

# P6 manual (V2)

## Introduction

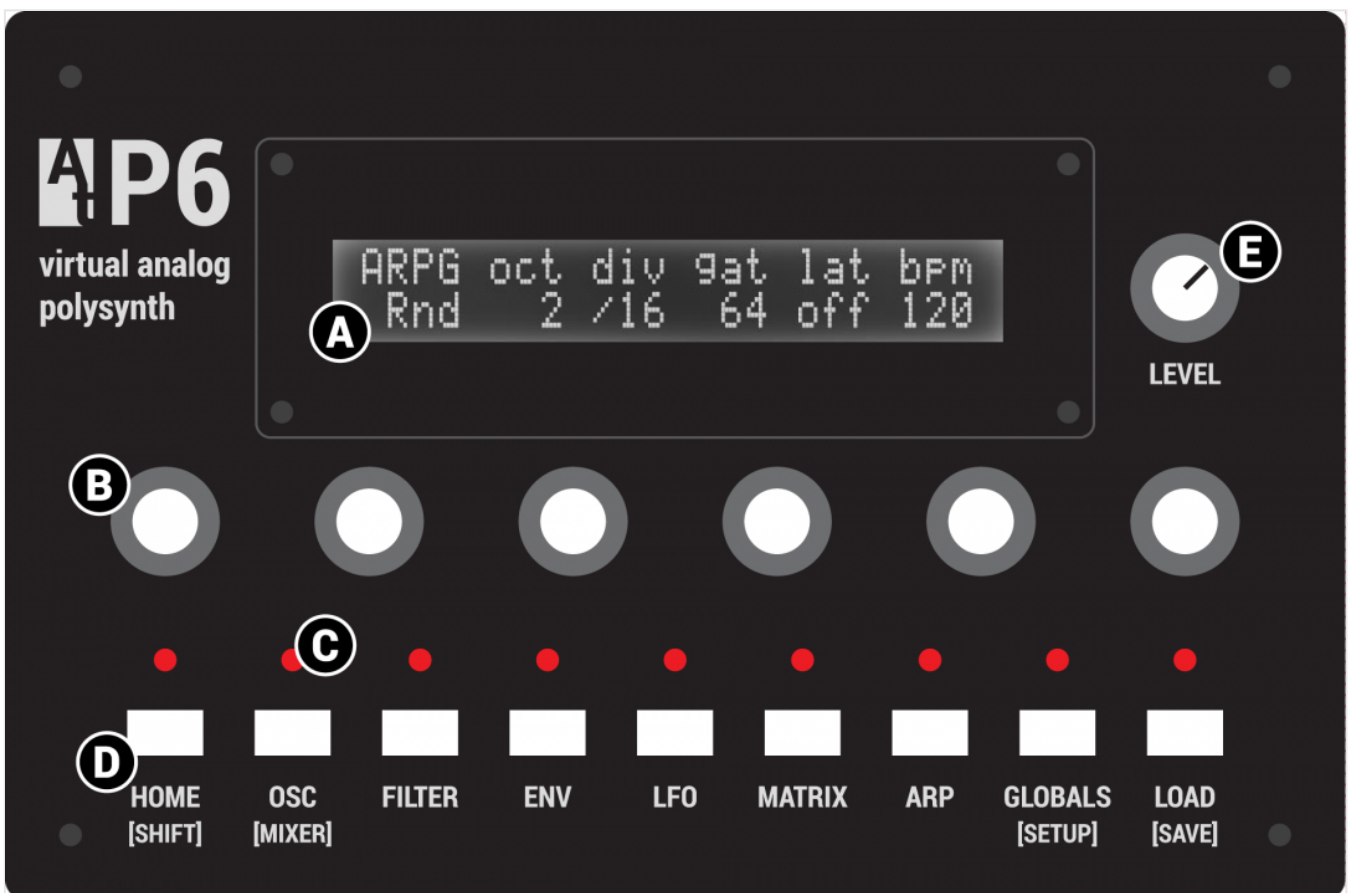
Audiothingies P6 is a 6-voice polyphonic virtual analog synthesizer.

In this section, you will find instructions about how to make the best use of your newly acquired synthesizer.

If you like to read or print a pdf manual, please use the print to pdf function of any modern web browser.

This manual is based on P6 firmware v2.0.

## Front panel



A LCD screen

B Encoders (1 to 6, counting left to right) – with push switch

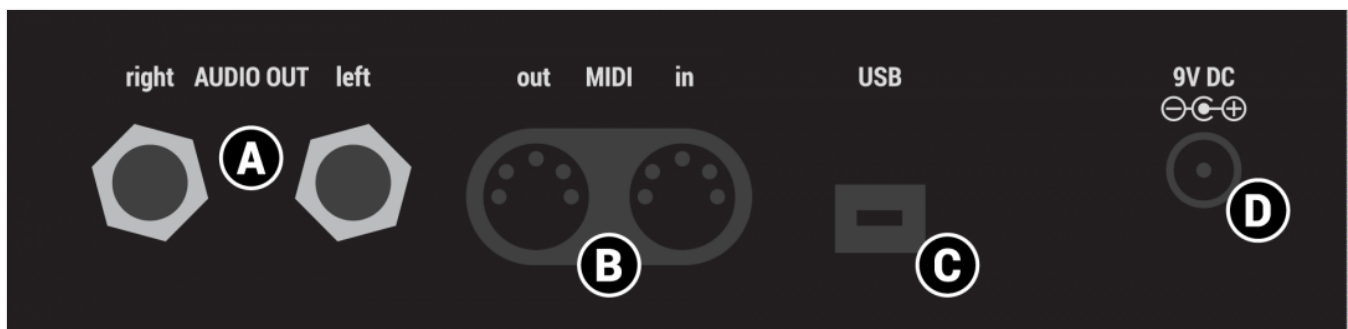
C Status LEDs: they provide feedback while editing parameters

D Buttons: used to select an edit page

E Stereo volume potentiometer: adjusts the output volume

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## Rear panel



A Audio outputs jacks. Use Left out if you only want mono sounds

B MIDI connectors

C Mini USB port. Used only for firmware upgrades

D 2.1mm 9V DC connector – use only regulated 9VDC, center positive, 300mA minimum psu

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## Quick start

- Connect audio outs to a mix table
  - Connect a MIDI keyboard into the MIDI Input
  - Power the P6 with a 9V DC 2.1mm psu.
  - Play, you should hear the default patch
  - Press Load
  - Use encoder 6 to navigate thru the patches. Press Load again to load selected patch, press Home to cancel and return to previously loaded sound.
  - Alternatively, you can push encoder 1 & 2 to navigate load previous/next patch
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## Using P6

P6 has been developed with easy editing in mind and we do think it is really easy to edit given the synthesis complexity. However, some parameters may need some explanations that you will find in this manual.

## Navigating pages

How to navigate through the P6 architecture?

Parameters are mapped across different pages accessed by pressing a corresponding button on the front panel.

When a section has several pages, you access them by successively pressing the same button several times. When you are on the last page, it returns to the first one.

For example, pressing OSC several times will make you travel the following pages: OSC1 > OSC2 > SUB > OSC1 > OSC2 etc.

Some pages are accessible by simultaneously pressing Home [shift] + another button.

For example [shift] + OSC will take you to the Mixer page.

## Editing parameters

The LCD provides up to 6 parameters to edit.

Simply use encoders 1-6 to change the corresponding parameter value.

Some parameters can be reset to a default value when pushing the corresponding encoder (all bipolar parameters).

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## Main page | [HOME]

This is where you land when you power your P6 synthesizer:

```
P002      cut res bpm mix
FunSync   72  58 125 100
```

You get the program number and name as well as shortcuts to 4 different parameters.

You can set these parameters, per preset, in the Globals menu (3rd page)

You can navigate presets from this screen by pressing encoder 1 and 2.

Quite useful in a live situation.

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## Oscillators | [OSC]

### The oscillator algorithms

There are 12 different oscillator algorithms available for OSC1 and OSC2:

p6 This is the oscillator from P6 V1 firmware.

When turning the shape parameter, its shape morphs from triangle (shape = 0), to sawtooth (shape

= 42), to square (shape = 84) to pulse width.

`sin` A sinus oscillator that turns into a basic FM operator with the shape control

`sin` A sinus oscillator that turns into a basic FM operator with the shape control

`tri` A triangle oscillator into a foldback digital distortion. Shape controls the gain.

When shape is set to 127, the oscillator will produce a triangle wave with its pitch one octave and a fifth higher.

`saw` The classic sawtooth waveform. Shape adds a second phase shifted sawtooth to the first one. Shape adds a second phase shifted sawtooth to the first one. When shape is set to 127, the oscillator will produce a sawtooth wave with its pitch of 1 octave higher.

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`squ` The classic square oscillator with PW.

Shape controls the pulse width.

`3sw` This oscillator produces 3 detuned saws for that Roland-ish "supers@w" sound, but without the nasty aliasing.

Shape controls the detuning of 3 oscillators

`3sq` Same as `3sw`, but with square oscillators instead.

`sws` Synchronized sawtooth waveform

This oscillator internally has 2 oscillators, 1 master, and 1 sawtooth slave oscillator that is hard synced to the master.

The shape parameter controls the pitch of the slave oscillator.

`sqs` Same as `sws` but with a slave square oscillator.

`rz1` `rz2` and `rz3` PD resonant waveforms

Those are phase distortion algorithms from the Casio CZ series.

They all simulate a filter sweep with the shape parameter.

`rz1` is the saw version, `rz2` the triangle, and `rz3` the trapezoidal one.

## Oscillator 1

Oscillator 1 is the main oscillator.

It also drives the sub oscillator.

```
OSC1 trs tun shp lfo1 mix
    saw  0  0 saw  0 127
```

OSC1 oscillator algorithm  
trs transpose +/- 2 octaves (all oscillators)  
tun oscillator fine tune  
shp shape  
lfo1 lfo1 modulation amount  
mix oscillator 1 level

## Oscillator 2

Oscillator 2 is basically the same as oscillator 1, but its tune can be offset -24/+24 semitones.

```
OSC2 rng tun shp env3 mix
    sin  -7  +2 100 off 100
```

OSC2 oscillator algorithm  
rng oscillator coarse tune  
tun oscillator fine tune  
shp shape  
env3 env3 modulation amount  
mix oscillator 2 level

## Sub / Noise

In this page, you access oscillator 1' sub oscillator and noise parameters.

```
SUB oct mix      NZE mix
tri  -1 120      0  25
```

sub shape (sinus / triangle / saw / square)  
oct octave (-1/-2)  
mix sub level  
nze noise filter

mix noise level

### A word about the bipolar-value filters

Throughout the synthesis architecture, several bipolar-value filters are available (noise filter, delay filter, global filter for example).

These filters are all working in the same way:

- When the value is negative, it acts as a 6dB lowpass filter
- When the value is positive, it acts as a 6dB hipass filter
- When set to 0, it has no effect

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## Mixer | [HOME] + [OSC]

This is the mixer section, where you can adjust all sources volumes, as well as a VCA drive parameter, allowing adjustments to the overall patch volume (if you want to balance patches volumes, this is the parameter you need).

```
osc1  osc2  sub  rmd  nze  vca
100    60   100   0   10   +6
```

A second shift+Home press will display the pan page, where you can set each voice's pan independently

```
PAN  pn2  pn3  pn4  pn5  pn6
+16  -63  -48  +42  +69  -53
```

---

## Filter | [FLT]

P6's filter features 8 different filter types:

LP1 1-pole lowpass filter  
LP2 2-pole lowpass filter  
LP3 3-pole lowpass filter

LP4 4-pole lowpass filter  
HP2 2-pole hipass filter  
BP2 2-pole bandpass filter  
Not Notch filter  
Pha Phaser filter

```
FLTR cut res env2 lfo2 kbd  
LP4 50 60 50 15 1/2
```

fltr filter type  
cut cutoff frequency  
res resonance amount  
env2 envelope 2 modulation amount (controls frequency)  
lfo2 lfo2 modulation amount (controls frequency)  
kbd keyboard tracking amount (off | 1/4 | 1/2 | 3/4 | 1/1)

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## Envelopes | [ENV]

The 3 envelopes feature the same parameters and their behavior is the same.

```
ENV1 atk dcy sus rel rst  
exp 0 60 95 25 off
```

ENV1 envelope curve (p6, expo, linear)  
atk attack time  
dcy decay time  
sus sustain level  
rel release time  
rst when on, the envelope is reset to zero when it is retriggered (off = analog mode)

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## LFOs | [LFO]

P6 features 3 identical LFOs that can optionally be synced to the patch tempo.

```
LFO1 spd dly phs atk key
```

tri 25 24 0 45 on

LFO1 LFO type

spd LFO speed (values > 127 are tempo sync value)

dly LFO delay time

phs LFO phase (0°/45°/90°/135°/180°/225°/270°/315°)

atk LFO attack time

key LFO key-sync (when on, will reset the LFO when a new note is assigned to this voice)

NOTE: when key sync is off, you don't have access to the delay, phase and attack parameter.

The different available shapes (waveforms) are:

sin sinus

tri triangle

saw sawtooth

squ square

s&h sample and hold

rnd random, like sh, but values are interpolated between cycles, producing a continuously randomly moving waveform

stp step-sequence

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## The 8-step LFO sequence | [HOME] + [LFO]

You can access it by pressing shift + LFO

```
>>> +8    0 +25 +51 len
      -5  -59 +44 +53  8
```

Encoder 1 selects the 4 active steps

Encoders 2 to 5 set the 4 active step values.

Encoder 6 sets the length of the sequence.

Remember that, to be active, one (or several) LFO(s) shape must be set to 'stp' for the sequence to have an effect.

And you also need to set a modulation destination amount <> 0 for this LFO too...

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# Modulation matrix | [MTX]

Modulation matrix contains 6 virtual patch cords, spread onto 3 pages (yeah you're right, that's 2 patch cords per page).

```
Patch 1      Patch 2
vel>cut +12  lfo3>pan +32
```

As you can see, you have access to the modulation source, modulation destination and modulation amount, for both patches at the same time.

Available modulation sources:

not note value	cst constant value	lfo1 lfo 1
vel note velocity	rnd random number	lfo2 lfo 2
aft aftertouch	generator	lfo3 lfo 3
bnd pitch bend	env1 envelope 1	
whl modulation wheel	env2 envelope 2	
	env3 envelope 3	

Available modulation destinations:

ptc global pitch (coarse)	osc1 oscillator 1 shape	xRm ring modulator level
fin global pitch (fine)	osc2 oscillator 2 shape	xNz noise source level
tn1 osc1 pitch (coarse)	nze noise color	cut filter cutoff frequency
ft1 osc1 pitch (fine)	xO1 oscillator 1 level	res filter resonance
tn2 osc2 pitch (coarse)	xO2 oscillator 2 level	
ft2 osc2 pitch (fine)	xSb sub oscillator level	

Some sources are bipolar (lfo's, rnd), other unipolar (envelopes, velocity, ...).

Modulation amount is bipolar, meaning you can reverse the modulation source amount by setting a negative number. On lfo's, this reverse the phase for example.

Without even using the matrix, the P6 has some fixed modulation assignments:

- ENV1 is routed to the AMP VCA
- ENV2 is routed to filter cutoff
- ENV3 is routed to OSC2 shape
- LFO1 is routed to OSC1 shape
- LFO2 is routed to filter cutoff

Look at the OSC1, OSC2 and Filter page to set these modulation amount.

This means that if you want to modulate the filter cutoff by a LFO, the first best candidate is LFO2, as it is already routed to the filter cutoff, it does not “eat” a modulation slot.

Some more are available in the Globals page (glide, pitch bend, key-trig detune).

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## Scalers, Lag operator | [HOME] + [MTX]

Scalers allow you to scale the amount of a modulation source (for example scaling ENV1 with note velocity will change the volume of the note according to its velocity).

The lag operator will lowpass filter a modulation source. It can be used to smooth a source, for example a square LFO.

### Scalers 1 & 2

```
Scaler1      Scaler2
mod>lfo2 +63 vel>env1 +32
```

### Scaler 3 and lag operator

```
Scaler1      LAG src  amt
env3>lfo2 -20      lfo3 100
```

### About the scaler amount

To better understand what the scaler is doing, let's take an example: say you scale LFO2 with modulation wheel.

LFO2 is routed to filter cutoff with a value of +40 in the filter page.

If you set the scaler amount to max (+63):

When modulation is set to max, LFO2 will change the filter cutoff, the maximum amount being set in Filter page, that is +40

When modulation wheel is set to 0, LFO2 will have no effect on filter cutoff

Now, what does happen if you set the scaler amount to 50% (+32)

When modulation is set to max, LFO2 will change the filter cutoff, the maximum amount being set in Filter page, that is +40

But when modulation wheel is set to 0, LFO2 WILL have an effect on Filter cutoff, the more the scaler amount, the less the effect.

In essence, the scaler amount allows you to set a minimum value for the scaler destination.

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## Arpeggiator / Chorder | [ARP]

P6 features a classic arpeggiator and a chorder, both can be used at the same time to enjoy beautiful one-finger arpeggios.

### Arpeggiator

```
ARPG stl ptn oct spd lat
    Up asP usr    1 1/8 off
```

ARPG arp on/off

stl arp style

ptn arp pattern (user/off)

oct arp octave transposition

spd arp speed

bpm latch: when on, the played chord will be latched

### Chorder

The chorder can generate up to 4-note chords, that is to say it can generate 3 notes in addition to the note you play.

```
CHRD key scl iv1 iv2 iv3
    on  D  min  +3  +5  +7
```

CHRD on/off switch

key base key for chord generation

scl scale (major, minor, harmonic minor)

iv2 2nd note to add to the base note (from 1 octave down to 2 octaves up)

iv3 3rd note to add to the base note

iv4 4th note to add to the base note

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## Arp pattern sequencer | [HOME] + [ARP]

When arp pattern is set to user, you can alter some arp steps with the following events

- x normal arp step
- o rest
- x tie
- 1 to 6 targets one particular note
- L the lowest note minus 1 octave
- H the highest note plus 1 octave
- c chord

```
ARP PATTERN STEP EDIT len  
[xxox]xx_xoxoxooLH 16
```

- Encoder 1 selects the 4 active steps
- Encoders 2 to 5 set the 4 active step values.
- Encoder 6 sets the length of the sequence.

This pattern sequencer will not play “alone”. It needs an user input, at least one note, or better, a chord (up to 6 notes) to trigger notes or chords.  
Arp and chorder can be used simultaneously.

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## Globals menu | [GLOBALS]

Here you can apply FX's and set globals parameters for the current loaded patch.

### FX

Available algorithms:

**stw**

Stereoizer effect: adds subtle stereo depth to the sound – the original and much appreciated pre-v1.0 effect!

Plus, we have added a hicut filter for more flexibility.

```
FX          cut mix
stw          30  64
```

cut eq cutoff  
d/w mix level

### **p/p**

The famous ping pong delay, this one with balance control and low pass filter

```
FX tim fbk bal cut mix
p/p 60 85 25 12 90
```

tim delay time  
fbk feedback amount  
bal balance (-64: first ping on left channel | 63: first ping on right channel | 0: ping center (no ping pong effect))  
cut eq cutoff frequency  
mix mix level

### **dly**

Stereo delay effect with a filter in the feedback path

```
FX tim fbk          cut mix
Lpf 60 85          25  90
```

tim delay time  
fbk feedback amount  
cut eq cutoff frequency  
mix delay mix level

### **mod**

Stereo modulated delay.

A LFO is modulating the delay time, adding a subtle – or not – pitch shift / chorus-y effect to the delay line.

```
FX tim fbk spd dpt mix
Mod 60 85 25 90 90
```

tim delay time

fbk feedback amount

spd lfo speed

dpt lfo amount

mix delay mix level

## chf

Stereo chorus/flanger effect with positive or negative feedback path.

Basically, this is a short delay line modulated by a LFO.

You get a flanger sound with smaller delay time values and high feedback amount.

```
FX tim fbk spd dpt d/w
chf 30 60 25 55 64
```

tim delay time

fbk feedback amount

spd lfo speed

dpt lfo amount

mix chorus mix level

## Globals preset options

```
gld bnd mod dtn eq bpm
0 2 p1 30 -5 125
```

gld glide amount, 0 means off

bnd pitch bend max tune amount (can be set between 0 and +24)

mod play mode

dtn oscillators detune parameter. Detunes each oscillator of each voice, differently at each keytrig.

Try it with high value in unison mode – instant fatness!

eq global eq

bpm patch tempo

## The different play modes

p1 Polyphonic mode. Tries to affect a voice that had the same note affected before, if does not exist, affects/steals the oldest voice

p2 Polyphonic mode. Affects/steals the oldest voice

m1 Monophonic mode, retrigs envelope even when played legato

m2 Monophonic mode, does not retrigger envelope when played legato

u1 Unison mode, retrigs envelope even when played legato

u2 Unison mode, does not retrigger envelope when played legato

## Encoder assign page

Assign the 4 parameter shortcuts from the home page.

These are saved per preset.

encoder en3 en4 en5 en6

assign cut res bpm mix

Use encoders 3 to 6 to change the values.

---

## Setup menu | [HOME] + [GLOBALS]

mid ext lnk ui

1 off off 32

mid MIDI channel (1 to 16)

ext External clock sync (off/on)

lnk Polychain mode (off/master/slave)

ui UI hold time. Sets the time to revert back to the normal menu when you turn an encoder. 0 disables the feature.

## Hidden – but very useful – functions

In this menu:

- Press encoder button 5 to send the current patch as sysex
  - Press encoder button 6 to SAVE the setup values
- 

## Load | [LOAD]

### Loading a preset from EEPROM

Encoder 6 sets the pgm to load.

it's loaded in the background. Press Load again to confirm, press Home to dismiss and return to the previously edited patch. This can be conveniently used as a compare feature.

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## Save | [HOME] + [LOAD]

### Saving a preset to EEPROM

Choose destination with encoder 6.

Change preset name with encoders 1 & 2 if needed.

Press Save to confirm, press Home to dismiss.

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## MIDI Control

The P6 accepts Program changes as well as Control changes (and NRPN's).

The whole synth architecture can be controlled from CC's and NRPN's.

The MIDI mapping specification can be found in the downloads section of the website