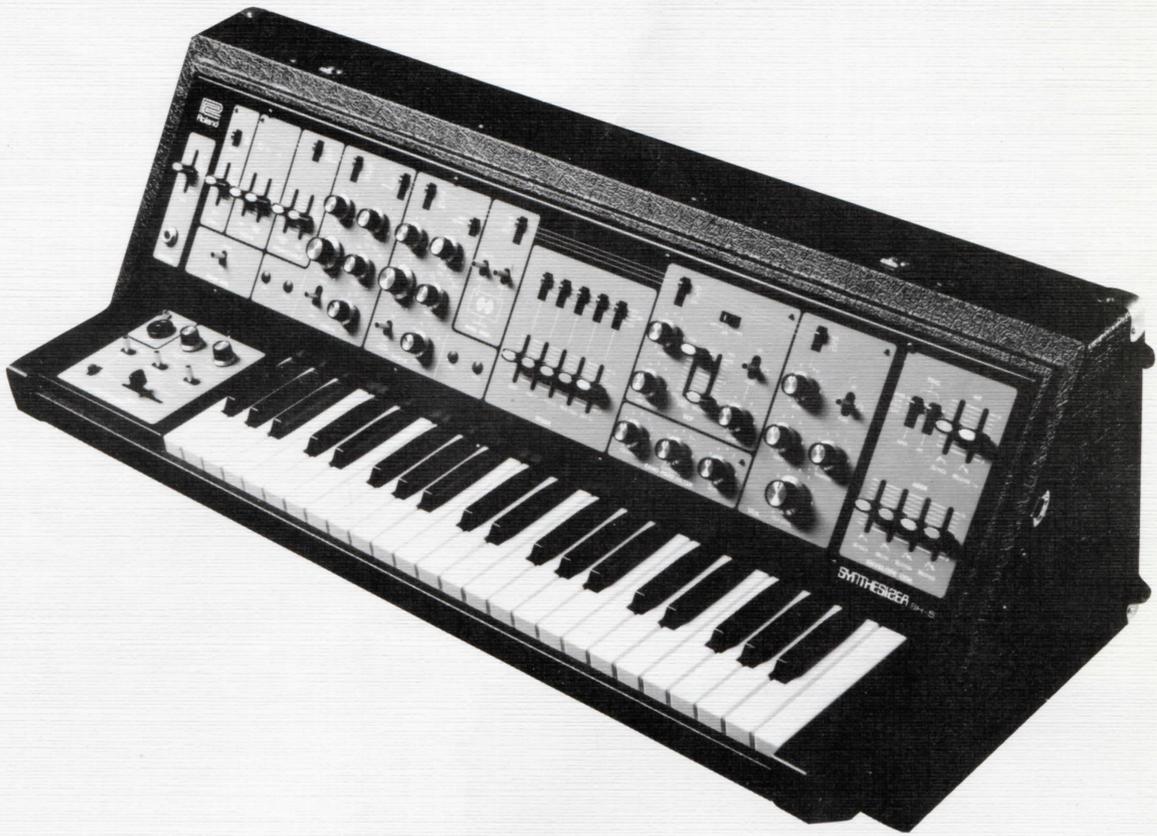


# Roland Synthesizer SH-5



## The ideal combo-type synthesizer for every performance need.

Roland Synthesizer

# SH-5

Functionally designed to create a wealth of rich, varied sounds, the new Roland 44 key combo-type synthesizer SH-5 is adaptable to all your demands. The control panel is conveniently located at the front with the controller segment placed separately at the left of the keyboard. A handy case for the body services as protection from damage when carrying.

### Features

- 1. Two VCOs for Heavy Sounds:** Both VCOs come equipped with Pitch, Range, Wave Selection, Modulation, and Pulse Width controls. Frequencies of the two VCOs can be compensated with the Sync Switch.
- 2. Filters for Various Sound Production:** Equipped filters aid in producing a variety of sounds. The VCF filter can be used for low pass, high pass and band pass, while another filter is used solely for band pass.
- 3. Panning is Possible at VCA with 2 Channels' Out:** In addition to standard functions, panning can be effected at VCA.
- 4. ADSR and AR Envelope Generators:** ADSR and AR envelopes come equipped. Trigger pulse selection is also possible.
- 5. Employment of Ring Modulator:** Comes equipped with a ring modulator, now enjoying wide use in sound production. Modulation of external input can be effected.
- 6. Mixer that Controls Five Signals:** Noise, VCO-1, VCO-2, Ring Modulator and External Input can be mixed simultaneously by the Mixer which at the same time functions as a terminal to select signal determination.
- 7. Signal Lamp for Each Block:** For monitoring the conditions of the blocks, signal lamps are installed on each block.
- 8. Input Terminal that Enables Sound Production from External Sources:** Sounds can be produced from voices or external instruments by connecting a microphone or electric guitar, etc., to this terminal.
- 9. Controller that Performs at Maximum Capacity during Improvisation:** A manual lever-type pitch bender allows for maximum performance in pitch controlling during improvising.

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## VCO-1

- One of the two VCOs (sound sources); and here, Range, Pitch, and Basic Wave selections, Modulation and Pulse Width adjustments and ON/OFF control of synchro switch are effected.
- Range (15) is used to select the basic sound height for the VCO-1 (sound source); and can effect changes for five octaves — from 32', the lowest, to 2', the highest.
- Pitch (9) is to determine the interval of the VCO-1 and controls within  $\pm 5$  degrees. Setting this with VCO-2's Pitch (17) for chords, "unison" is possible.
- The Sync Switch (10) causes the frequency of VCO-1 to synchronize with the frequency of VCO-2. Thus, when tuning the VCO's to unison or to other intervals, the two VCO's are synchronized so that the "beat" difference between the two is completely eliminated. The weak and strong positions of the switch give you a certain amount of control over this effect.
- Wave Form Selector (18) is for selection of basic wave forms which are important to produce sounds. Four wave forms available: "N", "M", "P" and "L", which can be varied by Pulse Width (11, 12).
- Pulse Width (11, 12) varies the wave from "L" according to the amount of change set by Pulse Width Control (12). The amount of change is fixed when the changeover switch is turned to MANUAL. When it is turned to "N", "M", or "P", change is automatically repeated according to the signals from LFO-1 and/or LFO-2, enabling the production of chorus effect sounds. Pulse Width Control (12) varies pulse width in a range of between 50% (P: graduation 0) and 98% (L: graduation 10).
- The function of VCO Modulation (7, 8) is to make the frequency, which has been set by the Pitch (9), fluctuate automatically (vibrato effect) by means of the "N", "M", and "L" signals from LFO-1 and LFO-2. Signals can be selected by the Changeover Switch (7) and the depth of the effect can be set by Modulation (8).

## VCO-2

- An independent sound source similar in function to the VCO-1, the VCO-2 can be used either independently or in harmony by setting frequencies relative to VCO-1.
- Range (22), Pitch (17), Wave Form Selector (21) have the same functions as those of VCO-1.
- The effects of Pulse Width (19, 20) are MANUAL, which fixes the change amount of the wave from "L" set by Pulse Width Control (20), and the automatic change of the said change amount further by the signals from ADSR.
- Keyboard Follow (16) for ordinary performances is set to "ON". When it is OFF, the frequency indicated by Range (22) and Pitch (17) of VCO-2 comes out regardless of keyboard intervals.
- According to the signals "N", "M", "L" from LFO-1 and 2, and the ADSR signals, the frequency indicated by Pitch (17) automatically repeats changing by means of VCO-2 Modulation (15, 16). In this case, too, signals are selected by the changeover switch (15) and the depth of effect is set by Modulation (16).

## Headphone Monitor

- Regardless of VCA out-level, monitoring is possible by connecting the headphone. Volume should be adjusted by Level Control (56).

## Ring Modulator

- Two frequencies combined can produce effects (such as chime tones) which could not be obtained from other sound sources. The following four combinations are produced using switches (24) and (25).
  - 1. VCO-1 and VCO-2
  - 2. VCO-1 and either (23) LFO (N, M, P), or noise.
  - 3. EXT-IN (external input) and VCO-2
  - 4. EXT-IN (external input) and either (23) LFO (N, M, P) or noise.
- They can be used independently as sound effects, or to make deep sounds with VCO-1 or VCO-2 added to them.

## MIXER

- The Mixer maintains a level balance of five sound sources: Noise (31), VCO-1 (32), VCO-2 (33), Ring Modulator (34), and External Input (35).
- At the same time, it functions as a terminal to indicate by the changeover switches (26, 27, 28, 29, 30) the four channels (VCF, VCF & BPF, BPF, VCA) of those five sound sources. To confirm action, signals are transmitted to VCF, BPF, VAC lamps.

## LFO-1/LFO-2

- These are oscillators of low-frequency signals to be used for each modulation (7, 15, 16) of VCO, VCF and VCA, Sample & Hold (4), Pulse Width Modulation of VCO-1 (11), and Ring Modulator (23). LFO-1 generates two types of wave forms: "N" and "M" while LFO-2 three types of wave forms: "L", "P", and "M". The respective rate controls (1, 2) set the low frequency generating.
- LFO-2 is provided with Delay Time (3), by which the time interval between the depressing of the key and the generating of the wave form can be adjusted.
- The speed lamps indicate the speeds of LFO-1 and LFO-2 by flickering.

## Sample & Hold

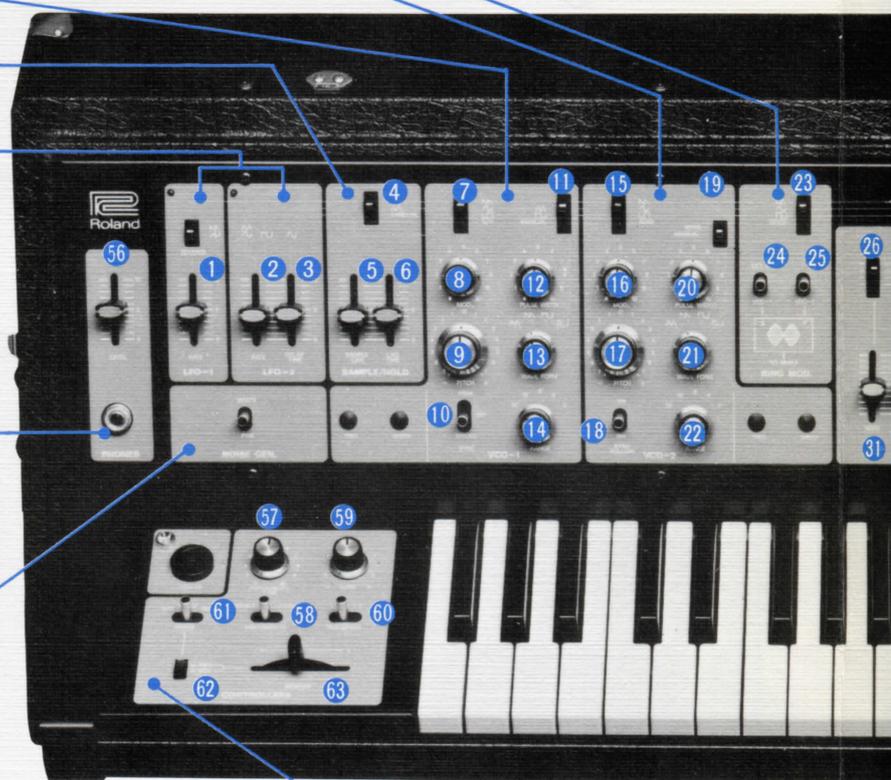
- This part cuts, at certain intervals, the modulations of VCO-1 made by the signals "N (M)" "M" Random" (4) from LFO-1, 2, Noise Generator, and takes up their respective frequencies. It can be utilized as an automatic device for special effects.
- The intervals of cut time can be adjusted by Sample Time (5), while the attack time of each detected signal can be adjusted by Lag Time (6).

## Noise Generator

- This is a device that generates noises which are used as sound sources for creating imitation sounds and/or sound effects. Two kinds can be selected: White noise audible as "Shyaa" and "Pink" noise audible as "Zaa". The level is to be set by Mixer (31) in the case of feeding the noise to VCF, BPF, and VCA.

## Controller

- The controls which are frequently used during the actual performance are gathered here. Such functions related to VCO as tuning, etc., are concentrated here.
- Tune control (59) can raise or lower the tone of the whole keyboard. It is used to tune in concert with another instrument and so on. The normal position is "0" in the middle of the scale. Adjustment is possible by 1-1/2 pitch



## VCF

- This determines and varies tone quality. Its operation is centered around the filter (40) which is capable of changing low pass, band pass and high pass.
- Cut-off Frequency (40) functions by means of the changeover switch (49) in three ways: as low pass filter (LPF) to cut down from high frequencies, as a high pass filter (HPF) to cut up from low frequencies, and as a band pass filter (BPF) to take up only special frequencies. The basic positions of knob (40) are "High" for low pass and "Low" for high pass.
- Resonance (41) emphasizes special frequencies indicated by Cut-off Frequency (40) providing tone color with some accent, enabling various tones to be created. Also, oscillating sounds are generated at scales over 8 — these can be used as tone effect.
- Keyboard Follow (38) is employed to adjust the extent of subjecting the filter-operating frequency range to the key to be played. With the key at the scale 10, it slides completely. As the knob is turned down, the tone color can be changed allowing the actual tones of conventional musical instruments to be established.
- By applying the signals of ADSR or AR to the filter, and by thus automatically changing the working range of the filter, the unique tone

of a synthesizer can be produced. In this case, envelope signals are selected by the changeover switch (42) and the setting of the sensitivity effect by Sensitivity (43).

- VCF Modulation (46, 47) automatically varies the working range of the filter by means of signals, "N", "V", "P" and repeats tonal changes (growl effect). This effect can also be produced by the signals of Sample & Hold, in which case signals are selected by the changeover switch (46) and the depth of effect is set by Modulation (47).

## Band Pass Filter

- This filter picks up special frequencies only. Using this, an effect which resembles resonance, in which tones differ according to the compass, can be produced. Besides this, it can be used in combination with VCF, or independently.
- Frequency (44) establishes the center of the frequency zone to take up, while Resonance (45) emphasizes the center of the band pass indicated by Frequency (44).
- Level Control (46) adjusts the output level of the band pass filter and maintains the level balance with VCF.

## VCA

- The VCA amplifies signals transmitted from VCF and BPF. Controls related to sound outlet, such as the setting of total volume, are found here.
- Envelope Changeover Switch (50) determines the rise and/or fading out of sound. Selection can be made from AR, ADSR, and the slow attack line "A" set by the envelope generator.
- Hold (48) enables the sound to elongated even if the key is released. At this time, the level can be controlled. Also, as the level of hold is raised, the functions of Modulation (47, 48) and Envelope ADSR, AR, "A" (50) will be weakened.
- VCO Modulation (47, 48) produces an effect in which volume automatically varies according to the signals "N", "V", "P" from LFO-1 and LFO-2 (tremolo effect). Selection of signals is controlled by the changeover switch (47) and sensitivity is set by Modulation (48).
- Out Level (52) determines the output level of VCA and acts as a total volume control.
- Panning (51) maintains horizontal balance by means of the out channel of the two channels. It also can control the horizontal panning of sound.

## Envelope Generator

- This produces the envelop signals which apply to VCF (42), VCA (40) and VCO-2, Modulation (48), Pulse Width (49), etc. There are two controls: ADSR and AR.
- ADSR (55), by means of four controls, produces the envelope signals based on rise and/or fading-out of sounds. Not only does it cover practically all envelopes of conventional musical instruments, but it also creates special envelopes. "A" controls the attach time of sound, "D" the decay time, "S" the sustain level, and "R" the release time.
- AR (54) performs a simplified function of ADSR, and is composed of A (attack time) and R (release time.)
- Trigger (53) selects the initial signal of the envelope. For normal use, it is set to "KYBD" at which the envelope signal works the moment the key is depressed. It can also be actuated by such signals as Sample & Hold, LFO-2, and External Input.



high and low.

- Transpose (60) is a switch which can be used to make a changeover by one touch among 3 octaves.
- Bender (58) enables VCO pitch or VCF cut-off frequency to be changed by a lever. Changes of VCO pitch or VCF cut-off frequency is made by the Changeover Switch (59).
- Using the Range Changeover Switch (61), 3

kinds of working ranges can be set for VCO pitch: "Semi", a half tone; "Whole", one tone; "Quint", 5 degrees. The bender operation of VCF cut-off frequency is to produce WOW effect by lever. By this operation, the frequency set by VCF cut-off frequency can be raised or lowered.

- Portamento (57, 58) is used to make an effect by which the continuous variation of sound is

possible from one previously depressed key to another later depressed key. The Changeover Switch (58) enables 2 modes to be selected: "Variable" where the effect is applied with the length set by Portament Control (57) and "Fixed" where the extremely long portamento is set.

