



REBORN

User Manual

Version 1.0
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ReBorn User Manual - Version 1.0
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INTRODUCTION

Introduction

Background

ReBorn provides a software emulation of three classic electronic musical instruments: the TB303 Bass Line, the TR808 Rhythm Composer and the TR909 Rhythm Composer. Originally manufactured by *Roland Corporation* in the early 1980s, they have subsequently become coveted items in the world of modern electronic dance music. The original Roland instruments are now no longer in production, but are still very much in demand and able to command a high price on the second-hand market.

In the late 90s a Swedish software company, *Propellerhead Software*, released a program for the Windows/Mac platforms called *ReBirth* which accurately recreated two TB303 bass synths and a TR808 rhythm composer (the TR909 appearing in a later version). The computer-based 'soft-synth' had truly come of age; now the screeching acid sounds of the TB303 and the booming bass drum of the TR808 were finally available to an audience for whom owning the originals had never been a reality.

ReBorn is therefore a recreation of a recreation; a soft-synth designed to emulate a soft-synth. The 303, 808 and 909 are reborn once again!

ReBorn and *Propellerhead's ReBirth*

Although ReBorn was inspired by *Propellerhead's ReBirth*, it is important to note that they share no code, graphics or audio samples in common. The '.rbs' file format is in the public domain and although operation of *ReBirth* was examined for compatibility reasons, the program was not dissected or reverse-engineered in any way.

ReBorn has its own sound. Songs written for *ReBirth* can be loaded and played in ReBorn, but *will* sound different. In many cases, tweaking of the various sound controls will be necessary for optimum playback quality of ReBirth songs.

Acknowledgements

Kurt Kurasaki <kurt@peff.com>

For the **TechnoBox MkII** Mod components. This was the first official Mod for ReBirth, so it's only fitting that it be the first official ReBorn Mod too! Kurt is something of a legend in the ReBirth community, and I'm honoured that he has made **TechnoBox** available for ReBorn.

Andrew H. Langton <<http://www.badside.freemove.co.uk>>

For the 3D rendered ReBorn logos. Check out Andrew's other impressive 3D graphics work on the *Badside Games* website.

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For permission to use code from his **gsynth** project as the basis of ReBorn's TB303 emulation.

Jerome Couderc <j.couderc@ifrance.com>

For permission to use the **Gtk Message Box** utility from his **EasyTag** project. (The lack of a decent modal message box in Gtk 1.2 has always been a serious deficiency, in my humble opinion!)

John Cupitt <john@giorgio.hart.bbk.ac.uk>

For the excellent **Gtk Fileselector2** utility.

Michael Fischer (Technopolis)

Jason Baker (Rob Roy Recordings)

For the 808 and 909 sample sets respectively. Both individuals appear to have dropped out of circulation. However, their sterling work in capturing the sounds of the original Roland machines lives on in ReBorn!

Claire Siddall

For proof reading this manual and generally being fab. Lots of love as ever.

Invoking ReBorn

Typing `reborn -h` on the command line will display a list of all valid options. ReBorn can be invoked in one of two fundamental operating modes: GUI mode or terminal mode.

GUI Mode

The full ReBorn Graphical User Interface can be started by typing `reborn` in an xterm (or similar X Windows terminal environment). Optionally, the filename of a song to load at startup may also be specified. For example:

```
reborn hypnotic.rbs
```

GUI mode is the usual mode of operation, allowing full access to all the program's features.

Terminal Mode

It is possible to use ReBorn without the GUI as a simple `.rbs` song file player by specifying the `-t` command line switch. In this mode, a song filename *must* be specified. For example:

```
reborn -t hypnotic.rbs
```

In terminal mode, the following options become available:

-s, -l

The default behaviour in terminal mode is to play all bars enclosed by the Loop Start and Length settings within the song file. (Refer to "Transport Panel" on page 22 for details of the Loop settings). This can be overridden from the command line (if the Loop settings do not encompass the required part of the song) with the `-s` and `-l` switches. For example, to play 100 bars starting from bar 10:

```
reborn -t -s 10 -l 100 hypnotic.rbs
```

-o <filename>

Renders the song to a 44.1KHz, 16 bit stereo `.wav` file. For example, to render the 100 bars from the previous example to `hypnotic.wav`:

```
reborn -t -s 10 -l 100 -o hypnotic.wav hypnotic.rbs
```

-v n

Sets the master volume to 'n' in the range 0 to 100. For example, to set the volume to 80%:

```
reborn -t -v 80 hypnotic.rbs
```

-d

A simple (and ultimately disappointing) textual progress display.



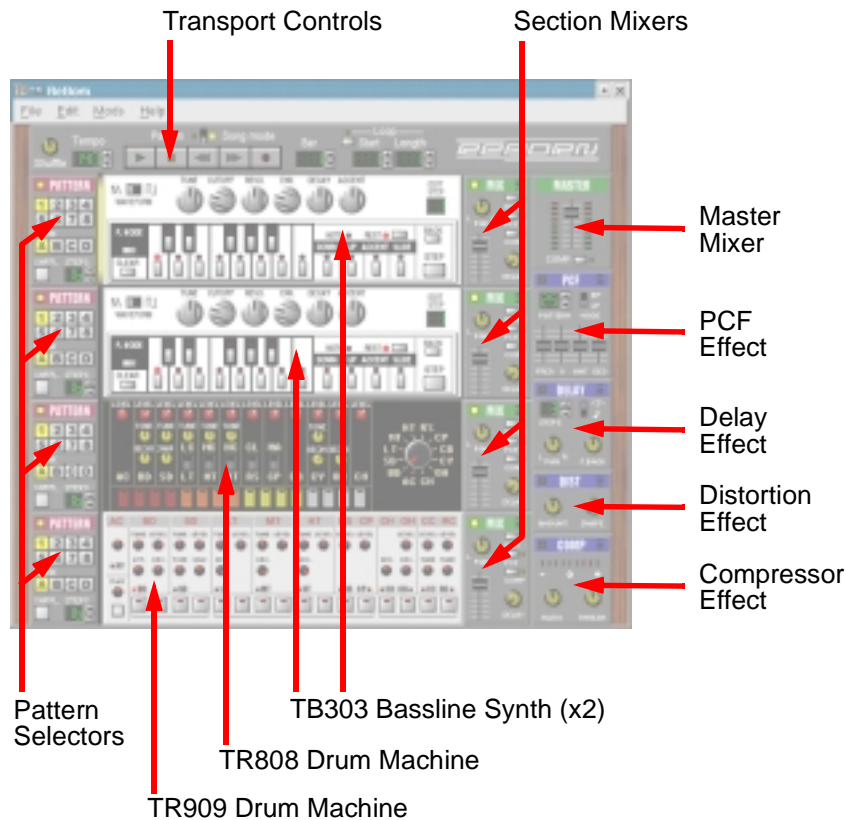
BASIC CONCEPTS

Basic Concepts

Overview

Figure 1 illustrates the ReBorn Graphical User Interface and identifies the main functional blocks.

Figure 1: ReBorn Overview



ReBorn emulates four separate instruments:

- Two TB303 Bassline synthesizers.
- One TR808 Rhythm Composer drum machine
- One TR909 Rhythm Composer drum machine.

In addition, it provides four separate audio effects which can be applied to the output of the instruments to create more interesting sounds:

- A Pattern Controlled Filter (PCF)
- A Delay line.
- A Distortion unit.
- A Compressor.

The instruments and effects units are joined together in an overall framework consisting of:

- An independent Section Mixer for each instrument.
- A Pattern Selector for each instrument.
- A programmable Sequencer.

Add all this together and it should be apparent that ReBorn is not so much a 'soft-synth' as a 'soft-studio'!

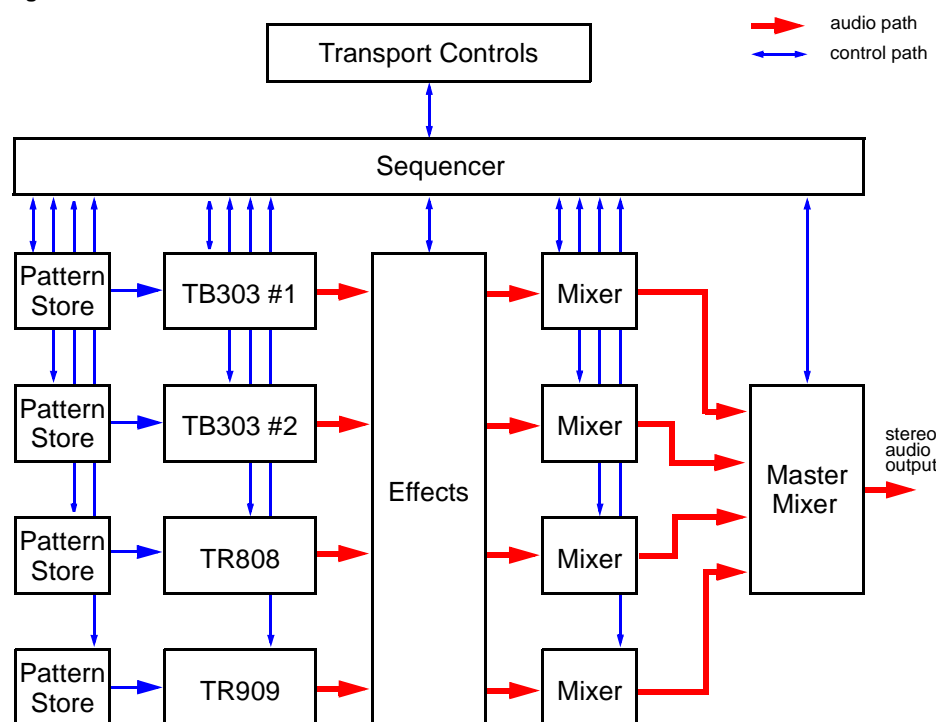
This chapter introduces some technical background, then goes on to describe some of the basic operations involved in using ReBorn. Later chapters contain more detail on the functional blocks highlighted in Figure 1.

- Operation of the Transport controls, the Section Mixers and the Master Mixer is described in "Control Sections" on page 22.
- Operation of the PCF, Delay, Distortion and Compressor effects is described in "Effects Sections" on page 26
- Operation of the TB303, TR808 and TR909 is described in "Instrument Sections" on page 30.

Technical Overview

The main functional blocks of ReBorn are illustrated in Figure 2, together with their associated control and audio signal paths.

Figure 2: Structural Overview



ReBorn consists of four **Instrument Sections** (capable of producing sound), each with an associated **Section Mixer**. **Effects Units** can be used to modify the instrument sound and the overall result fed into a **Master Mixer**. The instruments themselves are controlled by **Pattern Stores**, each one capable of storing 32 unique patterns. Operation of all these blocks is controlled by a **Sequencer** and may also be modified in real-time via the Graphical User Interface. In record mode, any changes made via the interface are recorded by

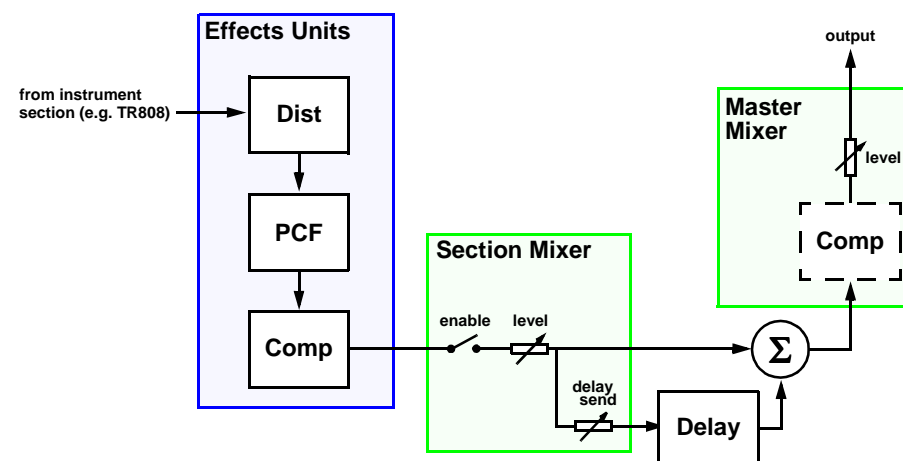
the Sequencer into the song.

All instruments in ReBorn are mono. A stereo output is created by the Pan controls in the Section Mixers, which allow the mono signal to be placed anywhere in the stereo field.

Effect Routing

The following diagram illustrates the signal path from the output of an instrument section, through the Effects Units (assuming they are all enabled for the section) and Mixers, to the Master Mixer (where it is combined with the other section's outputs - although this is not shown). The diagram should help establish a feel for the order in which effects are applied and the action of the various mixer enable and level controls.

Figure 3: Signal Flow



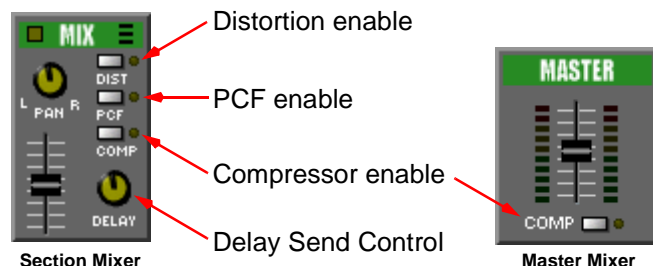
In practice, it is not possible for more than one section to use all the Effects Units at the same time. Table 1 details the availability of the four effects.

Table 1: Availability of Effects Units

Effect	Availability
Distortion	Can be used by all sections simultaneously
PCF	Can be used by one section only
Compressor	Can be used by one section only <u>or</u> the Master Mixer
Delay	Can be used by all sections simultaneously

Figure 4 shows how effects are enabled for an instrument section via controls on the corresponding Section Mixer. Details of how the various “controls” are used is covered in "Control Conventions" on page 14; further information on the mixers can be found in "Control Sections" on page 22.

Figure 4: Enabling Effects Units



Playing and Creating Songs

(The procedure for playing songs in terminal mode was described on page 5. This section deals only with the GUI mode of operation).

Songs in ReBorn can be thought of as having two main parts:

• Patterns

Each Instrument Section can have 32 unique patterns. A pattern can be thought of as one whole ‘bar’ of a song, divided into 16 quarter notes (or ‘steps’)¹. The contents of each pattern depends on the Instrument Section that created it; TB303 patterns will contain note, accent, and slide information whereas TR808 and TR909 patterns will contain drum hits. Patterns are created with the controls found on the Instrument Sections themselves, or via the Pattern Editors (page 18). Once the patterns have been created, they can be strung together in a specified order to create the basic song. The process of ‘recording’ songs is described on page 12.

• Control Automation

Control Automation allows changes to the knobs and sliders of the instruments, mixers and effects units to be synchronized in real time as the song plays. For example as a TB303 pattern is playing, real-time changes to the **Reso.** or **Cutoff** knobs can be stored as part of the song.

Pattern / Song Mode

ReBorn always operates in one of two fundamental modes selected by a switch on the **Transport Panel** (Figure 6).

• Pattern Mode

When playback is activated, the four instrument sections play their currently selected patterns indefinitely. The Sequencer is disabled and no control automation takes place; the **Forward**, **Rewind**, **Record**, **Bar** and **Loop** controls are also disabled. Patterns may be built up using either the instrument pattern step keys or the Pattern Editors (page 18) regardless of whether playback is active or not.

1. Each pattern can actually be any length from 1 to 16 steps. Refer to "Pattern Selector" on page 23 for more details.

• Song Mode

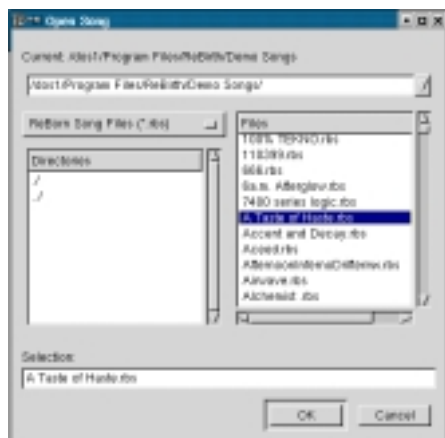
All pattern selections and device control settings are determined by events stored in the sequencer. With **Record** mode enabled, device controls and pattern change events can be written into the Sequencer to create and/or modify songs.

Loading Songs

ReBorn song files are identified by the **‘.rbs’** extension. The file format and extension is identical to that used by Rebirth, thus providing an instant collection of songs from the existing Rebirth community.

The **File->Open** menu item displays a file requester which can be used to select the required **‘.rbs’** song file, as shown in Figure 5.

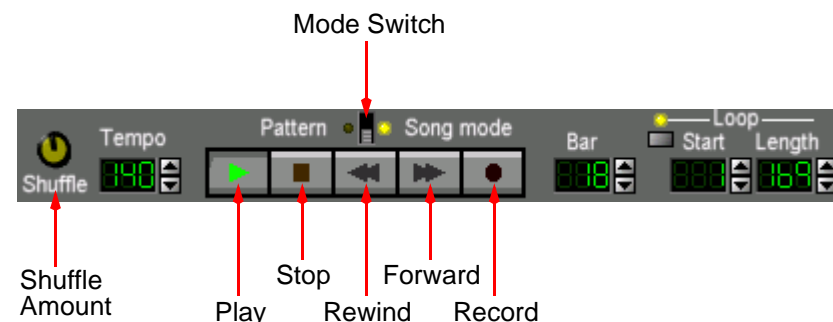
Figure 5: The Open Song File Requester



Controlling Playback

Song playback is controlled by the Transport Panel controls shown in Figure 6. The **Forward** and **Rewind** controls can be used to skip 10 bars in the required direction and will autorepeat if held down. Similarly, the **Bar** numeric selector shows the current bar and may be used to move the song position forwards or backwards one bar at a time.

Figure 6: Transport Panel Record/Playback Controls



The **Tempo** numeric indicator allows the song playback speed to be set in BPM (Beats Per Minute).

Songs in ReBorn do not really have an “end”. Unless the **Stop** button is pressed, playback always continues to bar 999 before stopping. The only exception to this behavior involves the Loop controls, which are described below.

Loop Controls

The loop controls can be set up to allow a section of the song to repeat indefinitely. **Start** is the first bar in the loop and **Length** is the number of bars in the loop; the **Loop** toggle switch enables or disable the loop function. For example, if **Start** was 10 and **Length** was 5, the song would play bars 1 to 14, then loop continuously through bars 10 to 14.

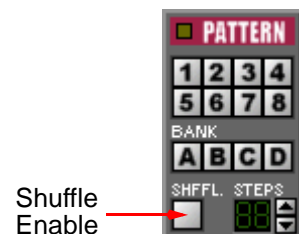
The **Start** and **Length** loop controls are also used to define a range for the loop editing commands in the Edit menu, described on page 16.

Shuffle

To provide rhythmic variation, the shuffle feature can be applied to give a “swing” feel to selected patterns. A shuffle rhythm involves delaying every second pattern step by a small amount. The actual amount is set using the **Shuffle** knob on the Transport Panel and is global to all sections using the shuffle feature.

Each of the 32 patterns in the Pattern Selector can have shuffle enabled or disabled individually. To enable shuffle for a particular pattern, the **Shuffle** button on the relevant Pattern Selector should be used, as shown in Figure 7.

Figure 7: Enabling Shuffle on a Pattern Selector



Record

The record function can only be used when ReBorn is in Song Mode and allows all modifications to device controls on the GUI to be stored in the Sequencer as part of the song automation¹. It may be activated regardless of whether the song is playing or not and is deactivated when the **Stop** button is pressed.

During record mode, modifications to a control cause any previously recorded 'events' for that control to be overwritten in the Sequencer for as long as the control is active. A control is deemed to be 'active' for the duration of time in which it is 'clicked on' by the mouse cursor.

This feature can be used to remove unwanted device control operations. For example, to remove a 'fade out' on one of the Section Mixers:

- Set the current bar to just before the start of the fade.
- Activate record mode and press the **Play** button.
- Click on the required Section Mixer level slider and hold the mouse button down (without moving the slider).

1. Some controls cannot be automated (examples being the Master Mixer level slider, the Section Mixer mute controls and all the controls on the Transport Panel). These controls are highlighted later in the relevant sections.

All events for this control will be removed until the mouse button is released.

Creating Songs: A Quick Guide

The recommended procedure for creating a new song is as follows:

- Select **New Song** from the **File** menu. This will ensure any existing data is cleared.
- Select **Pattern Mode**.
- Build up some basic patterns for the required Instrument Sections. Whilst working with a particular instrument, it may be helpful to silence all other Instrument Sections by muting the relevant Section Mixers (refer to page 23).
- Select **Song Mode**.
- Ensure **Record** is active and playback is stopped at bar 1. Select the initial patterns for all instruments (or disable the relevant Pattern Selector if any instrument is not required) then press **Play**.
- As the song plays back, use the Pattern Selectors to change the patterns as required. Note that once a pattern has been selected, it continues to play until another pattern is selected. Also note that, although patterns may be selected at any time, the change only takes effect at the *start* of a bar (i.e. pattern step 0). It may be easier to record the pattern changes for each instrument in turn. For example, record all changes for the first TB303, then stop playback and return to bar 1, enable record again and enter all the changes for the second TB303, and so on.
- Press **Stop** when all pattern changes have been recorded.
- Rewind to the start of the song and press **Record** and **Play** again. As the recorded patterns play back, adjust the controls on the various Mixers and Effects Units as required. It will probably be necessary to repeat this step a number of times to allow all the required control changes to be recorded.



THE USER INTERFACE

The User Interface

Although daunting at first sight, the ReBorn User Interface is actually quite simple to understand. All operations necessary to create and play songs are performed on the main window and all Instruments and Effects Units are always visible (Figure 8).

Sub-windows, such as the Pattern Editors (page 18) and the Mod Browser (page 37), are available to assist in song creation and are accessed from the menubar at the top of the screen.

Figure 8: The User Interface



Control Conventions

Throughout this manual, references are made to ReBorn's 'controls'. These controls take a variety of forms and are used in different ways.

• Toggle Switches



There are a number of different types of toggle switch, although each operates in basically the same way: clicking the switch toggles the current setting. Some toggle switches have LED indicators to indicate an 'on/off' operation, whereas others simply toggle between two different settings.

• Knobs



These are used to select a value between two limits. Some are used for level control, others for setting feedback or pan. The 808 section has a rotary knob to select one of 12 instruments. All knobs are operated in the same way: click anywhere on the knob with the mouse and then drag either *up* to increase the value, or *down* to decrease it.

• Sliders



Used to select a value between two limits in a similar manner to the knobs. The slider can either be dragged with the mouse, or made to 'jump' to a specific value by just clicking on the required part of the scale.

• Numeric Selectors



Whereas knobs and sliders are used to set 'analogue' values, the numeric selectors are used to set discrete values such as the current bar, or the length of a pattern. The displayed value can be either

increased or decreased by clicking one of the two small buttons to the right of the display. Holding a button will cause it to auto-repeat.

• Labels

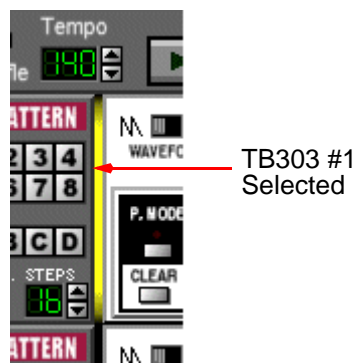


In both the 808 and 909 sections it is possible to select an instrument by simply clicking on its two-letter label in the section panel.

The Focus Bar

Some edit operations work on one Instrument Section at a time (for example, the Cut/Copy/Paste Pattern operations described on page 17). The section currently active for editing is indicated by a coloured bar between the Pattern Selector and the Instrument Section, as shown in Figure 9.

Figure 9: The Focus Bar



The File Menu

• New Song

Clears the current song and resets all controls to default values.

• Open Song

Allows a song to be loaded from disk. If the song cannot be loaded for any reason, a new (blank) song is created instead.

• Save Song

Saves the current song. If the song has not yet been given a filename, a file requester is opened to allow a name to be entered.

• Save Song As

Allows the current song to be saved under a new filename.

• Export Loop

Allows part or all of a song to be exported as a 44.1KHz, 16 bit stereo '.wav' file. First set the Loop **Start** and **Length** controls to enclose the required bars, then select **Export Loop** from the **File** menu and enter a filename for the '.wav' file.

• Song Info

Opens the Song Info window, allowing information about the current song to be edited:

Window Title - Text that will appear in the ReBorn main window title bar alongside the filename. (Maximum 40 characters)

Song Comments - Text describing the song. (Maximum 400 characters).

Creator's Webpage - URL to the song creator's homepage. (maximum 100 characters).

Show info when song is loaded - This checkbox determines whether song information windows are displayed when a song is loaded. This can be overridden in the Global Configuration Options, discussed later.

- **Mod Browser**

Displays the Mod Browser. This is discussed in detail on page 37.

- **Configure**

Opens the Global Configuration Options window:

Browser Command - Specifies the browser to use for viewing Mod webpages and the ReBorn Manual. The full pathname will be necessary if the specified browser is not in the path.

Display song information windows - This checkbox enables the display of song information when loading songs. If this option is disabled, the information windows will not appear.

Display mod information windows - This checkbox enables the display of mod information when songs are loaded and the required Mod is unavailable. If this option is disabled, the information windows will not appear.

Audio Buffer Size - Controls the trade-off between audio performance and GUI responsiveness. If the sound ‘breaks up’ during playback, try increasing the buffer size by moving the slider to the right. However, as the buffer size is increased, there may appear to be a noticeable delay in user interface controls taking effect. Generally, try and use the smallest audio buffer size that gives the best sound quality.

Note! Any changes to the audio buffer size will not take effect until the next time a song is played.

- **Quit**

Quits the program.

The Edit Menu

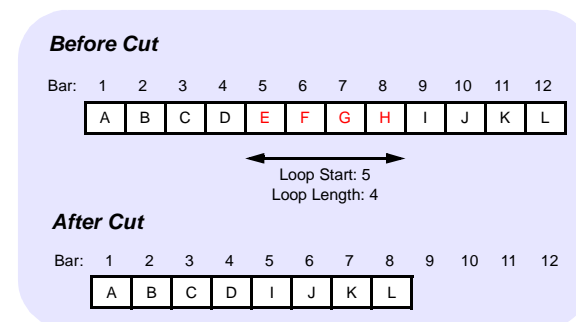
Loop Editing Operations

The following “loop” operations are only available in **Song** mode while playback is stopped. They all operate on multiple bars and can be used to delete, copy and move whole sections of a song.

- **Cut Loop**

Copies the bars within the selected loop range to the clipboard, then deletes them from the song. Any subsequent bars “shuffle down” to fill the gap:

Figure 10: Cut Loop Operation



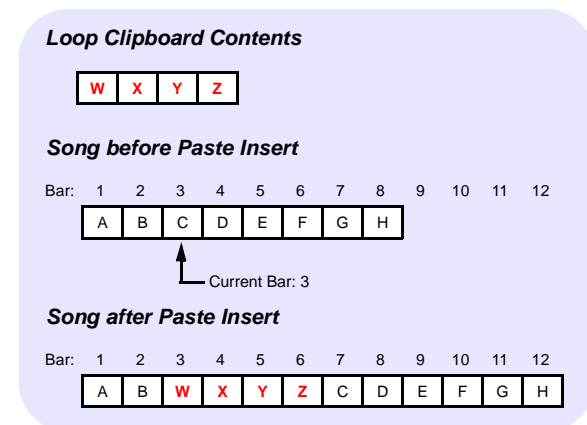
- **Copy Loop**

Copies the bars within the selected loop range to the loop clipboard.

- **Paste Insert Loop**

Pastes the bars in the loop clipboard into the song at the current bar position (determined by the **Bar** control in the Transport Panel). The bars at the current position in the song “shuffle up” to make room for the loop clipboard contents:

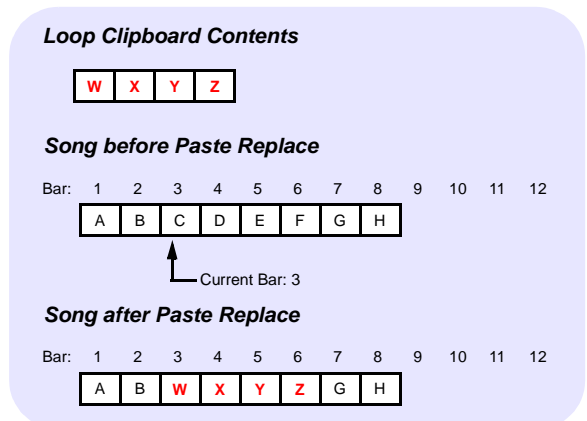
Figure 11: Paste Insert Loop Operation



• Paste Replace Loop

Pastes the bars in the loop clipboard into the song at the current bar position (determined by the **Bar** control in the Transport Panel), overwriting any existing bars in the song:

Figure 12: Paste Replace Loop Operation



Pattern Editing Operations

The following options work in either **Song** or **Pattern** mode but only on the currently selected Instrument Section, i.e. the section that has the focus bar (page 15). Furthermore, some options are only available when certain types of instruments are selected (for example the **Shift Drum Right** option only applies to the TR808 or TR909 sections).

Note that there are three distinct pattern “clipboards”; one shared by the two TB303 sections and one each for the TR808 and TR909 sections. Thus operations on any one clipboard will not affect the contents of the other two.

• Cut Pattern

Copies the selected pattern to the pattern clipboard, then clears it from the instrument.

• Copy Pattern

Copies the selected pattern to the pattern clipboard.

• Paste Pattern

Overwrites the selected pattern with the contents of the pattern clipboard. **Note!** *It is only possible to paste a pattern into the same type of instrument from which it was copied.*

• Clear Pattern

Clears the pattern.

• Shift Pattern Right

Shifts the pattern right by one pattern step in a circular fashion.

• Shift Pattern Left

Shifts the pattern left by one pattern step in a circular fashion.

• Shift Drum Right

TR808/TR909 only: Shifts only the currently selected drum right by one pattern step in a circular fashion.

• Shift Drum Left

TR808/TR909 only: Shifts only the currently selected drum left by one pattern step in a circular fashion.

- **Alter Pattern**

Randomly shuffles all elements of the pattern. **Note!** *In this context, 'Shuffling' means that the existing elements are preserved, but their positions in the pattern are randomized.*

- **Alter Pitches**

TB303 only: Randomly shuffles the pitches in the pattern.

- **Alter Accents**

TB303 only: Randomly shuffles the accent, slide and transpose settings in the pattern.

- **Alter Drum**

TR808/TR909 only: Randomly shuffles the currently selected drum, thus changing its rhythm.

- **Random Pattern**

Creates a new, random pattern.

- **Random Pitches**

TB303 only: Creates new, random pitches in the pattern whilst preserving the accent, slide and transpose settings.

- **Random Accents**

TB303 only: Creates new, random accent, slide and transpose settings in the pattern whilst preserving the pitch settings.

- **Random Drum**

TR808/TR909 only: Creates a new, random pattern for the currently selected drum.

Song / Loop Initialisation Operations

The following options work only in **Song** mode and are used to initialize the whole or part of a song with the device controls currently set in **Pattern Mode**. This is useful when creating a new song in **Song Mode** to ensure that all device controls are set up exactly as when the patterns were created in **Pattern Mode**.

- **Init Song From Pattern Mode**

All device automation is removed from the song and the current device control settings from **Pattern Mode** are inserted in Bar 1.

- **Init Loop From Pattern Mode**

All device automation is removed from the selected loop range and the current device control settings from **Pattern Mode** are inserted in the first bar of the loop.

Pattern Editors

The following options display the instrument Pattern Editor windows which may be used to create and modify patterns, or just to give a visual indication of an existing pattern. The pattern displayed is always the currently selected pattern for the section. The Pattern Editors may be used at any time in **Pattern** or **Song** mode, regardless of whether song playback is active or not.

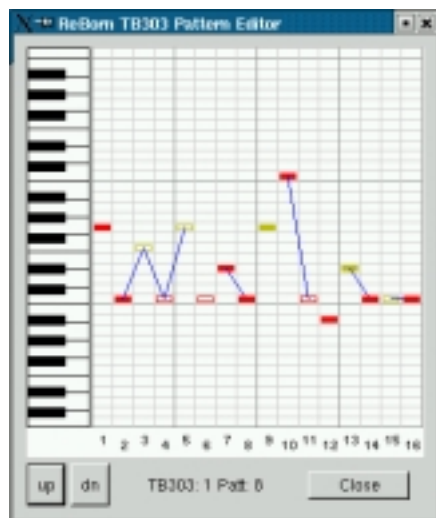
- **Edit TB303 #1 / #2 Pattern**

Displays the Pattern Editor for the relevant TB303 device. The vertical axis shows the range of available note pitches and the horizontal axis shows pattern steps. The following controls are used:






- **Left Mouse Button** sets the pitch of a pattern step, also toggling the selected step between a *note* and a *rest*.
- **Shift + Left Mouse Button** toggles *accent* on and off.
- **Ctrl + Left Mouse Button** toggles *slide* on and off.

The **up** and **dn** buttons can be used to transpose the entire pattern up or down respectively, in semitone steps.

Figure 13: The TB303 Pattern Editor



Key:

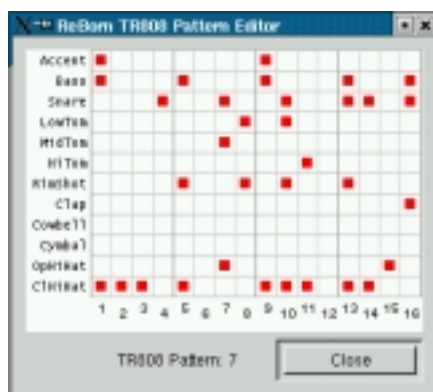
-  Rest
-  Accented Rest
-  Note
-  Accented Note
-  Slide

• **Edit TR808 Pattern**

The TR808 Pattern Editor shows instruments on the vertical axis and pattern steps on the horizontal axis. The following control is used:

- **Left Mouse Button** toggles pattern steps *on* and *off*.

Figure 14: The TR808 Pattern Editor

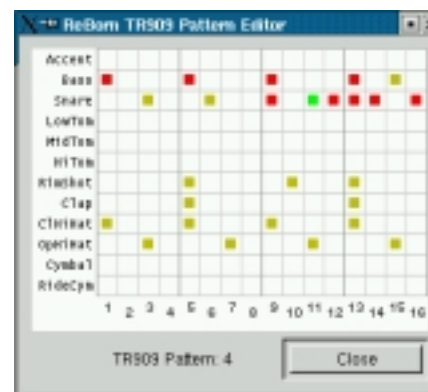


• **Edit TR909 Pattern**




The TR909 Pattern Editor is similar to the TR808 Editor except that each active instrument step (except *accent*) can have one of three values. The following controls are used:

- **Left Mouse Button** toggles pattern steps *on* and *off*.
- **Shift + Left Mouse Button** toggles accented steps *on* and *off*.
- **Ctrl + Left Mouse Button** toggles flam hits *on* and *off* (Flam hits are described on page 33).

Figure 15: The TR909 Pattern Editor



Key:

-  Normal Hit
-  Accented Hit
-  Flam Hit



CONTROL SECTIONS

Control Sections

Transport Panel



The Transport Panel provides control over various aspects of song playback and recording. **Note!** None of the controls on the Transport Panel can be recorded as part of the song automation.

- **Shuffle**

The shuffle knob varies the amount of shuffle applied to pattern playback, increasing as the knob is rotated clockwise. Shuffle is described on page 11.

- **Tempo**

Sets the overall tempo of song playback in Beats Per Minute.

- **Play**

Starts playback from the current bar.

- **Stop**

Stops playback. When playback is not active and Stop is pressed, the effect is dependent upon the current bar. If the current bar is beyond loop start, the current bar is set to the loop start value. If the current bar is less than loop start, the current bar is set to 1. Thus pressing stop repeatedly will move the current bar to the start of the song.

- **Rewind**

Moves the current bar back 10 bars. Keeping the button pressed will cause it to autorepeat.

- **Forward**

Advances the current bar forward 10 bars. Keeping the button pressed will cause it to autorepeat.

- **Record**

Enables record mode. Record can either be enabled before playback is started with **Play**, or while playback is active. The control can be used to toggle record mode *on* and *off*. When record mode is active, the action of all controls on the interface are stored as part of the song.

- **Bar**

The current bar.

- **Loop**

Enables looping, allowing a section of the song to be repeated indefinitely. The loop operation is described in more detail on page 11.

- **Start**

The first bar of the loop.

- **Length**

The number of bars in the loop.

- **Pattern/Song**

ReBorn can operate in one of two modes. In **Pattern** mode the Sequencer loops the currently selected patterns for all instruments indefinitely. In **Song** mode, full playback of the recorded song including all control automation takes place. These modes are described in more detail on page 10.

Pattern Selector



Each instrument has a Pattern Selector capable of storing 32 patterns, arranged as 4 banks of 8 patterns. Each individual pattern can have up to 16 steps and can have shuffle-time playback enabled. Shuffle-time playback provides a 'swing' feel to the rhythm and is described on page 11.

- **Pattern Enable/Disable**

The control at the top left of the Pattern Selector can be used to enable or disable pattern playback. Pattern playback is enabled when the indicator is lit and disabled when it is off.

- **Pattern Selection**

A pattern is selected using the pattern number (1-8) and bank (A-D) buttons. Pattern selections can be made at any time during playback, but will only take effect at the start of a bar. When selecting patterns, the bank should be selected before the number.

- **Shuffle**

Enables shuffle-time for the current pattern. Shuffle is described on page 11.

- **Steps**

Sets the number of steps in the current pattern from 1 to 16. By default, all patterns are 16 steps (one bar) long.

Section Mixer



Each Section Mixer is responsible for controlling the amplitude of the corresponding instrument's output and also for routing this output to the various effects units.

- **Section Mute**

The control at the top left of the Section Mixer can be used to mute or un-mute the section's output. When the indicator is off, the section is muted. **Note!** Operation of this control cannot be recorded and therefore to silence a section in a song, use the Pattern Selector enable/disable control.

- **VU Indicator**

This is located at the top right of the Section Mixer and can be used to establish if there is a signal at the mixer input. When a section is muted, this indicator will be off.

- **Pan**

Each section generates a mono output signal. The pan knob can be used to place this signal anywhere in the final stereo output field.

- **Delay**

Controls the amount of signal fed to the Delay unit ('Delay Send'). The amount varies from 0% to 100% as the knob is rotated clockwise. All sections may use the delay unit simultaneously as the delay input is the summation of all four 'Delay Send' outputs.

- **Dist**

When enabled, routes the mixer output to the Distortion unit. **Note!**
Only one section at a time may use the Distortion unit.

- **PCF**

When enabled, routes the mixer output to the Pattern Controlled Filter unit. **Note!** *Only one section at a time may use the PCF unit.*

- **Comp**

When enabled, routes the mixer output to the Compressor unit.
Note! *Only one section at a time (or the master mixer) may use the Compressor unit.*

Master Mixer



The Master Mixer controls the overall output sound level. Clipping of the audio occurs when the top LEDs on the VU scale are illuminated and the level slider should then be lowered to remedy this. **Note!** *Operation of the master level slider cannot be recorded as part of a song.*

- **Comp**

When enabled, routes the master output via the Compressor Unit (disabling the compressor on all instrument sections). When applied to the master output, the compressor operates on the stereo signal.



EFFECTS SECTIONS

Effects Sections

Effects sections modify the sound produced by Instrument Sections in a variety of ways.

PCF (Pattern Controlled Filter)



The PCF is a selectable bandpass/lowpass resonant filter implemented in such a way that the cut-off frequency can be controlled by one of 55 built-in 'patterns'. The PCF can be used by any one instrument at a time and can produce a wide variety of pumping, sweeping and phasing effects.

The patterns themselves are illustrated in "APPENDIX A - PCF Pattern Diagrams" on page 40.

Figure 16: Example PCF Pattern

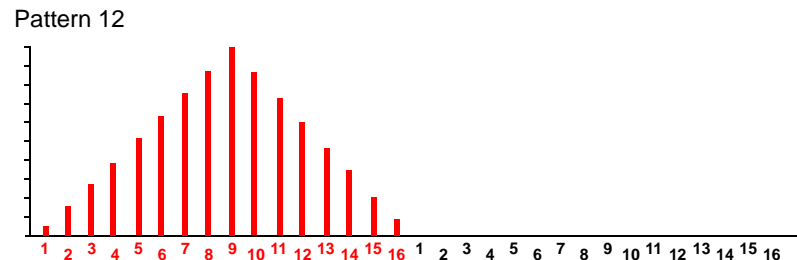
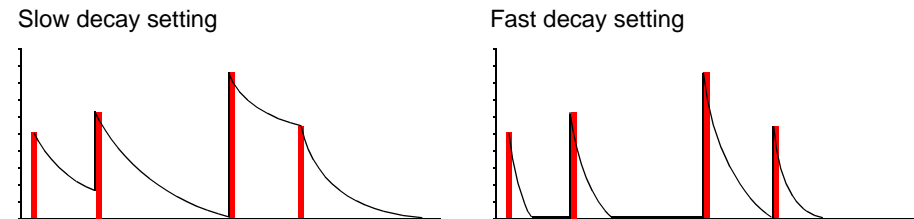


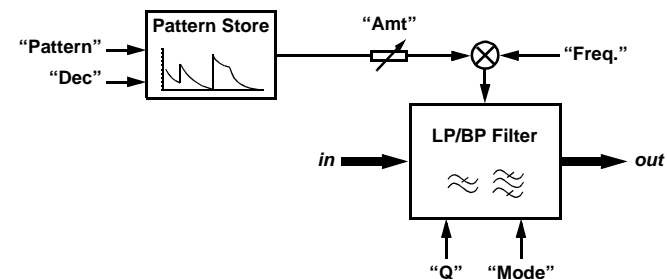
Figure 16 illustrates an example pattern where the duration of each step is one 16th note. The example pattern is 16 steps long on the x axis, giving a total length of one bar. The y axis indicates the pattern intensity at each step. The intensity is an impulse value which falls to zero at the rate set by the **Decay** control. Figure 17 illustrates the 'pattern envelopes' that occur at different decay settings.

Figure 17: The PCF Decay Control



Refer to Figure 18. The overall effect of the pattern envelope on the operating frequency of the filter is determined by the **Amt** (Amount) control. When the **Amt** control is at its minimum setting, no pattern effect takes place and the **Freq** control can be used to operate the filter as a simple 'tone' control. Similarly, when the **Freq** control is at *maximum*, no pattern effect takes place (regardless of the **Amt** control setting) as the filter is already fully 'open'.

Figure 18: PCF Functional Block Diagram



The PCF controls perform the following functions:

- **Enable/Disable**

The control at the top left can be used to enable or disable the effect. The effect is enabled when the indicator is lit and disabled when it is not. When disabled, the signal is passed through unchanged.

- **VU Indicator**

Located at the top right, this monitors the signal level at the input. It can be used to establish if a signal is reaching the input of the unit.

- **Pattern**

Selects one of 55 built in PCF patterns (as shown on page 40).

- **Mode**

Selects between Bandpass and Lowpass filter operation.

- **Freq**

Controls the operating frequency of the filter. When this control is at its *maximum* setting, the **Amt** control has no effect.

- **Q**

Controls filter resonance.

- **Amt**

Controls how much the current PCF pattern affects the filter operating frequency set by the **Freq** control. When **Amt** is at its *minimum* setting, no pattern effect takes place.

- **Dec**

Controls the pattern envelope decay. Each step in the PCF pattern represents an instantaneous value which begins to decay in the time before the next pattern step. With small decay values, a 'pumping' effect is achieved. Larger decay values cause successive pattern steps to merge into each other, producing a smoother sound.

Delay



The Delay Unit may be used by all instruments simultaneously. The input to the Delay Unit is the summation of all four Mixer 'delay send' outputs.

- **Enable/Disable**

The control at the top left can be used to enable or disable the effect. The effect is enabled when the indicator is lit and disabled when it is not. When disabled, the signal is passed through unchanged.

- **VU Indicator**

Located at the top right, this monitors the signal level at the input. It can be used to establish if a signal is reaching the input of the unit.

- **Steps**

Used to set the total length of the delay line from 1 to 32 steps.

- **Mode**

The mode switch selects the interval of each delay step, and hence the number of 'repeats'. The top setting gives an eighth-note (triplet) interval whilst the bottom setting gives a sixteenth-note (i.e one pattern step) interval.

- **Feedback**

Controls how long the delay will last. When fully anti-clockwise, the delayed signal will repeat just once. When fully clockwise the delayed signal will repeat forever.

- **Pan**

Controls where the Delay output will appear in the stereo field.

Distortion



The Distortion Unit can be used by any one instrument at a time and provides a harder, clipped edge to the sound. A section's output is routed to the Distortion Unit by enabling the **Dist** control in the relevant Section Mixer.

- **Enable/Disable**

The control at the top left can be used to enable or disable the effect. The effect is enabled when the indicator is lit and disabled when it is not. When disabled, the signal is passed through unchanged.

- **VU Indicator**

Located at the top right, this monitors the signal level at the input. It can be used to establish if a signal is reaching the input of the unit.

- **Amount**

Varies the amount of distortion applied to the input signal.

- **Shape**

Not currently implemented.

Compressor



A Compressor is used to reduce the overall dynamic range of a signal by attenuating louder sounds more than quiet ones. What this means in practice is that the overall output level of the signal can be made to appear more 'even'. The Compressor can be used by either one instrument or the master output.

- **Enable/Disable**

The control at the top left can be used to enable or disable the effect. The effect is enabled when the indicator is lit and disabled when it is not. When disabled, the signal is passed through unchanged.

- **VU Indicator**

Located at the top right, this monitors the signal level at the input. It can be used to establish if a signal is reaching the input of the unit.

- **Ratio**

Controls how much compression is applied above the current threshold.

- **Threshold**

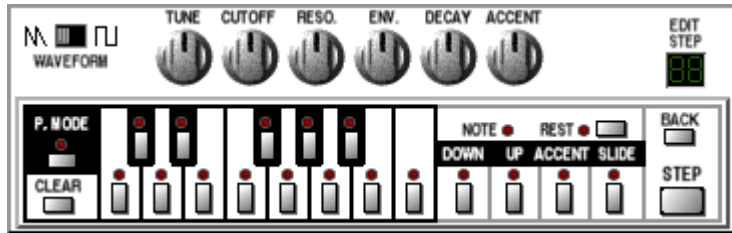
Sets the threshold level above which compression is applied.



INSTRUMENT SECTIONS

Instrument Sections

TB303 Section



ReBorn has two independent 303 sections, each capable of generating complex bassline patterns and providing musical accompaniment to the rhythm sections.

Getting the best from the 303 requires a little understanding of how it works. At the heart is a single oscillator, capable of generating either a sawtooth or a square wave. The rich sound capability of the 303 is due to a resonant filter, which can be used to modify the raw oscillator signal in a variety of ways, as described below.

TB303 Controls

- **Waveform**
Sets the fundamental oscillator mode to either sawtooth or square.
- **Tune**
Allows the oscillator to be tuned up or down one octave in semitone steps.
- **Cutoff**
Controls the filter cut-off frequency. As the control is rotated clockwise, the filter 'opens up' and the sound becomes less muffled.

- **Reso.**
Controls the amount of filter resonance.
- **Env.**
Controls the envelope modulation applied to the filter. The modulation affects the filter cut-off frequency resulting in a richer sound.
- **Decay**
Controls the speed of decay of the envelope modulation.
- **Accent**
Controls how much 'accent' will be applied to accented steps in the pattern. **Note!** In a real TB303, the accent affects both the amplitude and resonance of the sound but ReBorn currently only accents the amplitude.
- **Edit Step**
Shows which pattern step is currently being edited. The current pattern step will have its settings displayed on the TB303 key LEDs.
- **Back**
Moves to the previous pattern step.
- **Step**
Moves to the next pattern step. **Note!** The Back and Step buttons always count through the full 16 steps, regardless of how long the current pattern actually is.
- **P. Mode**
Enables 'Pattern Mode'. This is useful when programming the TB303 and means that every time a note key is pressed, the pattern step advances by one. It is important to ensure that **accent**, **slide** etc. are set for the current step *before* the note key is pressed, because the step advances as soon as the note key is pressed.
- **Clear**
Clears the current pattern.

- **Note/Rest**

Determines whether the current pattern step will be heard or not.

- **Down**

Transposes the current pattern step down one octave.

- **Up**

Transposes the current pattern step up one octave.

- **Accent**

Determines whether the current pattern step will be accented or not.
The amount of accent applied to the step is dependent on the **accent** knob setting.

- **Slide**

Causes the current note to smoothly 'slide' to the next note. ***Note!** If slide is applied to a step set to **rest**, the step will still be heard as it slides to the next step. Also, note that if the last step in a pattern is set to slide, it will slide to the first note of the same pattern and not the first note of the next pattern.*

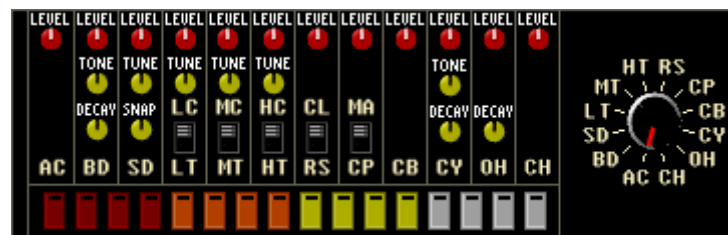
TB303 Programming

Patterns are entered into the TB303 either through the Pattern Editor (see page 18) or by using controls on the TB303 itself.

The **Edit Step** display indicates the current pattern step being edited. The pitch of this step can be set by clicking on the required note key and optionally on either the **Up** or **Down** keys to shift the note up or down one octave. **Accent** and **Slide** may also be activated, if required. The pattern step is then incremented with the **Step** key, or decremented with the **Back** key.

Alternatively, **P.Mode** may be used to automatically advance the pattern step after a note has been entered. This mode is described in "TB303 Controls" on page 30.

TR808 Section



The 808 section emulates a classic analogue drum machine with 16 different percussive instrument sounds.

The available instruments are: **BD** (Bass Drum), **SD** (Snare Drum), **LT** (Low Tom), **LC** (Low Conga), **MT** (Mid Tom), **MC** (Mid Conga), **HT** (High Tom), **HC** (High Conga), **RS** (Rim Shot), **CL** (Claves), **CP** (Clap), **MA** (Maracas), **CB** (Cow Bell), **CY** (Cymbal), **OH** (Open Hi-Hat) and **CH** (Closed Hi-Hat).

In addition, there is another 'special' instrument **AC** (Accent) which does not actually produce any sound, but instead serves to accent any other instruments playing on activated pattern steps. The amount of accent for all steps is set by the **AC Level** knob.

TR808 Controls

- **Level**

Controls the amplitude of the instrument sound.

- **Tone**

Controls a low-pass filter which varies the 'tone' of the instrument sound.

- **Tune**

Speeds up or slows down playback speed of the instrument, therefore varying the pitch (tuning) of the sound.

- **Decay**

Varies the duration of the instrument sound.

- **Snap**

Controls the volume of the noise (snare) component on the *Snare Drum*.

- **LC/LT, MC/MT, HC/HT, CL/RS and MA/CP selectors**

The Congas and the Toms share instrument settings, as do the Claves and Rim Shot and the Maracas and Clap. In each case, only one instrument may be selected to sound on any given pattern step.

- **Instrument Selector Knob**

Selects which instrument is to be programmed on the pattern step keys. Instrument selection can also be made by clicking on the two-letter instrument labels above the step keys.

- **Pattern Step Keys**

Each key represents a pattern step. Keys are toggled on and off by clicking on them. When a key is on, the currently selected instrument will sound on that pattern step.

TR808 Programming

Patterns are entered into the TR808 either through the Pattern Editor (see page 19) or by using controls on the TR808 itself.

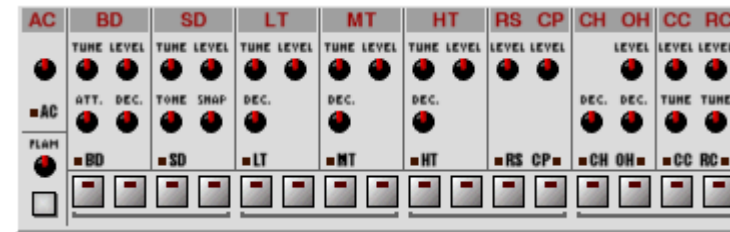
To add a particular drum instrument into the pattern, activate it using the selector knob or by clicking on the relevant instrument label (shown in Figure 19).

Figure 19: TR808 Instrument Labels



'Hits' for this instrument can now be programmed on the 16 pattern step keys along the bottom of the TR808 panel.

909 Section



The 909 section emulates a drum machine with 11 different percussive instrument sounds.

The available instruments are: **BD** (Bass Drum), **SD** (Snare Drum), **LT** (Low Tom), **MT** (Mid Tom), **HT** (High Tom), **RS** (Rim Shot), **CP** (Clap), **CH** (Closed Hi-Hat), **OH** (Open Hi-Hat), **CC** (Crash Cymbal) and **RC** (Ride Cymbal).

In addition, there is another 'special' instrument **AC** (Accent). It does not actually produce any sound, but instead serves to accent any other instruments playing on activated pattern steps. The amount of accent for all steps is set by the **AC** knob.

TR909 Controls

- **Level**

Controls the amplitude of the instrument sound.

- **Tune**

Speeds up or slows down playback speed of the instrument, therefore varying the pitch (tuning) of the sound.

- **Dec.**

(Decay) Varies the duration of the instrument sound.

- **Att.**

(Attack) Controls the sound of the initial 'kick' on the Bass Drum.

- **Snap**

Controls the volume of the noise (snare) component on the *Snare Drum*.

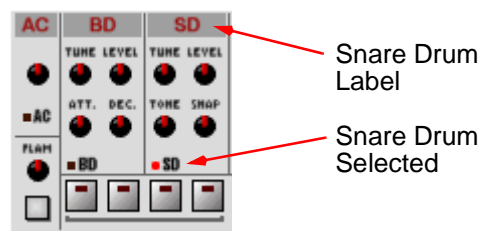
- **Tone**

Varies the fundamental drum tone of the *Snare Drum*.

- **Instrument Selection**

Instrument selection is achieved by clicking on the text labels along the top of the section. The active instrument is indicated on the row of small leds above the pattern step keys (as shown in Figure 20).

Figure 20: TR909 Instrument Selection



- **Pattern Step Keys**

Each key represents one of the 16 pattern steps. When Flam mode is *off*, repeatedly clicking on a pattern step will cycle it through three states: *off*, *normal* and *accented*. Pattern steps accented in this way will sound slightly louder than normal pattern steps. **Note!** This 'step accent' is unconnected with the accent instrument **AC**, which can be used to add further accent to selected pattern steps.

Figure 21: TR909 Pattern Step Leds



- **Flam**

When this button is activated it is possible to program 'flam' hits on the pattern step keys. A 'Flam' describes the action of hitting a drum twice, very quickly in succession. The delay between the two hits is set by the

Flam knob. Pattern steps programmed as flam hits will be indicated by a green indicator.

TR909 Programming

Patterns are entered into the TR909 either through the Pattern Editor (see page 19) or by using controls on the TR909 itself.

To add a particular drum instrument into the pattern, activate it by clicking on the relevant instrument label (shown in Figure 20).

'Hits' for this instrument can now be programmed on the 16 pattern step keys along the bottom of the TR909 panel. Normal or accented hits can be created by successively clicking the same pattern step. To create flam hits, the **Flam** button must be active, as described previously.



REBORN MODS

ReBorn Mods

A **Mod** is a collection of graphic and/or audio samples which can be used to change the way ReBorn looks and sounds. It is possible to change any or all of the user interface components and any or all of the drum sounds on the TR808 and TR909 sections (it is not possible to change the sound of the TB303 sections). The individual graphic and sound components are stored together in a special form of zip file called a ReBorn Mod Archive (**.rma**).

The figure below compares the 'Standard ReBorn' Mod with the 'TechnoBox MkII' Mod and illustrates how it is possible to dramatically change the whole 'look and feel' of the interface.

Figure 22: Example ReBorn Mods



Standard ReBorn

TechnoBox MkII

Songs and Mods

The name of the Current Mod is stored in the '**.rbs**' file when a song is saved. This allows ReBorn to automatically use the correct Mod when the song file is then subsequently re-loaded. If the required Mod is not available, the Default Mod is used instead.

Although ReBorn can load songs created by *Propellerhead's ReBirth*, it is unable to load ReBirth Mods. Therefore, when a song is encountered with an unknown Mod, ReBorn will use the Default Mod as previously stated and also display a warning advising the user of one of the following scenarios:

- If the song was saved by ReBorn, the required Mod must already be available for ReBorn as it would have been in use when the song was saved. It is therefore just a case of locating a copy of the Mod Archive (**.rma**) file and installing it.
- If the song was saved by *Propellerhead's ReBirth*, the required Mod possibly doesn't exist as a '**.rma**' file suitable for ReBorn. In this case, the only course of action is to contact the author of the ReBirth Mod and ask very nicely if they would be prepared to make the graphic and sound components available so that a ReBorn Mod Archive can be created.

Songs requiring the **Standard ReBirth** Mod will silently use the **Standard ReBorn** Mod unless the **Standard ReBirth** Mod is actually available (Refer to "Creating a Propellerhead's ReBirth Mod" on page 38 for more details).

Using Mods

The Default Mod

When first invoked, ReBorn compiles a list of all available '**.rma**' files stored in:

```
$REBORN_MOD_DIR  
$HOME/.reborn/mods  
/usr/local/share/reborn/mods
```

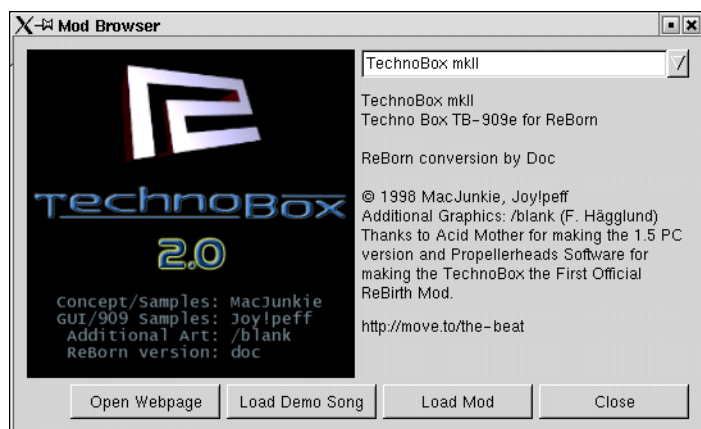
ReBorn first looks for a Mod called **Standard ReBorn** and uses this for the default user interface components and drum samples. If this Mod cannot be found, or has any components missing, the program will terminate.

The Mod Browser

The Mod Browser (Figure 23) is used to view information about available Mods and to load them into ReBorn.

In addition to the user interface and/or audio sample components, Mod Archives can contain textual information about the Mod, contact details for the author and a graphical 'splash' image.

Figure 23: The Mod Browser



With a Mod name selected via the pull-down list at the top right of the browser, the following operations can be performed:

- **Open Webpage**

This button is enabled if the Mod Archive contains a URL to the Mod Author's Webpage.

- **Load Demo Song**

In order to demonstrate the capabilities of a Mod, a demo song can be included in the archive. If a song is present, this button will be enabled and can be used to load the song (and, of course, the Mod itself) into ReBorn.

- **Load Mod**

Loads the Mod. The current song is unaffected by the operation of loading a new Mod, although may sound different if the Mod contains new drum samples. Mods may be loaded at any time, in Pattern or Song mode, except when playback is active.

Creating Mods

What is a Mod Archive?

The ReBorn Mod Archive (.rma) format is simply a standard 'zip' archive containing the required items. It is not necessary to replace every graphical interface component or audio sample; any missing items are taken from the default Mod instead. In fact, the only *required* component is the **modname.txt** file which defines a unique name for the mod. (The actual filename of the Mod Archive on disk is unimportant and is ignored by ReBorn).

Table 2 describes valid items that may appear in a Mod Archive. (For a complete list of interface component and audio sample filenames, refer to "APPENDIX B - Mod Components" on page 48).

Table 2: Mod Archive Components

Filename	Description
<code>modname.txt</code>	A unique name for the Mod. (64 characters maximum). N.B. This item is <i>mandatory</i> .
<code>comments.txt</code>	A brief textual description of the Mod. (400 characters maximum).
<code>www.txt</code>	A URL to the Mod author's webpage. (200 characters maximum).
<code>splash.png</code>	A Mod 'splash' graphic. (24-bit PNG format, 256x256 pixels).
<code>12xxx.png</code>	57 Individual User Interface components. (24-bit PNG format, various sizes).
<code>tr808xx.wav</code>	24 TR808 drum sample components. (44.1KHz, 16 bit mono WAV format).
<code>tr909xx.wav</code>	21 TR909 drum sample components. (44.1KHz, 16 bit mono WAV format).
<code>demo.rbs</code>	A demo song.

Creating a Mod Archive

Detailed instructions on creating a Mod Archive can be found on the ReBorn website. However, the basic process may be summarized thus:

1. Create a temporary directory to hold the Mod components.
2. Create graphical interface components and TR808/TR909 drum samples as required, ensuring they conform to the standards listed in "APPENDIX

B - Mod Components" on page 48. Copy the components into the temporary directory.

3. Create a 'splash' logo and copy to the temporary directory.
4. Create textfiles to hold a unique name, comments and a webpage URL and copy them to the temporary directory.
5. If there is a demo song for the Mod, copy it to the temporary directory.
6. In the temporary directory, use the **zip**¹ utility to package the components into a '`.rma`' file with the following command:

```
zip filename.rma *.txt *.png *.wav demo.rbs
```

Note! Although '`filename`' should obviously be replaced by a unique filename, it is important to remember that it is the `modname.txt` file within the archive which determines the actual Mod name that ReBorn uses.

7. Copy the '`.rma`' file to the required Mod location directory.
8. The temporary directory containing the Mod components is longer required and may be removed.

Creating a Propellerhead's ReBirth Mod

If you own a copy of *Propellerhead's ReBirth*, it is possible to use the original graphical interface components and sound samples to create a 'ReBirth' Mod. Some conversion is necessary as ReBirth uses the JPEG and AIFF formats for its Mod components whereas ReBorn uses PNG and WAV. A script is available from the ReBorn website to automate this process.

Once the ReBirth Mod is installed on the system, ReBorn will use it whenever a song is opened which requires the **Standard ReBirth** Mod. (The normal course of action when the ReBirth Mod is *not* installed and a song requires it, is to silently fall back on the **Standard ReBorn** Mod instead).

1. Available from <http://www.info-zip.org/pub/infozip/Zip.html>



APPENDICES

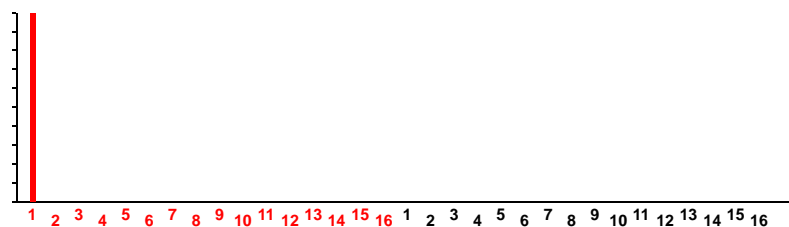
APPENDIX A - PCF Pattern Diagrams

The diagrams on the following pages illustrate the 55 patterns built into the PCF effect unit, described on page 26.

16th Note Patterns

In these patterns, each step is one 16th note (i.e. one sequencer pattern step). The length of each pattern is indicated along the x-axis, up to a maximum of 32 steps (which is two bars). The y-axis indicates the intensity of each pattern step.

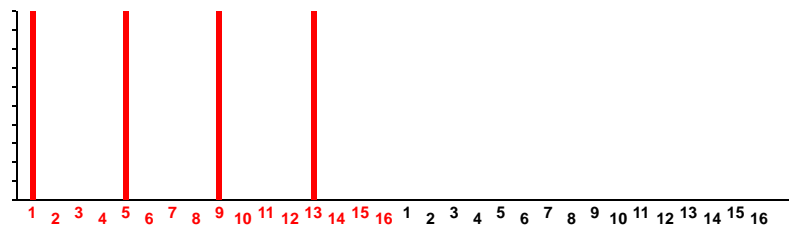
Pattern 0



Pattern 1



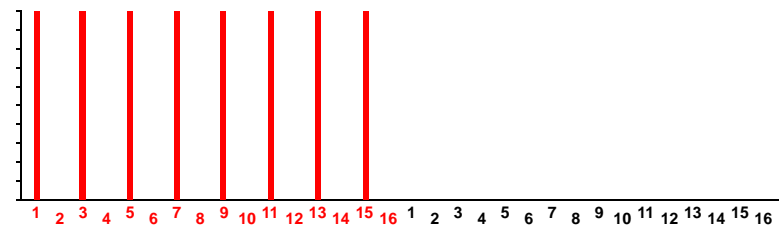
Pattern 2



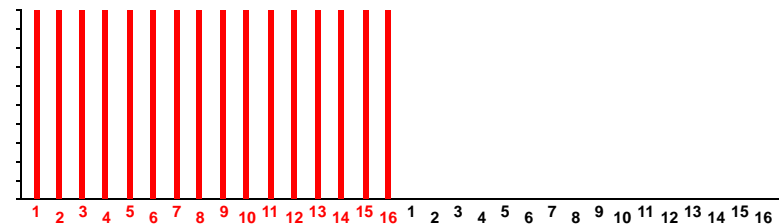
Pattern 3



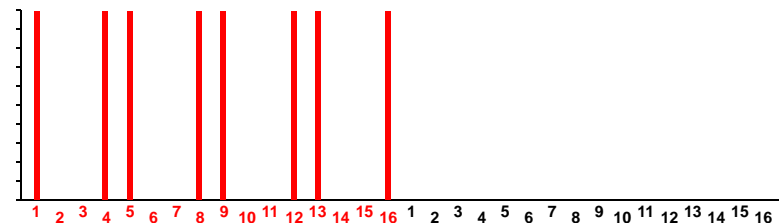
Pattern 4



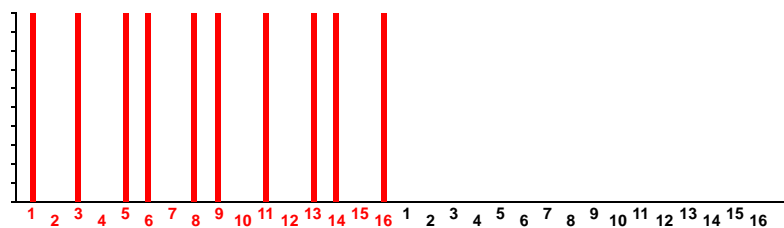
Pattern 5



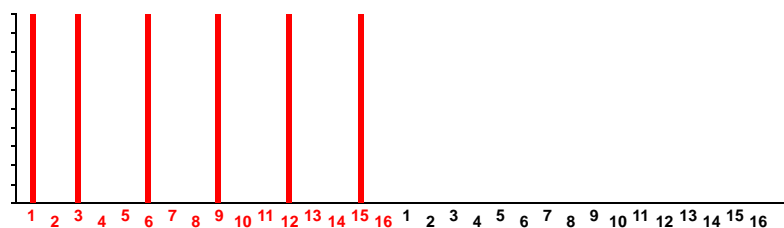
Pattern 6



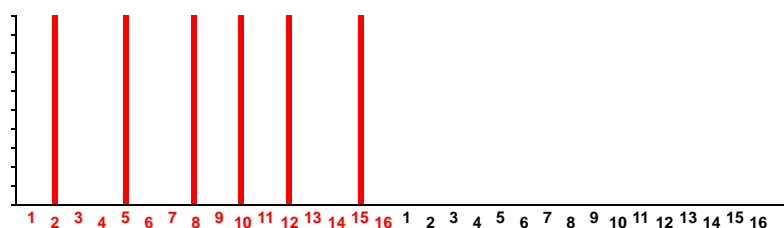
Pattern 7



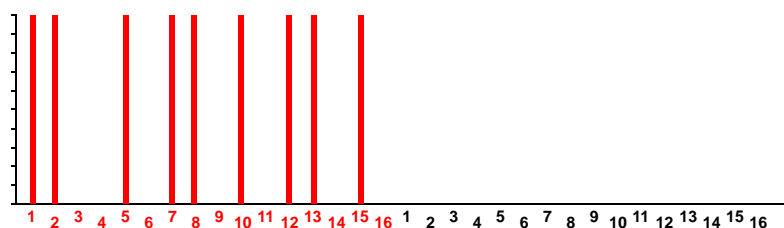
Pattern 8



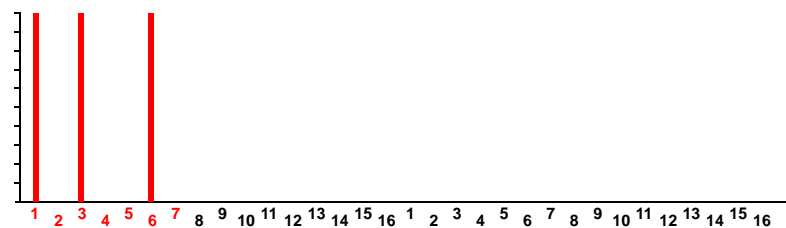
Pattern 9



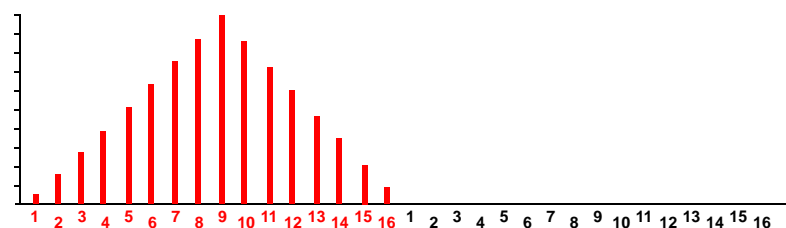
Pattern 10



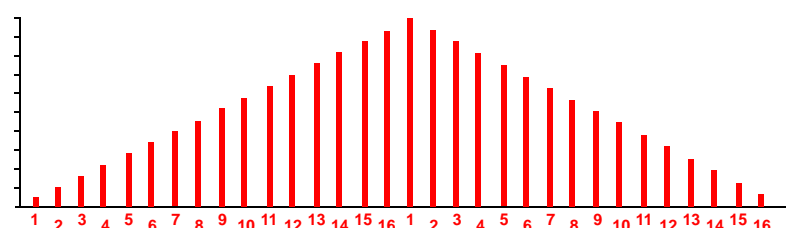
Pattern 11



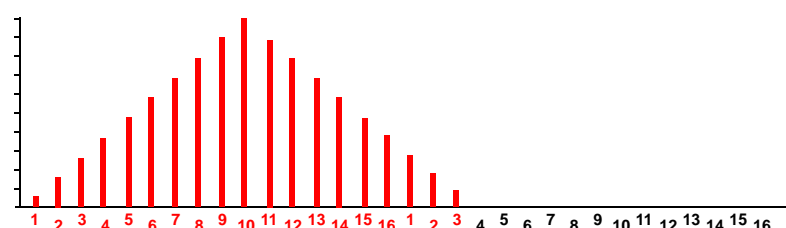
Pattern 12



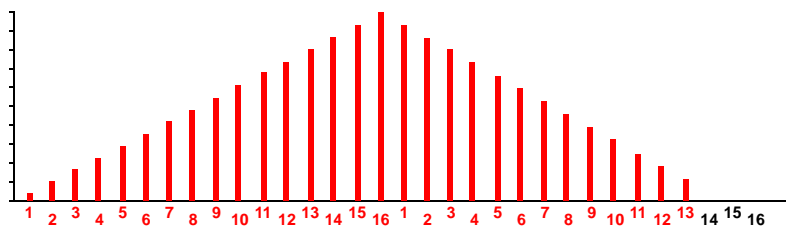
Pattern 13



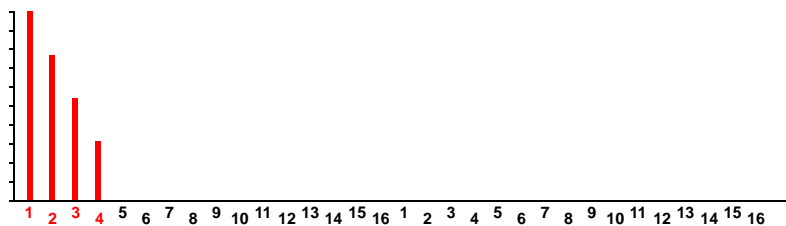
Pattern 14



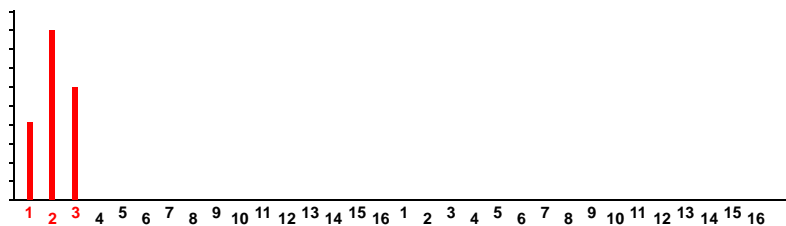
Pattern 15



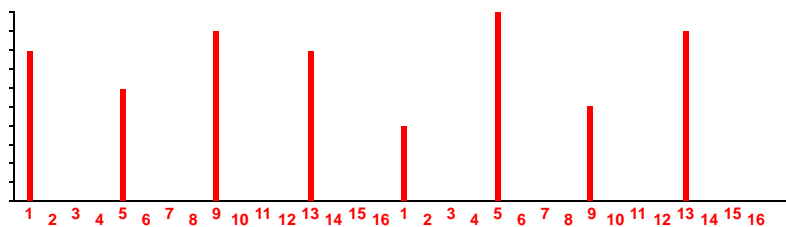
Pattern 16



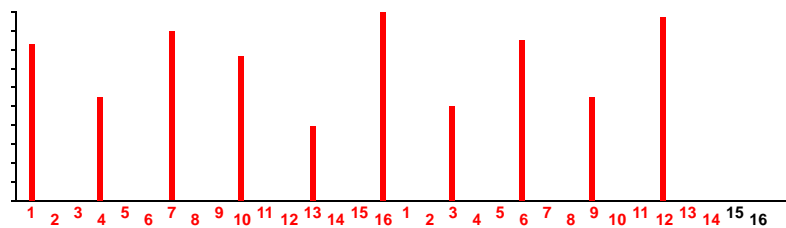
Pattern 17



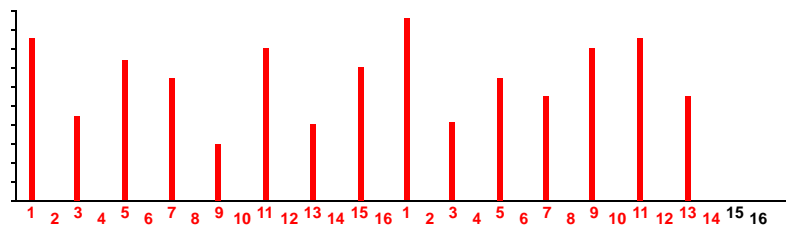
Pattern 18



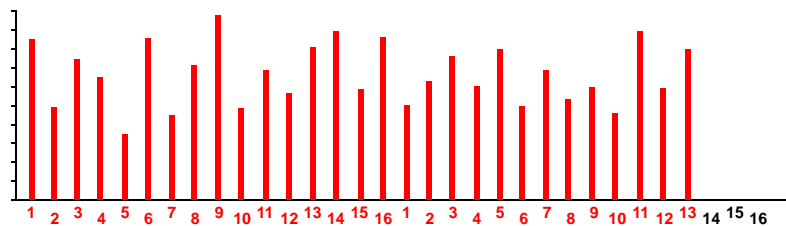
Pattern 19



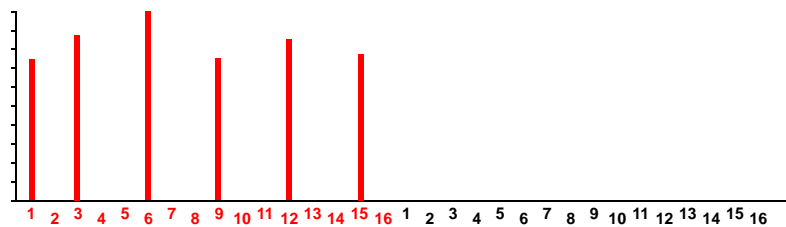
Pattern 20



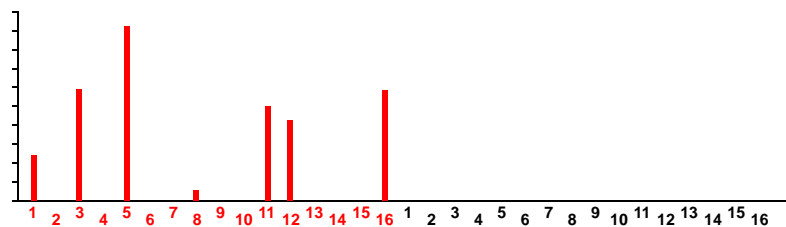
Pattern 21



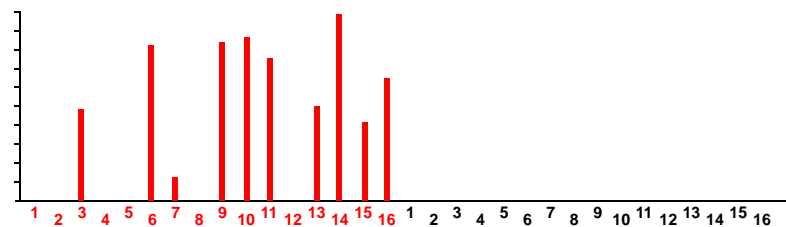
Pattern 22



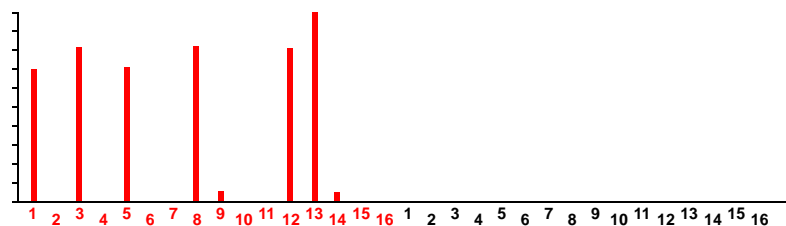
Pattern 23



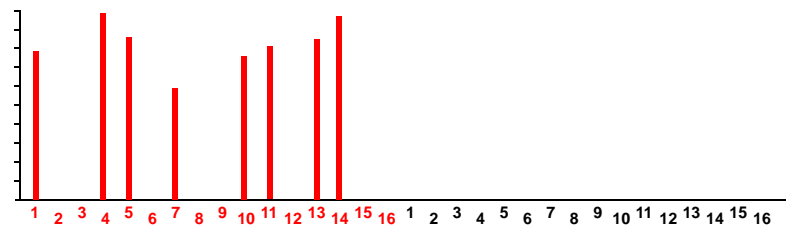
Pattern 27



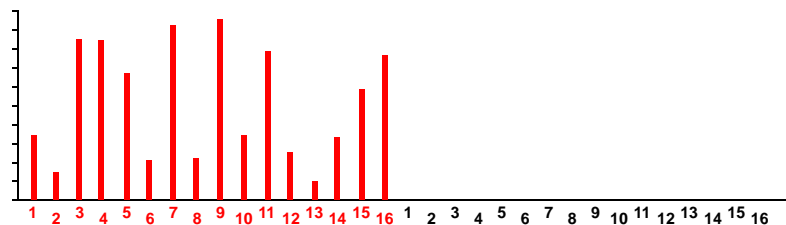
Pattern 24



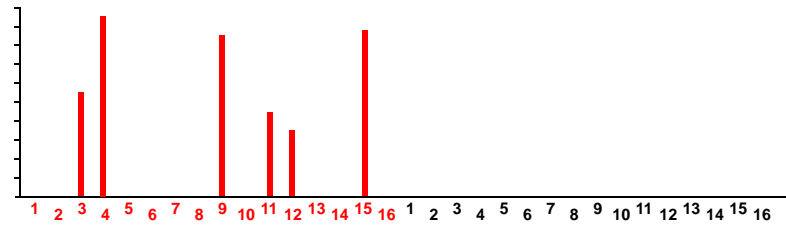
Pattern 28



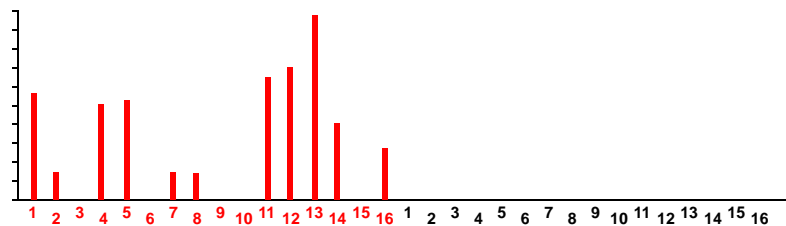
Pattern 25



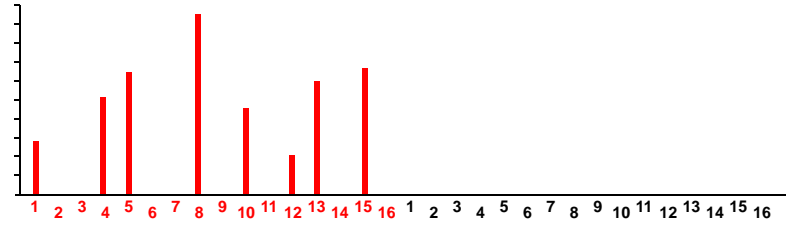
Pattern 29



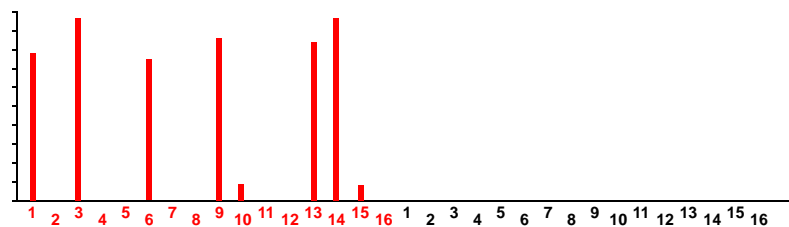
Pattern 26



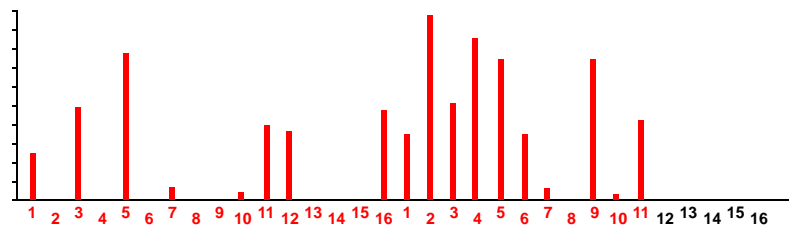
Pattern 30



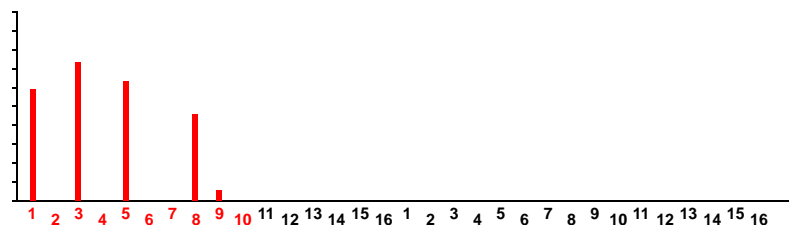
Pattern 31



Pattern 32



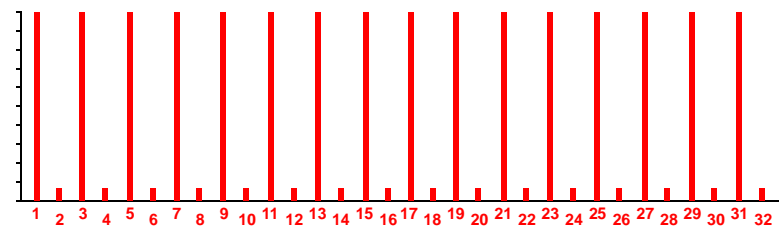
Pattern 33



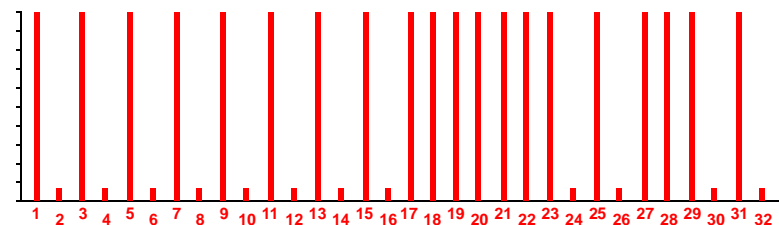
32nd Note Patterns

In the following patterns, each step is one 32nd note (i.e. half of one sequencer pattern step). The length of each pattern is indicated along the x-axis, up to a maximum of 32 steps (which is one bar).

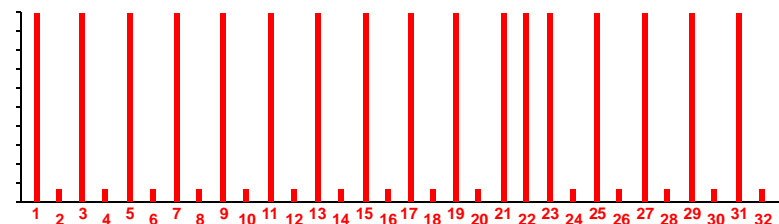
Pattern 34



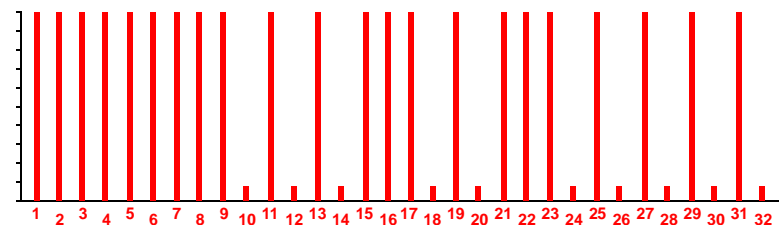
Pattern 35



Pattern 36



Pattern 37

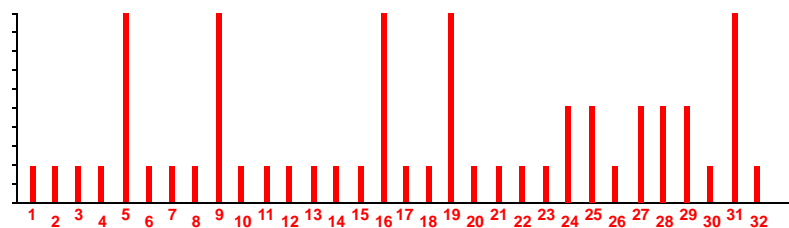


Miscellaneous Patterns

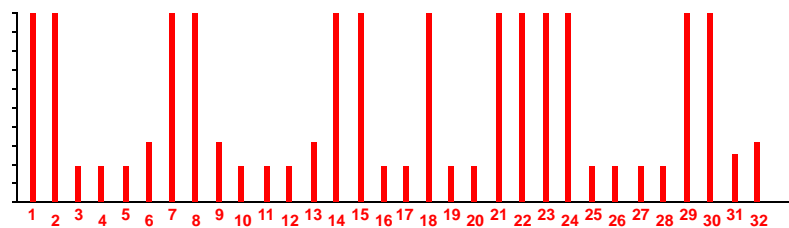
The following patterns are a mixture of 16th and 32nd note patterns with one 8th note pattern thrown in for good measure.

In the 8th note pattern (pattern 53), each step is equivalent to two sequencer pattern steps, giving a total length of 4 bars.

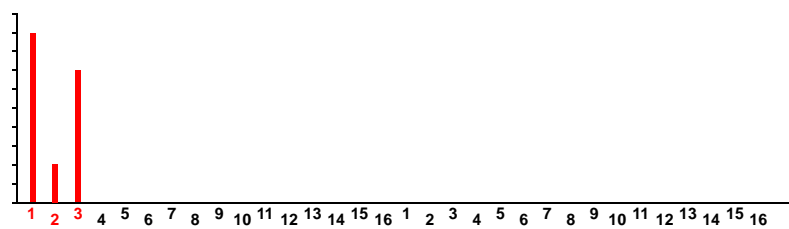
Pattern 46



Pattern 47



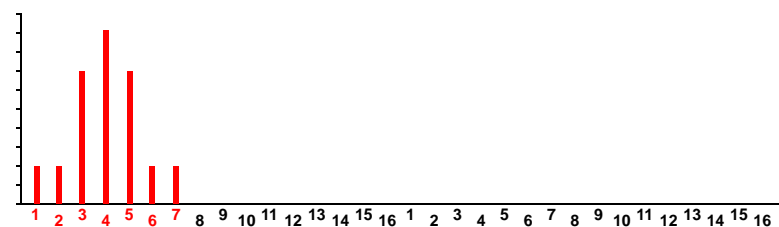
Pattern 48



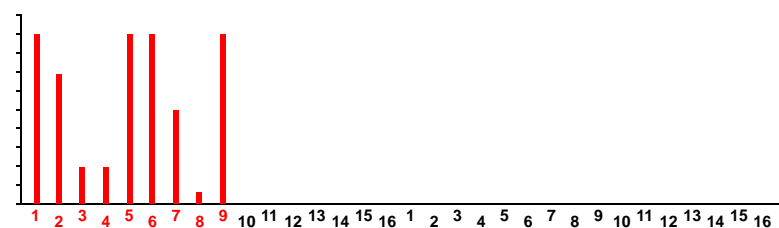
Pattern 49



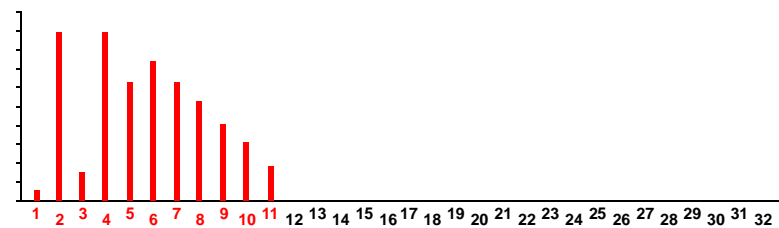
Pattern 50



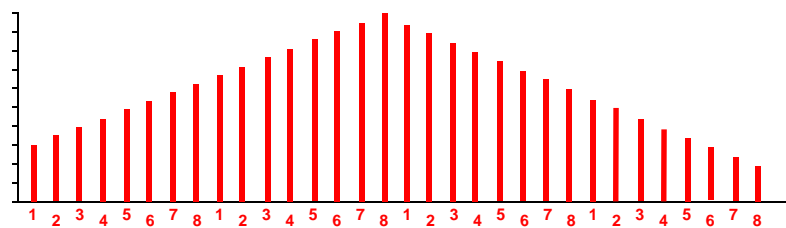
Pattern 51



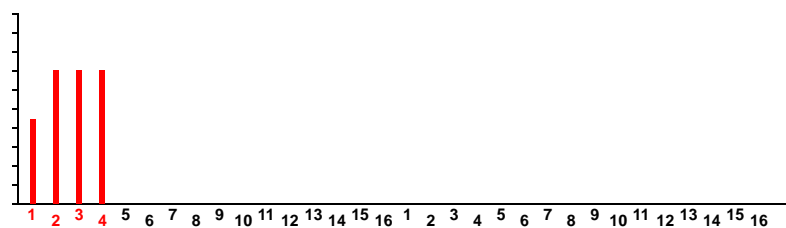
Pattern 52



Pattern 53



Pattern 54



APPENDIX B - Mod Components

Graphical User Interface Components

The user interface comprises 58 separate graphical images (including a Mod “Splash Screen”) as described in Table 3. Some of these images contain multiple frames - this allows for animated controls (such as switches that light up when pressed, or knobs that can be rotated). Any graphic with an entry in the **Frames** column is a multi-frame image and the size of each individual frame is then shown in the **Frame Size** column.

The **Spacing** column indicates the gap (in pixels) between each frame (where **xgap** implies the frames are laid out horizontally and **ygap** implies a vertical layout). Images marked with a “#” in the **Spacing** column indicates that there is no spacing after the last frame in the image.

For information on a method of creating knob animations, refer to the ReBorn website.

Note! Replacement image components must have exactly the dimensions shown in the table and be in 24-bit PNG format.

Table 3: Mod Archive Graphical User Interface Components

Filename	Description	Image Size	Frames	Frame Size	Spacing
12015.png	Numeric Digits	109 x 16	11	9 x 16	xgap=1
12016.png	Pattern/Song switch	53 x 19	2	26 x 19	xgap=1
12017.png	PCF/Delay switch	19 x 18	2	9 x 18	xgap=1
12019.png	Step-up switch	23 x 9	2	11 x 9	xgap=1
12020.png	Step-down switch	23 x 9	2	11 x 9	xgap=1
12030.png	PCF slider scale	15 x 45	-	-	-
12031.png	Slider knob	15 x 11	-	-	-
12032.png	Level slider scale	15 x 54	-	-	-
12040.png	Effect routing switch	49 x 11	2	24 x 11	xgap=1
12057.png	Transport panel	592 x 50	-	-	-

Table 3: Mod Archive Graphical User Interface Components

Filename	Description	Image Size	Frames	Frame Size	Spacing
12058.png	Pattern select panel	70 x 115	-	-	-
12060.png	Section Mixer	70 x 115	-	-	-
12061.png	Master Mixer	82 x 98	-	-	-
12062.png	Side panel	16 x 510	-	-	-
12063.png	Delay	82 x 93	-	-	-
12064.png	PCF	82 x 111	-	-	-
12065.png	Dist	82 x 65	-	-	-
12066.png	Effect enable LED	33 x 16	2	16 x 16	xgap=1
12067.png	Effect VU	55 x 16	4	13 x 16	xgap=1
12068.png	Section active bar	9 x 115	2	4 x 115	xgap=1
12500.png	TB303	366 x 115	-	-	-
12501.png	TB303 white note switch	19 x 16	2	9 x 16	xgap=1
12502.png	TB303 white switch	35 x 10	2	17 x 10	xgap=1
12503.png	TB303 step switch	51 x 17	2	25 x 17	xgap=1
12504.png	TB303 waveform switch	33 x 12	2	16 x 12	xgap=1
12505.png	TB303 white note LED	17 x 8	2	8 x 8	xgap=1
12506.png	TB303 black note LED	17 x 8	2	8 x 8	xgap=1
12507.png	TB303 knob	1674 x 30	54	30 x 30	xgap=1 #
12509.png	TB303 black note switch	17 x 15	2	8 x 15	xgap=1
12510.png	TB303 black switch	31 x 8	2	15 x 8	xgap=1
12520.png	TR808	366 x 115	-	-	-
12521.png	TR808 level knob	504 x 13	36	13 x 13	xgap=1 #
12522.png	TR808 tune knob	504 x 13	36	13 x 13	xgap=1 #
12523.png	TR808 toggle switch	23 x 17	2	11 x 17	xgap=1
12524.png	TR808 step LED	47 x 5	4	11 x 5	xgap=1
12525.png	TR808 selector knob	360 x 31	12	29 x 31	xgap=1 #
12550.png	Mixer enable LED	35 x 15	2	17 x 15	xgap=1

Table 3: Mod Archive Graphical User Interface Components

Filename	Description	Image Size	Frames	Frame Size	Spacing
12551.png	Loop switch	35 x 21	2	17 x 21	xgap=1
12552.png	Mixer/effect knob	608 x 19	32	18 x 19	xgap=1 #
12554.png	Pattern Number	68 x 504	9	68 x 40	ygap=16 #
12555.png	Pattern Bank	68 x 184	4	68 x 30	ygap=16 #
12556.png	Pattern enable LED	27 x 14	2	13 x 14	xgap=1
12557.png	Master VU	15 x 792	11	15 x 56	ygap=16 #
12558.png	Mix VU	59 x 15	4	14 x 15	xgap=1
12559.png	Play button	65 x 25	2	32 x 25	xgap=1
12560.png	Stop button	65 x 25	2	32 x 25	xgap=1
12561.png	Rwd button	65 x 25	2	32 x 25	xgap=1
12562.png	Fwd button	65 x 25	2	32 x 25	xgap=1
12563.png	Rec button	65 x 25	2	32 x 25	xgap=1
12564.png	TR909	366 x 115	-	-	-
12565.png	TR909 knob	532 x 12	41	12 x 12	xgap=1
12566.png	TR909 step LED	59 x 8	4	14 x 8	xgap=1
12567.png	TR909 instrument LED	6 x 6	-	-	-
12568.png	TR909 flam button	29 x 14	2	14 x 14	xgap=1
12569.png	Compressor	82 x 93	-	-	-
12570.png	Compressor VU	63 x 20	2	63 x 10	ygap=0
12571.png	Shuffle LED	37 x 20	2	18 x 20	xgap=1
splash.png	Splash graphic	256 x 256	-	-	-

TR808 Audio Sample Components

The 24 individual audio samples used to create the required TR808 instrument sounds are described in Table 4.

The snare drum is a special case; the “tone” (drum part) and the “noise” (snare part) are stored as separate audio samples and combined by ReBorn as required. The 5 tone samples are selected by the snare drum **Tune** knob. The noise samples are chosen randomly for each snare drum hit and are mixed with the tone part by means of the **Snappy** knob.

If it is not possible to obtain separate tone and noise components when replacing the snare drum, use the desired sample as the tone part and create a WAV file containing silence as the noise part. The **Snappy** knob will then have no effect. If possible, vary the speed of the sample to create the different tone parts, or if this is not possible, simply use the same sample for each of the 5 tone components.

All samples are in 44.1KHz, 16 bit mono WAV format

Table 4: Mod Archive TR808 Samples

Filename	Description
tr808bd.wav	TR808 Bass Drum
tr808sd1.wav	TR808 Snare Tone 1
tr808sd2.wav	TR808 Snare Tone 2
tr808sd3.wav	TR808 Snare Tone 3
tr808sd4.wav	TR808 Snare Tone 4
tr808sd5.wav	TR808 Snare Tone 5
tr808n1.wav	TR808 Snare Noise 1
tr808n2.wav	TR808 Snare Noise 2
tr808n3.wav	TR808 Snare Noise 3
tr808n4.wav	TR808 Snare Noise 4
tr808lt.wav	TR808 Low Tom
tr808lc.wav	TR808 Low Conga

Table 4: Mod Archive TR808 Samples

Filename	Description
tr808mt.wav	TR808 Mid Tom
tr808mc.wav	TR808 Mid Conga
tr808ht.wav	TR808 High Tom
tr808hc.wav	TR808 High Conga
tr808rs.wav	TR808 Rim Shot
tr808cl.wav	TR808 Claves
tr808cp.wav	TR808 Hand Clap
tr808ma.wav	TR808 Maracas
tr808cb.wav	TR808 Cow Bell
tr808cy.wav	TR808 Crash Cymbal
tr808oh.wav	TR808 Open Hi-Hat
tr808ch.wav	TR808 Closed Hi-Hat

TR909 Audio Sample Components

The 21 individual audio samples used to create the required TR909 instrument sounds are described in Table 5.

As with the TR808 section, the snare drum has separate samples for the tone and noise components. The **Snappy** knob controls the level of a randomly selected noise component while the **Tune** knob selects the tone sample to use.

Similarly, the bass drum is made up of 4 separate samples with the **Tune** knob selecting between them.

All samples are in 44.1KHz, 16 bit mono WAV format.

Table 5: Mod Archive TR909 Samples

Filename	Description
tr909bd1.wav	TR909 Bass Drum 1
tr909bd2.wav	TR909 Bass Drum 2
tr909bd3.wav	TR909 Bass Drum 3
tr909bd4.wav	TR909 Bass Drum 4
tr909sd1.wav	TR909 Snare Tone 1
tr909sd2.wav	TR909 Snare Tone 2
tr909sd3.wav	TR909 Snare Tone 3
tr909sd4.wav	TR909 Snare Tone 4
tr909sd5.wav	TR909 Snare Tone 5
tr909sdn1.wav	TR909 Snare Noise 1
tr909sdn2.wav	TR909 Snare Noise 2
tr909sdn3.wav	TR909 Snare Noise 3
tr909lt.wav	TR909 Low Tom
tr909mt.wav	TR909 Mid Tom
tr909ht.wav	TR909 High Tom
tr909rs.wav	TR909 Rim Shot
tr909hc.wav	TR909 Hand Clap
tr909chh.wav	TR909 Closed Hi-Hat
tr909ohh.wav	TR909 Open Hi-Hat
tr909ccy.wav	TR909 Crash Cymbal
tr909rcy.wav	TR909 Ride Cymbal