

# *V-Synth*

## Book II Official Edition

*Welcome to Elastic Audio Synthesis*

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- *Meet the V-Synth Family*
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*Elastic Audio  
Synthesis*



# *Elastic Audio Synthesis*

\* These pictures were taken at a Roland event in spring 2005.

# Welcome to Elastic Audio Synthesis

The Roland V-Synth and V-Synth XT are unique and expressive instruments designed to give players total control over their sound. With a powerful multiplex synthesis engine that combines sophisticated modeling with realtime audio manipulation, Roland's V-Synth instruments let you discover the "sound within the sound" using an intuitive programming interface and a myriad of realtime controllers. We call this "elastic audio synthesis," and it's what separates the V-Synth family from all other synthesizers on the market. Why limit yourself to traditional types of synthesis like analog modeling, FM or sampling, when you can have infinite possibilities and unparalleled sonic control?

At Roland, we believe real synthesis means manipulating audio elastically. But what exactly does that mean? Think of a rubber band and how it can be stretched into any shape or form. Now imagine being able to apply the same principles to any sound—giving you the flexibility to stretch and re-shape it all from a single waveform or sample! The V-Synth and V-Synth XT have this power, thanks to Roland's proprietary VariPhrase™ technology, which enables realtime and independent manipulation of a sound's pitch, time and formant. So, for example, a traditionally short sound like the attack of a piano key can be re-shaped and stretched into a long evolving sound. Or you could re-pitch a vocal performance in real time—even polyphonically—while keeping the sound completely natural.

Elastic audio synthesis gives you the power to make any sound work the way you want it to—live or in the studio. This book will help familiarize you with the V-Synth family and give you some helpful tips to get the most out of them. Happy programming with the V-Synth and V-Synth XT!

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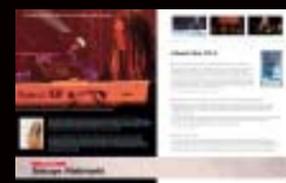
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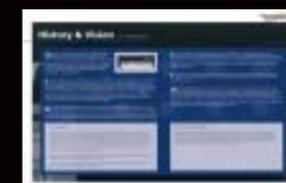
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History & Vision

# The Quest for New Sounds

by Paul Nagle

**Synthesis: the combining of often diverse concepts into a coherent whole or system.**

For too long now, we have allowed ourselves to believe that a synthesizer is merely a keyboard-oriented instrument whose sole purpose is to mimic pianos, saxophones, brass and so on. Even in terms of purely electronic sounds, our minds seem preconditioned. For example, mention “Moog” and the vast majority instantly think of fat basses and solos. But it wasn’t always this way. Many years ago, musicians in the know would never have thought a synthesizer’s role was to reproduce already familiar sounds. Instead, they would have whispered in hushed tones about creating original noises previously unheard by anyone; of developing innovative performance techniques never before witnessed and they would have spoken of the vast potential that lay ahead for these electronic wonders.

It’s all too easy to blame the advent of digital technology for the demise of such dreams. Simple analogue waveforms surely can’t represent the end of the story, can they? When musicians were given hundreds of realistic sounds and the potential to use real-world recordings as the raw material for synthesis, the future should have been more exciting than ever! And, indeed, some instruments came along that did represent very real steps forward.

Time has passed and we have seen spurts of innovation here and there. Virtual Analogue synthesizers gained popularity, offering DSP models of the oscillators and filters we knew already, plus internal effects and far greater polyphony than their analogue counterparts. However Virtual Analogues came in very conventional packages, mostly recycling what was already familiar; they didn’t aim to establish fresh sonic palettes and broke no new ground in terms of performance control. These were the qualities that first aroused my interest in synthesis and electronic music; I had almost given up hope of seeing a synthesizer that offered them again. Similarly, whilst I enjoyed working with PCM-based synths, I was frustrated at how little you could interact with the samples. Typically you could filter them, change their envelopes or add effects, but in most cases, this didn’t really feel like synthesis at all. And if your PCM synth was filled with a range of samples you didn’t like, you were stuck with them: precious memory wasted that could have been far better employed.

And then I discovered the Roland V-Synth.



I'm lucky that my first V-Synth demo was courtesy of my friend Howard Scarr—a skilled musician who has devoted time to really learning the instrument. He didn't just dial up the factory sounds and play the keyboard, he performed with it, offering me an exciting glimpse of the power on offer. Check out [www.v-synth.com](http://www.v-synth.com) and listen to an mp3 demo created by Howard; he plays a tune utilising only a single Patch with many twists and tweaks performed in realtime. It is hard to believe that only a vocal waveform is used in this demo.

With its open, flexible architecture and diverse technologies, it's difficult to think of any other synthesizer—old or new—offering such a wealth of choices. Truly, the sum of the V-Synth's parts adds up to the perfect blend of performance instrument and sound-designers' dream. Thus, you can layer samples with modelled analogue waveforms, or can process external signals, chopping them with the arpeggiator or running them through freely-chosen COSM<sup>®</sup> processors. Somehow Roland have managed to bundle everything together logically and seamlessly, creating a synth that is way easier to use than you might expect.



One of my favourite tricks involves using a vocal sample—perhaps the voice of a child—and taking manual control of its formant. Using the tools available, the child's speech can be transformed into a dark, deep timbre that can raise the hairs on the back of your neck! Or you might choose to step through user-defined sections of the waveform with each keystroke, articulating phrases or individual vowels as part of a performance. Or, using legato triggering, you can add harmonies to a recorded phrase whilst it progresses, rather than restarting the sample on each note as with traditional samplers. Yet another cool innovation is "robot voice" that extracts the pitch information from a sample and replaces it with pitch derived from the keyboard. And using the V-Synth's resampling, you can record its output to be used as a source for further exploration. You can even play chords that consist of loops—without all the chaos that a conventional sample-based instrument would produce. Or you can non-destructively split a loop to play the individual hits via the keyboard or re-order them via the arpeggiator.

## The Quest for New Sounds (continued)

Once you start to explore, you quickly reach for the performance controls. The TimeTrip™ pad is a superb controller; with it you can spin through a sample, turntable-style, or freeze the waveform at any point without compromising its pitch. Reverse the circular direction with your finger and you hear the sample played backwards. Intuition soon takes over; this is fantastic for manipulating speech, drum loops, you name it. The pad may also be used as an X-Y controller, perhaps for varying pitch or modulation via each axis, or for other assignable parameters such as formant or oscillator level.



▲ TimeTrip Pad

Next consider the twin D Beams. These are a revelation and highly responsive. Like the TimeTrip pad they are fully assignable to a variety of parameters. I've witnessed their effect on an audience personally and feel they finally give me the power of expression I've been searching for. For way too long, we synthesizer players have been regarded as "just keyboard players," restricted in performance gestures and expression. Not any more. With my V-Synth, I feel liberated at last!



▲ Twin D Beam

\* D Beam light has been colored for illustrative purposes only. Actual infrared light beam is invisible.

Since I've owned a V-Synth, I've used it extensively both live and in the studio. I've programmed eerie, whispering arpeggios or employed its effects section to create endless sound-on-sound loops—all perfectly synchronised to MIDI clock. I've taken guitar riffs and torn them apart to produce weird chimes and metallic roars; I've sampled my old monosynths such as the SH-101 and produced massive phasing pads or acid basslines. And I've used many, many vocal recordings to add unique character to my tracks; the V-Synth lets me impose alternative melodies and harmonies onto entire phrases.



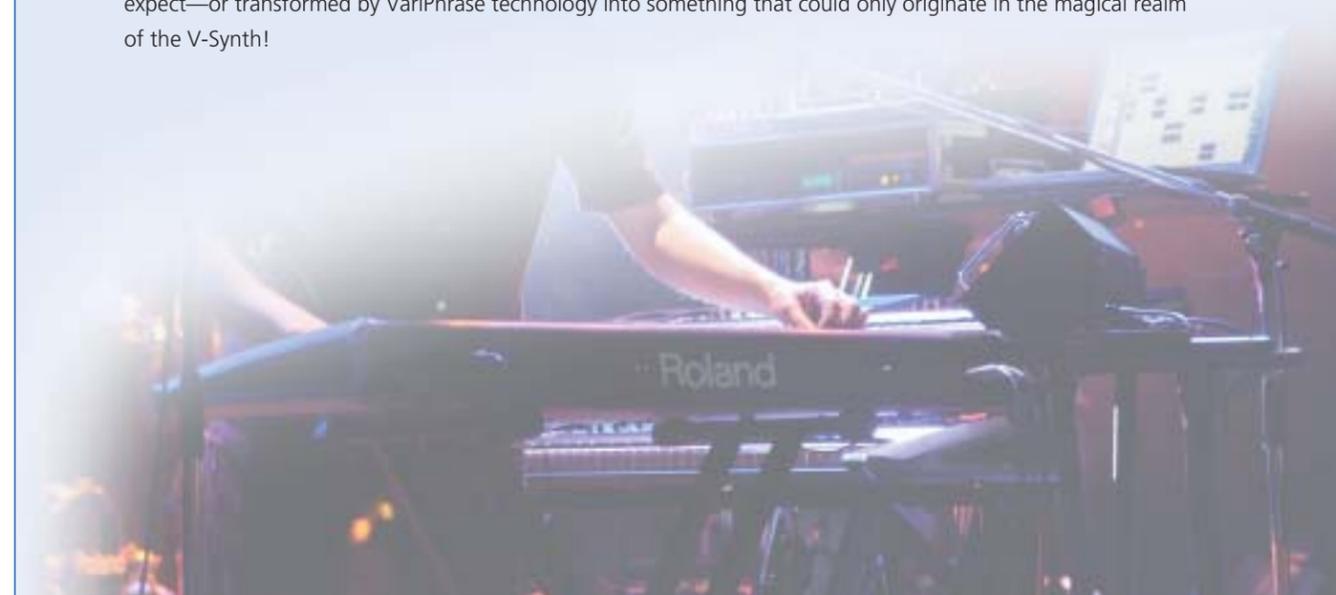
Sure, you can program traditional sounds, but these are often just the starting point because the V-Synth can stretch those sounds until they are completely unrecognisable—but do it in a way that makes sense musically. With this synth in your rig, you can produce lush, complex, evolving pads complete with wavesequence-like effects. You can construct searing, alien solo patches one minute and traditional synthesizer basses the next. If you want to process external audio, try mapping up to sixteen different zones on the keyboard, each with a different COSM processor and then select the signal processing you need at the touch of a key.

Unlike most of its PCM-based contemporaries, the V-Synth boasts a full complement of knobs for instant access (a homage to the JD-800?). Pair this with a superb touch-screen (you can even change parameters with your finger!) and you have a user interface second to none. I can't emphasise enough how cool it is to be able to grab dedicated controls at any time during a performance—for example to alter a sample's playback speed without affecting the pitch. Or to non-destructively change the structure that determines signal flow. And at all times, those envelope sliders are available to offer lightning-fast adjustment to the overall shape or, when navigating via the touch-screen, they take over any on-screen envelopes. It's little details like this that remind you of the care and thought that has gone into the design of this instrument.



▲ Touch-screen

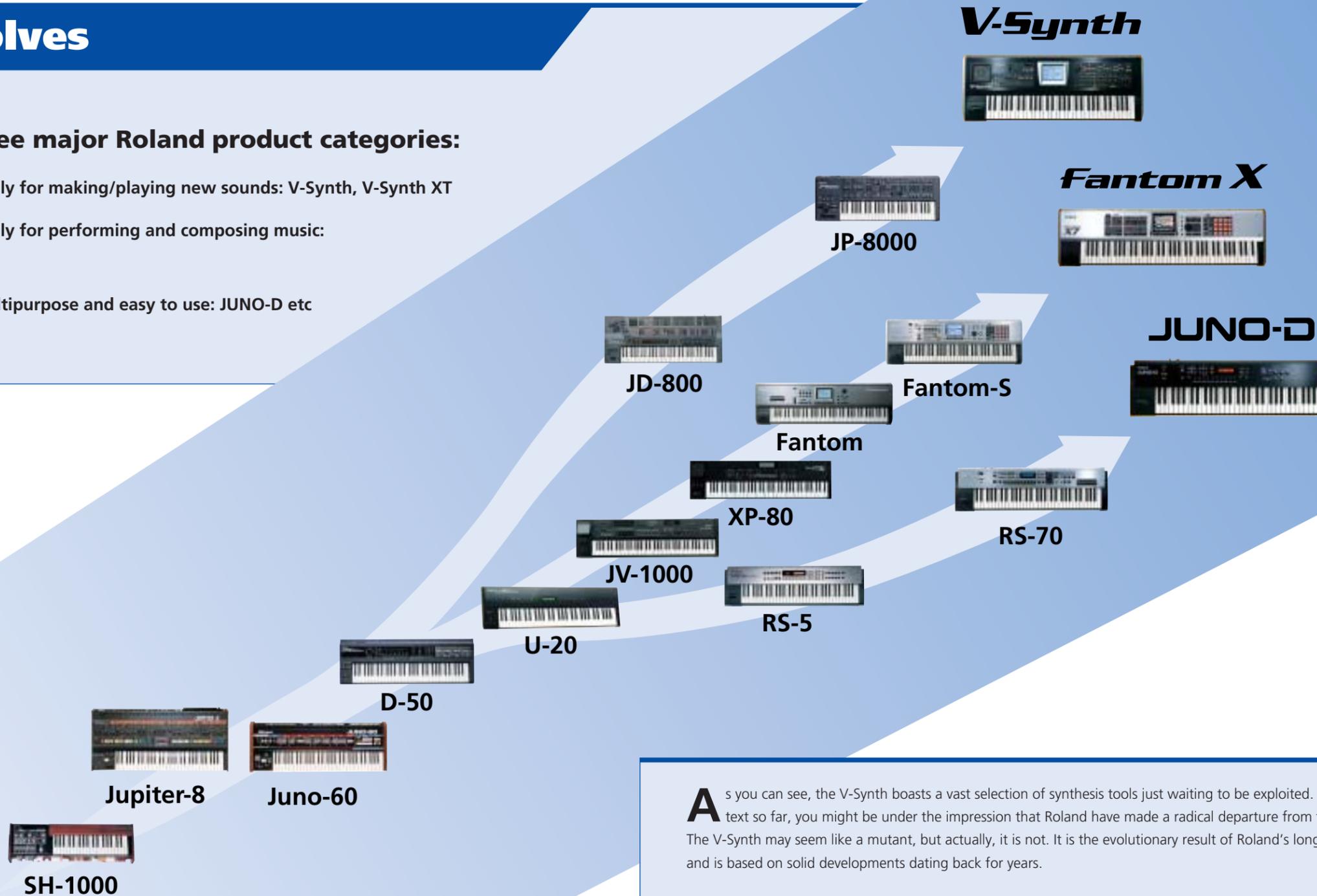
Finally, in order to encompass the widest range of possibilities, Roland also included some standard waveforms. There are guitars and pianos, strings, drums, woodwinds and so on. All are ready to be played as you'd expect—or transformed by VariPhrase technology into something that could only originate in the magical realm of the V-Synth!



# Synthesis Evolves

Currently there are three major Roland product categories:

1. Synths that are designed primarily for making/playing new sounds: V-Synth, V-Synth XT
2. Synths that are designed primarily for performing and composing music: Fantom-Series Workstations
3. Synth designed primarily for multipurpose and easy to use: JUNO-D etc



## Roland Synthesizer History Three Categories

As you can see, the V-Synth boasts a vast selection of synthesis tools just waiting to be exploited. Having read my enthusiastic text so far, you might be under the impression that Roland have made a radical departure from their range of products. The V-Synth may seem like a mutant, but actually, it is not. It is the evolutionary result of Roland's long journey in music technology and is based on solid developments dating back for years.

It's worth remembering that Roland was the first manufacturer to sell a synth in Japan. Starting from VCO origins, the company progressed to DCO, digital synthesis such as LA (Linear Arithmetic synthesis first employed on D-50), PCM, User Sampling, COSM (Composite Object Sound Modeling), and VariPhrase. And, as each new technology emerged, new product ranges arose. Thus we had the SH synths, Jupiters, JUNO/JX, D-Series, JV/JD/XP/XV-Series, and VP-9000 etc, each representing monophonic/duophonic VCO synths, polyphonic VCO synths, DCO synths, LA synths, PCM synths and workstations with massive Wave ROM capacity (especially when you consider the SR-JV80/SRX Series Wave Expansion Boards), and VariPhrase processing etc.

As the technologies steadily mature, their potential applications increase and diversify. Accordingly, Roland have begun to create product series whose names are based not on the underlying technology but on the character of each product.

## Synthesis Evolves (continued)

Once upon a time, synthesizers were seen as a way to make thrilling new sounds. Don't let that spirit die! The V-Synth is designed for the adventurous, for those who wish to explore and to weave sonic tapestries and manipulate them in ways otherwise impossible.

The flexible nature of its design means the journey does not end here. Already integration with a computer is well realised: samples may be loaded via a USB cable or imported from a standard PC card. This card slot has interesting potential for further exploitation: consider Roland's VC-1, the first of a range of alternate synth engine cards. With this installed, the entire instrument is transformed into the classic S&S synthesizer, the D-50. Apparently, the creation of this card involved digging in Roland's vaults for the original code—on 5-1/4 inches floppy disks—and then transplanting that code into the V-Synth. Of course the sound was much cleaner and of better quality so an additional "D-50 mode" was introduced—ideal for those who still wish to hear some of the grunge and aliasing that characterised that instrument. As a sign of how our expectations have changed, Roland engineers reportedly "rushed out to vomit" when they heard the V-Synth truly become a D-50!



▲ VC-1 on V-Synth XT



▲ VC-2 on V-Synth XT

The VC-1 is now joined by the VC-2 Vocal Designer, a card that transforms the V-Synth into a high quality vocoder and introduces vocal modelling for a variety of voice and choir (small or large ensemble) effects. Either use it as a traditional vocoder or play the modeled choirs from the keyboard with no need of audio input. The vast array of vocal textures at your command include Kraftwerk-style robotic speech, lush choral pads, gender-bending solo voices or growling, dissonant mumbles. And with its high-definition pitch detection algorithm, voice models can be played directly from the pitch of incoming audio, such as a vocalist or synthesizer solo. You can even alternate between keyboard-controlled pitch and external-signal pitch following, all within the same patch.

Both the VC-1 and VC-2 are included in the V-Synth XT, a butch-looking rack/table top version of the V-Synth with a touch-sensitive colour screen, 8 assignable controls, XLR input and streaming audio via USB. Furthermore, to coincide with the release of the XT, a new V-Synth operating system—version 2.0—is released. This upgrade includes a four-track "Step Modulator" providing stepped or smoothed automation of four parameters in any zone of your choice. All of the tracks run in sync with the current clock source. For maximum flexibility, their rates, shapes and lengths (up to 16 steps) are all set individually. Imagine four freely-assignable, synced LFOs with waveforms created dynamically by the user and you may begin to understand the power of the Step Modulator. Other features include the fabled SuperSaw waveform plus Feedback, and X-mod Oscillators. These extend the virtual analogue sound palette considerably. Rhythm-Sets now offer unparalleled drum kit manipulation and the Sound Shaper is a tool to make programming fresh sounds easier than ever before. Included with this (free) operating system update is a selection of patches created specifically to demonstrate the many unique features of the V-Synth. You may even find some of mine in there!



▲ VC-1 (D-50 for V-Synth/VariOS)

▲ VC-2 (Vocal Designer for V-Synth/VariOS)

To conclude, this is a deep and refreshingly different musical instrument that marks the pinnacle of Roland's achievements in synthesis so far. It will reward its player for years to come and should appeal to any who are interested in stretching their creativity and imagination. Together you can explore the very essence of synthesis. And if you briefly recall the definition with which we began, can you think of any other instrument that combines so many diverse concepts into a coherent whole?

Paul Nagle

*Paul Nagle*



# Meet the V-Synth Family

In early 2003, Roland introduced the original V-Synth keyboard and revolutionized the way sounds are created and performed. Since then musicians have been wondering "what's next?" Fast-forward a few years and Roland is set to re-energize the synthesis world again with the V-Synth Version 2.0, V-Synth XT and VC-1/VC-2 V-Cards. These ultra-intuitive instruments put powerful synthesis and extraordinary sounds at your fingertips... sounds you can actually use in your music from the moment you power on. Put the fun back into playing a synthesizer with the V-Synth and V-Synth XT!

# Roland's Mega-Synth Gets Re-loaded

**H**ow do you improve upon the most innovative synthesizer Roland has ever designed? You re-load with Version 2.0 software! The V-Synth is a 61-note keyboard that combines elastic audio synthesis with powerful COSM® modeling and effects to create sounds like you've never heard before. Built around a powerful set of realtime controllers, the V-Synth makes creating new sounds as easy as waving your hand over the light-sensing D Beam or dragging your finger along the TimeTrip™ Pad. This keyboard was meant to be programmed and played! And with USB connectivity, it's easy to transfer sounds and manage your library on a computer.



## Inside Version 2.0

**S**o what's new? To start, there's an entirely new bank of waveforms and sounds that give the V-Synth a completely different character. Known as the "V-Synth Producer Edition," these sounds were programmed by top artists and producers to fit right into your next production—proof that the V-Synth isn't just for full-time sound programmers, but for everyday musicians looking for new and inspiring Patches. And while at first blush some of the sounds may seem like familiar territory (strings, synth bass, etc.), they've all been programmed to take advantage of the V-Synth's extensive modulation and controller capabilities—making it easy to transform them into something completely unexpected and new. That's the beauty of elastic audio synthesis.

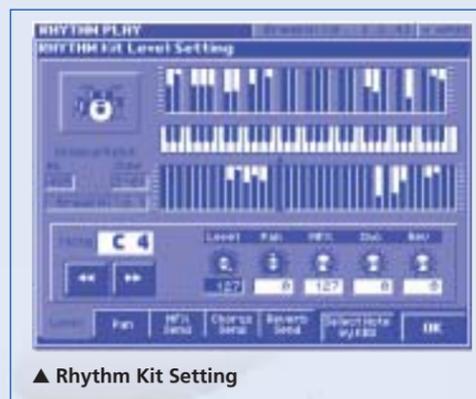
## New waveforms, new possibilities

**V**-Synth Version 2.0 also comes loaded with fresh new waveforms that further extend the sonic palette of this groundbreaking synth. There are newly sampled waves including standards like electric piano, guitars and flutes all the way to specialties like Gregorian chants (a great candidate for TimeTrip fun!) and ethnic instruments like sitar and didgeridoo. Roland even beefed up the V-Synth's analog modeling sounds, adding an enhanced version of the popular Super Saw waveform and Feedback Oscillator from the classic JP-8000 synthesizer, plus an all-new X-Mod (cross-modulation) Oscillator that can create some very aggressive/distorted metallic sounds. Have a particular sound in your mind? Let the V-Synth bring it to reality.

## Build the ultimate drum kit

Imagine having the power to put the entire V-Synth engine behind every sound contained in a drum kit. That's exactly what you get with Version 2.0's new Rhythm mode!

When engaged, Rhythm mode divides the V-Synth's keyboard into seven distinct Drum Patches, each with 12 individual sounds. Do the math and that's up to 84 different sounds that can be mapped and played back—each with independent realtime processing. Using Rhythm mode, you could, for example, create a drum kit using analog modeling for the bass drum while still being able to use a Side Band Filter on a cymbal and alter sampled loops with elastic audio processing. Powerful stuff indeed.

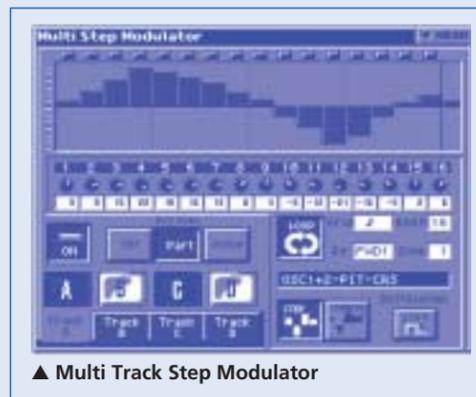


▲ Rhythm Kit Setting



## Multi Step Modulator puts your sounds in motion

One of the most exciting new features in Version 2.0 is the new Multi Step Modulator. It is essentially a 16-step sequencer with four individual tracks, each of which can be used to modulate a pre-defined parameter. Just select a track and choose what you'd like to control using the Destination List. Examples include oscillator pitch, COSM filter parameters, envelope settings and effect levels. Entering data is easy using the V-Synth's bank of knobs, or you can simply "draw" in a modulation curve using the touch screen, complete a smoothing function to make your curve sound perfect. Elastic audio synthesis means taking an otherwise still sound and putting it in motion, and the Multi Step Modulator is one of the most powerful yet intuitive ways to do just that.



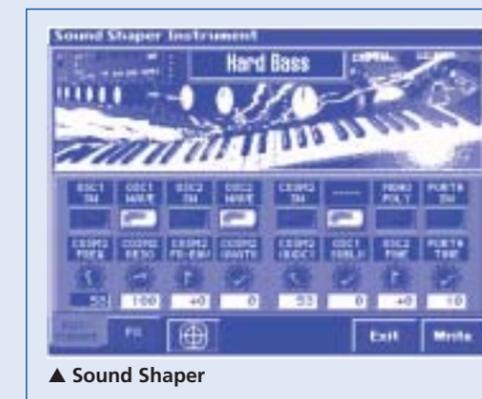
▲ Multi Track Step Modulator

## Sound Shaper: Programming simplified

To help you make sense of all this programming power, Roland has introduced a new feature called Sound Shaper. The idea is to condense the amount of parameters one uses when programming certain types of sounds. With Sound Shaper, you can select a type of sound you wish to program (i.e. polysynth, brass, organ etc.) and the V-Synth will automatically display the parameters that will have the most dramatic effect on the sound—no more searching through menus to make some simple tweaks! Just use the corresponding switches and knobs outlined on the display to edit. With Sound Shaper, even novice users can create radical new sounds with minimal effort.



▲ Sound Shaper Menu



▲ Sound Shaper



## Elastic Audio Synthesis to the Max—In Your Rack

For those who want it all Roland proudly offers the V-Synth XT. More than just a rackmount version of the V-Synth keyboard, this powerful new module adds a vibrant full-color display, XLR microphone input and the power of the VC-1/VC-2 V-Cards built-in! Of course, you also get the elastic audio synthesis engine that made the original V-Synth famous and all the new Version 2.0 software features. Whether used in tabletop mode or in a rack full of gear, the V-Synth XT brings fresh new sounds, powerful vocal modeling and external audio synthesis to musicians everywhere.



## Unparalleled synthesis capabilities

When you consider all the different types of synthesis built into the V-Synth XT, it's clear that this module is in a class all its own. For starters, there's Roland's award-winning elastic audio synthesis engine with independent, realtime control over a sound's pitch, time and formant—plus powerful COSM processing that includes things like a modeled TB-303 filter and studio-quality effects.

Want more? How about analog modeling with choices of synth waveforms including Super Saw and the Feedback Oscillator from the JP-8000. With V-Card technology built-in (please refer to the VC-1/VC-2 section later in this book), the V-Synth XT can also be transformed into the classic Roland D-50 L/A Synthesizer. Relive all those classic L/A sounds made popular in the early nineties while creating new sounds of your own.

Alternatively, you can connect a microphone and the XT becomes a powerful vocal synthesizer that can, for example, magically transform your voice into another gender or the sound of a full-on choir. And yes, it can also do classic vocoder sounds. The search for a vintage SVC-350 is over!



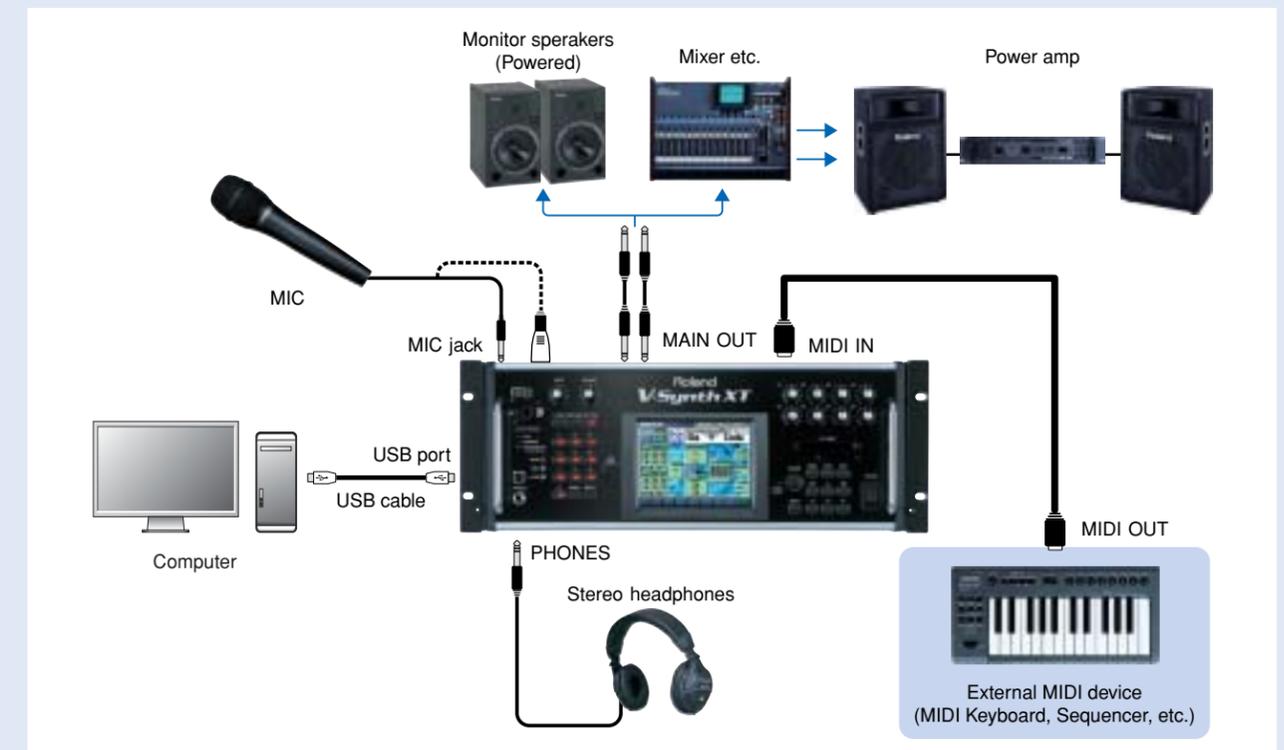
## Impressive design

Roland designed the V-Synth XT to be as flexible on the outside as it is on the inside. When rack-mounted, you can actually angle the front panel to suit your own personal taste. And using the XT is easy, thanks to a new full-color LCD screen with helpful menus and eight universal control knobs. The colorful touchscreen display can even function as a virtual TimeTrip Pad—just drag your finger over it and listen as the sound evolves.



## USB and analog I/O

The V-Synth XT provides several ways of getting audio into the module for sampling or external audio processing. The onboard USB port supports full audio/MIDI streaming for easy transfers with a computer, but there are also plenty of analog inputs ranging from a 1/4 inch input for connecting line-level instruments to an XLR mic input with phantom power and guitar Hi-Z input. Plug in a microphone and suddenly the V-Synth XT becomes a full-blown vocal modeling tool or vocoder. Connect a guitar and you've got an arsenal of killer COSM effects to create mind-blowing tones.



# Powerful expansions for V-Synth

**R**oland's VC-1 and VC-2 V-Cards are all you need to turn your V-Synth keyboard or VariOS module into a vintage L/A synthesizer or a vocal modeling powerhouse. Simply pop an optional V-Card into the PC card slot, re-boot and watch as you're the V-Synth or VariOS are transformed into an entirely new instrument! Purchase the V-Synth XT, and the VC-1 and VC-2 come pre-installed—no re-booting required. It's like getting two instruments free!



## VC-1

**T**he VC-1 is an exact emulation of Roland's legendary D-50 L/A synthesizer. Once installed, your V-Synth or VariOS will contain all the original D-50 Patches—including favorites like "Digital Native Dance," "Intruder FX" and "Living Calliope"—plus the ability to program entirely new sounds using the original D-50 interface. Roland also includes free "UniQuest VC-1" editor/librarian software, making it easy to program new sounds and manage your D-50 sound library from a Mac or PC.



## VC-2

**F**or some mind-blowing vocal modeling, try out the new VC-2. Whether you need the sound of a Gregorian Choir or just want to improve the quality and range of your own voice, you'll be amazed at the results you can get with this expansion. Simply plug in your mic and let the VC-2 transform your voice into a full choir—a boon for film score work! Ever wish you could sing higher or lower? Now you can... just sing into the mic while playing the melody on the keyboard and listen as your voice magically follows. The VC-2, combined with the V-Synth family's elastic audio synthesis and COSM, can yield some of the most incredible sounds you can imagine. We'll show you how as you delve deeper into this book.



**F**or now, we hope you have a better understand of what the V-Synth family is all about, and how these amazing instruments can put the fun back into sound creation, and ultimately help you find a sound that's all your own. Put a V-Synth Version 2.0 or V-Synth XT in your rig, and you'll put new life into your music for years to come. Enjoy!



\*Photo by Eiji Kikuchi



### Artist Profiles

## Richard Barbieri

— I'm still learning about the keyboard.

Famous for his stylish, synthetic contributions to the band Japan (circa 1970—80), Richard Barbieri has remained at the forefront of progressive music as a member of Porcupine Tree, as a contributor to numerous cutting-edge albums, and as a globally acclaimed producer and sound designer. Roland's V-Synth proved to be the perfect vehicle for Barbieri's sophisticated brand of music creation.

\*Photo by Eiji Kikuchi

"About a year ago I was asked to try the V-Synth," Barbieri relates, "and to see what my approach would be like with it. At first it was a very different kind of synthesizer than what I'd been used to. The possibilities for sound-shaping and performance were quite extensive, so this presented me with many opportunities for a deeper kind of programming."

"Usually, with most synthesizers, you only have limited materials to work with," he continues, "and you have to find ways to gain expression from the synth, but with V-Synth it's possible to have expression from so many sources. You can pre-program so many changes in sounds, and so many effects, so many modulation techniques, and then assign them not only to the keyboard with pressure or velocity or to the standard kind of modulation wheel or bender, but also to the D Beam and TimeTrip Pad. And now, with the VC-2 [Vocal Designer card], it's possible to use the human voice, the most expressive instrument, to shape sound to find new ways of adding dimension to your music."

The new Sound Shaper feature, introduced in the V-Synth's Version 2 operating system, makes programming sounds much quicker and easier. But for those who dare to create their sounds from an initialized palette, the V-Synth's depth might seem impressive and slightly intimidating. "It took me a long time," Barbieri confesses, "because you have to go very deep into the synthesizer to get the best results. And of course you have sampling techniques as well, so it's possible to import various sound sources uses these as waveforms in combination with the waveforms in the V-Synth, again to produce more interesting sounds and effects."

"I'm still learning about the keyboard, and that's a good thing because you should be learning for years and years, that means the technology that you're using is well thought-out and presents so many possibilities. Sometimes it can take five or six years to fully understand a keyboard, to fully understand the range and the techniques and the possibilities of the sound, so that's what I'm going to be now doing—taking my sound even a step further with the V-Synth."

# BT

— The V-Synth is a killer synthesizer. It's magic.



He's known around the world the "Father of Trance," but Brian Transeau (BT) is no one-trick pony. Whether he's writing for 80-piece orchestras (for films such as *The Fast and the Furious*), collaborating with mega-stars like Sting, or creating epic remixes for Sarah McLachlan, Tori Amos, Madonna, or Seal, BT consistently balances creative and memorable songwriting, sonic innovation, and the latest technology for a cutting-edge, yet organic sound.

\*Photo by Richard Salvador

One of the newest instruments added to BT's studio and live setup is the Roland V-Synth, which BT describes as one of "the most exciting and overlooked technologies in the last couple of years. It's exciting because it does things that no other synth does, and it's overlooked because people tend to judge synthesizers by their preset sounds, like its piano, etc., and they underestimate the V-Synth's potential. The V-Synth's core technology and application is amazing for both stage and studio.

When BT took delivery of his V-Synth, the first question he asked was, "How do I erase everything?" Building custom sounds from square one is the way he prefers to work with his synthesizers. "When we first got the machine, we threw in AIF and WAV files, and started manipulating them with the synthesis engine. Loading waveforms into the V-Synth from computer is really seamless and easy to do. Interesting things happen when you start combining the V-Synth's technologies—PCM, analog modeling, and external input—in several ways: mixing them, frequency-modulating them, envelope ring-modulating them, etc. There's a plethora of sound design possibilities with the V-Synth.

"External input is a killer thing when using the V-Synth with streaming audio," he continues. "It's great for sound designing as well, because you don't have to spend hundreds of hours writing code to get esoteric effects. It's just a killer tool to do stuff like this. And having the D Beam and TimeTrip pad opens up new areas of expression. The HOLD button allows the parameter value to stay where you last touched, so you can tap the pad like a drum pad and play rhythmic things for interesting effects. You can grab a loop and freeze it real time, and then pass it through the Resonator. There are good timestretching in plug-ins on the market these days, but with the V-Synth you can do real-time live manipulation, and that's what an instrument should be. An instrument shouldn't impose its will on us—we should impose our will on it!"

"The V-Synth is a killer synthesizer," BT concludes. "I'm working on a new film, and am digging under the hood like crazy. It's magic."



BT



\*Photo by Richard Salvador

— The main thing you've got to know is what you want to create.



Tatsuya Nishiwaki began his music career in 1987 as a member of the band "PAZZ" on CBS/Sony records. After the group's break-up in 1988, he began producing numerous albums—working as a composer/arranger, and playing instruments like keyboards, drums and harmonica. His emotional style of playing and unique arrangements have won him wide acclaim not only in Japan, but worldwide.

Over the years, Nishiwaki has worked with a variety of top artists as a player, arranger or producer. His credits include names such as Bobby Caldwell, Roberta Flack, Richard Marx, The Pointer Sisters, Chad Wackerman, Carlos Vega, Jimmy Johnson and Lee Sklar—plus major Japanese artists. An avid user of technology, Nishiwaki has also worked as a sound designer on several Roland synthesizers including the legendary D-50 and V-Synth.



T a t s u y a N i s h i w a k i

## About the VC-2

### ■ To begin, would you tell us about the amazing world of the VC-2 vocal designer?

The thing I was most attracted by was polyphonic pitch shift. The amazing thing is that unlike vocoders until now, you can use your own voice as the carrier (\*1). Your voice is output at the pitch that you play on the keyboard. And the vibrato is not just a triangle wave—the VC-2 has vibrato data that's been collected from real vocalists that are actually good. And of course you can play with the formants, so you can turn yourself into a completely different personality. The quality is good enough that you could make an entire album as a vocal alter ego. It's plenty good enough to be used as the main element in the song.

(\*1) The tone and pitch that forms the basis of the sound.

### ■ How do you feel about the response or ease of use when you sing while playing the keyboard?

For example until now, when I wrote a song for a female vocalist, I would use an effect on the VS-2480 (\*2) to raise the octave and format to the same range as a female vocalist when I made the demo tape, but this produced a delay of about 30 milliseconds, so I would have to sing a bit ahead of the song. I don't notice that problem with the VC-2. The delay is really minimal.

Of course the vocal timbre changes when you raise or lower the formant, but the basic character of the voice comes through, and it's interesting to hear the formant change. One of the things that make a good instrument is the possibility of the instrument sounding completely different when played by someone else.

(\*2) Such as P105: VT:M to Fm.

### ■ How is the legacy vocoder?

On vocoders until now, when I was trying to get a really clean sound, I always ended up getting the best result using a sawtooth wave as the carrier. But a nice thing about the legacy vocoder is that you can get a very intelligible sound even when using voice as the carrier. Even if you use a large number of voices—instead of a single voice—the result sounds like it really is a large number of voices. I have no idea what kind of processing is being done, but I think this is really great.



### Artist Profiles

# Tatsuya Nishiwaki



■ Choirs are often used in sound tracks, but I've heard that they're a lot of work to record.

If you needed to use a choir, the only choices you used to have were to use an "Uuh" or "Aah" sample in a sampler, or call in a real choir, or do multi-track recording with two or three people. And if you needed them to actually sing original lyrics properly, they just had to sing them. But now, this is really revolutionary—you can do it with just one person.

■ So it used to be a choice of whether you would spend time or spend money.

Whether you go the multi-track recording route or bring in an actual choir, there used to be a high threshold involved if you were going to need choral sounds. There would be non-musical considerations; you might decide "this is expensive, so let's feature the chorus" or, "it's too much work, so let's not do it." But now that it's so easy, you can be amazingly creative. The moment you decide you want a choir, you can just sing! I think there's amazing potential here. I've got all sorts of ideas.

■ Maybe you can try things that used to be impractical, and come up with new types of music?

In this age in which we're living, the most important thing is to maintain a firm sense of yourself. If you have a clear vision of the sound you yourself want to create, I think you can achieve anything. Roland synths are packed with tools that let you do just that.

■ In other words, we've got the tools, so now we need to develop our imagination?

I'm not going to say anything quite that pretentious [laughs], but when you realize that you want to do some certain thing, just open up this tool—the V-Synth—and I'm positive that you'll find an answer somewhere. If you've got a tool like this, you could easily be making new discoveries with it for five years or more. I really think this is that kind of synth. When you start wondering how to get a certain result, you can usually find it in the V-Synth. That's been my experience until now.

■ Compared to vocoders of the past, how much of an impact has this been for you?

I think legacy vocoder, analog modeling, vocal modeling, and vintage vocoder (\*3) sound very natural, but are also major leaps that go beyond anything in the past. And separately from these, I think that poly pitch shift and modeling choir are absolutely different than anything else. In addition to the fact that they're completely new and excellent, the effect is also amazingly clear, and that's something that hits everyone immediately. This is technology that gets a response of "Wow!" from everyone who listens to it.

(\*3) Types of VC-2 algorithm.



T a t s u y a N i s h i w a k i

■ How would you use the VC-2 in a live situation?

Recently, I set the VC-2 so that it would sound without my having to play the keyboard (\*4), and tried inputting a harmonica. It was really neat. The harmonica becomes sort of a wobbly sound. Of course it wouldn't take chords, but when I played two or more sounds on the harmonica on purpose, it was almost like the VC-2 had a problem deciding what to do, and generated this weird sound that was really interesting! When I used a square wave as the carrier, the harmonica morphs into a sort of clarinet sound. It might be interesting to input a guitar or bass.

(\*4) AutoNoteSw (Auto Note Switch).

■ So as you try various things, there's no telling what kind of sound you might come up with?

The easiest to understand in a live situation is probably Legacy. Sounds with a funky character, like Talking Modulator. Sing into that one, and use a little vocal slurring. That's probably the easiest to understand. There's a certain trick to getting a good result, and it takes a while to get it, but it's well worth taking the time to get the knack. Unlike when you're using a sampler or playback synth, you can use actual lyrics, so it's two or three dimensions better. You really end up wanting to use all of the functions in the VC-2.

■ How would you evaluate the significance of Roland's creating Vocal Designer at this time?

The VC-2 means that Roland is ten or twenty steps ahead of the other manufacturers. Everyone has instruments where you load the waveforms and edit them in various ways, but the V-Synth is designed to do this in realtime. This is truly an amazing thing. I've known for several years that there was such technology, but I've heard from Roland craftsmen—their engineers—that they didn't want to release anything until it had reached a level of completion as a well made instrument that was ahead of anything else in the world. Instrument craftsmen need time and effort, and also need inspiration and ideas. I am just deeply grateful to them that they have come up with a truly well-made instrument like this one.

# About V-Synth XT

## ■ What kind of potential did you sense in V-Synth XT?

I like the fact that even though it's a rack-mountable unit, it's designed with the assumption that you can operate it in the rack. When I heard that the V-Synth was coming out as a rack-mountable version, I knew from experience that the strength of the V-Synth was that it allowed you to tweak the controllers in realtime, and I hoped that this advantage would not be completely lost in the rack-mount unit. I think the XT is a real success of good design in that they've been able to keep these strengths of the V-Synth even in a rack-mountable unit—it still makes you want to tweak the controllers. You don't want to put it in a rack somewhere far away—you want it to be right by yourself. You shouldn't think of it simply as a rack-mount module.

## ■ So you found it a convincing concept?

On its own, Vocal Designer is enough to make me want it. And it's also got the V-Synth and the D-50. And you can even switch between these without powering-off. I think it's a great value. Even if you've already got the V-Synth, it's still worth buying the XT. You can use the V-Synth as your master, and since the TimeTrip pad and the D Beam are already supported, it's really convenient. The V-Synth is version 2, and you can use Vocal Designer on the XT to create patches. Of course if you don't have the V-Synth, it's also worth getting the XT. As I said earlier, it's got all the knobs and controllers, so you have plenty of control to create sounds just with the XT. I think it's worth having both.

## ■ I understand you sometimes use the V-Synth as an effect processor?

I route my guitar through the V-Synth. I've set up an audio arpeggio so that I can trigger guitar sounds at those rhythms. Whether I've already recorded the guitar, or whether I'm playing the guitar in realtime, either way works just fine. I just strum an ordinary chord with the guitar going right into the V-Synth, and trigger it to chop the sound into little pieces. It's sort of a stroboscopic effect in sound. Then for an electric bass, when I want a little more body resonance, I just use COSM. I get a bass line and put it through a resonator. I also use EQ to fatten it. You really can do a lot of things just by putting acoustic instruments through the V-Synth.

## ■ In closing, would you like to say something to those who are planning to buy a V-Synth?

I think it's really up to each person as to how they would use it. I know that makes it difficult! [laughs] Because there are really so many ways to use this. You can use the V-Synth to make a cake or to build the Great Wall of China. It's got all sorts of tools you can use to create completely different things. So the main thing you've got to know is what you want to create. If you know what you want to create, the V-Synth will definitely help you create it.



▲ E1—E8 knobs



▲ Virtual TimeTrip Pad



# About V-LINK

## ■ What are your thoughts about V-LINK?

I see great potential there, but I think it's still in the process of development. It's true that until now, musicians had to be the slaves to the video, but now the video can be synchronized to the musicians. But even now that it's audio-visual, we still need to be able to make the images ourselves. And that's a lot of work. I think Roland has to create hardware like the V-Synth that let us create our own visuals.

## ■ At the FMM, EDIROL (\*5) announced a product called the CG-8.

If you can use V-LINK to create video material that follows your performance, I think it would be a great thing for performance-oriented people. It would be fun if you wouldn't really know what the result would be, depending on your performance. Like in Windows Media Player, where you have these totally abstract images when you play back music by itself, you could have a pattern move according to the accents of the low notes, or the color might change when there are fewer notes.

(\*5) EDIROL is a brand of the Roland group.

## ■ That's just the sort of product! [laughs] It responds to audio, and can also be controlled via MIDI.

In the case of audio, a person might sense a strong attack but the audio might not respond in the same way. In other words, the dynamics felt by a person often does not match the waveform. It would be interesting to use MIDI in a way that lets you specify this sort of detail; for example, do this certain thing for a certain time only when this note occurs. Once it becomes a waveform, it's really hard to determine the real shape of the dynamics. The MIDI data contains a better picture of the actual dynamics. I think that's where V-LINK is going to become interesting.

## ■ It sounds like the future will be exciting.

For people who want to control the visuals from their music, the music is always going to be their strength. That's something that a VJ can't do. From the standpoint of a musician, it's really more interesting if the visuals can be the slave. Once that happens, I think there will be lots of different approaches from the musical standpoint.



▼ Visual Synthesizer CG-8

# History & Vision

The V-Synth development team

**H**istory sees the Pipe Organ as an early ancestor of the modern synthesizer, as it was first developed to emulate a variety of acoustic instrument sounds. Acoustic instrument emulation was also the underlying purpose of the first analog synthesizers, and continued as the goal for many subsequent synthesis technologies, including frequency modulation (FM), phase modulation (PM), and linear arithmetic (LA- as found on the D-50).



▲ D-50

**S**ampling technology, which started becoming practical in the 80's, had never been (and has not become) a focus for true computer music pioneers working at universities and research institutions worldwide. This is simply because something as easy as recording and reproducing an acoustic source held no real academic appeal. However, and ironically, as the popularity of sampling increased (thanks largely to the advent of high-capacity digital storage media), many ingenious techniques for synthesizing sound which had been developed by research institutions, corporations, and individuals, were almost completely abandoned. Ultimately these techniques were all forms of data compression (\*1) which were rendered obsolete by sampling.

**N**ow that semiconductor digital media has appeared, and uncompressed sampling can be used for the realistic recording and playback of any type of music, some would say that electronic musical instrument technology has reached points of both maturity and saturation. It is here where we can draw interesting parallels to the 19th century invention of photography (which, incidentally, predated audio recording), and how it inspired a revolution in visual art.

## (\*1) Data Compression

It may be surprising to hear that even with analog synthesizers, the essence of musical sound synthesis lies in data compression. The sawtooth and square waves produced by a VCO are conveniently similar in their static spectral structure to the sounds of string and wind instruments. Both waveforms are extremely simple geometric shapes that represent very little "data" thanks to their cyclical nature. Likewise, the tonewheels of an electric organ can be seen as a form a data compression technology, where the approximately-geometric sine waves molded into the gearwheels also cycle repetitively. Continuing with the VCO, the geometric waveforms it produces are not only repeated in the time dimension, but are also used over a broad range of pitches, again representing another kind of data compression.

Furthermore, the VCF, VCA, and envelope generators of an analog synthesizer are simplified representations of basic musical characteristics; they produce change using a minimal amount of data.

Various synthesis methods such as FM, PM, and Wave Shaping are also in essence, techniques in which a minimum amount of data is used to generate the characteristics of musical sound.

**T**he initial appearance of photographic media was seen by most as an innovation that "snatched away" the portraiture work that had been the bread-and-butter of most artists at that time. However, the subsequent invention of time-lapse motion pictures (\*2) may itself have been the impetus for the rapid appearance of expressionist painting trends such as Surrealism and Cubism; trends which went beyond the photo-realism which had become mainstream at that time.

**T**he parallel that exists in the world of sound is inescapable. Now that sampling has made it possible to play realistic acoustic sounds, a desire to search for musical expression that goes "beyond the reality" of acoustic imitation has emerged.

**W**hile Analog Modeling has generated interest, it is seen by some as not being terribly innovative. Analog Modeling uses digital signal processing to emulate only the past—analog synthesizers which have now earned the status of "vintage instruments." There have been numerous attempts at signal processing techniques such as analog modeling of sampled acoustic instrument sounds. However, with the exception of sound-field effects like reverberation, common experience has been that the more realistic and idiosyncratic a sound is, the more degraded and disappointing the results of this analog modeling process become.

## (\*2) Time-lapse Motion Photography

The British photographer Muybridge took time-lapse photographs of a galloping horse. Subsequently, these photographs had an important influence on the painters Degas, Henri Rousseau, and Toulouse-Lautrec—all contemporaries of Muybridge. Until these time-lapse photos, drawings of rapidly-moving objects had been done only from imagination. With time-lapse photography, a time dimension had been added, which enabled one to move forward, backward, or even freeze an image in motion. This breakthrough revolutionized the visual arts of Muybridge's time.

The essential character of a timbre is determined not so much by its harmonic spectrum, but by its time-variant (\*3) qualities; specifically how a timbre's harmonic spectrum changes over time (the differential calculus of a time period, so to speak). Further, Time is the fundamental dimension in which music exists; the dimensions of Pitch and Timbre, plus the element of Rhythm, all exist in Time.

With traditional linear audio technologies (tape, sampling, signal processing) of the past, Pitch, Timbre (Formant), and Time were closely bound to one another. VariPhrase (\*4) allows these elements to be manipulated independent of the temporal dimension, effectively liberating musical sound from Time itself. The result: user-sampled material converted to VariPhrase format becomes "elastic audio" (\*4), where Pitch, Formant, and Time can all be modified dynamically and independent of the Time dimension. With VariPhrase, musical sound (which until now had been limited to a two-dimensional plane upon which Pitch and Formant were mutually constrained) becomes a three-dimensional timbre-space that includes the time axis.



VariPhrase not only allows time to be compressed or expanded, it can also be reversed, or even halted completely. This new freedom on the time axis means that the texture (micro-structure) and architecture (macro-structure) of sound can be scrutinized or overviewed, not unlike a time-lapse motion picture.

The modern invention of photography can be traced back to the microscopes and telescopes of the Renaissance, which themselves expanded the world of images to the microcosms and macrocosms. VariPhrase can be thought of as a microscope and telescope for sound, expanding the world of audio into the micro and macro domains.

The COSM (\*5) processing built into the V-Synth can be used to apply spatial modulation effects to sampled sounds. However, when V-Synth introduces COSM to VariPhrase-processed sounds, the synergistic combination of these two technologies is capable of producing results that are totally new, and completely unique.



This is because COSM is being applied to sound that has the additional benefit of time-axis control.

Not limited to merely "sampling reality," V-Synth offers virtually unlimited potential for extending, and ultimately transcending reality. It may be appropriate to consider V-Synth the most significant sound-synthesis innovation since the invention of the analog synthesizer in the 60's; an instrument that introduced time-variant control as a method of bringing life to sterile geometric waveforms.

It is the sincere wish of the V-Synth design team that this instrument, which grants control of the time dimension that is the foundation of musical sound, will inspire creative artists to embark on a slightly risky (and thrilling!) voyage of temporal travel through timbral space. As it always has been (and always will be), the true creators are the artists and users; the instrument developers are merely providing potential.

The V-Synth development team

#### (\*3) Time Variant

In most acoustic sounds, there is a tendency for the overall amplitude following the onset to diminish over time, and for higher overtones to attenuate even more rapidly. Data compression was also applied to emulate this natural characteristic of acoustic sound.

In the 1960's, Dr. Moog's invention of the analog synthesizer was a revolution in electric and electronic musical instruments. In Dr. Moog's designs, the application of a voltage controlled filter (VCF), amplifier (VCA), and the systematic use of envelope generators to automatically control the time variant changes in harmonic structure, was a breakthrough. Additionally, the exponential envelopes created by charging and discharging a capacitor were themselves another type of data compression that effectively imitated the characteristics of natural acoustic sounds.

It was both out of respect for Dr. Moog, as well as an intention to emphasize this fundamental aspect of sound, that the filters used in Roland's first digital synth, the D-50, were called "Time Variant Filters" (rather than "Digital Control Filters").

#### (\*4) VariPhrase/Elastic Audio

On a tape recorder as on a conventional sampler, changing the playback time will also change the pitch and timbre. VariPhrase is a collective entity comprised of musical knowledge and multiple sophisticated technologies. One such component technology is an exquisite method for breaking-down a musical sound into minimal units called "grains"—the smallest possible fragments of sound that still retain their own timbral character. Through this component technology, once a sound is broken down, the resulting grains can be reassembled in ways that allow Time to be modified without affecting Timbre or Pitch. Conversely, Pitch or Timbre can be modified independently without affecting Time. Phrases sampled and processed using VariPhrase become "elastic audio," within which the dimensions of Pitch, Time, and Timbre can be modified with complete freedom.

#### (\*5) COSM

Composite Object Sound Modeling is a comprehensive technology for creating musical sound, and is based on object-oriented concepts that are an important paradigm in computer science. With COSM, sound objects (effects, processes, waves) created using a variety of digital signal processing techniques are combined synergistically (i.e., in a way that produces a result which is greater than the sum of the individual objects). In the V-Synth, COSM provides a full complement of spatial-type effects such as Side Band Filters.

# Roland Synthesizer Chronological Table

	VCO	DCO	LA	Fundamental Sound Module	Song Builder
1973	SH-1000				
1974	SH-3	SH-2000			
1975	SH-5				
1976	System-100	System-700			
1978	SH-1	SH-7			
	SH-09	System-100M			
1979	SH-2	Jupiter-4			
	promars				
1981	Jupiter-8				
1982	SH-101	Juno-6	Juno-60		
1983	Jupiter-6	JX-3P			
1984	MKS-80	Juno-106	MKS-30		
		JX-8P			
1985		Juno-106S	α Juno-1		
		α Juno-2			
1986		JX-10	MKS-70		
		MKS-50			
1987		D-50	D-550		
1988		D-10	D-20	U-110	W-30
		D-110			
1989		D-5		U-220	
1990		D-70			

NEXT →

NEXT →

	Fundamental Sound Module	Song Builder	Sound Designer	Fundamental Synth
1989~1991				U-20
			JD-800	
1992	JV-880	JW-50		JV-80
				JV-30
1993		JV-1000	JD-990	JV-90
				JV-50
				JV-35
1994	JV-1080			
1995		XP-50		XP-10
1996		XP-80	JP-8000	
1997	JV-2080	XP-60		
1998			JP-8080	
1999	JV-1010			XP-30
2000	XV-5080	XV-3080		RS-5
				XV-88
2001	XV-5050	Fantom	SH-32	RS-9
2002	XV-2020			
2003		Fantom-S Series		RS-50
			V-Synth	RS-70
2004	Fantom-XR	Fantom-X Series		Juno-D
2005		Fantom-X Audio Track Expansion for X6, X7, X8		
			V-Synth XT	

Application Period

Sound System Period



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