FLAME

CHORD MACHINE 2 MODULE

MANUAL

Version 1.00

Content

1. Short description

The Chord Machine 2 consists of a chord generator, an arpeggiator and a quantizer.

The module creates up to five CV voices derived from one incoming CV signal, with a range of eight octaves. 42 preset plus 16 user chords with up to four voices are available for musical experiments.

Additionally these chords can alter between their first, second and third inversion, so all in all users get access to 232 chords, which are playable within 54 preset and 15 user scales.

In addition you can transpose chords, scales and arpeggios via a CV input.

The fifth voice of the Chord Machine 2 is intended as an arpeggiator, which can run in several directions and octave ranges. Alternatively this channel can also be used as a quantizer. Setups can be saved in extensive program lists.

2. Hardware / Connections

2.1 Connection to the modular system (Doepfer bus)

The module is delivered with a connected ribbon cable for the Doepfer bus. The red lead marks -12 volt. Connecting the module please note the right polarity!

If the module is poled accidentally wrong safety diodes avoid the immediate destruction of the module but further damages cannot be excepted.

So please pay attention: Check the connection various times before switching on!

2.2 Modul overview

2x16 character display

keyboard

key SHIFT

3x CV-inputs (0..+10v)

CV-outputs chord 4 notes (0..+8v)

CHORD MACHINE 2
QUANTIZER – ARPEGGIATOR

FLAME
CHORD MACHINE 2

∧ CURSOR ∨   < OCTAVE >

CHORD   SCALE   KEYNOTE PROGRAM SETUP ARPEGGIO SAVE

MAIN/SHIFT

VALUE/MENU

PROGRAM   TRANSPOSE   INPUT   CLOCK   TRIGGER

CHORD OUT

1   2   3   4   ARP/Q

FLAME

dial knob with push button

trigger output (0/+10v)

clock input (0/+5v)

CV-output arpeggiator or quantizer (0..+8v)

3. FUNCTIONS

3.1 MENU OVERVIEW

Selecting the MENUs:
Hold SHIFT and press the respective menu button.

CHORD	load or edit a chord and choose its inversion
SCALE	load or edit a scale
KEYNOTE	choose keynote, show CV input transpose
PROGRAM	show or edit list parameters
SETUP	Tune Mode, Autoload
ARPEGGIO	choose the arpeggio function, which gets modulated by the CV INPUT
SAVE	save your data: settings, user chords, user scales, list

3.2 CHORD MENU

Selecting the MENU:
press SHIFT + CHORD (Key "C") to select

```
CHORD    root   P47
         MAJOR sus 2
```

The display shows the currently chosen, hence active, chord (plus inversion). Turning the DIAL potentiometer loads a new preset or user chord. The chord is shown as programmed in the LIST, with its defined keynote, inversion and transposition. Choose your own chord by pressing a maximum of 4 keys. If you press more, the highest key will be deleted automatically. If you want to save your chord press SHIFT + SAVE, go to menu SAVE CHORD and save it to one of the 16 user-defined slots

The mini keyboard's octave range can be shifted up to 4 octaves by pressing SHIFT + OCTAVE + L/R

Look out!
If you should change the respective row of the (cv) playlist - for instance via the program cv input - the chord of that new row will be loaded and your settings are lost

3.3 CHORD MENU - Inversions

While in the CHORD menu press SHIFT + CURSOR in order to change the inversions.
Look out: a recently edited but unsaved chord will be loaded again and inverted!

root	root setting
1st	1st inversion
2nd	2nd inversion
3rd	3rd inversion

ROOT:
In its initial state the first and lowest note of the chord is its root note (red dot), which will be emitted from the first cv output.
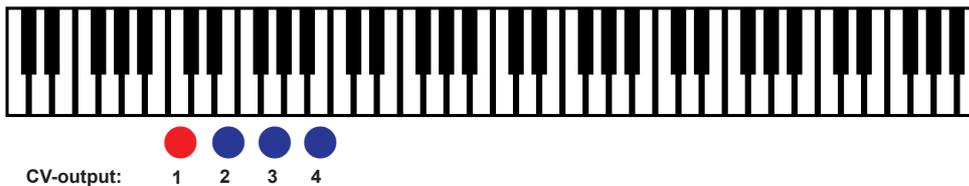
1st:
The first inversion transposes the root note (red dot!) up one octave, the chord shifts and starts with its second note which is also the lowest.
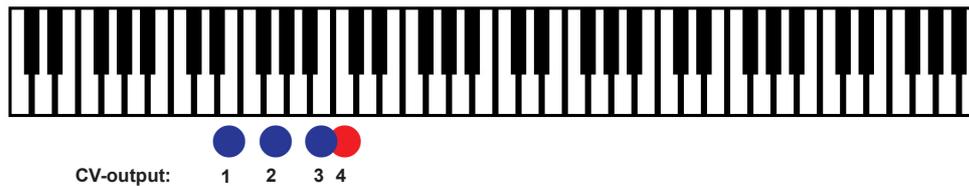
2nd:
The second inversion transposes the first & second note up one octave, the chord shifts again and the 3rd note becomes the lowest.
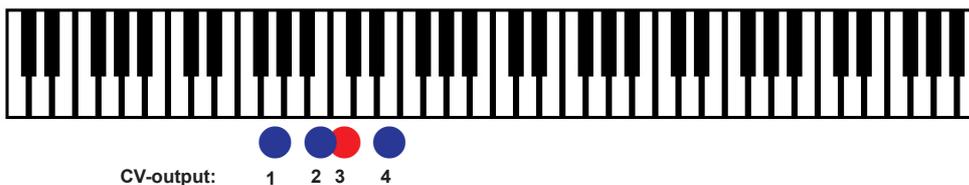
3rd:
The third inversion transposes the first 3 notes up one octave and the chord now starts with the fourth note.
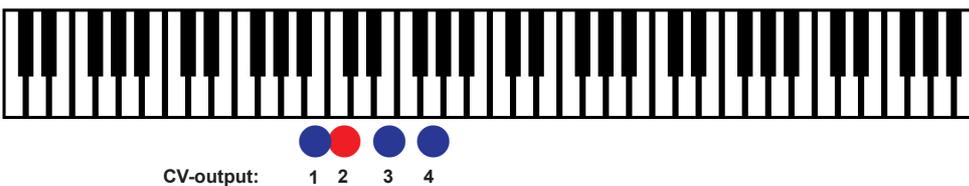
Look out! If you should change the respective row of the (cv) playlist - for instance via the program cv input - the inversion of the chord as saved in the list / row will be loaded.

3.4 SCALE MENU

Selecting the MENU:
press SHIFT + SCALE to select the menu

```
SCALE              P47
                PENTATONIC
```
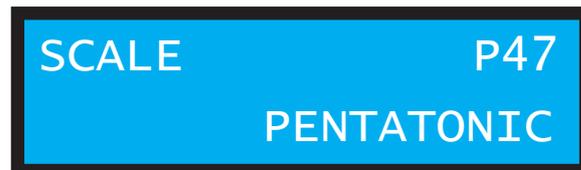
The display shows the currently chosen scale. Turning the DIAL knob will load a new preset- or user scale. The chosen scale is shown with the transposed root note as saved in the list.

If you want to create your own scale just press the according notes on the keyboard. A scale exists of a maximum of 12 notes. If you should press more than 12 notes, the highest note will be deleted automatically. If you want to save your scale press SHIFT + SAVE, go to the menu SAVE SCALE and save your scale to one of the 16 user defined slots.

The octave range of the mini keyboard can be shifted for four octaves by pressing SHIFT + OCTAVE & L/R.

Look out! If you should change the respective row of the (cv) playlist - for instance via the program cv input - the scale of that new row will be loaded and your settings are lost.

3.5 KEYNOTE MENU (Root note)

Selecting the MENU:
to select press SHIFT + KEYNOTE

```
KEYNOTE:          C
TRANSPOSE:      +00
```

The display shows the root note of the current cv playlist's row.
Press a key in order to change the root note or to play live.
You can instantly hear the chord and scale changing.

The lower row shows the value of transposition via the TRANSPOSE CV-input

Look out! If you should change the respective row of the (cv) playlist - for instance via the program cv input - the root note of the respective (cv playlist) row will be loaded and your settings are lost.

3.6 PROGRAM MENU (EDIT LIST)

Selecting the MENU:
To select press SHIFT + PROGRAM.

The PROGRAM MENU is the main menu of the module.
The main settings for chords, the arpeggiator and the quantizer will be defined and saved here.
This data is saved in a list with a maximum of 24 rows.
This list works like a playlist and each row can be addressed directly or sequentially via the CV-input PROGRAM. A list can have 1 to 24 rows.

List row
01..24

loaded list
A..L

```
LIST:A01    CHORD
<#C0> root   P27
```

submenu NAME

values

the value
in brackets
can be edited
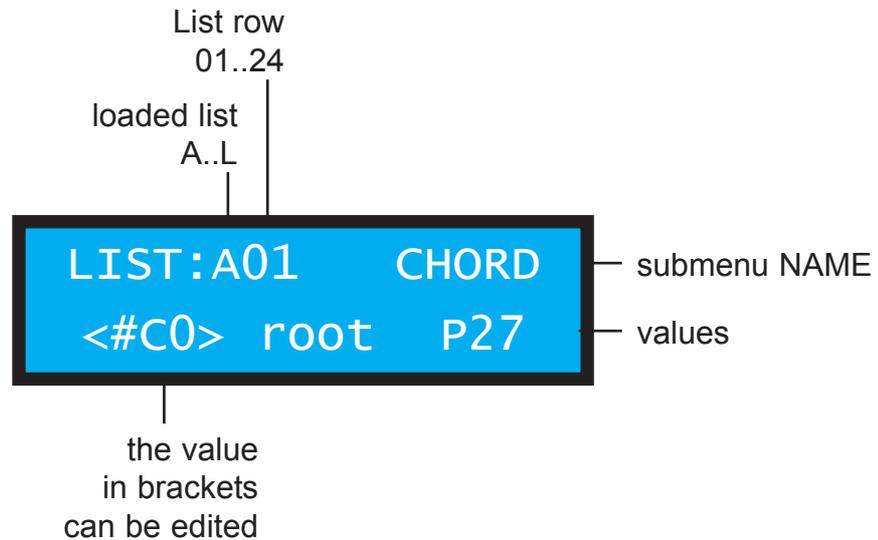
In order to change the parameter (shown in brackets) press the OCTAVE keys and use the DIAL knob to change its value. Use the CURSOR keys to change the row and press SHIFT+CURSOR in order to switch to a different list.

Look out:
Make sure you save your setting in the submenu SAVE LIST before you select a different list or all changes will be lost!

LIST WORKFLOW

	Chord values			Mode		Arp/Q values			global values	
	Keynote	Inversion	Chord	Arpeggio Quantizer	Transpose	Chord Scale	Direction Transpose	Divider Scale	List length	List select
1										
rows	⋮		⋮			⋮				
24										

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CHORD SETTINGS (OUTPUT 1-4)
> pay attention to the brackets!

ROOTNOTE / OCTAVE CHORDS & SCALES
The global root note for chords & scales
can be set here

```
LIST:A01    CHORD
<#C0> root   P27
```

CHORD INVERSION
Here you can choose your inversion:
root, 1st, 2nd, 3rd

```
LIST:A01    CHORD
 #C0 <root>  P27
```

CHORD NUMBER
Change your chord here:
P stands for preset, U for user defined.

```
LIST:A01    CHORD
 #C0   root <P27>
```

ARP/Q MODE
Here you can define how the ARP/Q channel behaves:

CHORD ARPEGGIO
The ARP/Q output emits the same chord as
outputs 1-4. Via the CV **INPUT** you can control the
arpeggio (see page 13).

```
LIST:A01    ARP/Q
<chord Arpeggio>
```

SCALE ARPEGGIO
The ARP/Q output emits a scale, which can be
defined by the following parameters. Via the CV
INPUT you can control the arpeggio (see page 13).

```
LIST:A01    ARP/Q
<scale Arpeggio>
```

STABLE QUANTIZER
The ARP/Q output emits the quantized voltage from
the CV **INPUT**. The quantization happens
permanently (1ms) and with every new quantized
value the trigger output will emit a short trigger.

```
LIST:A01    ARP/Q
<stabl.Quantize>
```

CLOCK QUANTIZER
The ARP/Q output emits the quantized voltage
present at the CV **INPUT**. Notes only get quantized
if there's a clock coming into the CLOCK IN.
The same clock will also be emitted via the
TRIGGER OUT.

```
LIST:A01    ARP/Q
<clock Quantize>
```

CHORD ARPEGGIO PARAMETERS

TRANSPOSITION
transpose the arpeggio in addition to the root note

```
LIST:A01 ARPEGIO
<+00> chord P27
```

CHORD NUMBER
This is the number of the chord for output 1-4, which can be changed here..

```
LIST:A01 ARPEGIO
+00   chord<P27>
```

SCALE ARPEGGIO PARAMETERS

TRANSPOSITION
transpose the arpeggio in addition to the root note

```
LIST:A01 ARPEGIO
<+00> scale P27
```

SCALE NUMBER
Here you can choose the scale emitted from the ARP/Q output.

```
LIST:A01 ARPEGIO
+00   scale<P27>
```

CHORD / SCALE ARPEGGIO PARAMETERS

DIRECTION
Define the arpeggio's direction here:
up   - up
down - down
alt1   - up & down without repeating the highest note
alt2   - up & down with repetition of the first and last note (2 more notes!)
rnd   - random notes from the chosen scale or chord

```
LIST:A01 ARPEGIO
DIR<alt1>DIV:no
```

DIVIDER
You can divide the arpeggiator's internal CLOCK:

no   - divider is set to off
2-32 - value of division

```
LIST:A01 ARPEGIO
DIR:alt1 DIV<no>
```

QUANTIZER SETTINGS

The quantizer quantizes the voltage preset at the INPUT. You can choose two separate scales (or transpositions) for the increasing and decreasing voltage.

TRANSPOSITION SCALE UP
The quantizer's scale gets transposed UP in addition to the root note.

```
LIST:A01    QUANT
<+00>↑scale:P01
```

SCALE UP
Sets the scale which gets emitted via the ARP/Q output. This scale will be used while voltage at the INPUT increases.

```
LIST:A01    QUANT
+00 ↑scale<P01>
```

TRANSPOSITION SCALE DOWN
The quantizer's scale gets transposed DOWN in addition to the root note.

```
LIST:A01    QUANT
<+00>↓scale:P01
```

SCALE DOWN
Sets the scale which gets emitted via the ARP/Q output. This scale will be used while voltage at the INPUT decreases.

```
LIST:A01    QUANT
+00 ↓scale<P01>
```

GLOBAL PLAYLIST PARAMETERS

These are once per list settings!
(in contrary to row parameters, which can vary with each row)

LIST LENGTH
Define the last row which can be addressed via the CV PROGRAM input here. For instance: a value of **"2"** means you'd switch between row 1 and 2.

```
LIST:A01   LENGHT
            <24>
```

SELECT LIST (via PROGRAM Input)
Here you can define the way the rows within the cv playlist are getting addressed.

direct per CV
the rows can be chosen directly with 1v/Oct.

```
LIST:A01   SELECT
 direct per CV
```

step by step
The rows are addressed sequentially as per the clock impulse present at the program input. The LED flashes with each clock impulse received..

```
LIST:A01   SELECT
 step by step
```

3.7 SETUP MENU

Selecting the MENU:
Press SHIFT + SETUP

The SETUP menu contains two sub menus: TUNE-MODE and AUTOLOAD.

You can switch between these sub menus with OCTAVE L/R.

TUNE-MODE

TUNE-MODE is utilised when the 1V/octave scaling and 0V offset for the 5 cv outs gets calibrated with the trim pots. In standard mode this has to be set to **OFF** !

```
SETUP   TUNE-MODE
Set CV-OUTs: off
```

Within TUNE-MODE all 5 CV outs will emit a fixed voltage in steps of 1V at once.

When set to 0V, the measured output voltage has to be calibrated to 0V with the trim pot of the respective output.

```
SETUP   TUNE-MODE
Set CV-OUTs: +0v
```

For +1V to +8V settings the channel's output gets calibrated in 1V steps.
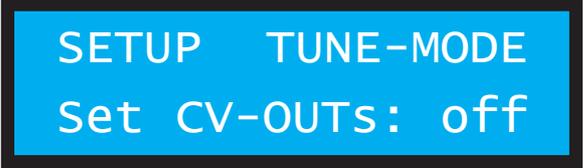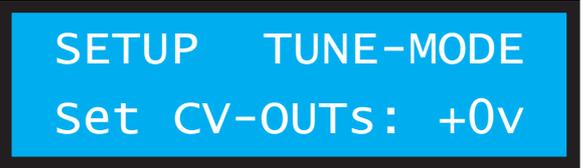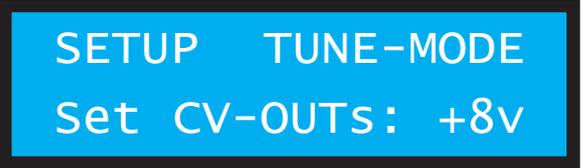
```
SETUP   TUNE-MODE
Set CV-OUTs: +8v
```

AUTOLOAD

Define which list (A to L) will be loaded after powering up the module.

You can either automatically load the most recently saved list ...
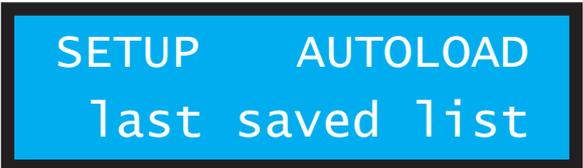
```
SETUP    AUTOLOAD
last saved list
```

...or you can choose a specific list from A to L.

```
SETUP    AUTOLOAD
        List: A
```

Make sure you save the AUTOLOAD settings in the menu SAVE SETTINGS !

3.8 ARPEGGIO MENU

In this menu you can adjust the arpeggio's behaviour when getting addressed with CV at the INPUT.

Selecting the MENU:
Press SHIFT + ARPEGGIO

Change the settings with the DIAL knob.

Make sure you save your changes in the SAVE SETTINGS menu!

The following settings are possible:

OCTAVE RANGE
With increasing CV (1V steps) the arpeggio runs over several octaves.

```
ARPEGGIO    INPUT
     Octave Range
```

OCTAVE TRANSPOSE
With increasing CV (1V steps) the arpeggio gets transposed in octaves. The arpeggio only loops once in the respective octave.

```
ARPEGGIO    INPUT
Octave Transpose
```

OCTAVE RANGE 1 + DIRECTION
With increasing CV (1V steps) the arpeggio runs over one octave and then changes its direction.

```
ARPEGGIO    INPUT
 1-Oct Direction
```

OCTAVE RANGE 2 + DIRECTION
With increasing CV (1V steps) the arpeggio runs over two octaves and then changes its direction.

```
ARPEGGIO    INPUT
 2-Oct Direction
```

OCTAVE RANGE 3 + DIRECTION
With increasing CV (1V steps) the arpeggio runs over three octaves and then changes its direction.

```
ARPEGGIO    INPUT
 3-Oct Direction
```

3.9 SAVE MENU

Selecting the MENU:
Press SHIFT + SAVE

Here your settings will be saved permanently.

Switch between the sub menus with OCTAVE L/R.

Save settings for:
ARPEGGIO-INPUT, AUTOLOAD

```
SAVE      SETTINGS
Press key CHORD!
```

Save the currently active chord to one of the
16 user defined slots.
Choose the slot with the DIAL knob.

```
SAVE CHORD > U01
Press key CHORD!
```

Save the currently active scale to one of the
16 user defined slots.
Choose the slot with the DIAL knob.

```
SAVE SCALE > U01
Press key CHORD!
```

Save the currently active list to one of the
12 slots from A to L.
Choose the slot with the DIAL knob.

```
SAVE      LIST > B
Press key CHORD!
```

In order to save press CHORD!

The display shows:
please wait !

```
SAVE      LIST > B
Please wait !
```

and confirms the successful saving with:
STORAGE OK !

```
SAVE      LIST > B
STORAGE OK !
```

and switches back to its previous state.

```
SAVE      LIST > B
Press key CHORD!
```

4. ARPEGGIATOR

4.1 Clock and direction

A scale or the chord for outputs 1-4 are serially emitted via the arpeggio CV output.
A clock impulse at the CLOCK input will serially send those values to the ARP/Q out.

The direction is defined within the LIST settings or can be modulated with CV.

There are 5 possible directions:

UP   - up
DOWN   - down
ALT1   - UP and DOWN without repeating the highest note
ALT2   - UP and DOWN with repetition of the highest and lowest note (2 more notes!)
RND   - Random

The CV of the ARP/Q is linked to the clock, hence a new chord selection will only become active with a new clock impulse received.

There are even more variations, all controllable via the CV INPUT.

Find more detailed information on page 13 in the chapter ARPEGGIO MENU .

5. List of preset chords and scales

5.1 Preset chords

NR	NAME	notes	chord
P01	UNISONO	3	0,0,0,0
P02	OCTAVES 1	4	0,12,0,12
P03	OCTAVES 2	3	0,12,24,0
P04	OCTAVES 3	4	0,12,24,36
P05	FIFTH 1	2	0,7,0,7
P06	FIFTH 2	4	0,7,14,21
P07	FOURTH 1	2	0,5,0,5
P08	FOURTH 2	4	0,5,10,15
P09	THIRD maj1	2	0,4,0,4
P10	AUGMENTED	3	0,4,8,12
P11	THIRD min1	2	0,3,0,3
P12	DIMINISHED	3	0,3,6,12
P13	MINOR add9	4	0,3,7,14
P14	MINOR 7/11	4	0,3,10,17
P15	MINOR 7 b5	4	0,3,6,10
P16	MINOR 7/9	4	0,3,10,14
P17	MINOR maj7	4	0,3,7,11
P18	MINOR b5	3	0,3,6,12
P19	MINOR 7	4	0,3,7,10
P20	MINOR 6	4	0,3,7,9
P21	MINOR	3	0,3,7,12
P22	MAJOR	3	0,4,7,12
P23	MAJOR 6	4	0,4,7,9
P24	MAJOR 7	4	0,4,7,10
P25	MAJOR maj7	4	0,4,7,11
P26	MAJOR sus4	3	0,5,7,12
P27	MAJOR sus2	3	0,2,7,12
P28	MAJOR 6/9	4	0,4,9,14
P29	MAJOR #5	3	0,4,8,12
P30	MAJOR b5	3	0,4,6,12
P31	MAJOR 7/4	4	0,5,7,10
P32	MAJOR 7 #5	4	0,4,8,10
P33	MAJOR 7 b5	4	0,4,6,10
P34	MAJOR 7/9	4	0,4,11,14
P35	MAJOR 7 b9	4	0,4,11,13
P36	MAJOR 7 #9	4	0,4,11,15
P37	MAJOR add9	4	0,4,7,14
P38	MAJ 7/9/11	4	0,11,14,17
P39	MAJOR 7/13	4	0,11,16,21
P40	MAJ 7/9/13	4	0,11,14,21
P41	MAJOR 7b11	4	0,4,11,18
P42	UNISONO	3	0,0,0,0
U01-U16	User chords	1..12	

5.2 Preset scales

NR	NAME	notes	scale
P01	Agerian	8	0,2,3,5,6,7,8,11
P02	Arabian	6	0,1,4,5,7,8
P03	Balinesian	5	0,1,3,7,8
P04	Blues major	6	0,3,4,7,9,10
P05	Blues minor	6	0,3,5,6,7,10
P06	Byzantine	7	0,1,4,5,7,8,11
P07	Chromatic	12	0,1,2,3,4,5,6,7,8,9,10,11
P08	Diatonic	5	0,2,4,7,9
P09	Double Harmonic	7	0,1,4,5,7,8,11
P10	Enigmatic	7	0,4,8,11,1,6,10
P11	Egyptian	5	0,2,5,7,10
P12	Hindustan	7	0,2,4,5,7,8,10
P13	Hungarian major	7	0,3,4,6,7,9,10
P14	Hungarian minor	7	0,2,3,6,7,8,11
P15	Japan: hira-yoshi	5	0,2,3,7,8
P16	Japan: iwato-yoshi	5	0,1,5,6,10
P17	Japan: kumoi-yoshi	5	0,1,5,7,8
P18	Japan: insen	5	0,1,5,7,10
P19	Japan: yosen	5	0,1,5,7,10
P20	Japan: ritsusen	5	0,2,5,7,10
P21	Japan: ryosen	5	0,2,4,7,9
P22	major Locrian	7	0,2,4,5,6,8,10
P23	super Locrian	7	0,1,3,4,6,8,10
P24	Lydian minor	7	0,2,4,6,7,8,10
P25	Minor harmonic 1	7	0,2,3,5,7,8,11
P26	Minor harmonic 2	7	0,1,3,5,6,9,10
P27	Minor harmonic 3	7	0,2,4,5,8,9,11
P28	Minor harmonic 4	7	0,2,3,6,7,9,10
P29	Minor harmonic 5	7	0,1,4,5,7,8,10
P30	Minor harmonic 6	7	0,3,4,6,7,9,11
P31	Minor harmonic 7	7	0,1,3,4,6,8,9
P32	Minor melodic	7	0,2,3,5,7,9,11
P33	Mode: Ionian/Maj	7	0,2,4,5,7,9,11
P34	Mode: Dorian	7	0,2,3,5,6,9,10
P35	Mode: Phrygian	7	0,1,3,5,7,8,10
P36	Mode: Lydian	7	0,2,4,6,7,9,11
P37	Mode: Mixolydian	7	0,2,4,5,7,9,10
P38	Mode: Aeolian	7	0,2,3,5,7,8,10
P39	Mode: Locrian	7	0,1,3,5,6,8,10
P40	Neapolitan major	7	0,1,3,5,7,9,11
P41	Neapolitan minor	7	0,1,3,5,7,8,11
P42	Nine Tone	9	0,2,3,4,6,7,8,9,11
P43	Octatonic	8	0,1,3,4,6,7,9,10
P44	Oriental	7	0,1,4,5,6,9,10
P45	Overtone	7	0,2,4,6,7,9,10
P46	Pelog	5	0,1,3,7,8
P47	Pentatonic	5	0,2,5,7,9
P48	major Pentatonic	5	0,2,4,7,9
P49	minor Pentatonic	5	0,3,5,7,10
P50	Prometheus	5	0,2,4,6,10
P51	Spanish	7	0,1,4,5,7,8,10
P52	Symmetrical	8	0,1,3,4,6,7,9,10
P53	Wholetone	6	0,2,4,6,8,10
P54	leading Wholetone	7	0,2,4,6,8,10,11

U01-U16 User scales   1..12

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6. PATCH EXAMPLES

Four voice chord
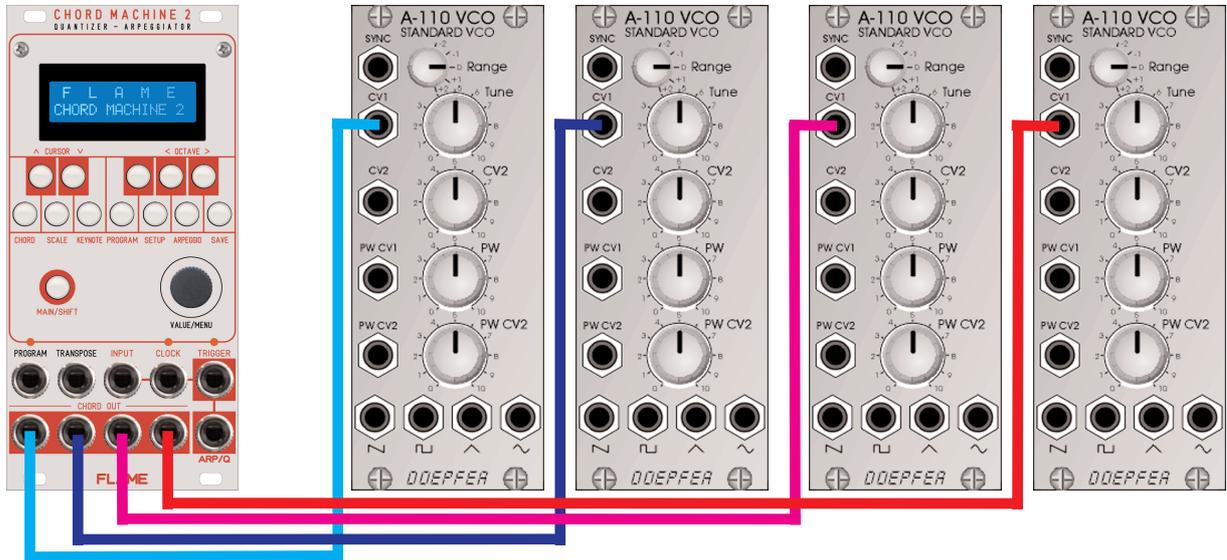
4 x single VCO

Arpeggio voice

CLOCK
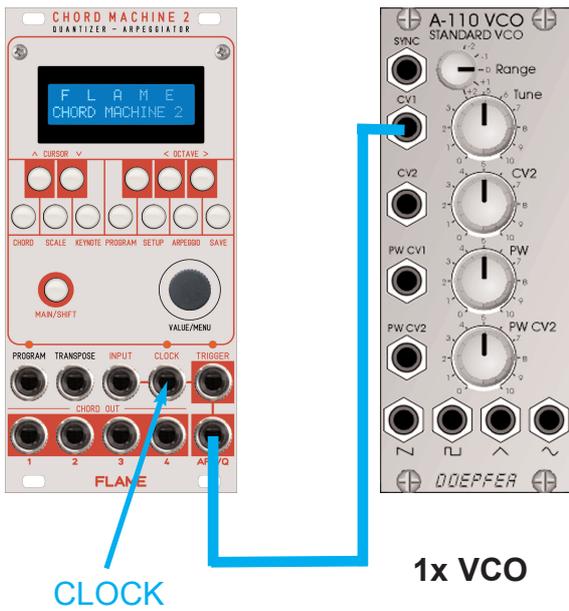
1x VCO
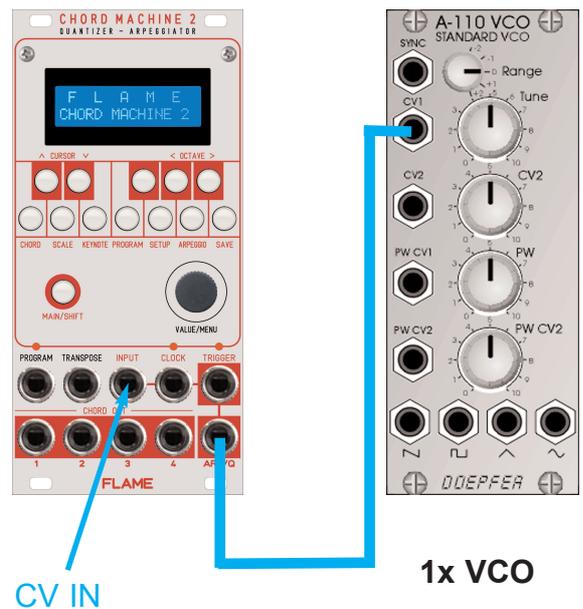
Quantizer

CV IN

1x VCO

7. Appendix

Technical details

Connections:
Ribbon cable adapter for Doepfer bus +/-12Volt
Input PROGRAM: Trigger or CV input program list 0..+10v
Input TRANSPOSE: CV input transpose 0..+10v
Input INPUT: CV input of Arpeggiator/quantizer channel 0..+10v
Input CLOCK: Trigger or CV input of Arpeggiator/quantizer channel 0..+10v
OUT TRIGGER: Trigger output quantizer 0/+10v
OUT 1-4:   CV output chord each note 0..+8v
OUT ARP/Q: CV output arpeggio or quantizer 0..+8v

All CV inputs with 100Kohm impedance.
All outputs are calibrated for 1v/Oct inputs with100Kohm impedance (0..+8v).

Current consumption: ca. +140mA / -20mA
Size: Euro Format 3U / 12HP 60,2 x 128,5 mm

Warrenty

Beginning from the date of purchase a 2-year warranty is guaranteed for this device in case of any manufacturing errors or other functional deficiencies during runtime.The warranty does not apply in case of:
- damage caused by misuse
- mechanical damage arising from careless treatment (dropping, vigorous shaking, mishandling, etc)
- damage caused by liquids penetrating the device
- heat damage caused by overexposure to sunlight or heating
- electric damage caused by improper connecting
  (wrong power supply/ jacks/ MIDI connections/ voltage problems).
If you have any complaints please contact your dealer or send an e-mail to:
service@flame.fortschritt-musik.de

Terms of production conformity: CE, RoHS, UL

Disposal

The device is produced with RoHS-conformity (subject to the regulations of the European Union) and is free of hazardous substances (like mercury, plumb, cadmium and hexavalent chrome). But electronical scrap is hazardous waste. Please don't add this to consumer waste. For an environment friendly disposal of waste please contact your distributor or specialist dealer.

Support Updated and additional informations, updates, downloads and more see:
http://flame.fortschritt-musik.de

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