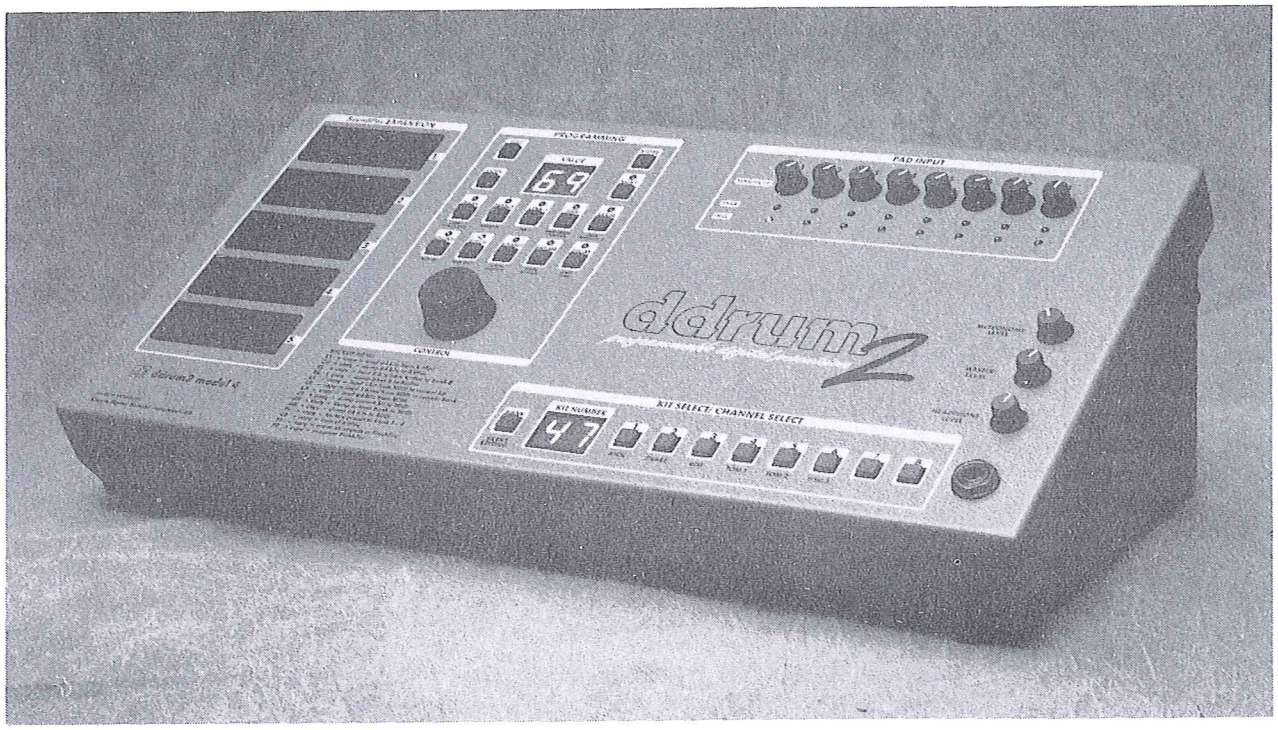
OPERATION MANUAL

for ddrum2 model 4



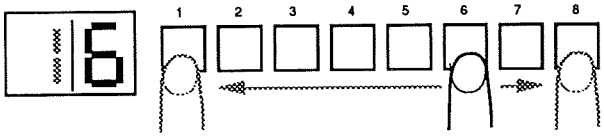
DDRUM AG • Riedstrasse 6 • Postfach • CH 8953 Dietikon • Tel. +41 44 742 26 00 • Fax +41 44 742 26 01

Selecting Kits

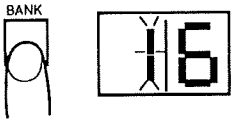
ddrum2 comes with 64 Kits in memory. They can all be replaced with your own, but 32 of them (11 to 48) can also be retrieved at any time using the BACKUP function

Selecting a **KIT** from the ones stored i memory is done in this way:

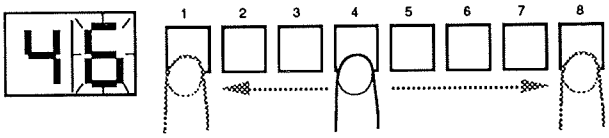
• **One of eight KIT's in a BANK** can be selected directly with the buttons labelled 1-8. The display indicates the **KIT** selected.



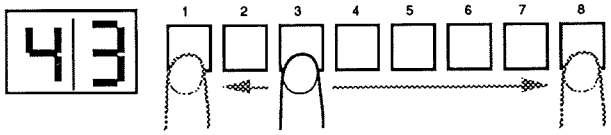
• **To switch to a new Bank of eight KIT's**, first press **BANK**. The left figure in the display flashes.



• Select the desired BANK with the buttons labelled 1 to 8. The right figure starts to flash.



• Select the desired KIT with the buttons 1-8 as above.



You can also use the *Kit Selector* (option) to select Kits in an even more convenient way. The Kit Selector is small an lightweight and easily put on a stand among your pads. In that way you can pre-program the order of your Kits for any performance and keep the **ddrum2** unit in a rack, together with other equipment on any distance from your Kit.

Internal Sound Memory, Ver. 2.0

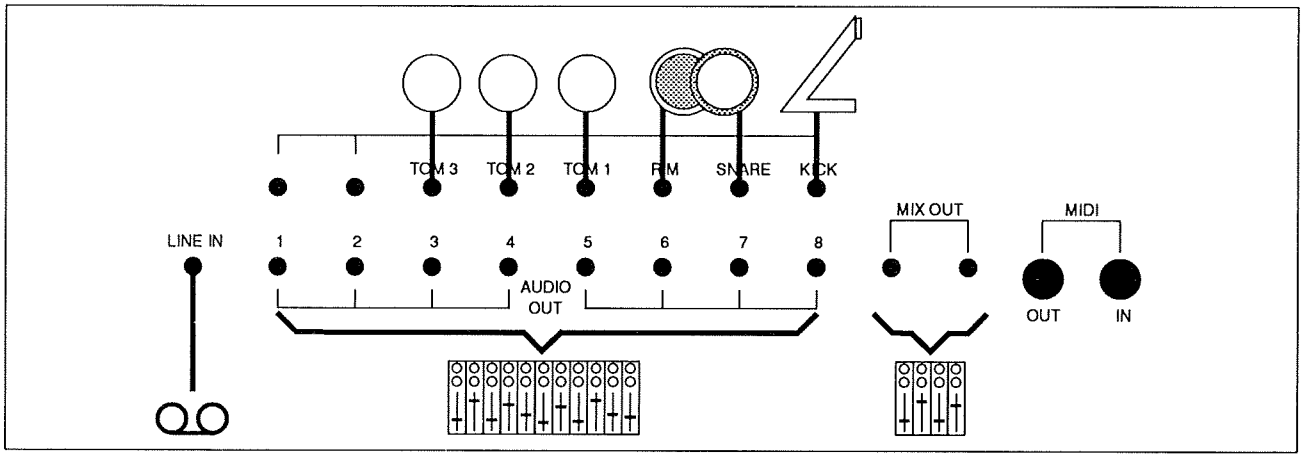
This is a list of the sampled sounds in ddrums internal memory. They can be combined in any way into Kits. Some factory Kits use the Link function (two or three sounds per pad). Most of theses use Sound Channel 3, 7 and 8 as Link Channels. The Kits that use Sound Channel 3 (the rim) as a Link Channel have the rim input turned off, using Local On/Off. Some factory Kits have a built in stereo effect. This comes to its right only when using Mix Out or headphones.

No	Category	Description
60	Large bongo	MP percussion glassfiber
61	Small bongo	MP percussion glassfiber
62	Timbales	LP timbales
63	Timbales	Cascara hit on a LP timbale
64	Tumba	GB tumbadore wood
65	Conga	GB Conga wood
66	Quinto	GB Quinto wood, open slap
67	Woodblock	LP Rosewood medium
68	Claves	Rosewood
69	Castanjettes	Studio 49
6A	Cabasa	LP Afuche. Contains two samples
6b	Cowbell	GB Cha-Cha open hit
6C	Cowbell	GB Cha-Cha closed hit
6D	Icebell	1 bell from a Ufip belltree
6E	Triangle	Medium size triangle from DDR
6F	Electric tom	SIM SDS5 high pitch
6H	Electric tom	SIM SDS5 low pitch
70	Snare	14" x 6 1/2" TA solid maple wood
71	Snare	14" x 6 1/2" YA metal
72	Snare	14" x 8" PRE wood
73	Snare	14" x 8" SO wood
74	Snare	14" x 7" No & Co
75	Snare	14" x 7" No & Co rimshot
76	Snare	14" x 6 1/2 LU supraphonic high pitch
77	Snare	14" x 6 1/2 LU without snare
78	Snare	14" x 6 1/2 YA wood
79	Snare	14" x 7" YA wood

No	Category	Description
7A	Snare	14" x 6 1/2" PE floating brass snare
7b	Rim	Cross stick on a 14" x 8" SO wood snare
7C	Rim	Cross stick on a 14" x 5" wood snare
7D	Rim	Rimshot on a 14" x 9" PRE heavy rock 9
7E	Cowbell	GB Large handbell
7F	Tambourine	Wood tambourine
7H	Kick	22" rock
7J	Kick	TA 22" x 14" with ambience
7L	Kick	TA 22" x 14" Rock
80	Kick	YA 20" x 16" Rock
81	Kick	Special mix, "yea man"
82	Kick	PE 20" x 14" tuned up Jazz
83	Kick	SO 20" x 16" with digital reverb
84	Tom	LU 12" acoustic tom
85	Tom	LU 13" acoustic tom
86	Tom	LU 16" acoustic floor tom
87	Tom	TA 10" acoustic tom
88	Tom	TA 12" acoustic tom
89	Tom	TA 14" acoustic tom
8A	Handclap	Mix with human hands
8b	Noise	High Frequency noise
8C	Noise	Dynamic timbre noise
8D	Noise	Low frequency noise

ddrum2

Setting Up and Getting Started



Setting Up

• Put the **KICK** together and mount **SNARE** and all **TOM**s on their stands (in case of difficulty, look up page 43 in the Operation manual). Make sure the wing nut is loose enough to allow the **TOM**s to move freely, before you change their angle.

• Connect each pad to an input on the back of the **ddrum2 as shown above**. One of the **SNARE**'s outputs is from the head and the other is from the rim (labeled RIM). Connect these to **PAD INPUT 2** and **3** respectively.

Connect the **MIX** outputs to the left and right channel of your sound system. If MIDI equipment or headphones are used, connect these too. The Headphone socket is on the front panel.

• Plug in and turn on power in this order:

1. **ddrum2.**
2. Any outboard gear that is used.
3. The external mixer (if used).
4. The sound amplifier.

• After the value display goes out, hit every pad and check that the corresponding LED labelled **TRIG** (green) lights up momentarily. If it doesn't, raise **SENSITIVITY** (clockwise) a little for that channel. The LED Labelled **PEAK** might also light up, but don't worry now, it doesn't affect the sound.

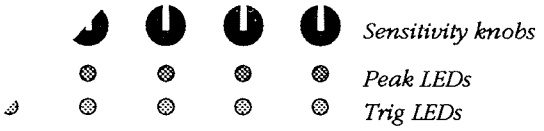
• If the **MIX OUT** jacks are used, put **MIX LEVEL** on "12 o'clock". Otherwize, raise **HEADPHONES LEVEL** to the same value.

• Raise the volume on the sound system, sit down and play!

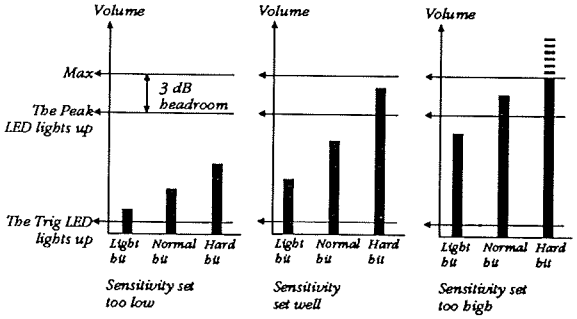
Remember to adjust dynamics before you go on (see below) This is extremely important if you want a natural feeling and sounding drumkit!

Adjusting dynamics

One of the things that make **ddrum**s superior to other electronic drumkits is the dynamic playing range. It is extremely close to that of an acoustic set. To make the most of this it is important that the following procedure is followed.



• Hit the pad connected to the channel to be adjusted with the strongest force you use during normal playing, while at the same time adjusting SENSITIVITY
• The correct position is when the LED labelled PEAK lights up shortly for the strongest hits.
• Repeat the procedure with the rest of the channels.



This diagram shows three different Sensitivity settings. Try to achieve the middle one.

SENSITIVITY is not a programmable function. This means it can not be set differently for each KIT. The knobs always indicate the true setting.
The fact that the PEAK LED lights up doesn't affect sound quality since it is the signal from the pad that is "peaking", not the *sound* from the channel itself.
Do not use SENSITIVITY as a volume control. Making a channel more sensitive is not the same as raising the volume.

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SAFETY INSTRUCTIONS

- Do not use the rack close to water, in very humid places or where it is extremely cold. If the unit has been kept at a low temperature for a long time, make sure it regains normal room temperature before switching on. The electronic specifications allow a working range of 0° to 40° centigrades.in the environment.. Provide proper ventilation!

- Check the line voltage. Make sure it is correct for the country you are presently in.

- If **ddrum2** is used close to a radio or TV-set, interference may occur. Try moving the rack unit or placing it further away from this type of equipment.

- Read the Maintenance section of this manual. It is important to take as much care of your **ddrum2** kit as you would with an acoustic drumkit.

- To avoid damage to the power supply cord or line cords, do not put them under boxes or stands, or where people will step on them. Make sure that the cords are not stretched unnecessarily.

- The power supply cord should be unplugged from the outlet when **ddrum2** is left unused for a long period of time.

- If the playing pads are exposed to low temperatures, make sure they regain normal room temperature before using them. This is because the plastic becomes brittle when very cold, and may crack in this condition.

- Do not under any circumstances try to repair or even open **ddrum2**. The chances are you will do more damage. Repairs and service should only be made by a Clavia authorized Service Center.

DIFFERENT VERSIONS

There are a few different versions of the **ddrum2** out on the market. They differ both in software and hardware.

SOFTWARE

The main part of this manual describes software version 2.x, where the "x" can be any number above 0. At the end of this manual is an addendum for hardware "Model 4" (see below) which uses software versions 3.1 and higher.

- **SoundPac** cartridges with more than sixteen sounds can only be used with software version 2.0 and later.

- **FlashPac** cartridges can only be used with software version 3.1 and later. See page 54 for more info about FlashPacs.

If you feel insecure about what software version you have, watch the VALUE display when you turn on power. It first shows "d2" (ddrum2) and then a number. If it for instance says "31", you have software version 3.1. If you have an old version, contact your dealer for an upgrade.

HARDWARE

The current hardware version is called "Model 4". This differs from earlier models in a number of ways. The main part of this manual describes "Model 3". There is a supplement starting on page 54 of this manual describing the differences between Model 3 and 4 only. You will have no problem getting acquainted with your ddrum2 by reading the original manual first and studying this supplement later, since nearly all of the changes are additions, not replacements. The main manual is only incorrect in two places: Bass Drum Defeat, the extra Pan function described on page 27 now allows you to defeat several channels individually, channels 1 to 4 to be exact. And, the "Restore Factory Presets" Backup function described on page 30 is now labelled "Pr" in the display.

The differences between Model 3 and Model 4 are the following, in brief:

- Multipad input, for ddrum PadStation.
- MIDI Thru connector.
- "ddmini" connector for use with ddrum Performer.
- ddrum Performer metronome level adjustment on front panel.
- Channel 1-4 Defeat, removes sound channels from Mix Outputs.
- "UD" — A new MDE mode for less dynamic pad and MIDI response.
- FlashPac support, for programming your own custom SoundPacs.
- The pad response has been improved, and is now more even than before.

OVERVIEW

THE SYSTEM

The **ddrum2** is an 8 channel/16 voice drum system based upon sampled sounds. The sounds you hear have, in most cases, an acoustic origin. They are recorded, digitalized and stored in computer memory.

But that's only half the story. All **ddrum2** sounds are edited, processed and then stored with a number of custom techniques hidden to the user. These techniques make use of the fact that **ddrum2** has two completely separate sound generators for each channel, and that they can be combined in a number of ways. A special method called Drumhead Vibration Algorhythm™ removes "machine gun" effects that normally occur when you play flams and tight rolls with a sampled sound and also ensures perfect reproduction of tomtom sounds among others. There are also special modes for making sounds from analog drum machines and kits sound just as the original.

The purpose of this whole process is to ensure perfect reproduction, whether you are playing hard, soft, single strikes or rolls. Different kind of percussion behave differently so the technique varies from sound to sound.

All this together forms a drum system that outperforms all other electronic drums on the market. The sound quality and feeling of the ddrum2 can in no way be compared to a regular sampler or ROM-player that is not designed especially for drum and percussion sounds.

THE SOUND MEMORY

The sound memory is divided into two parts: **Internal** and **SoundPac** (cartridge).

ddrum2 is loaded with sounds when it comes from the factory, but more sounds can be brought to the system through the **SoundPac Expansion** ports. Since all sounds are stored in ROM, there is no need for floppy disks and no waiting for sounds to be loaded.

ddrum2 treats the sound memory, both Internal and SoundPac, as one big sound bank to choose soundsamples from. There is no difference in how the two are treated.

One SoundPac can contain between 2 and 20 sounds, depending on the length and complexity of the sounds.

A SoundPac can be inserted or removed at any time. Neither the **SoundPac** or **ddrum2** will suffer any damage as a result of insertion or removal.

A SoundPac must always sit in the same slot when used, or the wrong sounds will appear on the playing pads. Therefore, label the SoundPacs (in the little box on the label) with the number of the slot you have selected.
ddrum2 needs a short moment of total silence to read the contents of a cartridge when it is first inserted. If you plug in a cartridge while a long sound is decaying, please pause for a couple of seconds, and the unit will catch up with you.

THE KIT MEMORY

The next step is to put your drum sounds together into **KIT's** that can be stored and retrieved at the touch of a button, complete with all settings. These KIT's are retained in the unit's memory even when power is turned off. 64 KIT's can be stored in **Kit memory** at one time.

A number of **parameters** can be set for adjustments of the sounds. Examples of such parameters are PITCH, DECAY, and TREBLE.

KITs can also be saved to special cartridges called **KitPacs** and via MIDI as System Exclusive codes.

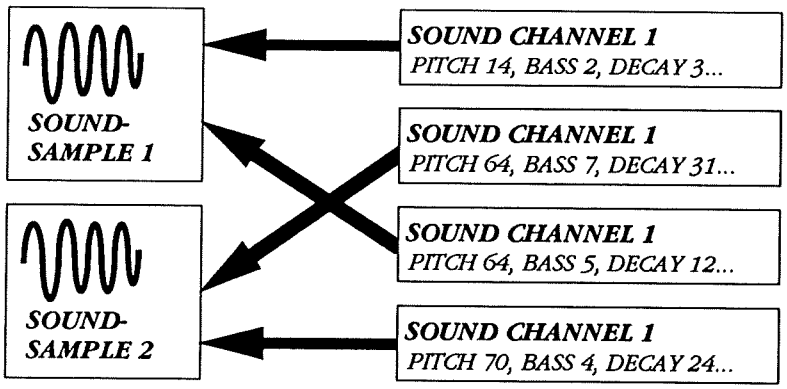
The Kit Memory is stored in EEPROM circuits which retain their information without the need of battery backup. There is no battery in **ddrum2** to replace or worry about.

THE SOUND CHANNELS

Each and every one of the eight sound channels have free access to the sound memory bank.

Each Sound Channel always has two independent "voices" at its disposal. This means that regardless of how advanced playing techniques you use, there is never any risk of lost sounds due to "voice robbing" from other Sound Channels. This is different from most other units, like samplers or ROM-players.

Different channels can play back the same sound sample simultaneously, and even with different parameter settings. This means that **one** sampled tom sound can be used by **all** TOM-pads in a KIT, but with different tuning and length.

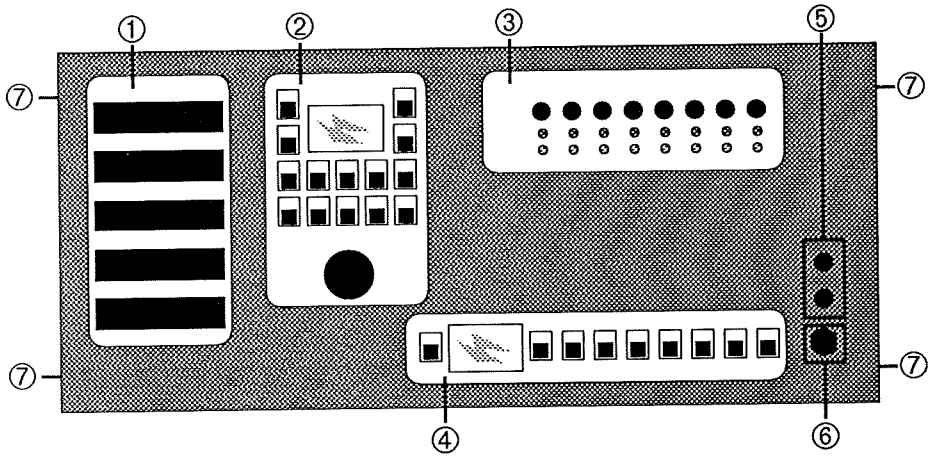


This picture shows how several Sound Channels can read the same sound, but each with its own settings.

One soundsample can be part of any number of drumkits, and can even be used by several drums within one KIT.

One playing pad can also play back up to **three** sounds at the same time using the LINK-function described on page 23.

THE FRONT PANEL



1. SoundPac/KitPac Expansion slots. There is space for five/six SoundPacs, each one containing a maximum of twenty sounds, all depending on the length of each sound. These slots are also used for KitPacs.

2. Programming section. This contains all the controls needed to change a sound, copy drumsounds, set the different MIDI-functions and store it all in KIT memory. It also contains the input knob (CONTROL), and the LED display that shows the different settings.

3. Pad Input. This includes eight sets of SENSITIVITY knobs with PEAK and TRIG LED's. The knobs are used to tailor dynamics to playing style. The LED's are used for adjusting dynamics and to a certain extent when programming.

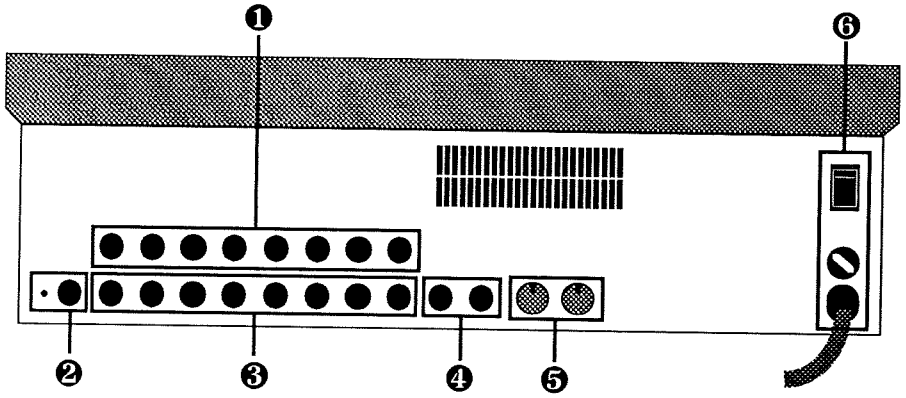
4. Kit Select (Channel Select). The buttons labelled BANK and 1-8 are for selecting pre-programmed KIT's and for choosing where to store a new KIT. The display always shows what KIT you are presently working on. The buttons labelled 1 to 8 are also used for channel selection in sound **EDIT** mode.

5. Master Level & Headphones Level. Controls the overall soundmix level to MIX OUT and HEADPHONES OUT respectively.

6. Headphone output. Stereo.

7. Bracket mounting holes. These holes (M5–metric 5mm) are provided for fastening the brackets provided for rack mounting the **ddrum2**.

THE BACK PANEL



1. Pad Input. Inputs for pads, but also for other sources used for triggering sounds.

The inputs are labelled (KICK, SNARE and so on) after the way the factory presets are set up. This is merely a recommendation, and any input can in fact be used for any pad.

2. Line In & Line In Level. Mono input for line level external sound sources such as clicks, CD-players, tape recorders, drum machines or similar. The knob controls the volume of the incoming signal, **and the signal is only mixed into the headphones output**. This input is **not** compatible with direct signals from record players.

3. Audio Out 1-8. Separate sound outputs for each channel. Line level.

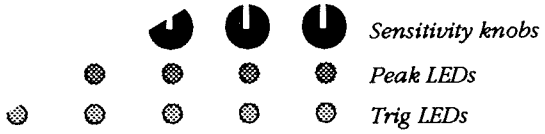
4. Mix Out. Outputs a stereo soundmix of all eight Sound Channels. Line Level.

5. MIDI In & Out. For connection to other equipment also equipped with a MIDI-interface.

6. Power switch, fuse holder and power cord.

ADJUSTING DYNAMICS

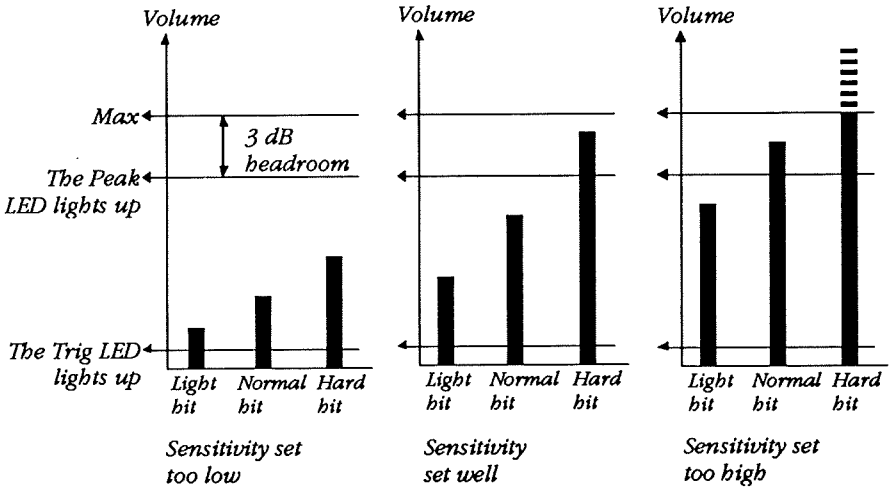
One of the things that make **ddrum2** superior to other electronic drumkits is the dynamic playing range. It is extremely close to that of an acoustic set. To make the most of this it is important that the following procedure is followed.



• Hit the pad connected to the channel to be adjusted with the strongest force you use during normal playing, while at the same time adjusting SENSITIVITY.

• The correct position is when the LED labelled PEAK lights up shortly for the strongest hits.

• Repeat the procedure with the rest of the channels.



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SELECTING KITS

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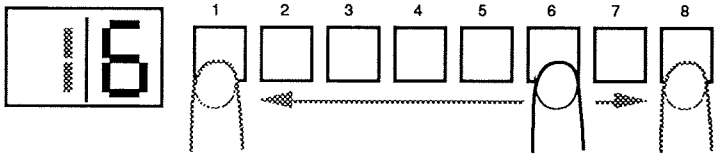

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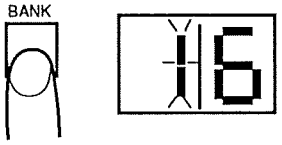

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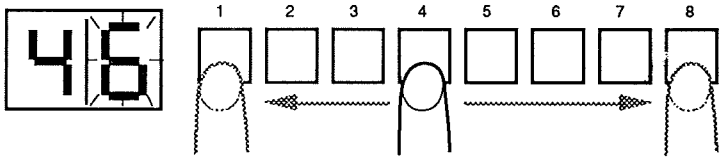
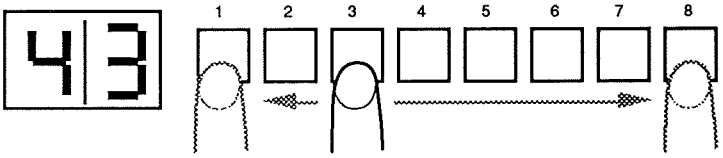


- Select the desired KIT with the buttons 1-8 as above. The display stops flashing and indicates the KIT selected.

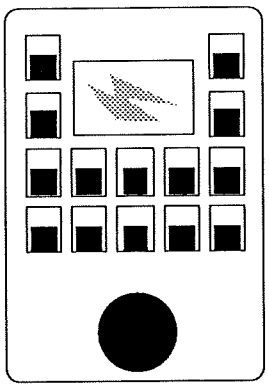


You can also use the **KitSelector** (option) to select Kits in an even more convenient way. The **KitSelector** is small and lightweight and is easily put on a stand among your pads. In that way you can pre-program the order of your Kits for any performance and keep the **ddrum2** unit in a rack, together with other equipment on any distance from your Kit.

EDITING KITS – AN OVERVIEW

Programming a new KIT is achieved by editing an already existing KIT and storing it at the same or at a new memory location.

The controls for all the values (or parameters) that can be changed are grouped together in a section on the front panel, labelled PROGRAMMING. There are also some special buttons in this section, for copying and storing sounds.



The programming part of the front panel.

Making your own drumkit is easy. These are the basic steps:

- Select a KIT to start with.
- Press the button EDIT (in the PROGRAMMING box).
- Select with the buttons the parameter to be changed (PITCH, DECAY and so on).
- Select the channel to be affected by hitting its pad, or by pressing the corresponding SELECT button (1 to 8), 1 for Kick, 2 for Snare and so on.
- Change the value with the CONTROL knob.
- Select another channel, and if so desired a new parameter.

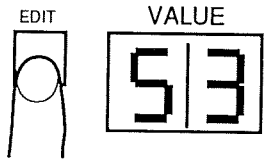
You *don't* have to store your changes before you select the next parameter or Sound Channel.

- When you are satisfied, store *all* your changes at the same time as described in the STORE procedure on page 17.

EDITING IN DETAIL

When you press EDIT, **ddrum2** is put into **EDIT mode**, and this is where all changes are made.

This is indicated by the display labelled VALUE in the PROGRAMMING box which lights up and indicates a value. The relevant parameter button also lights up. The VALUE display shows the value for the selected (lit) parameter.

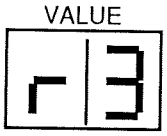


The TRIG LED for the channel selected for editing lights up and stays lit. It goes out momentarily when you play the sound. You could say that it works backwards compared to its normal operation.

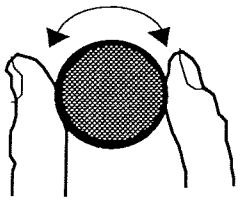
The lower display always shows which KIT you are working on.

CONTROL & VALUE

The VALUE display shows the present value of the selected parameter. Often these are not numerals, but different kinds of symbols and letters.



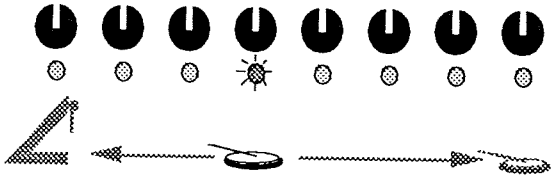
With the large knob labelled CONTROL you can increase (clockwise) or decrease (counterclockwise) the current value.



There are two ways of selecting the Sound Channel to be edited:

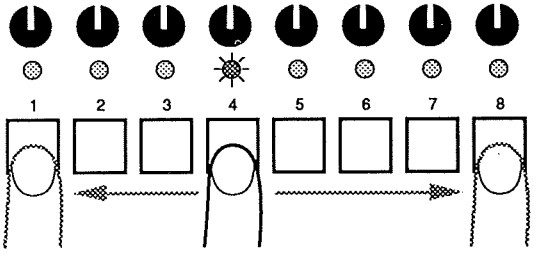
PAD SELECT MODE

When you first enter EDIT mode the channel is selected by hitting the relevant pad. This means that you are editing the Sound Channel you last hit. If you hit the Snare, you are editing this. If you then hit one of the Toms, you are editing that. This mode is suited for similar changes to several sounds, like for instance matching the pitch of three toms. The selected channel is indicated by the TRIG LED.



BUTTON SELECT MODE

If you press any of the buttons 1-8 on the **ddrum2** in EDIT mode, you switch to a mode where these buttons select the channel. The *selected channel* is indicated by the TRIG LED. The *display* in the KIT SELECT section always indicates the KIT you are currently working on.



Now you can play without having the EDIT channel changed every time you hit a pad. This mode is good for matching e.g. a snare with the rest of the kit, or when you use the rack without the pads.

Pressing the buttons also plays back the sounds, but with the same level regardless of how hard you hit them (watch your ears!).

To return to Pad Select Mode, press EDIT twice (exit EDIT mode and enter again). This does not erase any changes made to a KIT as long as you don't select a new KIT before you enter EDIT again.

Once you are in Pad Select Mode again, you can switch back to Button Select Mode by pressing any of the buttons 1 to 8 as described before. This is a convenient method of switching between the two modes.

Selecting a new channel while editing doesn't affect any changes made to the other channels. You only have to Store when you have finished editing the Kit altogether.

SHIFT

The parameter buttons all have two functions, one written above the button and one written below. You switch between these by pressing the SHIFT button, also in the programming section. See page 28 for the more information on the SHIFT-parameters.

EXITING EDIT MODE

If you press EDIT again you return to the original drumkit.

How to store the new drumkit is described in the STORE procedure on page 17. **All** sound parameters in a KIT are stored at the same time.

The parameter you last chose is the one selected (lit) when you enter EDIT mode again. This means that if DECAY was the last selected parameter in a certain drumkit, this will be the parameter ddrum2 defaults to when a new drum kit is selected for editing.

SILENT EDITING

You can listen to the sound while working, either by playing the pads as usual or by pressing KIT SELECT (CHANNEL SELECT) 1 to 8. The latter plays back the sounds with the same level regardless of how hard you hit them.

But you can also turn off the function that plays back the sounds from **ddrum2**'s buttons by pressing SILENT EDIT (BANK) as the first thing you do after entering Edit mode. This is called Silent Editing.

This is good if you want to Edit any of a sounds parameters without hearing it every time you select the Sound Channel, during rehearsal or sound check for example.

To return to normal editing, just exit Edit mode and enter it again (press EDIT twice).

TWO EXAMPLES

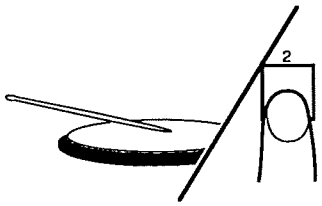
EXAMPLE 1

You want to re-tune the snare in KIT 23 from value 64 to 58.

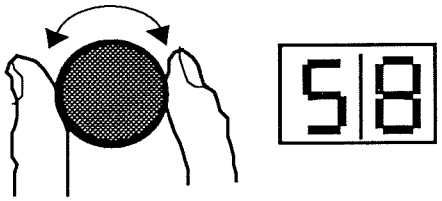
- Select KIT 23.
- Press EDIT.

- Press PITCH.

- Hit the Snare (Pad Select Mode) or press KIT SELECT (CHANNEL SELECT) 2 (Button Select Mode).



- Turn CONTROL counterclockwise until the VALUE display says 58.



- Store your changes with STORE (see below).

EXAMPLE 2

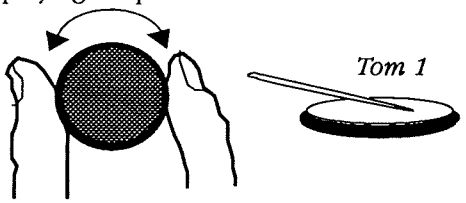
If you want to match the length of three toms in KIT 42, this is the best way:

- Select KIT 42.
- Press EDIT.

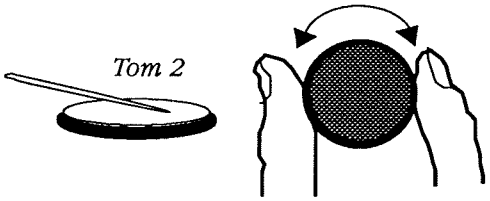
- Press DECAY.

- Hit the first tom (Pad Select Mode).

- Turn the CONTROL knob to the desired VALUE. Listen to the changes by playing the pad.



- Hit the next tom and adjust it. **You do not have to press DECAY again.** A drumstick in one hand and the other hand on the CONTROL knob is all that is needed.



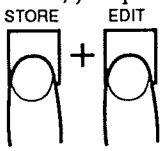
- Hit the different pads and adjust CONTROL until you are satisfied.
- Store **all** your changes with STORE (see the next page) or return to the old KIT by pressing EDIT again.

STORING AND COPYING KITS

STORING KITS

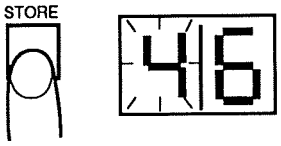
If you want to store the altered drumkit there are two ways to go:

If you want to store it under the same KIT number as it originally came from, just press STORE (the lower display flashes) and then EDIT.

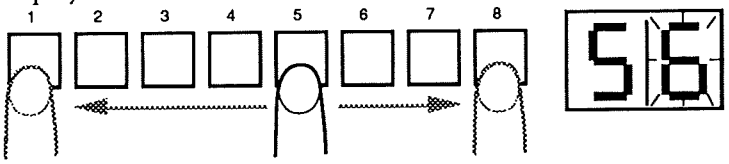


If you want to store it under another KIT number, this is how to do it:

- Press STORE. The left numeral in the lower display flashes.

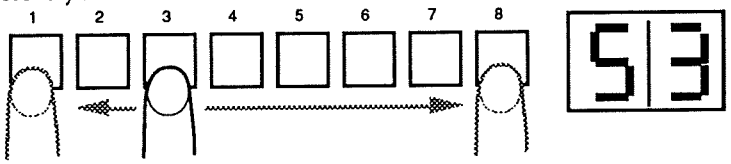


- Press the button (1 to 8) of the desired BANK. The right numeral in the display flashes.



If you happened to choose the wrong BANK number, just press BANK again for another choice.

- Press the number (1 to 8) of the KIT within the BANK where you want to store your new KIT.



If you change your mind before pressing one of the buttons 1-8, just press STORE again and the procedure is aborted and you return to EDIT mode.

When you have completed this procedure the new KIT is stored and the KIT previously stored under this number is overwritten and cannot be retrieved.

If you change your mind before step 4, all you have to do is to press STORE again. You then return to EDIT mode.

COPYING KITS

The STORE procedure described above is also a convenient way of copying KITs. When you for instance want to make one or more slightly different versions of an existing KIT, start by copying the existing KIT to one or more KIT numbers, and Edit them from there

- Select the KIT to be copied.
- Press EDIT.
- Press STORE and select BANK and KIT number as described above.

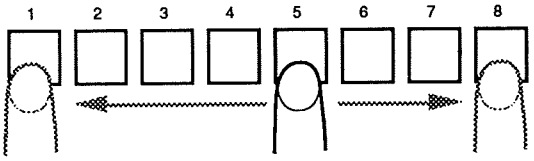
THE COPY FUNCTION

This function is used for copying the sound parameters of a certain Sound Channel to one or several other Sound Channels within the same KIT.

Every time you select a new channel with the KIT SELECT (CHANNEL SELECT) buttons in EDIT mode, all of that channel's settings are copied into a memory called the *Copybuffer*. This means that **ddrum2 remembers all settings for the last selected channel**. These can later be copied to one or several channels.

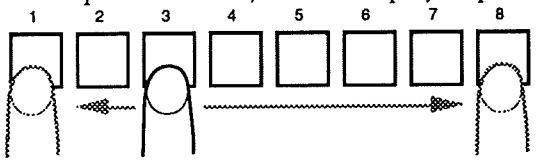
This is how it's done:

1. When in EDIT mode, select the sound to be copied by pressing button 1 to 8.



2. Press COPY. The VALUE display flashes.

3. Press the button (1-8) to select the channel that the sound is to be copied to. This copies the sound, and the display stops flashing.



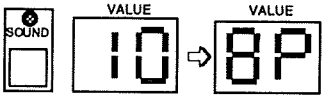
4. If the same sound is to be copied to several channels, repeat step 2 and 3.

If you change your mind before step 3, just press COPY again to cancel the procedure.

MIDI and LINK parameters are not copied.

THE SOUND PARAMETERS

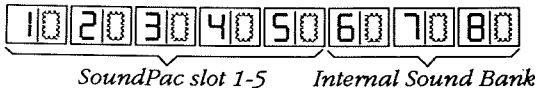
SOUND



Used to select which sound, from Internal or Sound Pac memory, will be allocated to a specific pad.

The sounds retained in Internal memory are listed on a separate sheet called "Setting Up and Getting Started" that comes with every **ddrum2**. Also, a numbered listing of contents is supplied with each SoundPac.

The sound samples are divided into eight blocks. The left hand numeral in the VALUE display is the block number and tells if the sound is Internal or SoundPac. Numbers **1** to **5** are the SoundPac and **6** to **8** are Internal.

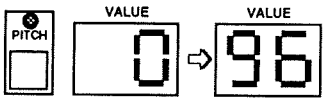


The right figure (or letter) tells which sound within the bank is currently operative. The first ten are labelled **0** to **9** and the last ten as letters **A, b, C, d, E F, H, J, L, P.**

Since different SoundPacs contain different quantities of sounds, it might happen that the display jumps from for example 32 to 40 when you turn the knob. This means that the SoundPac in slot number 3 only contained three sounds (30,31 and 32).

ddrum2 automatically knows how many sounds there are in a SoundPac, but it cannot distinguish one SoundPac from the other. This means that it is important to always use a SoundPac in the same slot to which it was originally allocated. For this purpose there is a little square on the SoundPac label where you can write the number of the slot used when programming.

PITCH

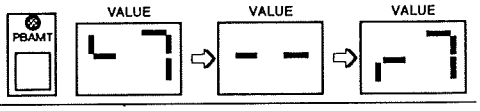


Controls the basic pitch of a sound. The range is one octave and each step is an eighth of a semitone.

The value 64 in most cases correspond to the pitch the original sound had when recorded. But it goes without saying that this is no guarantee of absolute pitch for use in tuning to other drums etc.

The pitch of a sound is also determined by the parameters PITCH BEND AMOUNT and PITCH BEND RATE.

PITCH BEND AMOUNT

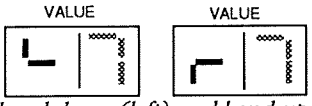


An acoustic tom drops in pitch just after it is struck. This parameter simulates or enhances that effect.

Most of **ddrum2**'s sampled tom sounds are manipulated so that the natural pitch bend is less apparent or none existent in the sample. This is done so that when you restore it with the PITCH BEND parameters you achieve an effect that varies naturally with dynamics, since PITCH BEND AMOUNT is a **dynamic parameter**. Some example settings are found on page 41.

The middle value (– –) indicates there is no pitch bend applied. The values above this (1 to 7) are preceded by a little symbol illustrating a sound **dropping** in pitch. The values below – – have the same symbol turned upside down. This means that the sound **starts at the lower pitch and goes up**. The higher the value, the stronger the effect.

In both cases the **final** pitch is the one set with the PITCH parameter.



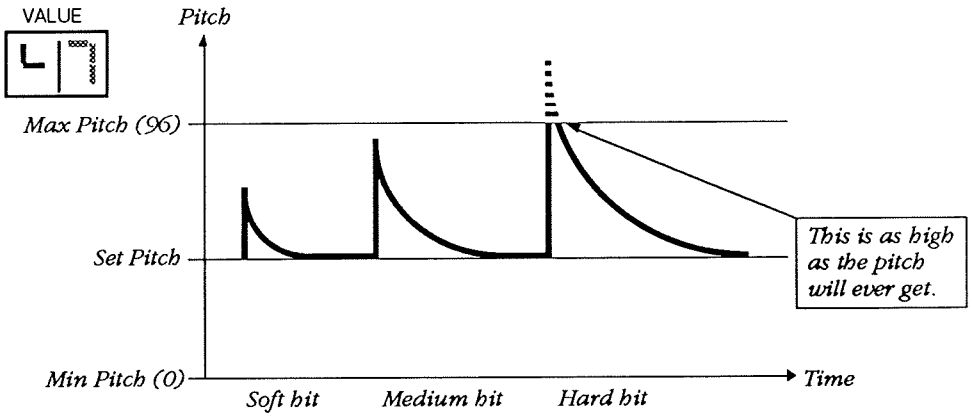
The two pictures above show bend down (left) and bend up (right), both with an amount of 7.

The amount of pitch bend determines how high (or low) the pitch will be at the beginning of the sound, but regardless of how you set it there is no way of exceeding the limits of the one octave range. The effect decreases to finally disappear when you come closer to the extreme values that can be set with PITCH.

PITCH BEND AMOUNT is dependent on striking force. The stronger the force the greater the effect. It is therefore important that dynamics are properly adjusted.

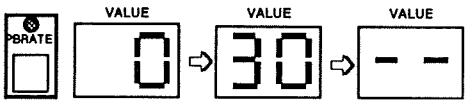
An average setting for toms is **down bend 4**, and for timbales **down bend 2**.

If you set PB RATE to 0 and PB AMT to 7 for a short sound, you get a sound with an extreme bend that varies with striking force. This can be used as a Link to a bass drum sound (see page 23), which gives you a kick with an interesting dynamic attack.



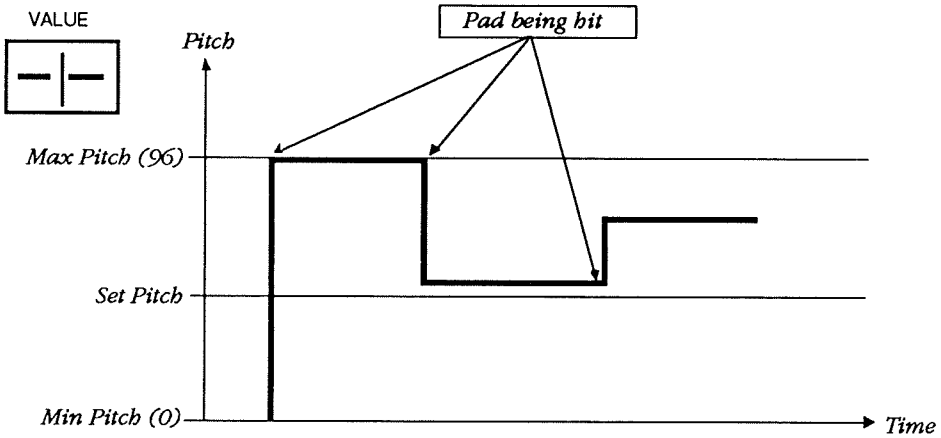
The diagram shows how the Pitch Bend Amount parameter works with a ***down bend of*** *7, and how the pitch bend-effect is affected by the limited PITCH range.*

PITCH BEND RATE



The time it takes for the pitch to bend up or down. Zero is the shortest and 30 the longest. This range corresponds to 50 to 500 milliseconds.

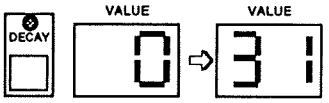
After 30 the value displayed is – –. Here the time is infinite but the pitch varies with dynamics. This means that pitch is a direct function of striking force, without any bend.



The diagram shows the "jump" effect with a PITCH BEND AMOUNT setting of ***down*** *7.*

The **amount** of this effect is also controlled with PITCH BEND AMOUNT.

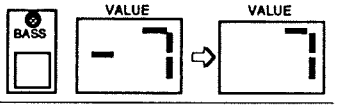
DECAY



Controls the overall length of the sound. Zero is the shortest and 31 the longest. This corresponds to a range of 40 milliseconds up to the samples length.

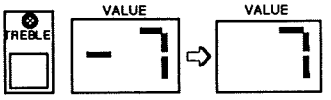
ddrum2 automatically knows the maximum length of all soundsamples. The DECAY range is automatically scaled to this. In other words, short sounds have a short Decay range, and long sounds have a long Decay range.

BASS



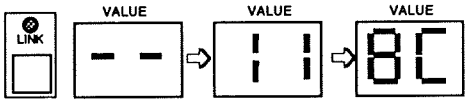
A (very) active bass filter. Bass can both be added and subtracted with this parameter. It boosts/attenuates ±15 dB at a frequency of approximately 600 Hertz.

TREBLE



A likewise active treble filter. Treble can both be added and subtracted with this parameter. This filter also boosts/attenuates ±15 dB.

LINK



Link is one of the most important parameters. It allows you to create totally new sounds out of the existing, and to make sounds that vary in interesting ways with dynamics.

Each pad is routed to a channel, the **Master**. But you can link one or two more channels to each pad. These channels are called the **Slave channels**. You can also select one of several modes for each slave which selects the type of link.

The Link function gives you access to double or triple sounds. It can also be used to add a click to a muddy bass drum, or for other special effects (see page 40, Good Drumsounds).

- If you want to Link a Sound Channel to another Sound Channel, first select the *Master Channel.*

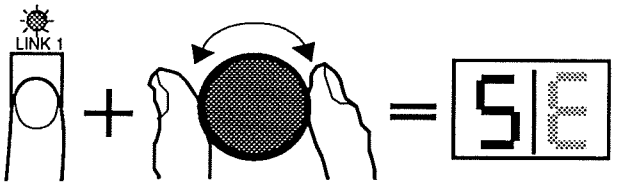
It is on the Master Sound Channel you make all settings that affect what Slave Channel to use, and what kind of Link you want. When you have all these settings right, you can select the Slave Sound Channel and edit its sound parameters there.

- Press Link.
- Select Link 1 or Link 2 by pressing Shift. When the Shift LED is lit, you are editing Link 2, and when it is out you are editing Link 1.

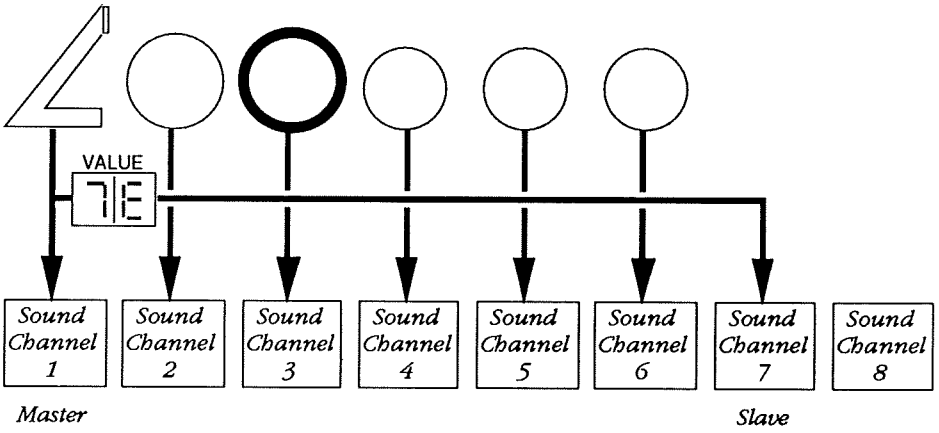
Editing Link 1 *Editing Link 2*

SLAVE CHANNEL

- Select *Slave Channel* by *holding down* the Link button and turning the Control knob. The left digit in the Edit display shows the selected Sound Channel (1-8).

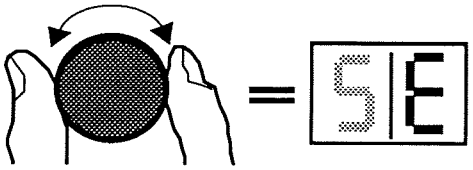


A Channel can not be Linked to itself.

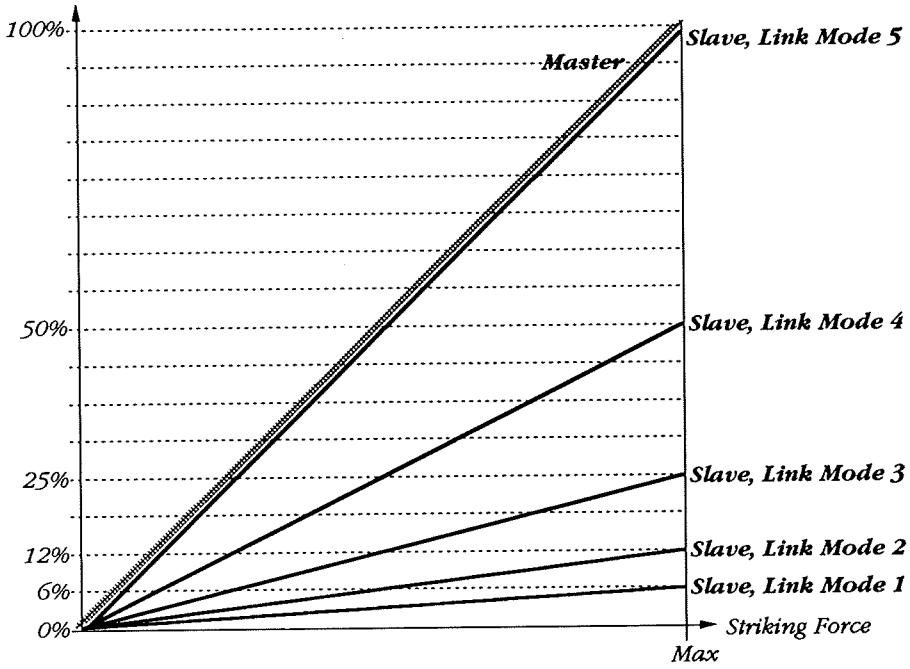


This picture shows how the Bass Drum channel (Sound Channel 1) is linked to Sound Channel 7.

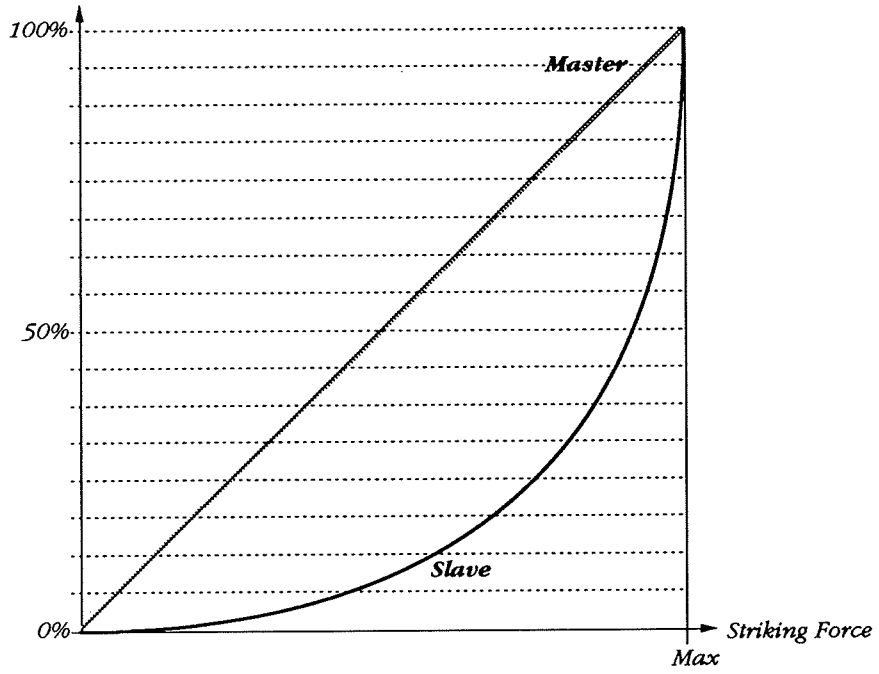
- You select one of the seven *Link modes* by rotating Control *without* pressing Link. The right digit in the Edit display shows the Link mode. You can of course have different modes set for Link 1 and Link 2.



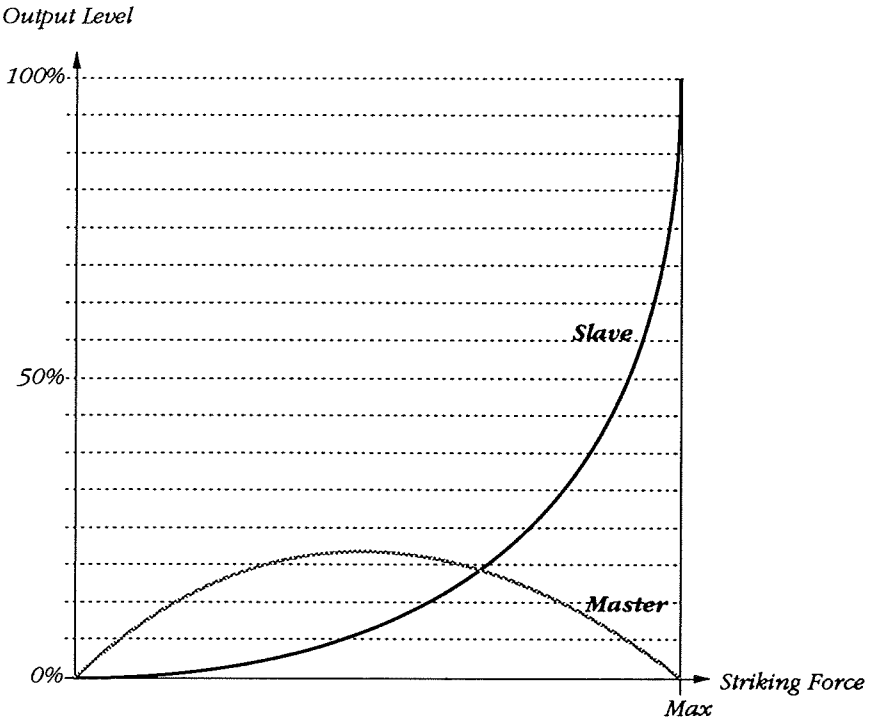
LINK MODE 1-5
Simply the balance in volume between the Master and the Slave. The higher the number, the louder the Slave compared to the Master.



LINK MODE E
Expanded Slave. The Slave Channel is given an exponential dynamic curve, so that it is only mixed in when you play very hard. This is used to "top" the Master with a Slave sound on hard hits.



LINK MODE C
Crossfade, which means that the balance in volume between the Master and the Slave depends on how hard you play. The harder, the more you will hear the Slave and less the Master.



Remember to adjust Sensitivity! The LED should only light up on the absolutely hardest hits.

- If you don't want any Link at all, set *either* parameter, or both (Link Mode or Slave Channel) to "–" (fully counterclockwise).

Several Masters can use the same Slave channels, and one channel may operate both as a Master and a Slave at the same time.

AN EXAMPLE OF LINK
Say that you want to double up the Snare (Sound Channel 2) with two other sounds. One of these is to be heard always, and this sound is on Sound Channel 7. The other one is only to "appear" when you hit the Snare very hard and this sound is on Sound Channel 8.

- Enter Edit mode and select Sound Channel 2.
- Press LINK.
- Hold down the LINK button and rotate the VALUE knob until the right numeral in the Edit display says 7.
- Release the LINK button and rotate the VALUE knob until the right numeral says any of the figures 1 to 5. Play the snare and adjust VALUE (1 to 5) until you have the desired mix between the Snare and the linked sound.

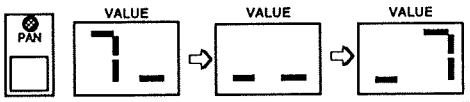
You have now linked the first slave channel to the Snare. The second one is done in a similar way:

- Press SHIFT. Its LED lights up. This indicates that you are now editing Link 2.

- Hold down the LINK button and rotate the VALUE knob until the right numeral in the Edit display says 8.
- Release the LINK button and rotate the VALUE knob until the right numeral says E (for Expanded Slave).

This second Link sound will only be heard when the Snare is played hard. You may have to Edit Sound Channel 8's VOLUME parameter also, to achieve the desired mix between this and the basic Snare sound.

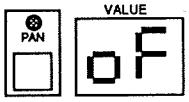
PAN



Controls the placement of each sound in the stereo image. 7– is extreme left, _ _ is in the middle and –7 is extreme right.

If you use the separate outputs, this parameter has no function.

BASS DRUM DEFEAT

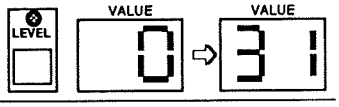


This function mutes the Output of Sound Channel 1 in the MIX Outputs.

This is a special Pan function on ddrum2 Model 3 only.

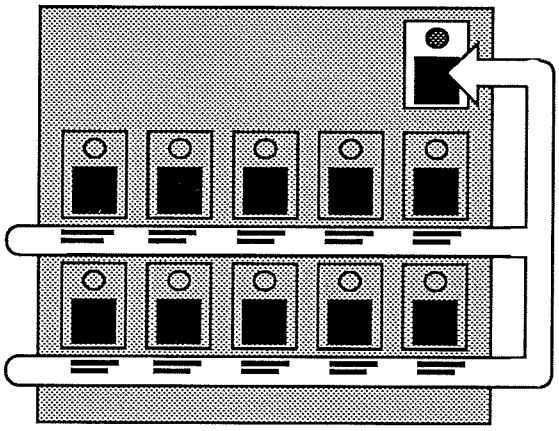
If you hold down the PAN button for a short while, the display shows oF (Off). In Off mode, Sound Channel 1 is not output at all via the MIX outputs, only via its separate output. This is primarily intended for the possibility for you to treat the bass drum separately in a mixer and the rest of the kit as one stereo "package". But, any sound can of course be played back via Sound Channel 1. This function is global, which means that it is valid for all Kits. To deactivate it, just press PAN again until the display returns to normal indication.

LEVEL



Controls the volume of each sound in the total sound mix. Zero is of course silence and 31 full volume. LEVEL affects sound volume both for the MIX OUT outputs and for the separate outputs.

THE SHIFT PARAMETERS IN GENERAL



The ten parameter buttons in the PROGRAMMING section have their main function written **above** the button. But they also have a second function. This has been introduced briefly in the description of the Link parameter on page 23.

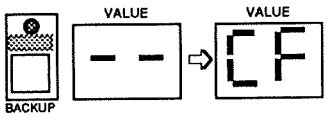
To activate this second function press the SHIFT button. The LED lights up and stays lit. The secondary function of each button is now available and the text written **below** the button is applicable.

SHIFT mode is activated until SHIFT is pressed again. The LED is then extinguished. **ddrum2** remembers the setting of the SHIFT-button even if you exit EDIT mode and enter again.

All the parameters described under sound programming are stored for each channel and for each KIT. This, however, is not the case with the SHIFT parameters. The table below shows this.

PARAMETER	STORED FOR EACH KIT?	STORED FOR EACH CHANNEL?	STORAGE METHOD
MIDI IN	NO	YES	AUTO
MIDI OUT (Global Mode)	NO	YES	AUTO
MIDI OUT (Non-Global Mode)	YES	YES	STORE
LOCAL ON/OFF	YES	YES	STORE
NOTE ASSIGN	YES	YES	STORE
GATE TIME	YES	YES	STORE
MIDI DYN EXP	NO	YES	AUTO
PROGRAM CHANGE (Global Mode)	YES	NO	STORE
PROGRAM CHANGE (Non-Global Mode)	YES	YES	STORE
TRIG THRESHOLD	NO	YES	AUTO

The parameters that are not stored individually for each kit do not have to be written to memory with the STORE procedure (see page 17). They are automatically stored each time you change their values. STORE in the "STORAGE METHOD" columns above means regular storing and AUTO means automatic storing. Backup is not in the table since it is a function rather than a parameter.



BACKUP

This is not really a parameter but rather a **function** accessed via SHIFT mode. It is used for copying the KIT memory to and from a so called RAM cartridge (**KitPac**) and via MIDI. Backup is also used to restore the 32 factory presets (KIT number 11-28) and to format old **KitPac** cartridges.

Only the settings are copied. No soundsamples are affected by these operations.

These procedures permanently overwrite Kits in the KitPac/ddrum2 Kit memory.

During all these procedures, the display shows whenever a value is replaced with a new value. If you for example save twice in a row to a **KitPac**, nothing is of course changed in the **KitPac** the second time.Therefore, no values are displayed on the **ddrum2** at that time.

TO AND FROM KITPAC

- To use a **KitPac** to store or retrieve sounds, first put it in any **SoundPac Expansion** slot.
- Press BACKUP. Select one of several Backup functions using CONTROL:
  - **Cl** Load 64 Kits from **KitPac** to **ddrum2**.
  - **Cd** Save 64 Kits to a **KitPac**.
  - **El** Load 8 Kits (saved using Ed + Copy) from a **KitPac** to **ddrum2**. The eight Kits replaces the Kits in Bank 8.
  - **Ed** Save the Kits in Bank 8 to a **KitPac**.
- When you have found the right function, press COPY. The display "counts" during the procedure. Here are the possible combinations:

Observe! Saving 8 Kits in a KitPac does not affect the normal 64-Kit memory in the cartridge. Bank 8 in ddrum2 is saved as a ninth Bank in a special memory area in the KitPac. This function makes it very practical to use Bank 8 as a "notepad".

Old **KitPacs** that have been used with earlier versions (before 2.0) of **ddrum2** must be formatted before they can be used. Put the KitPac in any slot, dial in CF and press COPY. This erases the KitPac and prepares it for 2.0 and later versions.

TO AND FROM MIDI

You can also transfer your Kit settings via MIDI as so called System Exclusive codes. This allows you to store your Kits on for example computer disks, together with the songs you have created with your sequencer program. You can also use dedicated librarian programs or other devices use to store or load MIDI data.

When you send out 64 Kits via MIDI, these are sent out as 8 System Exclusive packages of 8 Kits each. They are sent with a short pause between each one. This pause must be preserved in the recording when you send the Kits back to the ddrum2. This means that sequencing software used for recording music will probably work perfectly, while a librarian program or similar which do not consider the timing between the packages will not work. Also, sending out or loading 64 Kits may take some time (up to two minutes).

To save via MIDI (dump) you must connect the MIDI Out of the **ddrum2** to the MIDI In of the Storing device.

- Press Backup on the **ddrum2** and dial in the right combination in the EDIT window, using the CONTROL knob.
  d1 Dump one Kit to MIDI. The Kit sent out is the one that was selected when you entered EDIT.
  d8 Dump one Bank to MIDI. The Bank sent out is the one that was selected when you entered EDIT.
  dA Dump one complete set of 64 Kits to MIDI.
- Put the storing device in "record mode".
- Press COPY. The display "counts" during the procedure.

When the operation is complete, **ddrum2** automatically exits EDIT mode. If possible, check on the receiving unit that the Kit(s) have been recorded.

To load via MIDI you must connect the MIDI Out of the storing device to the MIDI In of **ddrum2**.

- Press BACKUP and dial in the right combination on the **ddrum2** display.
  L1 Load one Kit into **ddrum2** via MIDI. The Kit is stored on the Kit number selected when you entered Edit.
  L8 Load one Bank of 8 Kits into **ddrum2** via MIDI. The Bank is stored on the Bank number selected when you entered Edit.
  LA Load one complete set of 64 Kits into **ddrum2** via MIDI.
- Press COPY.
- "Play back" or in any other way send out the Kit(s) to the **ddrum2**.The display "counts" to show the incoming messages.

After loading, **ddrum2** automatically exits EDIT mode, and this is your verification on that something has actually been loaded.

All the MIDI operations described above are done using System Exclusive messages.

RESTORE FACTORY PRESETS

Kit number 11 to 48 can automatically be replaced by 32 factory Kits without any use of cartridges or MIDI connections. This of course erases the Kits currently stored under number 11 to 48.

- Enter Edit Mode.
- Press Backup.
- Dial in FP in the EDIT display and press COPY. The display "counts" during the procedure.

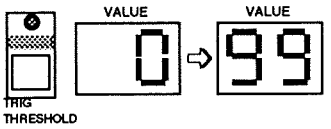
KIT PAC FORMATTING

Old **KitPacs** must be formatted before they can be used with software version 2.0 or later. This function is primarily intended for people who have upgraded an older **ddrum2** and have KitPacs they want to use after the upgrade.

Kits saved in the old format can not be loaded in the new format.

Formatting a KitPac erases its contents and prepares it for use with version 2.0.

- Enter Edit Mode.
- Press Backup.
- Dial in CF in the EDIT display and press COPY.



TRIG THRESHOLD

TRIG THRESHOLD can be set individually for each channel, but remains the same for all Kits.

This parameter is the threshold value for the Pad Inputs. Signals present at a given channels PAD INPUT jack are read by the unit. Only those signals that are **over** the TRIG THRESHOLD level result in a sound being triggered.

TRIG THRESHOLD is normally set to 10 for all Sound Channels except number 2, which is set to 5. However, sometimes unwanted triggers from several pads on the same stand might occur. Even extremely loud sounds from speakers can trigger sounds. Try raising the TRIG THRESHOLD a little for the channel with which you have a problem.

It can also be useful to change the TRIG THRESHOLD when triggering **ddrum2** from sources other than playing pads. In a studio you might want to replace a sound that is already on tape with a **ddrum2** sound. Exactly how to trigger with external sources is described on page 48, Triggering.

TRIG THRESHOLD's function in this context is to "mask out" sounds, or parts of sounds that are below a certain level. This is useful when you want to make sure that you don't get extra triggers from background noise (for example leakage from other tracks), or when you trigger with long sounds, since these have a habit of giving double triggers.

DDRUM2 AND MIDI

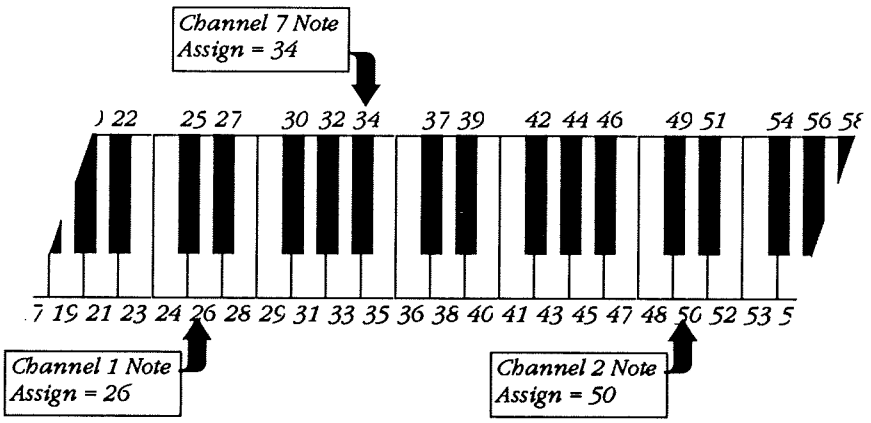
Some of the SHIFT parameters control the MIDI interface. The following is a description of them. Those who feel insecure about how **ddrum2** fits into a MIDI system should read the next paragraphs.

MIDI is an acronym for Musical Instrument Digital Interface and is a standard for transmission of data between musical instruments controlled by microcomputers. Later, the concept has expanded to include all kinds of music related products (mixers, effect units etc.) and even personal computers.

The MIDI specification is divided into an "electronic" part that says (among other things) what circuits and plugs are to be used, and another part that regulates the language itself. Different messages (like "play the note C3 with force 45") are represented by different combinations of figures.

MIDI was designed for communication between piano-like keyboards. Therefore, drum applications are something of a compromise. A note consists of a **key number** (0 to 127, middle C on a 5 octave keyboard is 60), **velocity** (a code that corresponds to how hard you hit the key, also 0-127) and a **MIDI-channel** that the whole package is sent on (1-16). When a note is to be turned off the same pack of data is sent, but with a code telling the receiving unit that this is the end of the note.

With **ddrum2**, each drum (and thereby sound channel) corresponds to a note-number. That's the way it is with all MIDI drum instruments. But there is no standard to what number should correspond to what drumsound. That's why there is a NOTE ASSIGN parameter on **ddrum2**.



Each key has a number in MIDI and you can assign a Sound Channel to one of the keys via these numbers.

The velocity values correspond to striking force. See page 38, MIDI DYNAMIC EXPANSION for details.

MIDI CHANNELS

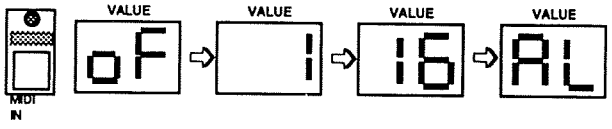
MIDI channels are similar to television. All the possible channels are available in the air (in our case in the MIDI cable). It is the receiving unit that determines which channel you see (in our case hear) by its settings.

This makes it possible to connect several MIDI instruments and effect units via MIDI IN, OUT and THRU and have them reproduce different parts of a musical piece (drums, strings, horns and so on). All the information can come from one source. In the TV allegory the transmitter, and in our case, perhaps, a sequencer.

The MIDI Channel number is something that is included in each MIDI message that is sent, like for instance a note message. Each unit in a MIDI system can be set to receive on one or more channels. This simply means that it only plays notes that have the same MIDI Channel number as it is set to. All other notes are just ignored. If a unit for example is set to MIDI Channel 10, it will ignore notes with any other MIDI Channel number that it receives via its MIDI In jack.

THE MIDI PARAMETERS

MIDI IN



This parameter is set individually for each sound channel, **but once for all Kits**. Once set, you do not have to store it with the STORE function. This is done automatically.

Each Sound Channel can be set to receive on a certain MIDI Channel. When a MIDI note code is present at **ddrum2**'s MIDI In jack, a drum sound will be played back if there is a **ddrum2** channel set to the right MIDI-channel and with a corresponding NOTE ASSIGN number. The velocity code corresponds to striking force.

The first value (OF) means that the sound channel is completely turned off for incoming MIDI signals.

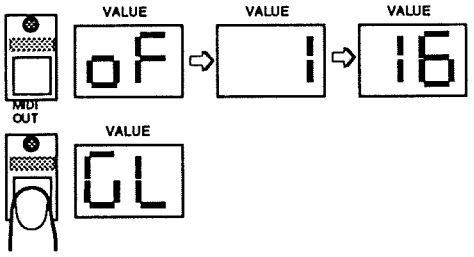
Values above OF (1-16) correspond to the MIDI-channel the sound channel is receiving on. This is not necessarily the same as the one it is sending on.

The last value (AL) is the same as Omni mode. This means that the sound channel reacts to all MIDI-information regardless of which channel it comes in on.

Normally you will not set each Sound Channel to a different MIDI Channel, but rather group the different categories of percussion on one MIDI channel each.

If the sending units channel-number doesn't correspond to the one set with the MIDI In parameter, the ddrum2 sound channel will react as if MIDI was completely shut off.

The MIDI-channel set for sound channel 8 is called the base channel. Program changes are received on this MIDI-channel only.



MIDI OUT

GLOBAL MODE
This is a special value for the MIDI Out parameter. When ddrum2 comes from the factory, it is set to Global Mode.

In this mode, the MIDI Out parameter can not be set by the user directly. Instead, it is automatically set to the same value as the MIDI In parameter. This means that the MIDI In parameter is used to set both the MIDI In and the MIDI Out Channel number.

The *MIDI In* parameter is set individually for each Sound Channel, but once for all Kits. This means that in Global Mode, when MIDI Out follows MIDI In, you can make each Sound Channel send on a different MIDI Channel, but all Kits have the same settings.

This mode is probably the best to use when you simply want to record your playing into a sequencer, and when don't play any external units from the pads.

Here is how to enter and exit Global Mode:

- Enter Edit mode.
- Press and hold the MIDI Out button for one or two seconds. The display shows GL (Global).
- If you press and hold the button again, the display goes back to showing the MIDI Channel number.

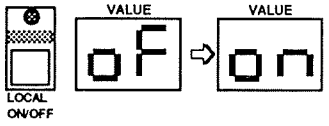
The Mode set (Global or Non-Global) also affects the Program Change parameter, see page 37.

NON-GLOBAL MODE
In Non-Global Mode, you can have individual MIDI Channel settings for each Sound Channel in each Kit. These settings are saved with the Kit when you Store. This mode is perfect when you are playing external units or use a larger MIDI setup in any other, more complex, way.

The fact that each Sound Channel can be set to send on a certain MIDI Channel. allows you to play external sounds via MIDI and to select new sounds on new MIDI Channels when you switch to a new Kit.

The first value (OF) means that **ddrum2** does not send any MIDI signals from that sound channel.

Values above OF (1-16) tell the sound channel to send out MIDI information on the MIDI-channel shown in the VALUE display. This is not necessarily the same MIDI-channel as the one you are "listening" to (the one set with MIDI IN).

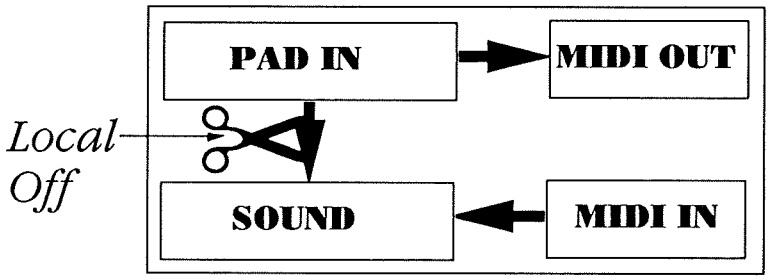


LOCAL ON/OFF

This parameter is set individually for **each channel** in **each KIT**, and is stored with the KIT when you go through the STORE procedure.

When LOCAL is set to On, **ddrum2** works just as usual. When turned Off (shown as oF) the signal from the pad will not produce a **ddrum2** sound at all.

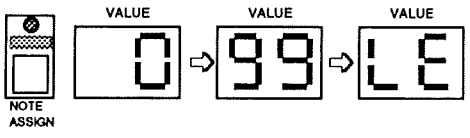
The signals from the pads are however still sent out as note codes over MIDI (if MIDI isn't turned off, of course). The channels are also still set to receive and play back sounds corresponding to incoming MIDI signals in this mode (again if MIDI is turned on).



Local Off cuts off the internal communication between pads and sounds.

When your **ddrum2** is controlling external equipment it is often desired to divide things so that one pad plays a sound on for example a sampler, while the others are playing **ddrum2** sounds. When **ddrum2** is controlled by other equipment you might want to have for example the bass drum sound played by a sequencer, and the other sounds from pads.

This function also makes it possible to "process" your MIDI information in an external device before sending it back to **ddrum2** to "fire off" the sounds.



NOTE ASSIGN

This function is also stored individually for **each channel** in **each KIT**, and stored with the KIT in the STORE procedure.

With this parameter it is possible to select which MIDI note-number is to correspond to which **ddrum2** channel. In that way you can match the setup of the drumsounds in a drum machine or sampler with your **ddrum2** sounds, so that snare pad plays a snare sound and so on.

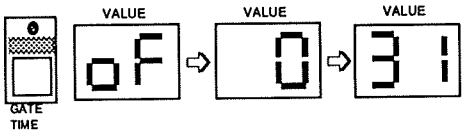
The values (00-99) correspond to the first 99 MIDI note numbers. The picture in the paragraph "DDRUM2 AND MIDI" explains this parameter further.

You can also set the note number by playing a connected MIDI device, which is handy if you for example know which key on a sampler plays back the right sound but feel insecure about which note number the key corresponds to.

- Select the parameter Note Assign and dial in the value LE (short for Learn—shown after 99).

- Play a key on the connected keyboard, or send in any other way a Note On message to **ddrum2**'s MIDI In.

The Sound Channel is now programmed to react on that note number. If you want to repeat this procedure for several Sound Channels, you have to select each one and dial in LE individually for each of them.

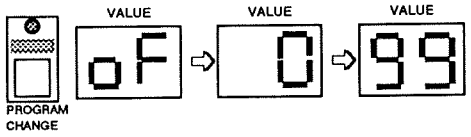


GATE TIME

This function is also stored individually for **each channel** in **each KIT**, and stored with the KIT in the STORE procedure.

Since there is no way to play a drum legato, the MIDI system with Note On and Off is really not the best for drum applications. However, you need to be able to set **the time between the On and the Off** code sent out when you play the pads, so that sounds on synthesizers or samplers play with a suitable length. This is done with GATE TIME.

This parameter can be set from 0 to 31, which corresponds to 3 milliseconds to 30 seconds and to Off (shown as oF) which means that no MIDI messages are sent out at all from that Sound Channel.



PROGRAM CHANGE

In the MIDI specification there are also provisions for sending and receiving information that make several instruments or other MIDI units switch to new programs simultaneously. This can be used for calling up new sounds on a sampler, to switch to a new setting on an effect unit and much more.

IN GLOBAL MODE

When the MIDI OUT parameter is set to Global Mode, only one Program Change is sent out when you select a KIT from the front panel. This Program Change message is sent on the MIDI Channel set for Sound Channel 8.

With the Program Change parameter you can select if (and in that case which) Program Change number is to be sent out.The first value (oF) means that no number is sent out at all. The following ones (00-99) are the first 100 Program Change numbers as defined by the MIDI standard.

IN NON-GLOBAL MODE

When MIDI Out is set to Non-Global Mode one Program Change message for each Sound Channel is sent out when you select a certain KIT from the front panel. The Program Change messages are sent on the MIDI Channel set for each Sound Channel using the MIDI Out parameter.

This means that eight program Change messages on any combination of up to eight different MIDI Channels can be sent out when you select a Kit.

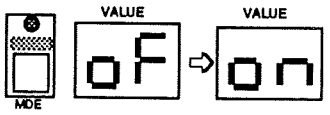
The first value (oF) means that no Program Change number is sent out at all. The following ones (00-99) are the first 100 Program Change numbers as defined by the MIDI standard.

When you have the PROGRAM CHANGE parameter selected in EDIT mode, Program Change numbers are sent out continuously when you turn the Control knob. This simplifies a search for the right Program in an external unit.

The PROGRAM CHANGE parameter has no effect on incoming Program Change messages. These are received only on the MIDI-channel set for sound channel 8. An incoming Program Change number makes ddrum2 switch to the KIT displayed as the number of the sent MIDI Program Change. This means that if you send Program Change "23" (decimal) to ddrum2, it will switch to KIT 23.

You can also use the **KitSelector** (option) to select Kits in an even more convenient way. The **KitSelector** is small and lightweight and easily put on a stand among your pads. In that way you can pre-program the order of your Kits for any performance and keep the **ddrum2** unit in a rack, together with other equipment on any distance from your Kit. The Kit Selector normally doesn't send MIDI Program Change messages to the **ddrum2** but rather System Exclusive "Kit Change" messages. These in turn can make the **ddrum2** send out up to eight Program Change messages to other units.

MIDI DYNAMIC EXPANSION



MIDI velocity is divided into 128 steps. This approximately corresponds to 40 dB. The **ddrum2** velocity range is a lot better, approximately 60 dB. The MIDI Dynamic Expansion parameter sets how these two worlds of dynamics should correspond to each other.

When using **ddrum2** as both a playing and playback MIDI device (as when recording your playing into a MIDI sequencer) you should set this parameter to **ON**. This ensures that the whole **ddrum2** dynamic range can be used.

On the other hand, when you are feeding **ddrum2** with MIDI data which origins from other devices such as keyboards, drum machines and so on, or when you are using **ddrum2** playing pads as an input source for a MIDI sound device, this parameter should be set to OFF (shown as OF). This ensures a one to one relationship between each dynamic step in **ddrum2** and the MIDI device. But, in OFF mode you cannot access the lower parts of the **ddrum2** dynamic register.

One pretty special way to use the MDE parameter is to record into a MIDI sequencer with it set to On and play back with it set to Off. This gives you a slightly compressed dynamic characteristics on playback.

MORE MIDI

DEFAULT MIDI SETTINGS

The MIDI parameters are set to the following values in the factory programs:

- MIDI In is set to Channel 1 for all Sound Channels.
- MIDI Out is set to Global (GL) mode.
- The Note Assign parameter is set as follows:

Sound Channel	MIDI note-number
1	37
2	49
3	51
4	58
5	56
6	54
7	0
8	0

- Program Change is set to the same number as the Kit number.
- Gate Time is set to 5.

"DOUBLE NOTE ON"

Some manufacturers of drum machines with tunable sounds stepped outside the MIDI standard and used special double note on messages to be able to enable transmission of information about both the drum in question and its tuning.

ddrum2 only uses the real MIDI-note number and ignores information about how the drum is tuned. This ensures compatibility with all kinds of equipment.

RUNNING STATUS

There is also a practice of leaving out superfluous so called status codes when sending MIDI information. **ddrum2** always sends complete Note Off packages, but recognizes both types of messages ("Complete Note Offs" and "Running Status").

ddrum2 can't presently handle Running Status for Program Change numbers.

GOOD DRUM SOUNDS

ABOUT YOUR SOUND SYSTEM

ddrum2 is a completely electronic drumkit and therefore totally dependent on a good sound system. All sounds are recorded in the best studios. So for best results, use good quality amplification.

The total sound will never be better than the sound system used.

- We recommend a system that reproduces all sounds as clear, strong and unadulterated as possible. PA-systems, studio monitors with good amplifiers and systems specially designed for electronic drums belong to this category. The attack parts of drum and percussion sounds are very rich in transients, and therefore require adequate sound-power and a fast power amplifier to sound *good* (not to sound loud). Do not underestimate the effect and speed requirements of the amplifier.

- A hi-fi system can be used, and will probably sound good. There is however a chance of serious damage at higher levels, and it can therefore not be recommended.

- Guitar and bass amplifiers are in most cases a bad choice. They are made to color the sound of the instrument in a way not suitable for drums.

HEADPHONES

Choose a pair with low impedance and high sensitivity. A hi-fi specialist or music dealer can help you select a pair. **Sony** headphones from their "digital" series have proven to be excellent!

MIXER

ddrum2 has a built in mixer. For those who want to mix the sound with more instruments or use many different effect units, it might be necessary to purchase a larger mixing console. Your music dealer knows what is suitable.

All ddrum2 outputs are line level. If possible, use the line inputs on the external mixer. If it has no such inputs, be careful with the input gain settings. Too high imput amplification (as when using microphone inputs) may lead to distorted sound.

DYNAMICS

Adjust dynamics properly! It is so easy to do and makes a lot of difference to how the sounds are perceived.

GENERAL PROGRAMMING TIPS

- **Be careful with Bass and Treble**. It is easy to crank them up to get more "power" out of the sound. Turn them back down and raise the volume instead! This is extra true about bass drums and the BASS parameter. TREBLE on the other hand is a good way to bring out the click of the beater against the drum.
- **Natural Pitch**. Most sounds are at their natural pitch with PITCH set to 64 (and PITCH BEND AMOUNT set to "– –" of course).
- **Long Decay**. A sound that feels okay by itself might be too long when played together with other drums in the kit. Toms especially have a tendency to become indistinct. Many of the snare sounds are recorded with compression which raises the volume of the snare rattle. To avoid a "sloppy" sound it might be a good idea to turn down Decay a little.
- **Pitch bend**. Is at its best with toms. **ddrum2** tom sounds are prepared especially for this. Bend on acoustic drums is a function that varies with striking force, and it is therefore also dynamic in the **ddrum2**. If the Bend function is to work properly, Gain has to be well adjusted. Here are some recommended settings for different types of sounds:

Instrument	PbAmt	PbRate
Toms	L 4	20
Timbales	L 2	20
Kicks	L 5 - 7	0
Timpanies	L 3	25
Roto Toms	L 4	– –
Chinese Op. gong	r 7	29

  PITCH BEND RATE set to "– –" makes the sound "jump" in pitch depending upon how hard you hit the pads (see page 22). If you are careful with this effect it can be used to liven up snare sounds a bit.
- **Even Levels**. Sharp sounds are perceived louder than dull sounds. Therefore it is important to set LEVEL for the sharp sounds carefully so that a good mix can be achieved. Too low a level leads to background noise so you have to find an intermediate position.
- **Tuned Percussion**. In the **SoundPac** library you can find **SoundPac** cartridges with tuned sounds (like timpanies). Use the fact that 8 steps in PITCH equals one semitone and turn your drumkit into a mallet instrument.

LINK TIPS

Link is one of the more exiting functions in the **ddrum2**. Here are some tips about it:

- **Example Kit.** If you want to check what the Link function can do for you, without programming yourself, call up Factory Kit 21. The Snare uses sound 74 and is crossfade-linked to Sound Channel 8 which plays sound 75. The toms are all Expanded Slave-linked to Sound Channel 7 which plays a short noise sound. Check how the sounds vary with dynamics.
- **Straight doubles**. Create a new sound by putting two sounds together.
- **Stereo.** Put the same sound on Master and Slave channel and PAN them in different directions. Also try to make them differ a little, a couple of steps in PITCH for example.
- **Click** Couple a short sound together with a long one. If the short one is very dynamic (for example with big differences in pitch) you end up with a sound that has an extreme dynamic attack but an even decay.
- **Noise**. There are three noise sounds in the Internal Sound Memory
  8b White noise.
  8c Noise with dynamic timbre

8d Low frequency noise.
Use these as slave sounds to toms, timpanies and similar sounds to enhance the sound of the stick or club against the skin.

- **Sympathetic vibrations.** An acoustic snare rattles a bit even when you hit the other drums. Put a snare sound channel with very little BASS as a Slave to **all** drums. The Slave sound mustn't be too loud.
- **Crossfade.** In the Internal sound bank you will find several examples of the same snare recorded twice with different playing styles, eg 74 and 75, or 76 and 77. There are also percussion sounds handled in the same way, the cowbell on 6b and 6c and the conga sounds on 65 and 66 for instance. If you use one of these sounds as a Master, the other is perfect for a Mode C Link. An example:

a. Select Sound 74 for the Master Sound Channel (probably Channel 2, the Snare).
b. Set Sound Channel 7 to play sound 75.
c. Set up a Crossfade Link from Channel 2 to Channel 7 by setting Link 1 to 7C for Sound Channel 2.

The rimshot sound now gets louder when you hit harder and takes over completely at the hardest hits.

- **Expanded Slave.** This function mixes in a new sound (the linked sound) when you hit hard. Use this to:
- Mix in a very short (low DECAY value) version of the noise sounds 8b, 8c or 8d with your toms. This gives you a very natural click sound.
- Make extreme sounds to be mixed in with your regular sounds. Remove all bass or treble and use low DECAY settings. This gives you interesting dynamic effects.
- Set up a sound with an extreme pitch bend effect and Link this to a bass drum sounds for a dynamic and interesting bass drum sound.

ACCESSORIES

We would also like to take to opportunity to tell you something about a few accessories for your **ddrum2** kit.

- **KitSelector.** This Kit switching remote device speeds up selection of Kits and frees up precious space among the pads. Switching is so fast — just hit it once with the stick— that you may very well select a new Kit during the course of a song, which in effect extends your drum kit by several sound channels. A more cost effective alternative than buying several **ddrum2**'s!
- **ddrum Tube.** The red metal Tube is great for playing hard percussion sounds like cowbells. By using the Crossfade function you can assign two sounds to one Tube and play typical cowbell patterns with one hand. The Tube has the same dynamic range as the pads.
- **ddrum SoundPac.** We have a growing library of extra sounds on cartridge. Ask your dealer for the latest list!.
- **ddrum KitPac.** This is a RAM cartridge that allows you to make backups of your Kits and that can at the same time be used as a scrap book. Save all your Kits onto one KitPac and you still have space for a Bank of eight sounds left in the KitPac for temporary use.

PLAYING PADS

Most TomTom and Rack stands that fit TAMA-type brackets can be used for **ddrum** Tom and Snare. You will easily find stands to suit your needs.

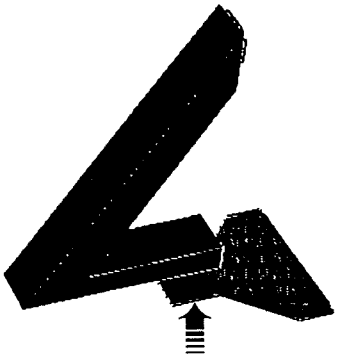
KICK

The Kick comes in three major parts:

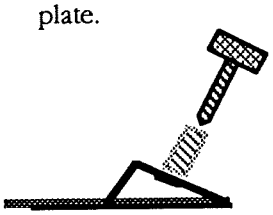
1. The "angle" with the head
2. The bottom plate.
3. The clamp where you put the pedal.

Some screws, springs and two Allen keys are also included. The smaller Allen key is for TOM and SNARE.

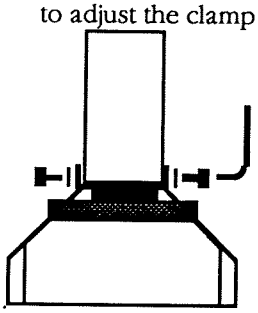
- Attach the bottom plate to the angle with the three screws included (a coin can be used) with the rubber surface upwards.



- Insert the two anchoring screws (with the springs) in the holes in the bottom plate.



- Attach the bass pedal clamp, with the rubber surface upwards, at the end of the Kick. Use the Allen key. Do not tighten it yet. Use your bass drum pedal to adjust the clamp to the correct height.



- Tighten the clamp with the Allen key (M8).
- Adjust the pedal beater so that it hits the center of the Kickhead.

It is important, both for the sensitivity and life of the Kick, that the beater really hits the center of the head.

Use a felt beater for best playing comfort and least wear. Remember that the quality of the beater does not affect the sound at all.

In the preprogrammed Kits, all bass drum sounds are on Channel 1, labelled **Kick** on the back. We recommend that you use this input for the Kick.

SNARE

The Snare differs from the Tom in that it has two outputs. One signal comes from the head, and one from the rim (one output is labeled RIM). This makes it possible to play two sounds from a single Pad, by connecting the Snare to two channels. A completely unique design makes the rim totally isolated from the skin.

The Snare fits all regular snare stands. It is fastened just like an ordinary snare, but remember to leave room for the two outputs at the bottom.

In the preprogrammed Kits all snare sounds are on Channel 2 and all rim sounds on Channel 3. We recommend that you use these inputs (labelled Snare and Rim on the back) for the Snare.

TOM

When you set up Tom on its stand, make sure the wing nut is loose enough to allow the Tom to move freely, before you try to change the angle of the pad.

In the preprogrammed Kits, all tom sounds are on Channel 4, 5 and 6. We recommend that you use these inputs (labelled Tom 1, 2 and 3 on the back) for the Toms. Tom 1 is highest in pitch.

DDRUM2 ON STAGE

ddrum2 is in its prime when used on stage. No other drumkit sounds as good and demands so little maintenance and extra equipment as **ddrum2**.

ddrum2 can be mounted in a 19" rack case with the brackets supplied.

The **ddrum KitSelector** (optional) is really the only thing you need close to the playing pads.

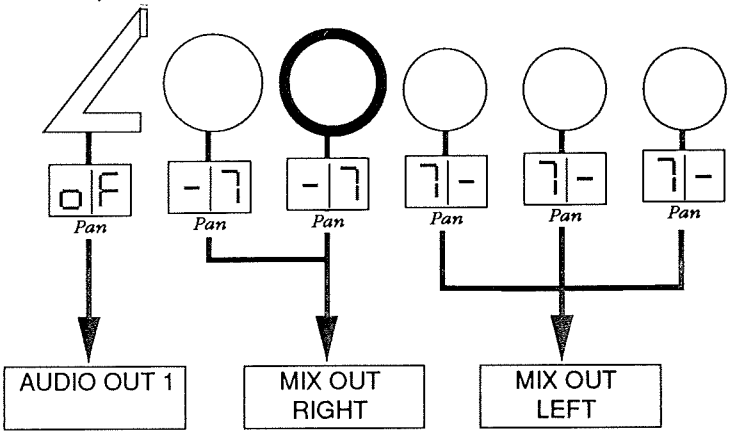
On stage, when you often wish you had more channels in the mixer, the stereo outputs can very well be used as a separate monitor mix to the drummers own sound system.

All sound outputs are at unbalanced line level.

Even if you use the separate outputs, one or both MIX OUT can be connected to the P.A. mixer. In that way you can achieve three different drum monitor mixes. One from the external mixer monitor sends, and two from the MIX OUTs.

The fact that Sound Channel 1 can be removed from the stereo mix using the special PAN function on all **ddrum2 Model 3** can be of great use when you don't have as many channels in the external mixer as you would wish. Try this:

- Pan the Snare and the Rim fully right. Use the RIGHT MIX OUT jack as a snare output.
- Pan all the Toms fully left. Use the LEFT MIX OUT jack as an output for toms only.
- Use the Bass Drum Defeat parameter to remove the bass drum from the MIX OUT jacks, and use AUDIO OUT 1 as an output for the bass drum.



This method gives you three mixes of the three most important parts of your Kit, the Snare, the Kick and the Toms, directly from your **ddrum2**.

Remember to take it easy on the BASS and TREBLE controls. What sounds good in a damped small rehearsal studio might very well be to much in a large concert hall.

Also remember that to loud monitor level can lead to double triggers from the pads. Try raising Sensitivity a little for the Sound Channel with which you have a problem.

The **ddrum2** MIDI interface can be used in a number of ways on stage. Since LOCAL ON/OFF, MIDI OUT and NOTE ASSIGN can be programmed individually for each channel in each KIT, it is easy to put together a system where a few

pads play other MIDI-instruments (like drum machines and samplers). In the same way you can automate a few of **ddrum2**'s sounds by playing them over MIDI (from a drum machine or sequencer) while other sounds are played from the pads as usual. You can even use synthesizers and play different notes from different pads by setting the Note Assign numbers.

When you switch to another KIT on **ddrum2** up to eight different Program Change numbers set with PROGRAM CHANGE can sent out. This can be used to match effects (like reverbs and echoes) or setups in samplers and similar, to certain drumkits.

DDRUM2 IN THE STUDIO

The separate outputs of course come to their own right in the studio, and the two MIX outputs can be used for monitoring if the mixer channels fall short.

All sound outputs are at unbalanced line level.

The MIDI interface can of course be used to control other instruments or to run **ddrum2** from another MIDI device just as you would on stage (see **ddrum2** on stage, the previous chapter).

In the studio you can store the actual drum playing in a sequencer via MIDI. Once there, you can edit it and play it back with **ddrum2** or any other MIDI drumsound device. Put **ddrum2** in MIDI Dynamic Expansion (MDE) On mode, and remember that the superb dynamic range can not be fully retained over MIDI. This is mainly apparent when playing very soft.

When you record **ddrum2** into a sequencer, each pad hit will arrive at the other end of the MIDI cable about 2 to 5 milliseconds later than you hit the pad. The same delay applies when you play back music from the sequencer. **ddrum2**'s MIDI interface is faster than most other drum to MIDI converters and drums with MIDI on the market. A delay of 2 to 5 milliseconds corresponds to the time it takes for sound to travel through air about 0.6 to 1.5 meters (2 to 5 feet), so it's not a big deal, really. You will probably find that most synthesizers are a lot slower. Anyway, if you are really sensitive to this lag you have to compensate in the sequencer by "sliding" the drum track in time. The sequencer's manual will explain how to do this.

Using a sequencer, you can store and have full control over the drums up until the final mix, without using any tape tracks at all.

Triggering when using the PAD INPUT jack for other sources than **ddrum** pads is described on page 48, Triggering.

TRIGGERING

When you work in the studio you often want to replace an existing drum sound, that is either on tape or comes from a drum machine. In the latter case you sometimes can do this over MIDI, but not always.

The solution is to "trigger" one sound from another. Unlike digital delays with trig inputs, **ddrum2** is **dynamic** — the trigger signal transfers its volume to the triggered sound.

When you trigger a sound you replace the signals from the playing pads with signals coming from tape recorders, microphones, drum machines, mixers or similar. To get the best possible results follow these tips:

- The Trig-signal should be approximately line level, or peak at 5 Volts.
- Remember to adjust SENSITIVITY as you would with the pads.
- To a certain extent, the triggered sound gets the same contour, or envelope, as the triggering signal. If the resulting sound feels "slow" the reason might be that the trigger signal has a slow attack.
- Signals that take some time to rise to full volume level (like bass drums, believe it or not) may need some extra treble boost before using as trigger signals for **ddrum2**.
- If background noise disturbs the trigger, this can be masked out with a raised TRIG THRESHOLD.
- If a double trigger occurs, as when playing flams, this can also be adjusted with TRIG THRESHOLD or by filtering out bass in the trigger source sound. Be careful if the trigger signal varies a lot in level.
- If it still does not sound right, try shortening the trigger signal with a noise gate.

MAINTENANCE

DDRUM2

ddrum2 is normally not exposed to serious wear and tear and shouldn't require any real maintenance. Clean it with a soft, lightly moistened cloth. Do not use any solvents.

Avoid using or storing **ddrum2** in cold and humid places. The electronics are designed to work at temperatures between 0° and 50° centigrade. If the unit has been kept in a cold place, it needs a chance to regain room temperature before it is used.

The KIT memory in **ddrum2** is retained in an EEPROM when power is turned off. This means that there is no battery replacement required. The sound samples are in EPROM's and can not be accidentally erased by the user.

There is a fuse in a holder on the back of the **ddrum2**. This is 250 mA for 230V, and 500 mA for 115V environments and slow-blow in both cases. Make sure you always carry a spare.

PADS IN GENERAL

Always make sure that the pads regain normal room temperature if they have been kept at a low temperature. The plastic becomes brittle when cold, and might crack. Also avoid extreme heat.

TOM

The Toms are made of a plastic material that should be cleaned with a soft cloth every now and then. Do not use any solvents.

The head should be replaced when worn out. If it becomes too uneven, the pad looses its sensitivity and "dead spots" might show up. When you replace the head, check that the foam layer underneath has not turned porous. This reduces sensitivity. The foam layer is a spare part. Contact your dealer for a replacement.

Remember that playing with worn out or damaged heads ruins both sensitivity and feeling, and wears out the foam. Any 10" drum head can be used.

SNARE

Wipe of the surface every now and then, as with the Toms. Do not use any solvents.

The Snare is the pad you use most, and it probably takes a beating. Therefore it is very important to replace the head as soon as it is worn out, so that the foam underneath is not damaged. If it has become porous and lost its springiness, it is time to replace it. The foam layer is a spare part. Contact your dealer.

The Snare requires a 12" drum head.

KICK

The Kick is of sturdy and solid construction. It is lacquered, so do not use any solvents when you clean it.

The Kickhead is designed to feel like a bass drum head. What follows are a couple of tips to make your Kick last long and live well:

Use a felt beater. It gives you the best comfort, and it will prolong the life of the head. The type of beater you use does not affect the sound.

It is important that the beater hits the middle of the Kickhead. The Kick is made to correspond to a 22" bass drum.

If you always bring extra drumheads with you when you work, then maybe you should bring an extra Kickhead. A head lasts a year under normal circumstances but a year passes quickly!

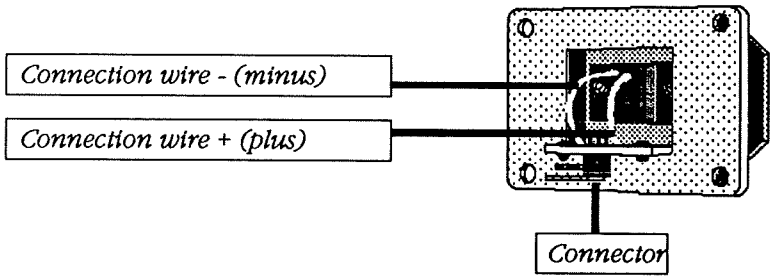
If the Kickhead has to be replaced, this is how to do it:

1. Unscrew the four bolts, take a firm grip on the head and pull it slowly towards you.

2. Under the head you will find a cable with a small female connector which is easily removed by lifting the tongue that locks the contact to the Kick.

3. Take the new head, make sure the two wires are not short-circuited, and plug it in, just as you unplugged the old one.

4. Put the bolts back, and you are ready to play again. The whole procedure shouldn't take you more than a couple of minutes.



TROUBLESHOOTING

If something isn't as it should, check the following list. If it still doesn't work, contact your dealer.

The rack is completely "dead".	Check the fuse. If blown, check the rate of the old fuse and replace it. Is there any power in the wall outlet?
All lamps are lit as normal, but there is no sound.	Check Mix Level and Headphones Level. Select another KIT. Are the cartridges in their correct slots?
There is no sound from one of the channels, even though the TRIG LED operates normally.	Check that SENSITIVITY isn't set too low. Are the cartridges in their correct slots? Is there any SOUND assigned to that channel in that KIT? Is LOCAL set to Off for that channel? Is LEVEL set to to zero for that channel? Is the sound panned fully left or right?
No Sound from Sound Channel 1 in the MIX OUTputs.	Check the Bass Drum Defeat parameter.
The sound is distorted.	Check the sound system. It isn't very likely that **ddrum2** is causing this one. Remember that all outputs are line level. The problem is not that PEAK lights up on any of the channels. **That indication has nothing to do with the sound itself, only dynamics**.
MIDI doesn't work.	Are the MIDI cables properly connected? Check the parameters MIDI IN and MIDI OUT. Check the MIDI channel. Check that the note numbers match NOTE ASSIGN. Check the other MIDI devices. Are you sending something **ddrum2** ignores? Check the MIDI Implementation Chart, page 53.

Strange double notes or flanger effects occur when using MIDI.	Check that the sequencer you are using is not set to Thru On, or that you have set up a MIDI loop in some other way. A MIDI loop is when you are playing the sounds from the pads directly, but also send out the pad signals as MIDI messages, and these MIDI messages are also immediately sent back to the ddrum2, playing each sound a second time.
One of the playing pads doesn't respond as it should.	Check the cable.
Each time you hit a pad you get double triggers or when you hit one pad, another sound is also triggered.	Raise the TRIG THRESHOLD setting for the Sound Channel with which you have a problem.
One of the playing pads responds unevenly.	This is probably because the head is worn out, or because the foam layer has become porous (or both). Check that SENSITIVITY is properly adjusted.
The KICK responds unevenly.	Check that the foam layers aren't completely worn out. If they are, the Kickhead needs to be replaced. Check that SENSITIVITY is properly adjusted.

MIDI IMPLEMENTATION CHART

Model: **ddrum2**

Date: July 6, 1989
Version: 2.2

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Channel	1-16 1-16	1-16 1-16	Individual for each Sound Channel.
Mode	Default Messages Altered	Mode 3 x *******	Mode 1, 3 x x	Individual for each Sound Channel.
Note Number	True Voice	0-99 *******	0-99 x	
Velocity	Note ON Note Off	o v=1-127 x	o v=1-127 x	
After Touch	Key's Ch's	x x	x x	
Pitch Bender		x	x	
Control Change		x	x	
Prog Change	True#	0-99 *******	11-88 See Notes	Sent on Base Channel only (the MIDI Channel selected for Sound Channel 8).
System Exclusive		0	0	"Kit Change" Commands only.
System	:Song Pos :Song Sel :Tune	x x x	x x x	
System Real Time	:Clock :Commands	x x	x x	
Aux Mes-sages	:Local ON/OFF :All Notes Off :Active Sense :Reset	x x x x	x x x x	
Notes:	1. **ddrum2** accepts Running Status but sends complete Note Offs. 2. Recognized Program Change numbers are: 11-18, 21-28, 31-38, 41-48, 51-58, 61-68, 71-78, 81-88, others are ignored.			

MODE 1: OMNI ON, POLY MODE 2: OMNI ON, MONO o= Yes
MODE 3: OMNI OFF, POLY MODE 4: OMNI OFF, MONO x= No

ddrum2 model4

Operation Manual Supplement

INTRODUCTION

ddrum2 Model 4 differs from earlier models in a number of ways. This supplement to your operation manual describes the differences only. You will have no problem getting acquainted with your ddrum2 by reading the original manual first and studying this supplement later, since nearly all of the changes are additions, not replacements. The original manual is only incorrect in two places: Bass Drum Defeat, the extra Pan function described on page 27 now allows you to defeat several channels individually, channels 1 to 4 to be exact. And, the "Restore Factory Presets" Backup function described on page 30 is now labelled "Pr" in the display.

NEW FUNCTIONS IN BRIEF

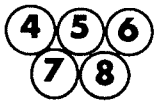
The following is a short list of what makes Model 4 differ from Model 3.

- Multipad input, for ddrum PadStation.
- MIDI Thru connector.
- "ddmini" connector for use with ddrum Performer.
- ddrum Performer metronome level adjustment on front panel.
- Channel 1-4 Defeat, removes sound channels from Mix Outputs.
- "UD" — A new MDE mode for less dynamic pad and MIDI response.
- FlashPac support, for programming your own custom SoundPacs.
- The pad response has been improved, and is now more even than before.

ddrum MULTI

This round eight-pin connector on the back of ddrum2 is for use with ddrum PadStation. Detailed information is found in your PadStation manual. Just remember, if you switch between using a PadStation and regular pads with your ddrum2, you need to readjust the Pad Input Sensitivities and possibly adjust the Trig Threshold values.

The different pads appear on the Input channels of your ddrum2 as indicated in the illustration below.



MIDI THRU

This is a regular MIDI Thru connector, which means that it "echoes" everything that ddrum2 receives via its MIDI In without any delay or modification to the data. This is used for regular MIDI Thru daisy chaining of several MIDI units.

DD MINI

If you have a ddrum Performer (Metronome and Kit Selector), you can connect it directly to your ddrum2 via this connector (the cable is included with the Performer). This has several advantages:

• The ddrum2 supplies the Performer with power, so there is no need for a separate power supply for the Performer.

• Kit Change commands are sent from Performer to ddrum2 in an internal format, making MIDI connection and adjustment between the two unnecessary. But, you may still make your ddrum2 send out up to eight MIDI Program Change messages to other equipment whenever it receives a Kit Change message from the Performer.

• The metronome click produced by ddrum Performer is also sent to the ddrum2 via the "ddmini" connector and appears in the ddrum2 headphones outlet. The click is always available in your ddrum2 when the metronome is activated, even when the Volume is turned down on the Performer. You adjust the level of the click using the Metronome Level knob on the ddrum2 front panel.

• Using the special "dd2" Stop Function setting in your Performer you get a new level of functionality from your Performer Metronome. In this mode, the metronome is as usual available from the moment you start it on the Performer. But, it is immediately shut off as soon as you hit any pad on your ddrum2. This means you have a metronome that automatically shuts itself off when you start to play after the count in.

If MIDI Clock is switched on on the Performer when it is set to "dd2" in Stop Function mode, you can even use your pads to start a sequencer or drum machine. No MIDI Start message is sent out until you hit the first pad after the count in. This allows you to have a metronome click going until you feel comfortable with the tempo. When you hit the first pad, the click is turned off and your sequencer or drum machine starts automatically, in the correct tempo. Combining this with Performers tap tempo function, you have total manual control over an entire sequencer system, just using your sticks.

METRONOME LEVEL

This knob, conveniently located on the front panel, allows you to adjust the metronome click coming in from a ddrum Performer via the "ddmini" connector on the back panel of your ddrum2. See above.

CHANNEL 1-4 DEFEAT

On previous models of ddrum2 you were able to cut out the bass drum sound from the Mix Outputs (Left and Right) allowing you to use Audio Out 1 for the Kick separately while sending all other drums to the Mix Outputs in stereo. This function has been expanded to work on Sound Channels 1 to 4 (individually), which even further reduces the need for expensive outboard mixers.

This description assumes you are reasonably familiar with editing your ddrum 2.

• Enter EDIT mode.

• Select the channel you want to remove from the Mix Outputs (Left and Right) by pressing the relevant Channel Select button (1-4).

• Press and hold the PAN button until the display switches from the current Pan value to "oF". The selected Sound Channel is now only output via its Direct Output and is not heard in the Mix.

• If you wish to remove another Sound Channel from the Mix Outputs, just select that channel and press the PAN button for a short while until the display shows "oF".

You do *not* need to separately save the Channel Defeat setting as with the normal PAN settings. If you defeat a channel from the Mix Outputs, this channel will be defeated in all Kits, and will remain defeated until you specifically bring it back to the mix as described below.

• If you press and hold the PAN button again for a sound channel that has been removed from the mix, the display will return to showing the last set Pan value, and the Sound Channel will again be heard on the Mix Outputs.

This function allows you to for example take separate signals of your bass drum, snare, and rim sound (possibly on Sound Channels 1 to 3) while still sending a stereo mix of all other sounds to the stereo outputs.

MDE-UD

Behind this cryptic abbreviation hides the possibility to make any sound channel less dynamic than it normally is.

The MDE parameter was in earlier models of ddrum2 only used to adapt the wide dynamic range of the ddrum2 to the less dynamic world of MIDI. The previous settings for this parameter was On and Off (shown as Of). In Model 4 there is a third setting, called UD (shown as "ud").This gives the Sound Channel you are editing an almost completely undynamic pad and MIDI response. Use this when an even sound is desired, e g to mimic the way bass drum and sometimes snare is played in contemporary music.

• Enter EDIT mode.

• Select the channel you want to set to MDE-UD.

• Press the SHIFT button once so that it lights up.

• Select MDE (by pressing BASS/MDE so that it lights up, since MDE is the Shift function of the BASS button).

• Turn CONTROL until the display shows "ud" (un-dynamic).

• If you wish to set another Sound Channel to a specific MDE setting, just select that channel and turn CONTROL until the display shows the correct value ("on", "oF" or "ud").

You do *not* need to separately save the MDE setting with a Kit. Once done, this setting is valid for all Kits, and remains as set until you specifically change it for that Sound Channel.

FLASHPACS

Another new feature of ddrum2 Model 4 is the ability to assemble FlashPacs with custom Banks of sounds, personal SoundPacs if you will. A FlashPac is the equivalent of a programmable SoundPac. This means that when programmed, it contains the actual sound samples needed to play back a certain sound, but not the Kit settings for it. Kit settings for FlashPac sounds are stored in internal Kit memory or in KitPac cartridges as usual.

FlashPacs can be purchased from your ddrum2 dealer. They come empty, but can easily be filled with sounds copied from regular SoundPacs. Any ddrum2 with any software later than 3.1 can read or write to a programmed FlashPac. FlashPacs are not erased by turning power off. One FlashPac has a capacity of 2 MegaBit, which translates into just below eight seconds of sound. Once the FlashPac is assembled, it is used as any SoundPac, which means that one or several FlashPacs may reside in any and all slots. Just remember this:

When you assemble (write to) a FlashPac, it must be in slot 1!

FORMATTING A FLASHPAC

A new FlashPac must be formatted before it can be used. FlashPacs that have been used before may also be formatted, which erases the contents and makes room for new sounds.

- Insert the FlashPac into Slot 1. This can very well be done while the power is turned on on your ddrum2.

- Enter EDIT mode.

- Press the SHIFT button once so that it lights up.

- Select BACKUP by pressing TREBLE/BACKUP.

- Turn the CONTROL until the display shows "FF" (FlashPac Format).

- Press and hold the COPY button for a few seconds until the display indicates that formatting has begun. The display now shows that formatting proceeds through its three stages (F, E and P). This takes approximately one minute. When the formatting is ready, the display shows – –. If there was a problem the display will show "Er" followed by a number. Refer to the list of error messages below.

COPYING A SOUND INTO A FLASHPAC

You can copy any sound in any SoundPac into a FlashPac, one at a time. One FlashPac can hold up to 20 sounds in any combination. The only restriction is that the total length of the sounds may not exceed approximately eight seconds. When you plan what sounds you are going to program into the FlashPac, please observe that you should start with the longest ones. For more information about how to organize sounds in your FlashPac, see the next section.

- Insert the FlashPac into Slot 1. This can very well be done while power is turned on on your ddrum2.

- Insert the SoundPac(s) you want to copy from, into one or more of the remaining slots.

- Enter EDIT mode.

- Select a Sound Channel with the Sound Channel Select buttons and use the SOUND parameter to make sure that channel plays the sound you want to copy to the FlashPac. The sound played by the Sound Channel with a steadily glowing green Trig indicator (the selected sound) will be copied to the FlashPac.

• Press the SHIFT button once so that it lights up.

• Select BACKUP by pressing TREBLE/BACKUP.

• Turn CONTROL until the display shows "PF" (Program FlashPac).

• Press the COPY button. The display now shows that the copying proceeds. When it is ready, "CC" (Copy Complete) is displayed, followed by a number. This number is the size of the largest available blocks of memory. Lastly, – – is shown.

If there was a problem during the copying, the display will show an error message. Refer to the list below.

• To copy another sound to the FlashPac, exit SHIFT mode, press SOUND and dial in another sound into one of the Sound Channels. Make sure this is the selected sound before you press SHIFT and TREBLE/BACKUP again. Proceed as with the first sound.

If you make a mistake during the copying (e g copy the wrong sound) you will have to reformat the FlashPac and start over again. There is no individual erasing of sounds in a FlashPac.

FLASHPAC MEMORY SIZES

As stated above, a FlashPac holds slightly less than eight seconds total. You should always start by copying the longest sounds to it. Theoretically, the total number of sounds that you can pack into a FlashPac is 20, but in practice, this number of course depends on the length of the sounds. The following list gives you a rough expectation of how much memory different types of sounds need.

Each cymbal or floor tom: approximately 1/5th of the FlashPac memory.
Each smaller tom or effect snare: approximately 1/8th of the FlashPac memory.
Each dry snare: approximately 1/16th of the FlashPac memory.
Each dry bass drum: approximately 1/32th of the FlashPac memory.

USING A PROGRAMMED FLASHPAC

A programmed FlashPac can be used as any SoundPac in any of the slots. For more information on SoundPacs in General, see pages 5 and 20 in your Operation Manual.

ERROR MESSAGES

Formatting Errors

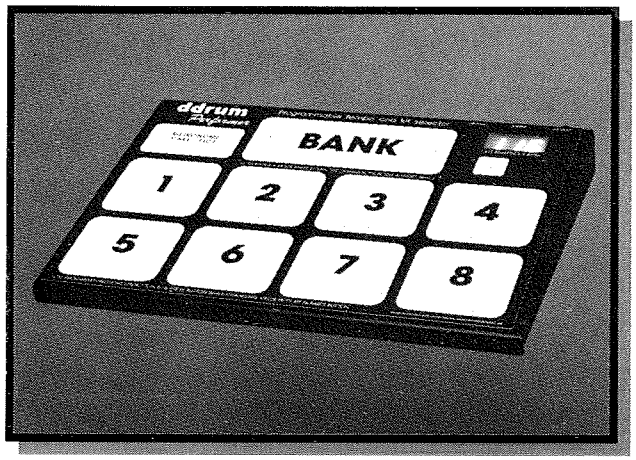
Er 1 FlashPac cartridge not found in Slot 1.
Er 2 Flash Prom not erasable (faulty Flash Prom in cartridge).
Er 3 Flash Prom not programmable (faulty Flash Prom in cartridge).

Copying Errors

nS No Sound found (in SoundPac).
FU Full, not enough room left for the sound you tried to copy (followed by a number which represents the largest available block).

ACCESSORIES:

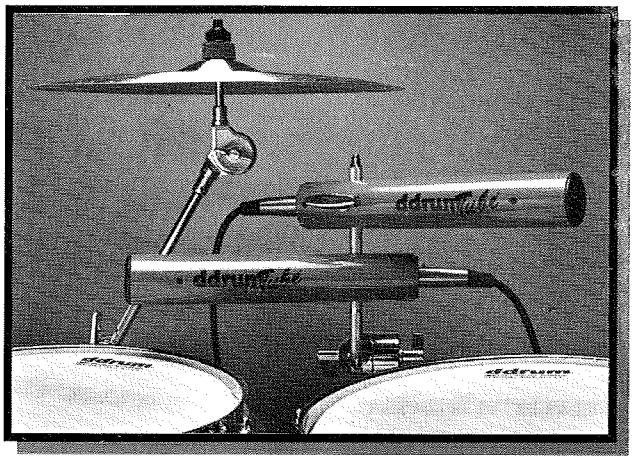
Here is a short presentation of some useful accessories to the **ddrum2**:



● ddrumPerformer

The **Performer** is a programmable metronome a n d a program switcher. Store tempo values of your choice at 128 different locations. The tempos are always retreivable with a tap of the stick. Use the **ddrumPerformer** as a count down, 4 or 8 beats or just play along to the programmable click. The **ddrumPerformer** sends **MIDI clock** to control a sequenser.

ddrumPerformer is also a clever switching device for the **ddrum2**. It allows you to change from one kit to another with a tap of the stick. Use the programmability to create your own setup with kitnumbers.



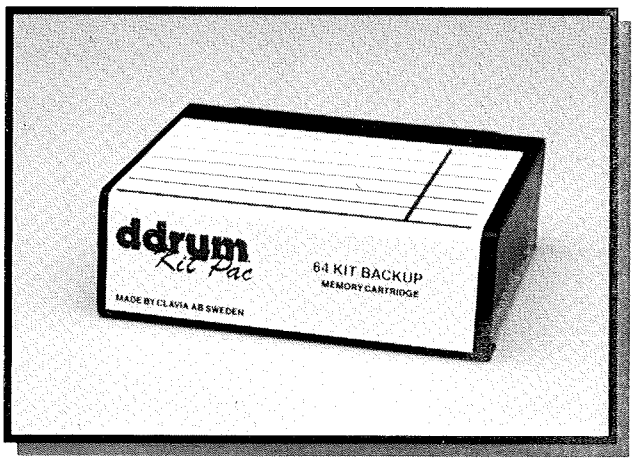
● ddrumTube

The red metal tube is great for playing hard percussive sounds like cowbells. The **ddrumTube** is very responsive and fast and it fits in perfectly among all your other drums. By using the **ddrum2** crossfade function you can assign two sounds to one tube and play typical cowbell patterns with one hand.

● ddrum SoundPac ● ddrumFlashPac

The growing sound library features hundreds of excellent sounds recorded in top studios. There are two types of **SoundPacs**: 1 Mbit that holds just under 4 seconds and 2 Mbit that holds 8 seconds of sound. Please check with your dealer for the latest list!

The **ddrumFlashPac** is special kind of **SoundPac** in which the user is able to arrange his own combination of sounds with separate sounds from the **ddrum2** soundlibrary. The **FlashPac** contains a special kind of electric erasable EPROM. Put the **FlashPac** in one of the slots and move the sounds of your choice from the SoundPacs into the **FlashPac**. All programming is easily done using the **ddrum2** brain. A **FlashPac** can hold up to 7 sec of sound.



● ddrumKitPac

This is a RAM cartridge that allows you to make a backup of all the parameter settings in all your kits but it can also be used as a scrap book. Save all your 64 kits into one **KitPac** and you still have space for a bank of eight drumkit left in the **KitPac** for temporary use.

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