FLAME

CHORD MACHINE MODULE
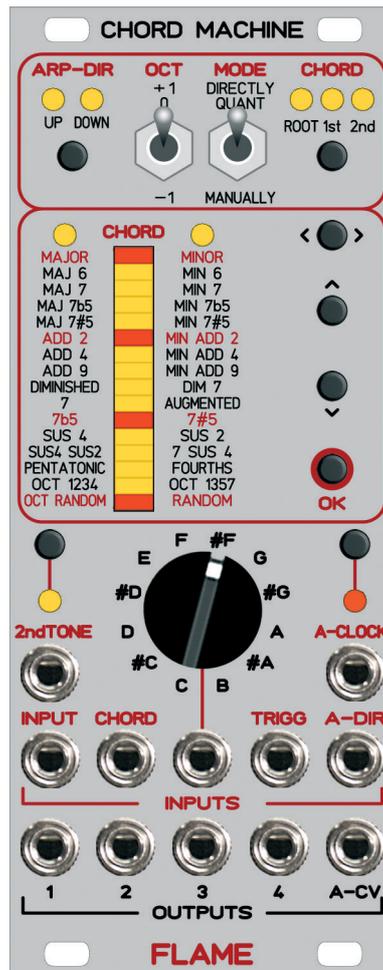
MANUAL

Version 1.00

Content

1. Short description

The module generates maximum four part chords within a range of maximum 9 octaves. To your disposal are 32 chords in 2 banks which can be put additionally into the first or second inversion. As a further variation the respective second note of the set chord (CV gate 2) can be transposed down about one octave. So in total there are 192 chords to your disposal.

The module can be used for the generation of 2 -note, 3-note or 4-note chords plus a fifth arpeggio voice. You have 3 operating modes for manual calibrations plus quantized or not quantized control via CV inputs.

The notes of the chord can be spread sequentially via the separate arpeggio output. Via the CV input the arpeggio can be spread or be put into scale mode (quantizer).
The arpeggio can be played in all three modes.

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!

Attention: Please check the correct connection several times before switching-on the module!

PLease note!!
The miniature precision ruler at the board is adjusted exactly to the correct justification of the reference voltage for the AD and DA converter. It must not be readjusted! The module would not more run precisely. A probably to big voltage could also damage the circuits.
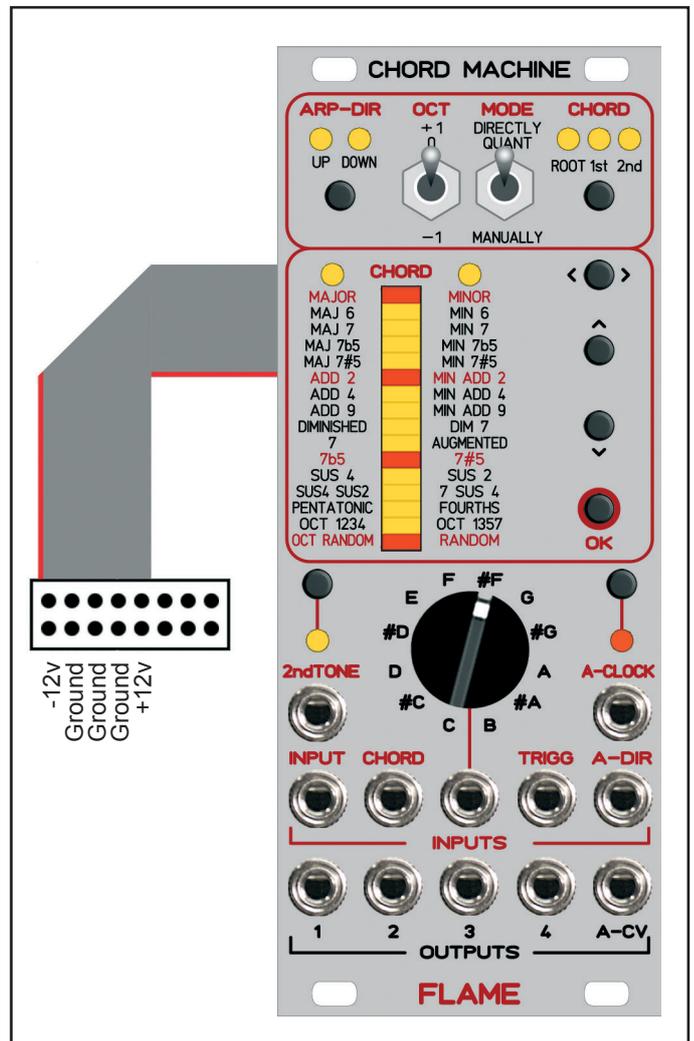
2.2 Module overview

❶ LEDs/button Arpeggiator play mode

❷ switch OCT (octaves)

❸ switch MODE

❹ LEDs/button chord variations

❺ LEDs chord bank left/right
    LEDs chords

❻ button <> select chord bank
    button select chord up/down
    button OK

❼ button/LED/input 2ndTone

❽ rotary switch KEYNOTE manually

❾ button Step Arpeggio manually

❿ LED Step Arpeggio

⓫ Clock input Step Arpeggio

⓬ Clock input Arpeggio direction

⓭ CV INPUT chord spread / quantizer

⓮ CV CHORD input for chord select

⓯ CV TRANSPOSE input
    (Keynote/Octaves/directly)

⓰ Trigger input OK

⓱ CV outputs 1..4 (chord notes 1..4)

⓲ CV output A-CV (arpeggiator note)
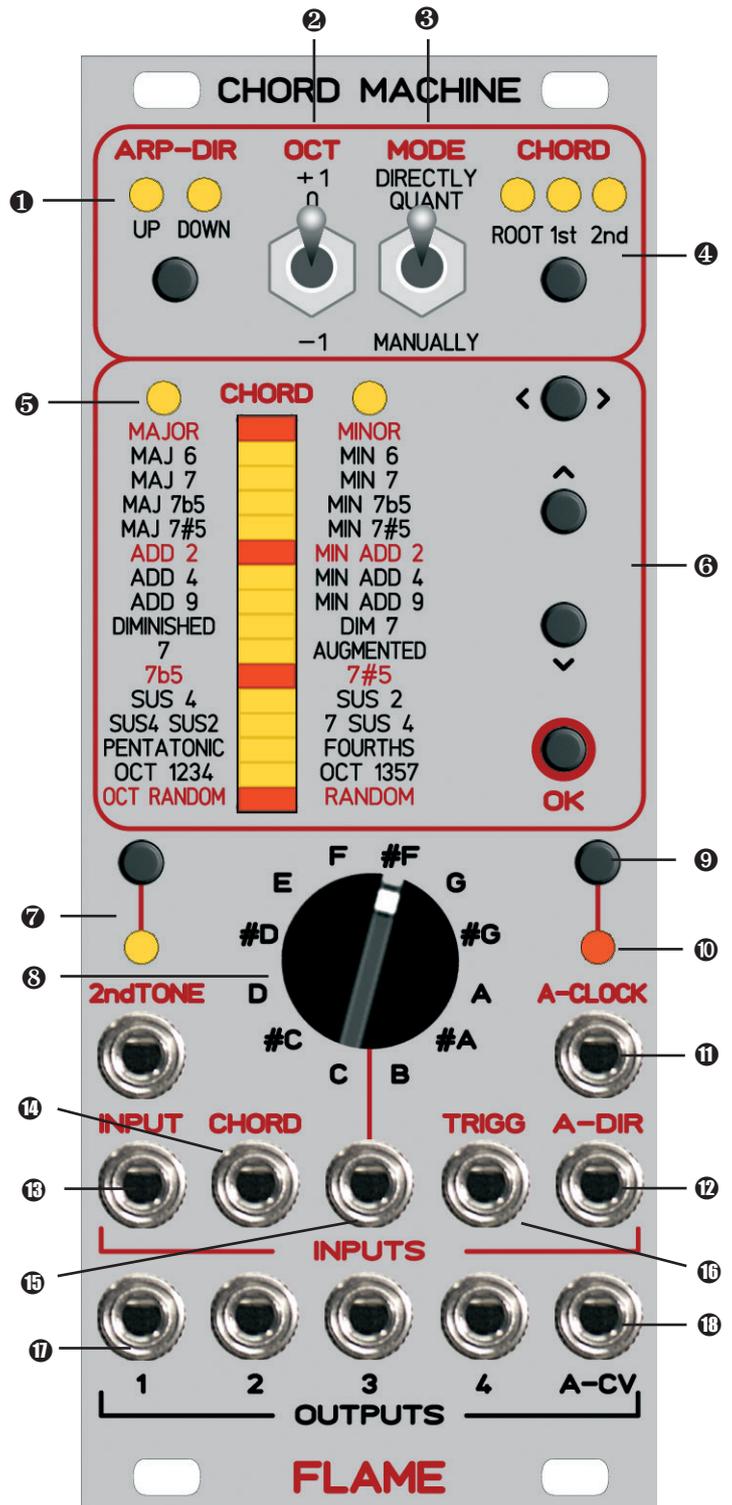
3. FUNCTIONS

3.1 Mode

Please choose one of the three modes with the switch:

MANUALLY:
Chords are set manually at the module.

In this mode fundamental note, octave, chord and inversion are set manually. A changing of the chord (chord, inversion) is displayed by blinking of the LEDs.
The adoption of the new adjusted chord happens with the OK switch. Keynote, octave and 2nd tone will be adopted directly without affirmation.
The inputs CHORD, TRANSPOSE and TRIGGER are inactiv.
2nd tone can be operated externally and adopts a possibly previous changing of the chord.

QUANT:
The output voltages of the chords follow the voltage at the transpose CV input starting from 1 volt in halftone steps (quantized).

In this mode too you can put manually keynote, octave, chord and inversion. Additionally the parameters can be effected also via CV input for CHORD and TRANSPOSE (starting from 1 volt). A changing of the chord is indicated by blinking LEDs.
The adoption of the new adjusted chord happens with OK switch, a positive trigger-in-impuls or the changing of "2nd tone".
Starting from 1 volt at the transpose input the keynote can be adjusted via CV. Then the octave will be added to the adjusted octave of the octave switch.
Keynote, octave and 2nd tone will be adopted immediately.

DIRECTLY:
The output voltages of the chords follow directly the voltage at transpose CV input (not quantized).
In this mode the input voltage is not quantized but the tone pitch of the chord follows directly the input voltage. The tone key, tone pitch and octave
are determined directly by the impressed voltage.

You adjust the chord here the same way as in mode QUANT.

3.2 Chord select

Button <>   changes between the two chord banks
Button up/down Change between the chords of the bank upwards or downwards
Button OK   Adopts the choosen chord

3.3 Chord inversions

With the push button you can set the inversion of a chord:

ROOT: basic position
1st: first inversion
2nd: second inversion

ROOT:
In basic position the chord starts with the root as low-pitched note on the first CV-output.

CV output: 1   2   3   4

1st:
The first inversion transposes the root about one octave up. The chord removes and starts now with the second note as the lowest note.

CV output: 1   2   3 4
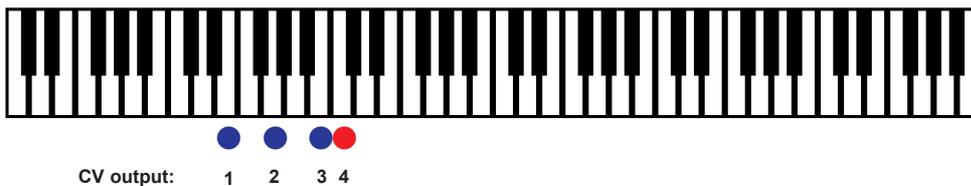
2nd:
The second inversion additionally transposes the second note about one octave up. The chord removes again and now starts with the third note as the lowest note.

CV output: 1   2 3   4
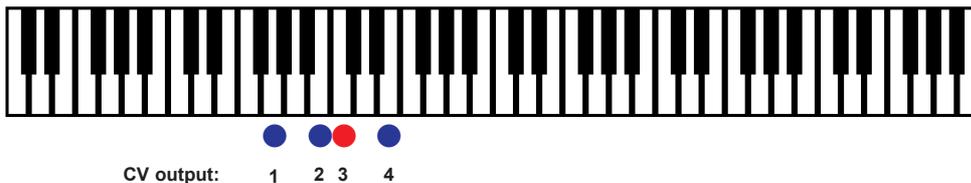
The inversions cannot be changed directly via seperate CV input. But this you can do via CHORD CV input, because the chords with their inversions are arranged
one after the other in the CV list (see schedule of the chords).

3.4 Second note (2ndTone)
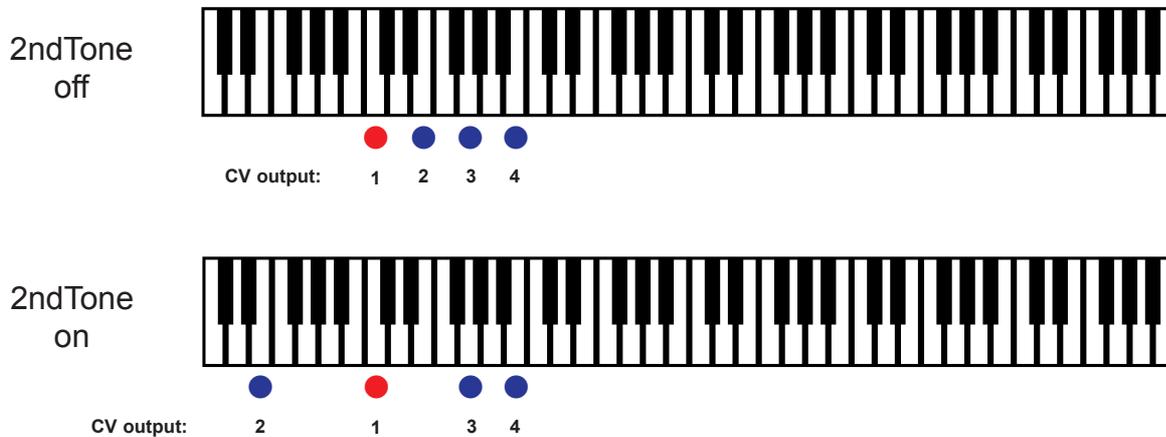
The second note of the chord can be transposed down about one octave. This offers a further chord variation.

In contrast to the inversions here at the CV outputs the chord doesn`t remove.

2ndTone off

CV output: 1   2   3   4

2ndTone on

CV output: 2   1   3   4

This affects also the arpeggio: The notes don`t go down equally any more (octave step in second note).

The transposition of the second note down is indicated by LED.

The shifting can also happen via positive impuls of trigger at the 2nd note input.

3.5 Generate chord via CV input (incl. position)

In mode QUANT/DIRECTLY you can set the chord via CV input CHORD. Assumed is an average input voltage about 5 volt:

Chords at the bank left:
Starting with MAJOR in halftone steps down you have Root, 1. inversion and 2. inversion in paralell.
Chords at the bank right:
Starting with MINOR in halftone steps up you have Root, 1. inversion and 2. inversion in paralell.

3.6 Keynote/ octave via CV input

In mode QUANT / DIRECTLY you can set root and additional octaves via CV input TRANSPOSE.

up to 1 volt - manual Setting of the keynote with rotary switch
from 1 volt - external with root in halftone steps plus ascending octaves 0,1,2, ...etc.

4. ARPEGGIATOR

4.1 Clock and playmode

The CLOCK sets the notes of the chord serially on the arpeggiator output (depending on the playmode).
You can set the clock manually with the key A-CLOCK or automatically with external clock. The playmode is set with the key A-DIR or automatically with clock impulse via A-DIR input.

The arpeggiator has four playmodes:

UP - LED up on - direction forward (loop=4 steps)
DOWN - LED down on - direction backwards (loop=4 steps)
UPDOWN - LEDs up+down on - direction alternated forward/backwards (loop=6steps)
RANDOM - LEDs up+down off - direction randomized

You choose the CV of the arpeggio output only by clock input. That means a new chord choise starts with the next arpeggio clock at the arpeggio output.

You can use the arpeggiator in all three playmodes likewise.

4.2 Arpeggio spreading

The arpeggio can be spread independently of the chord. You can select the spreading with different voltages at the CV-INPUT jack:

0..2 volt and 4..5 volt no Spreading (normal output):
The chord is played in the original tone pitch.

3..4 volt spreading first step:
The chord is spread up about 1 octave.
(the chord at the outputs 1 to 4 stays the same)

2..3 volt spreading second step:
The chord is spread up about two octaves.
(the chord at the outputs 1 to 4 stays the same)

Chord at the outputs 1-4:

Arpeggio normal (no spreading) :

Arpeggio spreading first step:

Arpeggio spreading second step:

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4.3 Scale mode (Quantizer)

The arpeggiator can also work as a quantizer. Then you use the choosen chord as scale. The keynote is determined by the keytone. The scales are limited on the 4 tones
of the chord.

The scalemode cannot be played manually but gets active starting from a voltage of 5 volt at the CV input "INPUT". Then the ARP-DIR-LED´s are off.

In this mode the arpeggiator doesn´t play the chord sequentially, but quantizes the input voltage at "INPUT" from 5 volt into a scale, which is determined by the chord as scale and the keytone as keynote. A positive trigger impuls at A-CLOCK input makes the quantization.

Chromatical keytone:
If you choose one of the two chords "OCT RANDOM" or "RANDOM" the chromatical scale (halftone steps) is set automatically.
At all other chords the notes of the chord correlate with the scale (see schedule).

5. Output calibration (via software)

The 5 CV outputs are set on the 1v/ octave characteristic (via hardware). To compensate variations of connected VCO`s, for each output you can separately adjust in small steps the 1v/octave spreading or an offset.

Start the menu: The unit has to be set in normal function! The menu can be set in all playmodes: Press button OK and then press button **<>**.

Choosing the CV output you want to calibrate:
The 5 yellow LEDs up (UP, DOWN, ROOT, 1st, 2nd) indicate the choosen CV output 1 to 5 from left to right. You choose with both of the push buttons (down to them) to the right or left.

Choose voltage fot note and octave:
Keynote with rotary switch, switches OCT and MODE set the octave:
MANUALLY: with switch OCT: octaves 1, 2, 3
QUANT: with switch OCT: octaves 4, 5, 6
DIRECTLY: with switch OCT: octaves 7, 8, 9
>>A changing of the voltage influences only the just choosen CV output.

Change between 1v/oct or offset setting and calibration:
With button<> you can change between 1v/oct (left chord LED on) or offset calibration (right chord LED on).
You can change the value starting from an average value seven steps up or down. The average value is on ADD 9 LED.
With the curser-down-button into direction random you can enlarge the spreading (or offset).
With the curser-up-button into direction major you can reduce it.

Finish of calibration- save settings:
When the calibration is finished, press the button OK. Then you will change into normal mode and the set values don`t get lost but saved permanently in the
internal EEPROM. At a reboot they are reloaded automatically.

6. List of chords

	CHORD BANK LEFT			
NR	NAME	ROOT	1.INVERSION	2.INVERSION	SCALE
1	MAJOR	0,4,7,12	4,7,12,16	7,12,16,19	0,4,7,12
2	MAJ 6	0,4,7,9	4,7,9,12	7,9,12,16	0,4,7,9
3	MAJ 7	0,4,7,11	4,7,11,12	7,11,12,16	0,4,7,11
4	MAJ 7b5	0,4,6,11	4,6,11,12	6,11,12,16	0,4,6,11
5	MAJ 7#5	0,4,8,11	4,8,11,12	8,11,12,16	0,4,8,11
6	ADD 2	0,2,4,7	2,4,7,12	4,7,12,14	0,2,4,7
7	ADD 4	0,4,5,7	4,5,7,12	5,7,12,16	0,4,5,7
8	ADD 9	0,4,7,14	4,7,12,14	7,12,14,16	0,4,7,14
9	DIMINISHED	0,3,6,12	3,6,12,15	6,12,15,18	0,3,6,12
10	7	0,4,7,10	4,7,10,12	7,10,12,16	0,4,7,10
11	7b5	0,4,6,10	4,6,10,12	6,10,12,16	0,4,6,10
12	SUS 4	0,5,7,12	5,7,12,17	7,12,17,19	0,5,7,12
13	SUS4 SUS2	0,2,5,7	2,5,7,12	5,7,12,14	0,2,5,7
14	PENTATONIC	0,2,5,10	2,5,10,12	5,10,12,14	0,2,5,10
15	OCT 1234	0,12,24,36	12,24,36,0	24,36,0,12	0,12,24,36
16	OCT RANDOM	randomized 0,12,24 or 36			0,1,2,3,4,5,6,7,8,9,10,11

	CHORD BANK RIGHT			
NR	NAME	ROOT	1.INVERSION	2.INVERSION	SCALE
1	MINOR	0,3,7,12	3,7,12,15	7,12,15,19	0,3,7,12
2	MIN 6	0,3,7,9	3,7,9,12	7,9,12,15	0,3,7,9
3	MIN 7	0,3,7,10	3,7,10,12	7,10,12,15	0,3,7,10
4	MIN 7b5	0,3,6,10	3,6,10,12	6,10,12,15	0,3,6,10
5	MIN7#5	0,3,8,10	3,8,10,12	8,10,12,15	0,3,8,10
6	MIN ADD 2	0,2,3,7	2,3,7,12	3,7,12,14	0,2,3,7
7	MIN ADD 4	0,3,5,7	3,5,7,12	5,7,12,15	0,3,5,7
8	MIN ADD 9	0,3,7,14	3,7,12,14	7,12,14,15	0,3,7,14
9	DIM 7	0,3,6,9	3,6,9,12	6,9,12,15	0,3,6,9
10	AUGMENTED	0,4,8,12	4,8,12,16	8,12,16,20	0,4,8,12
11	7#5	0,4,8,10	4,8,10,12	8,10,12,16	0,4,8,10
12	SUS 2	0,2,7,12	2,7,12,14	7,12,14,19	0,2,7,12
13	7 SUS 4	0,5,7,10	5,7,10,12	7,10,12,17	0,5,7,10
14	FOURTHS	0,5,10,12	5,10,12,17	10,12,17,22	0,5,10,12
15	OCT 1357	0,24,48,72	24,48,72,12	48,72,12,36	0,24,48,72
16	RANDOM	randomized 0,1,2,3,4,5,6,7,8,9,10 or 11			0,1,2,3,4,5,6,7,8,9,10,11

7. Appendix

Technical details

Connections:

Ribbon cable adapter for Doepfer bus +/-12Volt
Inputs: 3x CV (0..+10v), 4x Trigger (0/+5..10v), 1/8th inch mono jacks
Outputs: 5x CV (0..+10v) 1V/Octave, 1/8th inch mono jacks

Current consumption: ca. +130mA / -20mA
Size: Euro rack format 3U / 10HP   40 x 128,5 x 50mm

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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