Jeannie

POLYPHONIC DIY SYNTHESIZER

Operating manual V 1.04.66

Jeannie is an 8-voice polyphonic open source synthesizer kit with digital sound synthesis and digital filters based on a fast ARM Cortex-M7 processor with 1MByte Ram. For sound generation, the user has a variety of classic and band-limited waveforms at his disposal. A pool of 15 waveform banks with 63 different waveforms each offer plenty of space for sound experiments. A waveshaper with different characteristics provides for gentle to vicious sounding distortions.

To tame the waveforms, there is a digital 12dB multimode filter with fade function from low-pass to high-pass and a band-pass function. A 24Bit DSP effect module with adjustable parameters rounds off the sound synthesis. An integrated polyphonic 16-step sequencer provides for the playfulness of the small synthesizer.

A total of 2048 sound patchesfrom 15 banks can be loaded and stored via an integrated SD card. A color 1.8 inch TFT display allows a clear menu structure and easy operation of the synthesizer. The parameters are entered via four rotary knobs below the display and an encoder for selecting the sound programmes and switching to the menu functions. In addition, there are six buttons for operating special synthesizer functions.

Table of contents

Foreword

Thank you for purchasing the polyphonic synthesizer kit "Jeannie" from TubeOhm Instruments.

The synthesizer is designed as a kit and intended for customers who have basic knowledge of electronics and a little experience with digital or analog synthesizers.
Some mechanical experience is required, as soldering and assembling a case must also be done.

This synthesizer combines different types of sound synthesis, making it a great playground for sound tinkerers. A graphical 1.8 inch TFT display for the visual representation of the waveforms and a simple menu structure facilitate the operation.

Special thanks to

Paul Stoffregen, https://www.pjrc.com/

ElectroTechnique, https://electrotechnique.cc/

and to all those who have been forgotten here.

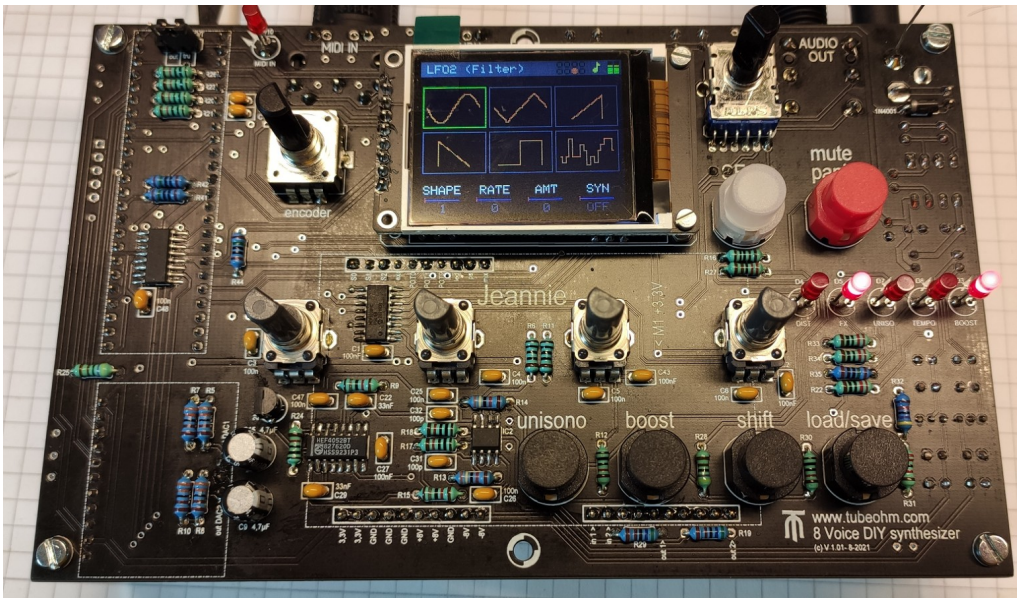
The development team

Software:	Rolf Degen
Hardware	Andre' Laska, Rolf Degen
Designe:	Andre' Laska https://www.tubeohm.com/
Firmware:	V 1.04.66 Januar 2022
Download:	https://www.tubeohm.com/jeannie.html

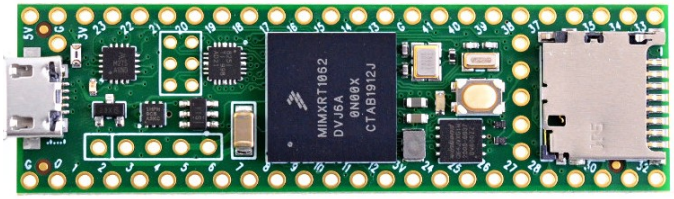
The assemblies

The kit consists of four boards, where the Teensy 4.1 board and the PCM5102A board are delivered already assembled and simply plugged into the existing contact strips on the back of the panel board. The panel board includes all controls as well as a 160x128 pixel color TFT display. The FxDSP board is equipped with a FV-1 Reverb IC from Spin Semiconductor and is responsible for the sound effects.

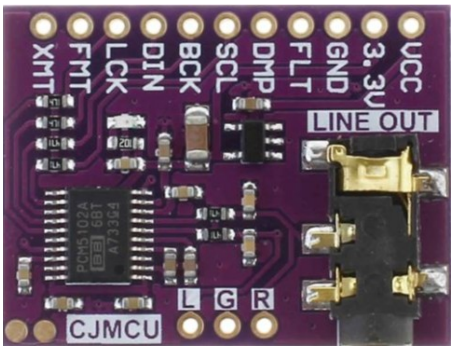
Panel Board



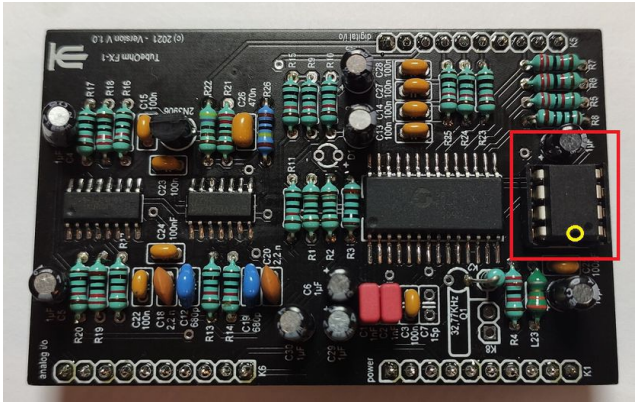
Teensy 4.1 Board *(fully assembled)*



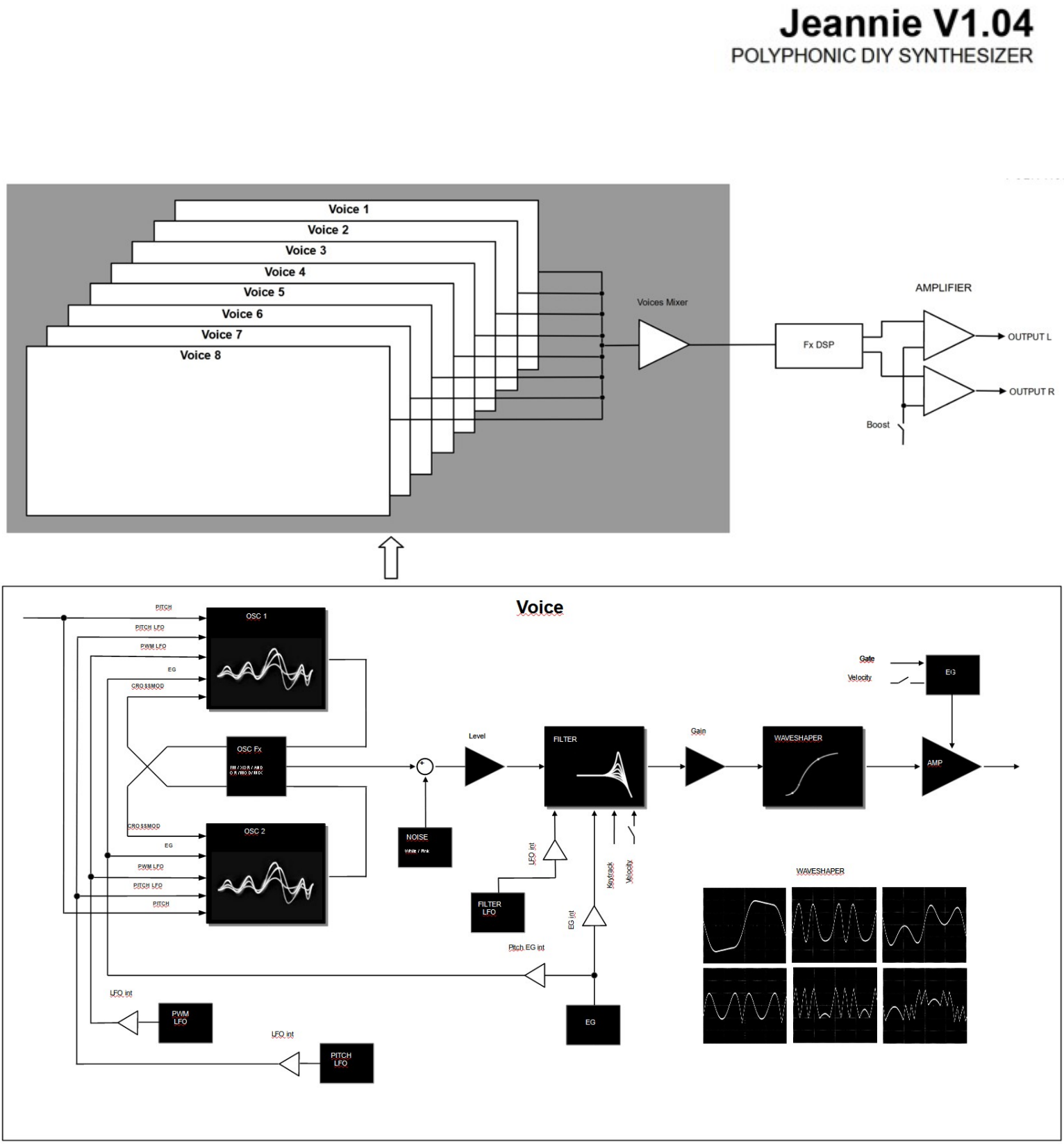
PCM5102A Board *(fully assembled)*



Fx DSP Board



Block diagram

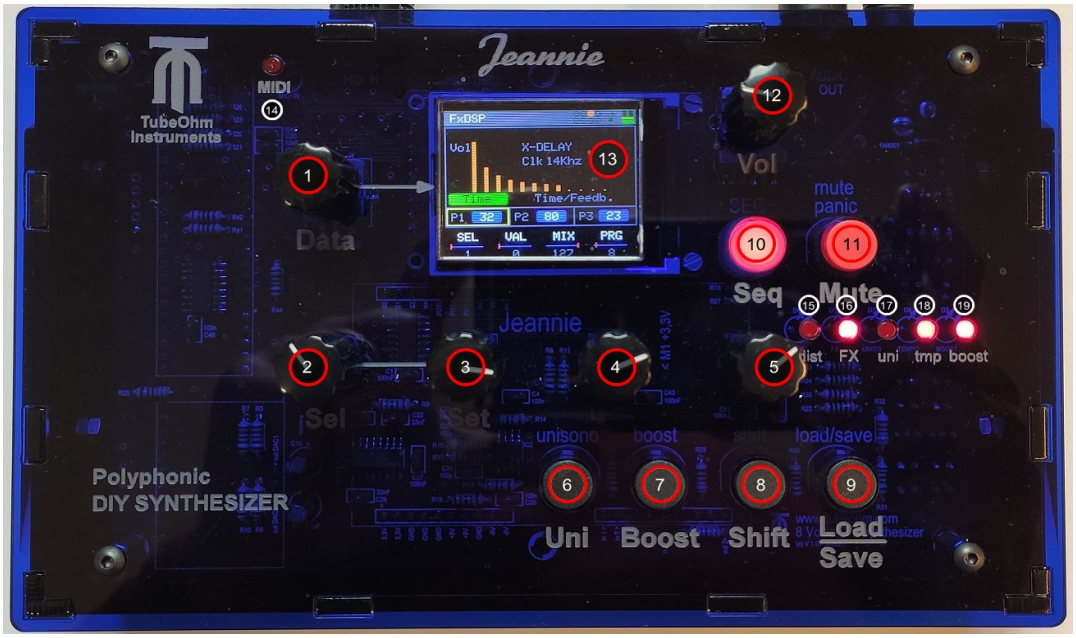


Features

- 8-voice polyphonic DIY synthesizer
- ARM Cortex-M7 processor 816MHz with 1MByte Ram
- two digital oscillators per voice
- 15 waveform banks with a total of 945 waveforms
- 12 standard waveforms partly bandlimited
- noise generator (white and pink noise)
- oscillator modulation (XOR, XMOD, MOD, AND, OR, FM)
- Waveshaper with different waveforms
- 2 LFOs for pitch and filter modulation with 6 different waveforms
- 1 PWM LFO from 0.04Hz - 25Hz
- Digital 12dB multimode filter with resonance and crossfade function (LP/HP/BP)
- 2 ADSR generators 0.3ms - 12s with positive and negative control
- 24Bit DSP effect module with 15 effects and adjustable parameters
- Polyphonic 16 step sequencer
- SD cards for loading and saving sound programs max. 2048
- Color 1.8 inch display with 160x128 pixel resolution
- Volume control
- Boost function for improved bass response
- Stereo audio output jack 6.3mm
- 4 potentiometers for parameter input
- Rotary encoder for menu control and sound selection
- 6 function keys
- External power supply 12V DC / 1000mA
- and power switch

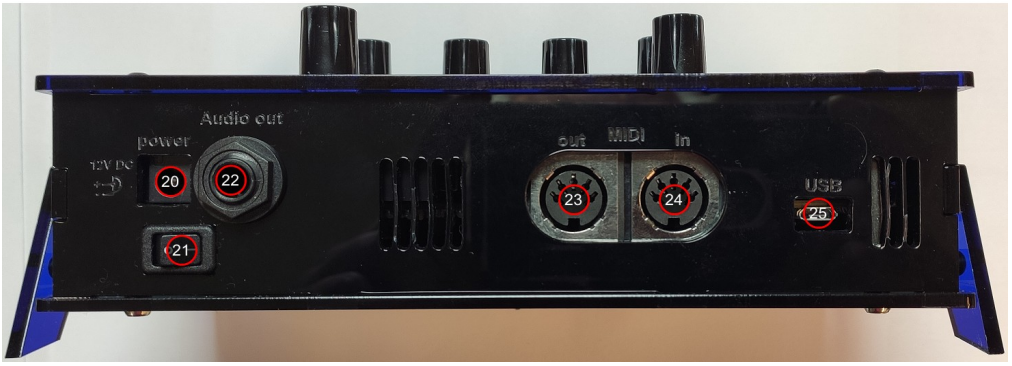
Controls and connections

Front



1	SOUND PATCH / MENÜ	**8**	SHIFT FUNCTION	**15**	FX CLIP LED
2	PARAMETER CONTROLLER	**9**	LOAD / SAVE	**16**	FX ON / OFF LED
3	PARAMETER CONTROLLER	**10**	SEQUENCER	**17**	UNISONO MODE LED
4	PARAMETER CONTROLLER	**11**	MUTE / PANIC	**18**	TEMPO LED
5	PARAMETER CONTROLLER	**12**	MAIN VOLUME	**19**	BASSBOOST ON / OFF
6	UNISONO	**13**	DISPLAY		
7	BASSBOOST	**14**	MIDI LED		

Anschlüsse auf der Rückseite

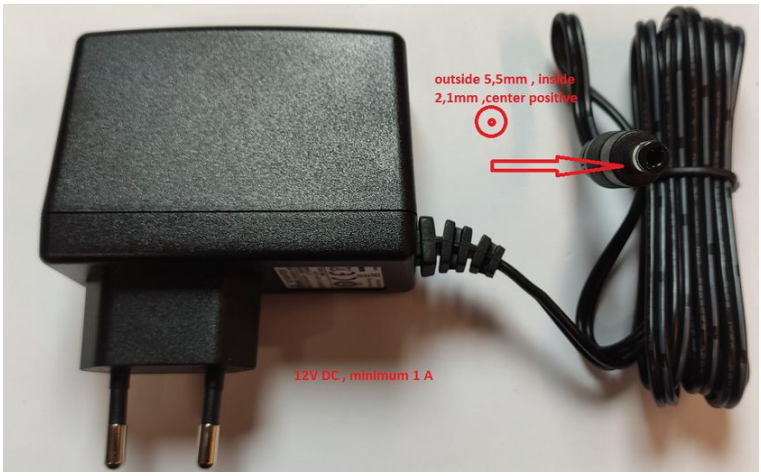


20	12V DC POWER SUPPLY CONNECTION
21	POWER SWITCH
22	STEREO OUTPUT
23	MIDI OUT / MIDI THRU
24	MIDI IN
25	USB CONNECTION (for firmware update)

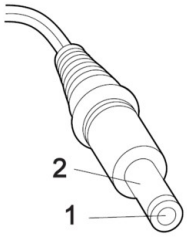
Power supply connection

The synthesizer is powered by an external 12V DC power supply at the power supply connector (20). The power supply should be designed for a current load of 1000 mA. The power switch (21) is used to turn the synthesizer on or off. Make sure that all peripheral devices such as active speakers or amplifiers are switched off and turn down the volume at the volume control (12).

Power supply



The synthesizer is delivered without power supply. We recommend to use a switching power supply with 12 Volt DC and 1000mA load. The power supply should have a spar connector with 5.5mm / 2.1mm and a positive polarity of the inner conductor as shown in the picture.



PIN	Voltage
1	+ 12V DC
2	Ground

Power on

After power-on, system parameters for initializing the synthesizer are loaded from the internal SD card inserted in the Teensy 4.1 board. During this time the startup screen with the TubeOhm logo is displayed. The required system folders and files must be present on the SD card, otherwise an error message will occur.

A detailed description of the required system folders and files can be found on the following page.

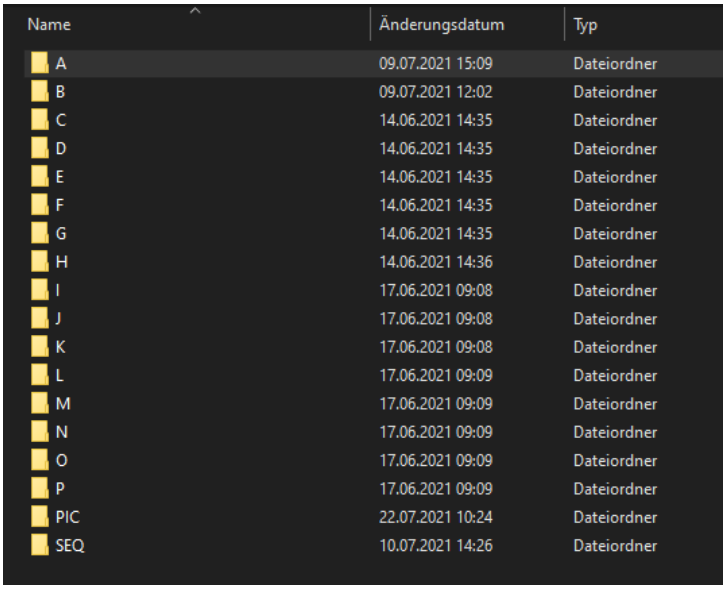
SD card

The synthesizer is delivered without SD card. It can be used micro SDHC cards of type Class 10-UHS I from 8-16GB as shown in the picture.

microSDHC Karten Class 10-UHS I

All necessary folders and files can be downloaded as a ZIP file from the download section on the tubeohm.com website. Please format the SD card as FAT32 and copy the unpacked folder to the SD card.

Folder and file structure on the SD card

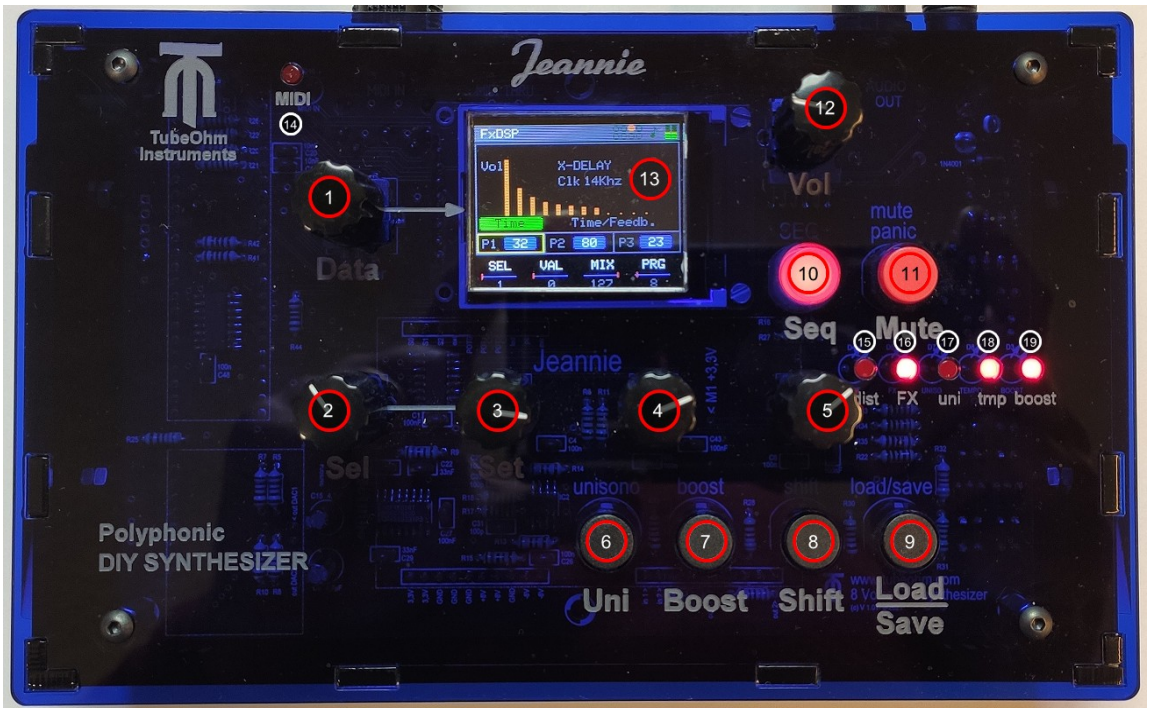


The folders A - P contain the stored sound programs. The sound programs are numbered from 1-128. An exchange of the files and folders is possible at any time, provided that the numbering and designations correspond to the original.

The folder PIC contains the start screen and other image elements. The SEQ folder contains the stored Sequencer Patterns. The Sequencer Patterns can be saved as individual files in the Sequencer Editor. The pattern files are numbered from 1-128.

If you are in the Patch menu, you still have the option of saving the sequencer pattern as part of a sound program in a sound file.

The operating concept



Rotary encoder (1)

The rotary encoder (1) is used to select a sound program and to switch the menu pages. It is equipped with a button to switch between the sound program and the menu pages. Below the display (13) there are four potentiometers (2 - 5) for parameter input. The respective parameter functions are shown in the lower part of the display menu.

The keys Functions (6 - 11)

Unisono key

With the unison key (6) you can activate the unison mode. In mode 1 (LED 17 on) all 16 oscillators sound on one note. With the **Detune** control in the Osc2 menu, the oscillators are slightly **detuned** against each other. If you press the **Unisono** button a second time, you enter **Unisono** Mode 2 (LED 17 flashes). This mode has a chord function. All oscillators play on one note, divided into pitches corresponding to the notes in different chords. The **Detune** control determines the chord type (major, minor, augmented...) . Pressing the **Unison** button again turns off the Unison mode (LED 17 off).

Boost key

The output amplifier in the synthesizer is equipped with a boost function. This boosts the low frequencies in order to improve the bass sound. The boost function is switched on or off with the boost key (7). LED 19 signals this function.

Shift key

The Shift key (8) is used in some menu functions. It is used, for example, to switch to a menu subpage (SP) or to cancel a function. Furthermore, when selecting a sound program, it is used to step through the sound programs in steps of 10 with the rotary encoder (1).

Load / Save key

With the Load and Save button (9) a sound program or sequencer pattern can be loaded and saved.

Seq key

The internal step sequencer can be started and stopped with the SEQ key (11). LED 18 lights up in the sequencer cycle.

Mute / Panic key

The Mute/Panic button (10) can be used in the Sequencer Editor to mute or reactivate a note step. If the key is pressed for a longer time in the Sequencer Editor, all sequencer settings are deleted and reset to default values.

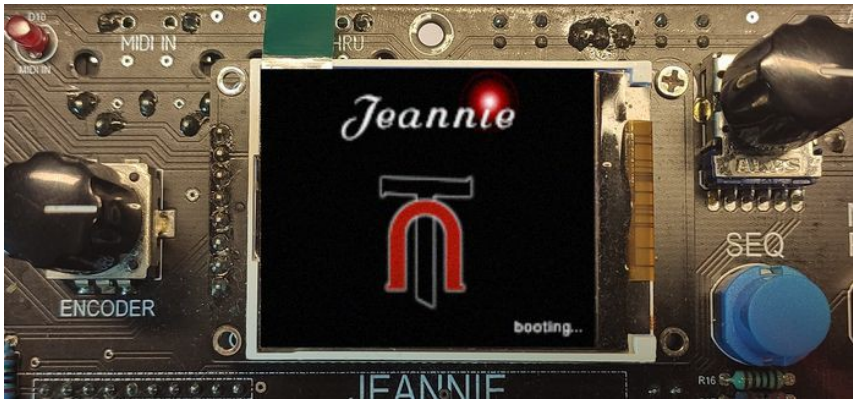
If you are outside the Sequencer Editor and press the Mute/Panic button (10) for longer than 2 seconds, all notes in the synthesizer are switched off.

Main Volume

The volume control (12) is used to set the volume level for the stereo output (22) in the synthesizer. It is recommended to turn the volume to zero before switching on the synthesizer (turn the potentiometer to the left) and to set the desired volume level only after switching on.

Display

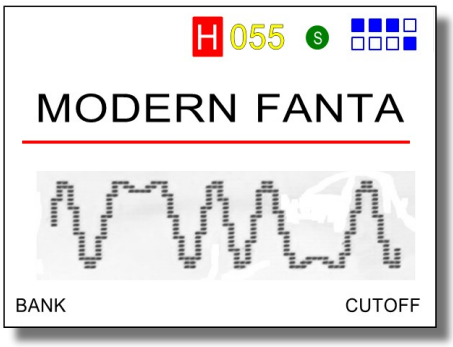
The color TFT display (13) in the synthesizer has a resolution of 160 x 128 pixels and has an LED backlight that cannot be changed in brightness.



Please note when building this synthesizer kit that you use the supplied TFT display from tubeohm.com. There are similar displays on the Internet, which may have a different pin assignment and can lead to malfunction or short circuit.

Selection of sound programs

Main page



After switching on, the synthesizer is on the main page. Here a sound program can be selected with the encoder (1) and the parameter knob BANK (2). In the upper half of the display the program name and the program number as well as the sound bank are shown. Next to it there are eight blue indicators for the voices. They light up blue when the voices are active. A green dot indicates the presence of a sequencer pattern in the sound program.

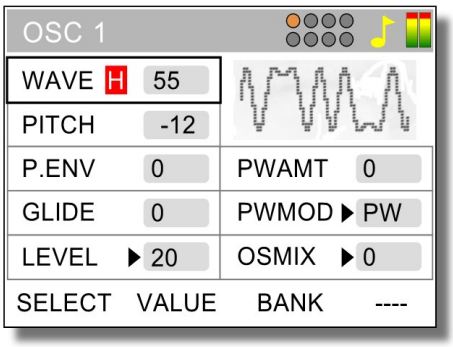
In the lower part is the oscilloscope. It shows the digital peak amplitude of all active voices in the internal audio processor of the Teensy CPU. The effect signal is generated in a special DSP chip (SPN1001-FV-1 Spin) and mixed analog to the audio signal. For this reason it cannot be displayed in the oscilloscope.

Furthermore you have the possibility to change the filter frequency with the control CUTOFF (5) without having to switch to the menu pages for the filter.

Menu pages

From the main page you can jump to the menu pages by pressing the encoder (1). Press it again to return to the main page.

Oscillator parameters



The synthesizer has two digital oscillators per voice that have almost the same parameter settings. The parameters are selected with the SELECT knob. A colored rectangle marks the selected parameter. The VALUE knob is used to change the parameter values. With BANK one of 15 waveform banks (A - O) can be selected.

Waveform selection

Oscillator 1

With Wave, one of a total of 63 waveforms can be selected from a waveform bank. The user has a total of 945 waveforms available in Bank A - O. The waveforms 0 - 12 in bank A differ from the other waveforms. They are partly band limited and are calculated by the CPU in realtime.

Wellenform 0 – 12 BANK A

0	The oscillator is switched off (All banks)	**7**	Sawtooth falling
1	Sine	**8**	Sawtooth to triangle *(varying)*
2	Triangle	**9**	Sawtooth falling *(band limited)*
3	Sawtooth rising	**10**	*Sawtooth rising (band limited)*
4	Rectangle	**11**	Rectangle (*band limited)*
5	Pulse width modulation	**12**	Pulse width modulation (*band limited)*
6	Sample & Hold		

Waveforms

The other waveforms are sample based and are loaded from the program memory. The selected waveform is shown in a small preview window at the top right of the display.

If the WAVE parameter is selected, a waveform bank A - O can be selected with the BANK control. The same applies to oscillator 2.

PITCH

With PITCH the pitch of the oscillator can be adjusted in semitone steps in the range of -24 ... +24 semitones.

P.ENV

The Pitch Envelope modulates the pitch of Oscillator 1 and is controlled by the Filter Envelope.

GLIDE

The GLIDE parameter determines the continuous glide of the pitch from one note to the next. Low GLIDE values create a short glide time and higher values create a longer glide time. GLIDE affects the pitch of both oscillators.

The parameters LEVEL, PWMOD and OSCMIX are marked with an arrow on the oscillator menu pages and influence both oscillators simultaneously.

LEVEL

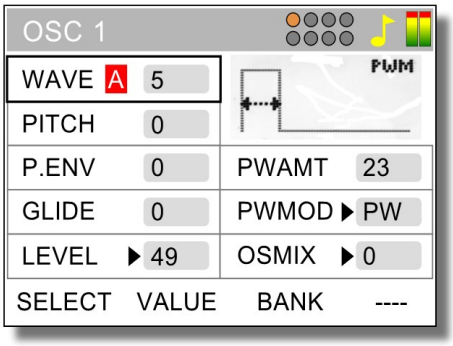
LEVEL controls the volume of oscillator 1 and oscillator 2.

OSCMIX

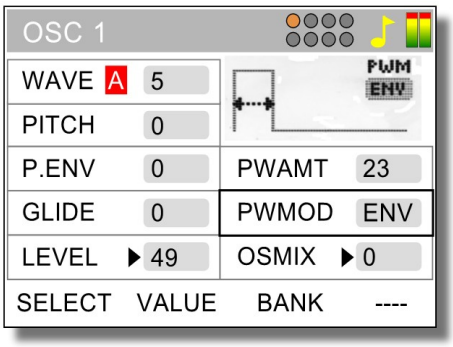
The OSCMIX influences the volume ratio of oscillator 1 to oscillator 2 and vice versa.
If the oscillators are in OSCMOD mode (Osc SupPage via Shift), then the OSCMIX parameter can be used to set various oscillator modulations, e.g. ring modulation (XOR, XMO) or frequency modulation (FM) (see OSCMOD function p.15).

PWAMT

Both oscillators have variable pulse and variable triangle waveforms. These can be selected from waveform bank A (wave no.5 / no.8 / no.12) with WAVE. If the PWMOD parameter (see next page) is set to PW (VALUE 0), then you can use PWAMT to set either the pulse width of the waveform or the triangle waveform. The middle setting corresponds approximately to a square wave or a triangle waveform.



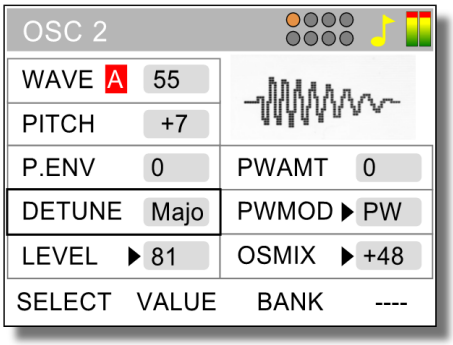
PWMOD (OSC1 / OSC2)



With PWMOD the modulation type (PW / ENV) or the modulation frequency can be determined by the PWM LFO. If the parameter is set to PW (left stop) the pulse width or triangle waveform can be set with PWAMT.
If you turn the knob clockwise a little bit more, the ENV sign is displayed in the graphic. The pulse width or triangle waveform is then controlled by the Envelope filter. The strength of the envelope modulation is determined by the PWAMT parameter.
If you turn the PWMOD parameter a bit more to the right, the control range for the PWM LFO starts (1 - 121). The graphic will then show an LFO sign. The PWM LFO oscillates with a sine wave and can be set from 0.04Hz - 25Hz.

Oscillator 2

WAVE



Function as described in Oscillator 1. To visually distinguish OSC1 and OSC2, the colors of the waveforms are different.

PITCH
Function as described in oscillator 1

P.ENV
Function as described in oscillator 1

DETUNE
The DETUNE parameter detunes oscillator 2 relative to oscillator 1, which is useful for creating a fat or chorus-like effect. In Unison Mode 1, DETUNE slightly detunes all 16 oscillators. In Unison Mode 2, DETUNE can be used to set different chord types.

LEVEL
Function as described in oscillator 1

PWAMT
Function as described in oscillator 1

PWMOD
Function as described in oscillator 1

OSCMIX
Function as described in oscillator 1

Oscillator submenu (SP)

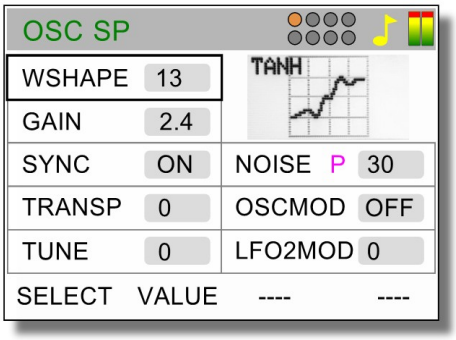
The oscillators have a common submenu which is marked with SP (stands for Subpage) in the menu bar. The "Shift" key takes you to the oscillator submenu. It contains various functions, e.g. the settings for synchronization, noise generator and waveshaper. On the following page all functions are described in more detail.

WSHAPE

WSHAPE

The waveshaper changes or distorts the shape of the set waveform. Complex spectra are created from simple tones. In this synthesizer we have not placed the waveshaper behind the oscillators as usual, but behind the filters. This way we achieve an additional distortion effect. With the parameter WSHAPE you can select a certain characteristic for the waveshaper.

The characteristic curve is displayed graphically in a small window on the right side of the display.



GAIN

With GAIN you can adjust the amount of distortion in the waveshaper. If the waveshaper is switched off, GAIN has no function.

SYNC

If SYNC is switched on , the oscillators are synchronized when a midi note is received.

TRANS

The TRANS parameter allows transposing the part from -12...+12 semitone steps.

TUNE

TUNE adjusts the fine tuning of the part.

NOISE

The synthesizer has a noise generator. With the NOISE control you can adjust the level and the coloring of the noise. A **W** in the menu stands for a white noise and a **P** for a pink noise. In the center position the noise generator is switched off.

OSCMOD

With OSCMOD different oscillator modulations can be set (see table).

Oszillator Modulation

OFF	Oscillator modulation is switched off
XOR	Ring modulation effect (similar to Korg MS20)
XMOD	Cross Modulation. Modulates one oscillator with the other, depending on the setting of the OSCMIX knob. Turning past center to the left increases the modulation of Oscillator 1 by Oscillator 2. Turning to the right increases the modulation of Oscillator 2 to Oscillator 1.
MOD	Digital MODULO operation of both oscillator outputs
AND	Digital AND operation of both oscillator outputs
OR	Digital OR operation of both oscillator outputs
FM	Ring modulation of oscillator 1 by oscillator 2

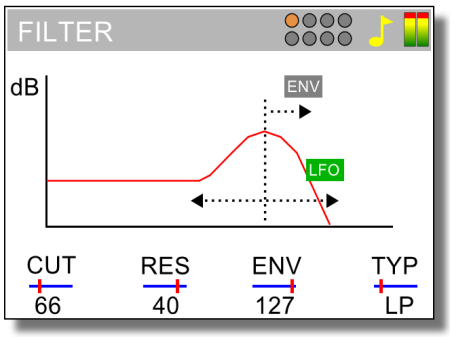
With the **OSCMIX** control in the oscillator menu the output of oscillator 1 or oscillator 2 can be mixed to the modulation output.

LFO2MOD

The LFOMOD parameter provides controllable pitch modulation of Oscillator 1 and Oscillator 2 through LFO 2 (Filter).

The filter

The synthesizer has a State Variable (Chamberlin) filter with 12dB/octave and adjustable resonance. Low-pass, high-pass and band-pass filters are available for selection.



CUT

With CUT you determine the cut-off frequency for the low-pass and high-pass filters or the center frequency for the band-pass filter.

RES

The resonance determines the boost of the frequencies in the range of the set cutoff frequency. Low settings make the sound more brilliant and high settings give the sound a typical filter character.

ENV

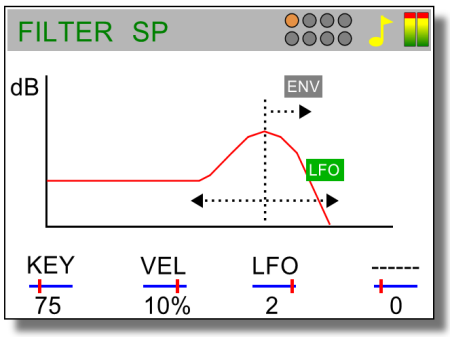
With ENV you determine the influence of the filter envelope on the filter frequency. With positive values, the filter frequency increases with the modulation excursion of the envelope. For negative values, the filter frequency falls accordingly. The display shows a visualization of the envelope and LFO value.

TYP

The TYPE parameter determines the filter type. You can choose between low pass (LP), high pass (HP) and band pass (BP). The TYPE control can be used to crossfade between lowpass and highpass. In the center position, a typical notch filter character results.

Filter submenu (SP)

Press the "**SHIFT**" key to enter the filter submenu. The SP in the heading indicates the subpage.



KEY

KEY sets the keytracking for the filter frequency. This determines how much the filter frequency depends on the played midi note. The setting +100% corresponds to a 1:1 scaling, i.e. if you play an octave on the keyboard, the filter frequency changes by the same amount.

VEL

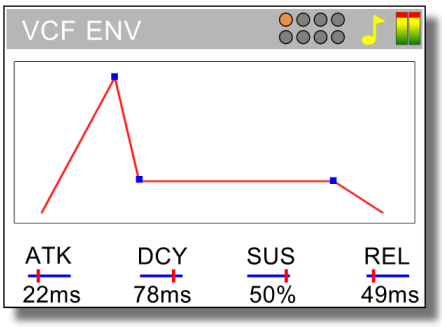
The Envelope Velocity parameter (VEL) determines the influence of the filter envelope on the filter frequency depending on the velocity of a midi note. The stronger the note velocity and the higher the VEL value, the greater the modulation of the filter frequency.

LFO

With the LFO parameter you determine the strength of the corner frequency modulation by the filter LFO. The display shows a visualization of the LFO value.

VCF Envelope

The filter envelope (VCF Envelope) allows to influence sound parameters by means of temporal progressions. The envelope values can be set from 0ms to a maximum of 11.9 seconds.



ATK

The attack time is the time it takes for the envelope signal to rise from zero to the maximum level. Long attack times result in a swelling sound (brass, strings), short attack times in a more percussive sound.

DCY

The decay time determines the time in which the envelope signal decreases from the maximum to the sustain level.

SUS

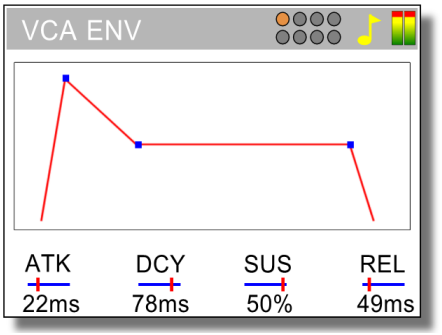
The sustain level indicates how high the envelope signal is (as a percentage of the maximum) while the keyboard key is held.

REL

As soon as the keyboard key is released, the release phase begins. In the release phase, the envelope signal drops from the current sustain level to zero in the set release time.

VCA Envelope

The amplifier envelope (VCA Envelope) is used to control the volume of a sound. It has no adjustable modulation intensity. The minimum value is always zero and the maximum value corresponds to the total volume set at the amplifier.



ATK

Attack determines the settling time from 0ms - 11.9 seconds for the volume envelope to rise from zero to maximum level.

DCY

The Decay value is a measure of the time it takes to reach the Sustain level.

SUS

The sustain level indicates how high the volume sustain level is (as a percentage of the maximum) while the keyboard key is held.

REL

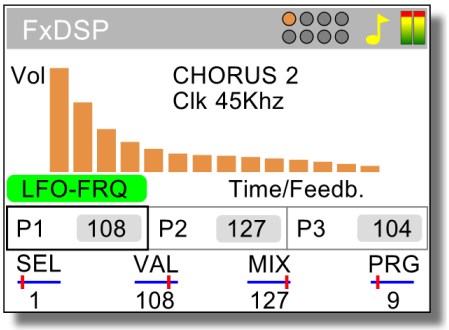
The time taken by the envelope from Note Off from the Sustain value back to zero.

AMP Envelope Submenu (SP)

VEL

With Velocity you determine how much the volume depends on the key velocity. This can be used to give the sound a stronger expression. In the system menu you can set a velocity curve for the velocity (see p. 22).

FxDSP Menu



The synthsizer has a **DSP effect module** with which you can use sound effects such as corus, reverb, echo or other effects. Each effect has adjustable parameters to adjust or change the effect.

The **FV-1 effect processor** is a programmable DSP designed for audio and effects applications. It has built-in 24bit AD/DA converters, making it easy to integrate into existing analog circuits.

The **FxDSP menu** has four controls for setting the effects.

SEL
SEL selects one of three effect parameters P1 - P3 and the clock rate of the effect processor. The effect parameters vary depending on the selected effect program. The respective parameter names are shown in the display when you select them with SEL.

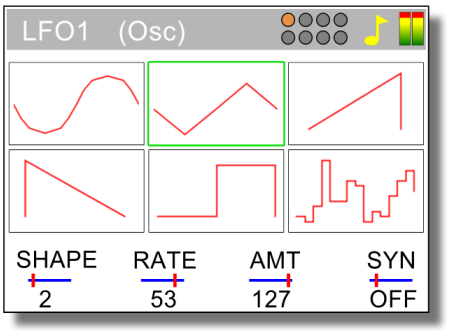
VAL
With VAL you can adjust the strength of the respective effect parameter. A bar graph visualizes the effect setting.

MIX
Determines the volume ratio of the original and effect signal. At setting 0, only the original signal is routed to the audio outputs, so that no effect is audible. At setting 127, the original signal + effect signal appears at the audio outputs.

PRG
Selection of an effect program. There are a total of 15 effect programs that you can set with the PRG knob. With setting 0 the effect is completely switched off.

CLK
CLK determines the clock rate of the effect processor. It can be set from 10KHz to a maximum of 60KHz. The change of the clock rate has e.g. influence on reverb and delay times.

LFO 1 Menu



The synthesizer has two low frequency oscillators (LFO) for modulation purposes in addition to the already existing two sound generating oscillators. Each LFO generates a periodic waveform with adjustable frequency and waveform. LFO 1 controls the pitch of the oscillators. There are four control parameters in total.

SHAPE
SHAPE lets you select one of six waveforms for LFO 1.

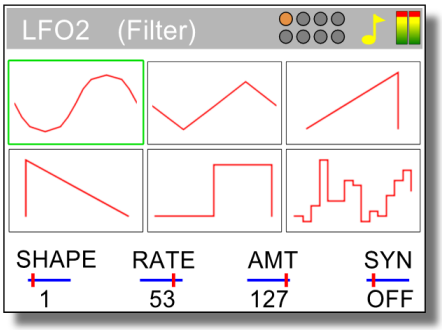
RATE
RATE determine the frequency of LFO 1. With small values the LFO needs some minutes for a complete run. With larger values the LFO oscillates up to a maximum of 40Hz.

AMT
This parameter determines the amount of modulation by LFO 1. If the value is set to 0, modulation by LFO 1 is disabled.

SYN
With SYN the LFO 1 is triggered. There are different settings (see table).

OFF	LFO 1 running free
0°	LFO 1 is restarted with keystroke at 0 degrees
180°	LFO 1 is restarted with keystroke at 180 degrees

LFO 2 Menu
LFO 2 is responsible for modulating the filter. The parameter settings are almost identical to LFO 1 and hardly differ. Only the SYN parameter has an additional function.



SHAPE
Function as described in LFO 1

RATE / DIV
Rate works as described in LFO 1. But if SYN is set to MIDI, then this parameter changes to DIV. With DIV the divider for the midi clock signal can be determined.

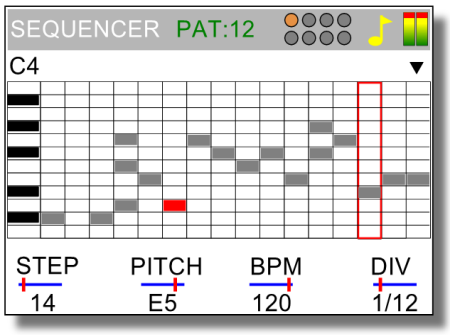
AMT
Function as described in LFO 1

SYN
With SYN the LFO 2 is triggered. There are different settings (see table).

OFF	LFO 2 running free
0°	LFO 2 is restarted with keystroke at 0 degrees
180°	LFO 2 is restarted with keystroke at 180 degrees
MIDI	LFO 2 is triggered via midi clock. With DIV the clock rate can be changed.

SEQUENCER Menu

The synthesizer has a polyphonic step sequencer with 16 steps and different playback modes e.g. forward, reverse and random. Notes can be recorded and edited directly in the sequencer editor using a midi keyboard. Furthermore, you can change the beat rate and the divider for the beat rate. The note volume (velocity) is also recorded.



STEP

Here you set the STEP position to be edited. In sequencer REC mode, you can record new notes from this position or switch a note off or on (mute). When you move over the steps, the notes are played for a short time. A display above the keyboard shows the corresponding note octave.

PITCH

With PITCH you can change the pitch of a step.

BPM

Sets the speed or playback sequence in BPM (beats per minute).

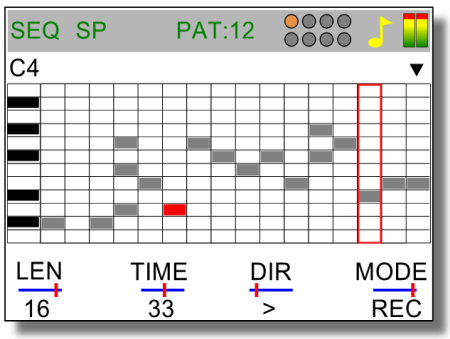
DIV

With the DIV control you determine the divider for the master clock (BPM setting).

1/2	Half note	**3/32**	Dotted sixteenth note
3/8	Dotted quarter note	**1/12**	Twelfth note (eight-note triplets)
1/3	Third note (semitone triplets)	**1/16**	Sixteenth note (the default value)
1/4	Quarter note	**1/24**	24th note (sixteenth note triplets)
3/16	Dotted eighth note	**1/32**	Thirty second note
1/6	Sixth note (quarter note triplets)	**1/48**	Forty-eighths (thirtieths triplets)
1/8	Eighth note		

SEQ submenu (SP)

The Sequencer submenu (SubPage) is accessed via the SHIFT key. Various functions can be activated here, e.g. setting the steps to be played or the note length in a step.
Furthermore, various functions for the sequencer operation can be set via the Mode control (see p. 21).



LEN

The LEN parameter determines the number of steps to be played. A small triangle above the grid indicates the end position of the sequencer loop. When the sequencer reaches the last step, the sequence is played from beginning to end or backwards, depending on how the running direction (DIR) is set (see p. 21).

TIME

With TIME (Gate-Time) you determine how long all notes should be held.

DIR

DIR determines the running direction and random step order in the sequencer. You can choose between Forward (>) or Reverse (<) as well as Forward and Reverse (<>) and Random Playback

(RND).

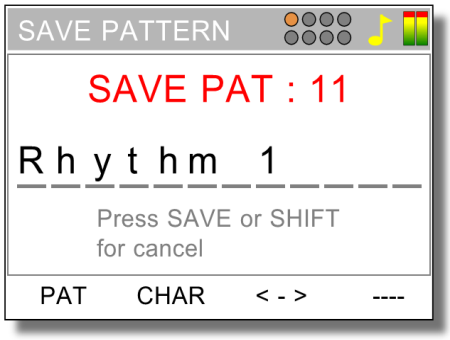
MODE

With MODE you can set various functions of the sequencer.

KEY	In KEY mode, midi notes can be received and played in parallel.
TRP	This function allows a transposition of the sequencer notes via a midi keyboard. The received midi notes are not played in the process.
REC	With REC the sequencer is in edit mode. Now the sequencer receives midi notes for a step with each keystroke. A maximum of four notes per step is possible. After releasing the key(s), the step automatically jumps to the next step. If you have played a wrong note in a step, you can go to the step with the STEP knob (1st sequencer page) and play it again or change the pitch with PITCH.

Load Sequencer Pattern

If you are in the sequencer editor you can load or save a sequencer pattern with the "Load/Save" button. If you press the button briefly, the Load menu is displayed. Now you can select one of 128 sequencer patterns with the PAT-knob. If the name field remains empty, either no pattern is available or the pattern was not given a name when it was saved. With the "Shift" key you can cancel the loading process.



Save Sequencer Pattern

To save a sequencer pattern, press and hold the "Load/Save" button in the sequencer menu for more than 3 seconds. Now the SAVE menu appears. Use the "PAT" control to select a memory location (1-128) for the new pattern. An existing pattern is displayed in the name field. Now you can enter a name or change an existing name with the two controls "CHAR" and " < - > ". To save the new pattern, press the "Load/Save" button again. If you have called up the SAVE menu by mistake, you can cancel the saving process by pressing the "Shift" key.

Saving Sequencer Patterns in the Sound Program

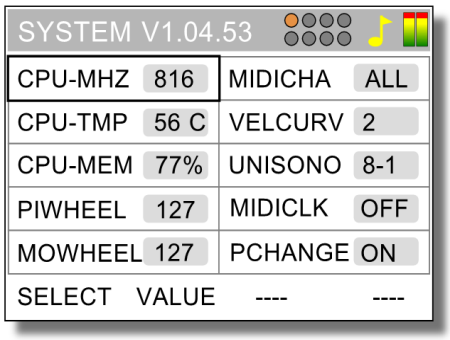
If you are outside the Sequencer Editor, it is possible to save the sequencer pattern as part of a sound program in a sound file.

This has the advantage that you can overwrite or delete old patterns in the sequencer editor without changing the sequencer pattern in the sound program.

If a sequencer pattern is present in the sound program, a green dot with an S is displayed to the right of the sound number on the main page.

SYSTEM Menu

The system menu informs you about some special processor data e.g. temperature, utilization of the audio buffer or processor clock rate. Furthermore you can set some global parameters for the synthesizer, which are described here in more detail.



MIDICHA

Determines the Midi receive channel. You can set the channels 1-16 and ALL. If MIDICHA is set to ALL (Omni-Mode), the synthesizer receives Midi data on all channels.

VELCURV

The Velucity Curve allows you to set the velocity for a keystroke. There are four curves to choose from.

1		Linear curve
2		Exponential curve
3		Steep exponential curve
4		Flat exponential curve

UNISONO

Different voice distribution in unison mode in planning

MIDICLK

Here the external midi clock signal can be switched on or off.

PCHANGE

The Program Change is a midi command to switch a sound program in the synthesizer. The reception of this midi command can be switched off with PCHANGE OFF to ignore the sound change command from another synthesizer.

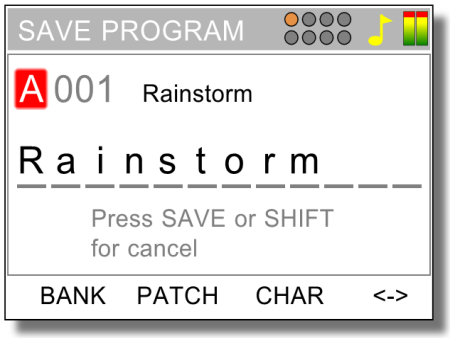
PIWHEEL

With PIWHEEL you determine the strength of the pitch wheel modulation by a connected keyboard or midi controller.

MOWHEEL

With MOWHEEL you determine the strength of the modwheel modulation by a connected keyboard or midi controller.

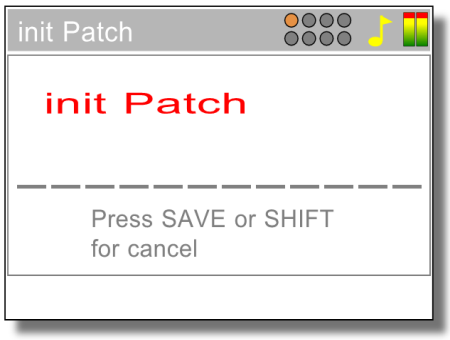
Save Sound Program



If you are outside the sequencer editor, you can save a sound program with the "**Load/Save**" key.
Press the "Load/Save" key , then the SAVE menu for a sound program is called up. The current program name is displayed in the menu. With the controls BANK and PATCH you can select another program place. If the selected program number is already occupied, the program name appears to the right of the program number. The program location is then overwritten.
With the two controls "**CHAR**" and " **< - >** " you can enter a program name or change an existing name. To save the new program, press the "Load/Save" key again. With the "**Shift**" key you can cancel the saving process.

Furthermore, in the Save menu you have the possibility to copy a selected sound program to another program location.
A total of 15 sound banks with 128 sound programs each are available for selection.

Init Sound Program



If you are outside the sequencer editor, you can initialize a sound program with a longer press (**> 3sec**) on the "**Load/Save**" key. This deletes all sound parameters including the sequencer data in the program memory and resets them to standard values (default). To confirm, you must press the "Load/Save" key a second time. With "**Shift**" you can cancel the function.

Please note that the "init Patch" function only deletes or initializes the data in the program memory and not any program data on the SD card. This only works in the Save menu.

Midi Controller Messages

0 - 63

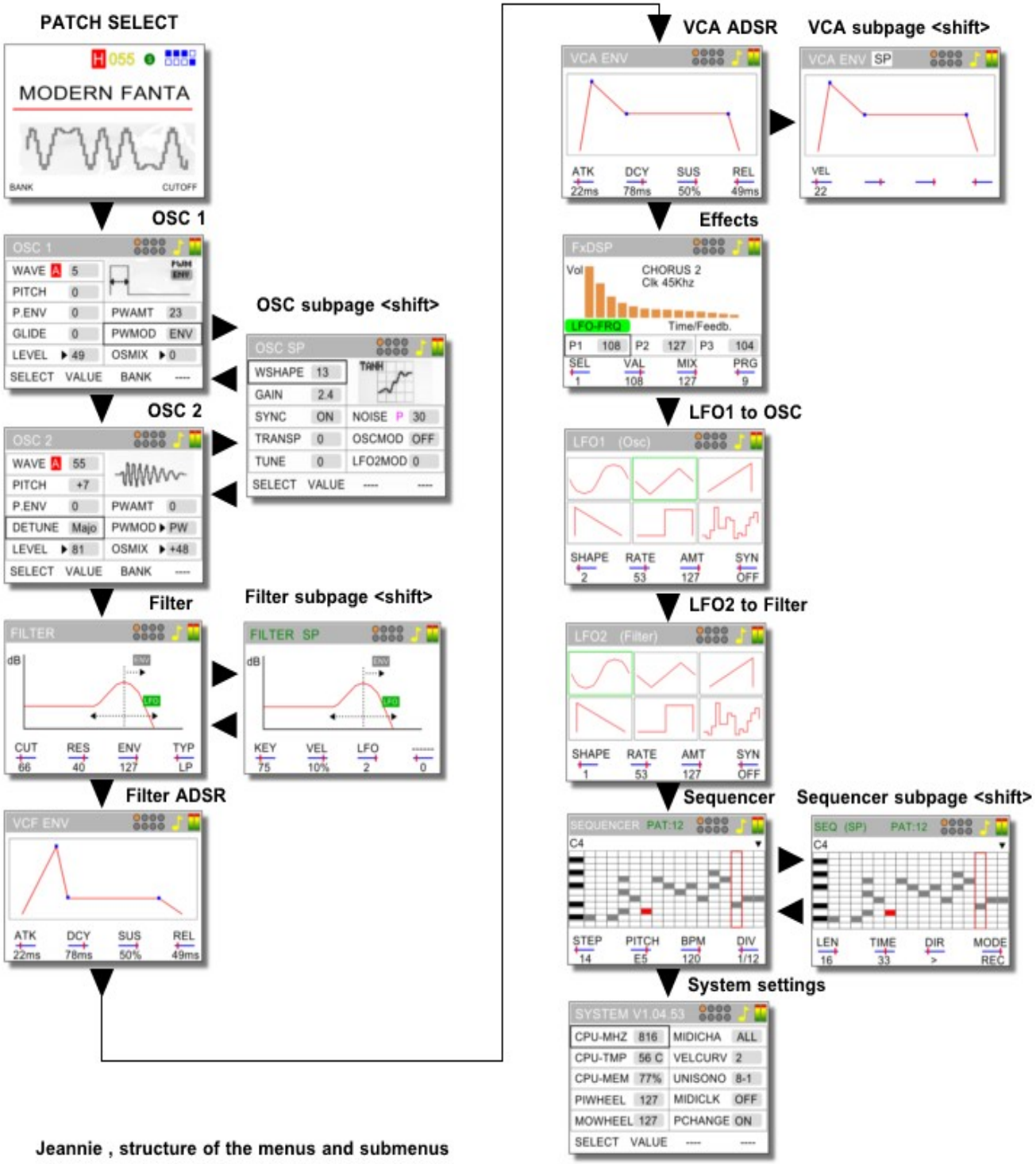
Midi CC	Controller	Midi CC	Controller
0	Bank select	32	
1	Mod Wheel	33	Program Change
2		34	
3	Pitch LFO	35	
4		36	
5	Glide	37	
6		38	
7	Osc1+2 Level	39	
8	OscMix	40	
9	Osc1 Wave Bank	41	
10	Osc2 Wave Bank	42	
11		43	
12		44	
13		45	
14	Osc1 Waveform	46	
15	Osc2 Waveform	47	
16	Filter Envelope	48	
17		49	
18		50	
19	Filter Type	51	
20		52	
21		53	
22		54	
23	Noise Level (0 White, 63 Off, 127 Pink)	55	
24		56	
25		57	
26	Osc1 Pitch	58	
27	Osc2 Pitch	59	
28	Osc1 Pitch Envelope	60	
29	Osc2 Pitch Envelope	61	
30		62	
31		63	

Midi Controller Messages

64 - 127

Midi CC	Controller	Midi CC	Controller
64		96	
65		97	
66		98	
67		99	
68		100	
69		101	
70		102	LFO1 Rate (Osc)
71	Filter Resonance	103	LFO1 Waveform (Osc)
72	AMP ENV Release Time	104	
73	AMP ENV Attack Time	105	
74	Filter Frequency (Cutoff)	106	
75	AMP ENV Decay Time	107	
76	LFO2 Rate (Filter)	108	
77	LFO2 Amount (Filter)	109	
78		110	
79	AMP ENV Sustain Level	111	
80	Filter ENV Attack Time	112	
81	Filter ENV Decay Time	113	
82	Filter ENV Sustain Level	114	
83	Filter ENV Release Time	115	
84		116	
85	Osc1 PWM Amounte (PWAMT)	117	
86	Osc2 PWM Amounte (PWAMT)	118	
87	PWM Rate (PWMOD)	119	
88		120	
89	Key Tracking	121	
90	LFO2 Waveform (Filter)	122	
91		123	
92		124	
93		125	
94	Detune	126	
95		127	

Structure of menus and submenus



Jeannie , structure of the menus and submenus

Technical data

Power supply

Supply voltage 12V DC

Maximum current consumption: 0.3 A

Maximum power consumption: 3.6 W

Dimensions and weight

Width: 200 mm

Depth: 115 mm

Height: 66 mm

Total weight: 0.22 kg

Temperature range

room temperature 10....35 °C

System TEMPERATURE Status max. 74 °C

Do not place on heater,

avoid direct sunlight

Connections

Midi IN / OUT - DIN 5 pin

Audio out 6.35 mm stereo jack plug

Power jack - 5.5 mm inner diameter , 2.1 mm pin diameter , center positive

Output level

U output max = +/- 6 V all voices and maximum overdriven

Have fun building and creating sounds

Rolf Degen

Andre' Laska

08.01.2022

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