VG-99 V-Guitar System

Introduction to the VG-99

VG99WS01

About the Workshop Booklets

Roland's VG-99 V-Guitar System is, simply put, the most powerful guitar processor ever made. It's the third and latest generation V-Guitar system from Roland, and it offers an astounding set of creative sound-making tools for the guitarist. Featuring dual COSM instrument and amp modeling paths, two independent multi-effects processors, massive realtime control options, guitar-to-MIDI conversion, and USB, the VG-99 is a guitarist's dream machine, capable of creating sounds that are limited only by your imagination.

Each VG-99 Workshop Series booklet focuses on one VG-99 topic, and is intended as a companion to the *VG-99 Owner's Manual*.

About This Booklet

This booklet introduces you to the VG-99. We'll give you an overview of what it is and what it does, and discuss its concept and application. We'll also talk about some of the technologies that are part of the VG-99.

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Understanding the Symbols in This Booklet

Throughout this booklet, you'll come across information that deserves special attention—that's the reason it's labeled with one of the following symbols.

A note is something that adds information about the topic at hand.

A tip offers suggestions for using the feature being discussed.

Inside the V-Guitar System

The "V" in V-Guitar stands for "virtual." In computer terms, virtual means to use software to create something that doesn't physically exist, or to recreate something that exists in the real world in the digital realm. The VG-99 is essentially a computer, one that's dedicated to processing guitar sounds. Its software uses Roland's proprietary digital technology called "Composite Object Sound Modeling"—or "COSM" for short—to process your guitar and turn it into a different guitar or another instrument, one that's created *virtually*, entirely within the VG-99.

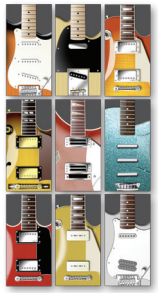
In addition to instrument modeling, the VG-99 uses COSM to create a multitude of different virtual guitar amplifiers and speakers, from vintage to modern. To add the icing on the cake, the VG-99 provides a staggering selection of effects to process your sound just the way you like it, including COSM models of classic stomp box effects. You can store all your sounds in 200 custom patches for later recall, and control sounds and patches in real time in a number of ways.

Using USB, you can connect the VG-99 to your computer, where you can transfer audio and MIDI back and forth, and even edit and store patches using the VG-99 Editor software. With the Guitar to MIDI function, you can use your guitar to trigger external MIDI instruments such as a hardware synthesizer or a virtual instrument in a computer.

The VG-99's versatile and convenient form factor makes it easy to integrate into a number of different environments. It works great as a table-top device in a recording studio, or it can be mounted in a rack with the optional RAD-99 rackmount adaptor. If desired, you can mount it on a stand for quick access in a performance. An integrated foot controller—the FC-300 (shown in the image to the left)—is available as well, which provides comprehensive foot control for switching patches and controlling an enormous variety of VG-99 functions.

COSM Instrument Modeling

With the VG-99's COSM instrument modeling, you can turn your guitar into a completely different instrument. That instrument could be:



- *an electric guitar*—Inside the VG-99 are ten electric guitar models, including Fender Stratocasters, a Gibson Les Paul, a Fender Telecaster, a Rickenbacker 360 12 string, a Gibson L4 archtop, and more. Each electric guitar model has pickups that sound just like the original articles, and you can shape the tonality of the instruments to taste with a powerful EQ. There's even a "Vari" guitar model that allows you to construct your own custom virtual electric inside the VG-99.
- *an electric bass*—There are two different electric bass models, the classic Fender Precision Bass and Fender Jazz Bass.

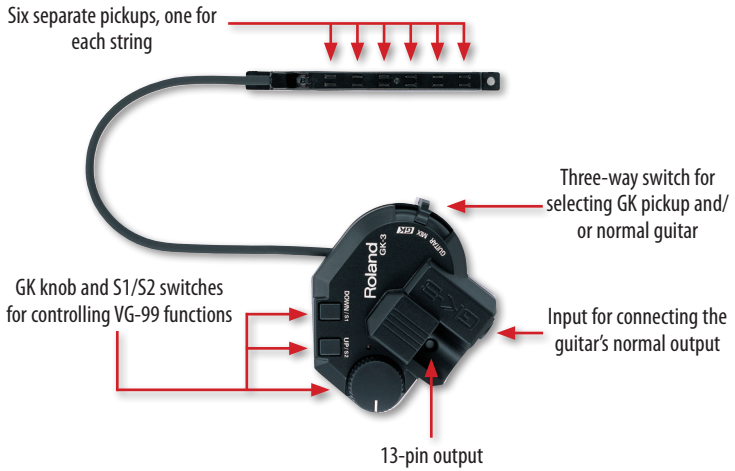
- *an acoustic instrument*—The VG-99 features models of five different classic steel string flat-top guitars, including a Martin D-28 and 000-28, a Gibson J-45 and B-25, and a Guild D-40. There's also a nylon string guitar, a resonator-type guitar (think bottleneck blues), a banjo, and a sitar. As with the electric models, there's a variable acoustic instrument, where you can build your own guitar, with adjustable parameters such as body size and type, as well as mic and pickup settings.

- *a synthesized instrument*—Utilizing digitally created waveforms, the VG-99 can transform your guitar into something completely unique and un-guitar like. Use the Pipe model to make your guitar sound like a woodwind instrument, or the Organ model to impart, well, an organ-like quality. Among the many available synth voices is a spot-on model of the GR-300, Roland's classic analog polyphonic guitar synthesizer from the early 1980s.

For more information on COSM instruments, see the *VG-99 Owner's Manual*.

Unlocking Instrument Modeling with a Divided Pickup

The VG-99 creates its virtual instruments by processing each of the guitar's six strings individually. This is accomplished by using a special pickup on your guitar called a "divided" pickup, such as Roland's GK-3. This type of pickup is actually *six separate pickups*, one for each string. As you play, the signal for each string—along with the output from your guitar's normal pickups, if desired—is sent through a special 13-pin cable to the VG-99. Additionally, the divided pickup's control section provides a knob and two switches that allow you to control various VG-99 functions remotely from your instrument, and a three-way switch for choosing the divided pickup, the normal pickups, or both.



Anatomy of the GK-3 Divided Pickup

A guitar's normal pickups sense the sum total of the guitar's six strings, creating a single monophonic output. For this reason, they can't be used to drive the VG-99's COSM instrument modeling section.

Divided pickups are also sometimes called "hex," "hexaphonic," or "polyphonic" pickups.

Installing a Divided Pickup

The Roland GK-3 provides an easy way to add divided pickup capabilities to your favorite guitar. It can be easily attached to most electric guitars with no modification to the instrument, and it can also be attached to many steel-string acoustic guitars as well. (Roland's previous generation divided pickups—the GK-2A and GK-2—can be used with the VG-99, too.) Roland also offers the GK-KIT-GT3, a kit version of the GK-3 that can be permanently installed inside your instrument (professional installation is required).

Guitar with a Roland GK-3 Divided Pickup installed

Another option is to purchase and install a piezo-type divided pickup system. These systems incorporate pressure-sensitive piezo elements in bridge saddles that replace the original saddles on your guitar. The output from the six individual saddles is then fed to a preamp with a 13-pin output. A piezo divided pickup system is necessary in applications where the GK-3 can't be used, such as with a nylon-string instrument, or with any instrument that has an unusually wide or narrow string spacing. A piezo system can also be installed on a standard electric guitar as an alternative to the GK-3. Pickup manufacturers such as RMC, L.R. Baggs, and Graph Tech Guitar Labs offer piezo divided pickups. In most cases, professional installation is required.

RMC piezo pickups on a Breedlove steel-string acoustic guitar (left) and a Godin Multiac SA nylon-string guitar (right)

If you wish to purchase an instrument with a divided pickup built in, guitar manufacturers such as Fender, Godin, Brian Moore, Breedlove, Carvin, and many more offer "Roland-ready" or "synth access" guitars. These instruments are factory-equipped with divided pickups and 13-pin outputs that can be plugged directly into the VG-99 or any previous V-Guitar System, as well as most Roland guitar synthesizers and guitar-to-MIDI converters.

13-pin jack on a Brian Moore iGuitar

Alternate Tunings and Polyphonic Effects

Once the VG-99 has each strings' signals, it converts them to digital information so they can be processed individually with its digital brain. Besides transforming your guitar into any of the instruments described previously, applying processing to each string individually allows for some wild realtime pitch-shifting and effects options with COSM instruments, such as the following.

- *Instant alternate tunings*—At the touch of a button, you can instantly change your COSM instrument's tuning to whatever you like. DADGAD, Open D/E/G/A, and various drop tunings are among the many presets, and you can create your own user tunings as well.
- *Pitch-bend effects*—You can change the pitch of an individual string or a combination of strings using one of the VG-99's controllers. This allows you to create pedal steel and "B-bender" effects.
- *12-string emulation*—COSM lets you turn your guitar into a 12-string, with both fine and course pitch control of the secondary strings.
- *Harmony*—Play instant harmonies based upon a key and scale that you determine.

- *Polyphonic effects*—or "Poly FX" allow you to apply powerful effects processing to each string individually. Available Poly FX include compression, distortion, octave, and Slow Gear.

So, Is It a Guitar Synthesizer?

Because it alters the entire guitar sound, has synth-type voices on board, and interfaces with a divided pickup, the COSM instrument modeling in a V-Guitar System is often mistaken for a guitar synthesizer. It's not, however; COSM actually does all its modeling magic in real time using super-fast digital signal processing (DSP) chips to alter the guitar's sound as you play. In this way, it's more akin to using a multi-effects processor—well, actually *multiple* super-powerful multi-effects processors, all running at once.

Like the VG-99, a guitar synthesizer—such as Roland's GR-20—utilizes string information from a divided pickup. However, it processes that information in a much different way. When a string is played and sensed by the divided pickup, the guitar synth determines the pitch of the string, and then it converts that pitch into digital information that *triggers* a sound engine, either internally in the guitar synth or externally via MIDI. As such, the guitar is only used as an input device—like the keys on a keyboard synth—to play sounds you call up on a menu, such as piano, strings, drums, and so forth.

With the VG-99, the guitar's string signals are the fundamental building blocks of the sound you hear, even when the realtime modeling process modifies that sound into something quite unlike a guitar. As a result, playing a COSM instrument always feels and responds just as naturally as playing your normal guitar, with every subtle, expressive nuance coming through.

Guitar to MIDI

While COSM instrument modeling itself isn't a guitar synthesizer, the VG-99 *does* have the ability to use the divided pickup signal to trigger sounds in an external synthesizer or sound module via MIDI. This is called the "Guitar to MIDI" function, and it's basically like having a Roland GI-20 GK-MIDI Interface built in.

Connecting a Normal Guitar Without a Divided Pickup

If you like the sound of your normal pickups as is—or you don't want to install a divided pickup—you can still use your guitar with the VG-99. Just plug its output into the VG-99's rear-panel 1/4-inch GUITAR INPUT jack. You won't be able to use COSM instrument modeling (including its alternate tunings and polyphonic effects) or the Guitar to MIDI function; those require a divided pickup. But you can use all the rest of the VG-99's processing options, including COSM amps and effects.

As mentioned earlier, the Roland GK-3 and other divided pickup systems allow you to send the guitar's normal pickup output along with the divided pickup output over the 13-pin cable connection. The GK-3 control unit has an onboard switch to allow you to easily switch between regular guitar, divided pickup output, or both, and the VG-99 has internal mixing options to blend the sounds as well.

COSM Amps to the Max

Once you've created a COSM instrument—or plugged your regular guitar into the GUITAR INPUT—you can "amplify" it virtually using a COSM amplifier model. The VG-99 offers 49 COSM amps, from vintage legends to modern classics. Each amp model offers uncannily accurate sound replication, as well as a set of familiar controls (volume, bass, treble, bright switch, etc.) as found on the real amp. The amp's speaker system—a critical component of any guitar amp's sound—is modeled as well, with a selection of five different virtual mics and variable mic positioning. (You can mix and match speaker types at will, or turn the speaker models off altogether if desired.)

For a detailed listing of the COSM amps and speakers, see the *VG-99 Owner's Manual*.

Effects, Effects, and More Effects

The VG-99 provides multi-effects to the gills—everything you need to sweeten, tweak, twist, and/or mangle your tone. The list of included effects reads like a history of Roland and BOSS signal processing, all under one hood. In addition, there are many COSM models of classic stomp boxes and effects units from other manufacturers.

The effects are organized into different groups, and all groups are available simultaneously. One effect within each group can be selected at any one time. The effects groups are described as follows.

- *COMP*—Provides compression and limiting effects.
- *OD/DS*—30 different overdrive and distortion effects are provided here, including models of legendary pedals and a plethora of BOSS classics. There's even a custom setting for rolling your own fuzz.
- *WAH*—Classic wah models along with original wah effects and a custom setting. Controlled via an optional expression pedal, the FC-300 Foot Controller, or MIDI.
- *EQ*—Shape your sound with a powerful four-band parametric equalizer.
- *DELAY*—Multiple mono and stereo delay effects are provided here, as well as reverse delay, and models of tape and analog units. You can also do sound-on-sound effects with the HOLD effect.
- *CHORUS*—Add depth and richness with mono and stereo chorus effects.
- *REVERB*—Create a sense of ambience with seven different reverb effects, including hall, room, spring, and plate.
- *MOD 1 and 2*—These two groups feature 25 effects types, including Phaser, Flanger, Slow Gear, Tremolo, Slicer, Octave, etc. Any one effect type can be selected for each group: MOD 1 and MOD 2.
- *NS*—This effect is a noise suppressor to reduce hum and noise.
- *FV*—Foot volume, controlled via an optional expression pedal, the FC-300 Foot Controller, or MIDI.

For a detailed listing of the effects and effects parameters, see the *VG-99 Owner's Manual*.

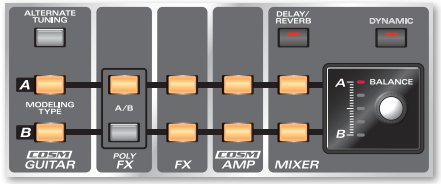
The Effects Chain

The order of the VG-99's effects can be changed at will. The COSM guitar path can be adjusted as well, allowing you to apply additional processing only to your guitar's normal pickups, if desired. For example, this is particularly useful for applying traditional guitar effects and COSM amp simulation to the normal pickups, and not to the COSM instrument. Effects after the point where the COSM guitar path is placed will be applied to both signals.

Processing Times Two: Dual Signal Paths

Okay, now that we've detailed what the VG-99 offers in the way of sound processing, let's double it. That's right—the VG-99 provides two separate and independent signal paths, A and B. And every processing option we've described so far—COSM guitar, COSM amps, and multi-effects—can be set up and used independently on both the A and B paths. That's an amazing amount of signal processing power!

The VG-99's POLY FX can only be applied to one signal path at a time, A or B.



Dedicated front-panel buttons controls allow you to easily select, edit, and balance the A and B signal paths

With the two signal paths layered together, it's like playing two instruments at once, with separate amplification and effects to boot. Imagine a Gibson Les Paul through a raging stack layered with a chorused 12-string acoustic flat top...or a sweet Fender Stratocaster combined with a GR-300 synth sound...or a Gibson ES-335/Fender Twin Reverb combo with a Fender Jazz Bass layered on the lowest two strings. And, of course, you can always blend in your guitar's normal pickup sound as well, giving you a third tonal option. The sound-shaping possibilities are nearly endless!

Mixing it Up

To combine the A and B paths, there's an onboard mixer. As you'd suspect, you can adjust levels and panning for each path as you like. But there's also a four-band EQ (separate from the effects section) that allows you to shape the overall tone of both paths, and additional reverb and delay effects are provided to add some final sweetening to your sound. The mixer also lets you route the A and B signal paths to any (or all) of the VG-99's multiple outputs.

One of the VG-99's mixer screens

Dynamic Control: Adjusting the Mix Balance with Your Playing Dynamics

The Dynamic feature allows you to control the A and B signal paths with your picking dynamics. By adjusting how hard or soft you play, you can blend A with B (or vice versa), or switch between the two paths. This can be used for many expressive effects, from subtle to extreme.

Patch Me In

The VG-99 provides a total of 400 patches. 200 patches contain preset sounds that demonstrate various VG-99 features, while 200 user patches offer locations to store your own custom settings for later recall. Furthermore, patch categories allow you to organize patches by music style or 10 user-defined categories.

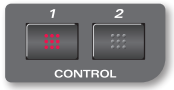
Patches can be selected with the PATCH/VALUE dial, the FC-300 (discussed in a bit), or via program change commands sent from an external MIDI device. You can also assign five of your most-used patches to the front-panel DIRECT PATCH buttons for quick access.

Revolutionary Realtime Control

The VG-99 gives you a multitude of ways to control its sounds and effects in real time during performances. Up to 18 different parameters per patch can be assigned to various onboard buttons and controllers, as well as optional external footswitches and pedals. Nearly any VG-99 parameter can be controlled—for example, the pickup selection on a COSM guitar, the gain of a COSM amp, the rate or depth of an effect, etc. In many cases, multiple parameters can be assigned to a single button or controller, so you can make multiple adjustments with a single action.

CONTROL Buttons

Parameters can be assigned to the VG-99's two CONTROL buttons. This gives you handy access from the VG-99's front panel.



F Knobs

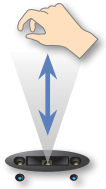
Under the display are six F knobs. The "F" stands for "function," and they're normally used to adjust parameters on the VG-99's various editing screens. However, when the home screen is displayed, they can be assigned to control any six VG-99 functions of your choice—and these assignments can be saved per patch.

D Beam and Ribbon Controller

The VG-99 offers two realtime controllers previously only seen on keyboards and grooveboxes: a D Beam and a ribbon controller. These two controllers give you exciting realtime control possibilities not normally associated with guitar performance.

D Beam

The D Beam is an invisible infrared light beam that emanates from the VG-99's D Beam controller. When you pass your hand over the D Beam, the assigned parameter or parameters are adjusted.



Ribbon Controller

The ribbon control is a touch-sensitive strip on the right side of the VG-99 panel. When you run your finger along the strip, the assigned parameter or parameters are adjusted.

CTL 3,4 and EXP PEDAL Jacks

You can connect optional footswitches to the CTL 3,4 jack (two FS-5Us or one FS-6) and an optional expression pedal to the EXP PEDAL jack (EV-5, FV-300L, etc.).

GK Knob and S1/S2 Switches

As we mentioned earlier, the GK knob and S1 and S2 switches on the GK-3 control unit or a Roland-ready guitar can be used to remotely control various VG-99 functions.

A Perfect Companion: The FC-300

The FC-300 MIDI Foot Controller offers the ultimate control for the VG-99. With five patch selection switches, two bank switches, two control switches, and two expression pedals, it's the perfect integrated foot controller for the VG-99. There's even an onboard display that shows VG-99 patch info. And when the VG-99's tuner is activated, the FC-300 display switches to a tuner screen.

If the onboard pedals aren't enough, the FC-300 has rear-panel jacks for connecting up to six optional footswitches or up to three optional expression pedals for additional realtime control. (Various combinations of both switches and pedals can also be configured).

It's simple to connect the FC-300 to the VG-99: just use a single CAT 5 Ethernet cable—the type of cable used for networking computers—to connect the RRC2 jacks on each unit. The CAT 5 cable provides two-way communication with the VG-99, and allows the VG-99 to provide remote power to the FC-300, so there's no fussing with an AC adaptor or batteries.

The FC-300 can also function as a full-featured MIDI controller, providing Program Change, Control Change, note, and System Exclusive control for any MIDI device.

MIDI

Nearly any assignable VG-99 parameter can be controlled via MIDI commands sent from an external device, such as a MIDI sequencer, keyboard, or another VG-99. Additionally, you can send numerous MIDI commands to the MIDI OUT jack from the VG-99's various controllers and the FC-300.

Audio Outputs

The VG-99's rear panel provides multiple output jacks to connect to any desired destination. The MAIN OUT jacks utilize 1/4-inch jacks, while the SUB OUTS provide a balanced output on XLR connectors. There's also a S/P DIF DIGITAL OUT, as well a PHONES jack for connecting headphones. Audio signals in the VG-99 can be freely assigned to any combination of MAIN, SUB, and DIGITAL outputs via the mixer, either globally or per patch.

When you've plugged a guitar's normal output into the VG-99, its unprocessed signal is available at the GUITAR OUTPUT jack.

USB

The VG-99 features a USB jack that you can connect to a personal computer for data exchange.

Connecting the VG-99 to a computer requires installation of the VG-99 USB Driver on the computer. For the latest driver version of the USB driver, check the VG-99 downloads page at www.rolandus.com.

The VG-99 Editor and Librarian

The VG-99 Editor software allows you to edit, save, and load VG-99 patches using an intuitive full-color graphic display. The VG-99 Librarian provides a way to organize patches in groups. The Editor and Librarian comes on the CD-ROM included with the VG-99, and they can also be downloaded at www.rolandus.com.

The VG-99 Editor's main screen

Audio/MIDI Interface Functionality

With the VG-99 USB Driver installed on a compatible Windows or Mac computer, you can use the VG-99 as a USB audio and MIDI interface. This allows you to record and playback audio through the VG-99 with digital audio workstation (DAW) software, and transfer MIDI information with MIDI-capable software, such as a MIDI sequencer. If you have a divided pickup installed on your guitar, you can use the Guitar to MIDI function to play software-based virtual instruments.

The VG-99's flexible USB routing allows you to record the VG-99's total sound, or record a dry, unprocessed signal to DAW software while monitoring the sound with COSM amps and effects during recording. When it's time to mix, you can play the dry audio back through the VG-99's COSM amps and effects, and then re-record the result on another track. This is a process known as "reamping," and it gives you the ability to adjust guitar sounds to match your needs at mixdown, rather than having to commit to them ahead of time.

Wow.

No doubt about it, the VG-99 is a guitar processing powerhouse. With its amazing COSM sound-shaping ability, powerful multi-effects processing, realtime control options, and USB connectivity, this is a digital guitar tone machine like no other.

They say that less is more, and that's often true. But the processing power in the VG-99 is so massive that we can't resist offering a hypothetical combination of things that can be done in a single patch:

- *Two different COSM instruments, each with altered tuning, 12-string, detune, and harmony (blended with the normal guitar sound if desired)*
- *Three different overdrive/distortion effects*
- *Two different COSM amp/speaker rigs*
- *Nine (!) different four-band parametric EQs*
- *Three different reverbs*
- *Three different delays (or five if you don't mind giving up two EQs)*
- *Two different compressor effects*
- *Two different wah effects*
- *Two different chorus effects*
- *Guitar to MIDI conversion*
- *USB audio/midi interfacing with a computer*

Whew. If you can settle for only *seven* four-band EQs and *three* delays in this hypothetical patch—we suspect that's probably enough—you can add in a bunch more effects options, too.

Of course, you don't have to use all this power at once, but it's good to know it's there when you need to kick in the afterburners. Ready to take a ride? The VG-99 provides the highway to take your guitar playing headlong into the 21st century.

The End

We hope you've found this workshop helpful. Keep an eye out for other VG-99 Workshop booklets available for downloading at *www.RolandUS.com*.