Tubbutec Modypoly / Modysix

MIDI RETROFIT AND FEATURE EXTENSION FOR KORG MONO/POLY

User Manual for firmware version v1.4

http://tubbutec.de

Contents

1 Modysix

The Modysix is a midi retrofit and feature extension for the Korg Polysix, Poly-61 and Mono/Poly synthesizers. It features various additional play modes, a free definable arpeggiator, midi in and midi out, and a sustain pedal input, two additional filter LFOs and plenty other features.

This manual only describes the features different from the original Mono/Poly. Great care has been taken to not alter the original behaviour, except of course for the additional features.

2 Play Modes

2.1 Play Modes Overview

In addition to the four play modes (Unison,Unison/Share, Poly and Chord Memory) featured in the original Mono/Poly the Modysix offers various other play modes.
The new play modes are: An extended unison mode, 2-Voice Mode, 3-Voice mode, two random polyphonic modes and Polychord.

2.2 Extended Unison

The Extended Unison features adjustable key priority settings. This way the Mono/Poly can behave just like the monophonic synthesizer of your choice.
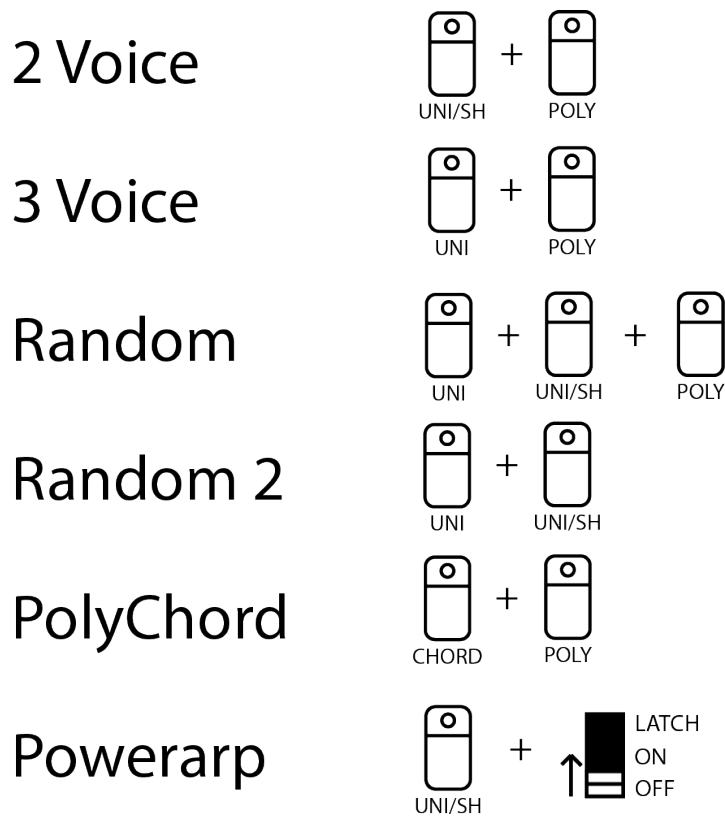The features can be set using the arpeggiator's switch for direction.

2 Voice

3 Voice

Random

Random 2

PolyChord

Powerarp

Figure 1: Play mode selection overview

2.2.1 Priority

Priority defines how the currently played monophonic note is selected from the keyboard input. This can be used to emulate the behavior of classic monophonic synths.

Priority can be set to Upper/Lower/Last using the UP/DOWN/UPDOWN switch of the arpeggiator. In the original Mono/Poly Priority is set to last. UPPER means the uppermost key is selected for playing, LOWER means the lower most key is selected.

When LAST is selected the 8 last played keys are used to determine the note played when a key is released.

2.3   3 Voice mode

The 3 voice mode is just like the normal polyphonic mode, but only the first three voices are used. This can be useful when using the arpeggiator

to get a rythm that repeats every three notes (instead of every 4). It can also be used when one of the voices is broken (maybe broken filter IC), but you need to be able to play on a gig tonight ;) To activate 3 Voice mode press simultaneously.

2.4 2 Voice mode

In the 2 Voice Mode there is only two voice polyphony, but oscillator 1,2 and 3,4 are layered to create an even denser, thicker sound. To activate 3 Voice mode press UNI/SH and POLY simultaneously.

2.5 Random mode

This mode is just like the normal poly mode, however the next voice used is chosen randomly. This can be used to create complex evolving patterns and sounds. To activate Random mode press UNI, UNI/SH and POLY and simultaneously.

2.6 Random mode 2

Just like Random mode, but the voice chosen randomly will never be the same as the previous one. To activate Random mode press UNI and UNI/SH simultaneously.

2.7 Polychord

The Polychord functionality allows you to assign an individual chord to each key of the keyboard and play these chords with a single key press. Like any other play mode Polychord can be used in conjunction with the Powerarp. Combining the two gives you a versatile chord sequencer!

2.7.1 Switching into Polychord

To switch into Polychord mode release all keys, and press POLY and CHORD simultaneously.

2.7.2   Recording a new Chord

Two record a new chord, play it on the keyboard and press POLY and CHORD simultaneously. The POLY led will now blink to indicate that the device is waiting for you to select the key you want the chord assigned to. Press a key and the chord will be assigned to this key. The synthesizer then returns to the play mode it was in before to speed up entry of multiple chords. This is a similar procedure to recording a chord in chord memory on the original Mono/Poly. Just press POLY+CHORD instead of just CHORD.

3   Powerarp

3.1   Powerarp overview

The Powerarp mode lets you define a custom arpeggiator sequence which - just like the normal arp - works in all play modes. You can define a sequence of up to 128 notes, transpose in pitch or shift it in time. The next note is triggered by the arp clock, or midi.

3.2   Creating a new sequence

Hold the UNI/SH key and move the arp switch from off to on. The UNI/SH led will start blinking. Now you can enter your sequence note by note. Pressing the HOLD key while holding down a key will insert a tie and make the note longer by one step. Pressing HOLD without holding down a key will insert a break with the duration of one note. The HOLD led will light up for a short while to indicate a break has been inserted. You can use this to program more complex rhythms, then a usual arpeggiator can provide. When finished press the UNI/SH key again to save the sequence and get into Powerarp mode. The sequence will be saved, even if you switch off the Mody/Poly.

3.3   playing and transposing

To play the sequence press the middle F (F3). To transpose the sequence press key above or below the middle F. When playing staccato the sequence is reset each time you press a key, when playing legato it will transpose without resetting. Activating HOLD will make sure the sequence is not re-triggered, just like playing legato. The two uppermost keys of the keyboard have a special function. The C will advance the sequence by one step, the B will move it back by one step.

3.4   Latch, Mode and Range

3.4.1   Latch

When the latch switch is set to on, any notes played are memorized and will continue to be arpeggiated even after you lift your fingers completely from the keyboard. To change the arpeggio pattern, simply play one or more new keys.

3.4.2   Mode

The mode switch defines weather the arpeggio is played upwards, downwards or both alternating. There is a fourth arpeggio mode that can be selected by the Range switch (see below)

3.4.3   Range

Set the range switch to 1OCT or 2OCT to play the sequence over a range of one or two octaves. In two octave mode notes that would extend the range of the keyboard are being folded back into the keyboards range.
Set the range switch to FULL to enter random mode. In this mode you can use the mode switch to select different random modes as follows:
UP: Normal random mode
DOWN: Non repeating random mode (two consecutive notes will never be the same)
UPDOWN: Forward/Backward random (the sequence will randomly advance or go back one step)

3.5   Playing a previously saved sequence

To switch directly into Powerarp hold the UNI/SH key and move the arp switch from off to on, then press the UNI/SH key again without entering a sequence. The previously stored sequence can now be played.

4   Sustain pedal input

4.1   Sustain in play modes

Pressing the sustain pedal will sustain the playing notes until it is released.

4.2   Sustain in Arp and Powerarp

The sustain pedal can also be used in combination with the arpeggiators. When pressing the sustain pedal the notes are sustained.
When using the unison mode with arp or Powerarp the sustain pedal has a special function. While it is pressed the re-trigger is switched off, allowing a smoother arp sound.

5   Midi

5.1   Midi in

Depending on the setting in the see config menu the Modysix receives midi on channel 1-16 or an all channels (omni).
It reacts to midi notes 41 - 82

5.2 Midi out

The Modysix has two separate midi out modes and sends both on two differ-
ent midi channels simultaneously. You can configure the channel numbers
in the config menu or turn the channels off.
Midi notes 41 - 82 are being sent.

5.2.1 Midi out as played

On the as-played channel only the key presses on the Mono/Poly keyboard
are sent. If you record this channel and send it back to the Modysix, the
synth will sound exactly the same as when you played it.
This is useful for using the Mono/Poly as a midi keyboard. In this mode
sustain pedal events will be sent as "sustain" midi messages.

5.2.2 Midi out as sounds

On the as-sounds channel instead of the key presses and releases, midi is
sent the way it actually sounds. In this mode the Modysix will output the
arpeggiator, Powerarp, chord memory, Polychord, unison mode including
retrigger, poly-, two,- and three and random voice modes. Sustain events
will not be sent as midi massages but rather simulated with note on and
off events.
When retrigger is turned off in unison mode the next note on event will
be sent before the note off event. By most monophonic synths this can be
interpreted as a 'glide's command.

5.3 Arpeggiator and Sample and Hold Trigger

The Arp and Sample and Hold clocks can be selected to trigger by the
internal arp or midi. (see config menu). There are two midi trigger modes.
when 'midi note' is selected as the trigger input, the trigger is midi note 0
(for the Arp) and midi note 1 (for the Sample and Hold)

When 'midi clock' is selected, the Arp and Sample and Hold will trigger
in sync to the received midi clock. You can choose between a number of
dividers for the midi clock to achieve various clock frequencies by sending
midi controller messages (see midi controller chart). The table below shows
the controller values and the resulting frequency in bars. You can also set
the dividers in the config menu.

Ctrl val	0-7	8-15	16-23	24-31	32-39	40-47	48-55	56-63
Bars	2.5	2	1.5	1	$\frac{3}{4}$	1T	$\frac{1}{2}$	$\frac{3}{8}$
Ctrl val	64-71	72-79	80-87	88-95	96-103	104-111	112-119	120-127
Bars	$\frac{1}{2}T$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{4}T$	$\frac{1}{8}$	$\frac{1}{8}T$	$\frac{1}{16}$	$\frac{1}{32}$

Table 1: Midi controller settings for arp and S/H LFO clock divider

5.4   Filter over midi

The Modysix features midi filter control. Controller massages received on controller number 17 will modulate the filter. The default value is 0.
The filter S/H LFO and the triangular LFO can also be controlled using midi.

5.5   Program change

The modysix responds to program change commands and changes the play mode. It also sends program change commands when changing the play mode. The following table shows which program number corresponds with which play mode:

Program number	Play Mode
0	6 Voice Polyphonic
1	Unison
2	2 Voice Polyphonic
3	3 Voice Polyphonic
4	Chord Memory
5	Polychord
6	Unison / Share
7	4 Voice Polyphonic
8	3 Voice Polyphonic (Mono/poly)
9	Random 4 Voice Polyphonic

Table 2: Midi program numbers and play modes

5.6 Pitch Bend

If the hardware is installed, the pitch bend can be controlled using midi by sending pitch bend commands.

6 Triangular filter LFO

The Modysix features an additional lfo for the filter which outputs a triangular waveform.Its frequency can be adjusted from 0,12Hz - 8kHz using a fine and coarse control. The amount can also be adjusted. See the midi controller chart for corresponding controller numbers.

7 S/H filter LFO

This is a build in sample and hold style LFO that controls the filter. A random value is created on every s/h clock event and sent to the filter. This simulates the effect of the sample and hold LFOs common in analog synthesizers, where a noise source is periodically sampled to get a new random value each time.

You can choose between three different clock sources by using the config menu. The internal arp clock, midi clock and midi trigger. The midi clocks divider can be adjusted in the config menu or via midi. When midi trigger is selected, the S/H will trigger when note C#-2 is played (second lowest midi note).

You can control the amount of this LFO by using the controller number

shown in the midi controller chart or by using the config menu.

8   Config menu

In the config menu various parameters can be adjusted. For some parameters a value can be selected by using the lower 17 key of the keyboard, others can be selected with a single key press. Figure 1 below shows the parameters and how they are assigned to the keys.

8.1   Enter and exit the config menu

To enter the config menu press the HOLD button until it starts blinking. To exit the config menu press it again.

8.2   Configure Midi Channels

Midi send an receive channels can be configured by pressing 'Midi In', 'Midi out as-sounds' and 'Midi out as-played' key and then selecting the channel with the lower keys. Midi in channel can be switched to 'omni', midi out channels can be turned off.

8.3   Configure arp trigger

The arp trigger source can be selected by pressing the ARP 'Internal', 'Midi note','and midi clock' keys.
The midi clock divider for the arp can be adjusted by pressing the ARP 'Divider' key and then selecting the divider with the lower 17 keys. The table below shows which key belongs to which divider.

8.4   Configure S/H trigger

The S/H trigger source can be selected by pressing the S/H 'Internal', 'Midi note','and midi clock' keys.

The midi clock divider for the S/H can be adjusted by pressing the S/H 'Divider' key and then selecting the divider with the lower 17 keys. The table below shows which key belongs to which divider.

8.5 S/H LFO amount

The S/H LFO amount can be set by pressing the S/H amount key and then using the lower 17 keys to set the amount. The OFF key will switch the S/H lfo off.

8.6 Pitch bend calibration

To perform pitch bend calibration set the tune knob to the center position, make sure the pitch bend wheel is at center and then use midi to send midi pitch bend messages until the synth is in tune. In the config menu press 'pitch bend cal' to save the current setting as the new pitch bend center position.

8.7 Factory reset

To perform a factory reset press the highest note on the keyboard (C5). It will take a couple of seconds to complete. When the HOLD led starts blinking again, factory reset is finished.

9 Tips and tricks

9.1 Transferring a melody to Powerarp

You can transfer a melody from an external sequencer to the Modysix Powerarp sequencer by going into Powerarp record mode and than sending the melody to the Modysix midi in channel.

Key	1	2	3	4	5	6	7	8
Bars	2.5	2	1.5	1	$\frac{3}{4}$	1T	$\frac{1}{2}$	$\frac{3}{8}$
Key	9	10	11	12	13	14	15	16
Bars	$\frac{1}{2}T$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{4}T$	$\frac{1}{8}$	$\frac{1}{8}T$	$\frac{1}{16}$	$\frac{1}{32}$

Figure 2: Config mode keyboard assigment

9.2   Use of Powerap transpose and Polychord

You can use the combination of Powerarp transpose and Polychord in multiple creative ways. You could for example save the notes C to B in the first octave, some minor and major chords in the second and some sept chords in the third. After recording a Powerarp sequence in the first octave you can transpose to play either single notes, or chords. You can use the same trick to 'transpose' between different melodies.

9.3   Copy a Polychord

If you want to move or copy a chord to a different key in Polychord mode, play it, then press POLY+CHORD to record it again.

10 Appendix

10.1 Midi controller chart

note: controller numbers in the chart are in the range of 0-127. If your midi controller displays controller numbers as 1-128 you have to add 1 to the numbers below.

Controller number	Usage	Range
16	Arp clock divider	* see table 1
17	Filter cutoff	0-127
18	S/H LFO amount	0-127
19	S/H LFO divider	0-127 *see table 1
21	CV2 (if installed)	0-127
22	CV3 (if installed)	0-127
23	Triangular lfo frequency coarse	0-127
24	Triangular lfo frequency fine	0-127
25	Triangular lfo amount	0-127
64	Sustain	off:0-63,on:64-127
120	All Sound Off	-
123	All Notes Off	-

Table 3: Midi receive controller numbers chart

10.2 Troubleshooting

10.2.1 Midi in not working

Are you sending on the correct channel? Try all 16 channels or configure the midi in channel using the config menu.
The Modysix excepts midi input in a range of 6 octaves from C0 to C5. Check if you are sending in this range.

10.2.2   Midi loop back problems

If you experience, weired phasing effects, chord memory and arpeggiator not working as expected or similar problems you are most likely victim of midi loop back. A possible cause could be your DAW sending the received midi back to the output or your midi interface having a loop back function. To check if midi loop back is the cause disconnect the midi in (or out) connection and see if the problem disappears.

10.2.3   Midi filter control and S/H LFO not working

This is caused by either not sending the midi controller information on the midi in channel or the filter cable not soldered to the correct location on the Mono/Poly board.

10.3   Thanks

go to

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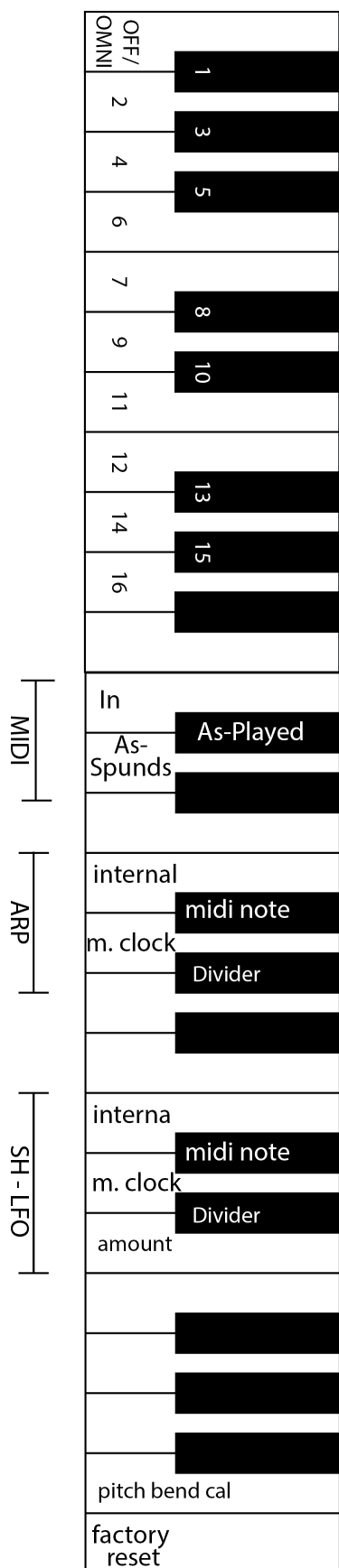for proof reading

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Figure 3: Config menu options on keyboard