DrumStation Rack™

DRUM SYNTHESIZER MODULE

OWNER'S MANUAL

ASM
Analogue Sound Modelling

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Contents

Introduction

Thank you for buying the Novation DrumStation Rack drum synthesizer. The module you have purchased is ideal for producing the kind of classic synthesized drum sounds which have returned to popularity in recent years in various styles of dance music.

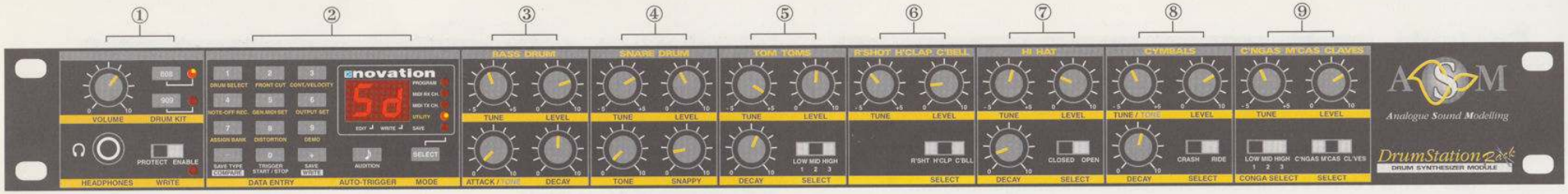
The two most popular drum machines which originally produced these sounds - Roland's TR808 & TR909* - are no longer manufactured and as a result, second-hand units are now changing hands for far more than their original selling prices (and indeed the selling price of the DrumStation). The DrumStation will allow you to produce these sounds with stunning realism and 'tweak' their parameters using the original analogue synthesis techniques, unlike sampling or PCM playback which 'freezes' the sound and makes it extremely difficult to edit. However, thanks to modern digital memories, once you have adjusted the sounds to your taste you can store them in complete 'kits' so that you can recall an exact set of sounds with the accuracy of samples, but with the life and warmth that only original analogue sounds have. To get you started 25 Factory kits have been provided and there are 15 User Programs which you can use to store your own kits, once you become familiar with the editing parameters. The DrumStation features stereo left/right and 6 individual assignable audio outputs so you can process your drum sounds individually through your mixer EQ and external effects.

The DrumStation is triggered via MIDI, allowing you to program your drums on your favourite MIDI sequencer (hardware or software). The TR808 and TR909 kits can be accessed simultaneously allowing any combination of drum sounds to be played as a 'Kit'. MIDI Controllers are transmitted when sounds are 'tweaked' in real-time and these too can be recorded on a MIDI sequencer and reproduced from sequencer playback. For those who cling to the traditional methods of triggering sounds the DrumStation uses the incoming MIDI Clock to generate the original Roland DIN Sync 5v output trigger for older external devices.

Welcome to a percussive "Analogue for the 90s".

** TR808 & TR909 are trademarks of Roland Corporation, Japan.*

Front Panel Controls & Features



① Master Volume Section

This section contains the Master Volume control, Drum Kit select buttons, Headphone output socket and the Program write switch.

② Data Entry / Program Section

This section contains the 12 Data Entry buttons, Display and Menu LED's, Audition/AutoTrigger and Mode select Buttons.

③ Bass Drum Section

This section contains the Bass Drum Level, Tune, Attack/Tone and Decay controls.

④ Snare Drum Section

This section contains the Snare Drum Level, Tune, Tone and Snappy controls.

⑤ Tom Toms Section

This section contains the Tom Toms Level, Tune, Decay and Select controls.

⑥ Rim Shot / HandClap Section

This section contains the Rim Shot and HandClap Level, Tune and Select controls.

⑦ Hi Hat Section

This section contains the Hi Hat Level, Tune, Decay and Select controls.

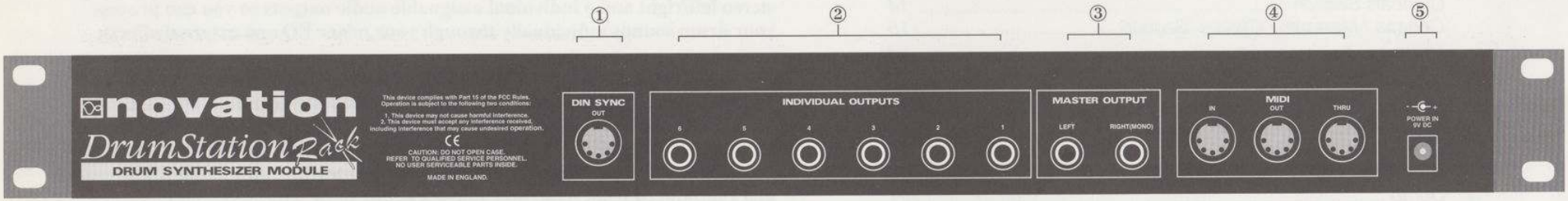
⑧ Cymbals Section

This section contains the Cymbals Level, Tune/Tone, Decay and Select controls.

⑨ Congas / Maracas / Claves Section

This section contains the TR808's Congas / Maracas / Claves Level, Tune, Select and Conga Select controls.

Rear Panel Features



① Din Sync. Out

This connector is used to control the tempo of classic analogue drum machines or synthesizers from the MIDI clock.

② Individual Outputs

The six connectors in this section are used to separate a drum sound(s) from the main stereo Left/Right outputs. The sound(s) can then be equalised or processed individually.

③ Master Output

These two 1/4 jack's deliver a stereo line-level output signal for connection to a mixing desk or amplifier.

④ MIDI

IN - This connector is used to receive MIDI data from an external device.

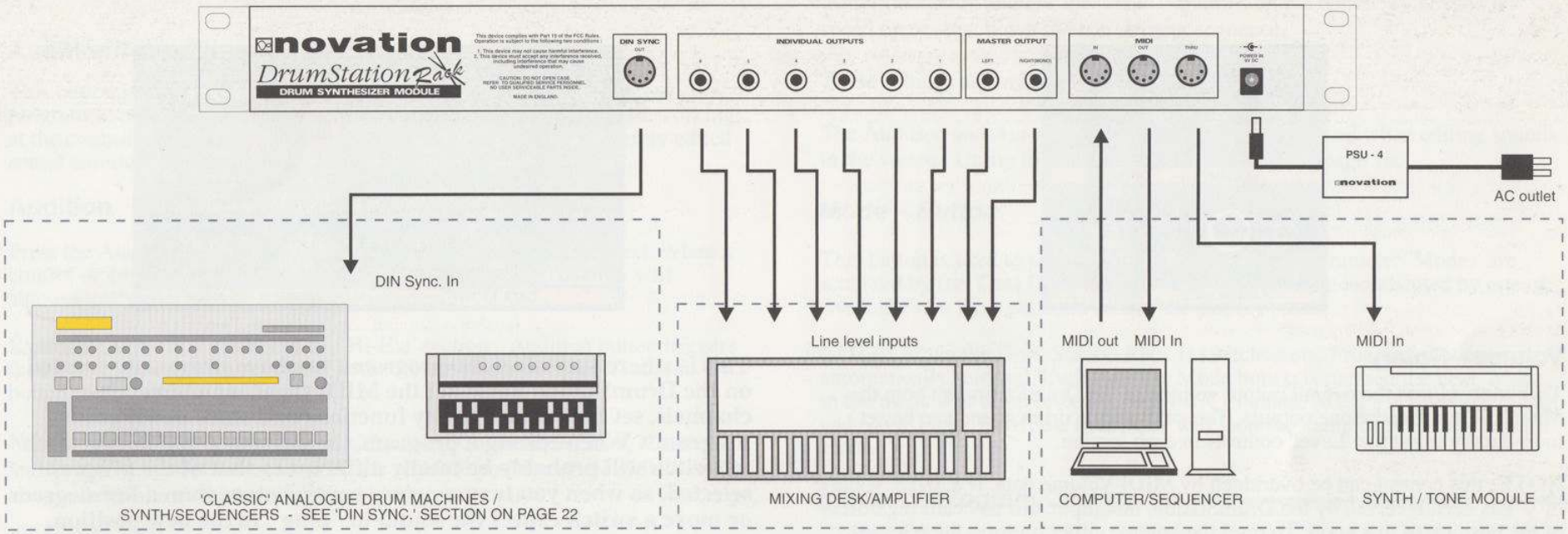
OUT - This connector is used to transmit MIDI data to an external device.

THRU - This connector re-transmits MIDI data received by the MIDI IN socket to an external device.

⑤ 9vDC Input

Connect the output plug of the AC adapter supplied with the DrumStation Rack to this socket.

Connections



Quick Set-up Guide

Connect the 'Master output' sockets of the DrumStation Rack to a suitable amplifier or mixing desk's stereo inputs and set the 'Volume' control on the front panel to a reasonably high output level (9-10). This will maintain a good signal to noise ratio on the line level outputs from the DrumStation, but be sure that the input volume setting on your amplifier or mixer is initially set at a low level (to ensure a comfortable listening volume when the first sounds are played) and then adjust accordingly. Connect the MIDI Out from your master keyboard or sequencer to the MIDI In on the DrumStation Rack and check that the 'Write' switch is in the 'Protect' position. Now, connect the power supply (Novation PSU-4) to the socket marked 'Power In 9VDC' and plug into a suitable AC power outlet.

The Display should now illuminate showing the last selected program number. If this does not happen, check that the power supply is of the specified type and that it is connected as described above.

Now you can use your master keyboard or sequencer to play the drum sounds of the currently selected program (the DrumStation Rack is initially set at the factory to receive on MIDI channel 10). To listen to all 25 factory presets, first make sure the 'Program' LED is on (if not, use the 'Mode' button to re-select) and then use the 'Data Entry' keypad to call up sounds '00' to '24'. See page 5 and the separate sheet for factory program information. You can also use the 'Audition' button on the front panel to trigger the sounds

The DrumStation Rack features a 'Demo' mode. To play the demo use the 'Mode' button to select 'Utility' (LED on) and then press the 'Demo' (9) button. To stop the demo, simply press the 'Demo' (9) button again.

Reading the following chapter "How the controls work" in detail will help you to obtain the best results from your DrumStation Rack.

Master Volume Section

Volume - *Rotary*

This knob adjusts the overall output volume of the DrumStation on both the Main L/R and Headphone outputs. The volume of a drum sound can be set individually using the 'Level' controls in each section.

NOTE: this control can be overidden by MIDI Volume data. If a MIDI Volume of '0' has been received by the DrumStation, no output will be heard regardless of the position of this knob. To reset the volume either transmit the relevant MIDI Volume level or move the Volume knob - this automatically overides the MIDI setting.

Drum Kit - *Buttons*

These two buttons are used to select which drum kit (TR808 or TR909) will be edited when using the front panel controls or any of the Utility functions.

Write - *Switch*

This switch protects your programs from accidental erasure. During normal operation it should be left in it's 'Protect' position however, when you have edited or created a new program that you want to save, moving it to the 'Enable' position will allow you to "write" over an existing program - see "Writing a Program Into Memory" on page 7.

Headphone - *Socket*

Use this 1/4 jack socket to monitor the output of your DrumStation Rack via headphones. This output will drive any type of headphones.

Data Entry / Program Section

This is where you select the programs you have previously created on the DrumStation Rack, set the MIDI transmit and receive channels, set the various utility functions and store newly edited programs. When editing a program, the current position of a knob or switch will probably be totally different to that of the program selected, so when you turn a rotary control more than a few degrees or move a switch expect the sound to "ping" to the new position.

Data Entry Keypad - *Buttons*

The 12 buttons of the calculator style 'Data Entry' keypad are used to call up and set the various operating parameters of each 'Mode'. You can use two methods to enter a number :

1. DIGIT INPUT - using the buttons 0 to 9.
Note: this must always be a two digit entry, for example :
Selecting program sound 8 ---- press the '0' and '8' buttons - display reads '08'.
Selecting program sound 17 --- press the '1' and '7' buttons - display reads '17'.

2. INCREMENT/DECREMENT - using the '-' and '+' buttons.
Press the '+' button to move up to the next program or value.
Press the '-' button to move down to the next program or value.
These buttons can also be used to 'scroll' through values by pressing and holding down until the desired value is reached.

Data Entry / Program Section Cont.

Audition/Auto-Trigger - *Button*

This button is used to trigger a drum sound from the currently selected program. It provides a convenient way of monitoring a sound whilst working at the control panel. The Auto-Trigger function will play the currently edited sound automatically at a pre-determined tempo.

Audition

Press the Audition button to trigger the currently edited drum sound. When a control or switch in another section is moved, the Audition button will automatically change over to trigger that sound.

Example: Move any control in the 'Hi-Hat' section - Audition button triggers the Hi-Hat, then move any control in the 'Snare Drum' section - Audition button triggers the Snare Drum etc.

NOTE: In the 'Tom Toms', 'Rimshot/Handclap/Cowbell', 'Hi Hat', 'Cymbals' and'Conga/Maracas/Claves' sections the physical position of the 'Select' switch always determines which drum sound is triggered.

Auto-trigger

The Auto-Trigger plays a basic 4 beats / bar sequence, accenting beat one.

To **start** the 'Auto-Trigger' running, press and hold the 'Audition' button and press the - 'Trigger Start/Stop' ('0') button on the data entry keypad. The currently edited sound will auto-trigger at the set tempo. When the control of a different drum sound is moved, the auto-trigger will 'jump' over to playing that sound.

Example: If the last control moved was in the Snare Drum section, the auto-trigger will play the Snare Drum sound. Move any control in the Hi-Hat section - auto-trigger plays the Hi-Hat sound. Move any control in the Bass Drum section - auto-trigger plays the Bass Drum etc.

To **stop** the Auto-Trigger , press and hold the 'Audition' button and press the '0' - 'Trigger Start/Stop' button.

To adjust the **tempo**, start the autotrigger playing as above, press and hold the 'Audition' button and use the '+' or '- ' buttons on the data entry keypad to speed up or slow down the auto-trigger sequence.

These settings are saved with a program.

The Audition and Auto-Trigger features can also be used when editing sounds in the various Utility functions - see Utility Mode on page 16.

Mode - *Button*

This button is used to select which of the five main parameter 'Modes' are accessed by the 'Data Entry' keypad. The current mode is indicated by one of five LED's on the right hand side of the display panel.

NOTE: When the DrumStation Rack is switched on, 'Program' mode is automatically selected. Each time the Mode button is pressed the next 'Mode' in the menu will be selected i.e. MIDI RX Channel, MIDI TX Channel, Utility and Save. From 'Save', the next press will loop the menu back to the Program mode.

Mode 1 - Program Change

This is where you select one of the DrumStation's 40 programs. The 'Program Change' mode is automatically selected when the DrumStation Rack is powered up and the program number displayed will be the one selected prior to power being turned off. To select a different program, first check that the 'Program' LED is on. Using the 'Data Entry' keypad as described above, you can quickly call up any of the DrumStation's 40 programs. The recognised numbers in this mode are from '00' to '39'.

You can also use MIDI Program Change commands from a sequencer or other external MIDI device to call up programs.

NOTE 1: Because the DrumStation Rack's program numbers begin at '00', the next higher number must always be used to call up the correct sound. i.e. to select program 18, transmit a MIDI Program Change 19.

NOTE 2: The 25 factory sounds are stored in programs '00' to '24' whilst the 15 user locations from '25' to '39' are all initially set up with a basic drum kit - see separate sheet for program listings.

Data Entry / Program Section Cont.

Mode 2 - MIDI Receive Channel

This is where you set the MIDI receive channel for the DrumStation Rack. Use the 'Mode' button to select the 'MIDI RX Ch.' mode - LED on, and then the 'Data Entry' keypad to enter your selection. The recognised numbers in this mode are from '01' to '16'.

NOTE: the 'MIDI RX CH.' LED will flash when MIDI data is received on this channel.

Mode 3 - MIDI Transmit Channel

This is where you set the MIDI transmit channel for the DrumStation Rack. Use the 'Mode' button to select the 'MIDI TX Ch.' mode - LED on, and then the 'Data Entry' keypad to enter your selection. The recognised numbers in this mode are from '01' to '16'.

NOTE: The MIDI Tx and Rx channel settings are memorized when the power is turned off.

Mode 4 - Utility

This is where you access the various Utility functions of the DrumStation Rack. See page 16 for full details on the operation and features of the Utility mode.

Mode 5 - Save

This is where you 'Save' the DrumStation Rack programs onto a computer or other data storage device using MIDI sysex dumps. There are two types of 'Save' as follows:

Type	Function	Display Ident.
1	Save single program.....	S S
2	Save all programs.....	S A

Ensure that your data storage device is ready to accept the data. Use the 'Mode' button to select 'SAVE' mode - LED on, the display shows:

Display Ident. for 'Save Single' dump

NOTE: The program 'Saved' will be the last one selected whilst in the 'Program' mode. If you were editing a program, the modified version will be saved. Press the 'SAVE' ('+') button to transmit the single program.
To save **all** the programs in the DrumStation Rack press the 'SAVE TYPE' ('-') button once, the display changes to:

Display Ident. for 'Save All' dump

Ensure that your computer or data storage device is ready to accept the sysex bulk dump. Press the 'SAVE' ('+') button to transmit the 'All programs' dump. The Global settings (MIDI Tx and Rx channels) will also be saved.

NOTE: the display will briefly go blank as the data is transmitted.

Loading Programs

SINGLE PROGRAMS - 1: If you want to overwrite an existing program, select the 'Program' mode and call up the program number you want to use. Now, move the 'Write' switch to the 'Enable' position and transmit the sysex dump from your computer. The 'Write' LED on the display will flash to confirm reception. Return the 'Write' switch to the 'Protect' position.

Data Entry / Program Section Cont.

2. If you want to listen to a program before committing it to memory, select the 'Program' mode (don't worry about which program number comes up). Ensure that the 'Write' switch is in the 'Protect' position and then transmit the sysex dump from your computer. The 'Edit' LED on the display will come on to show that the program available is different to the one displayed i.e. an 'edited' program. Now you can use the 'Compare' procedure to select a suitable location to store the imported program - see the 'COMPARE' paragraph opposite.

ALL PROGRAMS - 1: If you want to overwrite all the existing programs, move the 'Write' switch to the 'Enable' position and transmit the sysex dump from your computer. The 'Write' LED on the display will flash to confirm reception. Return the 'Write' switch to the 'Protect' position.

NOTE: if the 'Write' switch is in the 'Protect' position when the sysex dump is transmitted from your computer the display will flash to indicate that the data cannot be loaded.

Editing A Program

To change or 'Edit' a program, simply adjust the parameters you wish to alter. The Edit LED on the display will flash to show that you are no longer listening to the stored program. If you do not store this new edit before calling up another program it will be lost.

NOTE : Certain sounds are only available on each Kit.

Example : TR909 Kit does not include a Cowbell (C'BLL)

If, whilst editing a Drum Kit, a sound is selected that does not appear on that particular kit, the DrumStation will automatically switch over to the relevant kit. The selected kit is always indicated by the 'Drum Kit' LED's in the Master Volume section.

Writing A Program Into Memory

The program memory on the DrumStation Rack is divided up as follows:

'00' to '24'.....25 factory sounds in ROM. (cannot be overwritten)
'25' to '39'.....15 user sound locations in RAM. (can be overwritten)

If you edit a factory program, you can only save it in one of the 15 user program locations - just think of the 25 factory programs as a 'Reference Library' to take drum kits from. If you want to start creating a drum kit of your own from scratch, use one of the 'Plain Vanilla' kits initially stored in the user program locations.

To store a new or edited program, move the 'Write' switch to the 'Enable' position - LED flashes. Now, using the 'Data Entry' buttons ('0' to '9' only) select the program number where you want to store the program. To store the program in the same location (25 to 39 only) simply press the 'WRITE' button. If you want to listen to a program before overwriting it use the Compare function as follows:

COMPARE: When you have edited a program, move the 'Write' switch to the 'Enable' position - LED flashes. Press the 'COMPARE' button once - 'Edit' LED flashes at a faster rate to indicate 'Compare' mode is active. You can now listen to the original program before deciding whether you want to overwrite it or not - check the program using an external keyboard/computer or the 'Audition' button on the front panel. Pressing the 'COMPARE' again button will bring back the edited program. If you **do** want to save the program in this location, press the 'WRITE' button - 'Write' LED on display panel flashes momentarily. If you **don't** want to save the program in this location you can choose another by simply entering any program number from '25' to '39' using the 'Data Entry' keypad (buttons '0' to '9' only / the '-' and '+' cannot be used). Once again, you can check the programs using the 'COMPARE' feature and then, when you have found a suitable location, press the 'WRITE' button. The program is now saved - move the 'WRITE' switch back to the 'Protect' position.

NOTE 1: Always return the 'WRITE' switch to the 'Protect' position after completing a save operation. This will avoid any accidental erasure of programs - the 'Write' LED will flash to warn you of the 'Enabled' state.

NOTE 2: Programs can only be saved in the User locations ('25' to '39'). If you attempt to save a program into any of the Factory locations ('00' to '24') the display digits will flash rapidly to warn that this operation cannot be competed.

Voice Architecture

In the original TR808 and TR909 , many analogue circuits were used to produce the imitations of the various drum sounds. The essential sounds produced by skins (Bass Drum and TomToms) rely mainly on a pitched element, those produced by struck metal (HiHat & Cymbals) are based on multiple noise sources and the combination sounds like Snare and Rimshot use not surprisingly a combination of the two. In all cases though a very narrow range of settings is required to keep the sound within the broad description of the name.

As a result, there are different parameters for each drum sound, enough to make interesting variations within the sound category but far fewer than on analogue synthesizers such as the BassStation, which need to cover a much greater range of timbres.

Some parameters are only available on one or two sounds (eg. Attack on the TR909 Bass Drum) because those parameters are preset on the other sounds. Each of the parameters is covered in the appropriate section where you need to understand how it relates to that particular sound.

Other parameters feature on most or all sounds (eg. Decay, Tune & Level). Decay governs how quickly the sound dies away, Tune the pitch of the sound and Level the maximum volume it is played in the respective mix.

Analogue Sound Modelling

ASM™
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The DrumStation faithfully re-creates the original analogue sounds of the TR808 & TR909 using a new digital system specially developed by Novation - Analogue Sound Modelling (ASM)

A typical drum sound has a very complex structure made up of many simple waveforms all occuring at the same moment in time. To re-model an original drum sound, first it must be broken down and analized so as to identify the various simple waveforms in it's structure as these can be converted into a digital code more easily. When the digitized waveforms are added back together the original sound is faithfully re-created in every detail whilst real-time, 'fluid' changes to the character of the drum sound can still be made using any of the front panel controls.

TR808/TR909 Notes

Drum Sounds

The TR808 and TR909's range of drum sounds were not identical. For your reference, the full set of sounds from the original units and the method used to re-create them in the DrumStation are listed below.

	TR808	TR909	ASM	SIMPLE
BASS DRUM - BD	●	●	✔	
SNARE DRUM - SD	●	●	✔	
RIM SHOT - RS	●	●		✔
HANDCLAP - HC	●	●		✔
CLOSED HI HAT - CH	● **	● +	✔	✔
OPEN HI HAT - OH	● **	● +	✔	✔
RIDE CYMBAL - RC		●		✔
CRASH CYMBAL - CY	● **	● +	✔	✔
LOW TOM - LT	●	●	✔	
MID TOM - MT	●	●	✔	
HI TOM - HT	●	●	✔	
COWBELL - CB	●			✔
LOW CONGA - LC	●		✔	
MID CONGA - MC	●		✔	
HI CONGA - HC	●		✔	
MARACAS - MA	●			✔
CLAVES - CL	●			✔

** re-created by ASM on TR808 kit only
+ sample with ASM envelopes, tone etc.

Drum Sound Controls

The TR808 and TR909 also had differences in their sound editing controls. To give the DrumStation even greater sonic capabilities, the controls in each section will affect both drum kits. For your reference, the controls of the original units and the DrumStation's are as follows:

TR808 ●
DrumStation ●+●

808 KIT	BD	SD	RS	HC	CH	OH	CY	LT	MT	HT	CB	LC	MC	HC	MA	CL
LEVEL	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TUNE	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
TONE	●	●					●									
ATTACK																
DECAY	●				●	●	●	●	●	●						
SNAPPY		●														

TR909 ●
DrumStation ●+●

909 KIT	BD	SD	RS	HC	CH	OH	CY	LT	MT	HT	RC					
LEVEL	●	●	●	●	●	●	●	●	●	●	●					
TUNE	●	●	●	●	●	●	●	●	●	●	●					
TONE		●														
ATTACK	●															
DECAY	●				●	●	●	●	●	●	●					
SNAPPY		●														

Polyphony

The polyphony (number of drum sounds played at any one time) of the DrumStation is determined by how many modelled (ASM) sounds are used together. The ASM derived sounds use more processing power than the sampled sounds and this directly affects the polyphony (which will reduce as more ASM sounds are played). Under normal conditions this should not cause any problems, however you should always plan the use of drum sounds with the following guide in mind so as to avoid any 'dropped' sounds.

ASM Sounds	Sampled Sounds
3	9
5	7
6	6

Bass Drum Section

This section controls the timbre of the Bass (or kick) drum, the lowest pitched instrument in both the conventional or electronic drum kit. This is one of the most crucial sounds for dance music and many other styles as it normally defines the down beat and most of the other beats in the bar.

IMPORTANT NOTE: Because the TR808 and TR909 had various control differences in their sound editing sections a dual function knob has been included where applicable. The TR808's specific controls on the front panel are marked in **GREY** text as opposed to black.

Level - *Rotary*

This knob controls the volume of the Bass drum on both the stereo and individual outputs. When assigned to the stereo outputs this knob allows you to set the relative level of the bass drum in the "mix".

Tune - *Rotary*

This knob controls the pitch of the Bass drum. Turn anti-clockwise and the pitch will be lowered resulting in a 'looser' sound, clockwise and the pitch is raised, as if the skin on a real drum had been tightened.

NOTE : This control was *not* featured on the TR808. To re-produce the original pitch setting of the TR808 Bass drum always set this knob to the 12 o'clock position.

Attack/Tone - *Rotary*

This knob has two functions depending on which 'Drum Kit' is currently selected.

Attack - When the TR909 kit is selected this knob will affect the percussive character of the Bass drum by changing the level of a shaped pulse or 'thump' at the beginning of the sound. At '0' it is completely removed. As the knob is moved in a clockwise direction the 'thump' element will become increasingly louder.

Tone - When the TR808 kit is selected this knob will affect the tonal character of the Bass drum by changing the frequency content of the sound. At '0' all of the higher frequencies in the sound are removed making the sound more rounded and 'plummy'. As the knob is moved in a clockwise direction the higher frequencies are introduced giving a brighter, cleaner affect to the sound .

Decay - *Rotary*

This knob controls the time it takes for the sound to die away once it has reached full volume. At '0', the sound falls off immediately producing a very 'tight' sound. As the knob is moved in a clockwise direction the longer it takes for the level to drop to zero. A very long ring on the Bass drum is often used as a feature of dance grooves.

Snare Drum Section

The Snare Drum is pitched in the middle of the audible register and contains most of the frequencies in this area (which is why multiple noise is used in conjunction with a tuned pitch to synthesize it). Second only to the Bass Drum in terms of importance in most popular forms of music (and more important in some), the Snare is most commonly placed on the 'backbeat' or off-beat (beats 2 & 4 in 4/4 time), the place where people naturally clap when clapping along to music. It is also commonly used in 'rolls', fast repeated strikes played just before the downbeat when entering a new section or for emphasis. Four parameters are provided for adjusting the timbre of the snare sound on each drum kit.

Level - *Rotary*

This knob controls the volume of the Snare drum on both the stereo and individual outputs. When assigned to the stereo outputs this knob allows you to set the relative level of the Snare drum in the "mix".

Tune - *Rotary*

This knob controls the pitch of the Snare drum. Turn anti-clockwise and the pitch will be lowered resulting in a 'looser' sound, clockwise and the pitch is raised, as if the skin on a real drum had been tightened.

NOTE : This control was *not* featured on the TR808. To re-produce the original pitch setting of the TR808 Snare drum always set this knob to the 12 o'clock position.

Snappy - *Rotary*

This knob controls the amount of noise in the snare sound. The snare drum is unique in the fact that it is composed of two parts, a pitched element from the skin and a noise element from the metal snare. This parameter decides the proportional level of that noise element. At '0' it is completly removed. At '1' the noise element is introduced and, as the knob is moved in a clockwise direction it will become increasingly louder relative to the pitched element.

Tone - *Rotary*

This knob alters the 'character' of the TR808 and TR909 Snare drums in different ways.

TR808 - On this sound it changes the overall tone. At '0', the sound is at it's fullest. As the knob is moved in a clockwise direction the pitched element loses it's lower frequencies and, if an amount of 'Snappy' is applied to the sound the noise element will become more 'sharp'.

TR909 - On this sound it changes the duration of the noise element introduced by the 'Snappy' control. At '0' the noise element is at it's shortest, producing a 'tight' effect. As the knob is moved in a clockwise direction the duration increases giving the Snare drum a broader, 'looser' sound.

Tom Toms Section

Conventional drum kits usually contain several tom-toms, pitched in descending order, mostly used (together with the snare) for fills. The DrumStation therefore has three tom-toms available for each drum kit, named Low (1), Mid (2) & High (3). Each of these has three parameters to adjust its timbre with a selector switch to choose which of the three is currently being adjusted.

Level - *Rotary*

This knob controls the volume of the Tom Toms on both the stereo and individual outputs. When assigned to the stereo outputs this knob allows you to set the relative level of the Tom Toms in the "mix".

Tune - *Rotary*

This knob allows you to change the pitch of the Tom Toms. The pitching of toms is particularly important as they are often use to create rising or falling patterns. Having selected the Tom-Tom whose pitch you wish to alter with the select switch, turn anti-clockwise and the pitch will be lowered resulting in a 'looser' sound, clockwise and the pitch is raised, as if the skin on a real drum had been tightened.

Decay - *Rotary*

This knob controls the time it takes for a tom sound to die away once it has reached full volume. At '0', the sound falls off immediately producing a very 'tight' sound. As the knob is moved in a clockwise direction the longer it takes for the level to drop to zero. A long ring is often used for fills, whereas if a tom is used repeatedly in a pattern you may want to reduce its decay time.

NOTE : This control was *not* featured on the TR808. To re-produce the original decay setting of the TR808 Tom Toms, always set this knob to the '10' position (fully clockwise) as only a shorter decay time will be modelled.

Select - *Switch*

This switch selects which of the three Tom Toms will be affected by the Level, Tune and Decay knobs.

NOTE : Each Tom Tom sound has it's own individual MIDI Controller information so when recording via MIDI always check that this switch is pointing to the tom you want to change.

When playing back via MIDI, the position of this switch is irrelevant. i.e. all controls for the 3 toms on each 'Kit' can be manipulated simultaneously via MIDI - see the 'MIDI Control' section on page 22.

Rim Shot/Handclap/Cowbell Section

Rim Shot/Handclap/Cowbell Section - Cont.

The three specific percussion sounds in this section are easily recognizable from their names. As the original TR808/909 units only had a Level control for these sounds (no dynamic sound changes could be made) they are re-produced in the DrumStation using samples . A Tune control has been added into this section to give the sounds greater dynamic scope.

Level - *Rotary*

This knob controls the volume of the Rim Shot, Handclap and Cowbell on both the stereo and individual outputs. When assigned to the stereo outputs this knob allows you to set the relative level of these sounds in the "mix".

Tune - *Rotary*

This knob allows you to change the pitch of each of the sounds in this section. Turn anti-clockwise and the pitch will be lowered, clockwise and the pitch is raised.

NOTE : This control was *not* featured on the TR808/909. To re-produce the original pitch setting of the TR808/909 sounds, always set this knob to the 12 o'clock position.

Select - *Switch*

This switch selects which of the three sounds will be affected by the Level and Tune knobs.

NOTE : Each of the three sounds has it's own individual MIDI Controller information so when recording via MIDI always check that this switch is pointing to the sound you want to change.

When playing back via MIDI, the position of this switch is irrelevant. i.e all the controls for these sounds can be manipulated simultaneously via MIDI - see the 'MIDI Control' section on page 22.

Hi Hat Section

The highest pitched of the percussion sounds, it is often used in fast repetition to create the feel of fast movement (eight notes or even sixteens being the most common). When closed the sound dies away quite quickly, but when struck open, it can ring on for a few seconds unless closed which effectively shuts it off. A real HiHat is actually two small opposing cymbals held together or separated by a footpedal for closed and open sounds. The synthesized version's main ingredient is white noise and two different HiHat sounds can be selected representing the Open & Closed versions.

Level - *Rotary*

This knob controls the volume of the Hi-Hat on both the stereo and individual outputs. When assigned to the stereo outputs this knob allows you to set the relative level of the Hi-Hat in the "mix".

Tune - *Rotary*

This knob controls the pitch of the Hi-Hat. Turn anti-clockwise and the pitch will be lowered resulting in a 'looser' sound, clockwise and the pitch is raised, resulting in a 'tighter' sound.

NOTE : This control was *not* featured on the TR808/909. To re-produce the original pitch setting of the TR808/909 sounds, always set this knob to the 12 o'clock position.

Hi Hat Section - Cont.

Decay - *Rotary*

This knob controls the time it takes for the Hi-Hat sound to die away. At '0', the sound falls off immediately producing a very 'tight' sound. As the knob is moved in a clockwise direction the longer it takes for the level to drop to zero, producing a longer 'tail-off' to the sound.

Select - *Switch*

This switch selects whether the Open or Closed Hi-Hat sound is affected by the Level, Tune and Decay knobs.

NOTE : The Open and Closed Hi-Hats have their own individual MIDI Controller information so when recording via MIDI always check that this switch is pointing to the sound you want to change. When playing back via MIDI the position of this switch is irrelevant.

Cymbals Section

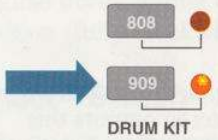
Another higher pitched percussion sound derived in its electronic form from multiple noise sources. The Crash cymbal has the fullest sound and a very long ring meaning it would probably be only struck on downbeats, whereas the Ride cymbal (TR909 only) is shorter and less full meaning that quicker rhythms can be played on it .

Level - *Rotary*

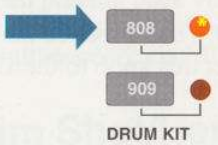
This knob controls the volume of the Cymbals on both the stereo and individual outputs. When assigned to the stereo outputs this knob allows you to set the relative level of the Crash and Ride Cymbals in the "mix".

Tune/Tone - *Rotary*

This knob has two functions depending on which 'Drum Kit' is currently selected.



Tune - When the TR909 kit is selected this knob will change the pitch of the Crash and Ride cymbals. Turn anti-clockwise and the pitch will be lowered resulting in a 'larger' cymbal, clockwise and the pitch is raised, as if a smaller cymbal has been struck.



Tone - When the TR808 kit is selected this knob will affect the 'character' of the TR808 Crash cymbal by changing the frequency content of the sound. Fully clockwise, all the frequencies in the sound are present, giving you the brightest sound possible. The further anti-clockwise you move the knob, the more high frequencies are removed, making the sound less harsh and intrusive.

Decay - *Rotary*

This knob controls the time it takes for the cymbal to die away. At '0', the sounds falls off rapidly. As the knob is moved in a clockwise direction the longer it takes for the level to drop to zero. The decay time of cymbals is quite critical especially if they are triggered repeatedly in the bar. Only set the longest decay time if you are using the cymbals sparingly in your patterns.

Cymbals Section - Cont.

NOTE : This control was *not* featured on the TR909. To re-produce the original decay setting of the TR909 Cymbals, always set this knob to the '10' position (fully clockwise) as only a shorter decay time will be modelled.

Select - *Switch*

This switch selects which Cymbal will be affected by the Level, Tune and Decay knobs.

NOTE : Each Cymbal sound has it's own individual MIDI Controller information so when recording via MIDI always check that this switch is pointing to the Cymbal you want to change. When playing back via MIDI the position of this switch is irrelevant.

Congas/Maracas/Claves Section

The sounds in this section were only featured on the TR808. They are all based on ethnic percussion instruments. Congas (long drums of African origin), Maracas (a Latin American hand-held percussion instrument) and Claves (a wooden percussion instrument). As the original TR808 only had a Level control for the Maracas and Clave sounds (no dynamic sound changes could be made) they are re-produced in the DrumStation using samples .

Level - *Rotary*

This knob controls the volume of each sound on both the stereo and individual outputs. When assigned to the stereo outputs this knob allows you to set the relative level of the Congas, Maracas and Claves in the "mix".

Tune - *Rotary*

This knob allows you to change the pitch of each of the sounds in this section. Turn anti-clockwise and the pitch will be lowered, clockwise and the pitch is raised.

NOTE : This Tune control was *not* featured in the TR808's Maracas and Claves sections. To re-produce the original pitch setting of these sounds, always set this knob to the 12 o'clock position.

Conga Select - *Switch*

This switch selects which of the three Congas will be affected by the Level and Tune knobs when the 'Select' switch is set to 'Congas'.

NOTE : Each Conga sound has it's own individual MIDI Controller information so when recording via MIDI always check that this switch is pointing to the Conga you want to change.

When playing back via MIDI, the position of this switch is irrelevant.
i.e. all controls for the 3 Congas can be manipulated simultaneously via MIDI - see the 'MIDI Control' section on page 22.

Select - *Switch*

This switch selects which of the three sounds will be affected by the Level and Tune knobs.

NOTE : Each of the three sounds has it's own individual MIDI Controller information so when recording via MIDI always check that this switch is pointing to the sound you want to change.

When playing back via MIDI, the position of this switch is irrelevant.
i.e all the controls for these sounds can be manipulated simultaneously via MIDI - see the 'MIDI Control' section on page 22.

Utility Mode

Operational Procedure

IMPORTANT NOTE: the operating system of the 'Data Entry' keypad is different in this mode (all of the functions in the Utility mode are visually indicated by orange text - see panel diagram on page 4). The '0' to '9' buttons are now used to call up 'sub-directories' of the Utility mode and the '-' and '+' buttons used to change their values whilst the display may flash alternatately between a value and a letter reference code. The nine sub-directories are as follows:

Button	Function	Display Ident.
1	Drum Select	Selected Drum
2	Front Cut	'FC'
3	Controller / Velocity	'tu'-'to'-'At'-'dE'-'Sn'-'VL'
4	Note Off Recognition	'nO'
5	General MIDI	'Gn'
6	Output Set	'01' to 'r4'
7	Assign Banks	'A1' to 'A6' and 'AA'-'Ab'-'AC'-'Ad'
8	Distortion	'dS'
9	Demo	'dE'

Each drum has a display code which, in connection with the 'Drum Kit' select LED's identifies which drum sound is currently selected or edited. The two

TR808 Bass Drum	-*bd*
TR808 Snare Drum	- *Sd*
TR808 Low Tom	- *t1*
TR808 Mid Tom	- *t2*
TR808 High Tom	- *t3*
TR808 Rim Shot	- *rS*
TR808 Hand Clap	- *CP*
TR808 Cowbell	- *Cb*
TR808 Closed HiHat	- *CH*
TR808 Open HiHat	- *OH*
TR808 Crash Cymbal	- *cC*
TR808 Low Conga	- *C1*
TR808 Mid Conga	- *C2*
TR808 High Conga	- *C3*
TR808 Maracas	- *Ar*
TR808 Claves	- *CL*

TR909 Bass Drum	- *bd*
TR909 Snare Drum	- *Sd*
TR909 Low Tom	- *t1*
TR909 Mid Tom	- *t2*
TR909 High Tom	- *t3*
TR909 Rim Shot	- *rS*
TR909 Hand Clap	- *CP*
TR909 Closed HiHat	- *CH*
TR909 Open HiHat	- *OH*
TR909 Crash Cymbal	- *cC*
TR909 Ride Cymbal	- *rC*

Use the 'Mode' button to select the 'UTILITY' mode - LED on.

Function 1 - Drum Select

This is where you select the drum sound that will be edited whilst using sub - directories 2 - 3 - 4 - 6 - 8 (and the one triggered by the 'Audition/Autotrigger' features). Each time you go into Utility mode, the selected drum sound will automatically be the one last edited on the front panel. The range, in connection with the front panel 808 and 909 'Drum Kit' select LED's is as follows:

TR808

bd-Sd-t1-t2-t3-rS-CP-Cb-CH-OH-cC-C1-C2-C3-Ar-CL

TR909

-bd-Sd-t1-t2-t3-rS-CP-CH-OH-cC-rC

Note that the sequence order of drum sounds flows from left to right across the DrumStation's front panel.

Typical Display Ident. (TR808 Snare Drum)

Use the '+' and '-' buttons to "page" through the different drum sounds.

Function 2 - Front Cut

This function allows you to remove up to 99 milleseconds of the start or 'front end' of a drum sound to create a similar effect to sample editing. To hear the effect this has on a drum sound, listen to the demo whilst making reference to Chart A on the seperate sheet.

Range = '00' (off) to '99' (max) Each increment = 1mS

Utility Mode - Cont.

First, use the 'Drum Select' utility function to select the drum sound to be edited. Press the 'FRONT CUT' button once - the display alternates between:

Display Ident. Value

Use the '-' and '+' buttons to change the value. Use the 'Drum Select' function again to change these settings on another drum sound. This setting can be saved with the program. See 'Writing a program into memory, on page 7.

NOTE : The Front Cut setting can also be accessed via MIDI. This feature allows real-time, dynamic changes to be made during a performance. See the 'MIDI Control' section on page 22.

Function 3 - Controller / Velocity

NOTE: All of the front panel rotary controls on the DrumStation can be set to transmit and receive MIDI data allowing record and playback of any 'live' changes made during a performance. For more information see the 'MIDI Control' section on page 22.

This function allows you to choose whether a front panel control responds to MIDI Controller data or MIDI Velocity data. This setting does not affect the transmitted data i.e. the front panel controls will always transmit MIDI Controller data.

Example 1: Snare Drum - If a control, say the snare drum's 'Snappy' is set to receive MIDI Velocity, the harder a note is played the more 'snap' will be applied. Any number of controls in a section can be set-up in this way. In this example the 'Tune', 'Tone' and 'Snappy' controls could all be set to respond to Velocity data giving a wide character change to the Snare Drum between minimum and maximum velocities.

Example 2: Closed HiHat - With the HiHat's 'Decay' control set to respond to Velocity data an extremely realistic 'Accent' can be created as the decay time increases with velocity, much like the real instrument.

The actual velocity (or volume) of the sound can be fixed at a predetermined level so that only the edit controls are affected by the velocity data. To hear the effect this can have on a drum sound(s), listen to the demo whilst making reference to Chart A on the seperate sheet.

Control	Display Ident.
Tune	'tu'
Tone	'to'
Attack	'At'
Decay	'dE'
Snappy	'Sn'
Velocity	'VL'

Only the controls relevant to a particular drum sound are available for selection with the exception of Velocity 'VL', which can be applied to every drum. Here are some typical examples:

Drum	Rotary Controls	Display Idents.
TR808 Bass Drum	Tune - Tone - Decay	tu - to - dE - VL
TR909 Bass Drum	Tune - Attack - Decay	tu - At - dE - VL
TR808 Tom 2 Mid	Tune - Decay	tu -dE - VL
TR909 Crash Cymbal	Tune - Tone	tu - to - VL
TR808 Crash Cymbal	Decay - Tone	dE - to - VL
TR909 Snare Drum	Tune - Tone - Snappy	tu - to - Sn - VL

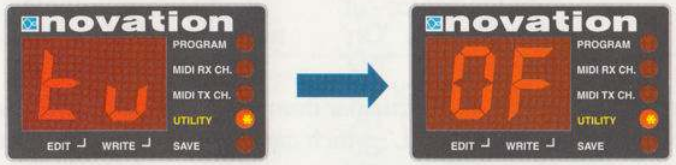
Utility Mode - Cont.

First, use the 'Drum Select' utility function to select the drum sound to be edited. Range = 'OF' & 'On'

Response for **tu - to - At - dE - Sn** parameters:
'OF' - will respond to MIDI Controller data
'On' - will respond to MIDI Velocity data

Response for **VL** parameter:
'OF' - has a fixed MIDI Velocity level (100)
'On' - will respond to MIDI Velocity data

Press the 'CONT./VELOCITY' button once - the display alternates between:



Typical Display Ident. Value

Use the '-' and '+' buttons to change the value. Press the 'CONT./VELOCITY' button again to select 'to' (Tone) 'At' (Attack) etc. The display will loop back to 'Tu' (tune) after 'VL' (Velocity). Use the 'Drum Select' function again to change these settings on another drum sound. This setting can be saved with the program.

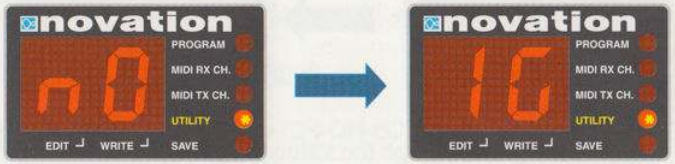
NOTE: the **'VL'** display ident. appears as a **'UL'** on screen due to limitations of the 7 segment display.

Function 4 - Note-Off Recognition

This function is used to setup a drum sounds response to MIDI Note-Off messages. Normally, when a MIDI Note-On message is received a drum sound will play in full (long decay on a bass drum, cymbal etc.) thus ignoring any Note-Off message. When set to recognised ('rE'), the duration of the drum sound will be determined by the length of time a note is held down. When set to ignored ('IG') the drum sound will play in full regardless of the note duration.

To hear the effect this has on a drum sound, listen to the demo whilst making reference to Chart A on the seperate sheet.

First, use the 'Drum Select' utility function to select the drum sound to be edited. Range = 'rE' (recognised) & 'IG' (ignored).Press the 'NOTE-OFF REC.' button once - the display alternates between:



Display Ident. Value

Use the '-' and '+' buttons to change the value. Use the 'Drum Select' function again to change settings on another drum sound. This setting can be saved with the program.

Function 5 - General MIDI Setup

This function is used to select which drum kit (TR808 or TR909) is placed in the General MIDI drum map area.
Range = '80' (TR808) & '90' (TR909). Press the 'GEN.MIDI SET' button once - the display alternates between:

Display Ident. Value

Use the '-' and '+' buttons to change the value. As a secondary visual indication, the relevant 'Drum Kit' LED will flash. This setting can be saved with the program. See 'Writing a program into memory, on page 7.

Note: Because the TR909 has fewer drum sounds than the TR808 (Conga's - Maracas - Cowbell etc.) only the drum sounds common to both units will be moved in this operation. - see the 'MIDI Percussion Maps' on page 22.

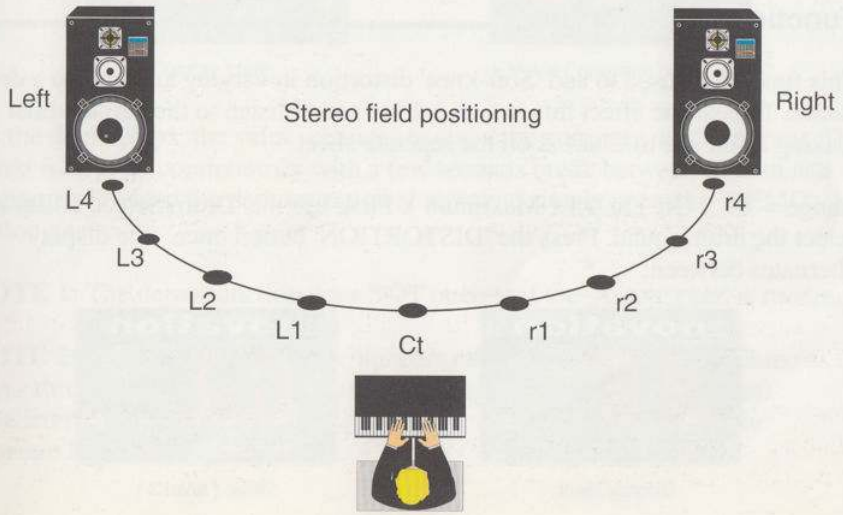
Utility Mode - Cont.

Function 6 - Output Set

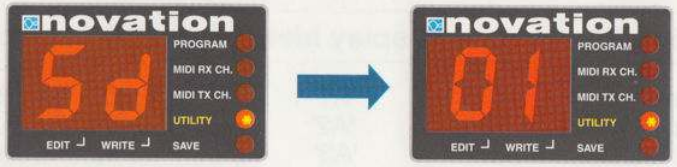
The DrumStation's output section consists of a Stereo left/right pair and six Individual outputs which enable a drum sound(s) to be processed seperately.

This function is used to select either a drum sound's position in the 'stereo field' or one of the six individual mono outputs.

Output	Display Ident.	Output	Display Ident.
Individual O/P 1	'01'	Stereo O/P Left 2	'L2'
Individual O/P 2	'02'	Stereo O/P Left 1	'L1'
Individual O/P 3	'03'		
Individual O/P 4	'04'	Stereo O/P Centre	'Ct'
Individual O/P 5	'05'		
Individual O/P 6	'06'	Stereo O/P Right 1	'r1'
		Stereo O/P Right 2	'r2'
Stereo O/P Left 4	'L4'	Stereo O/P Right 3	'r3'
Stereo O/P Left 3	'L3'	Stereo O/P Right 4	'r4'



First, use the 'Drum Select' function to select the drum sound to be edited. Press the 'OUTPUT SET' button once - the display alternates between:



Display Ident.(Selected drum) Value (Individual output 1)

Use the '-' and '+' buttons to change the value. Use the 'Drum Select' function again to change settings on another drum sound. This setting can be saved with the program. See 'Writing a program into memory, on page 7.

Any number of drum sounds can be routed to an Individual output enabling a 'stack' of sounds to be processed in a similar manner.

Example : TR808 Snare - TR909 Snare - TR909 Handclap all routed to output 1 - all treated with the same reverb/compression/Eq etc.

NOTE 1: When a drum sound is routed to an Individual output it will be removed from the Stereo left/right mix and Headphone outputs.

NOTE 2: The stereo output 'Pan' setting can also be accessed via MIDI. This feature allows real-time, dynamic changes to be made during a performance. See the 'MIDI Control' section on page 22.

Function 7 - Assign Bank

This dual function is used to setup the MIDI Controller and Pitch Play Assign Banks. Range = 'A1' to 'A6' then 'AA' to 'Ad'

1. MIDI Controller Assign Banks: The first six assign banks are used to select which drum sounds will respond to MIDI. Each bank consists of six 'preset' MIDI controllers (max. 36 MIDI controllers on 6 drum sounds active at any one time). Any drum sound can be assigned in this manner which will allow real-time MIDI control over it's parameters. See the 'Control / Parameter Assign Banks' section on page 22 for further information.

Utility Mode - Cont.

Assign Bank	Display Ident.	MIDI Controllers
Bank 1	'A1'	20 - 25
Bank 2	'A2'	26 - 31
Bank 3	'A3'	85 - 90
Bank 4	'A4'	102 - 107
Bank 5	'A5'	108 - 113
Bank 6	'A6'	114 - 119

Press the 'ASSIGN BANK' button once - the display alternates between:

Display Ident. Value (Snare Drum)

Use the '-' and '+' buttons to change the value (drum code). This setting can be saved with a program. See 'Writing a program into memory' on page 7. Press the 'ASSIGN BANK' button each time to select banks 2, 3, 4, 5 and 6.

NOTE 1 : We recommend that a 'system' of assign banks is used for the most common sounds in order to maintain a degree of uniformity for the MIDI Controller data i.e. use Bank 1 for Bass Drum, Bank 2 for Snare Drum etc.

NOTE 2 : See the 'MIDI Control' section on page 22 for full details on drum sound parameter / MIDI Controller number allocation.

2. Pitch Play Assign Banks: This feature places a drum sound in the centre of a one octave range of undefined MIDI note numbers. The drum sound can then be played over a wide pitch range allowing the drums pitch to follow a musical scale. To hear the effect this has on a drum sound listen to the demo whilst making reference to Chart A on the seperate sheet.

There are four Assign banks, A, B, C, & D. Range = 'AA' to 'Ad'.

Assign Bank	Display Ident.	MIDI Note Range
Bank A	'AA'	12 - 23
Bank B	'Ab'	84 - 95
Bank C	'AC'	96 - 107
Bank D	'Ad'	108 - 120

Press the 'ASSIGN BANK' button six times (to by-pass the MIDI controller banks) - the display alternates between:

Display Ident. Value (Bass Drum)

Use the '-' and '+' buttons to change the value (drum code). This setting can be saved with a program. See 'Writing a program into memory' on page 7. Press the 'ASSIGN BANK' button again to select banks B, C and D. The display will loop back to 'A1'(MIDI controller bank) after 'Ad '.

Function 8 - Distortion

This function is used to add 'Soft-knee' distortion in varying amounts to a drum sound. To hear the effect this has on a drum sound listen to the demo whilst making reference to Chart A on the seperate sheet.

Range = '0F' (Off) to '15' (Maximum). First, use the 'Drum Select' utility to select the drum sound. Press the 'DISTORTION' button once - the display alternates between:

Display Ident. Value (level 3)

Utility Mode - Cont.

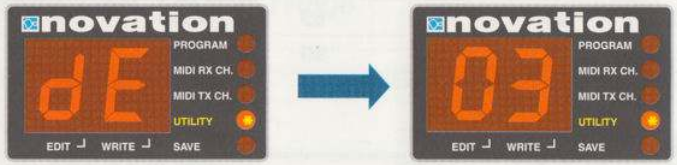
Use the '-' and '+' buttons to change the value. This setting can be saved with a program. See 'Writing a program into memory' on page 7.

NOTE : The Distortion setting can also be accessed via MIDI. This feature allows real-time, dynamic changes to be made during a performance. See the 'MIDI Control' section on page 22.

Function 9 - Demo

This function demonstrates the full potential of the DrumStation Rack. If a Novation BassStation is connected to the MIDI Out socket and set to receive on MIDI channel 1 an accompaniment to the rhythm track can be heard.

To start the demo running, press the 'DEMO' button once - the display alternates between:



Display Ident. Value (program number)

As the demo plays, the value changes to show the currently used program. The demo will 'loop' continuously with a few seconds break between the end and beginning. To stop the demonstration at any time simply press the 'DEMO' button again.

NOTE 1: The demo function does NOT operate if the 'Autotrigger' is running.

NOTE 2: The changing program numbers can be used to 'track' the demo as it plays through which will help identify the various functions and effects detailed previously in this chapter and as summarised in chart A on the seperate MIDI/information sheet.

MIDI Controllers

In addition to all the standard MIDI functions (see separate Implementation Chart) the DrumStation Rack has the ability to transmit and receive changes to any drum sound in real-time. This extensive control over various parameters allow drum sounds to be dynamically changed in a previously unheard manner.

Control / Parameter Assignment Tables

When a knob on the front panel is moved (in a drum section that has been setup to one of the six Assign Banks), MIDI controller data is transmitted via the MIDI Out socket enabling any changes to be recorded on a sequencer. If you want to concentrate on playing the drum sounds first, you can go back and 'overdub' any changes using the knobs later to enhance all or part of the performance.

Three of the Utility functions - Front Cut (2), Pan Position (6) and Distortion (8) - can also be controlled via MIDI. You can use the 'Controller Wheel' on your master keyboard (routed to the relevant controller number in your computer/sequencer) to input the MIDI controller data.

The following tables should be used as a reference to see which parameters will be affected when a drum sound is assigned to one of the six 'MIDI Assign Banks'. See Utility functio[illegible]

IMPORTANT NOTE
PLEASE READ
THE OPERATION OF MIDI CONTROLLERS HAS CHANGED.
PLEASE IGNORE ANY DETAILS RELATING TO THIS SUBJECT ON PAGES 19 - 20 - 22 - 23. SEE SEPARATE ADDENDUM SHEET FOR FURTHER INFORMATION.

TR808 Kit	Bass	Snare								M'acas	Claves
FRONT CUT	1	1								1	1
PAN POSITION	2	2								2	2
DISTORTION	3	3	3	3	3	3	3	3	3	3	3
TUNING	4	4	4	4	4	4	4		4	4	4
TONE	5	5						5			
ATTACK											
DECAY	6		6				6	6			
SNAPPY		6									

TR909 Kit	Bass	Snare	Toms	R'shot	H'clap	HiHats	Cym'bs				
FRONT CUT	1	1	1	1	1	1	1				
PAN POSITION	2	2	2	2	2	2	2				
DISTORTION	3	3	3	3	3	3	3				
TUNING	4	4	4	4	4	4	4				
TONE		5									
ATTACK	5										
DECAY	6		6			6	6				
SNAPPY		6									

	BANK 1	BANK 2	BANK 3	BANK 4	BANK 5	BANK 6
CONTROLLER 1	20	26	85	102	108	114
CONTROLLER 2	21	27	86	103	109	115
CONTROLLER 3	22	28	87	104	110	116
CONTROLLER 4	23	29	88	105	111	117
CONTROLLER 5	24	30	89	106	112	118
CONTROLLER 6	25	31	90	107	113	119

Examples

Example 1:
TR808 Bass Drum in Assign Bank **1**

BANK 1	MIDI CONT. No.
FRONT CUT	20
PAN	21
DISTORTION	22
TUNING	23
TONE	24
DECAY	25

Example 2:
TR909 Low Tom in Assign Bank **5**

BANK 5	MIDI CONT. No.
FRONT CUT	108
PAN	109
DISTORTION	110
TUNING	111
-	-
DECAY	113

MIDI Controllers - Cont.

Example 3:
TR808 Cymbal in
Assign Bank **3**

BANK 3	MIDI CONT. No.
FRONT CUT	**85**
PAN	**86**
DISTORTION	**87**
-	**-**
TONE	**89**
DECAY	**90**

Example 4:
TR909 Snare Drum in
Assign Bank 2

BANK 2	MIDI CONT. No.
FRONT CUT	**26**
PAN	**27**
DISTORTION	**28**
TUNING	**29**
TONE	**30**
SNAPPY	**31**

MIDI Percussion Maps

Utility Mode 'Gen. MIDI' = TR808

MIDI Key	Drum Sound	MIDI Key	Drum Sound
24	TR909 Bass Drum	39	TR808 Hand Clap
25	TR909 Rim Shot	40	TR808 Snare Drum
26	TR909 Snare Drum	42	TR808 Closed HiHat
27	TR909 Hand Clap	45	TR808 Low Tom
28	TR909 Low Tom	46	TR808 Open HiHat
29	TR909 Mid Tom	47	TR808 Mid Tom
30	TR909 Closed HiHat	49	TR808 Crash Cymbal
31	TR909 High Tom	50	TR808 High Tom
32	TR909 Crash Cymbal	56	TR808 Cowbell
33	TR909 Ride Cymbal	62	TR808 High Conga
34	TR909 Open HiHat	63	TR808 Mid Conga
		64	TR808 Low Conga
36	TR808 Bass Drum	70	TR808 Maracas
37	TR808 Rim Shot	75	TR808 Claves

Utility Mode 'Gen. MIDI' = TR909

MIDI Key	Drum Sound	MIDI Key	Drum Sound
24	TR808 Bass Drum	39	TR909 Hand Clap
25	TR808 Rim Shot	40	TR909 Snare Drum
26	TR808 Snare Drum	42	TR909 Closed HiHat
27	TR808 Hand Clap	45	TR909 Low Tom
28	TR808 Low Tom	46	TR909 Open HiHat
29	TR808 Mid Tom	47	TR909 Mid Tom
30	TR808 Closed HiHat	49	TR909 Crash Cymbal
31	TR808 High Tom	50	TR909 High Tom
32	TR808 Crash Cymbal	51	TR909 Ride Cymbal
33	BLANK	56	TR808 Cowbell
34	TR808 Open HiHat	62	TR808 High Conga
		63	TR808 Mid Conga
36	TR909 Bass Drum	64	TR808 Low Conga
37	TR909 Rim Shot	70	TR808 Maracas
		75	TR808 Claves

DIN Sync.

DIN Sync. was a standard developed by Roland for synchronising drum machines and basslines before the advent of MIDI.

This feature on the DrumStation converts the incoming MIDI clock from your sequencer or sync box into the DIN Sync. format allowing you to control the tempo of a unit like the original TB303 etc. with your MIDI equipment. It sends a 5v pulse at a rate of 24ppqn (pulses per quarter note) to keep a slaved machine at the same tempo as your master clock.

To use this feature, simply connect a suitable lead between the DrumStation's output and the slave units DIN Sync input. When the MIDI clock is running the slave unit will play it's current pattern or song at the same tempo.

Troubleshooting Guide

If the DrumStation Rack does not operate as expected, make reference to the troubleshooting guide below. Remember in most cases, problems that appear to be caused by equipment malfunction can often be traced to human error.

Problem	Possible Causes
No power	Power supply not connected correctly Check porality of 9v DC output plug (center pin +.)
No sound (Main L/R output)	'Volume' knob set at '0' Program saved with 'Level' knob(s) set to '0' MIDI volume set to zero - this will also affect the headphone output
No Individual Output	Drum sound assigned to different output - check settings on all outputs Drum sound level control set (or saved) in the '0' position

Specification

Sounds

Featured sounds: TR808, TR909

Modelled : Bass, Snare, Tom Toms, Hi Hat, Cymbals, Congas

Samples: RimShot, HandClap, Cowbell, Cymbals, Maracas, Claves

Polyphony: Up to 12 Note

MIDI

Program Change : 40 Programs - 25 factory/ 15 user

Controllers: Any front panel rotary control - Front Cut - Stereo Pan Position- Distortion effect

Note-Off Rec.: Selective Note-Off recognition for each drum sound

General MIDI: Selective Drum Kit (TR808/TR909) for placement within GM Map

Connections

MIDI : In-Out-Thru

Outputs : Stereo Left/Right + 6 Individual Outputs & Headphone

DIN Sync: Output - 24 ppqn

Power : 9vDC 500mA input / PSU-4

Dimensions / Weight

Case style : 1 U 19" Rackmount

Width : 483mm (19.2")
Depth : 100mm (3.9")
Height : 44mm (1.75")

Weight : Less than 2Kg

NOTE: *Specification and design subject to change without prior notice, due to improvements.*

FCC Information (U.S.A.)

1. IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT! This product, when installed as indicated in the instructions contained in this Manual, meets FCC requirements. Modifications not expressly approved by Novation may void your authority, granted by the FCC, to use the product.

2. IMPORTANT: When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorisation to use this product in the USA.

3. NOTE: This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

Relocate either this product or the device that is being affected by the interference.

Utilise power outlets that are on different branch (Circuit breaker or fuse) circuits or install AC line filter/s.

In the case of radio or TV interference, relocate/re orient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to co-axial type cable.

If these corrective measures do not produce satisfactory results, please contact the local retailer authorised to distribute this type of product.

The statements above apply ONLY to products distributed in the USA.

CANADA

The digital section of this apparatus does not exceed the "Class B" limits for radio noise emissions from digital apparatus set out in the radio interference regulation of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la "Classe B" prescrites dans le reglement sur le brouillage radioelectrique edicte par le Ministere Des Communications du Canada.

This only applies to products distributed in Canada.
Ceci ne s'applique qu'aux produits distribués dans Canada.

Other Standards (Rest of World)

This product complies with the radio frequency interference requirements of the Council Directive 89/336/EC.

Dette apparat overholder det gaeldenda EF-direktiv vedrørendareadiostøj.

Cet appareil est conforme aux prescriptions de la directive communautaire 89/336/EC

Diese Geräte entsprechen der EG-Richtlinie 89/336/EC.

Specifications subject to change:

The information contained in this manual is believed to be correct at the time of going to press. However, Novation reserves the right to change or modify the specification without notice or obligation to update existing units.

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