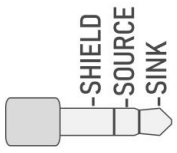
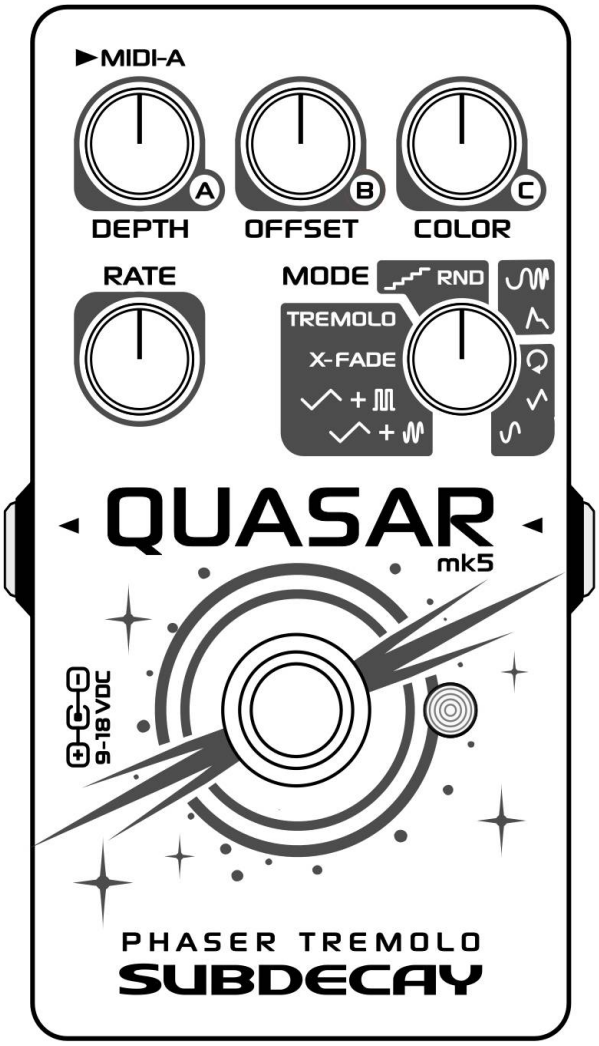
SUBDECAY
QUASAR
PHASER/TREMOLO



MIDI TYPE A
CONNECTION



User guide 1.00A

Comprehensive User Guide

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INTRODUCTION:

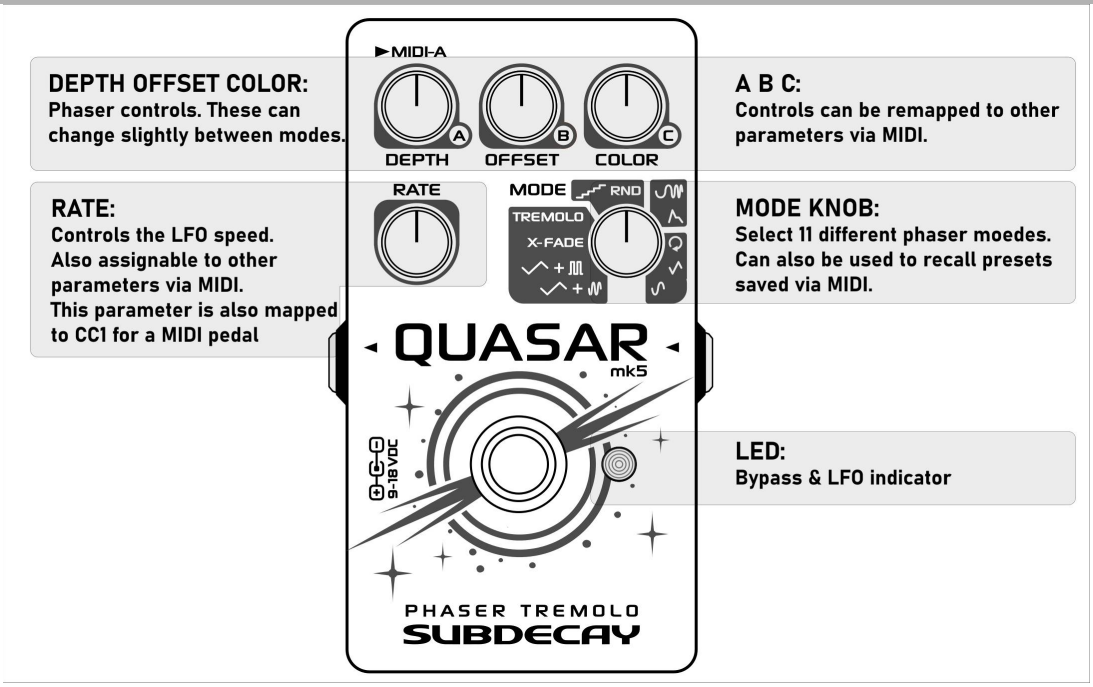
Welcome to the Quasar 5 Phaser/Tremolo

At first glance, the Quasar 5 carries the familiar layout of its predecessor, but under the hood lies a completely redesigned analog core featuring expanded headroom, quieter operation, and unprecedented digital control via MIDI.

At its heart, the Quasar 5 is a flexible 4-stage modulation engine. Historically, 4-stage phaser architecture forms the backbone of some of the most iconic modulation sounds ever created—from traditional, sweeping phasers to the rich, asymmetric throb of a classic Uni-Vibe, and even fluid rotary or vibrato effects. The Quasar 5 harnesses this versatility, letting you sculpt everything from subtle movement to intense, spatial pulse.

Designed so that you can plug in and play out of the box or unlock expanded synchronized modulation options with knob reassignment, deep modulation options and continuous control via MIDI.

SURFACE CONTROLS:



MODES:

Triangle/Sine: Two different LFOs modulate the phaser. Offset Controls the ratio between the two LFOs.	Triangle/Square:Two different LFOs modulate the phaser. Offset Controls the ratio between the two LFOs.	X-FADE Triangle wave phaser with another LFO modulating the mix. Offset Controls the ratio between the two LFOs.
TREMOLO Triangle wave phaser with another LFO modulating the tremolo. Offset Controls the ratio between the two LFOs.	Step LFO based on a Triangle wave. It's like a more predictable random sample/hold effect. Offset controls the step pattern.	RND Step LFO based on random sample/hold. Offset controls a square tremolo to emphasize the effect even more.
Envelope rate control. Playing dynamics changes the LFO rate. Offset controls how much the envelope affects the rate.	Envelope phaser: Offset controls the phaser resting point. Rate controls the envelope attack.	Rotary effect similar to the Vibrothang. Offset controls the phase mix.
Slow triangle wave phaser modulation.	Fast sine wave phaser modulation.	

The Depth, offset, color and rate knobs can all be reassigned via MIDI for each mode.

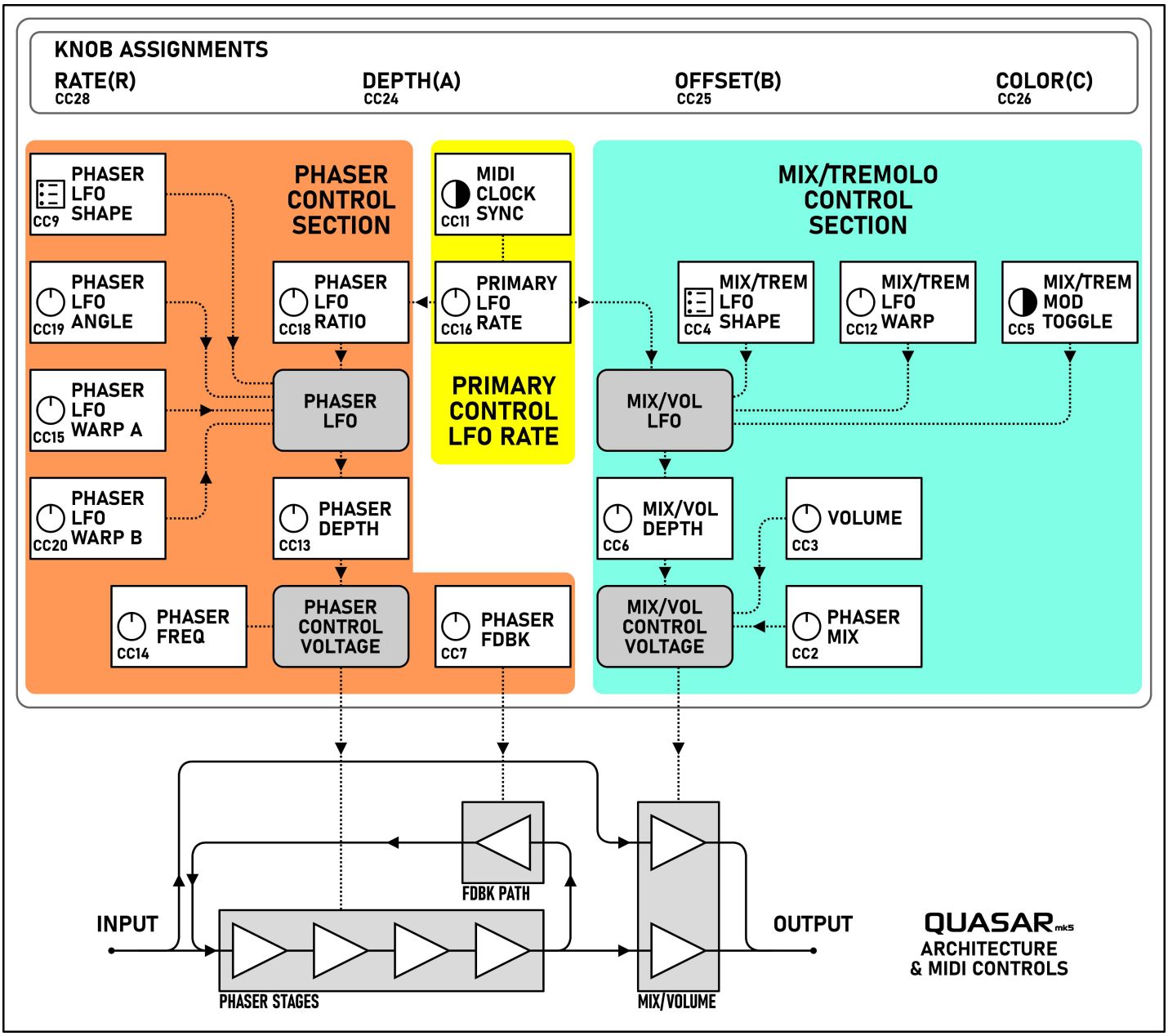
Standard Control Setup:

Depth: Controls modulation depth.	Offset: Varies depending on mode.
Rate: Controls the modulation rate.	Color: Controls phaser resonance.

ARCHITECTURE & INTERNAL PARAMETERS

Internally there are many more parameters allowing for much deeper customization. This can be used to create custom modes. These modes replace the modes from selected via the mode knob.
It is also possible to make modes act presets.
Additionally each mode can be set for sync to an incoming MIDI clock.

MASTER CONTROL LFO RATE: The Phaser and Trem/Mix mod LFOs both sync to the master LFO rate. The phaser LFO's rate is always locked to a ratio of the master control rate.
If MIDI clock sync is enabled the master LFO syncs to the midi clock if detected.



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SUBDECAY

MIDI CC MAP

CC	RANGE	PARAMETER
2	0-127	PHASER MIX
3	0-127	VOLUME
4	0-127	TREM/ MIXMOD LFO SHAPE
5	0-1	0= TREMOLO. 1= MIXMOD
6	0-127	TREM/ MIXMOD DEPTH
7	0-127	PHASER FEEDBACK
9	0-47	PHASER LFO SHAPE
10	>0	TAP TEMPO (TAP CC10 ON A CONTROLLER FOR TAP TEMPO)
11	0-1	MIDI CLOCK SYNC | 0 = OFF. 1= ON.
12	0-127	TREM/ MIXMOD LFO WARP
13	0-127	PHASER DEPTH
14	0-127	PHASER MANUAL FREQUENCY
15	0-127	PHASER LFO WARP A
16	0-127	PRIMARY LFO RATE (OR LFO RATIO IN TAP TEMPO OR MIDI CLK SYNC)
18	0-127	PHASER LFO RATE RATIO
19	0-127	PHASER LFO ANGLE
20	0-127	PHASER WARP B
22	>1	BPM TEMPO ON (RESTORES PREVIOUS TAP TEMPO RATE)
23	>1	BPM TEMPO OFF (RETURNS TO MANUAL CONTROL OF LFO RATE)
24	0-14	KNOB A PARAMETER MAP (SEE PARAM MAP TABLE)
25	0-14	KNOB B PARAMETER MAP (SEE PARAM MAP TABLE)
26	0-14	KNOB C PARAMETER MAP (SEE PARAM MAP TABLE)
27	0-1	BPM TEMPO ON/OFF | 0= TAP TEMPO OFF. 1= RESTORE PREVIOUS TAP TEMPO RATE.
28	0-14	KNOB R(ATE) PARAMETER MAP (SEE PARAM MAP TABLE)
33	0-127	PARAM R(ATE) (FROM PARAMETER MAP ASSIGNMENT CC28)
34	0-127	PARAM A (FROM PARAMETER MAP ASSIGNMENT CC24)
35	0-127	PARAM B (FROM PARAMETER MAP ASSIGNMENT CC25)
36	0-127	PARAM C (FROM PARAMETER MAP ASSIGNMENT CC26)
43	0-127	LED RED BRIGHTNESS
44	0-127	LED GREEN BRIGHTNESS
45	0-127	LED BLUE BRIGHTNESS
46	0-8	LED FUNCTIONALITY (0 IS DEFAULT)
47	0-127	LED COLOR (SIMPLIFIED)
96	0-1	0= SAVE A MODE | WHEN RECALLED VIA THE MODE KNOB ALL PARAMETERS WILL UPDATE INCLUDING CURRENT KNOB SETTINGS. 1- SAVE AS PRESET | WHEN RECALLED VIA THE MODE KNOB ALL PARAMETERS UPDATE INCLUDING PREVIOUS KNOB SETTINGS.
102	0-1	0= FAUX BYPASS (THIS ACTUALLY TURNS THE PHASER MIX AND EFFECT OFF, BUT IT IS NOT THE SAME BYPASS YOU GET USING THE EFFECT SWITCH) 1= EFFECT ENGAGE
118	>1	CAPTURE CURRENT SETTINGS TO BE SAVED AS CUSTOM MODE OR PRESET.
119	>1	SAVE CAPTURED PARAMETERS TO CUSTOM MODE OR PRESET.

KNOB > PARAMETER MAP

Each knob can be remapped to control different parameters per mode.

Map assignments set by CC 24 25 26 & 28.

0	NULL (Knob unassigned)	5	PHASER LFO WARP A	10	TREM/ MIXMOD DEPTH
1	PRIMARY LFO RATE	6	PHASER LFO WARP B	11	TREM/MIXMOD LFO WARP
2	PHASER MIX	7	PHASER LFO RATIO	12	PHASER LFO ANGLE
3	VOLUME	8	PHASER DEPTH	13	PHASER FILTER RESONANCE*
4	FEEDBACK	9	PHASER MANUAL FREQUENCY	14	ROTARY MIX**

* Phaser filter resonance is intended to be used with envelop modulation settings. This controls multiple parameters at once and may have unexpected results if the Phaser Mix or Phaser Feedback settings are altered.

** Rotary Mix is used by the Rotary Mode. This controls multiple parameters at once and may have unexpected results if the Volume, Phaser Mix or Phaser Feedback is altered.

LED FUNCTIONALITY

By default each mode has a color assigned for the LED.

In addition to assigned colors the LED behavior can also track the Phaser and Trem/Mix mod LFOs.

When bypassed the LED behavior can also be set up to pulse indicating the current LFO rate.

LED Behaviors (cc46)

0	COLOR (BP OFF)	2	LFOs→LED (BP OFF)	4	PHASER LFO→LED (BP OFF)	6	PHASER LFO→LED + PULSE (BP OFF)
1	COLOR (BP PRIMARY LFO RATE PULSE)	3	LFOs→LED (BP PRIMARY LFO RATE PULSE)	5	PHASER LFO→LED (BP PRIMARY LFO RATE PULSE)	7	PHASER LFO→LED + PULSE (BP PRIMARY LFO RATE PULSE)

If using the LED color behavior cc47 controls the LED color.

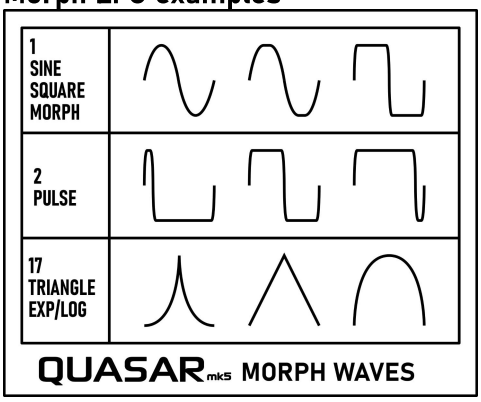
For more control over the color use:

CC43	RED BRIGHTNESS	CC44	GREEN BRIGHTNESS	CC45	BLUE BRIGHTNESS

PHASER LFOs CC9

NUM	LFO NAME	WARP A	WARP B
0	Sine to Square Morph	Morphs waveform shape continuously from Sine to Square	NA
1	Triangle to Square Morph	Morphs waveform shape continuously from Triangle to Square	NA
2	Pulse	Adjusts the duty cycle / pulse width	NA
3	Sample & Hold / Random	Sets smooth glide between random steps	NA
4	Envelope Follower Up	Adjusts envelope response time (Attack)	NA
5	Envelope Follower Down		NA
6	Square & Sub-Triangle Mix	Blends between Square wave and Sub-Triangle wave	Sets Sub-Triangle division ratio (1, 2, 3, 4, 6, 8, 12, 16, 24, 32)
7	Random & Sub-Triangle Mix	Blends between Random steps and Sub-Triangle wave	
8	Sine & Sub-Triangle Mix	Blends between Sine wave and Sub-Triangle wave	
9	Stepped Triangle	Interval multiplier (alters step pattern)	NA
10	Stepped Sine		NA
11	Stepped Sawtooth		NA
12	Stepped Ramp		NA
13	Multi-Triangle / Freq Multiplier	Blends primary Triangle with high-frequency Multi-Triangle	Sets multiplier frequency ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
14	Multi-Sine / Freq Multiplier	Blends primary Sine with high-frequency Multi-Sine	
15	Sawtooth Log/Exp	Morphs curve response continuously from Logarithmic to Exponential	NA
16	Ramp Logarithmic/Exponential		NA
17	Triangle Logarithmic/Exponential		NA
18	Sine Logarithmic/Exponential		NA
19	Phase Distortion Sine Pulse	Shifts phase distortion center point / symmetry	NA
20	Double Phase Distortion Sine	Shifts phase distortion center point / symmetry	NA
21	Phase Distortion Sine	Shifts phase distortion center point / symmetry	NA
22	Resonant Sync Ramp (1 to 8x)	Controls hard-sync multiplier frequency sweep	NA
23	Windowed Resonant Sync Sine	Controls hard-sync multiplier frequency sweep	NA
24	Sawtooth Tapered Center-Fade Out/In	Blends between raw Sawtooth and Tapered Center-Faded Sawtooth	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
25	Sawtooth Tapered Zero-Fade Out/In	Blends between raw Sawtooth and Tapered Zero-Faded Sawtooth	
26	Sawtooth Stepped Center-Fade Out	Blends between raw Sawtooth and Hard Center-Faded Sawtooth	
27	Sawtooth Stepped Zero-Fade Out	Blends between raw Sawtooth and Hard Zero-Faded Sawtooth	
28	Ramp Tapered Center-Fade Out/In	Blends between raw Ramp and Tapered Center-Faded Ramp	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
29	Ramp Tapered Zero-Fade Out/In	Blends between raw Ramp and Tapered Zero-Faded Ramp	
30	Ramp Stepped Center-Fade Out	Blends between raw Ramp and Hard Center-Faded Ramp	
31	Ramp Stepped Zero-Fade Out	Blends between raw Ramp and Hard Zero-Faded Ramp	
32	Sine Tapered Center-Fade Out/In	Blends between raw Sine and Tapered Center-Faded Sine	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
33	Sine Tapered Zero-Fade Out/In	Blends between raw Sine and Tapered Zero-Faded Sine	
34	Sine Stepped Center-Fade Out	Blends between raw Sine and Stepped Center-Faded Sine	
35	Sine Stepped Zero-Fade Out	Blends between raw Sine and Stepped Zero-Faded Sine	
36	Square Tapered Center-Fade Out/In	Blends between raw Square and Tapered Center-Faded Square	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
37	Square Tapered Zero-Fade Out/In	Blends between raw Square and Tapered Zero-Faded Square	
38	Square Tapered Center-Fade Out	Blends between raw Square and Stepped Center-Faded Square	
39	Square Stepped Center-Fade Out	Blends between raw Square and Stepped Center-Faded Square	
40	Square Tapered Zero-Fade Out	Blends between raw Square and Tapered Zero-Faded Square	
41	Square Stepped Zero-Fade Out	Blends between raw Square and Stepped Zero-Faded Square	
42	Random Tapered Center-Fade Out/In	Blends between raw Random and Tapered Center-Faded Random	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
43	Random Tapered Zero-Fade Out/In	Blends between raw Random and Tapered Zero-Faded Random	
44	Random Tapered Center-Fade Out	Blends between raw Random and Tapered Center-Faded Random	
45	Random Stepped Center-Fade Out	Blends between raw Random and Stepped Center-Faded Random	
46	Random Tapered Zero-Fade Out	Blends between raw Random and Tapered Zero-Faded Random	
47	Random Stepped Zero-Fade Out	Blends between raw Random and Stepped Zero-Faded Random	

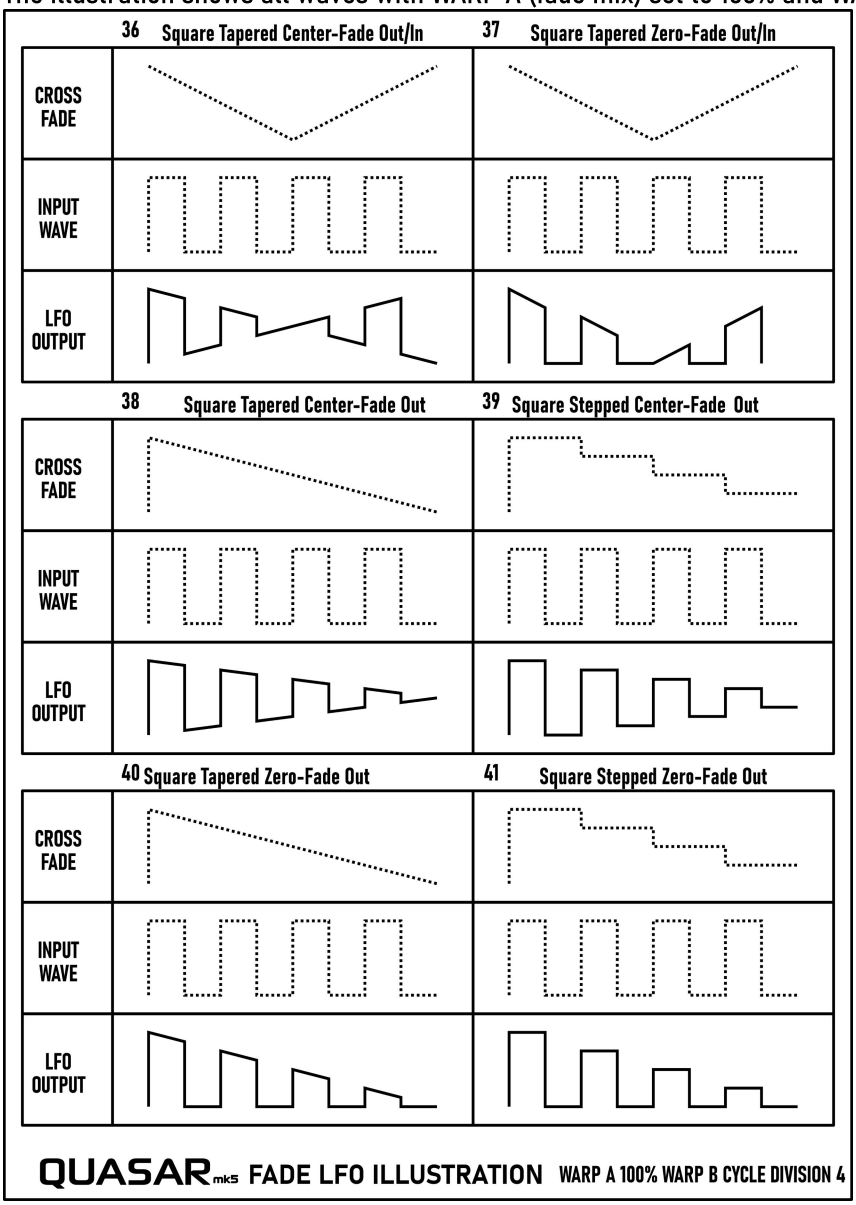
Morph LFO examples



Fade LFO examples:

Illustrations of the square cross fade modulation waves. Phaser LFOs 36-41. Square is used as the example because they are more intuitive to understand. (They were also easier to draw)

The illustration shows all waves with WARP A (fade mix) set to 100% and WARP B set for a cycle division of 4..



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TREM/MIXMOD LFOs CC4

Num	Manual Waveform Name	Warp Function
0	Sine to Square Morph	Morphs waveform shape from Sine to Square
1	Triangle to Square Morph	Morphs waveform shape from Triangle to Square
2	Pulse	Adjusts the duty cycle / pulse width
3	Sawtooth Log/Exp	Morphs curve response from Log to Exp
4	Ramp Logarithmic/Exponential	
5	Triangle Logarithmic/Exponential	
6	Phase Distortion Sine Pulse	Shifts phase distortion center point / symmetry
7	Double Phase Distortion Triangle	
8	Double Phase Distortion Sine	
9	Phase Distortion Sine	
10	Phase Distortion Triangle	
11	Triangle Center-Fade Out	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
12	Triangle Zero-Fade Out	
13	Triangle Center-Fade Out (4x)	Blends between Triangle and Center-Faded Triangle
14	Triangle Center-Fade Out (8x)	
15	Triangle Center-Fade Out (16x)	
16	Triangle Zero-Fade Out (4x)	Blends between Triangle and Zero-Faded Triangle
17	Triangle Zero-Fade Out (8x)	
18	Triangle Zero-Fade Out (16x)	
19	Sawtooth Center-Fade Out	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
20	Sawtooth Center-Zero Out	
21	Sawtooth Zero-Fade Out	Blends between Sawtooth and Zero-Faded Sawtooth
22	Sawtooth Center-Fade Out (2x)	Blends between Sawtooth and Center-Faded Sawtooth
23	Sawtooth Center-Fade Out (4x)	
24	Sawtooth Center-Fade Out (8x)	
25	Sawtooth Center-Fade Out (16x)	
26	Sawtooth Zero-Fade Out (2x)	Blends between Sawtooth and Zero-Faded Sawtooth
27	Sawtooth Zero-Fade Out (4x)	
28	Sawtooth Zero-Fade Out (8x)	
29	Sawtooth Zero-Fade Out (16x)	
30	Ramp Center-Fade Out	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
31	Ramp Zero-Fade Out	
32	Ramp Center-Fade Out (2x)	Blends between Ramp and Center-Faded Ramp
33	Ramp Center-Fade Out (4x)	
34	Ramp Center-Fade Out (8x)	
35	Ramp Center-Fade Out (16x)	
36	Ramp Zero-Fade Out (2x)	Blends between Ramp and Zero-Faded Ramp
37	Ramp Zero-Fade Out (4x)	
38	Ramp Zero-Fade Out (8x)	
39	Ramp Zero-Fade Out (16x)	
40	Sine Center-Fade Out	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
41	Sine Zero-Fade Out	
42	Sine Center-Fade Out (2x)	Blends between Sine and Center-Faded Sine
43	Sine Center-Fade Out (4x)	
44	Sine Center-Fade Out (8x)	
45	Sine Center-Fade Out (16x)	
46	Sine Zero-Fade Out (2x)	Blends between Sine and Zero-Faded Sine
47	Sine Zero-Fade Out (4x)	
48	Sine Zero-Fade Out (8x)	
49	Sine Zero-Fade Out (16x)	
50	Square Center-Fade Out	Sets cycle fade division ratio (2, 3, 4, 5, 6, 8, 12, 16, 24, 32)
51	Square Zero-Fade Out	
52	Square Center-Fade Out (2x)	Blends between Square and Center-Faded Square
53	Square Center-Fade Out (4x)	
54	Square Center-Fade Out (8x)	
55	Square Center-Fade Out (16x)	
56	Square Zero-Fade Out (2x)	Blends between Square and Zero-Faded Square
57	Square Zero-Fade Out (4x)	
58	Square Zero-Fade Out (8x)	
59	Square Zero-Fade Out (16x)	
60	Envelope Speed-Controlled Sine	Sets envelope-to-speed sensitivity/depth multiplier
61	Envelope Speed-Controlled Square	

LFOs: PRIMARY RATE AND DUAL LFO SYNC

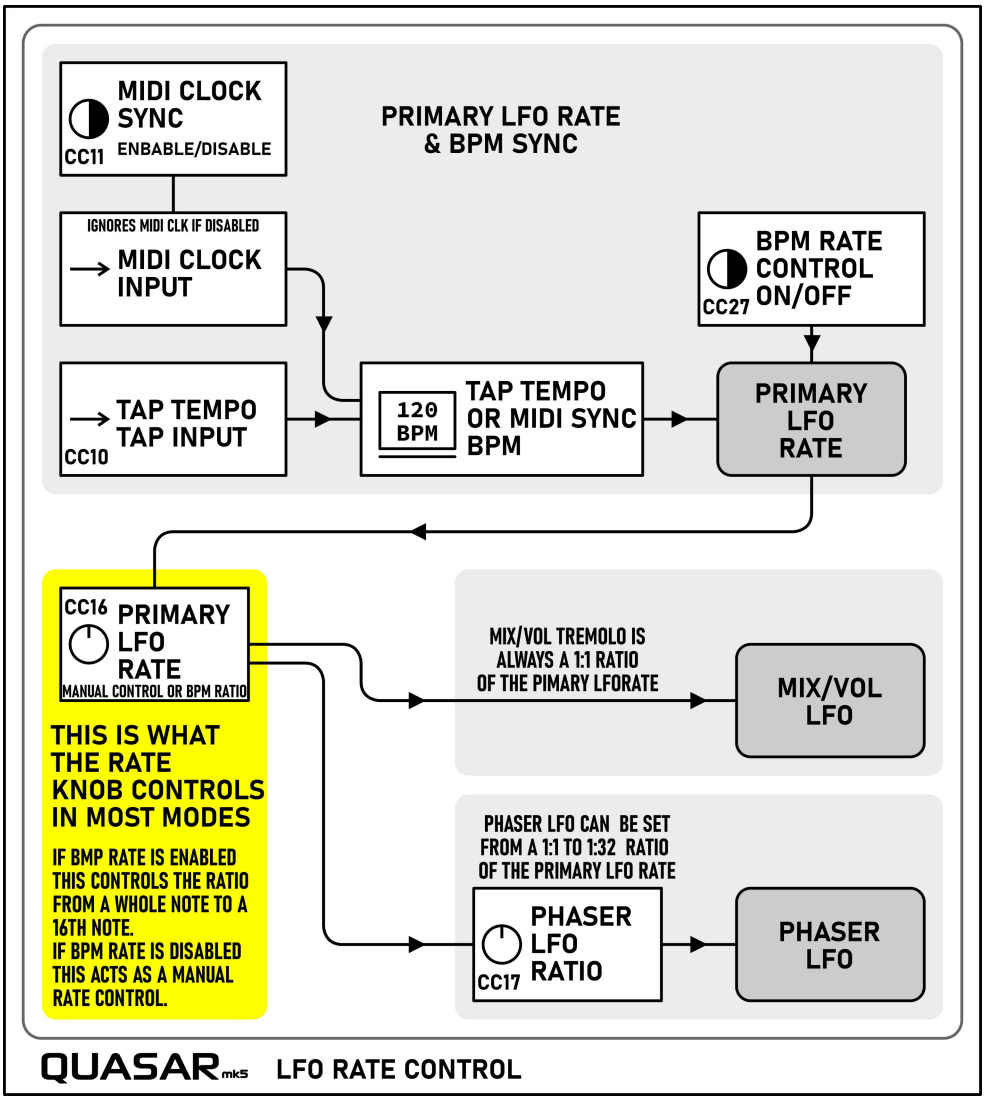
The primary rate is designed to be intuitive. Unless you plan on diving deep into MIDI control for live performances you can probably skip this section.

The Quasar features two LFOs. Both LFOs are synced to the primary LFO rate. The Phaser LFO rate can be set to a ratio of the Primary rate. 1:1 to 1:32.

The primary rate can be controlled via the rate control (mapped to the rate knob for most modes or cc16.)

The primary rate can be overridden by BPM control BPM can be set via tap tempo (cc10) or MIDI clock sync.

The illustration below shows how the primary rate affects the dual LFOs.



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CREATING CUSTOM MODES AND PRESETS

Save patches as modes or presets. These are recalled via the mode knob. Saving a mode or preset replaces the default mode.

MODE vs PRESET:

- **Preset:** Recalls all parameters exactly as they were saved, ignoring physical knob positions until a knob is moved.
- **Mode:** Recalls all non-knob settings, but immediately updates all knob-mapped parameters to match the physical position of the controls.

Create custom modes and presets via the online MIDI editor.

- Use the online MIDI editor to customize LFOs, knob assignments and more.
  - To save as a MODE check MODE BEHAVIOR: BEHAVE AS MODE.
  - To save as a PRESET check MODE BEHAVIOR: BEHAVE AS PRESET.
- When ready to save a patch click CAPTURE (cc118) in the MIDI editor.
- Select a mode position for the patch. (Use the mode knob or MIDI editor.)
- Click Save (cc119) in the MIDI editor.

Your patch can now be selected with the MODE knob or via a MIDI PC change.

WARRANTY

Warranty: Subdecay Studios offers a 3 year limited warranty from the purchase date to the original purchaser. This warranty does not cover polar bear attacks, willful destroyment, using your pedal as a hammer, or the neglect of the user. It does not cover the finish, paint or any external superficial damage. Any unauthorized repairs or modifications voids the warranty.
This document was believed to be accurate at the time it was created. Specifications are subject to change without notice.