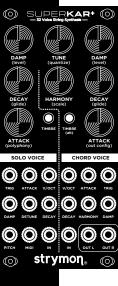
SUPERKAR+ — 32 Voice String Synthesis —

USER MANUAL

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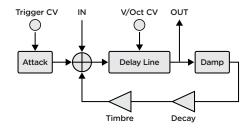
ABOUT SUPERKAR+

SuperKar+ is a polyphonic voice module capable of producing a diverse range of natural instrument sounds, including orchestral strings, deep double bass, pan flutes, pipes, tuned percussion, sustained vocal choirs, and more.

Utilizing the principles of Karplus-Strong synthesis, SuperKar+ employs finely tuned delay lines to create a truly natural voice module with extended tuning stability over a range of six octaves. The carefully crafted voice control parameters (Attack, Decay, and Damp) provide maximum sonic flexibility with maximum simplicity. CV control for all parameters allows for limitless creative possibilities.

- Karplus-Strong based voice module
- Two independent Voice channels Solo Voice and Chord Voice
- Each Voice is polyphonic up to 16 notes
- Solo Voice plays single notes capable of sustaining simultaneously
- Chord Voice plays chord structures based on the root from the received V/Oct (Volt per Octave) CV
- Chord Voice includes fixed intervals with smart harmonies available

- Selectable Wide & Narrow Stereo, Split Voice, and Mono output options
- MIDI input controls the Solo Voice for a 16 part polyphonic experience with velocity sensitivity (when using MIDI, unplug the Solo Voice TRIG and Solo Voice V/Oct CVs)
- Stable tuning over six octaves
- 520MHz ARM Superscalar processor
- 32-bit floating point processing
- Designed and built in the USA



SuperKar+ single voice block diagram

MAIN CONTROLS AND SECONDARY FUNCTIONS



Primary functions are labeled in CAPS and can adjust the Solo and Chord Voices individually.

Secondary functions are labeled in parentheses on each control. Access the secondary functions by pressing and holding the TIMBRE [alt] button and turning the desired knob

DAMP: Adjusts the high frequency damping within the string vibrations for the respective voice.

(level): Adjusts output level for the respective voice.

DECAY: Adjusts the string sustain for the respective voice. **(glide):** Adjusts the portamento effect for the respective voice.

ATTACK: Varies the string attack from a sharp strike to a soft bow (or "breath" in alternate Timbre) for the respective voice.

(polyphony): Sets the number of Solo Voices that will sustain simultaneously, from 1 to 16.

(out config): Offers the following functions depending on the knob position.

- Minimum: A wide stereo mix (the Solo Voice signal is hardpanned Left/Right for alternating voices, and the Chord Voice tones are heard in stereo).
- 10 o'clock: A narrow stereo mix (the Solo Voice is softpanned Left/Right for alternating voices, and the Chord Voice tones are heard in stereo).
- 2 o'clock: Split outputs (the Solo Voice is heard on OUT L and the Chord Voice on OUT R).
- Maximum: Both Voice signals are summed to mono, and the mono signal is routed to both OUT L and OUT R.

TUNE: Varies the output pitch range over one octave. (quantize): From minimum to 12 o'clock, selects continuous TUNE adjustment. From 12 o'clock to maximum, quantizes to half steps.

MAIN CONTROLS AND SECONDARY FUNCTIONS

HARMONY: Selects fifteen harmony settings across the knob range. The left TIMBRE button LED will briefly flash off and then on again when a new harmony is selected.



 $\begin{tabular}{ll} \textbf{(scale):} Selects eight different scale types across the knob range: \\ \end{tabular}$



NOTE: The Expanded Voicing Major Scale spreads out intervals further and includes a higher degree of extensions.

TIMBRE: These two switches select the feedback polarity to alter the timbre of the string:

- The left TIMBRE button controls the Solo Voice. Press and hold to access tertiary functions (see the next section).
- The right TIMBRE controls the Chord Voice.
- Green LED denotes positive feedback for string-based sounds, and red LED denotes negative feedback for hollow-tube-based

(alt): Press and hold the right TIMBRE button to access the secondary functions.

TERTIARY FUNCTIONS

sounds

The tertiary functions perform module fine-tuning and calibration to compensate for V/Oct variances from external modules. Access the tertiary functions by pressing and holding the left TIMBRE button and turning the SOLO DAMP or TUNE knob.

SOLO DAMP: Adjusts V/Oct compensation. Damping is neutral at 12 o'clock. Turn clockwise to sharpen the response, turn counter clockwise to flatten the response.

TUNE: Fine tunes +/- half step for when using quantized TUNE control, to allow for any base reference tuning.

AUDIO AND CV CONNECTIONS

SOLO VOICE		
0	0	0
TRIG	ATTACK	V/OCT
0	0	0
DAMP	DETUNE	DECAY
0	0	0
PITCH	MIDI	IN

SOLO VOICE CV NAME	VOLTAGE RANGE	DESCRIPTION
TRIG	0 to +5 V	Rising edge trigger.
ATTACK	-5V to +5V	Continuous control of the attack. The Solo Voice's ATTACK knob acts as an offset.
V/OCT	0V to +6V	C0 = 0V, 1V/Octave, six octave range.
DAMP	-5V to +5V	Continuous control. The DAMP knob acts as an offset.
DETUNE	0V to +5V	Adds random tuning errors on note trigger corresponding to the CV value: $0V = perfect tuning$, $5V = randomly out of tune max$.
DECAY	-5V to +5V	Continuous control. The DECAY knob acts as an offset.
PITCH	-5V to +5V	Changes the pitch of the note by +/- 1 octave, useful for vibrato, trills, hammer-on effects, or offsetting the pitch by a fixed amount.
MIDI	MIDI Input	For MIDI control of the Solo Voice, eight octaves available via MIDI. Set the (polyphony) secondary function to maximum for a 16 voice polyphonic MIDI sound module.
IN	Audio Input	20 Vpp maximum. Audio is fed directly to the Solo Voice channel strings, in parallel with the trigger input, to allow for audio excitation of the string(s) or to use SuperKar+ as a sympathetic resonator array. Best results are obtained with the (polyphony) secondary function set to minimum.

AUDIO AND CV CONNECTIONS



OUT L and OUT R:

The left and right outputs. Use the **(out config)** secondary function to select the desired stereo or mono output. The output level is 17.5 Vpp maximum.

CHORD VOICE CV NAME	VOLTAGE RANGE	DESCRIPTION
V/OCT	0V to +5V	CO = 0V, 1V/Octave, five octaves of chord root, quantized to nearest half step for maximum stability.
ATTACK	-5V to +5V	Continuous control. The Chord Voice's ATTACK knob acts as an offset.
TRIG	0V to +5 V	Rising edge trigger.
DECAY	-5V to +5V	Continuous control. The Chord Voice's DECAY knob acts as an offset.
HARMONY	-5V to +5V	Continuous control. The Chord Voice's HARMONY knob acts as an offset. Sweeps Harmony through 2nd half of knob, increasing and decreasing number of smart harmony voices.
DAMP	-5V to +5V	Continuous control. The Chord Voice's DAMP knob acts as an offset.
IN	Audio Input	20 Vpp maximum. Audio is fed directly to the Chord Voice channel strings, in parallel with the trigger input, to allow for audio excitation of the string(s) or to use SuperKar+ as a sympathetic resonator array.

SUPPORT

Additional Product Information: strymon.net/support/superkarplus Questions & Technical Support: support@strymon.net

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