SH-201
SYNTHESIZER

Creating Sounds with Fun and Ease

Synthesizer 101 Course with SH-201

Printed in Japan. Apr. 2006 RAM-0000 PBL-XXX-SE BHB-2

SH-201
SYNTHESIZER

Creating Sounds with Fun and Ease

Synthesizer 101 Course with SH-201

Top Panel

Arpeggiator adds instant rhythmic motion to sounds.

Short recorder onboard to capture and loop your performance and knob tweeking.

Invisible infrared D Beam controller. P5

Ultra-EZ front panel is logically designed to teach the basics of synthesis.

OSC P9 FILTER P11 AMP P13 LFO P15

External input for manipulating external audio from CD/MP3 players, etc. P17

Built-in delay, reverb, and overdrive effects. P19

VSTi Editor software included for computer integration.

USB port for audio/MIDI connection to computer.

Put the Fun Back in Synthesis!

The biggest kick you get out of your synthesizer is the ability to create your own unique sound from your ideas or inspirations.

For more than half a century, Roland has introduced various synthesizers that were suited best for various eras.

Today, the fundamentals for sound creation remain the same for most of the synthesizers.

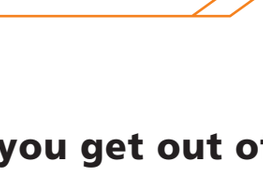
By understanding the fundamentals, anyone can enjoy creating sound for virtually any type of synthesizer.

Roland Synthesizer History

SH-1000 1973

The first of its kind to be produced in Japan, the SH-1000 was an instant hit with its compact dimensions, easy operation, and affordable pricing.

SYSTEM-700 1976



Bringing together all the soundmaking technology of its day, this complete electronic studio system was used by leading broadcasting stations and groundbreaking electronic music artists.

JUPITER-8 1981

An 8-voice analog synthesizer with 64-sound memory. One of Roland's earliest polyphonic synthesizers. This significant product opened the way to today's synthesizer development.

JUNO-60 1982

61 key, 6-voice fully programmable polyphonic synthesizer. 56-sound memory available. Roland's proprietary DCB interface standard was used for exchanging control information with external device.

D-50 1987

Equipped with the Linear Arithmetic (a.k.a LA) synthesis, this is Roland's first full-digital synthesizer. One of Roland's best-selling models, this synthesizer was a worldwide sensation due to its operating ease and stunning sound.

JD-800 1991

Combining stunning digital sound with a natural feel and operability reminiscent of analog instruments, the JD-800 was the pinnacle of synthesizer development of its era.

JP-8000 1996

This 8-voice synthesizer has a rich array of knobs and sliders to manipulate an analog modeling synthesis engine. It has a built-in Motion Control function that allows operations on a panel to be recorded and played back.

V-Synth 2003

V-Synth XT 2005

Independently manipulate the pitch, time and formant of sampled waveforms using VariPhrase technology — a world's first in a synthesizer!

The V-Synth XT is fully stocked with a potent array of synthesis types, including the V-Synth's famous Elastic Audio Synthesis engine, plus analog-synth modeling, vocal modeling, and classic D-50 emulation.

The other type of evolution — Workstation —

The Fantom-X Series is the flagship of the Roland workstation family, offering musicians nearly 1GB of wave memory when fully expanded, and 128-voice performance.

Fantom-X 2004

Roland has released numerous legendary synthesizers in the past. Roland has merged all the technologies and prior experiences to proudly introduce the newest member of our synthesizer line-up, the SH-201.

NEW

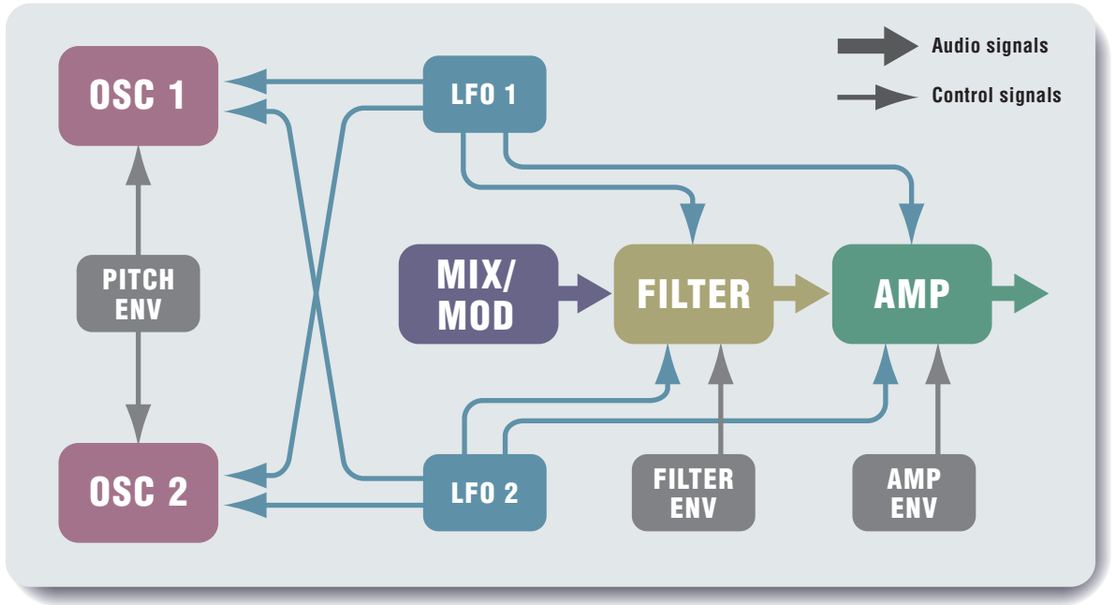
SH-201 2006

Even though this is synthesis at its friendliest, the SH-201 is no toy. With two beefy analog-modeling oscillators, complete with Roland's famous Supersaw waveform and resonant filter, this little synth can blow down doors.

In this text, you will have plenty of opportunities to create some classic synthesizer sounds on the SH-201. You will be glad to know that we will guide you every step of the way, so no worries!

As you master the fundamentals for creating sounds, the unexplored world of new sounds await you. Now, let's begin our journey together!

The typical synthesizer will have a signal flow-chart as follows. First of all, let's understand the fundamental flow for creating sounds.



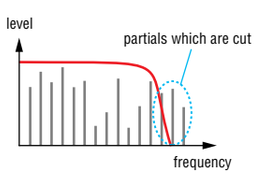
OSC Oscillator (→ P. 9)

This is the basis of the sound, where the waveform and pitch are selected. It is indeed the heart and soul of a synthesizer. On analog synthesizers, it is called VCO(*1). VCO is a sound generator capable of changing frequency through changes in voltage. SH-201 has 2 oscillators (OSC1 and OSC2). It's like the SH-201 housing two synthesizers in one.

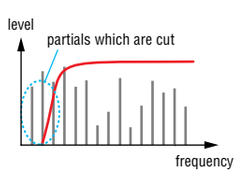
FILTER (→ P. 11)

This is where the sound signal generated from the OSC is processed through the emphasis and rejection of a selected frequency range. On analog synthesizers, it is called VCF(*2). VCF is used to continuously change the characteristics of a filter (cutoff frequency) through changes in voltage. SH-201 houses three separate filters, each designed for a specific purpose.

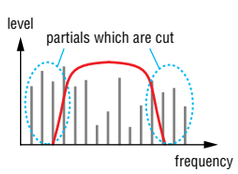
LPF Low Pass Filter



HPF High Pass Filter



BPF Band Pass Filter



AMP (→ P. 13)

Sound generated in OSC and processed through the FILTER is amplified here. On analog synthesizers, it is called VCA(*3). VCA is used to change the volume (level) of sound signal through changes in voltage.

LFO Low Frequency Oscillator (→ P. 15)

This is a sound generator capable of producing low frequencies. On analog synthesizers, it is also called LFO(*4). LFO affects the OSC, FILTER, and AMP individually as it adds modulation. LFO is a must have for producing synthesizer-like effects.

■ Examples of LFO

LFO	applied on OSC	→	Vibrato
	applied on FILTER	→	WahWah (Growl)
	applied on AMP	→	Tremolo

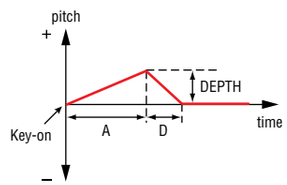
ENV Envelope Generator (→ P. 10, 12, 13)

ENV controls the initiation and termination of sounds. On analog synthesizers, it is also called ENV(*5). Every time you play the keyboard, ENV affects the volume and timbre on OSC, FILTER, and AMP individually as it processes its time-varied elements.

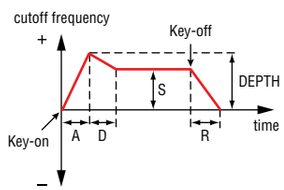
■ Examples of ENV

ENV	applied on OSC	→	Pitch becomes higher or lower
	applied on FILTER	→	Sound becomes brighter or darker
	applied on AMP	→	Sound becomes louder or softer

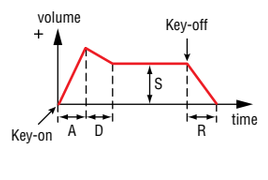
PITCH ENV



FILTER ENV



AMP ENV

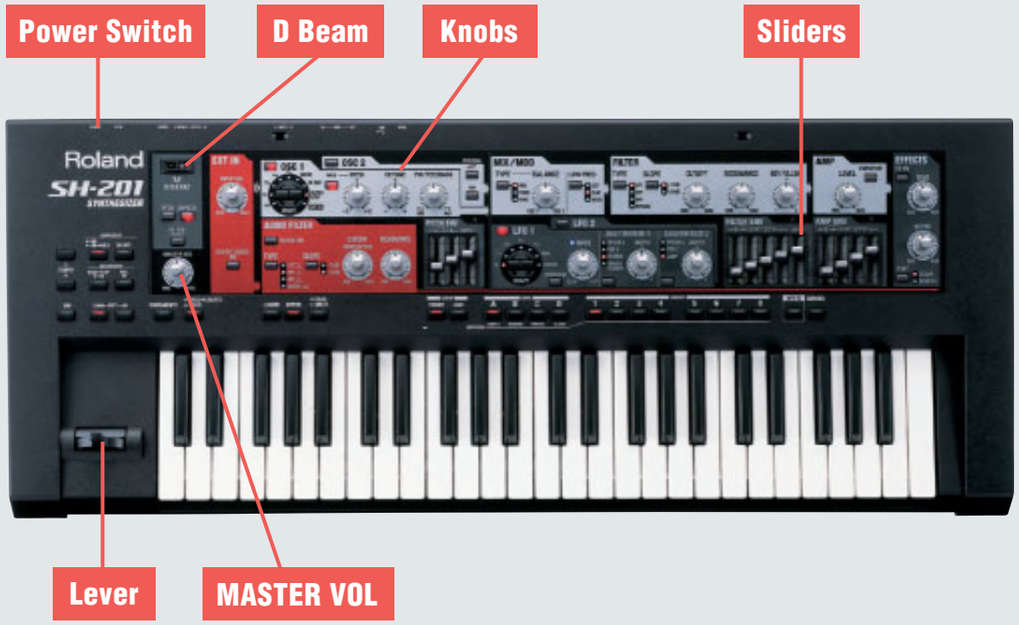


Analog Synthesizer

Lately, analog synthesizers are attracting attention once again. The simple and easy to understand OSC → FILTER → AMP structure enables real time control to achieve dynamic sound variation. Moving knobs and faders to create your own unique sound can be a very exciting experience indeed. The SH-201 is recommended for not only the keyboardists but for any artist who demands brand new sound production.

(*1) Voltage Controlled Oscillator (*2) Voltage Controlled Filter (*3) Voltage Controlled Amplifier
(*4) Low Frequency Oscillator (*5) Envelope Generator

You can start playing the SH-201 as soon as you turn on the power. Go ahead and play the keyboard while adjusting the volume with the [MASTER VOL] knob.



- Lever on the left side of the keyboard can be moved left or right to change the pitch.
- Lever on the left side of the keyboard can be moved forward to add vibrato.
- D Beam on the upper left of the keyboard can be controlled from your hand movement above to change the pitch, volume, or brightness.
- Check out and hear the sound as you move any or all of the knobs and sliders gradually.

SH-201 is designed so that you can create sound while listening to it in real time by moving knobs and sliders.

At this stage, it is perfectly O.K. not comprehending how each control affects the sounds. Don't worry, because you will get a hang of it as you continue with this text!

SH-201 allows you to store the timbres (sounds) you have created. These stored timbres are called patches.

A total of 64 patches can be stored. The patch storing location works like a file cabinet. A patch can be selected through the GROUP, BANK and NUMBER buttons.

PRESET GROUP (read only)

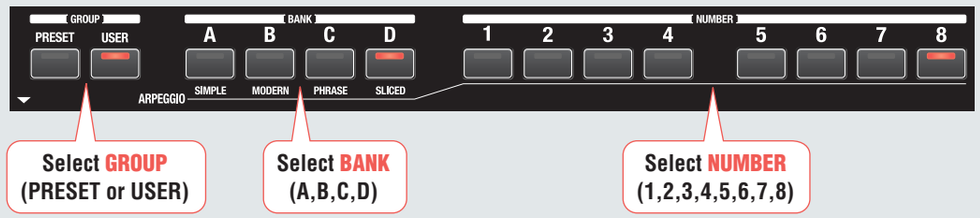
BANK (A–D) \ NUMBER (1–8)								
A	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8
B	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8
C	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8
D	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8

USER GROUP (rewritable)

BANK (A–D) \ NUMBER (1–8)								
A	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8
B	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8
C	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8
D	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8

Half of the total or 32 patches are user programmable. In other words, use these locations to store your original timbres that you have created.

Once the timbres are stored, it can easily be recalled and played through simple button operations. How about recalling all of the patches on SH-201 to hear the sounds created!



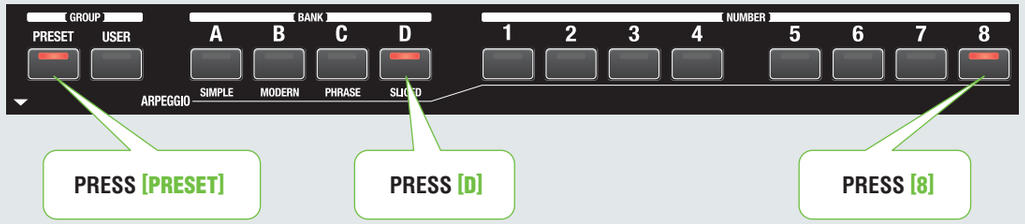
Let's get into the function of each of the controls.

Sound Programming for Thought

As you check out the factory preset patches in details, you will find many creative ideas. Use them as examples to create the sound from scratch. This method will enhance your skills toward sound making verses the common approach of editing an already existing sound.

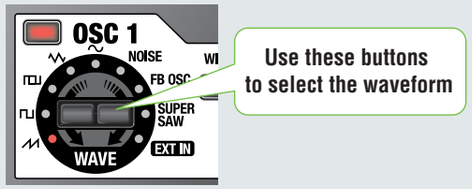
The OSC determines the waveform and pitch, which becomes the source of the sound. This is the heart and soul of a synthesizer. On analog synthesizers, it is called the VCO(*1). The VCO is a sound generator capable of changing frequency through changes in voltage.

Let's recall the standard patch "PRESET D-8".



This patch has the sawtooth wave of the OSC1(oscillator 1). Play the keyboard and hear the sound of this waveform.
The sound at this stage is very simple and expressionless. To hear how the sound changes with each step, play the keyboard after each process.

First, determine the waveform to use as the source of the sound. Play the keyboard with your left hand while switching waveforms with the **[WAVE]** button. Check out and hear the differences in the sound of each waveform as you play the keyboard.



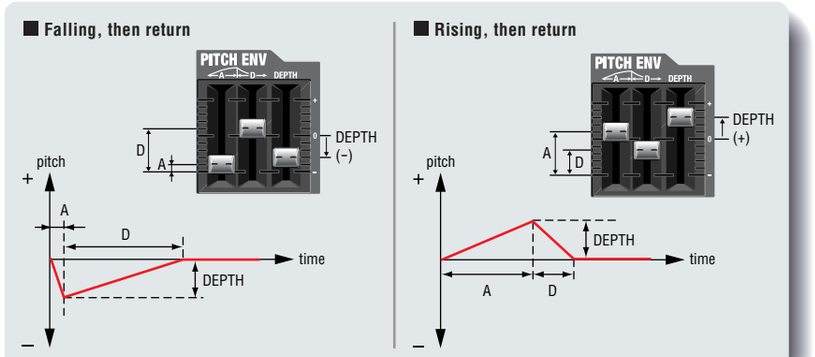
Waveform Examples		
	Sawtooth Wave	It is very rich in harmonics. May be used to simulate the basis for most of the musical instruments. Especially suitable for creating brass and string instruments sounds (violin, piano, etc.)
	Square Wave	It includes many of the odd numbered harmonics. Best suited as the sound basis for woodwind and percussion instruments (clarinet, xylophone, etc.).
	Sine Wave	It is the most basic waveform. It does not possess any of the harmonics. It sounds like a whistle.

Check out and hear the different sounds from each of the waveforms, afterward returning the setting to the sawtooth wave.

Next, let's determine the pitch. Playing the keyboard with your left hand while turning **[PITCH]** and **[DETUNE]** knobs left and right gradually. Check out and hear the changes in pitches.

After listening to the sounds each knob creates, make a habit of returning the knobs to its center position.

On brass instruments such as a trumpet, the initial part of the blow may be a little off pitch. Let's recreate this time-varied change in pitch. Move the **[A]**, **[R]**, and **[DEPTH]** sliders up and down gradually and check out and hear the effects.



Next, let's go to the "FILTER", where the sound is processed.

Envelope

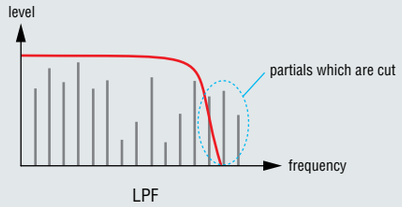
ADSR affect the pitch, filter, and amp of the envelope. Here are their names and definitions.

Symbol	Name	Pitch/Brightness/Volume
A	Attack Time	Time taken from zero to max
D	Decay Time	Time taken from max to sustain level
S	Sustain Level	Level Level of Volume/Brightness while key is held
R	Release Time	Release Time Time taken from sustain to zero after key is released

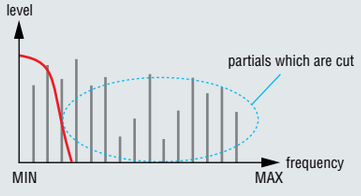
(*1) Voltage Controlled Oscillator

The sound signal generated from the OSC is processed here through emphasis and rejection of a selected frequency range. It affects and changes the sound in brightness and boldness.

Press **[TYPE]** button and select LPF(*1). The LPF controls the amount of high frequencies that passes through. Thus, it has no effect on sounds at low frequencies.



Turn the **[CUTOFF]** knob as you play. Slowly turn it counter clockwise from all the way right (MAX) leftward to (MIN). Sound would gradually muffle during this process and when it is turned left all the way, most of the sound becomes inaudible. This is due to the fact that most of the sound frequencies have been filtered out and rejected.

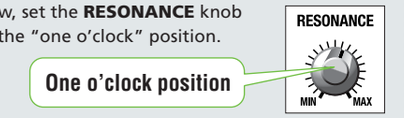


First, set the **[CUTOFF]** knob to the "two o'clock" position.

Next, turn the **[RESONANCE]** knob. Turn it all the way left (MIN), then gradually rightward to (MAX). It is starting to resonate with distinctive sound like a typical synthesizer.

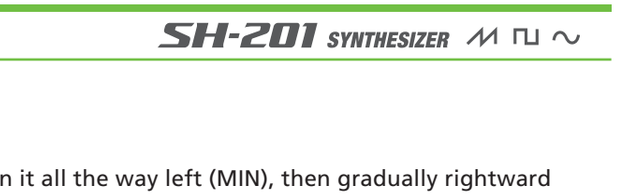
If you turn the knob far too right, you will hear an ear piercing, high-pitched sound. This sound is generated from the filter itself. If you continue to play the keyboard in this manner, you will realize that the filter-generated sound is completely independent to the waveforms and pitches generated by the OSC (oscillator).

Now, set the **RESONANCE** knob to the "one o'clock" position.



On a piano, it's initial sound would include most of the harmonics which generates bright sound. Afterward, the sound would fade gradually as decrease in harmonics result in a dull (dark) sound. To re-create this phenomenon, create a time-varied effect with the filter. In other words, the operation of turning **[CUTOFF]** knob becomes automated as you play the keyboard.

Set the **FILTER ENV** sliders in this manner and play the keyboard.



Lastly, turn the **[KEY FOLLOW]** knob. Turn it right all the way to (+); the low frequencies become softer and the high frequencies become brighter inversely. Try setting the knob at different positions and play the keyboard to hear what it does.

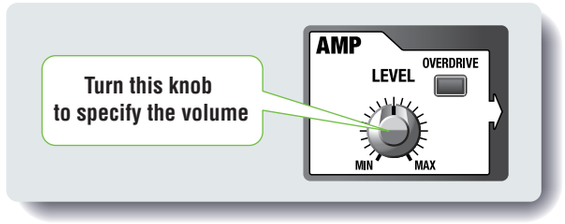
When you are finished, turn the knob all the way right to (+).

Next, let's go to the "AMP", where the initiation and termination of sound are determined.

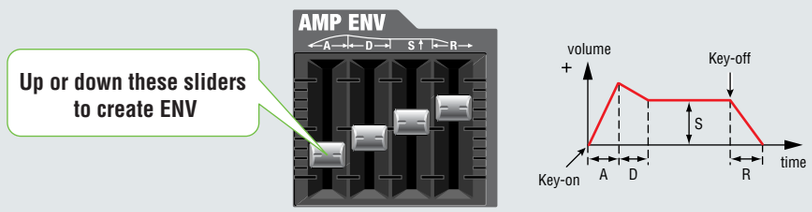
(*1) Low Pass Filter

The sound signal generated in OSC and processed through the FILTER is amplified here. The Amp also controls the attack and decay of sounds.

Turn the **[LEVEL]** knob left and right. Check out and hear the change in the sound levels (volume).

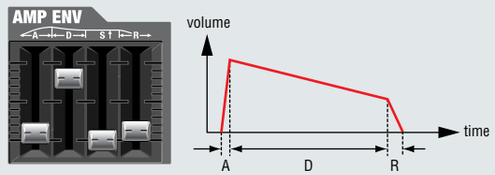


The Attack and decay of sounds are created at ENV (Envelope Generator).



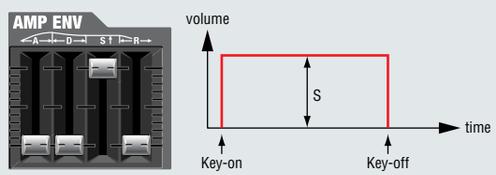
Think about playing a piano for a moment.

When the key is struck, the hammer pounds on the sound source (string) and the vibration of the string would reach a peak immediately. Afterwards, even if the key is held down, the sound will gradually become weaker and softer. Anytime the hand is released from the key, the sound will stop at that instant.



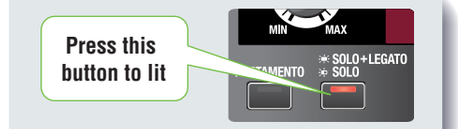
Next, think about playing an organ.

When the key is struck, sound generates immediately. As long as you hold down the key, there will be no change in volume. Anytime the hand is released from the key, the sound will stop at that instant.

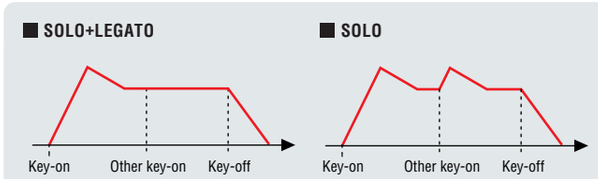


Move these **[A]**, **[D]**, **[S]**, and **[R]** sliders up and down and check out and hear how it affects the sound. Afterward, to leave some lingering sound after releasing the hand, leave the **[R]** slider at the mid-high position.

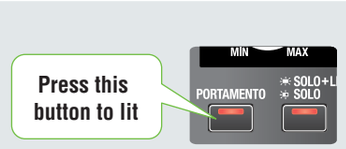
Additionally, to create a classic synth sound (analog lead sound), set it up to play monophonic (single note at a time) by pressing the **[SOLO]** button.



In this set up, when you play a key while playing another key, timbre will remain unchanged but the pitch will change (SOLO+LEGATO). This effect is similar to the trill technique used in string instruments.



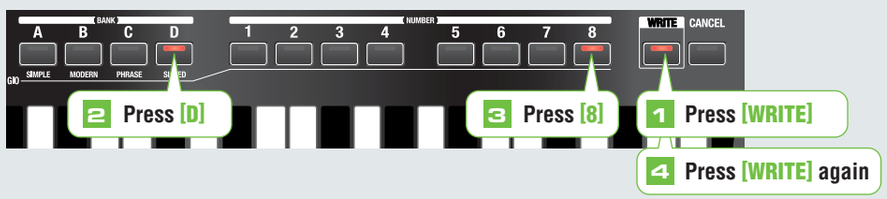
Moving right along, let's set the portamento control. The portamento is an effect where the transition between the two notes is smooth and gradual in pitches. This effect is very unique to synthesizers and creates an effect similar to the slide (glissando) technique used in violins.



You can control the speed of the portamento effect by pressing the NUMBER button **[1]** through **[8]**, while pressing the **[PORTAMENTO]** button down. Try various settings.

You were able to create a basic timbre of analog lead synthesizer through the previous steps. If you power the unit off right now, this timbre will be lost. Since you worked hard to program this timbre, let's store it safely.

Press the **[WRITE]** button and select the location you want to store the timbre.
Store it at USER D-8 location by first pressing BANK **[D]** button and then press NUMBER **[8]** button.
Press the **[WRITE]** button once again and ta-da!! You have stored it!

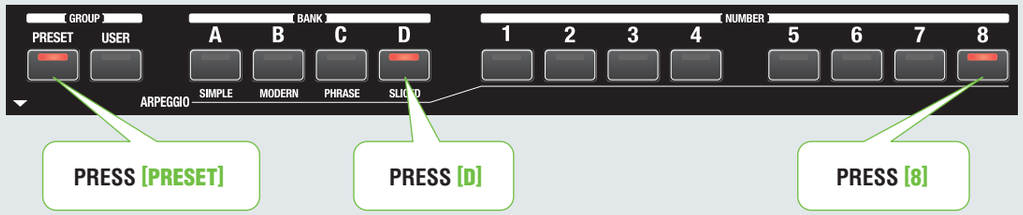


This is a sound generator capable of producing low frequencies. On analog synthesizers, it is also called LFO(*1).

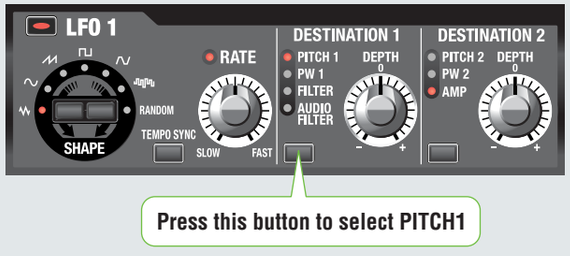
To achieve rich sound resonance, various musical instruments are played with cyclic vibration of sound frequency, volume and/or timbre. LFO creates these effects for a synthesizer.

Vibration in Frequency (OSC)	→	Vibrato (voice, violin, etc.)
Vibration in Volume (AMP)	→	Tremolo (organ, electric piano, etc.)
Vibration in Timbre/Sound	→	Growl (woodwinds, etc.)

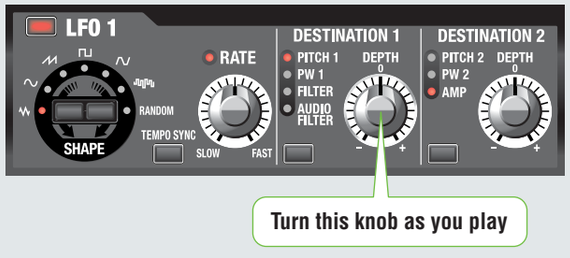
To understand the LFO effect, let's recall the basic patch **[PRESET D-8]** once again.



Press the **[DETINATION1]** button and select the target where LFO would process. Try the vibrato effect here by selecting and lighting PITCH1.



Turn the **[DEPTH]** knob gradually while playing. As you turn the knob all the way to either right or left, the vibrato becomes deeper.



You can switch the waveform of the vibrato by pressing the **[SHAPE]** button. Additionally, turning the **[RATE]** knob will change the speed of vibrato. Check out and hear various settings for vibrato with different waveforms and speeds. For example, the human voice or a violin would have a vibrato rate of 2 to 7 cycles per second.

Press the **[DETINATION]** button and light-up AMP2 for tremolo or Filter1 for growl effects.

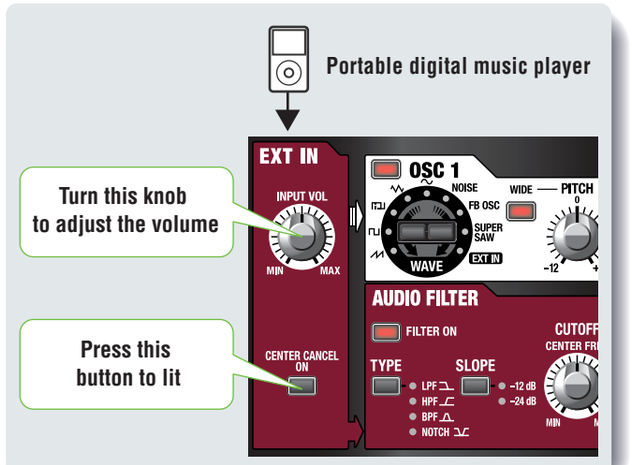
PCM Synthesizer

On the other end, with its high capacity wave memory, there are synthesizers that realistically reproduce acoustic instruments. These synthesizers are compatible with a wide range of genre from rock, pop, jazz, and classic. Whether you are a singer/keyboard player, performing in a band or orchestra, these keyboards are suitable for a keyboardist who enjoys composing and performing.

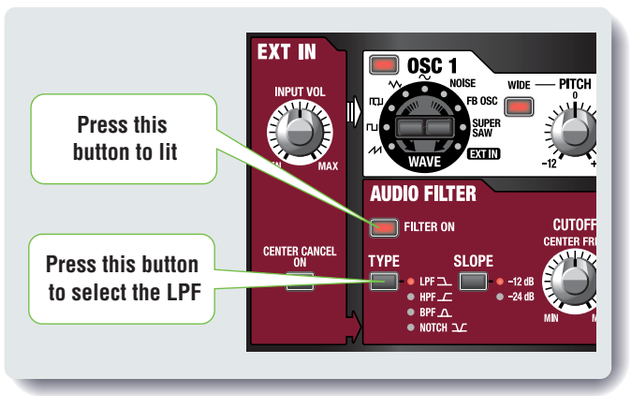
(*1) Low Frequency Oscillator

The newest feature of the SH-201 is the EXT IN(*1), which is a major evolution from the prior analog synthesizers. When devices such as portable digital music players are connected to the SH-201, various effects can be added to the music being played.

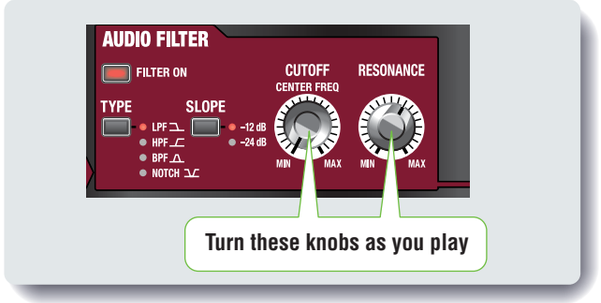
Set the portable digital music player to play mode. Turn the **[INPUT VOL]** knob to adjust the volume level. You can delete centrally panned sounds, such as vocal or bass, by pressing the **[CENTER CANCEL]** button.



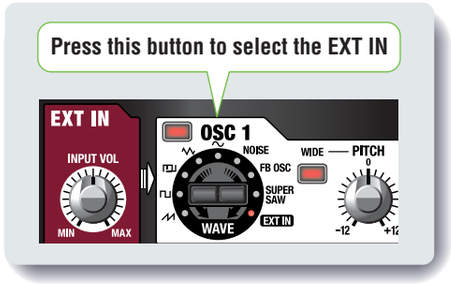
Next, press and light-up the **[FILTER ON]** button. Press the **[TYPE]** button and select LPF(*1). The LPF filters out the amount of high frequencies that pass through. This has no effect on the low frequencies what so ever.



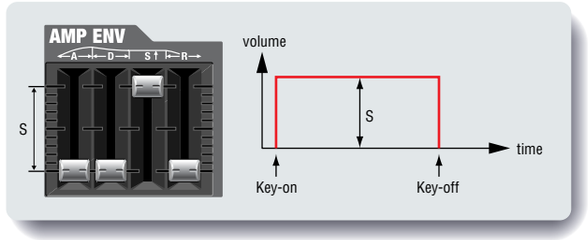
Additionally, turn the **[CUTOFF]** and **[RESONANCE]** knobs gradually to either left or right, to check out and hear the sound changes. Afterward, turn the **[CUTOFF]** knob all the way left to (MIN). Now, the sound will be inaudible as most of the frequency range is blocked.



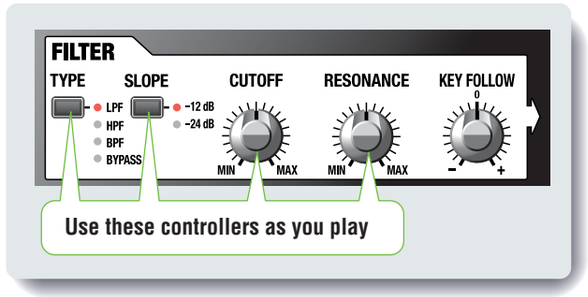
Next, set it up so the portable digital music player will sound only when the keyboard is played. Press the **[WAVE]** button on the OSC1 (oscillator 1) and select the waveform to EXT IN.



Set it up so that when your hand is released from the keyboard, sound will silence. Lower the **[R]** slider of the AMP ENV all the way down.



Play around with the **[TYPE]**, **[CUTOFF]**, and **[RESONANCE]** controls as you play the keyboard. Just as the sawtooth and square waves were processed with effects, your portable digital music player's music is processed with effects now.



It doesn't really matter which keys you play, the portable digital music player's music will play in the original pitch unchanged. If you press down on too many keys simultaneously, it may cause the sound to distort, so select and light-up the **[SOLO]** button and play monophonic (a single note at a time).

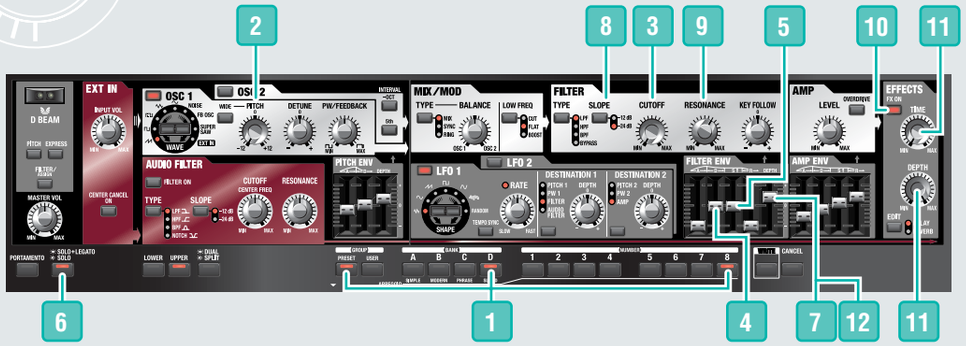
Next, let's create sounds and experience them!

How you use the EXT IN

How you use the EXT IN is completely up to you! You can play the keyboard along with the rhythm of the music, or play fast riffs on the keyboard to achieve the effect of the high-speed camera shots. Experiment and explore the many effects and usages!

(*1) External In (*2) Low Pass Filter

1 Examples of Various Sound Creations
Synth Bass



1 Recall the basic timbre **“PRESET D-8”**. The sawtooth wave is selected.

2 Since bass involves low frequencies, turn the **[PITCH]** knob on the OSC section all the way to left and set to (-12). Now the sound is lowered by 1 octaves.

3 Turn the **[CUTOFF]** knob on the FILTER section all the way left and set to (MIN). The sound becomes inaudible.

4 Let’s create the initial attack of the sound. Raise the **[D]** slider of the FILTER ENV a little.

5 Let’s determine the timbre of the sustained note. Raise the **[S]** slider of the FILTER ENV a little.

6 In order to achieve the effect of sliding over the frets while holding the string down (glissando), select and light-up the **[SOLO]** button.

7 Raise the **[DEPTH]** slider of the FILTER ENV a little and determine the overall timbre. The attack is weakened a little and sound is darkened.

8 Press the **[SLOPE]** button and select -24dB. The core of the sound is retained, yet it sounds a little darker now.

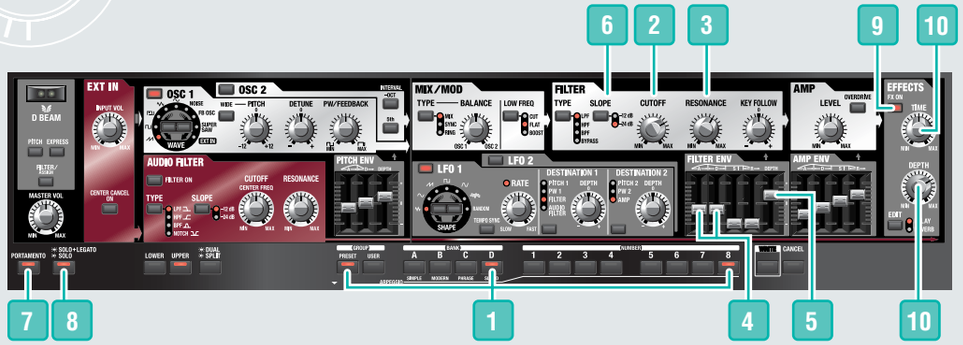
9 Turn the **[RESONANCE]** knob and add a little bite to the sound as you like.

10 Press and light-up the **[FX ON]** button.

11 Turn the **[TIME]** knob in the EFFECTS section all the way left to (MIN). Turn the **[DEPTH]** knob and fatten the bass timbre.

12 Lastly, fine adjust the **[DEPTH]** slider of the FILTER ENV and determine the overall sound.

2 Examples of Various Sound Creations
Synth Lead



1 Press and recall the basic timbre **“PRESET D-8”**. The sawtooth wave is selected.

2 Turn the **[CUTOFF]** knob in the FILTER section to the “two o’clock” position.

3 Turn the **[RESONANCE]** knob in the FILTER section to the “one o’clock” position.

4 Let’s create the initial portion of the sound. Raise the **[A]** and **[D]** sliders of the FILTER ENV a little.

5 Let’s determine the overall timbre. Raise the **[DEPTH]** slider of the FILTER ENV.

6 Press the **[SLOPE]** button in the FILTER section and select -24dB. The sound gains more bite by doing so.

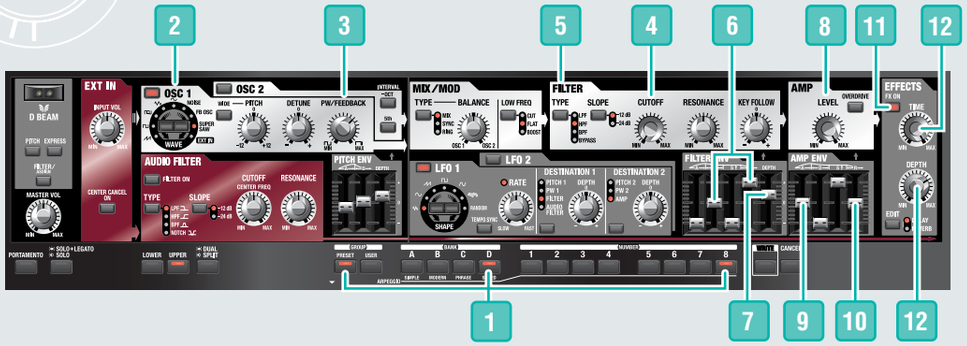
7 Press and light-up the **[PORTAMENTO]** button.

8 To further enhance the lead synth sound, press and light- up the **[SOLO]** button. Now it plays monophonic (a single note at a time). Also when you press down on a key while pressing another key, the two notes will transition smoothly.

9 Press and light-up the **[FX ON]** button.

10 Position the **[TIME]** knob at “twelve o’clock”. Turn the **[Depth]** knob and add some echo effect to the lead sound (delay).

3 Examples of Various Sound Creations
Synth Pad



1 Recall the basic timbre **"PRESET D-8"**. The sawtooth wave is selected.

2 Press the **[WAVE]** button of the OSC1 section and select the SUPER SAW.

3 Turn the **[PW/FEEDBACK]** knob of the OSC1 section to the "one o'clock" position.

4 Turn the **[CUTOFF]** knob in the FILTER section all the way left to (MIN). The sound becomes inaudible.

5 Press the **[TYPE]** button in the FILTER section and select HPF. The sound is audible once again.

6 Let's determine the overall timbre. Raise the **[D]** slider of the FILTER ENV mid-way up and raise the **[R]** slider all the way up.

7 Raise the **[DEPTH]** slider of the FILTER ENV gradually and determine the overall timbre.

8 Turn the **[LEVEL]** knob of AMP section all the way right to (MAX).

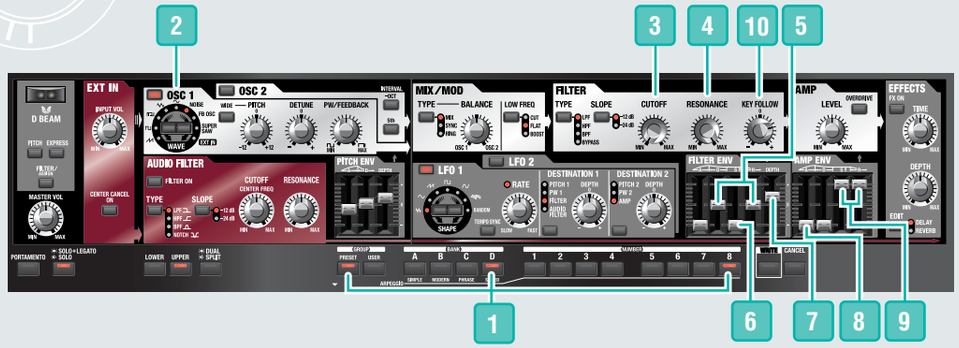
9 Raise the **[A]** slider of AMP ENV mid-way up. The initial attack of the sound becomes slower.

10 Raise the **[R]** slider of the AMP ENV mid-way up. Sound will not die off after you release your fingers from the keyboard now.

11 Press and light-up the **[FX ON]** button.

12 Turn the **[TIME]** knob in the EFFECTS section all the way left to (MIN). Turn the **[DEPTH]** knob and enhance the resonance.

4 Examples of Various Sound Creations
Sound Effects



Let's create a sound effect like a synth drum. This sound is created from deliberately generated sound from the filter.

* Sudden loud sound may occur. In order NOT to damage your hearing or speakers, turn the knob slowly.

1 Recall and select the basic timbre **"PRESET D-8"**. The sawtooth wave is selected.

2 Press the **[WAVE]** button in the OSC1 section and select noise.

3 Turn the **[CUTOFF]** knob in the FILTER section all the way left to (MIN). The sound becomes inaudible.

4 Turn the **[RESONANCE]** knob in the FILTER section all the way right to (MAX).

5 Raise the **[D]** and **[R]** sliders of the FILTER ENV mid-way up.

6 Lower the **[S]** slider of the FILTER ENV all the way down.

7 Raise the **[DEPTH]** slider of the FILTER ENV gradually upward.

8 Lower the **[A]** slider of the AMP ENV all the way down.

9 Raise the **[S]** and **[R]** sliders of the AMP ENV all the way up.

10 As you turn the **[KEY FOLLOW]** knob rightward a little, you can change sound brightness with your key location.

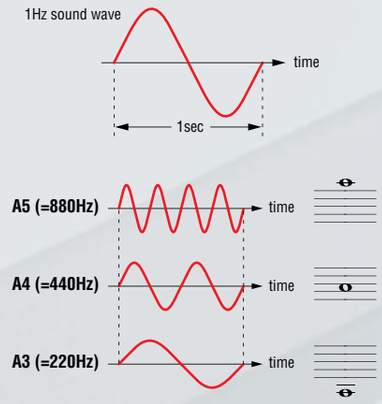
We are surrounded by various sounds in our everyday life.

These sounds are actually waves that vibrate through the air. These waves eventually reach our ears and we would recognize them as sounds. These waves create many variations of sounds, depending on the types of waves.

In concept, sounds are composed of three elements. They are the sound pitch, sound volume, and sound brightness.

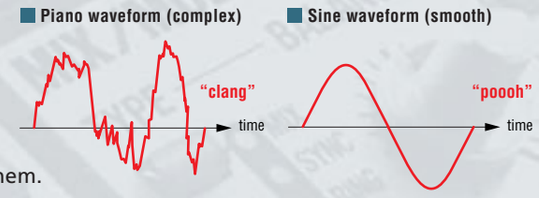
Sound Pitch

The pitch of sound is determined by the speed of wave cycles. Wave that vibrates 1 cycle per second is called 1 Hz (hertz). As the frequencies become higher, Hz becomes higher in numbers. Lower the number in hertz, frequencies will become lower as well. For example, when A4 (center A) equals 440.0 Hz, an octave higher pitch would generate twice the amount of frequency at 880.0 Hz (A5) and an octave lower pitch would produce half the frequency at 220.0 Hz (A3).



Sound Brightness

The brightness of sound is determined by the shape of waveforms. By comparing the piano and the square wave side by side, you can see the difference in complexity. These differences caused by the complexity are recognized as brightness of sound as we hear them.

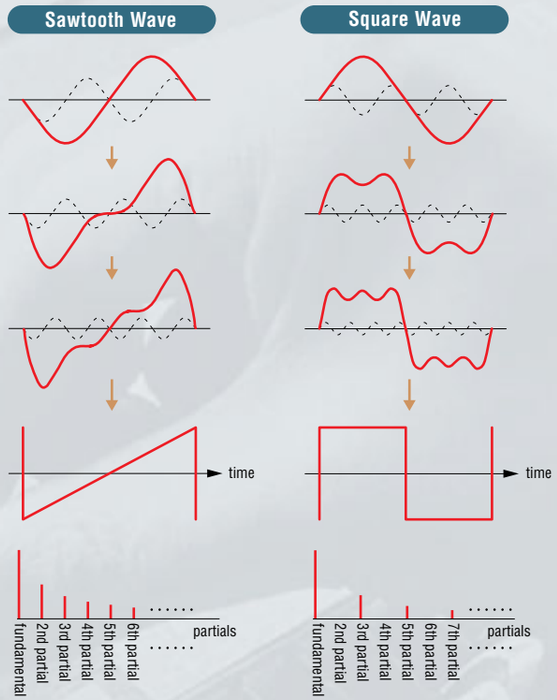


Sound Volume

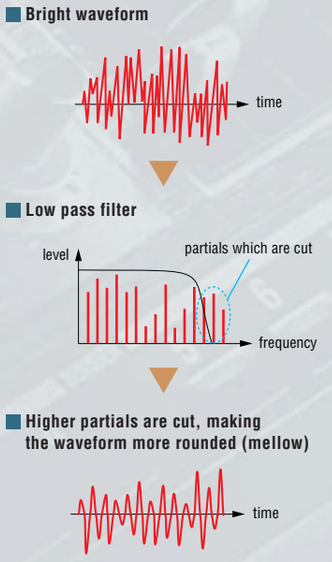
The volume of sound is determined by the size or the width of the waves. As the waves become wider, louder the volume becomes, and as the width narrows, volume becomes softer.

Harmonics

We have just talked about the brightness of sounds and how they are determined by the shape of waveforms. Then, how are these waveforms constructed? Commonly, it is known that waveforms are composed of combination of sine waves. Let's take the sawtooth or the square wave for example; it is comprised of sound basis and additional sine waves that are the integer multiples as in two times or three times the frequency. These sine waves that are two times or three times the frequency are called harmonics, or overtones. There are two kinds of harmonics. One has the frequencies of integer multiples as in two times or three times, the other has other frequencies that are non-integer multiples. By combining these harmonics, various sounds can be created.



Sounds are more brighter when it includes many high frequency harmonics and darker (rounder) as it includes more of the low frequency harmonics. There is a technique called subtractive synthesis method where these harmonic elements are cut to change the brightness (waveform) in sounds. It is a popular method for creating composite waveforms.
The SH-201 has waveforms with built-in harmonics. These waveforms with harmonics components are rejected through the filter to change the brightness in sounds.



One look at the panel is all it takes to inspire your creative images. That's "SH-201".

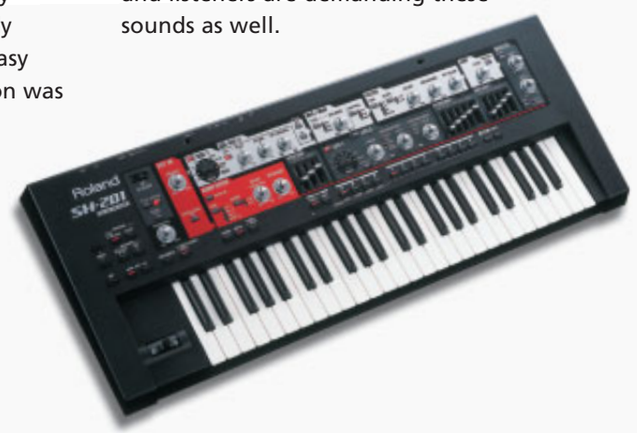
It's been 26 years since my first encounter with a synthesizer, and that memorable first synthesizer was the "Roland SH-2". At that time, it was not unusual for synthesizers to carry a price tag of several thousand dollars or more. It was truly a dream instrument out of reach for middle-class citizens.

During that time, the synthesizer to break the affordable thousand dollar barrier was the original SH series that became a global success. The synthesizer's fundamental signal flow of "VCO"→"VCF"→"VCA" was easily mastered through the SH-2's user friendly panel layout. The result was a fun and easy to operate machine where sound creation was thoroughly delightful.

Also, analog synthesizers back then had many unstable elements such as poor pitch and tuning calibration. However the SH-2 was very consistent and outstanding in that area among the others. Best of all, the "Sound" itself is magnificent and there are still many musicians who use them today.

Looking back at that time, most people thought of the synthesizer as a tool to replicate real-life sound.

In contrast, listing to the latest music trend, numerous sound/music producers have created sounds that only synthesizers could produce, and listeners are demanding these sounds as well.



Most of the PCM synthesizers have set their goal on the pursuit of reality or replication. I am so glad to see that this particular synthesizer, the "SH-201", is built upon the ultimate pursuit of the "Synthesized Sound" itself. One look at the panel is all it takes to inspire your creative images. That's "SH-201".

The eight oscillator waveforms are carefully selected and distinctively different from the PCM in the way it possesses the ultimate analog modeling qualities. The smooth yet aggressive contour of the filters is the result of Roland's quarter of a century experience and technological compilation.

Of course it's quite obvious to see that the multi-range of the modulation can be achieved through the "LFO"; the synthesizer's backbone function.

As for the controls, rotary knobs are used for controlling filters, pitches, and rates, and the vertical faders are used to control the time-variable parameters such as the envelope generator for easy visual setting. It's design with the sound creation as the top priority is simply phenomenal.

Today, evolution in the technological advance for the electronic music industry has placed the synthesizers with large memory capacity in the main stream. It is also a fact that most keyboardists rely on its enormous sound library and just select the preset sounds.

That is where the "SH-201" kicks in as it creates "Sounds from Scratch" with its simple analog controls, the way synthesizers were designed to do in the first place.

It is truly a 21st century masterpiece in the SH-series, with its light- weight body and incredible cost-performance. I hope you take your time and thoroughly enjoy this incredible instrument!


Photo by Isao Nishimoto

Profile

Hisashi Saito

He has been active in various Techno/Club units within Japan and overseas since the 1980's. His involvement includes development support for numerous musical instrument manufacturers, appearances in various events and seminars, along with writing columns and reviews for various music magazines.
He is an active member of the Japan Synthesizer Programmers Association (JSPA), an organization supporting and educating the synthesizer enthusiasts of tomorrow through various activities promoting the overall electronic music.