINT**

The VSC-2 detectors work very precise. Stereo compression can be achieved even without stereo linking. Adjust all parameters the same on both channels and switch the unit into "Mono-Mode". This stragety can widen your stereo image. This procedure might be the cure and a enhancement to your mix. If the stereo image gets too "shaky" switch back to the conventional stereo mode.



### *Gainreduction Metering*

This metering shows the amount of gain reduction being applied to the input signal. The metering is equipped with a non-linear scale and corresponding electronics to visualize the common area up to 6 db gainreduction with utmost precision. It shows quick and exactly what is done to your material.

### *Colouration, Distortion & Sound*

Colouration is one of the hidden secrets and is the basis for a unique sound and one first step creating a classic of tomorrow.

In fact the 1979 VCA produces mainly second harmonics depending on Gainreduction & Make Up.

The cocktail of clean precise sound and the right mix out of second and third harmonics dynamically and frequency dependent is the secret of the 1979 VCA.

#### **> HINT**

**If you want to use the VSC-2 adding some colouration without Gain Reduction then turn the thresholdpots fully clockwise to the right, and use Make Up to control the amount of harmonics.**

**(In many large consoles at that time like SSL, MCI, Quad Eight the discrete VCA stayed in the signal path of the output section also when deactivating the limiter).**

### *The signal Path:*

*Less components – more clarity*

The input section of the audiopath is equipped with Jensen JT-11-P1 transformers (other transformers on request) which provide the maximum possible Common Mode Rejection of unwanted signals.

These transformers have a single "Faraday" and a 30 dB magnetic "MU-metal" shield can. The audio then already reaches the VCA. Again leaving the VCA the signal passes the device via a "BURR BROWN® or 1646"-type output stage.

Looked at that way the signal path is kept as short as possible. All other ICs and elements are not in the audiopath. These peripheral parts are just controlling the Audio VCA and do not harm the sonic performance.

The power supply PCB, the audio PCBs and signal processing PCBs are completely separated, so any unwanted interaction between those is impossible (=no noise, bleedthrough, crosstalk, hum etc.) We can guarantee that no unwanted interferences are added to the audiosignal.

Deactivating the system bypasses the processor completely (real hardware bypass).

The outer appearance of the VSC-2 and all mechanical parts are constructed in the same manner like we engineered the electronic design:

Ratio, Attack and Release controls are fixed position gold plated rotary switches for easy recall, illuminated super fast, scale optimised metering, CNC machined aluminium knobs and a rugged housing construction.



## >> Vertigo Sound – One name steps out of the herd.

### *Technical Specifications*

- > Stereo/Dual Mono switchable
- > Jensen Balanced In. That 1646 or Burr Brown  
Balanced Out
- > Dynamic Range: 115 db
- > Frequency response: 10Hz ... 70kHz (-3 db)
- > Max. Output Level: +25 dBu/600 Ohm  
balanced floating
- > Signal to Noise Ratio at +6 dBu = 97 db (20 ... 20kHz,  
unweighted, RMS)
- > Noise: -91 dBu (20Hz-22kHz-unweighted, RMS)  
@ 0db Unity Gain
- > Crosstalk between channels: >100 db at any  
frequency
- > Power consumption: max 8 Watts

### *Safety, Grounding, Groundloops and more!*

#### **This Appartus must be earthed!**

- > To avoid groundloops all Audio-Grounds (XLR-Pin 1) are separated from the outer metallcase (housing of the VSC-2).
- > To keep them separated, please avoid connecting any XLR-Pin1 with of any XLR-housing or the housing of the VSC-2. Unnecessary groundloops might occur!
- > XLR-Pin1 of the inputs are "soft-grounded" internally over 10 Ohms Resistors. Internal climbing diodes mounted in the power PCB avoid voltages more then 48 volts between audio-ground and chassis ground!
- > The powersupply is secured against overload and is fire-protected: Several melting fuses, overheat sensors, security resistors etc. The powersupply is of noiseless linear construction: There is no "digitally switching" type psu with unaudible but AD-Conversion disturbing HF-Noise.
- > There are no signal relevant magnetic or static fields coming out of the unit. The toroidal power transformer works with reduced primary voltage, therewith the already neglectable stray field is reduced once again dramatically. The steelcase of the VSC-2 shields all the rest, electrostatic and magnetic and for that reason your studio stays 100% clean after installing the VSC-2.



*SAFETY INSTRUCTIONS:*

**Mains Voltage either 115V or 230V please contact the manufacturer for Mains voltage change.**

**Mainfuse 230V 80mA**

**Mainfuse 115V 160mA**

Note: Check the line voltage marked on the rear panel of the VSC-2 and verify that it is correct for your country.

CAUTION: Never remove the cover. There are no user serviceable parts inside.

GROUNDING: This Appartus must be earthed!

WARNING: If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

WATER AND MOISTURE: Appliance should not be used near water (e.g. near a bathtub, wash-bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

SERVICING: To reduce the risk of fire or electric shock, the user should not attempt to service the appliance. All servicing should be referred to qualified service personnel.

FOR UNITS EQUIPPED WITH EXTERNALLY ACCESSIBLE FUSE RECEPTACLE: Replace fuse with same type and rating only.

MULTIPLE-INPUT VOLTAGE: This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. Connect this equipment only to the power source indicated on the equipment rear panel. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel or equivalent.

Vertigo Sound herewith declares that all our products will be manufactured RoHS conformal.



## Contact

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