1 Introduction

DrumStation is a virtual drum computer and groove studio for your PC. It is roughly based on the legendary Roland TR-909 drummachine.
DrumStation makes it possible to create beats in CD quality without any further knowledge and in no time.

All created grooves can of course be saved as .WAV data in order to be used in other music software.

Wether you are a DJ in a club or a producer in a studio, DrumStation is your ideal partner for smoothe grooves, funky breaks and hardcore techno beats.

1.1 TR-909: The Past

In the beginning of the 1980s, Roland surprised the musicians with a brand new instrument. A programmable drummachine brought the machine beats to the masses, after the old ones could only play hardwired rhythms.
The TR-909 (Transistor Rhythm) didn't sell at all, quite similar to the TB-303 due to the machine like sounds which did not quite fit into the pop world at this time.

But acid house, techno and dance brought the little machine whose sound generation consists of a combination of samples and synthesis to a sudden renaissance.
Together with the well known TB-303, the TR-909 has become the standard in every electronic production studio.
The well known, fat 909 bassdrum is probably the most used in this time, as well as the famous 909 hihats that penetrated the aural perception of every european.

1.2 DrumStation DT-010: The Future

1998:

A young and dynamic software company, named d-lusion brought the cult back to its roots. The renaissance of the analogue sound-generation embedded in the digital age makes it possible to simulate and enhance the traditional TB-909 machine on a usual PC.
The old dream of equal accessibility of the means of productions has come true: DrumStation DT-010.

2 Features

DrumStation features

- 8 channels
- step sequencer with 384 entries
- realtime effects for every channel
- reverb, hall, flanger, delay, lp filter, distortion, timeshifting
- 16 Bit, 44.1 kHz, CD quality
- enhanced sampler functionality
- live-act tools
- virtual drums and wave file import
- drumkit manager (drumkit files available from www.d-lusion.com)
- synchronizer to RubberDuck H30+ 2.0 available.
- WAV render function

2.1 Hardware Recommendation

In order to run DrumStation, you will need at least a Pentium PC with 100 MHz running under Windows95/98 or Windows NT 4.0 with a soundcard supported by the system. Your graphics should support 16bit colors (65000). DrumStation will only take about 105 MB of your precious hard disk space.

2.2 Installation

Windows 95/98 or Windows NT (4.0 and above):

Click on setup.exe and follow the steps of the installation program. A „d-lusion sound systems" folder with a DrumStations icon will be added in the Start bar.

2.3 De-Installation

If you might ever want to deinstall DrumStation (although we can't figure out why you would :)), use the Windows Install/Deinstall option in the Configuration/Software menu. Everything will be taken care of then...

3 Setup

3.1 Soundcard Setup

Before you can use DrumStation for the first time, you have to check the soundcard setup in setup/soundcard setup.

Output Device

Determines the audio driver that DrumStation uses for sound generation.

Windows Wave Mapper
The wave mapper device that windows uses to map audio devices. Use this option if you often change your soundcard driver in windows.

Windows MME soundcard driver
The normal soundcard driver that came with your soundcard.

DirectX Sound Interface
The DirectX soundcard driver. Due to performance reasons you should use this driver it is possible. You can get DirectX drivers for your soundcard from the vendor or Microsoft. Please make sure that DirectX is installed on your system before selecting this option.

D-LUSION Audio Server
The d-lusion audio server is a tool to synchronize several d-lusion products running at the same time (for example a set of two RD-H3O+s and one DrumStation).

Please read on in the documentation or check our web site at www.d-lusion.com/das/ for further information !

Frequency

Mixing frequency for the DrumStation sound-generation. You will use 44.1kHz to achieve CD quality, unless your soundcard doesn't support it or you want to torture yourself.

Resolution

The resolution of the generated audio data. Usually 16bit.

Buffersize

The buffer size determines the size of the output buffer. If you use a smaller buffer, the time between the movement of a slider and the actual reaction of the sound generation gets shorter. Unfortunately this highly depends on the soundcard driver you are using. If the buffer size gets too small, you will hear a stuttering noise in
the sound output. It is best to reduce the buffer size to the smallest possible size without getting a   stuttering sound.

4 Making Your Own Grooves

4.1 Quick Intro

Now that you have learned about all the cool features, you probably want to start right away. If you already setup your soundcard as described in the last chapter, this is no problem:

First, click on the play button in the upper left corner of the screen (you probably know how it looks from your home stereo).
Now you will see some leds flickering in the upper half of the window which is the first channel so to say.
By pressing the buttons below which symbolise one measure each with the left mouse button, you will hear you first attempt in making a groove. If you are not satisfied with the rhythm, just klick on the same button again and it will be erased from the time scale.
When you are satisfied with your bassdrum, click on the next track number on the left side on the screen.
The track should now change its appearance and offer all editing possibilities.
Now you can enter another rhythm in this track. If you want to change the instrument, just click on the instrument name and choose a new drum.

Experiment and you will soon get it groove !

5 Realtime Functions

All realtime functions can be directly accessed on the DrumStation window with sliders or knobs.

The user interface is divided in two main areas:

The upper part consists of the master panel that incorporates important controls such as speed, volume, start/stop, record etc.

Below are the 8 drum channels which offer channel specific functions like drum sequence, drum parameter, effects, channel volume and so on.

5.1 Channel Panel

DrumStation is a 8 channel drum machine. Though you have 8 channel panels, sorted by number.

In order to save space and preserve better handling, the channel display can be toggled either by clicking on the channel number with the mouse or by pressing ALT+L.

The channel panel itself contains several areas:

5.2 Step Sequencer

The step sequencer is the heart of the electronic groove production.
One step sequence equals one measure like they are used by normal musicians. It can be splitted in 4 subgroups (DT operates only in 4/4 measures) which are separated into 4 steps again. Every single step equals 1/16.

If you want to do a classic 4-to-the-floor house beat, just set the beats with the left mouse button on the first step of each group: position 1, 5, 9, 13.
If the step is enabled you will see a LED shimmering on the button.
By pressing the button again, the step is turned off. By pressing with the right button, you can select the volume of the step

Directly above the step buttons, you can see sixteen red LEDs.
These show the actual position while playing the beat and are though a very important feature during live play and beat programming.

5.3 Channel Controls

The channel controls for volume, panning and effect are just above the step sequencer. Their function is to mix the channels together and emphasize one track while playing live.

Vol
The volume for this channel.
Just imagine a slowly fade-in of a snare whirl. The club crowd will start pumping soon !!!

Pan
The stereo position of the channel (left-right-middle)

Effect
Controls the strength of the selected effect.
Effects can be chosen by clicking on the box right to the left.

None (---)
Indicates that no effect is selected on this channel.
You should choose this instead of setting the effect strength to zero since it makes sure that no effect is computed.

Shift (SHFT)
Equals a delay without feedback. groovy.

Delay (DLY)
Equals a delay with feedback. Simple echo effect.

Low Pass (LP)
A dynamic 4 pole (24dB) lowpass filter. Nice effect on fat drum loops.

Distortion (DIST)
Nirvana would have loved this one.

Flanger (FLG)
The well known phase shifting flanger.

Reverb (RVB)
Simulates room reverb.

Reverb L-Hall (HAL)
Another reverb but with a bigger room. A classical warehouse sound for your beats.

Due to the computing power necessary for the effects, we recommend to use them not too much. If the sound output starts choking, you should either buy a faster machine or turn some effects off.

Channel Muting

Left from the channel control is another button with a red LED. This starts blinking as soon as information is played on the specific channel. By clicking on it, you can mute this channel.

5.4 Drum/Loop Parameter

DrumStation has two kinds of instruments that can be played on a channel: *drums and loops*

Through the context menu that you can reach by pressing the right mouse button on the channel background, you can switch the types and either load drums or loops into the channel.

Drum Parameter

In drum mode, a sample or the internal drum generation is use to produce hard, percussive sounds.
The drum parameters contain the drum name and 4 realtime controls via knobs.

Tone
Alters the pitch of the sound in the range of one octave.

Punch
Alters the volume envelope to give more punch to the sound.

Attack
Alters the attack rate. A larger value will give a softer start of the sound.

Decay
Decay rate of the volume envelope. Increasing gets you a shorter, harder sound.

Loop Parameter

In loop mode, complete drumloops, that were recorded with DrumStation or any other music software are used for sound generation.

These can be cut in very different manners. A production technique that is quite common in the breakbeat and drum&bass scene.

Note: You can load drum loops by clicking the right mouse button over one of the 8 channels.
Select Load Sample as loop.

Cut position
Here you can choose in how many snippets the loop will be cut (1, 2, 3, 4, 6, 8). In loop mode, the step sequencer works in slightly different manner. By clicking with the left button you can increase the area number that should be played, with the right one, you decrease the number. The loop is played the whole time, though this results in weird offset jumping effects.

Loop length
Right from the cut position buttons is the display for the loop length. It shows how many measures the loop will normally take to play one time.

Loop reverse
With this button you can revert the playing direction of the loop. Wicked !

5.5 Context Menu

The context menu is accessed by pressing the right mouse button on a free area in the channel panel. You can choose from the following functions:

Select drum
Selects a new drum via the drumkit dialog for the current channel.

Load sample as drum
Loads a .wav file as drum. Now you can use the screams of your little sister as an cool bassdrum in your industrial tracks !

Load sample as loop
Loads a .wav file as loop. You can load stereo .wav files too, but they will be converted to mono while loading.

Insert REC pattern as loop
When DrumStation has completed playing a whole measure (pattern), the result is saved in an internal record buffer.

In the status window on bottom window bar you can see which pattern is currently in the buffer.
By using this function, you can insert the last played pattern as a loop. This makes it possible to produce grooves in a simple, incremental fashion.
Let's imagine you have made a very tight groove, but it uses already 6 channels. No problem. Just insert it as a loop and it is reduced to a single channel. Now you can add some nifty snare whirls on top in the other channels !

Channel erase
Time for something new. This deletes the whole step sequencer information from the current channel

Channel copy
Copies the step sequencer information in the clipboard.

Channel paste
Pastes the information from the clipboard into the current channel step sequencer.

Channel on/off
Mutes the channel.

5.6 DrumKit Dialog (Select drum)

1. Virtual Drums
These are virtual drums that are generated by the internal DrumStation synthesizer. They are always available.

2. Drumkits
Drumkits contain drum samples in an organized form.
Each sample is assigned a category: bass, low-tom, snare, hihat open, hihat closed, cymbal, claps, percussion, fills or fx.
A variety of drumkits is available on the drumstation homepage under www.d-lusion.com/drumstation/.
You can also create your own drumkits.

While using drums from Drumkits in your productions, these will not be saved in the file itself to preserve memory.
This is also another nice feature: you can load another drumkit in your groove and check
out how your fancy 909 groove bumps on a CZ. Cool, eh ?

3. Drums/Loops in sequence
If you add own loops and drums, which are specific for this beat, you can save them in the .DT file too.
This is done by adding the drums/loops in the sequence.
Another feature is that you can distribute your grooves to people who don't own the specific drumkits. Just insert all the drums you used in the sequence....

If you select "Drum select" in the context menu, or by clicking on the drum name in the channel panel, you will reach the drumkit dialog where you have the following functions available for drumkit management:

Drumselect window
This window shows all drums and loops that drumstation has in its internal memory at this point. Double click on a category to expand it and select the single drums. If you double-click on a drum it is selected for the current channel.

Load drumkit
Loads a new drumkit in the drumkit categories.

Add drumkit
This function adds an exisiting drumkit to the current.

Save drumkit
Saves the current drumkit as .dkt file on disk. Makes a perfect gift for friends and relatives.

Add drum
First select the proper category, then use this button to add .wav files as drums.

Add loop
Adds a .wav file as loop into a sequence.

Delete drum
Deletes the selected drum/loop from memory.

Drums to sequence
Inserts all drums used in your patterns into the sequence in order to save them in a .dt file.

Note: By clicking on a drum sample in the drumkit window or pressing Space   you can preview the sample.

5.7 Control Panel

The control panel on the upper part of the window contains all the basic functionalities of a drum machine.

Play control

Play (Button)
Starts the sequencer. Press again to pause.

Record (Button)
With this button you start the recording to the internal record buffer.
All what you can hear afterwards will be recorded by DrumStation with superior CD quality. By pressing this button again, the recording will be stopped and you will be asked to enter a filename for saving.

Stop (Button)
Stops the sequencer and rewinds.

Sequencer
The sequencer arranges the single pattern into a complete song. It contains four banks (A, B, C, D), each consisting of 8 patterns and 3 different play modes.

Pattern
A single pattern consists of the rhythm information of the 8 channels.

Bank
A bank contains 8 pattern. In each bank, you can select different settings for the drums. If the bank is switched, so are the drums and drumsets for the selected banks.

In a whole, you can use 4+8 = 24 pattern in a song.
To select a pattern, first select the appropriate bank an then the pattern itself (e.g. bank b, pattern 3).

You have the following play modes available in the sequencer:

Single pattern mode (circle button)
Only the current pattern is played in a loop.

Bank mode (oval button)
Only pattern inside the current bank are played in a loop. You can select the "bank-range" and start...

Sequence mode (cross button)
You can program up to 99 steps with patterns from different banks.

Programming a sequence

- make sure the sequencer is stopped
- switch to sequence mode
- enter the length of the sequence via the steps field
- the position field shows the actual position in the sequence
- you can choose a bank and pattern for every position

While playing, the position will be counted from 0 to sequencer steps and the corresponding pattern for the position will be played.

"Follow Me" Switch
This switch (the one with the two arrows to the right) is a very useful option while programming patterns when the sequence is played. If the switch is activated, the sequence displays the sound that is currently played. If you want to edit a pattern, just turn it off and the sound will continue, but you can focus on editing the current pattern.

Machine control

Controls the basic behavior of the drummachine.

Main Volume
The main volume of the drum machine (don't forget your neighbors :))

Tempo
The tempo of the sequencer. This can be adjusted form 60 to 199 beats per minute. Use a double click on the field to enter the value directly.

Swing
This is a nice feature to give a bit of groove to a machine beat. Right from the swing knob, you can see the step swing entry. Here you can simply select by clicking, which steps should be delayed.

Context menu
By clicking on the right mouse button on the background, you gain access to the control panel context menu:

Mute all channels [Shift-A]:
Mutes all channels.

All channels on [Ctrl-A]:

Switches all channels back on.

Swing even 1/16, Swing uneven 1/16, Swing even 1/8, Swing uneven 1/8
Sets swing step to the specific swing.

Bank copy
Copies the whole bank into the clipboard.

Bank insert
Inserts the whole bank from the clipboard.

6 Menu Functions

6.1 File

Reset machine (Ctrl-N)
Resets all controls and clears all banks and patterns.

Load machine state (Ctrl-O)
Load a .DT file into the drum machine.

Save machine state (Ctrl-S)
Save a .DT file. This contains knobs and slider values, sequencer and drums.

Save machine state as
Save a .DT file under a different filename

Load Drumkit (Ctrl-D)
Loads a new drumkit (.dkt) from disk.

Save Drumkit
Save the current drumkit to file.

Quit
Quits DrumStation.

6.2 Edit

Pattern clear (Ctrl-X)
Clears the current pattern on all channels.

Pattern copy (Ctrl-C)
Copies the current pattern into the clipboard.

Pattern insert (Ctrl-V)
Inserts the clipboard into the current pattern**.**

Bank copy (Alt-C)
Copies the bank into the clipboard.

Bank insert (Alt-V)
Insert the bank from clipboard.

6.3 View

Switch channels
Selects whether the channels zoom while switching only or if every channel is shown zoomed.

Follow sequencer position
Selects whether the display follows the sequencer position while playing.

Channel 1-8 (Alt 1-8)
Zooms the respective channel.

Statusbar
Turns the statusbar on/off.

6.4 Output

Start sequencer (Return)
Starts/stops the sequencer. If you can't hear any music, your either a cool minimalist, or your soundcard is not working properly.

Record (F9)
Records the output into the internal buffer. Selecting this function again stops recording and prompts for saving.

Save Pattern (Ctrl-F9)
Saves the last played pattern to .WAV

Pattern break (Space)
Breaks the currently played pattern and jumps directly to the beginning of the next. You know...

Mute
DrumStation allocates the whole audio output for itself. If you want to take a little break, in order to play with a sample editor for example, just press mute and DrumStation will free the sound output for use with other products. Before you can use DrumStation again, you will have to click on the button.

6.5 Setup

Soundcard setup
Specifies your setup (see above).

6.6 Help

You probably guessed it all ready...

7 Live-Act Controls

Club tests have proved that ladies really dig a good live-act. Don't worry, this is no problem for you, because DrumStation has a variety of cool live act features to adjust your sound to the club crowd !!

Y, X, C, V, B, N, M, ","
Plays the drum on the specific channel (1-8). A nice feature for live drumming...

Return
Starts/stops the sequencer

1-8 (Channel keys)
Mutes the specific channel.

Shift 1-8
Switches the specific channel to solo mode. All other channels will be muted.

Shift-A
Turns all channels on.

Ctrl-A
Turns all channels off.

Ctrl-1-8
Jumps to pattern 1-8 at the current position.

Ctrl-Shift-1-8
Jumps to the selected pattern after finished playing the current.

Space
Stops playing the current pattern and continues with the next one.

8 DAS Synchronizer

If you have got a power full machine available: it is possible to run many d-lusion software synthesizer simultaneously, to build up your own software sound gear setup.

In order to do this you need DAS, which stands for „d-lusion Digital Audio Server". The latest version of the program is available at http://www.d-lusion.com/das/.

DAS implements the sharing of the soundcard, features a very stable synchronisation of the so called DAS machines and offers possibilities to sync to midi.

With DAS you are able to load DrumStation twice or even often and use it along with other DAS aware software sound machines.

How to use two DrumStations simultaneously

After the installation of DAS.
First you have to start the DAS application (DAS icon in the program-Folder „d-lusion sound systems"). Configure DAS with you soundcard settings.
Now start DrumStation, DAS should still be running in the background. DrumStation will report that it has found the Digital Audio Server and asks if it should connect. Press „Yes" and DrumStation will continue open up normal.
Load you favourite beat. Press play. DrumStation is now ready to go but does not run, that is ok.
Start up a second DrumStation let it again connect to DAS, also load a beat into it and press again play.

Now press the play button (RUN) in DAS, the two DrumStation start playing with absolute synchrony.
You can change the tempo in DAS and both DrumStations will react with the same tempo change.

Please note that using many DAS sound machines parallel needs a huge amount of processor time. If the sound starts to crackle and stutters your CPU power is possibly exhausted.

9 Error Solving

My soundcard works perfectly with other programs, but when I start DrumStation I get the error "can not open output device". What am I doing wrong ?

We tried to test the application on a great variety of soundcards and driver. But some old or very exotic soundcard drivers wont just not work correctly with the program. In this case please get the newest driver version from your vendor or try to install DirectX.

The sound quality is quite bad since there is a lot of crackling and stuttering noise in it. What can I do about this ?

The realtime sound generation uses quite a lot of processor power. In addition, soundcard manufacturers emphasize more or less on making good drivers.
Try to set the buffer size in setup/output to a higher value.
Anyway, we would suggest to use DirectX sound drivers since the latency is by far better. You have to install DirectX on your system first though.