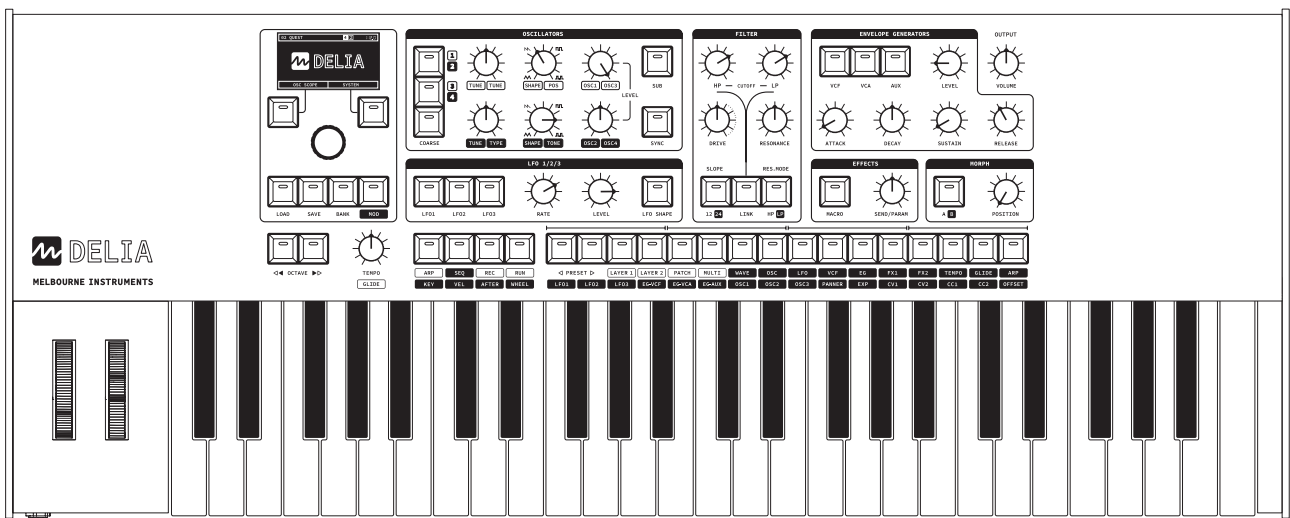




MELBOURNE
INSTRUMENTS



DELIA

6 Voice Motorized Morphing Polyphonic Synthesizer

User Manual

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Introduction

Welcome to DELIA, the first keyboard synthesizer from Melbourne Instruments.

Delia is a hybrid version of a classic analog synthesizer and wavetable synthesizer combined. Delia features a fully motorized control panel, A/B patch morphing, virtually unrestricted and unlimited modulation matrix, bi-timbral operation and is built on an open-source platform.

Melbourne Instruments' patent pending motorized knobs are a world first in synthesizers. They have been custom designed by Melbourne Instruments from a 3 phase brushless drone motor design. These motors are extremely strong, high reliability design that will practically never wear out. The position sensing is done using a contactless optical system with very high resolution.

Delia's analog circuits are discrete, custom designed and do not use resistor trimpots (which can go out of calibration). There are 6 analog filters and VCAs which enable true 6 voice operation, and Delia offers a unique 12 note mode to double the number of effective voices and limit note-stealing

About the User Manual

This manual is a guide that assumes you already have a good understanding of how these kinds of classic analog and wavetable synthesizers are used to create sounds. It will explain all the new features of Delia that build on this foundation.

Safety & Compliance

**Tested to comply with FCC Standards
FOR HOME OR OFFICE USE.**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Overview

Motorized Control Panel

Delia's unique motorized control panel differentiates it from other synthesizers. This new technology allows all the control surface knobs to always be where they are supposed to be, and opens up new ways of interacting with the synth. During Patch Editing, the knobs show how the oscillators, VCF, VCA etc are set.

In Modulation Mode, they show you how much each MOD destination is assigned. In Multi-Timbral, they jump between the different presets as you change the current layer, and in MORPH mode the entire control panel updates on the fly, according to the Morph amount.

An important aspect of the knobs is that they are very high resolution. The resolution of the sensor is extremely high, around 15,000 steps. This resolution is what actually controls the audio circuitry and what is stored in the Preset. The LCD display will show a rounded down version of this eg 0 to 100 in steps of 0.1.

The DATA Knob is used to interact with the LCD screen, and the 2 Keys under the LCD are soft-keys, with their functions labelled on the LCD. The remainder of the knobs have dedicated functions printed under them. The main output volume is the only standard potentiometer in the unit.

Each of Delia's red keys have an LED to indicate status. These are summarized in the table on page 8.

Voice Architecture

The following page shows a block diagram of Delia's voice architecture. The final stage of the 6 voices, Ladder LP filter, analog drive and the stereo VCAs are all analog circuitry. The preceding stage of VCOs, Wavetables and HP filter are all digitally generated. This arrangement gives most of the analog sound character while offering the flexibility and tuning accuracy of a digital oscillator front end, and a 12 note mode.

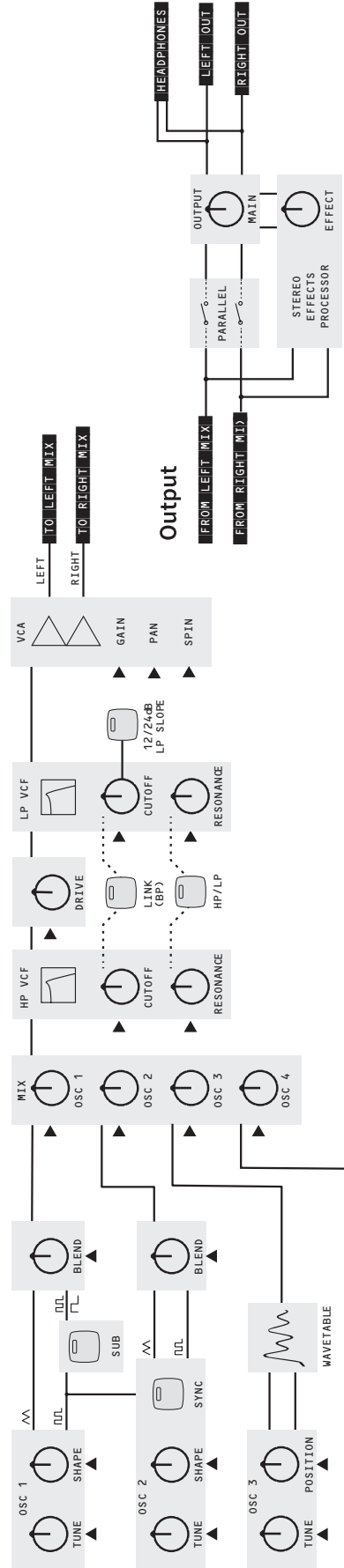
In 12 note mode, there are 12 complete sets of oscillators, generating the sound for 12 notes. These 12 notes then share the 6 analog filters. Voice stealing with unison voices and multi-timbral stacks is virtually eliminated.

The Digital VCOs and High Pass Filter are complex models of analog circuitry run at high oversampling rates to give a warm, natural sound without aliasing. Delia additionally offers a Vintage Level control for each Preset to set how much Analog deviation is modelled.

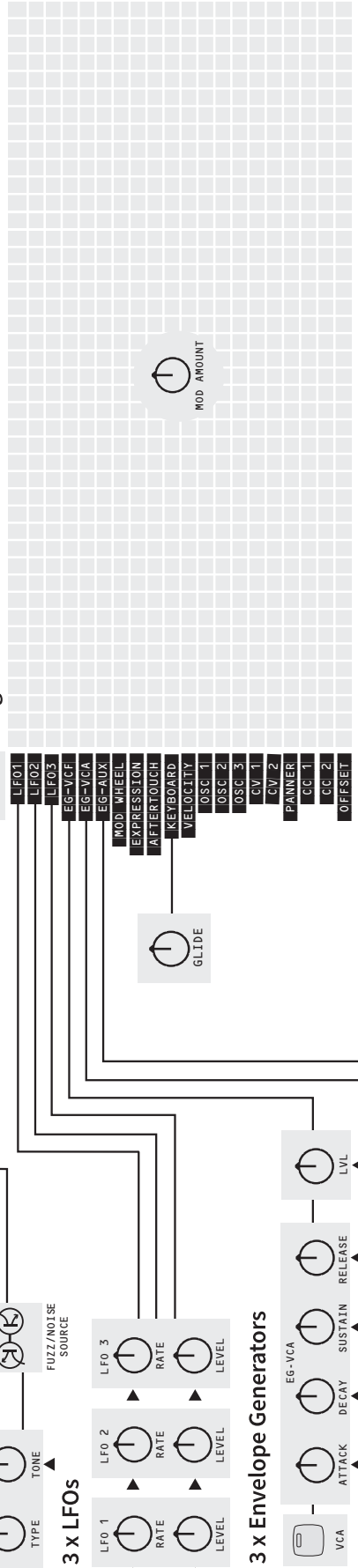
The Wavetables have their own natural aliasing which is an intrinsic part of the characteristic of their sound.

The digital effects are processed afterwards at 96kHz and 24bit.

Voices 1-6

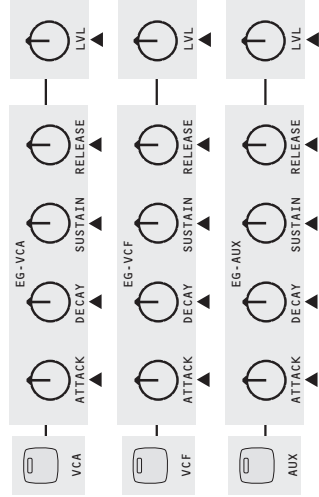


Programmable Modulation Matrix



- MORPH
- LFO 3 LVL
- LFO 3 RATE
- LFO 2 LVL
- LFO 2 RATE
- LFO 1 LVL
- LFO 1 RATE
- EFFECTS MACRC
- EFFECTS SEND
- EG-3 LVL
- EG-3 RELEASE
- EG-3 SUSTAIN
- EG-3 DECAY
- EG-3 ATTACK
- EG-2 LVL
- EG-2 RELEASE
- EG-2 SUSTAIN
- EG-2 DECAY
- EG-2 ATTACK
- EG-1 LVL
- EG-1 RELEASE
- EG-1 SUSTAIN
- EG-1 DECAY
- EG-1 ATTACK
- VCA SPIN
- VCA PAN
- VCF DRIVE
- VCF HP RESONANCE
- VCF LP CUTOFF
- VCF HP RESONANCE
- VCF HP CUTOFF
- NOISE MIX
- WAVE MIX
- WAVE SHAPE
- VCO-3 MIX
- VCO-3 POS
- VCO-3 TUNE
- VCO-2 MIX
- VCO-2 SHAPE
- VCO-2 TUNE
- VCO-1 MIX
- VCO-1 SHAPE
- VCO-1 TUNE

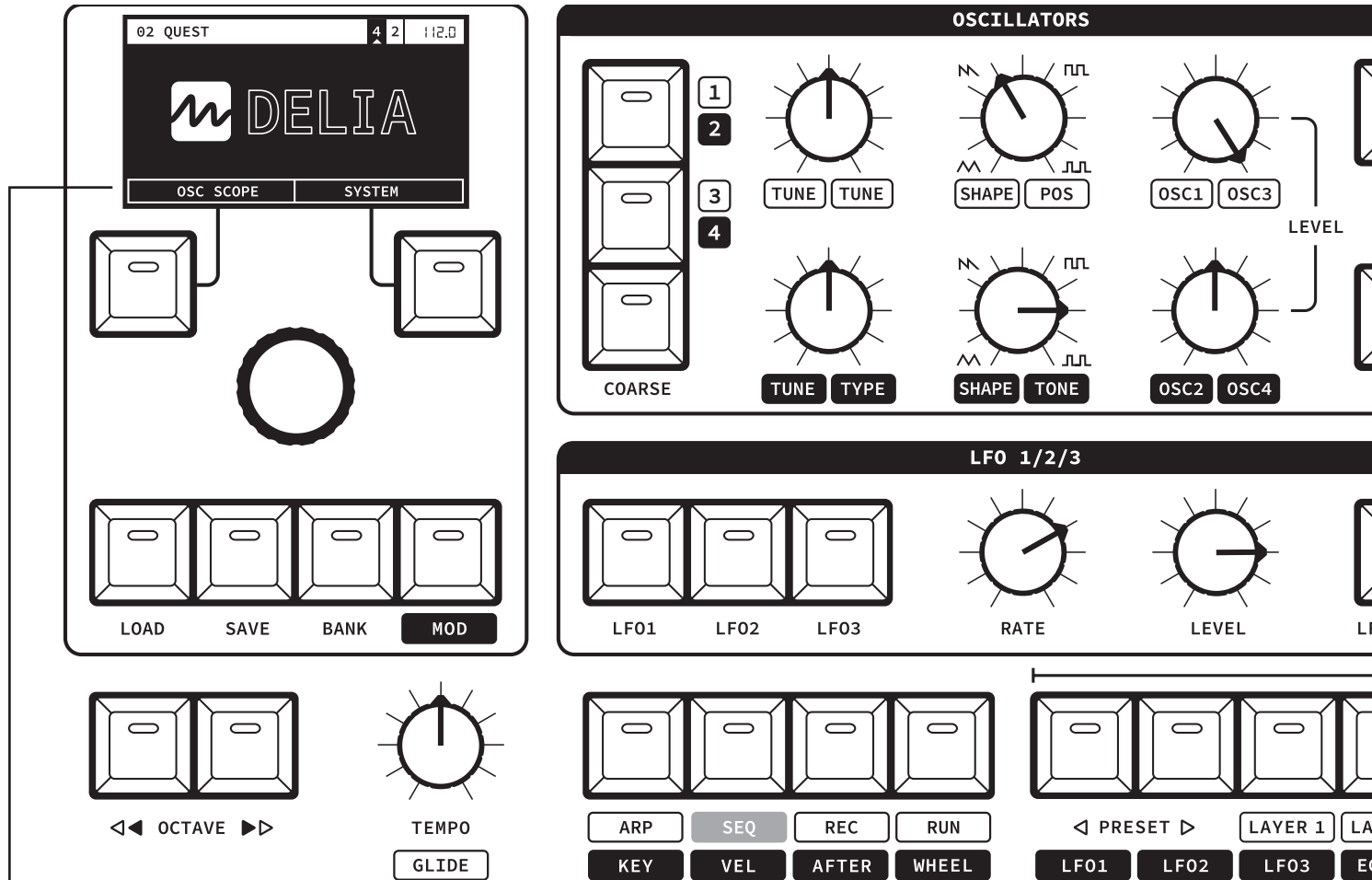
3 x Envelope Generators



KEY: ▲ = CV FROM MOD. MATRIX **LABEL** = SOURCE / DESTINATION

Main Control Panel

See Pages 8-13 for detailed descriptions and basic operations.
Refer also to the **Getting Started Guide** included with DELIA.



Labels

SOFT KEYS The two keys under the Display correspond with the information on screen, such as EDIT.

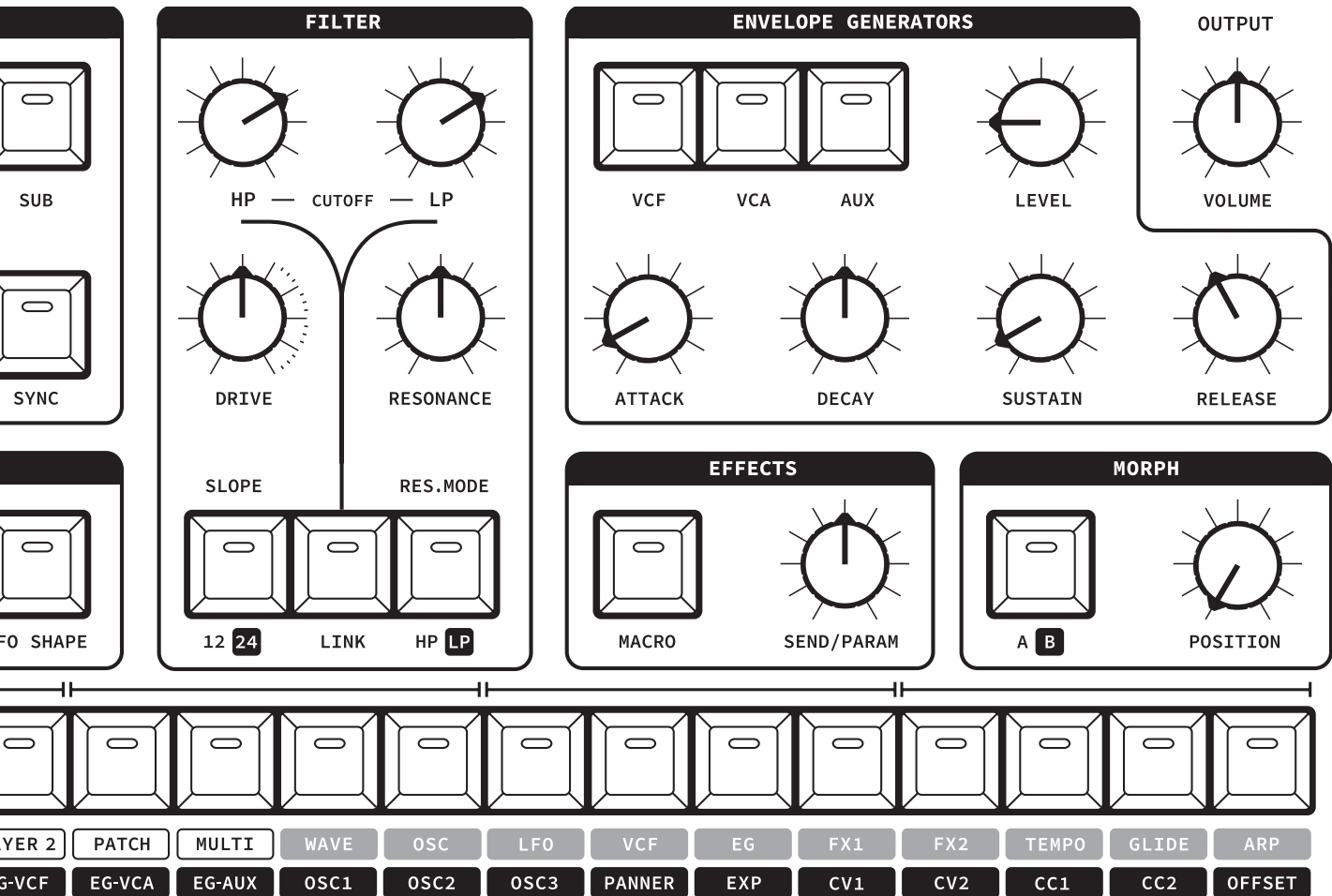
ARP **ACTION/COMMAND** - Indicates an 'ACTION' such as ARP ON, REC, RUN or switch LAYER.

SEQ **MENU** - All GREY TABS in the bottom rows are MENU keys. Pressing will open that menu.

LF01 **MOD SOURCE** - TABS in bottom row indicate Modulation Source. KEY to OFFSET.

A B **LED OFF / LED ON** - For Morph operation, LED ON indicates B SOUND active.





OUTPUT - Main volume and Headphone Level control



Menus

- | | | | |
|-------------|---|--------------|--------------------------------------|
| SEQ | SEQUENCER MENU - type-steps-MIDI etc | FX1 | EFFECTS 1 MENU - type-level-slot etc |
| WAVE | WAVETABLE BROWSE/SELECT (OSC 3) | FX2 | EFFECTS 2 MENU - type-level-slot etc |
| OSC | OSC 1/2/3 MENU | TEMPO | TEMPO KNOB MODE |
| LFO | LFO 1/2/3 MENU - polarity-retrigger-shape | GLIDE | GLIDE KNOB MODE + glide options |
| VCF | VCF/FILTER MENU | ARP | ARP MENU - direction-hold-note value |
| EG | EG MENU - VCF/VCA/AUX - slow mode | | |

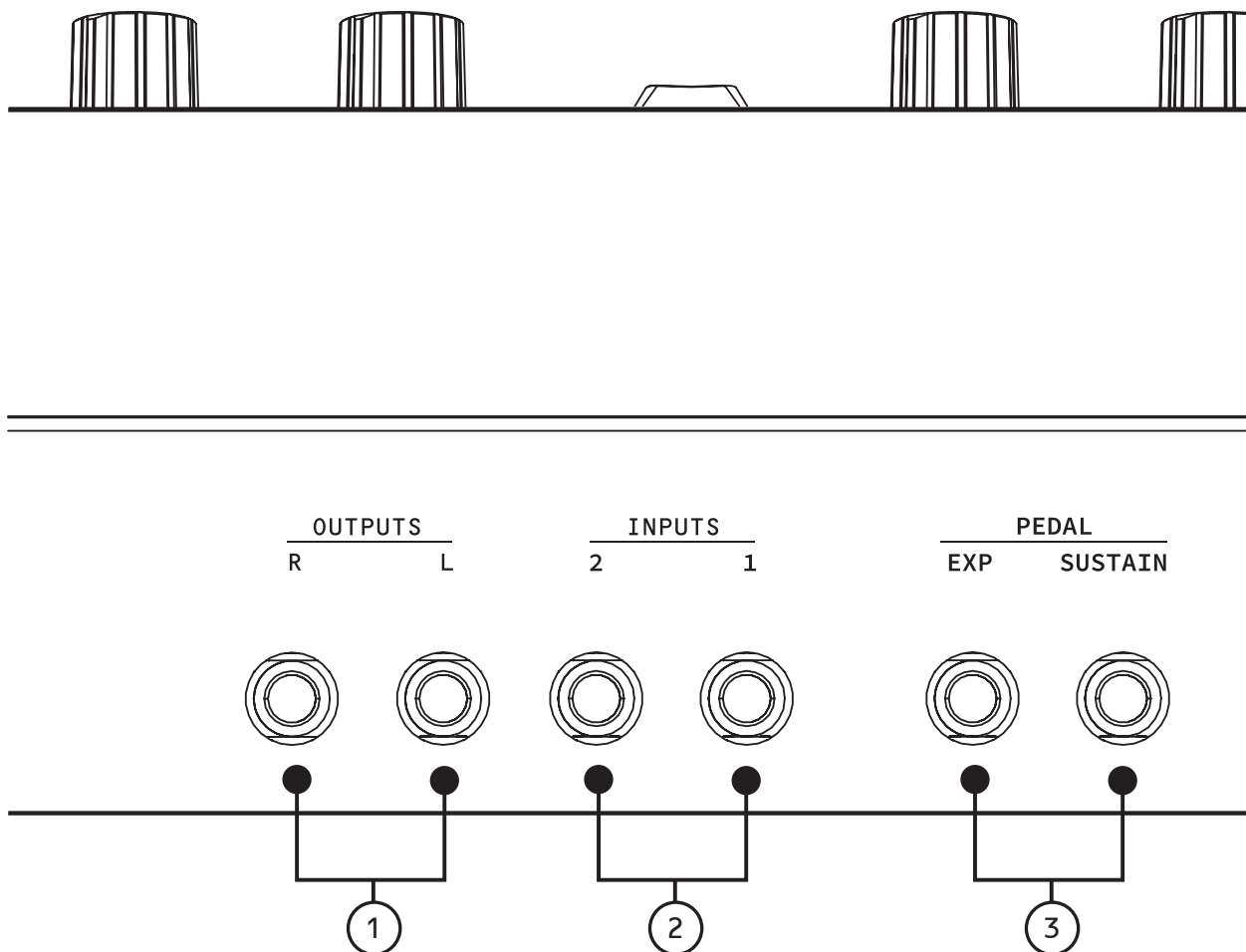
DELIA Keys

KEY	LED STATUS	FUNCTION
SOFT KEY 1	ON = key pressed	EXIT / BACK / BANK Corresponds with screen mode
SOFT KEY 2	ON = mode active	EDIT / RENAME etc. Corresponds with screen mode
LOAD	ON = Load mode active	Load a Preset onto the current Patch, on the active Layer. If in LAYER menu, load a Layer setup.
SAVE	ON = Save mode active	Save the Patch on the current Layer to a Preset. If in LAYER menu, save a Layer setup.
BANK	ON = Bank/Load mode active	Press BANK to access available Presets Banks.
MOD	Blinking = MOD mode active	Enter modulation mode
OCTAVE DOWN	ON = Down one octave Blinking = Down two octaves	Press to move down by one octave.
OCTAVE UP	ON = Up one octave Blinking = Up two octaves	Press to move up by one octave.
OSC BANK 1/2 SELECT  	ON = OSC 1 + 2 active	OSC. BANK 1/2 SELECT Choose to edit OSCILLATORS 1 + 2 Select active OSC when using OSC MENU. Light ON = OSC 1. Light BLINKING = OSC 2.
OSC BANK 3/4 SELECT  	ON = OSC 3 + 4 active	OSC. BANK 3/4 SELECT Choose to edit OSCILLATORS 3 + 4 Select active OSC when using OSC MENU. Light ON = OSC 3 Light BLINKING = OSC 4.
COARSE TUNING MODE	ON = Coarse Tuning	Toggle between FINE TUNE and COARSE TUNING.
SYNC	ON = SYNC ON	Hard Sync VCO 2 to VCO 1.
SUB	ON = SUB Osc OFF = Normal Pulse	Switch VCO 1 pulse to sub-octave square
LFO 1 SELECT	ON = LFO 1 active	Selects the active LFO
LFO 2 SELECT	ON = LFO 2 active	Selects the active LFO
LFO 3 SELECT	ON = LFO 3 active	Selects the active LFO
LFO SHAPE	ON = LFO SHAPE MENU active	Select LFO waveform.
LP SLOPE	ON = 24dB OFF = 12dB	Select 12db or 24db slope for LP Filter.
LINK	ON = LINK is active	Links HP + LP filters for BANDPASS control.
RESONANCE MODE	ON = LP Resonance OFF = HP Resonance	Select control of HP or LP resonance.
VCF SELECT	ON = VCF active	Set Envelope control to VCF
VCA SELECT	ON = VCA active	Set Envelope control to VCA
AUX SELECT	ON = AUX active	Set Envelope control to AUX
MACRO	ON = MACRO Knob active	When active the SEND/PARAM knob will control the user defined MACRO Parameter.
A/B COMPARE	OFF= A Sound (0) ON = B Sound (100)	Toggle between A/B for the A or B sound. Select B to create new B sound. B Patch can only set when set to B.

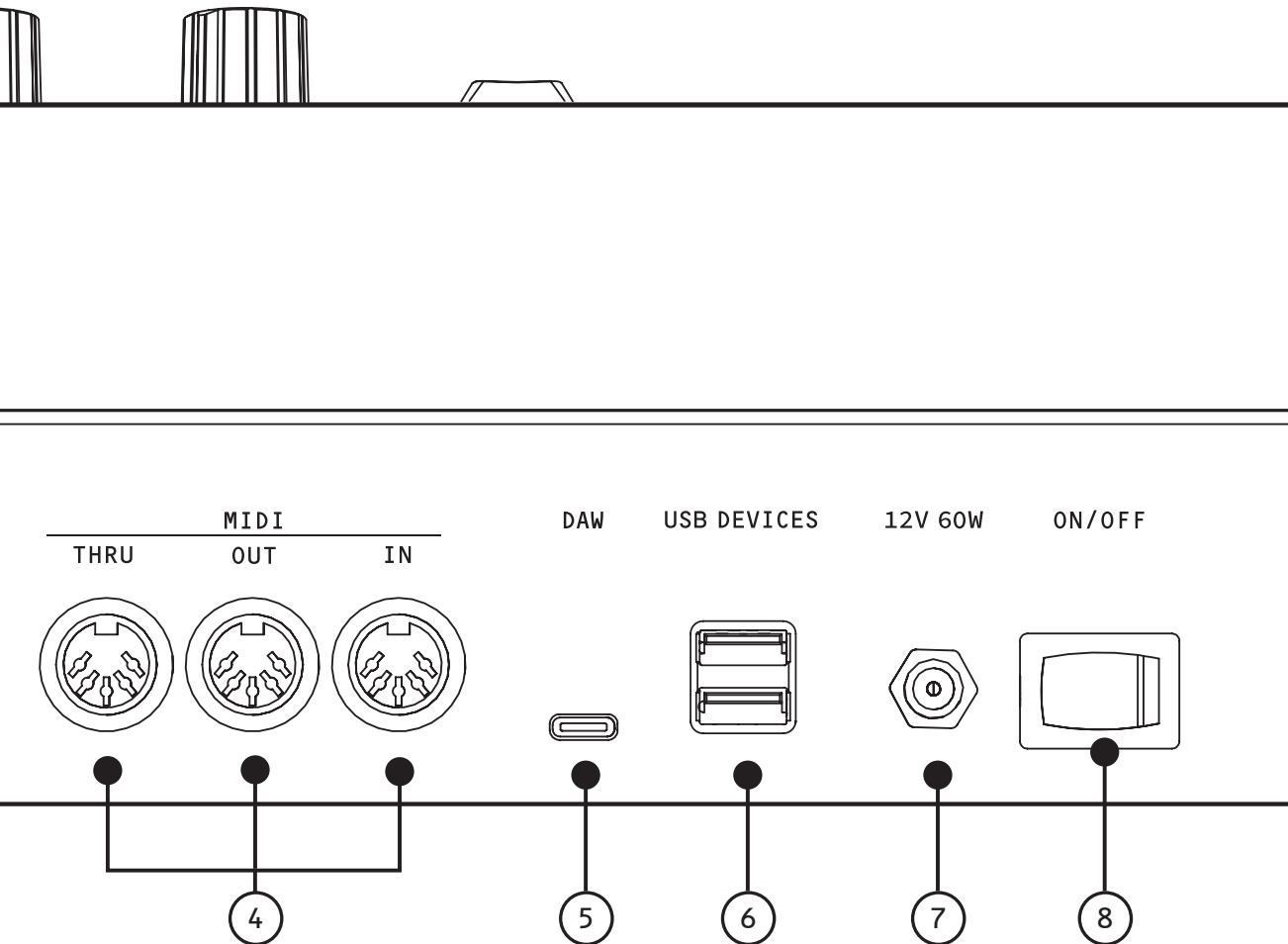
DELIA Knobs

SECTION	LABEL	FUNCTION
OSC 1/3 TUNE	1 OSC 1 TUNE	Fine tune +/- 7 semitones (1/5). Coarse Tune +/- 2 octaves.
	3 OSC 3 TUNE	Fine tune +/- 7 semitones (1/5). Coarse Tune +/- 2 octaves.
OSC 1/3 SHAPE	1 OSC 1 SHAPE	Variable Shape Oscillator.
	3 OSC 3 POSITION	Wavetable position for OSC 3.
OSC 1/3 MIX	1 OSC 1 - MIX LEVEL	Level of OSC 1 into mix.
	3 OSC 3 - MIX LEVEL	Level of OSC 3 into mix.
OSC 2/4 TUNE	2 OSC 2 TUNE	Fine tune +/- 7 semitones (1/5). Coarse Tune +/- 2 octaves.
	4 OSC 4 TYPE	Selectable type: NOISE / XOR / INPUT 1 / INPUT 2 / AUX.
OSC 2/4 SHAPE	2 OSC 2 SHAPE	Variable Shape Oscillator.
	4 OSC 4 TONE	Set the TONE of OSC 4.
OSC 2/4 MIX	2 OSC 2 - MIX LEVEL	Level of OSC 2 into mix.
	4 OSC 4 - MIX LEVEL	Level of OSC 4 into mix.
LFO	RATE	LFO Rate control of LFOs 1/2/3.
	LEVEL	LFO Level (Gain) control of LFOs 1/2/3.
FILTER	HP CUTOFF	Set the VCF High Pass Cutoff frequency
	LP CUTOFF	Set the VCF Low Pass Cutoff frequency
	DRIVE	Control of 3-Stage Drive / Overdrive.
	RESONANCE	Selectable HP/LP VCF Resonance.
ENVELOPE GENERATORS	EG LEVEL	Sets the overall amplitude of the selected envelope.
	ATTACK	Attack amount for selected EG
	DECAY	Decay amount for selected EG
	SUSTAIN	Sustain amount for selected EG
	RELEASE	Release amount for selected EG
EFFECTS	SEND/PARAM	Control Effects SEND LEVEL. Press MACRO to control User Defined Effects Parameter
MORPH	POSITION	MORPH all PATCH parameters between A/B sounds (per layer).
TEMPO GLIDE	TEMPO GLIDE	Control of TEMPO and GLIDE Parameters. Mode is defined by active TEMPO or GLIDE keys in bottom row.
OUTPUT	LEVEL	Master Volume and Headphone Level. NOTE: This is not a motorized knob
CONSOLE	NONE (DATA KNOB)	Use DATA WHEEL to select presets, adjust values and navigate up and down menus..

Rear Panel & Connections



- 1. OUTPUTS:**
Main Audio Left and Right: Line Out
For best results use a TRS Balanced cable
- 2. INPUTS:**
Inputs 1 and 2: Line Level Audio or CV
- 3. PEDAL INPUTS:**
Expression and Sustain
- 4. MIDI:**
Standard DIN MIDI IN / OUT / THRU



5. **DAW (USB HOST):**USB-C connection for MAC/PC

6. **USB DEVICES:**

USB MIDI Keyboards and controllers, USB thumb drives

7. **POWER INPUT:**

Use supplied power accessories only 12V 60W

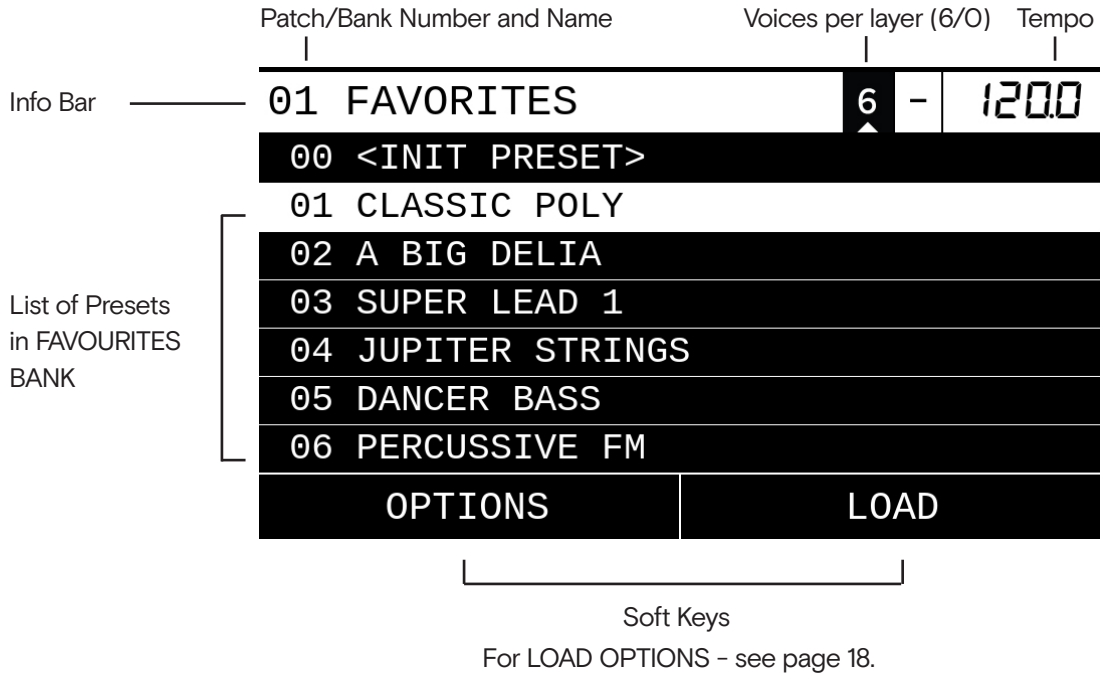
8. **POWER SWITCH:**

On/Off

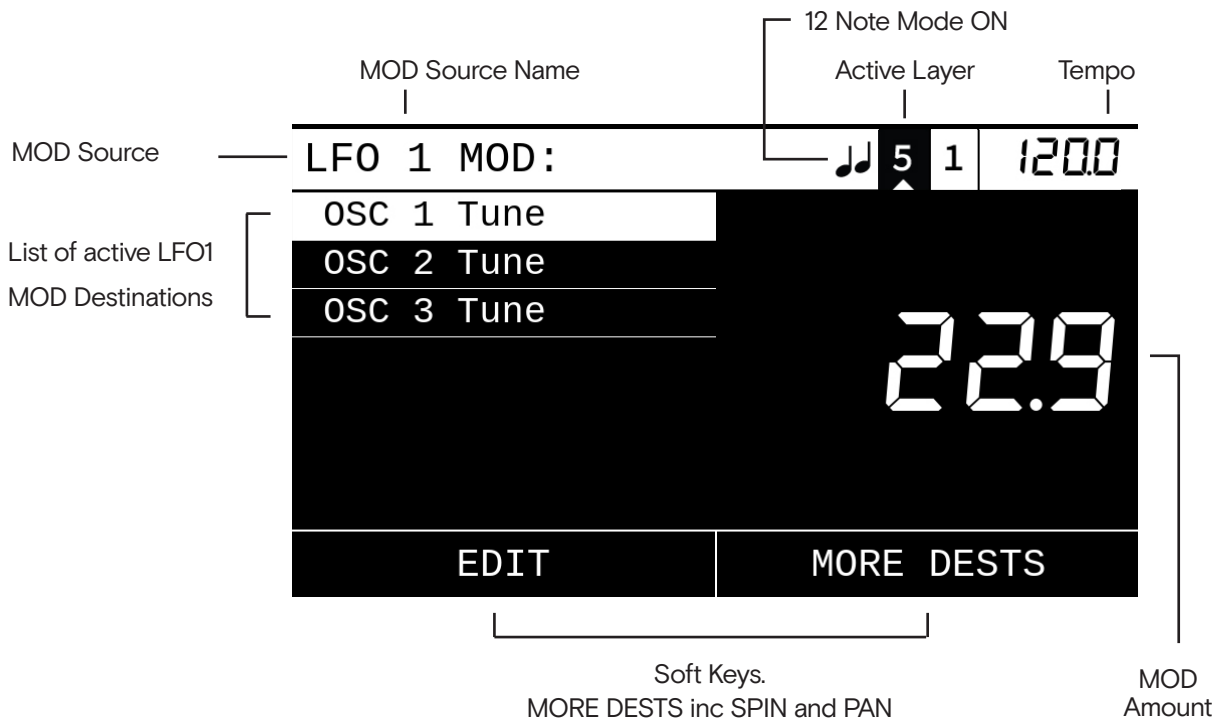
PHONES: Headphone jack is located on front panel

Display Layout

LOAD PRESETS Screen

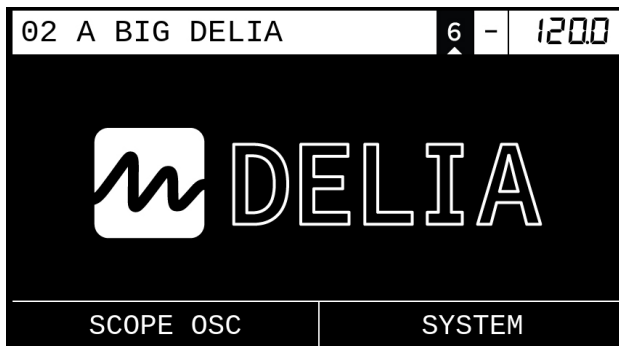


MODULATION Screen example



Home Screen

DELIA's home screen provides simple status information such as the active Preset, the current BPM, and the voice icons show the number of assigned voices and the currently active layer (as reflected on the control panel).



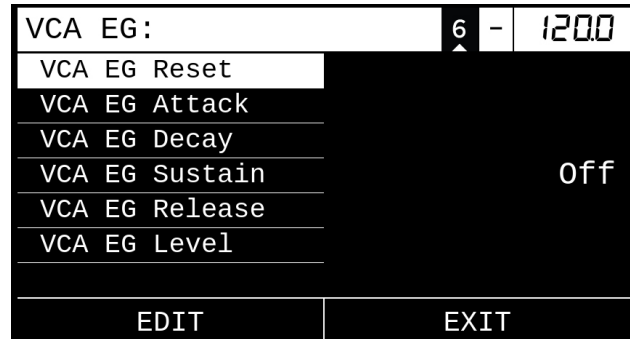
Home Screen Status updates

While in Home Screen Mode Delia's display will momentarily show adjustments in real-time each time you move a knob, and in some instances provide Soft-key options like SAVE TO A and SAVE TO B as shown below.



Menu Screens

Most of DELIA's settings are accessible via the control panel and via the Menu Keys. 'Grey tab' labelling along the bottom row of keys indicates a MENU. Pressing the Key will open the associated menu. Below is the VCA-EG Menu, accessed by pressing the EG Key while the VCA EG is active. Quickly jump between other Envelopes using the EG Select Keys ie. VCF, VCA, AUX.



The EDIT soft-key has 2 modes of operation:

LATCHED: If you press EDIT momentarily, it will latch the data knob will adjust the current value up or down, until you press EDIT again.

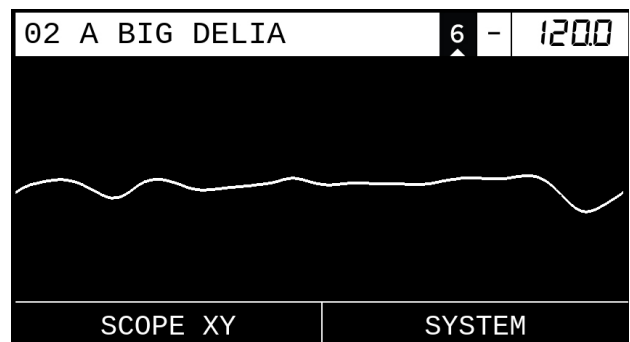
QUICK EDIT: Press and hold down the EDIT soft-key while you turn the data knob to adjust the value without latching or needing to press EDIT a second time to exit.

Scopes

When on the home screen Delia will display an oscilloscope showing the analog output before effects are applied. The scope has 3 options for display.

SCOPE OSC

Normal, oscilloscope style scope



SCOPE XY

XY or Goniometer mode. This visualises the stereo field, where the X axis is the left channel and the Y axis is the right channel audio.

SCOPE OFF

Disables the SCOPE. Soft Key shows the 'next' option.

Presets

A Preset in Delia stores the full configuration of the synth. This includes 2 layers with a Patch on each layer for multi-timbral operation, and an A and B Sound in both Patches ready for A/B morphing.

Please note the use of the words 'Preset', 'Patch' and 'Sound' in this manual, to refer to this structure.

The table at right shows the contents of a Preset.

Most Factory Presets have a Patch on Layer 1 using all 6 voices, and Layer 2 is disabled (zero voices assigned). Presets also include the Arpeggiator, Sequencer Data, Tempo and Effects setup.

A multi-timbral Preset (MULTI) can be built up from this by loading a new Patch/Preset into Layer 2, with the option to create a 'Split' or a 'Stacked' Preset.

Presets are stored in Banks. Each Bank can contain up to 127 Presets. New Banks can easily be created, up to 127 (SYSTEM > BANK/PRESET MANAGEMENT > ADD BANK). Banks can also be imported and exported via USB Flash drives, see Bank/Patch Management on page 39, in the System Menu section.

Preset Structure

GLOBAL PRESET SETTINGS			
PRESET NAME: KEYS HORNS			
EFFECTS			
SEQUENCER DATA			
ARPEGGIATOR			
TEMPO (BPM)			
MULTI MENU			
LAYER 1: KEYS		LAYER 2: HORNS	
LAYER VOICES		LAYER VOICES	
VOLUME		VOLUME	
OUTPUT ROUTING		OUTPUT ROUTING	
MIDI CHANNEL		MIDI CHANNEL	
LOW NOTE		LOW NOTE	
HIGH NOTE		HIGH NOTE	
OCTAVE OFFSET		OCTAVE OFFSET	
PATCH MENU			
PATCH NAME: KEYS		PATCH NAME: HORNS	
UNISON VOICES		UNISON VOICES	
UNISON DETUNE		UNISON DETUNE	
PANNER POSITION		PANNER POSITION	
POLY MODE		POLY MODE	
PITCH BEND RANGE		PITCH BEND RANGE	
KEY PITCH OFFSET		KEY PITCH OFFSET	
SPIN		SPIN	
SPIN RETRIGGER		SPIN RETRIGGER	
12 NOTE MODE		12 NOTE MODE	
VINTAGE LEVEL		VINTAGE LEVEL	
MORPH MODE		MORPH MODE	
MIDI CC 1		MIDI CC 1	
MIDI CC2		MIDI CC2	
CONTROL PANEL			
LAYER 1 A	LAYER 1 B	LAYER 2 A	LAYER 2 B
CONTROLS	CONTROLS	CONTROLS	CONTROLS
MOD MATRIX	MOD MATRIX	MOD MATRIX	MOD MATRIX
WAVETABLE	WAVETABLE	WAVETABLE	WAVETABLE
< A/B MORPHABLE >		< A/B MORPHABLE >	

Loading Presets

Press the LOAD Key to show the list of Presets in the current Bank. The display will show the current bank in the title bar (01 FAVORITES) and the list of Presets, starting with the last Preset loaded.

01 FAVORITES		6	-	1200
00 <INIT PRESET>				
01 CLASSIC POLY				
02 A BIG DELIA				
03 SUPER LEAD 1				
04 JUPITER STRINGS				
05 DANCER BASS				
06 PERCUSSIVE FM				
OPTIONS		LOAD		

Press the LOAD soft-key to load the Preset. This will load the entire preset, including the full multi-timbral configuration, effects, sequencer and arpeggiator.

Pressing PRESET UP/DOWN Keys (</>) will quickly load the next or previous Preset in the Bank.

When a Preset loads, the display will remain on the LOAD screen and the LOAD Key LED will stay ON. To exit, press the LOAD Key again.

NOTE: You can still adjust the Patch using the knobs and Keys or RUN a sequence while in LOAD mode.

Preset BANKS

The BANK Key allows you to switch to another bank of Presets. Pressing BANK will display the list of available Banks:

BANKS		6	-	1200
01 FAVORITES				
02 BASSES				
03 LEADS				
04 KEYS				
05 STRINGS				
06 PADS				
07 EFFECTS				
RENAME		ENTER		

Press ENTER to open the selected bank and show the available Presets.

Press RENAME to change the name of a BANK, as described below. If you decide not to change bank, press BANK again and return to current bank, or press the LOAD Key to exit. Pressing the LOAD Soft-key will load the selected Preset.

INIT (Initialize) Preset

Initializing clears all settings and sets 'all knobs left', with a single oscillator sawtooth, no effects and almost no modulation. Upon INIT, Layer 1 is assigned all six voices and Layer 2 disabled with zero voices assigned.

There are two ways to initialize:

From the LOAD menu, by loading the <INIT PRESET> at position 00 in every Bank (see below),

or via shortcut by holding the PRESET </> Keys together for 2 seconds.

05 STRINGS		6	-	1200
00 <INIT PRESET>				
01 STRING MACHINE				
02 ANCIENT STRINGS				
03 JUPITER STRINGS				
04 STRINGS				
05 PING STRING				
06 SONINA STRINGS II				
---		LOAD		

Saving Presets

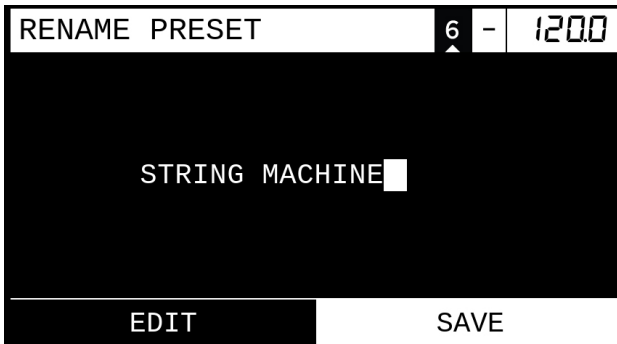
Saving Presets is very similar to loading. Press the **SAVE** key to show the list of Presets in the current Bank.

Pressing SAVE will always return to the Preset you last loaded. If you simply wish to overwrite the Preset, press the SAVE Soft-key.

To save a new Preset, scroll to a new position in the current list, or use the BANK Soft-key and navigate to a different Bank and position.

05 STRINGS		6	-	1200
25 SPIN ME				
26 HIGHNESS				
27 VIENNA SOLINA				
28 BASIC PRESET				
29 BASIC PRESET				
30 BASIC PRESET				
31 BASIC PRESET				
BANK		SAVE		

When you press the **SAVE** Soft-key you will be prompted to change or update the name. Use the DATA knob to select the characters and press EDIT to modify.

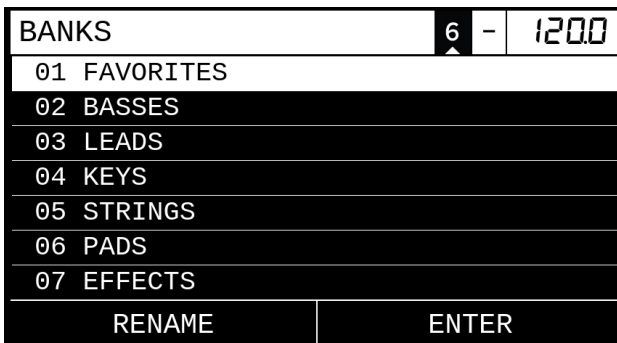


When you press **SAVE** Soft-key again, DELIA will briefly inform you that the Preset has been saved.

Renaming Banks and Presets

Banks can be renamed from the BANK selection screen, and Presets can be renamed when saving.

Use the Data Wheel to scroll the cursor left or right. Press and hold **EDIT** while you adjust the data knob to change the letter or number at the current cursor position. Note that all the letters to the right of the cursor are grayed out. The grayed out letters will be trimmed off the name when you press **ENTER**. If you want to retain all character in current name, move the cursor to the end before you press **ENTER**.



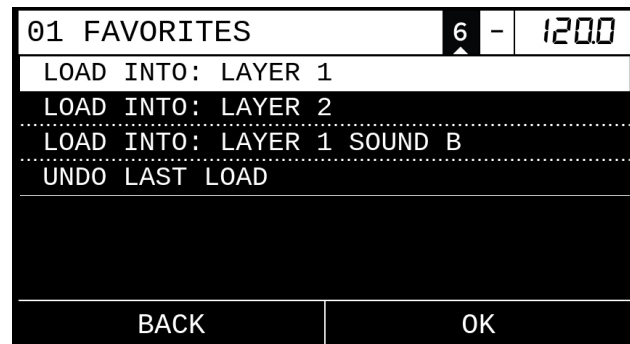
Import and Export Presets

Banks of Presets can be imported and exported to and from DELIA via .zip files stored on a USB flash drive. See section Bank/Patch Management on page 41, under System Functions.

Loading OPTIONS for Multi-Timbral Layers & Morph

If you want to build a Multi-Timbral Preset or load a new Patch into the B sound of your current Preset you can do this by pressing the **OPTIONS** Soft-key.

These **OPTIONS** allow you to load a Preset, Patch or Sound into the selected location without affecting other parts of the active Preset.



The **OPTIONS** are:

- LOAD INTO: LAYER 1
- LOAD INTO: LAYER 2

These 2 options load the Preset you have just selected into just LAYER 1 or LAYER 2. Other settings in the current Preset are not changed.

Depending on the active preset, the following **OPTIONS** may also be available:

- LOAD INTO: LAYER 1 SOUND B
- LOAD INTO: LAYER 2 SOUND B
(only available if active Preset is MULTI)

These 2 options load the A Sound of the selected Preset into just the B Sound of the chosen layer.

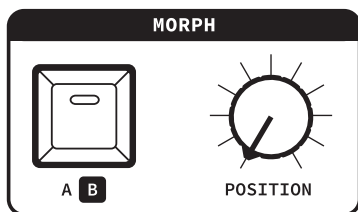
NOTE: if you load a Patch into Layer 2, and layer 2 is currently disabled, Delia will automatically assign one voice to LAYER 2

If you select a Multi-Timbral Preset from the Bank and press **OPTIONS**, Delia will first ask which of the 2 **LAYERS** in that Preset you want to use, eg:

- USE L1: WOBBLE BASS
- USE L2: FUNKY LEAD

After selecting the normal **OPTIONS** will be shown as above.

Morphing and A/B Compare



All Patches have 2 sounds, the A sound and the B sound. Delia's Morph knob smoothly interpolates all the parameters individually between the A and B sounds, including all of the modulation matrix settings. The Morph setting is a destination in the Modulation Matrix, for example an LFO or Envelope can be used to dynamically morph notes while playing.

Morph is a great way to explore new sounds for sound design, doing an A/B compare when editing, or creating 2 versions of a sound for performance.

The A/B key switches between sound A and sound B. If the A/B Key LED is OFF, you are editing the A sound; if the LED is ON, you are editing the B sound.



As you press the A/B Key, you will notice that the Morph Knob jumps between fully-left (A) and fully-right (B). When you turn the Morph knob, the sound will morph between the A and B sounds according to the position of the Knob.

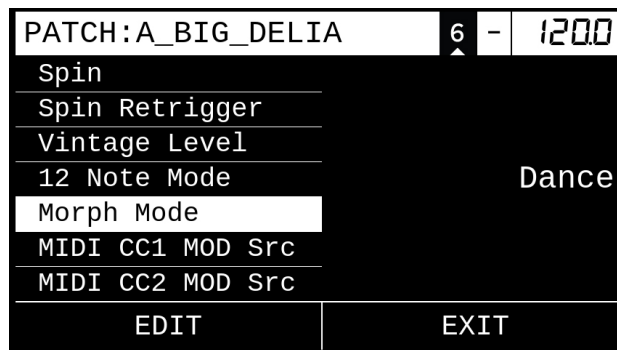
Some settings cannot be morphed in the same way, so work a bit differently.

Setting	Morph Operation
OSC 3	Crossfades between the sound of OSC 3 on A and B.
COARSE Tune	Steps between the octaves on A and B in even steps divided over the Morph Range.
SUB Oscillator Enable	Steps between the A sound and B sound setting at the 50% Morph position.
SYNC Enable	Steps between the A sound and B sound setting at the 50% Morph position.
NOISE Type	Setting is always the same on A and B. Does not morph.
OVERDRIVE	Setting is always the same on A and B. Does not morph.
EFFECTs	Setting is always the same on A and B. Does not morph.
TEMPO, ARP, SEQUENCER	Setting is always the same on A and B. Does not morph.

Dance Mode

In Dance mode, the knobs will all move to show their positions in the Morph, and you can edit that morphed sound as you go.

As you morph between the A and B, you can also move any of the front panel knobs to lock in that parameter. For example, if you are morphed $\frac{1}{4}$ of the way from A to B, and you adjust the Resonance Knob, then when you move the morph knob again, the Resonance Knob will not move anymore.



DJ Mode

In DJ mode, the Morph knob will morph between the sounds, and you will hear the morphed sound, but the knobs will not move. The controls will either be editing the A or B sound, depending on the A/B Key.

TIP: DJ Mode works well if you are automating the Morph control from a DAW and want to use the patch editing knobs at the same time.

In Dance mode, you edit the Morphed sound if you adjust with the knobs, but in DJ mode you edit the original A and B sounds when you adjust the knobs.

Store Morph Position to A/B

Any time you adjust the Morph knob, the display will offer STORE TO A and STORE TO B soft-keys. These functions will appear for around 6 seconds after adjusting Morph.

STORE TO A or B will save the current Morphed sound to the A or B sound. The A/B Key will switch to that sound.

This feature can be used to quickly save a particular sound that you like, and can also be used to copy the A sound to the B, or the B sound to the A.

For example, if you want to copy the A sound to B, turn the Morph knob all the way to the left (A), and then choose STORE TO B.

Below: **STORE TO B** soft-key shown because A/B is on.



Load a Preset into B

A great way to explore new sounds is to load two completely different sounding Patches into the A and B sounds, and morph between them.

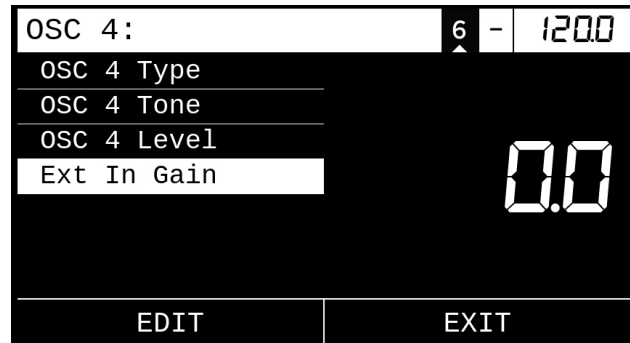
See the 'Load Into' section on Page 16.

Synthesizer Controls

Menu Keys

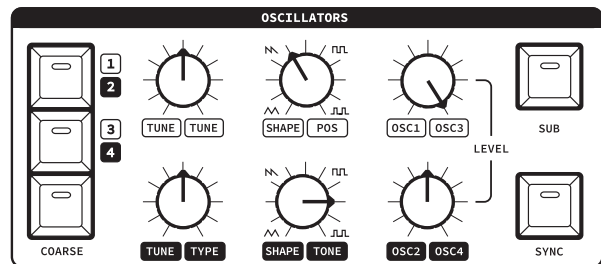
The MENU KEYS (as shown on page 9) access the menus for the different sections of Delia. These allow access to all settings, including those not available from the front panel controls.

Shown below is the Oscillator 4 menu, accessible via the OSC key.



Oscillators

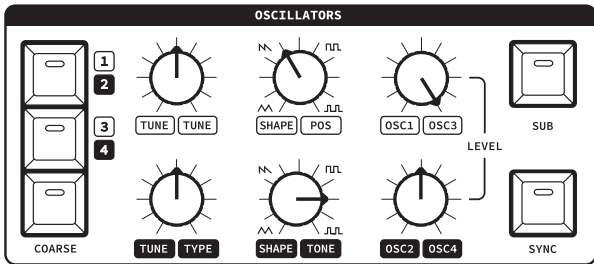
DELIA has 4 'Oscillators', with 2 sets of knobs to control them. Oscillators 1 and 2 are like traditional VCOs. OSC 3 is a Wavetable and OSC 4 has a number of different functions.



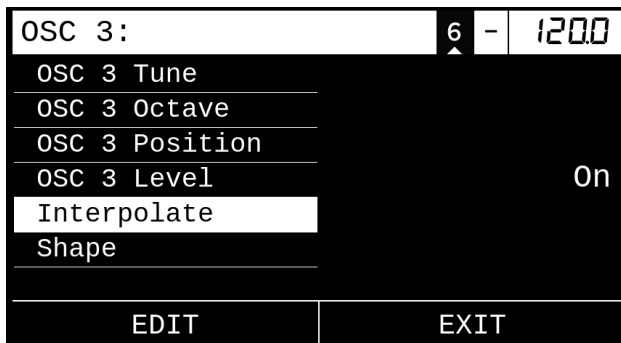
Pressing 1/2 key will control oscillators 1 and 2, and pressing 3/4 switches the Oscillator Bank to control Oscillators 3 and 4. When the key is illuminated it indicates the active oscillator pair.

The labels on the left under the knobs, in white show Oscillators 1 & 2 functions.

The labels on the right under the knobs, in grey show Oscillators 3 & 4 functions.



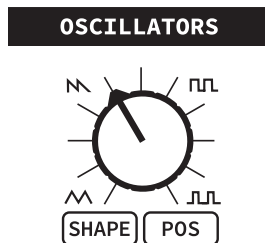
The OSC MENU (via OSC Key) shows all the settings for the oscillators. When this menu is open the OSC1/2 KEY switches the menu between OSC1 and OSC2 settings and similarly, the OSC3/4 KEY switches the menu between OSC3 and OSC4.



OSC 1/2 Digital VCOs

OSC 1 and OSC 2 are Analog-Modelling digital VCOs based on Melbourne Instruments' discrete transistor VCO, used in NINA. Part of the modelling is the natural drift of this circuit, and the amount can be set in the Patch menu via the 'Vintage Level' setting. See page 32.

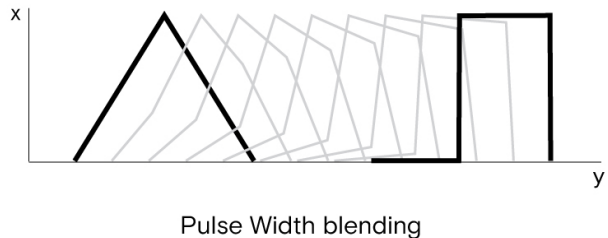
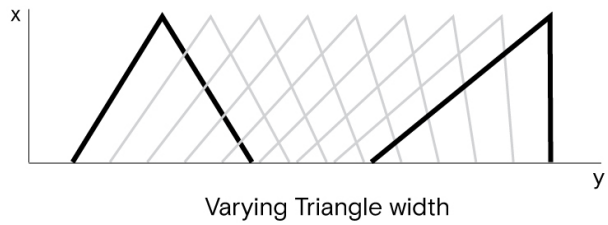
The VCOs generate a Sawtooth/Triangle shape and a Pulse Shape.



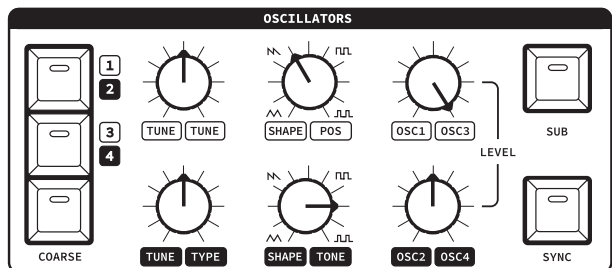
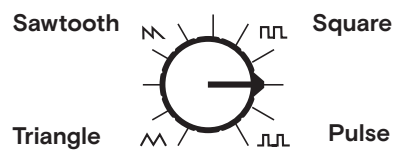
The control of Delia's sawtooth to triangle wave shape has a unique feature —

Most existing synthesizers do a crossfade between triangle and sawtooth when you adjust the shape control. DELIA's oscillators do a smooth shape transition between triangle and saw, which follows the pulse width. This is creates a unique set of timbres between the two shapes.

The following diagram shows a picture of how the Width Knob changes the shape of the Saw/Triangle and Pulse



The Shape control knob varies the width of the triangle/saw and square/pulse, and in between these is a blend as indicated on the scale around the knob.



The **SUB** key makes OSC 1's pulse output drop 1 octave and become a square wave.

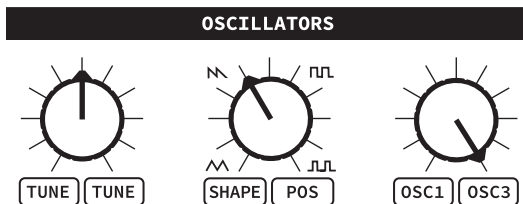
The **SYNC** Key makes OSC 2 hard sync to OSC 1. This means the every time OSC 1 restarts its waveform it forces OSC 2 to restart.

The **TUNE Knob** is used for either fine or coarse tune adjustment, as determined by the state of the **COARSE Key**. If the Coarse Key LED is off, the TUNE Knob is a fine tune control in cents (1/100 of a semitone), with a range of +/-7 semitones (700 cents) ie a perfect fifth.

If the COARSE Key LED is on, the TUNE Knob is an octave transpose 5 position switch with a range of +/- 2 octaves.

OSC 3 Wavetable Oscillator

OSC 3 is a Digital Wavetable Oscillator.



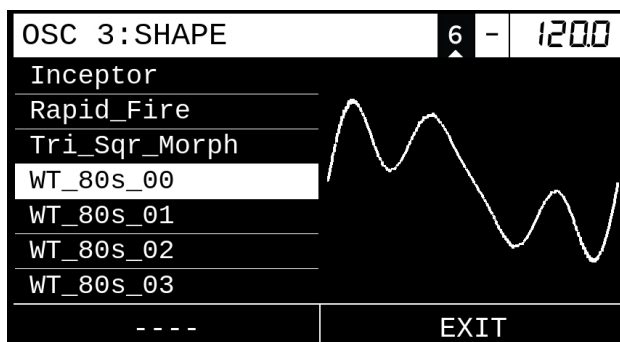
Delia's included factory wavetables cover a range of styles, from retro 80s style to modern high resolution interpolated waveforms. Wavetables can be imported and exported, and formats from popular software synthesizers are supported. See **Wavetable Management** for more details.

The **TUNE Knob** performs the same coarse and fine tune functions as it does with OSC 1 and OSC 2.

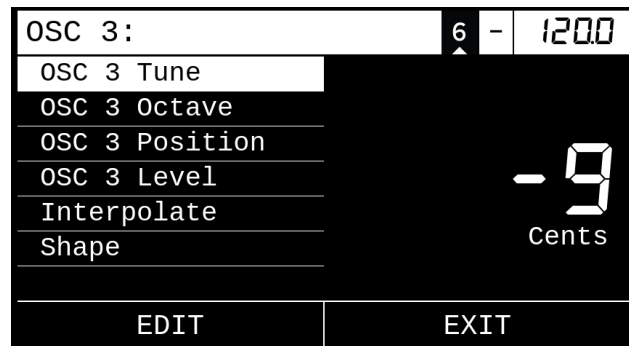
The **POS Knob** sets the wavetable position. The position is often assigned as a modulation destination to let the wavetable sound evolve as notes play.

WAVE

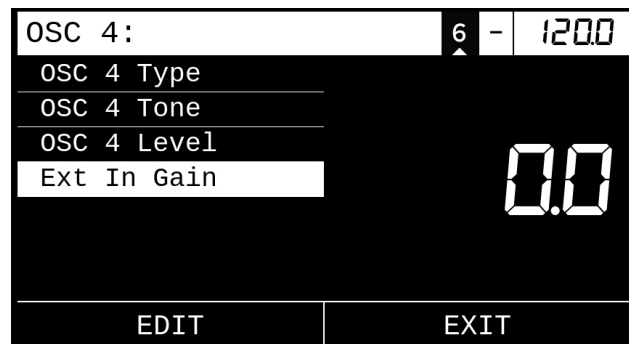
The **WAVE MENU** displays the currently selected wavetable. The visualiser scans forward and backward though all the waves in the table. To change wavetable simply scroll with DATA wheel when in EDIT mode



The OSC Menu Key with the OSC3/4 Key shows all OSC 3 settings.



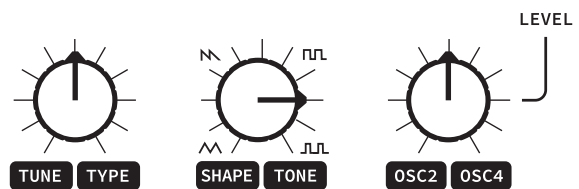
The Interpolate option determines how the wavetable sounds. If Interpolation is on, the wavetable Position (POS) will smoothly transition the sound between the wavetables. If it is off, then it will step from one to the next. How 'steppy' the sound is will depend on many steps the chosen wavetable contains.



OSC 4 Noise, Fuzz & Others

OSC 4 has a number of possible functions.

The **TYPE Knob** chooses the function:



NOISE

This source is white noise. Adjust the Tone knob to make this less bright.

XOR

This source is a ring modulation of the Pulse outputs of OSC1 and OSC2. This ring modulation models a discrete transistor XOR gate. This sound has a very particular and unusual fuzzy timbre.

EXT L and EXT R

Selecting this source routes the external audio inputs to be inserted into the front end of the voice.

This lets you mix in external sources to each voice and pass through the overdrive, VCFs, VCA and effects.

LOOP

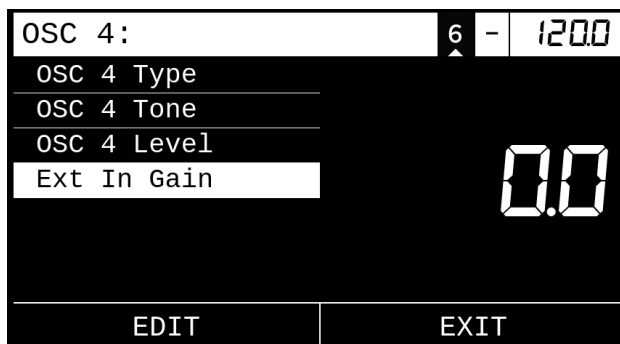
This routes the total analog output of the synth back into start of the voice, in a feedback loop.

Tone

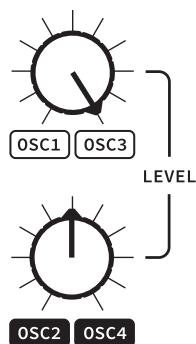
Oscillator 4 TONE affects the brightness of the the selected 'Noise' type, from a darker 'Pink Noise' through to a typical 'White Noise' range.

Ex Input Gain

Adjusts the gain on the analog inputs.



Voice Mix



All of the four sound sources: OSC 1, OSC 2, OSC 3 and OSC 4 are mixed together using their level control Knobs. Use these to adjust the timbre of the sound.

TIP: To get the best sound out of the MIX section, set the dominant oscillator's level control to its maximum and adjust the other oscillators down relative to that. This will give the best dynamic range and SNR.

The mix of the four Oscillators goes into the High Pass filter, and then through an analog overdrive circuit before it goes into the analog Low Pass VCF.

Drive

The DRIVE Knob controls the gain of the overdrive. The range of the drive DRIVE knob up to the 1 o'clock position (value 60.0) has a basic level of gain which goes from smooth sound with no overdrive, to quite a thick overdriven character.



There is a notch at the 1 o'clock position on the drive knob. When you turn above this notch, the overdrive circuit switches in an extra gain stage of around 10 times the voltage. This allows the signal to completely overdrive the Analog Ladder filter for a massive amount of overdrive/distortion in the sound.

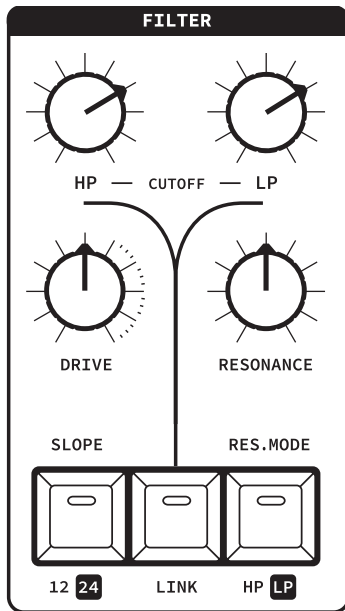
Note that there is a very slight click, and a big change in the sound as this overdrive circuit is engaged. If you are modulating the drive, and it crosses this amount, it will dramatically change the character as this happens. You may or may not want this to happen. If you don't want it to happen, adjust the modulation amount and drive level to keep the modulated drive above or below the 60.0 value.

Multi-mode Filter/VCF

Delia has a Multi-mode Filter in 2 sections.

The first section is a High Pass 2 pole digital model of a transistor Ladder filter with Resonance.

The second section is the classic analog resonant transistor ladder filter as designed by Robert Moog in the 1960s. The Filter has 2 pole (12dB/octave) or 4 pole (24dB/octave) operation. The input to the LP filter is from the overdrive circuit as described above.

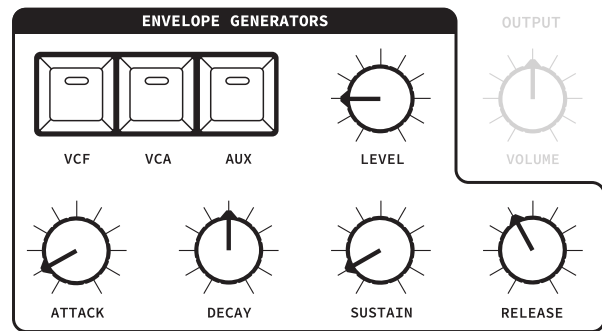


The two CUTOFF knobs set the HP and LP filter cut-off frequencies. Note that the frequency is not precisely tuned to exact semitones across the full operating temperature range, but is close. This variation adds character and depth as different voices are allocated to different notes played, but it also means you cannot use the self-oscillation of the filter to play fully in-tune notes.

The LINK Key locks the relative positions of the HP and LP Cut, which puts the filter into Bandpass operation.

The RESONANCE Knob sets the amount of resonance separately for the HP and LP filter according to the state of the HP/LP Key. Both filters can self-oscillate.

Envelope Generators



Delia has 3 standard ADSR + LEVEL Envelope Generators. The **VCF**, **VCA** and **AUX** Keys select which envelope is controlled.

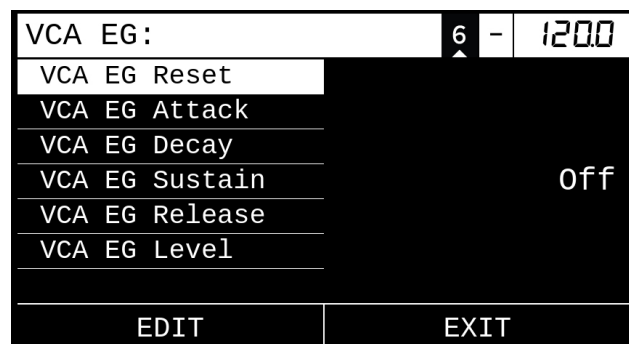
The **VCA** envelope is always connected to the final Analog VCAs, and can also be assigned to other destinations via the mod matrix.

The **VCF** envelope is usually assigned to the LP VCF cutoff, but does not have to be. It can be assigned to other destinations via the mod matrix.

The **AUX** envelope is free to be assigned to any destination in the mod matrix.

The **LEVEL** knob adjust the overall gain of the envelope.

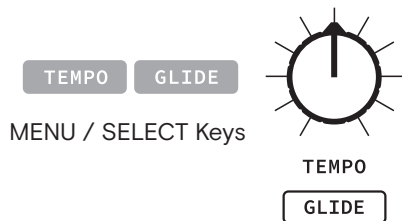
EG MENU — access to a RESET option which chooses what happens if a note is still being heard when a new one is played. If RESET is ON, then the old note will be instantly turned off, and the envelope will start the Attack phase from silence. This makes an abrupt transition at each note start. This is a common setting for bass sounds, where the attack phase needs to be heard on each note.



If RESET is OFF, then the old note is not silenced, instead the envelope starts the Attack phase from the tail of the previous note. This makes a smooth transition from one note to the next, especially when the envelope has a slow release.

The AUX Envelope also has a Slow mode. This slows the envelope down for use with very slow time transitions. It is around 10 times slower than a normal envelope.

Glide & Tempo



The GLIDE/TEMPO Knob controls either the Glide/Portamento rate or the Tempo of the internal clock for the Sequencer/Arpeggiator.

The TEMPO MENU and GLIDE MENU Keys in the bottom row are used to select and show what the Knob is controlling.

For **GLIDE**, the knob controls how quickly the pitch of notes changes as different notes are played. A glide setting of zero makes the pitch change instantly, like a piano does. As you increase the setting, the pitch change between notes will take longer, which is a portamento effect.

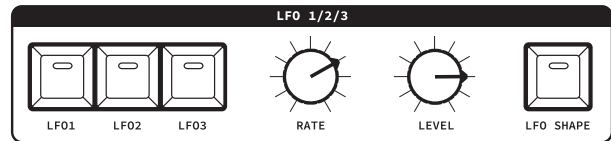
When you press the **GLIDE MENU Key** in the bottom row, the Glide Type can be set to Linear, Logarithmic or Legato Linear.

The choice between Linear and Logarithmic comes down to the style of playing, sound and personal preference. The 'Legato Linear' glide type changes the glide depending on whether the playing is legato or not. If the notes are played legato (a new note is played before the previous note is released), then glide is done between the notes. If the previous note is released before a new note is played (non-legato or staccato), then glide is not done and the pitch steps immediately to the new note.

The **TEMPO MENU key** indicates Tempo is the active Knob assignment and a momentary press will allow tempo control via the DATA wheel.

LFOs

The LFO 1/2/3 Keys choose which LFO controls are active.



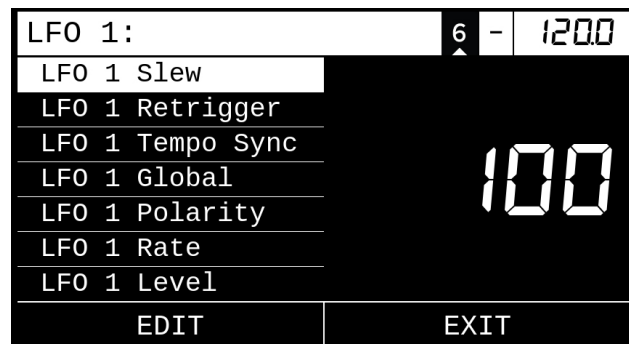
The LFO Rate is set by the RATE knob and has a frequency of 1/33 Hz at 0 to 30Hz at 100. The LFO Rate is also a Modulation destination, so it can be made a lot faster by adding a SET amount in the Mod Matrix to the LFO Rate.

The LFO Level knob sets the amplitude of the LFO from 0 to 100. Note that amplitude is set before the LFO is sent into the Mod matrix, so it combines (multiplies) with the amount set in the mod matrix. The LFO is bipolar, so for an amplitude of 100, it will range from -100 to +100. If you wish to make a unipolar LFO, or offset the waveform, you can apply a SET to add a value to the same destination. See SET in the Modulation Sources below for more details.

The **LFO SHAPE Key** sets the LFO waveform shape.

The choices are Sine, Triangle, Square, Ramp Up, Ramp Down or Random.

The **LFO MENU** accesses additional settings for the LFOs.



LFO Slew affects the overall transition rate for the LFO, which is particularly useful for the Square and Random LFO shapes.

If Retrigger is On, then the LFO waveform will restart with each note played, if it is Off then it will free-run, but each voice will have its own LFO running independently. If it is Global then this LFO will feed every voice at exactly the same amplitude and waveform phase, so they will all move together.

If **Tempo Sync is On** then the LFO will follow the tempo of incoming MIDI clock pulses the Arpeggiator and Sequencer (or MIDI Clock if enabled). When this sync is on, the LFO Rate knob chooses a multiple of the Tempo, as shown in this table:

Sync Rate	Tempo to LFO Frequency Multiplier
0.125	1/8 (0.125)
0.25	1/4 (0.25)
0.5	1/2 (0.5)
1d	2/3 (0.667)
1	1
2d	4/3 (1.333)
2	2
4d	8/3 (2.667)
4	4
4t	4x(4/3) = 16/3 (5.333)
8	8
8t	8x (4/3) = 32/3 (10.667)
16	16
16t	16x (4/3) = 64/3 (21.333)
32	32
32t	32x (4/3) = 128/3 (42.667)

Stereo Infinite Panning

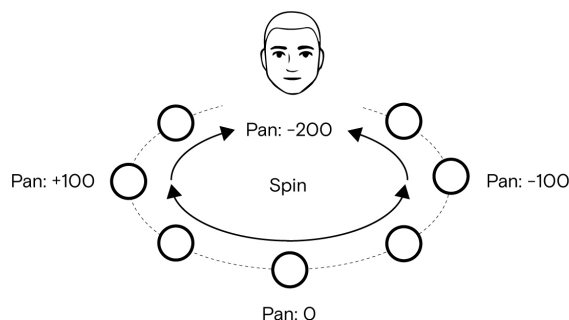
DELIA has advanced panning capabilities, far more than a simple left-to-right pan. There are a powerful set of functions to allow control and movement in the stereo field in normal and anti-phase. We call this **Stereo Infinite Panning**.

Each voice in DELIA has two final VCAs which are a stereo pair. The VCAs are a custom four-quadrant (aka through-zero or attenuverter) circuit, which allows for each voice to be panned beyond the apparent edges of the speakers, or behind the listener with headphones.

This is based on a psycho-acoustic effect which is sometimes used in mastering and surround sound. To explain this effect, imagine a hard left pan. This is full level on the left and zero on the right. From this, if you then invert (anti-phase) the signal in the right channel and increase its level, then it will appear that the sound is moving past the left of the left speaker, or behind your head if you are wearing headphones.

Note that this is an illusion, so the effect is not as precise as a real bee buzzing around you. However, the effect does give a huge stereo image. Experiment with it and see how it affects the sounds you make.

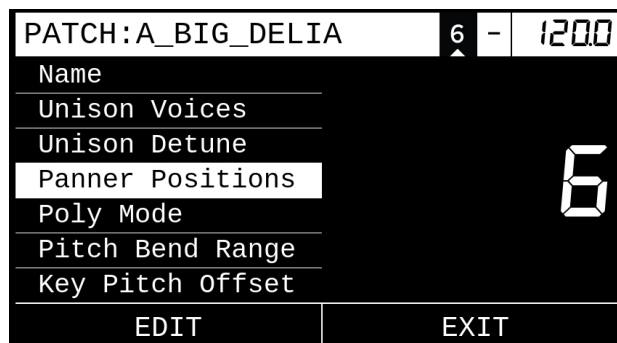
The Pan value which comes out of the modulation matrix sets the position of each voice. Hard left is -100, center is 0 and +100 is hard right. The range of -100 to -200 goes into anti-phase, giving the effect of being behind the headphones or beyond the speakers.



There are a number of tools you can use to position multiple voices around this 360° field, control their stereo spread and spin them in the field. These are explained in the following sections.

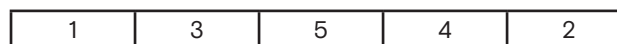
The Panner

As each note is played, the Panner decides what the pan (Left to Right) position of that note will be. The settings for the Panner are accessed via the PATCH MENU.



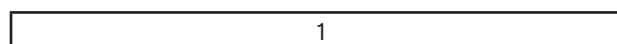
For each note played, the Panner divides the stereo field by the number of Panner Positions set.

For example, if you set 5 positions, then the notes are evenly spread across 5 positions from left to right:



Note that the panner alternates the positions from right to left, to keep the overall sound balanced in the stereo field.

If the Panner positions is set to 1, then there is only one position and the panner effectively does nothing, everything is in the center.

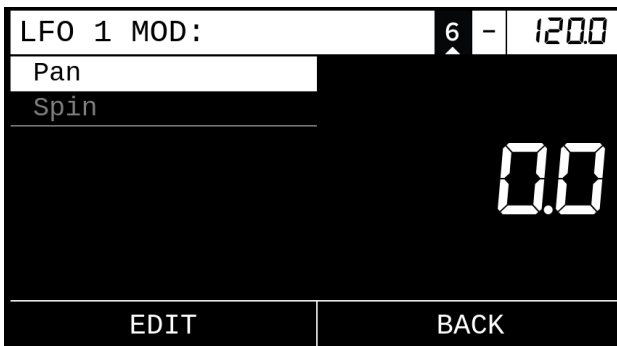


If 12 Note Mode is enabled, then the note pairs will go to the same panner position. If A and B are the notes that are paired, then the 5 position example will be:

1A 1B	3A 3B	5A 5B	4A 4B	2A 2B
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The Panner setup is only the first step in deciding a note's pan position. The settings in the modulation matrix determine how the Panner values control the actual position in the stereo field.

MOD Matrix Pan



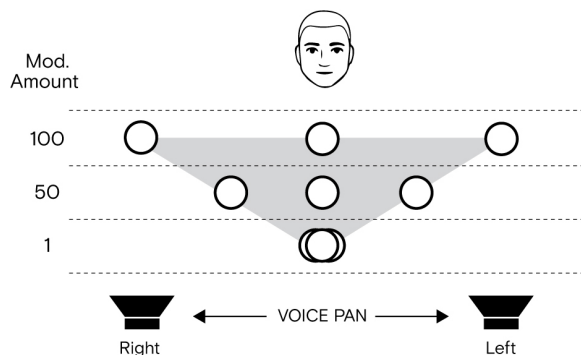
Each voice's final pan position at the audio outputs is determined by the modulation matrix PAN destination available via the MORE DESTS soft-key in MOD mode. See the Modulation section on page 28.

To use the Panner in MOD Mode, select the PANNER source Key and the PAN destination amount can be set with the DATA knob.

The amount set in the Mod Matrix determines how wide the stereo spread is. A modulation amount of 100 gives 100% of the spread defined by the Panner, 50 give 50% and 0 gives no spread so all voices will be dead center.

The diagram on below page depicts this example.

Pan Mode: Spread | Pan Number: 3



Note that the Mod Matrix can make the Pan position move into the antiphase region. If the sum of all the mod sources is greater than 100 at the Pan destination (or less than -100), then the Pan position will be in the antiphase region. For example, if you had a Mod Amount of 100 in the above diagram and you also have a Sine LFO going to the Pan with a Mod Amount of 100, then the peak pan position will be $100+100 = 200$, giving the sound an anti-phase effect.

Panner with Unison

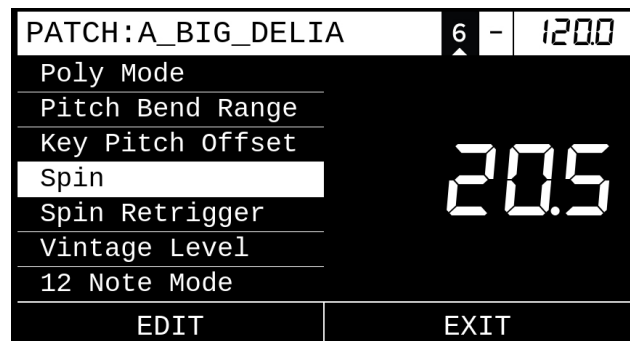
Unison operation plays each note with multiple voices, to create a thicker, more powerful sound. Unison repeating of the notes happens before the Panner, so the Panner will affect each of the unison voices separately.

For example, if Unison Voices is set to 3 and the Pan Spread is set to 3, then each note plays with 3 voices across the stereo field left, center and right.

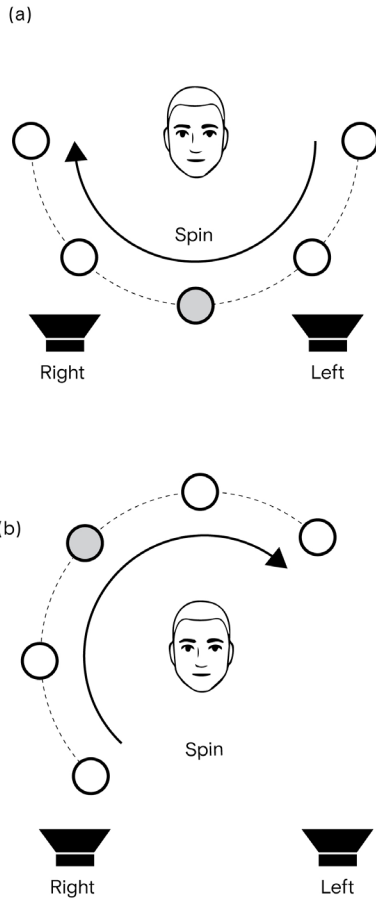
Spin

The last part of DELIA's Stereo Infinite Panning capabilities is spin. Spin is applied after the modulation matrix, so spins all the notes playing together.

The spin function is accessed in the PATCH Menu.



For example, if you have five notes playing in Unison, the Panner set to Spread and the Panner -> Pan Mod Matrix amount is 100 left to right in a unison pan, the stereo field will sound as shown in (a) diagram below. Spin will spin all of that group of 5 around the stereo field while holding the same apparent distance between them. The SPIN knob determines the speed and direction of the spin. Spin is clockwise for positive and counter-clockwise for negative amounts.



Note that the diagram shows the sounds coming from behind the listener, which is not exactly correct as the effect is less distinct at the back. However, it is a very wide stereo effect. Play with this effect to hear how it sounds.

With Retrigger ON, the spin starts at normal position with each new note. If it is OFF then the spin free-runs.

Modulation

Delia has a powerful modulation matrix, where virtually anything can modulate anything else. It does not have a limit on the number of modulation connections (slots) that can be made.

The common problem with a lot of modulation capability on synthesizers is that setup usually involves working with cumbersome lists of text on a screen.

DELIA addresses this problem by using the capabilities of its Motorized Knobs and the 20 Buttons on the bottom row to quickly view and modify all the active matrix connections. This is called MOD MODE, as explained next.

Modulation is additive and assigned. For example if the Filter cut-off level is 50, and an LFO modulates cutoff with an amount of 25, then the LFO will vary the cutoff from $(50-25) = 25$ to $(50+25) = 75$.

Keyboard Velocity works a bit differently. It is additive to all destinations except the Envelope Generators it is multiplicative. So the MOD Matrix sets how sensitive to velocity the envelope is. An assignment of 0 makes the EG not sensitive to velocity, so it will play at full amplitude. An assignment of 100 makes EG1 and EG2 100% sensitive, so it will play full range from quiet to loud.

LFO 1 MOD:	6	-	1200
OSC 1 Tune			
OSC 2 Tune			
OSC 3 Tune			
FX Send Level	9.3		
EDIT	MORE DESTS		

MOD Mode

DELIA has a quick and simple way to access the Modulation Matrix using the motorized knobs to expose the settings and see how a sound is created.

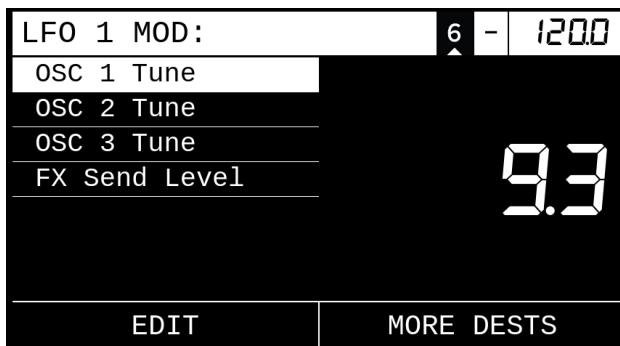
Press the **MOD Key** to enter modulation mode. In modulation mode, all of the knobs change their function. The MOD LED will blink, as a reminder that the Knobs are not doing their normal function.

In MOD mode, the 20 keys along the bottom select the **Modulation Sources**.



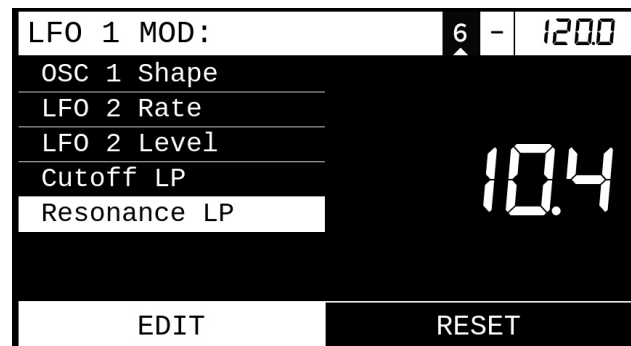
As you press these keys the corresponding Knobs will move into position according to how much this source affects the destination at each Knob.

For example if you select LFO1, the CUTOFF Knob will move to the amount that LFO 1 affects the Filter Cut-off frequency. The CUTOFF knob has a center detent, at zero, so allows a range of -100 through 0 to 100. The negative range makes the LFO move the cut-off frequency down, and positive makes it move up.



NOTE: When a modulation source is selected, it cannot modulate itself as a destination, so the knobs at that destination will control their usual settings in the patch. For example, if LFO is selected as a source, then the LFO1 RATE and LEVEL controls will affect LFO1. This means you will not have to exit the MOD mode to adjust LFO1 and hear the effect on the patch. Likewise if EG1 is selected as the source, then the ATTACK, DECAY, SUSTAIN and RELEASE controls for EG1 will adjust the envelope as usual in patch editing.

The Info Bar shows which source has been selected and the list shows each destination that is affected by this source. Use the DATA Wheel and the EDIT soft-key to adjust the value.



If you hold down the EDIT soft-key, the right soft-key will change to RESET. Tap RESET while holding down EDIT to clear this modulation amount to zero .

NOTE: The corresponding control panel knob is a higher resolution than data wheel, and offers greater control than setting the value in steps of 0 to 100.

The **RESET** soft key is a quick way to zero the modulation amount to the selected destination in the list.

TIP: In MOD Mode, a quick step through the bottom row Keys while looking at the knobs and display is a great way to get an overview of how a Patch uses the modulation matrix.

MOD SOURCES 1-4



MOD SOURCES 5-12



MOD SOURCES 13-20



Modulation Sources

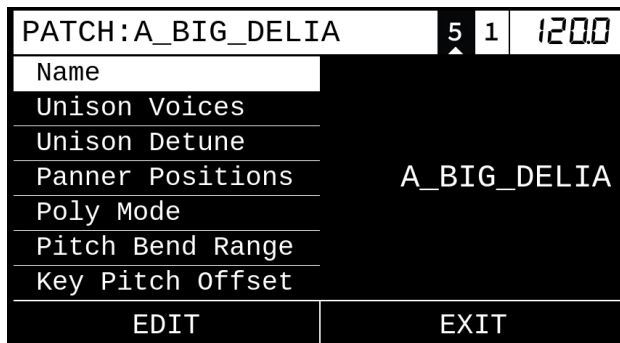
MOD Key #	Name	Description
1	KEY	The MIDI Note Number. This is normally assigned 100% to the Tune destination of OSC1, 2 and 3, so that the keys play notes at the correct frequency. An example use is assigning this source to the PAN destination to create a sound that pans left to right as you play from the bottom to top note.
2	VEL	The MIDI Note Velocity. This is a multiplicative to the Envelope Generators. An example use is to assign to the EG-VCA sustain to make notes play louder or softer according to how hard or softly you play.
3	AFTER	The MIDI Channel or Polyphonic Aftertouch. This is the pressure on the keyboard after notes are pressed down. An example use it to assign to Filter Cutoff to open the filter by pressing on the keyboard. Delia's keyboard is channel afterouch only, however poly aftertouch is supported from an attached keyboard.
4	WHEEL	The MIDI Mod Wheel. This is a positive range of modulation only. *****
5	LFO1	An LFO Source can be assigned to any destination, including the rate and level of any other LFO (1, 2 or 3).
6	LFO2	
7	LFO3	
8	EG-VCF	The ADSR Envelope from the 3 envelope generators. The VCF and AUX envelopes may be assigned to anything. The VCA envelope is always assigned to the output stereo VCA from each voice at 100%. This is not shown in the VCA MENU. The VCA-EG may also be assigned to any other destination.
9	EG-VCA	
10	EG-AUX	
11	OSC1	The output of the oscillators. Note that the oscillators can modulate each other for FM and other effects.
12	OSC2	
13	OSC3	
14	PANNER	See Stereo Infinite Panning. Refer to page 24. Please note this is not the MIDI Pan control.
15	EXP	The MIDI Expression Control. This can be an expression pedal attached to Delia or any incoming MIDI CC 11 messages.
16	CV1	Control Voltage 1. This is from external Analog input 1.
17	CV2	Control Voltage 2. This is from external Analog input 2.
18	CC1	MIDI controller CC Number 1. This is a positive modulation source only. The choice of which MIDI CC Number can be found in the PATCH MENU.
19	CC2	MIDI controller CC Number 2. This is a positive modulation source only. The choice of which MIDI CC Number can be found in the PATCH MENU.
20	OFFSET	Is a constant value. This value is added onto the destination at all times. For example if you want to make the LFO values go between 0 and 100, instead of -100 to 100, make the LFO amplitude 50, and add a SET of 50 to the same destination as the LFO.

Modulation Destinations

Name	Function
OSC 1 TUNE OSC 2 TUNE OSC 3 TUNE	Pitch of the oscillator. The response of OSC to the amount received is shaped so that small values give a small detune while larger values move pitch a lot more. A value of 100 will match exactly 127 semitones. This means is designed so that if you assign the KBD (MIDI note number) to pitch with a value of 100, then each note on the keyboard will play its correct frequency. A small value such as 10 will apply a small detune, such as for vibrato from an LFO.
OSC 1 SHAPE OSC 2 SHAPE	The Sawtooth/Triangle/Pulse shape of OSC1 and OSC2 VCOs.
OSC 1 LEVEL OSC 2 LEVEL OSC 3 LEVEL OSC 4 LEVEL	The level of the OSC in the mix. Note that a negative value at the mix level amount means that the OSC outputs will be inverted and mixed in at that level.
OSC 3 POS	Oscillator 3 Wavetable position.
LFO 1 RATE LFO 2 RATE LFO 3 RATE	LFOs can modulate other LFOs, but not themselves.
LFO 1 LEVEL LFO 2 LEVEL LFO 3 LEVEL	Amplitude of LFOs 1, 2 and 3. LFOs can modulate other LFOs, but not themselves.
RESONANCE	HP or LP VCF resonance. Select with the RES MODE Key.
HP CUTOFF	HP Filter Cutoff frequency.
LP CUTOFF	LP Filter Cutoff frequency.
DRIVE	LP VCF Overdrive level.
EG ATTACK	Envelope Generator Attack Time (VCF/VCA/AUX).
EG DECAY	Envelope Generator Decay Time (VCF/VCA/AUX).
EG SUSTAIN	Envelope Generator Sustain Level (VCF/VCA/AUX).
EG RELEASE	Envelope Generator Release Time (VCF/VCA/AUX).
EG LEVEL	Envelope Generator Level (VCF/VCA/AUX).
MORPH	Morph position.
EFFECTS SEND	Effects Send Level.
EFFECTS MACRO	Effects MACRO Parameter value. (Set when MACRO key is ON).
SPIN	Spin Rate (access via MOD > MORE DESTS Soft-key).
PAN	Pan Position (access via MOD > MORE DESTS Soft-key).

PATCH Settings

Press the PATCH Key to access the PATCH menu for extra settings for the Patch on the active Layer. Use the Layer 1 and Layer 2 Keys while in this menu if you have patches on both layers.



Name

You may wish to rename or update a layer a name. This is done via the PATCH MENU Name option.

Unison Voices and Unison Detune

Unison Voices sets how many voices are played for each note. Using unison to overlay multiple voices playing the same note gives power and texture to the sound. Unison Detune adds weight to this by detuning the voices as they play together.

TIP: When you have a lot of voices playing in Unison, applying a small amount detune (eg 4) usually gives a nicer sound than having detune at 0.

Panner Positions

Panner settings, See page for more information.

Poly Mode

Auto Low: Monophonic playing with the lowest note held being heard.

Legato: Monophonic legato mode, where the envelope does not retrigger when you play legato style. If you release one note before pressing down the next, the envelope generator will restart from Attack. If you start playing a new note before you release the last one, then the envelope generator will not restart.

Mono Retrigger: Monophonic playing where every note retriggers (restarts) the envelope when it is played

Poly: Poly mode is polyphonic. Notes are played up to the maximum number of available voices.

Pitch Bend Range

Set how many semitones the pitch bend control moves the oscillators.

Key Pitch Offset

Move all keys played up by the specified number of semitones.

Spin and Spin Retrigger

Spin settings. See page 30 more additional information.

Vintage Level

This is the amount of variation that is used in the analog modelling of the OSC1 and OSC2 oscillators.

12 Note Mode

12 note mode settings. See page 34.

Morph Mode

Morph setting. See page 30.

MIDI CC 1 and MIDI CC 2 Source

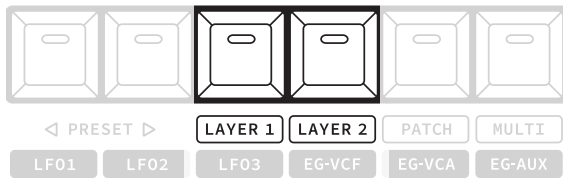
Chooses the MIDI CC numbers for the CC1 and CC2 Modulation Matrix sources.

Multi-timbral Operation

Multi-timbral operation splits DELIA into two independent synthesizers, on two layers.

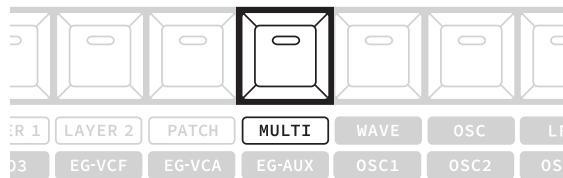
Each synthesizer has a Patch loaded into it, a number of voices assigned, a start and end note of the keyboard and a MIDI channel that it responds to, and some other settings.

The **LAYER 1** and **LAYER 2 Keys** change the current layer and the motorized controls all move to the settings for the Patch on that layer



An example of use is a Keyboard split where the lower part of the keyboard on Layer 1 has a mono bass sound, and the upper part of the keyboard has a polyphonic lead sound. Another example is to make a stack, where every note plays both sounds mixed together from the 2 layers.

Delia's MULTI MENU accesses the multi-timbral settings of an active Multi-timbral Preset.

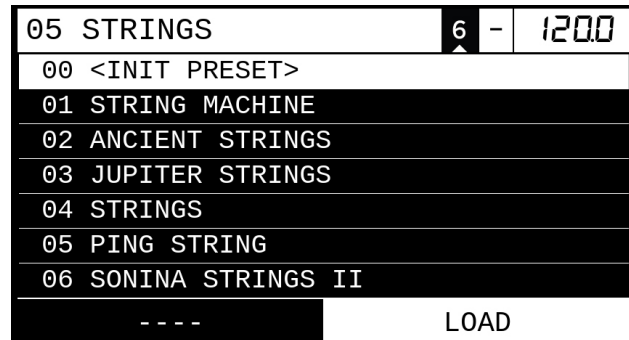


All operation in Delia is multi-timbral; a Preset is always 2 Layers. Simple operation with a single timbre is Layer 1 with all 6 voices assigned, and zero voices assigned to Layer 2 (disabled). See page 14 for more information about Preset structure.

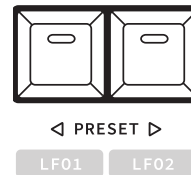
Delia has one Effects Processor, one Arpeggiator and one Sequencer shared by the two Layers. Refer to the Arpeggiator, Sequencer and Effects sections for details on how these operate with two layers.

INIT Preset - PATCH and MULTI

Loading the INIT Preset will reset all Layer 1 and Layer 2 settings, and revert to a single layer with 6 voices.



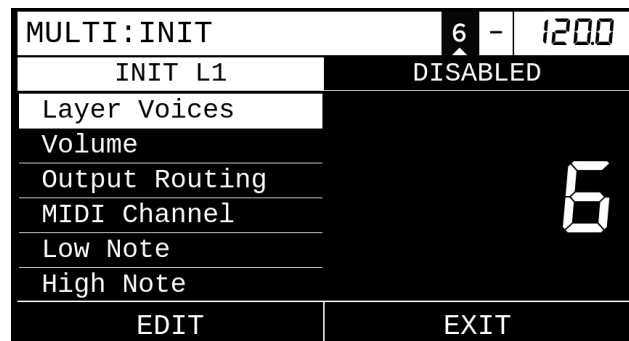
Load INIT Patch from position 00 of any Bank, OR holding Preset Up/Down together for 2 seconds



If you accidentally load INIT, you can use **LOAD > OPTIONS > UNDO LAST LOAD** to return to your previously loaded Patch.

MULTI Configuration

Press the MULTI MENU provides access the settings to control multi-timbral operation of splits and stacks. When in the MULTI menu, the LAYER 1 and LAYER 2 Keys select the settings for the that layer.



Layer Voices

This item sets the number of voices assigned to each layer. You need to manually decide this, and it is a foundation of the multi-timbral setup. To turn off Layer 2, assign it 0 voices.

The voices currently assigned to Layer 1 and Layer 2 are shown in the INFO Bar.

Volume

This sets the overall volume of the layer between 0 (silence) and 100 (full volume). Use this to adjust the relative mix of the 2 layers. We recommend setting the quieter layer to 100, and then reduce the volume of the more dominant layer to ensure the best signal to noise ratio on the output.

Output Routing

This sets which of Delia's 2 analog outputs the layer is sent to. This can be used to route the layers separately as mono for external processing. Note that the voices are always stereo, so be careful with sounds that use panning.

MIDI Channel

This setting chooses which MIDI channel the layer will respond to, from 1 to 16. The extra setting of 0 (omni) will make the layer respond to MIDI on all channels.

Low Note / High Note

These settings are used to create keyboard splits. Notes in the range of Low Note to High Note (inclusive) will play on the layer, and all other notes ignored.

TIP: Quickly select the LOW and HIGH note values using the keyboard when in EDIT mode. Alternatively use the DATA wheel.

Octave Offset

This setting will offset notes on the chosen layer by a selectable number of octaves. Note that this offset can also be controlled by the OCTAVE UP/DOWN Keys.

12 Note Mode

DELIA has 6 analog voice circuits. When all voices are being used to play notes, voice stealing will drop old notes as new notes are played. In typical single-timbre playing this is unlikely. However, in some cases it can be a problem, such as with unison voices, multi-timbral stacks and some sounds with very long release tails.

Delia's **12 note mode** generates a complete mix of oscillators for up to 12 notes: The 2x VCOs, wavetable, OSC 4, with the Sync and Sub functions, and the applied modulation are all created and mixed together. These (up to) 12 notes are then sent in pairs to the 6 VCFs. This means that two notes will share one filter.

In this mode Delia behaves and sounds like a 12 voice polyphonic synth. This works very well for most sounds, multi-timbral setups and styles of playing.

It is obviously more limited than true 12 voice polyphony, and the two important factors are:

- 1. How pairs of notes are chosen to feed into one filter**
- 2. Modulation. Particularly when a VCF envelope is a big part of the timbre as notes are played.**

Delia therefore offers 4 choices of 12 note mode operation, which are accessed via the PATCH MENU.

Mode	Operation
Off	Normal 6 voice polyphony
ON Time Based	Notes are paired based on how close together in time they are played. Envelopes* & LFOs are not retriggered for the second note in the pair.
ON Time Rtrig	Notes are paired based on how close together in time they are played. Envelopes & LFOs are retriggered for the second note in the pair.
ON Dist Based	Notes are paired based on distance on the keyboard. Envelopes & LFOs are not retriggered for the second note in the pair.
ON Dist Rtrig	Notes are paired based on distance on the keyboard. Envelopes & LFOs are retriggered for the second note in the pair.

* Note that regardless of choice, the VCA envelope is always a merge of the 2 notes.

The correct choice of these depends on the Patch and the style of playing. However a very simple and effective method to decide which to use, is to turn on the first option 'Time based', which will cover most cases very well, and if you do notice any voice stealing or timbre changes try the other options.

Multi-Timbral operation

When 2 patches on 2 layers are used, 12 note mode is separately enabled per layer. The operation doubles the number of 'voices' per layer. So if you have 2/4 voices, and 12 note mode on for both layers, the layers will have a maximum of 4 and 8 voices playable.

Tips for using 12 note mode

When switching to 12 Note Mode you will hear a slight drop in audio level compared to 6 note mode. The level is lowered by Delia so that the mix of 2 voices does not clip.

For some sounds, the DRIVE level affects the timbre a lot. If you notice a big change in the timbre when you turn on 12 Note Mode (even with just one note playing), try adjusting the drive.

12 Note Mode vs. Paraphonic

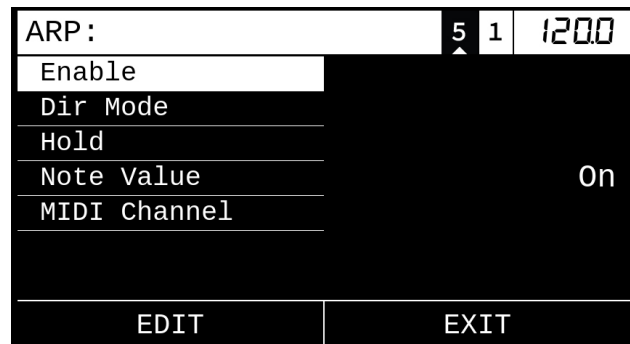
DELIA's 12 Note Mode is similar to, but not the same as typical 'paraphonic' modes. Typical paraphonic modes 'split' the oscillators so that multiple oscillators can be used to play different notes. However, if multiple oscillators interact to produce the timbre of a sound, then this splitting can change the timbre when 2 notes are played.

Delia's 12 note mode is much more powerful because the complete set of oscillators is doubled, keeping the construction of the timbre intact.

Arpeggiator

DELIA has a simple Arpeggiator. If you play multiple notes, the Arpeggiator will play those notes in an repeating sequence, according to its settings and the rate control TEMPO or MIDI clock.

When you load or save a Preset, the Arpeggiator settings will be loaded or saved with it.



Basic Operation

The **ARP ON Key** on the left of the bottom row is used to turn the Arpeggiator on and off.

The **ARP MENU Key** (grey MENU tab), on the right of the bottom row will access the Arpeggiator settings as shown above.

Direction Mode

Sets the direction of notes played out.

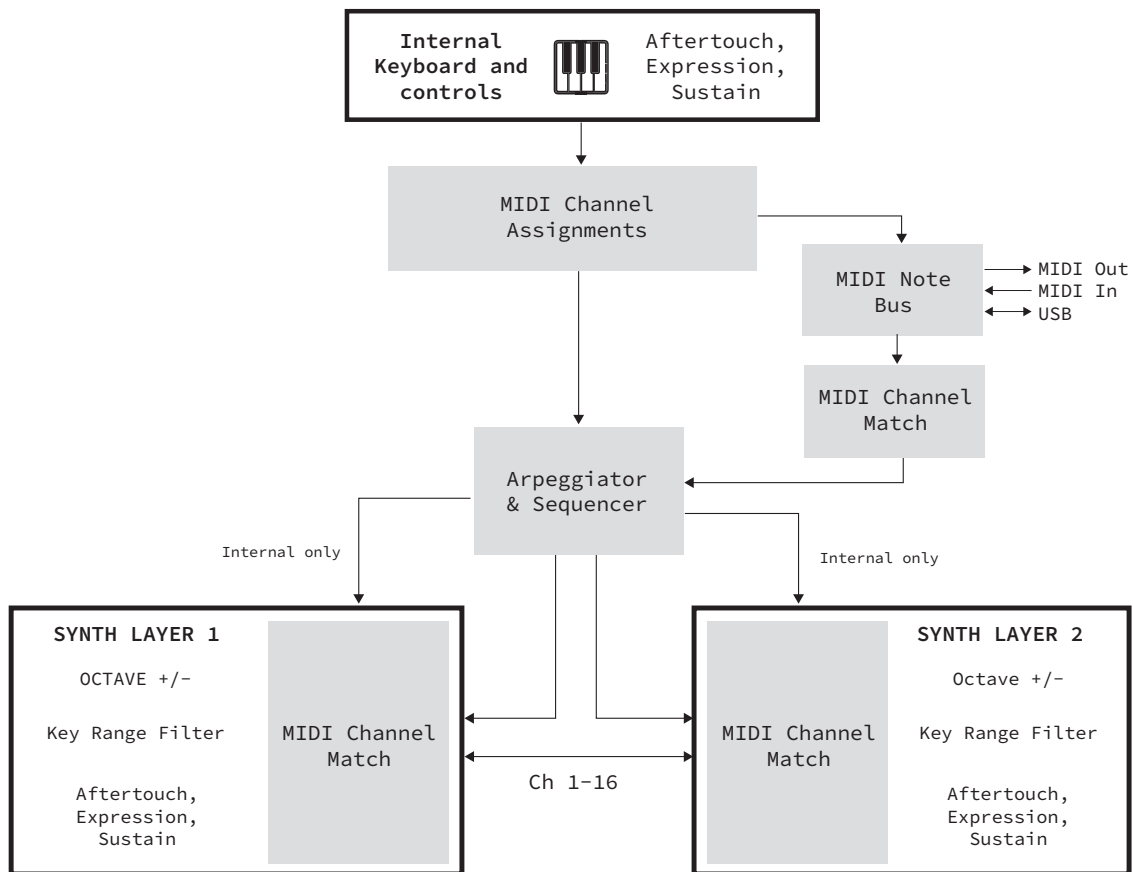
Assignment	Routing
Up	Notes are played from the lowest to the highest, then restarting from the lowest.
Down	Notes are played from the highest to the lowest, then restarting from the highest.
Up-down	Notes are played from the lowest to the highest, then back down to the lowest.
Random	Notes are played in a random order. They are shuffled each time they repeat.
Assigned	Notes are played in the order they were played on the keyboard.

Hold

With Hold on, the arpeggiator will continue to play after you release the notes, until you turn the arpeggiator off.

With hold off, the arpeggiator will play out while you hold notes down, and will stop when you release the notes.

MIDI Routing



Note Value

Multiplies the TEMPO BPM to play the Arpeggiator. The meaning of Beats per Minute follows the MIDI convention that a Beat is a quarter-note.

For example, if the Tempo is 60 BPM, and the setting is 1/4, the Arpeggiator will play one note per second. The T settings have triplet timing.

SETTING	MULTIPLIER
1/4	1 note per Beat
1/8	2 notes per Beat
1/16	4 notes per Beat
1/32	8 notes per Beat
1/4T	1.5 notes per Beat (Triplet)
1/8T	3 notes per Beat (Triplet)
1/16T	6 notes per Beat (Triplet)
1/32T	12 notes per Beat (Triplet)

MIDI Channel

All notes received on this MIDI channel will be Arpeggiated and sent to the same channel. If the channel is O (omni), then the notes received on any channel will be arpeggiated, and sent to the same channel that they came from.

In Multi-timbral operation, the MIDI channel assignments of the Arpeggiator, Keyboard and Layers allow you to choose whether the arpeggiator works on both layers or just one on the internal keyboard, or with an external keyboard. See the MIDI routing diagram above for details.

Sequencer

Delia has two types of step sequencer, a **16 step polyphonic sequencer** and a **phrase looper**.

The sequencer settings are accessed by pressing the SEQ MENU key. The first menu option, 'Mode' is used to select whether the Step Sequencer or Phrase Looper is active.

Both Step Sequencer and Phrase Looper data is stored as part of the Preset, so it is saved and loaded with every Presets. Presets can store both a Step Sequence and a Phrase Loop.

For Multi-Timbral operation there is just one sequencer. The Sequencer, keyboard and Layer MIDI channel assignments allow you to choose whether the sequencer works on both layers, or just one on the internal keyboard, or with an external keyboard. See the MIDI routing diagram on page 36 for details.

Step Sequencer

The Step sequencer records a sequence of notes or chords (up to 16 steps). Once recorded, playing back notes triggers the sequence to run from the note played. The sequence is transposed to start playing from the note you play. There is also a HOLD function to play continuously. Press and hold the ARP ON key to activate HOLD mode.

The step sequencer records notes but not the velocity, duration, or control changes.

Recording a Step Sequence

Ensure MODE is set to 'Step'. To record a sequence, press the REC Key. Play one or more notes or chords. When you release a note or all of a chords notes, this will record one step and move to the next.

The LEDs will show the current step, stepping forward as you play. When the LED is illuminated it indicates that step is ready to receive input.

To insert a REST (silence for 1 step), use the Keys on the bottom row. Simply press the currently illuminated Key and it will insert a rest and move to the next step.

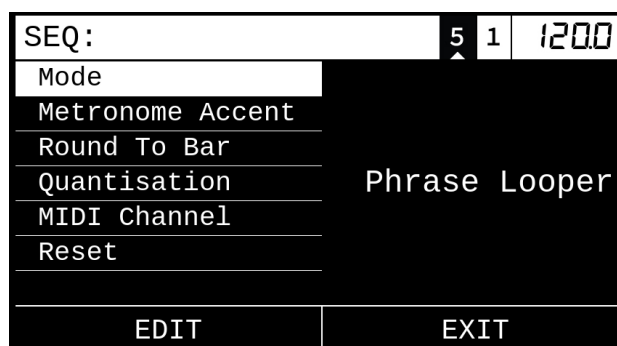
To insert a TIE (hold a note for a number of steps), press the step one or more ahead of the currently illuminated step, and play the note or chord.

To finish recording the sequence, press REC again.

Playing a Sequence

First check the TEMPO to ensure you have a suitable BPM set. Press the **RUN Key** to run the sequencer. If the HOLD setting is ON, the step sequence will free-run. If HOLD is OFF then the sequence will play once when you play a note, or continue to cycle through the sequence when you hold down a note. The sequence will be transposed to play from any note you play, at any step in the sequence.

If the Sequence still seems fast or slow, you may need to adjust the **NOTE VALUE** in the **SEQ MENU**.



Phrase Looper

The Phrase Looper is a free-form style of sequencer, intended as a fun, creative tool.

It works by recording an initial phrase of notes, and then playing these in a loop. You can play over this phrase, and you can also record while playing to overdub and build up the phrase.

With multi-timbral operation you can play two sounds together.

Record, Play and Overdub

From the SEQ MENU, **set MODE to 'Phrase Looper'**.

Then press **REC**. The metronome will begin, but recording will not start until you play the first note.

TIP: This is a good time to adjust tempo/BPM.

Once at the desired tempo play your phrase and press **REC** to stop recording and create a loop.

The **RUN** light will come on and the sequencer will continue to loop the phrase you recorded. You can now play over the top of the loop.

If you want to overdub, press **REC** and any notes you play will be recorded into the looping phrase.

Record a new Phrase

If you want to record a new phrase, choose **RESET** from the SEQ menu. This will clear the Phrase Loop and you're ready to begin a new recording.

The Phrase Looper offers some additional controls to experiment with:

Beats Per Bar

The **Beats Per Bar** option will make the phrase record in whole bars. If you start or end playing part way through a bar, then rests are added so that whole bars are recorded. The length of a bar is set by the Metronome Accent setting.

Beats per bar is applied to the initial recorded phrase when recording stops. The phrase length is then set and can only be changed by resetting the phrase.

TIP: Begin with all recording aids off.

Beats per Bar: NONE

Quantisation: NONE

Once you have a basic phrase recorded try applying quantisation. Beats per Bar will only affect the first recording/loop and activating later will have no effect.

Quantisation

Quantisation to whole beats (1/4), halves (1/8), quarters beats (1/16), eighths (1/32) or triplet timing of these can be selected from the list.

Quantisation is applied dynamically as playing occurs and does not affect the recorded timing of notes.

MIDI Channel

MIDI Channel specifies which the incoming MIDI notes are used by the sequencer. The sequencer does not play to MIDI out, it plays internally. See the MIDI routing diagram on page 36 for details.

Effects

Delia has two digital effects processors. The two effects can be chained in any order and each effect has its own wet/dry mix level.

The input to the effects chain is the stereo sum of all the analog voices. This is sampled with a 96kHz, 24 bit ADC, processed in stereo by the effects and then added back to the final outputs.

The FX1 and FX2 MENU Keys access the settings for the two effects units.

There are 2 'slots' which are used to set the order of effects chaining. The diagram below shows this. The main left and right synth output is fed into slot 1 then slot 2. Effects placed in the same slot are processed in parallel and then mixed together.

There is only one each of Chorus, Delay and Reverb. For example if you place Reverb in slot 1, you cannot have a second Reverb in slot 2.

The **FX 1 Mix** and **FX 2 Mix** controls sets the level of each individual effect. The **FX SEND** Level sets how much of the analog output is sent to the effects chain.

The following two examples show how effects chaining and Mix controls work:

In fig. 1, the analog sound is fed into chorus and delay all in slot 1.

In Fig 2, Chorus is in Slot 1 and Reverb in slot 2. The effects are chained in series, so the individual effects mix levels are wet/dry mixes of that individual effect, as shown by the arrows in the diagrams allows you to independently set how much chorus and reverb are heard.

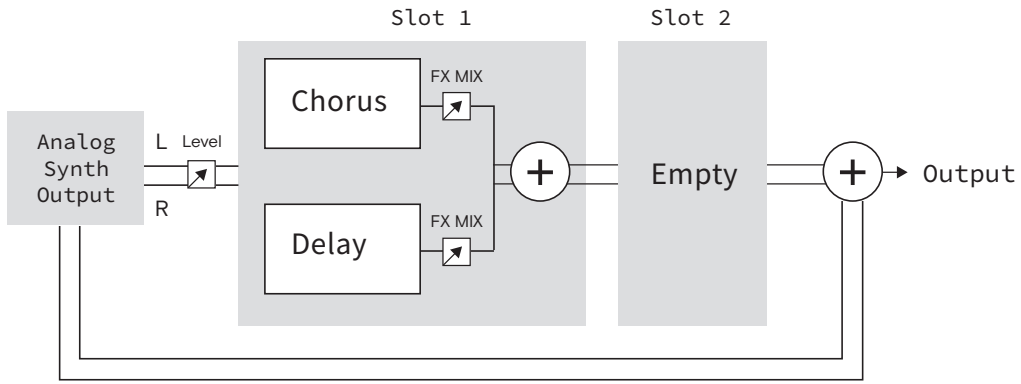


Fig. 1

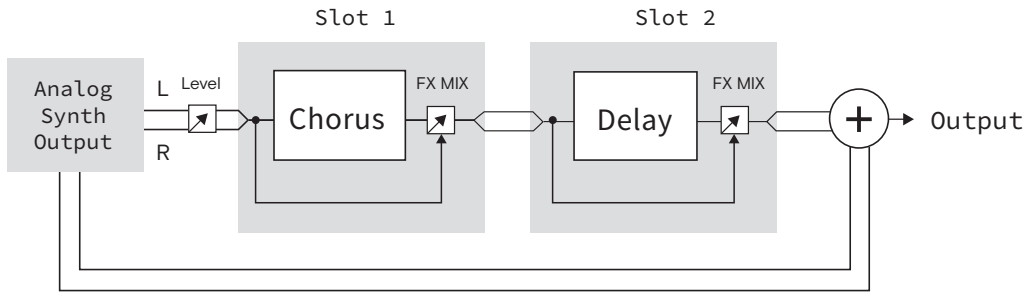


Fig. 2

Effects Macro

The **MACRO Key** chooses between two different functions for the Effects **SEND/PARAM knob**.

If **MACRO LED** is off, the knob controls the overall effects SEND level for the chain.

If the MACRO LED is on, the knob control will adjust the parameter (PARAM) that you have assigned.

The FX MACRO setting in the FX1 or FX2 MENUS allows the user to choose what the MACRO assignment is.

Note that in the Modulation Matrix, the Effects SEND/PARAM knob is a MOD destination, allowing you to modulate both and Effects Macro Parameter as well as the main Effects Send level.

FX1:	5	1	1200
Type	Chorus		
Slot			
FX Send Level			
Chorus Mode			
FX 1 Mix			
FX Macro Select			
EDIT	EXIT		

Multi-Timbral Operation

During Multi-Timbral operation, there is just one effects chain for both layers. The layer outputs are summed together according to their levels and then effects are applied to that sum.

Chorus

The Chorus effect is a classic synthesizer chorus. The Chorus Mode chooses the type. Type I adds a gentle shimmer to the sound, type II has a deeper, wider effect and both can be turned on together. Note that the Chorus effect is much more pronounced when the voices have stereo spread. For example, if you are playing just single note lead, then the combination of a number of Unison voices and Stereo spread using the Panner will make the Chorus a lot more prominent.

FX1:	5	1	1200
Type	Delay		
Slot			
FX Send Level			
Delay Feedback			
Delay Time			
Delay Time Sync			
Delay Sync			
EDIT	EXIT		

Delay

DELIA's delay is a digital delay with adjustable time and feedback level with a low-pass filter. It can be synchronized to the Arpeggiator / Sequencer. The settings are as follows:

Setting	Description
Delay Time	Sets the delay from 60ms at minimum (0) to 1.8 seconds at 100. Used when Sync is Off.
Delay Time Sync	Sets the delay as a multiple of the Sequencer/Arpeggiator clock. Used when Sync is On. The multiple settings are the same choices as for the LFO Sync. See page 26.
Sync	Choose which of the two above Delay times are used.
Delay Feedback	Sets the level of the feedback. 0 is no feedback, so there will just be one repeat. 100 is feedback at 100% level.
Delay Tone	Sets the frequency of the low pass filter on the feedback loop. The filter is 6dB per octave, so each repeat will sound progressively darker.

Reverb

The Reverb effect has a number of Presets, and then a number of parameters that can be adjusted to change the effect. Note that the Presets configure the effect into distinct modes of operation and are not just a way of recalling the other settings. Room reverb emulates a reverberant room, Hall 1 and 2 a small and large hall, and plate 1 and 2 emulate a small and large metal plate reverb.

Setting	Description
Reverb Preset	Choose between a room, plate 1, plate 2, hall 1 and hall 2 effect.
Reverb Decay	Sets how fast the reverb decays to silence. Low values are fast and high slower.
Reverb Early Mix	Sets the level of the early reflections, which gives the impression of how large the room or chamber is.
Reverb Tone	Sets how bright or dark the reverb sounds, by adjusting a low pass filter.
Reverb Shimmer	Shimmer is created by mixing in the reverb pitch shifted up one octave. Shimmer sets the level of this mix.

Global Settings

GLOBAL SETTINGS:		5	1	1200
MIDI Clock In				
MIDI Echo Filter				
Master Tune				
KBD MIDI Channel				off
CV 1 Offset				
CV 1 Gain				
CV 1 Mode				
EDIT				EXIT

Midi Clock In

If set to On, the sequencer and arpeggiator will use MIDI clock coming in. If set to Off, the internal clock, as set by the TEMPO Knob will be used.

Midi Echo Filter

The MIDI Echo filter fixes a problem with DAWs and external devices which send back all MIDI Control Change (CC) messages when they receive them. If this happens, the knobs will send MIDI CC messages as you turn them, but then be told by the external device to put them back to where they were, creating a feedback loop fighting for position. The settings are:

Setting	Description
No filter	MIDI Echo Filter is Off. Use this only if external devices or DAWs do not echo.
Echo Filter	MIDI CCs that are detected as an echo are removed. Other received CCs will be followed.
Filter All	All incoming MIDI CCs are ignored. Use this if you do not want any external control or automation.

Master Tune

Master tune can be used to tune the entire instrument up or down from -200 to 200 cents.

KBD MIDI Channel

Sets the MIDI Channel for the internal keyboard, pitch and mod wheels, aftertouch, sustain and expression pedals. Setting of 0 ('local') assigns all these controls for internal control of Delia only and they will not send MIDI messages.

See MIDI routing diagram on page 36.

CV Offset Gain and Mode

These settings are to precisely calibrate or tune the response to an external Control Voltage input. The CV's follow the 1 Volt-per-octave convention. The CV Modes are:

Setting	Description
-10:10	Range is -10V to +10V. 0V is nominally C4
0:10	Range is 0V to +10V. 5V is nominally C4
-5:5	Range is -10V to +10V. 0V is nominally C4
0:5	Range is -0V to +5V. 2.5V is nominally C4

Sustain Polarity

Sets the type of sustain pedal connected: Normal or Inverted.

GLOBAL SETTINGS:	5	1	1200
CV 1 Mode			
CV 2 Offset			
CV 2 Gain			
CV 2 Mode			DELIA Default
Sustain Polarity			
System Color			
Reset to Factory			
EDIT			EXIT

System Color

Sets the color of the LCD screen. Currently choose from High visibility DELIA DEFAULT, Orange, Green, Blue or Pink.

Reset to Factory

Sets all the Global Settings to the factory defaults. If you are getting strange behaviour of the unit, this is a good starting point for trouble shooting.

Note that if you have set your CV input gains and offsets etc, these will also be reset.

Backup

The Backup & Restore menu items will be available when a FAT32 formatted USB Flash drive is plugged into one of the USB-A ports on the back.

Backup will save the complete set of user data to two zip files on the drive. Press the ENTER soft-key on the BACKUP list item to perform the backup. The two files will be called 'delia_presets_backup_NNNN.zip' and 'calibration_SSSSSS.zip', where NNNN and SSSSSS are automatically generated numbers which increment by one every time a backup is generated.

The delia_presets_backup_NNNN.zip file contains all of the Layer setups and Presets that are on the unit. It will not include the default preset called BASIC PRESET.

The calibration_SSSSSS.zip stores all of the factory analog calibration settings. SSSSSS is the unique internal serial number of the Delia unit. You should normally never need to use this file, and is there for customer support and servicing use only.

Restore

The RESTORE Menu item will be available if a USB flash drive is inserted and there is a file called 'delia_presets_backup.zip' on it. Note that this file name does not have a number suffix. If you wish to restore from a previously made backup, first rename the file from 'delia_presets_backup_NNNN.zip' to 'delia_presets_backup.zip'.

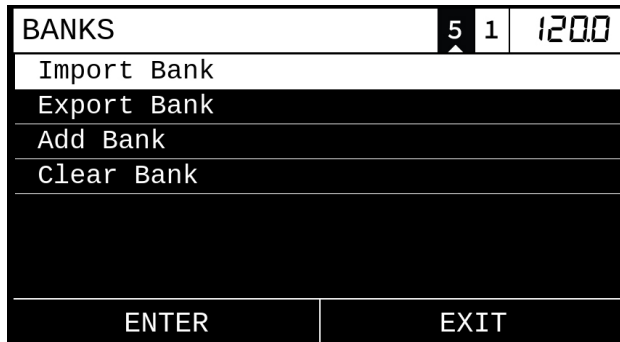
When you start the restore operation, Delia will first do a backup and write it to the flash drive. This is for safety, because the restore is a complete overwrite. The restore operation will read all patches and layer setups from the backup and overwrite those currently on Delia, in the same Preset locations as they are in the backup.

Bank/Preset Management

Whole banks of Presets can be exported and imported from a USB flash drive. This can be used to share patches, copy and there are other functions to help organize Presets.

Import Bank

Banks are stored as zip files. The name of the bank is in the file (eg DELIA_BANK_BASSES.zip for a bank called BASSES) and the patches are .json files inside it.

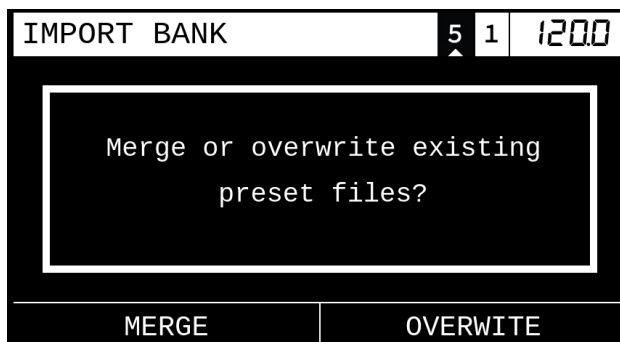


NOTE: If you are preparing your own Banks on Mac or PC, do not include any folders in the zip file. The zip file MUST contain only '.json' files and no folders.

Choose the zip file you want and press the NEXT soft-key. You will then be asked where to store the bank, the screen will show the list of all banks currently in Delia.

Choose the BANK where you want to store the imported Presets and press the NEXT soft-key again. You will then be asked if you want to Merge or Overwrite the presets in the bank.

If you choose OVERWRITE, then Delia will write all of the Presets in the zip file to the bank in their number order. The Presets in the Bank will be overwritten and the Bank will be renamed to the name of the zip file. Note that if there are more Presets in the destination bank than in the zip file, the import will not delete the extra Presets in the bank. For example if there are 20 Presets in the destination bank and only 5 in the zip file, Delia will overwrite the first 5 and the other 15 will still be there after import.



If you choose MERGE then Delia will read all the Presets from the zip file, and add all new Presets into the destination bank, without affecting the Presets already

in that bank. If there is a Preset in the Bank already with the same name, then it will skip (not import) the Preset. All new Presets will be written to the Bank, to fill all the empty locations. An empty location in the Bank is one that has a Preset called BASIC PRESET.

Example: A friend gives you a Bank of Presets with some bass sounds. When you import, you choose the destination bank called BASSES, and choose MERGE. This will add the new sounds to your unit, and keep everything you had there.

NOTE: For a MERGE import, Delia will first check if there is enough free space in the destination Bank for the new patches. If there is not, it will tell you the import cannot be done. In this case, choose a different bank, create a new one, or use OVERWRITE.

After import is complete, you will be asked if you want to Eject the USB flash drive. Choose EJECT and remove the drive, or choose BACK if you want to do something else with the drive eg import another bank of Presets.



Export Bank

Choose Export Bank to write a bank of Presets to a USB flash drive. After you choose Export Bank, you will be asked to choose which bank. A zip file will be created called DELIA_BANK_NAME.zip, where NAME will be the name of the bank exported.

TIP: You can make a copy of an entire Bank of Presets on Delia by using Export Bank and then Import Bank.

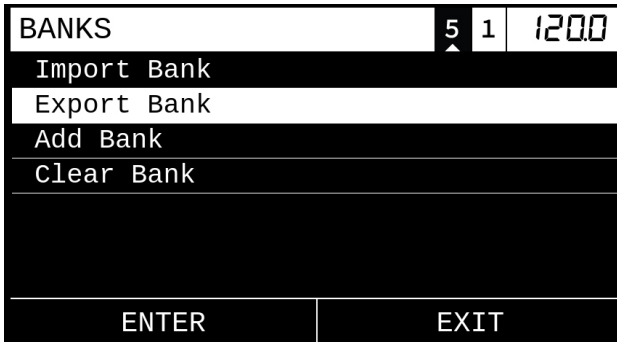
If you want to make a selection of Presets to share, create a new bank, load up each Preset and save it to your new bank. Rename your new bank and export it.

After the export, the display will show 'Bank export complete' and you will be asked if you want to EJECT the USB drive. Choose EJECT and remove drive, or choose BACK if you want to do something else with the drive eg export another bank of Presets.



Add bank

The Add Bank function will create a new Bank of 127 Presets. The Bank's name will be BANK. The Presets will all be the INIT preset. As usual, INIT Presets will show as BASIC PRESET. You can rename the BANK after it is created, from the LOAD or SAVE menus.



Clear Bank

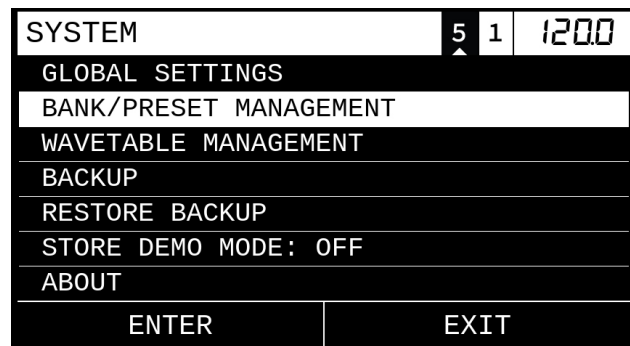
The Clear Bank function will delete all Presets from a Bank. Choose the Bank you want and confirm the delete. Note that there is no Undo, so it is a very good idea to do Export the BANK or to a complete Backup to the USB flash drive first.

After a bank is cleared, as usual it will show 127 entries with the init BASIC PRESET. The BASIC Preset is always shown in every location in a Bank where there is no factory or user-saved Preset.

Wavetable Management

The Wavetable Management function allows import and export of wavetables to a zip file on a USB flash drive.

For details on the wavetable file format, see page 46.

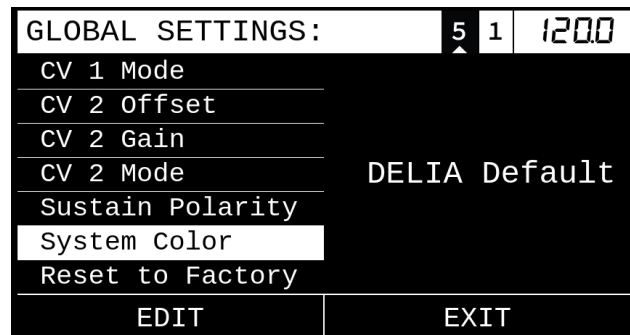


Import Wavetables

Choose Import Wavetables from the list. Delia will look for a file called delia_wavetables.zip and read all the wavetables on the drive and copy them into its internal storage. After import, you can find the new wavetables from the WAVE Menu Key. Wavetables are listed in alphabetical order. A maximum of 127 wavetables can be loaded.

Export Wavetables

Choose Export Wavetables from the list. Delia will create a file called delia_wavetables.zip, with all of the imported wavetables in its storage. The factory built-in wavetables will not be exported.

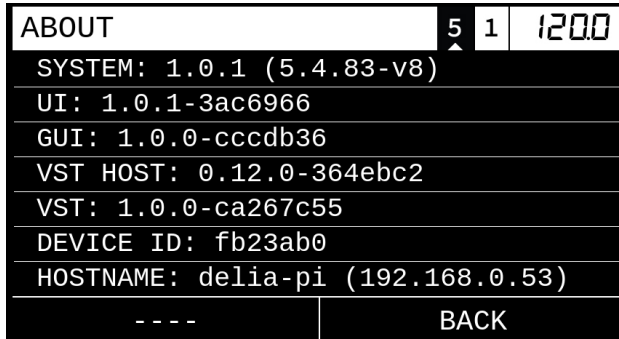


Delete Unused Wavetables

This function allows clean-up of imported wavetables. It scans all the Presets to determine which wavetables are used, and which are not. All wavetables that are not used are deleted. The factory loaded wavetables are not deleted by this operation.

About

The ABOUT item on the SYSTEM menu will show you the current System firmware revision number in the first line, and a number of internal numbers and status.



Firmware Upgrades

To perform a firmware upgrade, first download the Delia firmware and copy onto a FAT32 formatted USB flash drive. The file is a .fw file.

It will usually take around 5 minutes for the whole process, but may take up to 20 minutes, so make sure you have time and reliable power when you do it.

After Reboot, Delia may run a Calibration, depending on the firmware version and state of the unit. This process can take up to 10 minutes.



To update, power off Delia, insert the flash drive into either one of the USB-A ports, and power on. Delia will boot up to the Knob calibration stage, and then read the firmware update file. At this point it will display that it is doing the firmware upgrade, and the version number:

The hourglass symbol will spin to show you the unit is running.

WARNING: Do not Power off while the Update is running.

After the upgrade is finished, you will be asked to power odd. Power off the unit, and on again. The unit will then reboot with the new firmware loaded. You can check the version in the ABOUT item in the SYSTEM menu.



USB Flash Drive Removal

USB flash or thumb drives may be safely pulled out any time that they are not in use. Do not remove them while Delia is actively writing to them e.g. EXPORT BANK. At times you will be asked if you want to EJECT them. This is mainly for convenience, and to make it clear that the device is finished being used and ejecting is safe. If you choose EJECT, the device will not be seen by Delia until you remove and reinsert it.

Appendix A: MIDI Control

Delia uses CC and not RPN/NPRN message for external control and automation.

The USB-C connector on the rear port exposes a class compliant USB MIDI device to a connected host computer. The DIN MIDI IN supports the same functions.

MIDI CC	Param.	MIDI CC	Param.
0	Bank Select (MSB)	33	OSC 3 Position
1	Mod Wheel	34	OSC 4 Tone
2	Mod Matrix MIDI Source	35	OSC 3 Level
3	<Unused>	36	OSC 4 Level
4	<Unused>	37	LFO 1 Rate
5	Glide Rate	38	LFO 1 Level
6	<Unused>	39	LFO 2 Rate
7	Layer Volume	40	LFO 2 Level
8	<Unused>	41	LFO 3 Rate
9	Tempo	42	LFO 3 Level
10	Pan	43	HP Cutoff
11	Expression Source	44	LP Cutoff
12	Effect Level	45	Drive
13	FX1 Mix	46	HP Resonance
14	FX 2 Mix	47	LP Resonance
15	Delay Feedback	48	VCF Level
16	Delay Time	49	VCF Attack
17	Delay Tone	50	VCF Decay
18	Reverb Time	51	VCF Sustain
19	Reverb Delay	52	VCF Release
20	Reverb Tone	53	VCA Level
21	Reverb Shimmer	54	VCA Attack
22	OSC 1 Tune	55	VCA Decay
23	OSC 2 Tune	56	VCA Sustain
24	OSC 1 Coarse Tune	57	VCA Release
25	OSC 2 Coarse Tune	58	AUX Level
26	OSC 1 Shape	59	AUX Attack
27	OSC 2 Shape	60	AUX Decay
28	OSC 1 Level	61	AUX Sustain
29	OSC 2 Level	62	AUX Release
30	OSC 3 Tune	63	Spin
31	OSC 4 Noise Type	85	Morph
32	OSC 3 Coarse Tune	86	Sustain

Appendix B: Wavetables

The wavetables are stored in WAV file format. Each waveform is encoded in 2048 samples, and there can be from 1 to 256 waveforms.

The bit depth of the WAV file may be 16 or 24 bit.

The waveform's 2048 samples is usually just one cycle of the waveform. DELIA assumes this, and the waveform is automatically resampled to the pitch of the notes played.

NOTE: The maximum number of wavetables you can load at one time is 127. This includes factory loaded wavetables. When adding new wavetables, ensure that your new set + factory wavetables combined does not exceed 127. To make space for new wavetables use the Wavetable Management feature (page 42) to scan and remove unused wavetables

Appendix C: DELIA Technical Specifications

Polyphony & Multi-Timbres 6 Voices Polyphonic 2 part multi-timbral. Independent voice routing to main (1 & 2) and/or Aux (3 & 4) outputs	Memory Up to 16,129 Presets arranged in 127 Banks of 127 Presets. User import and export to USB media. 127 Wavetables. Import and Export in WAV format to USB media.
Voice Architecture 2 Digital VCOs with variable triangle/sawtooth shape. Pulse and Triangle/Sawtooth outputs. Hard Sync and Sub Oscillator Operation for Analog VCOs 1 Digital Wavetable. Wavetables from 1-256 waveforms. User loadable. 1 Noise/XOR/AUX Oscillator Fine & Course tune control. 7 octave range. External Audio feed In. Main output audio feedback into voices. 3 ADSR Envelopes with traditional slopes and fast attack Low Pass transistor ladder filter 24dB/oct with Resonance. VCF Overdrive circuit 3 Digital LFOs. 6 waveform shapes. Stereo VCAs, four-quadrant (through zero) VCA with Stereo Infinite Panning	CV Inputs 2 Analog inputs may be line or CV CV Inputs: 1/4" TS Unbalanced: 0 to 10V; -5 to 5V; 0 to 5V; -10V to 10V Electrical Line Level Inputs: 1/4" TRS. 56k Ohm. Unbalanced 13dBu. Balanced 19dBu Line Out 1 & 2: 1/4" TRS pseudo-balanced*. 120 Ohm. 8.2dBu (nom). Attenuated with Main potentiometer, digital Effects summed. 2 USB-A 3.0/2.0 host connection. 5V/500mA 1 USB-C 2.0 device connection. MIDI USB class-compliant device. 1 DIN MIDI In + MIDI Out + MIDI Through 1 DC IN 12V. 12V, 8A AC/DC adapter supplied Power: 30W (nominal), 60W (peak). Operating Ambient Temperature: 0-40 C°
Modulation matrix 20 sources to 40 destinations. No slot count limitation. Modulation amounts bipolar (through zero). Morph between 2 patches. Morphable Modulation settings.	Keyboard 49 key semi-weighted Velocity and Aftertouch sensitive Pitch Wheel Modulation Wheel
Digital Effects 1 Digital Effects unit on main mix output to Line Outputs 1 and 2 Stereo Reverb, Delay or Chorus 96kHz, 24 bit processing.	Physical Weight: 11.5kg (25.3lb) Dimensions: 810mm x 320mm x 100mm (31.9" x 12.6" x 3.9").
Arpeggiator Directions: up, down, up-down, random, assigned ARP Hold function Timing divisions 1/4, 1/8, 1/16, 1/4T, 1/8T, 1/16T	Display 854px x 480px 2.95" LED backlit LCD

Warranty

Melbourne Instruments Pty. Ltd. warrants that:

- (a) The main product, not including or any external accessories, will be free from defects in materials and workmanship for a period of 2 years from the date of purchase.
- (b) Please contact us by email at support@melbourneinstruments.com to notify us of any material or processing faults or defects to the Goods during the Warranty Period. Our authorised Personnel will review your claim and may request any further details of the fault or defect including photos, proof of purchase, the serial number of the Goods (if any) and any other material required to substantiate the claim. We reserve the right to reject a warranty claim if you fail to provide any of the information requested by us that is reasonably necessary for us to substantiate your claim.
- (c) The warranty only extends to the original (first) owner and is not transferable. If the goods have been used for hire, the warranty does not apply and is voided.
- (d) You must not return the goods to us unless requested to do so by our authorised personnel. We will pay the associated shipping costs and insurance provided the warranty claim is made within 30 days of delivery of the Goods (and we have approved the return of the goods back to us). You must pay all relevant shipping costs and insurance when shipping the goods to us in respect of any warranty claim received after 30 days from delivery. All risk in respect of the goods will remain with you.
- (e) You must remove all accessories and components attached to the goods prior to shipping the goods back to us. Under no circumstances will Melbourne Instruments Pty. Ltd. be liable for any loss or damage to any accessories or components attached to the goods.
- (f) Any repair work carried out on the Goods by any person other than our Personnel will void the warranty.
- (g) We incur no liability for, and no warranty claim may be made by you for, any damage caused by normal wear and tear, accidents, accidental damage, unauthorised modifications, negligence, or improper handling of the Goods or arising as a result of the occurrence of any of the other events set out in clause 16.
- (h) Full details of our warranty policy are set out in our User Manual and which form part of these Terms. You can access the User Manual at the melbourneinstruments.com/support. Please follow the instructions in our User Manual for making a warranty claim.
- (i) Any goods accepted by us as being defective or faulty in accordance with the warranty policy during the Warranty Period will be replaced or repaired by us (at our option).
- (j) The Warranty Period is not extended in the case of a repair or replacement.
- (k) We reserve the right to change our warranty policy (including the duration of the warranty) from time to time. Notice of any such changes to these policies or schemes will be provided by Melbourne Instruments by posting a notification on our Site or providing an updated User Manual, or as otherwise deemed appropriate by Melbourne Instruments.

Please visit melbourneinstruments.com/support for more information.

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User & Technical Support: support@melbourneinstruments.com