

KORG
MONOPHONIC SYNTHESIZER
MS-10
OWNER'S MANUAL

KORG MONOPHONIC SYNTHESIZER MS-20

KORG ANALOG SEQUENCER



1)

SQ-10

KORG MONOPHONIC SYNTHESIZER MS-10



⑫ VOLTAGE CONTROLLED AMPLIFIER (VCA)

VOLTAGE CONTROLLED LOWPASS FILTER (VCLPF)

⑧ CUT-OFF FREQUENCY

⑨ PEAK

VOLTAGE CONTROLLED OSCILLATOR (VCO)

① SCALE 32'16'8'4'

② WAVE FORM

③ PITCH

④ PW/PWM

⑤ PORTAMENTO

⑬ EXTERNAL SIGNAL LEVEL

⑭ CONTROL WHEEL

⑥ FREQUENCY MODULATION BY MG

⑦ FREQUENCY MODULATION EG/EXT

⑩ CUT-OFF FREQUENCY MODULATION BY MG

⑪ CUT-OFF FREQUENCY MODULATION BY EG/EXT





ENVELOPE GENERATOR (EG)

- ⑬ HOLD TIME
- ⑭ ATTACK TIME
- ⑮ DECAY TIME
- ⑯ SUSTAIN LEVEL
- ⑰ RELEASE TIME

POWER SWITCH / VOLUME

SIGNAL OUT

⑲ INITIAL GAIN

⑳ VCO CV IN

㉑ KBD CV OUT

㉒ TRIGGER IN (TRIG IN)

㉓ TRIGGER OUT (TRIG OUT)

CONTROL WHEEL OUT

㉔ ENVELOPE GENERATOR REV OUT

㉕ NOISE GENERATOR

㉖ PACH PANEL

⑱ MODULATION GENERATOR (MG)

WAVE FORM $\sim \wedge \sim \vee$, $\square \sim \square \sim \square$

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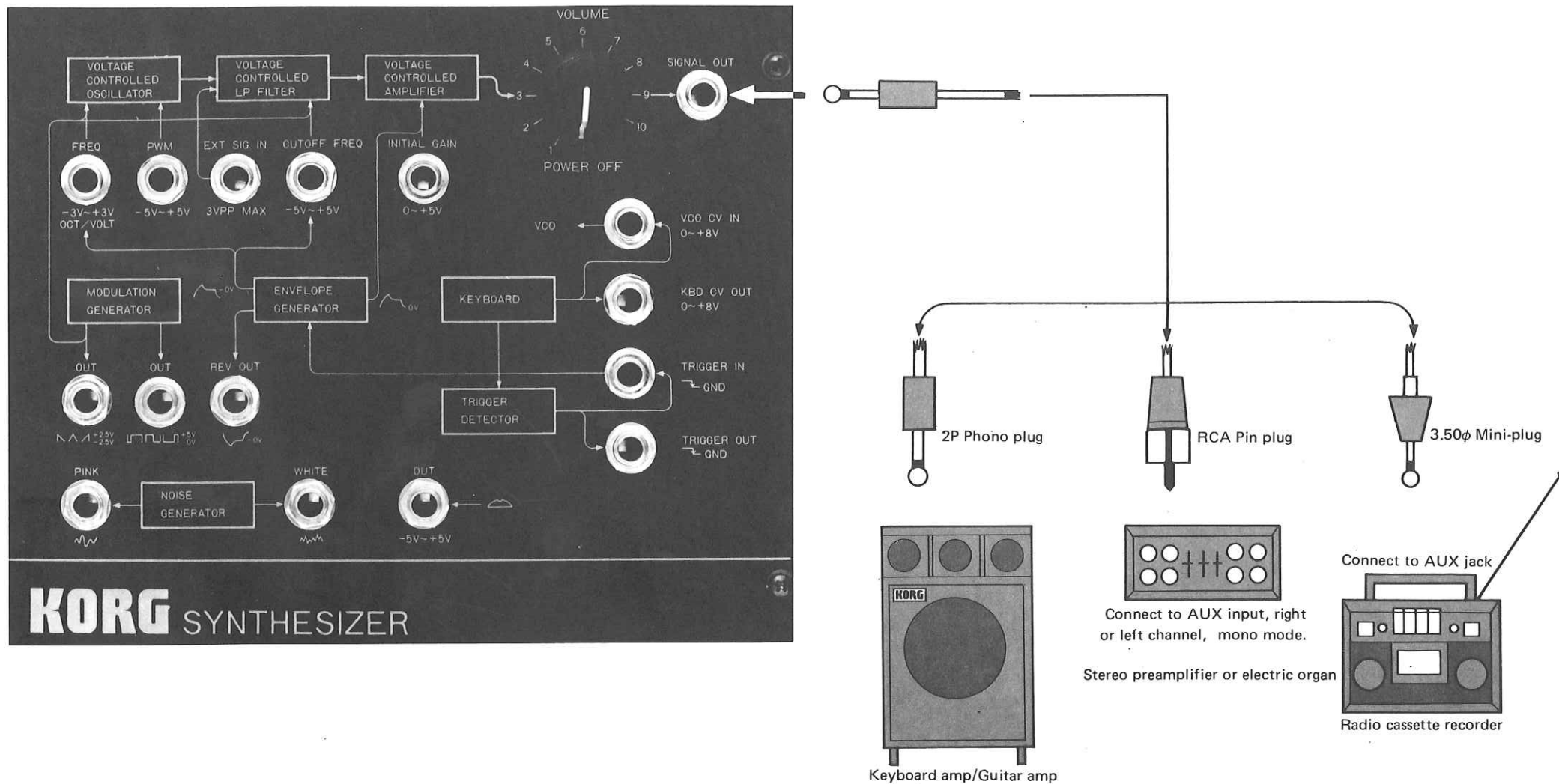
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1) Introduction

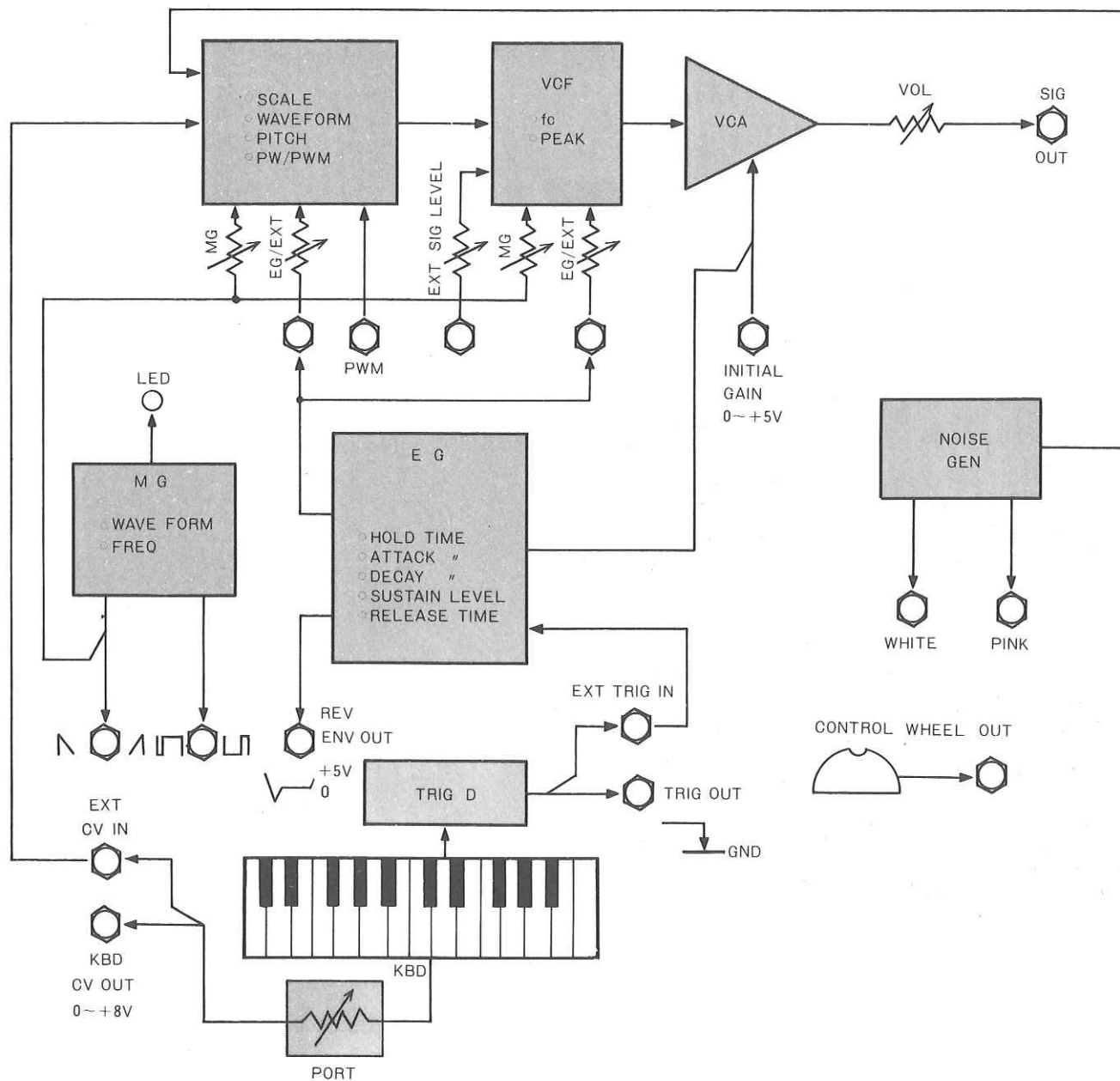
Congratulations on purchasing the Korg MS-10 Synthesizer. This instrument has been engineered and manufactured using the most advanced techniques known today, and features the same unparalleled technology utilized in Korg's revolutionary Polyphonic Synthesizers, the PS-3100 and PS-3300. With reasonable care, it will provide years of high quality and reliable use with unsurpassed stability, versatility and longevity. Please read this manual carefully to get the most out of your MS-10.

2) Connection with an Amplifier



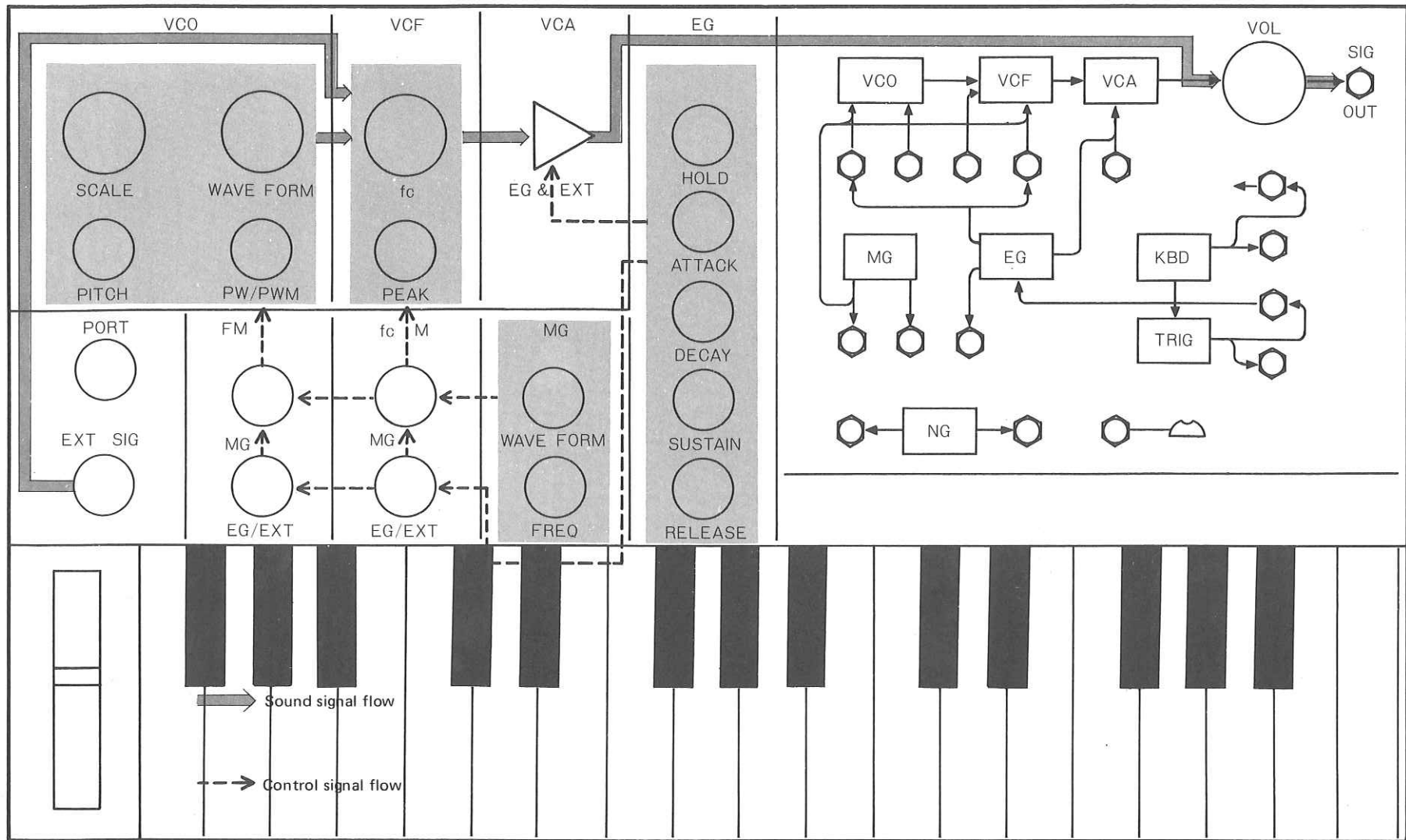
3) Block diagram and signal flow chart

3-1 Block diagram



3-2 Signal Flowchart

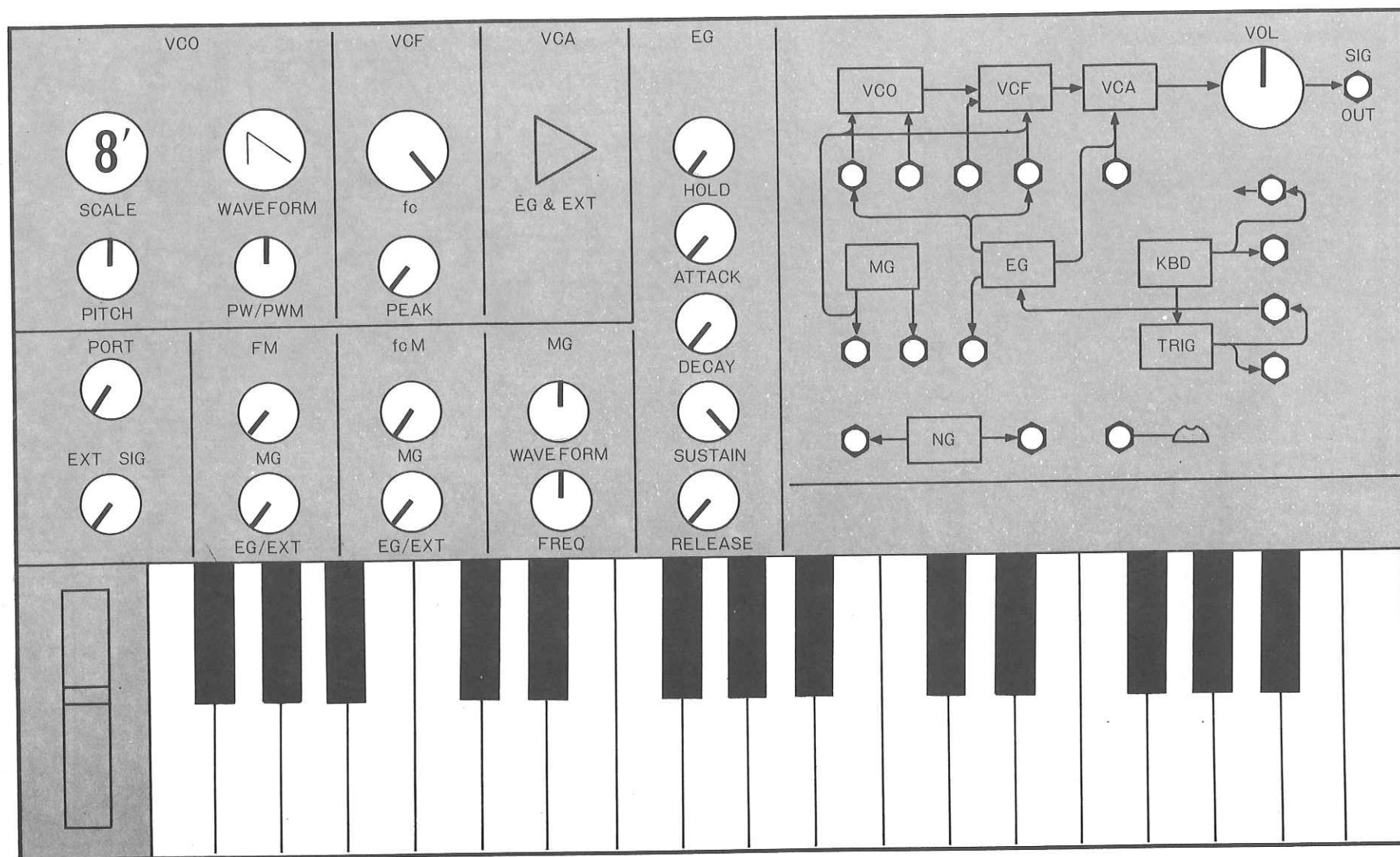
This diagram shows the various signal paths in the MS-10 Synthesizer. Solid lines (\Rightarrow) represent sound (audio) signal flow; broken lines (\dashrightarrow) represent control signal (control voltage) flow. Control signals are connected from various parts of the synthesizer to the VCO, VCF and VCA by means of internal patches. You can supplement these by using the Patch Panel.



4) Normal Setting

This diagram illustrates control positions for the Normal Setting. In this setting, all modulation functions are disconnected, producing a basic unmodulated tone.

This Normal Setting is the foundation on which you will build when creating sounds with the MS-10. You will find it useful to be able to return to this setting whenever you start a new patch. Therefore, it is recommended that you memorize these control positions for greater efficiency of operation.



5) Features and functions

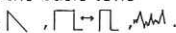
Voltage Controlled Oscillator (VCO)


The VCO is the source of all sound for the MS-10 synthesizer. It is here that all pitch and basic tone color elements are determined.


① Scale:


This control is an Octave selector. With each halving of the number displayed, the pitch goes up one octave. For example the 4' (foot) scale indication is one octave higher than 8'; similarly, 16' is one octave lower than 8'.


② Waveform:

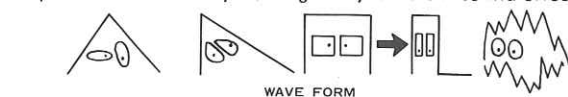
This selects the various waveforms that determine the basic tone color (timbre). Four waveforms are provided . Each waveform has its own unique characteristic sound.

 **(Triangle Wave):** A very basic waveform having few harmonics, and possessing a soft, round tone color. Excellent for flute, vibes and other such effects. The Triangle Wave may be changed into a Sine Wave (having no harmonics) by the use of the Low Pass Filter.

 **(Sawtooth):** A waveform rich in all harmonics, and one of the most useful to the synthesist. Used for string, brass, voice and other harmonically rich sounds. The Voltage Controlled Filter (VCF) is highly effective on Sawtooth Waveforms.

 **(Rectangle Wave):** A variable waveform having different timbres depending on on the width of the top (called Pulse Width). When the top and bottom widths are equal, the waveform is called a Square Wave, and possesses the "hollow" qualities of the reed family (i.e., the clarinet). As the pulse width proportionately decreases, a strong shift in tone color occurs; the sound becomes "nasal" in quality. This waveform is called a Pulse Wave. Pulse Width is varied on the MS-10 using the PW/PWM control and any external controller patched into the PWM jack.

 **(White Noise):** An unpitched sound consisting of equal amounts of all frequencies. Used for wind, surf, gunshot, percussion instrument and other such effects. The use of the filter will emphasize certain frequencies over others, creating many different sound effects.



③ Pitch:

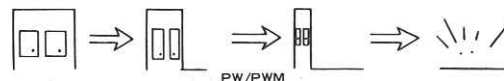
This control varies the VCO's pitch over a range of \pm one octave. Once set, the pitch level remains extremely stable throughout the playing range, thanks to Korg technology.

④ PW/PWM:

This control varies the Rectangle Wave's Pulse Width (PW), when no patch is in the PWM jack. At "0", the waveform is symmetrical (ie, a Square Wave). Rotating the control clockwise proportionately decreases the pulse width. Near the full clockwise position, the

pulse width becomes so narrow as to virtually disappear, and no sound will be heard. This function is useful for eliminating the VCO when external sound sources are being processed through the MS-10 EXT signal in jack.

In addition, pulse width may be varied externally by other parts of the synthesizer (e.g. Control Wheel, MG, EG, etc.) by patching the PWM jack to the appropriate controller output. This effect is called Pulse Width Modulation (PWM); the PW/PWM control now varies the intensity of the modulation effect. For example, when connected to the MG Triangle Wave output on the patch panel, a "chorus" effect similar to the sound of two oscillators slightly detuned from each other is achieved, due to the constantly shifting harmonic balance.



⑤ Portamento:

Varies the rate of "glide" ... the time it takes the MS-10 to go from note to note. The ability to make smooth transitions in pitch between notes is unique to the monophonic synthesizer, and adds to the creative effects available.

Frequency Modulation controls.

These controls allow other parts of the synthesizer to affect the VCO's pitch, for such effects as vibrato, trills, pitch bends, "sweeps," etc.

⑥ Frequency Modulation by MG:

Varies the intensity of vibrato from the Modulation Generator (MG) Triangle Wave output.

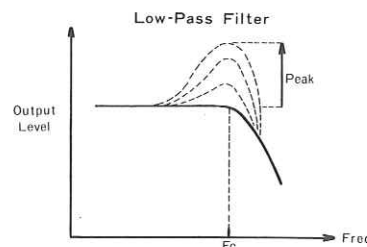
⑦ Frequency Modulation by EG/EXT:

With no patch in the VCO's FREQ jack, this control varies the effect of the Envelope Generator (EG) on the VCO. Advance the control and play a note on the keyboard. Notice that the pitch of the note rises and falls corresponding to the envelope curve (see Envelope Generator).

With any external controller patched in (eg, Control Wheel, Reverse Envelope, etc.), this control now varies the intensity of the external device.

Voltage Controlled Low-Pass Filter (VCLPF):

The VCF alters the tonal quality of the VCO waveform by removing certain frequencies while passing others. The fact that the VCF can vary its characteristics dynamically gives the synthesizer enormous expressive powers. The MS-10 is equipped with a wide range Voltage Controlled Low Pass Filter (VCLPF) which, as its name implies, passes lower frequencies while blocking, or filtering out, higher frequencies.



⑧ Cut-off Frequency (Fc):

Controls the point in the frequency spectrum where sounds start to be filtered out. At "10", the filter is wide open and sounds pass through unaffected. As the control is rotated counterclockwise, sounds passing through gradually become rounder and softer in tonal quality, as more and more higher frequency components are reduced and eliminated. At "0", the filter is almost completely "closed," and sounds passing through are barely audible.

⑨ Peak:

This control varies the amount of the filter's Resonance or Emphasis ("Q") at the cut-off frequency. At "0" there is no Emphasis, and frequencies are rolled off smoothly at the cut-off frequency point. As the control is advanced clockwise, a "peak" rises in the filter's frequency response at the cut-off frequency. The effect of this function is to make the action of the filter more pronounced. "Wah" and "Twang" effects are produced using this function.

At somewhere near its maximum setting, the filter itself begins to oscillate, generating its own pure sine wave ... thus in effect becoming another sound source. Its pitch is affected by the cut-off frequency and cut-off frequency modulation controls.

Cut-off Frequency Modulation Controls

These controls allow other parts of the synthesizer to vary the filter's cut-off frequency, in a manner similar to VCO frequency modulation.

⑩ Cut Off Frequency Modulation by MG:

The Modulation Generator's Triangle Wave output modulates the filter frequency, for filter vibrato, automatic "wa-wa", etc..

⑪ Cut Off Frequency Modulation by EG/EXT:

This control varies the modulation intensity from the Envelope Generator (when no patch is in the VCF's "CUTOFF FREQ" jack). This highly useful effect is called "filter contouring", and allows you to obtain changes in tonal quality over time. Learn to use this function, and to experiment with different settings of the Envelope Generator controls.

When an external device (eg, Control Wheel, Pedal, Reverse Envelope, etc.) is patched into the CUTOFF FREQ jack on the patch panel, this control varies the intensity of the external modulation effect.

⑫ Voltage Controlled Amplifier (VCA):

This device varies the volume of sound passing through it in accordance with the sum of control voltages from the Envelope Generator (EG), and from any external controller patched into the patch panel VCA INITIAL GAIN jack.

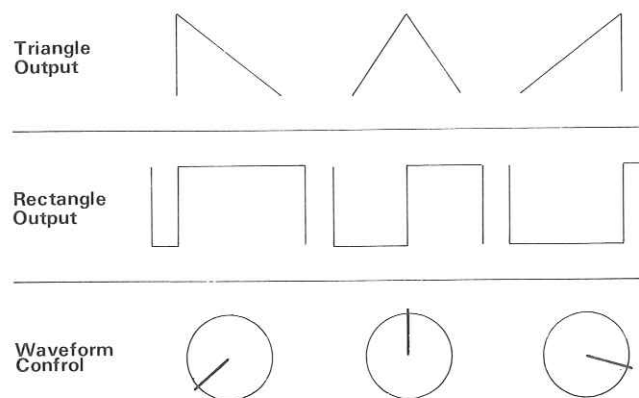
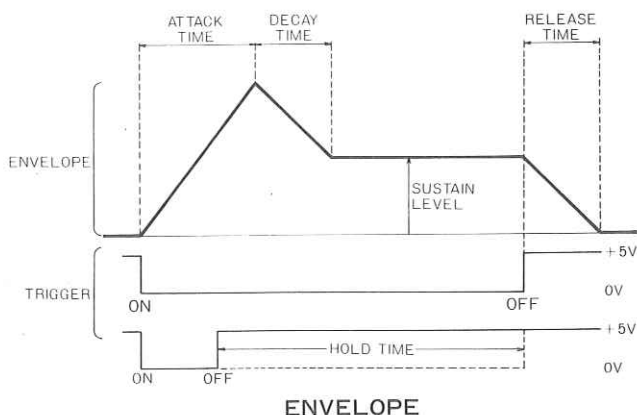
Envelope Generator (EG):

This device generates a rising and falling voltage which when applied to the VCA and VCF produces corresponding changes in volume and tone color respectively. The MS-10 features a unique 5 part Envelope Generator for added flexibility. When "triggered" (usually by depressing a note on the keyboard), the EG voltage rises to a peak at a rate set by the Attack Time control, then falls at the Decay Time control rate to a level set by the Sustain Level control and eventually falls back to zero at the Release Time control rate following termination of the trigger signal.

- 13 Hold Time:** Extends the trigger signal by a variable amount of time. In effect, it "remembers" the trigger for a specified time period.
- 14 Attack Time:** Sets the time the voltage takes to rise to a peak.
- 15 Decay Time:** Sets the time the voltage takes to fall from the peak to the Sustain Level.
- 16 Sustain Level:** Sets the voltage level which will be sustained for the duration of the trigger signal (plus time set by Hold control).
- 17 Release Time:** Sets the time the voltage takes to fall to zero after the trigger signal ends.

The EG output is internally patched to the VCA so that changes in volume over time will occur to sounds according to the EG control settings.

In addition, another EG output is sent to the Filter Modulation controls (EG/EXT) so as to modulate the VCF's cut-off frequency. In this mode, the filter's "steady state" is the Sustain Level. The filter's cut-off frequency will start below this level, initially will rise above the Sustain level during the Attack cycle, will fall to the Sustain level, and then will fall below to the initial level again following trigger release.



19 External Signal Level:

The MS-10 provides an external Signal In jack on the patch panel, allowing external sound sources to be processed through the MS-10's VCF and VCA sections. This control varies the level of the external source, which may be combined with the VCO sound, or the VCO may be eliminated by selecting the Rectangle waveform (□→□) and turning the PW/PWM control to the extreme clockwise position.

20 Programmable Control Wheel:

This control produces a voltage from -5 to +5 volts, depending on the wheel position. Its output appears on the patch panel, and may be connected to various control input jacks as desired, for such effects as Pitch Bend, Pulse Width Modulation Filter "Sweeps", etc.

21 Patching Panel:

The flow chart on the patching panel shows the structure of the MS-10 and the way the internal patch is connected. Think of this chart as the starting point for discovering the multitude of hidden possibilities of the synthesizer.

22 VCO Control Voltage In (VCO CV IN):

Instead of using the keyboard, you can use the control voltage from an external source (another synthesizer or sequencer) to operate the VCO through this input jack.

23 TRIG IN:

The MG output (□) or trigger signal from an external source can be connected to this input to control beginning and end of EG operation.

24 KBD CV OUT:

This output allows you to use the control voltage (control signal) from the keyboard to control the VCO or VCF cut-off frequency of another synthesizer.

25 KBD TRIG OUT:

Whenever you play a key on the keyboard a trigger signal is generated. Ordinarily, this trigger signal output is used along with the KBD CV OUT to operate another synthesizer.

26 INITIAL GAIN:

Although the VCA and EG are connected by the internal patch, this input permits you to use an external input along with the EG to control the VCA. However, when the sum of the input control voltages goes above 5V no further change in volume will occur.

27 Envelope Generator Reverse Out (EG REV OUT):

While the normal envelope (∧) is ordinarily connected internally to the VCO, VCF, and VCA, the reverse of this envelope (∨) is available at the REV OUT jack. Patching this into one of the inputs gives many new possibilities for creating sounds.

28 Noise Generator:

Noise is also available as one of the VCO waveforms but these outputs give you both pink noise and white noise which may be used as modulating signals. Pink noise is white noise with reduced high frequency components.



6) About Patching

Setting up a patch is one way to use the MS-10 more effectively. Patching involves using such outputs as the control wheel in a creative way to control various synthesizer functions. This greatly increases the sounds and effects that are possible.

To get the effect you want, follow these steps:

- (1) Where (VCA, VCF, VCO, etc.) do you want the effect and what kind of effect do you want?
- (2) What kind of control signal do you need for the effect?
- (3) Which section of the synthesizer will generate that kind of control signal?

If you don't put your thoughts into this order before you start connecting patch cords from one jack to another, it is not possible to get the kind of sound you are looking for.

Even if you just use the internal patch without external patch cords, these same rules apply. When you want a certain sound, break it down into its elements of pitch, tone color (timbre), volume, and envelope (volume change over time). Then put these elements together by using the various sections of the synthesizer.

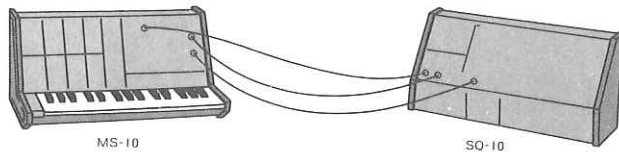
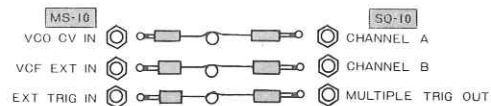
Remember that the keyboard generates both a control voltage and a trigger signal every time you play a key. In other words it acts as a control knob and a switch.

Make maximum use of this and other less obvious possibilities for sound creation. The more techniques you know, the more freely you can make music.

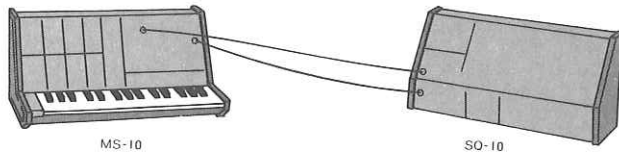
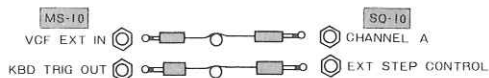
7) Upgrading your system

- * The SQ-10 Korg Analog Sequencer can easily be used along with the MS-10 for some interesting results. Here are just two examples. (Refer to the SQ-10 owner's manual for more details.)

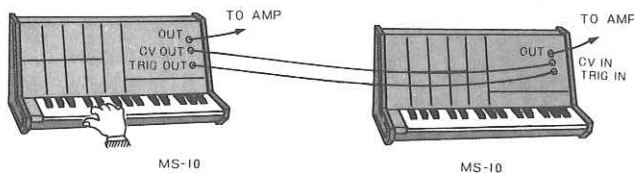
(1) One simple idea is to set the SQ-10 to produce a different pitch and tone color in the MS-10 at each step. Then use the internal clock of the SQ-10 to run through the steps. This results in automatic control of the MS-10.



(2) For performing live, another effective way of using the SQ-10 is to set up a patch so that the SQ-10 advances one step and changes the tone color every time you play a key on the MS-10.



- * Two MS-10 synthesizers can be used together to increase the richness and depth of the sound.



Connect patch cords from the KBD CV OUT and TRIG OUT of the MS-10 on the left to the VCO CV IN and TRIG IN of the MS-10 on the right. With this arrangement, both synthesizers operate together when you play the keyboard of the one on the left. But if you try to play the right hand keyboard, nothing will happen because it has been disconnected by the patch cords in the VCO CV IN and TRIG IN input jacks. So decide which keyboard you are going to use before you set up the patch.

Using separate amps (or left and right stereo channels) for each synthesizer gives a better effect.

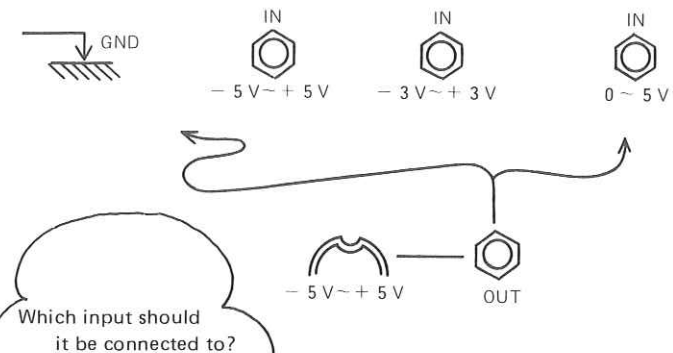
You can also try setting all the controls at the same positions for both synthesizers and then varying the pitch slightly on one of them. This can produce a phase effect or jet effect. This can be effectively used both on the stage and in the recording studio for multi-track recording.

* There are many ways of using other equipment with the MS-10. But the simplest way of upgrading your system is to use a lot of patch cords. It's also the cheapest. So stock up with plenty of Korg Patch Cords. The teachings of Doctor Korg remind us to consider what we want and how to go about getting it before plugging patch cords into every hole we see. But if you run out of jacks you can always buy or make a junction box.



8) Caution

- (1) On the MS-10 front panel are five small rubber plugs which cover internal adjustment trimmer controls. Do not change these control settings. They have been adjusted at the factory to give optimum results. Changing their setting will result in performance deterioration, and possible harm to the instrument.
- (2) Pay attention to the voltage indications (0~+5V, -5V~+5V, 5Vpp, etc.) on the patch panel and their relationship with the block diagram and signal flow chart. The patch panel itself is arranged in a flow chart to make things simpler. Note that if you connect a -5V~+5V control signal to a 0~+5V input, nothing will happen during the -5~0V portion of the control signal. It will only operate from 0~+5V. So always consider both the output and the input and whether the signal is analog or digital, the latter indicated by GND.



9) Specifications

< CONTROL SECTION >

1. Keyboard
 - * F~C 32 Keys/(2-2/3 octaves)
 - * Scales [32', 16', 8', 4',]/(5.5 octaves + 6 octaves (FM))
 - * Wave form [\wedge , \searrow , PW/PWM, Noise]/(4 modes)
 - * PW adjust/PWM intensity
 - * Pitch [1 OCTAVE OR MORE]
 - * Portamento
 - * Frequency modulation intensity by MG
 - * Frequency modulation intensity by EG/EXT
3. Voltage controlled low pass filter
 - * Cut-off frequency
 - * Peak [flat ~ self OSC]
 - * Cut-off frequency modulation intensity by MG
 - * Cut-off frequency modulation intensity by EG/EXT
4. Envelope generator
 - * Hold time
 - * Attack time
 - * Decay time
 - * Sustain level
 - * Release time
5. Modulation generator
 - * Wave form $\searrow \wedge \nearrow$, \square - \square - \square CONTINUALLY
 - * Frequency
6. External input
7. Manual controller
8. Power, SW & volume
 - * Signal level adjust
 - * Control wheel CENTER CLICK STOP
 - * Volume

< PATCH PANEL SECTION >

1. Keyboard
 - * Keyboard control voltage output (exponential)/0V~+8V
 - * Keyboard trigger output/ \square GND
 2. VCO
 - * VCO control voltage input (linear response)/0V~+8V
 - * External frequency control input (OCT/V)/-3V~+3V
 - * External pulse width modulation input/-5V~+5V
 3. VCF
 - * External signal input/3VPP max.
 - * External cut-off frequency control input (2OCT/V)/-5V~+5V
 4. VCA
 - * Initial gain control input/0V~+5V
 5. EG
 - * External trigger input/ \square GND
 - * Envelope signal reverse output/-5V~+5V
 6. MG
 - * Triangle output ($\searrow \wedge \nearrow$)/5VPP
 - * Rectangle output (\square - \square - \square)/0 \leftrightarrow +5V
 7. Noise generator
 - * Pink noise output/5VPP
 - * White noise output/5VPP
 8. Manual controller
 - * Control wheel output/-5V~0V~+5V
 9. Signal out
 - * Signal output/2VPP max (output impedance 3.5k Ω)
 10. Power consumption
 - * 5Watts
-
- * Dimensions
 - * Weight
 - * Accessories
- * 499(W) x 309(D) x 249(H) mm
 - * 6.3 kgs
 - * Connecting cord/3m x 1
 - * Patch cord/35 cm x 1

10) Setting Chart

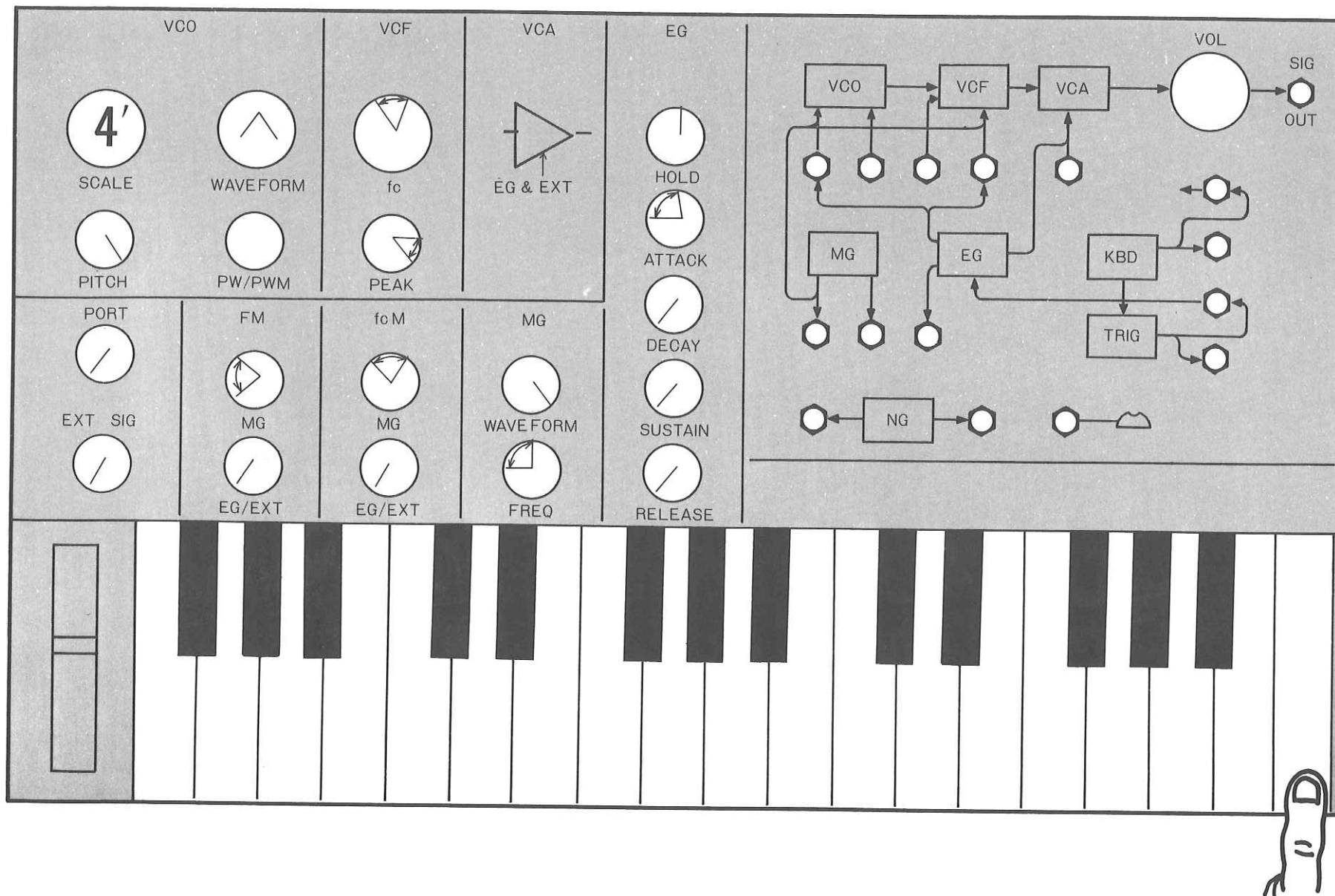
Bird call: :Play the highest note on the keyboard while turning the MG section Frequency knob.

10) Einstelltabelle

Vogelruf: Die höchste Note auf der Tastatur spielen und den Frequenzregelknopf des Modulationsgenerators drehen.

10) Schémas de réglage

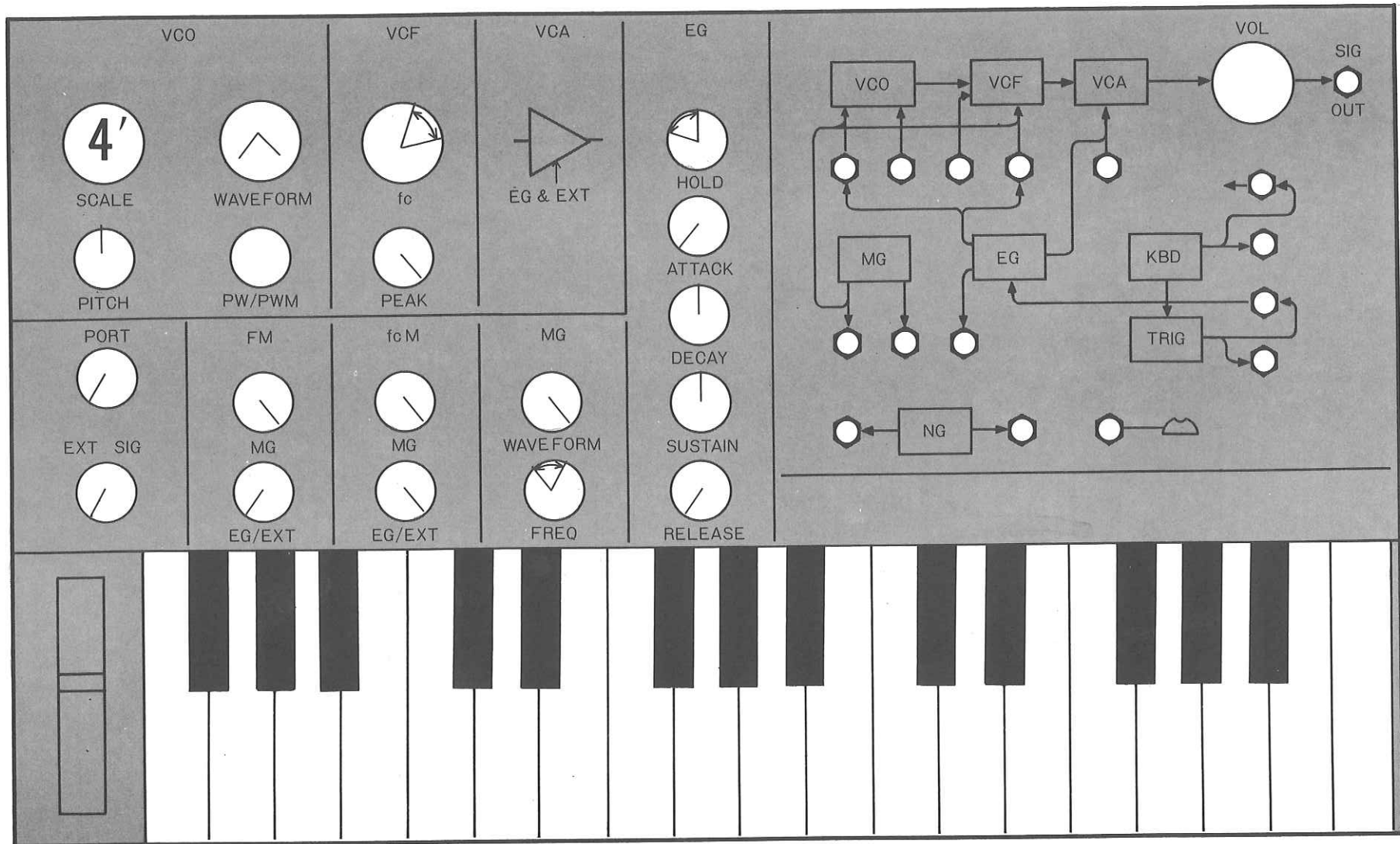
Appel d'oiseau: jouez la plus haute note du clavier tout en tournant le bouton de fréquence de la section MG.



UFO: Turn the knobs and meet your own UFO.

UFO: Den Knopf drehen um Ihre "fliegende Untertasse" zu erleben.

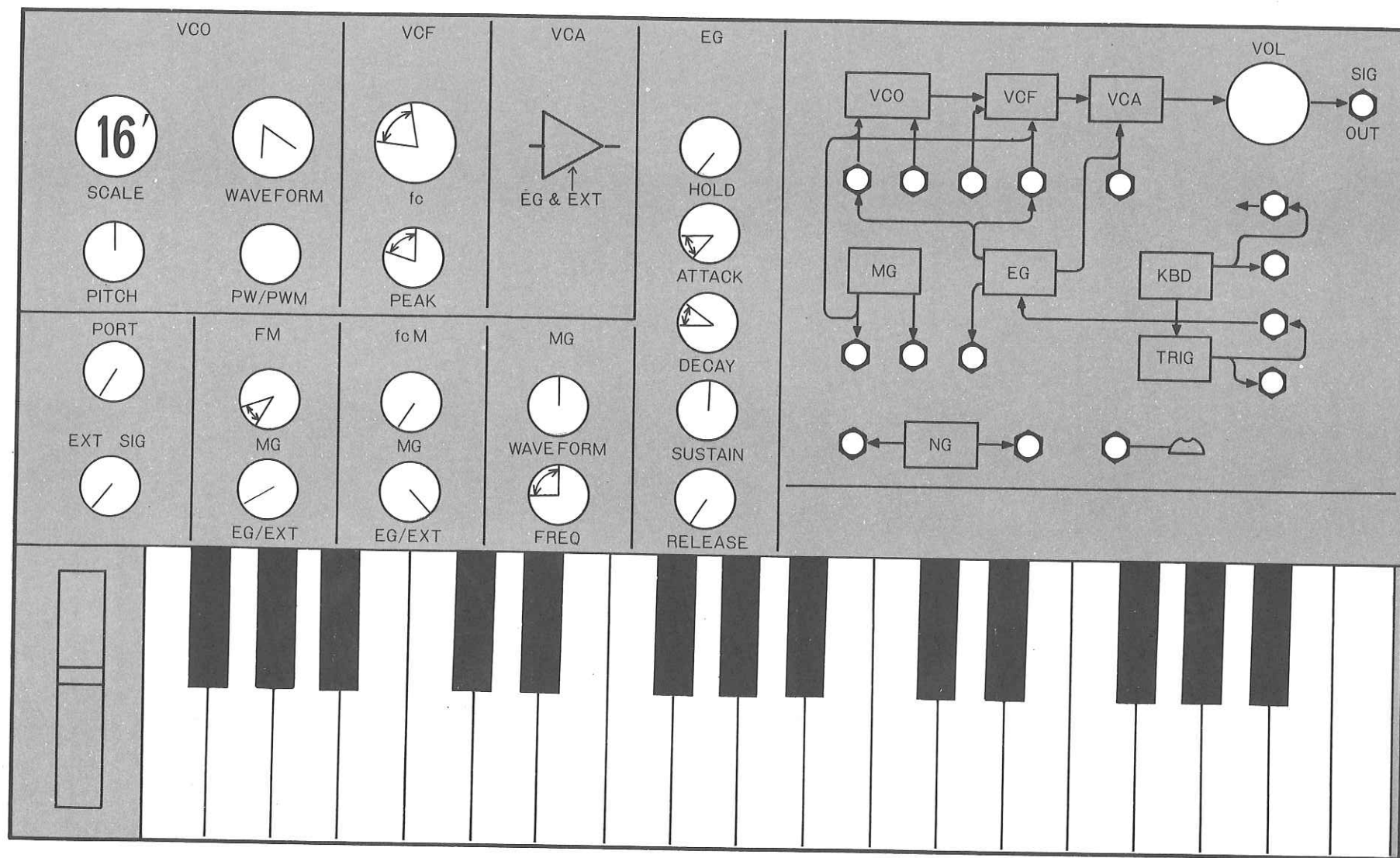
Soucoupe volante: tournez les boutons, et préparez-vous à affronter votre propre soucoupe volante.



Horn: This is a soft horn sound. Turn the Scale knob for other brass instruments. Make fine adjustments in tone color by turning the VCF section fc knob.

Horn: Ein weicher Hornklang. Den Skalenknopf für andere Blechinstrumente drehen. Feineinstellungen hinsichtlich der Klangfarbe durch Drehen des fc-Knopfes des VCF-Abschnittes vornehmen.

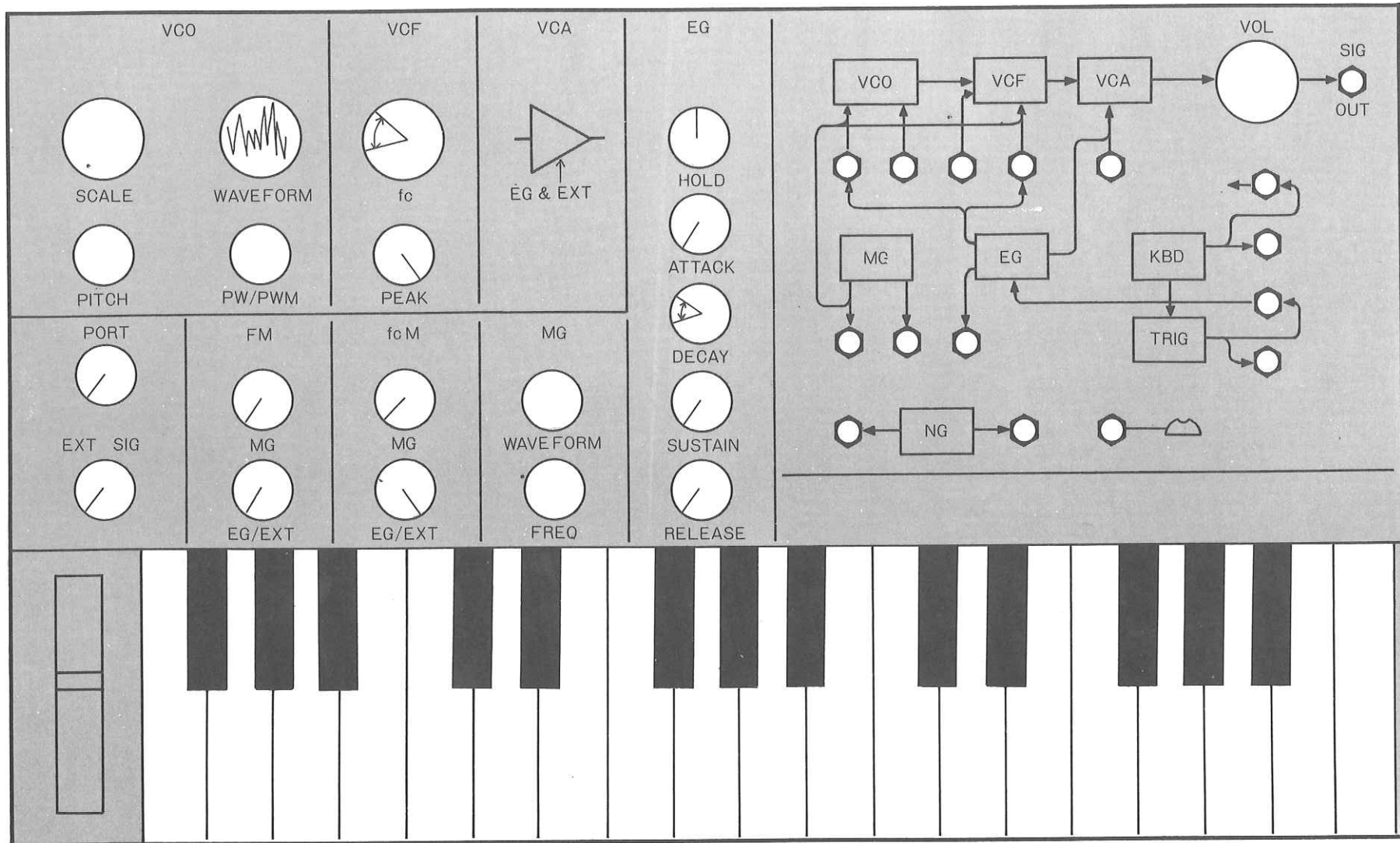
Cor: c'est un son de cor doux. Pour imiter le son des autres cuivres, tournez le bouton d'octave (SCALE). Pour le réglage fin du timbre, tournez le bouton "fc" de la section VCF.



Gun shot: When you play a key, it sounds like a pistol. How would you set up a patch for continuous gunfire.

Pistolenschuß: Wenn Sie eine Taste anschlagen, dann ertönt ein Pistolenschuß. Überlegen Sie die erforderlichen Anschlüsse, um kontinuierliches Pistolenfeuer zu erhalten.

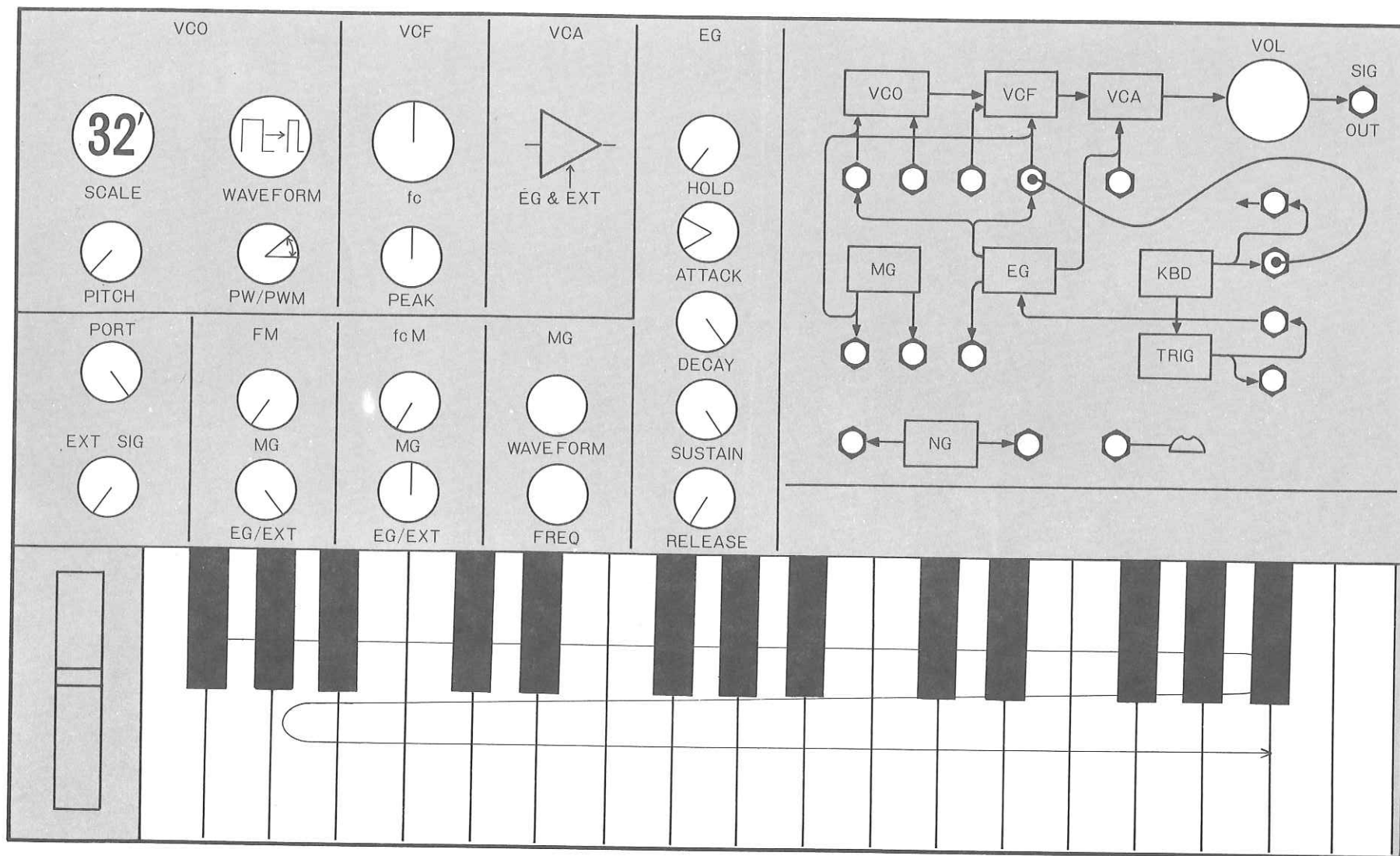
Coup de feu: sonne comme un coup de pistolet quand vous jouez une touche. Comment établiriez-vous une liaison pour imiter un tir en rafale?



Engine: Sounds like a car engine speeding up. Drag your finger along the keys as shown in the diagram from the low notes to the high notes.

Motorlärm: Klingt ähnlich, wie der Motorlärm beim Gasgeben.
Fahren Sie mit dem Finger gemäß Abbildung von den tiefen zu den hohen Noten über die Tasten.

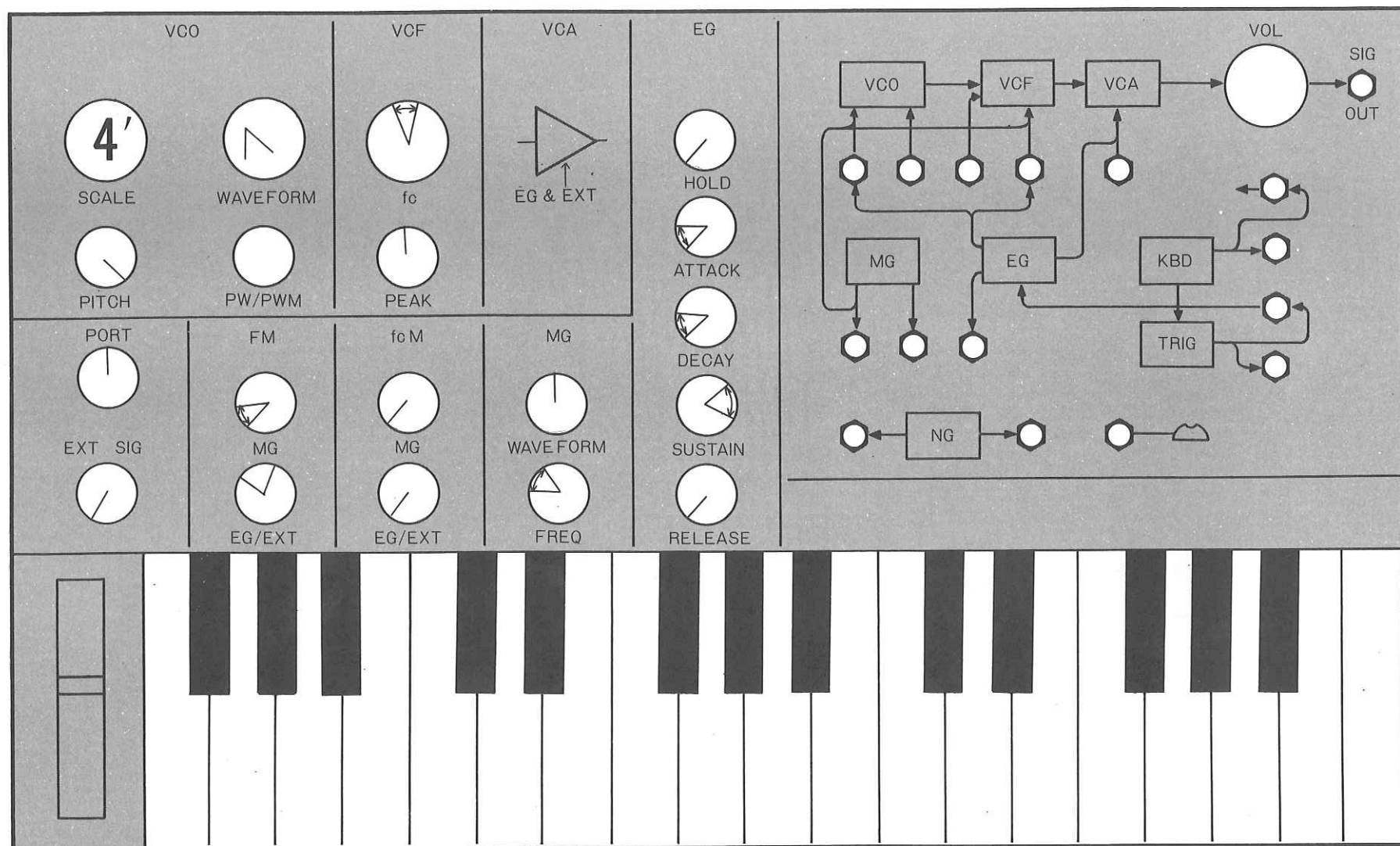
Moteur: imite le bruit de moteur d'une voiture en train d'accélérer.
Balayez le clavier avec le doigt, du grave à l'aigu, comme indiqué sur le schéma.



Whistling: Use the VCF section fc knob to vary the tone color.
Try to make it sound like your own whistle.

Pfeifen: Den fc-Knopf des VCF-Abschnittes verwenden, um die Klangfarbe zu ändern. Versuchen Sie Ihr eigenes Pfeifen nachzumachen.

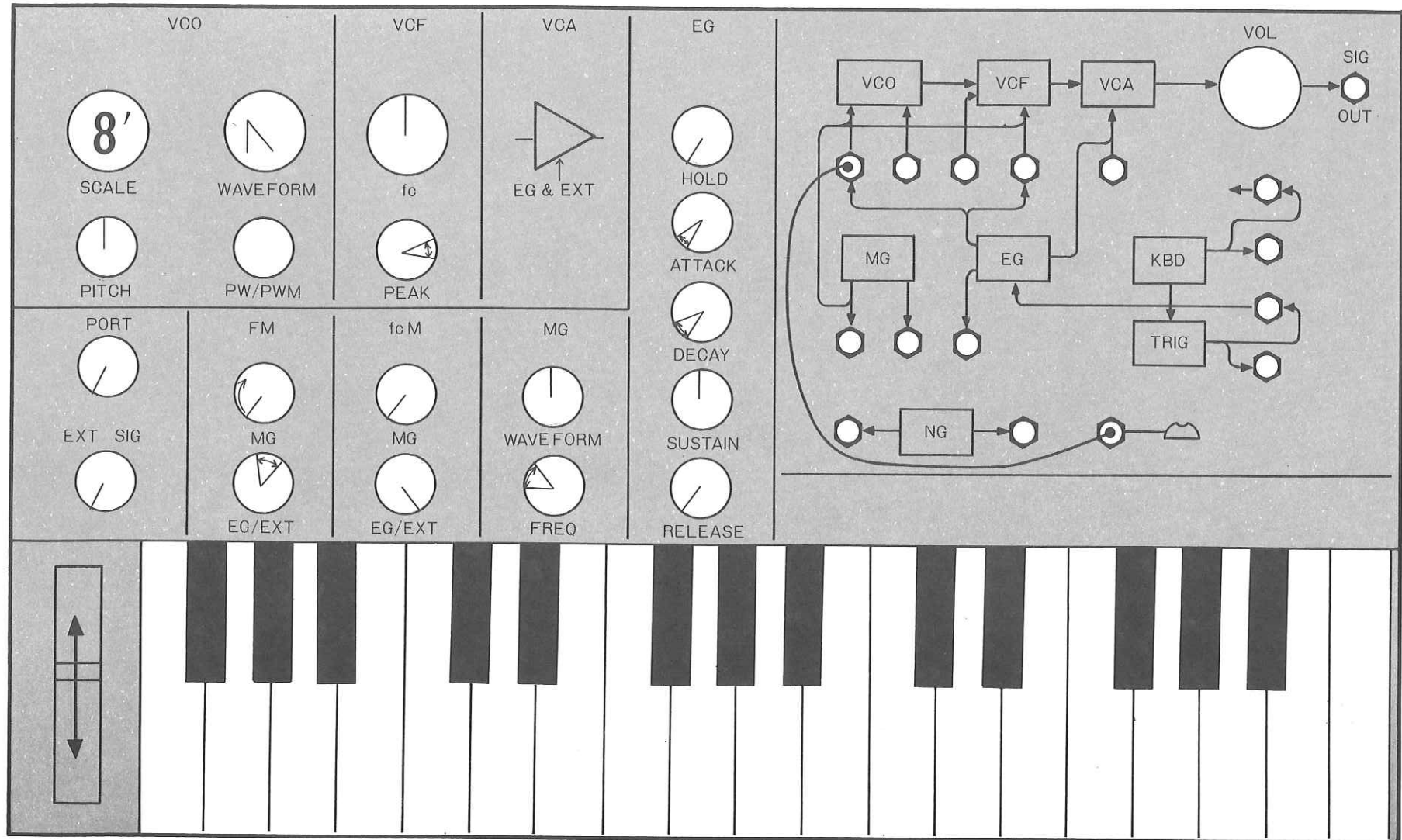
Sifflet: utilisez le bouton "fc" de la section VCF pour faire varier le timbre. Essayez d'imiter votre propre sifflement.



Pitch bend: In this example, the control wheel varies the pitch so you have real control over the type of pitch bend.

Tonhöhenänderung: In diesem Beispiel wird mit Hilfe des Regelrades die Tonhöhe verwendet, so daß präzise Regelung ermöglicht wird.

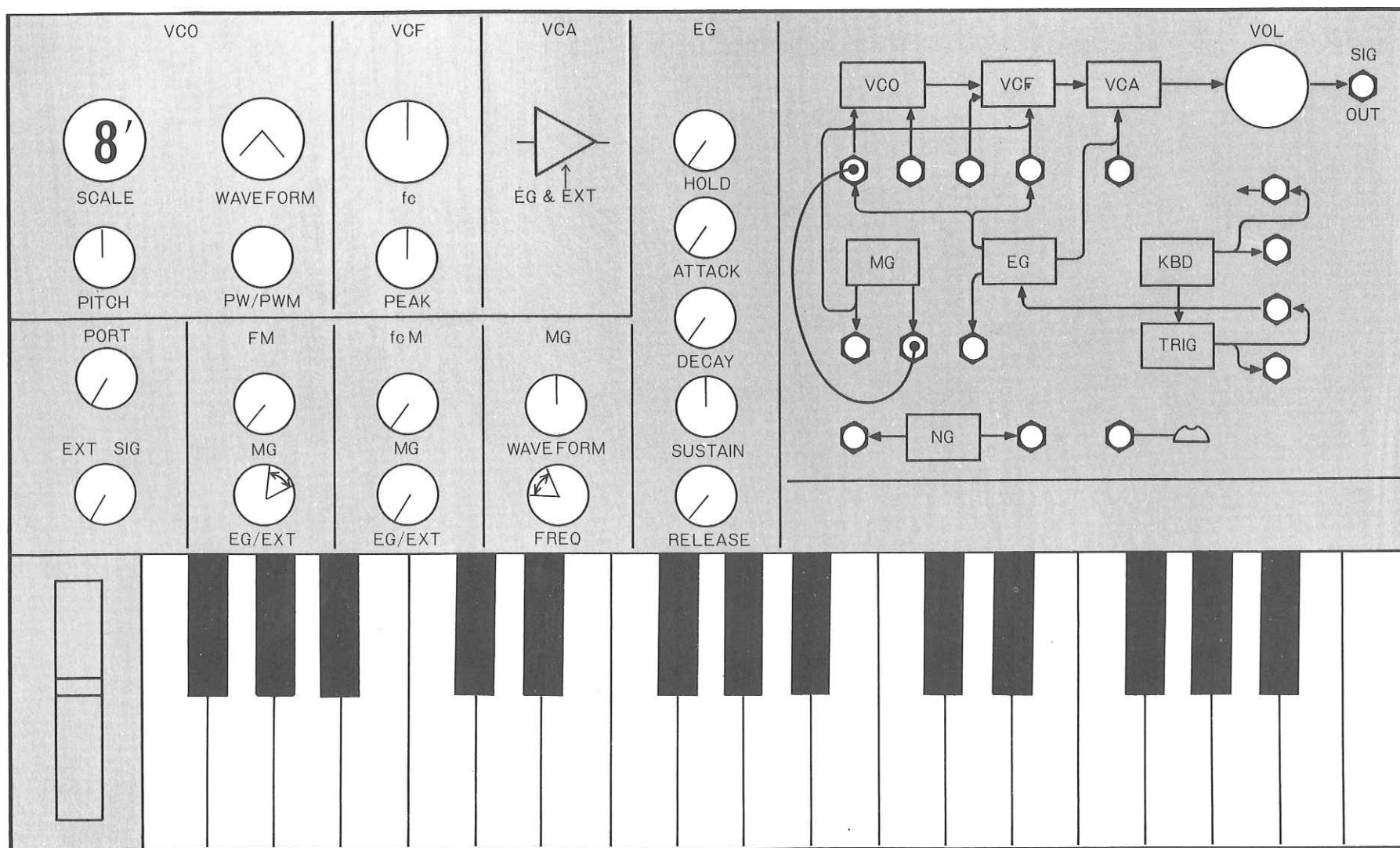
Variation de ton: dans cet exemple, le volant de commande est utilisé pour faire varier le ton avec une liberté totale, puisque la commande est manuelle.



Marimba: When you play a note on the keyboard, turn the MG EG/EXT knob (under the VCO section) up to the point where there is a one octave rise in pitch. Use the MG section FREQ knob to control the speed (of the mallet striking the marimba).

Marimba: Wenn Sie eine Taste der Klaviatur betätigen, den MG EG/EXT Knopf (unter dem VCO-Abschnitt) aufdrehen, bis die Tonhöhe um eine Oktave erhöht wurde. Den FREQ-Knopf im MG-Abschnitt verwenden, um die Geschwindigkeit zu regeln, mit der der Hammer die Marimba anschlägt.

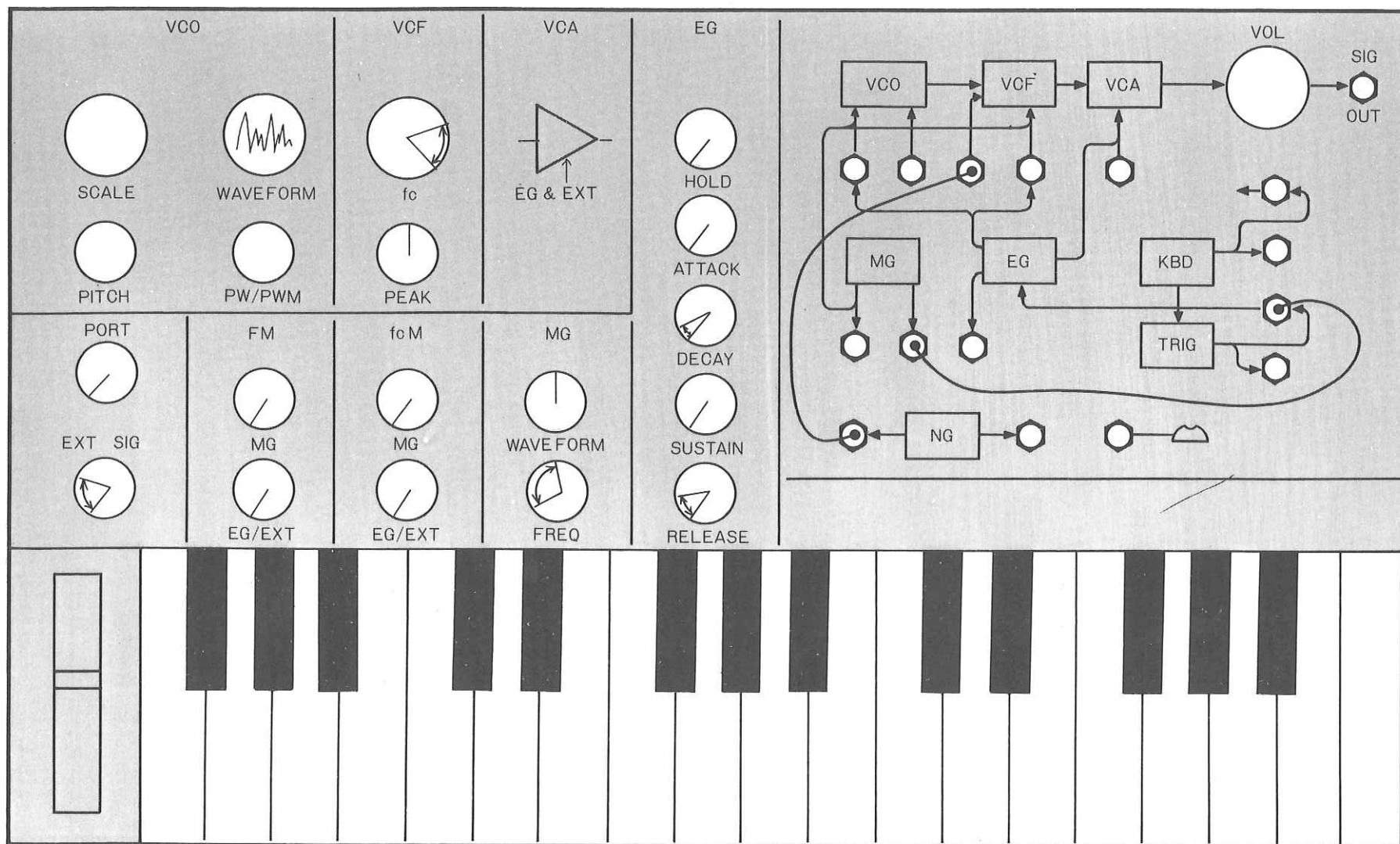
Marimba: Tout en jouant une note sur le clavier, tournez le bouton MG EG/EXT (sous la section VCO) jusqu'à ce que la hauteur du son augmente d'une octave. Utilisez le bouton FREQ de la section MG pour régler la vitesse (du maillet frappant la marimba).



Steam engine: Try varying the Decay and Release times in the EG section to get the kind of sound you want. Vary the speed with the MG section Frequency knob.

Dampfmaschine: Abklingzeit (Decay) und Freigabezeit (Release) des EG-Abschnittes ändern, um den gewünschten Klangeffekt zu erzielen. Die Geschwindigkeit mit Hilfe des Frequenzknopfes im MG-Abschnitt variieren..

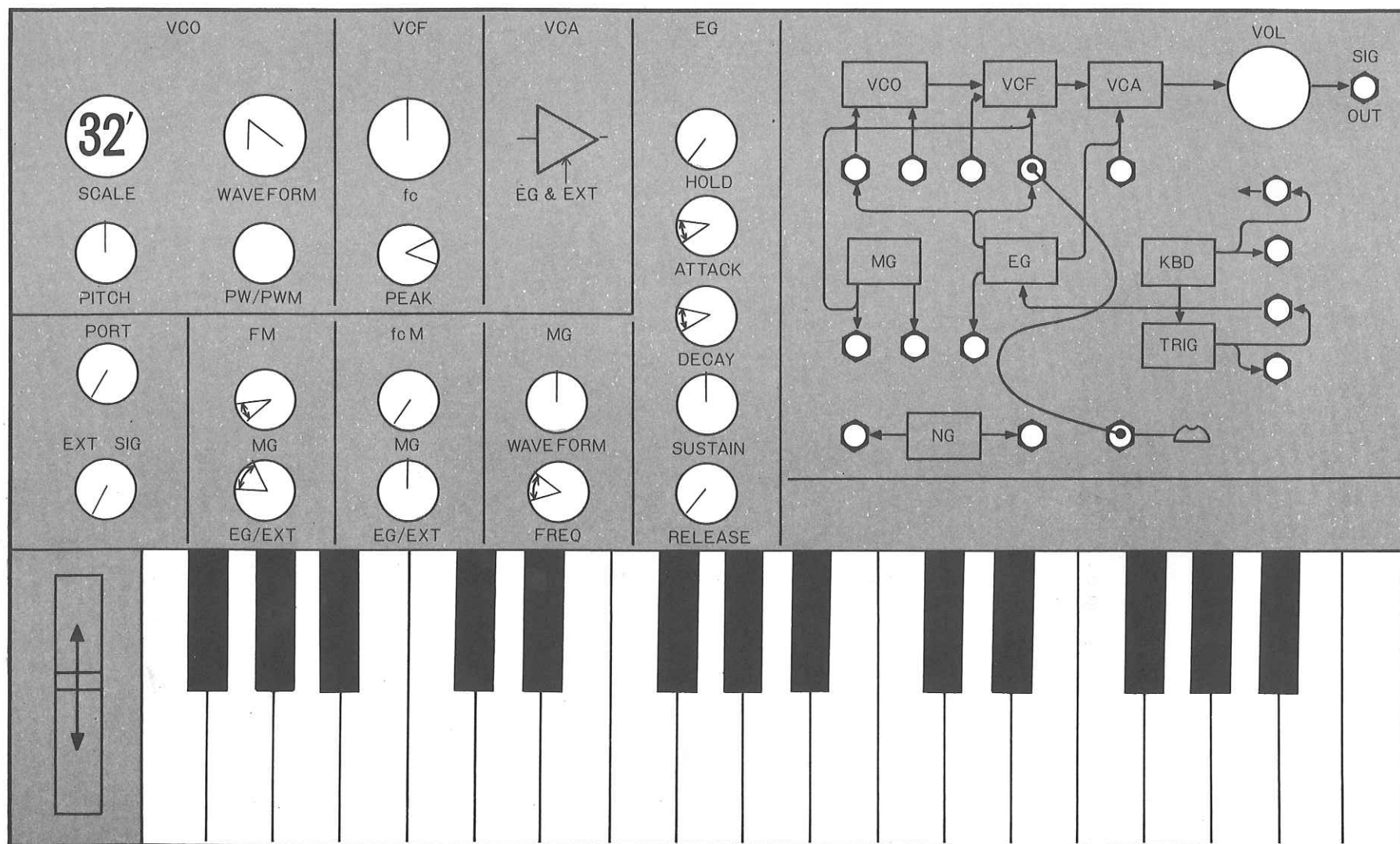
Locomotive: essayez d'obtenir l'effet désiré en faisant varier les temps de chute et de relâchement de la section EG. Faites varier la vitesse à l'aide du bouton de fréquence de la section MG.

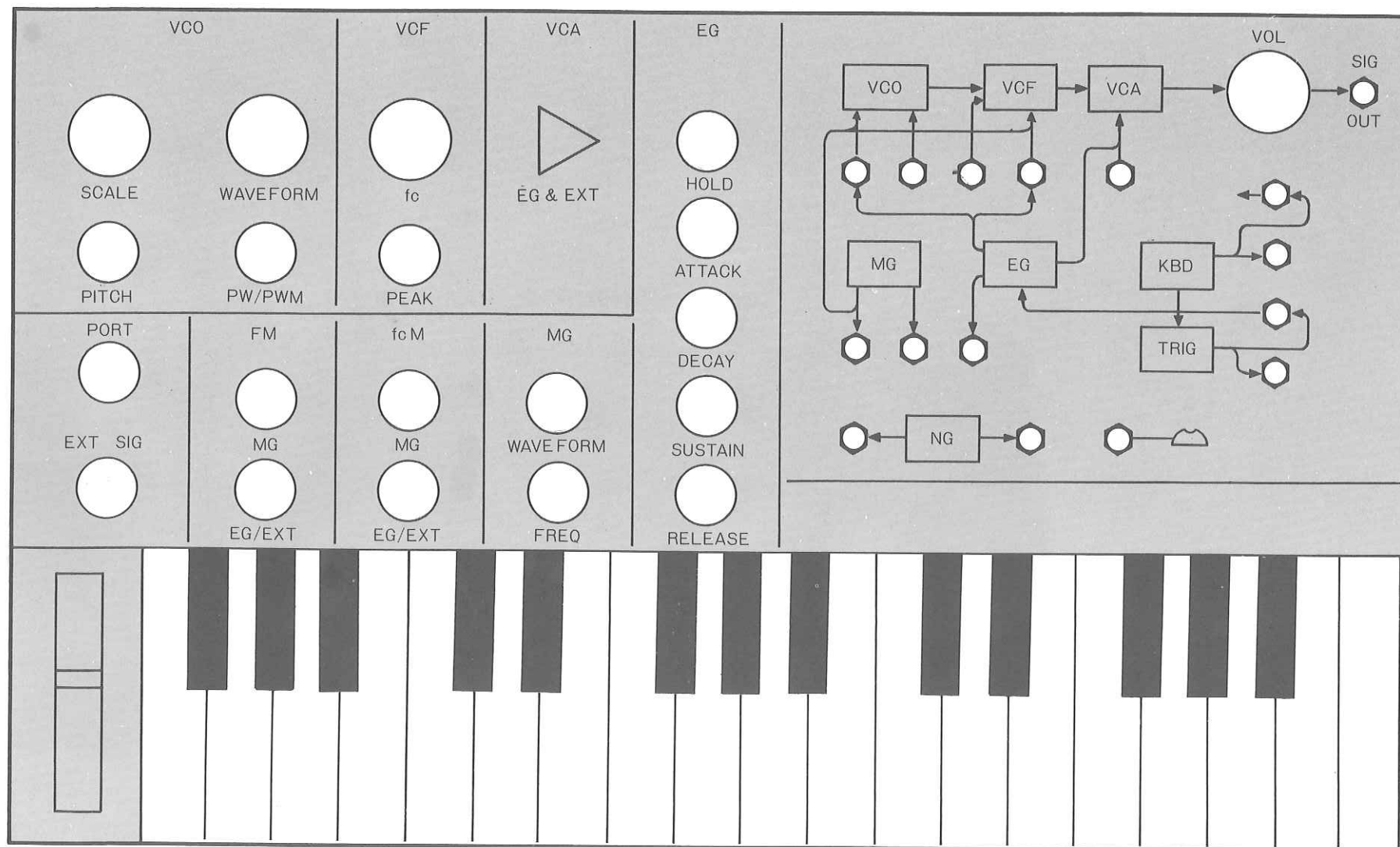


Voice: Note the positions of the VCO section EG/EXT knob and the EG Attack knob. Turn the control wheel and try to synthesize the vowel sounds.

Voice: Auf die Position des EG/EXT-Knopfes des VCO-Abschnittes sowie den Einschwingknopf (Attack) des EG-Abschnittes beachten. Das Regelrad drehen und die Vokallaute aufbereiten.

Voix: notez les positions du bouton EG/EXT de la section VCO et du bouton d'attaque du EG. Essayez de synthétiser les sons de voyelles en tournant le volant de commande.





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