Tubbutec Juno-66

User Manual for Firmware V1.29

JUNO-66

The Tubbutec Juno-66 is a midi retrofit and feature extension for the Roland Juno-6 and Juno-60 synthesizers. It features added play modes, an expanded arpeggiator/sequencer, midi in and midi out, two chord memory modes, two additional filter LFOs, ADSR Envelope for the filter, more.

This manual only describes the features which are different from the Juno-6 / 60. Great care has been taken to not alter the original behaviour of the synths with the exception of the key transpose button. The key transpose button has become the primary mode switch to program the Juno-66, and as the result, the original behavior is lost. Workarounds are described in this manual as we go.

This manual we remixed by Sunshine Jones and is formatted to be printed. It will print out nicely as a booklet, single or double sided, full size, or half size. It's also fine as a PDF, but blank pages are added for a nicer physical experience.

Version History

Version 1.29
Local On/Off functions are added.

Version 1.28
Arp is now behaving correctly in up/down mode when highest notes are played. Spread amount in menu exponential control. Scale uploading enabled, and improved timing playing connected notes via midi

Version 1.26
Arp U&D mode now working correctly, Arp max speed now available.

Version 1.25
Four custom scales can now be uploaded, and selected. These are saved during power down.

Version 1.24
Uploading of custom scales via midi.

Version 1.23
Changed Up/Down mode of Arp to behave like original. Portamento now switches fully off, when controlling speed over midi. Looping mode, delay and polarity for ADSR. ADSR and LFO are now reset with firmware reset

Version 1.22
Polymode only kills every second voice, and "click" sound when switching from very low to very high note fixed.

Version 1.21
Midi controller not sensitive to specific midi channel fixed.

Version 1.20
ARP and SH-LFO clock sources can now be controlled via midi. TRI-LFO max speed has been changed to about 2.2kHz. Due to technical reasons everything above was not usable. In exchange you get a better control law for the LFO-speed-course midi control.
Double triggers when pressing keys in arp mode with internal arp clock are corrected.
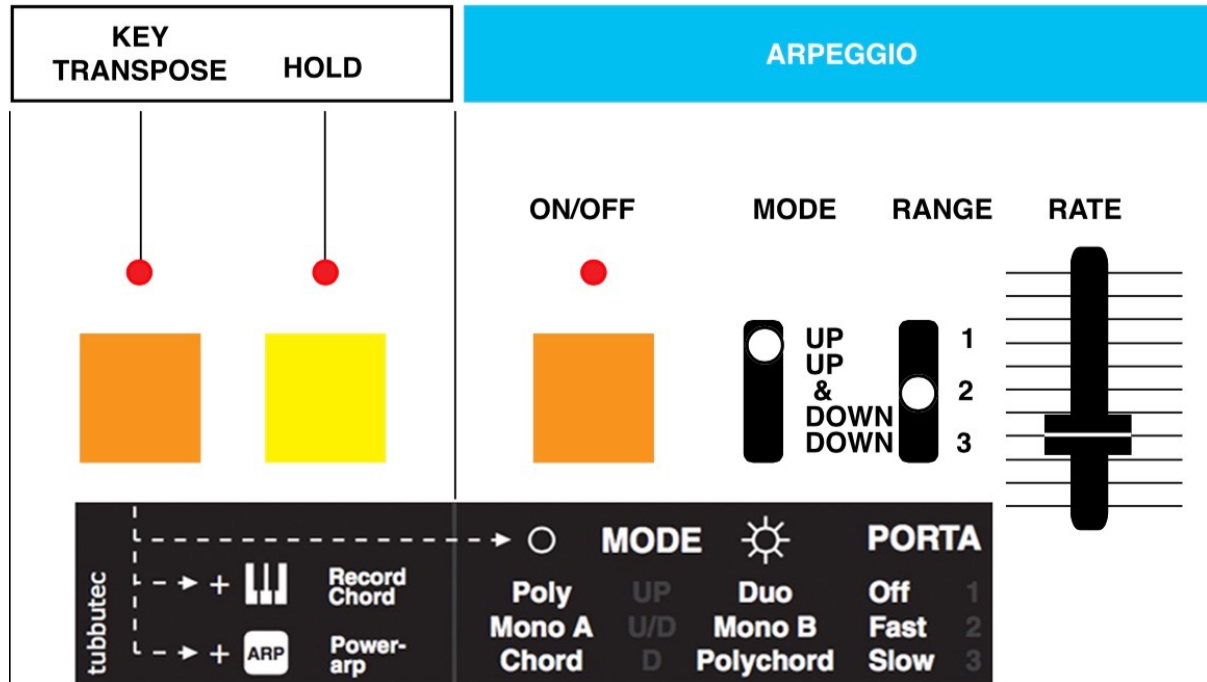
Version 1.1
Additional ADSR envelope for filter. Three voice mode. New school chord memory modes. Optional auto portamento in MONO B mode.

CONTENTS

SWITCHES AND BUTTONS

The Juno-66 functions are controlled by the following switches and buttons on the left side of the synth's panel:

KEY TRANSPOSE, HOLD, ARPEGGIATOR ON/OFF, MODE and RANGE.

KEY TRANSPOSE
The original function of the Key Transpose button has been replaced. It now serves as a 'FUNCTION TRANSPOSE' button. This is how we enter into programming mode for the Juno-66, and also access alternate modes. The Key Transpose button no longer transposes the keys of the Juno-6 or Juno-60.

ALTERNATE FUNCTIONS
Key Transpose (long press) will put the Juno-66 into programming mode. Pressing keys on the keyboard allow us to change the midi channel, adjust the clock divider, clock source, and many of the things the Juno-66 can do.

MODE and RANGE switches on the arpeggiator switch between POLY, MONO A, CHORD, DUO, MONO B, POLYCHORD, and adjust the PORTAMENTO rate.
Key Transpose (short press) enables alternate settings for the arpeggior's MODE and RANGE switches and
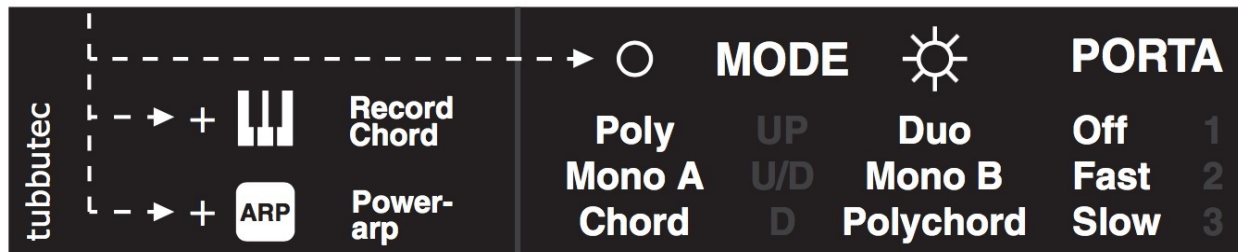
KEY TRANSPOSE, HOLD and ARPEGGIO are important keys for accessing all of these functions. They are described as we go. Also, a sticker showing the most important additional features comes with the kit, and there is a cheat sheet for you to refer to as you learn (in case you don't want to put a sticker on your beautiful synthesizer.)

PLAY MODES

Play Modes Overview

In addition to the 6 voice polyphonic mode five new play modes are introduced with the Juno-66:

Two monophonic modes (A & B), a duophonic mode, traditional chord memory and assignable Polychord mode. When the arpeggiator is turned off, use the MODE switch and the KEY TRANSPOSE button to select the play mode.

tubbutec	Record Chord	Power-arp	○ MODE ☀ PORTA			
			Poly	UP	Duo	Off	1
			Mono A	U/D	Mono B	Fast	2
			Chord	D	Polychord	Slow	3

KEY TRANSPOSE OFF
Select the left column of modes (Poly, Mono A and Chord)

KEY TRANSPOSE ON
Select the second column (Duo, Mono B and Polychord)

NOTE
You can use the arpeggiator freely in all modes, so it isn't a choice between them, however, sometimes you might get confused, or even worried that something's wrong. Probably not, there's just a lever set into the mono mode, or something like that. Its good practice to reset these levers to the UP position when you're done playing, to avoid confusion while you're learning these features, and discovering what they do, and how they work.

POLY

Poly mode is the normal 6 voice polyphonic mode also used in the original synth.
The voices are assigned in a rotary algorithm and voice stealing is performed on the 'oldest' voice.

To play the Juno as you might typically expect it to work, turn off the arpeggiator, flip the MODE switch into the UP position (POLY) and the RANGE switch up to 1. This is POLY mode (portamento off).

DUO

The duophonic layers three oscillators per voice and detunes the voices to create a thicker, denser sound similar to the 'supersaw' or 'supersquare' modes often found in synthesizers.

Enter DUO mode by pressing Key Transpose (short press, so it isn't flashing) and set the MODE switch to the top position (UP). You should

hear the polyphony cut in half (3 voices) and the sound get super fat (doubled). Press Key Transpose again, and hear it return to POLY mode. Press it again and you're back in DUO mode.

The "fatness" or detune can be controlled by midi CC 6 or in the config menu 11.By adjusting the

fatness a wide range of sonds from 'clean' over 'fat' to 'dirty' and finally 'detuned' can be achieved.

ADJUST FATNESS LOCALLY
1. Long press the Key Transpose button until it starts flashing
2. Select "Fatness" by playing F#3 (F sharp 3) on the keyboard.
3. Choose the amount with the number keys C#1 (1) - E2 (16) on the keyboard.
4. Press Key Transpose to exit programming mode.

ADJUST FATNESS VIA MIDI CC
This is much more straightforward. Connect any midi controller, and assign MIDI CC #27 for fatness, and CC #26 for detune to any rotary controller or fader you have handy, and adjust them in real time. Make sure that your controller is transmitting on the MIDI channel you've selected

for the Juno-66, otherwise this will not do anything, and it will get confusing.

It's easy to get discouraged with things like this which aren't clear, or built into the panel of our instruments. Don't get discouraged. Make sure everyone is talking to eachother on the same channel, and if it doesn't work the first time, read all this again, and give it another try. The cheat sheet is also helpdul so you can double check midi CC numbers, and find the correct keys quickly.

VOICE STEALING
Voice stealing is performed so that only the second played voice is replaced, the first stays until released.
Use the config menu to select between Duo and Three-voice modes.

THREE VOICE (TRI)

The three voice mode optionally replaces the Duo mode.
Use the config menu to select which of the two are used when setting the panel switch to Duo.

SWITCH BETWEEN DUO & THREE VOICE MODE
1. Hold the Key Transpose until it is flashing (Programming Mode).
2. Press F#2 (F sharp 2) for TRI (three Voice Mode) or F2 for DUO.
3. Press KEy Transpose again to exit programming mode.

NOTE
You can freely switch back and forth using this technique, and whichever mode you select, switching between POLY and DUO mode will access whichever of these modes you have selected.

FATNESS
Three voice mode layers two oscillators per voice and detunes the voices to create a thicker, denser sound similar to the 'supersaw' or 'supersquare' modes often found in synthesizers.

ADJUST FATNESS LOCALLY
1. Long press the Key Transpose button until it starts flashing
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MONO A and B

In the monophic modes all six Oscillators are layered and detuned with respect to each other to achive a thicker, denser sound similar to the 'supersaw' or 'supersquare' modes often found in synthesizers.

FATNESS

MONO mode layers all the DCO oscillators per voice and detunes the voices to create a thicker, denser sound. By adjusting the fatness a wide range of sonds from 'clean' over 'fat' to 'dirty' and finally 'detuned' can be achieved.
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ADJUST FATNESS LOCALLY

1. Long press the Key Transpose button until it starts flashing
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3. Choose the amount with the number keys C#1 (1) - E2 (16) on the keyboard.
4. Press Key Transpose to exit programming mode.

ADJUST FATNESS VIA MIDI CC

This is much more straightforward. Connect any midi controller, and assign MIDI CC #27 for fatness, and CC #26 for detune to any rotary controller or fader you have handy, and adjust them in real time.

By adjusting the fatness a wide range of sonds from 'clean' over 'fat' to 'dirty' and finally 'detuned' can be achieved.

The monophonic mode assignes the notes in a 'last played' fashion:
Press a key and it will be played. When releasing a key and keys are still pressed, the last played note is played. The algorithm memorizes the last eight played keys to create an intuitive feeling.

MONO A

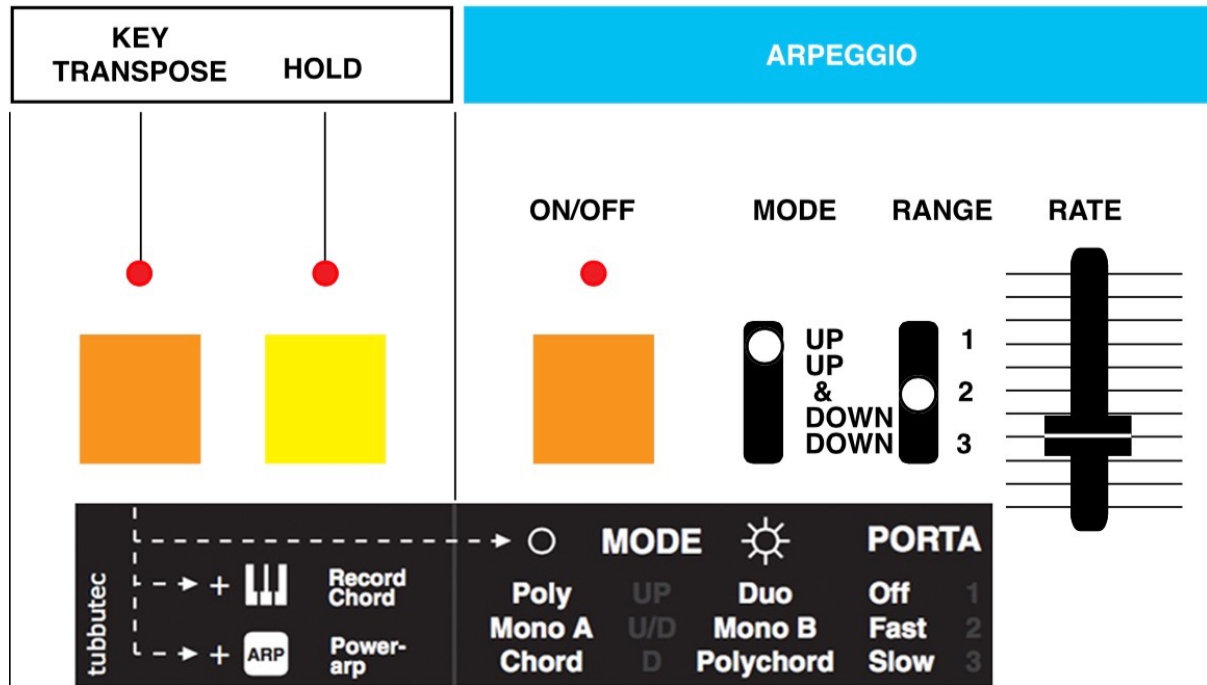the envelope is retriggered each time a note is played.

MONO B

Does not retrigger the envelope when playing legato.

Auto portamento in Mono B
If auto portamento is activated in the config menu, in Mono B mode portamento will only be active when playing legato. Otherwise there will be no glide.

CHORD MODE

KEY TRANSPOSE	HOLD	ARPEGGIO			

ON/OFF   **MODE**   **RANGE**   **RATE**

UP
UP
&
DOWN
DOWN

1
2
3

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○ MODE ☼ PORTA

Record Chord · Poly · UP · Duo · Off · 1
Power-arp · Mono A · U/D · Mono B · Fast · 2
· Chord · D · Polychord · Slow · 3

The chord memory mode allows you to memorize a chord consisting of up to six notes and transpose it with the keyboard.

In the Juno-6 and 60 traditional chord mode works like this:
1. Play a chord.
2. Press the Hold button
3. Press Key Transpose
4. Freely transpose your held chord across the keyboard.

The Juno-66 offers a version of this as follows:

STANDARD CHORD MODE
1. Play a chord
2. While holding the chord press the Hold button
3. Press Key Transpose (long press so it is blinking)
4. Stop plaing the chord
5. Press Key Transpose (short press so the light goes out)

PUT THE JUNO INTO CHORD MODE
1. Make sure the Arpeggiator is OFF
2. Select Chord Mode (Down) with the MODE selector switch of the Arpeggiator controls.
3. Play your chord across the keyboard.

NOTE
You can switch in and out of Chord mode for playing both regularly as well as using the chords by simply switching this lever to bring you in and out of chord mode.
You can even use the arpeggiator and arpeggiate the chord (so fun!)

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!

Essentially this is memory locations for chords. You can program chords, and save them to specific keys. You can enter any chord you like (considering the 6 notes of polyphony the Juno-6 and Juno-60 are capable of) and save them to keys in an order that makes sense to you.

One example is to sequentially save a series of chords for a particular song or set.
Another example is to select your favorite chords in a scale and save them to each of the corresponding notes in an octave. Then you can enter Polychord mode and play all of those beautiful chords with one finger, and not have to remember how they go.

Something fun to remember:
You can use Polychord mode with the arpeggiator, and the locations without a chord saved to them will play as single notes. So an arpeggio including four regular notes, and one chord is possible, or arpeggiating between various types of chords is also possible. It's really fun, and accidents here can provoke inspiration. It's dope.

RECORD A NEW CHORD
1. Play a chord.
2. While holding the chord, press the HOLD button.
3. Press Key Transpose (long press) so it starts flashing.
4. Now while the Key Transpose light is still flashing, choose your memory location and press the key

The Key Transpose light goes out to confirm that you have successfully entered the chord in that location.

ENABLE POLYCHORD MODE
Polychord mode is just Chord Mode with the Key Transpose light on (short press/not blinking)

1. With the Arpeggiator off, switch the Mode Lever to DOWN (Chord Mode)
2. Press Key Transpose button (short press)

Now you can play the chords from the memory locations you have saved them to.

NOTE
Polychord remembers these chords between power cycles. So you can use them again and again, and don't need to set it up every time you sit down to play the Juno. Thank you.

Changing the play mode when arp is on
You can enter and exit different play modes while using the arpeggiator. Press the Key Transpose button while making your selection to shift into the play mode you want. Exit by pressing the Key Transpose button again, or switch off the arpeggiator.

PORTAMENTO

The Juno-66 features portamento for all play modes.
The portamento used in the Juno-66 is linear on the musical scale.
This means that when sliding from C to E, the time spent between C and D is the same than between D and E.

Select portamento speeds
You can use the RANGE (PORTA) switch when the arpeggiator is turned off to switch on portamento and select its speed.
When the range switch is set to 1, portamento is turned off.
Setting it to 2 enables fast portamento
3 slow portamento.

The exact times for 'Slow' and 'Fast' can be set using midi CC 6 or the config menu 11. You can use a midi controller to change the portamento speed/time instantly.

Portamento and play modes
Portamento works in all play modes.
In Poly, Mono and Duo mode the last played note is used as the start for the slide.
In Chord mode all the voices slide in paralel and the structure of the cord is preserved.
In Polychord mode the structure is preserved if the two chords are transpositions of each other (e.g. two minor chords.)

Otherwise an extra algorithm makes sure that the lowest note of the first chord slides to the lowest of the second chord and so on. This is to make sure that even here a portamento sounds natural and you do not end up with musically unpleasant sounds while sliding.

**Constant Time and Constant Speed**
The Juno-66 features two portamento modes: 'Constant Time' and 'Con- stant Speed'.
In 'Constant time' mode it always takes the same amount of time to slide from one note to the next no matter how far they are apart.
In 'Constant speed' mode it takes a certain amount of time to slide from one semitone to the next, the overall time for the slide changes with the distance of the notes played. The modes can be selected in the config menu 11.

'Constant time' is set as default.

POWERARP
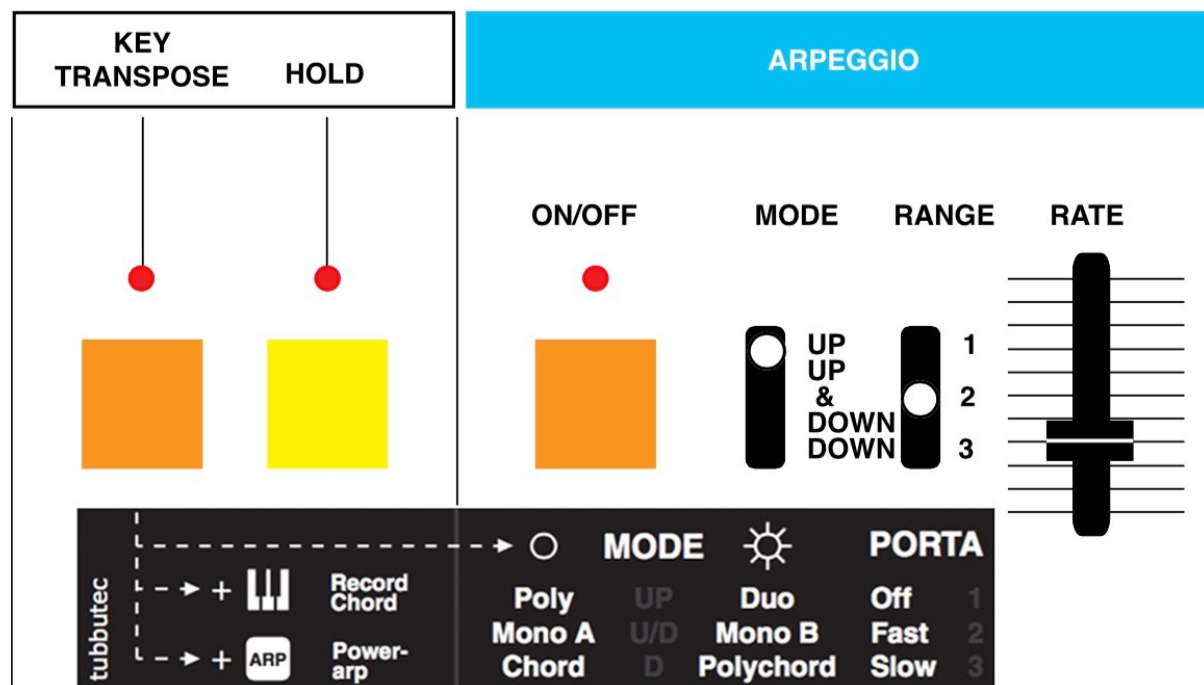
POWERARP OVERVIEW

The Powerarp mode lets you define a custom arpeggiator sequence which works in all play modes. You can define a sequence of up to 128 notes, transpose in pitch or shift it in time.

Enter the notes, adding rests or ties, and then playing it back using the internal clock, or triggering it from the Arpeggiator Clock Input, or from the Midi clock, or with triggers from midi notes. This is perhaps best understood by exploring. A lot more can be done here than just arpeggiation and basic sequencing.

CREATE A SEQUENCE
Here's how to create a sequence from scratch

1. Press and Hold Key Transpose and Press the Arpeggiator button
The Key Transpose light should be blinking

2. Enter the notes of your sequence
Tapping the HOLD button will create a rest
Tapping the HOLD button while playing a key will create a TIE
Don't actually latch the Hold button, we're just trying to tap it. A hold pedal will also work for this.

3. Press Key Transpose to end the programming, and save the sequence.

PLAYING AND TRANSPOSING A SEQUENCE
Play back the recorded sequence by playing middle C (C3)
Transpose by playing other keys.

Pressing HOLD or using a hold pedal will engage the playback so that we are free to do other things and like an arpeggiator's latch, it will just keep playing until we turn HOLD off.

SHIFT
You can shift the time of the sequence by playing the highest C and B on the keyboard.
C will advance the sequence by one step
B will shift the sequence back by one step.
Multiple key presses will advance, and retreat the sequence by as many steps as we press them.

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SELECTING THE CLOCK SOURCE
You can choose how to clock the arpeggiator by entering into programming mode and setting it up.

Hold Key Transpose until the light is flashing (program mode)
Play a key which represents the choice you would like to make:

F4 - **INTERNAL CLOCK**
This will operate normally, and the internal arpeggiator fader will adjust the tempo of the arp.

F#4 - **MIDI NOTES**
This clocks the arpeggiator from incoming midi note messages. It can be used in a siilar way to analog clock input.
Advance the arpeggiator, or the powerarp sequence one step per pulse with a midi note (C-2 - or lowest available note.) A very interesting solution to a long standing problem of MIDI being a contastant and inflexible tempo without the fun, and exploration that analog clocking can offer.

G4 - **MIDI CLOCK**
This clocks the arpeggiator with the incoing MIDI clock and starts and stops with the external source which is sending it.

CLOCK DIVISION
You may also adjust the MIDI Clock Division by pressing G#4 and then selecting the value of division you want from the keyboard (see the appendix, or the cheat sheet for the values and keys)

You may also adjust the analog clock divider in the same way. In programming mode, select A4 and then select the clock division you would like to try.

When you're done with programming operations, press the Key Transpose button again (short press, and the light stops flashing)

MODE & RANGE
These are the controls which configure playback of the Powerarp sequences for performance.

MODE
The mode switch defines weather the arpeggio is played upwards, downwards or both alternating. There is a fourth Random Mode that can be selected by the Range switch.

RANGE
Set the range switch to 1 or 2 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 3 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)
UP & DOWN: Forward/Backward random (the sequence will randomly advance or go back one step)

PLAYING A PREVIOUSLY SAVED SEQUENCE
To switch directly into Powerarp hold the KEY TRANSPOSE button, switch on the arp using the arp ON/OFF switch (same as recording a sequence).
Now without recording a sequence press the KEY transpose button again. The Juno-66 is now in Powerarp mode with the previously used sequence.

MIDI

MIDI IN
Depending on the setting in the see config menu the Juno-66 receives midi on channel 1-16 or an all channels (omni).

It reacts to midi notes 36 - 97

MIDI OUT
The Juno-66 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 36-97 are being sent.

MIDI OUT AS PLAYED
On the as-played channel only the key presses on the Juno keyboard are sent.

If you record this channel and send it back to the Juno-66, the synth will sound exactly the same as when you played it.

This is useful for using the Juno as a midi keyboard. In this mode sustain pedal events will be sent as "sustain" midi messages.

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 Juno-66 will output the arpeggiator, Powerarp, chord memory, Polychord and Monophonic modes including retrigger information. Sustain events will not be sent as midi massages but rather simulated with note on and off events.

When Mono B mode is selected 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.

HOW TO SET THE MIDI CHANNEL
Setting the MIDI channel is more intuitive than it may initially appear.

1. Enter the menu by holding Key Transpose until it begins to flash
2. Press C4 (MIDI IN)
3. Press the keyboard key which corresponds to the MIDI input channel you want (C1 = OMNI, C#1 = CH1, D1 = CH2, etc.)
4. Press the Key Transpose button again until it stops flashing and you're done.

You may do the same for the output channel, they can be different channels. The JU-66 will remember these settings between power ups so you don't have to do this every time.

ARPEGGIATOR AND SAMPLE & 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	$\frac{1}{2}T$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{4}T$	$\frac{1}{8}$	$\frac{1}{8}T$	$\frac{1}{16}$	$\frac{1}{32}$

FILTER VIA MIDI

The Juno-66 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.

PROGRAM CHANGE

The Juno-66 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	Poly
1	Duo
2	Mono
3	Chord
4	Polychord

PITCH BEND

If the hardware is installed, the pitch bend can be controlled using midi by sending pitch bend commands. Use the Juno's amount sliders next to the bender to set the amount of pitch bend and/or filter modulation.

ADDITIONAL FILTER ADSR

The Juno-66 features an additional ADSR envelope for the filter. It is a global envelope. This means there is not one envelope for each voice but one shared by each voice. In Poly, Duo, Three voice modes the envelope is retriggered after all keys had been released. in Mono A mode it is retrigged with each key press, in Mono B mode it is not retriggered when playing legato.

Envelope parameters delay, attack, decay, sustain, release, and amount can be controlled via midi controller messages. The range of the parameters is very wide: From a couple of milliseconds on the low end up to 5 seconds on the longest setting. The parameter control low is logarithmic to ensure a good control over the whole range.

The delay paramter is adjustable between 0 and 5 seconds is the time until the attack phase begins.
If the looping mode is turned on (midi controller value >63), the ADSR will start a new attack phase the moment the sustain level is reached. This way the ADSR is looped until the gate is turned off, after which the ADSR will continue its release phase like normally.
If the polarity is set to inverted (midi controller >63), the hole envelope

will be inverted. Since the Juno-66 can only output positive values, this means, that here the zero level equals the ADSR amount setting.

The midi controller numbers can be found in the Appendix.

TRIANGULAR FILTER LFO
The Juno-66 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.

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.

ALTERNATE TUNINGS

Juno-66 has the ability to use several alternative scales, as well as four user defined custom scales. Built in are the following scales: Pythagorean, Werckmeister III, Werck- meister IV, Werckmeister V, 1/4 meantone and Harmonic (All with 12 notes / octave). You can also upload a custom scale with a program such as Scala using midi standard tuning bulk dump messages. These scales can have any number of notes per octave.

UPLOAD A CUSTOM SCALE
Custom scales can be uploaded via midi tuning standard bulk messages, with Device ID 0 and MTS Preset 0-3. If you are using Scala, set these parameters in the Options - Synth menu. It is important you select bulk message format, not single note. MTS Preset defines in which of the four custom scale slots the scale will saved (0-3).

After loading your scale you can now upload it by pressing 'Send'. Make sure the correct midi output is selected in the MegaMid settings.
After upload you can select the custom scale in the config menu.
The scales will be saved and are also availible after power down.

LOCAL OFF

Local OFF disables the connection between the internal keyboard and the synthersizer. The keyboard will work as a pure midi keyboard and the synthesizer as a pure midi controlled synthesizer. By default, local off is turned OFF and Juno-66 functions normally.

CONFIG MENU

In the config menu various parameters can be adjusted. For some param- eters a value can be selected by using the lower 17 key of the keyboard, others can be selected with a single key press. Parameters that are also controlled using midi are saved when pressing any unused key in the konfig menu. You could for example set the portamento times using a midi con- troller and then save them in the config menu.

The figure on the next page shows the parameters and how they are assigned to the keys. A larger version is provided at the end of this manual. This is also inclluded in the cheat sheet as well.

ENTER AND EXIT THE CONFIG MENU
To enter the config menu without having any key pressed on the keyboard, press the KEY TRANSPOSE button until its led starts blinking. To exit the config menu press it again.

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.

PORTAMENTO SETTINGS
To set times / speed for 'Slow' and 'Fast' settings, press the 'Speed fast' or 'Speed slow' key, then use the lower 17 keys to select a speed.

To switch between 'Constant time' and 'Constant speed' modes, press the coresponding buttons.

DETUNING, SCALES AND FATNESS
Press the Detuning and Fattnes keys and then use the lower 17 keys to set their parameters. The lowest key produces a very clean sound, (no fatness or detuning). Increasing the parameters will make the sound more alive, extreme parameter settings might sound detuned and experimental.

Press the scale key then use the associated lower keys to select a tuning or the 17th key to select a custom tuning.

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.

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.

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.

DUO AND THREE VOICE
Use the DUO and TRI keys to select between Duophonic and Three voice modes.

NEW-SCHOOL AND OLD-SCHOOL CHORD MEMORY MODES
Use the NEW and OLD keys to select between New-school and Old-school chord memory modes.

AUTO PORTAMENTO
Use the Auto-porta ON and OFF keys to select wheater auto portamento in Mono B mode is active or not.

SCALE SELECTION
Press the 'Scale' key to enter scale selection mode. Now use the lower keys to select one of the built in scales, or a custom scale.

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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.

FACTORY RESET

To perform a factory reset press the highest note on the keyboard (C5).

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	$\frac{1}{2}T$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{4}T$	$\frac{1}{8}$	$\frac{1}{8}T$	$\frac{1}{16}$	$\frac{1}{32}$

TIPS AND TRICKS

Transferring a melody to Powerarp
You can transfer a melody from an external sequencer to the Juno-66 Powerap sequencer by going into Powerarp record mode and than sending the melody to theJuno-66 midi in channel.

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.

Copy a Polychord
If you want to move or copy a chord to a different key in Polychord mode, play it and then record it again.

Analog Style Clock
To manually program a clock pattern for the Polyarp or Arpeggiator, select the clock source as "MIDI NOTE" and then send a pattern of C-0 (C-1, C-2 or whatever the lowest note of your sequencer is) into the Juno. This pattern will be the one note per pulse style clock for your sequence. Endless analog fun via MIDI!

APPENDIX

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 midi 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
20	Arp clock 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
26	Detune amount	0-127
27	Fatness amount	0-127
28	Portamento speed fast	0-127
29	Portamento speed slow	0-127
30	Filter ADSR attack	0-127
31	Filter ADSR decay	0-127
32	Filter ADSR sustain	0-127
33	Filter ADSR release	0-127
34	Filter ADSR amount	0-127
35	seq / seq clock source	-
36	sh-lfo clock source	-
37	Filter ADSR delay	0-127
38	Filter ADSR looping	off:0-63,on:64-127
39	Filter ADSR polarity inversion	off:0-63,on:64-127
64	Sustain	off:0-63,on:64-127
120	All Sound Off	-
123	All Notes Off	-

Equal tempering — OFF. / OMNI

Pythagorean — 1

Werckmeister III — 2

Werckmeister IV — 3

Werckmeister V — 4

1/4 meantone — 5

Harmonic — 6 / 7 / 8 / 9 / 10 / 11 / 12

Custom 0 — 13

Custom 1 — 14

Custom 2 — 15

Custom 3 — 16

"Duo" play mode — DUO / TRI

Chordmem — NEW / OLD

Auto Poarta in MONO B — ON / OFF

Speed fast

Speed slow

C. time

Const. Speed

TUNE

Detuning

Fattness

Scale

MIDI

In

As-Played

As-Sounds

Local OFF

ON

OFF (normal playing)

ARP

internal

midi note

m. clock

Midi Clk Div

Clk div

SH-LFO

interna

midi note

m. clock

Divider

amount

pitch bend cal

factory reset

TROUBLESHOOTING

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 Juno-66 excepts midi input in a range of 6 octaves from C0 to C5.

Check if you are sending in this range.

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 software 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.

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 Juno board.

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